Progress and Challenges for Remote and Indigenous Broadband

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ISER: More than 60 years of public policy research
Infrastructure Funding: Billions for Broadband!

- **US:**
  - About $97 billion in federal funds
  - Also some state programs
- **Canada:**
  - CRTC Broadband Fund
    - Up to C$675 million over 5 years
  - ISED
    - Universal Broadband Fund: $3.225 billion
- **Now questions become:**
  - Are there other barriers to bridging the digital divide?
  - Whether funded projects are sustainable
    - What happens after infrastructure is installed?
  
  **AND**

  WHAT DIFFERENCE DID IT MAKE?
<table>
<thead>
<tr>
<th>Funding Program</th>
<th>Federal Agency</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEAD: Broadband Equity Access and Deployment Program</td>
<td>NTIA</td>
<td>$42.5 Billion</td>
</tr>
<tr>
<td>ARPA: American Rescue Plan Act</td>
<td>Treasury</td>
<td>$20 Billion</td>
</tr>
<tr>
<td>RDOF: Rural Digital Opportunities Fund</td>
<td>FCC</td>
<td>Up to $20 Billion</td>
</tr>
<tr>
<td>CPF: Capital Projects Fund (ARPA)</td>
<td>Treasury</td>
<td>$10 Billion</td>
</tr>
<tr>
<td>Tribal Broadband Connectivity</td>
<td>NTIA</td>
<td>$3 Billion</td>
</tr>
<tr>
<td>Reconnect Round 4</td>
<td>USDA</td>
<td>$1.15 Billion</td>
</tr>
<tr>
<td>Middle Mile Program</td>
<td>NTIA</td>
<td>$1 Billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>~ $97 Billion</td>
</tr>
</tbody>
</table>
Connectivity: Necessary but not Sufficient

Context
   Economic:  
      existing economic activities
   Cultural  
      Languages, traditions such as consulting with elders
   Infrastructure:  
      Electricity: availability, reliability, affordability
      Transportation: roads, aviation, public transportation

Content
   Relevance  
      To local population and conditions
   Languages 
      Is content available in local languages?

Capacity
   Digital literacy:  
      Finding information
      Assessing quality and veracity of content
      Using popular software and apps
   Organizational capacity  
      • Putting information tools to use
Challenges: Sustainability

• Challenge:
  – Covering operating and maintenance costs
  – Strategies:
    • Building costs into operational budgets
    • Subsidies
    • Providing services to anchor tenants
    • Charging users

• Funding:
  – Capex vs. Opex
  – Short term vs. longer term

• Subsidies
  – May go to providers (e.g. for high cost regions)
  – May go to users:
    • Individuals, households, institutions
Subsidy Programs

- U.S. has several programs that can contribute to operating costs
  - Subsidies may go to providers or directly to users
  - High Cost Fund – for carriers in rural and remote regions
  - Institutional subsidies for major public service customers
    - E-Rate: schools and libraries
    - Rural Health Care: rural clinics and hospitals
  - Institutions can become anchor tenants – source of predictable revenue

- ACP: Affordable Connectivity Program
  - Discounts for broadband access: $30 per household; $75 per Tribal household
  - BUT no new Congressional funding – UNSUSTAINABLE!

- Canada – has no federal Opex programs
  - Some funding for telemedicine from provinces
  - Some industry support:
    - voluntary participation
    - Connecting Families
Small/Indigenous Providers

• Canada: Indigenous ISPs
  – Provide “first mile” services in some communities
  – Internet, some also VOIP and mobile

• U.S.: Rural telecom co-operatives
  – Originally established to provide telephone service with REA loans

• Challenges:
  – Qualifying for funding as providers
    • U.S.: ETCs (Eligible Telecom Provider)
    • Collateral and matching funds
  – Access to poles, conduit
    • Delays, pricing
    • Canada: Barriers to Rural Broadband addressed in CRTC hearing
  – Pricing services
    • High costs for access to backhaul
    • U.S.: no regulation of middle mile pricing (Alaska)
  – Partnerships without Equity
    • Alaska: carriers partner with Native corporations/organizations to qualify for funding
    • Yukon: carrier partners with group of First Nations organizations
      BUT Native participants have no control and no equity
Challenges: Engagement

- Consultation with community
  - Explain proposed project
  - Discuss benefits including new or improved services, possible jobs
  - Explain requirements including access to land or facilities

- Get “buy-in” from community
  - Donated facilities, people to be trained, etc.

- U.S.:
  - FCC requires consultation for projects on Tribal land
    - Appears to be little enforcement

- Canada:
  - CRTC now requires evidence of consultation for Broadband Fund applications
    - Previously just “attempt to consult”

- Neither country requires local training or hiring to receive federal funding
Challenges: Digital Literacy

• Training for Users
  – Use of popular software, platforms, apps
  – Searching for information
  – Evaluating content
  – Privacy, security of personal data
• Infomediaries (digital navigators)
  – To help users
• Technical skills for jobs:
  – Installation of equipment
  – Operation and maintenance
  – Local customer support
• Funds for user training
• and support
• Training and hiring of locals for jobs
Technology and Competition

• Incumbents argue for no competition
  – Competition: facilities and services based
  – Canada: Northern incumbents assume no competition when applying for government funding
  – U.S.: federal funding prioritizes fiber

• BUT:
  – LEO services are proliferating (Starlink and some others)
  – Fiber backbone subject to cuts
    • Ocean ice scouring in Alaska; permafrost in Canada
    • So satellite backup is required
Need for Research

• Need for evaluation of funding initiatives
• Rigorous research designs
  – Starting now!
  – Before/after, multiple measure field research
• Demographic data
• Historical data
• Sustainability analyses
• Important for:
  – Identification of success factors
  – Identification of gaps and barriers
  – Evidence for policies and regulation
• Sources of research funding?
  – From project funds
  – From government, other agencies
  – From foundations
  – Other?
Research...

What difference did it make – or could it make?

Natural Disasters
- Monitoring climate, water levels, weather
- Coordinating relief activities, monitoring damage

Distance education:
- How to improve completion rates at all levels
- How online courses can enhance rural education
- What difference these offerings can make:
  - In future careers? In savings? In economic impact?

Telemedicine and Telehealth
- Analysis of cost savings
- Analysis of patient impact

Businesses and organizations
- Savings in time and/or money
- Employee recruitment/retention
- New economic activities or jobs
- Monitoring renewable energy, crops, fisheries
Conclusions:

• Barriers beyond infrastructure funding
  – Sustainable business models
  – Subsidies where necessary
  – Engagement with communities, users
  – Promotion of competition: facilities and services
  – Digital skills
  – Disrupting technologies

• Still many unanswered research questions:
  – Can short term outcomes contribute to long term benefits?
  – What do we know about diffusion and adoption; do demographics of adopters change over time?
  – How should externalities or indirect benefits be assessed?
  – Under what conditions is connectivity necessary but not sufficient to achieve socio-economic benefits?
  – What conditions are necessary for networks to be sustainable?
Mahalo!

For more information:

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