

# Meeting the Challenges in Delivering Broadband Services in Rural and Remote Areas

February 25, 2014

Delivered to

Telecommunications  
Forum

Prepared by

Stuart Jack

# Outline of Presentation

1. Importance of Broadband in Rural & Remote Areas
2. Challenges in Delivering Broadband Services
3. Goals / Policies for Delivering Broadband Services
4. How Do Canadian Goals / Policies Compare with Other Best Practice Jurisdictions
5. Data on Canadian Broadband and Wireless Coverage and Penetration
6. Going Forward

# 1. Importance of Broadband in Rural and Remote Areas

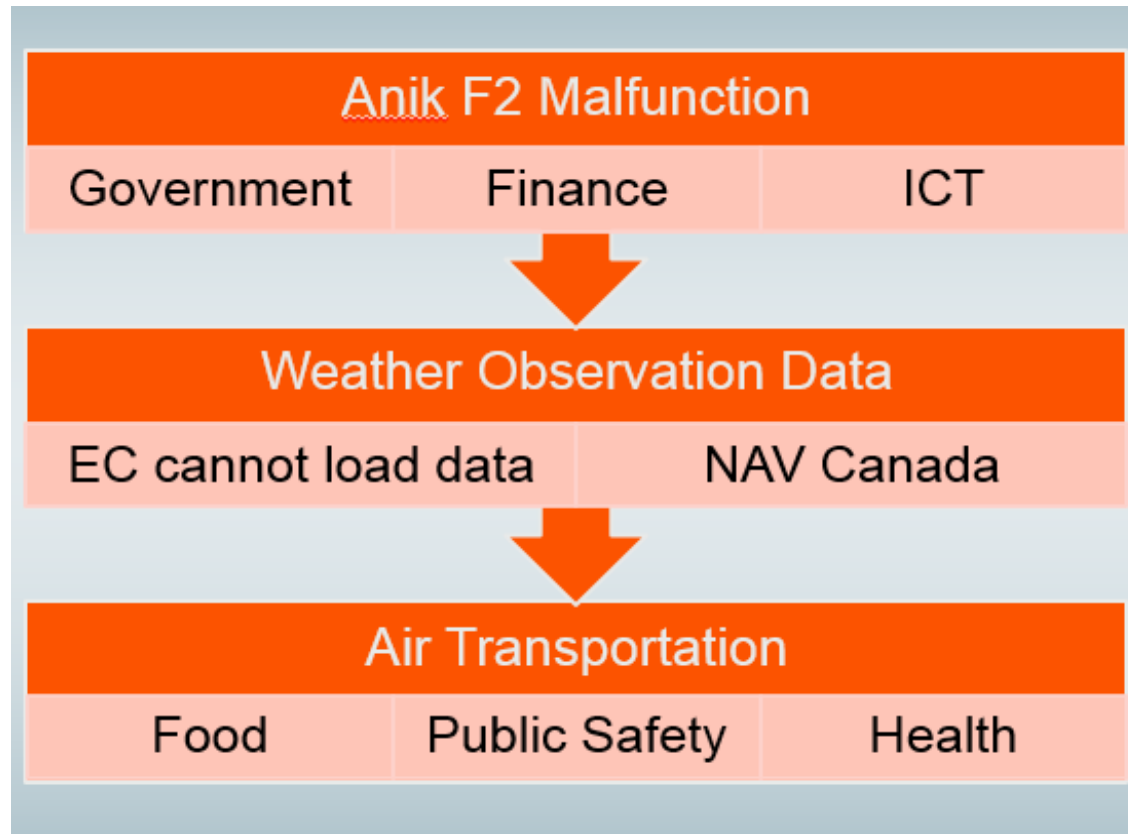
- Households, businesses and public service providers in rural and remote areas are more dependant on broadband than those in urban areas given the absence of alternative infrastructure (e.g. roads).
- Critical public services (health, justice, 1<sup>st</sup> responders, etc.) in particular, have latency, reliability and redundancy requirements comparable to those found in metro areas.

## 2. Challenges in Delivering Broadband to Rural and Remote Communities

- Canada as a whole is relatively well served by national 4G service networks plus a variety of satellite and other service providers.
- However, rural and remote communities still face important challenges:
  - More costly to deploy – Up to 5X more expensive to deploy in rural and Northern Canada due to factors linked to population density, climate, geography, and distance.
  - Fewer service choices and higher prices than in larger, more populated markets, which results in bandwidth being available but not affordable to a significant # citizens.
  - Population density is ongoing barrier to scale.
  - Many remote areas have only a single service provider, underdeveloped infrastructure and no redundancy. These factors combined with extreme weather conditions generate serious risks

## 2. Challenges in Delivering Broadband to Rural and Remote Communities (cont'd)

Case study: *The Anik F2 Malfunction in October 2011*



Source: Presentation by the Northern Communication and Information Systems Working Group (NCIS WG),

### 3. Goals / Policies for Broadband Connectivity in Rural & Remote Areas

- The benchmark adopted by Industry Canada defines broadband connectivity as access to Internet services that support download speeds of 1.5Mbps. This benchmark was used as a **funding criterion by IC's 2012 Broadband Canada program**. It is also used as a reference by the CRTC in their annual *Communications Monitoring Report*.
- The most recent (2014) Economic Action Plan refers to a 5Mbps (download) target: *"To keep pace with the needs of Canadians in rural and Northern communities, Economic Action Plan 2014 proposes to provide \$305 million over five years to extend and enhance broadband service to a target speed of 5Mbps for up to an additional 280,000 Canadian households, which represents near universal access."*
- This corresponds **to the CRTC's** 2015 target broadband speeds of  $\geq 5$ Mbps for downloads and  $\geq 1$ Mbps for uploads of expects all Canadians to have access to by the end of 2015.
- Fall 2013 – Minister of Industry announces that wireless spectrum licenses intended to provide high-speed Internet access to rural Canadians will only be renewed if license holders are using them for this purpose.

### 3. Goals / Policies for Broadband Connectivity (cont'd)

- In 2000, the CRTC created a National Contribution Fund to subsidize basic residential telephony in high cost service areas. The CRTC uses the following definitions:
  - *'Rural': 'areas with a density of <400 people/sq. km or population centres with <1000 people'*
  - *'High-cost service areas': areas where the cost of providing service is substantially higher than the average cost in other parts of the incumbent local exchange carrier's **territory**'.*
- In 2011, in its Broadband Access Decision (CRTC 2011-291), the Commission underlined the importance of relying on market forces in delivering broadband services and indicated that creation of a funding mechanism for broadband access would not be appropriate. However, the Commission did establish a national broadband target of 5Mbps by year end 2015.

## 4. How do Canadian Broadband Goals / Policies Compare with Other Best Practice Countries?

- Most leading industrialized countries have recognized access to broadband as an essential service and have developed national broadband strategies with targets and commensurate funding:
  - EU set basic broadband target of 512kbps-4Mbps for 2013 and by 2020 targets of 100Mbps for 50% citizens with the remainder at 30Mbps.
  - Australia set a national 12Mbps '**near term target**' and **100Mbps 2016 target with** detailed roll out plan and funding.
  - NZ 80% rural households to have **≥ 5Mbps** with remainder at 1Mbps.
  - Korea 10Mbps with a maximum of 1Gbps.
  - US – National Broadband Plan Commission set a national target of 4Mbps for 2012. By 2020, 100M households should have affordable access to 100Mbps and every community should have affordable access to 1Gbps to anchor schools, hospitals, and government buildings.



## 4. How do Canadian Broadband Goals / Policies Compare with Other Best Practice Countries? (cont'd)

- **Industry Canada's target of 5Mbps** – to be used for funding broadband projects – including those in rural & remote areas – **is in the same 'ball park' as those of other jurisdictions**; however, this target only reflects current/ past needs\*\* & the broadband funding is only for 5 years (2014-18).
- BP countries have a much longer funding horizon, which takes into account that market forces will likely not be sufficient.
  - A typical operators' investment cycle of 15-20 years.
  - Ongoing subsidization of basic broadband for low income users.
- Broadband targets also need to be re-evaluated and increased as technology & demand evolves.
- Canada is the only G8 country without a national broadband strategy.

## 4. Northern Connectivity Needs & Network Performance Analysis: Key Findings

- Based on current connectivity, the recommended current minimum broadband **speed requirement for Northern users' is 9 Mbps download and 1.5 Mbps upload.**

Standard	Recommendation
<b>Minimum Bandwidth*</b>	Download: 9 Mbps (now), evolving into the future Upload: 1.5 Mbps *Overall average usage per household for the population across the territories.
<b>Reliability</b>	No specific standard, technology dependent
<b>Redundancy</b>	100% of the projected bandwidth used for critical applications <i>e.g.</i> , health, safety & security
<b>Service Quality</b>	Bandwidth – differentiated according to population, demand by different user categories, simultaneous usage, type of platform  <b>Jitter</b> (Packet Delay Variation) – 0.5ms average, not to exceed 10ms maximum jitter more than 0.1% of the time  Lost or dropped packets - <0.1%
<b>Service Availability</b>	99.99% of the time.

## 4. Northern Connectivity: Capital Cost Analysis (Option 3): Base Network Upgrade with Redundancy for All Traffic

	Microwave Costs (\$000)	Fibre Costs (\$000)	Satellite Costs (\$000)	Redundant Satellite Link Costs (\$000)
Yukon	\$15,847	\$1,750	\$4,225	\$368,316
NWT	\$27,988	\$1,413	\$37,686	\$653,247
Nunavut	\$-	\$-	\$533,771	\$533,771
3-Territory Totals	\$43,835	\$3,164	\$575,682	\$1,555,334



Main Link Upgrade Costs	\$622,680
Redundant Link Upgrade Costs	\$1,555,334
3-Territory Grand Total	\$2,178,014

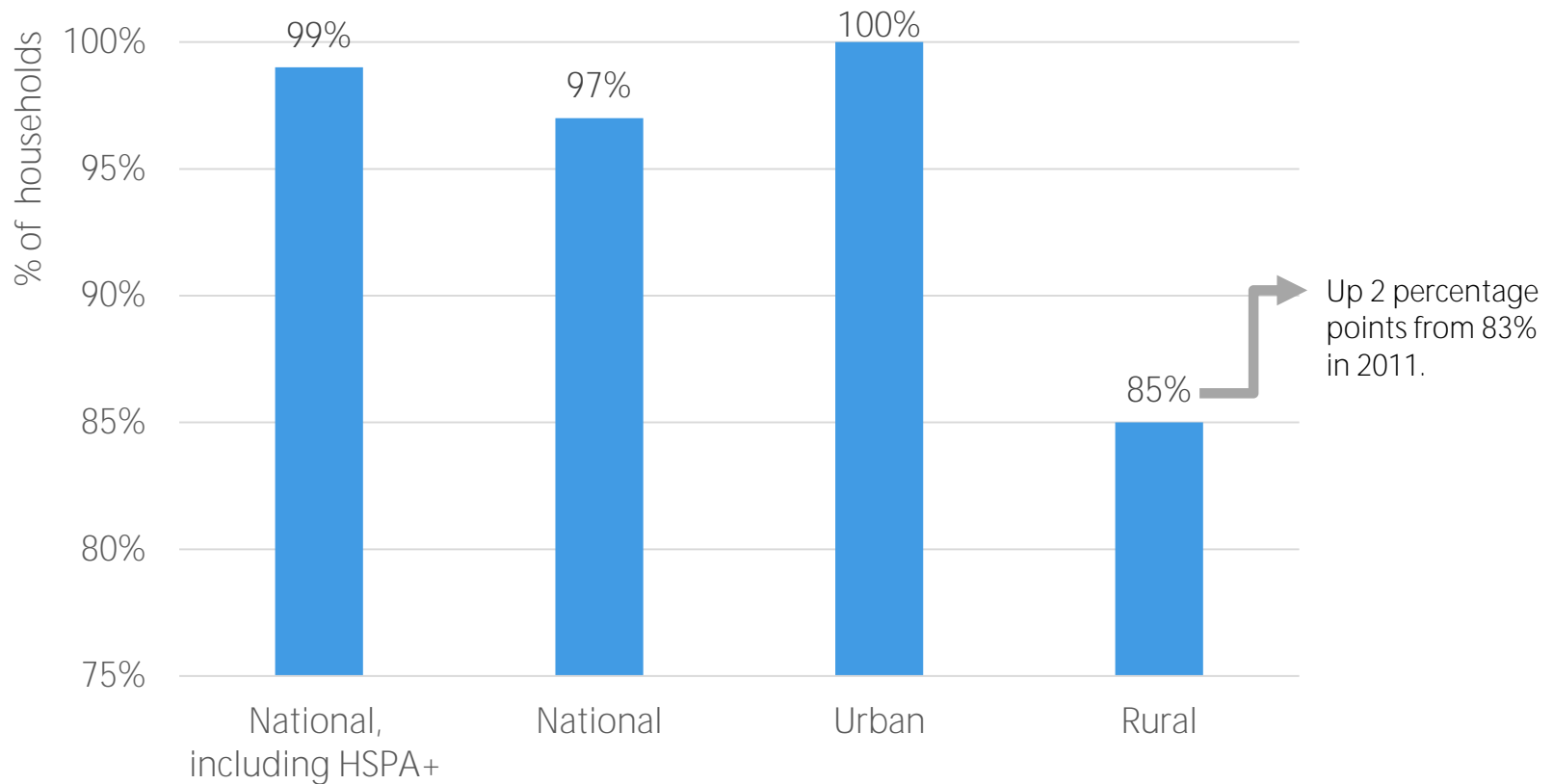
Upper Estimate (+50%)	\$3,267,021
Lower Estimate (-50%)	\$1,089,007

Another option examined involved assessing the impact of modeling the networks while assuming provision of redundancy for 100% of traffic. This option resulted in large cost increases attributable to increased satellite costs.

## 5. Data on Broadband Coverage & Penetration in Canada

## 5 i. Broadband and Wireless Coverage

### *Residential Broadband Availability in Urban and Rural Areas, 2012*

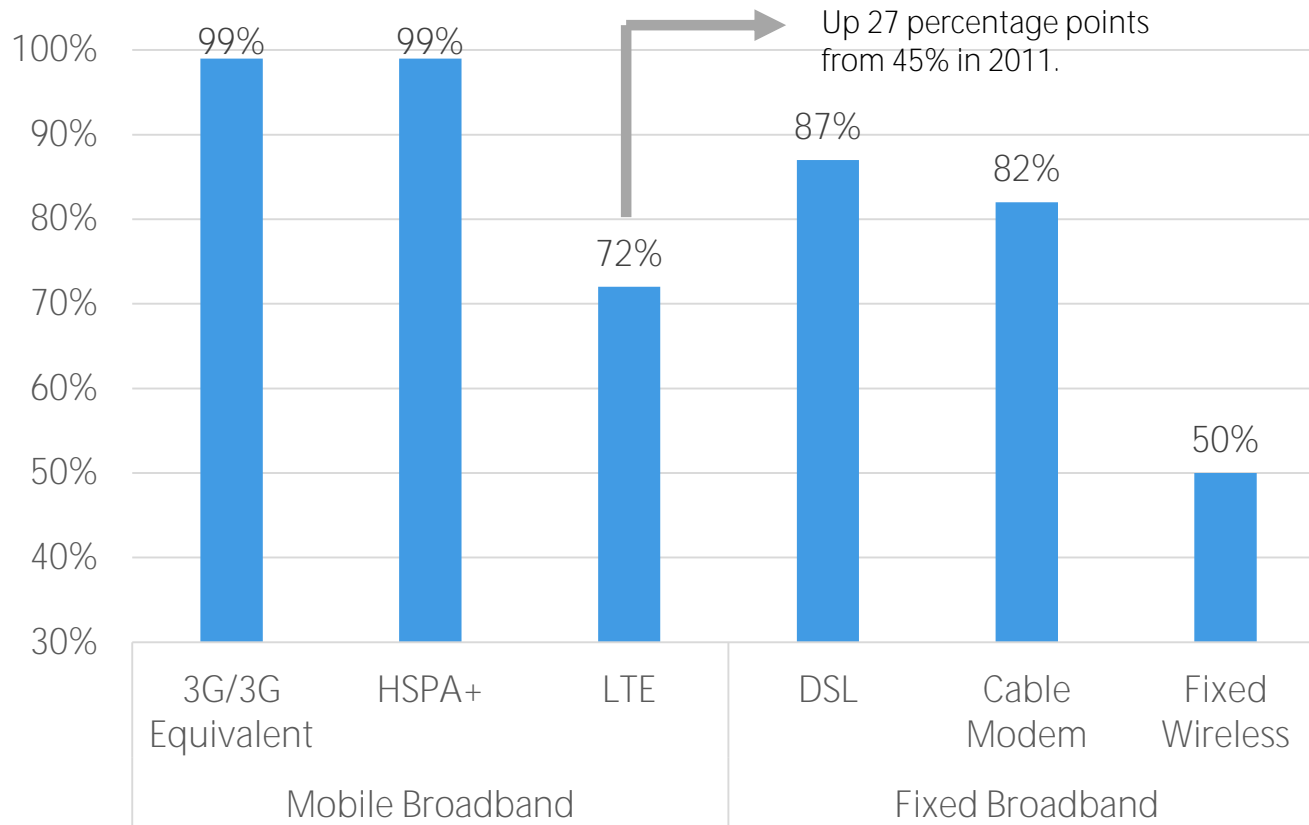


Notes: 1) Excludes satellite; 2) Rural is defined as areas with a density of fewer than 400 people per square km, or population centres with fewer than 1,000 people.

Source: CRTC (2013) "Communications Monitoring Report," p. 173.

## 5 ii. Broadband and Wireless Coverage

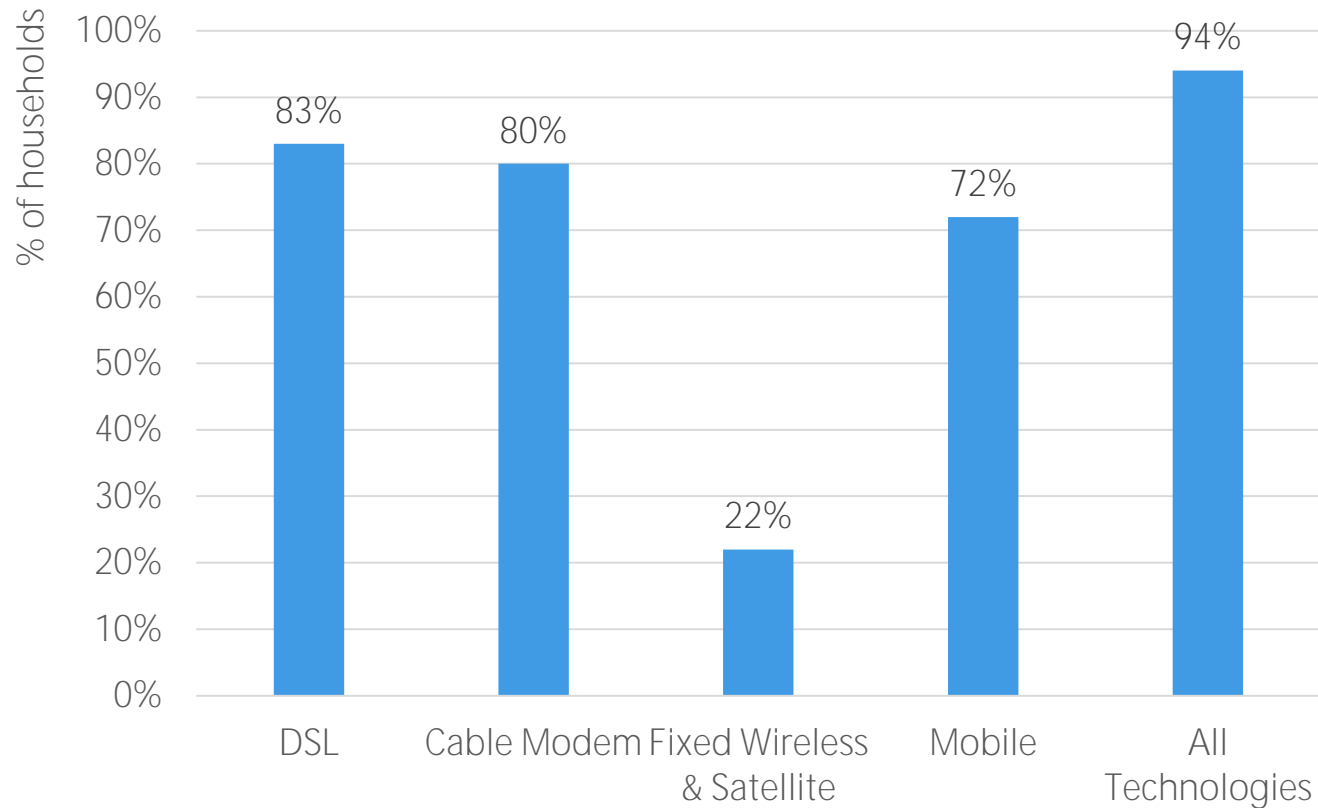
### *Broadband Availability by Type of Technology, 2012*



Source: CRTC (2013) "Communications Monitoring Report," Table 6.1.3, p. 177.

## 5 iii. Broadband and Wireless Coverage

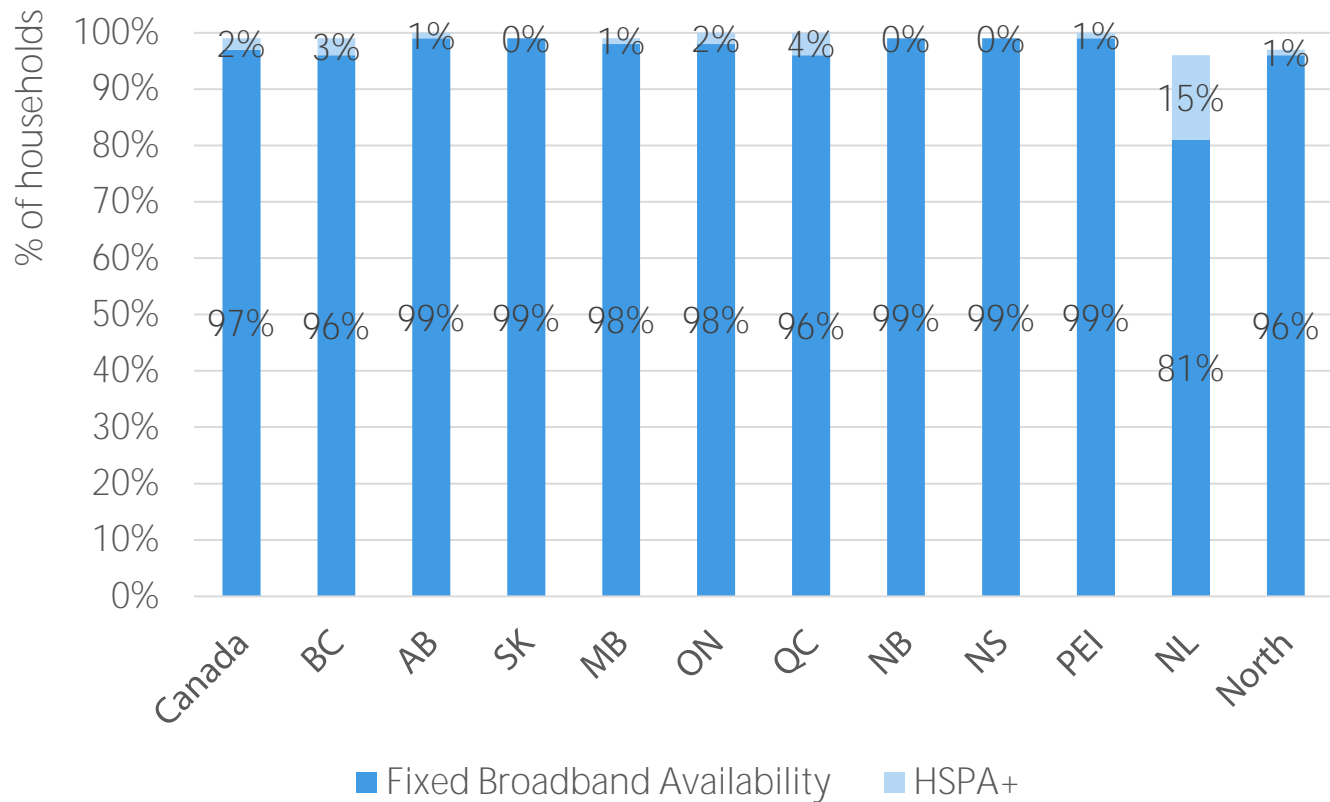
### 5 Mbps (Download) Broadband Availability by Type of Technology, 2012



Source: CRTC (2013) "Communications Monitoring Report," Figure 6.1.4, p. 178.

## 5 iv. Broadband and Wireless Coverage

### *Broadband Availability by Province and Territories, 2012*



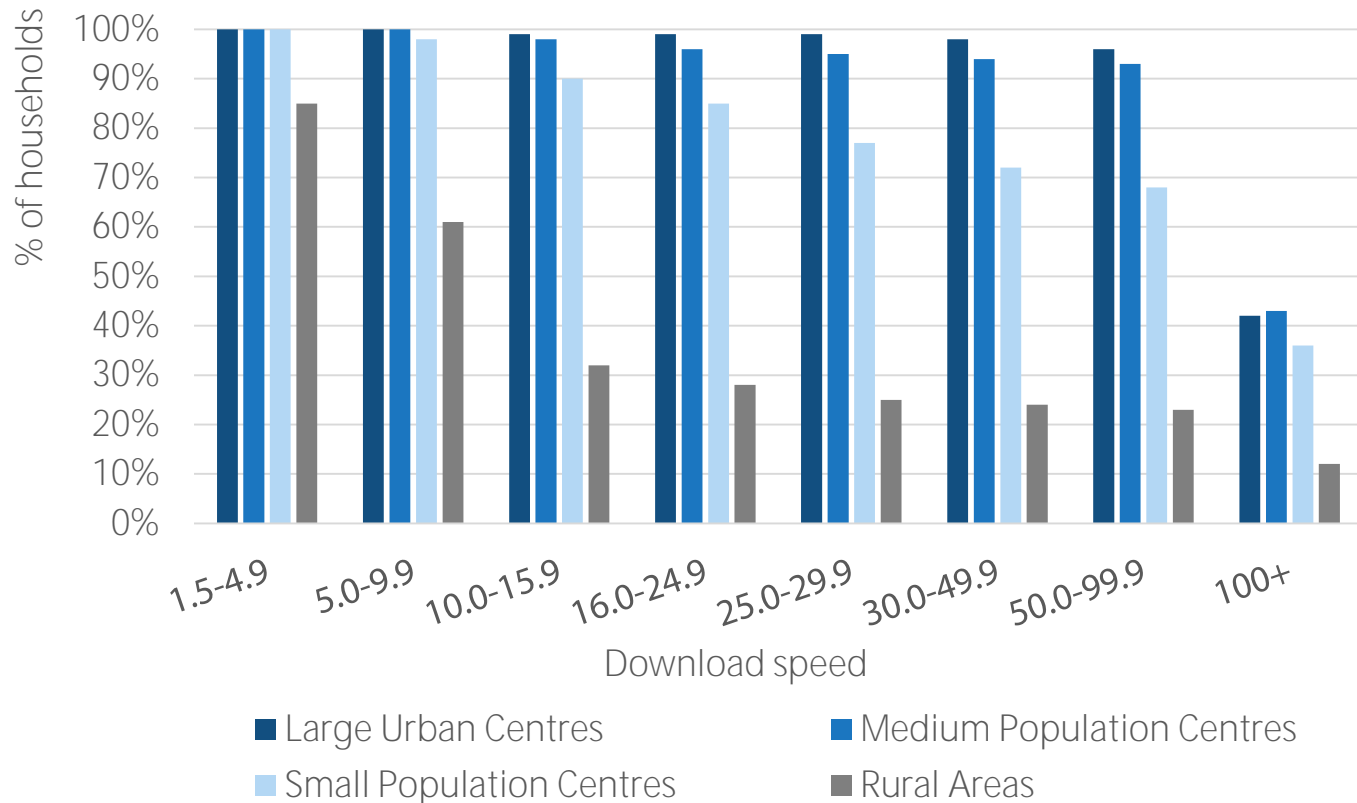
Note: Excludes satellite.

Source: CRTC (2013) "Communications Monitoring Report," Figure 6.1.3, p. 178.



# 5 v. Broadband and Wireless Coverage

## Broadband Availability by Download Speed, Urban vs Rural, 2012



Notes: 1) Excludes satellite; 2) Rural is defined as areas with a density of fewer than 400 people per square km, or population centres with fewer than 1,000 people.

Source: CRTC (2013) "Communications Monitoring Report," Figure 6.1.6, p. 181.

## 5 vi. Broadband and Wireless Coverage

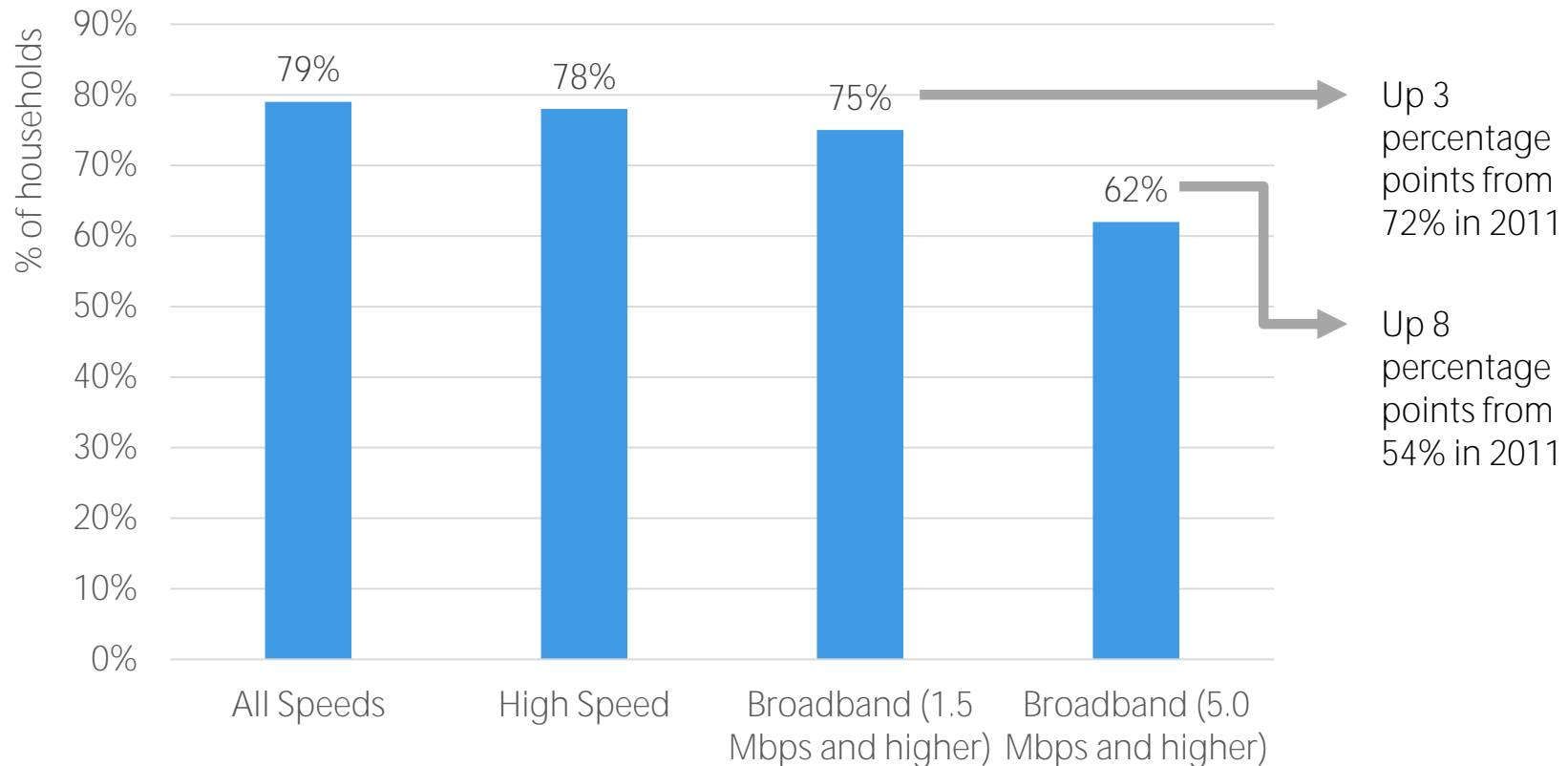
### *Percentage of Population with Access to One or More Facilities-based Wireless Service Providers, by Province, 2012*

	Number of facilities-based wireless service providers				
	none	1 only	2 only	3 only	4 or more
Canada	1%	3%	17%	22%	57%
British Columbia	1%	2%	32%	6%	59%
Alberta	0%	1%	32%	11%	55%
Saskatchewan	1%	16%	75%	8%	0%
Manitoba	2%	2%	18%	78%	0%
Ontario	0%	1%	3%	33%	63%
Quebec	1%	4%	6%	8%	82%
New Brunswick	0%	4%	73%	22%	0%
Nova Scotia	0%	4%	53%	43%	0%
Prince Edward Island	0%	4%	96%	0%	0%
Newfoundland and Labrador	4%	39%	18%	40%	0%
The North	30%	63%	7%	0%	0%

Source: CRTC (2013) "Communications Monitoring Report," Table 5.5.11, p. 167.

## 5 vii. Broadband and Wireless Penetration

### *Residential Internet Services Penetration Rate by Download Speed, 2012*

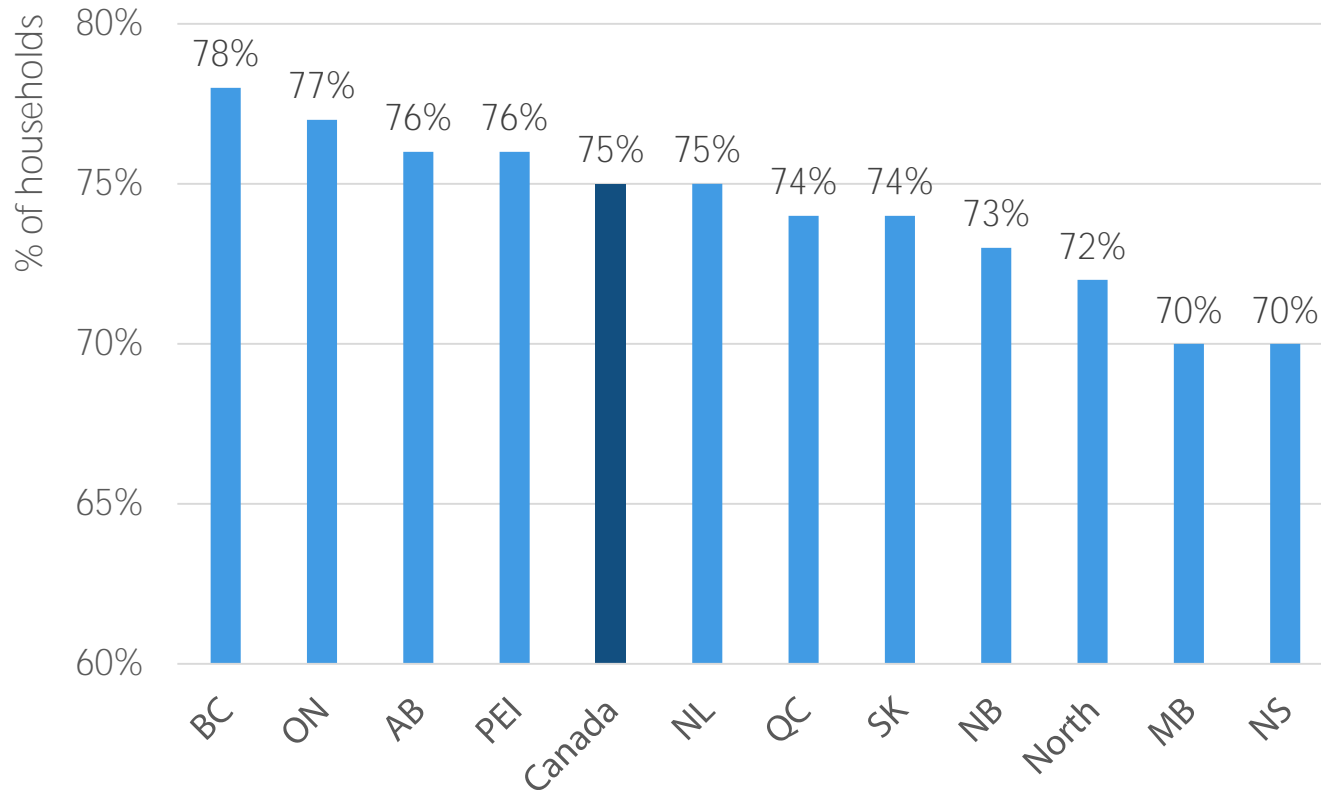


Note: Penetration rate calculated as % of households with Internet services subscriptions.

Source: CRTC (2013) "Communications Monitoring Report," p. 143.

## 5 viii. Broadband and Wireless Penetration

### *Fixed Broadband Penetration Rate by Province, 2012*

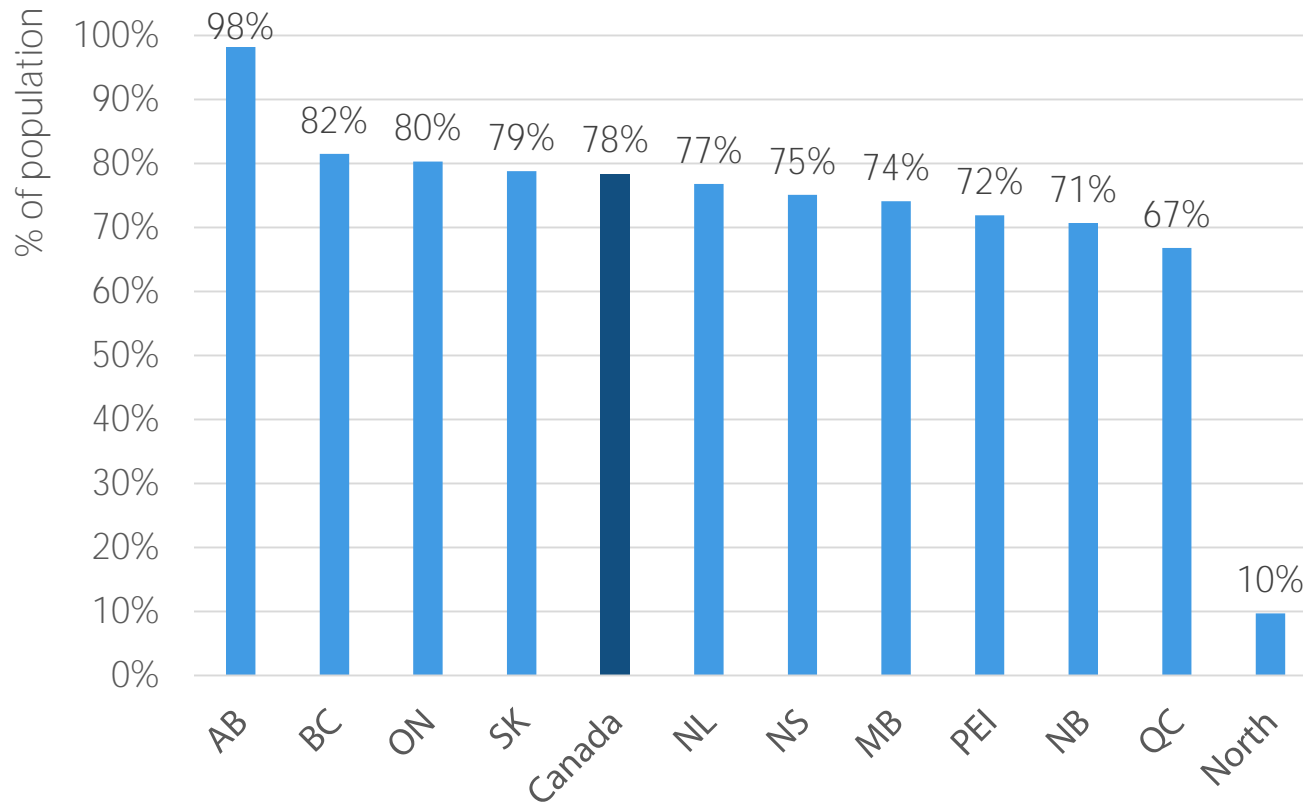


Note: : Penetration rate calculated as % of households with broadband subscriptions.

Source: CRTC (2013) "Communications Monitoring Report," Table 6.1.3, p. 178.

## 5 ix. Broadband and Wireless Penetration

### *Wireless Penetration Rate by Province, 2012*



Note: Penetration rate calculated as % of population with wireless subscriptions.

Source: CRTC (2013) "Communications Monitoring Report," Figure 5.5.9, p. 166.

## 6. Going Forward: A National Broadband Strategy is a Pre-requisite for Delivery of Broadband Services in Rural & Remote Areas

- A national broadband strategy requires a long term policy and funding framework containing measurable targets.
- Targets necessarily need to be re-examined - and likely increased, with evolving technology and demand.
- Funding windows need to be announced well in advance to encourage **participation of, & / partnerships with small players and to avoid 'funding frenzy'**.

## 6. Going Forward: A National Broadband Strategy is a Pre-requisite for Delivery of Broadband Services in Rural & Remote Areas **(cont'd)**

- Wireline, wireless and satellite incumbents are essential partners in developing cost efficient broadband networks in rural and remote areas.
- Funding needs to take into account the operators / service providers investment cycle either through an upfront payment or continuing subsidy.
- Access (coverage) does not ensure affordability. Subsidization of basic broadband services for low income users is likely to be an on going requirement for **'affordable communications'**. \*\*

*Questions?*



# Nordicity

Ottawa

+1 613 234 0120

Toronto

+1 416 657 2521

London

+44 75 1197 9022

[nordicity.com](http://nordicity.com)