



Society + Technology + Equity

*WRC's chamber for antenna and wireless-device testing
COLBY KATZ FOR THE WALL STREET JOURNAL*



Society + Technology + Equity

This document outlines WRC's solution to address the digital divide in America, with equity as the foundation.

The digital divide is a complex, three-part problem combining connectivity, affordability, and digital workforce skills training.

“

Each part of society has a responsibility to provide equity of opportunity”

- Gabrielle Starr, President, Pomona College



Access to the Internet ... is the civil rights issue of the 21st century.”

- Congressman John Lewis

Nearly **three times** as many people are without broadband in urban/metro versus rural communities - **lack of broadband adoption is significantly greater among Black, Hispanic, and lower-income households.**

FCC Commissioner Geoffrey Starks, joined by civil rights leaders, explained, “**Our historic failure to close the digital divide has had a devastating effect on communities of color in both rural and urban America.**”

- Benton Institute, *Broadband for America Now*



“Digital Divide ‘a Matter of Life and Death amid COVID-19 Crisis’”

- UN Secretary-General António Guterres

A report from the Human Rights Council of the United Nations General Assembly declares **access to the Internet a basic human right** which enables individuals to "exercise their right to freedom of opinion and expression."

SDGS

10. REDUCED INEQUALITIES

17. PARTNERSHIPS FOR THE GOALS

The Digital Divide, Defined

A complex three-part problem & solution with a massive upside for society and the economy.



Digital Skills (Abundance)

1/3rd of U.S. lacks digital workplace skills/training



Connectivity

1/3rd of U.S. is not connected

Affordability (Adoption)

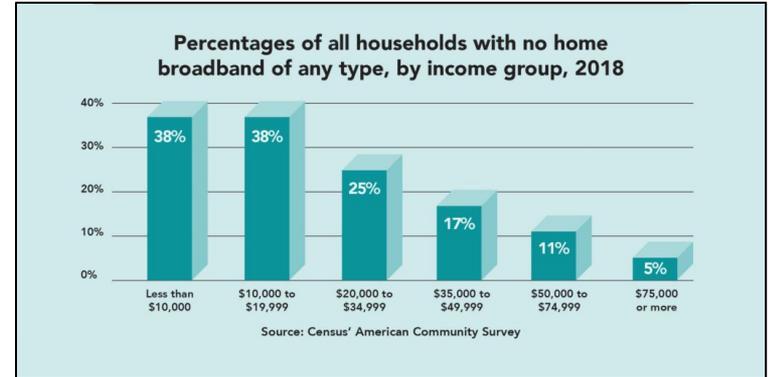
1/3rd of U.S. cannot afford high performance broadband

The Digital Divide is...



“Structurally racist, discriminating against unconnected Black Americans and other communities of color.”*

- U.S. households with incomes below \$35,000 accounted for 28% of all households, but 60% of those without broadband subscriptions (source: [NDIA](#))
- Households with incomes above \$50,000 accounted for 59% of all households, but only 26% of those lacking broadband.
- Existing broadband programs target tens of billions of dollars to expand broadband of “unserved and underserved” rural areas, while studiously ignoring tens of millions of urban Americans who still lack high-speed internet service.



*Source: NDIA

However, there is a Perfect Storm of Opportunity

Current trends all point to an unprecedented moment to improve livelihoods, the economy and society



Economic / Jobs Development: In 2019, nearly 7M jobs went unfilled largely due to a growing skills gap, combined with millions of low skill workers who lost their jobs due to COVID-19 creates the perfect storm and opportunity.

[Source: CNBC]

Remote Work: Over 1/3rd NOW working remote - COVID-19 thrust business community into new paradigm, remote work opportunities have skyrocketed, expected to be permanent. [Source: Gallup]

Education: Millions of youth already in challenged situations low income / in poverty, have been thrust to learn from home where they do not have access to necessary resources.

Broadband Connectivity: Upwards of 150M Americans are unserved or underserved either due to physical access, affordability or both. [Source: NC@High Speed research, Microsoft, Various]

TeleHealth: Healthcare, insurance and health policy have been catapulted years forward due to COVID-19 while millions remain unable to access due to poor Internet connectivity, training and affordability.



WRC is an independent nonprofit dedicated to driving sociotechnical solutions for improving communities.

Like Electricity and Highway Systems, Broadband Positioned to Massively Increase Opportunity

Universal High Performance Broadband + Digital Skills Training & Job Pairing, Building Career Ladders



The opportunity exists at this important juncture to demolish yet another societal inequity - more than 150M people in the United States do not use high-speed internet access services (Source: Microsoft).

Digital skills training and job pairing, combined with high performance (100Mbps) connectivity, we will increase opportunity, income and livelihoods, solving the affordability issue through increased competition and higher wages.

We have a once-in-a-lifetime opportunity to seize and solve the digital divide and create a new generation of knowledge workers while ending disconnection and cycles of poverty left over from past generations.

With the cost of capital at an all-time low, added to record federal stimulus funding (much of it specifically targeted for broadband, affordability and workforce development), now is the time to think big and creatively, WRC is uniquely positioned to see this strategy from the drawing board to reality.

“The nation is finally moving beyond talking about the digital divide to actually doing something about the problem...”



- Tom Wheeler, former FCC Chair

What's Missing?

An Independent Instigator Focused on Equity, Best Practices, Planning and Implementation



For decades, splintered and ineffectual programs have attempted to stem the issue, combined with incumbent market players whose motivation and loyalties in the end are to their shareholders and share prices.

It is time for a new playbook that combines *improving livelihoods while lowering societal costs* - this can only be accomplished by looking at the solution and opportunity as a Sociotechnical System (society + technology).

WRC stands in the middle of existing & siloed sectors and organizations, serving as the connective tissue to solve the digital divide. We are successful founders, operators, engineers and social entrepreneurs - combining our decades of experience, we take an integrated, systems level approach, sourcing the best each sector has to offer while keeping equity and community at the center.

“ The nation as a whole is at risk of being left behind in the digital age. ”



COUNCIL *on*
FOREIGN
RELATIONS

100

Independent.

Experience.

*Focus on Equity, and
Measurable Results.*

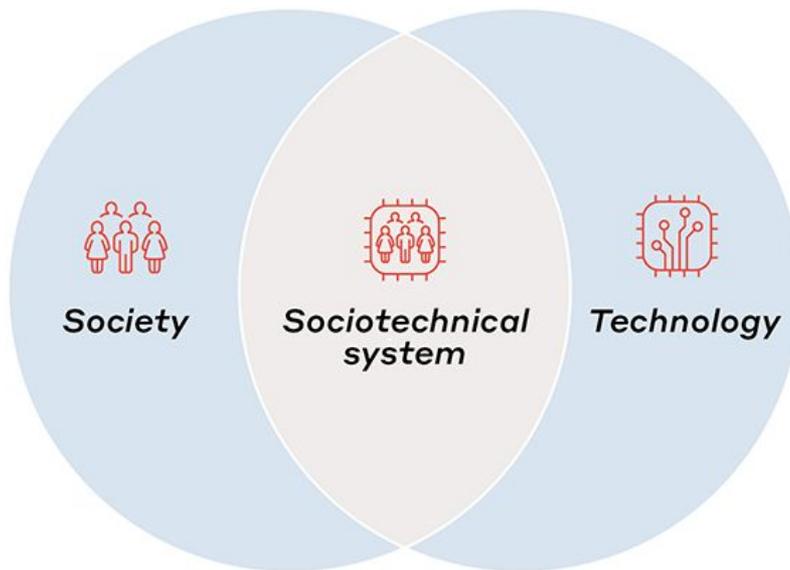
New Playbook

WRC's Sociotechnical Approach



Society

- Equity and Truth
- Jobs - economic development - Digital skills gap, over 1/3rd of workforce not ready
- K-12 Education, homework, remote learning
- Industry Ready to Partner: HealthTech, AgTech, ForestTech
- Civic participation
- Service delivery
- Public safety / elderly services



Connected Communities
DigitalBridge

Infrastructure

- Urban affordability and digital skills hinder adoption
- Lack of Rural Open Access, Competitive Networks
- Market solutions not solving digital divide, growing every year
- Many tech solutions ready to serve, including:
 - Fiber
 - Mobile: 4G, 5G, LTE
 - Citizens Broadband Radio Service (CBRS)
 - Satellite / Low Earth Platforms

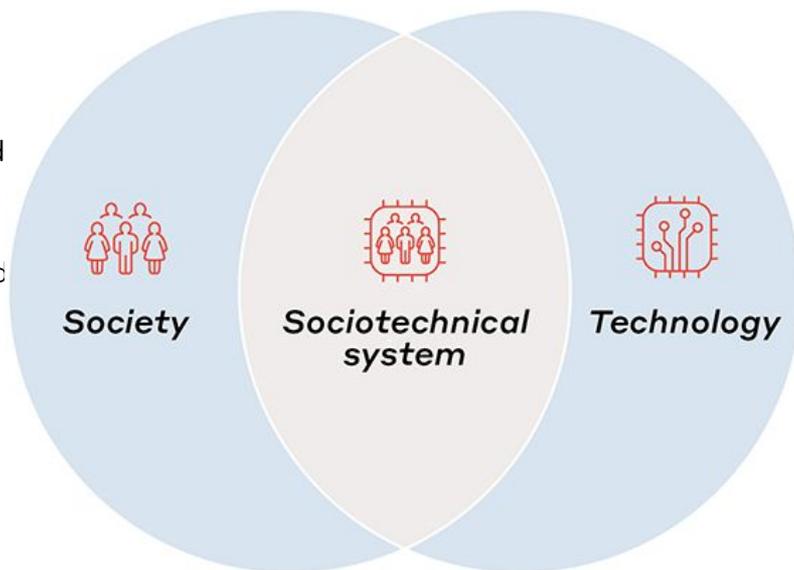
New Playbook

Improving Livelihoods While Lowering Societal Costs



Learning from Past

- Digital divide solutions both siloed and parochial environment
- Project largely envisioned by the community and/or government and funded by government
- Market forces and design not reducing digital divide
- Covid-19 pandemic shining a spotlight on the urgency of digital divide



Connected Communities *DigitalBridge*

The Opportunity Now

- Link the three pillars of digital education, healthcare, and workforce development at the household level
- Deploy Open Access networks to supplement market
- Removing geography from the equation, focus on fast track digital / remote career paths
- Increase civic participation
- Better health, education and job outcomes increase public revenues and decrease costs
- Improving health, education and job outcomes lowers societal costs while increasing tax revenues

Connected Communities Innovation Corridors

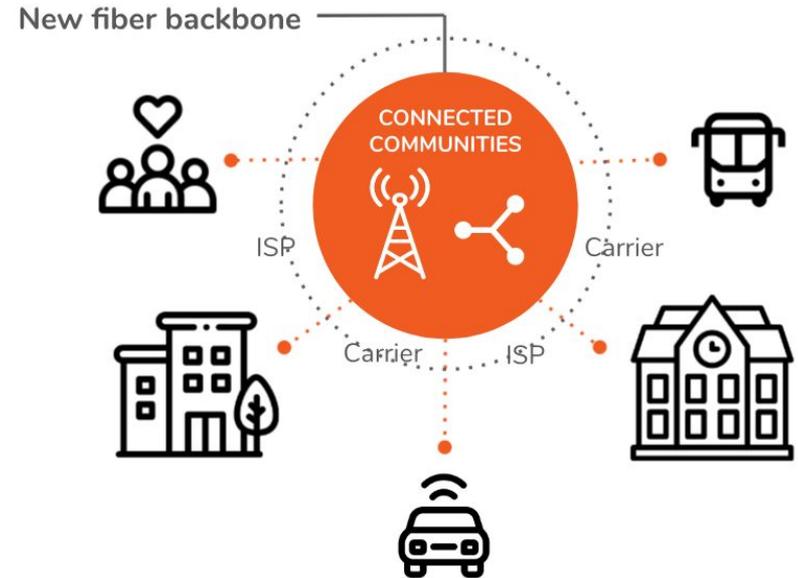


Vision: Like Electricity and Highway Systems Achieved, Digital Infrastructure is the Key to Increased Opportunity

Problem: Both urban and rural areas are not taking advantage of the incredible advances offered by ubiquitous, always-on high performance connectivity and the systems & advancement it enables.

Opportunity: We call these *Connected Communities Innovation Corridors* - from connecting the unconnected, to healthcare delivery, transportation, emergency management, and natural disasters the possibilities for efficiency, job creation, saving lives and costs are limitless.

Proposal: Building on our work in North Carolina, Colorado, and the USVI - create an action template to fund and deploy Connected Communities Innovation Corridors across the country



Hubs: Modern, Digital Certifications, Job Pairing



Career Pairing

Initial Career Pathways: These certifications allow access to remote jobs that are in demand including existing Marketplaces for full time Remote work as well as gig opportunities.

Grow with **Google**



SUPPORT.COM

National Cyber Scholarship



Participating employers include:



Deloitte.



T-Mobile



verizon✓



[A proprietary list of Additional Remote Jobs can be found here](#)

Our Informed Vision, Borne of Experience

Examples of Broadband Equity Projects from the Past Decade



State of North Carolina: Developed and operated In partnership with WRC, NC@High Speed (iConnect NC) is Governor Roy Cooper's multi-layered, interdisciplinary partnership to equitably eliminate North Carolina's Digital Divide and build abundance across the State via 3 pillars: Connectivity (delivery of high performance service), Adoption (eliminating encumbrances) and Abundance (maximizing opportunities).



United States Virgin Islands: WRC team members helped create, develop and lead an organization that won a U.S. Dept. of Commerce stimulus grant, securing over \$100M in funding to lay a new fiber infrastructure in the USVI. As part of the grant, we founded and operated ConnectSpaceVI, which trained thousands of people and helped provide job pathways to the broadband economy for the entire Territory.



Grand County, Colorado: Over 2020 and 2021, WRC has developed a three-pronged Digital Economic Resiliency Platform: Broadband Workforce Development, ForestTech Center, and Open Access Network, all tailored for Grand County's economic landscape, local, state and federal forest lands, educational institutions, COVID impacts, and the recent wildfires,



National U.S.: The first national voice & data telecom carrier with a social impact mission, founded and operated by WRC team members - founding B Corp. member.

WRC in the Headlines

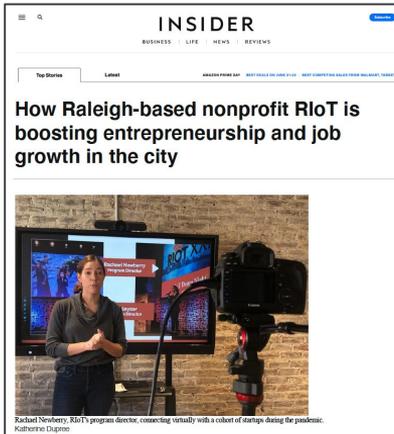
Digital Equity, Innovation and Leadership



WRC's Digital Divide playbook and partnership with NC helps create first statewide Office of Digital Equity



WRC's Colorado Workforce Development, Open Access Broadband and ForestTech Initiatives Make the Headlines



WRC's RIoT featured in Business Insider for groundbreaking economic development through accelerators and entrepreneurship training in the Mid-Atlantic region



WSJ highlights WRC's Wireless Research Center leadership and research on how 5G can be used to help manage climate change

Deploying Equity, Eliminating the Digital Divide



A Measured Plan informed by experience, passion and results

WRC Process

Develop

Create playbook (funding, design, implementation) for solving community-level connectivity + digital skills + affordability solutions. Develop model that is executable and portable in any community.

Deploy

- National Innovation Digital Skills Hub online and available to any household / community
- High Performance Open Access Playbook completed and first engagement signed

Measure & Scale

Utilizing leading edge measurement & evaluation systems/techniques to help scale the impact, equity and number of engagements, both direct (WRC engaged) and indirect (virtual)

WRC Toolkit

Digital Skills

Develop a nationwide virtual hub - increased wages and opportunity for ALL. We pair all program participants with career opportunities & work with various corporate and other partners to develop bespoke training.

Connectivity

From building and operating networks ourselves, to tailoring our plan and assisting communities, nonprofits and for profit / for good community networks implement higher speed / lower cost solutions.

Affordability

Tackled by increased competition and higher wages gained through other two legs of the stool, but we will also educate and advocate for stipends and assistance where necessary.

Our National Business Plan / Conclusion

Win Win for People + Public & Private Sectors



People

- Improved livelihoods
- Fulfilling career path replaces one and done/minimum wage jobs
- Remote education access and understanding
- Telehealth
- Community connection
- Living wage, financial stability
- Empowerment
- Generational wealth, stability, home ownership
- Single parents able to juggle challenges more effectively
- Civic participation

Government

- Higher revenues, tax base and tax rate
- Lower costs: Lower rates of incarceration, homelessness, healthcare, less crime, and other social cost centers/ determinants
- Improved services and connection to communities
- Full circle: Higher tax base and lower costs
- Digital knowledge workers can live anywhere with high performance broadband, revitalize dying towns and areas

Business and Industry

- Hiring one of the most difficult challenges every company faces, we train workers to immediately fill positions
- Increase productivity
- Diversity of workforce increases performance (proven)
- Remove geographical barriers
- Retention: Satisfied and productive employees major boost to bottom line
- Halo: Corporation seen as positive force in the community

Appendix I

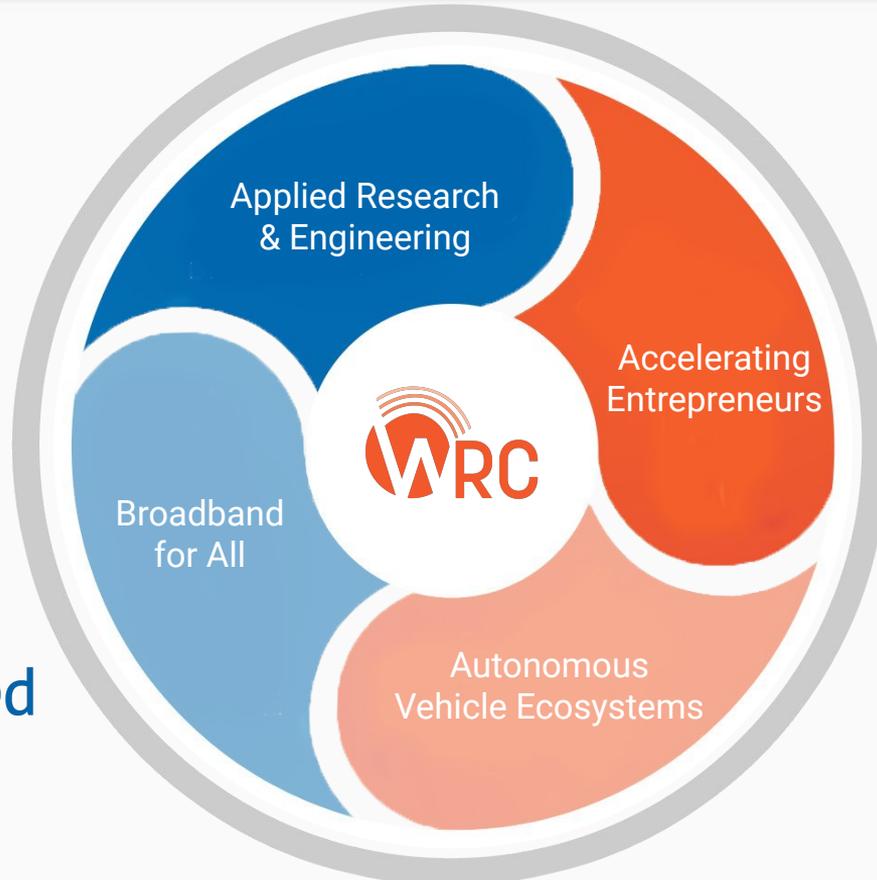
About Us



Founded in 2010 as an independent 501(c)(3) non-profit, WRC is a leader in providing communications solutions for education, healthcare and economic development for the underserved and unserved. Based in Wake Forest, NC (Research Triangle Park) and with offices in Colorado and other regions of the country, WRC has national and global impacts as a:

- Central, shared resource for public and private organizations
- Thought leader in weaving sociotechnical, systems-level & equity-based solutions
- Helping advance communications technologies, training and affordability on a regional, national and international scale.

Strategic Initiatives





Bridging the digital divide with high-speed, open-access broadband networks and programming for underserved communities.

- Public-private Partnerships
- Connectivity & Access
- Digital Skills Training
- Affordability
- Economic Development





ADVANCED MOBILITY
Collective

Bringing new mobility services to life through public-private collaboration.

- Connected and Autonomous Vehicles for Air and Ground
- eVTOLs, UAVs, UAS, UGV
- Advanced Wireless 5G Testbeds
- Economic Development



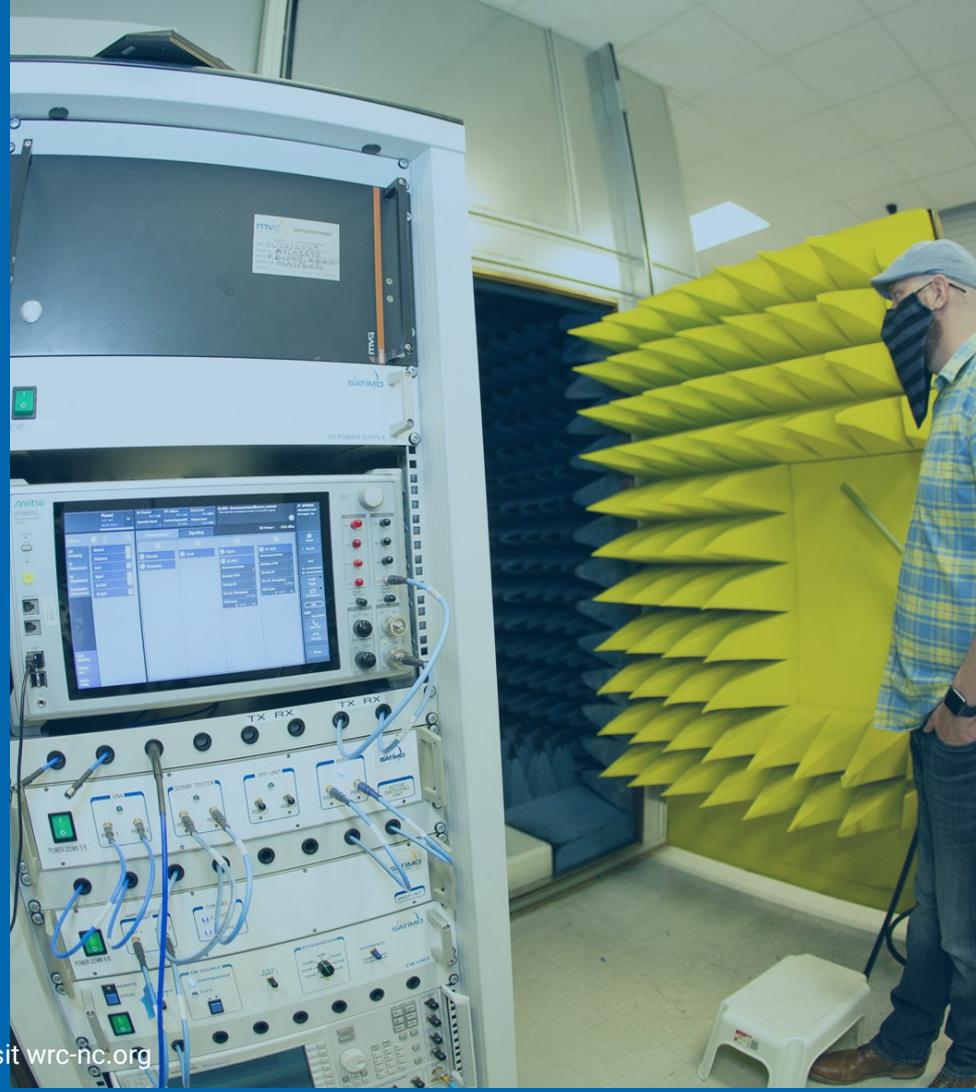
Creating Internet of Things (IoT) opportunities locally, nationally, and globally.

- Economic Development
- Startup Accelerator
- Community Events
- Education
- R&D Lab



Applied wireless research and engineering.

- Engineering and Design Services
- State-of-the-art Facilities
- Certified Testing Lab
- ISO Accredited



WRC Team

United by our experience and passion to make a difference

Gerard Hayes, Ph.D.
President and Founder

Matthew Bauer
Vice President
Connected Communities,
Executive Director

Jeremy Kennell
Program Director,
Connected Communities Digital Hubs

Tom Snyder
Vice President
R!OT, Executive Director



Locations

WRC HQ

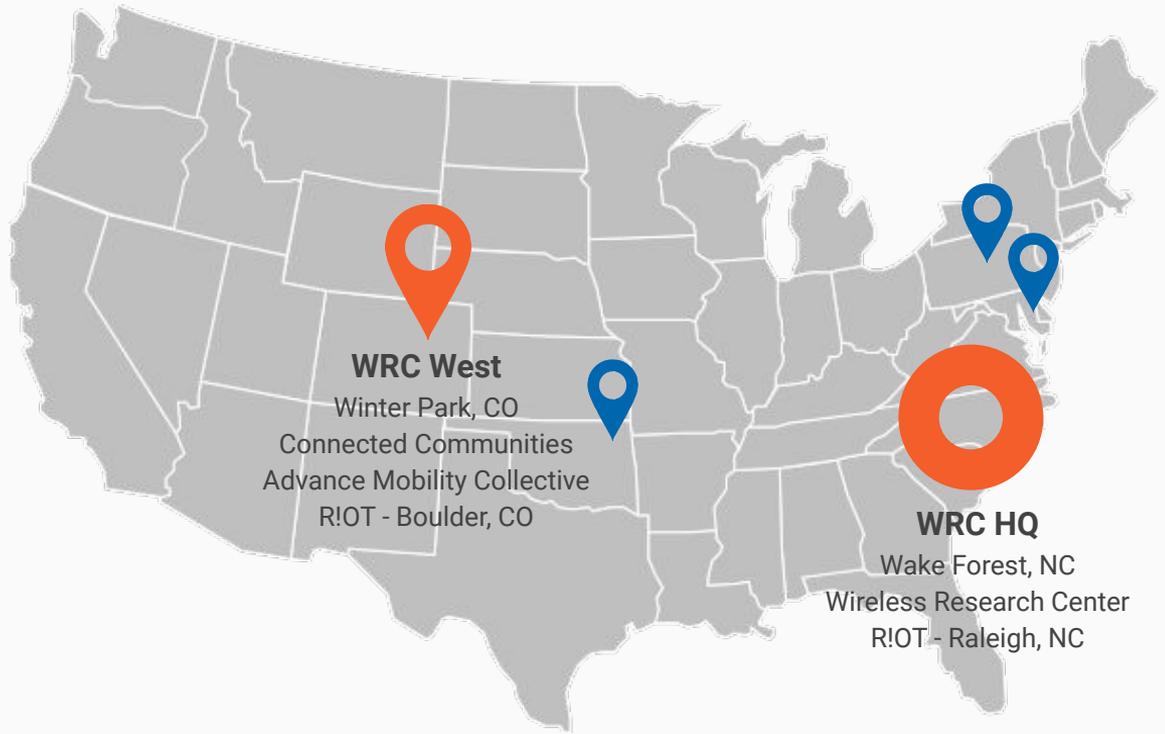
Wireless Research Center
3331 Heritage Trade Dr.
Suite 101
Wake Forest, NC 27587

R!OT

Raleigh, NC
Wilson, NC
Boulder, CO

WRC West

Connected Communities
Advanced Mobility Collective
Winter Park, CO



Appendix II

One source of important data on the digital divide front, effective and accurate mapping, has been at best elusive and at worst, completely inaccurate.

The NC@High Speed partnership has a data driven focus - through project partner Bcombs we are exploring all available data sources (BIO, Policy Data), developing new ones (MLS) to create a comprehensive dataset and mapping system to guide our decision and rollout strategy.

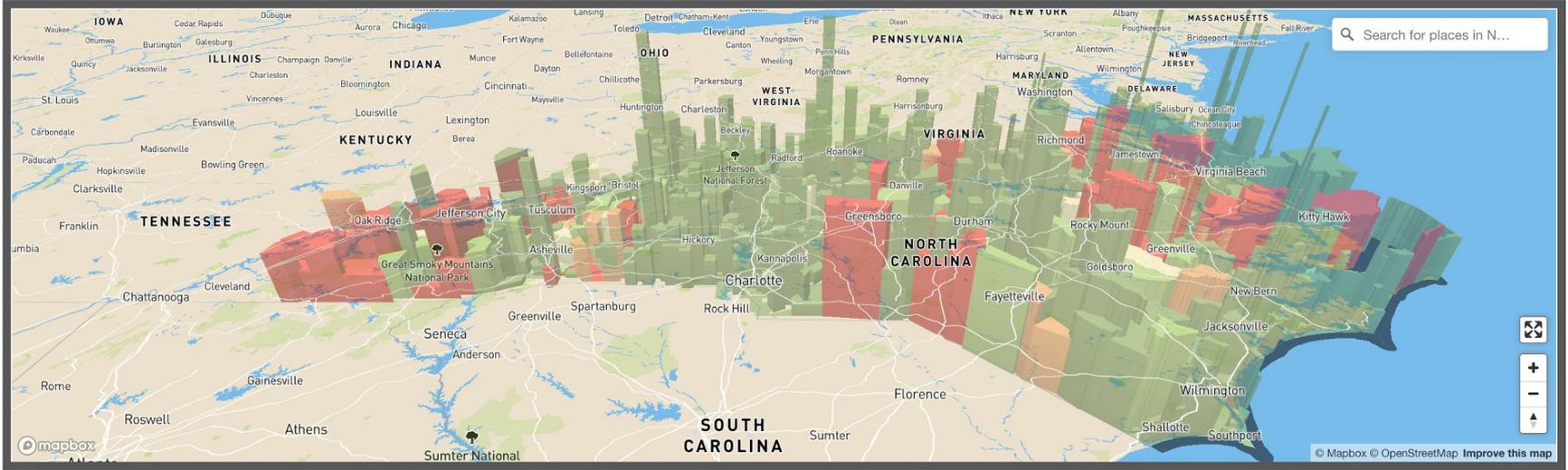
Following are examples of statewide maps melding different datasets and decision making tools.

Reality - Access and Poverty

Combining multiple economic factors, teasing out the true perspective



3D Choropleth Example - Internet Access to Poverty Rate



Legend:

Percent with access to $\geq 100/20$ Mbps:

0 - 12%	20%	30%	60%	100%
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Source: FCC, ACS

Percent in poverty:

Taller bar = higher poverty

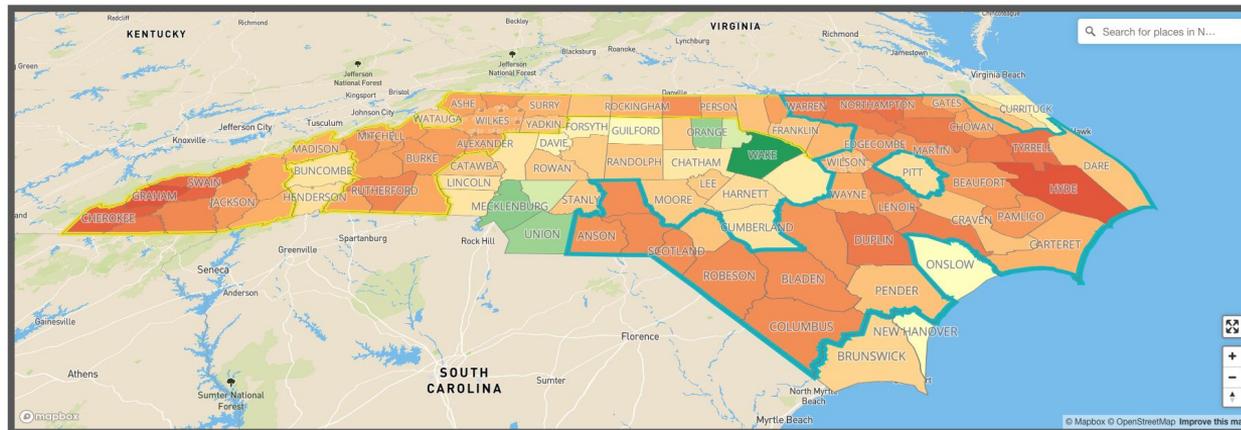
Source: NC@High Speed Proprietary ECI Mapping System

Phased Rollout Design - NC@ High Speed Equitable Connectivity Index (ECI)

Statewide View



Counties by Equitable Connectivity Index (ECI)



Rank	County	ECI
1	GRAHAM	14.55240854
2	HYDE	15.34816479
3	CHEROKEE	19.71179596
4	SWAIN	22.24563123
5	NORTHAMPTON	26.44565227
6	TYRRELL	26.55262429
7	CLAY	28.13174065
8	DUPLIN	29.04111077
9	BERTIE	29.8145908
10	WASHINGTON	30.50100638
11	HALIFAX	30.53024179
12	GREENE	31.30448183
13	WARREN	31.45626871
14	JONES	32.14248019
15	RUTHERFORD	33.83750936
16	MACON	34.8459807
17	HERTFORD	36.0580426
18	COLUMBUS	36.34724839
19	ROBESON	36.40627071
20	RICHMOND	36.57829444
21	MONTGOMERY	36.87802973
22	SCOTLAND	36.97481774
23	BLADEN	36.98242694
24	CASWELL	38.14715895
25	ANSON	39.31106199
26	LENOIR	39.44518056
27	EDGECOMBE	39.94173477
28	SAMPSON	40.11502082
29	MARTIN	40.16857073
30	ALLEGHANY	41.45364955
31	YANCEY	41.69813791
32	PAMLICO	42.02891194

County Rankings - ECI

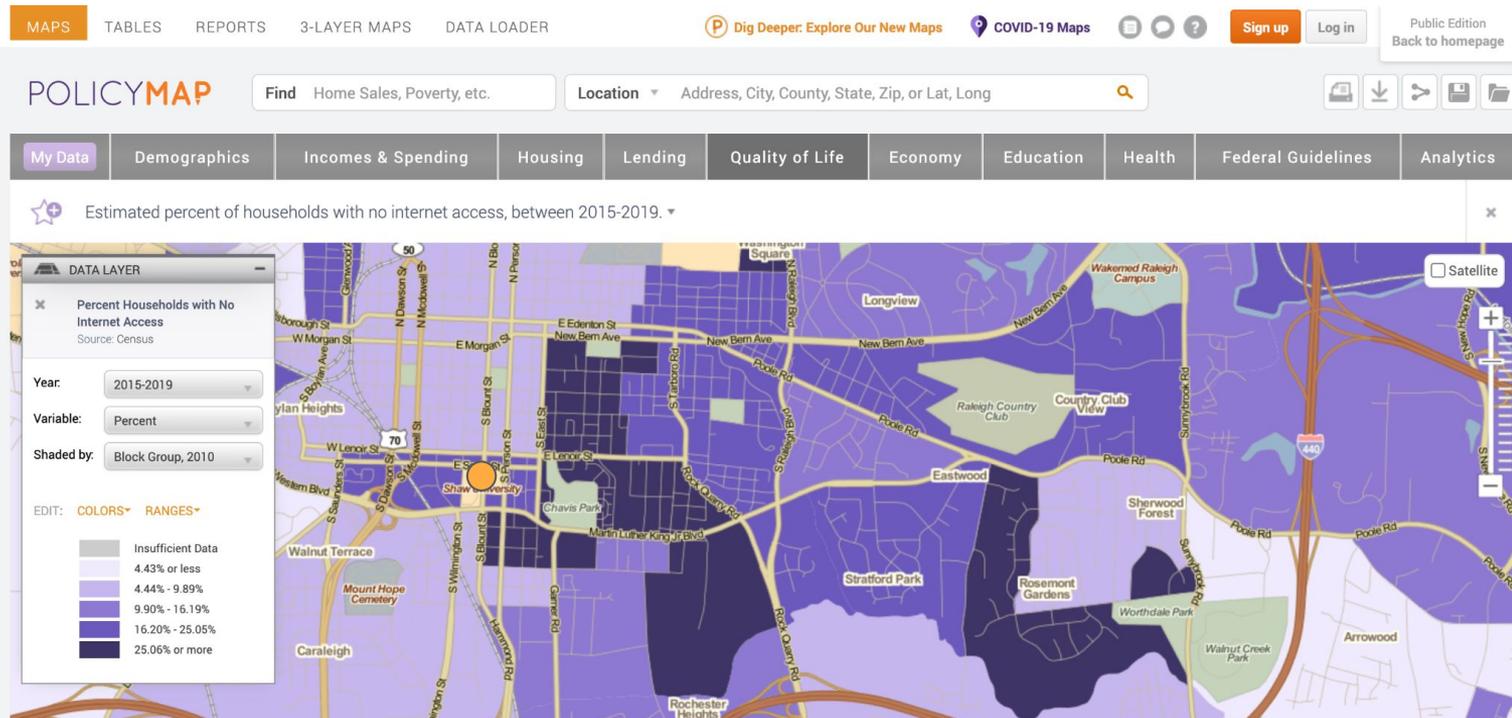
Rank	County	ECI
100	GRAHAM	14.55
99	HYDE	15.35
98	CHEROKEE	19.71
97	SWAIN	22.25
96	NORTHAMPTON	26.45



How ECI Is Calculated
 ECI is calculated taking an equal weighting of normalized z-scores for each:
 Counties broadband availability
 Broadband adoption
 Proximity to a metro area
 Median income

Mapping Neighborhoods Most in Need

Strategically located to maximize opportunity and impact -
Shaw Campus, Downtown Raleigh Example



Proposed:
NC@High Speed
Shaw Hub

25%+ of
households in
many sections of
area do NOT
have high speed
Internet access

Source:
PolicyMap

“It’s no longer a luxury. This is serious. It’s really a social justice issue. It’s a 21st century civil rights issue.”

- Cheptoo Kositany-Buckner



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