

PuebloConnect: Expanding Internet Access and Content Relevance in Tribal Communities

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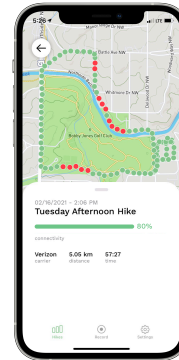
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<http://puebloconnect.cs.ucsb.edu>

The Problem and Intellectual Merit: Native American communities have the lowest Internet broadband access rates in the U.S. The focus of our work is to quantify and contextualize the lack of access, develop new technical solutions appropriate for Internet access in remote and sparsely populated regions, and increase technical literacy in Northern New Mexico pueblo communities.

Selected technical contributions:

- Analysis and critique of FCC Broadband map inaccuracies on NM tribal lands, and presentation to FCC members
- Evidence of Coverage (EoC): a numerical calculation of what is known about cellular availability at a geographic location
- Targeted Active Measurement Framework (TAMF): calculates an ordered sequence of regions for coverage measurements to maximize value of a measurement campaign with limited budget
- LoRaX: multi-hop LoRa for low bit rate long distance communication
- NetWatch: crowdsourcing platform and app for Internet coverage measurement



Broader impacts:

- increased technical capacity and Web literacy in local pueblo communities can lead to increased sovereignty and economic gain
- novel middle and last mile technical solutions can lead to expanded Internet access in remote pueblo regions
- measurement workshop with kids in Santa Clara Pueblo after school program
- coverage on cnet.com of our broadband analysis

Selected social science contributions:

- "Full Circle Model" to support community-centered network augmentation
- chapter in Networked Feminisms on social and political goals of Native women working towards broadband advancement
- research on knowledge ecologies compounding Covid-19 in Indigenous North America, including lack of adequate Internet access



Next steps:

- technical publication of LoRaX, our last mile long distance communication solution
- deploy and analyze TVWS link at Coconino Community College with homework gap application
- deploy and analyze NetWatch on Android and iOS
- user studies of crowdsourcing behavior and data use for planning and safety



PuebloConnect and Covid-19:

- studied tribal mobility pre- and post-Covid and correlated with infection rates (ACM HotMobile'21 paper)
- coordinated delivery of over 257,000 donated PPE, including to project pueblos
- worked with ITDRC to deploy emergency WiFi hotspots at pueblos
- trained pueblo librarians and tribal housing authority to build and manage websites for local community outreach

