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The Honourable Judy A. Sgro

Standing Committee on Transport, Infrastructure and Communities

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● (1110)

[*English*]

The Chair (Hon. Judy A. Sgro (Humber River—Black Creek, Lib.)): I call to order meeting number 45 of the Standing Committee on Transport, Infrastructure and Communities of the 42nd Parliament. Pursuant to Standing Order 108(2), we're doing a study of infrastructure and smart communities.

I welcome the witnesses we have with us today: Michael Riseborough, director of terminal infrastructure for the Greater Toronto Airports Authority, and Hugo Grondin, director of the strategic support services division of the information technology service of the City of Quebec. Unfortunately, Mr. Charest, another one of our witnesses, had to cancel this morning.

Mr. Riseborough, would you like to go first?

Mr. Michael Riseborough (Director of Terminal Infrastructure, Greater Toronto Airports Authority): Thank you.

I'll be speaking today about the unprecedented growth at Toronto Pearson to set the context for what I'm presenting: existing and emerging ground transportation challenges as a result of this growth, and the new developments that we have in our plan in response. I'll also touch on transportation and technical challenges as far as regulatory and design implementation is concerned.

Toronto Pearson is experiencing a period of unprecedented growth. In 2016 we moved more than 44 million passengers. It's estimated that in 2035 we will move as many as 80 million passengers. A global hub status would be achieved should we meet that number of 80 million, and we would be in a group of airports—much like JFK or Heathrow—providing global connectivity.

Global hubs provide prosperity to the region in which they operate through job growth, foreign direct investment, and tourism. Keeping up with this growth within our physical facilities is difficult, and the expectation of the passenger is key. People have a choice about where they travel or which airport they choose to connect through. Our direct competitors are JFK, Detroit, Chicago O'Hare, and other airports that provide connectivity, such as Atlanta. Passengers have a choice of which airport they choose. We want them to choose ours.

One key deliverable to achieve that is to provide connectivity for the passenger using various transportation mechanisms to allow them to move freely and quickly through the facility from gate to gate, from check-in to gate, or from gate to ground transportation.

We'll increasingly rely on technology to move our passengers and their bags in an expedited fashion. We've explored the use of accelerating high-speed moving walkways, personal rapid transit vehicles—PRTs—and automated people mover systems to move people efficiently.

I have an example of this. I met a passenger who was travelling on Air Canada from Frankfurt. She was going to be travelling out to Calgary on WestJet. The distance from gate to gate was likely three kilometres. She travelled on various moving walkways, escalators, vertical transportation systems, the automated people mover or accelerated moving walkway, and she arrived at her gate in less than 30 minutes. That wouldn't have been possible without these technologies.

One thing I want to mention is that the high-speed walkways that exist at Toronto Pearson are unique. There are two of them in the world, both at Toronto Pearson. They're the result of a research and development project that we undertook with ThyssenKrupp in Spain to develop these high-speed walkways, which move at three times the speed of a normal moving walkway.

Yet the movement of people and goods outside of the airport is arguably a greater challenge and is more out of our direct control. Toronto Pearson is located within the second-largest concentration of jobs, the airport employment zone, and accounts for about a million trips per day. Of that, less than 10% is on transit. As the region grows and our traffic grows, transit becomes so important to preventing our roads from reaching critical levels, affecting the movement of airport employees, cargo, and passengers.

To ensure that Toronto Pearson is able to continue operating efficiently in serving our community, we have recently announced plans for a regional transit centre at the airport. The facility is strategically located to provide a missing link for a number of existing and planned transit lines that come close to the airport but don't actually connect. We're asking our government partners to connect these lines to this facility so that we can keep people and goods moving freely through the region.

We'll also be looking for technology to help solve problems. The transit centre could provide important connections in all directions, including important economic zones like the Kitchener–Waterloo corridor. However, we're looking at innovative transit solutions for passengers for that “last mile” from the transportation centre to the airport terminals.

● (1115)

This could employ the use of digital technologies, automated vehicles, or other emerging technologies. Existing emerging technologies, such as electric vehicles and autonomous vehicles, will require changes in road design and electrical utilities infrastructure. It is expected that as different types of technologies become established there will be a need for the integration of regulatory standards and design.

As an example, the UP Express connecting Pearson to Union Station's heavy rail system and the automated people mover system that connects the terminals to other elements of Toronto Pearson are on the same platform system. Nowhere in the world does this exist, to my knowledge.

It was an interesting exercise to integrate the regulatory framework that guides the safety of workers and passengers in the heavy rail system with a mature regulatory structure around automated people movers. Nowhere else do they exist on the same platform, in the same space, and in the same dynamic envelope. I think you can expect to see this more and more frequently as different technologies emerge, and there is a requirement for those technologies to be in the same space or a relatively similar space.

Some airports have begun integrating new transportation technologies and processes. As an example, Hartsfield-Jackson Atlanta International Airport, along with MARTA, the regional transit provider, partnered with Uber to provide critical connectivity to and from the airport.

As the airport operator, we invest in tools that we need to keep people and goods moving through our airport and our ever changing region. We ask government to support us and partner with us to ensure that Toronto Pearson, one of Canada's most important commercial assets, continues to operate efficiently and to flourish.

The Chair: Now we have Mr. Grondin from the City of Québec.

Welcome, we're glad to have you here.

[*Translation*]

Mr. Hugo Grondin (Director of the Strategic Support Services Division, Information Technology Service, City of Québec): Thank you, Mr. Chair. I'd like to thank the committee for having me.

The objective of my presentation is twofold. First, I want to provide some context for the smart city concept. Second, I'd like to share the approach the City of Québec is taking. Those are the two elements I plan to address.

The City of Québec has a population of 532,000 people spread across a 454-square-kilometre area. More than 40% of the population has a post-secondary education. In addition to being more francophone, the population is older than the provincial average. The Internet use rate is above 80%, and the unemployment rate is below 5%. That is a quick snapshot of the City of Québec.

Now I'd like to talk about what a smart city is. The use of smart technologies to make a city's infrastructure and services more efficient and interconnected. You'll find countless definitions out there, but that is the one we chose to go with. As we see it, a smart city is a better-managed and better-performing city thanks to the support of information technology, or IT. It is not, however, the use of IT, strictly speaking, that gives rise to a smart city but, rather, the context in which it functions.

A variety of smart city models and references exist. A number of private firms have developed concepts, including IBM. In fact, more and more ISO standards are emerging in the area, namely, the 37000 series of standards.

The smart city concept has really evolved. It's something we, in the City of Québec, have been interested in for eight or nine years now. We began by exploring what a smart city was through joint research with Université Laval and research partners around the world. That gave rise to some very interesting findings.

It's important to understand the reason for wanting a smart city; that is a basic point. The issues facing the City of Québec are certainly not the same as those facing Mexico City, for instance, where air quality was the most defining element at the time of the study. That isn't necessarily the case in the City of Québec.

Implementing technology all over the place is not enough; sound choices governing its use have to be made. A smart city is built around the needs of its residents and partners, who are stakeholders in the city's development. That is the logic guiding our efforts.

Our efforts, in the City of Québec, hinge on the co-operation and engagement of a variety of business sectors. I am, indeed, talking about an overall approach. It is based on certain elements such as information gathering, data interconnectivity, and analyses. All of that helps us to understand what a smart city entails and how to turn that understanding into reality.

In the City of Québec, we sought to figure out why we wanted to become a smart city. We adopted two strategic directions. On the one hand, we wanted the city to be appealing to tourists and immigrants from all over the world. On the other hand, at the city level, we wanted to improve our performance as an organization, primarily to improve the quality of life enjoyed by residents, business people, and tourists.

In tangible terms, a pillar of the city's 2012 economic development strategy was innovation and creativity. One of the fundamental objectives is to evolve as a smart city.

The City of Québec's technology sector is made up of 540 companies and employs nearly 20,000 people, 2,000 of whom work in research. The sector generates $1.7 billion in annual revenues and encompasses 65 research centres, chairs, groups, and institutes. Clearly, economic development is the way to attract people.

Specifically, the city chose to focus on six key areas. We have services to the public. In the services we deliver, first and foremost, are basic services such as water, public safety, and communication and interaction with the public.

● (1120)

We have services to the public, such as garbage collection. We have water, transportation, safety, economic development, and buildings and infrastructure.

How does technology bring a smart city to life?

Those are the areas our approach is based on. Unlike other organizations, the City of Québec did not set up an administrative body, office or service for the smart city. Mainly, we chose to synchronize the various initiatives and monitor how the city evolved.

Of course, the smart city concept helped us to better understand the phenomenon and work with other entities. Our efforts have been recognized by organizations such as the New York-based Intelligent Community Forum. We had the opportunity to take part in a philanthropic challenge put on by IBM. We explored the issue of digital inclusion. Although less focused on technology, the idea was to determine where in our region Internet service was least accessible.

We were interested in figuring out how we could incorporate libraries in our service offering. Naturally, we held a number of discussions and consulted multiple articles on the subject. Our approach focused on six key areas.

Now I would like to share with you the projects that emerged.

The city wants to better plan its network of bike paths and has sought the help of residents. It developed an app, called Mon trajet vélo, to track the routes that cyclists take throughout the city and to better understand their overall travel patterns. Albeit a less conventional form of civic engagement, this information-sharing initiative sheds light on cyclists' movements and leads to better city planning.

In addition, a series of technology showcases give businesses the opportunity to use city data and work with the city to pilot business projects they are interested in launching. Also available is a collection of digital books. City residents currently have access to more than 7,700 titles, accounting for nearly 100,000 book loans.

The city's transit provider, Réseau de transport de la Capitale, known as RTC, developed an app to make travel easier. The city is one of RTC's largest shareholders. We are working with the company to improve the flow of travel using traffic signal preemption. Normally reserved for fire trucks, this mechanism allows for better traffic light synchronization.

On the open data front, in conjunction with other large cities in the province, the City of Québec contributed to the implementation of a common data portal. The data belongs, of course, to the public, so we provided access to certain data sets, which can be leveraged to build all kinds of applications.

I should stress that the first objective of becoming a smart city is to improve residents' quality of life and support the activities provided to them by the city.

● (1125)

[*English*]

The Chair: Thank you very much for sharing your comments about the city with the committee.

We'll go to Mr. Reyes for six minutes.

[*Translation*]

Mr. Alain Rayes (Richmond—Arthabaska, CPC): Thank you, Madam Chair.

Mr. Grondin, how does the City of Québec measure up as a smart city in relation to other major cities around the country and the world?

Mr. Hugo Grondin: As I mentioned, it's a matter of identifying your reasons for becoming a smart city. That is fundamental. It has to be in response to a need. The challenges vary from city to city. The city isn't necessarily competing on all the same fronts. First and foremost, we serve the clientele that lives within our boundaries. That is our core mission.

I would say our approach is a healthy one. As I said, the smart city concept is fairly new for us. Over the past seven or eight years, we have sped up the pace of our IT investments. That brings us closer to being on trend with other North American cities.

It boils down to your reasons for becoming a smart city and the understanding that investments will be necessary.

Mr. Alain Rayes: Could you share with us some concrete measures that the City of Québec has taken in the way of smart infrastructure?

I live near the City of Québec, and I often go skiing in the area. I can tell you that traffic doesn't always flow smoothly. We hear a lot about Montreal, but I think the situation in the City of Québec is similar at certain times of the day.

What steps have you taken in that regard? What so-called smart infrastructure measures have you taken, aside from public transit?

Mr. Hugo Grondin: I understand.

Mr. Alain Rayes: We know about the system.

Mr. Hugo Grondin: Very good.

We have made efforts in terms of parking. I realize it does not improve the flow of commuter traffic, but we have built apps to make parking easier. Tangibly speaking, we do have plans in the works, but the priority right now is on public transit.

Mr. Alain Rayes: I see.

Is the municipality partnering with the private sector at all? I am thinking of companies like Uber, which provides signals, and other high-tech companies that are open about the fact that they have access to technology government and municipalities don't. Their contribution could be brought to bear if they weren't seen as competitors. Everyone is familiar with the Uber issue in Quebec. You have been involved, in your region, as well.

Is your municipality partnering with these private companies with a view to making improvements? That brings me back to the issue of traffic flow, which is a huge problem right now.

● (1130)

Mr. Hugo Grondin: Nothing specific that I know of right now.

Mr. Alain Rayes: Very well.

How could the federal government help you make traffic and transit improvements? I'd rather not focus too much on public transit but, rather, on other issues. The problems are known, and they are on everyone's mind.

Mr. Hugo Grondin: As you know, the federal government, through the provincial government, is giving us tremendous infrastructure support. Smart investments, which favour technology, are perhaps something the federal government could help us with, through the province, as I said. That could help us do more in that regard.

The government has made many solid investments, which we are very happy about. Nevertheless, the more technological dimension isn't always a focus.

Mr. Alain Rayes: Would you say the government's current programs always focus on concrete building projects? That is my impression, and I think the situation is the same at the provincial level.

We rarely hear about technology or measures that could be taken to improve traffic flow and, inevitably, residents' quality of life.

Mr. Hugo Grondin: Certainly.

I will speak on behalf of the City of Québec. We have clearly made a major effort to, at least, ensure the sustainability of the infrastructure within our boundaries, to stabilize and consolidate the area within the new city. Even though the merger happened nearly 15 years ago, we still have some consolidation work to do. Could there be a bit more room for initiatives like the one you're describing? Most likely, yes.

Mr. Alain Rayes: Great.

We talked about transportation. Security-wise, do you have any concerns about the data-sharing measure you talked about in the beginning? You mentioned open data and making information accessible to residents and, I imagine, private businesses interested in developing new applications to support the services available to the public.

Mr. Hugo Grondin: As far as the data we make available are concerned, we always work with the owners of the information and obtain their permission.

We do have to stay vigilant, but the data in question are generally less sensitive in nature, I would say.

Mr. Alain Rayes: Thank you very much.

Thank you, Madam Chair.

[*English*]

The Chair: Thank you very much.

Mr. Iacono.

[*Translation*]

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

Good morning, gentlemen. Thank you for joining us today.

Mr. Grondin, I have a few questions I'd like to ask you.

Earlier, you mentioned the reasons for wanting a smart city. You also talked about making the right choices. I'd like to continue along the same lines as my colleague, Mr. Rayes.

You have already introduced some smart infrastructure. What would you say the general challenges are in implementing that kind of infrastructure?

Mr. Hugo Grondin: The challenge is to do the right thing. As I said, you have to be aware and manage your capacity with a view to delivering initiatives. After that, the focus becomes managing projects in the traditional sense.

You have to apply the utmost rigour and ensure appropriate follow-up, and that is a challenge for every community in Canada and the world. You have to make the right choices and make sure you have what you need to do things properly.

Mr. Angelo Iacono: What positive effects have your initiatives had on the economy, services to the public, and the environment?

Mr. Hugo Grondin: I'll talk about services to the public first.

One application that is very popular is the one that helps people easily find a parking spot. It makes life easier not just for residents, but also for visitors to the city.

Could you refresh me on the first element you asked about?

● (1135)

Mr. Angelo Iacono: It was the economy.

Mr. Hugo Grondin: I talked about the economic aspect when I described the technology showcases. They allow businesses to pilot a product, either by physically setting something up in the city such as a new type of streetlamp, or by working together to introduce a new technology app. We provide the businesses with funding. We also work with them by providing access to a part of the city where they can pilot a concrete project. Those are a few examples.

Mr. Angelo Iacono: What about environmental impacts?

Mr. Hugo Grondin: Tangibly speaking, we've had fewer initiatives with effects on the environment.

Mr. Angelo Iacono: Thank you.

I'm going to give the rest of my time to my colleague, Mr. Sikand.

[*English*]

Mr. Gagan Sikand (Mississauga—Streetsville, Lib.): Thank you.

The Chair: Mr. Sikand.

Mr. Gagan Sikand: Michael, thanks for being here. I enjoy my tours of Pearson quite a bit. I refer to the control tower as my "pushing tin" moment. I also like the vision of Pearson being a transit hub. I'm in favour of that as well.

Something you mentioned raised some concerns for me. You said that Pearson employs roughly a million people. You're trying to integrate automation. Will that not adversely affect all of those jobs?

Mr. Michael Riseborough: I said there are roughly a million trips a day.

Mr. Gagan Sikand: Sorry. Okay.

Mr. Michael Riseborough: Of that, 10% is by transit.

Automation is inevitable. It's a developing technology that will continue to show itself in various ways.

I could share an example that I came across a number of years ago. RATP, the transit authority in Paris, automated line 7, which is one of their subway lines, to test it about 15 years ago for the safety of workers and passengers and to benchmark it against the information it had. As a result, they discovered that safety had improved substantially in terms of both worker and passenger safety.

Over and above that, from an employment point of view, they redeployed the driving staff to customer service and security functions within the service. As a result, there was no job loss, just a repurposing of those positions. Since then they have automated line 1 and likely others. Line 1 runs from Champs-Élysées to Notre Dame. It moves about 700,000 passengers a day. That happened about five years ago. I don't know how that has turned out, but I assume it has done well, because I haven't heard anything further.

Mr. Gagan Sikand: You answered my second question, which was whether you could repurpose those jobs.

In your opinion, can that add to the job numbers as well? As automation increases, you're going to need more people to operate, do the software, and all that.

Mr. Michael Riseborough: Automation will provide efficiency, and efficiency brings passengers, and passengers create jobs.

Mr. Gagan Sikand: Okay. Thank you for your answer.

The Chair: Thank you very much.

Mr. Aubin.

[*Translation*]

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

Thank you to the witnesses for being with us today.

I must admit that, ever since we began our study on smart cities, I've had trouble wrapping my head around the concept. It's as though I'm in front of a smorgasbord of technologies, each more fascinating than the last. What would really make cities smart is the ability to prioritize and coordinate these various techniques to achieve a well-defined objective, which I don't seem to be hearing from many of you.

I am hearing a lot about Internet use; Mr. Grondin talked about the fact that 80% of people in the City of Québec have Internet access, for example. That is pretty standard for North America. When you have 80% of people with Internet access, that does not translate into a smart application use rate of 80%, however.

Do you have any usage data for the measures you have put in place?

● (1140)

Mr. Hugo Grondin: In concrete terms, as regards the measures and usage, we rely mainly on resident satisfaction surveys. That is where our main figures come from in that regard.

Among residents, the overall rate of satisfaction with the city stands at 85%. We've measured that element over time. We don't have a method to assess each experience by impact. As I mentioned, the approach we've taken changes and evolves according to need. Furthermore, a number of initiatives are getting under way.

Mr. Robert Aubin: Allow me to give you an example.

In your efforts to become a smart city, you said that tourism was one of the priority areas you focus on. Tourism can come from anywhere, including Trois-Rivières, the riding I represent.

When I get to the City of Québec, how will I know I have entered a smart city?

Mr. Hugo Grondin: It's important to make sure that the smart city concept is not the be all and end all. Let's agree on that. What you are asking revolves around the idea that we absolutely have to present ourselves as a smart city, but that isn't how we see things.

Mr. Robert Aubin: How would a tourist know, upon arriving in the City of Québec, that they could access a certain number of applications to make their stay easier or more pleasant?

Mr. Hugo Grondin: It would take a portal to bring all that together, but we don't have one right now. That's one of the things we would need to develop. Tourists can go to the website of the city's tourism office. In terms of sending people alerts to advise them of all the activities available during a certain period, as soon as they enter the city limits, we don't offer that right now. Frankly, it's not something that's ever been expressed as a need.

Mr. Robert Aubin: My question pertains directly to an example you gave, the parking app. I realize that city residents are all probably very happy with the app because it benefits them on a daily basis. When I come to the City of Québec, however, I won't know that you offer such a service or be able to take advantage of it.

Mr. Hugo Grondin: Yes, that's right. A broader communication effort is needed. A portal should be created presenting all the possibilities that are consistent with smart cities, but we are not there yet.

Mr. Robert Aubin: At the very start of your presentation, you referred to a study by Laval University professors that helped shape your thinking on the smart city concept.

Is that study available? Could we get a copy of it? Perhaps it could help us in our thinking about smart cities.

Mr. Hugo Grondin: Mr. Sehl Mellouli, from Laval University, has considered the concept a great deal and conducted a lot of research into it. That study could of course be provided to the committee to help it in its work.

Mr. Robert Aubin: Thank you.

I have a question for you, Mr. Riseborough.

You talked about the Toronto airport. I have no doubt that, within the boundaries of the airport, you have both the means and the ability to coordinate all efforts to achieve your objectives. For problems outside the airport's boundaries, however, how do you work with the City of Toronto in order to achieve fluidity as quickly as possible?

[*English*]

Mr. Michael Riseborough: I'm not the expert on this, but our board of directors is made up of representatives from the surrounding cities—the City of Brampton, the City of Toronto, the City of Mississauga—and they're integrated into our processes on a regular basis. There's a consultative process to discuss transit, in particular, and roadways and connectivity to the airport. I don't know if that answers your question. Perhaps you could reframe it and I could get back to you on it.

● (1145)

[*Translation*]

Mr. Robert Aubin: I think that the smart nature...

[*English*]

The Chair: Mr. Aubin, sorry, it was so interesting there, I didn't want to cut you off.

Mr. Badawey.

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

I do want to thank the witnesses for coming out today.

There's no doubt that today, and the days that we're working on this strategy have become the first days in our lives as they relate to investing in infrastructure. It's the new norm when it comes to investing in infrastructure.

That said, establishing a foundation is what we're trying to do here today, to begin the process of establishing a strategy in partnership with our municipal partners throughout the nation as well as the private sector. So, I'm going to ask you a blanket question to prepare us for that, and I'm looking forward to hearing from both of you.

In your opinion, what are the key components of a community improvement plan and growth strategy for a national smart city. I'm deliberately adding the words “community improvement” and community “growth strategy” along with a smart infrastructure strategy, for obvious reasons.

I would like to hear your comments on that.

[*Translation*]

Mr. Hugo Grondin: May I begin?

[*English*]

Mr. Vance Badawey: Jump in; yes, go ahead.

[*Translation*]

Mr. Hugo Grondin: We have to give priority to the people we serve and listen to them. We have to identify citizens' expectations and needs. That is the most important thing. This has to be integrated into a priority intervention plan. I would insist on that.

Earlier, I was asking why we need smart cities. The objective is to improve citizens' quality of life. We have to pay attention to their expectations and respond accordingly.

[*English*]

Mr. Vance Badawey: Mr. Riseborough.

Mr. Michael Riseborough: Yes. At Toronto Pearson, as I was mentioning, we've experienced unprecedented growth, and that growth continues to come in a large margin, with close to three million additional passengers on an annualized basis. As a result of that, employment increases as well to be able to service the needs of those passengers.

What we actually do is move people and cargo, and aircraft are the instruments that we use to do that. To be able to do that, we need to be able to move people in and out of the physical facility in a reasonable and efficient way. What we really require is transportation systems to be able to facilitate that growth pattern.

If you look at 2035, with a possible 80-million passenger airport —perhaps even exceeding that—the transportation challenges in and around that employment zone will be significant. So, what we really need is a transportation infrastructure to develop using existing and emerging technologies and to take advantage of that to be able to provide the movement that's required.

Mr. Vance Badawey: Thank you.

Should the emphasis on the funding envelope the minister announced in tandem with the provinces and territories not only be leveraged by the federal, provincial, and municipal governments and private sector, but also be aligned with a lot of the strategies that are coming forward within the smart infrastructure strategy?

Mr. Michael Riseborough: I assume that question is for both of us.

Mr. Vance Badawey: Yes.

Mr. Michael Riseborough: Can I ask you to reframe it a little just so I understand what you're asking?

Mr. Vance Badawey: We're looking at getting returns on the investments that we're making in the infrastructure envelope from the $168 billion we've announced alongside the provincial allocations. Do you think that each and every cent that comes out of those funding formulas or funding envelopes should be aligned with the strategies that are being established through smart infrastructure?

Mr. Michael Riseborough: I'm in agreement with that concept. There's certainly a large volume of infrastructure dollars being spent, and it's key to us to have a strong transportation support for the airport movement, both in and out.

A large margin of our growth is also internal. Passengers don't necessarily enter the greater Toronto area; they may move on to other locations within Canada or the world. However, a measure of that growth is also local. The largest challenge, of course, is the movement of passengers in and out of the facility, as well as employees. There are about 45,000 employees working at Toronto Pearson, and a much larger number in the employment zone in and around Pearson. Investment in that transportation infrastructure would have a net return of significant value, generating better job growth. And the better the transportation, the more likely people will want to work in that area and businesses settle in that area and continue to develop and prosper.

● (1150)

Mr. Vance Badawey: In the fall statement in 2016, the federal government announced its intention to launch a smart cities challenge in 2017. In your view, what should be the priorities of this challenge?

The Chair: Who would like to answer that?

Mr. Grondin.

[*Translation*]

Mr. Hugo Grondin: With regard to infrastructure, the priority is to give information technologies a greater role. One of your colleagues said earlier that we have invested in concrete infrastructure, which is good. But is there a space to support that infrastructure? That is something your strategy should address.

[*English*]

The Chair: Thank you very much.

Mr. Hardie.

Mr. Ken Hardie (Fleetwood—Port Kells, Lib.): Thank you, Madam Chair, and thank you to our guests here.

I want to cover three areas. One has to do with the basic infrastructure, the foundational infrastructure, that you need to bring on the real enhancements that smart city infrastructure can make. I'd particularly like to hear your advice as to how the federal government can support that foundational piece upon which you build the rest of your network.

The second one, which I'm going to start with, is dead-end technology. In my younger days I bought a Sony Betamax; I bought a Mini Disc system, and now they're gathering dust. I've seen my kids put a lot of money into video game systems and only a year and a half later needing a new one, because the new games outstrip the capacity of the old one.

We can spend a lot of money on technology that gets us nowhere. How do we guard against that? Do you see technology providing that iterative growth so you can build on one generation to enhance it, rather than throwing it all away and starting from scratch?

Mr. Riseborough, we'll start with you.

Mr. Michael Riseborough: That's a great question. One of the difficulties with technology is that you never really know how it's going to be adopted by the population. It could vary from location to location. I'd like to talk about the accelerating speed walk that we invested in as a research and development project.

Mr. Ken Hardie: You can do that briefly, so we can have time for the other question.

Mr. Michael Riseborough: Sure. It's a research and development project, and we thought long and hard about it. It's a significant expense for us—tens of millions of dollars—and it was a difficult project to complete. We still believe strongly in that project, yet we still have the only two devices in the world to date. The manufacturer is pursuing other commercial options within other airports and other cities around the globe, but it still hasn't sold any of these accelerating walks.

If we don't invest, though, in research and development and take a chance on what seems to be a practical solution, technology will not advance. This was our attempt at making a calculated investment that we thought was a good investment in a technology that would survive.

Mr. Ken Hardie: Thank you for that.

Mr. Grondin, maybe I'll ask you the other question.

If we have cities that want to embrace the smart city technologies and are maybe not as far along as yours, what should the federal government do through its infrastructure to prepare them or help them be ready to apply smart city technology?

[*Translation*]

Mr. Hugo Grondin: Investments in education and research are important. As to cities, their raison d'être is pretty basic. Their role is not to do research and development. As I said earlier, we work with the universities and CEGEPs.

Thought must be put into this and funding is needed to support the "smart city" concept. This is an interesting and important vector.

● (1155)

[*English*]

Mr. Ken Hardie: Thank you for that.

I was thinking in terms of the real technical backbones like fibre optic lines, and even the electrical grid, which may need to be upgraded to handle this, because everything seems to run on electrical power.

Mr. Riseborough, I'm going to ask you a question that you're free to defer to somebody else, but I want to ask it anyway. The rail service to the Toronto airport has been underutilized. The ridership is low. What's missing? It's obviously a large infrastructure project that isn't performing as a lot of people thought it would, so are there gaps? What would you see happening to bring that up to its potential?

Mr. Michael Riseborough: I'll have to defer. Can I get back to you in writing on that question? I don't have the information.

Mr. Ken Hardie: Please do. Thank you.

I'm fine.

The Chair: Okay, thank you.

Mr. Berthold.

[*Translation*]

Mr. Luc Berthold (Mégantic—L'Érable, CPC): Thank you very much, Madam Chair.

I would like to thank our guests for being here. I will start with the spokesperson for Quebec City.

Since the initial studies of smart cities, there has been must discussion of improving citizens' access to various municipal services, facilitating transit, and sharing information.

I have noted that several communities do not have adequate Internet access. That might be less of a problem in Quebec City, but it still is in certain parts of Canada. That might not be as much of a concern to you. I would like to know, however, whether in your various meetings to plan the launch of the "smart municipality", you considered people who cannot afford a cell phone to reserve their parking spot and who cannot afford to get Internet access.

In launching a smart city, what consideration is given to people who cannot pay $60 per month for an Internet connection and $60 per month for a cell phone?

Mr. Hugo Grondin: Earlier I mentioned that some work had been done with IBM in particular, in 2013. Digital inclusion and the digital divide were considered at that time.

Over 80% of people use the Internet, but we were wondering how exactly to adapt the way we offered our services. In our opinion, this involves libraries. We really want to democratize them. We want to provide access to tablets there so that people who cannot afford those tools can use and experience them. That is the vector we are using.

Mr. Luc Berthold: Going to the library to find a parking spot is not very convenient. If I cannot park to go use a tablet, to see if there is a space available, and to see if I can pay for my parking remotely because I don't have smart phone that costs $70 or $75 per month, this is not a very inclusive approach.

Mr. Hugo Grondin: That is a fact, in your example.

What we can offer our citizens does of course depend on the infrastructure and equipment we have.

We are betting on libraries. We do not claim that smart cities can solve all the problems and address all the issues. Cities are complex. As you know, cities offer quite a wide range of services. That is the vector we support to democratize Internet use. The more traditional avenues of communication are still in place, of course, and will certainly be around for some time to come.

Looking beyond Quebec City, we have to consider the situation in other cities in Quebec and Canada. You talked about installation, wireless and high-speed Internet networks. These are important factors to consider in examining the issue of Internet access across Canada.

● (1200)

Mr. Luc Berthold: As you know, revolutions often start with people who know the issues. I am talking about people like you who are directly involved in the process and in the way of thinking about these things. Personally, I think the idea of sending people to libraries is a bit too easy.

I would like to see people like you, who are working very hard to make all technologies available, spend a bit more time thinking about these people. To my mind, a truly smart city would not have this divide in daily use and access to digital services. Looking at the big picture, it is nearly impossible. How can we make sure that everyone has access to a cell phone though?

Mr. Hugo Grondin: I have duly noted your suggestion since we want to work towards broad use of these tools. We have not addressed that aspect. We have considered it, but have not found a solution.

Mr. Luc Berthold: I do not think that a city that leaves 20% of its population without services is smart.

Mr. Hugo Grondin: I definitely share your concern.

Mr. Luc Berthold: Thank you. You can pass on the message then.

I will certainly do that at upcoming meetings, once I have had the opportunity to talk with municipal representatives.

Mr. Riseborough, the problem is not as great at airports, I would say, because all the people who use airports already have a bit more money, which gives them access to technology.

[*English*]

Mr. Michael Riseborough: That's quite true.

Also, the airport has dynamic signage as well. We have a localized audience, which makes it a little bit easier for us to communicate with than for a city. As well, the passengers' needs are quite predictable and not so diverse. Essentially, they're trying to get to their aircraft or get from their aircraft to their bag to the ground transportation. Dynamic signage assists with that, particularly during irregular operations, which are not abnormal. We probably have about 100 days of irregular operations as a result of weather, not just in the local area but elsewhere around the globe.

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

Thank you to the witnesses. We have finished the first hour.

Thank you very much for your testimony. We appreciate it. I'm sure you'll be monitoring where we all go with our smart cities and smart infrastructure.

Thank you very much. I will suspend for a moment while we get our other witnesses at the table.

● (1200)

(Pause)

● (1205)

The Chair: We will reconvene for the second half of our meeting.

Today we have with us Teresa Scassa from the University of Ottawa, Sriram Narasimhan from the University of Waterloo, and Jennifer Schooling from the University of Cambridge in the United Kingdom.

Welcome to all of you. We appreciate your being here.

Teresa, would you like to go first?

● (1210)

Ms. Teresa Scassa (Canada Research Chair in Information Law, University of Ottawa, As an Individual): Thank you very much for the opportunity to address the Standing Committee on Transport, Infrastructure and Communities on the issue of smart cities.

My research on smart cities is from a law and policy perspective. I have focused on issues around data ownership and control and related issues of transparency, accountability, and privacy.

The “smart” in “smart cities” is shorthand for the generation and analysis of data from sensor-laden cities. The data and its accompanying analytics are meant to enable better decision-making around planning and resource allocation, but the smart city does not arise in a public policy vacuum. Almost in parallel with the development of so-called smart cities is the growing open government movement, which champions open data and open information as keys to greater transparency, civic engagement, and innovation. My comments speak to the importance of ensuring that the development of smart cities is consistent with the goals of open government.

In the big data environment, data is a resource. Where the collection or generation of data is paid for by taxpayers, it's surely a public resource. My research has considered the location of rights of ownership and control over data in a variety of smart cities contexts. It raises concerns over the potential loss of control over such data, particularly rights to reuse the data, whether for innovation, civic engagement, or transparency purposes.

Smart cities innovation will result in the collection of massive quantities of data, and this data will be analyzed to generate predictions, visualizations, and other analytics. For the purposes of this very brief presentation, I'll characterize this data as having three potential sources. First, there are newly embedded sensor technologies that become part of smart cities infrastructure. Second, there are existing systems by which cities collect and process data. Third, there's citizen-generated data—data that is produced by citizens as a result of their daily activities and captured by some form of portable technology. Let me briefly provide examples of these three situations.

The first scenario involves newly embedded sensors that become part of smart cities infrastructure. Assume that a municipal transit authority contracts with a private sector company for hardware and software services for the collection and processing of real-time GPS data from public transit vehicles. Who will own the data generated through these services? Will it be the municipality that owns and operates the fleet of vehicles, or the company that owns the sensors and proprietary algorithms that process the data? The answer, which will be governed by the terms of the contract between the parties, will determine whether the transit authority is able to share this data with the public as open data.

This example raises the issue of the extent to which data sovereignty should be part of any smart cities plan. In other words, should policies be in place to ensure that cities own and/or control the data they collect in relation to their operations? To go a step further, should federal funding for smart infrastructure be tied to obligations to make non-personal data available as open data?

The second scenario is one in which cities take their existing data and contract with the private sector for its analysis. For example, a municipal police service provides its crime incident data to a private sector company that offers analytics services such as publicly available crime maps. Opting to use the pre-packaged private sector platform may have implications for the availability of the same data as open data, which, in turn, has implications for transparency, civic engagement, and innovation. It may also result in the use of data analytics services that are not appropriately customized to the particular Canadian local, regional, or national contexts.

In the third scenario, a government contracts for data that has been gathered by sensors owned by private sector companies. The data may come from GPS systems installed in cars, from smart phones or their associated apps, from fitness devices, and so on. Depending on the terms of the contract, the municipality may not be allowed to share the data upon which it is making its planning decisions. This will have important implications for the transparency of planning processes.

There are also other issues. Is the city responsible for vetting the privacy policies and practices of the app companies from which it will be purchasing its data? Is there a minimum privacy standard governments should insist upon when contracting for data collected from individuals by private sector companies? How can we reconcile private sector and public sector data protection laws when the public sector increasingly relies on the private sector for the collection and processing of its smart cities data? Which normative regime should prevail, and in what circumstances?

Finally, I would like to touch on a different yet related issue. This involves the situation in which a city that collects a large volume of data, including personal information, through its operation of smart services is approached by the private sector to share or sell that data in exchange for either money or services. This could be very tempting for cash-strapped municipalities. For example, a large volume of data about the movement and daily travel habits of urban residents is collected through smart card payment systems. Under what circumstances is it appropriate for governments to monetize this type of data?

My comments have only briefly touched on some of the law and policy issues regarding data in the smart cities context. I will be happy to address these issues, as well as any others, in the time allotted for questions.

● (1215)

The Chair: Thank you very much, Ms. Scassa.

We'll move on to Ms. Schooling.

Welcome. We very much appreciate the fact that you're sharing your information with us today and monitoring what we're doing here in Canada.

Ms. Jennifer Schooling (Director, Centre for Smart Infrastructure and Construction, University of Cambridge, As an Individual): It's a pleasure to be here. Thank you for the opportunity to speak to you.

I am the director of the Cambridge Centre for Smart Infrastructure and Construction, which is based in the department of engineering at the University of Cambridge.

We are slightly interesting for a research organization in that we're jointly funded, not just by the research council, but also by Innovate UK, which is the government's innovation funding arm. They normally give their money purely to industry, but in the case of centres like mine, they give it to universities to help us bridge the innovation gap between good research coming out of the university and its implementation in industry.

The reason they chose to fund an innovation and knowledge centre in smart infrastructure and construction was that they perceived there to be a market failure at the moment. There's a real opportunity with the sort of fourth industrial revolution and this huge burgeoning of the capability to sense things with newly invented sensors and to gather data to understand the condition of our infrastructure better, understand how well our designs perform, and get better value out of our infrastructure on behalf of the citizens.

However, the infrastructure and construction industry is being very slow at responding to this fourth industrial revolution. If we look at the manufacturing industry, particularly in Germany, they're pushing something called industry 4.0. They are really embracing the opportunity that sensor data gives them to understand their assets, to get better models of how they're degrading and, therefore, to offer different kinds of service models to their customers. In infrastructure and construction, certainly in the U.K.—and, actually I think it's fair to say, globally—we are far behind the curve on this. But there is a huge potential to deliver massive value to the public through better use of our infrastructure.

One of the challenges we have in the U.K.—and I suspect you have similar challenges in Canada—is that a lot of our infrastructure is very old. A lot of it was built in the Victorian era, and we have very limited information about it. If we're really lucky, we might have a drawing of a bridge that's 120 years old, but we don't know whether they built what they drew. We don't know quite what lies behind the abutment walls and so forth.

When we come to try to maintain these assets, we are really working in the dark, and we aren't doing a very good job as an industry of gathering our data in a consistent way so that we can use it to start to understand these assets and also to understand even our new assets and get better models for how we design them, construct them more efficiently and effectively, and then manage and operate them better.

The issue with that is as follows. The previous speaker talked about data being a resource. It's also an asset. What's tending to happen in the infrastructure and construction industry is that people are going and inspecting things, for example, going and inspecting a bridge, but the data isn't well gathered. It isn't well curated and it's not retrievable later on. If you then have a problem further down the line with that asset, it's very hard to look back and get value from that, to get good deterioration models, to get good understanding of how the condition of an asset is impacting its serviceability, and so forth.

There have been, however, some interesting steps forward in the U.K., partly through the setting up of our centre. We work with 40 partners in industry and government to demonstrate potential solutions. We've done everything from send our guys out onto construction sites in lovely luminous orange jackets to install sensors and understand how to interpret the data from that to understand the assets better through to working at an organizational level with asset management teams to look at how they structure their data, how they share their data, and enable them to get better use from that data. But we are very much in the foothills, I think, as an industry.

The U.K. government has made some interesting moves in this area. They decided about four years ago that, from the year 2016, any publicly funded construction project would have to comply with the requirements of what's called BIM level 2—that's building information modelling level 2—which is essentially a way of using 3-D, CAD-generated data and other kinds of data to collaborate around the design of something, but then also around the construction of it. You can use this BIM protocol to manage everything from the design through to the construction and potentially the handover of the asset.

That has really driven the industry to embrace this. Our industry is typically very conservative because it works with very low margins. It's heavily regulated for reliability, safety, and so forth. But if the government, as a client says, expects industry to deliver this, then people have no choice but to deliver it. That's enabled a big step forward in the U.K.

● (1220)

The industry is still a little nervous and struggles somewhat with the challenges of making sense of data. The big data arena that the previous speaker alluded to is a great opportunity, but it's also quite frightening, particularly if you're sitting in a contractor's organization and wondering how on earth you process it all.

One of the other challenges, certainly in the U.K. context, is that our supply chain is very segmented and so there are a lot of split incentives. If you have an organization that's responsible for building an asset, it's very hard for them to justify, in their own business case, investing in something that will bring benefits 20 years down the line in operation. At the same time, as a client, you might want that because 20 years down the line, you will still have your asset, your bridge, your tunnel, whatever it is, and you want to be able to use the benefits that would bring. So there's quite a challenge at the moment in the way the industry is structured and the way we carry out contracting. I'm afraid I don't know anything about the way contracts work in Canada, but these things are set up quite adversarially and, therefore, we're struggling to get the benefits over the whole lifetime of a project.

Then there is this challenge of getting data protocols. That will help to enable people to share data more easily, both between organizations that are given points in the assets' life, be that design, construction, or management, and also over the lifetime of the asset. Most assets will have several organizations responsible for them over the time they exist physically for 100 to 120 years, and we need to find ways that data can be passed from one organization to another.

The other interesting aspect that we're starting to focus on in the U.K.—and I'm involved in some of the standards organizations on this—is cybersecurity. I'll touch very briefly on this, but if people want more information, I can expand on it a bit later. The Centre for the Protection of National Infrastructure in the U.K. realized quite quickly when we started getting engaged with these BIM models—these wonderful 3D models or assets that we were plastering up all over presentations everywhere—was that we were inadvertently revealing a huge amount of information about pretty critical assets.

There's a major station in London called Victoria Station, which has several underground and overground lines running through it. It's also very close to Parliament, so there are quite a lot of parliamentary-related buildings around there. As engineers we were happily throwing up these BIM models rather naively and saying, "Look how brilliant BIM is. We can use it in these ways to manage construction and make sure we don't interfere with operations and so forth." This chap from CPNI saw one of these presentations and said he could see three or four critical national asset components there that we really shouldn't be showing to anybody who happens to be able to get hold of a set of these slides. That has initiated a process of trying to bring in cybersecurity protocols and good practice around security at as early a stage as possible with these digital protocols we're using.

Just to make sure that we get over our naïveté—it was in the early days, and we got over our naïveté pretty quickly—so we can get the best use out of these maps—

The Chair: Excuse me, Ms. Schooling, can you include the rest of your testimony possibly in answers to questions from the committee?

Ms. Jennifer Schooling: That was pretty much the last thing I was going to say.

The Chair: Okay. Thank you very much.

Sriram Narasimhan, from the University of Waterloo, please go ahead.

Mr. Sriram Narasimhan (Associate Professor, University of Waterloo, As an Individual): Thank you, Madam Chair, and members of the committee, for the opportunity to present before you this afternoon. I'll try to keep my introductory comments brief.

My name is Sriram Narasimhan. I'm an associate professor in the department of civil and environmental engineering at the University of Waterloo. I'm also cross-appointed with the department of mechanical and mechatronics engineering for the University of Waterloo. There, I also hold the title of Canada research chair in smart infrastructure.

I received my Ph.D. in 2005 from Rice University in Houston, Texas. I joined the University of Waterloo shortly thereafter, in 2006. Prior to joining the University of Waterloo, I was employed with American Bureau of Shipping in the risk consulting division, in Houston, Texas. I'm a registered engineer in the province of Ontario.

With regard to a bit about what my students and I are doing in research, the overarching aims of my chair here at Waterloo are to understand issues surrounding infrastructure and to enable condition assessment of critical infrastructure, such as bridges, airport systems, and water distribution networks, primarily through the use of sensors and smart data acquisition systems and hardware. This is so that we can develop strategies to mitigate unanticipated failures in vulnerable and aging infrastructure and develop cost-effective maintenance and capital projects planning.

My research spans across the areas of structural dynamics, condition assessment of vulnerable infrastructure, and structure control. Most of my work in the context of my chair pertains to how best to extract pertinent information regarding the health of infrastructure from measurements acquired from sensors installed on structures and systems. For example, I'm working with my team of students and post-doctoral fellows in developing hydrant-mounted sensors that can effectively determine leaks and other disruptive events within varied water distribution networks. Similarly, we are working towards better understanding what measurements tell us are going to help aging bridges.

I'm partnered with several public and private entities in pursuit of our research goals. We are now witnessing an era of digital transformation, where our ability to measure infrastructure performance during operation using sensors and processors has far surpassed our wildest imagination from just a few decades ago.

The smart communities of the future are ones that will effectively utilize this explosion of technology for the betterment of the life of their citizens. For example, our ability to measure energy demands within a smart community will help us to better balance generation and storage. Our ability to assess the health of aging bridges using sensors will help planners to come up with maintenance and refurbishment plans, taking into account budgetary and manpower constraints. Such technology will also help us identify and repair leaks in water mains before they flood our streets and hospitals.

For us to realize the goal of smart communities, we should overcome the technical gaps and technological gaps to using this technology, specifically how best to infer knowledge from data and through investments that enable the adoption of this technology within communities.

In Canada, we have some unique challenges related to geography and weather constraints. Hence, we cannot expect manual inspections in remote areas to ensure structural integrity. In my role as a witness to this important committee, I can offer my perspective on where and how sensors can transform our lives and better balance budgetary constraints and aging infrastructure needs.

Thank you.

● (1225)

The Chair: Thank you very much. We appreciate that.

Mr. Rayes, for six minutes.

[*Translation*]

Mr. Alain Rayes: Thank you, Madam Chair.

My first question is for you, Ms. Scassa.

You pointed out a number of yellow flags and warnings as regards privacy issues.

Could you suggest some solutions since this is a real concern for all levels of government? We are caught in the middle. If we want to move forward, we need data, but how far would we be willing to go to protect that data?

What would you recommend to the committee so that it can move forward, not hold things up, and not stand in the way of progress?

[*English*]

Ms. Teresa Scassa: It's a good question. If I were able to answer it in a nutshell, then we'd all be in great shape. Unfortunately, it's one of those very complicated problems.

I think there are a number of issues that I see coming up in this context repeatedly and that need to be addressed. Obviously, one of them is the whole private sector data protection puzzle. I think the standing committee on access to information is going to be looking at the Personal Information Protection and Electronic Documents Act. I think there are some significant issues with the capacity of that statute to deal with the collection of personal information by private sector actors in the big data era. One piece of the policy puzzle would be to look at that as something that really needs to be modernized and updated to address some of those challenges.

In the smart cities context, what I've seen now for quite a number of years is a growing conflict between the ways in which we've structured data protection: we have public sector legislation and we have private sector legislation, and then of course at the public sector level, you have provincial and you have federal.

I think this is increasingly challenging when you have projects that blend together both the public and the private, so that you have governments that are contracting with the private sector for services that are going to involve the collection and processing of this data. I gave you the example of the public transit smart card data, where perhaps you have a cash-strapped municipality interested in a lucrative offer they're receiving for their smart card data and so on. You have more and more issues in which the lines between public and private are not as clear as the legislation would make it seem and the norms that are established under the different statutes are not necessarily compatible, so they can be quite different. I think that's one area that requires some attention. How do you create a framework for this blended data protection context?

● (1230)

[*Translation*]

Mr. Alain Rayes: On my Apple phone, I have access to Facebook and Twitter. I truly believe that all these multinationals already have access to all my personal information. I do not honestly think it is protected. I think they have access to it somewhere on a server.

Is it reasonable to expect that, given a government structure which I would go so far as to describe as archaic as regards the evolution of society—and that includes all orders of government, regardless of political parties—, it is possible to create legislation with regard to all this information and be confident that it is handled appropriately and safely by companies? In your view, would it be unrealistic to expect that?

Ms. Teresa Scassa: We have to try nonetheless. I think it is essential that we try.

There are, however, other measures that governments can adopt. For instance, as I said earlier, governments buy information from the private sector. I am seeing this more and more. This is essentially big data from the private sector that can be used for analysis purposes. It is easier and less expensive to get this data from the private sector. It is often collected by companies that offer consumer applications. Consumers use those application. The data is then collected and purchased and used by government.

That leads me to the following question. Should governments that wish to collect personal data and information from the private sector have minimum standards as to the privacy policies of those companies? Is it enough to simply buy personal data from any company? Does the government have standards regarding the purchase of that data? We can demand certain conditions to protect citizens.

Mr. Alain Rayes: Okay.

I just have a few seconds left so I will hand it over to a colleague. My next question was for another witness and might have taken some time.

Thank you very much.

[*English*]

The Chair: Go ahead, Mr. Iacono.

Mr. Angelo Iacono: Thank you.

Dr. Scassa, I know that you have a privacy background, so I will address this question directly to you. As we can see, smart communities by their nature require the collection of substantial amounts of data from citizens. How should communities and technology providers address the privacy issue linked to the collection of vast amounts of data?

Ms. Teresa Scassa: This is essentially the challenge. This is the challenge under private-sector data protection legislation as well. There have to be certain norms for the collection of personal information and for compliance with those norms.

● (1235)

Mr. Angelo Iacono: Can you give us an example?

Ms. Teresa Scassa: In the smart cities context?

Mr. Angelo Iacono: What's one example that you'd like to give?

Ms. Teresa Scassa: If you mean an example of how a city or a government should go about ensuring.... I have already given the example of contracting for data in the hands of private sector companies. I do think it's important that governments set basic standards for any personal information they'll be acquiring from private sector companies or aggregated information that requires citizens to use apps. If you'll be collecting app data from certain types of apps, then maybe you should say that you will only purchase data from companies that set these basic standards in their policies.

Mr. Angelo Iacono: According to you, then, who should own the data collected, and why?

Ms. Teresa Scassa: I think there are a couple of questions there. Often where data is provided by app companies to governments for planning or other purposes, they retain ownership of the data. I think that's an interesting and significant issue for municipalities, for a number of reasons. Often they'll say that this is aggregate data that's been provided and it's not specific to individuals, so the impact on the individual comes in terms of what's happening to their personal information in relation to the private sector context.

In terms of ownership, that becomes interesting. Of course, if the app company retains ownership, then the government is restricted in terms of what it can do with that data, who it can share that data with, and in what circumstances.

Mr. Angelo Iacono: Irrespective of who will own this data, what safeguards should be instored in order to address the privacy issue and thus protect personal information? What are the three main safeguards that you think would be ideal to have some level of protection of personal information?

Ms. Teresa Scassa: Where the government is collecting personal information directly, or where the government is collecting it through the private sector, I suppose, there needs to be a level of transparency in terms of the practices that are taking place so that people can understand what data is being collected and what purposes it's being put to. That principle is already there in the legislation, but I think its application certainly needs to be improved. I think we all feel that there isn't sufficient transparency. We don't know what's happening to our personal information. Greater transparency would be pretty high on my list. Obviously that's easy to say and much harder to do, in terms of just listing things, but I would say greater transparency.

I'm also extremely concerned about a porousness in the link between private sector data and government surveillance and monitoring of citizens. This is something that is becoming an increasing problem, that all of these masses of data collected by private sector companies are relatively easily accessible, under our current laws, by government agencies. I think that raises transparency issues and also raises surveillance issues.

Mr. Angelo Iacono: Finally, should we have some type of safeguard on the utility of the data—for example, a time frame on who can use it and for what purposes, for what objectives?

It will be very hard to control this data. There's so much being collected, just in our phone.

Ms. Teresa Scassa: Yes.

Mr. Angelo Iacono: We could somewhat have control if we said that we were going to control the usage of it, or the usage of reusing the data that's been collected. For example, do we get the person's authorization to do so, or is it used with certain specific boundaries?

Ms. Teresa Scassa: Purpose limitation is already in the legislation, but I agree that it's something that has become problematic in terms of its monitoring and enforcement. It is an important principle.

Mr. Angelo Iacono: Thank you.

I have a question for you, Dr. Schooling, with respect to smart communities. In your view, because of their reliance on digital technologies and the risk of cyber-attacks, how should cybersecurity concerns be addressed and what should be the role of our federal government in this regard?

Ms. Jennifer Schooling: Certainly in the U.K., the national government is taking a significant interest in this. My centre looks at things more from the position of the physical infrastructure rather than the sorts of personal private data the previous speaker was talking about, but even so, there are security implications in this. Some of the data we want could potentially come from people's mobile phones, such as travel data and that sort of thing. There's definitely a role for the federal government, and there's definitely role for the standards organizations as well.

In the U.K., we are currently developing some standards around cybersecurity for smart cities. One of the reason for this is that you really have to assume that someone will hack you at some point, and if you're using digital infrastructure to manage your critical physical infrastructure, that includes your water supply, your power supply, your transport systems, etc. A malicious hack into that could potentially derail very important and critical national infrastructure. You need to have systems that are appropriately secure from each other such that they can't interfere with each other but at the same time will allow the healthy and useful sharing of data. I think there's definitely a role for the federal government in making sure that is happening.

● (1240)

Mr. Angelo Iacono: Thank you.

The Chair: Thank you very much.

Monsieur Aubin.

[*Translation*]

Mr. Robert Aubin: Thank you, Madam Chair.

Welcome to our guests. Thank you for being here and sharing your expertise.

Ms. Scassa, you are being bombarded with questions since you are probably the first witness with whom we can really discuss privacy. I sensed your concerns about Canadian legislation in this area.

Can you compare our laws with those in other countries in this area? Is our country on par with others or are we definitely lagging behind?

[*English*]

Ms. Teresa Scassa: There are significant differences between Canadian data protection legislation and what is in place in Europe, including European legislation on the reuse of public sector information. Some of those differences are due to updating, because of the process of reviewing, revising, updating, and producing directives with respect to new technologies. It seems to move forward more quickly and more effectively in Europe than it has done in Canada. The data protection laws at the federal and private sector levels in Canada have been neglected over the years and have been allowed to become considerably out of date. That's certainly one difference.

Another difference is the approach to or the conception of privacy in Europe, as compared to Canada, but I think it's English Canada as opposed to French Canada. I think in Quebec the approach to privacy is much more in line with the European approach to privacy, where privacy is seen much more as a human right rather than something that can be commodified and traded. In data protection frameworks such as PIPEDA, the Personal Information Protection and Electronic Documents Act, you see this idea that as long as people consent to things being done with their personal information, that's fine, and we know that consent has become unmanageable. Sometimes it seems that there isn't an underlying human rights principle that reinforces the value of personal information.

Those are the big differences that I see.

[*Translation*]

Mr. Robert Aubin: Thank you.

As to human rights, I think the term says it all: it should be up to the person, it should be their right to decide whether or not to share their personal information.

Yet we all know how appealing modern technologies are. Every time we are offered a contract on our cell phone, we immediately click on “I accept” without even reading the contract. Once I took the trouble of reading a contract, only to find that it was completely incomprehensible.

Should that not be one of the first steps that is needed, that is, to require that contracts be understandable to consumers so they can make an informed choice?

Ms. Teresa Scassa: I think that is one of the challenges. That is certainly on the agenda at the Office of the Privacy Commissioner of Canada. It is currently examining the issue of consent. I think this is an increasingly urgent problem to be addressed in Canada.

Mr. Robert Aubin: Thank you.

Can you give us an example of a multinational in Canada that misused the data it had collected? Could you at least give us the first letter of its name?

Ms. Teresa Scassa: There are certainly companies that have had data leaks and security problems. Complaints have also been made against companies, but I think transparency is also still a problem. How can we know what happens behind the walls? Is the use of personal information consistent with privacy policies? That is always a challenge to understand and know.

● (1245)

Mr. Robert Aubin: Is there a way for us to catch up legislatively on privacy? If not, will we always be lagging on technology?

Ms. Teresa Scassa: I think we are still a bit behind, but I also think we can make up a lot of ground. We can and must make the effort to do that.

Mr. Robert Aubin: Thank you.

Madam Chair, do I still have a bit of time left?

[*English*]

The Chair: You have a minute and a half.

[*Translation*]

Mr. Robert Aubin: My next question is for Mr. Narasimhan.

With regard to the major infrastructure project that the government has put forward for the coming years, there is a lot of talk about smart cities right now. Should we not be talking about smart infrastructure first though? What that means is that we should no longer build a building, a bridge, or a viaduct unless it is connected. The goal is quicker tracking in order to take action before the structure deteriorates, so as to protect our investments. We know that we are investing so much right now because, over the years, we have fallen significantly behind in infrastructure maintenance.

[*English*]

Mr. Sriram Narasimhan: Thank you very much for this question.

I think you recalled what I think. A lot of the conversations regarding smart communities and smart cities have largely been centred around buildings, power grids, and water distribution systems.

These are very important infrastructure types. But I think that when we talk about the broader context of infrastructure spending, we are entering into an era where the average age of critical transportation infrastructure, for example, is reaching a point where we should be thinking about replacing some of it in a short period of time.

However, budgets are limited. We are living in a capital-constrained environment. We have to do this in a intelligent way. In other words, we have to triage which bridges have enough residual capacity left in them that they don't need to be replaced right away—some minor repairs would suffice—and which bridges and other types of critical infrastructure need replacement right away. The only way we are going to gather and infer this information is by working at it through understanding what the current performance levels are. This also means that, in tandem to investment in infrastructure, we have to invest in the technologies that will help us better understand its health so we can triage and can dedicate resources and capital in an intelligent way.

The Chair: Thank you very much. Sorry, I have to interrupt now.

Mr. Hardie.

Mr. Ken Hardie: Thank you, Madam Chair. I'll be sharing my time with Mr. Sikand.

This is just a quick reflection. It's interesting how in the great, old cities in Britain and Europe there is infrastructure that's been used for 150 years or more. Over here, if something's 50 years old, we tear it down and build something new. I don't know if there's a disconnect there, but that's a story for another time.

I do want to throw out some open questions—just raise a hand or let me know if you want to comment. When we look at technology and we make a choice, it's like taking one frame out of a motion picture that's going by at Lord knows how many frames per second. The challenge is to obviously pick the right one.

In that regard, is there, continuously, a use or a role for futurists? Is anybody friends with any futurists? Do we listen to them anymore, or are they out of date by the time we leave the room?

Ms. Schooling, we'll start with you.

Ms. Jennifer Schooling: There is a certain value in doing what we would call horizon scanning to try to look at the potential alternative routes. I think the main value to that is in making sure that you don't preclude potential future options by your choices today, that by making choice A rather than choice B, you don't prevent yourself from making another good choice later on. This relates to some of what we have been doing, which we call "futureproofing", in which we look at infrastructure assets, for example. We think about the different kinds of stress they might be under in the future and the different kinds of usage patterns they may have in the future, for example. Then we look at how futureproofed an asset needs to be against those changes and how futureproofed we think it is at the moment. Doing that can help you prioritize investments in the areas, if you like, that are weaker, against rising sea levels or increasing urban temperatures or changing demographics and usage and that sort of thing. So there is a role for it.

The nature of horizon scanning is always that it is best-guess work rather than concrete science. But if you don't do it, then it's very difficult to make informed decisions on it.

● (1250)

Mr. Ken Hardie: I submit that in addition to horizon scanning, we should turn around and look backwards, simply because we may end up in a situation in which we're one power failure away from the Stone Age. If everything we rely on so much all of a sudden collapses—Wow!—what do we do?

With that comment, I'll pass the remainder of my time on to Mr. Sikand.

Mr. Gagan Sikand: Thank you.

Ms. Schooling, my question is directed towards you. Not too long ago, we had a witness who was discussing driverless vehicles. I think he said that the U.K. invests £120 million relative to our $3 million in this province. My numbers might be wrong but the disparity is accurate. As you mentioned, England has an old infrastructure. Actually I can attest to that; I lived in Uxbridge for three years.

There must have been a hegemonic shift or a shift in thought, because despite this infrastructure, the funding is so great. I'm trying to understand the thought process or the steps that were taken to become a leader in that field or to even want to shift to such infrastructure.

Ms. Jennifer Schooling: One of the aspects of that was some very good lobbying, I think, by our automotive industry to explore the potential.

Mr. Gagan Sikand: Okay.

Ms. Jennifer Schooling: But there's also the sense that the U.K. government wants to take a lead in the area of smart cities, building information modelling—BIM, as I was calling it—and these kinds of arenas because they perceive that we have a relative strength both in the digital economy area and in some of the developments around automotive and around infrastructure thinking. That was a lot of what was behind the government's investment. They were looking to pick winners, and obviously in our current new political context, they are seeking to do so even more. I think that's broadly the context, but it's also because we have a strong automotive sector here already.

Mr. Gagan Sikand: I guess the lesson for us is that the shift was led by the government.

Ms. Jennifer Schooling: It's the government and the automotive council, I would say.

Mr. Gagan Sikand: Okay.

Ms. Jennifer Schooling: Those industry councils are close to government and they represent their industry. So someone sitting on that industry council from say Ford isn't just representing Ford; it's representing a number of other manufacturers and it's very good at taking the temperature of the industry and lobbying government in a constructive way to get good outcomes.

Mr. Gagan Sikand: Okay. Thank you for your question.

The Chair: Mr. Badawey.

Mr. Vance Badawey: Thank you, Madam Chair.

This question goes to all the participants today.

I thank you for being here. I'm going to ask the same question that I asked the witnesses earlier on today. In your opinion, what are the key components of a national smart city community improvement growth strategy? Jump in.

The Chair: Who would like to answer that?

Ms. Schooling.

Ms. Jennifer Schooling: I'm just gathering my thoughts.

From our perspective, that of managing and constructing infrastructure that we want to get the best value out of throughout its life, I think standards are incredibly important, because we have to be able to manage data among organizations. We have to be able to access each other's data. Inevitably, these things are not going to be generated by a single organization, and different kinds of data can be used in different ways by different organizations. You can get increased value out of data as an asset. So standards are important.

I think, referring to what one of the other witnesses said, clarity from government about what it wants and what it expects is also very important. In the U.K. we wouldn't have taken the leap forward that we have taken around the digital agenda in construction and infrastructure without the government's actually saying, as a client, "We expect BIM level 2 on every project that we fund from here on in." That took an investment by government, because it had to actually invest in a committee to help the industry do that, as it's such a fragmented industry. But it's now paying dividends, and the industry has sort of turned the tanker around and is now pointing together in the right direction. Those would be the two components I would pick.

● (1255)

Mr. Vance Badawey: Just to help the others along as well.... This is synergistic with what this committee has been working on for past year.

When we look at the assets in our part of the world, such as the Great Lakes, the St. Lawrence, and the natural assets of our location in general; when we look at our other assets such as airports, the St. Lawrence Seaway system in relation to water, rail, short and main lines, spur lines and, of course, a road network; when we look at innovation, research and development, and technology; when we look at the private sector and the partnerships we're trying to create, we see that those are different pillars.

Now take it up a level, to the next level. We're working on a national transportation strategy. We're working on a smart infrastructure strategy, and there are many other strategies that the government and our partners in the House of Commons are working on in forming that strategy—and which is also a result of those pillars I just mentioned.

Now take it up to the next level and how it then relates to creating a smart city, community improvement and growth strategies, and therefore, proper—and this is the key part—infrastructure investments, and then, attached to those investments, proper asset management plans and financing plans. That's where I'm going with this question for you about what, then, are the key components for establishing all the above.

If I could go to the other two participants, I would appreciate your comments on that as well.

Ms. Teresa Scassa: I think I would build on the comments of Dr. Schooling here. I think a robust data management infrastructure is one of the requirements. I think data tends to get forgotten in discussions of infrastructure, and the focus tends to be on the hardware, but the software and the data part is tremendously important.

In a country like Canada, a federal state spread over a vast geography, we already see issues and difficulties comparing data from one province to another, one municipality to another, and different municipalities within single provinces.

Mr. Vance Badawey: Absolutely.

Ms. Teresa Scassa: There are very significant standards issues. There are very significant issues around the security of the data infrastructure. There are really important issues around ownership, which I mentioned in my comments. If the foresight and the planning is not there, municipalities or governments end up not owning the data related to their assets, and then find themselves having to pay over and over again to use it in different ways.

I think the public policy around data is a tremendously important piece.

Mr. Vance Badawey: I would add to that the importance of our U.S. partners and our relations with the U.S., because a lot of this we share with respect to our interests. Of course, with that, there is the integration of those.

Thinking ahead then, although we invest in our infrastructure, sometimes we have to talk to our neighbours on the other side of the border to ensure that what we integrate, transportation strategies for example, integrate appropriately with those we're doing business with.

Ms. Teresa Scassa: Yes.

Mr. Vance Badawey: You're up.

Mr. Sriram Narasimhan: If I can jump in, I'll echo the previous two speakers, Dr. Schooling and Dr. Scassa.

From my point of view, to summarize, the key components for making this happen are, first, the vision, which I think this committee has clearly shown. Then, that progresses to an identified and urgent need for this technology. Then the technology itself matures and comes to a point where there's market uptake and demand.

I think that all of these pieces, when supported by proper legislation, are going to make this smart infrastructure vision happen.

Mr. Vance Badawey: How much time do I have, Madam Chair?

The Chair: You have half a minute, and then I'll probably conclude the time altogether. It's one o'clock.

Mr. Vance Badawey: I just want to make a point for members of the committee.

I thank you folks for being here today, because you are solidifying a lot of the work this committee has been doing for the past year, albeit we are now just putting the pieces of the puzzle together as they relate to all of the strategies we're putting forward.

When you look at the national transportation strategy from one side of the committee; at the smart infrastructure strategy and what the minister has announced most recently to encourage municipalities to be more involved in smart infrastructure; and at the other strategies we're all speaking about now....

Furthermore, a sidebar to that is the investments to be made. When we're looking at $168 billion being invested, in tandem with the dollars being announced by the provinces and territories, both to ensure that those are attached to asset management and, equally, that they are getting returns on those investments as they relate to our assets, both natural, and location—

● (1300)

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

To our witnesses, thank you very much for adding to the study we're doing. We appreciate very much your taking the time and communicating with us.

I move adjournment.