

T Mobile

Colorado Readout

7-9-2024



AGENDA

- **RF Spectrum Introduction**
- **State of the Network**
- **Future Network Plans**
- **Obstacles**





RF Spectrum Introduction

Wireless networks can be built in different ways from multiple bands of wavelength spectrum: low-band, mid-band, and high-band.

High-band mmWave (>24 GHz)

High capacity, ultrafast, but limited range.

Used for dense environments and private networking.

Mid-band (Ultra Capacity) (1-6 GHz)

Enhanced 5G speeds for metro areas.

Critical for high bandwidth applications, both fixed and mobile.

Low-band (Extended Range) (<1 GHz)

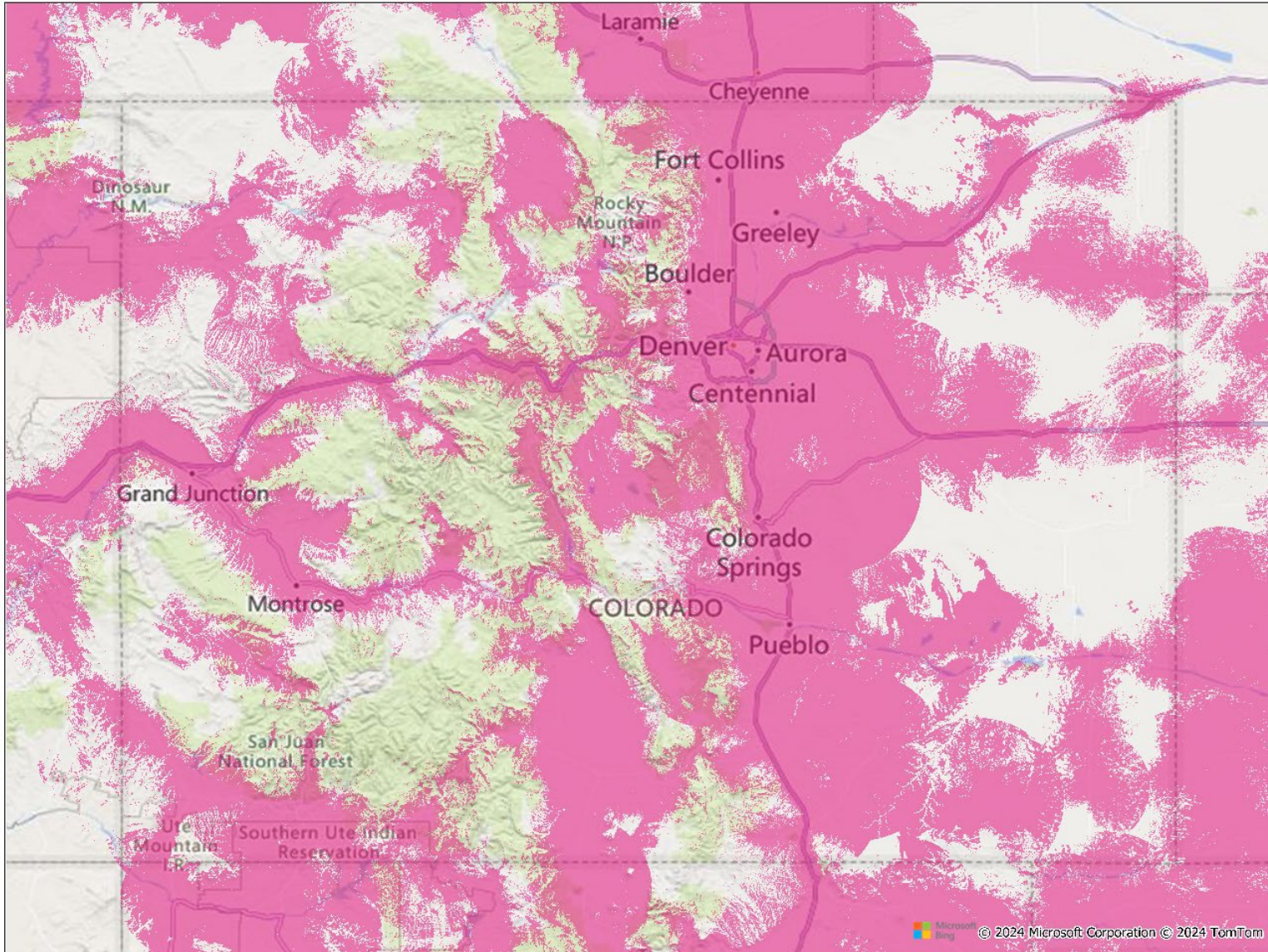
Coverage for wide open spaces. Important for high mobility field applications and IoT sensing.



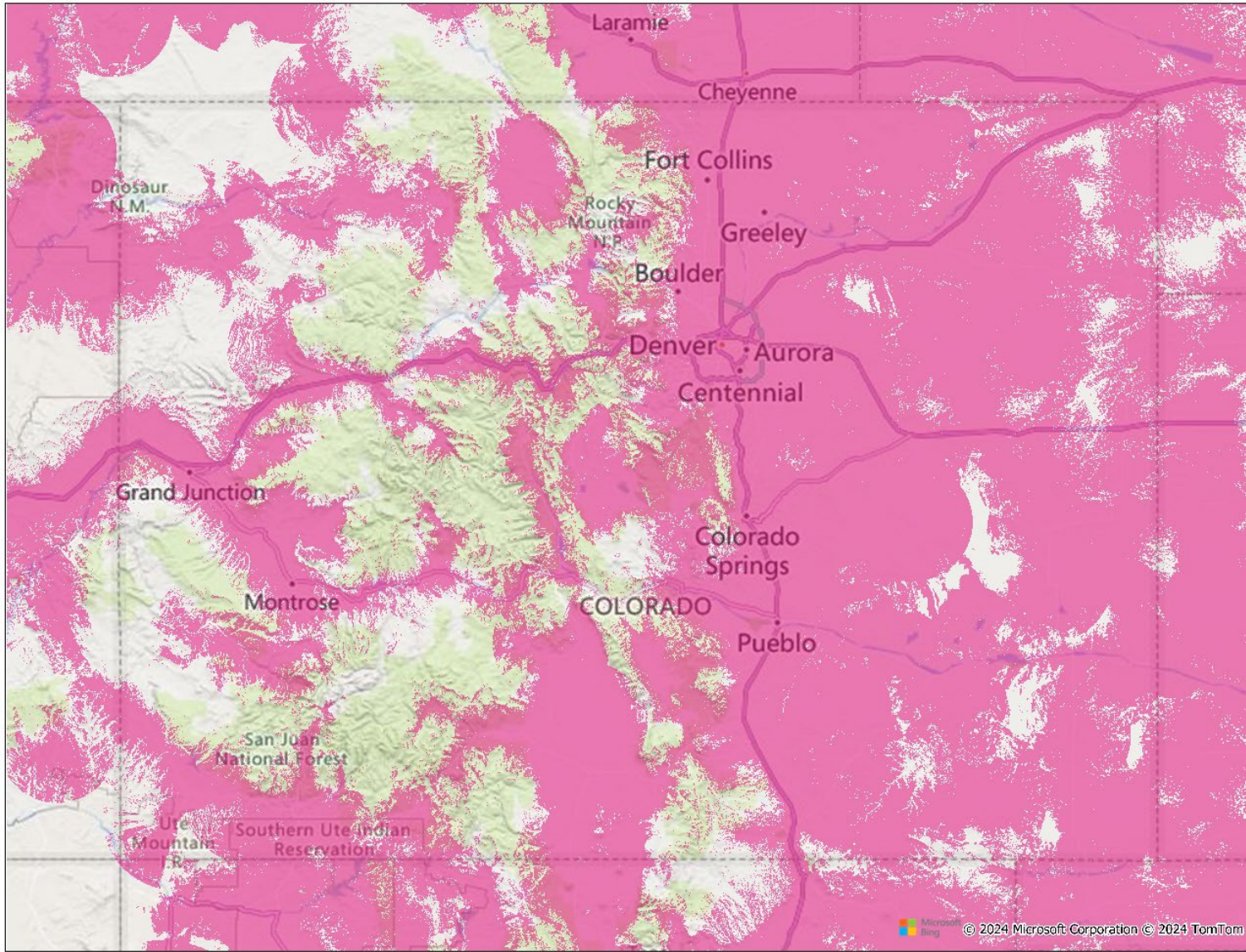
A great 5G network requires ALL spectrum bands.



Colorado Coverage EOY 2021



Colorado Coverage (Current)





Future Network Plans

▪ FCC Commitments (Yr-3 Colorado)

- Overall speeds
 - 100+ Mbps 68%
 - 50+ Mbps 76%
- Rural Speeds
 - 100+ Mbps 60%
 - 50+ Mbps 63%

All have been Met

▪ FCC Commitments (Yr-6 Colorado)

- Overall speeds
 - 100+ Mbps 92%
 - 50+ Mbps 93%
- Rural Speeds
 - 100+ Mbps 74%
 - 50+ Mbps 84%

▪ Coverage (Yr-6 Colorado)

- 5G Midband
 - Overall – 87.2%
 - Rural – 76.4%
- 2.5GHz
 - Overall – 62.6%
 - Rural – 54.9%
- 5G PCS
 - Overall – 84.4%
 - Rural – 74.8%





Obstacles

- **Our State's topography**
- **Regulatory Compliance – Carriers must navigate complex regulatory environments, including zoning laws and environmental regulations, which delay the deployment of new infrastructure or the upgrade of existing facilities**
 - Zoning and Permitting
 - Planning Department and City Council – for building permits and final approval, you must GAIN and seek approval of 5 departments after Planning and Building, which are:
 - 1. Public Works Dept.
 - 2. Fire Dept.
 - 3. City Engineering Dept.
 - 4. Utilities Dept.
 - 5. Land Use.
 - Inconsistent Zoning and Permitting Requirements throughout the State of Colorado
 - EXTENSIVE REGULATORY & FCC ENVIRONMENTAL
 - *NOTE the Colorado Public Utilities Commission (PUC) has its own set of telecommunication rules that must be adhered to (regulatory requirements for telecommunication sites in Colorado)*
 - RIGHT-of-WAY (ROW) Issues
 - Negotiating agreements for small cells in public ROWs can be complex. Throughout the Front Range, we have to navigate local police power controls, such as height limits and the number of poles allowed for aesthetic or public safety reasons
 - Vandalism on telecommunication sites
 - YTD > \$250,000
 - Developing Telecommunications Sites on USFS and BLM lands – significant timelines, unoptimized process, extensive cost:
 - Requires Right-of-Way (ROW) Grants
 - Detailed Management Plan
 - Rental Fees (based on inventory)
 - Certificates of Occupancy
 - Environmental & Cultural Compliances

