



Measuring the Economic Impact of Broadband

NTIA Webinar Series

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September 18, 2019

Participants

Presenters

- Alison Grant, Research Assistant and Instructor, Department of Agricultural Economics, Purdue University
- Brian Whitacre, Professor, Oklahoma State University
- Roberto Gallardo, Assistant Director - Center for Regional Development, Purdue University

Moderator

- Katherine Bates, Manager of State and Local Partnerships, BroadbandUSA

Helpful Information

Questions

- Please type questions and comments in the question box on the right hand side of the screen. Questions will be taken after the final presenter.

Presentation

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Alison Grant

Research Assistant and Instructor

Department of Agricultural Economics

Purdue University

September 18, 2019

The Net Benefits of Broadband Adoption: An Empirical Case Study of Rural Indiana

Alison Grant, Graduate Student, Purdue University

Wallace Tyner, James and Lois Ackerman Professor

Larry DeBoer, Professor, Agricultural Economics, Purdue University

Links to Studies: [BENEFIT-COST ANALYSIS FOR IMPLEMENTATION OF RURAL BROADBAND IN THE TIPMONT COOPERATIVE IN INDIANA](#)

[ESTIMATION OF THE NET BENEFITS OF INDIANA STATEWIDE ADOPTION OF RURAL BROADBAND](#)

Data – Fuel for the Future

- “Digital information is unlike any previous resource; it is extracted, refined, valued, bought and sold in different ways. It changes the rules for markets and it demands new approaches from regulators.”

“Fuel of the future: Data is giving rise to a new economy.” The Economist, May 2017

- “The economic impact of rural broadband will be more important for the role it plays in changing what the economy is. It has also disrupted the role that location plays in the economy. This disruption will reach as far as the broadband speed required to support these uses will allow.”

Kuttner, Hanns. “The Economic Impact of Rural Broadband.” Hudson Institute, April 2016

Overview

1. Present value of total benefits and costs by category for the Tipmont Case Study
2. Other metrics
 1. Benefit cost ratio
 2. NPV benefit per member
 3. Annualized benefit per member
 4. Benefit per \$1 expended by customers
3. Review the extrapolation of broadband benefits to the State of Indiana
4. Tax and govt. expenditure impact calculations

Summary of Results

- The benefit/cost ratio is around 4
- Statewide, the net benefits (NB) amount to about \$1 billion/year
- Federal and state governments would have increased tax receipts and lower Medicare and Medicaid costs.
- Government tax revenues and health care cost savings amount to about $\frac{1}{4}$ of total NB

Study Approach

- We estimated rural broadband benefits by category (type of benefit)
 - Telemedicine
 - Education (K-12 & Adult)
 - Consumer savings
 - Farm income increases
 - Multiplier benefits
- System cost information came from Tipmont

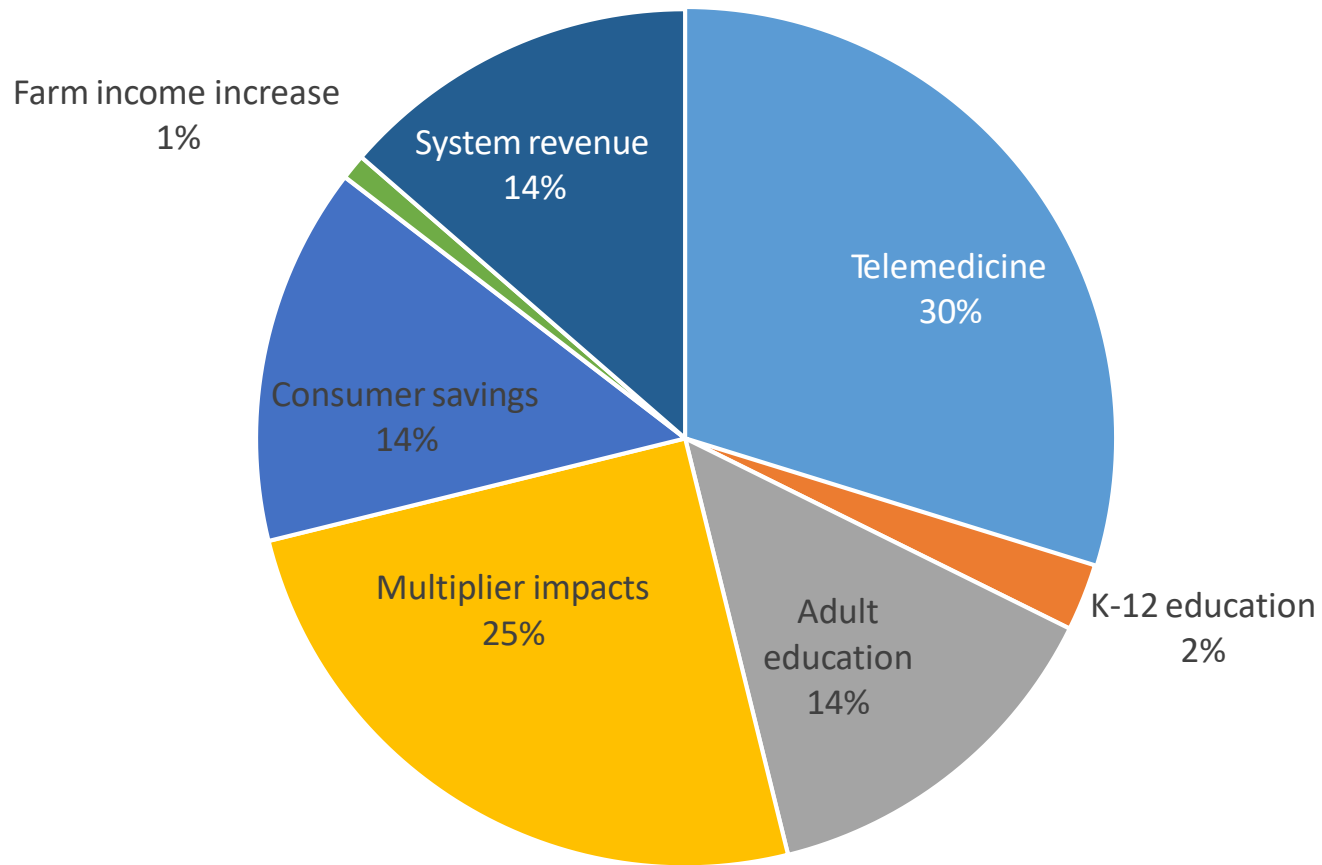
Other Assumptions

- We used a 6% discount rate for future benefits and costs
- We used a 20 year project period, but clearly benefits would continue beyond that period.
- The take rate was taken from analysis done by Prof. Nicole Widmar

Benefit Cost Summary for the Different Benefit Categories

Item	Net present values
Capital cost	99,804,558
Operating cost	89,613,882
Total cost	189,418,440
Telemedicine	
Primary care savings	22,977,791
Specialist	28,633,511
Transport	671,568
Missed Work	7,961,549
Pharmacy	20,992,056
Imaging	4,255,146
Web consultation	5,106,176
Urgent care	21,701,247
Emergency care	110,986,276
Total telemedicine	223,285,320
K-12 education	18,981,795
Adult education	103,672,388
Multiplier impacts	187,524,256
Consumer savings	106,946,014
Farm income increase	7,165,348
System revenue	102,123,515
Total Benefit	749,698,635
Net benefits	560,280,195

Benefit Categories by Share of Total Benefits



Tipmont Result Summary

- NPV benefit per member: **\$24,757**
- Net benefit per member per year: **\$2,158**
- Benefit-cost ratio: **3.96**
 - Every \$1 invested in broadband returns \$4 to the local economy
 - Every dollar expended by customers returns \$4.5
- In terms of extrapolating to the state: we use the benefit per co-op member for all other state co-ops

Telemedicine

- Overview of Benefit Categories:

1. Hospital Cost Savings from Outsourcing Procedures
2. Lab/Pharmacy Work Performed Locally
3. Reduced Use of Emergency Departments, Overnight Stays, Ambulance Services, Number of Referrals, etc.
4. Initial Health Consultation via Web
5. Transportation Savings
6. Missed Work Income

PROVIDER
SIDE

PATIENT
SIDE

- \$20.5 million in year 3
- \$223 million NPV over 20 years

Education K-12

- Benefit Estimation included proxy of the value of improvement in teacher productivity
- We know that teachers provide value greater than their cost
- Used teacher salaries as a basis for a productivity increase
- **Benefit Estimation: \$1,538,383 in year 3**

Education - Adult

- The Tipmont customer median household income is \$73,092.
- We assume that 1 in 5 of those households would have a new or better job valued at 5% of household income
- This benefit calculation is scaled to connected households each year
 - **Benefit Estimation: \$9,594,041 in year 3**

General Economic Development

- Household income growth, business investment, and consumer savings
- Previous work had suggested a household income gain independent of other categories. However, we decided to assume it is included in the adult education and multiplier categories.

Multiplier Benefits

- When an investment is made, the spending associated with that investment provides benefits to those who receive the spending and to others in the community.
- We used two sources of multiplier values of 1.99 and 1.3264, and also 0.99 thereby excluding the system costs.
- Multiplier NPV ranged from \$188 million (base case) to \$376 million NPV.

Consumer Savings

- Consumers potentially save in purchases of household items, insurance, energy, services, etc.
- A UK study by Price Waterhouse Coopers estimated household savings of \$754/household/year
 - **Benefit Estimation: \$ 9,896,989 in year 3**

Farm Income Increases

- The literature indicates farm sales and expenses grow due to broadband access (encompasses access to information, technology such as GIS and scouting drones, precision ag, etc.)
- Tippecanoe County crop sales in 2012 were \$132,619,000 and we assumed a 1% increase due to broadband and applied it to 50% of sales. We also used a lower bound of \$500 per connected member.
 - **Benefit Estimation: \$663,095 in year 3**

Civic Engagement

- We found two important studies on the impacts of broadband on civic engagement and voluntary activity
- The qualitative descriptions of benefits were significant
- **We could not quantify this benefit**
- This is a probable benefit that has been left out in our calculations

Investment Costs

		Adjusted
Capital Cost	Amount (\$)	Amount
Distribution Fiber	86,080,296	86,080,296
Core Network	1,625,000	1,625,000
Substation Electronics*	4,561,405	2,787,674
Drop Installation*	12,359,200	7,553,248
Subscriber Electronics*	12,675,600	7,746,614
Total Build Capital Cost	117,301,501	105,792,832

*Based on 100% take rate

Operating Costs

year	Fixed	Labor	Subscribers	Revenue	Tax	New Sub.	Billing	Churn	Bad debt	Marketing	Access Fee	Total
1	868,549	1,098,750	3281	2,362,676	33,077	39,378	25,596	26,252	23,627	778,930	617,479	3,511,638
2	1,155,455	1,841,250	8532	6,142,959	86,001	63,005	66,549	68,255	61,430	565,775	2,119,491	6,027,211
3	1,190,205	2,016,250	13126	9,450,706	132,310	55,129	102,383	105,008	94,507	339,465	3,501,093	7,536,349
4	1,165,070	2,122,500	13224	9,521,586	133,302	1,181	103,151	105,795	95,216	228,007	4,286,962	8,241,184
5	1,210,562	2,242,500	13324	9,592,998	134,302	1,190	103,924	106,589	95,930	229,717	4,294,199	8,418,913
6	1,189,115	2,242,500	13424	9,664,945	135,309	1,199	104,704	107,388	96,649	173,580	4,301,438	8,351,882
7	1,193,269	2,242,500	13524	9,737,432	136,324	1,208	105,489	108,194	97,374	174,882	4,295,966	8,355,206
8	1,229,197	2,325,000	13626	9,810,463	137,346	1,217	106,280	109,005	98,105	176,194	4,279,951	8,462,295
9	1,218,898	2,325,000	13728	9,884,042	138,377	1,226	107,077	109,823	98,840	177,515	4,268,396	8,445,152
10	1,210,249	2,325,000	13831	9,958,172	139,414	1,236	107,880	110,646	99,582	178,846	4,363,477	8,536,331
11	1,213,815	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,397,778	8,572,962
12	1,215,738	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,411,608	8,588,716
13	1,219,444	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,398,193	8,579,006
14	1,223,222	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,368,733	8,553,324
15	1,227,073	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,373,574	8,562,016
16	1,232,890	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,362,786	8,557,044
17	1,236,892	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,348,125	8,546,387
18	1,246,370	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,395,150	8,602,889
19	1,248,030	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,430,695	8,640,094
20	1,252,271	2,325,000	13831	9,958,172	139,414	0	107,880	110,646	99,582	178,846	4,435,536	8,649,176
NPV	13,527,498	24,485,885	141,838	102,123,515	1,429,729	145,164	1,106,338	1,134,706	1,021,235	3,164,847	43,598,480	89,613,882

Recap

- Total NPV over 20 years: **\$560 million**
- NPV benefit per member: **\$24,757***
- Annualized benefit per member per year:
\$2,158
- Benefit-cost ratio: **3.96**
 - Every \$1 invested in broadband returns \$4 to the local economy
- NPV revenue/NPV cost = 0.54

*Over a 20-year time horizon

State Extrapolation

- NPV per member for the 7 cooperatives is \$24,293.
- There are 400,263 cooperative members in Indiana not included in the 7.
- The extrapolated Statewide NPV benefits are \$11,976,222,899, or about \$12 billion.
- Over 20 years at 6%, that translates to \$1.0 billion per year.

Indiana Broadband: State Commits \$100M; New Study Shows Value of High-Speed Access

Published

August 31, 2018

Author

Cathy Cash

Tags

[Broadband](#),
[Rural Economic
Development](#)

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A Purdue University study finds that broadband internet access in rural areas could mean billions in economic benefits for Indiana. (Photo By: Jenna Wagner, iStock/Getty Images)

Thanks!

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Measuring the Economic Impact of Broadband

Brian Whitacre

Oklahoma State University



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DEPARTMENT OF
AGRICULTURAL ECONOMICS

What the Research Says



- Broadband DOES matter for a whole host of social & economic outcomes!
 - Household income
 - Employment levels
 - Firm attraction
 - Farm profits
 - Civic engagement
 - Increased housing values



- Adoption is (arguably) more important than simple availability
- The extent to which *very fast* speeds matter is TBD...

Broadband and Household Income



The economic impact of broadband on growth:
A simultaneous approach

- Koutroumpis (2009):

Pantelis Koutroumpis

- Broadband accounted for 10% of annual economic growth in OECD countries

BROADBAND INFRASTRUCTURE AND ECONOMIC GROWTH*

- Czernich et al. (2011):

Nina Czernich, Oliver Falck, Tobias Kretschmer and Ludger Woessmann

- Positive relationship between broadband expansion and annual per capita growth in OECD countries

- Whitacre, Gallardo, Strover (2014a):

Broadband's contribution to economic growth in rural areas:
Moving towards a causal relationship[☆]

Brian Whitacre^{a,*}, Roberto Gallardo^b, Sharon Strover^c

- Rural areas with high broadband adoption had faster Median Household Income growth between 2001 - 2010

Broadband and Employment Levels



THE EFFECTS OF BROADBAND INTERNET EXPANSION ON LABOR MARKET OUTCOMES

HILAL ATASOY*

- Atasoy (2013)
 - Access to broadband is associated with a 2% increase in employment rate

BROADBAND AVAILABILITY AND EMPLOYMENT: AN ANALYSIS OF COUNTY-LEVEL DATA FROM THE NATIONAL BROADBAND MAP

BY KRISHNA JAYAKAR† AND EUN-A PARK‡

- Jayakar and Park (2013)
 - Counties with better broadband availability had lower unemployment rates

Does rural broadband impact jobs and income? Evidence from spatial and first-differenced regressions

Brian Whitacre · Roberto Gallardo ·
Sharon Strover

- Whitacre, Gallardo, Strover (2014b)
 - Rural counties with high broadband adoption had more firms / employees

Broadband and local growth

Jed Kolko

- Kolko (2012):
 - Positive relationship between broadband expansion and local employment growth

Broadband and Firm Attraction



An econometric approach for evaluating the linkages between broadband and knowledge intensive firms

Elizabeth A. Mack*, Sergio J. Rey

- Mack and Rey (2014)

- Highlights importance of broadband to U.S. knowledge-based firms

BROADBAND INTERNET AND NEW FIRM LOCATION DECISIONS IN RURAL AREAS

YOUNJUN KIM AND PETER F. ORAZEM

- Kim and Orazem (2017)

- Broadband availability had positive effect on location decisions of rural firms in early 2000s.

Rural Broadband Speed and Business Startup Rates

- Deller, Whitacre, Conroy (working)

- BB speed availability has impacts on rural entrepreneurship levels

Broadband and Farm Profits



The Impact of Broadband on U.S. Agriculture: An Evaluation of the USDA Broadband Loan Program

Amy M.G. Kandilov, Ivan T. Kandilov, Xiangping Liu, and
Mitch Renkow

- [Kandilov, Kandilov, Liu, Renkow \(2017\)](#)

- Broadband loan program has positive impacts on farm sales, expenditures, and profits

Willingness to Pay for Broadband Access by Kentucky Farmers

Chris Jeffcoat ^(a1), Alison F. Davis ^(a1) and Wuyang Hu ^(a1) 

- [Jeffcoat, Davis, Hu \(2012\)](#)

- Farmers without broadband access willing to pay more in property taxes to support broadband investments

Broadband and Civic Engagement



Measuring Digital Citizenship: Mobile Access and Broadband

KAREN MOSSBERGER¹
University of Illinois at Chicago

CAROLINE J. TOLBERT
University of Iowa

ALLISON HAMILTON
University of Iowa

- [Mossberger, Tolbert, Hamilton](#) (2012)
 - Broadband crucial for gathering civic information

Impact and benefits of digital inclusion for social housing residents

Robyn Broadbent^{a*} and Theo Papadopoulos^b

- [Broadbent and Papadopoulos](#) (2013)
 - Communicating with friends / family significant benefit for disadvantaged residents

Broadband and civic engagement in rural areas: What matters?

Brian E. Whitacre and Jacob L. Manlove

- [Whitacre and Manlove](#) (2016)
 - Levels of broadband adoption matter more than simple availability for predicting how civically engaged rural residents are

Broadband and Housing Values



Reevaluating the Broadband Bonus: Evidence from Neighborhood Access to Fiber and United States Housing Prices¹


Gabor Molnar

- [Molnar, Savage, and Sicker](#) (2015)
 - Fiber availability increases U.S. urban housing values by 3%

Speed 2.0
Evaluating Access to
Universal Digital Highways

- [Ahlfeldt, Koutroumpis, Valletti](#) (2014)
 - Upgrading to 8 Mbps connection in England increased property values by 3%

Broadband's relationship to rural housing values

- [Deller and Whitacre](#) (2019) Steven Deller¹ | Brian Whitacre² 
 - Rural housing values positively impacted by higher-speed access... but “some” matters more than “very fast”

Broadband Policy

- Federal efforts to increase availability have worked...

- Dinterman and Renkow (2017)

Evaluation of USDA's Broadband Loan Program: Impacts on broadband provision[☆]

Robert Dinterman¹, Mitch Renkow^{*}

- ASR Analytics (2014) – ARRA Evaluation

Broadband Technology Opportunities Program
Evaluation Study

Order Number D10PD18645

- But increasing adoption is much harder!

- Hauge and Prieger (2015)

Evaluating the impact of the American Recovery and Reinvestment Act's BTOP on broadband adoption

J. A. Hauge^{a,*} and J. E. Prieger^b

- Manlove and Whitacre (2019)

An evaluation of the Connected Nation broadband adoption program[☆]

Jacob Manlove^{a,*}, Brian Whitacre^b



Does Speed Matter?

Mixed Evidence to Date



- Positive Results:

- [Briglauber et al.](#) (2019) show that German county-level GDP grew 0.05% for each 1% increase in 50 Mbps availability

A Retrospective Study on the Regional Benefits and Spillover Effects of High-Speed Broadband Networks: Evidence from German Counties

- [Lobo et al.](#) (2019) find that ultra-fast broadband reduces county unemployment rates in TN

Broadband speed and unemployment rates: Data and measurement issues

Bento J. Lobo^{a,*}, Md Rafayet Alam^a, Brian E. Whitacre^b

- [Hasbi](#) (2017) finds a positive impact of high-speed broadband on company creation in France

Impact of Very High-Speed Broadband on Local Economic

Growth: Empirical Evidence

Maude Hasbi*

Does Speed Matter?

Mixed Evidence to Date



- Negative Results:

- Ford (2018) shows no difference in economic outcomes between counties with 10 MBPS and 25 MBPS

Is faster better? Quantifying the relationship between broadband speed and economic growth

George S. Ford

- Whitacre et al. (2019) refute an earlier paper showing that faster speeds increase employment levels

Econometric error nullifies finding of the impact of broadband speed on county-level employment

Brian E. Whitacre^a, Md Rafayet Alam^b, Bento J. Lobo^b

- Haller and Lyons (2015) do not find any effect of higher-speed adoption on Irish manufacturing firm growth

Broadband adoption and firm productivity:
Evidence from Irish manufacturing firms ☆



Thank you!

Brian Whitacre

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Broadband's Impact: Conveying the message



Roberto Gallardo, Ph.D.

Purdue Center for Regional Development / Extension



@robertoge

#Rural2pt0



Digital age makes possible



Credit: Jordana Barton. Federal Reserve Bank of Dallas

2017 Digital Economy in the U.S.

5.1
million jobs

\$132,223
average compensation

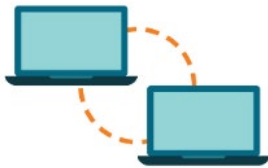
6.9%
of GDP
\$1.35 trillion

Source: [Bureau of Economic Analysis](#)



Unlocking Rural's Digital Potential

- **\$47 billion per year to the U.S. GDP**
- **360,000 jobs in the next 3 years**



Increase digital connectivity in rural areas



Increase the talent pipeline of candidates trained in digital skills (cloud, digital marketing)



Increase adoption of digital training and digital tools by rural small businesses so they can scale their operations

Source: [C Tec](#); [Amazon](#)

Potential of Precision Agriculture

Broadband infrastructure
Digital technologies
On-farm capabilities

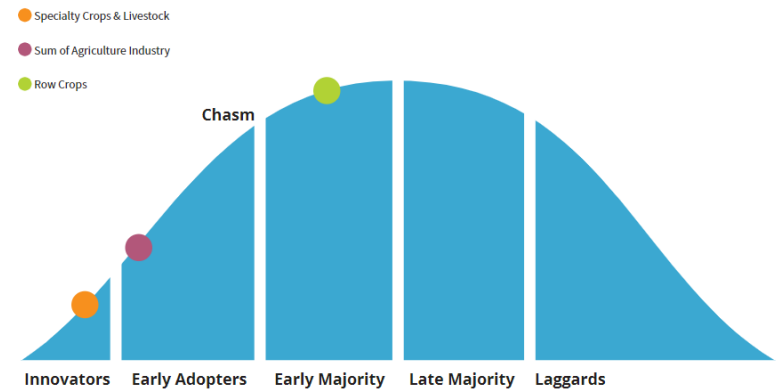
Row crops
Specialty crops
Livestock & dairy

Planning
Production
Market coordination

\$47-\$65B/year
\$18-\$23B

Source: [USDA](#)

FIGURE 2.
ESTIMATION OF AGRICULTURE ON THE TECHNOLOGY ADOPTION CURVE



Digital Globalization

1. 19 years old

**2. Larger impact on GDP
than 100s year old goods trade**

**3. Includes developing countries,
small companies, start-ups, &
billions of individuals**

Source: [McKinsey Global Institute](#)

Airbnb

4 years

600,000
rooms

Hilton

93 years

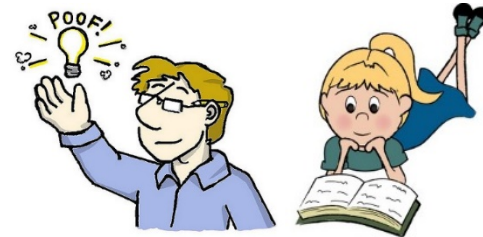


Source: [World Economic Forum](#)

**100,000
Kickstarter
funded
projects**



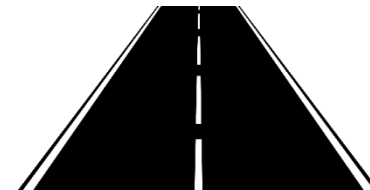
169 countries



86,101 creators



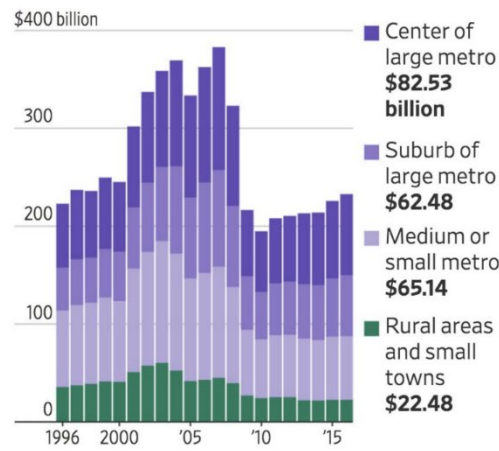
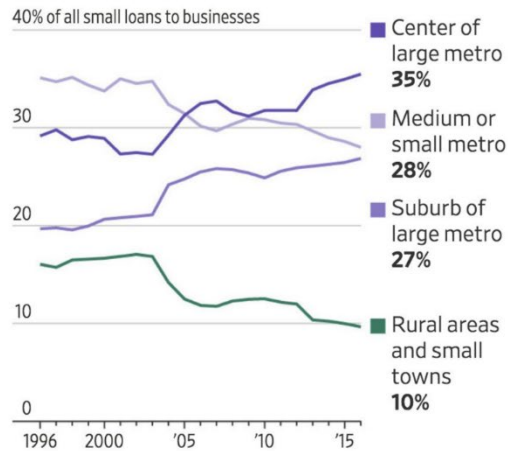
9 million backers



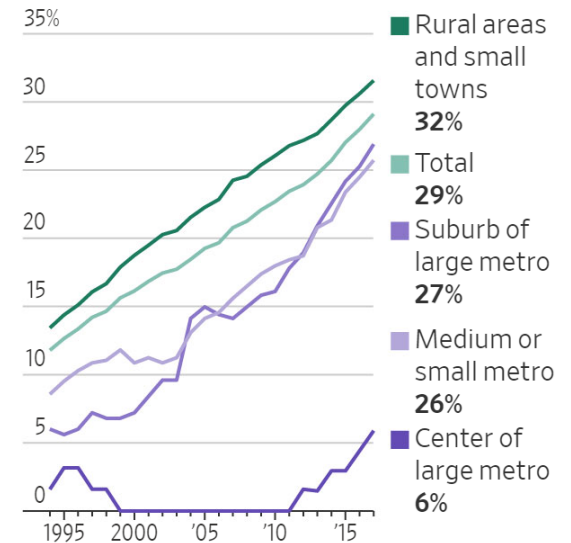
2,317 miles

Source: [Kickstarter](#)

Decreasing local banks in rural ...



Percentage of counties without a local bank



Source: [Wall Street Journal](#)

What is Digital Inclusion?

Refers to the adoption of broadband technologies and its meaningful use for social and economic benefits.

Source: [Community Developments Investments Magazine, November 2018](#)



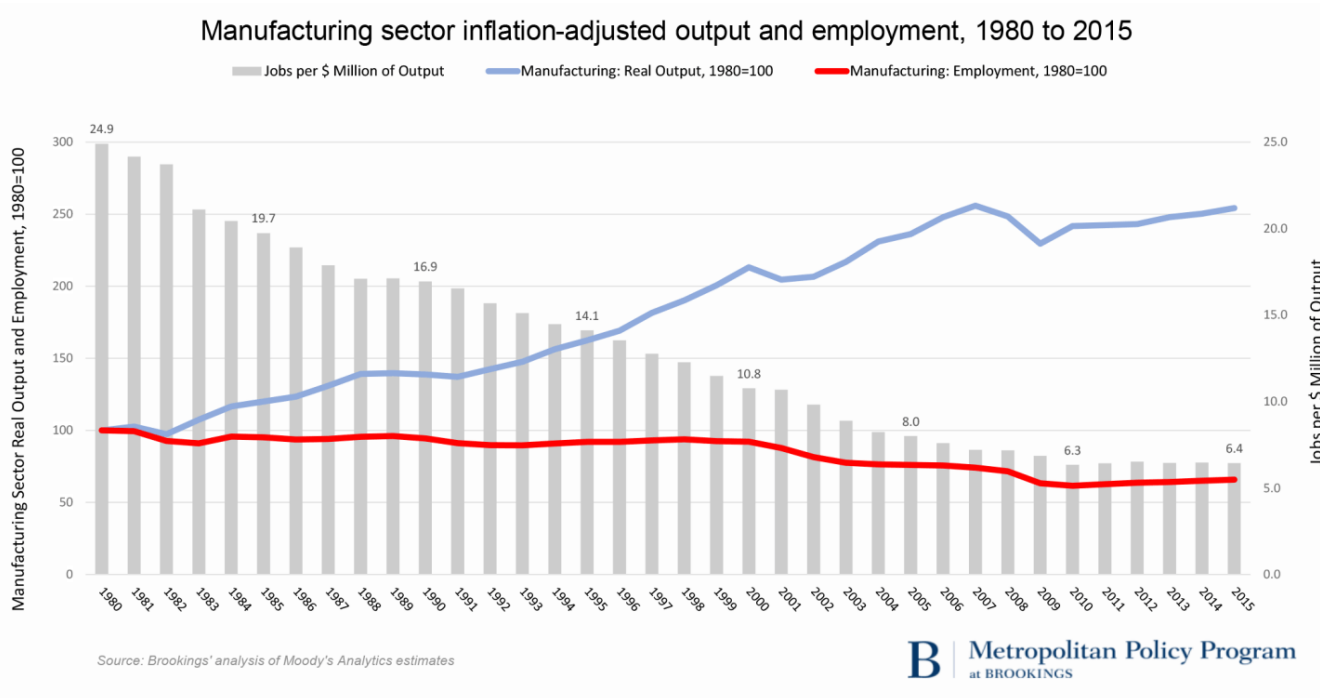
Digital Inclusion Dimensions

- 1. Affordable & robust broadband**
- 2. Internet-enabled devices that meet needs of user**
- 3. Digital Literacy training**
- 4. Quality technical support**
- 5. Applications & online content that encourage self-sufficiency, participation, & collaboration**



Source: [National Digital Inclusion Alliance](#)

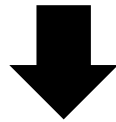
Jobs Vs. Productivity



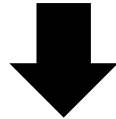
Source: [Brookings Institution](https://www.brookings.edu/)

Future of Work

512 Counties (83.7 percent rural)



20.3 million people



25% displaced workers in ten years

Source: [McKinsey & Company](#)

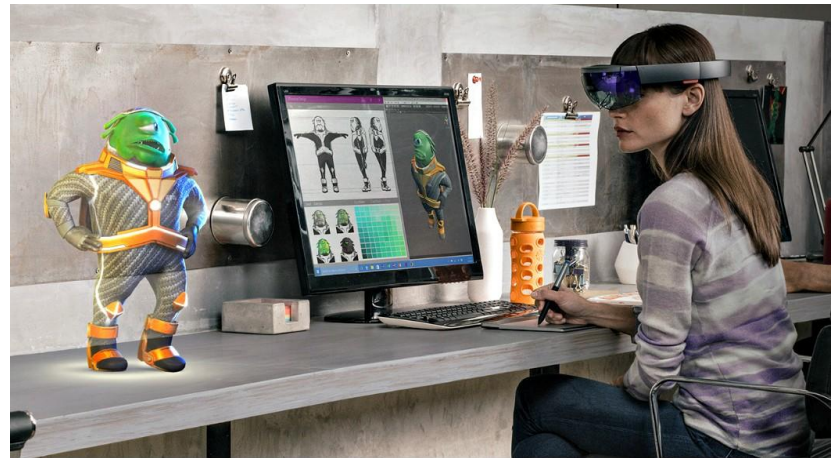
No sudden robot takeover, but an ongoing and accelerated change in how work is organized



Workforce Development

Up to 54 million workers in the US or one-third of workers in 2030 may need to switch occupational categories

Source: [McKinsey Global Institute \(2017\)](#)



Middle & Digital Skills

Occupations that typically don't require a bachelor's degree and pay above the national living wage.

Source: [Capital One](#); [Burning Glass](#)

As Technology Transforms the Workplace,
Digital Skills are Critical
to Future Proof **Middle-Skill Careers**



of labor demand is composed of
MIDDLE-SKILL jobs

82%

of middle-skill jobs require digital skills,
an increase of **4%** since 2015

CAREERS

Google, Apple and 12 other companies that no longer require employees to have a college degree

Published Mon, Oct 8 2018 • 12:51 PM EDT • Updated Mon, Oct 8 2018 • 12:51 PM EDT



Courtney Connley
@CLASSICALYCOURT

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Source: [Glassdoor](#)

It is not only coding ...

“Behavioral skills, such as the ability to work well on a team, communication, creativity, and empathy are best developed through experience rather than structured learning programs like a webinar.”

Impact

Soft skills dominate the top competencies global executives seek in workers

Skill	2016	2018	Change	Type
Willingness to be flexible, agile, and adaptable to change	4	1	3 ▲	Soft
Time management skill and ability to prioritize	7	2	5 ▲	Soft
Ability to work effectively in team environments	5	3	2 ▲	Soft
Ability to communicate effectively in business context	3	4	-1 ▼	Soft
Analytics skills and business acumen	8	5	3 ▲	Technical
Technical core capabilities for STEM	1	6	-5 ▼	Technical
Capacity for innovation and creativity	9	7	2 ▲	Soft
Basic computer and software/application skills	1	8	-7 ▼	Technical
Ethics and integrity	10	8	2 ▲	Soft
Foreign language proficiency	12	10	2 ▲	Technical
Fundamental core capabilities around reading, writing and arithmetic	5	11	-6 ▼	Technical
Industry of occupation-specific skills	11	12	-1 ▼	Technical

Source: [Bloomberg](#); [IBM](#)

Homework Gap

Barriers when completing online assignments and homework due to lack of appropriate devices and/or broadband

- **Lower graduation rates**
- **Score lower on tests**

17% of U.S. students with no computer access
18% of U.S. students with no broadband access

Source: [Associated Press](#)



Telework

- **50% of US workforce hold jobs that are compatible with telework**
- **Teleworkers can save \$4,000 per year (gas, wardrobe, lunch expenses, etc.)**
- **Companies can save about \$2,000 per employee per year**
- **Can reduce turnover by 50%**



Source: [Flexjobs.com](https://www.flexjobs.com); [GlobalWorkplaceAnalytics.com](https://www.globalworkplaceanalytics.com)

Healthcare + Smartphone

- **Most significant innovation in modern healthcare**
- **Mobile Health (mHealth): \$23 billion; \$102 billion by 2022**
- **Hearing implants**
- **Depression-combating Facebook messenger bots**
- **Instant ultrasounds**
- **Pancreatic cancer**



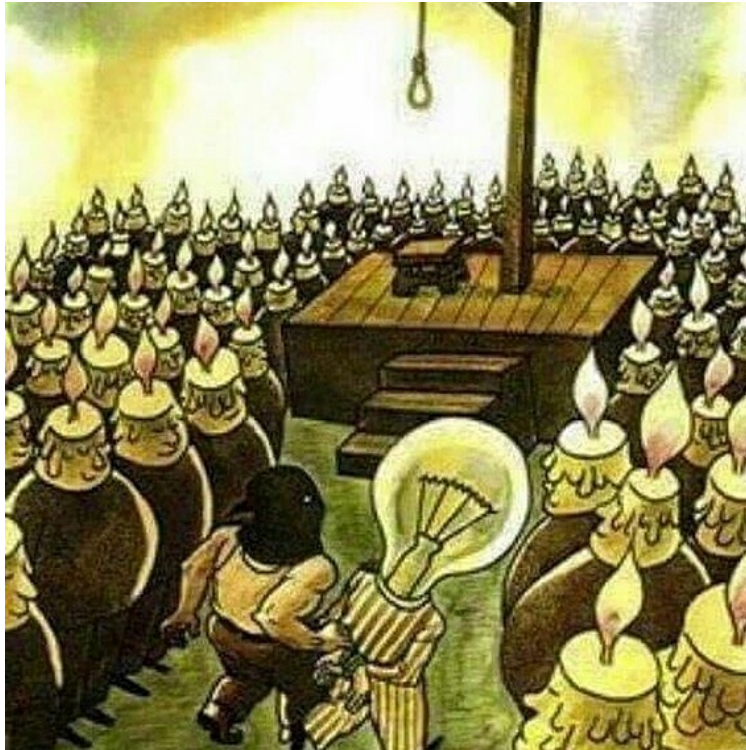
Source: [Futurism](#)

Moving forward ...

Update required 

Hang on while we fetch the update **39%**

Change is not easy



“Doubt is an uncomfortable condition, but certainty is a ridiculous one.”

Voltaire

In summary ...

- **Quality of life**
- **Homework gap**
- **Sustainable community & economic development**
- **Workforce development**



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#Rural2pt0

Measuring the Economic Impact of Broadband

Questions and Answers

- Please type your questions in the question box.
- The slides, transcript, and an audio recording will be posted on the BroadbandUSA website within 7 days of the webinar.

<https://broadbandusa.ntia.doc.gov/past-event>

BroadbandUSA

Thank you for attending.

Tune in for the next Practical Conversations Webinar

Topic: Broadband is Revitalizing Main Street

October 16, 2019

2:00 pm EST

Registration is required for each webinar:

<https://broadbandusa.ntia.doc.gov/event>

BroadbandUSA is available to help communities with their broadband access and digital inclusion efforts

For General Information:



202-482-2048



broadbandusa@ntia.gov



<https://broadbandusa.ntia.doc.gov/resources>

To Request Technical Assistance (TA):



Broadband TA Request Form -

<https://broadbandusa.ntia.doc.gov/ntia-common-content/how-we-can-help>

BBUSA Resources

- [Implementing a Broadband Network Vision: A Toolkit for Local and Tribal Governments](#)
- [Community Broadband Roadmap Toolkit](#)
- [Guide to Federal Funding of Broadband Projects](#)
- [Using Partnerships to Power Smart Cities](#)