



Innovation, Science and  
Economic Development Canada

Innovation, Sciences et  
Développement économique Canada

Canada

# Presentation to Taiwan National Communications Commission

November 2, 2018

## The Minister's Telecom Vision

"We need every Canadian to be innovation ready – ready to spot opportunities, imagine possibilities, discover new ideas, start new businesses, and create new jobs. *All* Canadians need access to high-speed Internet, regardless of their income level or postal code."



**Quality:** Fast, high-quality networks support the implementation of transformative technologies for Canadian businesses and consumers

**Coverage:** All Canadians have access to world-class telecommunications networks, including in remote and rural areas

**Price:** Competition leads to affordable telecommunications services for Canadians

# The Spectrum Outlook 2018 to 2022

## ISED's spectrum release plan to support next-generation services

Gives an overview of ISED's approach to meeting expected spectrum demand from 2018-2022

Discusses ISED's high-level plans to address licensing and technical issues raised by stakeholders

Outlines ISED's assessment of demand and spectrum needs for four services / applications

Sets priority for our planned spectrum releases and related work for 2018 to 2022

## Commercial Mobile

Mobile traffic will continue to grow:

- 6-fold growth in Canada from 2015 to 2020
- From 53 PB/month in 2015 to 300 PB/month in 2020

**Need to prepare for 5G**



## Licence exempt

Wi-Fi use and traffic expected to increase:

- 5-fold growth of hotspots globally from 94M in 2016 to 541M 2021
- Traffic will increase from 700 PB/month to 2000 PB/month

**New technologies allow new opportunities for operators and consumers**



## Satellite

Demand varies widely for different applications and frequency bands

- Low for TV services and declining for low bands
- High for data, mobility and government services, and increasing for higher bands

**Satellite systems that are capable of competing with terrestrial infrastructure**



## Backhaul

Expected to be a steady ongoing need with growth in higher frequency bands

In NA the share of microwave backhaul to remain steady at around 20% through to 2021

**Support for small cells and short hauls for 5G networks**



The Outlook is focused on four services

## It addresses upcoming technical issues



### **Modernized regulations**

Remain abreast of advances in technology, and adjust our standards accordingly

Acknowledge comments on specific changes to our technical rules to address evolving technologies and innovative applications



### **5G technology**

Reiterate ongoing initiative on ensuring that Canada is at the forefront of 5G

Specific example (MIMO) of how advances are being considered and integrated into our frameworks



### **Dynamic access technology**

Acknowledge infancy of technologies and reiterate long-term goal of supporting this technology

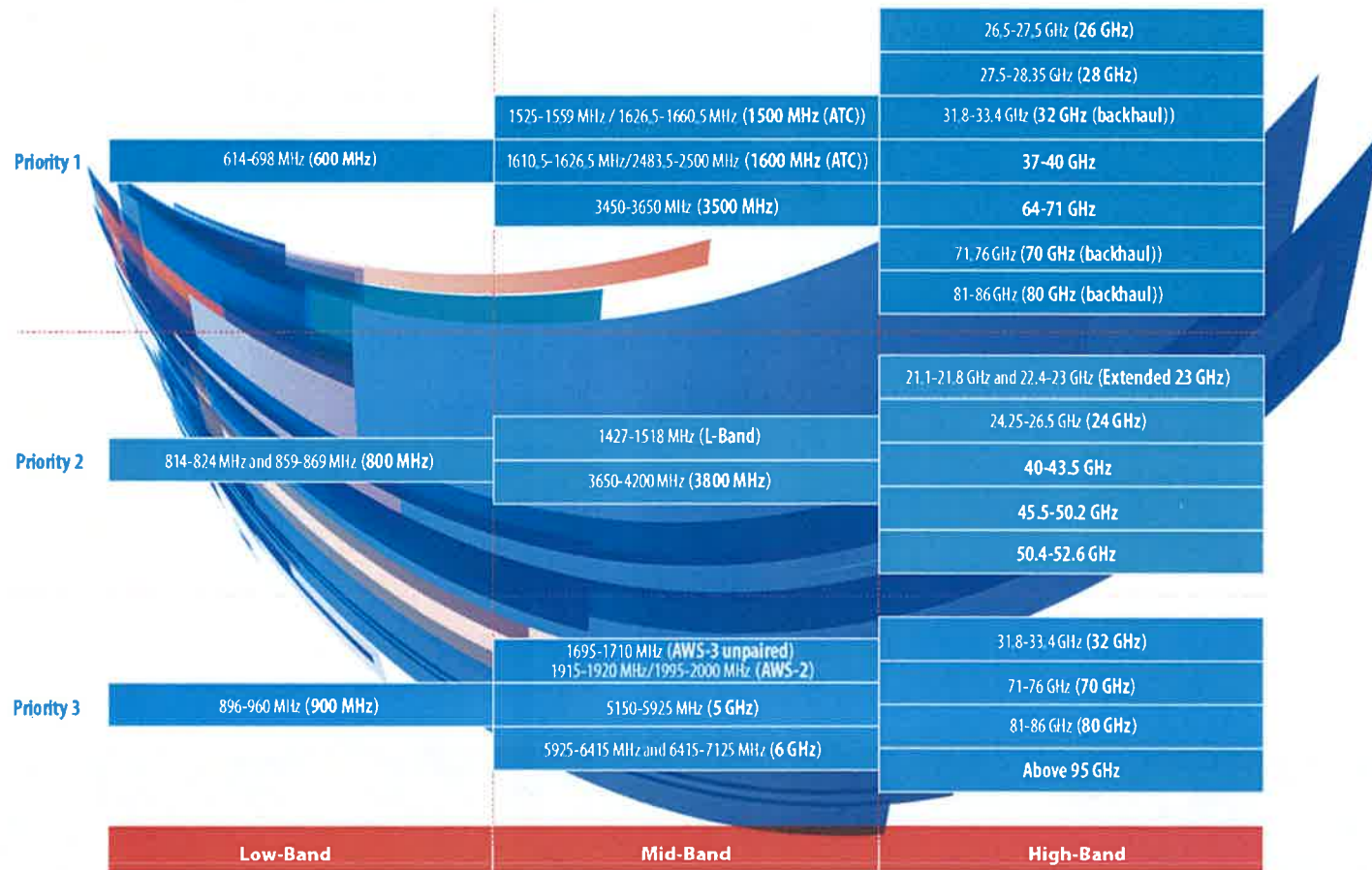
Future consultations before enabling DSA



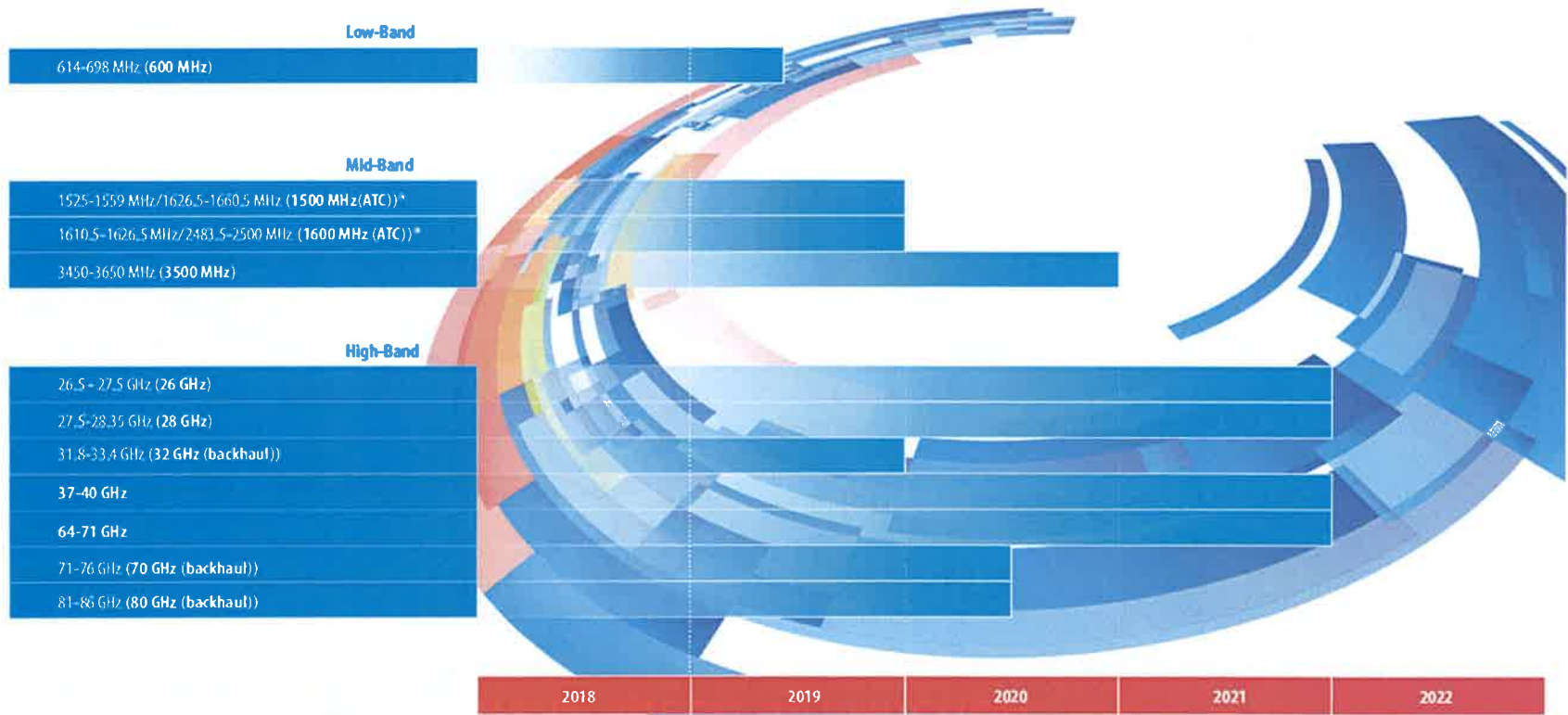
### **NGSO**

Work domestically and internationally to allow for these systems to be deployed in a timely manner

# Spectrum Outlook Priorities



# Spectrum Outlook Timing



\* Anticipated timing refers to review of RP-023

# 600 MHz Spectrum Auction

## Key Dates

Auction framework published **March 2018**

Application deadline – **December 4, 2018**

Publication of list of qualified bidders –  
**December 18, 2018**

Information session for qualified bidders –  
**January 17, 2019**

Auction – **March 12, 2019**

## Key Features

Auction services by Power Auctions

Results verification by Smith Institute

CCA with GARP

16 services areas

Opening bids = lowest price paid in 700 MHz  
auction in each group of service areas

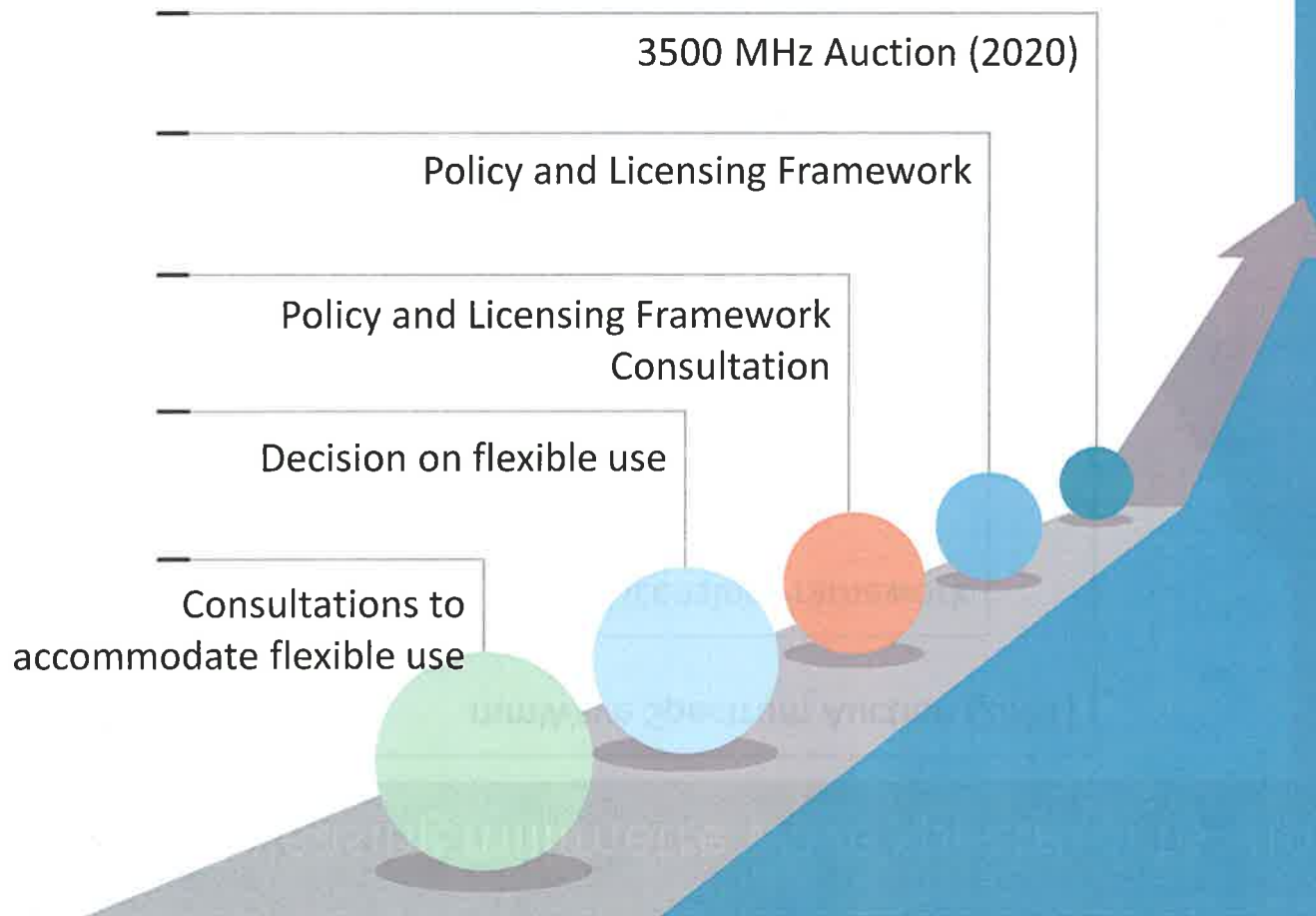
20-year licence term

Competitive measures

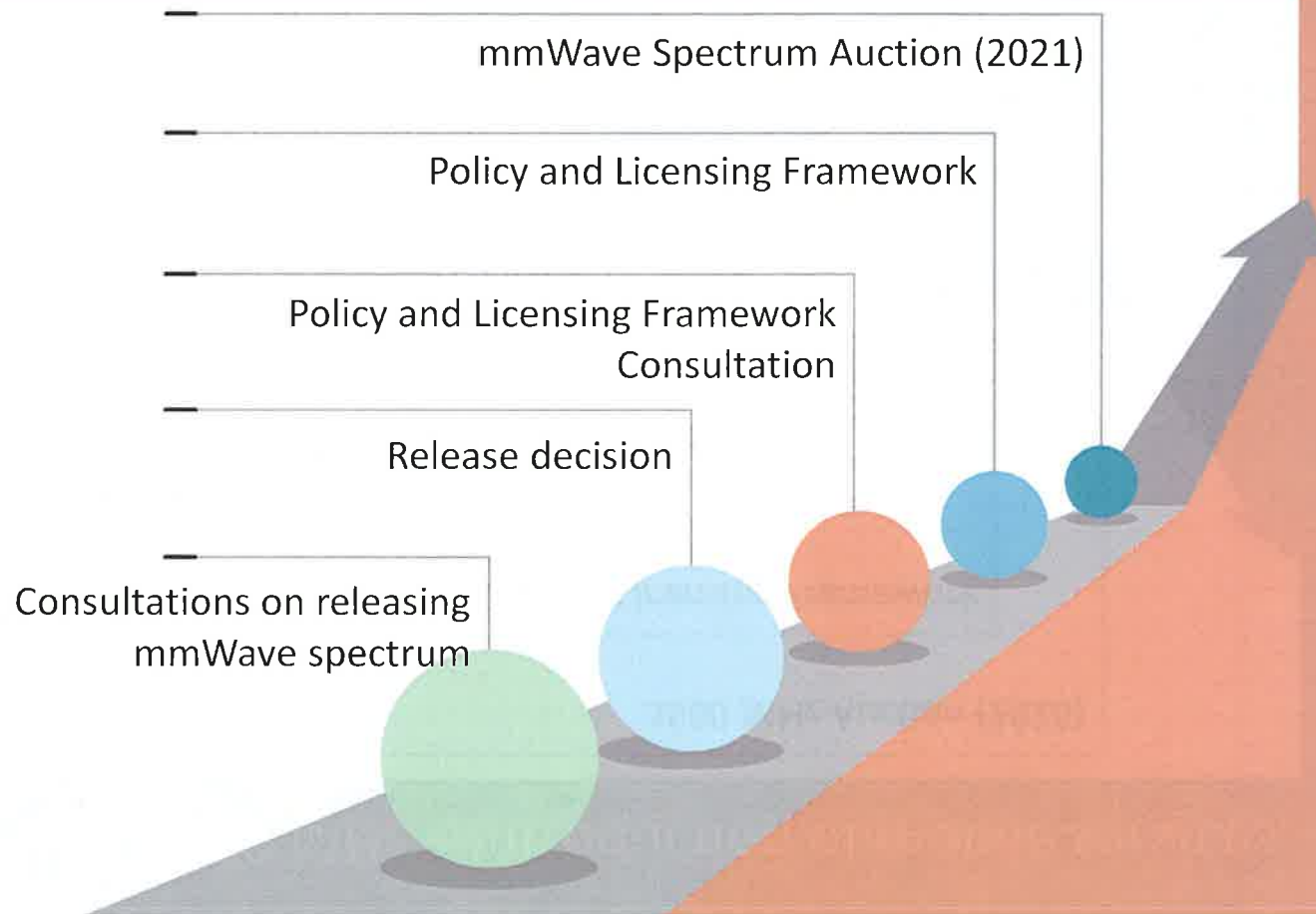
Deployment requirements



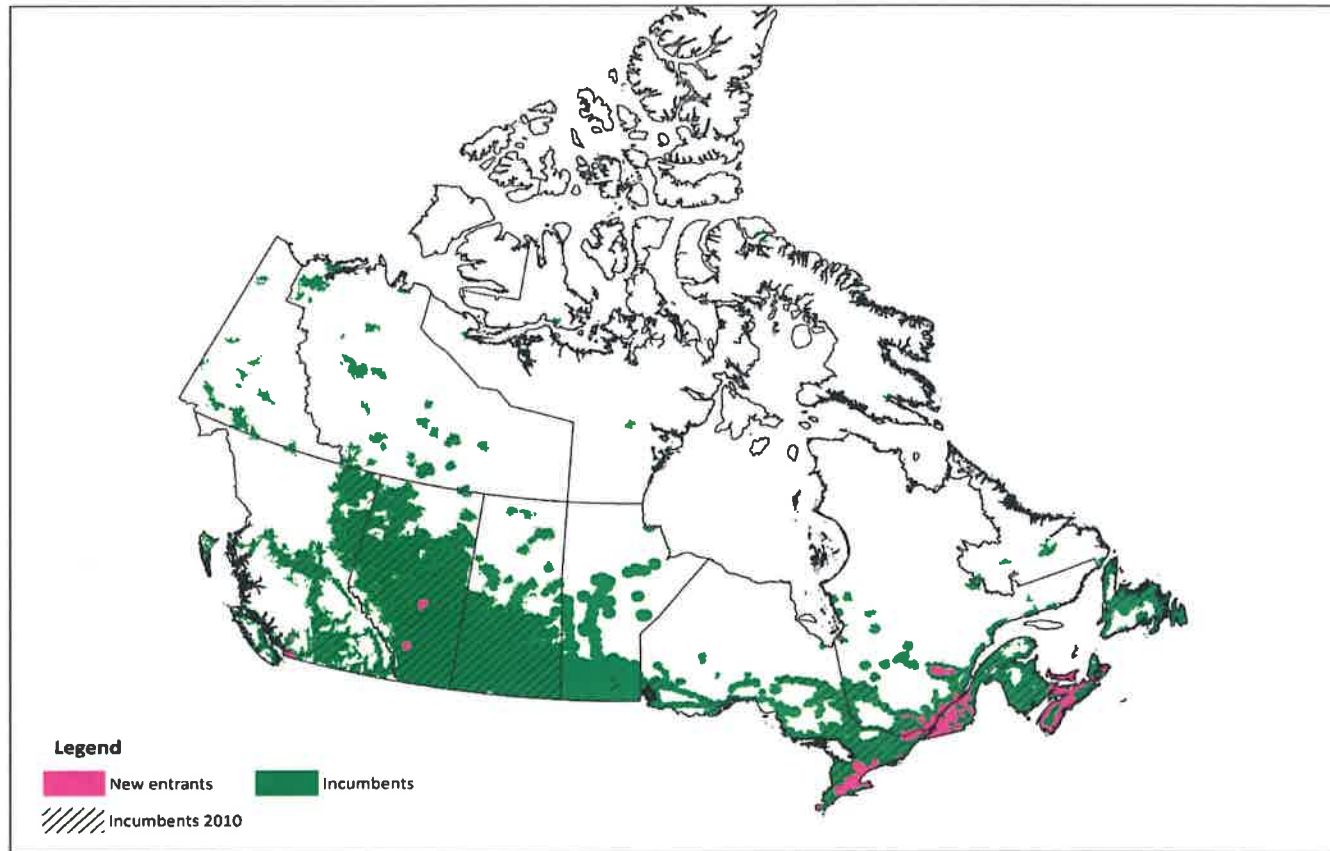
# 3500 MHz – Introduction of mobile services



# mmWave – Releasing millimetre wave spectrum to support 5G



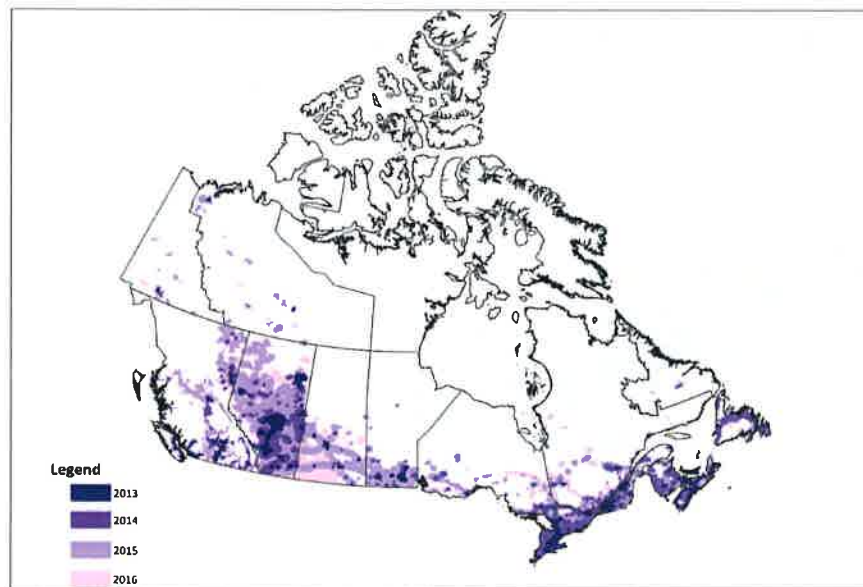
HSPA+ network coverage 2010 vs. 2016



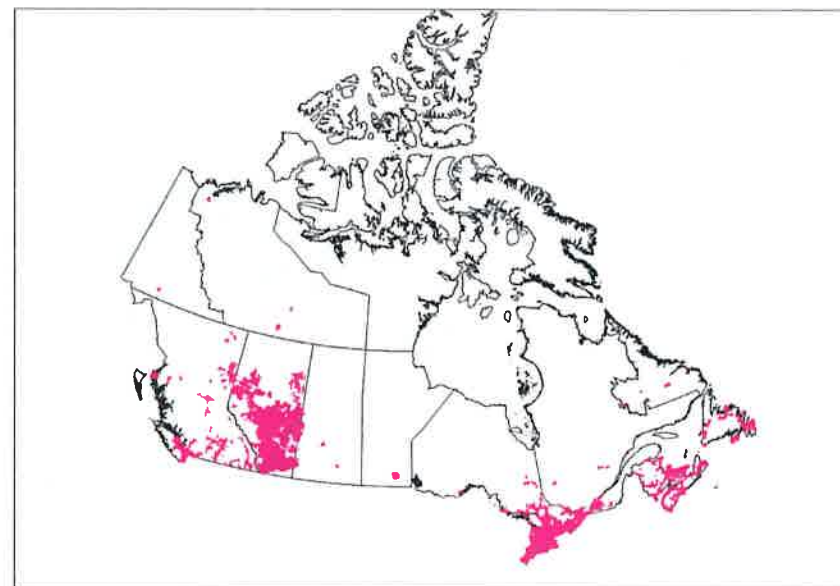
- HSPA+ coverage: 99.4 % of Canadians

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Expansion of LTE coverage since 2013



LTE Advanced Coverage, 2016



- LTE coverage: 98.5 % of Canadians
- LTE-A coverage: 83 % of Canadians

ISED – technology neutral - does not mandate specific technologies