

# Ottawa Light Rail Commission

Meeting No. 1  
on Wednesday, March 30, 2022



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

[neesonsreporting.com](http://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 NO. 1: TRANSPORTATION ACTION  
CANADA - DAVID JEANES  
MARCH 30, 2022

-----

--- Held via Zoom Videoconferencing, with all  
participants attending remotely, on the 30th day of  
March, 2022, 9:00 a.m. to 11:05 a.m.

-----

1 COMMISSION COUNSEL:

2

3 Kate McGrann, Co-Lead Counsel Member

4 Anthony Imbesi, Litigation Counsel Member

5

6

7 PARTICIPANT:

8

9 Transportation Action Canada:

10 David Jeanes

11

12

13 ALSO PRESENT:

14

15 Judith Caputo, Stenographer/Transcriptionist

16 Gabriel Lavoie, Virtual Technician

17

18

19

20

21

22

23

24

25

INDEX OF EXHIBITS

NUMBER/DESCRIPTION

PAGE NO.

1: E-mail dated March 29, 2022 8  
and attached Curriculum Vitae of David Jeanes.

\* \* The following is a list of documents undertaken  
to be produced or other items to be followed up \* \*

INDEX OF UNDERTAKINGS

The documents to be produced are noted by U/T and  
appear on the following pages: 10:3, 14:4, 30:2

1 -- Upon commencing at 9:05 a.m.

2

3 KATE McGRANN: Good morning,  
4 Mr. Jeanes. Thanks for joining us today.

5 By way of introductions, my name is  
6 Kate McGrann. I am one of the two co-lead counsel  
7 for the Ottawa Light Rail Transit Public Inquiry.  
8 I'm joined by Anthony Imbesi, who is a member of  
9 our counsel team. And then Judith Caputo, who you  
10 met before we started the transcript, is here  
11 transcribing the interview.

12 So before we turn to some of the  
13 questions we want to discuss with you, I just want  
14 to share some information with you about today's  
15 interview.

16 The purpose of today's interview is to  
17 obtain your evidence under oath or solemn  
18 declaration for use of the Commission's Public  
19 Hearings.

20 This will be a collaborative interview  
21 such that Mr. Imbesi, who is joining me from the  
22 counsel team, may intervene to ask certain  
23 questions as well.

24 If time permits, if you have anything  
25 you want to share at the end of the interview that

1 comes out of our questions or otherwise, you're  
2 welcome to share.

3 As we discussed before we started the  
4 transcription, this interview is being transcribed.  
5 The Commission intends to enter this transcript  
6 into evidence at the Commission's Public Hearings  
7 either at the hearings or by way of procedural  
8 order before the hearings commence.

9 The transcript will be posted to the  
10 Commission's public website, along with any  
11 corrections made to it after it is entered into  
12 evidence.

13 The transcript, along with any  
14 corrections later made to it, will be shared with  
15 the Commission's participants and their counsel on  
16 a confidential basis before it's entered into  
17 evidence.

18 You will be given the opportunity to  
19 review your transcript and correct any typos or  
20 other errors before the transcript is shared with  
21 the participants or entered into evidence. Any  
22 non-typographical corrections you request will be  
23 appended to the transcript.

24 And finally, pursuant to Section 33 (6)  
25 of the Public Inquiries Act 2009: A witness at an

1 inquiry shall be deemed to have objected to answer  
2 any question asked him or her on the ground that  
3 his or her answer may tend to incriminate the  
4 witness, or may tend to establish his or his  
5 liability to civil proceedings at the instance of  
6 the Crown or of any person, and no answer given by  
7 a witness of an inquiry shall be used or be  
8 receivable in evidence against him or her in any  
9 trial or other proceedings against him or her  
10 thereafter taking place, other than a prosecution  
11 for perjury, in giving such evidence.

12 As required by Section 33 (7) of that  
13 act, you are hereby advised that you have the right  
14 to object to answer any question under Section 5 of  
15 the Canada Evidence Act.

16 Do you have any questions about any of  
17 that commission?

18 DAVID JEANES: No, I think that's  
19 straightforward. This morning I'm not necessarily  
20 in a position to provide you with exact dates if  
21 I'm referring to occurrences. I have dates of the  
22 most significant occurrences that I will probably  
23 be talking about.

24 And similarly, if there are documents,  
25 supporting documents, that are required, I would

1 have to follow up in supplying those to you if  
2 they're documents you don't have already.

3 KATE McGRANN: Okay, that's just fine.  
4 We'll have the transcript that we can refer to that  
5 will help us follow along if there are any  
6 documents that you mention that you'd like to go  
7 look at and later come back to.

8 ANTHONY IMBESI: If I may, before we  
9 begin, I was not certain that the witness was  
10 affirmed.

11 MS. MC GRANN: No.

12 DAVID JEANES: Okay.

13 DAVID JEANES: AFFIRMED.

14 KATE McGRANN: I'm going to start off  
15 by testing myself and trying to share my screen for  
16 a second here.

17 Mr. Jeanes, what I am going to try and  
18 show you, and see if it works, is a copy of an  
19 e-mail that you sent to me yesterday in response to  
20 my request for a CV.

21 Are you looking at a copy of the e-mail  
22 that you sent to me?

23 DAVID JEANES: I am, yes, there is a  
24 typo in this I didn't spot before I sent it to you.

25 I had to tailor it somewhat to the



1 information that I thought you needed to have.

2 KATE McGRANN: That's understandable;  
3 this isn't a spelling or grammar test. I didn't  
4 notice the typo when I read it. You can point it  
5 out to us if you want.

6 DAVID JEANES: It's in the "Awards and  
7 Recognitions" section. There's a list of three  
8 items which are repeated there, and it's the second  
9 occurrence which is the correct one.

10 KATE McGRANN: Okay.

11 DAVID JEANES: But I can certainly send  
12 you an update on that. Okay, go ahead.

13 KATE McGRANN: We'll enter this  
14 transcript into evidence so that it becomes an  
15 exhibit, I guess it would be Exhibit 1 to your  
16 transcript.

17 EXHIBIT NO. 1: E-mail dated March 29,  
18 2022 and attached Curriculum Vitae of  
19 David Jeanes.

20 KATE McGRANN: I wanted to ask you a  
21 couple of questions about some of the information  
22 listed here. First of all, with respect to  
23 publications, you've noted that -- many  
24 international conference papers and journal  
25 articles.

1                   My question for you is, were any of  
2 those papers or articles relevant to the issues  
3 that you see with the Commission's mandate in  
4 relation to the Ottawa LRT Stage 1 Project.

5                   DAVID JEANES: I think probably not.  
6 The majority of the international conferences were  
7 telecommunications related, and certainly not  
8 specific to the railway or transit industry.

9                   Although I've written many newspaper  
10 articles and articles for Transport Action's own  
11 newsletter on rail-related matters, I don't believe  
12 any of those are specifically relevant to this  
13 inquiry.

14                  KATE McGRANN: Okay, and I think you've  
15 answered my next question, which was: You note  
16 here you were previously editor of Transport  
17 Action's newsletter. Anything written in that  
18 newsletter related to the Ottawa LRT Stage 1  
19 project?

20                  DAVID JEANES: Not at the time I was  
21 editor, because it was an earlier period.  
22 Transport Action has a current monthly electronic  
23 newsletter, and there have certainly been a number  
24 of articles written by various people in that  
25 newsletter that relate to Ottawa LRT.

1 I can certainly provide those if they  
2 are required.

3 U/T KATE McGRANN: That would be very  
4 helpful. So that will be our first follow up  
5 question for you, and we will follow up with you  
6 via e-mail with a list of these.

7 But if you could provide us with any  
8 editions of the Transport Action Canada newsletter  
9 with articles that touch on Stage 1 of the Ottawa  
10 LRT that are relevant to the Commission's terms of  
11 reference, that would be appreciated.

12 DAVID JEANES: Okay.

13 KATE McGRANN: Similarly, under the  
14 heading "Transportation Advocacy", you've noted  
15 here: Research and briefs to multiple Federal and  
16 Provincial inquiries on transcontinental passenger  
17 trains, high speed rail, railway policy, rail  
18 safety, etcetera.

19 What was the nature of the research and  
20 briefs that you reference here in your CV?

21 DAVID JEANES: Well, it was  
22 particularly -- as you may be aware, there have  
23 been a number of studies over the decades into the  
24 potential for high speed rail in Canada.

25 And there were, for example, hearings

1 conducted by the -- jointly by the Province of  
2 Ontario and Province of Québec in a Rapid Train  
3 Task Force.

4 I wrote briefs there addressing how  
5 other countries had approached migration to high  
6 speed rail, and how those, how those approaches  
7 might be applicable to Canada.

8 Similarly with transcontinental rail,  
9 those were hearings of the, initially the Canadian  
10 Transportation Commission, which is today the  
11 Canadian Transportation Agency. Plus various other  
12 hearings, I appeared before senate committees, for  
13 example, when rail policy was being discussed.

14 Most of those briefs were verbal, but I  
15 did do a variety of presentations and papers,  
16 either in PowerPoint form or as written reports.

17 KATE McGRANN: Okay. And I will come  
18 to the specific information that you provide about  
19 your involvement with the Ottawa LRT for a second.  
20 But with respect to the transportation advocacy  
21 otherwise, has any of that work related to light  
22 rail transit?

23 DAVID JEANES: Well, yes, it certainly  
24 has. I've been involved as, on behalf of Transport  
25 Action, as a member of the public and as a member

1 of various consultation groups for the past  
2 25 years in terms of specific inquiries, planning  
3 activities, environmental assessments etcetera,  
4 that relate to light rail.

5 So those are all on the record. In  
6 most cases I was appointed by the City of Ottawa to  
7 be a member of various advisory committees. And in  
8 two specific cases, they were appointments that had  
9 to be directly approved by council, because they  
10 were quite significant membership, for example, in  
11 the Steering Committee for the Light Rail Pilot  
12 Project in 1998, and the Advisory Committee for the  
13 Rapid Transit Expansion Study in 2003.

14 Because in that case, I was one of only  
15 two public members appointed to sit on those  
16 committees.

17 KATE McGRANN: And so let me come to  
18 your work on the Ottawa Light Rail Transit and  
19 steps that preceded Stage 1, so planning and things  
20 like that.

21 Other than in Ottawa, have you done any  
22 work with respect to light rail transit?

23 DAVID JEANES: Mostly the point of view  
24 of visiting and observing other light rail systems.  
25 During the initial planning for Ottawa light rail,

1 I visited light rail systems in Britain, in Europe,  
2 in different parts of the United States.

3 And the existing rail transit systems,  
4 which at the time were either subway or streetcar,  
5 or in case of Vancouver, sky train type of  
6 operations.

7 So I visited those, I was involved in  
8 organizing presentations by experts from those  
9 systems, to Transport Action. You know, we had  
10 meetings which featured the chief planners from the  
11 LRT in Calgary, the Toronto Transit Commission and  
12 so on, where we had interaction and I was closely  
13 involved with the experts and senior managers of  
14 those systems.

15 Also the visits included visiting  
16 control centres for LRT systems, maintenance  
17 facilities for LRT systems, again, in different  
18 cities.

19 And I could make a list enumerating  
20 those. In terms of was I involved in the planning  
21 of any of those systems? No, I did not submit any  
22 submissions with respect to planning transit in  
23 other cities.

24 KATE McGRANN: Okay. If you could make  
25 a list for us of those activities, including the

1 expert meetings, the visits that you discussed and  
2 the other work there along with dates as best you  
3 can, we'll ask you to do that as well.

4 U/T DAVID JEANES: Okay, sure.

5 KATE McGRANN: And then turning to the  
6 entry on your CV titled "Ottawa LRT".

7 DAVID JEANES: Yes.

8 KATE McGRANN: You've listed here a  
9 number of different activities, and I wonder if you  
10 would just walk us through these and provide us  
11 with a bit more detail about what your involvement  
12 looked like, the nature of the issues that you were  
13 speaking to, and any output that came from that,  
14 inputted reports, submissions, letters and things  
15 like that.

16 DAVID JEANES: Okay. So I've been  
17 involved in transit planning already for nearly two  
18 decades, particularly as an employee of Bell  
19 Northern Research and Nortel, but that was  
20 primarily working with OC Transpo, including  
21 numerous meetings between Nortel and OC Transpo  
22 senior management on bus service improvements for  
23 Nortel.

24 But my first public activity  
25 specifically related to light rail was in 1997,

1 when the Transportation Master Plan came forward  
2 for approval before the Transportation Committee of  
3 what was then the regional council.

4 And I and several other colleagues from  
5 Transport Action spoke at that meeting. We gave a  
6 coordinated presentation on the benefits of light  
7 rail for Ottawa.

8 This was building on one of the reports  
9 that had been prepared by consultants as part of  
10 the preliminary studies for the 1997 Transportation  
11 Master Plan and we actually were instrumental in  
12 convincing the Transportation Committee to vote in  
13 favour of a light rail pilot project.

14 That was actually -- at the time it was  
15 strongly opposed by cities, staff and by  
16 OC Transpo, but the Transportation Committee  
17 overruled.

18 That was subsequently a key topic in an  
19 election. And Bob Chiarelli became the regional  
20 chair for the regional municipality as a result of  
21 that election on -- in part, a light rail platform.  
22 And the commitment to light rail was part of his  
23 acceptance speech after that election.

24 Following that, I, in collaboration  
25 with city staff, planned a workshop in early 1998,



1 which was the very first public meeting to show the  
2 public what light rail was all about and how it  
3 might apply to Ottawa.

4 That workshop was held at one of the  
5 City of Ottawa community centres, the Jim Durrell  
6 Centre, and was very well attended. I and other  
7 colleagues, and although it was organized by the  
8 region municipality, a lot of the content was  
9 provided by us, by Transport Action. And I and  
10 others presented, and we mounted displays there  
11 again, showing light rail technology from around  
12 the world.

13 It was partly as a result of that that  
14 I was appointed by the regional council to be 1 of  
15 4 advisory members of the Steering Committee to  
16 implement the light rail pilot project. Two of  
17 those members were city councillors; two of the  
18 members were members of the public who had been  
19 involved in advocacy for light rail.

20 And those appointments were actually a  
21 requirement from the -- from city council, that  
22 there be external participants in the Steering  
23 Committee for the project, that it not be limited  
24 to city staff and consultants.

25 So I then participated for nearly two

1 years in regular meetings. They were half-day  
2 meetings every two weeks basically of that Steering  
3 Committee, dealing with all aspects of planning the  
4 light rail pilot project, including the  
5 participation in those meetings of the consultants,  
6 who were KPMG, and the rail consultant IBI, and the  
7 representatives of the different departments that  
8 were involved.

9 And also representatives of CP Rail,  
10 because the pilot project was being implemented in  
11 their corridor. So that was a significant thing.  
12 I won't go into more detail on that right now  
13 because obviously that was quite a while ago.

14 Subsequent to that, as I mentioned, I  
15 also received a similar type of appointment from  
16 what was then Ottawa City Council because there had  
17 been amalgamation of the different municipalities  
18 into the larger City of Ottawa.

19 And I was appointed to be -- again, 1  
20 of 4 public representatives on the Advisory  
21 Committee for a very large transit study which was  
22 conducted by the City of Ottawa, the Rapid Transit  
23 Expansion Study, which was conducted as a separate  
24 activity from the 2003 Transportation Master Plan.

25 So basically the Transportation Master

1 Plan was done without a rail component to it, and a  
2 parallel study addressed the rail strategy, which  
3 was basically how we would build on the pilot  
4 project going forward.

5 That study led to further studies which  
6 were, which I followed but in which I did not  
7 participate personally, such as the identification  
8 of the priority project as the north-south  
9 corridor, with a secondary possible project being  
10 the east-west rail corridor, which ran to the  
11 south.

12 It wasn't the present Confederation  
13 line route. It was an existing rail corridor that  
14 ran in the southern part of the City.

15 But I did follow that closely and was  
16 involved, again, as a member of various environmental  
17 assessment public advisory committees.

18 There was one environmental assessment  
19 done on the north-south line, which led to the 2006  
20 North-South Light Rail Project, where contracts  
21 were actually awarded for constructing the --  
22 basically electrifying, modernizing the north-south  
23 diesel light rail service from the pilot project  
24 and extending it through the downtown.

25 So I participated in that environmental

1 assessment. I also participated in the parallel  
2 environmental assessment for the other line, the  
3 east-west line.

4 That project at an advanced stage, as  
5 you're probably aware, was cancelled subsequent to  
6 a municipal election, and I can go in to the  
7 details of that later. But at the moment I'm  
8 really just concentrating on my personal  
9 involvement.

10 I will mention that during this whole  
11 period, Transport Action had a lot of involvement  
12 directly with different players in the rail  
13 industry.

14 Whether VIA Rail, Canadian Pacific,  
15 railway suppliers. We participated actively in the  
16 Railway Association of Canada, which brings  
17 together operating railways and railway suppliers.  
18 Attended many conferences.

19 Were involved in joint activities such  
20 as the Railway Association of Canada's Rail Days on  
21 Parliament Hill, where the representatives of the  
22 railway industry met with members of Parliament to  
23 brief them on the current progress in the rail  
24 industry.

25 So I and others of my colleagues

1 actually participated jointly with other  
2 representatives of the rail industry in those kinds  
3 of meetings.

4 So that was all happening in the  
5 background. And, in that context, we actually had  
6 quite good relations with various rail suppliers  
7 that had been on the north-south light rail  
8 project. And that included companies like  
9 Bombardier and Siemens. Siemens was the company  
10 that eventually won the vehicle contract.

11 In any case, after that project was  
12 cancelled, and there are obviously a lot of  
13 complicated politics around that, the subsequent  
14 activity was in 2007, which was the formation of a  
15 task force under Mayor Larry O'Brien that was  
16 chaired by the former Transport Minister David  
17 Collenette.

18 And that was take to a comprehensive  
19 look into the future of rail transit for Ottawa.

20 That study was conducted by a panel, a  
21 number of people on the panel where they came from  
22 different sectors, one from the taxi industry, one  
23 from Transport Action, as it happened, not me, and  
24 also other people.

25 I think, in any case, during the

1 deliberations of that task force, I did submit a  
2 brief to them, and I met with them on two occasions  
3 to provide input, suggestions, perspective.

4 That study led to the recommendation of  
5 a downtown tunnel, and that study is available,  
6 slightly different from what the Confederation line  
7 evolved to.

8 Because it was proposing a tunnel that  
9 would be similar to transit systems that had been  
10 constructed in European cities such as Munich and  
11 Frankfurt, which were essentially heavy rail  
12 tunnels that would allow existing surface rail  
13 lines to actually feed into the city centre.

14 What that proposal recommended was more  
15 like something like the GO Transit network in  
16 Toronto, based on existing rail lines or rail  
17 corridors in the Ottawa area that would have all  
18 come together in a tunnel under downtown.

19 So although it was the genesis of the  
20 rail tunnel concept, it wasn't what was actually  
21 built. But I was not a member of that task force,  
22 I only provided input to it through submission and  
23 through meetings.

24 Subsequent to that, the actual planning  
25 for the downtown transit tunnel included an

1 environmental assessment, and I was a member of one  
2 of the advisory committees, public advisory  
3 committees for that assessment.

4 Each of these EAs had generally  
5 multiple advisory committees. One representing  
6 public community associations etcetera, one  
7 representing business associations, and one  
8 representing people with professional involvement  
9 in transportation planning.

10 I participated for a while in the  
11 public ones, but then by agreement with the City of  
12 Ottawa I transitioned to be a member of the -- what  
13 they call the agency consultation groups, which  
14 included representatives from organizations like  
15 Hydro Ottawa, Rideau Valley Conservation Authority,  
16 OC Transpo, different government agencies, National  
17 Capital Commission, etcetera.

18 And I have continued since then to  
19 participate in multiple environmental assessments  
20 on transportation planning as a member of those  
21 agency consultation groups, rather than as a member  
22 of the public consultation group.

23 I'm going on. Interrupt me if you want  
24 to ask me any questions as I --

25 KATE McGRANN: I have one question and

1 it's with respect to the 2007 task force that you  
2 told us about, where you said that you weren't on  
3 the task force but you submitted a brief, and I  
4 believe made some submissions.

5 What was the topic of the brief that  
6 you submitted?

7 DAVID JEANES: It was actually a  
8 proposal for a light rail tunnel -- light rail, in  
9 fact, rather than heavy rail underneath Queen  
10 Street.

11 So very similar to what actually got  
12 built except that it was based more on what  
13 Vancouver was doing on Granville Street in  
14 Vancouver, which was building light rail only a  
15 short distance below the surface rather than a deep  
16 tunnel.

17 And so there were -- I mean, there were  
18 other examples, but basically what I provided was  
19 an outline of what a light rail service under Queen  
20 Street could look like.

21 And the task force did not adopt what I  
22 submitted, at least not exactly, because, as I  
23 said, they went for more of what I would classify  
24 as a heavy rail tunnel than light rail.

25 KATE McGRANN: Okay. And I recognize



1 that this question may not be possible, but if  
2 possible, could you briefly summarize for us the  
3 benefits of the shallow, I'll call it, light rail  
4 tunnel that you were proposing in that brief.

5           DAVID JEANES: Well, the advantage of  
6 it is that you don't have the requirement for such  
7 deep elevators and escalators. People movement is  
8 easier. It was partly based on a concept which I  
9 had observed working very effectively in Tokyo,  
10 where, under the Ginza, there is a sequence of  
11 subway stations with a mezzanine above.

12           The mezzanine is essentially a walking  
13 roof that parallels the entire subway line. So  
14 that basically what happens is every station you  
15 get on or off at, you can actually walk from there  
16 to the next station and therefore exit at any block  
17 along the Ginza.

18           You don't end up with everybody pouring  
19 out of one set of stairs at one intersection and  
20 then nothing for the next half kilometre.

21           So the Ginza one was kind of extreme.  
22 But what I was looking at was the possibility in  
23 Ottawa of having something like that, either linked  
24 into the existing buildings on the south side of  
25 Queen Street, which had internal pedestrian

1 malls, there were quite a number.

2 So that basically you would have a sort  
3 of a continuous indoor pedestrian walking route all  
4 the way from Elgin Street essentially to Lyon  
5 Street, taking advantage of existing buildings.

6 Because there were many buildings  
7 particularly on the south side, the World Exchange  
8 Plaza, the Place de Ville and various other  
9 buildings that could have been integrated.

10 And at the same time, the stations  
11 would typically be at intersections. So that, as  
12 is quite common in Toronto or in Edmonton, when you  
13 get off at a station you can actually choose which  
14 corner of the intersection you wish to exit at,  
15 which minimizes the requirement for pedestrians to  
16 be crossing the street in large numbers.

17 And those ideas were not adopted in the  
18 system that has been built. In general, you know,  
19 even where there were multiple exits from a  
20 station, they didn't have any downtown stations  
21 where all four corners were provided some access to  
22 the underground.

23 I've strayed a little bit away from the  
24 question, but there were other issues which  
25 obviously I wasn't dealing with directly which were

1 things like the buried utilities, which proved to  
2 be a rather massive problem in the construction of  
3 the LRT.

4 And that's primarily because in Ottawa,  
5 most of those buried utilities were very old, and  
6 many of them life-expired anyway. And so it was  
7 kind of a complex situation, and some of what I  
8 proposed might have been difficult to achieve, but  
9 in retrospect probably not more difficult than the  
10 amount of work they eventually had to do anyway,  
11 basically rebuilding most of that infrastructure.

12 During the project, Queen Street --  
13 although they were digging a deep tunnel, Queen  
14 Street was actually closed for many, many months  
15 during that project, during the project.

16 KATE McGRANN: Now, I took you away  
17 from what you had been discussing and I'll take you  
18 back there, which was your involvement in Ottawa  
19 LRTC.

20 You had been speaking, before I asked  
21 you that specific question, I think, about your  
22 involvement in public consultation and agency  
23 consultation, subsequently groups going forward.

24 Was there anything else you wanted to  
25 add about your work in that respect?

1                   DAVID JEANES: Well, I haven't listed  
2 all of them, and it would take a bit of work for me  
3 to go back and review all of them. But obviously  
4 the principal one was the downtown transit tunnel  
5 environmental assessment. So I participated in  
6 that throughout.

7                   But there have been many other  
8 environmental assessments that were related and  
9 that did potentially include rail components.

10                  KATE McGRANN: Okay.

11                  DAVID JEANES: For example, for Stage 2  
12 and Stage 3 there were other environmental  
13 assessments extending the plan out to Moody Drive  
14 in Stage 2, for example, and Baseline Road. And  
15 then extending out to Stittsville, basically in  
16 Stage 3.

17                  And so I participated as well on an  
18 advisory basis in those environmental assessment  
19 agency consultation groups.

20                  And then other ones which were partly  
21 rail-related, going south, south-west transit way  
22 extension into Barrhaven and the environmental  
23 assessments eventually looking at conversion of  
24 that to light rail.

25                  The most recent one has involved

1 extending light rail south from the Baseline  
2 Station down into Barrhaven, with new grade  
3 crossings of the VIA Rail line, Fallowfield Road,  
4 etcetera. And so I participated in that.

5 Similarly, there were other specific  
6 environmental assessments for the hospital corridor  
7 in the east end of Ottawa, which was originally  
8 considered as a potential light rail route, and the  
9 southeast transit way extension, which was looked  
10 at both as bus and rail, but was eventually decided  
11 to remain as a bus transit way project. And that's  
12 the one that roughly follows Innes Road in the east  
13 end.

14 As I said, I haven't covered every  
15 single one because there have been many, many of  
16 them. And some I've only monitored. I've been  
17 invited to be on an agency consultation group, but  
18 particularly if there wasn't a rail component to  
19 it, I didn't necessarily participate. But I  
20 generally remained on the distribution list for  
21 these activities.

22 KATE McGRANN: I'm going to stop  
23 sharing my screen now or try to at least, okay.

24 So thank you for sharing all of that  
25 information, I'm going to turn now to some

1 questions about Transport Action Canada.

2 I have some questions about its  
3 structure and its membership. So who are the  
4 current board members of the group?

5 DAVID JEANES: The Board currently --  
6 do you want to give you actual names right now?  
7 The Board is composed of members from across  
8 Canada. Transport Action, I should say, is a  
9 registered charity, and it is a Canadian  
10 not-for-profit corporation. It was founded in  
11 1976, and it has been a registered charity for  
12 almost all that time.

13 It's governed by a Board of Directors.  
14 Currently the Board of Directors has 12 people on  
15 it. Two are from Nova Scotia, one is from New  
16 Brunswick, one is from Québec, three are from  
17 Ontario, one is from Manitoba, and one is from BC.  
18 And hang on just a second. Sorry, two are from BC.

19 Do you need me to give you the names?  
20 The names are on the record. They're available  
21 both from Canada Revenue Agency's website and from  
22 Corporations Canada's website, and I can give you  
23 that full list.

24 KATE McGRANN: If you can give us the  
25 full list after the interview, that would be just

1 great.

2 U/T DAVID JEANES: If you wish, I could  
3 give you the names right now.

4 KATE McGRANN: No that's okay, you can  
5 provide it afterwards.

6 So it's governed by a Board of  
7 Directors, and then are there members of the Board  
8 as well?

9 DAVID JEANES: Yes, the Board of  
10 Directors is elected by the membership at an Annual  
11 General Meeting. And the membership is members  
12 across the country currently, approximately, 235  
13 members across the country.

14 And the membership numbers tend to  
15 fluctuate. They tend to be higher when it's an  
16 issues-oriented organization and membership tends  
17 to increase when there is a particularly a national  
18 issue.

19 Transportation Action Canada is  
20 affiliated with regional organizations in different  
21 parts of the country. So there's a regional  
22 organization that's an affiliate in Atlantic  
23 Canada, in Québec, and in British Colombia and in  
24 Ontario.

25 And each of those regional

1 organizations is separately incorporated, either as  
2 a provincially regulated association or as a  
3 not-for-profit corporation.

4 KATE McGRANN: To your knowledge, is  
5 the Ontario related regional organization engaged  
6 at all with the Ottawa Stage 1 Light Rail Transit  
7 Project.

8 DAVID JEANES: Well, they are, because  
9 I actually do sit on the Board of Transport Action  
10 Ontario as well. And a lot of the activity of  
11 Transport Action Ontario has been focused on the  
12 Greater Toronto, Hamilton area, southwestern  
13 Ontario. Also there are active groups in different  
14 parts of Northern Ontario.

15 So the organization has a number of  
16 focused areas, and Ottawa is certainly one of them.

17 KATE McGRANN: Can you just describe to  
18 me generally, how Transport Action Canada and  
19 Transport Action Ontario go about the work that  
20 they have done on Ottawa Stage 1 LRT?

21 DAVID JEANES: Yes. Going back to the  
22 first activity that I mentioned since 1997, we have  
23 generally, through multiple people living in the  
24 Ottawa area or with an interest in the Ottawa area,  
25 produced submissions to meetings of the city's



1 Transit Commission, or Transportation Committee.

2 Transportation Committee deals mainly  
3 with infrastructure matters; the Transit Commission  
4 deals mainly with operational matters.

5 And we have been there, not just me,  
6 though I have presented many times at those  
7 meetings, and those generally are five-minute oral  
8 presentations. Sometimes accompanied by a written  
9 brief or PowerPoint presentation. And quite a few  
10 of our local members have made such presentations  
11 from time to time.

12 We've also interacted with the media,  
13 media interviews, OpEd articles and so on, related  
14 to transit.

15 And then also, from time to time,  
16 specific meetings with city bureaucrats.

17 For a period during the planning, the  
18 North-South Light Rail Project, the one which was  
19 cancelled and the subsequent planning for the  
20 downtown transit tunnel, I used to meet every two  
21 weeks with the general manager of planning for the  
22 City of Ottawa, just to go over issues and  
23 concerns.

24 And I've had many, many meetings with  
25 members of city staff in the planning department

1 over the years.

2 And those meetings have often involved  
3 other local members of Transport Action. I should  
4 say the way Transport Action Canada works, most of  
5 our members are actually members of both the  
6 regional association and the national organization.

7 KATE McGRANN: Okay. And how do your  
8 members organize the work that they have done with  
9 respect to Stage 1 of the Ottawa Light Rail  
10 Transit?

11 I'll give you an example of what I  
12 mean. For example, was a committee struck, are  
13 working groups organized? How do you go about  
14 doing the work that you do?

15 DAVID JEANES: Yeah, so we have, from  
16 time to time, had specific subworking groups. We  
17 put together a proposal back in 2006 for a  
18 significant change that we proposed to the  
19 North-South Light Rail Project.

20 And that involved four of our members,  
21 essentially working as a committee and producing  
22 the brief, which was then subsequently released to  
23 the media and actually had a significant citywide  
24 impact in the run up to the 2006 election.

25 Our local members with an interest in

1 transit meet regularly. We do, in fact, have a  
2 weekly Zoom meeting where we go over these issues  
3 and what we're working on.

4 In between those meetings we generally  
5 work by e-mail exchange when we're collaborating on  
6 preparing briefs or submissions or articles.

7 KATE McGRANN: Okay. The focus of the  
8 Commission, as you know, is the commercial and  
9 technical circumstances that led to the breakdowns  
10 and derailments on the Stage 1 project.

11 You mentioned a minute ago attending  
12 meetings with both city staff and others. Would  
13 any of those meetings have touched on topics that  
14 are relevant to the Commission?

15 DAVID JEANES: I would say yes. One of  
16 the most important ones was the technology forum  
17 which was held in June of 2009, and I think in one  
18 of my previous communications with you I had the  
19 wrong year for that; I said 2007.

20 But that was an event organized by the  
21 City of Ottawa in preparation for the decision to  
22 go with light rail as their technology.

23 And it was a fairly large scale  
24 conference which was held for an invited audience,  
25 but with representatives from transit systems

1 across the country, including Toronto Transit  
2 Commission and Calgary Transit and so on.

3 A number of presentations were given;  
4 city staff were there and other invited  
5 stakeholders, including myself, were there. That  
6 was then followed up with an abbreviated public  
7 presentation where the public didn't get to hear  
8 all of the presentations that had been given by the  
9 experts from other cities, but they basically got a  
10 summary version presented by OC Transpo and by the  
11 City's transportation planners.

12 But that forum was very significant,  
13 because it really was dealing with the question of  
14 what kind of rail transit system Ottawa should  
15 have?

16 Should it be a subway or a metro?  
17 Should it be a light rail and some aspects, how the  
18 stations should be designed, how it should be  
19 operated, a whole number of things like that.

20 And there was various advice given that  
21 came from the other cities about things to avoid,  
22 such as underbuilding the system at the beginning,  
23 designing platforms that were too short, having  
24 systems that were not, you know, where the speed of  
25 operation wasn't really high enough to provide a

1 good transit service.

2 There was advice on vendor selection  
3 for vehicles that came, the importance of choosing  
4 proven robust technology and particularly  
5 understanding how the users want to access the  
6 system.

7 A lot of discussion went on about  
8 specific climate requirements at that forum, and  
9 then there was also discussion about the problem of  
10 transitioning from an existing very high capacity  
11 bus rapid transit system, which was fairly unique  
12 for Ottawa.

13 The other cities had mostly built up  
14 their transit over many years. Toronto, for  
15 example, since the mid 1950s. So the TTC subway  
16 and related transit had evolved, whereas Ottawa was  
17 going to be a -- you know, jumping into the water  
18 at the deep end basically, where we already had a  
19 heavily loaded transit system.

20 So there were also presentations by  
21 manufacturers, so various vehicle manufacturers  
22 were present at that technology forum: Alstom,  
23 Bombardier, Kinkisharyo, which was a Japanese  
24 company providing light rail transit vehicles  
25 particularly for Dallas, Texas, for example, and

1 other cities.

2 That was a pretty important forum and I  
3 participated in it, and I had lots of discussions  
4 with Ottawa city staff around that event. And it  
5 did deal with many issues which subsequently were  
6 significant in the way that the Confederation line  
7 was built, and the transition from bus rapid  
8 transit to light rail transit.

9 KATE McGRANN: Okay. From that forum,  
10 particularly with respect to the advice that other  
11 cities and organizations provided about risks and  
12 how they could be avoided, so you mentioned  
13 underbuilding, operational speed not being high  
14 enough, and you listed a number of others.

15 Any pieces of advice that you can  
16 recall that you don't feel were followed in the way  
17 the City went about implementing Stage 1 of the  
18 LRT?

19 DAVID JEANES: Well, I think the  
20 strongest message that came was choosing technology  
21 that is proven, robust and meets the needs.

22 My perspective is that we didn't  
23 actually follow that route. We ended up trying to  
24 be leading edge on technology, and in fact, going  
25 to designs that were significantly different from

1 anything that was currently in use at the time.

2 And that was for a variety of reasons.

3 So one was the decision which was made and was  
4 ratified by the City Council shortly after that  
5 forum, to adopt light rail technology rather than  
6 metro technology. Because that essentially led to  
7 the need to find a light rail vehicle that exceeded  
8 the performance characteristics of anything that  
9 existed at the time.

10 So the City of Ottawa actually built in  
11 requirements for characteristics like 100 percent  
12 low floor for accessibility for its vehicles, even  
13 though the industry standard at the time was  
14 essentially 70 percent low floor.

15 Which meant at the front and backs of  
16 light rail vehicles you can still have a high  
17 enough floor to have the necessary equipment  
18 underneath the floor.

19 Whereas going 100 percent low floor,  
20 which was a technology that was being developed for  
21 streetcar systems, which, of course, have to be  
22 boarded from the sidewalk, they ended up  
23 essentially having to go with a design which was  
24 quite new. And therefore, not meeting that  
25 requirement of being proven and robust.

1                   And I think that's significant. And  
2 I'm not talking about the ability of any particular  
3 manufacturer to deliver a vehicle that met the  
4 requirements. I'm actually talking about the  
5 requirements themselves.

6                   Because certainly that was an area that  
7 was being explored and developed for streetcar type  
8 systems, but the decision for Ottawa to go with  
9 light rail vehicle technology for what, in terms of  
10 capacity requirements, was essentially a heavy  
11 metro, was, I think, a fundamental problem and  
12 advice from that technology forum that wasn't  
13 followed.

14                   KATE McGRANN: Along those lines, any  
15 other advice from the technology forum that you can  
16 recall that you feel wasn't followed that's related  
17 to the commercial and technical circumstances that  
18 led to the Stage 1 breakdowns and derailments?

19                   DAVID JEANES: Well, I guess one  
20 message, and this was actually the number one  
21 message that was summarized by OC Transpo's General  
22 Manager, Alain Mercier, at the public session, was  
23 that in many cities the capacity of their initial  
24 system design was not enough.

25                   The message is: Don't underbuild. And



1 I'm afraid that subsequently what we did was, we  
2 built too close to the capacity that was going to  
3 be there almost from day one.

4 The message certainly came throughout  
5 the implementation again and again from  
6 John Manconi, the subsequent general manager of  
7 OC Transpo, that we were building a light rail  
8 system that from day one would have the heaviest  
9 rider ship in light rail system in North America.  
10 That should have been a red flag, I think.

11 What happened was when we went into  
12 service, we went into service with barely enough  
13 vehicles to operate the planned frequency when  
14 nothing went wrong. When anything went wrong, we  
15 were over the line in terms of having the capacity  
16 to handle the existing demand.

17 So, for example, whenever we had a  
18 disabled train, we would be going to single line  
19 infrequent operation on certain parts of the  
20 system, and the system capacity would be  
21 dramatically dropped below what was already, you  
22 know, sort of barely enough to handle the  
23 ridership.

24 The trains were crowded to the doors  
25 from day one and that certainly led to a lot of the

1 door problems which plagued the system in the early  
2 days.

3 And so I think that what happened was  
4 that it was designed to be just enough, but not --  
5 but not more.

6 -- INTERRUPTION IN THE MEETING --

7 Anyway, sorry about that phone ringing.  
8 Anyway, so I think that was the key system.

9 Just to go back to that, there were  
10 various things -- you did talk on your list about  
11 value engineering. And I think that there were  
12 some value engineering decisions that were made  
13 later on that, again, brought the design capacity  
14 of the system down from what it might have been.

15 One, for example, one planned passing  
16 siding was eliminated to save costs between Hurdman  
17 and Tremblay Station. That passing siding could  
18 have made in fact a significant difference in  
19 providing better fallback in case of failures.

20 The general opinion that we have is  
21 that the system was not designed with enough  
22 crossovers to support the times when you would have  
23 to go to single track operation on certain parts of  
24 the system.

25 For example, there's a stretch on the

1 west end which is nearly 3 and a half kilometres  
2 with no crossovers, so that really limits the  
3 overall capacity of the system whenever there is a  
4 disabled train at one of the stations.

5 And those seem to have been cost saving  
6 measures that brought the system capacity down to  
7 be barely enough to handle the demand even when  
8 everything was working, and not enough when there  
9 was any kind of failure.

10 The decision was made to require a  
11 certain number of vehicles to operate the system,  
12 and that was based on mainly considering the number  
13 of vehicles that had to be in service, plus the  
14 number of vehicles that had to be in maintenance.

15 But there wasn't any allowance for  
16 vehicles that would be taken out of service because  
17 of incidents.

18 So that when you lost a vehicle for a  
19 protracted period of time, for example, because of  
20 the wheel cracks that were detected in 2020, July  
21 of 2020, there were no longer enough vehicles to  
22 meet the original plan, because the original plan  
23 had only allowed those two factors: Vehicles in  
24 service and vehicles in maintenance.

25 And in order to have adequate fallback

1 in case of failures, they probably should have  
2 planned for more vehicles than they did. Because,  
3 again, they were designing for the expected  
4 capacity rather than in excess of the expected  
5 demand, rather.

6 KATE McGRANN: I would like to start  
7 now to some questions about observations you've  
8 made about technology choices and planning  
9 decisions to the extent we haven't covered them  
10 already.

11 Before I do, I just want to give my  
12 colleague Mr. Imbesi an opportunity to ask any  
13 follow up questions he may have at this time.

14 ANTHONY IMBESI: Just one question, Mr.  
15 Jeanes, and I think this will probably be addressed  
16 to a certain extent in some further questions.

17 When you were talking about that  
18 original public meeting that you said was critical,  
19 was anything discussed at that time about the  
20 tunneling, or was that more focused on technology  
21 and planning generally?

22 DAVID JEANES: I think at the time that  
23 the 2009 technology forum was held, it was pretty  
24 clear that it was going to be a tunnel.

25 There had been -- the 2008

1 Transportation Master Plan had basically looked at  
2 different operations for getting transit through  
3 downtown Ottawa, but the idea of a surface route  
4 had largely been dismissed at that point, partly  
5 because of opposition from downtown businesses.

6 There was a business coalition on  
7 Albert and Slater Streets which was strongly  
8 opposed to putting in a surface light rail line on  
9 those streets. And that coalition actually had a  
10 fair bit to do with the decision in 2006 by City  
11 Council to cancel the project.

12 So that coalition was strongly in  
13 favour of a tunnel. As I mentioned, the 2007 study  
14 that was done by the task force led by David  
15 Collenette had recommended a tunnel, albeit a  
16 somewhat different type of tunnel.

17 And so when that technology forum was  
18 held, we were really looking at what technology  
19 would be appropriate for operating what essentially  
20 was a subway under downtown Ottawa.

21 Does that answer your question?

22 ANTHONY IMBESI: Yes, thank you.

23 KATE McGRANN: Okay. So why don't we  
24 carry on on the theme on the topic of the tunnel.

25 You've made some observations that

1 we've seen in the media, in particular, asking  
2 about whether after some studies were done that  
3 indicated deeper bedrock than anticipated, and poor  
4 soil conditions, whether the plans for the tunnel  
5 should have been reevaluated.

6 Can you speak to us about those  
7 concerns that you expressed in a bit more detail?

8 DAVID JEANES: Yeah, a lot of --  
9 digging tunnels under Ottawa is not impossible.

10 The Federal Government constructed a  
11 very large tunnel, basically the full length of  
12 Wellington Street, as a service corridor for  
13 providing steam heat and other facilities from the  
14 Cliff Heating Plant, which is west of the Supreme  
15 Court, all the way through downtown Ottawa.

16 And certainly the construction of that  
17 tunnel, I don't know whether any of the technical  
18 details about it were available, but it was a  
19 massive tunnel effort that happened a few decades  
20 ago from excavation point in front of the Supreme  
21 Court. And so tunneling in Ottawa's downtown  
22 bedrock was understood.

23 It was also understood that there were  
24 areas where the bedrock didn't exist. Particularly  
25 near Rideau Street, where the major sinkhole

1 happened, it was known that the soil there was very  
2 unstable, and that therefore a lot of precautions  
3 would have to be taken tunneling through it.

4 It wasn't known that similar conditions  
5 also applied in another area along Waller Street  
6 nearer to where the east portal of the tunnel  
7 happened, where another smaller sinkhole happened  
8 earlier in the project.

9 But certainly there was a lot of test  
10 drilling that was done over an extended period to  
11 examine those soil conditions and the -- but we  
12 didn't really have, from the public perspective,  
13 and even from the perspective of City Council, we  
14 didn't really have a perspective into how the  
15 tunnel planning was being done.

16 At one point, 1997 City Council treated  
17 this as a very important issue and they actually  
18 passed a motion requiring that -- this was a little  
19 earlier in the project, but requiring that a  
20 company with extensive tunneling experience had to  
21 be a major partner in the first project, which was  
22 the tunneling project that was cancelled in 2006.

23 Sorry, the 2006 was surface light rail.  
24 Sorry. But there was a later stage where City  
25 Council was very concerned about that.

1                   But, in fact, we never met with and  
2 never heard public presentations from tunneling  
3 experts; all of that was really done internal to  
4 the construction consortium. So you know, although  
5 the tunneling experts and certainly the company  
6 that was involved, my understanding is had very  
7 extensive experience with tunneling. But there  
8 wasn't much visibility or transparency to those  
9 kinds of issues.

10                   So, for example, the decision to go  
11 with a device called a "roadheader" to basically  
12 mine out the tunnel, rather than using a tunneling  
13 shield, that was quite revolutionary for Canada.

14                   Most other tunnels in other cities  
15 including fairly recently had been built by  
16 tunneling shields. For example, the Canada line in  
17 Vancouver passing under the city centre and under  
18 Burrard Inlet was done with a tunneling shield.

19                   The extension of the Montréal Metro to  
20 Laval in the north, had been done with a tunneling  
21 shield.

22                   Most of the Toronto subway extensions,  
23 whether the Sheppard line, or the extension under  
24 York University and up into Vaughan in Toronto,  
25 those were all done by tunneling shields. So there



1 was a lot of experience there.

2 That approach to tunneling can deal  
3 with the problems where you transition from hard  
4 rock into unstable soil, but it requires, you know,  
5 the appropriate equipment to do that, and it's not  
6 unknown for major issues to happen in other  
7 countries.

8 The main north-south rail line in  
9 southern Germany was taken completely out of  
10 service when the excavation -- when there was a  
11 total collapse of the ground around the tunneling  
12 shield where they were building a high speed rail  
13 tunnel in southern Germany.

14 And that caused massive problems, far  
15 greater economic disruption than we had from the  
16 Rideau Street sinkhole, for example.

17 So it's not unknown for tunneling  
18 problems to happen, or for there to be failures.

19 But again, we don't know exactly what  
20 were the reasons why the different approach of  
21 mining out the tunnel with these roadheader  
22 machines was adopted rather than using a tunneling  
23 shield approach, which was perhaps better  
24 understood, and that we had more experience with in  
25 Canada.

1                   But I'm not an expert in tunneling  
2 matters. As I said, there was really no public  
3 exposure of the planning that led to those  
4 decisions by the contractor.

5                   KATE McGRANN: Okay. A couple of  
6 follow up questions on that.

7                   So you had said that it was known that  
8 the soil was unstable around Rideau Street; how was  
9 it known?

10                  DAVID JEANES: It's part of the geology  
11 of Ottawa, and it's also -- certainly, it was fully  
12 documented during the planning process, that the  
13 alignment in the depth of the tunnel and the  
14 placement of stations and so on, had to take into  
15 account those geological features. And of course  
16 it was confirmed by the testing.

17                  You know, I can't say -- you know,  
18 there has never been a public inquiry into the  
19 Rideau Street tunnel collapse, and I believe  
20 there's still litigation going on between the City  
21 of Ottawa and the contractors over that.

22                  There have been conflicting reports  
23 produced by the two parties on what the reason was.  
24 You know, what came first? Did the excavation of  
25 the tunnel cause the sinkhole, or did the sinkhole

1 happen for other reasons and flood the tunnel?

2 But in either case, it was a  
3 catastrophic circumstance. I believe, although I'm  
4 not certain, that they lost two of their three  
5 roadheader machines as a result of that incident  
6 and fortunately they were fairly close to  
7 completing the tunnel.

8 But they had to complete the rest of  
9 the tunnel with only one of the road headers  
10 operational. And those are very expensive pieces  
11 of equipment. So you know, that was somewhat  
12 catastrophic.

13 But certainly the need to take  
14 precautions at that particular point in the  
15 tunneling were well understood.

16 KATE McGRANN: Just to make sure I've  
17 covered off what you've described. So generally,  
18 as a result of information that's available about  
19 that part of Ottawa and then also specifically as a  
20 result of studies and other work done as part of  
21 the planning process?

22 DAVID JEANES: Yes, that's true.

23 KATE McGRANN: You mentioned in a  
24 CTV article that you referenced other projects in  
25 Ottawa where there were issues I think as examples

1 of why this should have been an area where caution  
2 was exercised.

3 First of all, do you know what I'm  
4 talking about when I say that?

5 DAVID JEANES: No, I'm not certain what  
6 that reference was to.

7 KATE McGRANN: Okay.

8 DAVID JEANES: Over the years, there  
9 have been various infrastructure issues in Ottawa,  
10 but I'm not sure that they would classify as  
11 similar to that.

12 We've certainly have had other  
13 sinkholes. We've had some very large sinkholes,  
14 certainly big enough to swallow a car.

15 One that happened on Highway 174, which  
16 is the freeway, city-owned freeway east of the  
17 City, a very big sinkhole that basically took away  
18 a whole block of Gladstone Avenue in a popular  
19 built up area in the west end.

20 We've had many of these sinkholes have  
21 related to water main failure or drainage problems,  
22 or things like that.

23 We lost a railway line that connected  
24 Ottawa north up the Gatineau Valley because of a  
25 massive washout of rail bed that occurred because

1 of drainage issues.

2 So over the years there have been many,  
3 many issues related to that. I think that is one  
4 reason why there was a question of whether the  
5 Rideau Street sinkhole had been caused by the  
6 failure of a water main, or was the water main  
7 broken as a result of the collapse into the tunnel?

8 So those are questions which perhaps  
9 haven't been answered and I'm not competent to  
10 judge what the answer is there.

11 KATE McGRANN: Okay. I'm going to move  
12 away from questions about the tunnel and the  
13 sinkhole, but before I do, Mr. Imbesi, do you have  
14 any follow up questions on those topics?

15 ANTHONY IMBESI: No, I don't, thank  
16 you.

17 DAVID JEANES: Perhaps I could offer  
18 two things. One of the things was, there were  
19 other issues, of course, with the tunnel that  
20 happened.

21 One of the biggest problems was the  
22 fact that a sanitary sewer was punctured during  
23 some of the surface level work and resulted in the  
24 groundwater becoming contaminated.

25 And because the tunnel is not water

1 tight, it's actually designed to allow groundwater  
2 to enter the tunnel and be pumped out, as a result  
3 you've had a persistent sewage smell since the  
4 opening of the system.

5 And at other points the rock bolts that  
6 were being used to secure the wall of the tunnel  
7 actually punctured the walls of the parking garage  
8 that were adjacent to the route being followed.

9 So there were other mishaps that  
10 occurred during the construction of the tunnel. It  
11 wasn't only the Rideau sinkhole and Waller  
12 sinkhole; there were other issues as well that  
13 occurred as well during the tunnel construction.

14 And whether that's to be expected or  
15 not, and whether something could have been done to  
16 prevent that happening, is hard to say. But they  
17 certainly have led to some residual problems with  
18 the tunnel. It's not really a finished product.

19 KATE McGRANN: Okay. Are there other  
20 technology choices that were made with respect to  
21 the Stage 1 of the LRT that may be related to the  
22 breakdowns and derailments that you observed?

23 DAVID JEANES: Yes, so a couple here.  
24 I mentioned already the 100 percent low floor,  
25 which necessitated the design of a new bogie, the

1 bogie or truck, you know, being the assembly that  
2 contains the wheels, the axles, the motor, the  
3 gearbox and brakes and so on.

4           Ottawa's requirements were quite  
5 complex for that because they also, to meet  
6 accessibility needs, required an innovation that  
7 didn't exist on any streetcars, which was that the  
8 system had to be automatically leveling, so it  
9 would always be exactly the same level as the  
10 station platforms.

11           That feature didn't exist in the bogies  
12 that were currently available. So a new bogie had  
13 to be designed by Alstom called the Iponam bogie.  
14 And, in fact, it was a new patent and developed  
15 specifically for North America, in fact, for Ottawa  
16 as the first customer for it.

17           So that introduced a lot of complexity,  
18 on top of which Ottawa also imposed the requirement  
19 that the vehicle be capable of speed of 100  
20 kilometres an hour.

21           At the time, most light rail vehicles  
22 were designed for a top speed of 80 kilometres an  
23 hour. So this was an additional technology  
24 challenge that had to be met.

25           Although the vehicles have been tested

1 to 100 kilometres per hour, they are not actually  
2 using that speed. Their maximum speeds are really  
3 approximately 80 kilometres per hour.

4 So the question is whether that  
5 specification that was a requirement from the City  
6 of Ottawa was actually necessary.

7 I think probably what motivated it was  
8 that the light rail line was replacing buses which  
9 had a normal operating speed of 100 kilometres per  
10 hour.

11 It was kind of hard to imagine that  
12 you'd replace your main transit system with  
13 something that was 20 percent slower. So that may  
14 have been the reason, but for whatever was the  
15 reason, it did require new technology development  
16 in the vehicles.

17 And in fact, when you look at the  
18 bogie, that's where we've had many of the technical  
19 problems that have plagued the system.

20 You know, we've had emergency brake  
21 applications resulting in flat wheels. We've had  
22 axle bearing boxes that overheated because they  
23 weren't properly maintained and resulted eventually  
24 in the failure of the axle itself, and the  
25 derailment that happened at Tunney's Pasture.



1                   We've had a similar problem with  
2 maintenance issues with the gearbox resulting in a  
3 gearbox actually falling off and the train  
4 derailling at Trumblay Station.

5                   And although not specifically to do  
6 with the bogie design, we've also had the wheel  
7 cracks, which were a maintenance or installation  
8 issue that resulted in most of the -- many of the  
9 trains being taken out of service for extended  
10 periods of time and all the trains having to have  
11 their wheels replaced.

12                  So that was perhaps a technology issue.  
13 These bogies and wheel assemblies are extremely  
14 complicated and particularly to maintain.

15                  They have a very large number of bolts  
16 holding them together, all of which have to be  
17 torqued exactly according to very exacting  
18 requirements.

19                  Which apparently have not been followed  
20 in a number of cases because the mistorquing of the  
21 bolts has been identified as related to the cause  
22 of at least two and possibly three of the  
23 incidents.

24                  Another technology area was related to  
25 climate. And obviously the specification called

1 for operation in Ottawa's climate, which, as you  
2 know, is a very wide temperature difference between  
3 the lowest winter temperatures and the highest  
4 summer temperatures.

5           And it appears, that, you know, however --  
6 and I'm not certain whether sufficient  
7 specifications were given for Ottawa's unique  
8 situation, one example being the large quantity of  
9 road salt that's used in Ottawa. And in many cases  
10 the rail line, where it's operating on the surface,  
11 is adjacent to roadways.

12           So we've had situations where we've had  
13 salt contamination building up on the roofs of the  
14 vehicles. The maintenance had not included  
15 facilities for washing the roofs and removing that  
16 salt.

17           And as a result, there were severe  
18 electrical problems, extensive system failures and  
19 a requirement to eventually replace all of the  
20 roof-mounted inductors which are part of the  
21 electrical supply system for the trains.

22           And so clearly, either there was  
23 something wrong with the specification or there was  
24 something wrong with the technology that was used  
25 to meet Ottawa's requirements.

1                   Those were not the only winter  
2 problems. They also extended to the track. For  
3 example, we've had incidents of broken rail wells,  
4 which occur at low temperature. That's, you know,  
5 rail integrity is a well understood science, and so  
6 it's, you know, a little puzzling why we had those  
7 failures and that hasn't been fully explained.

8                   The reverse problem happens in summer  
9 where at higher temperatures, when the temperatures  
10 get up into the 30-degree range, they've had to  
11 reduce the operating speed of the system for safety  
12 reasons.

13                   And of course when you're running a  
14 system that's pretty close to capacity anyway, when  
15 you reduce the operating speed you're also reducing  
16 the system capacity, and therefore not meeting the  
17 demand.

18                   Other countries seem to have dealt with  
19 that. You know, we looked at the rules that VIA  
20 Rail follows, for example, when it imposes speed  
21 restrictions due to high heat.

22                   We looked at Australia, which has  
23 extremely high temperatures, sometimes getting up  
24 into the 40-50 degree range. And, again, they have  
25 generally the ability to continue rail operations

1 at much higher temperatures than the temperatures  
2 where we started having to have speed restrictions.  
3 So that's an issue.

4           There were other issues concerning  
5 snow, where the intruder detection system, which is  
6 supposed to stop a train with an emergency brake  
7 application if a person or an animal or some  
8 obstruction is on the track ahead, and that system  
9 was triggered by blowing snow, resulting in a  
10 number of emergency brake applications that then  
11 caused flat wheels, which then took trains out of  
12 service or created discomfort and noise for the  
13 passengers.

14           You know, a lot of the trains were  
15 actually operating with flat wheels for some time,  
16 just because there were so many of these  
17 occurrences.

18           And in the early days of winter, the  
19 steps in the railway stations all -- in the  
20 stations all became very dangerous because they  
21 were excessively slippery.

22           And basically they had to be resurfaced  
23 with a better tread in order to make the stairs  
24 safe for users, because people were falling in the  
25 stations as soon as the floors became wet.

1                   And then there's the whole -- this  
2 isn't so much a safety question, but major changes  
3 had to be made to the bus transfer points because  
4 there had been no provision of adequate shelter  
5 capacity.

6                   And so, for example, at Tunney's  
7 Pasture they had to essentially build a station out  
8 of scaffolding, and temporary shelter material,  
9 just because the design of the station was  
10 completely unacceptable in Ottawa winters.

11                   So I think that was a specification  
12 issue that did have safety and failure related  
13 issues.

14                   I haven't mentioned a couple of things  
15 related to the overhead electrical supply. Almost  
16 all the overhead conductor wire supports in the  
17 catenary system had to be replaced because of  
18 failures that were occurring under extreme weather  
19 conditions, and we also had periods where there was  
20 fairly extensive arcing.

21                   Where, you know, where we're getting  
22 sparks as electricity jumped from the overhead wire  
23 to portions of the train that were not part of the  
24 intended electrical current path.

25                   So, you know, all those kinds of issues

1 which happened really seemed to show that the  
2 requirements of Ottawa winters and to some extent  
3 Ottawa summers were not met.

4 One other thing doesn't really relate  
5 to safety but does relate to passenger comfort.

6 We had a lot of experience of winter  
7 operation on the light rail pilot project, and we  
8 had discovered there it was very important that the  
9 doors be closed most of the time and that stations  
10 only be opened when they had to be used.

11 So on the Trillium line, the  
12 north-south line, the normal process is that if a  
13 passenger wants to get in or out of the train, you  
14 press a button the door opens, you go through it,  
15 the door closes.

16 Whereas on the Confederation line the  
17 doors remain open for the entire time the train is  
18 in the station, and it's all 14 doors that are open  
19 while you're stopped. So that essentially the  
20 heating and air conditioning does not work on the  
21 Ottawa system.

22 And that was a decision that was made,  
23 I think, post-delivery of the trains. Possibly  
24 related to the door problems, but as a result we've  
25 ended up with a system which, from the passenger's

1 point of view, doesn't meet the climate control  
2 requirements that were specified, that we knew were  
3 needed from our experience with the light rail  
4 pilot project in the north-south line and that  
5 should have been used.

6 So you know, that's an issue it's not a  
7 safety-related issue except that potentially the  
8 decision to disable that feature of allowing  
9 passengers to open the doors resulted from all of  
10 the problems that existed on the overcrowded trains  
11 with failures of the doors during closing.

12 You know, they didn't want the  
13 customers touching the doors at all. And that's  
14 led to this climate problem.

15 People do find that it's extremely cold  
16 travelling on those trains in winter. They're  
17 based on -- although additional insulation was  
18 installed in the trains compared to what would have  
19 been used in European installations, for example,  
20 it's not really enough anyway.

21 And when the doors are open the  
22 insulation that is present in the doors and the  
23 walls, which are very thin, really isn't enough to  
24 provide adequate climate control.

25 KATE McGRANN: A couple of follow up

1 questions on what you've said on these topics, just  
2 to make sure I understand what you're talking about  
3 and to help our court reporter. The first one is  
4 the Iponam bogie. Do you know how that's spelled?

5 DAVID JEANES: Yes, it's I-P-O-N-A-M so  
6 Norman, Arthur, Michael. Iponam, and it's been  
7 fairly well documented in technical papers. It's  
8 been referenced on Alstom's own website as a  
9 product specifically for Ottawa and for North  
10 America.

11 And it has been patented in the --  
12 there's a U.S. patent for it, and I suspect there  
13 are also other patents that have been applied for  
14 that really detail how it works.

15 But the specific requirements were to  
16 meet the low floor requirement that had been  
17 imposed by Ottawa, to provide for the automatic  
18 levelling of the train at station platforms, which  
19 involved the ability to do basically compressed air  
20 lifting.

21 So what would normally just be a spring  
22 suspension in these bogies is springs plus  
23 compressed air to allow some variability to ease  
24 the wheelchair access at the doors.

25 And then the other thing about it is



1 unlike the more conventional approach to light rail  
2 vehicles, which had been 70 percent low floor, you  
3 can't put all the equipment under the floor so you  
4 have to essentially place it outside the wheels.

5           And that's why when you're looking at  
6 the derailments, for example, you're seeing that  
7 the brakes, the electric motor, and gearbox are  
8 located outside of the wheels rather than inside  
9 under the floor, which is the more conventional  
10 approach where you can have a higher floor at the  
11 front or the back of the train.

12           And you can also have larger diameter  
13 wheels, which may provide better performance than  
14 the smaller wheels which have to be used with these  
15 bogies.

16           KATE McGRANN: You've made several  
17 references to specifications. I'm wondering  
18 whether the specifications were adequate, accurate.  
19 What specifications are you referring to?

20           DAVID JEANES: Well, the actual RFP,  
21 which was given to the bidders on the project, was  
22 not made public. And in some cases, I think was  
23 not even provided in confidence to members of City  
24 Council. In many cases we don't know exactly what  
25 it was that the City was asking for.

1                   For example, I've mentioned  
2 specifically the requirements for 100 percent low  
3 floor and for 100 kilometre per hour operation. I  
4 don't actually know where I could find the precise  
5 document that states that those were requirements  
6 in the RFP. I have that information from other  
7 sources.

8                   Similarly, the actual bids that were  
9 submitted to the City of Ottawa were not made  
10 public, and, you know, throughout this process,  
11 many documents have been treated as commercial  
12 confidence and I know that -- I have not been  
13 involved in trying to obtain such documents.

14                   I personally, and Transport Action,  
15 haven't initiated any Freedom of Information  
16 requests, for example, to try to get at any such  
17 documents.

18                   But certainly, there has been an  
19 understanding throughout this process that a lot of  
20 it was done behind closed doors and not visible to  
21 either public scrutiny or scrutiny by city  
22 councillors.

23                   KATE McGRANN: Okay. Those were the  
24 follow up questions I had on the areas we just  
25 discussed. Mr. Imbesi, do you have any follow up

1 questions?

2 ANTHONY IMBESI: I have just one  
3 question, Mr. Jeanes, to tie things off. There's  
4 an article in the Ottawa Citizen after you were  
5 granted standing and it attributes a few comments  
6 to you. Some of them we just talked about in terms  
7 of your comments that not enough planning was done  
8 for winter conditions. You also made a comment or  
9 one that's attributed to you, that's asking why the  
10 City went with the train model, the Alstom model,  
11 that hadn't been used anywhere else.

12 Are there any issues from your  
13 perspective with the new train model that  
14 contributed to (inaudible) --

15 -- Reporter's Note: (Experienced  
16 virtual connection difficulties).

17 KATE McGRANN: Can we go off the record  
18 to address these technical issues?

19 -- OFF THE RECORD DISCUSSION --

20 ANTHONY IMBESI: Yes, Mr. Jeanes, thank  
21 you. I have one question: There's a comment  
22 that's attributed to you in an Ottawa Citizen  
23 article.

24 The question is why the City went with  
25 the train model the Alstom Citadis Spirit, which

1 hadn't been used anywhere else?

2 Are there any issues from your  
3 perspective that have led to the subject matters  
4 that are matters of this inquiry beyond what we've  
5 already spoken about other than the bogies and  
6 other issues that we've spoken to in relation to  
7 the train?

8 DAVID JEANES: Yes, I'd just like to  
9 point out that article did slightly misquote me on  
10 that point. I was specifically referring to the  
11 new bogie design when I spoke to the reporter Jon  
12 Willing.

13 The Alstom Citadis as a family of  
14 vehicles has been used in other cities and has been  
15 fairly widely used, but it had to undergo  
16 significant modifications including using  
17 additional insulation in the walls which I had  
18 already mentioned.

19 And the substitution of a new bogie  
20 design, which, because the bogie contains so many  
21 of the important operating elements of the system,  
22 that essentially made the whole thing new  
23 technology as opposed to proven off the shelf  
24 technology.

25 There's been a difference on the

1 Trillium Line in Ottawa. We are going, we are  
2 going into our third generation of diesel light  
3 rail vehicle on the Trillium Line and in each case  
4 the vehicle acquired has been taken straight off  
5 the shelf with minimal modifications for Ottawa  
6 conditions. And as a result in 2001, we obtained  
7 three vehicles from Bombardier that performed  
8 extremely well for ten years or more.

9 Subsequently, similar vehicles from  
10 Alstom were used on the Trillium Line and have  
11 likewise had very few technical problems because  
12 they were basically identical to large numbers, in  
13 fact, hundreds of similar vehicles that have been  
14 used in Europe in all kinds of weather conditions.

15 And now we're in the process of  
16 assembling and testing these light rail vehicles  
17 from Stadler in Switzerland, again, from a family  
18 of vehicles that has a great deal of experience.

19 And of course in Switzerland lots of  
20 operation in winter conditions, which can involve  
21 heavy snowfall and so on.

22 So there really was a fundamental  
23 difference that I referred to that I wasn't stating  
24 that the Citadis Spirit itself was a completely new  
25 vehicle.

1                   Certainly not much experience in North  
2 America, although Alstom has provided vehicles, for  
3 example, for the Montréal Metro. That's a  
4 completely different type of technology from the  
5 light rail technology which was certainly being  
6 used in Ottawa for the first time, although it had  
7 been used in other cities on other continents.

8                   I would if I could also like to go back  
9 and mention I omitted one thing when I was talking  
10 about preparedness for winter, and that was the  
11 switch heaters. The electric switch heaters, which  
12 proved to be a major source of failures on the  
13 track infrastructure.

14                   And again, they seemed to have been  
15 underdesigned for the realities of Ottawa winters.  
16 In many cases they have now had to go to additional  
17 heating mechanisms, either electrical or  
18 substituting gas heaters for the original electric  
19 switch heaters with a larger capacity.

20                   And again, that was probably to be  
21 anticipated. We had lots of experience with switch  
22 heaters, gas powered, propane powered switch  
23 heaters on the Trillium Line from day one and we  
24 knew exactly what was needed for reliable operation  
25 of that line.

1                   So going with heaters of much lower  
2 capacity for the Confederation line seems to have  
3 been a mistake.

4                   And switch heaters of course are used  
5 on main line railways throughout Canada, Montréal,  
6 Toronto. Toronto Union Station has probably nearly  
7 a hundred such heaters installed at various places  
8 around the approach to the station. And generally  
9 they're all designed to be high capacity to meet  
10 Canadian winter conditions.

11                  So that was just another area where I  
12 think, again, we were not really meeting what  
13 should have been the specifications for Ottawa  
14 winter conditions.

15                  Sorry to go back to that, but I had  
16 omitted it from the list of things I had intended  
17 to mention.

18                  KATE McGRANN: Please don't apologize.

19                  I'm going to switch our focus slightly  
20 to ask if there are any planning decisions related  
21 to Stage 1 of the LRT that you haven't already  
22 discussed that you feel are related to our mandate  
23 with respect to the breakdowns and derailments of  
24 Stage 1?

25                  DAVID JEANES: Well, one thing I

1 haven't talked about, maybe it was cost-related but  
2 it's the decision to rather closely follow the  
3 alignment of the preexisting bus transit way.

4 That was partly done for cost reasons;  
5 the City of Ottawa already owned that corridor. It  
6 had less of an environmental impact because it was  
7 already being used for intensive transit purposes.

8 But in a number of places the  
9 curvature, which had been acceptable for buses, was  
10 really rather extreme for what was intended to be a  
11 100 kilometre per hour rail system.

12 As a result we had very tight curves in  
13 some parts of the system, particularly between  
14 Hurdman and Tremblay stations.

15 Those curves present operational  
16 problems. It's been necessary to install what's  
17 called a check rail, just to make sure that the  
18 wheels are actually guided properly around the  
19 curve.

20 And you don't see such check rails on  
21 most other systems that are designed to operate  
22 rapid transit because, you know, generally the  
23 curves would be designed to be more appropriate for  
24 the intended speeds.

25 Either by not being as sharp, or the



1 other approach is to do what's called super  
2 elevation, which is basically you tilt the outside  
3 rail up, so that the train is kind of leaning into  
4 the curve, which helps to keep the train centered  
5 on the rails and avoid the need for an inside check  
6 rail to prevent the, to hold the wheel against the  
7 track.

8           So as a result, those areas, first of  
9 all they've been places where there has been  
10 stress, including one of those rail weld failures  
11 which I referred to where the rail actually broke.

12           There's been a lot of noise and  
13 vibration which they've tried to eliminate but  
14 haven't succeeded now. Customers are still  
15 complaining about the noise and vibration on that  
16 curve even today after many attempts to improve the  
17 situation.

18           And I think that's an issue. And it  
19 also does mean there are a number of places on the  
20 system where even the designed speed of 80  
21 kilometres an hour can't be met because they've had  
22 to impose lower speed limits on those curves.

23           Whereas, I think you'd find on most of  
24 the bus transit way, the buses would continue to be  
25 rolling at a steady sort of 100 kilometres an hour

1 most of the way.

2           Nowhere on the bus transit way do they  
3 have speed limit signs telling the bus drivers that  
4 they have to slow down because there's a curve in  
5 the road. And yet on the Confederation line, that  
6 does happen.

7           So I think that was a planning issue,  
8 maybe done for cost reasons, but the system could  
9 have been designed to be better able to handle the  
10 intended speeds of operation, particularly since  
11 they were specifying 100 kilometres an hour for the  
12 vehicles.

13           Other things, you have a question and I  
14 don't know whether you're going to get to it in  
15 your list of topics, which is Canadian content  
16 requirements. Would this be an appropriate point  
17 to mention that?

18           MS. MC GRANN: Yes, please, go ahead.

19           DAVID JEANES: So these vehicles, like  
20 all rail vehicles, we do have rail manufacturing in  
21 Canada, but the rail industry, as has been  
22 mentioned many times, sources its components  
23 worldwide.

24           So the elements of the vehicles that  
25 we're using do come from all over the world. The

1 wheels are manufactured in one country; the car  
2 bodies in another country. The cast steel frames  
3 of the bogies come from Britain but the rest of the  
4 bogie doesn't. So various other things like that.

5 So Canadian content requirements,  
6 again, I don't know exactly what they were in the  
7 RFP. But certainly they have been met in various  
8 ways. Alstom assembles its bogies at a factory  
9 that they operate in Sorel, Québec. So certainly  
10 labour content is Canadian there.

11 The vehicles, the final assembly of all  
12 of the vehicles but 1 or 2 was done in Ottawa by  
13 using the maintenance shops at the Belfast  
14 maintenance and storage facility as an assembly  
15 facility.

16 So that provided Canadian employment  
17 and Canadian content for the vehicles, even though  
18 most of the components were coming from outside  
19 Canada.

20 And that's, that's not an unusual  
21 approach. The same approach was used with  
22 Bombardier's contract to provide vehicle, Sky Train  
23 vehicles for the Millennium Line in Vancouver.  
24 Where basically Bombardier used the maintenance  
25 facility as their assembly factory, and then turned

1 the facility as well as the trains over to  
2 TransLink, to operate the system.

3 So that's not very different, except  
4 here, the RTG was turning over the maintenance to  
5 its affiliate company, RTM, rather than to  
6 OC Transpo.

7 So, I mean, those are factors. I can't  
8 comment on how that, you know, what impact having  
9 Canadian labour content and Canadian assembly  
10 plants and foreign components, what impact that may  
11 have had on the vehicles.

12 You know, clearly there were some  
13 manufacturing issues. We know that the cracked  
14 wheels related to incorrectly installed wheels in  
15 that there were bolts called jacking bolts, which  
16 should have been removed before the wheels were  
17 assembled, and that wasn't done.

18 So clearly there have been some  
19 mistakes made in the vehicle assembly that might  
20 not have happened if there hadn't been a Canadian  
21 content requirement. But I can't judge to what  
22 extent the problems stem from that.

23 It's just a factor that maybe has to be  
24 considered. And particularly, where you can't  
25 insist on Canadian components because they don't

1 necessarily exist.

2           You know, these pieces come from  
3 whoever in the world is the, you know, the supplier  
4 of such elements. The wheels for example, the  
5 company that made the wheels is probably the  
6 leading company in the world for this type of  
7 product.

8           And so the fact that the wheels cracked  
9 is not something to do with the selection of the  
10 company that supplied the wheels.

11           KATE McGRANN: Are there any other  
12 issues that you're aware of as a result of your  
13 work or the work of Transport Action Canada that  
14 you think would be related to the breakdowns and  
15 derailments on Stage 1 that we haven't discussed  
16 yet?

17           DAVID JEANES: Well, I'm not really  
18 able to discuss this aspect. But you will be  
19 talking a fair bit with Thales, the supplier of the  
20 signalling and control system. Again this is an  
21 innovation.

22           The system that Thales installed, which  
23 largely eliminates line sight signals, the only  
24 light signals are basically at the places where  
25 there are crossovers or switches. And the

1 interface between the Thales signalling system and  
2 the actual vehicle control.

3 I think this is on your list of, you  
4 know, it's number nine on your list the Alstom and  
5 the Thales interface, the management of the same.

6 So here you have a signalling system  
7 which is something new for North America, I think.

8 I mean, Thales is a very experienced  
9 company in the field of railway signalling, but  
10 still here we're talking about something that would  
11 also fall into that category of being a technology  
12 risk, because not necessarily meeting those  
13 requirements which were mentioned back in 2009 at  
14 the technology forum, which were proven robust,  
15 etcetera.

16 But again, I'm not capable of making  
17 any judgments about the quality of that system.  
18 But certainly, there were some of the failures that  
19 occurred, which have been documented over the  
20 course of the operation of the system, have been  
21 because of issues between the signalling and  
22 control system and the on board vehicle control  
23 computer system.

24 So that's just an area to look at.

25 I think one other area that I'd like to

1 talk about, and I don't know where it fits exactly  
2 is the approach to testing the system before  
3 bringing it into service, and the way of doing the  
4 cutover from bus service to rail service.

5 Can I talk about that now?

6 KATE McGRANN: Yes, please go ahead.

7 DAVID JEANES: Yeah, so there were  
8 criteria that were set for how the system would be  
9 tested and they were quite strict. They required  
10 12 days of continuous operation with a full  
11 complement of trains running at the designed  
12 service frequency which I think was a train every  
13 four minutes, and so on.

14 And during that period, I went out  
15 several times to observe the system and to actually  
16 record the times of all the trains on the line as  
17 they were passing, just to determine how many  
18 trains were actually being tested and how closely  
19 they were adhering to the target test schedule and  
20 so on.

21 I think it's fairly clear and it's  
22 since been admitted by OC Transpo, that the  
23 requirement for 12 days of continuous uninterrupted  
24 service was never met.

25 They stopped it several times rather

1 than going back to the beginning of the 12-day  
2 period. They restarted the clock part way through  
3 the 12 days, which originally was something they  
4 said they weren't going to do.

5           And as a result, when the system did  
6 reach a state that was called "operational  
7 readiness", it's far from clear that it actually  
8 was ready and I think that, you know, subsequent  
9 events and discussion have proven that a lot of  
10 compromises were made in those criteria.

11           So I think that's important. I think  
12 the amount of testing wasn't enough. The fact they  
13 didn't really do any winter testing because with  
14 the system going into service in September, most of  
15 the testing was done during the month of August,  
16 which meant they really had no idea how the system  
17 would behave once we reached winter.

18           By contrast, VIA Rail right now is  
19 testing a brand new locomotive and train system  
20 built by Siemens, which they're going to be  
21 bringing in as their main corridor train in Canada.

22           And they have said that they need to do  
23 a full year's testing and particularly winter  
24 testing, which they have been doing in and around  
25 Ottawa. As you know -- well, you may not know --



1 but we've had some extreme winter conditions in  
2 terms of snowfall and temperature that have been a  
3 very good test.

4 Normally for a system like this where  
5 it's known you're going to be operating under very  
6 challenging conditions in winter, not having any  
7 winter testing prior to the start of service, I  
8 think was a mistake.

9 Another thing that was a mistake then  
10 was deciding that after three weeks' operation of  
11 the system in September, it was safe to terminate  
12 the bus transit way. So the system went into  
13 service on the 14th of September in 2019, and the  
14 bus transit way was shut down on the 6th of  
15 October 2019.

16 I think that there were probably cost  
17 reasons for doing that. The City had certainly  
18 intended to save money by eliminating buses and  
19 reducing the bus driver workforce and so on, but  
20 that was a mistake.

21 If instead they had decided to continue  
22 parallel bus service at least into and perhaps  
23 through the winter, we would never have had the  
24 chaos which we had during the late fall and winter  
25 of 2019-2020.

1                   And particularly since it had been  
2                   stated again and again by John Manconi that we were  
3                   transitioning from the heaviest bus-based -- bus  
4                   transit system in North America which would be the  
5                   heaviest used light rail system in North America.

6                   I think that that decision to do that  
7                   cutover was a mistake. There was no particular  
8                   need for it because the surface roadways through  
9                   Ottawa, the transit way on Albert and Slater Street  
10                  continued to exist.

11                  In fact, they left the reserve bus lane  
12                  and the driving restrictions in place even after  
13                  their were no buses anymore. So that it wasn't a  
14                  case that the buses had to be taken out of service  
15                  in order to allow the rail line to operate.

16                  So I think that that plan for service  
17                  introduction was wrong for the complexities and the  
18                  demands that we were facing in 2019.

19                  KATE McGRANN: I don't have any follow  
20                  up questions on those comments.

21                  Mr. Imbesi, do you?

22                  ANTHONY IMBESI: No, I don't.

23                  KATE McGRANN: The last specific area I  
24                  have that I wanted to ask about today was, I'll  
25                  call it the commercial approach that the City took

1 to this project. So the public-private  
2 partnership.

3 Did you or Transport Action Canada have  
4 a view on the appropriateness of that approach to  
5 implementing this project?

6 DAVID JEANES: Not really at the time.  
7 I think we were more focused on technical and  
8 service issues. Certainly there have been good  
9 examples of public-private partnerships in Ottawa  
10 in other areas and in other parts of the world.  
11 And there have also been disasters.

12 You know, Britain is an interesting  
13 example, because in the Margaret Thatcher era,  
14 Britain decided to completely privatize its railway  
15 system and turned over the infrastructure to a  
16 private operator.

17 Which then, from the point of view of  
18 profit motive, they neglected maintenance which led  
19 to catastrophic multi-fatality accidents.

20 And eventually the same Conservative  
21 government which had privatized the infrastructure  
22 operation, had to renationalize it because the  
23 profit motive in the private sector was in fact  
24 working against the operation of the safe system.

25 And so I think we've never made this as

1 a public submission, but there is a concern that  
2 when you're looking at public-private partnerships,  
3 the profit motive is always going to add a cost to  
4 the project that has to come, you know, that has to  
5 come from somewhere.

6 Governments generally don't have to  
7 make a profit on public infrastructure investment.  
8 It's nice if they can break even, but they don't  
9 have to build in a profit. I think that's a  
10 factor.

11 The other point of discussion that has  
12 come from up from time to time is financing costs  
13 because governments generally can achieve a lower  
14 cost of money than the private sector can. So that  
15 also has to be built into the costs.

16 You set that off against the fact that  
17 the private sector is believed to be capable of  
18 doing things more efficiently than government, so  
19 there's obviously a trade off.

20 And the higher costs of financing and  
21 the need to generate a profit may be offset by  
22 those efficiencies. But that's not an area where I  
23 have expertise, so really I'm saying those are  
24 matters that we discuss, but there's no clear  
25 answer that says that the private sector should not

1 be a partner in these kinds of projects.

2 Because there have been plenty of  
3 examples where private sector involvement has been  
4 very good. And we've seen, you know, fairly  
5 successful -- GO Transit in Toronto for example,  
6 decided that they would contract their maintenance  
7 and their railway operations to the private sector  
8 at that time with Bombardier.

9 With the case of the maintenance of the  
10 Trillium Line in Ottawa, we always contracted to  
11 the private sector; the maintenance of the vehicles  
12 was contracted to Bombardier. The maintenance of  
13 the track and infrastructure was contracted to  
14 Rail-Term, so both private companies.

15 But that project as a whole was still  
16 managed as a City project and financed as a City  
17 project and of course never expected to actually  
18 yield a profit.

19 So the Confederation line, of course,  
20 has to yield a profit in some way and normally that  
21 profit comes through the -- it's built into the  
22 cost of the initial construction contract and it's  
23 built into the periodic payments for the  
24 maintenance services over the 30-year life of the  
25 maintenance contract. But the profit element is

1     there.

2                     So I don't want to say that to -- it  
3     becomes a bit of an ideological debate and there  
4     isn't a clear answer as to where the best division  
5     is between public and private participation in  
6     these large projects.

7                     KATE McGRANN:   Okay.   And then along  
8     the same lines, do you have any views on what I'll  
9     call the division of responsibilities with respect  
10    to the project?

11                    So the private partner takes on the  
12    design, the construction and maintenance; the City  
13    maintains responsibility for the operation of the  
14    system.   Any views on that division?

15                    DAVID JEANES:   Well, I think to some  
16    extent it's necessary in an environment, where you --  
17    OC Transpo is a big employer; it's a unionized  
18    employer.   And in making these kinds of innovations  
19    to our transit system, it's very important to have  
20    the unions onboard as partners, rather than as  
21    opponents.

22                    So I think there's a bit of a fine line  
23    here.   The maintenance was a bit of an issue  
24    perhaps for the unions because the maintenance is  
25    contracted to RTM, and is not being done by

1 OC Transpo. But they've managed that, I guess.

2 One of the interesting consequences of  
3 that, though is we have very little insight into  
4 how the maintenance operation actually works. We  
5 see very little about what RTM actually does in the  
6 Belfast maintenance yard in the maintenance  
7 facility.

8 Occasionally we get reports which are  
9 submitted to the Transportation Safety Board saying  
10 that vehicles have derailed in the yard, but it's  
11 entirely an internal concern of RTM when that  
12 happens and neither the City nor OC Transpo nor the  
13 public really are involved in that.

14 So there's kind of a curtain that's  
15 hiding part of the operation that might not be  
16 there if the maintenance were a public operation.

17 For example, OC Transpo has always  
18 welcomed the public to go and view their  
19 maintenance operations at events like "Doors Open".

20 I think the public have a fairly good  
21 understanding or at least an opportunity to  
22 understand how bus maintenance works. And the bus  
23 maintenance garages have been built by the City,  
24 you know, with public processes and so on.

25 Whereas in the case of the

1 Confederation line, most of that maintenance  
2 activity is happening behind a curtain that we  
3 can't see through.

4 KATE McGRANN: What in your view are  
5 the benefits of the kind of public access that  
6 you've been describing to the maintenance  
7 facilities?

8 DAVID JEANES: Well, I guess people can  
9 perhaps have more pride in their work when they  
10 know other people are seeing what they do. And I  
11 think, you know, pride in workmanship and good  
12 working conditions are essential to good  
13 maintenance.

14 And your inquiry may be delving into  
15 that, because you already have reports from the  
16 Transportation Safety Board that indicate that  
17 there were significant maintenance deficiencies  
18 that led, particularly, to the two derailments and  
19 to the wheel cracks.

20 So those are kinds of issues that  
21 became public because of failures. But a more open  
22 operation might lead to a better process.

23 I know the City does audit the training  
24 and maintenance policies of RTG and RTM and they've  
25 employed a consultant specifically to do that.



1                   But that's not the same as having, you  
2 know, day-to-day visibility as to what's going on.  
3 And I think that the quality of maintenance and the  
4 pride in workmanship and so on would be higher with  
5 a more open operation.

6                   KATE McGRANN: That brings me to the  
7 end of the specific questions that I have for you.  
8 Mr. Imbesi, did you have any other questions?

9                   ANTHONY IMBESI: No.

10                  KATE McGRANN: So my last general  
11 question for you, Mr. Jeanes, is were there any  
12 other topics that we haven't discussed related to  
13 the breakdowns and derailments of Stage 1 that  
14 you'd like to discuss now? Is there any other  
15 information you'd like to share with the  
16 Commission?

17                  DAVID JEANES: Okay, just trying to  
18 think through it. I mean, I mentioned briefly sort  
19 of value engineering and the decisions that were  
20 made at various points during the process to bring  
21 down some of the costs and, I don't know, the whole  
22 range of decisions that may have been taken during  
23 that process.

24                  Some of them would have been taken by  
25 the contractor in consultation with the City.

1 Possibly some were taken without having to be  
2 revealed to the City. I don't know about that.

3 But we do know, for example, that  
4 somebody made the decision that it wasn't necessary  
5 to have temperature sensors on the axle bearings,  
6 and that that led to the failure in August 2021,  
7 the derailment at Tunney's Pasture.

8 And it's normal in the rail industry to  
9 monitor the temperature of axle bearings. Every  
10 main line railway has what are called hot box  
11 detectors, which are devices that are located  
12 beside the track and actually measure the  
13 temperature of every axle as a train goes by.

14 And that's normal, because you do get  
15 bearing problems on all kinds of trains, and  
16 bearings do overheat, and they do lead to  
17 derailments, and they can lead to axle failures.

18 In this case, because of the design of  
19 the bogie, the bearing box was on the inside of the  
20 wheel, wasn't visible during normal maintenance,  
21 couldn't be got at easily because of where it was  
22 under the train.

23 And because of the incorrectly torqued  
24 bolts, overheated, you had bearing failure, you had  
25 very high temperature, you had axle failure, none

1 of which was detected because there was no  
2 temperature sensor built into the system.

3 They couldn't use an external one  
4 because the bearing box was on the inside of the  
5 wheel, unlike most railways, where you can detect  
6 the temperature from the outside. And they didn't  
7 have sensors actually mounted.

8 Now they could have at a price, and for  
9 some reason they didn't. So was that value  
10 engineering during the project? Was it something  
11 the City agreed to; that the City was prepared to  
12 take that risk and so on. I don't know.

13 But I think that's an issue you need to  
14 look at because it was definitely related to the  
15 axle failure on the -- in August of last year.

16 I guess there's an issue, I don't know  
17 exactly what the status is, Transportation Safety  
18 Board reports can't be used as evidence in judicial  
19 proceedings, so I don't know to what extent you  
20 have access to the Transportation Safety Board  
21 reports.

22 They are public documents; we've  
23 certainly read them and are very concerned about  
24 some of those issues that happened.

25 We still don't know exactly why and how

1 the gear box fell off the train on the 19th of  
2 September when you had the derailment at Tremblay  
3 Station, but, again, it's a similar kind of thing.

4 As I mentioned earlier these Iponam  
5 bogies are extremely complex. They have very large  
6 number of bolts on them all of which have to be  
7 very precisely torqued.

8 They're subject to all kinds of  
9 stresses. Not only the interaction between the  
10 wheel and the rail, but the disk brakes, the  
11 gearing between the motor and the wheel and the  
12 complexity of the suspension.

13 So there's a lot of stuff there that  
14 needs -- very intensive maintenance is required and  
15 has to be done exactly right.

16 So you know, that's an issue for the  
17 derailment at Tremblay that you know we haven't  
18 seen a final report on that yet. So not clear  
19 exactly how that happened. But of course that was  
20 fairly catastrophic because it tore up several  
21 hundred metres -- or it required the replacement of  
22 several hundred metres of track, destroyed part of  
23 the signalling system.

24 Serious damage to one of the train sets  
25 and fortunately no injuries to any member of the

1 public, although it did happen on an inservice  
2 train and there were passengers on that train.  
3 Unlike the derailment at Tunney's Pasture the  
4 previous month, where the train was already out of  
5 service when it derailed. But you know, it could  
6 have been more serious. If those trains had been  
7 operating under rush hour crowd conditions, those  
8 could have been quite serious incidents.

9 I think that's probably all I have to  
10 say right now. I will get to you the articles  
11 related to Ottawa LRT from the Transport Action  
12 newsletter.

13 Also, the presentation that I made to  
14 the Rapid Transit Task Force under David Collette  
15 and a list of the transit systems that I visited  
16 and also the presentations that we arranged for  
17 Transport Action from people from other transit  
18 systems.

19 And I think I mentioned already that  
20 included the Toronto Transit Commission, the  
21 Calgary Transit, also the Canada Line in Vancouver,  
22 we had a presentation from senior management of the  
23 Canada Line at one of our national board meetings  
24 that we had held in Vancouver. So plus other  
25 things like that.

1                   So I will submit that to you. And if  
2 there are any other things that you feel that I  
3 need to document in terms of dates or specifics, I  
4 will also give you the list of board members of  
5 Transport Action Canada. And I could do the same  
6 for Transport Action Ontario as well if that would  
7 be relevant for you, because -- for the Board for  
8 Transport Action Ontario.

9                   KATE McGRANN: Yes, that would be  
10 helpful, thank you.

11                  DAVID JEANES: If there's anything else  
12 you feel I should submit to you, I'll try and do  
13 that as quickly as I can.

14                  I understand your absolutely drop dead  
15 date is the end of April, but I want to be much  
16 sooner than in terms of getting the information to  
17 you. I'll try to get it to you within a few days.

18                  KATE McGRANN: Much appreciated. I  
19 think this will end the mark the end of the  
20 interview.

21                  If we have any further questions, we'll  
22 be in touch and if you come across further  
23 information that you want to share, please feel  
24 free to send it to me.

25 -- Concluded at 11:05 a.m.

1 REPORTER'S CERTIFICATE

2  
3 I, JUDITH M. CAPUTO, RPR, CSR, CRR,  
4 Certified Shorthand Reporter, certify;

5 That the foregoing proceedings were  
6 taken before me at the time and place therein set  
7 forth;

8 That the statements of the presenters  
9 and all comments made at the time of the meeting  
10 were recorded stenographically by me;

11 That the foregoing is a Certified  
12 Transcript of my shorthand notes so taken.

13  
14 Dated this 31st day of March, 2022.

15 *Judith M. Caputo, RPR, CSR, CRR*  
16 \_\_\_\_\_

17 NEESONS, A VERITEXT COMPANY

18 PER: JUDITH M. CAPUTO, RPR, CSR, CRR  
19  
20  
21  
22  
23  
24  
25

**WORD INDEX**

**< 1 >**

**1** 1:7 3:5 8:15,  
17 9:4, 18 10:9  
12:19 16:14  
17:19 31:6, 20  
33:9 34:10  
37:17 39:18  
53:21 70:21, 24  
74:12 76:15  
88:13  
**10:3** 3:17  
**100** 38:11, 19  
53:24 54:19  
55:1, 9 65:2, 3  
71:11 72:25  
73:11  
**11:05** 1:17  
93:25  
**12** 29:14 78:10,  
23 79:3  
**12-day** 79:1  
**14** 61:18  
**14:4** 3:17  
**14th** 80:13  
**174** 51:15  
**1950s** 36:15  
**1976** 29:11  
**1997** 14:25  
15:10 31:22  
46:16  
**1998** 12:12  
15:25  
**19th** 91:1

**< 2 >**

**2** 27:11, 14  
74:12  
**20** 55:13  
**2001** 68:6  
**2003** 12:13  
17:24  
**2006** 18:19  
33:17, 24 44:10  
46:22, 23  
**2007** 20:14  
23:1 34:19  
44:13  
**2008** 43:25  
**2009** 5:25  
34:17 43:23  
77:13  
**2019** 80:13, 15

81:18  
**2019-2020** 80:25  
**2020** 42:20, 21  
**2021** 89:6  
**2022** 1:9, 17  
3:5 8:18 94:14  
**235** 30:12  
**25** 12:2  
**29** 3:5 8:17

**< 3 >**

**3** 27:12, 16 42:1  
**30** 1:9  
**30:2** 3:17  
**30-degree** 58:10  
**30th** 1:16  
**30-year** 84:24  
**31st** 94:14  
**33** 5:24 6:12

**< 4 >**

**4** 16:15 17:20  
**40-50** 58:24

**< 5 >**

**5** 6:14

**< 6 >**

**6** 5:24  
**6th** 80:14

**< 7 >**

**7** 6:12  
**70** 38:14 64:2

**< 8 >**

**8** 3:5  
**80** 54:22 55:3  
72:20

**< 9 >**

**9:00** 1:17  
**9:05** 4:1

**< A >**

**a.m** 1:17 4:1  
93:25  
**abbreviated**  
35:6  
**ability** 39:2  
58:25 63:19  
**absolutely** 93:14  
**acceptable** 71:9  
**acceptance**  
15:23

**access** 25:21  
36:5 63:24  
87:5 90:20  
**accessibility**  
38:12 54:6  
**accidents** 82:19  
**accompanied**  
32:8  
**account** 49:15  
**accurate** 64:18  
**achieve** 26:8  
83:13  
**acquired** 68:4  
**Act** 5:25 6:13,  
15  
**ACTION** 1:7  
2:9 9:22 10:8  
11:25 13:9  
15:5 16:9  
19:11 20:23  
29:1, 8 30:19  
31:9, 11, 18, 19  
33:3, 4 65:14  
76:13 82:3  
92:11, 17 93:5,  
6, 8  
**Action's** 9:10, 17  
**active** 31:13  
**actively** 19:15  
**activities** 12:3  
13:25 14:9  
19:19 28:21  
**activity** 14:24  
17:24 20:14  
31:10, 22 87:2  
**actual** 21:24  
29:6 64:20  
65:8 77:2  
**add** 26:25 83:3  
**additional** 54:23  
62:17 67:17  
69:16  
**address** 66:18  
**addressed** 18:2  
43:15  
**addressing** 11:4  
**adequate** 42:25  
60:4 62:24  
64:18  
**adhering** 78:19  
**adjacent** 53:8  
57:11  
**admitted** 78:22  
**adopt** 23:21  
38:5

**adopted** 25:17  
48:22  
**advanced** 19:4  
**advantage** 24:5  
25:5  
**advice** 35:20  
36:2 37:10, 15  
39:12, 15  
**advised** 6:13  
**advisory** 12:7,  
12 16:15 17:20  
18:17 22:2, 5  
27:18  
**Advocacy** 10:14  
11:20 16:19  
**affiliate** 30:22  
75:5  
**affiliated** 30:20  
**affirmed** 7:10,  
13  
**afraid** 40:1  
**after** 5:11  
15:23 20:11  
29:25 38:4  
45:2 66:4  
72:16 80:10  
81:12  
**agencies** 22:16  
**Agency** 11:11  
22:13, 21 26:22  
27:19 28:17  
**Agency's** 29:21  
**ago** 17:13  
34:11 45:20  
**agreed** 90:11  
**agreement**  
22:11  
**ahead** 8:12  
59:8 73:18 78:6  
**air** 61:20 63:19,  
23  
**Alain** 39:22  
**albeit** 44:15  
**Albert** 44:7  
81:9  
**alignment** 49:13  
71:3  
**allow** 21:12  
53:1 63:23  
81:15  
**allowance** 42:15  
**allowed** 42:23  
**allowing** 62:8  
**Alstom** 36:22  
54:13 66:10, 25

67:13 68:10  
69:2 74:8 77:4  
**Alstom's** 63:8  
**amalgamation**  
17:17  
**America** 40:9  
54:15 63:10  
69:2 77:7 81:4,  
5  
**amount** 26:10  
79:12  
**animal** 59:7  
**Annual** 30:10  
**answered** 9:15  
52:9  
**Anthony** 2:4  
4:8 7:8 43:14  
44:22 52:15  
66:2, 20 81:22  
88:9  
**anticipated** 45:3  
69:21  
**anymore** 81:13  
**anyway** 26:6, 10  
41:7, 8 58:14  
62:20  
**apologize** 70:18  
**apparently**  
56:19  
**appear** 3:17  
**appeared** 11:12  
**appears** 57:5  
**appended** 5:23  
**applicable** 11:7  
**application** 59:7  
**applications**  
55:21 59:10  
**applied** 46:5  
63:13  
**apply** 16:3  
**appointed** 12:6,  
15 16:14 17:19  
**appointment**  
17:15  
**appointments**  
12:8 16:20  
**appreciated**  
10:11 93:18  
**approach** 48:2,  
20, 23 64:1, 10  
70:8 72:1  
74:21 78:2  
81:25 82:4  
**approached**  
11:5



<p><b>approaches</b> 11:6 <b>appropriate</b> 44:19 48:5 71:23 73:16 <b>appropriateness</b> 82:4 <b>approval</b> 15:2 <b>approved</b> 12:9 <b>approximately</b> 30:12 55:3 <b>April</b> 93:15 <b>arcing</b> 60:20 <b>area</b> 21:17 31:12, 24 39:6 46:5 51:1, 19 56:24 70:11 77:24, 25 81:23 83:22 <b>areas</b> 31:16 45:24 65:24 72:8 82:10 <b>arranged</b> 92:16 <b>Arthur</b> 63:6 <b>article</b> 50:24 66:4, 23 67:9 <b>articles</b> 8:25 9:2, 10, 24 10:9 32:13 34:6 92:10 <b>asked</b> 6:2 26:20 <b>asking</b> 45:1 64:25 66:9 <b>aspect</b> 76:18 <b>aspects</b> 17:3 35:17 <b>assembled</b> 75:17 <b>assembles</b> 74:8 <b>assemblies</b> 56:13 <b>assembling</b> 68:16 <b>assembly</b> 54:1 74:11, 14, 25 75:9, 19 <b>assessment</b> 18:17, 18 19:1, 2 22:1, 3 27:5, 18 <b>assessments</b> 12:3 22:19 27:8, 13, 23 28:6</p>	<p><b>Association</b> 19:16, 20 31:2 33:6 <b>associations</b> 22:6, 7 <b>Atlantic</b> 30:22 <b>attached</b> 3:6 8:18 <b>attempts</b> 72:16 <b>attended</b> 16:6 19:18 <b>attending</b> 1:16 34:11 <b>attributed</b> 66:9, 22 <b>attributes</b> 66:5 <b>audience</b> 34:24 <b>audit</b> 87:23 <b>August</b> 79:15 89:6 90:15 <b>Australia</b> 58:22 <b>Authority</b> 22:15 <b>automatic</b> 63:17 <b>automatically</b> 54:8 <b>available</b> 21:5 29:20 45:18 50:18 54:12 <b>Avenue</b> 51:18 <b>avoid</b> 35:21 72:5 <b>avoided</b> 37:12 <b>awarded</b> 18:21 <b>Awards</b> 8:6 <b>aware</b> 10:22 19:5 76:12 <b>axle</b> 55:22, 24 89:5, 9, 13, 17, 25 90:15 <b>axles</b> 54:2  &lt; B &gt; <b>back</b> 7:7 26:18 27:3 31:21 33:17 41:9 64:11 69:8 70:15 77:13 79:1 <b>background</b> 20:5 <b>backs</b> 38:15 <b>barely</b> 40:12, 22 42:7 <b>Barrhaven</b> 27:22 28:2</p>	<p><b>based</b> 21:16 23:12 24:8 42:12 62:17 <b>Baseline</b> 27:14 28:1 <b>basically</b> 17:2, 25 18:3, 22 23:18 24:14 25:2 26:11 27:15 35:9 36:18 44:1 45:11 47:11 51:17 59:22 63:19 68:12 72:2 74:24 76:24 <b>basis</b> 5:16 27:18 <b>BC</b> 29:17, 18 <b>bearing</b> 55:22 89:15, 19, 24 90:4 <b>bearings</b> 89:5, 9, 16 <b>becoming</b> 52:24 <b>bed</b> 51:25 <b>bedrock</b> 45:3, 22, 24 <b>beginning</b> 35:22 79:1 <b>behalf</b> 11:24 <b>behave</b> 79:17 <b>Belfast</b> 74:13 86:6 <b>believe</b> 9:11 23:4 49:19 50:3 <b>believed</b> 83:17 <b>Bell</b> 14:18 <b>benefits</b> 15:6 24:3 87:5 <b>best</b> 14:2 85:4 <b>better</b> 41:19 48:23 59:23 64:13 73:9 87:22 <b>bidders</b> 64:21 <b>bids</b> 65:8 <b>big</b> 51:14, 17 85:17 <b>biggest</b> 52:21 <b>bit</b> 14:11 25:23 27:2 44:10 45:7 76:19 85:3, 22, 23</p>	<p><b>block</b> 24:16 51:18 <b>blowing</b> 59:9 <b>board</b> 29:4, 5, 7, 13, 14 30:6, 7, 9 31:9 77:22 86:9 87:16 90:18, 20 92:23 93:4, 7 <b>boarded</b> 38:22 <b>Bob</b> 15:19 <b>bodies</b> 74:2 <b>bogie</b> 53:25 54:1, 12, 13 55:18 56:6 63:4 67:11, 19, 20 74:4 89:19 <b>bogies</b> 54:11 56:13 63:22 64:15 67:5 74:3, 8 91:5 <b>bolts</b> 53:5 56:15, 21 75:15 89:24 91:6 <b>Bombardier</b> 20:9 36:23 68:7 74:24 84:8, 12 <b>Bombardier's</b> 74:22 <b>box</b> 89:10, 19 90:4 91:1 <b>boxes</b> 55:22 <b>brake</b> 55:20 59:6, 10 <b>brakes</b> 54:3 64:7 91:10 <b>brand</b> 79:19 <b>break</b> 83:8 <b>breakdowns</b> 34:9 39:18 53:22 70:23 76:14 88:13 <b>brief</b> 19:23 21:2 23:3, 5 24:4 32:9 33:22 <b>briefly</b> 24:2 88:18 <b>briefs</b> 10:15, 20 11:4, 14 34:6 <b>bring</b> 88:20 <b>bringing</b> 78:3 79:21 <b>brings</b> 19:16 88:6</p>	<p><b>Britain</b> 13:1 74:3 82:12, 14 <b>British</b> 30:23 <b>broke</b> 72:11 <b>broken</b> 52:7 58:3 <b>brought</b> 41:13 42:6 <b>Brunswick</b> 29:16 <b>build</b> 18:3 60:7 83:9 <b>building</b> 15:8 23:14 40:7 48:12 57:13 <b>buildings</b> 24:24 25:5, 6, 9 <b>built</b> 21:21 23:12 25:18 36:13 37:7 38:10 40:2 47:15 51:19 79:20 83:15 84:21, 23 86:23 90:2 <b>bureaucrats</b> 32:16 <b>buried</b> 26:1, 5 <b>Burrard</b> 47:18 <b>bus</b> 14:22 28:10, 11 36:11 37:7 60:3 71:3 72:24 73:2, 3 78:4 80:12, 14, 19, 22 81:3, 11 86:22 <b>bus-based</b> 81:3 <b>buses</b> 55:8 71:9 72:24 80:18 81:13, 14 <b>business</b> 22:7 44:6 <b>businesses</b> 44:5 <b>button</b> 61:14  &lt; C &gt; <b>Calgary</b> 13:11 35:2 92:21 <b>call</b> 22:13 24:3 81:25 85:9 <b>called</b> 47:11 54:13 56:25 71:17 72:1 75:15 79:6 89:10</p>
---	--	---	---	---

**CANADA** 1:8  
2:9 6:15 10:8,  
24 11:7 19:16  
29:1, 8, 21  
30:19, 23 31:18  
33:4 47:13, 16  
48:25 70:5  
73:21 74:19  
76:13 79:21  
82:3 92:21, 23  
93:5  
**Canada's** 19:20  
29:22  
**Canadian** 11:9,  
11 19:14 29:9  
70:10 73:15  
74:5, 10, 16, 17  
75:9, 20, 25  
**cancel** 44:11  
**cancelled** 19:5  
20:12 32:19  
46:22  
**capable** 54:19  
77:16 83:17  
**capacity** 36:10  
39:10, 23 40:2,  
15, 20 41:13  
42:3, 6 43:4  
58:14, 16 60:5  
69:19 70:2, 9  
**Capital** 22:17  
**Caputo** 2:15  
4:9 94:3, 18  
**car** 51:14 74:1  
**carry** 44:24  
**case** 12:14  
13:5 20:11, 25  
41:19 43:1  
50:2 68:3  
81:14 84:9  
86:25 89:18  
**cases** 12:6, 8  
56:20 57:9  
64:22, 24 69:16  
**cast** 74:2  
**catastrophic**  
50:3, 12 82:19  
91:20  
**category** 77:11  
**catenary** 60:17  
**caused** 48:14  
52:5 59:11  
**caution** 51:1  
**centered** 72:4

**Centre** 16:6  
21:13 47:17  
**centres** 13:16  
16:5  
**certain** 4:22  
7:9 40:19  
41:23 42:11  
43:16 50:4  
51:5 57:6  
**certainly** 8:11  
9:7, 23 10:1  
11:23 31:16  
39:6 40:4, 25  
45:16 46:9  
47:5 49:11  
50:13 51:12, 14  
53:17 65:18  
69:1, 5 74:7, 9  
77:18 80:17  
82:8 90:23  
**CERTIFICATE**  
94:1  
**Certified** 94:4,  
11  
**certify** 94:4  
**chair** 15:20  
**chaired** 20:16  
**challenge** 54:24  
**challenging** 80:6  
**change** 33:18  
**changes** 60:2  
**chaos** 80:24  
**characteristics**  
38:8, 11  
**charity** 29:9, 11  
**check** 71:17, 20  
72:5  
**Chiarelli** 15:19  
**chief** 13:10  
**choices** 43:8  
53:20  
**choose** 25:13  
**choosing** 36:3  
37:20  
**circumstance**  
50:3  
**circumstances**  
34:9 39:17  
**Citadis** 66:25  
67:13 68:24  
**cities** 13:18, 23  
15:15 21:10  
35:9, 21 36:13  
37:1, 11 39:23

47:14 67:14  
69:7  
**Citizen** 66:4, 22  
**City** 12:6 15:25  
16:5, 17, 21, 24  
17:16, 18, 22  
18:14 21:13  
22:11 32:16, 22,  
25 34:12, 21  
35:4 37:4, 17  
38:4, 10 44:10  
46:13, 16, 24  
47:17 49:20  
51:17 55:5  
64:23, 25 65:9,  
21 66:10, 24  
71:5 80:17  
81:25 84:16  
85:12 86:12, 23  
87:23 88:25  
89:2 90:11  
**city-owned**  
51:16  
**city's** 31:25  
35:11  
**citywide** 33:23  
**civil** 6:5  
**classify** 23:23  
51:10  
**clear** 43:24  
78:21 79:7  
83:24 85:4  
91:18  
**clearly** 57:22  
75:12, 18  
**Cliff** 45:14  
**climate** 36:8  
56:25 57:1  
62:1, 14, 24  
**clock** 79:2  
**close** 40:2  
50:6 58:14  
**closed** 26:14  
61:9 65:20  
**closely** 13:12  
18:15 71:2  
78:18  
**closes** 61:15  
**closing** 62:11  
**coalition** 44:6, 9,  
12  
**cold** 62:15  
**Co-Lead** 2:3  
4:6

**collaborating**  
34:5  
**collaboration**  
15:24  
**collaborative**  
4:20  
**collapse** 48:11  
49:19 52:7  
**colleague** 43:12  
**colleagues** 15:4  
16:7 19:25  
**Collenette**  
20:17 44:15  
92:14  
**Colombia** 30:23  
**come** 7:7  
11:17 12:17  
21:18 73:25  
74:3 76:2 83:4,  
5, 12 93:22  
**comes** 5:1  
84:21  
**comfort** 61:5  
**coming** 74:18  
**commence** 5:8  
**commencing**  
4:1  
**comment** 66:8,  
21 75:8  
**comments** 66:5,  
7 81:20 94:9  
**commercial**  
34:8 39:17  
65:11 81:25  
**COMMISSION**  
1:6 2:1 5:5  
6:17 11:10  
13:11 22:17  
32:1, 3 34:8, 14  
35:2 88:16  
92:20  
**Commission's**  
4:18 5:6, 10, 15  
9:3 10:10  
**commitment**  
15:22  
**Committee**  
12:11, 12 15:2,  
12, 16 16:15, 23  
17:3, 21 32:1, 2  
33:12, 21  
**committees**  
11:12 12:7, 16  
18:17 22:2, 3, 5  
**common** 25:12

**communications**  
34:18  
**community**  
16:5 22:6  
**companies** 20:8  
84:14  
**company** 20:9  
36:24 46:20  
47:5 75:5 76:5,  
6, 10 77:9 94:17  
**compared** 62:18  
**competent** 52:9  
**complaining**  
72:15  
**complement**  
78:11  
**complete** 50:8  
**completely** 48:9  
60:10 68:24  
69:4 82:14  
**completing** 50:7  
**complex** 26:7  
54:5 91:5  
**complexities**  
81:17  
**complexity**  
54:17 91:12  
**complicated**  
20:13 56:14  
**component**  
18:1 28:18  
**components**  
27:9 73:22  
74:18 75:10, 25  
**composed** 29:7  
**comprehensive**  
20:18  
**compressed**  
63:19, 23  
**compromises**  
79:10  
**computer** 77:23  
**concentrating**  
19:8  
**concept** 21:20  
24:8  
**concern** 83:1  
86:11  
**concerned**  
46:25 90:23  
**concerning** 59:4  
**concerns** 32:23  
45:7  
**Concluded**  
93:25

<b>conditioning</b> 61:20	22 26:22, 23 27:19 28:17 88:25	<b>corrections</b> 5:11, 14, 22	<b>crossovers</b> 41:22 42:2 76:25	49:10 50:22 51:5, 8 52:17 53:23 63:5 64:20 67:8 70:25 73:19 76:17 78:7 82:6 85:15 87:8 88:17 92:14 93:11
<b>conditions</b> 45:4 46:4, 11 60:19 66:8 68:6, 14, 20 70:10, 14 80:1, 6 87:12 92:7	<b>contains</b> 54:2 67:20	<b>corridor</b> 17:11 18:9, 10, 13 28:6 45:12 71:5 79:21	<b>crowd</b> 92:7 <b>crowded</b> 40:24	<b>Crown</b> 6:6 <b>CRR</b> 94:3, 18 <b>CSR</b> 94:3, 18 <b>CTV</b> 50:24
<b>conducted</b> 11:1 17:22, 23 20:20	<b>contaminated</b> 52:24	<b>corridors</b> 21:17	<b>current</b> 9:22 19:23 29:4 60:24	<b>day</b> 1:16 40:3, 8, 25 69:23 94:14
<b>conductor</b> 60:16	<b>contamination</b> 57:13	<b>cost</b> 42:5 71:4 73:8 80:16 83:3, 14 84:22	<b>currently</b> 29:5, 14 30:12 38:1 54:12	<b>Days</b> 19:20 41:2 59:18 78:10, 23 79:3 93:17
<b>Confederation</b> 18:12 21:6 37:6 61:16 70:2 73:5 84:19 87:1	<b>content</b> 16:8 73:15 74:5, 10, 17 75:9, 21	<b>cost-related</b> 71:1	<b>Curriculum</b> 3:6 8:18	<b>day-to-day</b> 88:2
<b>conference</b> 8:24 34:24	<b>context</b> 20:5	<b>costs</b> 41:16 83:12, 15, 20 88:21	<b>curtain</b> 86:14 87:2	<b>de</b> 25:8
<b>conferences</b> 9:6 19:18	<b>continents</b> 69:7	<b>council</b> 12:9 15:3 16:14, 21 17:16 38:4 44:11 46:13, 16, 25 64:24	<b>curvature</b> 71:9	<b>dead</b> 93:14
<b>confidence</b> 64:23 65:12	<b>continue</b> 58:25 72:24 80:21	<b>councillors</b> 16:17 65:22	<b>curve</b> 71:19 72:4, 16 73:4	<b>deal</b> 37:5 48:2 68:18
<b>confidential</b> 5:16	<b>contract</b> 20:10 74:22 84:6, 22, 25	<b>COUNSEL</b> 2:1, 3, 4 4:6, 9, 22 5:15	<b>curves</b> 71:12, 15, 23 72:22	<b>dealing</b> 17:3 25:25 35:13
<b>confirmed</b> 49:16	<b>contracted</b> 84:10, 12, 13 85:25	<b>countries</b> 11:5 48:7 58:18	<b>customer</b> 54:16 62:13 72:14	<b>deals</b> 32:2, 4
<b>conflicting</b> 49:22	<b>contractor</b> 49:4 88:25	<b>country</b> 30:12, 13, 21 35:1 74:1, 2	<b>customers</b> 81:7	<b>dealt</b> 58:18
<b>connected</b> 51:23	<b>contracts</b> 18:20	<b>couple</b> 8:21 49:5 53:23 60:14 62:25	<b>cutover</b> 78:4 81:7	<b>debate</b> 85:3
<b>connection</b> 66:16	<b>contrast</b> 79:18	<b>course</b> 38:21 49:15 52:19 58:13 68:19 70:4 77:20 84:17, 19 91:19	<b>CV</b> 7:20 10:20 14:6	<b>decades</b> 10:23 14:18 45:19
<b>consequences</b> 86:2	<b>contributed</b> 66:14	<b>Court</b> 45:15, 21 63:3	<b>&lt; D &gt;</b>	<b>decided</b> 28:10 80:21 82:14 84:6
<b>Conservation</b> 22:15	<b>control</b> 13:16 62:1, 24 76:20 77:2, 22	<b>covered</b> 28:14 43:9 50:17	<b>Dallas</b> 36:25	<b>deciding</b> 80:10
<b>Conservative</b> 82:20	<b>conventional</b> 64:1, 9	<b>CP</b> 17:9	<b>damage</b> 91:24	<b>decision</b> 34:21 38:3 39:8 42:10 44:10 47:10 61:22 62:8 71:2 81:6 89:4
<b>considered</b> 28:8 75:24	<b>conversion</b> 27:23	<b>cracked</b> 75:13 76:8	<b>dangerous</b> 59:20	<b>decisions</b> 41:12 43:9 49:4 70:20 88:19, 22
<b>considering</b> 42:12	<b>convincing</b> 15:12	<b>cracks</b> 42:20 56:7 87:19	<b>date</b> 93:15	<b>declaration</b> 4:18
<b>consortium</b> 47:4	<b>coordinated</b> 15:6	<b>created</b> 59:12	<b>dated</b> 3:5 8:17 94:14	<b>deemed</b> 6:1
<b>constructed</b> 21:10 45:10	<b>copy</b> 7:18, 21	<b>criteria</b> 78:8 79:10	<b>dates</b> 6:20, 21 14:2 93:3	<b>deep</b> 23:15 24:7 26:13 36:18
<b>constructing</b> 18:21	<b>corner</b> 25:14	<b>critical</b> 43:18	<b>DAVID</b> 1:8 2:10 3:6 6:18 7:12, 13, 23 8:6, 11, 19 9:5, 20 10:12, 21 11:23 12:23 14:4, 7, 16 20:16 23:7 24:5 27:1, 11 29:5 30:2, 9 31:8, 21 33:15 34:15 37:19 39:19 43:22 44:14 45:8	<b>deeper</b> 45:3
<b>construction</b> 26:2 45:16 47:4 53:10, 13 84:22 85:12	<b>corners</b> 25:21	<b>crossing</b> 25:16		<b>deficiencies</b> 87:17
<b>consultant</b> 17:6 87:25	<b>corporation</b> 29:10 31:3	<b>crossings</b> 28:3		<b>definitely</b> 90:14
<b>consultants</b> 15:9 16:24 17:5	<b>Corporations</b> 29:22			<b>degree</b> 58:24
<b>consultation</b> 12:1 22:13, 21,	<b>correct</b> 5:19 8:9			<b>deliberations</b> 21:1

<b>demand</b> 40:16 42:7 43:5 58:17 <b>demands</b> 81:18 <b>department</b> 32:25 <b>departments</b> 17:7 <b>depth</b> 49:13 <b>derailed</b> 86:10 92:5 <b>derailing</b> 56:4 <b>derailment</b> 55:25 89:7 91:2, 17 92:3 <b>derailments</b> 34:10 39:18 53:22 64:6 70:23 76:15 87:18 88:13 89:17 <b>describe</b> 31:17 <b>described</b> 50:17 <b>describing</b> 87:6 <b>design</b> 38:23 39:24 41:13 53:25 56:6 60:9 67:11, 20 85:12 89:18 <b>designed</b> 35:18 41:4, 21 53:1 54:13, 22 70:9 71:21, 23 72:20 73:9 78:11 <b>designing</b> 35:23 43:3 <b>designs</b> 37:25 <b>destroyed</b> 91:22 <b>detail</b> 14:11 17:12 45:7 63:14 <b>details</b> 19:7 45:18 <b>detect</b> 90:5 <b>detected</b> 42:20 90:1 <b>detection</b> 59:5 <b>detectors</b> 89:11 <b>determine</b> 78:17 <b>developed</b> 38:20 39:7 54:14 <b>development</b> 55:15 <b>device</b> 47:11	<b>devices</b> 89:11 <b>diameter</b> 64:12 <b>diesel</b> 18:23 68:2 <b>difference</b> 41:18 57:2 67:25 68:23 <b>different</b> 13:2, 17 14:9 17:7, 17 19:12 20:22 21:6 22:16 30:20 31:13 37:25 44:2, 16 48:20 69:4 75:3 <b>difficult</b> 26:8, 9 <b>difficulties</b> 66:16 <b>digging</b> 26:13 45:9 <b>directly</b> 12:9 19:12 25:25 <b>Directors</b> 29:13, 14 30:7, 10 <b>disable</b> 62:8 <b>disabled</b> 40:18 42:4 <b>disasters</b> 82:11 <b>discomfort</b> 59:12 <b>discovered</b> 61:8 <b>discuss</b> 4:13 76:18 83:24 88:14 <b>discussed</b> 5:3 11:13 14:1 43:19 65:25 70:22 76:15 88:12 <b>discussing</b> 26:17 <b>discussion</b> 36:7, 9 66:19 79:9 83:11 <b>discussions</b> 37:3 <b>disk</b> 91:10 <b>dismissed</b> 44:4 <b>displays</b> 16:10 <b>disruption</b> 48:15 <b>distance</b> 23:15 <b>distribution</b> 28:20 <b>division</b> 85:4, 9, 14 <b>document</b> 65:5 93:3	<b>documented</b> 49:12 63:7 77:19 <b>documents</b> 3:11, 16 6:24, 25 7:2, 6 65:11, 13, 17 90:22 <b>doing</b> 23:13 33:14 78:3 79:24 80:17 83:18 <b>door</b> 41:1 61:14, 15, 24 <b>doors</b> 40:24 61:9, 17, 18 62:9, 11, 13, 21, 22 63:24 65:20 86:19 <b>downtown</b> 18:24 21:5, 18, 25 25:20 27:4 32:20 44:3, 5, 20 45:15, 21 <b>drainage</b> 51:21 52:1 <b>dramatically</b> 40:21 <b>drilling</b> 46:10 <b>Drive</b> 27:13 <b>driver</b> 80:19 <b>drivers</b> 73:3 <b>driving</b> 81:12 <b>drop</b> 93:14 <b>dropped</b> 40:21 <b>due</b> 58:21 <b>Durrell</b> 16:5  < E > <b>earlier</b> 9:21 46:8, 19 91:4 <b>early</b> 15:25 41:1 59:18 <b>EAs</b> 22:4 <b>ease</b> 63:23 <b>easier</b> 24:8 <b>easily</b> 89:21 <b>east</b> 28:7, 12 46:6 51:16 <b>east-west</b> 18:10 19:3 <b>economic</b> 48:15 <b>edge</b> 37:24 <b>editions</b> 10:8 <b>editor</b> 9:16, 21	<b>Edmonton</b> 25:12 <b>effectively</b> 24:9 <b>efficiencies</b> 83:22 <b>efficiently</b> 83:18 <b>effort</b> 45:19 <b>elected</b> 30:10 <b>election</b> 15:19, 21, 23 19:6 33:24 <b>electric</b> 64:7 69:11, 18 <b>electrical</b> 57:18, 21 60:15, 24 69:17 <b>electricity</b> 60:22 <b>electrifying</b> 18:22 <b>electronic</b> 9:22 <b>element</b> 84:25 <b>elements</b> 67:21 73:24 76:4 <b>elevation</b> 72:2 <b>elevators</b> 24:7 <b>Elgin</b> 25:4 <b>eliminate</b> 72:13 <b>eliminated</b> 41:16 <b>eliminates</b> 76:23 <b>eliminating</b> 80:18 <b>E-mail</b> 3:5 7:19, 21 8:17 10:6 34:5 <b>emergency</b> 55:20 59:6, 10 <b>employed</b> 87:25 <b>employee</b> 14:18 <b>employer</b> 85:17, 18 <b>employment</b> 74:16 <b>ended</b> 37:23 38:22 61:25 <b>engaged</b> 31:5 <b>engineering</b> 41:11, 12 88:19 90:10 <b>enter</b> 5:5 8:13 53:2 <b>entered</b> 5:11, 16, 21 <b>entire</b> 24:13 61:17 <b>entirely</b> 86:11 <b>entry</b> 14:6	<b>enumerating</b> 13:19 <b>environment</b> 85:16 <b>environmental</b> 12:3 18:16, 18, 25 19:2 22:1, 19 27:5, 8, 12, 18, 22 28:6 71:6 <b>equipment</b> 38:17 48:5 50:11 64:3 <b>era</b> 82:13 <b>errors</b> 5:20 <b>escalators</b> 24:7 <b>essential</b> 87:12 <b>essentially</b> 21:11 24:12 25:4 33:21 38:6, 14, 23 39:10 44:19 60:7 61:19 64:4 67:22 <b>establish</b> 6:4 <b>etcetera</b> 10:18 12:3 22:6, 17 28:4 77:15 <b>Europe</b> 13:1 68:14 <b>European</b> 21:10 62:19 <b>event</b> 34:20 37:4 <b>events</b> 79:9 86:19 <b>eventually</b> 20:10 26:10 27:23 28:10 55:23 57:19 82:20 <b>everybody</b> 24:18 <b>evidence</b> 4:17 5:6, 12, 17, 21 6:8, 11, 15 8:14 90:18 <b>evolved</b> 21:7 36:16 <b>exact</b> 6:20 <b>exacting</b> 56:17 <b>exactly</b> 23:22 48:19 54:9 56:17 64:24 69:24 74:6 78:1 90:17, 25
--	--	--	--	---

91:15, 19  
**examine** 46:11  
**example** 10:25  
11:13 12:10  
27:11, 14 33:11,  
12 36:15, 25  
40:17 41:15, 25  
42:19 47:10, 16  
48:16 57:8  
58:3, 20 60:6  
62:19 64:6  
65:1, 16 69:3  
76:4 82:13  
84:5 86:17 89:3  
**examples** 23:18  
50:25 82:9 84:3  
**excavation**  
45:20 48:10  
49:24  
**exceeded** 38:7  
**excess** 43:4  
**excessively**  
59:21  
**Exchange** 25:7  
34:5  
**exercised** 51:2  
**exhibit** 8:15, 17  
**EXHIBITS** 3:1  
**exist** 45:24  
54:7, 11 76:1  
81:10  
**existed** 38:9  
62:10  
**existing** 13:3  
18:13 21:12, 16  
24:24 25:5  
36:10 40:16  
**exit** 24:16  
25:14  
**exits** 25:19  
**Expansion**  
12:13 17:23  
**expected** 43:3,  
4 53:14 84:17  
**expensive** 50:10  
**experience**  
46:20 47:7  
48:1, 24 61:6  
62:3 68:18  
69:1, 21  
**Experienced**  
66:15 77:8  
**expert** 14:1  
49:1  
**expertise** 83:23

**experts** 13:8, 13  
35:9 47:3, 5  
**explained** 58:7  
**explored** 39:7  
**exposure** 49:3  
**expressed** 45:7  
**extended** 46:10  
56:9 58:2  
**extending** 18:24  
27:13, 15 28:1  
**extension** 27:22  
28:9 47:19, 23  
**extensions**  
47:22  
**extensive** 46:20  
47:7 57:18  
60:20  
**extent** 43:9, 16  
61:2 75:22  
85:16 90:19  
**external** 16:22  
90:3  
**extreme** 24:21  
60:18 71:10  
80:1  
**extremely** 56:13  
58:23 62:15  
68:8 91:5

< F >

**facilities** 13:17  
45:13 57:15  
87:7  
**facility** 74:14,  
15, 25 75:1 86:7  
**facing** 81:18  
**fact** 23:9 34:1  
37:24 41:18  
47:1 52:22  
54:14, 15 55:17  
68:13 76:8  
79:12 81:11  
82:23 83:16  
**factor** 75:23  
83:10  
**factors** 42:23  
75:7  
**factory** 74:8, 25  
**failure** 42:9  
51:21 52:6  
55:24 60:12  
89:6, 24, 25  
90:15  
**failures** 41:19  
43:1 48:18

57:18 58:7  
60:18 62:11  
69:12 72:10  
77:18 87:21  
89:17  
**fair** 44:10 76:19  
**fairly** 34:23  
36:11 47:15  
50:6 60:20  
63:7 67:15  
78:21 84:4  
86:20 91:20  
**fall** 77:11 80:24  
**fallback** 41:19  
42:25  
**falling** 56:3  
59:24  
**Fallowfield** 28:3  
**family** 67:13  
68:17  
**favour** 15:13  
44:13  
**feature** 54:11  
62:8  
**featured** 13:10  
**features** 49:15  
**Federal** 10:15  
45:10  
**feed** 21:13  
**feel** 37:16  
39:16 70:22  
93:2, 12, 23  
**fell** 91:1  
**field** 77:9  
**final** 74:11  
91:18  
**finally** 5:24  
**financed** 84:16  
**financing** 83:12,  
20  
**find** 38:7 62:15  
65:4 72:23  
**fine** 7:3 85:22  
**finished** 53:18  
**fits** 78:1  
**five-minute** 32:7  
**flag** 40:10  
**flat** 55:21  
59:11, 15  
**flood** 50:1  
**floor** 38:12, 14,  
17, 18, 19 53:24  
63:16 64:2, 3, 9,  
10 65:3

**floors** 59:25  
**fluctuate** 30:15  
**focus** 34:7  
70:19  
**focused** 31:11,  
16 43:20 82:7  
**follow** 7:1, 5  
10:4, 5 18:15  
37:23 43:13  
49:6 52:14  
62:25 65:24, 25  
71:2 81:19  
**followed** 3:12  
18:6 35:6  
37:16 39:13, 16  
53:8 56:19  
**following** 3:11,  
17 15:24  
**follows** 28:12  
58:20  
**Force** 11:3  
20:15 21:1, 21  
23:1, 3, 21  
44:14 92:14  
**foregoing** 94:5,  
11  
**foreign** 75:10  
**form** 11:16  
**formation** 20:14  
**former** 20:16  
**forth** 94:7  
**fortunately** 50:6  
91:25  
**forum** 34:16  
35:12 36:8, 22  
37:2, 9 38:5  
39:12, 15 43:23  
44:17 77:14  
**forward** 15:1  
18:4 26:23  
**founded** 29:10  
**frames** 74:2  
**Frankfurt** 21:11  
**free** 93:24  
**Freedom** 65:15  
**freeway** 51:16  
**frequency**  
40:13 78:12  
**front** 38:15  
45:20 64:11  
**full** 29:23, 25  
45:11 78:10  
79:23  
**fully** 49:11 58:7

**fundamental**  
39:11 68:22  
**future** 20:19  
  
< G >  
**Gabriel** 2:16  
**garage** 53:7  
**garages** 86:23  
**gas** 69:18, 22  
**Gatineau** 51:24  
**gear** 91:1  
**gearbox** 54:3  
56:2, 3 64:7  
**gearing** 91:11  
**general** 25:18  
30:11 32:21  
39:21 40:6  
41:20 88:10  
**generally** 22:4  
28:20 31:18, 23  
32:7 34:4  
43:21 50:17  
58:25 70:8  
71:22 83:6, 13  
**generate** 83:21  
**generation** 68:2  
**genesis** 21:19  
**geological** 49:15  
**geology** 49:10  
**Germany** 48:9,  
13  
**Ginza** 24:10, 17,  
21  
**give** 29:6, 19,  
22, 24 30:3  
33:11 43:11  
93:4  
**given** 5:18 6:6  
35:3, 8, 20 57:7  
64:21  
**giving** 6:11  
**Gladstone** 51:18  
**Good** 4:3 20:6  
36:1 80:3 82:8  
84:4 86:20  
87:11, 12  
**governed** 29:13  
30:6  
**government**  
22:16 45:10  
82:21 83:18  
**Governments**  
83:6, 13  
**grade** 28:2  
**grammar** 8:3

**GRANN** 7:11  
73:18  
**granted** 66:5  
**Granville** 23:13  
**great** 30:1  
68:18  
**Greater** 31:12  
48:15  
**ground** 6:2  
48:11  
**groundwater**  
52:24 53:1  
**group** 22:22  
28:17 29:4  
**groups** 12:1  
22:13, 21 26:23  
27:19 31:13  
33:13, 16  
**guess** 8:15  
39:19 86:1  
87:8 90:16  
**guided** 71:18

< H >

**half** 24:20 42:1  
**half-day** 17:1  
**Hamilton** 31:12  
**handle** 40:16,  
22 42:7 73:9  
**hang** 29:18  
**happen** 48:6, 18  
50:1 73:6 92:1  
**happened** 20:23  
40:11 41:3  
45:19 46:1, 7  
51:15 52:20  
55:25 61:1  
75:20 90:24  
91:19  
**happening** 20:4  
53:16 87:2  
**happens** 24:14  
58:8 86:12  
**hard** 48:3  
53:16 55:11  
**headers** 50:9  
**heading** 10:14  
**hear** 35:7  
**heard** 47:2  
**Hearings** 4:19  
5:6, 7, 8 10:25  
11:9, 12  
**heat** 45:13  
58:21

**heaters** 69:11,  
18, 19, 22, 23  
70:1, 4, 7  
**Heating** 45:14  
61:20 69:17  
**heaviest** 40:8  
81:3, 5  
**heavily** 36:19  
**heavy** 21:11  
23:9, 24 39:10  
68:21  
**Held** 1:15 16:4  
34:17, 24 43:23  
44:18 92:24  
**help** 7:5 63:3  
**helpful** 10:4  
93:10  
**helps** 72:4  
**hiding** 86:15  
**high** 10:17, 24  
11:5 35:25  
36:10 37:13  
38:16 48:12  
58:21, 23 70:9  
89:25

**higher** 30:15  
58:9 59:1  
64:10 83:20  
88:4  
**highest** 57:3  
**Highway** 51:15  
**Hill** 19:21  
**hold** 72:6  
**holding** 56:16  
**hospital** 28:6  
**hot** 89:10  
**hour** 54:20, 23  
55:1, 3, 10 65:3  
71:11 72:21, 25  
73:11 92:7  
**hundred** 70:7  
91:21, 22  
**hundreds** 68:13  
**Hurdman** 41:16  
71:14  
**Hydro** 22:15

< I >

**IBI** 17:6  
**idea** 44:3 79:16  
**ideas** 25:17  
**identical** 68:12  
**identification**  
18:7

**identified** 56:21  
**ideological** 85:3  
**imagine** 55:11  
**Imbesi** 2:4 4:8,  
21 7:8 43:12,  
14 44:22 52:13,  
15 65:25 66:2,  
20 81:21, 22  
88:8, 9  
**impact** 33:24  
71:6 75:8, 10  
**implement** 16:16  
**implementation**  
40:5  
**implemented**  
17:10  
**implementing**  
37:17 82:5  
**importance** 36:3  
**important** 34:16  
37:2 46:17  
61:8 67:21  
79:11 85:19  
**impose** 72:22  
**imposed** 54:18  
63:17  
**imposes** 58:20  
**impossible** 45:9  
**improve** 72:16  
**improvements**  
14:22  
**inaudible** 66:14  
**incident** 50:5  
**incidents** 42:17  
56:23 58:3 92:8  
**include** 27:9  
**included** 13:15  
20:8 21:25  
22:14 57:14  
92:20  
**including** 13:25  
14:20 17:4  
35:1, 5 47:15  
67:16 72:10  
**incorporated**  
31:1  
**incorrectly**  
75:14 89:23  
**increase** 30:17  
**incriminate** 6:3  
**INDEX** 3:1, 14  
**indicate** 87:16  
**indicated** 45:3  
**indoor** 25:3  
**inductors** 57:20

**industry** 9:8  
19:13, 22, 24  
20:2, 22 38:13  
73:21 89:8  
**information**  
4:14 8:1, 21  
11:18 28:25  
50:18 65:6, 15  
88:15 93:16, 23  
**infrastructure**  
26:11 32:3  
51:9 69:13  
82:15, 21 83:7  
84:13  
**infrequent** 40:19  
**initial** 12:25  
39:23 84:22  
**initially** 11:9  
**initiated** 65:15  
**injuries** 91:25  
**Inlet** 47:18  
**Innes** 28:12  
**innovation** 54:6  
76:21  
**innovations**  
85:18  
**input** 21:3, 22  
**inputted** 14:14  
**Inquiries** 5:25  
10:16 12:2  
**Inquiry** 4:7 6:1,  
7 9:13 49:18  
67:4 87:14  
**inservice** 92:1  
**inside** 64:8  
72:5 89:19 90:4  
**insight** 86:3  
**insist** 75:25  
**install** 71:16  
**installation** 56:7  
**installations**  
62:19  
**installed** 62:18  
70:7 75:14  
76:22  
**instance** 6:5  
**instrumental**  
15:11  
**insulation** 62:17,  
22 67:17  
**integrated** 25:9  
**integrity** 58:5  
**intended** 60:24  
70:16 71:10, 24

73:10 80:18  
**intends** 5:5  
**intensive** 71:7  
91:14  
**interacted** 32:12  
**interaction**  
13:12 91:9  
**interest** 31:24  
33:25  
**interesting**  
82:12 86:2  
**interface** 77:1, 5  
**internal** 24:25  
47:3 86:11  
**international**  
8:24 9:6  
**Interrupt** 22:23  
**INTERRUPTION**  
41:6  
**intersection**  
24:19 25:14  
**intersections**  
25:11  
**intervene** 4:22  
**interview** 4:11,  
15, 16, 20, 25  
5:4 29:25 93:20  
**interviews** 32:13  
**introduced**  
54:17  
**introduction**  
81:17  
**introductions**  
4:5  
**intruder** 59:5  
**investment** 83:7  
**invited** 28:17  
34:24 35:4  
**involve** 68:20  
**involved** 11:24  
13:7, 13, 20  
14:17 16:19  
17:8 18:16  
19:19 27:25  
33:2, 20 47:6  
63:19 65:13  
86:13  
**involvement**  
11:19 14:11  
19:9, 11 22:8  
26:18, 22 84:3  
**Iponam** 54:13  
63:4, 6 91:4  
**I-P-O-N-A-M**  
63:5

**issue** 30:18  
46:17 56:8, 12  
59:3 60:12  
62:6, 7 72:18  
73:7 85:23  
90:13, 16 91:16  
**issues** 9:2  
14:12 25:24  
32:22 34:2  
37:5 47:9 48:6  
50:25 51:9  
52:1, 3, 19  
53:12 56:2  
59:4 60:13, 25  
66:12, 18 67:2,  
6 75:13 76:12  
77:21 82:8  
87:20 90:24  
**issues-oriented**  
30:16  
**items** 3:12 8:8

< J >

**jacking** 75:15  
**Japanese** 36:23  
**JEANES** 1:8  
2:10 3:6 4:4  
6:18 7:12, 13,  
17, 23 8:6, 11,  
19 9:5, 20  
10:12, 21 11:23  
12:23 14:4, 7,  
16 23:7 24:5  
27:1, 11 29:5  
30:2, 9 31:8, 21  
33:15 34:15  
37:19 39:19  
43:15, 22 45:8  
49:10 50:22  
51:5, 8 52:17  
53:23 63:5  
64:20 66:3, 20  
67:8 70:25  
73:19 76:17  
78:7 82:6  
85:15 87:8  
88:11, 17 93:11  
**Jim** 16:5  
**John** 40:6 81:2  
**joined** 4:8  
**joining** 4:4, 21  
**joint** 19:19  
**jointly** 11:1  
20:1

**Jon** 67:11  
**journal** 8:24  
**judge** 52:10  
75:21  
**judgments**  
77:17  
**judicial** 90:18  
**Judith** 2:15 4:9  
94:3, 18  
**July** 42:20  
**jumped** 60:22  
**jumping** 36:17  
**June** 34:17

< K >

**Kate** 2:3 4:3, 6  
7:3, 14 8:2, 10,  
13, 20 9:14  
10:3, 13 11:17  
12:17 13:24  
14:5, 8 22:25  
23:25 26:16  
27:10 28:22  
29:24 30:4  
31:4, 17 33:7  
34:7 37:9  
39:14 43:6  
44:23 49:5  
50:16, 23 51:7  
52:11 53:19  
62:25 64:16  
65:23 66:17  
70:18 76:11  
78:6 81:19, 23  
85:7 87:4 88:6,  
10 93:9, 18  
**key** 15:18 41:8  
**kilometre** 24:20  
65:3 71:11  
**kilometres** 42:1  
54:20, 22 55:1,  
3, 9 72:21, 25  
73:11  
**kind** 24:21  
26:7 35:14  
42:9 55:11  
72:3 86:14  
87:5 91:3  
**kinds** 20:2  
47:9 60:25  
68:14 84:1  
85:18 87:20  
89:15 91:8  
**Kinkisharyo**  
36:23

**knew** 62:2  
69:24  
**knowledge** 31:4  
**known** 46:1, 4  
49:7, 9 80:5  
**KPMG** 17:6

< L >

**labour** 74:10  
75:9  
**lane** 81:11  
**large** 17:21  
25:16 34:23  
45:11 51:13  
56:15 57:8  
68:12 85:6 91:5  
**largely** 44:4  
76:23  
**larger** 17:18  
64:12 69:19  
**Larry** 20:15  
**late** 80:24  
**Laval** 47:20  
**Lavoie** 2:16  
**lead** 87:22  
89:16, 17  
**leading** 37:24  
76:6  
**leaning** 72:3  
**led** 18:5, 19  
21:4 34:9 38:6  
39:18 40:25  
44:14 49:3  
53:17 62:14  
67:3 82:18  
87:18 89:6  
**left** 81:11  
**length** 45:11  
**letters** 14:14  
**level** 52:23 54:9  
**leveling** 54:8  
**levelling** 63:18  
**liability** 6:5  
**life** 84:24  
**life-expired** 26:6  
**lifting** 63:20  
**LIGHT** 1:6 4:7  
11:21 12:4, 11,  
18, 22, 24, 25  
13:1 14:25  
15:6, 13, 21, 22  
16:2, 11, 16, 19  
17:4 18:20, 23  
20:7 23:8, 14,  
19, 24 24:3

27:24 28:1, 8  
31:6 32:18  
33:9, 19 34:22  
35:17 36:24  
37:8 38:5, 7, 16  
39:9 40:7, 9  
44:8 46:23  
54:21 55:8  
61:7 62:3 64:1  
68:2, 16 69:5  
76:24 81:5  
**likewise** 68:11  
**limit** 73:3  
**limited** 16:23  
**limits** 42:2  
72:22  
**lines** 21:13, 16  
39:14 85:8  
**linked** 24:23  
**listed** 8:22  
14:8 27:1 37:14  
**Litigation** 2:4  
49:20  
**living** 31:23  
**loaded** 36:19  
**local** 32:10  
33:3, 25  
**located** 64:8  
89:11  
**locomotive**  
79:19  
**longer** 42:21  
**looked** 14:12  
28:9 44:1  
58:19, 22  
**looking** 7:21  
24:22 27:23  
44:18 64:5 83:2  
**lost** 42:18 50:4  
51:23  
**lot** 16:8 19:11  
20:12 31:10  
36:7 40:25  
45:8 46:2, 9  
48:1 54:17  
59:14 61:6  
65:19 72:12  
79:9 91:13  
**lots** 37:3 68:19  
69:21  
**low** 38:12, 14,  
19 53:24 58:4  
63:16 64:2 65:2  
**lower** 70:1

72:22 83:13  
**lowest** 57:3  
**LRT** 9:4, 18, 25  
10:10 11:19  
13:11, 16, 17  
14:6 26:3  
31:20 37:18  
53:21 70:21  
92:11  
**LRTC** 26:19  
**Lyon** 25:4

< M >

**machines** 48:22  
50:5  
**made** 5:11, 14  
23:4 32:10  
38:3 41:12, 18  
42:10 43:8  
44:25 53:20  
60:3 61:22  
64:16, 22 65:9  
66:8 67:22  
75:19 76:5  
79:10 82:25  
88:20 89:4  
92:13 94:9  
**main** 48:8  
51:21 52:6  
55:12 70:5  
79:21 89:10  
**maintain** 56:14  
**maintained**  
55:23  
**maintains** 85:13  
**maintenance**  
13:16 42:14, 24  
56:2, 7 57:14  
74:13, 14, 24  
75:4 82:18  
84:6, 9, 11, 12,  
24, 25 85:12, 23,  
24 86:4, 6, 16,  
19, 22, 23 87:1,  
6, 13, 17, 24  
88:3 89:20  
91:14  
**major** 45:25  
46:21 48:6  
60:2 69:12  
**majority** 9:6  
**making** 77:16  
85:18  
**malls** 25:1

**managed** 84:16  
86:1  
**management**  
14:22 77:5  
92:22  
**manager** 32:21  
39:22 40:6  
**managers** 13:13  
**Manconi** 40:6  
81:2  
**mandate** 9:3  
70:22  
**Manitoba** 29:17  
**manufactured**  
74:1  
**manufacturer**  
39:3  
**manufacturers**  
36:21  
**manufacturing**  
73:20 75:13  
**MARCH** 1:9, 17  
3:5 8:17 94:14  
**Margaret** 82:13  
**mark** 93:19  
**massive** 26:2  
45:19 48:14  
51:25  
**Master** 15:1, 11  
17:24, 25 44:1  
**material** 60:8  
**matters** 9:11  
32:3, 4 49:2  
67:3, 4 83:24  
**maximum** 55:2  
**Mayor** 20:15  
**MC** 7:11 73:18  
**McGrann** 2:3  
4:3, 6 7:3, 14  
8:2, 10, 13, 20  
9:14 10:3, 13  
11:17 12:17  
13:24 14:5, 8  
22:25 23:25  
26:16 27:10  
28:22 29:24  
30:4 31:4, 17  
33:7 34:7 37:9  
39:14 43:6  
44:23 49:5  
50:16, 23 51:7  
52:11 53:19  
62:25 64:16  
65:23 66:17  
70:18 76:11

78:6 81:19, 23  
85:7 87:4 88:6,  
10 93:9, 18  
**meant** 38:15  
79:16  
**measure** 89:12  
**measures** 42:6  
**mechanisms**  
69:17  
**media** 32:12, 13  
33:23 45:1  
**meet** 32:20  
34:1 42:22  
54:5 57:25  
62:1 63:16 70:9  
**MEETING** 1:7  
15:5 16:1  
30:11 34:2  
38:24 41:6  
43:18 58:16  
70:12 77:12  
94:9  
**meetings** 13:10  
14:1, 21 17:1, 2,  
5 20:3 21:23  
31:25 32:7, 16,  
24 33:2 34:4,  
12, 13 92:23  
**meets** 37:21  
**Member** 2:3, 4  
4:8 11:25 12:7  
18:16 21:21  
22:1, 12, 20, 21  
91:25  
**members** 12:15  
16:15, 17, 18  
19:22 29:4, 7  
30:7, 11, 13  
32:10, 25 33:3,  
5, 8, 20, 25  
64:23 93:4  
**membership**  
12:10 29:3  
30:10, 11, 14, 16  
**mention** 7:6  
19:10 69:9  
70:17 73:17  
**mentioned**  
17:14 31:22  
34:11 37:12  
44:13 50:23  
53:24 60:14  
65:1 67:18  
73:22 77:13

88:18 91:4  
92:19  
**Mercier** 39:22  
**message** 37:20  
39:20, 21, 25  
40:4  
**met** 4:10 19:22  
21:2 39:3 47:1  
54:24 61:3  
72:21 74:7  
78:24  
**metres** 91:21, 22  
**metro** 35:16  
38:6 39:11  
47:19 69:3  
**mezzanine**  
24:11, 12  
**Michael** 63:6  
**mid** 36:15  
**migration** 11:5  
**Millennium**  
74:23  
**mine** 47:12  
**minimal** 68:5  
**minimizes** 25:15  
**mining** 48:21  
**Minister** 20:16  
**minute** 34:11  
**minutes** 78:13  
**mishaps** 53:9  
**misquote** 67:9  
**mistake** 70:3  
80:8, 9, 20 81:7  
**mistakes** 75:19  
**mistorquing**  
56:20  
**model** 66:10, 13,  
25  
**modernizing**  
18:22  
**modifications**  
67:16 68:5  
**moment** 19:7  
**money** 80:18  
83:14  
**monitor** 89:9  
**monitored** 28:16  
**month** 79:15  
92:4  
**monthly** 9:22  
**months** 26:14  
**Montréal** 47:19  
69:3 70:5  
**Moody** 27:13

**morning** 4:3  
6:19  
**motion** 46:18  
**motivated** 55:7  
**motive** 82:18,  
23 83:3  
**motor** 54:2  
64:7 91:11  
**mounted** 16:10  
90:7  
**move** 52:11  
**movement** 24:7  
**multi-fatality**  
82:19  
**multiple** 10:15  
22:5, 19 25:19  
31:23  
**Munich** 21:10  
**municipal** 19:6  
**municipalities**  
17:17  
**municipality**  
15:20 16:8  
  
< N >  
**names** 29:6, 19,  
20 30:3  
**National** 22:16  
30:17 33:6  
92:23  
**nature** 10:19  
14:12  
**near** 45:25  
**nearer** 46:6  
**nearly** 14:17  
16:25 42:1 70:6  
**necessarily**  
6:19 28:19  
76:1 77:12  
**necessary**  
38:17 55:6  
71:16 85:16  
89:4  
**necessitated**  
53:25  
**needed** 8:1  
62:3 69:24  
**needs** 37:21  
54:6 91:14  
**NEESONS** 94:17  
**neglected** 82:18  
**neither** 86:12  
**network** 21:15  
**new** 28:2 29:15  
38:24 53:25

54:12, 14 55:15  
66:13 67:11, 19,  
22 68:24 77:7  
79:19  
**newsletter** 9:11,  
17, 18, 23, 25  
10:8 92:12  
**newspaper** 9:9  
**nice** 83:8  
**noise** 59:12  
72:12, 15  
**non-**  
**typographical**  
5:22  
**normal** 55:9  
61:12 89:8, 14,  
20  
**normally** 63:21  
80:4 84:20  
**Norman** 63:6  
**Nortel** 14:19, 21,  
23  
**North** 40:9  
47:20 51:24  
54:15 63:9  
69:1 77:7 81:4,  
5  
**Northern** 14:19  
31:14  
**north-south**  
18:8, 19, 20, 22  
20:7 32:18  
33:19 48:8  
61:12 62:4  
**note** 9:15 66:15  
**noted** 3:16  
8:23 10:14  
**notes** 94:12  
**not-for-profit**  
29:10 31:3  
**notice** 8:4  
**Nova** 29:15  
**number** 9:23  
10:23 14:9  
20:21 25:1  
31:15 35:3, 19  
37:14 39:20  
42:11, 12, 14  
56:15, 20 59:10  
71:8 72:19  
77:4 91:6  
**NUMBER/DESCR**  
**IPTION** 3:3  
**numbers** 25:16



<p>30:14 68:12 numerous 14:21</p> <p>&lt; O &gt;</p> <p>object 6:14 objected 6:1 O'Brien 20:15 observations 43:7 44:25 observe 78:15 observed 24:9 53:22 observing 12:24 obstruction 59:8 obtain 4:17 65:13 obtained 68:6 OC 14:20, 21 15:16 22:16 35:10 39:21 40:7 75:6 78:22 85:17 86:1, 12, 17 Occasionally 86:8 occasions 21:2 occur 58:4 occurred 51:25 53:10, 13 77:19 occurrence 8:9 occurrences 6:21, 22 59:17 occurring 60:18 October 80:15 offer 52:17 offset 83:21 old 26:5 omitted 69:9 70:16 onboard 85:20 ones 22:11 27:20 34:16 Ontario 11:2 29:17 30:24 31:5, 10, 11, 13, 14, 19 93:6, 8 OpEd 32:13 open 61:17, 18 62:9, 21 86:19 87:21 88:5 opened 61:10 opening 53:4 opens 61:14</p>	<p>operate 40:13 42:11 71:21 74:9 75:2 81:15 operated 35:19 operating 19:17 44:19 55:9 57:10 58:11, 15 59:15 67:21 80:5 92:7 operation 35:25 40:19 41:23 57:1 61:7 65:3 68:20 69:24 73:10 77:20 78:10 80:10 82:22, 24 85:13 86:4, 15, 16 87:22 88:5 operational 32:4 37:13 50:10 71:15 79:6 operations 13:6 44:2 58:25 84:7 86:19 operator 82:16 opinion 41:20 opponents 85:21 opportunity 5:18 43:12 86:21 opposed 15:15 44:8 67:23 opposition 44:5 oral 32:7 order 5:8 42:25 59:23 81:15 organization 30:16, 22 31:5, 15 33:6 organizations 22:14 30:20 31:1 37:11 organize 33:8 organized 16:7 33:13 34:20 organizing 13:8 original 42:22 43:18 69:18 originally 28:7 79:3 OTTAWA 1:6 4:7 9:4, 18, 25</p>	<p>10:9 11:19 12:6, 18, 21, 25 14:6 15:7 16:3, 5 17:16, 18, 22 20:19 21:17 22:12, 15 24:23 26:4, 18 28:7 31:6, 16, 20, 24 32:22 33:9 34:21 35:14 36:12, 16 37:4 38:10 39:8 44:3, 20 45:9, 15 49:11, 21 50:19, 25 51:9, 24 54:15, 18 55:6 57:9 60:10 61:2, 3, 21 63:9, 17 65:9 66:4, 22 68:1, 5 69:6, 15 70:13 71:5 74:12 79:25 81:9 82:9 84:10 92:11 Ottawa's 45:21 54:4 57:1, 7, 25 outline 23:19 output 14:13 outside 64:4, 8 72:2 74:18 90:6 overall 42:3 overcrowded 62:10 overhead 60:15, 16, 22 overheat 89:16 overheated 55:22 89:24 overruled 15:17 owned 71:5</p> <p>&lt; P &gt;</p> <p>Pacific 19:14 pages 3:17 panel 20:20, 21 papers 8:24 9:2 11:15 63:7 parallel 18:2 19:1 80:22 parallels 24:13 parking 53:7 Parliament 19:21, 22</p>	<p>part 15:9, 21, 22 18:14 49:10 50:19, 20 57:20 60:23 79:2 86:15 91:22 PARTICIPANT 2:7 participants 1:16 5:15, 21 16:22 participate 18:7 22:19 28:19 participated 16:25 18:25 19:1, 15 20:1 22:10 27:5, 17 28:4 37:3 participation 17:5 85:5 particular 39:2 45:1 50:14 81:7 particularly 10:22 14:18 25:7 28:18 30:17 36:4, 25 37:10 45:24 56:14 71:13 73:10 75:24 79:23 81:1 87:18 parties 49:23 partly 16:13 24:8 27:20 44:4 71:4 partner 46:21 84:1 85:11 partners 85:20 partnership 82:2 partnerships 82:9 83:2 parts 13:2 30:21 31:14 40:19 41:23 71:13 82:10 passed 46:18 passenger 10:16 61:5, 13 passengers 59:13 62:9 92:2 passenger's 61:25 passing 41:15, 17 47:17 78:17 Pasture 55:25 60:7 89:7 92:3</p>	<p>patent 54:14 63:12 patented 63:11 patents 63:13 path 60:24 payments 84:23 pedestrian 24:25 25:3 pedestrians 25:15 people 9:24 20:21, 24 22:8 24:7 29:14 31:23 59:24 62:15 87:8, 10 92:17 percent 38:11, 14, 19 53:24 55:13 64:2 65:2 performance 38:8 64:13 performed 68:7 period 9:21 19:11 32:17 42:19 46:10 78:14 79:2 periodic 84:23 periods 56:10 60:19 perjury 6:11 permits 4:24 persistent 53:3 person 6:6 59:7 personal 19:8 personally 18:7 65:14 perspective 21:3 37:22 46:12, 13, 14 66:13 67:3 phone 41:7 pieces 37:15 50:10 76:2 Pilot 12:11 15:13 16:16 17:4, 10 18:3, 23 61:7 62:4 place 6:10 25:8 64:4 81:12 94:6 placement 49:14 places 70:7 71:8 72:9, 19 76:24</p>
--	--	---	--	--

<p><b>plagued</b> 41:1 55:19 <b>Plan</b> 15:1, 11 17:24 18:1 27:13 42:22 44:1 81:16 <b>planned</b> 15:25 40:13 41:15 43:2 <b>planners</b> 13:10 35:11 <b>planning</b> 12:2, 19, 25 13:20, 22 14:17 17:3 21:24 22:9, 20 32:17, 19, 21, 25 43:8, 21 46:15 49:3, 12 50:21 66:7 70:20 73:7 <b>plans</b> 45:4 <b>Plant</b> 45:14 <b>plants</b> 75:10 <b>platform</b> 15:21 <b>platforms</b> 35:23 54:10 63:18 <b>players</b> 19:12 <b>Plaza</b> 25:8 <b>plenty</b> 84:2 <b>Plus</b> 11:11 42:13 63:22 92:24 <b>point</b> 8:4 12:23 44:4 45:20 46:16 50:14 62:1 67:9, 10 73:16 82:17 83:11 <b>points</b> 53:5 60:3 88:20 <b>policies</b> 87:24 <b>policy</b> 10:17 11:13 <b>politics</b> 20:13 <b>poor</b> 45:3 <b>popular</b> 51:18 <b>portal</b> 46:6 <b>portions</b> 60:23 <b>position</b> 6:20 <b>possibility</b> 24:22 <b>possible</b> 18:9 24:1, 2 <b>possibly</b> 56:22 61:23 89:1 <b>post-delivery</b></p>	<p>61:23 <b>posted</b> 5:9 <b>potential</b> 10:24 28:8 <b>potentially</b> 27:9 62:7 <b>pouring</b> 24:18 <b>powered</b> 69:22 <b>PowerPoint</b> 11:16 32:9 <b>precautions</b> 46:2 50:14 <b>preceded</b> 12:19 <b>precise</b> 65:4 <b>precisely</b> 91:7 <b>preexisting</b> 71:3 <b>preliminary</b> 15:10 <b>preparation</b> 34:21 <b>prepared</b> 15:9 90:11 <b>preparedness</b> 69:10 <b>preparing</b> 34:6 <b>PRESENT</b> 2:13 18:12 36:22 62:22 71:15 <b>presentation</b> 15:6 32:9 35:7 92:13, 22 <b>presentations</b> 11:15 13:8 32:8, 10 35:3, 8 36:20 47:2 92:16 <b>presented</b> 16:10 32:6 35:10 <b>presenters</b> 94:8 <b>press</b> 61:14 <b>pretty</b> 37:2 43:23 58:14 <b>prevent</b> 53:16 72:6 <b>previous</b> 34:18 92:4 <b>previously</b> 9:16 <b>price</b> 90:8 <b>pride</b> 87:9, 11 88:4 <b>primarily</b> 14:20 26:4 <b>principal</b> 27:4</p>	<p><b>prior</b> 80:7 <b>priority</b> 18:8 <b>private</b> 82:16, 23 83:14, 17, 25 84:3, 7, 11, 14 85:5, 11 <b>privatize</b> 82:14 <b>privatized</b> 82:21 <b>problem</b> 26:2 36:9 39:11 56:1 58:8 62:14 <b>problems</b> 41:1 48:3, 14, 18 51:21 52:21 53:17 55:19 57:18 58:2 61:24 62:10 68:11 71:16 75:22 89:15 <b>procedural</b> 5:7 <b>proceedings</b> 6:5, 9 90:19 94:5 <b>process</b> 49:12 50:21 61:12 65:10, 19 68:15 87:22 88:20, 23 <b>processes</b> 86:24 <b>produced</b> 3:12, 16 31:25 49:23 <b>producing</b> 33:21 <b>product</b> 53:18 63:9 76:7 <b>professional</b> 22:8 <b>profit</b> 82:18, 23 83:3, 7, 9, 21 84:18, 20, 21, 25 <b>progress</b> 19:23 <b>Project</b> 9:4, 19 12:12 15:13 16:16, 23 17:4, 10 18:4, 8, 9, 20, 23 19:4 20:8, 11 26:12, 15 28:11 31:7 32:18 33:19 34:10 44:11 46:8, 19, 21, 22 61:7 62:4 64:21 82:1, 5 83:4 84:15, 16, 17 85:10 90:10 <b>projects</b> 50:24</p>	<p>84:1 85:6 <b>propane</b> 69:22 <b>properly</b> 55:23 71:18 <b>proposal</b> 21:14 23:8 33:17 <b>proposed</b> 26:8 33:18 <b>proposing</b> 21:8 24:4 <b>prosecution</b> 6:10 <b>protracted</b> 42:19 <b>proved</b> 26:1 69:12 <b>proven</b> 36:4 37:21 38:25 67:23 77:14 79:9 <b>provide</b> 6:20 10:1, 7 11:18 14:10 21:3 30:5 35:25 62:24 63:17 64:13 74:22 <b>provided</b> 16:9 21:22 23:18 25:21 37:11 64:23 69:2 74:16 <b>providing</b> 36:24 41:19 45:13 <b>Province</b> 11:1, 2 <b>Provincial</b> 10:16 <b>provincially</b> 31:2 <b>provision</b> 60:4 <b>Public</b> 4:7, 18 5:6, 10, 25 11:25 12:15 14:24 16:1, 2, 18 17:20 18:17 22:2, 6, 11, 22 26:22 35:6, 7 39:22 43:18 46:12 47:2 49:2, 18 64:22 65:10, 21 83:1, 7 85:5 86:13, 16, 18, 20, 24 87:5, 21 90:22 92:1 <b>publications</b> 8:23 <b>public-private</b></p>	<p>82:1, 9 83:2 <b>pumped</b> 53:2 <b>punctured</b> 52:22 53:7 <b>purpose</b> 4:16 <b>purposes</b> 71:7 <b>pursuant</b> 5:24 <b>put</b> 33:17 64:3 <b>putting</b> 44:8 <b>puzzling</b> 58:6  &lt; Q &gt; <b>quality</b> 77:17 88:3 <b>quantity</b> 57:8 <b>Québec</b> 11:2 29:16 30:23 74:9 <b>Queen</b> 23:9, 19 24:25 26:12, 13 <b>question</b> 6:2, 14 9:1, 15 10:5 22:25 24:1 25:24 26:21 35:13 43:14 44:21 52:4 55:4 60:2 66:3, 21, 24 73:13 88:11 <b>questions</b> 4:13, 23 5:1 6:16 8:21 22:24 29:1, 2 43:7, 13, 16 49:6 52:8, 12, 14 63:1 65:24 66:1 81:20 88:7, 8 93:21 <b>quickly</b> 93:13 <b>quite</b> 12:10 17:13 20:6 25:1, 12 32:9 38:24 47:13 54:4 78:9 92:8  &lt; R &gt; <b>RAIL</b> 1:6 4:7 10:17, 24 11:6, 8, 13, 22 12:4, 11, 18, 22, 24, 25 13:1, 3 14:25 15:7, 13, 21, 22 16:2, 11, 16, 19 17:4, 6, 9 18:1, 2, 10, 13, 20, 23</p>
--	--	--	---	---

19:12, 14, 20, 23 20:2, 6, 7, 19 21:11, 12, 16, 20 23:8, 9, 14, 19, 24 24:3 27:9, 24 28:1, 3, 8, 10, 18 31:6 32:18 33:9, 19 34:22 35:14, 17 36:24 37:8 38:5, 7, 16 39:9 40:7, 9 44:8 46:23 48:8, 12 51:25 54:21 55:8 57:10 58:3, 5, 20, 25 61:7 62:3 64:1 68:3, 16 69:5 71:11, 17 72:3, 6, 10, 11 73:20, 21 78:4 79:18 81:5, 15 89:8 91:10 <b>rail-related</b> 9:11 27:21 <b>rails</b> 71:20 72:5 <b>Rail-Term</b> 84:14 <b>railway</b> 9:8 10:17 19:15, 16, 17, 20, 22 51:23 59:19 77:9 82:14 84:7 89:10 <b>railways</b> 19:17 70:5 90:5 <b>ran</b> 18:10, 14 <b>range</b> 58:10, 24 88:22 <b>Rapid</b> 11:2 12:13 17:22 36:11 37:7 71:22 92:14 <b>ratified</b> 38:4 <b>reach</b> 79:6 <b>reached</b> 79:17 <b>read</b> 8:4 90:23 <b>readiness</b> 79:7 <b>ready</b> 79:8 <b>realities</b> 69:15 <b>really</b> 19:8 35:13, 25 42:2 44:18 46:12, 14 47:3 49:2 53:18 55:2 61:1, 4 62:20,	23 63:14 68:22 70:12 71:10 76:17 79:13, 16 82:6 83:23 86:13 <b>reason</b> 49:23 52:4 55:14, 15 90:9 <b>reasons</b> 38:2 48:20 50:1 58:12 71:4 73:8 80:17 <b>rebuilding</b> 26:11 <b>recall</b> 37:16 39:16 <b>receivable</b> 6:8 <b>received</b> 17:15 <b>Recognitions</b> 8:7 <b>recognize</b> 23:25 <b>recommendation</b> 21:4 <b>recommended</b> 21:14 44:15 <b>record</b> 12:5 29:20 66:17, 19 78:16 <b>recorded</b> 94:10 <b>red</b> 40:10 <b>reduce</b> 58:11, 15 <b>reducing</b> 58:15 80:19 <b>reevaluated</b> 45:5 <b>refer</b> 7:4 <b>reference</b> 10:11, 20 51:6 <b>referenced</b> 50:24 63:8 <b>references</b> 64:17 <b>referred</b> 68:23 72:11 <b>referring</b> 6:21 64:19 67:10 <b>region</b> 16:8 <b>regional</b> 15:3, 19, 20 16:14 30:20, 21, 25 31:5 33:6 <b>registered</b> 29:9, 11 <b>regular</b> 17:1 <b>regularly</b> 34:1 <b>regulated</b> 31:2	<b>relate</b> 9:25 12:4 61:4, 5 <b>related</b> 9:7, 18 11:21 14:25 27:8 31:5 32:13 36:16 39:16 51:21 52:3 53:21 56:21, 24 60:12, 15 61:24 70:20, 22 75:14 76:14 88:12 90:14 92:11 <b>relation</b> 9:4 67:6 <b>relations</b> 20:6 <b>released</b> 33:22 <b>relevant</b> 9:2, 12 10:10 34:14 93:7 <b>reliable</b> 69:24 <b>remain</b> 28:11 61:17 <b>remained</b> 28:20 <b>remotely</b> 1:16 <b>removed</b> 75:16 <b>removing</b> 57:15 <b>renationalize</b> 82:22 <b>repeated</b> 8:8 <b>replace</b> 55:12 57:19 <b>replaced</b> 56:11 60:17 <b>replacement</b> 91:21 <b>replacing</b> 55:8 <b>report</b> 91:18 <b>reporter</b> 63:3 67:11 94:4 <b>Reporter's</b> 66:15 94:1 <b>reports</b> 11:16 14:14 15:8 49:22 86:8 87:15 90:18, 21 <b>representatives</b> 17:7, 9, 20 19:21 20:2 22:14 34:25 <b>representing</b> 22:5, 7, 8 <b>request</b> 5:22 7:20 <b>requests</b> 65:16	<b>require</b> 42:10 55:15 <b>required</b> 6:12, 25 10:2 54:6 78:9 91:14, 21 <b>requirement</b> 16:21 24:6 25:15 38:25 54:18 55:5 57:19 63:16 75:21 78:23 <b>requirements</b> 36:8 38:11 39:4, 5, 10 54:4 56:18 57:25 61:2 62:2 63:15 65:2, 5 73:16 74:5 77:13 <b>requires</b> 48:4 <b>requiring</b> 46:18, 19 <b>Research</b> 10:15, 19 14:19 <b>reserve</b> 81:11 <b>residual</b> 53:17 <b>respect</b> 8:22 11:20 12:22 13:22 23:1 26:25 33:9 37:10 53:20 70:23 85:9 <b>response</b> 7:19 <b>responsibilities</b> 85:9 <b>responsibility</b> 85:13 <b>rest</b> 50:8 74:3 <b>restarted</b> 79:2 <b>restrictions</b> 58:21 59:2 81:12 <b>result</b> 15:20 16:13 50:5, 18, 20 52:7 53:2 57:17 61:24 68:6 71:12 72:8 76:12 79:5 <b>resulted</b> 52:23 55:23 56:8 62:9 <b>resulting</b> 55:21 56:2 59:9 <b>resurfaced</b> 59:22	<b>retrospect</b> 26:9 <b>revealed</b> 89:2 <b>Revenue</b> 29:21 <b>reverse</b> 58:8 <b>review</b> 5:19 27:3 <b>revolutionary</b> 47:13 <b>RFP</b> 64:20 65:6 74:7 <b>Rideau</b> 22:15 45:25 48:16 49:8, 19 52:5 53:11 <b>rider</b> 40:9 <b>ridership</b> 40:23 <b>ringing</b> 41:7 <b>risk</b> 77:12 90:12 <b>risks</b> 37:11 <b>Road</b> 27:14 28:3, 12 50:9 57:9 73:5 <b>roadheader</b> 47:11 48:21 50:5 <b>roadways</b> 57:11 81:8 <b>robust</b> 36:4 37:21 38:25 77:14 <b>rock</b> 48:4 53:5 <b>rolling</b> 72:25 <b>roof</b> 24:13 <b>roof-mounted</b> 57:20 <b>roofs</b> 57:13, 15 <b>roughly</b> 28:12 <b>route</b> 18:13 25:3 28:8 37:23 44:3 53:8 <b>RPR</b> 94:3, 18 <b>RTG</b> 75:4 87:24 <b>RTM</b> 75:5 85:25 86:5, 11 87:24 <b>rules</b> 58:19 <b>run</b> 33:24 <b>running</b> 58:13 78:11 <b>rush</b> 92:7  < S > <b>safe</b> 59:24 80:11 82:24
---	---	--	---	---

<p><b>safety</b> 10:18 58:11 60:2, 12 61:5 86:9 87:16 90:17, 20 <b>safety-related</b> 62:7 <b>salt</b> 57:9, 13, 16 <b>sanitary</b> 52:22 <b>save</b> 41:16 80:18 <b>saving</b> 42:5 <b>scaffolding</b> 60:8 <b>scale</b> 34:23 <b>schedule</b> 78:19 <b>science</b> 58:5 <b>Scotia</b> 29:15 <b>screen</b> 7:15 28:23 <b>scrutiny</b> 65:21 <b>secondary</b> 18:9 <b>Section</b> 5:24 6:12, 14 8:7 <b>sector</b> 82:23 83:14, 17, 25 84:3, 7, 11 <b>sectors</b> 20:22 <b>secure</b> 53:6 <b>selection</b> 36:2 76:9 <b>senate</b> 11:12 <b>send</b> 8:11 93:24 <b>senior</b> 13:13 14:22 92:22 <b>sensor</b> 90:2 <b>sensors</b> 89:5 90:7 <b>separate</b> 17:23 <b>separately</b> 31:1 <b>September</b> 79:14 80:11, 13 91:2 <b>sequence</b> 24:10 <b>Serious</b> 91:24 92:6, 8 <b>service</b> 14:22 18:23 23:19 36:1 40:12 42:13, 16, 24 45:12 48:10 56:9 59:12 78:3, 4, 12, 24 79:14 80:7, 13, 22 81:14, 16</p>	<p>82:8 92:5 <b>services</b> 84:24 <b>session</b> 39:22 <b>set</b> 24:19 78:8 83:16 94:6 <b>sets</b> 91:24 <b>severe</b> 57:17 <b>sewage</b> 53:3 <b>sewer</b> 52:22 <b>shallow</b> 24:3 <b>share</b> 4:14, 25 5:2 7:15 88:15 93:23 <b>shared</b> 5:14, 20 <b>sharing</b> 28:23, 24 <b>sharp</b> 71:25 <b>shelf</b> 67:23 68:5 <b>shelter</b> 60:4, 8 <b>Sheppard</b> 47:23 <b>shield</b> 47:13, 18, 21 48:12, 23 <b>shields</b> 47:16, 25 <b>ship</b> 40:9 <b>shops</b> 74:13 <b>short</b> 23:15 35:23 <b>Shorthand</b> 94:4, 12 <b>shortly</b> 38:4 <b>show</b> 7:18 16:1 61:1 <b>showing</b> 16:11 <b>shut</b> 80:14 <b>side</b> 24:24 25:7 <b>sidewalk</b> 38:22 <b>siding</b> 41:16, 17 <b>Siemens</b> 20:9 79:20 <b>sight</b> 76:23 <b>signalling</b> 76:20 77:1, 6, 9, 21 91:23 <b>signals</b> 76:23, 24 <b>significant</b> 6:22 12:10 17:11 33:18, 23 35:12 37:6 39:1 41:18 67:16 87:17 <b>significantly</b></p>	<p>37:25 <b>signs</b> 73:3 <b>similar</b> 17:15 21:9 23:11 46:4 51:11 56:1 68:9, 13 91:3 <b>similarly</b> 6:24 10:13 11:8 28:5 65:8 <b>single</b> 28:15 40:18 41:23 <b>sinkhole</b> 45:25 46:7 48:16 49:25 51:17 52:5, 13 53:11, 12 <b>sinkholes</b> 51:13, 20 <b>sit</b> 12:15 31:9 <b>situation</b> 26:7 57:8 72:17 <b>situations</b> 57:12 <b>sky</b> 13:5 74:22 <b>Slater</b> 44:7 81:9 <b>slightly</b> 21:6 67:9 70:19 <b>slippery</b> 59:21 <b>slow</b> 73:4 <b>slower</b> 55:13 <b>smaller</b> 46:7 64:14 <b>smell</b> 53:3 <b>snow</b> 59:5, 9 <b>snowfall</b> 68:21 80:2 <b>soil</b> 45:4 46:1, 11 48:4 49:8 <b>solemn</b> 4:17 <b>somebody</b> 89:4 <b>somewhat</b> 7:25 44:16 50:11 <b>soon</b> 59:25 <b>sooner</b> 93:16 <b>Sorel</b> 74:9 <b>Sorry</b> 29:18 41:7 46:23, 24 70:15 <b>sort</b> 25:2 40:22 72:25 88:18 <b>source</b> 69:12 <b>sources</b> 65:7 73:22</p>	<p><b>south</b> 18:11 24:24 25:7 27:21 28:1 <b>southeast</b> 28:9 <b>southern</b> 18:14 48:9, 13 <b>south-west</b> 27:21 <b>southwestern</b> 31:12 <b>sparks</b> 60:22 <b>speak</b> 45:6 <b>speaking</b> 14:13 26:20 <b>specific</b> 9:8 11:18 12:2, 8 26:21 28:5 32:16 33:16 36:8 63:15 81:23 88:7 <b>specifically</b> 9:12 14:25 50:19 54:15 56:5 63:9 65:2 67:10 87:25 <b>specification</b> 55:5 56:25 57:23 60:11 <b>specifications</b> 57:7 64:17, 18, 19 70:13 <b>specifics</b> 93:3 <b>specified</b> 62:2 <b>specifying</b> 73:11 <b>speech</b> 15:23 <b>speed</b> 10:17, 24 11:6 35:24 37:13 48:12 54:19, 22 55:2, 9 58:11, 15, 20 59:2 72:20, 22 73:3 <b>speeds</b> 55:2 71:24 73:10 <b>spelled</b> 63:4 <b>spelling</b> 8:3 <b>Spirit</b> 66:25 68:24 <b>spoke</b> 15:5 67:11 <b>spoken</b> 67:5, 6 <b>spot</b> 7:24 <b>spring</b> 63:21 <b>springs</b> 63:22 <b>Stadler</b> 68:17</p>	<p><b>staff</b> 15:15, 25 16:24 32:25 34:12 35:4 37:4 <b>Stage</b> 9:4, 18 10:9 12:19 19:4 27:11, 12, 14, 16 31:6, 20 33:9 34:10 37:17 39:18 46:24 53:21 70:21, 24 76:15 88:13 <b>stairs</b> 24:19 59:23 <b>stakeholders</b> 35:5 <b>standard</b> 38:13 <b>standing</b> 66:5 <b>start</b> 7:14 43:6 80:7 <b>started</b> 4:10 5:3 59:2 <b>state</b> 79:6 <b>stated</b> 81:2 <b>statements</b> 94:8 <b>States</b> 13:2 65:5 <b>stating</b> 68:23 <b>station</b> 24:14, 16 25:13, 20 28:2 41:17 54:10 56:4 60:7, 9 61:18 63:18 70:6, 8 91:3 <b>stations</b> 24:11 25:10, 20 35:18 42:4 49:14 59:19, 20, 25 61:9 71:14 <b>status</b> 90:17 <b>steady</b> 72:25 <b>steam</b> 45:13 <b>steel</b> 74:2 <b>Steering</b> 12:11 16:15, 22 17:2 <b>stem</b> 75:22 <b>Stenographer/Tra nscriptionist</b> 2:15 <b>stenographically</b> 94:10 <b>steps</b> 12:19 59:19</p>
---	--	---	--	--

**Stittsville** 27:15  
**stop** 28:22 59:6  
**stopped** 61:19  
78:25  
**storage** 74:14  
**straight** 68:4  
**straightforward**  
6:19  
**strategy** 18:2  
**strayed** 25:23  
**Street** 23:10, 13,  
20 24:25 25:4,  
5, 16 26:12, 14  
45:12, 25 46:5  
48:16 49:8, 19  
52:5 81:9  
**streetcar** 13:4  
38:21 39:7  
**streetcars** 54:7  
**Streets** 44:7, 9  
**stress** 72:10  
**stresses** 91:9  
**stretch** 41:25  
**strict** 78:9  
**strongest** 37:20  
**strongly** 15:15  
44:7, 12  
**struck** 33:12  
**structure** 29:3  
**studies** 10:23  
15:10 18:5  
45:2 50:20  
**Study** 12:13  
17:21, 23 18:2,  
5 20:20 21:4, 5  
44:13  
**stuff** 91:13  
**subject** 67:3  
91:8  
**submission**  
21:22 83:1  
**submissions**  
13:22 14:14  
23:4 31:25 34:6  
**submit** 13:21  
21:1 93:1, 12  
**submitted** 23:3,  
6, 22 65:9 86:9  
**Subsequent**  
17:14 19:5  
20:13 21:24  
32:19 40:6 79:8  
**subsequently**  
15:18 26:23

33:22 37:5  
40:1 68:9  
**substituting**  
69:18  
**substitution**  
67:19  
**subway** 13:4  
24:11, 13 35:16  
36:15 44:20  
47:22  
**subworking**  
33:16  
**succeeded**  
72:14  
**successful** 84:5  
**sufficient** 57:6  
**suggestions**  
21:3  
**summarize** 24:2  
**summarized**  
39:21  
**summary** 35:10  
**summer** 57:4  
58:8  
**summers** 61:3  
**super** 72:1  
**supplied** 76:10  
**supplier** 76:3, 19  
**suppliers** 19:15,  
17 20:6  
**supply** 57:21  
60:15  
**supplying** 7:1  
**support** 41:22  
**supporting** 6:25  
**supports** 60:16  
**supposed** 59:6  
**Supreme** 45:14,  
20  
**surface** 21:12  
23:15 44:3, 8  
46:23 52:23  
57:10 81:8  
**suspect** 63:12  
**suspension**  
63:22 91:12  
**swallow** 51:14  
**switch** 69:11,  
19, 21, 22 70:4,  
19  
**switches** 76:25  
**Switzerland**  
68:17, 19  
**system** 25:18  
35:14, 22 36:6,

11, 19 39:24  
40:8, 9, 20 41:1,  
8, 14, 21, 24  
42:3, 6, 11 53:4  
54:8 55:12, 19  
57:18, 21 58:11,  
14, 16 59:5, 8  
60:17 61:21, 25  
67:21 71:11, 13  
72:20 73:8  
75:2 76:20, 22  
77:1, 6, 17, 20,  
22, 23 78:2, 8,  
15 79:5, 14, 16,  
19 80:4, 11, 12  
81:4, 5 82:15,  
24 85:14, 19  
90:2 91:23  
**systems** 12:24  
13:1, 3, 9, 14, 16,  
17, 21 21:9  
34:25 35:24  
38:21 39:8  
71:21 92:15, 18  
  
< T >  
**tailor** 7:25  
**takes** 85:11  
**talk** 41:10 78:1,  
5  
**talked** 66:6  
71:1  
**talking** 6:23  
39:2, 4 43:17  
51:4 63:2 69:9  
76:19 77:10  
**target** 78:19  
**Task** 11:3  
20:15 21:1, 21  
23:1, 3, 21  
44:14 92:14  
**taxi** 20:22  
**team** 4:9, 22  
**technical** 34:9  
39:17 45:17  
55:18 63:7  
66:18 68:11  
82:7  
**Technician** 2:16  
**technology**  
16:11 34:16, 22  
36:4, 22 37:20,  
24 38:5, 6, 20  
39:9, 12, 15  
43:8, 20, 23

44:17, 18 53:20  
54:23 55:15  
56:12, 24 57:24  
67:23, 24 69:4,  
5 77:11, 14  
**telecommunicati  
ons** 9:7  
**temperature**  
57:2 58:4 80:2  
89:5, 9, 13, 25  
90:2, 6  
**temperatures**  
57:3, 4 58:9, 23  
59:1  
**temporary** 60:8  
**tend** 6:3, 4  
30:14, 15  
**tends** 30:16  
**terminate** 80:11  
**terms** 10:10  
12:2 13:20  
39:9 40:15  
66:6 80:2 93:3,  
16  
**test** 8:3 46:9  
78:19 80:3  
**tested** 54:25  
78:9, 18  
**testing** 7:15  
49:16 68:16  
78:2 79:12, 13,  
15, 19, 23, 24  
80:7  
**Texas** 36:25  
**Thales** 76:19,  
22 77:1, 5, 8  
**Thanks** 4:4  
**Thatcher** 82:13  
**theme** 44:24  
**thin** 62:23  
**thing** 17:11  
61:4 63:25  
67:22 69:9  
70:25 80:9 91:3  
**things** 12:19  
14:14 26:1  
35:19, 21 41:10  
51:22 52:18  
60:14 66:3  
70:16 73:13  
74:4 83:18  
92:25 93:2  
**third** 68:2  
**thought** 8:1

**tie** 66:3  
**tight** 53:1 71:12  
**tilt** 72:2  
**time** 4:24 9:20  
13:4 15:14  
25:10 29:12  
32:11, 15 33:16  
38:1, 9, 13  
42:19 43:13, 19,  
22 54:21 56:10  
59:15 61:9, 17  
69:6 82:6  
83:12 84:8  
94:6, 9  
**times** 32:6  
41:22 73:22  
78:15, 16, 25  
**titled** 14:6  
**today** 4:4  
11:10 72:16  
81:24  
**today's** 4:14, 16  
**Tokyo** 24:9  
**told** 23:2  
**top** 54:18, 22  
**topic** 15:18  
23:5 44:24  
**topics** 34:13  
52:14 63:1  
73:15 88:12  
**tore** 91:20  
**Toronto** 13:11  
21:16 25:12  
31:12 35:1  
36:14 47:22, 24  
70:6 84:5 92:20  
**torqued** 56:17  
89:23 91:7  
**total** 48:11  
**touch** 10:9  
93:22  
**touched** 34:13  
**touching** 62:13  
**track** 41:23  
58:2 59:8  
69:13 72:7  
84:13 89:12  
91:22  
**trade** 83:19  
**Train** 11:2 13:5  
40:18 42:4  
56:3 59:6  
60:23 61:13, 17  
63:18 64:11  
66:10, 13, 25

67:7 72:3, 4 74:22 78:12 79:19, 21 89:13, 22 91:1, 24 92:2, 4 <b>training</b> 87:23 <b>trains</b> 10:17 40:24 56:9, 10 57:21 59:11, 14 61:23 62:10, 16, 18 75:1 78:11, 16, 18 89:15 92:6 <b>transcontinental</b> 10:16 11:8 <b>transcribed</b> 5:4 <b>transcribing</b> 4:11 <b>transcript</b> 4:10 5:5, 9, 13, 19, 20, 23 7:4 8:14, 16 94:12 <b>transcription</b> 5:4 <b>transfer</b> 60:3 <b>Transit</b> 4:7 9:8 11:22 12:13, 18, 22 13:3, 11, 22 14:17 17:21, 22 20:19 21:9, 15, 25 27:4, 21 28:9, 11 31:6 32:1, 3, 14, 20 33:10 34:1, 25 35:1, 2, 14 36:1, 11, 14, 16, 19, 24 37:8 44:2 55:12 71:3, 7, 22 72:24 73:2 80:12, 14 81:4, 9 84:5 85:19 92:14, 15, 17, 20, 21 <b>transition</b> 37:7 48:3 <b>transitioned</b> 22:12 <b>transitioning</b> 36:10 81:3 <b>TransLink</b> 75:2 <b>transparency</b> 47:8 <b>Transpo</b> 14:20, 21 15:16 22:16 35:10 40:7 75:6 78:22	85:17 86:1, 12, 17 <b>Transport</b> 9:10, 16, 22 10:8 11:24 13:9 15:5 16:9 19:11 20:16, 23 29:1, 8 31:9, 11, 18, 19 33:3, 4 65:14 76:13 82:3 92:11, 17 93:5, 6, 8 <b>TRANSPORTATI ON</b> 1:7 2:9 10:14 11:10, 11, 20 15:1, 2, 10, 12, 16 17:24, 25 22:9, 20 30:19 32:1, 2 35:11 44:1 86:9 87:16 90:17, 20 <b>Transpo's</b> 39:21 <b>travelling</b> 62:16 <b>tread</b> 59:23 <b>treated</b> 46:16 65:11 <b>Tremblay</b> 41:17 71:14 91:2, 17 <b>trial</b> 6:9 <b>triggered</b> 59:9 <b>Trillium</b> 61:11 68:1, 3, 10 69:23 84:10 <b>truck</b> 54:1 <b>true</b> 50:22 <b>Trumblay</b> 56:4 <b>trying</b> 7:15 37:23 65:13 88:17 <b>TTC</b> 36:15 <b>tunnel</b> 21:5, 8, 18, 20, 25 23:8, 16, 24 24:4 26:13 27:4 32:20 43:24 44:13, 15, 16, 24 45:4, 11, 17, 19 46:6, 15 47:12 48:13, 21 49:13, 19, 25 50:1, 7, 9 52:7, 12, 19, 25 53:2, 6, 10, 13, 18 <b>tunneling</b> 43:20 45:21 46:3, 20, 22 47:2, 5, 7, 12,	16, 18, 20, 25 48:2, 11, 17, 22 49:1 50:15 <b>tunnels</b> 21:12 45:9 47:14 <b>Tunney's</b> 55:25 60:6 89:7 92:3 <b>turn</b> 4:12 28:25 <b>turned</b> 74:25 82:15 <b>turning</b> 14:5 75:4 <b>type</b> 13:5 17:15 39:7 44:16 69:4 76:6 <b>typically</b> 25:11 <b>typo</b> 7:24 8:4 <b>typos</b> 5:19  <b>&lt; U &gt;</b> <b>U.S</b> 63:12 <b>U/T</b> 3:16 10:3 14:4 30:2 <b>unacceptable</b> 60:10 <b>underbuild</b> 39:25 <b>underbuilding</b> 35:22 37:13 <b>underdesigned</b> 69:15 <b>undergo</b> 67:15 <b>underground</b> 25:22 <b>underneath</b> 23:9 38:18 <b>understand</b> 63:2 86:22 93:14 <b>understandable</b> 8:2 <b>understanding</b> 36:5 47:6 65:19 86:21 <b>understood</b> 45:22, 23 48:24 50:15 58:5 <b>undertaken</b> 3:11 <b>UNDERTAKINGS</b> 3:14 <b>uninterrupted</b> 78:23 <b>Union</b> 70:6 <b>unionized</b> 85:17 <b>unions</b> 85:20, 24	<b>unique</b> 36:11 57:7 <b>United</b> 13:2 <b>University</b> 47:24 <b>unknown</b> 48:6, 17 <b>unstable</b> 46:2 48:4 49:8 <b>unusual</b> 74:20 <b>update</b> 8:12 <b>users</b> 36:5 59:24 <b>utilities</b> 26:1, 5  <b>&lt; V &gt;</b> <b>Valley</b> 22:15 51:24 <b>value</b> 41:11, 12 88:19 90:9 <b>Vancouver</b> 13:5 23:13, 14 47:17 74:23 92:21, 24 <b>variability</b> 63:23 <b>variety</b> 11:15 38:2 <b>various</b> 9:24 11:11 12:1, 7 18:16 20:6 25:8 35:20 36:21 41:10 51:9 70:7 74:4, 7 88:20 <b>Vaughan</b> 47:24 <b>vehicle</b> 20:10 36:21 38:7 39:3, 9 42:18 54:19 68:3, 4, 25 74:22 75:19 77:2, 22 <b>vehicles</b> 36:3, 24 38:12, 16 40:13 42:11, 13, 14, 16, 21, 23, 24 43:2 54:21, 25 55:16 57:14 64:2 67:14 68:7, 9, 13, 16, 18 69:2 73:12, 19, 20, 24 74:11, 12, 17, 23 75:11 84:11 86:10 <b>vendor</b> 36:2 <b>verbal</b> 11:14 <b>VERITEXT</b> 94:17 <b>version</b> 35:10	<b>vibration</b> 72:13, 15 <b>Videoconferenci ng</b> 1:15 <b>view</b> 12:23 62:1 82:4, 17 86:18 87:4 <b>views</b> 85:8, 14 <b>Ville</b> 25:8 <b>Virtual</b> 2:16 66:16 <b>visibility</b> 47:8 88:2 <b>visible</b> 65:20 89:20 <b>visited</b> 13:1, 7 92:15 <b>visiting</b> 12:24 13:15 <b>visits</b> 13:15 14:1 <b>Vitae</b> 3:6 8:18 <b>vote</b> 15:12  <b>&lt; W &gt;</b> <b>walk</b> 14:10 24:15 <b>walking</b> 24:12 25:3 <b>wall</b> 53:6 <b>Waller</b> 46:5 53:11 <b>walls</b> 53:7 62:23 67:17 <b>wanted</b> 8:20 26:24 81:24 <b>wants</b> 61:13 <b>washing</b> 57:15 <b>washout</b> 51:25 <b>water</b> 36:17 51:21 52:6, 25 <b>ways</b> 74:8 <b>weather</b> 60:18 68:14 <b>website</b> 5:10 29:21, 22 63:8 <b>weekly</b> 34:2 <b>weeks</b> 17:2 32:21 80:10 <b>welcomed</b> 86:18 <b>weld</b> 72:10 <b>Wellington</b> 45:12 <b>wells</b> 58:3
--	---	---	--	---

**west** 42:1  
45:14 51:19  
**wet** 59:25  
**wheel** 42:20  
56:6, 13 72:6  
87:19 89:20  
90:5 91:10, 11  
**wheelchair**  
63:24  
**wheels** 54:2  
55:21 56:11  
59:11, 15 64:4,  
8, 13, 14 71:18  
74:1 75:14, 16  
76:4, 5, 8, 10  
**wide** 57:2  
**widely** 67:15  
**Willing** 67:12  
**winter** 57:3  
58:1 59:18  
61:6 62:16  
66:8 68:20  
69:10 70:10, 14  
79:13, 17, 23  
80:1, 6, 7, 23, 24  
**winters** 60:10  
61:2 69:15  
**wire** 60:16, 22  
**wish** 25:14 30:2  
**witness** 5:25  
6:4, 7 7:9  
**won** 20:10  
**wonder** 14:9  
**wondering**  
64:17  
**won't** 17:12  
**work** 11:21  
12:18, 22 14:2  
26:10, 25 27:2  
31:19 33:8, 14  
34:5 50:20  
52:23 61:20  
76:13 87:9  
**workforce** 80:19  
**working** 14:20  
24:9 33:13, 21  
34:3 42:8  
82:24 87:12  
**workmanship**  
87:11 88:4  
**works** 7:18  
33:4 63:14  
86:4, 22  
**workshop** 15:25  
16:4

**world** 16:12  
25:7 73:25  
76:3, 6 82:10  
**worldwide** 73:23  
**written** 9:9, 17,  
24 11:16 32:8  
**wrong** 34:19  
40:14 57:23, 24  
81:17  
**wrote** 11:4

< Y >

**yard** 86:6, 10  
**Yeah** 33:15  
45:8 78:7  
**year** 34:19  
90:15  
**years** 12:2  
17:1 33:1  
36:14 51:8  
52:2 68:8  
**year's** 79:23  
**yesterday** 7:19  
**yield** 84:18, 20  
**York** 47:24

< Z >

**Zoom** 1:15 34:2