

Executive Summary

Gauging precisely how broadband impacts the economy — in terms of jobs, gross domestic product and other economic measures — is difficult as benefits are intertwined with advances in computing and improved digital literacy. Other gains, such as quality-of-life improvements, are easy to recognize but harder to quantify. Finally, broadband installation and household adoption occurring over a long period means broadband's economic benefits take time to unfold.

Despite these measurement challenges, recent research provides a practical approach to understanding how broadband expansion benefits local economies over many years. Economic gains tied to broadband include the following:

- **Broadband investment:** Installing broadband infrastructure to previously unserved households will generate construction-related economic gains over several years.
- **Telemedicine:** Virtual health care saves households money by reducing visits to the emergency room and doctor's office. It also reduces lost income associated with travel and missed work.
- **Education productivity:** Access to online resources increases teacher productivity.
- **Income:** Broadband technology enables more effective job matching, online training, access to goods and services, and it improves productivity that can raise household and farm incomes.
- **Employment:** Community job growth, especially in knowledge-intensive services, leads to entrepreneurial, investment and productivity gains.

Although necessary, broadband access is not sufficient for economic growth. To realize economic benefits, community residents and businesses must increasingly adopt broadband service and gain skills in using broadband-related technologies. **Increased broadband adoption drives long-term economic gains.**

About this study

This study estimated the 10-year economic benefits that would result from expanding fixed broadband adoption in three Missouri counties that vary in their existing adoption levels and population size: Bollinger, Henry and Nodaway. Fixed broadband includes fiber optic, cable, or DSL (digital subscriber line) technologies considered more reliable than other broadband connections. The study considered minimum and maximum broadband adoption growth scenarios to capture the range of potential economic outcomes in a 10-year period. The minimum scenario assumes a 10 percentage point increase in household fixed broadband adoption for Bollinger and Henry counties, and a 7.5 percentage point increase for Nodaway County. In the maximum scenario, household fixed broadband adoption increases by 20 percentage points for Bollinger and Henry counties, and 15 percentage points for Nodaway County. Nodaway County had a higher household fixed broadband adoption level already, so gains are assumed to be less than the other two counties.

Key study findings

The following discussion describes how job, labor income and gross domestic product indicators would change under the minimum and maximum broadband adoption gains.

Job and labor income growth are the most tangible economic benefits expected from expanded broadband adoption:

- In both scenarios, all counties see substantial employment growth in the 10-year period. Exhibit 1 shows employment gains by year 10 for Bollinger (79), Henry (261) and Nodaway (143) counties under the minimum scenario. Job gains double in the maximum scenario.
- For context, Exhibit 1 shows the average annual job growth rates as a percent of 2019 employment along with county job trends from 2014 to 2019. The minimum scenario shows annual job growth of 0.8% for Nodaway County and 1.6% for Bollinger County. Those counties had slower growth rates — 0.2% and 0.6%, respectively — from 2014 to 2019. Henry County had average annual job declines of 3.4% from 2014 to 2019. Annual gains of 3.2% in the maximum scenario, all else equal, would largely wipe out those declines.
- Labor income would also grow further as broadband use expands; see Exhibit 1. From \$16 million in total labor gains for Bollinger County in the minimum scenario to \$148 million for Henry County in the maximum scenario, these income gains would increase spending in local communities and benefit businesses and residents alike. Labor income would largely mirror job gains in average annual growth rates.

Gross Domestic Product (GDP) communicates the value of all final goods and services produced in a county. It represents the largest measure of economic benefits from broadband expansion.

- The study projected that GDP would increase significantly under both minimum and maximum scenarios; see Exhibit 1. For example, Bollinger County gains \$23 million in total GDP over 10 years in the minimum scenario and nearly \$39 million in the maximum scenario. The more populated Nodaway and Henry counties have greater GDP increases ranging from \$56 million to \$206 million, depending on the scenario.
- With modest 10 percentage point broadband adoption gains, Bollinger and Henry counties would **increase their annual GDP by an estimated 1.4% and 1.7%**, respectively, relative to their 2019 GDP levels. Annual GDP growth would total an estimated 2.4% and 3.2%, respectively, assuming 20 percentage point broadband adoption gains in these counties.
- In Nodaway County, with 7.5 percentage point broadband adoption gains, **annual GDP would**

How Significant is GDP Growth?

GDP measures total economic growth that results in new income and profits circulating within a community.

For the three counties, the minimum growth scenario shows annual, inflation-adjusted GDP increases of less than 2%.

Even those gains, which may seem modest, are significant. For example, Bollinger County had a 2.2% annual GDP growth rate from 2014 to 2019. Adding 1.4% to the county's economy each year would, all else equal, **boost GDP annual gains to 3.6%**.

This represents a 64% increase in annual GDP gains

For context, the annual GDP growth rate from 2014 to 2019 for Missouri and the U.S. averaged 1.1% and 2.5%, respectively.

grow by 0.8% compared with 2019 levels. Annual GDP would grow by 1.5% assuming the maximum broadband adoption gain of 15 percentage points.

Exhibit 1 shows how the three counties' economies benefit from fixed broadband expansion in terms of county employment, labor income and GDP under the two scenarios.

Exhibit 1. Minimum and Maximum Fixed Broadband Adoption Scenario Summaries of the Employment, Labor Income and GDP Benefits by County

	Bollinger	Henry	Nodaway
Minimum Scenario – 10 Percentage Point Increase in Household Fixed Broadband Adoption*			
10-Year Total Economic Benefits of Broadband Expansion			
Employment Gain in Year 10	79	261	143
Total Labor Income (in Millions)	\$16.4	\$78.8	\$37.3
Total Gross Domestic Product (in Millions)	\$23.3	\$109.4	\$55.7
Average Annual Gains of Broadband Expansion Compared to 2019 Figures and Prior 5-Year Trends			
Annual Avg. Employment as % of 2019 Emp.	1.6%	1.5%	0.8%
<i>For Reference: Annual Employment % Change, 2014-19**</i>	0.2%	-0.7%	0.6%
Annual Avg. GDP as % of 2019 GDP	1.4%	1.7%	0.8%
<i>For Reference: Annual GDP % Change, 2014-19**</i>	2.2%	-3.4%	-1.2%
Maximum Scenario – 20 Percentage Point Increase in Household Fixed Broadband Adoption*			
10-Year Total Economic Benefits of Broadband Expansion			
Employment Gain in Year 10	159	524	287
Total Labor Income (in Millions)	\$26.7	\$148.4	\$68.8
Total Gross Domestic Product (in Millions)	\$38.7	\$205.9	\$102.8
Average Annual Gains of Broadband Expansion Compared to 2019 Figures and Prior 5-Year Trends			
Annual Avg. Employment as % of 2019 Emp.	2.7%	2.9%	1.5%
<i>For Reference: Annual Employment % Change, 2014-19**</i>	0.2%	-0.7%	0.6%
Annual Avg. GDP as % of 2019 GDP	2.4%	3.2%	1.4%
<i>For Reference: Annual GDP % Change, 2014-19**</i>	2.2%	-3.4%	-1.2%

Notes: *Nodaway County gains are assumed to be 7.5 and 15 percentage points for minimum and maximum scenarios, respectively, due to higher initial broadband adoption levels. ** Reference source is U.S. Bureau of Economic Analysis, 2014-19. Employment is average annual growth rate. GDP is compound annual growth rate in real dollars.

This study intended to test whether the methodology and scenarios used in the analysis reasonably estimate broadband adoption benefits. The findings are specific to the three counties analyzed, but comparable Missouri counties would likely see similar gains. Given the COVID-19 pandemic and the country's resolve to better connect its economy, this study creates a timely foundation for understanding how broadband expansion economically benefits Missouri communities — a foundation on which further research can build.

This summary is part of the [Economic Benefits of Expanding Broadband in Select Missouri Counties](#) study published by MU Exceed, June 2021. [Additional resources](#) available from MU Exceed.