



HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Standing Committee on Transport, Infrastructure and Communities

TRAN • NUMBER 096 • 1st SESSION • 42nd PARLIAMENT

EVIDENCE

Monday, March 26, 2018

—
Chair

The Honourable Judy A. Sgro

Standing Committee on Transport, Infrastructure and Communities

Monday, March 26, 2018

• (1535)

[English]

The Chair (Hon. Judy A. Sgro (Humber River—Black Creek, Lib.)): I call to order meeting number 96 of the Standing Committee on Transport, Infrastructure and Communities. Pursuant to Standing Order 108(2), we are studying automated and connected vehicles in Canada.

The witnesses we have on this first panel are David Ticoll, Distinguished Senior Fellow, Innovation Policy Lab, Munk School of Global Affairs, University of Toronto. From the Canadian Automobile Association, we have Ian Jack, Managing Director of cCommunications and Government Relations, and from the the Canadian Automated Vehicles Centre of Excellence, we have Barrie Kirk, Executive Director.

Mr. Ticoll, you may go first. We have to warn you that there may be a vote coming up shortly, so we may have to suspend and go to the House and then come back.

The floor is yours for five minutes, please.

Mr. David Ticoll (Distinguished Senior Fellow, Innovation Policy Lab, Munk School of Global Affairs, University of Toronto, As an Individual): Thank you very much, Madam Chair and committee, for this opportunity to testify in support of your study on the issues related to automated and connected vehicles in Canada.

As you may know, I also had the honour, along with my co-witnesses, of testifying on this topic at the Senate Standing Committee on Transport and Communications last spring. The Senate committee report is excellent. Please consider my remarks to be a build on that report.

I plan to focus on some major policy issues, but first I'll address the recent fatality of a pedestrian hit by a self-driving vehicle in Arizona. The video record suggests the collision was due to a technology systems failure, but the technologies involved are straightforward and in wide use. Why this happened is a mystery. There are probably big implications for regulatory policy, but automated vehicle technology will continue to advance.

I'll get into the main topic by respectfully suggesting that we broaden the conversation. The policy issues related to automated vehicles and connected vehicles—AVs and CVs, what I call intelligent mobility—are best addressed in combination with municipal planning and the smart city agenda. This is because

intelligent mobility applications will be the defining networks of future cities, just as cars with human drivers shaped our cities and towns over the past 100 years. Smart cities and intelligent mobility bring many promises, such as safety, environmental benefits, congestion management, accessibility, convenience, and cost savings, among others.

There are also risks and challenges. For example, we know that ride-sharing in major U.S. cities has already increased congestion and reduced public transit use. The question is what Canada is doing to maximize the upside and minimize or mitigate the downside risks.

I'm going to focus on five topics: governance, data, infrastructure, mobility sector development, and social policy.

First, on governance, the Senate called for a joint Transport Canada-ISED policy unit for this topic. I suggest that as is happening elsewhere, this be broadened to an all-of-government approach. This is because the mobility and urbanism revolutions will have profound and disruptive impacts on just about every government policy and program area.

I further suggest the formation of a standing federal-provincial-territorial and municipal smart city intelligent mobility forum. This national SCIM forum, if you like, should be mandated to ensure that we realize the vision of a smart Canada that Canadians want.

Why do we need a new national forum? Well, consider my second topic, which is really at the heart of the issue: data policy. The Senate report rightly pays a lot of attention to this issue. There is a good chance that a handful of global mobility companies will dominate our streets, capture the data, and assert control over its use. The risks associated with this scenario are all over today's headlines. The Senate offers more recommendations on data policy than on any other topic, including cybersecurity, road safety, and of course privacy. The Senate also importantly identifies the need to open digital mobility data and algorithms so Canadian-based companies can participate and compete in this market.

The Senate's data policy framework deserves expansion. Governments need mobility and municipal data to manage traffic and inform infrastructure investments. The data is essential to mobility as a service concept that lets consumers move easily from bikes to buses to cars. It's necessary for transparent reporting of incidents, collisions, emissions, fuel efficiency, and road use and is necessary for assuring compliance with accessibility, pricing, and algorithmic neutrality policies.

More fundamentally, we should treat data rights as human rights. Individuals and communities should control the data derived from their essential activities, such as moving around and using public services. Mobility and city life is not the same as Facebook, which is an optional human choice.

My third topic is infrastructure. Two things are clear. First, some key current infrastructure plans fail the futureproofing test. Second, models of smart people-centric and transit-centric intelligent mobility design are now becoming clearer than they were even a year or two ago. The current approach of letting local decision-makers set the priorities has too often led to decisions with built-in obsolescence. We need to turn this around.

Fourth is innovation and growth of intelligent mobility and smart city sectors. I'm very active in this area. We have 175 digital mobility companies in Ontario. I'm on the advisory committee for the Automated Vehicle Innovation Network. There is a lot of good stuff happening here.

I'm going to skip through this because I'm running out of time, but I would say that the government needs to do a lot of work around skills development in this area. We need to proactively promote gender and diversity in these careers, and governments need to prioritize investments in intelligent mobility-friendly infrastructure and open up the data to support the sector.

Last, I will highlight the social policy implications. By my calculation, intelligent mobility will generate downside risks for jobs in sectors that employ 1.3 million Canadians. Most of these, such as insurance agents, car dealers, and carbon sector workers, aren't even professional drivers. On the other hand, we can achieve wonderful gains for the environment, for all kinds of disadvantaged groups, and for transportation equity if we get our policies and programs right. Once again, coordination can only help.

• (1540)

I'll close by saying that I'll be pleased to work with the committee and committee members in helping develop your work in this area. I'm also an adviser to the Information Technology Association of Canada, and we both have a great interest in data policy in particular, and in many dimensions, one of which is around economic development for Canada and Canadian competitiveness.

Thank you.

The Chair: Thank you very much.

We'll move on to Mr. Jack for five minutes.

Mr. Ian Jack (Managing Director, Communications and Government Relations, Canadian Automobile Association): Thank you very much, Chair and committee members. Thank you for your interest in the subject, which is a very important one to over six million CAA members across the country. Our main issue is on the non-profit public affairs side of our operation, including road safety, the environment, mobility, infrastructure, consumer protection, and the future of the automobile, which is what brings us here today, among other things.

[Translation]

First of all, it's important to know that connected vehicles are already on our roads, and that their presence is growing every year in

Canada. For example, most new vehicles offer a GPS connection via an internal antenna. Moreover, various safety features, such as lane support systems and automatic parking assist systems, allow on-board computers to know what's going on outside, and take control of the vehicle, even if it is for just a few seconds.

[English]

Most of us are familiar with the image of the Google car, and we think of that when we think of autonomous vehicles. It looks like a different species. The reality is more likely to be evolutionary, however, than revolutionary. Slowly features are being added that, taken together, are leading down the path to full autonomy.

To us, the development of the technology needed for fully autonomous vehicles is inevitable. There are at least three big questions outstanding, however.

The first is how quickly the environment outside the vehicle will be able to evolve to accommodate the technology. All levels of government will have to adapt regulations for this new world and, to some extent, change the way they spend on infrastructure. One quick example is insurance legislation, which universally speaks of persons. Where will liability rest in this new world? It's quite possible to arrive at an answer, but the topic will have to be debated and legislation created.

[Translation]

The second concern, which is related to the first, is how soon autonomous vehicles will become commonplace on our roads. Did you know that all the vehicles in use today could be completely different in 20 years? It's impossible to be sure of it, but we believe that autonomous vehicles will be dominating the market between 2025 or 2040. All the more reason to start preparing as soon as possible.

[English]

There is expert consensus, however, on the fact that AVs will kill fewer people than human drivers and that AVs should extend personal mobility to many, such as the elderly, who cannot drive today. For these reasons, CAA supports the responsible development of autonomous vehicle technologies.

[Translation]

The third major concern we have at the Canadian Automobile Association is the control over the huge amounts of personal data that will be collected by connected and autonomous vehicles about the drivers.

[English]

Vehicles are becoming smart phones on wheels. It's almost trite to say so today. Your vehicle will soon, if it doesn't already, know as much or more about your movements, likes, and dislikes as anyone in your life, even your spouse, unless you drive everywhere with them. CAA has long held that vehicle owners should be informed about what data is being collected and be able, within reasonable limits, to choose with whom they share it. It must not be a take-it-or-leave-it approach that forces the owner to abandon all rights to privacy in order to enjoy the benefits of in-car technology.

This is not a theoretical concern. In an early 2017 CAA national opinion poll, 49% of Canadians said that they were not aware of the range of data being collected by their vehicle today. When it comes to sharing of that vehicle data, nearly 90% of Canadians agreed that the consumer should decide who gets access to their vehicle data. Further, in a late 2017 national poll, 77% of Canadians said they were not aware that they had consented to the collection and use of their private data when they purchased their vehicle.

Illustrating that the issue of privacy of data in connected vehicles exists today, not as a theoretical construct for 10 years from now, one in three Canadians polled who have rented a car or used a car-sharing vehicle have found a previous user's personal information still in the vehicle's system.

[Translation]

According to this same survey, 81% of Canadians believe that clear rules must be applied to protect the personal data collected by these vehicles.

[English]

CAA participated in the Senate's recent AV study, and we welcomed the final report, which was released in January 2018. The findings echoed CAA's position on this file, recommending that "Canadians should have control over their personal information." The report went on to recommend that "Transport Canada bring together relevant stakeholders—governments, automakers, and consumers—to develop a connected car framework, with privacy protection as one of its key drivers."

These discussions have not been happening to date. We hope this committee will agree that these issues need to be addressed and endorse this recommendation.

● (1545)

[Translation]

In conclusion, even if some challenges must be addressed, it is obvious that connected and autonomous vehicles will provide many benefits over the years. However, now is the time to join the discussion, strategically speaking, so that governments can contribute to the responsible development of these innovative technologies.

[English]

CAA looks forward to continuing to represent the consumer interest on this important topic. We thank you for your invitation to speak to you today.

Thank you, Madam Chair.

The Chair: Go ahead, Mr. Kirk, for five minutes, please.

Mr. Barrie Kirk (Executive Director, Canadian Automated Vehicles Centre of Excellence): Thank you, Madam Chair. Good afternoon, and thank you all for the opportunity to testify.

I am going to be frank and honest in my comments this afternoon, but I will be polite.

In June 2014 the federal government asked the Honourable David Emerson to review the Canada Transportation Act. CAVCOE contributed to that review.

The Emerson report was published in December 2015, with research on AVs. Also in December 2015, CAVCOE published its white paper on what we felt the federal government should do. There were 30 AV-related recommendations. The vast majority of those are still waiting to be implemented.

In 2016 Transport Canada conducted extensive consultations with Canadians as a follow-up to the Emerson report. Also in 2016 the Library of Parliament researched AVs and CVs. Again we contributed to that work, and the report was published in September 2016.

In 2017, as you know, the senate committee conducted research and held hearings. Again we contributed, and the report was published two months ago.

It is now March 2018, and you are holding these hearings. In parallel with all of this, Transport Canada staff have been discussing AVs with other groups within Transport Canada. Transport Canada has been holding discussions with ISED. The federal government has been discussing AVs and CVs with the provinces and the territories, and Transport Canada has been discussing them with the U.S. In total there have been three and a half years of hearings, research, consultations, and reports.

As *Yes, Minister's* Sir Humphrey Appleby might have said, "Everybody has been terribly busy holding meetings and consultations and discussing this topic." My first message to you this afternoon is "Enough, already." It's time to move beyond research, consultations, and reports and to put some action items in place.

There was an excellent op-ed piece in *The Globe and Mail* last year by Kevin Lynch, the vice-chair of the Bank of Montreal and the former Clerk to the Privy Council and secretary to the cabinet. The op-ed was entitled "How disruptive technologies are eroding our trust in government". Mr. Lynch wrote, "There is the ever-increasing pace of technical change versus the pace of policymaking...."

I have a second message to the committee this afternoon, and I've picked one key recommendation. I propose that the federal government create the Canadian automated vehicles institute, CAVI, modelled on the U.K. government's centre for connected and autonomous vehicles, CCAV. I propose that the Canadian AV institute be a joint policy unit of Transport Canada and the Department of Innovation, Science and Economic Development. It would be a focal point for those in government, industry, academia, and internationally. It would help Canada to move to the forefront not only of the development but also the deployment of autonomous vehicles. The website for the U.K.'s CCAV includes more detailed objectives that can be a template for the Canadian version.

According to the consulting company KPMG, the Netherlands, believe it or not, are the world leaders in readiness for AVs, with the Dutch AV Institute, or DAVI. The Australians have the Australian Driverless Vehicle Institute, ADVI, and CAVCOE has a formal partnership with them. In the same KPMG report, there is a table showing the AV readiness of 20 countries. Canada is number seven.

My advice to the Senate committee looking into AVs included the recommendation for a Canadian AV institute. My advice became recommendation number one in the Senate report.

In summary, I believe it's time for the federal government to transition from studies, reports, and consultations and to start to better prepare Canada for the AV era.

• (1550)

I propose that action item number one be the formation of a Canadian automated vehicles institute.

Thank you again for this opportunity to let off some steam on what I believe.

Thank you, Madam Chair.

The Chair: Thank you very much, Mr. Kirk.

We'll move on to Mr. Chong for six minutes.

Hon. Michael Chong (Wellington—Halton Hills, CPC): Thank you, Madam Chair. With your permission I'd like to split my time with Mr. Liepert.

I have a very simple question for all three of you, but to Mr. Ticoll and Mr. Kirk in particular. We're not the government, so we can't enact regulations. We are interested in this, though, as a legislative committee, and we are studying it because we think it's important.

In light of the fact that the Senate has done this study and that there have been numerous other studies, what should this committee focus on to fill the gaps that have not yet been studied, and what should be the focus of this particular committee report?

Mr. David Ticoll: First of all I want to say that I agree with Barrie that the first step is to form this joint Transport Canada-ISED thing. We can then build on that to the national initiative that I'm talking about, but it should be led by that. This issue of governance and how this phenomenon is going to be driven in this country is a critical issue, and I would recommend that your very first priority be to find a way to help government get off the dime on that.

The second issue is the data issue. I believe one of the reasons the government has been so slow to act is that the data issue is a confounding issue: we don't have the necessary mandates, tools, or legislative frameworks. I agree with you that privacy is a big issue, but it's not the only issue. There are many other issues: cybersecurity, access to data for innovation, mobility within cities, how cities manage their environments, and so on. We don't have the skills within government to develop and implement policy along these lines. It extends beyond cars and mobility into just about every other area. These are two fundamental challenges that I believe would be critical to move the ball forward.

Let me make one last comment: there are many other factors at work here. There is all kinds of housekeeping-type stuff, the regulatory things that need to be done to realize this phenomenon.

That's a whole other area, and I believe the committee in this respect needs to find a way to ensure that the government administration moves a bit more quickly on those fronts. Those should be very easy to do relative to these complex issues that I've just identified.

• (1555)

Mr. Barrie Kirk: It's a very good question, and I agree with my colleague David Ticoll here.

As I said in my testimony, the place to start—and we're both agreed—is the Canadian AV institute. As David said, there's a long list of other things that government should be doing, and for that I refer you back to the white paper we did over three years ago, with 30 recommendations for the federal government. The Senate report has 16 recommendations—15 others—and part of the issue in all of this is what Kevin Lynch wrote about. It's very challenging for government to deal with very disruptive technologies. The past is no guide to the future, and that makes it really challenging. It's important, in any disruptive technology, to get ahead of the curve.

We've been doing some work for the City of Toronto, and they understand that you don't wait for the technology to arrive and then develop the regulatory framework. You try to get ahead of the curve, and that's one of the very important things that I agree with Kevin Lynch on—to get ahead of the curve from the policy framework perspective.

Mr. Ian Jack: May I just add very quickly and in support of something one of my colleagues here at the table said? Communicating a sense of urgency to government on this file is very important. One of the things that's delayed it is that government likes to fight fires, and you could look at this file and say this is an issue for 2025 or 2030, so why would we get involved today?

As I alluded to in my remarks and as my colleagues are saying, there's an awful lot of work to be done that's going to take years to get through. We're not opposed to the machinery proposal that's been put forward here, but I would point out that an awful lot of this jurisdiction, traditionally and under our Constitution, is provincial as well. Part of the long tail that it'll take to get this right is figuring out ways for the federal government and the provinces to work in ways they haven't had to before. The federal spectrum people at ISED have not had to think about provincial road regulations before, for instance.

This is all going to have to come together in a new way, so there is a sense of urgency that we really shouldn't put this on the back burner and think we can do that for five or 10 years. We can't.

The Chair: Mr. Liepert, I'm sorry, but you may have just a short question.

Mr. Ron Liepert (Calgary Signal Hill, CPC): It can be short, because I happen to agree with all three panellists. Do you not think, however, that generally when things work well, government just gets out of the way? With technology, it seems as though government is always trying to catch up anyway.

I'm sitting here wondering what the creation of the institute is going to do that is going to necessarily speed this along. Sometimes it's better just for government to get out of the way, let technology do what technology has been doing well for over the last several dozen years anyway, and then if there are issues that government has to deal with, you deal with it.

The reality of it is that if you want government in this, government thinks they can solve everybody's problem that really doesn't exist. Maybe I'm asking you to be careful what you ask for.

The Chair: We're well over the time limit.

Mr. Ron Liepert: Well, I'm going to pass on my next question, Judy...or Madam Chair.

The Chair: Okay, call me Judy.

In response to some of our other colleagues, maybe you can try to weave an answer to Mr. Liepert's question.

Mr. Fraser is next.

Mr. Sean Fraser (Central Nova, Lib.): Thank you very much, Madam Chair; and thank you to our witnesses for being here.

I heard on at least two occasions during the testimony you gave that to open things, in fact, we might not have the skills in place today to deal with the need that the emerging technology presents. Mr. Ticoll, you specifically discussed it in the context of the need to be there as innovations happen around the world in terms of skills development.

As a quick example, a young woman approached my office because she has been doing research, at about age 13, on automatic vehicles and came with a printed presentation she had at her science fair on the issue. Her name is Hayley. She is well versed in the issues on automatic vehicles, and I would suggest that she knows more about them than the vast majority of parliamentarians. When she was asking me how to stay engaged with this, my face was blank. I didn't know where to tell her to go.

How do we make sure there are opportunities for people such as Hayley to stay engaged with this developing industry and take advantage of the talent that exists so we are ahead of the curve, so to speak, in Mr. Kirk's turn of phrase?

Maybe Mr. Ticoll could respond first, and then Mr. Kirk, if he'd like to follow.

• (1600)

Mr. David Ticoll: As I mentioned, I'm on the advisory committee to the Automated Vehicle Innovation Network for Ontario. I was at a meeting just last week and I was having a conversation with one of the folks from the Ontario government about what is attracting these 175 companies to invest in Ontario. He said the number one reason

is talent, the number two reason is talent, and the number three reason is talent.

That means we're already off to a good start because we're attracting a massive amount of investment from pretty much a standing start two or three years ago.

Where I think we need to take this now—and I have some experience in this area—is to start professionalizing this field. We need to start structuring it around clear career definitions. We need to start building post-secondary programs devoted to both smart cities and autonomous vehicles. That's how you address the skills agenda—and if I may, to respond to the previous question, that's one example of how government can play a role.

I would just say on that front that my personal view is that because we're now dealing with human lives and these valuable human assets such as data, again, look at the headlines. Government has let some organizations do what they like with our data, and that seems to be creating a few problems that we need to deal with societally.

Unfortunately, we do have to. There is a good case for a role for government in these matters, among others.

Mr. Sean Fraser: Mr. Kirk, you had some feedback on this issue as well.

Mr. Barrie Kirk: Indeed, yes. Thank you for the question.

First of all, I agree with my colleague here. The big issue for government is that there are three different sectors of the issue, which makes it more complicated. There's the technology, the innovation and research and development. That's moving ahead pretty well at the moment.

Second, there is the regulatory framework. I don't like unnecessary government intervention, but as David has mentioned, there are issues about privacy and issues about the regulatory framework. I know that General Motors has in fact requested of the U.S. government certain changes to vehicle safety regulations, which is one of the ways that government must be involved. GM has announced that they will start mass-producing driverless vehicles in 2019, next year, and they've requested a number of variances to the safety regulations, not to make cars less safe but to be realistic. Regulations in Canada and the U.S. at the moment require that there be an airbag tucked inside the steering wheel. If there's no steering wheel, that makes no sense. What GM is proposing is to treat both front seats in a car the same way, the same way that a passenger seat, at the moment, is controlled.

Mr. Sean Fraser: Certainly.

If I can interject, there's another topic I want to cover, and I'm conscious of the time I have.

On a number of occasions I heard testimony about the need to change the way we fund infrastructure and move away from the model whereby we let local decision-makers—I assume that meant municipalities—dictate the priorities, in collaboration with the provinces. What model can we look to and how do we avoid the federal government playing SimCity and trying to build little things in communities that they may not need? How do we make sure we're instead preparing for efficient transit within cities and between cities in the future?

Mr. Barrie Kirk: I'll talk first, if I may. One of the things I've been saying for about three years is it's very important that any application for funding for new infrastructure, for transportation or transit, include an evaluation of the impact of autonomous vehicles.

Anthony Foxx, who was the transportation secretary in the Obama administration, wrote an article, which was published in a magazine, that said full deployment of autonomous and connected vehicles can in fact increase the traffic-carrying capacity by a factor of five, which is huge. With all due respect to former secretary Foxx, I don't believe him, but if we could increase the traffic-carrying capacity even by a factor of two, that's huge. For the long term, I wonder how much of all this new infrastructure we really need. Some of it is justified. Some of it may not be. I've been recommending that all applications for financing for infrastructure carry that evaluation of the impact of AVs.

• (1605)

Mr. Sean Fraser: Madam Chair, do I have any time remaining?

The Chair: You have 15 seconds, so you don't have any time.

Mr. Sean Fraser: In the 15 seconds, I think I'll say thank you.

The Chair: Mr. Aubin is next.

[Translation]

Mr. Robert Aubin (Trois-Rivières, NDP): Thank you, Madam Chair.

Gentlemen, thank you for being with us.

After listening to you, I realize two things. First, we are loud and clear on how we must stop undertaking studies, and start taking action. Though it also seems that Canada is falling slightly behind—more than slightly, actually—on this issue.

I would like to come back to you, Mr. Kirk, but the other witnesses can also join in.

If it were created, what specificity would the Canadian institute contribute that hasn't already been contributed by the other institutes that have a head start on us? Would this specificity be related to the Canadian climate, for example?

[English]

Mr. Barrie Kirk: My testimony to the Senate committee pointed out a metaphor. I think the Canadian federal government is doing a wonderful job on the innovation and research and development file. ISED is doing a wonderful job. That, to me, says the federal government has its foot on the gas pedal. However, Transport Canada is very focused on safety, as it should be, almost to the point of inertia, and that is acting as a brake. I see the federal government trying to move ahead in this field, this space, with one foot on the gas pedal and one foot on the brake. That metaphor made its way into the Senate report. It wasn't attributed to me, but that was my testimony. I think the one thing this institute would do is bring together the policy units from Transport Canada and ISED into one group and break down the silos so that we get a far more balanced policy for the future, one that balances innovation and safety.

Mr. David Ticoll: I slightly differ with my colleague Mr. Kirk on this point. I do believe that from the perspective of technology development, we've leapt ahead way further than we were even a year ago when we were testifying in front of the Senate. From that

perspective, our AV sector is doing very, very well. What we need to do as a society is figure out what this means for the Canada of the 21st century. What kind of a country are we going to have? How are our cities going to work? What about this complex new data issue? How are we going to manage around that?

I believe this requires consultation and engagement, which would perhaps be driven by TC and ISED, but it requires a much broader set of stakeholders to become engaged in it. That would be a way also to start defining criteria for investment around city-building that would reflect the national consensus about what kinds of cities we want that are enabled by information and information technologies.

Mr. Ian Jack: Very quickly, I'll differ slightly with my colleagues. We don't get too caught up on machinery issues at CAA. I think that the issue, as I said in response to an earlier question, absolutely needs to be elevated by the government, whether that continues to be a joint committee of bureaucrats or a separate institute. However it's done, I wouldn't want to spend six months or a year having government try to figure that out and then another year and a half trying to get a contract for a photocopier before they start doing any work. I think the work needs to get going. It needs to be elevated. I'm hoping that's the message the committee will send forward.

If they decide to move on that institute, we won't complain about that. We'll be fine with that, but let's get moving with the issue and elevate it one way or the other, please.

[Translation]

Mr. Robert Aubin: Mr. Kirk, I will return to the example of air bags.

When we studied Bill S-2, we expressed the opinion that new technologies should at the very least have the same, if not higher, safety standards as those established for conventional vehicles.

You asked the following question: If we remove the steering wheel, where will we put the air bag? Is it possible that air bags will no longer be needed? If so, is it the right approach to tell the government that we should be making sure that the new technologies are at the very least as safe as the old ones, if not safer? Or is it that these new technologies simply cannot be compared with the old ones?

• (1610)

[English]

Mr. Barrie Kirk: I'll make two quick points, as I'm conscious of the time, Madam Chair.

One is that I did not suggest, with respect, that we make the cars less safe. What GM is asking for in the U.S., which I support, is making both front seats with the same level of safety, the same number of air bags, as the passenger seat has at the moment.

In terms of overall safety, a while back we did a joint report with the Conference Board of Canada, and we predicted that with full deployment of AVs and CVs, we could in fact eliminate 80% of the collisions, traffic deaths, and injuries. That's a big step forward. I think most people agree that AVs and computers will be much safer than human drivers.

The Chair: Time is up.

Go ahead, Monsieur Iacono.

Mr. Angelo Iacono (Alfred-Pellan, Lib.): Thank you, Madam Chair.

Thank you for coming.

We have modern airliners capable of flying themselves, yet they still have at least a two-person crew on board. Is it reasonable, is it responsible, is it healthy, is it safe to have cars, trucks, or any motor vehicles driving themselves autonomously with no driver on board? Is this what you're suggesting? Why?

Mr. David Ticoll: A driverless car is a much more complicated problem than a driverless airplane, because there's not a lot of traffic up there in the air. You're asking a very good question, and that's why it's going to take a very long time before we get to the point where, on the major streets of our cities, we're going to see these cars driving around willy-nilly. We'll probably take quite a number of years, maybe 20 to 25 or something of that nature.

In the meantime, what I believe will happen will be like what Google is doing right now with cars in a suburb of Tempe, Arizona. It's a very flat area, and there's not a lot of weather. The streets are big and wide, and they're just trying it out. They're being extremely conservative about how they roll this technology out.

The way that's likely to happen in Canada, where we have the additional weather factors to consider, is that we will see it initially in very limited areas that are highly geographically bounded, where the vehicles have a lot of information about the 3-D mapping of the streets down to the millimetre level, or at least the sub-centimetre level. It's going to take time.

Mr. Angelo Iacono: Thank you.

Mr. Jack, would you like to add something to that?

Mr. Ian Jack: Sure. We believe that in the long term, autonomous vehicles will be safer. One of the questions that nobody has an answer to today is how long this adoption will take, and I would agree with my colleagues that it will be longer rather than shorter. Our view, as we indicated in our remarks, is that it's not so much because of the automotive technology; it's because of all the surrounding infrastructure that's going to have to be adapted as well. By the time these are widespread, I think you and I will be happy with them, because we'll be in an old folk's home and we'll have some mobility as a result of them.

Absolutely, in the shorter term, are there risks? Yes. That's one of the reasons government needs to be involved in a regulatory capacity, just as it is now with all other vehicles.

Mr. Angelo Iacono: Well, I'm glad that you both made interesting comments in answering one of your questions, which was about why it is taking so long. One, the infrastructure's not all there, so we have to worry about the infrastructure before putting cars on the road that are going to drive themselves; and two, it's taking a very long time because with a car on the road, there's a lot of traffic. It's not the same as having a plane flying in the air. That explains why it's taking so long.

I have another question.

[*Translation*]

Mr. Ticoll, I've read your 2015 report on the issue with a lot of interest. The report focuses on Toronto, but some of its findings can be applied to places such as the Greater Montreal area, especially concerning connected and intelligent infrastructure, which is the fundamental issue.

Can you shed some light on how the type of infrastructure needed to eventually support autonomous vehicles would operate?

• (1615)

[*English*]

Mr. David Ticoll: Some autonomous vehicle designers and manufacturers, such as Waymo, have said they are designing their vehicles on the assumption that eventually there will be no supporting infrastructure. They must assume that if their vehicle can actually go anywhere—which is the long-term goal—they can't rely on the availability of infrastructure that will support them.

Therefore, if Canada believes, and if you believe as part of our government, that it's desirable for Canada, from the perspective of both industry development and urban innovation, to move more quickly, then it's quite likely that investing in intelligent infrastructure would be a good idea.

We call these “connected and autonomous vehicles”, so that's the “connected” part, and there are two kinds of things we can put in. The first is a lot of smart devices that the vehicle can communicate with that are part of the streets—the traffic lights, other cars, and so on. Those are all electronic. The second is road markings, which are physical technologies.

The City of Montreal, which is being very innovative these days in bike infrastructure, is rethinking how its streets work and has a wonderful opportunity. There is also the artificial intelligence community there, and so on. That would be a great place to start innovating, because there's a lot of transformation happening in the streets already.

Mr. Angelo Iacono: Thank you, Madam Chair.

I'll give the rest of my time to Mr. Sikand.

Mr. Gagan Sikand (Mississauga—Streetsville, Lib.): David, you mentioned that article, and when I saw it, I believe there was a spotter in the vehicle. I'm not sure what they're called—

Mr. David Ticoll: Safety driver.

Mr. Gagan Sikand: I believe they hit somebody on a bicycle.

I represent a GTA riding and I would love to see AV development in the riding because I have the third-largest transportation system in Ontario and we have a lot of congestion there. I would welcome further comment on the implications of such accidents in AV development.

Mr. David Ticoll: It's interesting because, as I said at the beginning, I believe that the technology is there to prevent an accident of this type from occurring. The visual sensors are present, the computer capabilities are present to interpret that data, the ability to brake the vehicle is present, and they all work together.

Another manufacturer—I'm not going to name any names—but another designer of CAV technology said they've tested against precisely this scenario dozens of times with all kinds of crazy ways of possibly having this accident, and they're pretty confident that if it had been them, this would not have happened, so it sounds as if there was some kind of failure.

The Chair: We have to move on.

Mr. Hardie, I've used up one of your minutes in order to get that question answered.

Mr. Ken Hardie (Fleetwood—Port Kells, Lib.): Really?

The Chair: Sorry about that.

Mr. Ken Hardie: I have a couple of comments.

We have to have a very holistic view. What about the employment of drivers? From years with the Insurance Corporation of B.C. and dealing with traffic safety, especially speeding, we know that it's the variance in operating attributes, if you will, that can cause all kinds of traffic conflicts. What about the transition period, when you have three-quarters of the people still driving cars and the other quarter autonomous? I'll leave you to think about that one.

I want to challenge some of your assumptions.

When I was a kid, they delivered milk to my front door by horse, believe it or not. I'm that old. Well, guess what, guys? They're delivering groceries again. Certainly if I look at Metro Vancouver, I see that the design of that city is meant to reduce the need to move around. Are you trying to come up with new technology that might be buggy-whipped by the time it's ready to go if people don't need to do as much travelling around?

The other issue is that driving is not a utilitarian function. People like to drive. They socialize in the car. They do many other things over and above simply getting from point A to point B. Would you consider mandating that people can't drive their cars anymore in order to reduce traffic conflicts?

•(1620)

Mr. Barrie Kirk: That's a good question.

In terms of resistance, I have two thoughts.

First of all is infrastructure. David made the right comment that there are two different kinds of infrastructure. Physical infrastructure is one, and the first commandment over AVs, to my way of thinking, is "thou shalt have no special physical infrastructure". AVs will have

the sensors, software, and artificial intelligence to drive on the same roads as humans do. No government, no combination of governments, can afford to upgrade all of the infrastructure in time for the arrival of AVs.

The second commandment of infrastructure, as far as AVs are concerned, is that once we have enough AVs in use, we can optimize the infrastructure. There's a study out of Texas that shows—

Mr. Ken Hardie: Excuse me, sir, but I'd like to get the others' reflections on this in the time available to us.

Mr. David Ticoll: The most interesting point about what you said is that we're moving to a different dynamic in the use of transportation. On the one hand, people are getting more deliveries to their homes; they're not going out shopping anymore. On the other hand, there's this tension between people who want to drive their own cars and people who are quite happy to use an on-demand vehicle as a kind of automated taxi arrangement. I believe the commitment to driving one's own car is a generational thing. I think that eventually those of us who like to drive will probably end up being in the minority. It won't be taken away from us; we'll just evolve away from it.

The fundamental point that underlies what you're saying is that yes, we do need to redesign our streets, and in particular our curbs. If we're going to be picking up and dropping off passengers and picking up and dropping off all our groceries and other things—and who knows, using mobile stores—then we do need to rethink our streets, which again is why I believe we need an all-of-government approach.

Mr. Ian Jack: Sure, and for the record, CAA will never recommend taking people's cars away from them.

At the same time, I do agree with my colleague David. Certainly the surveys that we see suggest that the younger you are, the less attached you are to driving and to a vehicle, and the more utilitarian you see it to be. That's not 100% of the population, but it is coming.

Again, we're looking at a fairly long time horizon here. This is not coming in 2021. It's coming a bit later than that, in terms of mass adoption of these things.

I would take a page from something somebody said on this side of the table, which was that the technology is coming. A point I made earlier is that this is likely.... It's evolutionary as much as it is revolutionary. If you have lane assist, if you have a vehicle that brakes for you if you're getting too close to the vehicle ahead of you, you already have a vehicle that is moving towards autonomy. I think most of us—generation by generation of vehicle over the next five to 10 to whatever years—are simply going to go from being 5% or 10% to 20% to 50% to 75% autonomous before we even realize it.

The Chair: Thank you very much.

We'll go to Mr. Jeneroux, for four minutes, or five. See what you can squeeze through.

Mr. Matt Jeneroux (Edmonton Riverbend, CPC): Sure. We'll see if we can push it to five, Madam Chair.

I want to preface my comments by first saying that I am personally very excited about the future of autonomous vehicles and I think it's something that most Canadians are excited about, but with the caveat of knowing that there are issues that happen. I make reference to the issue that happened in Arizona.

I was talking with some of the folks within the AI realm. I'm from Edmonton, Alberta, where there's significant AI development happening at the University of Alberta in terms of finding areas to test the autonomous vehicles there in what we won't refer to as Nevada weather but as different types of weather. Still, when one of those incidents like the Arizona incident happens, there is always a kind of pullback to ask what we do now and to say that it's moving too fast.

In your opinion, have certain companies and organizations jumped and moved too fast? You've mentioned that government is really slow here, but these things are still happening. I don't think it's within the government's purview to go in and say not to worry about it, that it won't happen here, that it shouldn't happen in downtown Toronto. Toronto has pulled its vehicles off the road.

I'll give you an opportunity to give some comfort to those Canadians who are thinking that when these isolated instances happen, they represent a bigger systemic problem in artificial intelligence on the roads.

• (1625)

Mr. Barrie Kirk: As I mentioned earlier, we have predicted that with full deployment we can save 80% of collisions and deaths, but not 100%. The technology is not perfectly safe. It never will be—I'm an engineer—but what I feel is that if we delay the deployment of AVs too much, we will delay the benefits of saving those lives.

There are two sides of the coin here. One of the issues is that the public and most other people in the know have expectations that are too high. The technology is going to be much better than humans, but never perfect. If we delay too much, we will in fact allow those accidents and collisions to happen. Those lives might otherwise be saved.

Mr. David Ticoll: I'll just comment that I think the industry and governments are going to learn a big lesson from this fatality. It shouldn't have happened. Somebody did something. Somebody, I believe, made a mistake, and not all people are making those mistakes. We need to get to the bottom of it and fix it.

Mr. Ian Jack: It's entirely appropriate, in our view, that vehicles have been pulled off the road while we figure this out, given that it's hard to understand how that particular death happened.

Over 300 Canadians a year are killed on our roads. Over 3,000 Americans are killed on the roads there every year. We focus on these rare instances in AVs and CVs, but a lot of deaths can be prevented with this technology.

Mr. David Ticoll: A lot of deaths can be prevented with existing advanced technologies in existing cars, and there are many cars on Canadian roads that already have advanced driver assistance systems and collision detection technologies. Right now, they're mainly in high-end cars like Cadillacs, but eventually they'll become widely available and they'll prevent a lot of accidents long before we have CAVs being universal.

Mr. Matt Jeneroux: As a driver, I still make a number of arbitrary decisions that avoid having another incident happen. There are algorithms in place for a number of these scenarios, but let me throw one scenario at you. Let's say I'm driving down a two-lane road on a mountainside. There's a semi truck coming at me, and a mom and her baby walking a stroller near there. I'm in an autonomous vehicle. What does the autonomous vehicle do? Does it make the decision to take me off the cliff? Do we hit the semi truck? Do we run into the mom and the baby? Now, do I get into a vehicle thinking that it would probably mean taking me off the cliff? Do I get into a vehicle thinking that there's a risk that it's going to take me off the cliff? I think these are the issues, the moral and ethical issues, that are facing the industry. I'm curious as to how we justify every algorithm.

Mr. David Ticoll: Not to trivialize it, but one thing it will do is hit the brakes a lot faster than any of us could. That's number one. Number two, to reinforce what Mr. Kirk has been saying, is that on average the accident rate will go down dramatically, because that's not the typical situation that causes an accident. Over 90% of accidents are caused by human factors, and there's a whole range of them, from inattention to drunken driving to purposely running red lights—you name it.

All of those things are going to go away with CAVs. Yes, there will be some cases, but they will be such a small percentage of the collision risk situations that they'll be a rounding error compared to what we're experiencing right now.

As I say, and I don't mean to trivialize it, for one thing, they'll be able to hit the brakes a lot quicker and they may be programmed to make wiser decisions than you or I would make.

Mr. Matt Jeneroux: I don't know if a semi can hit the brakes quite as quickly, but sure....

The Chair: Thank you very much to our witnesses. We very much appreciated the information. We will suspend for a moment while our other panel come up as quickly as possible, please.

• _____ (Pause) _____
 •
 • (1630)

The Chair: I call the meeting back to order.

We have, from the Canadian Vehicle Manufacturers' Association, Mark Nantais; from Electric Mobility Canada, Catherine Kargas; and from Sun Country Highway Ltd., Kent Rathwell.

Mr. Nantais, would you begin the testimony for five minutes, please?

Mr. Mark Nantais (President, Canadian Vehicle Manufacturers' Association): Thank you very much, Madam Chair. Good evening, everyone.

I thank you for this opportunity to appear before you on the subject of automated vehicles and connected vehicles.

Industry's effective and managed introduction of these technologies provides an opportunity to enable technological advancements that have the potential to significantly improve safety and enhance mobility, as well as help to foster innovation and growth at Canadian technology companies and research institutes.

It is imperative that Canada work in partnership with the United States and with industry to achieve alignment and synchronization of policy requirements, as these countries form a region with consistent infrastructure and seamless travel across borders. Vehicle technology in these areas continues to evolve at a rapid pace, and CVMA members remain committed to research, development, and deployment of advanced driver-assist technologies that reduce crashes, injuries, and fatalities for occupants and vulnerable road users, including those involving automated vehicles and connected vehicles.

Government engagement, under Transport Canada's leadership, will be needed to facilitate deployment and public acceptance of these technologies. While there are reports that AV and CV technologies, as we call them, could be ready in the next two to three years, we wish to clarify that their introduction will begin slowly and in a very controlled fashion, likely beginning with dedicated commercial applications, such as ride-sharing, before becoming available to consumers. As the technology progresses and rolls out, Transport Canada has a key role to play in ensuring nationally coordinated and aligned regulatory approaches that are informed by and synchronized with U.S. regulatory and non-regulatory approaches.

We would like to acknowledge recent progress, including amendments to the Motor Vehicle Safety Act that allow for the testing and deployment of new technologies where conflicts with current regulations exist. There have also been actions that make the act more nimble to align regulations with rapidly developing industry and U.S. requirements, given our largely shared driving conditions and public policy objectives.

In addition, the Senate Standing Committee on Transport and Communications have issued their report, "Driving Change: Technology and the future of the automated vehicle", and Transport Canada has initiated consultation on policy options for enhancing the safety regime for AVs and CVs. Transport Canada is also engaging with the provinces and territories through the Canadian Council of Motor Transport Administrators.

As preparation continues, it is critical to ensure that approaches are aligned across jurisdictions and to avoid barriers that may inhibit the testing and deployment of these technologies in Canada. These actions are essential for Canada to attract activities that would support the global efforts, given the substantial testing and research that are already taking place in other jurisdictions.

We are also acutely aware that data privacy and cybersecurity are key elements for successful deployment and public acceptance of automated and connected vehicles. They are a priority for the auto industry, the consumer, and government. Data protection and data privacy are embedded from the earliest stages of product development. As these technologies evolve, CVMA member companies will continue to comply with the comprehensive Canadian federal and provincial privacy laws that are in place to safeguard consumers'

personal information. Federally, this includes PIPEDA as well as CASL.

Automakers are also proactive when it comes to actions to address cybersecurity issues. Security features are implemented in every stage of vehicle design and manufacturing. The sector also has a long history of partnering with public and private research groups and of participating in forums on emerging issues. The Automotive Information Sharing and Analysis Center—Auto-ISAC, as it's called—was created in July 2015 to identify and share information on potential cyber-threats as part of industry's ongoing efforts to safeguard electronic systems and networks.

As automated vehicles and connected vehicle technologies are developed and implemented, continued discussion will be needed in many areas, but I will end here by reinforcing the commitment of CVMA members to the safety and privacy of Canadians and our commitment to constructive dialogue with the government as these technologies continue to advance.

Thank you very much.

•(1635)

The Chair: Thank you very much.

Go ahead, Ms. Kargas.

[*Translation*]

Ms. Catherine Kargas (Chair, Electric Mobility Canada): Good afternoon.

Thank you for inviting me.

[*English*]

It is widely understood that over the next decade the transportation sector will experience more change than it has experienced in the last century. New vehicular technologies and new mobility models will profoundly impact how people and goods move around.

On the technology side, connectivity and automation will become an integral part of the mobility landscape. The combination of these technologies holds promise for safer, more democratized, and, if planned for appropriately, more sustainable mobility through the appropriate use of AVs. Around the world, governments are introducing regulations favouring the arrival of these vehicles and investing in the creation of industry hubs around connected and autonomous vehicular technologies in the hopes of attracting mobility stakeholders who will invest locally, resulting in strong economic benefits.

In Canada, the Province of Ontario has taken the lead in supporting the development and integration of these technologies. Through the Ontario Centres of Excellence, the Government of Ontario is investing with private industry in R and D efforts. The availability of qualified people to work on the development of these technologies is, of course, key to attracting stakeholders. The internationally recognized work of the University of Waterloo in AV-related research, for example, is attracting private industry attention and investment.

In December 2017, the Quebec government introduced Bill 165 to amend the Highway Safety Code and other provisions. It provides for the special rules that could be set under a pilot project authorized by the minister to allow AVs to operate on Quebec's road network. As was said previously, the time to act is now to ensure that Canada is an important player in what is expected to be a multi-billion-dollar industry.

With the expertise of its members, Electric Mobility Canada is uniquely positioned to understand and to promote the accelerated adoption of AVs as a key component of sustainable mobility. We are convinced that future connected and autonomous vehicles must be equipped with electric propulsion to reduce greenhouse gas emissions. We encourage the Government of Canada to study the impacts of connected vehicles and AVs as part of the pan-Canadian framework on clean growth and climate change and to develop regulations that will ensure that future vehicular technologies are electric.

The International Zero-Emission Vehicle Alliance, with member jurisdictions in Europe and North America, including two in Canada, in Quebec and B.C., is currently studying the future of shared autonomous fleets and how to ensure that these fleets are composed of electric vehicles. The jurisdictions seek to collaborate with other governments to expand the global ZEV market and enhance government co-operation on ZEV policies in order to strengthen and coordinate efforts to combat air pollution, limit global climate change, and reduce oil dependency by increasing ZEV deployment.

I am the project manager of this initiative and I lead the work the alliance is doing. I encourage the Government of Canada to learn from the work being undertaken by this alliance.

The House of Commons Standing Committee on Transport, Infrastructure and Communities should study how to ensure that connected and automated vehicles are electric. This study should have three objectives.

The first is to determine the advantages of electric AVs on Canada's climate change. Today transportation generates approximately a quarter of the country's GHG emissions. If the number of vehicle kilometres travelled increases, as is being expected, with the arrival of AVs, without a change in propulsion technologies we can reasonably expect that the transportation sector will result in significant increases in GHG emissions. Given GHG emissions generated by the transportation sector, given Canada's climate change commitments, and given the unknowns surrounding usage of AVs, it is imperative that the committee recommend and document the numerous benefits associated with future vehicular technologies that are electric.

The second objective is to determine the areas of federal regulation. The Canadian federal government is to act in the best interests of Canadians. In the area of AVs and CVs, collaborating and learning from other jurisdictions, as well as organizations such as the ZEV Alliance, is recommended. The proposed work that we're suggesting should evaluate the impacts of these technologies and related business models in order to develop policies, regulations, and programs that have the individual Canadian, the economy, and the environment in mind, and it should comprise three elements.

● (1640)

First is determining how to ensure the safety of the technology, how we test for it.

Second is undertaking an assessment of how data laws will need to be changed to reflect the best interest of Canadians. This includes custody, access, and use of the mobility data, and an evaluation of how best to collaborate with provincial, territorial, and municipal governments on these technologies to ensure that sustainable mobility models are in place.

The third part of this study is to identify economic benefits and opportunities for employment creation in this country. We've talked about the loss of jobs. We now need to figure out how the arrival of this technology and these business models can develop jobs in this country.

The Chair: Thank you very much.

Mr. Rathwell, you have the floor, sir.

Mr. Kent Rathwell (Founder and Chief Executive Officer, Sun Country Highway Ltd.): Hello. I am Kent Rathwell, from Sun Country Highway.

Many years ago, really before anything much was happening in the electric vehicle sector, we decided that if the fact that electric vehicles couldn't actually travel wasn't dealt with, then the electric vehicle would die. It would be no different from gas vehicles without gas stations.

Back in about 2011, we decided to electrify the entire Trans-Canada Highway from St. John's, Newfoundland, to Victoria, B.C., and to do it without any government money. We wanted to prove that average individuals and Canadians across the country could actually come together to ensure that the electric vehicle did not die globally.

We electrified the Trans-Canada from St. John's, Newfoundland, to Victoria, B.C., in a matter of eight months. In the ninth month, we drove 10,000 kilometres in a car that was faster and sexier than virtually everybody's car in the world. It had no tail pipes, and the infrastructure was actually a few hundred per cent faster than what the automotive sector had designated as their limit for level 2 charging.

We drove it in the middle of the winter to prove that in Canada, even in virtually the most rugged and coldest climate in the world, electric vehicle infrastructure was in. We put it to bed. We showed that not only can cars be fast and sexy, but they can travel with no emissions, and the whole network was actually free. Since then, we've virtually electrified most of Canada's highways with the same technology.

In regard to the automotive sector, they still haven't caught up completely on the level 2 capabilities at which we can actually charge their cars, which is a few hundred per cent faster than what their cars can do today, other than Tesla and a couple of other car companies that have followed our lead.

We've rolled out this infrastructure to numerous countries now, and at the end of the day, we've proved that cars can travel pretty much across our country and can charge up a lot faster than the current standards with an infrastructure that's already in place today. The automotive sector, however, hasn't caught up to that level.

Basically, I am here to add some feedback on what the rollout of autonomous vehicles could be.

We've been involved with bringing other automakers to Canada to get Canadian engineering and design and Canadian parts. Actually, all their crash tests are done in Canada as well.

In regard to autonomous vehicles, it is a new sector. It's growing rapidly and it is going to be safer than what we have presently. It has been said that we're looking at upwards of a few trillion dollars by 2025 in the sector.

Canada can either focus on why it's too difficult to do and get done, or we can focus on the low-hanging fruit, try to implement autonomous driving in some capabilities and some areas that we can implement quickly, and become a world leader on this front. If we do so, we have the ability not only to drive our economy but also, as a previous witness mentioned, to save lives.

We can also reduce emissions. In Canada, transportation emissions are one of our largest issues in combatting climate change, and we can do it very easily in the transportation sector.

Again, I thank you for having me here today.

•(1645)

The Chair: I think that at this point we've had the testimony, so we will suspend and go in the House to do our vote.

Does the committee desire to return for the remaining 15 minutes or so, so that we can get a few questions in?

An hon. member: Why don't we do a few questions now?

The Chair: Well, we could get maybe a couple of questions in. How about if we get one from you, one from this side, and one...so it will be two, four, and six.

An hon. member: And then we're done.

The Chair: Let's go.

Go ahead, Matt.

Mr. Matt Jeneroux: Thank you for coming.

When AVs are on the road, could you provide a few comments on what needs to happen at not just the federal level but the provincial and municipal levels with the stop signs and everything, including the lines being painted?

Ms. Catherine Kargas: Do you want me to address the infrastructure issue?

It depends on the kind of development that is taking place right now. There are organizations like Waymo, for example, which is considered to be one of the leaders in the development in this technology, that are moving forward assuming that there will be no changes to infrastructure. However, there has to be a minimum amount of... For example, we need minimal potholes. If you go into

any city, particularly Montreal, you'd think you were in a war zone. The condition of our roads needs to allow these vehicles to function appropriately.

The other thing that is considered minimal is being able to see the lane markings. I think many of the developers will say the same thing. If we can have quality pavement and be able to see the lane markings, much of the technology that is being developed can certainly function in collaboration with appropriate mapping technologies.

The Chair: Thank you very much.

We'll go on to Mr. Badawey.

Mr. Vance Badawey (Niagara Centre, Lib.): Thank you, Madam Chair.

I want to dig a bit deeper into the weeds here, especially as we had the discussion earlier, and put a lens on both the manufacturers and the consumers.

I have two questions.

Take into consideration that we as a government are attempting to be an enabler. We're attempting to give the sector tools through our research and development programs, our innovations programs, and our science programs, and with that we're trying to facilitate between levels of government—whether they be federal, provincial, municipal, or the different ministries within both federal and provincial levels of government—and of course make proper investments in infrastructure so that we best prepare for this change in culture. The last point I want to make before I ask my questions is to say that the culture is not just about driving but also about the way product is delivered, and transit, and the list goes on.

Taking that all into consideration, it's twofold. First, what more can we do as a government to enable industry to bring the yardsticks down the field that much quicker, as was alluded to earlier from the previous delegates?

My second question is about the best interests of the consumer, because we recognize that there is going to be a great deal of advantage when it comes to revenue opportunities for manufacturers. They're going to be able to accrue new revenues versus one-time buying of the vehicle and moving on. There's not much accrual left in that process. Now with data collection, advertising, and things of that nature, there are going to be a lot of opportunities for those manufacturers to realize revenues.

My second question is about the consumer. Are there going to be opportunities for the consumer to take advantage of lower pricing or for the consumer to take advantage of that accrual of revenue opportunities for those different areas that the vehicle is now going to offer?

•(1650)

The Chair: Before you answer, I want to make a suggestion. Mr. Aubin wants to get his question out. Mr. Aubin, do you want your two minutes?

Then you can answer both questions at the same time, so that everybody gets their two minutes.

Go ahead, Mr. Aubin.

[Translation]

Mr. Robert Aubin: Thank you, Madam Chair.

I would like to ask Ms. Kargas a quick question, but the other witnesses can join in as well.

I understand from your presentation that all future autonomous vehicles will have to be electric; you've raised an important point here. I am fully aware that the fight against greenhouse gases is of great importance, but why reject all hydrogen technologies, for example, from the outset?

Ms. Catherine Kargas: The solutions for vehicle automatization include both electricity and hydrogen.

Mr. Robert Aubin: Perfect.

Thank you.

[English]

The Chair: Can you get an answer out for Mr. Badawey's question at the same time?

Mr. Mark Nantais: Perhaps I can take a stab at that.

First off, with these technologies, it won't be next year or perhaps the next. It's going to be a slow introduction. We don't need to have ZEVs as the only ones—in fact, they probably all won't be ZEVs to begin with—but we certainly see electric vehicles as being a major component of the future under autonomous vehicles.

We're moving to a shared economy. We're moving to not just shared riding, but a shared economy in which people may not necessarily buy a vehicle, but they will get all the benefits of transportation they would otherwise get with a vehicle. That will offer a whole bunch of opportunities in terms of mobility and for people who are disabled, and there will be consumer benefits in that respect.

We talk about advertising and economic opportunity in terms of sales and things like that, but that's probably the least of our objectives. What we're concerned about is building a vehicle that's safe, that will be able to anticipate all road conditions, that will be connected to the infrastructure in a way that will facilitate the movement of vehicles and reduce congestion and emissions. It's all of those things.

We have to be careful here, because this is not plug-in technology. This technology has been integrated into the design and making of the vehicle from the ground up. That's because we have to anticipate every type of road condition and weather condition and the integration with the infrastructure itself, and that is a huge task. This is why we are moving forward with research partnerships with universities and institutes here in Canada on artificial intelligence and so forth.

This is part of the other economy that we will benefit from. Consumers themselves are going to get this benefit with perhaps not all the costs associated with ownership, and that's really the key thing here.

We'll be spending probably \$100 billion on zero-emission vehicles, electric vehicles, so they will be very much a part of the future, but we have to make a distinction between connected vehicles

and AVs. That's not driven by electric vehicles; it's driven by simply the autonomous side of it, the benefits that accrue in terms of reducing injuries and fatalities and mobility. ZEVs will be part of that in the future, but I can tell you that it will be a combination of those things while we go through the transition period, and that transition period will take some time.

These are very complicated issues, and our industry wants to go about it in a way that is managed and deliberate. That's why it's important to be working with Transport Canada and the provinces across the country to make sure we have consistent regulations that won't inhibit or impede the introduction of these technologies.

The Chair: Thank you very much, Mr. Nantais.

Witnesses, we have to suspend and go in for a vote. We'll be about 12 to 14 minutes. If the witnesses are prepared to wait...

Does the committee want to return after the votes so that we can get a few questions asked on the record? What's the desire of the committee? Do you want to come back after the vote for 15 minutes? That's about all we'll have.

Some hon. members: Agreed.

The Chair: Okay. Are the witnesses willing to wait? Okay.

I'll suspend. Thank you.

• _____ (Pause) _____

•
• (1710)

The Chair: I call the meeting back to order.

Thank you to our witnesses for your patience.

Mr. Aubin, we're going to start with you.

[Translation]

Mr. Robert Aubin: Thank you, Madam Chair.

I would like to thank the witness for her clarification on hydrogen. This brings me to a question for you, Mr. Rathwell.

With this network of charging stations that would allow us to drive across the country, we are really talking about electric cars that can we plug in, and not a parallel network for hydrogen fuel cell cars. I would imagine that this network would be set up by the private sector. Is that the idea?

[English]

Mr. Kent Rathwell: Yes.

[Translation]

Mr. Robert Aubin: Thank you for clearing that up.

• (1715)

[English]

The Chair: Thank you.

Go ahead, Mr. Graham.

Mr. David de Burgh Graham (Laurentides—Labelle, Lib.): I have a lot of questions. I'll do them as fast as I can. How much time are you giving me?

The Chair: As little as possible.

Mr. David de Burgh Graham: Oh, boy. Then I'll speak faster than normal.

Mr. Nantais, I have a few questions for you.

You talked about a rollout of AVs over time. In your opinion, do you believe that autonomous cars are going to operate more like taxis, or are people still going to be inclined to buy their own vehicles—and it's your intention that people buy their own vehicles—rather than have a sharing economy of vehicles? What's your objective?

Mr. Mark Nantais: I think the initial step will be commercial vehicles and taxi fleets. That way they have more control over the fleet. Generally I think it's safe to say that for those initial stages, those fleets will be self-insured by the companies that own those fleets. That's the way it will start out.

Part of the issue is on how you can gather up enough field experience with these technologies, build that back into your software, and build that back into your vehicles. When we say “manage”, that's part of what we're saying: how do you do this in a safe and managed way?

Mr. David de Burgh Graham: I imagine that for commercial vehicles the answer will be yes, but for private vehicles, should autonomous vehicles be permitted to operate unoccupied? Should people be allowed to drive them without anybody in them? The reason I ask that is if everybody has an autonomous vehicle and they all go to work and send the cars home empty, we have an echo rush hour. I wonder what your thoughts are on that.

Mr. Mark Nantais: Well, first off, you'll have a stepped process in terms of automated driving systems. Usually we use the definitions under the international Society of Automotive Engineers. They have five definitions for technology, from essentially zero or one through to five. Level 5 is fully autonomous, meaning no driver. It's just a vehicle on its own. It's a stepped process from there. We're roughly at about level 3 right now in terms of automated driver-assist systems.

Ultimately we'll get there, but it's not going to be straight out the door at this point in time.

The Chair: Mr. Graham, I have to try to get a few other questions here. We're going to throw out all the questions we can in our 15 minutes.

Mr. Badawey is next.

Mr. Vance Badawey: Thank you, Madam Chair.

I want to go back to the first question that I asked earlier and get more of an in-depth answer on it. That was on how much more government can participate.

We spoke earlier about some of the opportunities when it comes to revenue. I know I got an in-depth answer on that. When you look at government as being an enabler, offering resources, working with different levels of government, with the different ministries, we have many programs that we've launched to date in the last two years. What more can we do?

Mr. Mark Nantais: My advice would be to continue what you're doing, but one thing we have to be sure to avoid is the introduction of impediments by lack of coordination, lack of consistency.

Between Canada and the United States, vehicles move back and forth across the border. There's really no border, because the vehicles are ubiquitous. We're a little behind NHTSA, the national highway transportation system, in the sense that they have a whole set of different policies as to what vehicle manufacturers should look at in terms of automated vehicle design and deployment. Those are the things that we should be moving forward with on our own and being consistent with.

We need to be consistent. We should not be allowing individual municipalities, for instance, to put in place their own requirements, because that will definitely slow down the advance of these technologies. It's consistency north-south, consistency east-west.

That's what's critical, and government has a role.

Mr. Vance Badawey: Speaking of that, in terms of both sides of the border—internationally, actually—has the industry also looked at not just the vehicles, but at integrating transportation methods, working with, for example, air, water, rail, and the vehicles themselves?

Mr. Mark Nantais: I can tell you how we manufacture vehicles. Because we're a highly integrated industry, we move things back and forth across the border as many as six or seven times a day toward the final product. We are true multimodal companies, in the sense that we'll use trucks, we'll use rail, and we will use marine and air as the case may be.

Air, of course, in our business, is extremely expensive, but if you have an assembly line that goes down, stops, that's roughly about \$1.5 million lost revenue per hour, so we do what it takes. We are truly multimodal, going from one to the other, and they're fully interconnected.

Mr. Vance Badawey: Great. Thank you.

The Chair: Go ahead, Mr. Chong.

Hon. Michael Chong: Thank you, Madam Chair.

I want to ask Madam Kargas a question and give her an opportunity to explain.

You made a pretty bold recommendation that all autonomous vehicles must have electric propulsion. That is a pretty strong recommendation. From many of the expert reports I have read, the internal combustion engine is going to be around for a while, so maybe you could tell us exactly what you mean when you say that all autonomous vehicles must have electric propulsion.

● (1720)

Ms. Catherine Kargas: Sure.

In every analysis and evaluation that has taken place to date internationally to try to evaluate the number of vehicle kilometres travelled with AVs, the estimates have ranged anywhere from a 50% to a 100% increase in the number of kilometres travelled. That means that if these kilometres continue to be travelled with internal combustion engines, given the importance of the transportation sector in generating greenhouse gas emissions, we're going to be in a very difficult situation, as a country or even internationally, for meeting many of our climate change mitigation objectives if we do not think about this in advance and start to put rules in place.

For example, there are municipalities and countries around the world that are already saying that in 2030 or 2035, depending on the jurisdiction, there will be no more internal combustion engine vehicles. What I'm suggesting is that as we prepare for a future of AVs, given what we already know in terms of the number of vehicle kilometres travelled, we should already be starting to think about introducing electric drives in those vehicles.

The Chair: Thank you.

Mr. Hardie is next.

Mr. Ken Hardie: I gave you a heads-up on what I was going to ask, so I hope you've had a chance to think about it.

Nobody can dispute that an electric vehicle travelling down the road is probably as close to zero emissions as we can get, but a lot depends on where that electricity comes from to charge that vehicle. If we're in the Prairies and we're charging vehicles by burning coal to generate the electricity for them, we're not much farther ahead.

Therefore there are two questions, I guess. What would you anticipate to be the additional demand in gigawatts for our electrical system to handle a really large fleet of electric vehicles? Second, what are provincial and federal governments going to have to do to come up with a better way of generating that electricity?

Ms. Catherine Kargas: Do you want me to answer?

Mr. Ken Hardie: I do.

Ms. Catherine Kargas: It is very different from one region of the country to another. In a province like Quebec, for example, the provincial utility has already done the analysis and feels that with over one million electric vehicles on provincial roads, the utility can handle them without any changes whatsoever to the grid. As far as the local distribution companies in Ontario are concerned or as far as BC Hydro is concerned, we're hearing a lot of the same rhetoric.

In terms of your statement that if we're burning coal we're not further ahead, there is no grid in this country that is 100% coal, where coal generates all of the electricity, so we have an opportunity, even if it's not all renewables, in a province like Ontario where there's a lot of nuclear, or in a province like Manitoba, or in provinces like B.C. or Quebec where we have a lot of renewables—in fact, almost all renewables—to reduce the greenhouse gas emissions and—

Mr. Ken Hardie: What about in Alberta, Saskatchewan, or Newfoundland and Labrador?

Ms. Catherine Kargas: Alberta has already introduced regulations and plans to do away with all of its coal-burning facilities.

● (1725)

Mr. Ken Hardie: They're replacing them with what?

Ms. Catherine Kargas: Well, renewables.... The price of solar is coming down in such an important way.

The Chair: Mr. Rathwell is trying to get a comment in there too.

Mr. Kent Rathwell: Alberta has provided some contracts for renewable energy, and for all intents and purposes, they are some of the lowest rates ever, in the range of 4¢ per kilowatt hour. You can't build coal plants for that, so that's definitely possible.

To go back to what I said earlier, we've electrified virtually every highway in Canada with the charging network that's actually free to use. Just a week ago we launched the first 100% solar-powered car share in Canada. This means that 100% of this car is powered with 100% solar power, and there are no tailpipe emissions in this car. If solar-powered car-sharing is possible today, autonomous vehicles are a very simple transition for us to hit. Having 100% zero-emission transportation in Canada is very easy to achieve.

Most metro bus fleets in Canada are subsidized to the tune of 60% or greater. If you move those metro fleets to 100% electric vehicles, you can pretty much cash-flow all of those metro fleets across the nation. What's possible with electric is pretty substantial.

That's today. Those vehicles are out there today.

The Chair: Mr. Aubin, do you have a question?

[Translation]

Mr. Robert Aubin: Yes, I have a question.

A number of witnesses have talked about the importance of protecting their personal data. Mr. Nantais, you also talked about this in the beginning of your presentation. I actually just came back from an international commission where this issue was on the agenda. Everyone agrees on how much of a priority this is, but few witnesses have come forth with specific proposals.

All of us have already checked the "I accept" box on documents that we would not have been able to understand even if we had taken the time to read them. Shouldn't requiring that contracts be written in a way that people can understand be the first step to take?

My question is for the both of you, Mr. Nantais and Ms. Kargas.

[English]

Mr. Mark Nantais: Certainly, I think that contracts such as that should be in lay language and should be understandable. Second, our companies must comply with all applicable laws. Whether it's PIPEDA or CASL, that's what we must comply with. That's what we do, and that's what we're going to do in the future as and when the legislation changes, if it does.

Right now in Canada, for instance, the privacy legislation is actually more stringent than in the United States. Canada's privacy legislation may actually impede some of the technologies that we're talking about here in terms of the timing of their introduction.

We hold up personal privacy information as of the utmost importance, and like cybersecurity, privacy is also built into the vehicle from the ground up at every stage of development and every stage of design. That's something we will not withdraw from. That's of paramount importance.

[Translation]

Ms. Catherine Kargas: I would strongly recommend that you study what the government of Finland has done for protecting data, and how data will be used in the context of autonomous vehicles.

[English]

The Chair: Are there any other pressing questions for the minute and a half that we have left?

Go ahead, Mr. Sikand.

Mr. Gagan Sikand: Thank you, Madam Chair.

Kent, you mentioned something that I'd like your comment on. You said that infrastructure isn't actually a bar to electric vehicles, but that's often what we hear. Could you just explain that a bit?

Mr. Kent Rathwell: Sure. It was one of the main issues, obviously, before we electrified the longest highway in the world and globally shattered the myths about electric vehicles.

Charging stations are very inexpensive to apply to your place of business or your home. Our model was to have businesses leverage charging stations and the expense of powering vehicles to attract people to their place of business, their hotel, or their restaurant. If you're going to spend a dollar to attract an electric vehicle to your hotel and then the person spends \$200 there, it's a very inexpensive way to attract people to your place of business.

With regard to the access to electric vehicles in Canada, there's more supply than demand, but it's difficult for the automakers to make this available.

I would say that at the federal level—

• (1730)

Mr. Gagan Sikand: I'm just going to jump in there quickly, because according to one study, the market share that electric vehicles have is 0.4% in Canada and 0.7% in the U.S., but 23.3% in Norway.

Go ahead.

Mr. Kent Rathwell: Why? It was all federal incentives in Norway, for the most part.

We have chargers in Norway too. They just made electric vehicles, black and white, so much better to buy than regular vehicles. It was a federal incentive that did that.

The Chair: Mr. Nantais, you wanted to add something.

Mr. Mark Nantais: Yes, I would just add to the Norway experience that it's true that government played a big role in

incentives, but these were not one-time incentives; these were incentives at many levels. Some were financial, but some are not financial. They estimate that the incentive every year is about \$12,000, so even Norway is now reconsidering the whole issue of incentives.

One thing is very clear: without incentives at this early stage of deployment, we will not be making any targets in terms of sales or anything such as that. They are so critical to consumers' early adoption of electric vehicles. We should be looking at them provincially and federally, and combining them.

The Chair: Mr. Badawey, do you have a short question? Oh, you're fine.

Is everybody good?

Thank you very much to our witnesses.

Go ahead, Mr. Graham, quickly.

Mr. David de Burgh Graham: Mr. Rathwell and Ms. Kargas, I drive 65,000 kilometres a year, mostly on dirt roads and back roads, given the nature of my job. How do we expect to succeed with electric cars before we have battery swap stations where I can just swap a battery and keep going, and therefore have standardized batteries?

We have to.

Mr. Kent Rathwell: It's going to be difficult for the automakers to agree to swapping batteries. There are too many variations in vehicles. With the level 2 charging, it was pretty amazing that they agreed to that. As for level 3, they haven't agreed to that yet, so battery swaps are probably not going to happen unless it's a private fleet.

Mr. Mark Nantais: That's absolutely right. Much of the technology, the design, is proprietary. Keep in mind how different vehicles are in their design. I don't think you'll ever see just a swap system. Pilot programs have been tried in Israel and other places, and they haven't worked.

By the way, when we talk about infrastructure or a recharging station, one station is not going to do it. All the reports I've seen show that many, many more charging stations are going to be required in terms of our infrastructure. Right now, we're so far from that objective that it will impede, actually, people's ability to see the value proposition as they go forward, particularly if they are doubtful that they'll be able to get recharging.

The Chair: We have to adjourn the meeting now, but witnesses have not left the room, so if anybody has a pressing question, I'm sure they'd be glad to answer.

Thank you all very much, and thank you again to the witnesses.

The meeting is adjourned.

Published under the authority of the Speaker of
the House of Commons

SPEAKER'S PERMISSION

The proceedings of the House of Commons and its Committees are hereby made available to provide greater public access. The parliamentary privilege of the House of Commons to control the publication and broadcast of the proceedings of the House of Commons and its Committees is nonetheless reserved. All copyrights therein are also reserved.

Reproduction of the proceedings of the House of Commons and its Committees, in whole or in part and in any medium, is hereby permitted provided that the reproduction is accurate and is not presented as official. This permission does not extend to reproduction, distribution or use for commercial purpose of financial gain. Reproduction or use outside this permission or without authorization may be treated as copyright infringement in accordance with the *Copyright Act*. Authorization may be obtained on written application to the Office of the Speaker of the House of Commons.

Reproduction in accordance with this permission does not constitute publication under the authority of the House of Commons. The absolute privilege that applies to the proceedings of the House of Commons does not extend to these permitted reproductions. Where a reproduction includes briefs to a Committee of the House of Commons, authorization for reproduction may be required from the authors in accordance with the *Copyright Act*.

Nothing in this permission abrogates or derogates from the privileges, powers, immunities and rights of the House of Commons and its Committees. For greater certainty, this permission does not affect the prohibition against impeaching or questioning the proceedings of the House of Commons in courts or otherwise. The House of Commons retains the right and privilege to find users in contempt of Parliament if a reproduction or use is not in accordance with this permission.

Also available on the House of Commons website at the following address: <http://www.ourcommons.ca>

Publié en conformité de l'autorité
du Président de la Chambre des communes

PERMISSION DU PRÉSIDENT

Les délibérations de la Chambre des communes et de ses comités sont mises à la disposition du public pour mieux le renseigner. La Chambre conserve néanmoins son privilège parlementaire de contrôler la publication et la diffusion des délibérations et elle possède tous les droits d'auteur sur celles-ci.

Il est permis de reproduire les délibérations de la Chambre et de ses comités, en tout ou en partie, sur n'importe quel support, pourvu que la reproduction soit exacte et qu'elle ne soit pas présentée comme version officielle. Il n'est toutefois pas permis de reproduire, de distribuer ou d'utiliser les délibérations à des fins commerciales visant la réalisation d'un profit financier. Toute reproduction ou utilisation non permise ou non formellement autorisée peut être considérée comme une violation du droit d'auteur aux termes de la *Loi sur le droit d'auteur*. Une autorisation formelle peut être obtenue sur présentation d'une demande écrite au Bureau du Président de la Chambre.

La reproduction conforme à la présente permission ne constitue pas une publication sous l'autorité de la Chambre. Le privilège absolu qui s'applique aux délibérations de la Chambre ne s'étend pas aux reproductions permises. Lorsqu'une reproduction comprend des mémoires présentés à un comité de la Chambre, il peut être nécessaire d'obtenir de leurs auteurs l'autorisation de les reproduire, conformément à la *Loi sur le droit d'auteur*.

La présente permission ne porte pas atteinte aux privilèges, pouvoirs, immunités et droits de la Chambre et de ses comités. Il est entendu que cette permission ne touche pas l'interdiction de contester ou de mettre en cause les délibérations de la Chambre devant les tribunaux ou autrement. La Chambre conserve le droit et le privilège de déclarer l'utilisateur coupable d'outrage au Parlement lorsque la reproduction ou l'utilisation n'est pas conforme à la présente permission.

Aussi disponible sur le site Web de la Chambre des communes à l'adresse suivante : <http://www.noscommunes.ca>