



# CANADA

# 2030

## INFRASTRUCTURE

### WHAT IF...

THE PUBLIC INFRASTRUCTURE BECAME SMART?



Government  
of Canada

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Canada

## CANADA 2030 SERIES

Canada is experiencing significant social and technological changes that could disrupt many aspects of society. In this context, the next 10 to 15 years could be a transformative period for the relationship between Canada's government and broader society. This Insight is part of a series developed by Policy Horizons Canada on a variety of topics.

### WHO WE ARE

Policy Horizons Canada (Horizons) is a strategic foresight organization within the Public Service of Canada with a mandate to help anticipate emerging policy challenges and opportunities and to experiment with methods and technologies to support resilient policy development. Horizons is exploring plausible futures for Canada over the next 10 to 15 years in the areas of governance, sustainability, infrastructure, and the digital economy. With the active participation of experts from governmental and other organizations, Horizons identifies the key factors driving change, looks for potential surprises, explores plausible futures in the form of scenarios, and surfaces key emerging policy challenges and opportunities.

### VISUAL CONCEPT

The *Canada 2030* visual concept juxtaposes the past and the future in a subtle mix of colours, fonts, and imagery. The vibrant colour palette creates a safe space for the reader to open his or her mind. The main imagery found throughout the suite of products is rooted with the leaf of the sugar maple. The maple fruits, the samaras, gracefully fall throughout the Canadian landscape. They hold the potential of growing into trees and forever leaving their mark from coast-to-coast. Just like the Insights surfaced through the foresight methodology, they may one day be part of our reality. The traditional style of ink hatching accentuates the ribs of the leaves and evokes the system maps used in foresight. As we embark on Canada's 150<sup>th</sup> year, let us embrace our past and consider our plausible futures.

*This document does not attempt to predict the future. The purpose is to stimulate reflection and dialogue and support the development of public policy that is more robust and resilient across a range of plausible futures. The views contained in this document do not necessarily represent the views of Horizons, the Government of Canada or participating departments and agencies.*

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# WHAT IF...

## ... THE PUBLIC INFRASTRUCTURE BECAME SMART?



The 5G wireless network will allow for real-time vehicle-to-infrastructure communication



### WHAT'S CHANGING?

The digitization of public infrastructure in Canadian cities could fundamentally change the ways in which we go about our daily lives. The technology supporting self-driving and autonomous personal vehicles is currently being transferred to buses used in public transit systems, and may be implemented on a large scale before self-driving cars. The bus stops could themselves be transformed – functionally and visually – to become

WiFi and information hubs, such as the LinkNYC system, with highly interactive transit and city maps. The displays are likely to be proximity and voice activated, touchless and capable of answering complex questions and instructions. The transfer of directions from these hubs to a personal wearable device, such as a smart watch or augmented reality glasses, would be seamless due to an automatic wireless connection between the hub station and the personal electronics of the transit rider. When not in active use the displays could be used for targeted advertising, news feed displays or public announcements.

Because public bus transit is likely to become fully electrified, these hubs at bus stops are also likely to include a type of electric charging station – either wirelessly through integration in the ground, or through overhead charging stations – that are capable of safely ‘topping up’ a bus’ battery during the loading and unloading of passengers. To provide enough electricity, especially in suburban or more remote areas, bus stops could be equipped with 3D solar towers or other forms of renewable electricity-generating infrastructure. The smart bus stop could also be equipped with sensors to inform an approaching bus if a pick up would be required or if an ‘out-of-the-way’ bus stop can be avoided and the route optimized.

The introduction of the 5G wireless network is likely to allow for real-time vehicle-to-X (vehicle-to-vehicle, vehicle-to-infrastructure, etc.) communication, especially in urban downtown cores, which could improve traffic flows and limit the number of accidents. Most traffic lights today are already equipped with cameras and sensors to monitor traffic flows. It is likely that easy-to-do software and hardware upgrades and improved connectivity will allow for better monitoring and calculations of traffic flows. Increasing connectivity of pedestrians, cyclists and vehicles, through the constant exchange of information with their surroundings, could avoid accidents. The possible use of local delivery drones that could complement electric trucks would further contribute to improvements to the daily life in the city.



## POTENTIAL IMPLICATIONS

**The implementation of a “smart” city could reduce social inequality.** The introduction of more sensors, cameras and increasing connectivity through free public WiFi could raise net social benefit by transforming society into one where everyone is highly connected and less isolated. [Social programs](#) could be implemented proactively, based on big data collected across the city. Real time monitoring in the city could lead to more accountability for law enforcement, a possible decline in crime rates and a decrease in law enforcement-related costs.

**An electrified autonomous transportation system of connected buses and metro cars could increase the attractiveness and ease of public transit.** Coupled with a shift to autonomous cars the demand for parking in urban centers could decline, thereby allowing for repurposing for urban food production or into public attractions such as parks or public places. It is likely that further improvements and changes to the electrical grid would be required as demand and consumption is likely to increase. Consumers could look to other sources of supply such as solar panels, in-home batteries and the use of micro grids, which could further drive the development of alternative and cheaper sources of energy.

**Canada could see a wide range of “smart” cities with smart infrastructure highly customized to the size and specific local needs of the city and its population.** This could lead to a range of different types of cities and neighbourhoods within these cities, with varying degrees of emphasis on mobility over accessibility, amenities, air and water quality, and sense of security.



A “smart” city  
could reduce  
social inequality

