

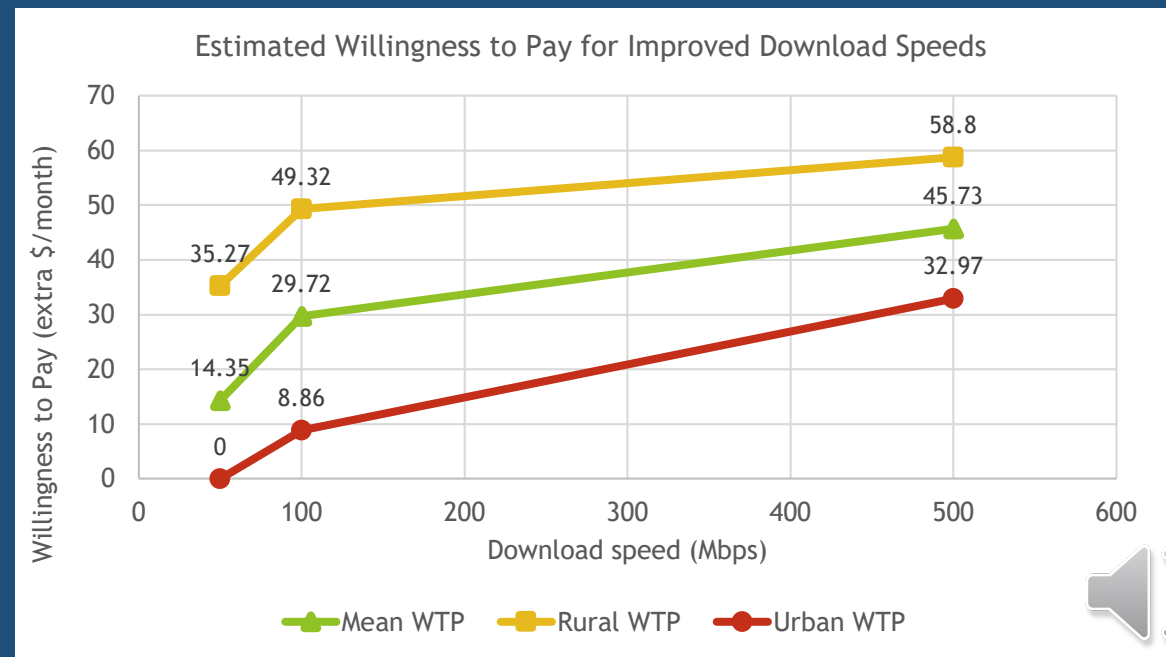
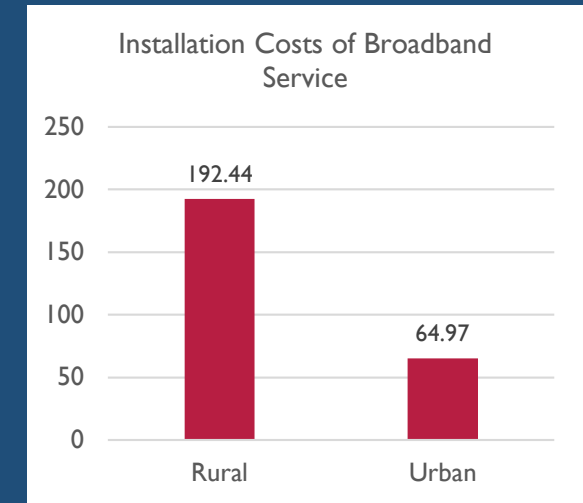
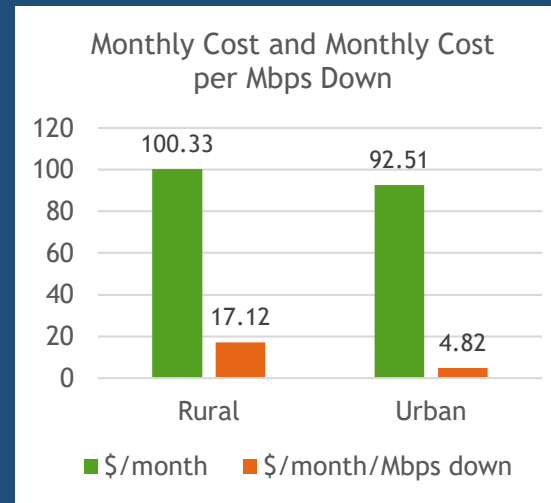
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 Regional and Rural Broadband (R2B2) Project, University of Guelph, Ontario, Canada
 TPRC 48, February 17th to 19th, 2021

Background:

- In Canada, much like in the U.S., significant subsidization of ISPs is underway to deliver improved broadband to rural areas.¹ The Canadian basic service objective is 50/10.
- Few recent U.S. studies assessing costs/affordability and willingness to pay (demand) across rural/urban, even fewer examining different types of costs (i.e., monthly versus installation cost), and no studies on the topic in Canada.
- Using a 2020 survey of urban and rural households in Ontario, Canada we assess the disparity in costs and willingness to pay across the digital divide while controlling for demand effects of the COVID-19 pandemic.

Objectives:

1. Assess to what extent monthly and installation costs for broadband vary across rural and urban households.
2. Assess willingness to pay for improved quality of service and the variation among rural and urban households.



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Methods:

1. Linear regressions for monthly and installation cost analysis.
2. Double-bounded dichotomous choice experiment for willingness to pay analysis.

Summary of Key findings:

1. Monthly costs are similar for rural and urban households; however, the cost on a \$/Mbps basis is significantly higher for rural households. Mixed results on effect of COVID-19 on costs.
2. Installation costs are significantly higher for rural customers even after controlling for connection type.
3. Despite relatively higher costs, rural customers have a higher willingness to pay for 50/10, 100/50, and 500/500 service; no significant effect from COVID-19.

| Monthly Cost N = 1,212 | R ² = 0.1415 |
|---------------------------|-------------------------|
| Rural | n.s |
| Pre-COVID | - |
| Incumbent ISP | + |
| Low income | - |
| Fiber | + |
| Fixed wireless | + |
| Mobile wireless | + |
| Satellite | + |

| \$/month/Mbps N = 1,519 | R ² = 0.3339 |
|----------------------------|-------------------------|
| Rural | + |
| Pre-COVID | n.s |
| Incumbent ISP | + |
| Low income | - |
| Fiber | - |
| Cable | - |

| Install Cost N = 885 | R ² = 0.2146 |
|-------------------------|-------------------------|
| Rural | + |
| Pre-COVID | n.s |
| Incumbent ISP | - |
| Cable | - |
| DSL | - |

| WTP: 50/10 N = 984 | |
|-----------------------|-----|
| Rural | + |
| Pre-COVID | n.s |
| Low income | - |
| Download speed | - |
| Upload speed | - |

| WTP: 100/50 N = 1,177 | |
|--------------------------|-----|
| Rural | + |
| Pre-COVID | n.s |
| Low income | - |
| Fiber | - |
| Cable | - |
| Download speed | - |

| WTP: 500/500 N = 1,187 | |
|---------------------------|-----|
| Rural | + |
| Pre-COVID | n.s |
| Low income | - |
| Mobile wireless | + |
| Satellite | + |
| Download speed | + |



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Policy implications:

1. The economic value of rural broadband expansion may be higher than estimates using urban valuations would suggest.
2. Similar to other studies,² the \$/Mbps is marginally decreasing (concave) which suggests higher household economic return from investment in worst serviced areas.
3. The COVID-19 pandemic doesn't appear to have fundamentally altered costs or demand; further study needed.

Acknowledgements:

Funding for this project was provided by SWIFT, Durham Region, and the City of Hamilton.

References:

1. Hambly, H. & Rajabiun, R. 2021. Rural broadband: Gaps, maps and challenges. *Telematics and Informatics*, 60, 1-18.
2. Liu et al. 2018. Distinguishing bandwidth and latency in households' willingness-to-pay for broadband internet speed. *Information Economics and Policy*, 45, 1-15.

