



# **Building Network Values: Broadband as an Economic Development Tool**

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**Pennsylvania Economic Development Association**  
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**Broadband**

**Rural/Urban**

**PA**

**Smart Rural  
Community**

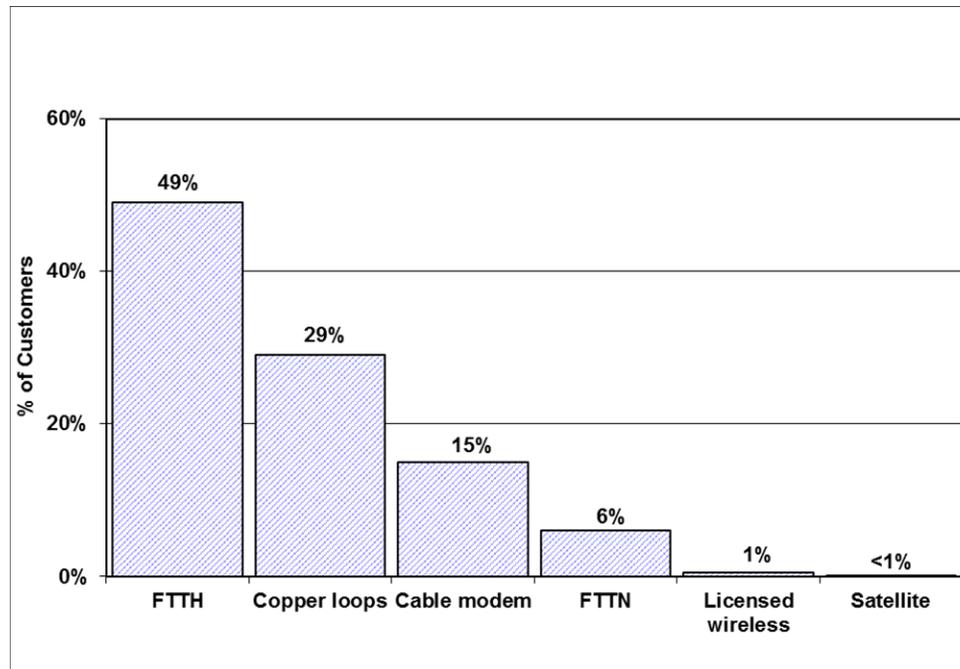
# Questions Presented

- Does broadband stimulate economic activity?
- Does rural economic activity affect urban regions?
- What are the potential impacts for PA?

# Introduction

- NTCA-The Rural Broadband Association
- Members provide:
  - Wireline and wireless voice
  - Broadband
  - Video

# NTCA 2016 Annual Survey



# Factors in Rural Deployment

- Capital intensive network
- Population density
- Geography and terrain
- Regulatory inputs

# Broadband



*“In the global economic competition, we really need to make sure that we play with our full team . . . And the only way they will be able to do that is if they have access to broadband.”*

Norman Jacknis, ICF

# Broadband as a Generator

- Direct and indirect impacts
- Expands supply networks, customer bases, access to information
- Difficulties in quantifying

# Broadband as a Utility\*

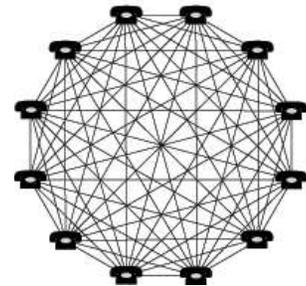
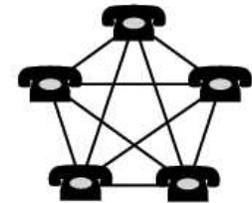
*“ . . . in the long-run, public infrastructure investment is positively correlated with input demands and output supply.”*

Richard A. Krop

*\* literally, not legally*

# Metcalfe's law

- “Network value”
- The value of a telecom system is proportional to the square number of connected users on the network





*“You can see the computer age everywhere but  
in the productivity statistics.”*

Robert Solow, MIT

# Quantification

- Nascent industry, rapid geographic expansion
- Separate impact of broadband from other factors
- Percentage point increase in state deployment yields 0.2 – 0.3 employment growth (Crandall)\*

# QED Approach

- Quasi-Experimental Design
- Used for: airport, highways, military base impacts
- USDA: selected 228 rural counties for treatment, and a “twin” for each (Stenberg)

# Analysis (USDA ERS)

- Farm sector: mostly unaffected, but broadband embedded in productivity
- Growth in construction and wholesale trade
- Growth in private income

# Findings

*“Wage and salary jobs, as well as the number of proprietors, grew faster in counties with early broadband access.”*

USDA ERS (2014)

# Other reports

- Whitacre, Gallardo, Strover (2015)
  - Reviewed “economic health variables”
  - Causal positive effects to income and causal negative effects to unemployment
  - Adoption is crucial to obtaining results

# Other numbers

- Broadband/ICT contributed \$945.5B to U.S. private industries in 2014 (Hassett)
- Spillovers calculated to be \$692B (Hassett)

## Some more numbers

- Impact on smaller firms takes longer to measure because they need to restructure (ITU)
- 10 percent increase in broadband penetration associated with 3.6 percent increase in efficiency (Thompson and Garbacz, Ohio U., 2008)



*“[W]hile broadband will not bring immediate transformation to rural America, regions that lack broadband will be crippled.”*

Center for Rural Strategies (2011)



*“Businesses that depend on information technology largely avoid being in areas where they cannot get what they need.”*

Center for Rural Strategies (2011)

# Beyond GNP

- Does GNP impart well-being?
- Stiglitz and GNH (Gross National Happiness)
- Education, health care, community (stay tuned!)

# Recap

- The economic impact of broadband can be measured quantitatively
- The difficulty of early measurements has been mitigated by QED approach

# Rural/Urban

# What does this mean for PA?

- Rural areas in PA
- Urban areas in PA
- Imperative to build strong state and regional economies

# An evolving national relationship

- Federal Reserve Bank of Kansas City (2001)
- Series of social contracts
  - Frontier period
  - Storehouse period
  - Third stage?

# U.S. FARMERS FALL BEHIND NEW POWERS

Bumper harvests in Brazil, Russia depress prices, imperil American growers

BY JESSE NEWMAN AND JACOB BUNGE

GREENVILLE, Ill.—On a pancake-flat stretch of land not far from the Mississippi River, Illinois farmer Jerry Gaffner thumbs through weather forecasts and crop reports on his tablet computer, searching for clues about when to market his soybean crop.

The data streaming in isn't from Illinois or even the American Midwest. It is from half a world away in Brazil, where farmers are harvesting what's expected to be a record soy-

bean crop. With 43% of the export market—up from just 12% 30 years ago—Brazil can sway global prices with a weather hiccup or transportation snarl, spurring U.S. farmers to sell crops and capture profits, or to bunker grain and hold off until prices improve.

Mr. Gaffner pays close attention to South American conditions because of the new reality facing U.S. farmers: America's agricultural dominance has eroded.

Brazil overtook the U.S. as the world's big-  
*Please see FARMS page A9*

WSJ, Apr. 22, 2017

# Compare US stats

- 1970-2000 – US pop +38 percent
- PA +4 percent, 46<sup>th</sup> fastest growing state
- Projecting to 2030: US +29 percent from 2000
- PA +4 percent, 45<sup>th</sup> fastest growing state

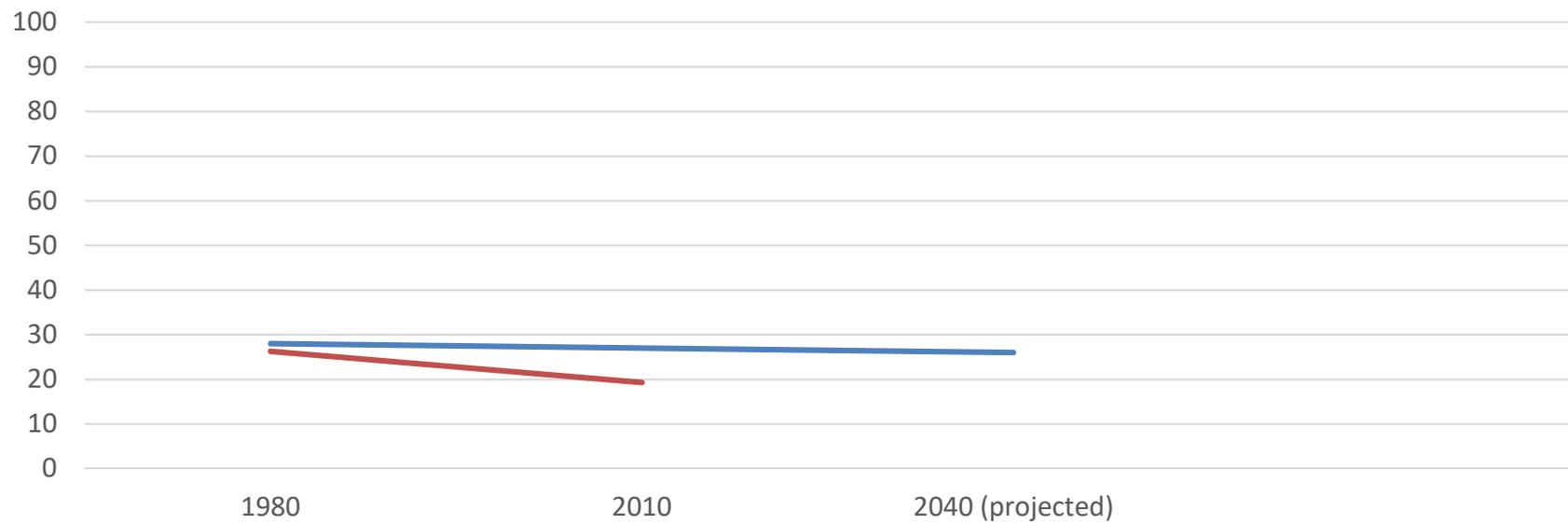
# Rural Stats

- Manufacturing: 14 percent rural jobs, 3 points higher than national average
- Challenges include lack of economic diversification, higher unemployment rates than nation as a whole
- Lack of employment leads to out-migration – leaving elderly, less affluent, less educated

*The Rural Economy*

PA

# PA rural population



# PA rural projections

- Aggregate growth
  - 1980-2010: +6 percent
  - 2010-2040: +4 percent
- As compared to state
  - 1980-2010: 22 percent PA growth in rural
  - 2010-2040: 10 percent PA growth in rural

# PA population trends

- Births in rural PA declined 17 percent, 1980-2010
- Attributable to 13 percent decrease in women 15-44
- Urban counties during this period saw a 4 percent decrease in births
- 1980-2010 rural death rate increased 10 percent
- 2010-2040 projections to increase 25 percent

# Impacts

- Decline in working age adults could be challenging to some businesses in terms of labor pool
- Mix of rural businesses change
- Closing schools, increase need for aging

# PA Economic Forecast

- Real GDP +1.7 annual rate in 2015, US GDP +2.4
- Health care, e-commerce logistics and leisure/hospitality are growing sectors
- 70 percent of job growth in PA health care/social assistance and professional/business sectors
- Hospitals hiring again following post-ACA slowdown

*Wells Fargo (2016)*



# Pause, and recap

- Broadband as an economic generator
- Relationships among rural and urban spaces
- National and local pressures on rural areas

# Smart Rural Community

# Rural condition, and response

- Population shifts
- Economic studies
- Smart Rural Community



# State economic studies

- Undertaken in 2011 to address proposed changes to Federal regulations
- Conducted by academic institutions
- Measured direct and indirect impacts

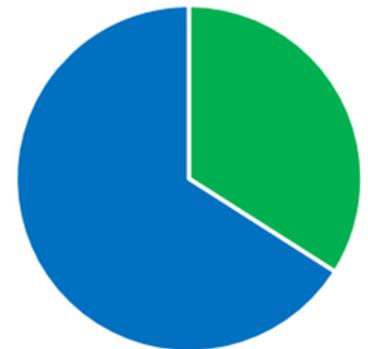
# Rural telecom impact

- CO: \$45.5M direct, \$18.2M indirect
- ND: \$18M Fed tax revenues; \$31M state
- KS and NM examined adverse impacts of reduced investment

# National study

- Rural broadband supports \$24.1B U.S. activity
  - \$8.2B in rural areas (34%)
  - \$15.9B in urban areas (66%)

U.S. Economic Activity  
(2015)

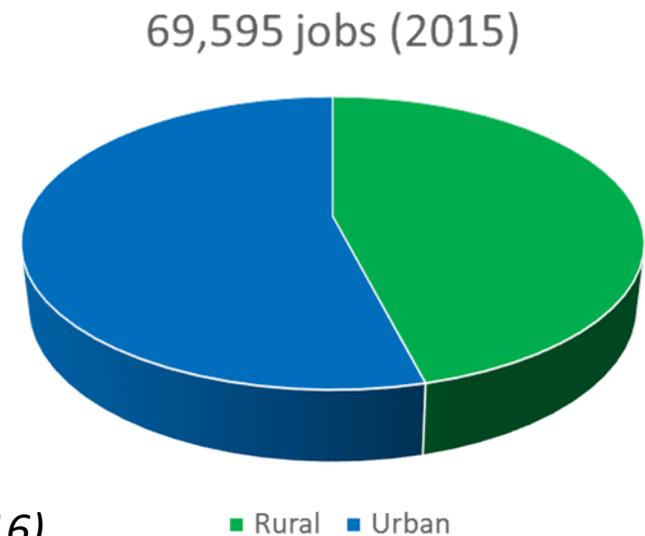


■ Rural ■ Urban

*Hudson Institute (2016)*

# Employment and e-commerce

- Rural broadband supports
  - 69,595 jobs
    - 46% rural (32,013)
    - 54% urban (37,582)
  - \$100B e-commerce



*Hudson Institute (2016)*

# PA impacts

- Direct: \$795.4M
- Indirect: \$376.4M
- Total: \$1,170.0M
- Jobs: 3,233

*Source: Hudson Institute (2016)*

# Smart Rural Community<sup>SM</sup>

- Rural broadband to support:
  - Commerce
  - Education
  - Health care
  - Public utilities



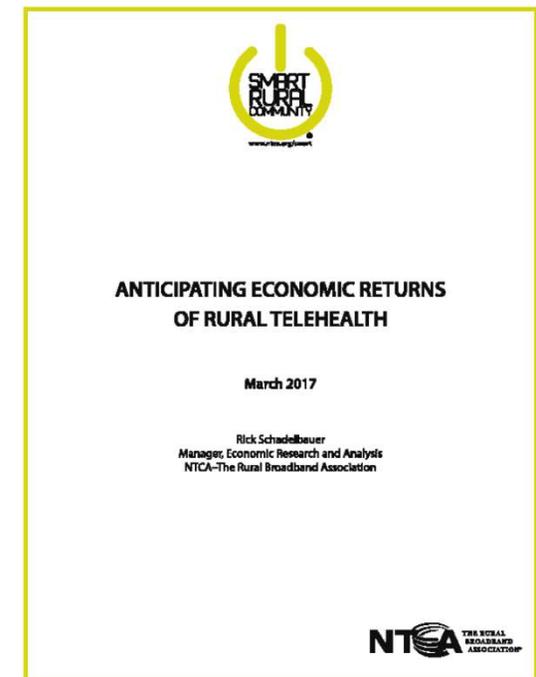
# Case studies

- Perham, MN: mobile app for fire department
- Alpine, TX: optical telescope and U.S. border security
- Hawkinsville, GA: connected school health cart



# Telehealth

- National telehealth savings projections (per facility, annually):
  - Travel expense: \$5,718
  - Lost wages: \$3,431
  - Hospital costs: \$20,841
  - Increased local and pharm revenues: \$11,523 - \$46,121



# Conclusions

- Broadband/ICT is an economic generator
- Relationships among urban and rural spaces enable benefits to cross “borders”
- PA rural/urban population mirroring national challenges
- Broadband enables opportunities to secure rural and, therefore, regional urban futures

# Contact Information

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