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The Economic, Fiscal, and Social Effects of Public Investments in Broadband Internet Access in Illinois

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Executive Summary

Access to reliable high-speed internet has become an essential part of commercial activity and daily life. The COVID-19 pandemic further revealed the importance of broadband internet, as more families worked, learned, and shopped from home. Since 2019, both the State of Illinois and the federal government passed infrastructure programs that include funding to expand access to broadband internet.

There is a "digital divide" between those with and without access to broadband internet in Illinois.

- Only 83 percent of Illinois residents have broadband internet access—82 percent in the City of Chicago, 88 percent in the Chicago suburbs, and 76 percent Downstate.
- 82 percent of working-age residents with broadband internet access are employed compared to just 77 percent of their counterparts without access, a difference of 5 percent.
- Workers with broadband internet access earn about $60,000 in annual incomes, which is 45 percent more than the $41,400 earned by their counterparts without access.

Illinois is investing hundreds of millions of dollars to expand broadband internet access.

- The bipartisan Rebuild Illinois capital program includes $400 million to expand access.
- The bipartisan federal Infrastructure Investment and Jobs Act includes a minimum of $100 million for broadband projects in Illinois.
- Since 2020, $162 million has been invested in Illinois—$73 million from the state matched by $89 million in federal and nonstate funds—to expand access to 39,000 homes, businesses, and farms at a cost of about $4,200 to connect each location.

The expansion of broadband internet access from Rebuild Illinois and the Infrastructure Investment and Jobs Act will grow the Illinois economy and save or create 25,800 total jobs.

- The investments will expand access to nearly 238,000 households, businesses, and farms and raise worker incomes by $843 million annually.
- During the construction phase, the investments are projected to create 14,400 jobs, including 5,600 direct jobs for workers earning prevailing wages, and boost economic activity by $2.6 billion.
- After construction, the long-run impact of the broadband expansion is expected to be a growth of 11,400 jobs annually and $2.0 billion in economic activity per year.
- State and local tax revenues are expected fully pay for the state's initial $400 million investment just four years after construction of the expanded broadband infrastructure.
- However, despite historic levels of investment, 13 percent of Illinois residents will still be without access to broadband internet without additional action that could cost upwards of $3 billion.

Expanding broadband investments can produce the following social benefits in Illinois:

- Reversing some of the population losses in Downstate Illinois, which likely lost residents between 2010 and 2020 while the Chicago area gained population.
- Reducing racial and ethnic digital divides in the Chicago area, where 90 percent of white residents have access compared to just 78 percent of Black residents and 79 percent of Hispanic residents.
- Improving health outcomes by advancing telehealth and improving educational outcomes by ensuring that low-income students can turn to remote learning in special circumstances.

Ultimately, historic public investments in broadband internet access are expected to increase labor income, create jobs, promote business activity, generate tax revenues, and address rural and racial divides in communities across Illinois.

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Introduction

Over the past three decades, the internet has evolved from a system of communication to an essential part of commercial activity and daily life. According to Pew Research Center, 99 percent of U.S. adults between the ages of 18 years old and 29 years old, 98 percent of adults between the ages of 30 years old and 49 years old, and 96 percent of adults between the ages of 50 years old and 64 years old use the internet (Pew, 2021). Tasks such as shopping, working, applying for jobs, learning, viewing entertainment, and accessing vital information now depend on robust internet service. The COVID-19 pandemic further revealed the importance of reliable high-speed internet access, as more and more families performed these tasks remotely.

Broadband is the high-speed, wide-bandwidth transmission of information that forms the internet. The definition of broadband has evolved over time as speeds and capacity have increased. In the 1990s, internet download speeds increased from 56 kilobits per second (kbps) to 200 kbps. By 2010, download speeds increased twentyfold to 4 megabits per second (Mbps). The current standard for broadband, established by the Federal Communications Commission (FCC) in 2015, is 25 Mbps for download speed and 3 Mbps for upload speed (Gonsalves, 2021). This standard is generally considered too slow for modern uses. Most new broadband infrastructure investments aim to achieve 1 gigabits per second (Gbps) for download and upload, or 40 to 333 times the current FCC standard (e.g., see DCEO, 2020).

The four factors that define broadband use—and affect quality of service and user experience—are access, devices, culture, and governance (Wilson & Corey, 2011). Access is the ability to connect to a network at an affordable cost, usually using Wi-Fi, cable, satellite, or cellular data. Many rural and low-income communities rely on costly and slow satellite service that limits their opportunities. Devices include phones, laptops, tablets, computers, and other technologies that enable access—which are more likely to be owned by high-income households. Culture refers to online behavior and norms, which have shifted during the growth of social media, while governance recognizes that local, state, and federal governments can all shape the environment in which broadband is provided.

Infrastructure deployment alone is one supply-side approach to closing divides in broadband access. Research suggests that broadband internet is part of all aspects of life and could be harnessed to local economic strengths as part of efforts to renew and revive rural communities (LaRose et al., 2008). While grants to expand broadband infrastructure have helped significantly, removing access barriers by improving affordability and education are also central to closing these gaps (Whitacre et al., 2015). States that include stakeholder engagement, goals and objectives, and program evaluations have been most successful at expanding broadband internet service (Whitacre & Biedny, 2021).

Investments in broadband internet have grown local economies (Stenberg et al., 2012). For example, communities reaching 50 percent broadband access saw greater economic growth compared to communities with less or no adoption (Pantelis, 2009). In 2022 and beyond, accessible, affordable, and fast internet connections are essential for both businesses and homes as more and more workers telework and report that they want the option to continue working from home (Parker et al., 2020). Accordingly, expanding broadband internet access can boost the economy, promote economic opportunities for workers in remote areas, and contribute to worker satisfaction and flexibility.

Both the State of Illinois and federal government have passed large infrastructure programs that include funding to expand broadband internet access, especially to rural areas and low-income communities. This report, conducted by researchers at the Illinois Economic Policy Institute (ILEPI) and the Project for Middle

Class Renewal (PMCR) at the University of Illinois at Urbana-Champaign, discusses the impact of the "digital divide" in Illinois, summarizes recent efforts to expand the state's broadband infrastructure, and assesses implications for Illinois' homes, businesses, and farms. Then, the economic and fiscal impacts of these historic public investments in broadband infrastructure are estimated before associated social benefits are considered. A concluding section recaps key findings.

The Digital Divide in Illinois

There is currently a large "digital divide" in Illinois. The digital divide includes the gap between those with and those without access to affordable broadband internet service. Even among households that have an internet connection, many still do not have access at the minimum speeds of 25 Mbps download and 3 Mbps upload established as the benchmark from the FCC in 2015 (Horrigan et al., 2020). The digital divide and the lack of reliable high-speed internet prevents many residents from undertaking necessary tasks.

While internet service providers often claim to meet the FCC's minimum broadband speeds, the reality of internet access often falls short. The FCC's definition of broadband is based on *potential* speeds. Under this definition, fewer than 15 million Americans lack access to broadband internet. However, the tech company Microsoft has measured the *actual* speeds that users get when they connect to their networks. Microsoft finds that 120 million people do not have functional access to regular broadband internet across the United States (Kahan & Lavista Ferres, 2021).

The experience in Illinois is no different (Figure 1). Figure 1 shows the percentage of the population in each county that should have broadband internet access, according to the FCC's standards, along with Microsoft-reported data on performance. Over 99 percent of the population in all six of the counties in the Chicago metropolitan area should have the potential for broadband internet, but Microsoft reports that only between 64 percent (Cook County) and 88 percent (DuPage County) of connections meet the low 25 Mbps download and 3 Mbps upload thresholds. Microsoft's data also demonstrate a significant urban-rural divide. While all six Chicago-area counties have over 60 percent of the population regularly achieving broadband speeds, only eight of the remaining 96 counties (8 percent) have at least 60 percent access, according to Microsoft.

Figure 2 provides a geographical representation of similar data provided by Connect Illinois, the statewide broadband deployment program (Connect Illinois, 2022). The map shows that while most residents have access to the 25 Mbps download and 3 Mbps upload benchmark set by the FFC, there are still many areas of the state—mostly rural—that lack this access. Furthermore, very few areas have access to 1 Gbps download and 1 Gbps upload speeds (Figure 2).

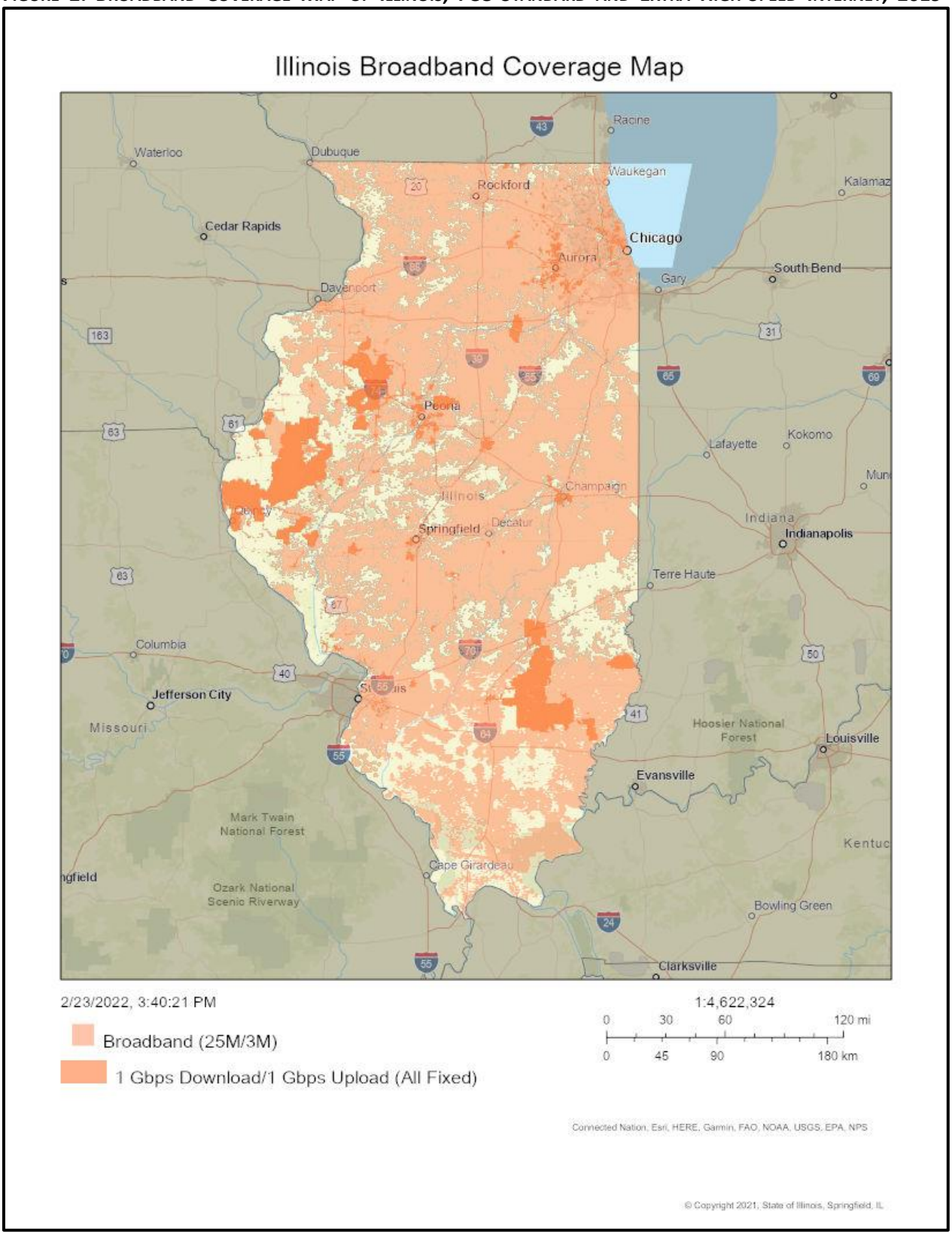
The U.S. Census Bureau also asks U.S. households whether they subscribe to the internet using broadband internet such as cable, fiber optic, or digital subscriber line (DSL) service (Ruggles et al., 2021). The Census' survey approach may be the best metric for understanding access to high-speed internet because the FCC standard is so low and Microsoft's higher definition could be influenced by their lobbying efforts to expand high-speed internet connections to grow the potential customer base of their products.

FIGURE 1: SHARE OF POPULATION WITH ACCESS TO BROADBAND, FCC'S POTENTIAL VS. MICROSOFT'S ACTUAL

County in Illinois	FCC's Definition	Microsoft's Definition	County in Illinois	FCC's Definition	Microsoft's Definition
Cook	99.2%	63.7%	LaSalle	100.0%	41.5%
DuPage	99.3%	88.3%	Lawrence	77.8%	32.0%
Kane	99.1%	71.6%	Lee	100.0%	34.7%
Lake	99.1%	77.1%	Livingston	100.0%	33.4%
McHenry	99.7%	72.6%	Logan	93.5%	42.4%
Will	99.4%	71.5%	McDonough	98.8%	46.4%
Adams	90.1%	55.8%	McLean	97.6%	66.2%
Alexander	0.1%	10.4%	Macon	99.4%	63.6%
Bond	100.0%	17.3%	Macoupin	83.9%	27.9%
Boone	97.1%	43.6%	Madison	99.9%	52.3%
Brown	79.9%	31.5%	Marion	92.3%	44.4%
Bureau	100.0%	38.2%	Marshall	100.0%	17.7%
Calhoun	73.4%	5.8%	Mason	79.5%	18.0%
Carroll	91.7%	24.8%	Massac	73.4%	10.6%
Cass	93.3%	21.4%	Menard	96.2%	14.1%
Champaign	96.8%	52.5%	Mercer	100.0%	23.2%
Christian	100.0%	38.6%	Monroe	98.4%	74.3%
Clark	80.8%	20.0%	Montgomery	86.7%	29.4%
Clay	86.1%	58.7%	Morgan	89.7%	39.9%
Clinton	100.0%	22.2%	Moultrie	95.4%	23.7%
Coles	89.9%	33.0%	Ogle	95.9%	28.1%
Crawford	79.2%	23.3%	Peoria	100.0%	56.4%
Cumberland	56.1%	11.6%	Perry	95.9%	29.5%
DeKalb	96.5%	54.0%	Piatt	96.1%	36.6%
De Witt	87.9%	30.9%	Pike	87.5%	28.5%
Douglas	82.6%	42.8%	Pope	83.9%	30.8%
Edgar	92.2%	17.3%	Pulaski	44.9%	11.0%
Edwards	78.0%	18.8%	Putnam	100.0%	16.8%
Effingham	95.3%	58.6%	Randolph	96.1%	24.8%
Fayette	55.8%	19.8%	Richland	75.3%	38.0%
Ford	89.8%	34.9%	Rock Island	100.0%	47.1%
Franklin	98.2%	23.5%	St. Clair	100.0%	55.8%
Fulton	80.7%	26.5%	Saline	83.4%	25.0%
Gallatin	91.9%	21.6%	Sangamon	98.4%	66.5%
Greene	90.9%	12.0%	Schuyler	61.6%	21.0%
Grundy	100.0%	54.7%	Scott	93.1%	41.8%
Hamilton	75.5%	28.9%	Shelby	89.7%	24.2%
Hancock	80.8%	30.0%	Stark	100.0%	23.5%
Hardin	100.0%	37.7%	Stephenson	97.5%	51.1%
Henderson	100.0%	22.8%	Tazewell	97.6%	67.3%
Henry	100.0%	44.2%	Union	80.3%	20.6%
Iroquois	78.7%	18.5%	Vermilion	94.6%	37.1%
Jackson	100.0%	35.0%	Wabash	87.5%	20.3%
Jasper	50.1%	30.9%	Warren	100.0%	22.6%
Jefferson	99.4%	49.8%	Washington	88.3%	20.1%
Jersey	98.5%	26.2%	Wayne	93.1%	21.9%
Jo Daviess	88.4%	38.0%	White	81.4%	29.2%
Johnson	55.1%	16.8%	Whiteside	100.0%	46.2%
Kankakee	97.8%	53.4%	Williamson	92.4%	52.9%
Kendall	98.8%	73.9%	Winnebago	98.3%	66.3%
Knox	100.0%	47.8%	Woodford	100.0%	62.0%

Source(s): Authors' reproduction of "United States Broadband Usage Percentages Dataset" (Kahan & Lavista Ferres, 2021).

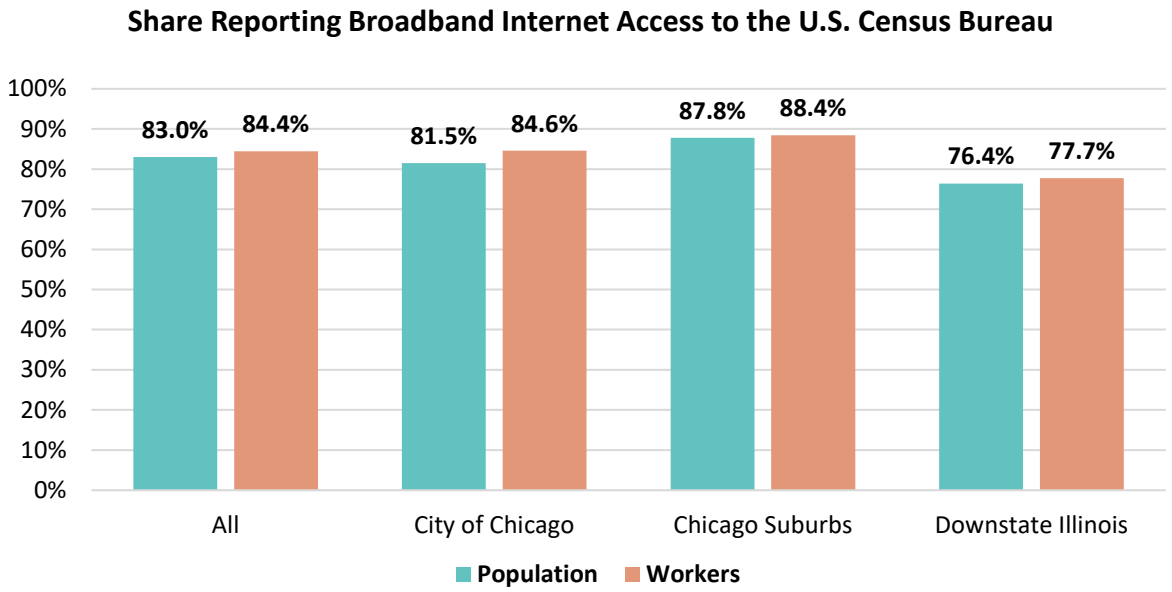
FIGURE 2: BROADBAND COVERAGE MAP OF ILLINOIS, FCC STANDARD AND EXTRA HIGH-SPEED INTERNET, 2019



Source(s): Authors' reproduction of "The Illinois Broadband Map" from the Connect Illinois at the Illinois Department of Commerce and Economic Opportunity (Connect Illinois, 2022).

Fully 83 percent of residents and 84 percent of workers in Illinois report to the U.S. Census Bureau that they have access to high-speed internet service (Figure 3). Like the estimates from the FCC and from Microsoft, Census data suggests that broadband coverage is highest in the suburbs of Chicago, with 88 percent of both people and workers reporting access. In the City of Chicago, about 82 percent of residents and 85 percent of workers have access. By contrast, only 76 percent of people and 78 percent of workers have access to broadband internet in the rest of Illinois—often referred to as "Downstate."

FIGURE 3: SHARE OF POPULATION AND WORKERS REPORTING BROADBAND ACCESS TO THE CENSUS, BY GEOGRAPHY



Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021).

Figure 4 summarizes the FCC, Microsoft, and Census Bureau estimates on the share of Illinois' population with and without access to broadband internet. These figures suggest that between 535,000 and 5.0 million residents do not have access to reliable high-speed internet. The middle-of-the-road estimate from the U.S. Census Bureau translates into about 2.2 million people who lack broadband internet access in Illinois (Figure 4).

FIGURE 4: TOTAL POPULATION WITHOUT BROADBAND INTERNET ACCESS—FCC, MICROSOFT, AND THE CENSUS BUREAU

Estimate for Illinois	FCC	Microsoft	Census Bureau
Share of Population with Broadband	95.8%	60.7%	83.0%
Share of Population Without Broadband	4.2%	39.3%	17.0%
Estimated Population Without Broadband	**535,494**	**5,033,580**	**2,178,126**

Source(s): Authors' reproduction of "United States Broadband Usage Percentages Dataset" and 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Kahan & Lavista Ferres, 2021; Ruggles et al., 2021).

A broadband affordability study conducted by researchers at Oklahoma State University and Simmons University in Boston, Massachusetts was presented to the Illinois Broadband Advisory Council in December 2020 (Horrigan et al., 2020). The report estimated that the cost of providing 25 Mbps download speed and 3 Mbps upload speed to unserved housing units in Illinois would be between $306 million and $485 million. The researchers found that the cost of upgrading all housing units to a 100 Mbps download speed and 20 Mbps upload speed would be as much as $1.9 billion (Horrigan et al., 2020).

Recent Public Policies and Broadband Investments

Illinois is currently investing hundreds of millions of dollars in broadband infrastructure. In June 2019, Governor JB Pritzker signed Rebuild Illinois, a bipartisan $45 billion capital program, into law (Munks & Petrella, 2019). Rebuild Illinois included $400 million for the Department of Commerce and Economic Opportunity (DCEO) to expand access to reliable high-speed internet services. The statewide broadband deployment program, Connect Illinois, was launched in 2019. Another $20 million was devoted to repairing and expanding broadband networks at K-12 schools, colleges, and universities (DCEO, 2022a).

In November 2021, President Joe Biden signed the bipartisan Infrastructure Investment and Jobs Act, a $1.2 trillion infrastructure program over eight years (NCSL, 2022). Illinois will receive at least $17 billion in infrastructure funding from the Infrastructure Investment and Jobs Act, including at least $100 million for reliable high-speed internet (Biden White House, 2021). While all states will receive a minimum of $100 million to expand broadband internet, another $32 billion is available from the federal government for broadband projects in unserved locations and an extra $4 billion is available for broadband projects in underserved locations in high-cost areas across the country (Reynolds, 2021). The federal law requires a matching contribution of at least 25 percent of project costs for a state to receive funding from these additional programs, and Illinois is positioned well to leverage Connect Illinois money to receive more federal grants above-and-beyond the $100 million minimum investment.

The State of Illinois has recently invested $73 million in broadband infrastructure, matched by $89 million in federal and other nonstate funds. This means that about 18 percent of the state funding for broadband infrastructure from the Rebuild Illinois capital program has been deployed. Note that, to date, the federal match has all occurred prior to the implementation of the Infrastructure Investment and Jobs Act. Round 1 of Connect Illinois was announced in June 2020, awarding $50 million in state grants matched by $65 million in nonstate funding to expand internet access to 26,000 homes, businesses, and farms in all regions of the state (WIFR, 2020). Round 2 was announced in January 2022, awarding $23 million in state grants matched by $24 million in nonstate funding to expand access to another 13,000 premises (DCEO, 2022b). In January 2022, Connect Illinois posted a Notice of Funding Opportunities (NOFO) for Round 3 funding totaling $350 million (DCEO, 2022c).

All told, since 2020, $162 million has been invested in Illinois to expand broadband access to 39,000 homes, businesses, and farms (Figure 5).[1] State funding has accounted for 45 percent of the total investment, with federal and nonstate matching funds contributing the other 55 percent. On average, the cost to connect each location to reliable high-speed internet has been about $4,200 (Figure 5).

FIGURE 5: FUNDING, PREMISES SERVED, AND ESTIMATED COSTS OF RECENT BROADBAND INVESTMENTS, 2020-2022

Connect Illinois Investments (2020-2022)	A. State Funding	B. Nonstate Match	C. Total Funding [A + B]	D. Homes, Farms, and Businesses Served	E. Estimated Cost to Connect Each Service Location [C ÷ D]
Round 1 (2020)	$50.0 million	$65.0 million	$115.0 million	26,000	$4,423
Round 2 (2022)	$23.0 million	$24.0 million	$47.0 million	13,000	$3,615
Total	**$73.0 million**	**$89.0 million**	**$162.0 million**	**39,000**	**$4,154**

Source(s): Authors' analysis of Connect Illinois "Broadband Grants" data and related press releases (DCEO, 2022a; WIFR, 2020; DCEO, 2022b).

[1] For a full list of broadband infrastructure projects receiving state grants, their location, and their reported number of premises served, please see Table A in the Appendix.

Figure 6 uses this actual project data to estimate the full impact of the Rebuild Illinois and Infrastructure Investment and Jobs Act investments on broadband internet access in Illinois. The projection assumes that the cost to connect each location will be similar to the average from Round 1 and Round 2.[2] It also assumes that the pre-federal law split in state-nonstate funding (45 percent to 55 percent, respectively) will continue, even though the Infrastructure Investment and Jobs Act only requires a minimum state contribution of 25 percent. The exception is the $100 million in minimum federal funding, which is allocated to each state and does not require a state match. In total, Rebuild Illinois and the Infrastructure Investment and Jobs Act are projected to expand broadband internet access to nearly 238,000 households, businesses, and farms across Illinois (Figure 6).

FIGURE 6: ESTIMATED NUMBER OF PREMISES SERVED AFTER SIX YEARS OF BROADBAND INVESTMENTS, 2020-2025

Broadband Investments (2020-2025)	A. State Funding	B. Nonstate Match	C. Total Funding [A + B]	D. Estimated Homes, Farms, and Businesses Served [C ÷ $4,154]
Rebuild Illinois	$400.0 million	$487.7 million	$887.7 million	213,699
Federal IIJA	--	$100.0 million	$100.0 million	24,074
Total	**$400.0 million**	**$587.7 million**	**$987.7 million**	**237,773**

Source(s): Authors' projected impact of broadband investments from the statewide Rebuild Illinois capital program and the federal Infrastructure Investment and Jobs Act using data from Connect Illinois "Broadband Grants" data and related press releases (DCEO, 2022a; WIFR, 2020; DCEO, 2022b; Munks & Petrella, 2019; Biden White House, 2021).

The Economic Impacts of Broadband Investments in Illinois

The expansion of broadband internet across Illinois will have significant economic impacts (Figure 7). Using three years of data from the *American Community Survey*, which is an annual survey of approximately 1 percent of the U.S. population that is conducted by the U.S. Census Bureau, 82 percent of Illinois' working-age population (i.e., people between the ages of 21 years old and 54 years old) with access to broadband internet are employed. On average, workers with access to broadband internet earn about $60,000 in income from wages and salaries per year. By contrast, only 77 percent of working-age residents without broadband access have jobs, and their annual incomes average about $41,400. Accordingly, ***Illinois workers with broadband access are 5 percent more likely to be employed and they earn 45 percent more than their counterparts without broadband access*** (Figure 7).

FIGURE 7: WORKING-AGE ILLINOIS RESIDENTS WITH JOBS AND THEIR INCOMES, BY BROADBAND ACCESS, 2017-2019

Illinois' Working-Age Population: Residents Ages 21 to 54 Years Old	Residents With Broadband Access	Residents Without Broadband Access	Broadband Difference
Employment Rate	82.4%	77.0%	**+5.4%**
Average Annual Income	$60,012	$41,385	**+45.0%**

Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021). "Average Annual Income" is adjusted for inflation.

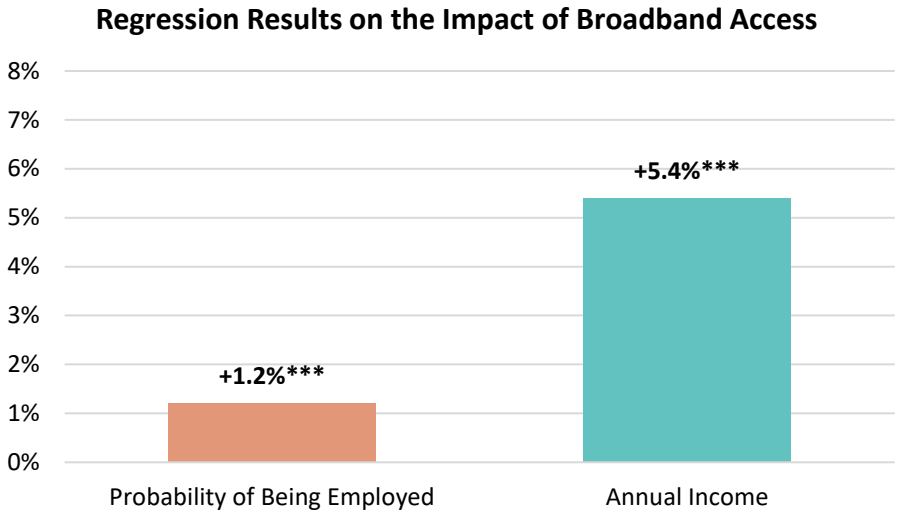
There may, however, be other factors that contribute to these gaps in economic outcomes. For example, workers with bachelor's degrees may be more likely to have access to broadband internet than those with high school degrees. Greater levels of educational attainment are associated with lower unemployment rates and higher incomes (BLS, 2021). Similarly, workers in jobs that can be done remotely could be more

[2] This assumption may be plausible because the average cost to connect a home, business, or farm was 18 percent cheaper in Round 2 (2022) than in Round 1 (2020), but year-over-year inflation has been about 8 percent in the United States (Lane, 2022).

likely to have broadband internet at their homes. Remote occupations are generally higher-paying than face-to-face occupations (Manzo & Bruno, 2020).

Figure 8 uses "regression" analyses to control for these and other observable factors to parse out the unique and independent effect of access to broadband internet on employment and incomes. After accounting for age, racial and ethnic background, gender identification, marital status, household size, veteran status, native-born or foreign-born status, citizenship status, school enrollment status, and level of educational attainment, access to broadband internet is associated with a 1 percent increase in the chances that an Illinois resident is employed. After accounting for occupation, industry, sector of employment, weeks worked over the year, hours worked per week, and the previously mentioned factors, access to broadband internet is associated with an annual income increase for an Illinois worker of 5 percent. Both effects are statistically significant.

FIGURE 8: STATISTICAL IMPACTS OF BROADBAND ACCESS ON EMPLOYMENT RATES AND WORKER INCOMES, 2017-2019



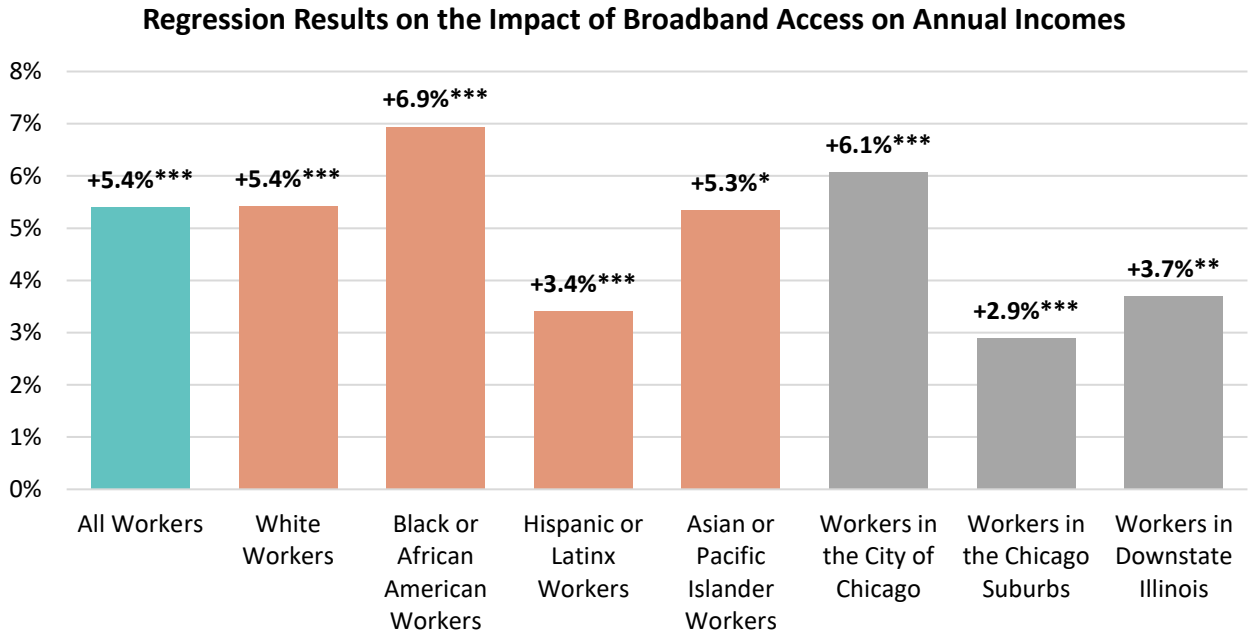
Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021). ***P≤|0.01|; **P≤|0.05|; *P≤|0.10|. For full regression results, see Appendix Table B. Income results, which are in inflation-adjusted terms, are converted to percent changes using correct adjustments (Kennedy, 1981; IDRE, 2021).

Access to broadband internet raises wages for all workers (Figure 9). After accounting for other factors, broadband internet access is associated with annual income increases of 5 percent for white workers, 7 percent for Black workers, and 3 percent for Hispanic workers. Broadband internet access is also correlated with 6 percent higher incomes for workers living in the City of Chicago, 3 percent higher for workers living in the Chicago suburbs, and 4 percent higher for workers located in the rest of Illinois (or "Downstate"). Each of these results is statistically significant. Importantly, the effect is positive for all workers—regardless of racial and ethnic background or geographic location.

Investments in broadband internet will expand employment and improve worker incomes across Illinois (Figure 10). According to 2019 Census data, there were 5.5 million workers, 12.8 million people, and 5.4 million housing units in Illinois—or 1.03 workers and 2.38 residents per housing unit (Census, 2021). State and federal investments are projected to expand broadband internet access to nearly 238,000 premises across Illinois, primarily households and farms (see Figure 6). This means that nearly 244,100 currently employed residents will be impacted by the broadband expansion. Based on statistical results that account for other factors, these workers would be likely to experience an average income increase of 5

percent from the new access to high-speed internet, translating into a gain of over $2,200 annually per worker. The broadband expansion would also increase employment by 1 percent for the people living on these premises, creating 6,800 new jobs that pay about $43,600 per year. In total, Illinois' expansion of broadband internet will boost annual labor income by $843 million (Figure 10).[3]

FIGURE 9: STATISTICAL IMPACTS OF BROADBAND ACCESS ON WORKER INCOMES, BY RACE AND GEOGRAPHY, 2017-2019



Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021). ***P≤|0.01|; **P≤|0.05|; *P≤|0.10|. For selected regression results, see Table B in the Appendix. All results, which are in inflation-adjusted terms, are converted to percent changes (Kennedy, 1981; IDRE, 2021).

FIGURE 10: ESTIMATING THE IMPACT OF THE 2020-2025 BROADBAND EXPANSIONS ON WORKER EARNINGS BY 2026

Housing, Economic, or Broadband Metric	Estimate
A. Housing Units with Expanded Access	237,773
B. Existing Workers with Expanded Access [A x 1.03 Workers Per Unit]	244,053
C. Total People with Expanded Access [A x 2.38 Residents Per Unit]	565,410
D. Impact of Broadband on Employment	+1.2%
E. New Workers Due to Broadband Expansion [C x D]	+6,823
F. Average Income of Workers without Broadband	$41,385
G. Impact of Broadband on Worker Incomes	+5.4%
H. Average Income Gain for Workers with Expanded Access [F x G]	+$2,235
I. Income of Workers with Expanded Access [F + H]	$43,620
J. Change in Worker Earnings for Existing Workers from Expanded Access [B x H]	+$545.4 million
K. Change in Worker Earnings for New Workers from Expanded Access [E x I]	+$297.6 million
L. Total Change in Worker Earnings from Broadband Expansion [J + K]	**+$843.0 million**

Source(s): Authors' projected impact of broadband investments from the statewide Rebuild Illinois capital program and the federal Infrastructure Investment and Jobs Act using data from Connect Illinois "Broadband Grants" data and related press releases as well as 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (DCEO, 2022a; WIFR, 2020; DCEO, 2022b; Munks & Petrella, 2019; Biden White House, 2021; Ruggles et al., 2021). *NOTE: All estimates are in current dollars.

[3] All estimates are in today's dollars and are not adjusted for projected inflation or projected wage increases.

This analysis utilizes IMPLAN to assess the short-term and long-term economic impacts of Illinois' investments in broadband internet infrastructure (IMPLAN, 2022). IMPLAN is an industry-standard economic modeling software that inputs U.S. Census Bureau data, accounts for the interrelationship between households and businesses, and follows dollars as they cycle throughout the economy. The economic impact analysis includes $400 million from the State of Illinois (45 percent) that is matched by $488 million in federal and other nonstate sources (55 percent) as well as $100 million in additional federal funds, for a total of $988 million invested over six years. All estimates are in current dollars.

During the project construction phase, Illinois' broadband investments will save or create about 14,400 jobs, including 5,600 direct jobs for construction and installation workers. Workers on state-funded projects earn prevailing wages, which ensure that they earn middle-class wages and family-supporting benefits, that apprenticeship investments are made to train the next generation of skilled tradespeople, and that tax dollars are more likely to be awarded to local contractors (ILEPI, 2022). The infrastructure investments are also expected to boost economic activity by $2.6 billion over six years—a multiplier effect of $2.63 per dollar invested—and expand state and local tax revenues by $126 million (Figure 11).

FIGURE 11: SHORT-TERM ECONOMIC AND FISCAL IMPACTS OF BROADBAND INVESTMENTS IN ILLINOIS, 2020-2025

Short-Term Economic Impacts of the Construction Phase	Employment (Jobs)	Worker Earnings (Labor Income)	Total Output (Business Sales)	State and Local Tax Revenues
Direct Industries	+5,610	+$419.4 million	+$987.7 million	+$21.4 million
Indirect Supply Chain Industries	+1,245	+$98.0 million	+$298.0 million	+$19.8 million
Induced Consumer Demand	+7,566	+$438.1 million	+$1,313.3 million	+$84.8 million
Totals	**+14,421**	**+$955.5 million**	**+$2,599.0 million**	**+$126.0 million**

Source(s): Authors' IMPLAN analysis using data from Connect Illinois "Broadband Grants" data as well as 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (IMPLAN, 2022; DCEO, 2022a; WIFR, 2020; DCEO, 2022b; Munks & Petrella, 2019; Biden White House, 2021; Ruggles et al., 2021). *NOTE: All estimates are in current dollars.

The direct construction and installation phase will save or create jobs for trades workers of all backgrounds (Figure 12). However, across Illinois, Black residents are relatively underrepresented in construction, extraction, installation, repair, and maintenance occupations—7 percent below their share of the overall workforce in Illinois. Hispanic workers are disproportionately employed in these occupations (about 9 percent above their share of the overall workforce) and white workers are overrepresented by about 3 percent. While racial and ethnic diversity on broadband projects in rural areas is likely to mirror these overall statistics, broadband investments in urban communities may offer both job opportunities and new apprenticeship training opportunities for Black residents.

FIGURE 12: RACE AND ETHNICITY OF DIRECTLY EMPLOYED WORKERS VS. OVERALL WORKFORCE IN ILLINOIS, 2017-2019

Workforce Diversity by Racial or Ethnic Background	Construction, Extraction, Installation, Repair, and Maintenance Occupations	Total Employment (All Occupations)
White (non-Hispanic)	66.6%	63.7%
Black or African American	5.1%	11.7%
Hispanic or Latinx	25.7%	16.8%
Asian or Pacific Islander	1.4%	6.0%

Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021).

After the construction and installation phase, the $843 million growth in incomes from 6,800 new jobs and higher earnings for existing workers will increase consumer demand (see Figure 10). Greater levels of employment and additional worker earnings are projected to save or create about 4,500 additional jobs

across Illinois and generate $51 million in state and local tax revenues annually. Consequently, the broadband expansions will annually grow employment by 11,400 jobs, the economy by nearly $2.0 billion, and state and local tax revenues by $77 million (Figure 13).

FIGURE 13: ANNUAL IMPACTS OF BROADBAND INVESTMENTS AFTER CONSTRUCTION, ILLINOIS, 2026 AND BEYOND

Annual Economic Impacts of Wage and Employment Gains	Employment (Jobs)	Worker Earnings (Labor Income)	Total Output (Business Sales)	State and Local Tax Revenues
Direct Impact	+6,823	+$843.0 million	+$1,201.3 million	$20.0 million
Indirect Supply Chain Industries	0	$0	$0	$0
Induced Consumer Demand	+4,530	+$262.3 million	+$786.8 million	+$50.8 million
Totals	**+11,353**	**+$1,105.3 million**	**+$1,988.1 million**	**+$76.8 million**

Source(s): Authors' IMPLAN analysis using data from Connect Illinois "Broadband Grants" data as well as 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (IMPLAN, 2022; DCEO, 2022a; WIFR, 2020; DCEO, 2022b; Munks & Petrella, 2019; Biden White House, 2021; Ruggles et al., 2021). *NOTE: All estimates are in current dollars.

Investments in broadband internet access spurred by the statewide Rebuild Illinois capital program and the federal Infrastructure Investment and Jobs Act are expected to have large positive economic impacts in Illinois and pay for themselves in a relatively short period of time (Figures 11 and 13). In total, expanding broadband in Illinois will create about 24,800 jobs, including 14,400 jobs during construction and 11,400 jobs after construction. The investments will boost labor income and promote business activity. State and local tax revenues—mostly from income, sales, and property taxes—will increase by $126 million during the construction and installation phase and $77 million every year after that (in today's dollars). This means that the state's initial $400 million in investments is anticipated to be fully paid for just four years after construction of the expanded broadband infrastructure.

FIGURE 14: ESTIMATING THE DIGITAL DIVIDE IN 2026 AFTER THE BROADBAND EXPANSIONS, WITHOUT FURTHER ACTION

Economic and Broadband Estimates	Population	Workers
A. Approximate Number of People in Illinois	12.8 million	5.5 million
B. Share with Broadband Access	83.0%	84.5%
C. Number with Broadband Access	10.6 million	4.7 million
D. New People with Broadband Access After Expansion	565,410	244,053
E. New Share with Broadband Access After Expansion [(C + D) ÷ A]	87.4%	88.9%
F. Change in the Share with Broadband Expansion [E – B]	+4.4%	+4.4%
G. Share of People without Broadband Access After Expansion [100% - E]	**12.6%**	**11.1%**
H. Estimated People without Broadband Access After Expansion [G x A]	**1,608,673**	**613,551**
I. Estimated Additional Cost to Fully Connect Illinois*	**$2.81 billion**	

Source(s): Authors' projected impact of broadband investments from the statewide Rebuild Illinois capital program and the federal Infrastructure Investment and Jobs Act using data from Connect Illinois "Broadband Grants" data and related press releases as well as 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (DCEO, 2022a; WIFR, 2020; DCEO, 2022b; Munks & Petrella, 2019; Biden White House, 2021; Ruggles et al., 2021). Estimates were calculated prior to the U.S. Census Bureau report suggesting that Illinois' population was undercounted in the 2020 Census and is likely over 13 million people (Hill et al., 2022; Ramos & Armentrout, 2022). *The math is 1,608,673 people divided by 2.38 residents per unit multiplied by the $4,154 cost to connect each unit: (1,608,673 ÷ 2.38) x $4,154 = $2.81 billion.

However, despite historic levels of infrastructure investment, Illinois will still have unmet broadband infrastructure needs (Figure 14). Currently, 83 percent of Illinois residents and nearly 85 percent of Illinois workers report having access to high-speed broadband internet, according to the U.S. Census Bureau. Funding from the Rebuild Illinois capital program and from the Infrastructure Investment and Jobs Act will extend access to an additional 4 percent of Illinois residents and workers. This will leave about 13 percent of all Illinois residents and 11 percent of all Illinois workers without access to broadband internet unless internet service providers or policymakers find other ways to address this infrastructure deficit. Those left

out are likely to continue to be disproportionately Black, Hispanic, and low-income households. Based on average costs and the remaining need according to U.S. Census Bureau estimates, it would cost $2.8 billion—in current dollars—to fully connect all Illinois residents to reliable high-speed internet (Figure 14).

Social Benefits of Broadband Investments in Illinois

Location inequality stems from uneven distribution of networks across Illinois. Affluent communities and densely populated areas were developed first for internet infrastructure. Rural areas were more expensive to serve, with fewer people to share in the cost of laying cable to each household. The result has been that high-income and urban areas tend to have faster and better broadband service than low-income and rural communities. This has partially contributed to a "brain drain," or out-migration of college-educated individuals from rural areas to urban areas, across the United States (AESE, 2022). Between 2010 and 2020, the City of Chicago added nearly 51,000 residents and the collar suburbs added over 78,000 residents, while Downstate lost more than 147,000 residents, according to the 2020 Census (Figure 15). However, a post-Census review by the U.S. Census Bureau found that Illinois' population was likely undercounted by 2 percent, meaning that Illinois actually has around 13 million residents (Hill et al., 2022; Ramos & Armentrout, 2022). While correcting for this undercount may change the estimates in Figure 15, it does not change the fact that the rural parts of the state are generally stagnant or losing in population while the Chicago metropolitan area is growing.

FIGURE 15: POPULATION CHANGES BETWEEN THE 2010 CENSUS AND THE 2020 CENSUS IN ILLINOIS, BY GEOGRAPHY

Population Estimates	2010 Census	2020 Census	Change (#)	Change (%)
Illinois	12,830,632	12,812,508	-18,124	**-0.1%**
City of Chicago	2,695,598	2,746,388	+50,790	**+1.9%**
Chicago Suburbs and Collar Counties	5,621,052	5,699,478	+78,426	**+1.4%**
Downstate	4,513,982	4,366,642	-147,340	**-3.3%**

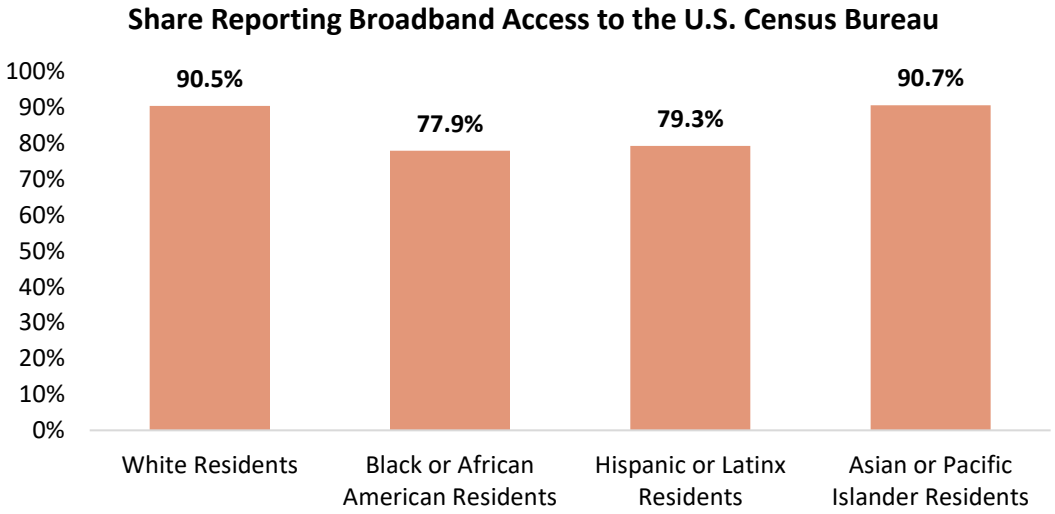
Source(s): Authors' reproduction of Census QuickFacts data for "Illinois; Chicago City, Illinois" and for "Kane County, Illinois; Will County, Illinois; DuPage County, Illinois; Lake County, Illinois; McHenry County, Illinois; Cook County, Illinois." (Census, 2022a; Census, 2022b). NOTE: All six counties in the Chicago metropolitan area—Cook (+1.4 percent), DuPage (+1.7 percent), Kane (+0.2 percent), Lake (+1.5 percent), McHenry (+0.5 percent), and Will (+2.8 percent)—added population between the 2010 Census and the 2020 Census. Estimates were calculated prior to the U.S. Census Bureau report suggesting that Illinois' population was undercounted in the 2020 Census and is likely over 13 million people (Hill et al., 2022; Ramos & Armentrout, 2022).

Investments in broadband infrastructure can help address this urban-rural divide. First, broadband investments will benefit Illinois' farmers. Modern farming is more intertwined with technology than ever before, with farmers relying on broadband just as much as they do highways, railroads, and waterways (FB, 2022). Today's farmers utilize global positioning system (GPS) guided tractors, GPS sensors, remote-controlled equipment, and automated technologies to grow crops and support livestock. Broadband investments in rural communities—and in particular those that connect unserved farms—can improve crop yields and agricultural productivity. Second, the increased ability to work-from-home has caused more workers to consider relocating to rural communities and the suburbs (Markarian, 2021). Expanding access to broadband infrastructure can entice remote workers who prefer small-town living to relocate to rural Illinois, potentially reversing the population losses and stagnation in Downstate communities.

Within urban areas, investments in broadband infrastructure can also address racial disparities. In the Chicago metropolitan area, nine-in-ten white (90 percent) and Asian and Pacific Islander residents (91 percent) have access to broadband internet compared with fewer than eight-in-ten Black (78 percent) and Hispanic (79 percent) residents (Figure 16). Recent research has also revealed that nearly one-in-five

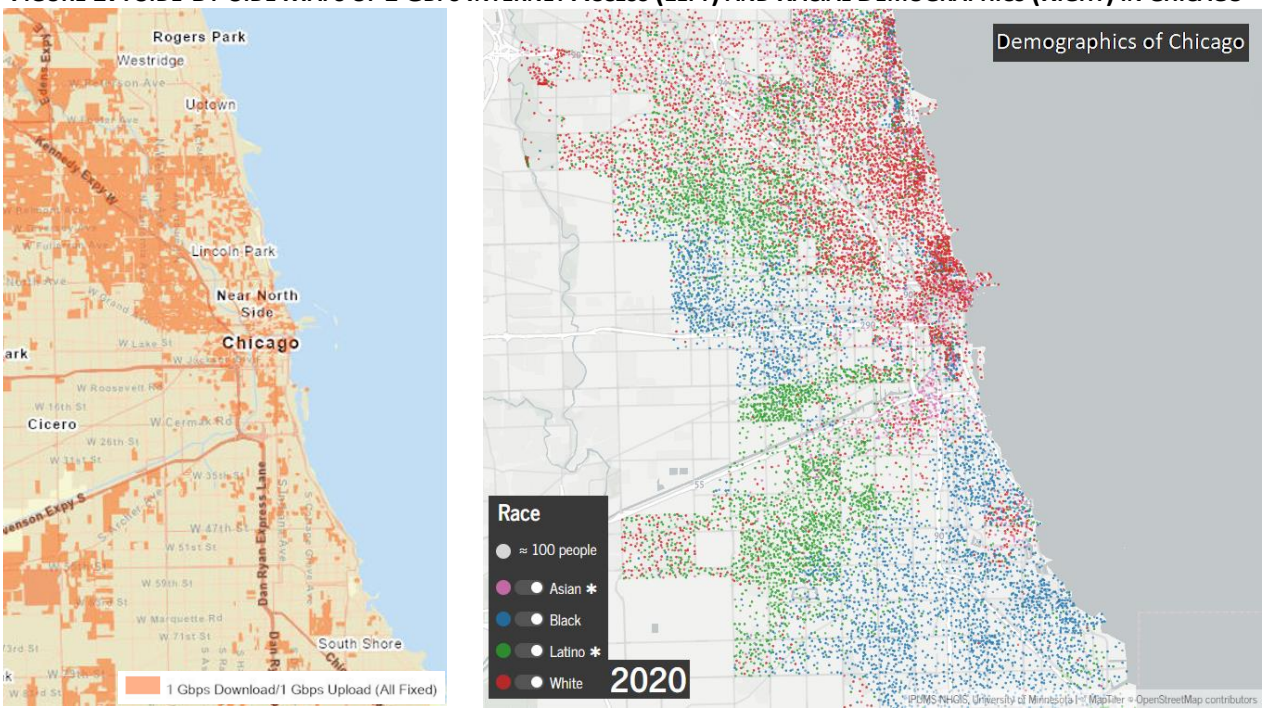
Chicago students lacks access to broadband, with the largest gaps in internet connectivity in the south and west sides of the city. Fully 46 percent of children lack broadband access in the West Englewood neighborhood of Chicago (KFC-MPC, 2020).

FIGURE 16: SHARE OF THE CHICAGO AREA'S POPULATION REPORTING BROADBAND ACCESS, BY RACE OR ETHNICITY



Source(s): Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021).

FIGURE 17: SIDE-BY-SIDE MAPS OF 1 GBPS INTERNET ACCESS (LEFT) AND RACIAL DEMOGRAPHICS (RIGHT) IN CHICAGO



Source(s): Authors' reproductions of 2019 data in "The Illinois Broadband Map" from the Connect Illinois at the Illinois Department of Commerce and Economic Opportunity (left) and the 2020 "Firsthand Segregation" map (right) publicized by *WTTW News* with credit to Charmaine Runes and Pat Sier of *South Side Weekly* (Connect Illinois, 2022; Cherone, 2022).

Figure 17 illustrates and juxtaposes the access to 1 Gbps internet service with the segregated racial and ethnic demographics within the City of Chicago. Generally speaking, high-speed 1 Gbps download and upload speeds are most available in the northern and northwest areas of the city, where communities are predominantly white. On the south and west sides of the City of Chicago, which are majority Black, there is a noticeable lack of 1 Gbps broadband internet access. Areas with high Hispanic populations are more mixed but tend to also lack 1 Gbps internet, especially relative to predominantly white neighborhoods (Figure 17). Expanding broadband access to unserved and underserved communities can close racial digital divides.

Access to reliable high-speed internet can improve the health of Illinois residents. Humans are social beings who communicate with one another. The internet allows communication through messaging, emails, videos, and other modes. In addition to facilitating social interaction, the technology is an asset for people who live in remote areas, people who are isolated, and people who are ill. The availability of reliable high-speed internet may thus have the intangible benefit of improving mental health and access to preventative telehealth services, in addition to financial benefits around work and commerce.

Telehealth and telemedicine, or the delivery of health services over the internet, has been essential for doctors and patients to interact without risking exposure to the COVID-19 virus. Practitioners can share information quickly regardless of geographic location if they have access to broadband internet. Telehealth also allows people to interact with health practitioners who otherwise may not be available, such as by connecting rural residents to specialists in urban centers without travel. With Illinois' rural areas facing challenges in attracting and retaining health care workers, augmented telehealth infrastructure is one way to improve access to medical and behavioral health specialists (SIU Medicine, 2021).

Finally, the pandemic revealed that Illinois is not prepared for remote learning. In the 2020-2021 school year, student enrollment declined by 4 percent and one-in-five students was chronically absent (Dey, 2021). Compared with the 2018-2019 school year two years before, 17 percent fewer students met grade-level standards for English and 18 percent fewer students met grade-level standards for math (Dey, 2021). Children with poor, slow, or no internet access likely fared even worse. While this "forced experiment" in remote learning produced negative outcomes, some districts may continue to turn to remote learning in special circumstances. For example, schools may go to remote learning on snowy days instead of canceling classes and making up the day in the summer. Expanding access to broadband internet can reduce the number of students who are left behind when these special circumstances arise.

Conclusion

Access to reliable high-speed internet has become an essential part of commercial activity and daily life. Illinois will be investing $500 million in broadband infrastructure—and upwards of $1 billion after federal and nonstate matching—to expand this access to rural and low-income communities across the state. These public investments will raise worker incomes, create jobs, expand business activity, and generate additional state and local tax revenues while addressing digital divides within the State of Illinois. However, despite historic public investments, nearly $3 billion will be needed in additional private or government funding to connect the 13 percent of Illinois residents who will still be without access. Those left without access will disproportionately be Black, Hispanic, and low-income households. Additional steps can be taken to expand high-speed internet access in, and employ more residents from, these communities to help diversify the skilled trades in Illinois.

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Appendix

TABLE A: LIST OF PROJECTS, STATE FUNDING AMOUNTS, AND LOCATIONS OF BROADBAND INVESTMENTS, 2020-2022

Project	Round	State Grant	Location
Adams Telsystems, Inc.	1	$4,954,066	Adams and Brown Counties
Allpoint NetworX	1	$2,679,502	Bond and Madison Counties
Cambridge Telecom Inc	1	$817,053	Henry
Century Enterprises, Inc.	1	$3,123,122	Fulton, Peoria, and Knox Counties
Comcast 2	1	$595,301	Sterling, Whiteside County
Comcast 3	1	$595,301	Vermillion County
Cook County	1	$1,876,581	Cook County Southland
Diverse Communications	1	$426,000	Rural Alpha and Lynn Center
Geneseo Communications	1	$5,000,000	Henry and Rock Counties
Grafton Technologies, Inc.	1	$1,483,007	Jersey County
Illinois Electric Cooperative	1	$3,443,670	Calhoun County
Illinois Fiber Connect, LLC	1	$4,874,174	Effingham County
JoCarrol Energy Cooperative (Projects 2-3)	1	$6,050,115	Carroll, Jo Daviess, Stephenson, Whiteside Counties
Madison Communications	1	$4,230,223	Macoupin and Madison Counties
Mediacom 2	1	$249,424	Edgewood
Mediacom 3	1	$210,831	Franklin
Oneida Telephone Exchange	1	$576,900	Rural Sparta-Henderson Township
Shawnee LEC 1	1	$2,264,157	Johnson County
Shawnee LEC 2	1	$3,525,068	Williamson and Johnson Counties
Shawnee LEC 3	1	$1,183,982	Saline County
Spectrum Mid-America (Projects 1-6)	1	$214,822	Bethalto, Freeburg, Granite City, Lebanon, North Woodlawn, O'Fallon
Wabash Telephone	1	$1,591,098	Clay County
Adams Telsystems, Inc.	2	$1,252,041	Adams and Pike Counties
Bspeedy Wireless, Inc.	2	$152,108	Richland, Edwards, Jasper, Wabash, Lawrence, Clay, Wayne, and Crawford Counties
Century Enterprises, Inc.	2	$215,120	Knox County
Clearwave Communications	2	$1,025,431	Saline, Williamson, and Johnson Counties
Comcast of Illinois III, Inc.	2	$630,903	Vermilion County
Comcast of Illinois III, Inc.	2	$595,300	Whiteside County
East Moline CUSD	2	$1,706,494	Rock Island and Henry Counties
Jo-Carroll Energy, Inc.	2	$4,688,840	Jo Davies, Carroll, and Whiteside Counties
Mediacom, LLC	2	$117,054	Champaign County
Mediacom, LLC	2	$52,434	St. Clair County
Mediacom, LLC	2	$45,905	LaSalle County
Metro Communications	2	$292,118	Livingston County
ProTek Communications, LLC	2	$2,409,025	Williamson County
Spectrum	2	$29,555	Madison County
Spectrum	2	$99,556	St. Clair County
Spectrum	2	$109,320	Madison County
Spectrum	2	$107,416	Clinton County
Spectrum	2	$50,198	Washington County
Spectrum	2	$50,750	Winnebago County
Strada Communications, LLC	2	$5,000,000	Rock Island and Whiteside Counties
Village of Palatine	2	$101,387	Cook County
WKT Cooperative	2	$4,728,300	Union and Pulaski Counties

Source(s): Authors' analysis of Connect Illinois "Broadband Grants" data and related press releases (DCEO, 2022a; WIFR, 2020; DCEO, 2022b).

TABLE B: REGRESSION RESULTS ON THE IMPACT OF BROADBAND ACCESS ON THE PROBABILITY OF BEING EMPLOYED (ROBUST PROBIT REGRESSION) AND THE NATURAL LOG OF REAL INCOME FROM WAGES AND SALARIES (ROBUST OLS REGRESSION), 2017-2019

Robust Regression Models	[1] Prob(Employed)		[2] ln(Real Income)		[3] ln(Real income | Black)	
Variable	*dy/dx*	(St. Err.)	Coefficient	(St. Err.)	Coefficient	(St. Err.)
Broadband Internet Access	**+0.0121*** **	**(0.002)**	**+0.0526*** **	**(0.006)**	**+0.0671*** **	**(0.019)**
Race: Black or African American	-0.0453***	(0.003)	-0.1149***	(0.008)		
Race: Hispanic or Latinx	+0.0245***	(0.003)	-0.0500***	(0.007)		
Race: Asian or Pacific Islander	-0.0482***	(0.004)	-0.0131	(0.010)		
Race: All Other Non-White	-0.0237***	(0.006)	-0.0625***	(0.017)		
Age	+0.0381***	(0.000)	+0.0541***	(0.001)	+0.0506***	(0.004)
Age^2	-0.0005***	(0.000)	-0.0005***	(0.000)	-0.0005***	(0.000)
Gender Identification: Female	-0.0684***	(0.002)	-0.1658***	(0.005)	-0.0738***	(0.017)
Demographics: Married	-0.0141***	(0.002)	+0.0895***	(0.005)	+0.0712***	(0.017)
Demographics: Military Veteran	-0.0305***	(0.004)	-0.0228**	(0.011)	+0.0079	(0.036)
Education: Less than High School	-0.1279***	(0.002)	-0.1184***	(0.010)	-0.0874**	(0.039)
Education: Some College, No Degree	+0.0530***	(0.003)	+0.0710***	(0.006)	+0.0650***	(0.020)
Education: Associate Degree	+0.0753***	(0.003)	+0.1096***	(0.008)	+0.0892***	(0.027)
Education: Bachelor's Degree	+0.0915***	(0.003)	+0.3126***	(0.007)	+0.2382***	(0.025)
Education: Master's Degree	+0.1087***	(0.003)	+0.4924***	(0.009)	+0.3993***	(0.030)
Education: Professional or Doctorate	+0.1637***	(0.005)	+0.6983***	(0.014)	+0.5141***	(0.057)
Geography: Lives in City Center	-0.0146***	(0.002)	+0.1113***	(0.006)	+0.0478**	(0.021)
Geography: Lives in Suburb	+0.0011	(0.002)	+0.0567***	(0.005)	+0.0341*	(0.021)
Geography: Lives in Rural Area	+0.0108***	(0.003)	-0.1051***	(0.009)	-0.0384	(0.008)
Demographics: Foreign-Born	+0.0265***	(0.003)	-0.0317***	(0.008)	+0.0142	(0.036)
Demographics: Not a U.S. Citizen	-0.0356***	(0.004)	-0.0811***	(0.010)	-0.0043	(0.057)
Family: Number of Children	-0.0086***	(0.001)	+0.0153***	(0.002)	+0.0046	(0.006)
Education: Enrolled in School	-0.0868***	(0.003)	-0.1209***	(0.008)	-0.0670***	(0.003)
5 Sector of Employment Variables	N		Y		Y	
19 Industry Variables	N		Y		Y	
20 Occupation Variables	N		Y		Y	
Weeks Worked Per Year Variables	N		Y		Y	
Usual Hours Worked Per Week			+0.0319***	(0.000)	+0.0323***	(0.001)
Constant	0.5205***	(0.001)	5.7276***	(0.035)	5.5577***	(0.129)
R^2	0.427		0.682		0.577	
Observations	327,058		162,794		12,106	
Weighted	Y		Y		Y	

Authors' analysis of 2017-2019 *American Community Survey* data (five-year estimates) from the U.S. Census Bureau (Ruggles et al., 2021). ***P≤|0.01|; **P≤|0.05|; *P≤|0.10|. Model 1 probit uses average marginal effects (margins, dydx in STATA) to assess the impact on the probability that any given individual is employed. Model 2 is a natural logarithm to assess the impact on inflation-adjusted annual income from wages and salaries. Model 3 is the same as model 2, except that the analysis is limited to Black or African American respondents. Model 3 serves as an example. For full regression results in a .txt file, contact author Frank Manzo IV at fmanzo@illinoisepi.org.