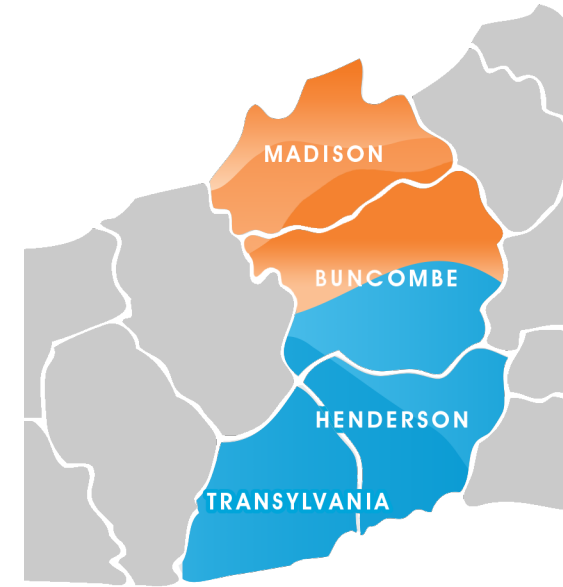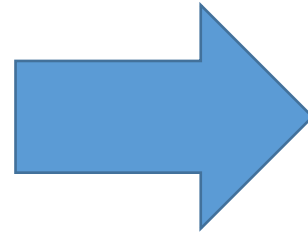# A Conversation About High Speed Broadband!

WEST NGN broadband

Our dog Zack!

Using NGN Model in Western North Carolina

Creating a public – private partnership under auspices of Land of Sky Regional Council

Four Observations + Bonus!

- Broadband literacy is useful
- Gigabit speeds are needed
- Private/Public Partnership is the "model" to use
- West Next Generation Network initiative is "happening"

- Bonus: What you can do & conversation

But first - who we are!

Self introduction:

MSU Grad – married with 2 grown children

Michigan State Senator (R- East Lansing)

University President
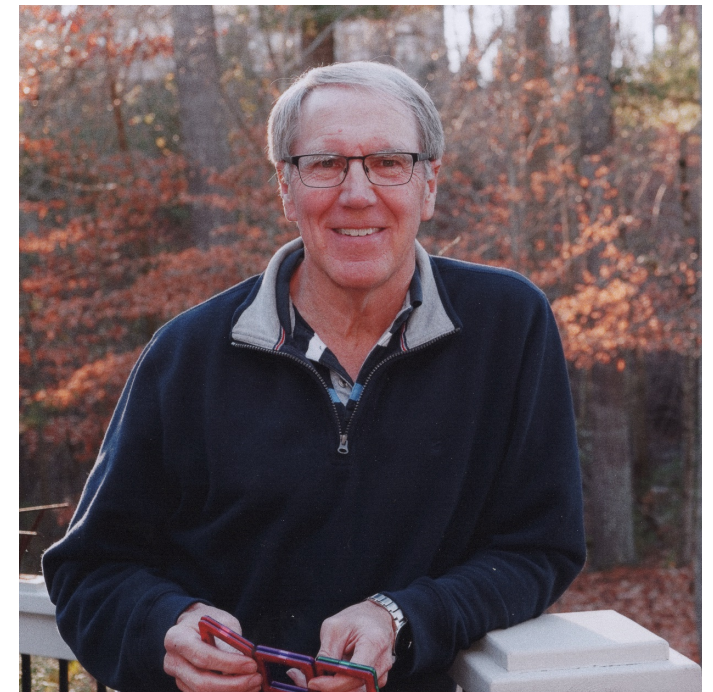   Ferris State University
    Utah Valley University
    UNCW Interim Chancellor

Utah Commissioner of Higher Education

Retired to Enka, NC in 2012

OLLI Member Since 2012

Michigan State

Vs

Michigan
Oct. 20

Dr. Michael Dempsey

- Dean of Lenoir-Rhyne University's Center for Graduate Studies of Asheville.

- 12 years as director of community partnerships for A-B Tech

- Member, Board of Directors for the Martin Luther King, Jr. Association of Asheville/Buncombe County and the Raphael Guastavino Museum.

- Degrees in philosophy, history, and educational leadership.

Mike, explaining the wonders of gigabit network speed to the media.

Mr. Hunter Goosmann

- Executive Director and Chief Executive Officer of the Education & Research Consortium of the Western Carolinas, Inc (ERC, dba ERC Broadband)

- Board of Directors for the North Carolina Technology Association, the Board President of the Bob Moog Foundation.

- He is also currently an adjunct professor of Management at UNCA, photographer, soccer referee, and guitarist.

Hunter, counting his fiber strands!

Ms. Erica Anderson

- Director of Economic and Community Development – Land of Sky Regional Council

- Responsible for planning for land use, conservation, water management, transportation and GIS systems (among others)

- Master of Urban and Regional Planning, Virginia Polytechnic Institute and State University

Observation 1: Public understanding of broadband is fundamental to our "success."

One computer to another through packet switching.	ARPANet four computers connected	Vincent Cerf and network Transmission Control Protocal (HTTP)
1965	1969	1970s

Observation 1: Public understanding of broadband is fundamental to our "success."

Jean Armour Polly – Librarian U. of Minn.
1992
AKA   "Net Mom"

One computer to another through packet switching.

ARPANet four computers connected

Vincent Cerf and network Transmission Control Protocal (HTTP)

1965   1969   1970s

Observation 1: Public understanding of broadband is fundamental to our "success."

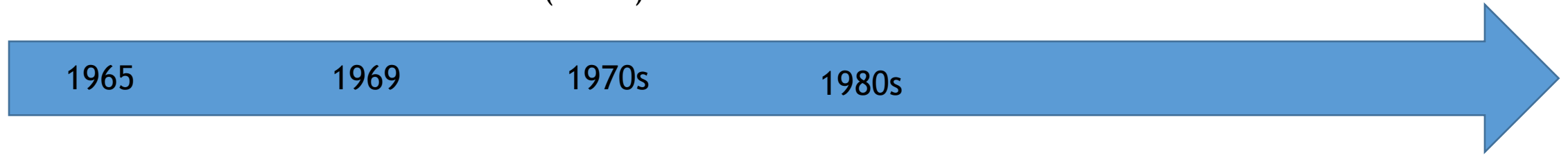| One computer to another through packet switching.	ARPANet four computers connected	Vincent Cerf and network Transmission Control Protocal (HTTP)	Telephone modems & bulletin boards
1965	1969	1970s	1980s

ON-LINE WITH A MICHIGAN STATE SENATOR

The All-American admonishment to "write your representative" about a political gripe may be easier than many computer users know. At least for concerned constituents in Lansing, Michigan, contact is just a few keystrokes away.

State Senator William Sederburg went on-line almost a year ago, opening an electronic mail-box for computer-using constituents to call, express concerns, offer information, and explore with him the new communications tools of public electronic bulletin boards. Now, 10 months later, he's thinking of splitting the Political Forum bulletin board system (BBS) into several systems by topics or going to a multiuser system. The board is so popular, he has trouble signing on to answer his mail.
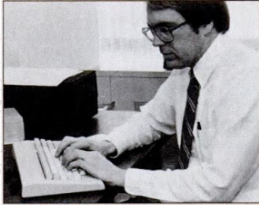
"It has far exceeded our expecta-

away from high-level languages. He has a Vector Graphic in his office and a Zenith 150 at home, where he does most of his bulletin board watching.

Still, he notes wryly, his legislative colleagues apparently consider him a bit of a whiz and back off from starting bulletin board systems of their own. "That's one of the great surprises," Sederburg says. He says many of his fellow legislators apparently underestimate the number of constituents with computers and modems, and doubt an electronic bulletin board would be a worthwhile outreach project. "I suspect they're not aware of how widespread it is."

Sederberg acknowledges that quite a few of his early callers were from nearby Michigan State University. He also sees that as an opportunity to reach the young,

William Sederburg, a state senator on-line

Nations first legislative "on line constituent service" and state hearing on a computer bulletin board system

One computer to another through packet switching.

ARPANet four computers connected

Vincent Cerf and network Transmission Control Protocol (HTTP)

Telephone modems & bulletin boards

| 1965 | 1969 | 1970s | 1980s | 1990's | 2000's |

Observation 1: Public understanding of broadband is fundamental to our "success."

Sir Timothy John Berners-Lee

One computer to another through packet switching.	ARPANet four computers connected	Vincent Cerf and network Transmission Control Protocol (HTTP)	Telephone modems & bulletin boards	World Wide Web using hypertext transfer protocols
1965	1969	1970s	1980s	1990's

Observation 1: Public understanding of broadband is fundamental to our "success."

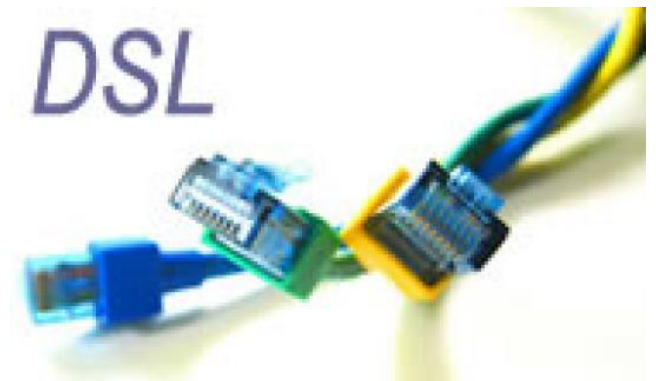| One computer to another through packet switching.	ARPANet four computers connected	Vincent Cerf and network Transmission Control Protocal (HTTP)	Telephone modems & bulletin boards	Tim Berners-Lee invented World Wide Web	Phone lines split into "Broadband" carriers – wire and wireless
1965	1969	1970s	1980s	1990's	2000's

And the race was on!

- Medium of transmission –
  - Coaxial Copper Cable   -   traditional cable TV
  - Twisted Pair Copper Cable – Digital Service Line (DSL) – AT&T Uverse
  - Optical Fiber – glass fibers (human hair size)
    - Speed of light
    - Huge capacity
    - Doesn't "degrade" easily
    - Easy maintenance
  - Wireless – 4G and soon 5G WI-FI (fifth generation)

DSL

Observation 2: Gigabit speeds are needed.

- Network to carry the transmission close to customer
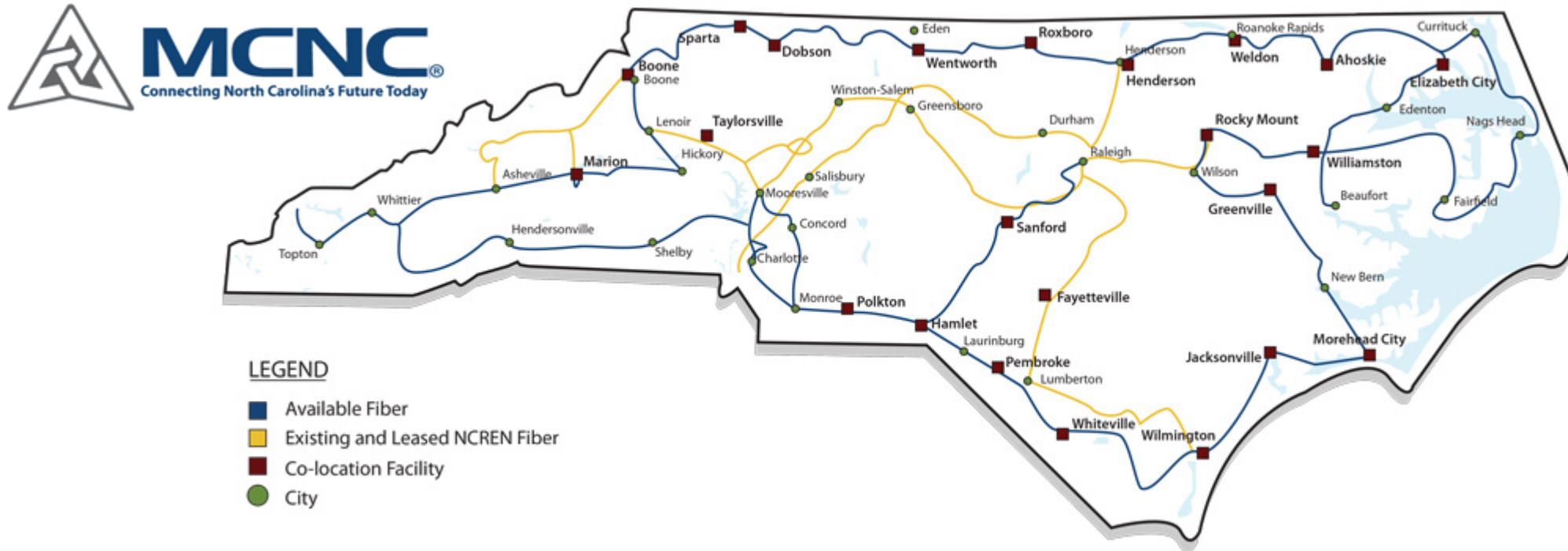
+

- Demand to drive business opportunities

Regional Vision Profile

erc
Connect to Something Bigger.

Digital Factoids

- The digital universe consisted of 281 exabytes (281 billion Gigabytes) in 2007
   45 GB for EVERY person on the planet

- The amount of information created, captured or replicated exceeded available storage for the first time in 2007 (info is email, images, phone calls, social media, just plain ole data !!)

- Global IP traffic reached 1 Zettabyte in 2016 and will triple by 2021 to 3 ZB
    1,000,000,000 Gigabytes = 1 Zetabyte / 5 Exabytes = all words ever spoken by humans
      (DVD, RFID, Digital TV, MP3, Digital Cameras, Camera Phones, VOIP, Medical Imaging, Laptops, Games, DataCenter Applications, GPS, Satellite Images, Scanners, ATMs, Sensors, Digital Radio, Email, Instant Messaging, Video Conferencing, Security Systems, CAD/CAM, Appliances)

- YouTube used as much bandwidth in 2007 as the entire Internet in 2000

- As of Oct 2018 there are 1.9 billion + websites on the Internet

- Almost 4 million photos are uploaded to Instagram and 250 billion emails sent daily

- 4 billion (out of 7 billion on earth) are online

- The result of this growth is the installation of 100 Gigabit equipment (which grew by 450% in 2016)
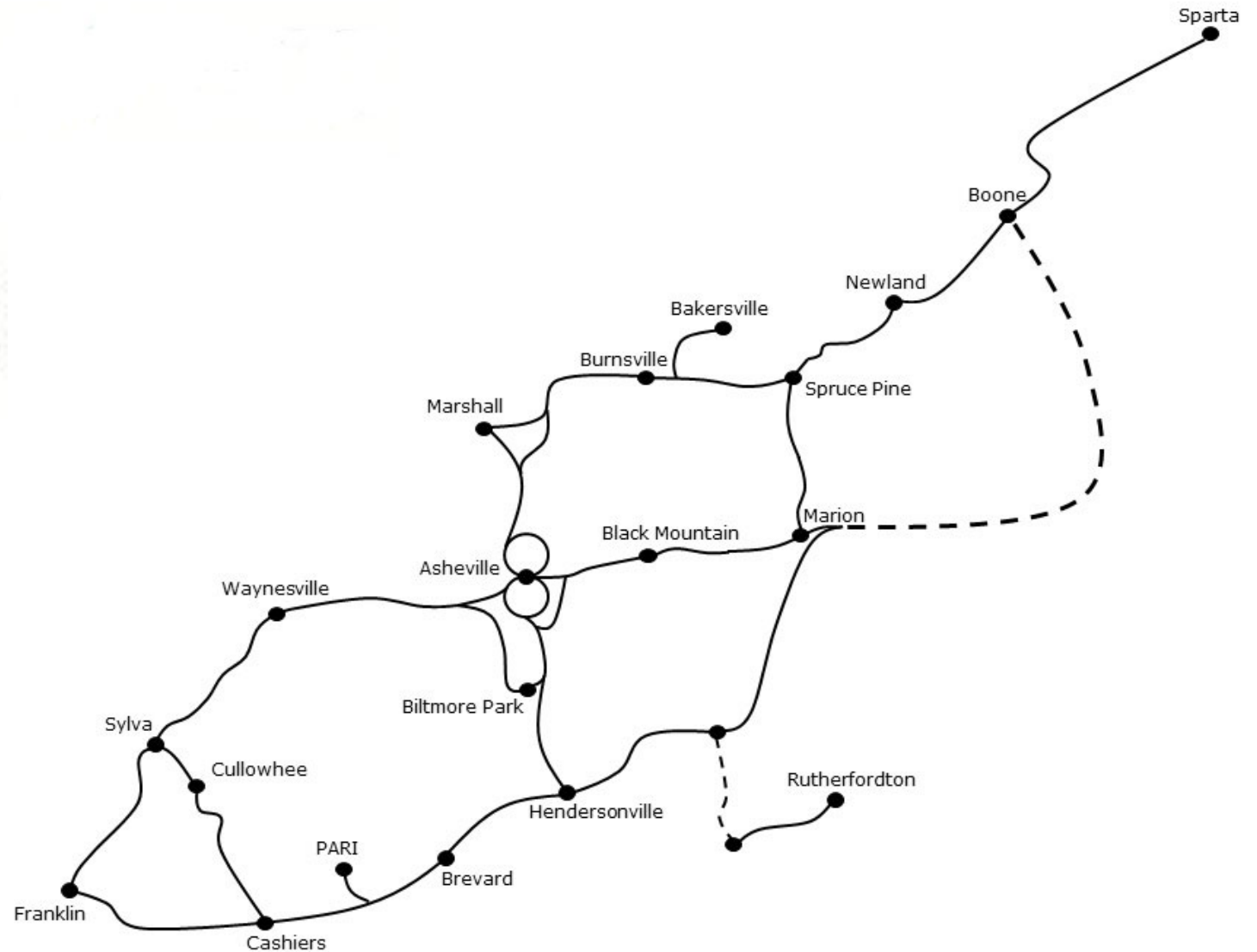
What Drives Growth

- 3 digital conversions (1) images, (2) voice, and (3) IPTV / video
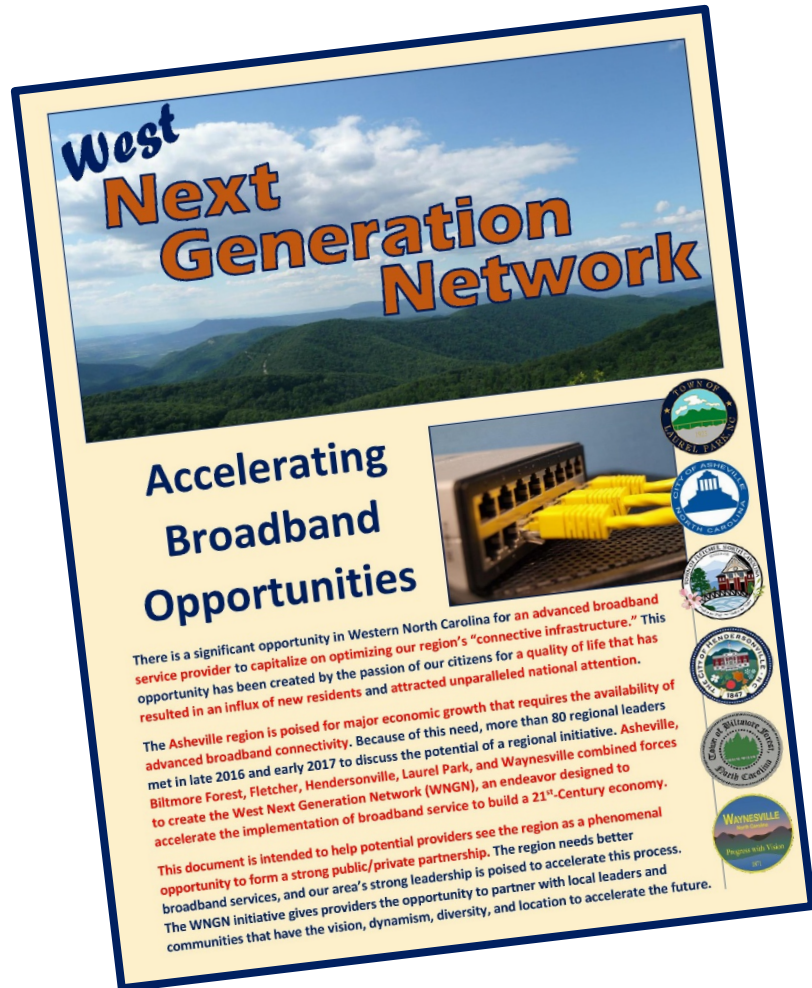- What middle mile networks carry this traffic in North Carolina ?

How will we reach rural communities ??
- "Old" copper wiring
- Wireless (P2P)
- Fiber Optic Cable
- Cellular (5G)

Observation 2: Gigabit speeds are needed.

Regional Vision Profile

University team
Dr. Mike Dempsey
Dr. Ed Katz
Graduate Students

A Place People Want to

An Area Poised for

The Asheville region is **expected to grow significantly over the coming decades**. The growth is likely to be from the **migration of highly educated young people and economically secure retirees**. The statistics are compelling:

Population → By 2036 Buncombe, Henderson, Madison and Haywood counties are expected to have a combined population of 552,056 residents, up from 425,494 in 2010.

Jobs & Income → According to the Bureau of Labor Statistics, Buncombe County is in the top 10% for job growth and top 1/3 for wage growth among nation's largest 345 counties.

Educated → 59% of adults ages 25-44 have an associate's degree or higher, and 50% of adults ages 45+ have an associate's degree or higher (TownCharts.com).

Young → Median age is 42 – 36% of the population is between the ages of 30 and 50 (2010 Access NC).

Not-So-Young → Population of people ages 65 to 74 expected to grow 21% by 2020 (Asheville Citizen-Times).
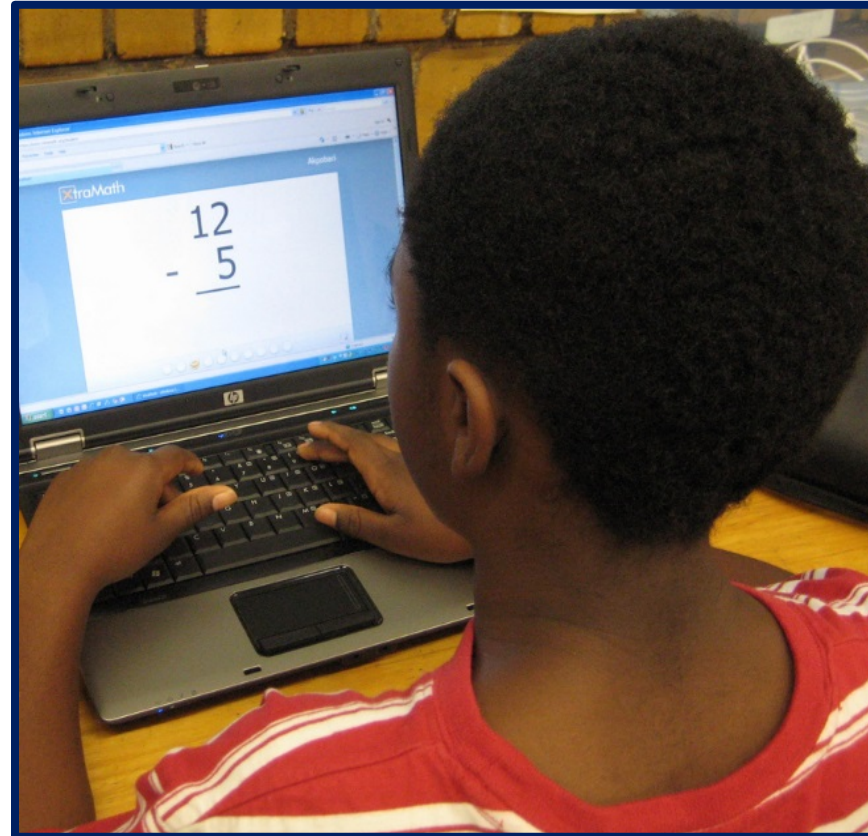
Education

High-speed internet is needed to boost learning

Increased delivery of content.

Streaming capabilities that connect students and increase access to learning resources.

More collaboration with artists, scientists, statisticians, and other experts in remote areas.

Heightened capabilities for

Improves effectiveness of instruction through more engaging, interactive activities.

Encourages innovation in how education is delivered, including hybrid approaches to teaching.

Allows students to engage in activities that refine and extend technical skills.
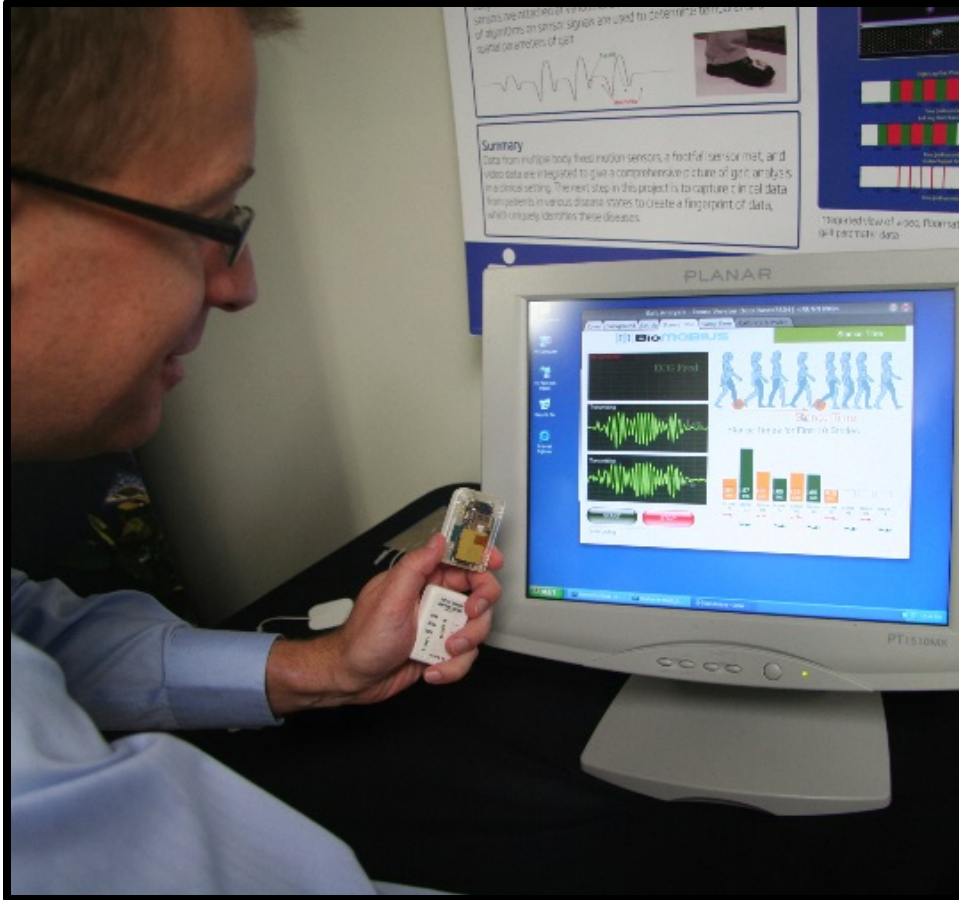
Facilitates the collection and analysis of greater amounts of student-performance data.

A MBA in Social Entrepreneurship class meets at Lenoir-Rhyne University's Asheville campus.

Healthcare

Advanced broadband strengthens medical services

Real-time transmission of medical imagery enables the interpretation of diagnostics to be performed remotely.

Patient visits can be reduced through remote monitoring, online consultations.

Broadband allows physicians to connect with distant specialists for real-time guidance in emergency situations.

Government
Broadband = Efficiency, public safety, better value

Extensive broadband is a prerequisite to creating a "smart city." "Smart cities" collect, analyze, and communicate data to enhance sustainability livability, and workability. Information is collected through sensors and other devices. The data are "crunched" to understand current situations, as well as to predict future occurrences.

Energy
- Smart electrical grid & energy planning
- Electronic metering of homes, businesses
- Strategies for renewable energy management

Safety and Security
- Integrated operations centers
- Lighting efficiencies
- Public transportation route management
- Electronic security systems

Health
- Telehealth monitoring in the home
- Telecare via video conferencing
- Mobile clinical assistance

Transportation
- Supply chain and logistics management

"Our first responders stake their safety daily on the ability of large amounts of information to be communicated immediately during difficult situations."
Scott Burnette, City of Asheville Fire Chief

Tourism

Service providers & visitors crave better access

Broadband-supported virtual reality plays a key role when tourists access information about museums, hotels, restaurants, and events.

Allows conference speakers and attendees to simultaneously access internet during large meetings and presentations.

Expands marketing opportunities that allow hoteliers and other industry experts to utilize state-of-the-art software programs that are instrumental for growing their businesses.

Improves the quality of industry services, particularly in the area of cloud-based software systems.

"Meetings mean business in Asheville and broadband is essential for successful group events. High-speed connectivity is a requirement for today's technology-intensive tourism industry, which generates revenue for local businesses and supports 27,000 jobs in Buncombe County."

Stephanie Pace Brown, CEO, Explore Asheville

Advanced Manufacturing

Efficiency will be maximized with broadband's help

Respondents to a survey distributed to WNC manufacturers indicated broadband would serve them by:

- Allowing for greater efficiency in customer service

- Providing access to online training for remote workers

- Increasing the speed of business and responsiveness

- Improving logistics by serving needs of global consumers

- Automating sales processes, due to increased availability of real-time customer data and reduced response time

- Boosting remote access to assembly lines and machines

Observation 3: Gigabit service requires effective public/private partnerships!

Multiple players in the broadband "space."

Government –
    Schools, Universities
    Transportation
    Cities/counties
    Planning councils
Private –
    Backbone carriers
    Service providers (At&T, Charter, etc.)

NC Legislature bans counties & cities from providing customer broadband services directly.

Observation 4: Our regional response is the West Next Generation Network initiative!

- Leveraging current assets to build a strong public/private partnership

Leadership Interest

- Mayors
- Council Members
- County Commissioners
- College Chancellors
- School Superintendents
- Economic development leaders
- Many others …

Faux representation of leadership interest!

Mayor Manheimer, Mayor Volk, Commission Chair Newman, LOS Director Hembree, Supt. Baldwin, Chancellor Grant and many others.

Gigabit speeds will ultimately be offered in the region at reasonable cost.

The issue is moving the region ahead of others for investment.

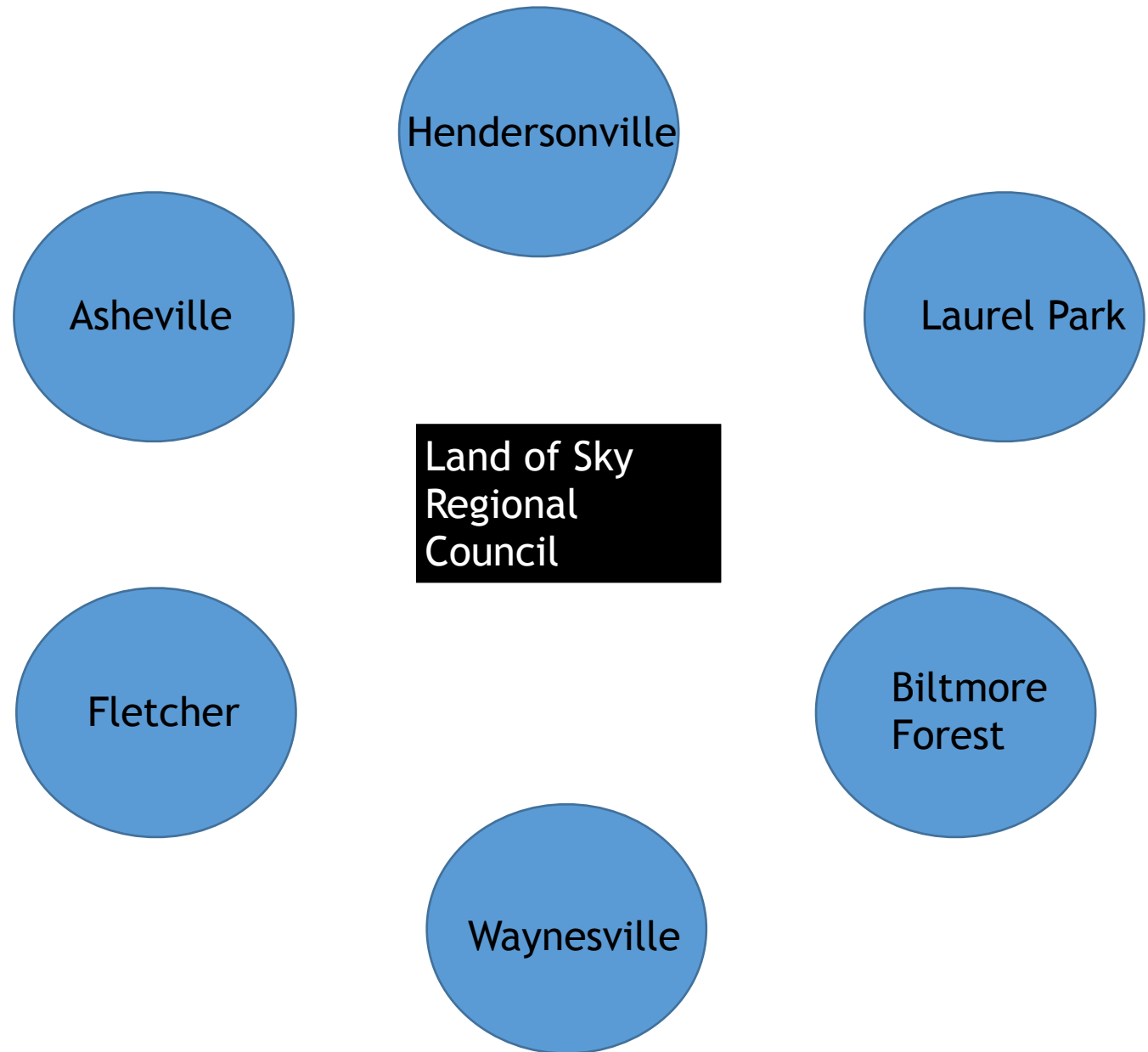NGN Strategy without a big pot of money!

Reduce Cost

Assist Utilization

Private Sector Engagement

WNGN - Two Phases

- Phase 1 – Urban areas along fiber networks with available "dark fiber"
  - Asheville, Waynesville, Hendersonville, Fletcher, Laurel Park & Biltmore Forest
  - Excluded a number of interested communities & areas

Six communities created West Next Generation Network (WNGN)

Hendersonville

Asheville

Laurel Park

Land of Sky Regional Council

Fletcher

Biltmore Forest

Waynesville

Along fiber optic backbone!

Cost & Convenience

Request for Negotiations

Erica Anderson – Land of Sky
John Connet – Hendersonville
Jonathan Kanipe – Biltmore Forest
Alyson Alexander   - Laurel Park
Mark Biberdorf - Fletcher
Jonathan Feldman – Asheville
Jon Feichter – Waynesville

Utilization

Regional Vision Profile

University team
    Dr. Mike Dempsey
    Dr. Ed Katz
    Graduate Students

Resulted in 2 New Providers in Region

- RiverStreet – Wilkesboro Telecom Cooperative
  - Interested in connecting Saluda with Barnardsville
  - Payback requirements allow more rural strategy

- Hotwire – new to North Carolina
  - Interested in partnering with governments creating their own networks
  - Big gigabit provider in Florida and 6 other states

Current status

- Hotwire

  - On hold until new city and county managers are appointed.

Hotwire
COMMUNICATIONS

Current status

- RiverStreet – public conversation

  - Dec. 4 – 10 AM Biltmore Forest Town hall
  - Dec. 4 – 6 PM Fletcher Town Hall

  - Dec. 5   - 6 PM Hendersonville Town Hall
  - Dec. 5 - 10 AM Laurel Park Town Hall

WNGN - Two Phases

- Phase 2 – Less urban areas in Land of Sky service region (Henderson, Transylvania, Buncombe & Madison Counties)
  - Planning grant from Appalachian Region Commission (ARC)
  - Inclusive strategy

Phase 2: Building <u>regional</u> collaboration

- Conversation with regional leaders about what we need to do

- Appalachian Regional Commission Grant
  - Utilize Phase 1 work
  - Analyze current situation
    - Vertical assets
    - Fiber assets
  - Identify pressing needs

What you can do.

- Participate in WNGN Surveys

- Assist with usage study in partnership with UNCA

- Convey your support to local and state leaders