support every child
reach every student

2017-18 EDUCATION FUNDING ENGAGEMENT

Digital Education

November 10, 2016

What is the Broadband Modernization Program?

Goal/Objective:

To provide an **_adequate level_** of broadband connectivity to all Ontario **_students and educators_** at an **_affordable price_**, and to enhance student achievement and well-being through connected, innovative learning environments.

Foundational to:

☑ Providing equal access to digital resources, content-rich lessons, educators and experts to support well being; and

☑ Enabling online collaboration, cloud computing, and eLearning offerings

 *Digital literacy = being prepared for the high tech world in which we live, learn and work.*

support every child
reach every student

Ontario

Why is this program important?

Achieving Excellence

To achieve success Ontario will:

- invest in the technology, design and infrastructure required for the classrooms of the future to serve the needs of all communities;

- invest in innovative teaching practices and instructional methods enabled by technology to more precisely engage and address the learning needs of all students.
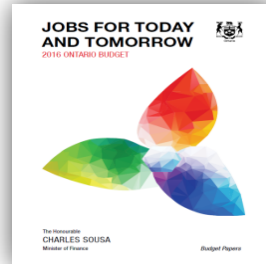
2016 Ontario Budget

Excerpt:

"*To support the learning and teaching requirements of the 21st century, the government is ensuring that Ontario's publicly funded school boards have equitable and affordable access to high-speed broadband services.*"

"*Ontario will help school boards, especially those in northern and remote communities, gain access to high-speed connectivity, to support stronger 21st century competencies and learning needs.*"
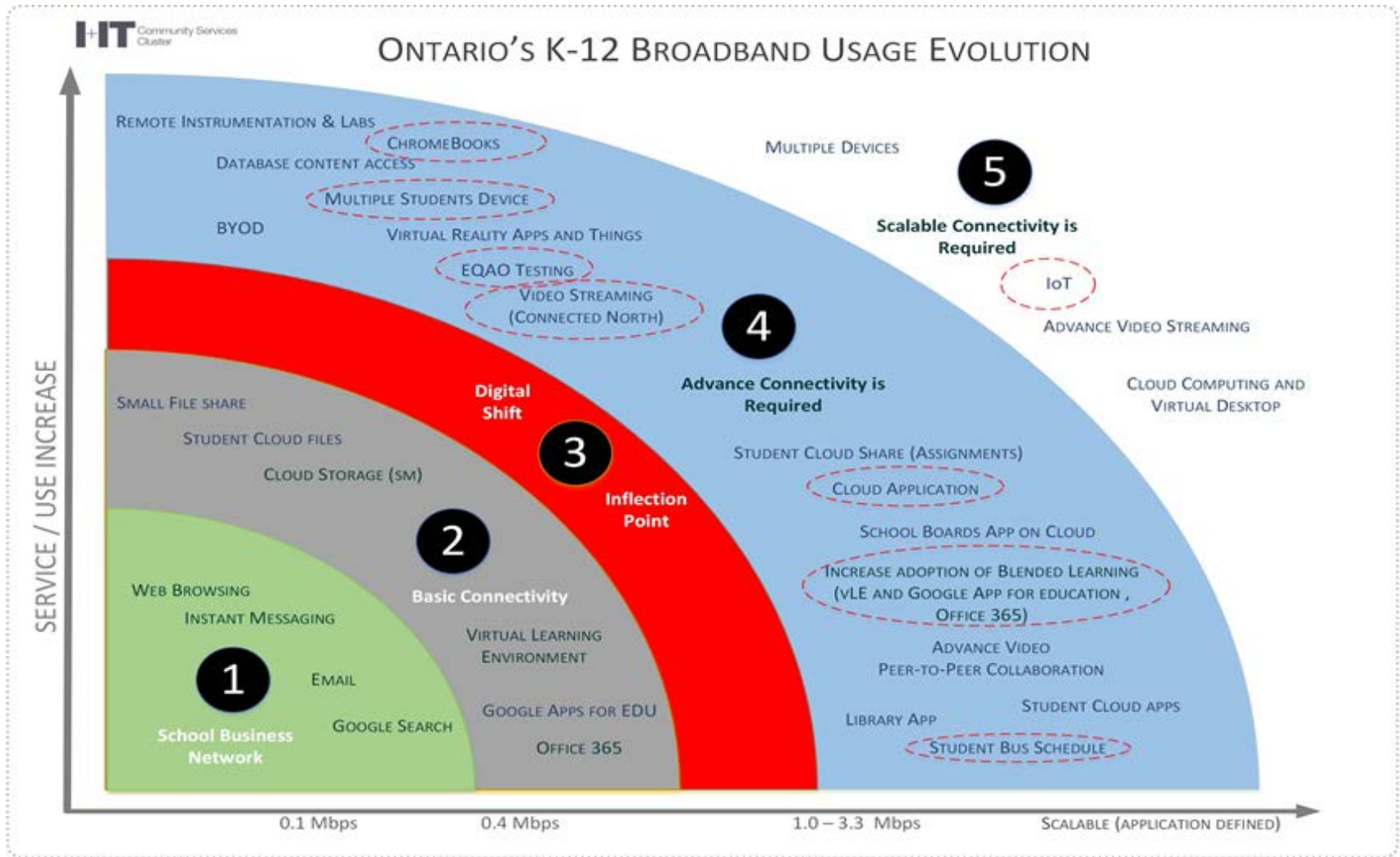

OASBO's Manifesto for 21st Century Learning

Manifesto identified multiple benefits of broadband enabled technologies. A few examples:

- improve the effectiveness of instruction and enhance learning outcomes through more engaging, interactive activities.
- enhance access to quality education via distance learning programs and interactive eLearning programs, and the availability of relevant content from any location.

support every child
reach every student

Ontario

Broadband Changes in K-12 Schools

ONTARIO'S K-12 BROADBAND USAGE EVOLUTION

Understanding Bandwidth Usage

	Application Type	Recommended bandwidth (per device)
1	Web browsing	0.25 - 0.5 Mbps
2	Email	0.25 - 0.5 Mbps
3	Download file / digital document	1.5 Mbps
4	Online web based Learning	0.5-1.4 Mbps
5	Online Telepresence	1.5 Mbps
6	HD Video streaming	1.5 – 5.0 Mbps
7	Cloud application access (web)	0.5 Mbps
8	Skype or Google hangout group Video Session	1.5 – 5.0 Mbps
9	Microsoft Office 365	0.5-1.4 Mbps
10	Google Apps for education (GAFE)	0.5-1.4 Mbps
11	Google Cloud	0.75- 5.0 Mbps
12	Virtual Learning Environment (vLE)	0.5-1.4 Kbps
13	Unintended traffic (i.e. Device Synchronization, auto updates and notifications)	0.06 Mbps

	Environment	Average Bandwidth (per user connection)
1	Average broadband bandwidth in Ontario	4.86 Mbps
2	Average broadband bandwidth in Canada	5.67 Mbps
3	Average broadband bandwidth in South-western Ontario	Greater 10.0 Mbps
4	Average user Northern Ontario	0.6 to 3 Mbps

support every child
reach every student

Ontario

Current Status/Opportunity

Schools across Ontario lack access to adequate high-speed broadband for the following main reasons:

1. Last-Mile Fibre Infrastructure: 31% of schools do not have the final leg of fibre that connects from their school to the Internet Service Provider (ISP).

2. Inadequate Network Capacity: >70% of schools do not have the minimum bandwidth capacity of 1Mbps/student to support new technologies in the classroom.

3. Outdated Network Design: 90% of schools require multiple links/connections, sometimes known as "hops" to get access to the internet, which is an inefficient design given the increase in technology use.

support every child
reach every student
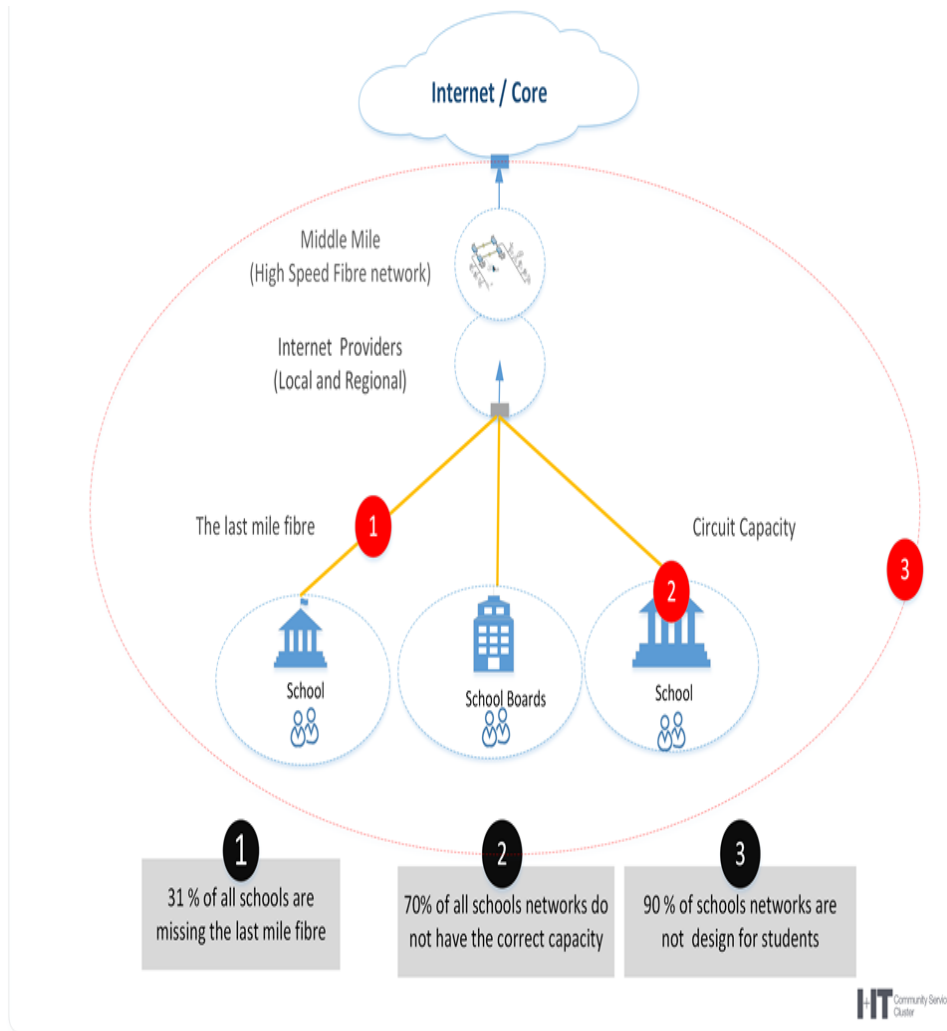
Current Status/Opportunity

Analysis & Planning Phase:	Wave 1:	Wave 2:	Wave 3:	Project Closeout:
-Broadband Assessment	-School Selection Criteria	-Select Schools	-Address Remaining Schools	-Lessons Learned
-Assessment Analysis & Report	-Kick off with Selected Schools	-Complete Fit/Gap	-Complete Fit/Gap	-KPIs
-Modernization Strategy	-Complete Fit/Gap	-Deliver Solution Components (Fibre, Design and Service/Capacity)	-Address Organizational Design	-On-Going Support / Maintenance & Architecture Governance
-Reference Architecture	-Deliver Solution Components	-Lessons learned	-Changes to Support On-Going Maintenance	
-Program Governance	-Key Findings Used to Inform Subsequent Phases			
	-Lessons learned			

Basic principles behind the Broadband Modernization Program approach include ensuring the solution:

- *Is student centric, device agnostic.*
- *Provides adequate levels of broadband at an affordable price.*
- *Enables a learning environment that supports student achievement and well-being through connected, innovative learning environments.*

support every child
reach every student

Ontario

Proposed Performance Measures and Approach

Student Achievement

- **Intended Outcome:** Access to adequate broadband over a sustained period is correlated with measures of student outcomes.
- **Proposed Approach to developing performance measures:**
  - Cluster and program areas will research and identify any correlation between broadband connectivity and student outcomes, which may include analyzing scores on standardized assessment results over time.
  - Collaborate with **Centre of Excellence for Evidence-Based Decision Making** to further refine approach and performance measures.

Learning Conditions

- **Intended Outcome:** More effectively deliver on goals set out in school improvement plans, enabled by broadband connectivity.
- **Proposed Measures:** Working with schools to integrate the use of specific types of technology , which enabled by broadband connectivity can help enhance the learning environment for students.

Technical

- **Intended Outcome:** resolve the primary issues identified in Wave 1, such as obtaining 1Mbps/student in the selected schools. Also to obtain sufficient information to proceed with Waves 2 and 3.
- **Proposed Measures:**
  - Speed in which it takes a student to download an average course file (25MB)
  - Reduction in number of times students are disconnected from the internet.
  - Verification from schools their network design is as stipulated in Wave 1.
  - Able to quantify scope and financial estimates for Waves 2 and 3.

support every child
reach every student

Ontario

Thank You

"Broadband is seen as a foundational layer to enable the acceleration of deep learning, which restructures the process towards knowledge creation and purposeful use."

Fullan, M., & Langworthy, M. et al. (2014). A Rich Seam: How New Pedagogies Find Deep Learning. Pearson

support every child
reach every student

Ontario

Considerations

1. What are our system's learning needs when it comes to technology enabled learning?

2. What mechanisms are in place to ensure that broadband is used to support student achievement, ensure equity, promote well-being, and enhance public confidence in ways that are not otherwise possible? Are these mechanisms scalable?

3. If TLF funding was continued, how could we allocate the portion of funding for technology and digital learning tools more effectively and/or efficiently?

4. Is there a role for a collaborative governance structure of digital education assets (e.g., consortia)?

5. Ministry analysis has shown that computer expenditures (operating and capital) can vary significantly from year to year. What are some of the reasons for this volatility?