



# Microsoft Airband: Bridging the Digital Divide

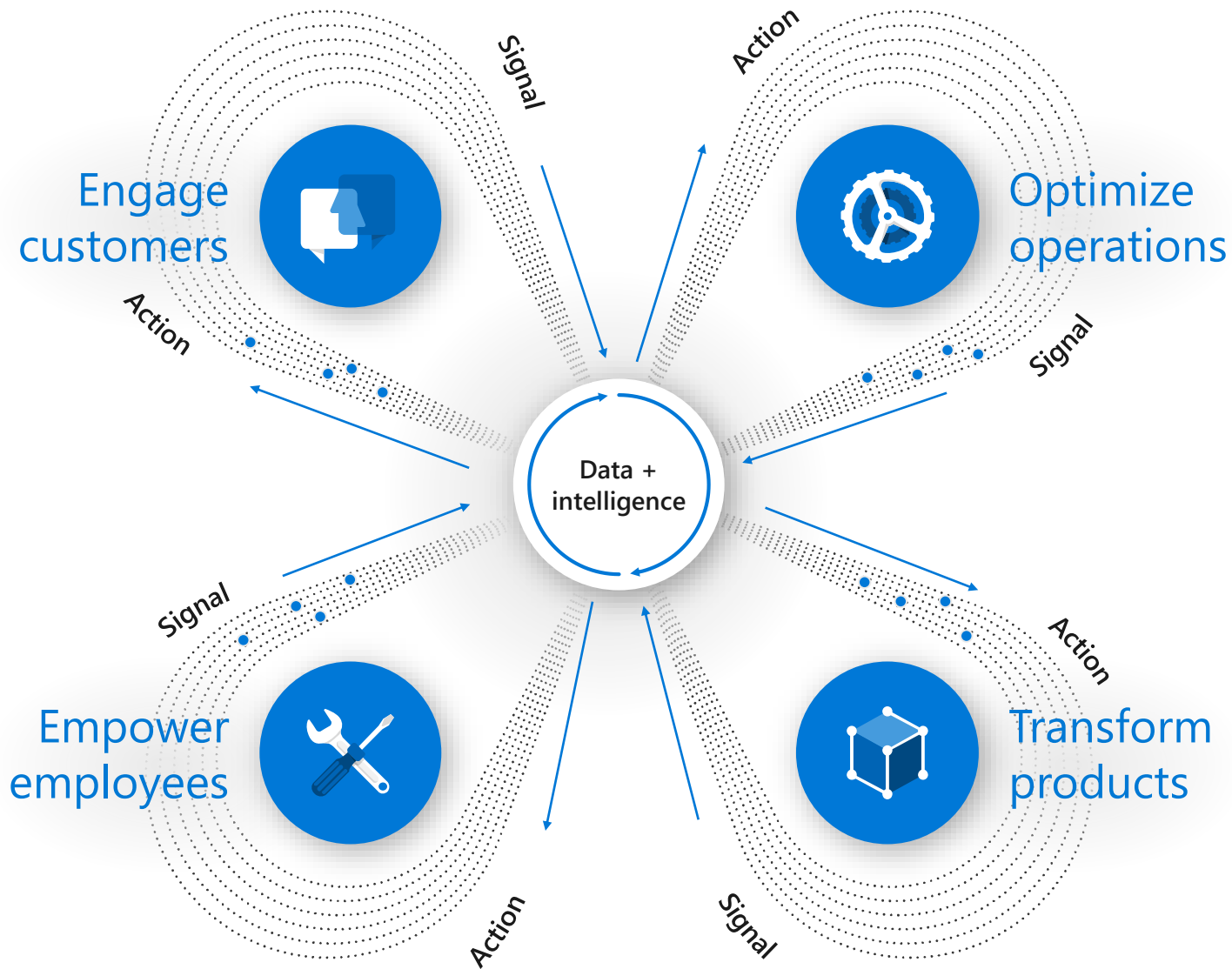
Zena Kebede  
Technical Program Manager  
Airband Initiative



# Microsoft Mission

*"Empower every person and every organization on the planet to achieve more." - Satya Nadella*





**80B**

Connected “things” by 2025  
generating 180ZB of data



**\$130B**

New monetization avenues  
due to IoT-related services



**80%**

Companies that increased  
revenue as a result of IoT  
implementation



**\$100M**

Average increase in  
operating income (avg. 8%)  
among the most digitally  
transformed enterprises



# The challenge across the world

## Internet Access

Nearly 49% of the world is not using the internet<sup>1</sup>



*"With no internet access, there is no cloud access." - Satya Nadella*



# The connectivity gap in the United States

At least

**21.3 million people**

lack access to broadband<sup>1</sup>

---

At least

**16.8 million people**

reside in rural communities<sup>1</sup>



# FCC 2018 Broadband Deployment Report

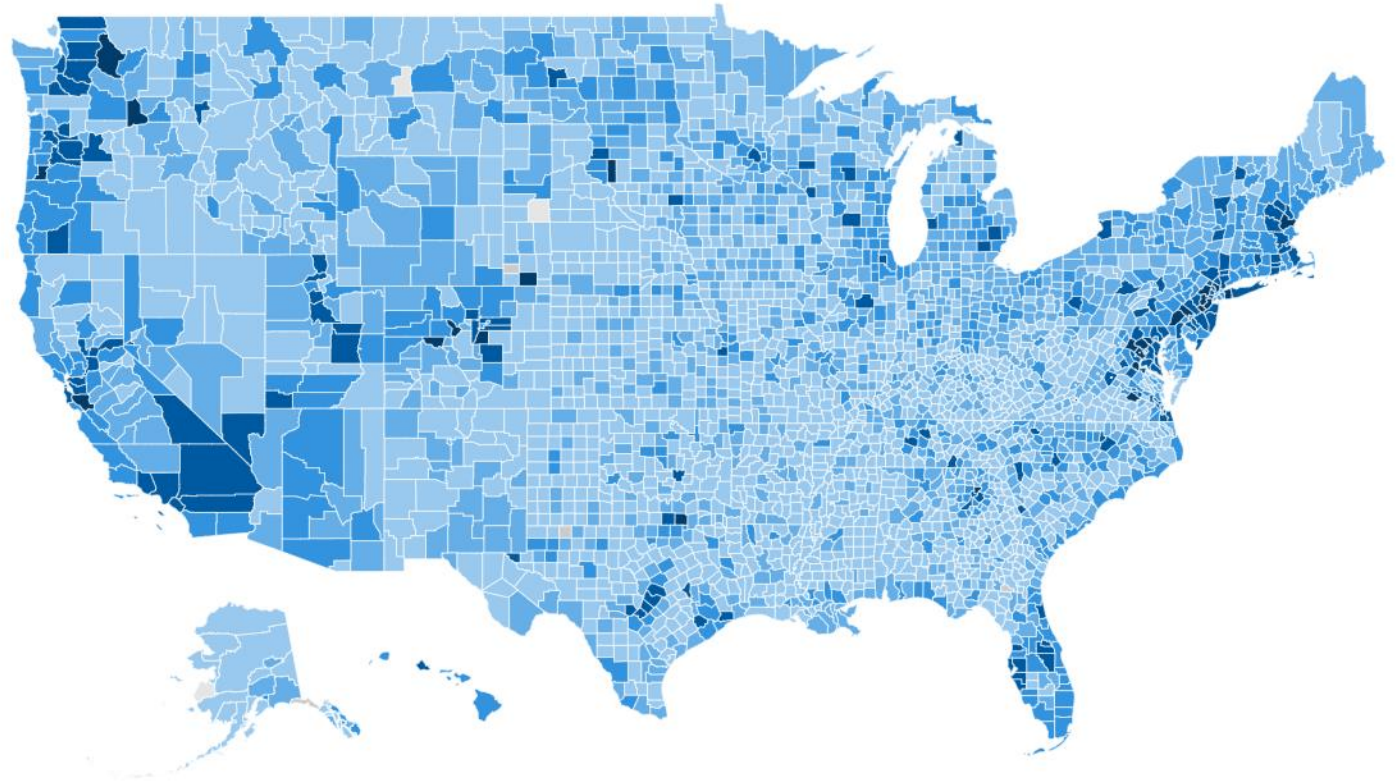
## Fixed Broadband as defined by the FCC

25 MBPS DOWNLOAD · 3 MBPS UPLOAD

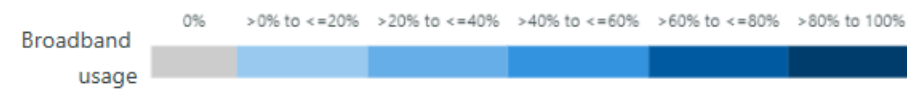
■ Number of people in US rural areas per county **without access** to fixed broadband



Microsoft data  
indicates **162M**  
people do not use  
the internet at  
**broadband speeds**

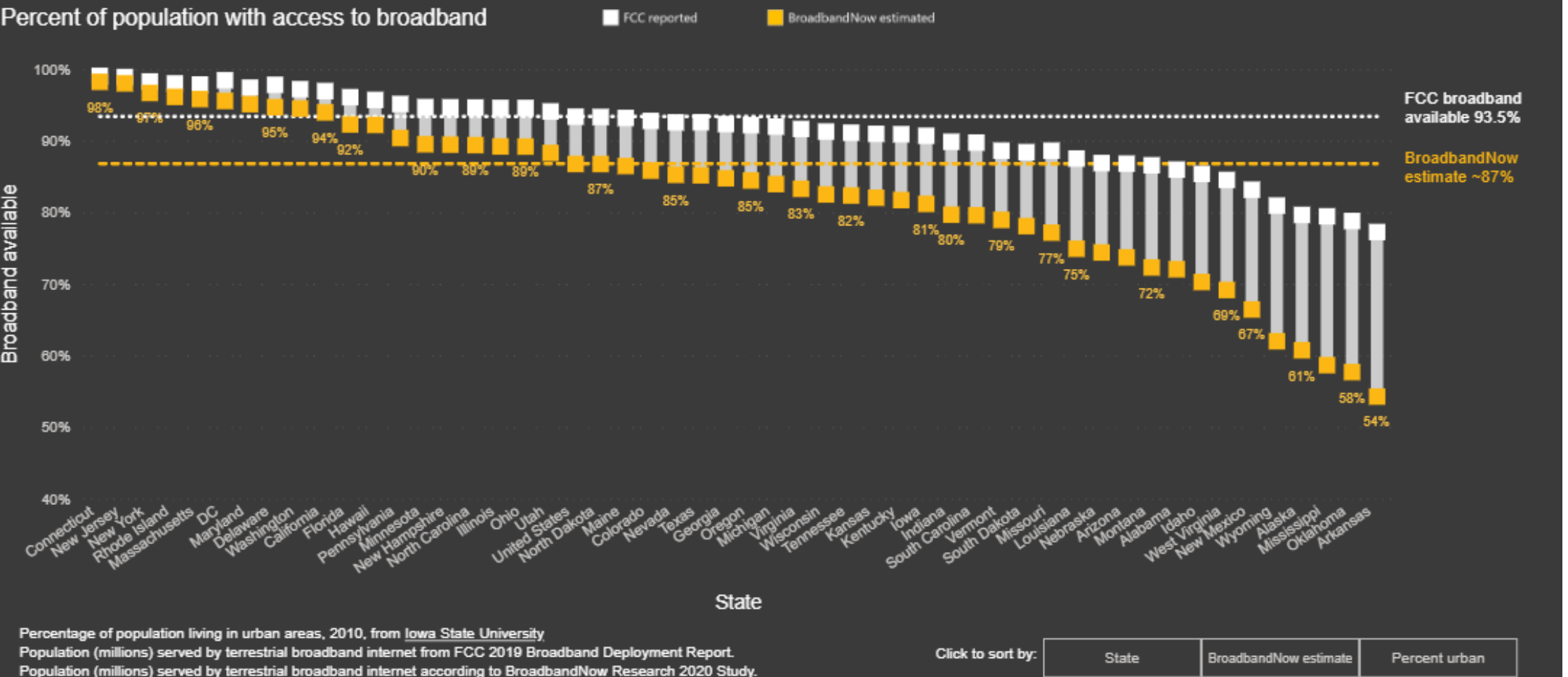


Broadband speed greater than or equal to 25Mbps



# BroadbandNow Estimate

FCC reports broadband is not available to 21.3M people, our study indicates ~42M do not have access. Especially in areas with larger rural populations.



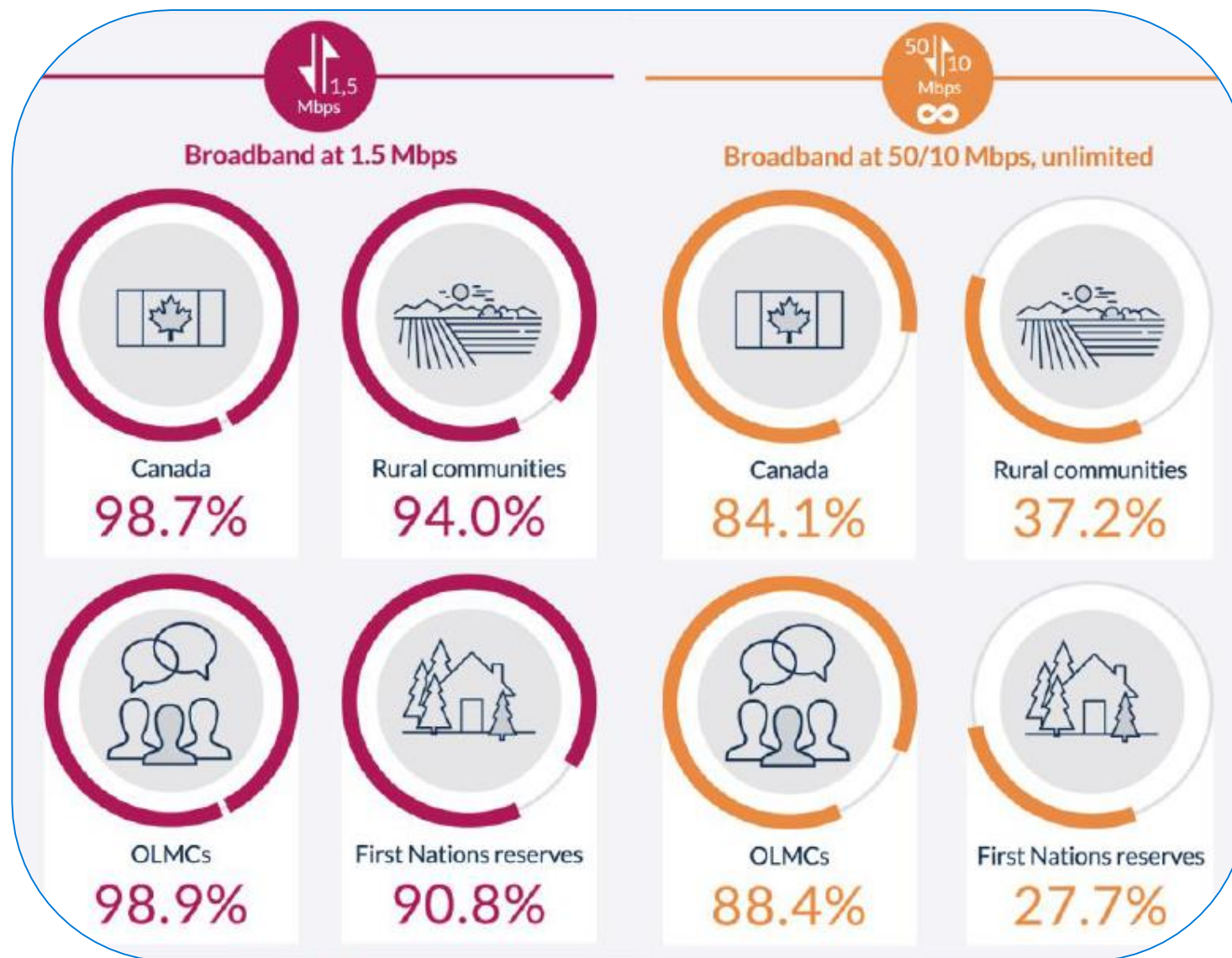
Percentage of population living in urban areas, 2010, from [Iowa State University](#)  
Population (millions) served by terrestrial broadband internet from FCC 2019 Broadband Deployment Report.  
Population (millions) served by terrestrial broadband internet according to BroadbandNow Research 2020 Study.

Source: FCC 2019 Broadband report and 2020 BroadbandNow study

BROADBANDNOW



# Broadband Coverage in Canada in 2017





# Airband mission - to connect the unconnected

Partner with equipment makers, internet and energy access providers, and local entrepreneurs to make affordable broadband access a reality for communities around the world.

**3 Million  
POPs**

---

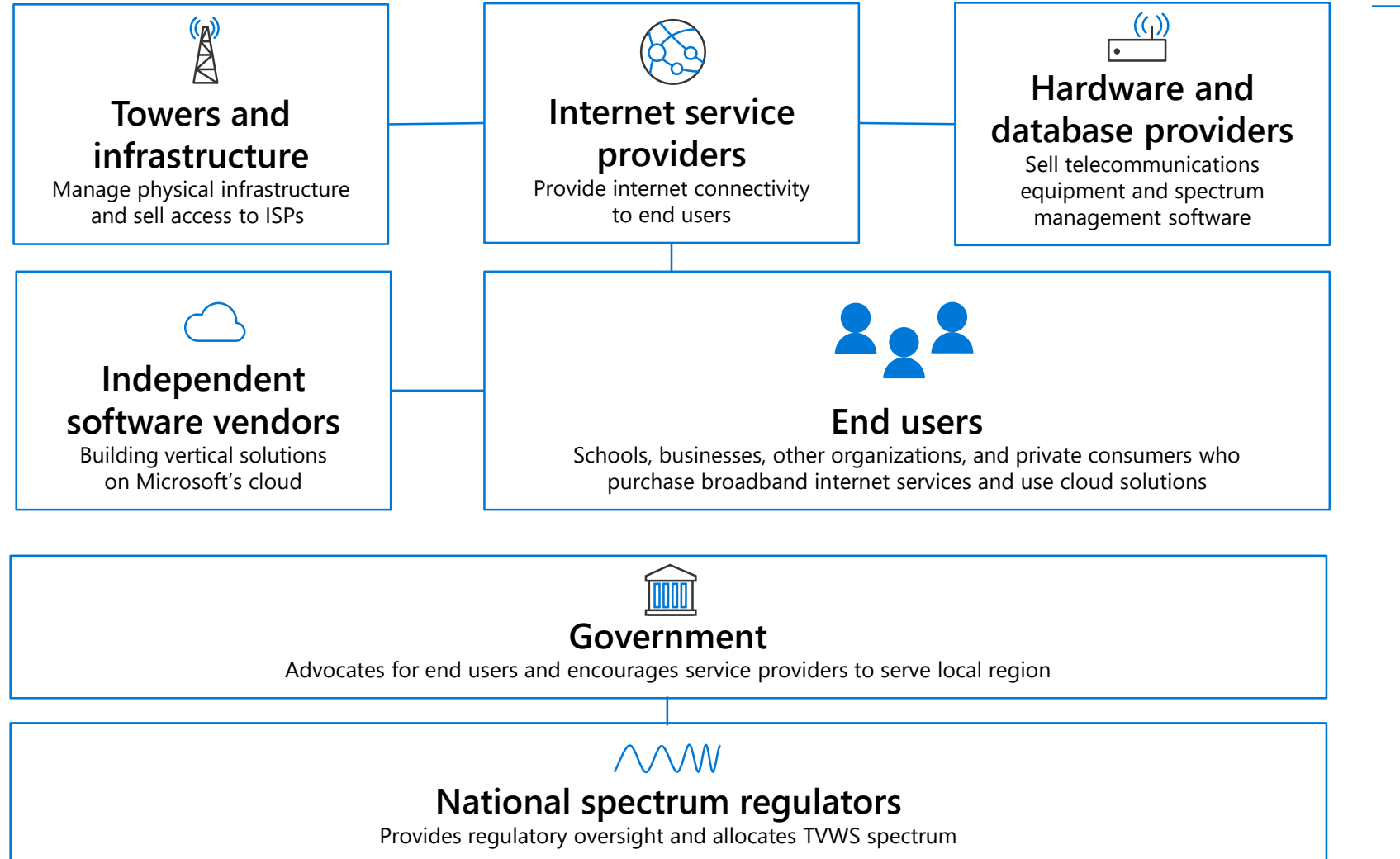
Projected people covered in rural unserved areas of U.S. by July 2022

**40 Million  
POPs**

Projected people covered globally by July 2022



# Airband Value Ecosystem



## Microsoft Airband Initiative

Supports projects with partners to expand broadband coverage and advocates for regulatory changes to empower communities globally

# Key Airband Verticals



Healthcare



Education



Agriculture

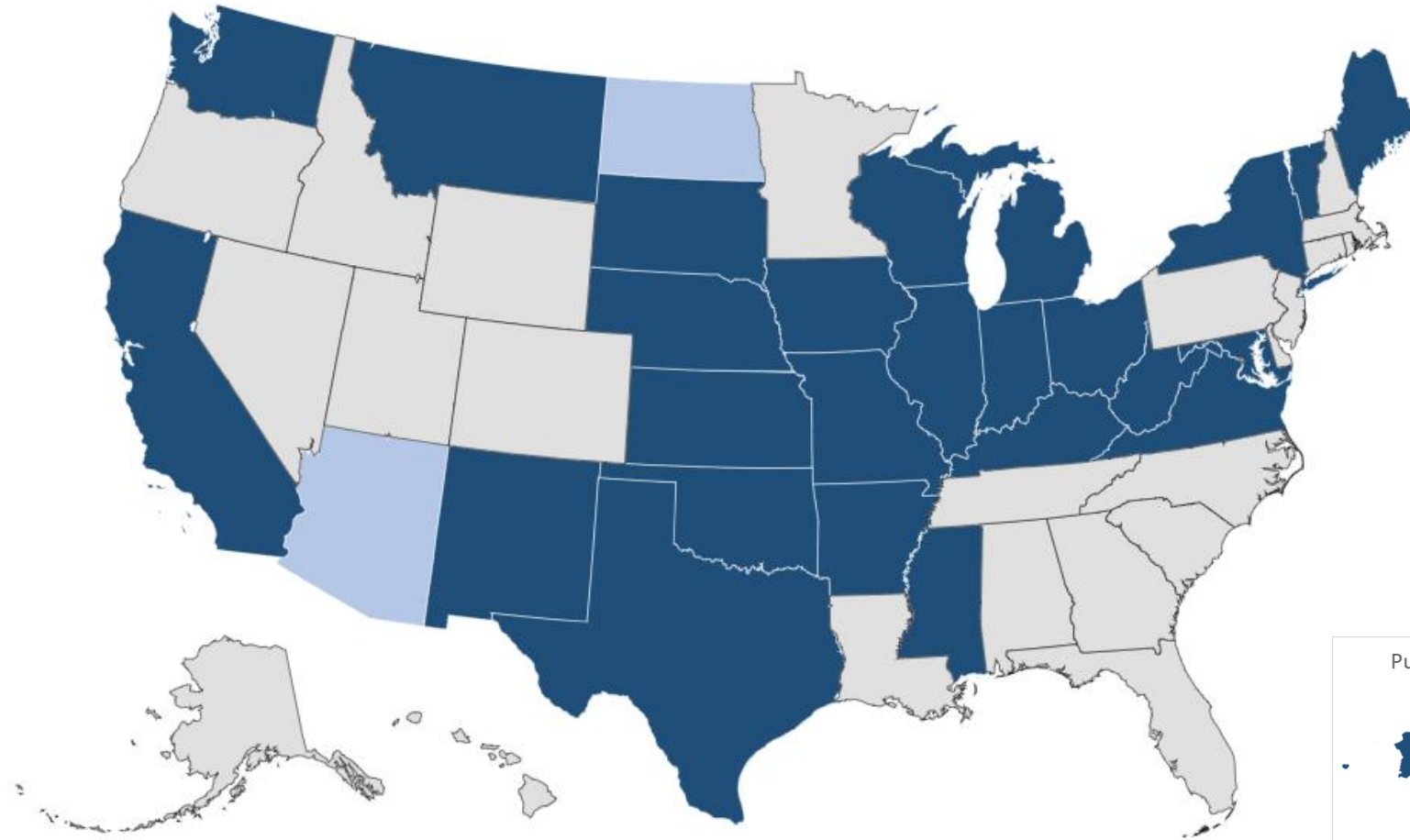


Business



# Microsoft Airband U.S Map

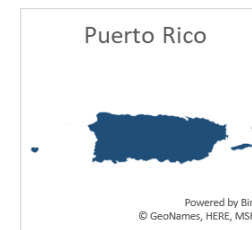
*The overall NEW goal is to cover 3 million people in unserved rural USA by July 4, 2022*



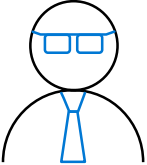



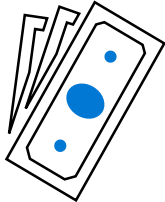
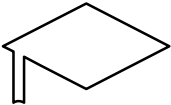
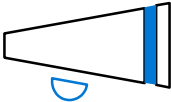
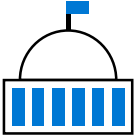
US States/Territories covered by  
Airband partnerships  
as of February 2019

Pilot / Grant	Commercial
2	26

- Commercial deals
- Pilots/Grants



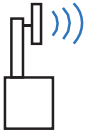
# Airband offering for commercial ISP partners

<p>Expertise</p> 	<p>Low cost TVWS equipment, towers and fiber infrastructure</p> 	<p>Azure</p> 	<p>Microsoft Reseller Programs</p> 
<p>Revenue share investments</p> 	<p>Digital skills programming and content</p> 	<p>PR &amp; marketing</p> 	<p>Advocacy &amp; industry outreach</p> 



# Airband ISP Program

After a simple online sign-up at [aka.ms/airbandisp](https://aka.ms/airbandisp), ISP Program participants gain access to:



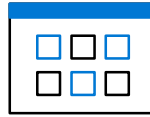
## TV White Spaces Volume Pricing

Receive preferential pricing for  
TV White Space equipment



## Microsoft Reseller Programs

Join cloud service and device  
reseller programs



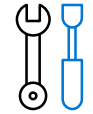
## ISP Business Applications

Qualify for preferential pricing  
on cloud-based billing and  
operations software



## Tower Access Pricing

American Tower offers access  
to over 40,000 prime tower  
sites in the U.S. to help you  
accelerate your network build



## Digital Skills Content

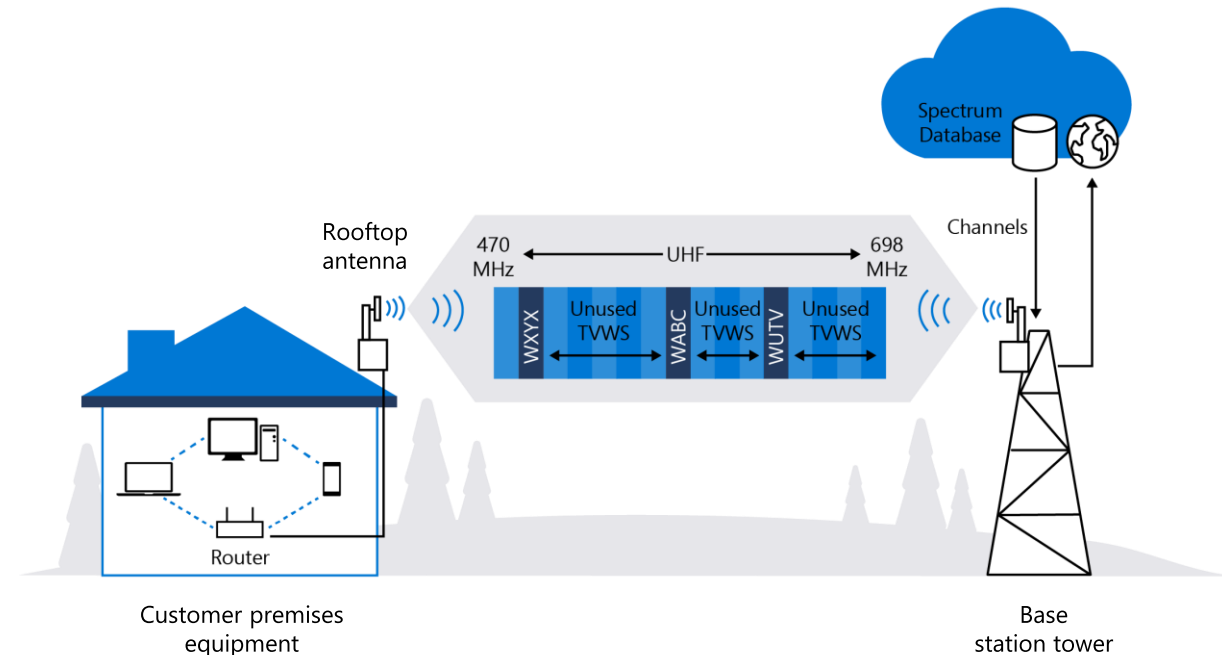
Get access to skills training and  
content for your customers

# TV White Space – One solution in the internet connectivity toolkit

TV White Space (TVWS) enables network operators to deploy cost-effective, affordable internet in underserved rural communities.

**TVWS leverages unused spectrum in the traditional UHF and VHF television broadcast band.** White space radios operate dynamically across this spectrum referencing a database to identify unused frequencies.

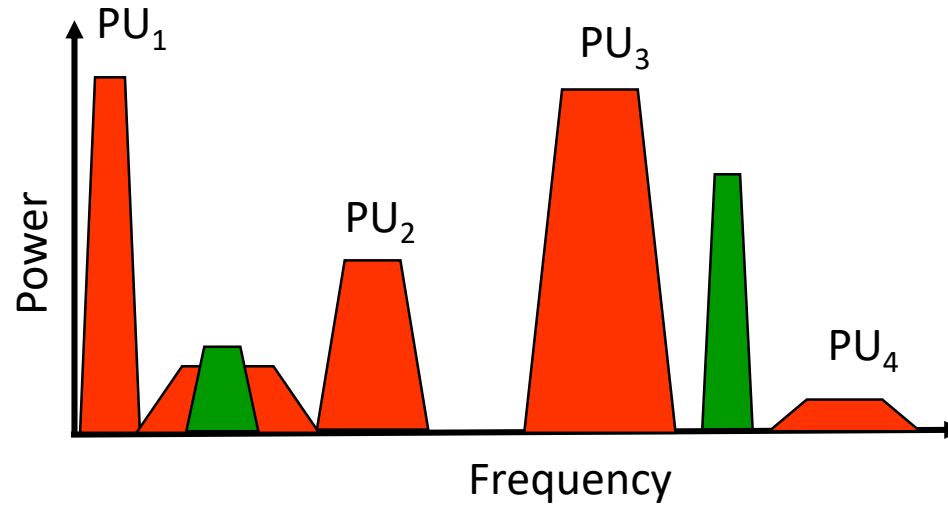
TVWS signal can travel over long distances and penetrate buildings and foliage better than other wireless communications technologies, making it an ideal technology for rural communities.



## Multiple use cases:

- High speed internet
- WiFi access points
- Telemetry and internet of things (IoT)

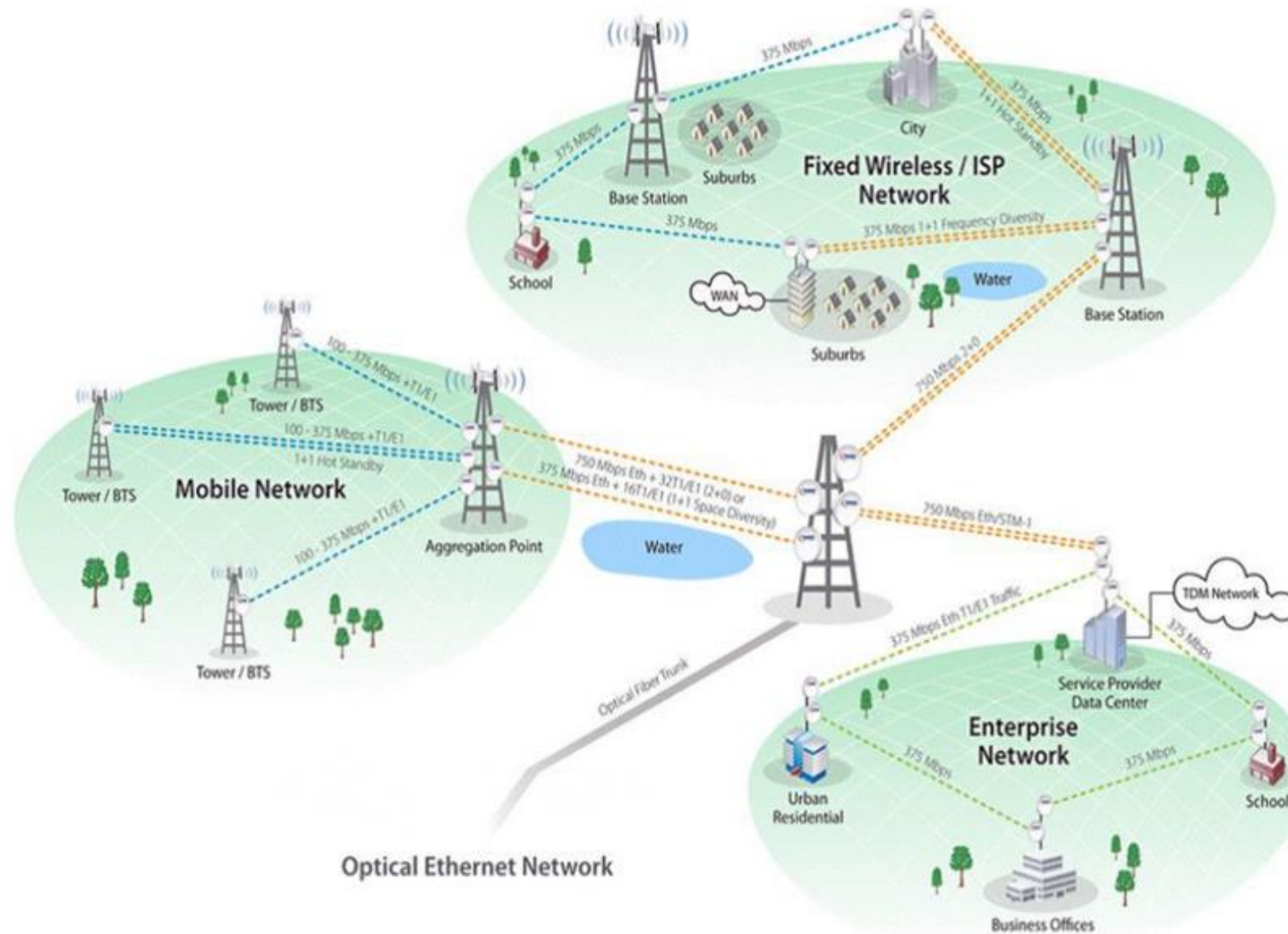
# Dynamic Spectrum Access (DSA)



- **Determine** available spectrum (**white spaces**)
- **Transmit** in "available frequencies"
- **Detect** if primary user appears
- **Move** to new frequencies
- **Adapt** bandwidth and power levels



# Hybrid Network Topology



- Fiber
  - Microwave
  - Wi-Fi
  - mmwave
- ➔
- Urban
  - Licensed/Unlicensed
  - LOS
  - Wireless + Wired
- 
- 3.5GHz
  - 5.8GHz
  - Satellite
- ➔
- Urban/Rural
  - Licensed/Unlicensed
  - LOS
  - Wireless
- 
- TVWS  
(470 -698 MHz)
- ➔
- Urban + **Rural**
  - Unlicensed
  - LOS + **NLOS**
  - **Wireless**

Technology selection depends on use cases, coverage, and capacity requirements

# The Agriculture Challenge



## Global Access

**1 in 9** people are undernourished

**65%** reduce poverty for 65% of the world's poor who live in rural areas and work in farming

**70%** more food needed by 2050



## Sustainability

**70%** of global water resources are needed for agriculture

**24%** of global greenhouse emissions come from agriculture

**251T** liters of water to be saved by 2030 by implementing smart agriculture



## Economic Growth

**30%** of global workers are employed by the agriculture industry

**10-30%** agriculture contributes to 10% of global GDP and up to 30% in low income countries

**\$4.8T** global agriculture revenue

# Data Driven Agriculture



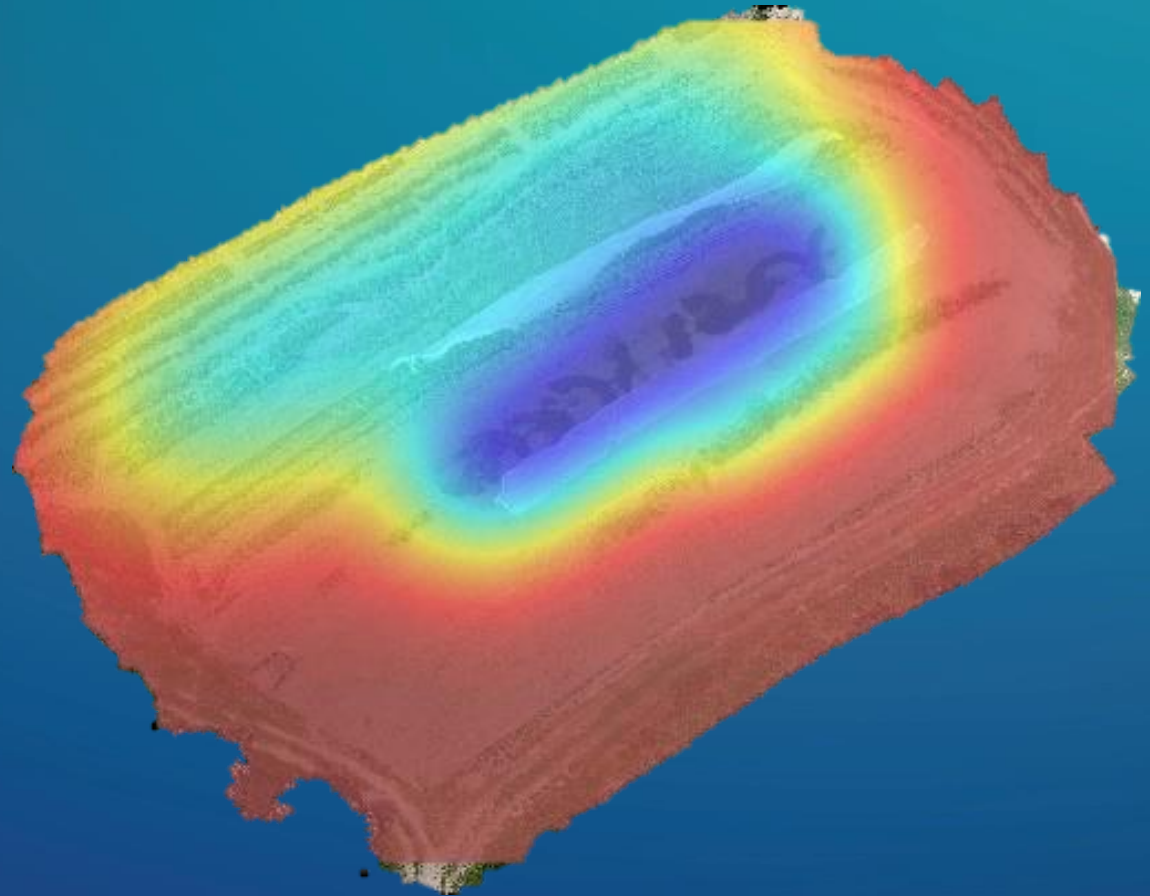
Improves yield



Reduces cost

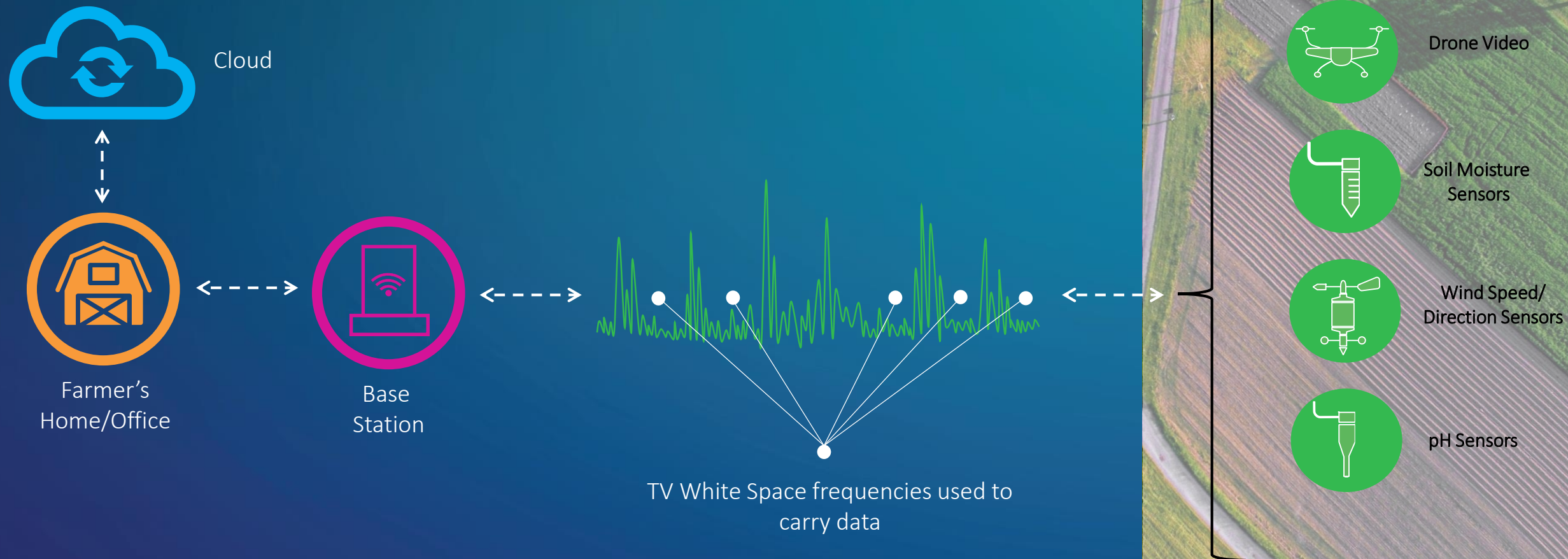


Ensure sustainability



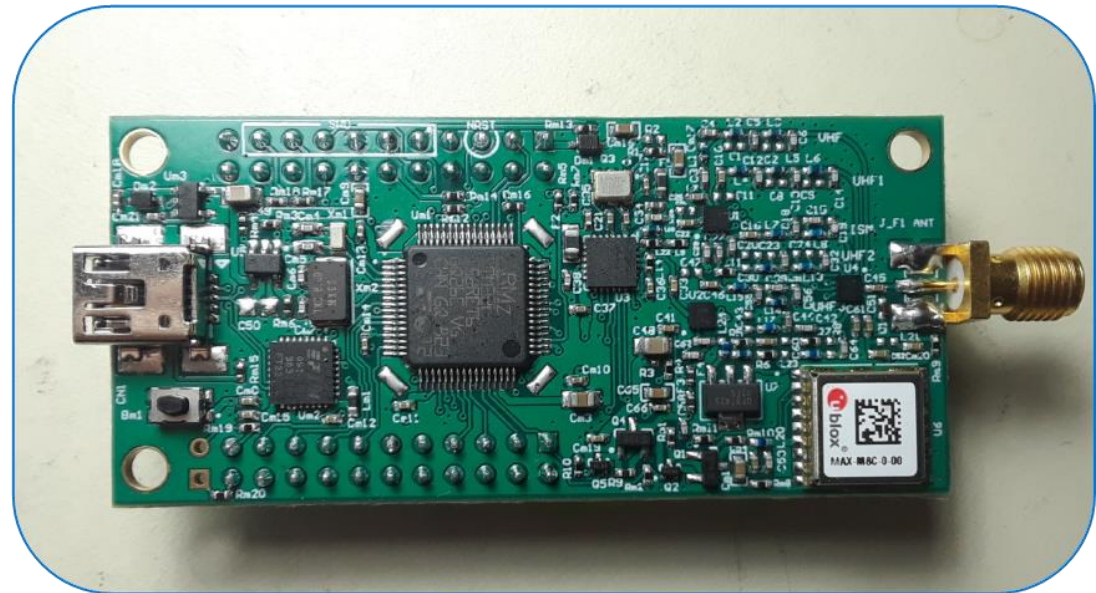
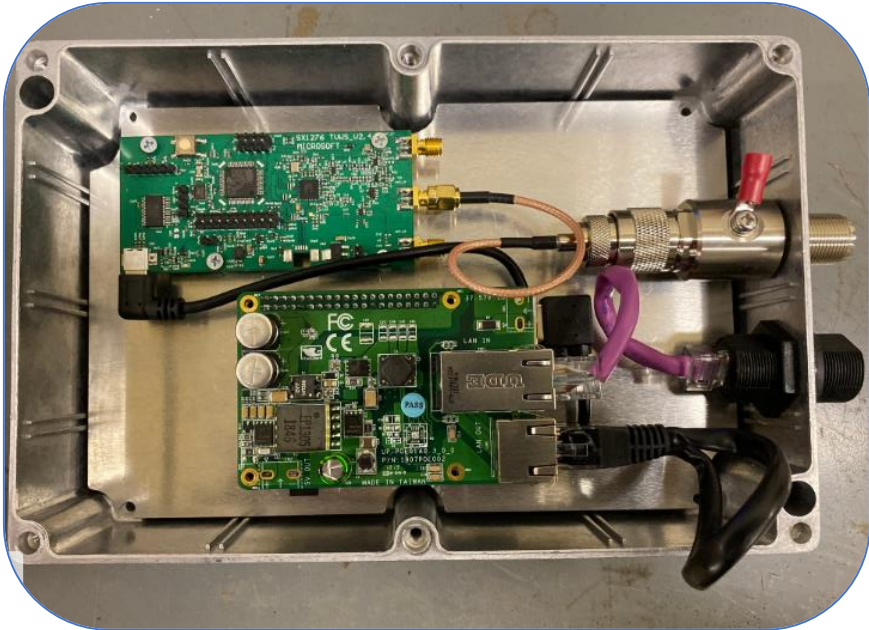


# Farm Connectivity



# Microsoft Triple Band IoT Radio

- Frequency Band: 150MHz – 1GHz
- Full 800 and 900 ISM Bands
- Very Low Power
- RF Output up to 18dBm
- Built in GPS







Thank you!