WEBINAR

EMERGING BROADBAND TECHNOLOGY

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COLORADO MUNICIPAL LEAGUE

Agenda

Introduction **Drivers of Emerging Broadband Technology** Impacts **Government and Private Industry Help Emerging Broadband Technology & Solutions Closing Statement** Q&A

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2022 Inc's 5000 Fastest Growing Privately Held Co's in US
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2021 CES IoT Breakthrough Award Global Partner
2020 CES IoT Breakthrough Award Enterprise IoT
2018 and 2019 CIO Review Top 20 IoT Growth Companies in US

Board of Director EUCAST Global

5G/LTE/CBRS Private Network Manufacturer Moved Headquarters from S. Korea to Denver, CO – February 2022



Digital Divide

- The digital divide is the gap that exists between individuals who have access to modern information and communication technology and those who lack access.
- Digital inequality is evident between:
 - communities living in urban areas and those living in rural settlements
 - between less economically developed areas and more economically developed areas
 - between the educated and uneducated population
- According to the FCC, nearly 17 million school children lack home internet access.
- According to the Pew Research Center, 44% of adults in households with incomes below \$30,000 lack internet.
- According to Gartner, 30 billion Sq. Ft. of commercial floor space has poor mobile coverage.

A Connected U.S.

- From 2016 2020, the number of 'connected devices' in the US grew from 180M to over 260M devices.
- Since the roll out of 5G, the forecast for connected devices is expected to rise to over 300M by 2024.
- Broadband providers are working hard to keep up with the evolution of connected devices, automation and smart everything. However, the growth of automation is growing faster than networks and chip manufacturers can produce and keep up with.
- Barriers for the industry has been due to, oversees
 supply chain issues, global Wars, raw materials and labor costs
- The US carves a path to less reliability on international goods and more on US sourcing and manufacturing.

How do we move forward together?

Where are the impacts?

• It's estimated that 93% of Coloradans have some form of Broadband.

• Areas without broadband are unable to take advantage of the use cases that those who have broadband often do and sometimes do everyday.

Some of the largest impacts:

- Distant Learning: due to COVID and lack of connectivity access, kids in rural or underserved areas were greatly impacted by not being able to connect to schools for daily curriculum.
- Telehealth: with broadband connectivity, patients can connect with their doctors and receive prescriptions and diagnosis without having to drive in for an appointment. With underserved areas, this is not possible and often the closest doctor is 100's of miles away.
- Many underserved areas are connected to farming: smart farming has proven in the past 8-10 years to be a driver of higher crop yields, better quality and predictive patterns for growing crops, netting in greater farm values and ultimately wealth. Participation in eCommerce economy
- Smart Cities: So many services and advancements in city automation have allowed cities to create a more sustainable environment for their citizens (emergency services, citizen safety, smart transportation, water/wastewater management, energy consumption management -smart grid).

Households without at-home internet service, percent of county



166k households in Colorado currently do not have reliable internet

Using U.S. Census data and surveys of Colorado residents in June, the Colorado Broadband Office estimated that 166,000 households, or 14% of urban and rural residents, do not have access to internet speeds of at least 100 mbps down and 20 mbps up. (Colorado Broadband Roadmap)

What about Sovereign Nations?



- The Tribal Broadband Connectivity Program is a \$980 million program directed to tribal governments to be used for broadband deployment on tribal lands, as well as for telehealth, distance learning, broadband affordability, and digital inclusion
- \$3 Billion from NTIA's Tribal Broadband Connectivity Program.
- \$20 Billion from Coronavirus State Fiscal Recovery Funds from American Rescue
 Plan of 2021 for Water, Sewer, or
 Broadband.
- \$100 Million Coronavirus Capital Projects Fund from American Rescue Plan of 2021 for work, education, and health monitoring, including remote options.
- \$100 Million Indigenous Communities
 Program from the American Rescue Plan
 of 2021 for economic development
 (including Broadband).

Indian reservations are mostly impacted in rural areas outside of their main towns and roads where smart farming, water monitoring, and grid management are out of reach. One third of the Tribal population is underserved in Broadband.

What is the Government doing to help?

In Colorado over the past two years, Congress passed spending plans to provide <u>up to \$900 million</u> to improve broadband access.

These include:

- \$400 million to \$700 million The Broadband, Equity, Access and Deployment Program (funded by the U.S. Infrastructure, Investment and Jobs Act, or IIJA)
- \$21 million Digital Equity Act (funding by IIJA)
- **\$5 million to \$100 million** Enabling Middle Mile Broadband Infrastructure Program, (funded by IIJA)
- **\$171 million** Capital Projects Fund (funded by American Rescue Plan Act)
- \$75 million State and Local Fiscal Recovery (via ARPA)

Broadband boards in all states/cities are tasked with working together with Private companies to expand their use of funds for Broadband. This quickly creates a gap in technology knowledge and reliance on the industry to help guide the way.

Can technology close the gap? Hybrid is key!

There are several solutions in the market that help address coverage or lack of adequate bandwidth for underserved and rural areas as well as help advance the demand for new growth in automation.

- **Fiber**: fiber optic is proving to be the single greatest of technology for both broadband speed and scale. States are investing heavy in fiber rings which are literally connected fiber infrastructure that supports a city and its surrounding areas. The speeds allow for all types of use cases and automation for homes and businesses with direct access. Key is cost and physical infrastructure/timing.
- **Licensed 5G cellular**: along with fiber, 5G deployments and expansion is a plan to get the 'footprint' of ISP to cover all areas where network towers and antennas can be installed. Keys are low subscriber count vs investment into infrastructure.
- Unlicensed 5G/CBRS cellular: The FCC released new spectrum in the unlicensed Citizen Broadband Radio Service. Key is adoption of new technology.
- Satellite: Providers like DISH, DIRECTV, STARLINK, LEO Sat, ViaSat can provide a point-to-point solution within a geo sat footprint. Key is line of sight and weather or environmental issues/natural disaster.
- Smart Poles: hybrid approach to combining fiber, LTE (private networks) and Wi-Fi. Key is easily deployed, less time and combines multiple solutions.
- **Shared Wi-Fi**: public connectivity; good for social and texting, bad for scale, security and reliability. Key is new forms of Wi-Fi 6 in the marketplace to improve throughput indoors and embedded into new wireless devices (spectrum optimization and lower latency).

Concluding Statement

Funding has finally caught up to the affordability and cost of technology in the areas of Broadband. Over the next 10 years the US will close the digital divide and do so with technology that is US based and domestically manufactured. As technology becomes more affordable and connectivity spreads, the growth of the US will be felt in the increase in economic value chain (more automation), more jobs and a greater involvement from rural and underserved areas, together. Technology in this space will continue to merge and innovate and deliver new solutions surrounding all communities and users, united in the goal of digital equality and prosperity.



Thank You!

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