



Informing Strategic Investment in Digital Equity

Cleveland/Cuyahoga County

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The National Digital Inclusion Alliance (NDIA) is a national nonprofit organization founded in 2015 to provide a unified voice for local technology training, home broadband adoption and public broadband access programs. NDIA's 270 affiliated organizations currently include 38 national nonprofits and 199 local public and nonprofit organizations in 35 states, the District of Columbia and the U.S. Virgin Islands. Our local affiliates include local governments, public libraries and community-based nonprofits, along with college and university programs, state broadband agencies, school districts and public housing authorities.

In Cuyahoga County, NDIA's affiliates include the Ashbury Senior Computer Community Center, the Cleveland Housing Network, Connect Your Community, Cuyahoga Community College, the Cuyahoga County Public Library, the Cuyahoga Metropolitan Housing Authority, DigitalC, the Fund for Our Economic Future, Metro West Community Development, Open NEO, Saint Colman Parish, Seeds of Literacy, the Shaker Heights Public Library, University Settlement, and the Urban Health Initiative of the CWRU School Of Medicine. Cuyahoga County is also home to one of NDIA's Founding Directing Council Members, Wanda Davis, and one of NDIA's Founding Staff Members, Bill Callahan.

NDIA's wide range of affiliates – from city governments, library systems and colleges to grassroots community organizations – reflects our core commitment to inclusive local collaboration as the only truly effective path to digital inclusion.

Our partners in Greater Cleveland have a long history of collaborative effort to overcome the community's large, persistent gaps in digital literacy and access. Among other achievements, Cleveland can claim:

- one of the nation's earliest grassroots initiatives to link basic digital literacy training to affordable home ownership of refurbished computers (Stockyards Computer Ownership for Neighbors, started in 1996);
- one of the first local, multimillion-dollar grant funds to support neighborhood technology centers (the Cleveland City Council – Adelphia Cable Neighborhood Technology Fund, 2001);
- nationally recognized public access and digital training programs in both of the county's major library systems, the Cleveland Public Library and Cuyahoga County Public Library;
- one of the largest, highest-impact household broadband adoption projects funded by the 2010-2013 Federal broadband stimulus program (OneCommunity's Connect Your Community Project, led locally by the Cleveland Housing Network with five other community partners);
- current, cutting-edge initiatives in the areas of high-end community broadband, digital health literacy, and technology workforce development – led by DigitalC, the Ashbury Senior Computer Community Center, the Cuyahoga Metropolitan Housing Authority, and the Urban Health Initiative among others.

This history has created a powerful foundation of experience, skills and program capacity for building a digital inclusion strategy for Greater Cleveland.

NDIA is grateful to the Cleveland Foundation for the opportunity to contribute to this effort.

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Commissioned by the Cleveland Foundation

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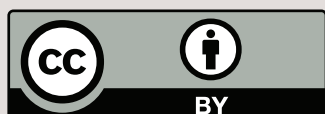
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Introduction

Commissioned by the Cleveland Foundation, this report's purpose is to guide the Foundation's staff and partners as they strategically determine how best to dedicate resources toward digital literacy, internet access and broad technological empowerment. The Cleveland Foundation's Digital Excellence Initiative aims to position Greater Cleveland as a leader in digital innovation and access by investing in efforts that align with the five focus areas of the foundation's Digital Excellence Initiative:

- Creating a more connected community
- Supporting digital skills development
- Improving digital civic engagement
- Elevating regional digital leadership
- Encouraging technology innovation for social good

Nonprofit organizations and public libraries have operated a variety of digital inclusion programs in Cuyahoga County since the mid-1990s, providing public Internet access opportunities, digital literacy training, cheap refurbished computers, and various types of affordable home Internet access.

The high-water mark for digital inclusion efforts in the Cuyahoga County was the period 2010 through 2012, when Federal stimulus funds granted by the Commerce Department's Broadband Technology Opportunities Program supported two of the nation's largest local broadband adoption efforts – one implemented by a coalition of nonprofits led by OneCommunity and the Cleveland Housing Network in Cleveland and East Cleveland and the other by the Cuyahoga County Public Library. Other significant, often long-term contributions to digital inclusion and equity have come from the Cleveland Public Library, other local library systems, Cuyahoga Community College, Cuyahoga Metropolitan Housing Authority, and dozens of community development, social service, and neighborhood technology organizations.

Local government and philanthropic support for these programs has generally been modest and (with the exception of the Time Warner – Cleveland City Council Neighborhood Technology Fund administered by the Cleveland Foundation) inconsistent, limiting local digital inclusion practitioners' opportunities to build scale or sustainable capacity. Nonetheless, this long history has left Cuyahoga County with a digital inclusion ecosystem of experienced practitioners and nationally recognized programs in all aspects of digital inclusion work.

This report answers six questions. Each question is the subject of a chapter.

1. What does the available data tell us about a) home computer and Internet access and use by Cuyahoga County residents, and b) demographic and geographic disparities in that access and use? Answered in Chapter 1.
2. What home broadband services are available to residents of local neighborhoods and communities by speed, cost, technology and provider – including discounted commercial services for low-income households, and free public Internet access opportunities? Answered in Chapter 2.
3. What public and nonprofit programs in Cuyahoga County currently support digital inclusion with digital literacy training, affordable computer equipment, and assistance with home connectivity for disadvantaged residents? Answered in Chapter 3.

4. Why is Cleveland's home broadband connection rate significant lower than Pittsburgh's? Answered in Chapter 4.
5. What can we learn from the experience of community-wide digital inclusion collaboratives under way elsewhere in the U.S.? Answered in Chapter 5.
6. What can we learn from innovative digital literacy training and connectivity solutions targeted to disadvantaged populations elsewhere in the U.S.? Answered in Chapter 6.

In chapters 1, 2, and 3 we refer to "Digital Equity High Need Areas," or "DEHNAs." This is a shorthand to denote geographic areas – typically smaller municipalities for which the available evidence points to persistently low levels of household broadband Internet access. DEHNAs are thus the areas of Cuyahoga County for which we can make a reasonable presumption of high need for digital inclusion resources, as outlined in detail in Chapter 1.

The most important indicator of a Digital Equity High Need Area is Census tract rankings of "1" or "2" in the Federal Communications Commission's Form 477 tract data on fixed Internet access service for December 2014. These rankings indicate that according to provider reports, fewer than 40% of households in the tract(s) in question had fixed broadband Internet connections with download speeds of at least 3 mbps. (More recent versions of the FCC's 477 tract data have used 10 mbps as a download speed benchmark, which is too high to be useful for our purposes at this time.) See Chapter 1, Map 3.

A second indicator is the 2015 Digital Divide Index¹ (DDI) calculated for each U.S. Census tract by Dr. Roberto Gallardo of the Center for Regional Development at Purdue University, with the aim of helping policymakers to identify counties and Census tracts with the greatest likelihood of significant disparities in household broadband access. The DDI ranges in value from 0 to 100, where 100 indicates the highest digital divide. Its formula combines data on broadband adoption and deployment with social and demographic predictors of non-connection such as poverty, age, and educational attainment. An overall DDI of 60.00 or more puts a Census tract squarely in the national top (worst) 25%.

Based on these two indicators, the Cuyahoga County communities that we consider Digital Equity High Need Areas are:

- The city of Cleveland, most East Side neighborhoods, and several West Side neighborhoods (Clark-Fulton, Brooklyn Centre, Stockyards, Detroit-Shoreway)
- The city of East Cleveland
- Areas in the city of Euclid, especially along Euclid Avenue
- The village of North Randall and areas of Warrensville Heights, Highland Hills, Garfield Heights, and Bedford Heights.

The findings of this report are illustrated and augmented by maps throughout. We are pleased to offer highly detailed, interactive versions of many of these maps at <https://digitalinclusion.org/cuyahoga-2017>

¹ <https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php>

The three authors of this report have substantial experience in the field of what we now call digital inclusion.

Angela Siefer is the Founder and Director of the National Digital Inclusion Alliance. Her leadership of NDIA caps twenty years of digital inclusion experience. Her history is with local community organizations, local governments, state governments, and the federal government, including the Coalition to Access Technology and Networking in Toledo, OCLC's WebJunction, the Ohio Community Computing Network, University of Illinois Center for Digital Inclusion, the Schools, Health & Libraries Broadband (SHLB) Coalition, and U.S. Department of Commerce National Telecommunications Information Administration. A portfolio of her written work is at angelasiefer.com.

Bill Callahan is NDIA's Research and Policy Coordinator and also directs [Connect Your Community](http://connectyourcommunity.org),² a Cleveland-based nonprofit working to develop strategies for disconnected people and communities to overcome their exclusion from the digital mainstream. A community-organizing and development professional in Cleveland since 1980 and a leader in local digital inclusion efforts since 1996, Callahan served as director of OneCommunity's Connect Your Community Project, one of the largest broadband adoption initiatives funded by the 2010-13 Federal stimulus program; Cleveland Digital Vision, an advocacy coalition which raised millions of dollars to support neighborhood technology training programs between 2002 and 2008; and the West Side Community Computer Center, one of Cleveland's earliest computer training and ownership programs.

Mary Beth Henry is NDIA's Senior Fellow and the former Director of the City of Portland's Office for Community Technology, where she initiated and oversaw development of the [City of Portland's Broadband Strategic Plan](#)³ and [Digital Equity Action Plan](#),⁴ which brought together business, community, and governmental partners in the recognition that digital equity and affordable, ubiquitous, next-generation broadband Internet are essential. She served on the NATOA Board of Directors including as its President and received NATOA's 2016 Broadband Visionary of the Year and Strategic Plan of the Year. Henry served on the Oregon Broadband Advisory Council from 2009-2016. She wrote [Connecting to Our Future: The Digital Livable City for International Making Cities Livable](#).⁵

² <http://connectyourcommunity.org/>

³ <https://www.portlandoregon.gov/revenue/article/645907>

⁴ <https://www.portlandoregon.gov/revenue/article/643895>

⁵ <https://www.portlandoregon.gov/revenue/article/643890>

Executive Summary

A significant impact on broadband access and use in Cleveland and Cuyahoga County will require a large-scale, broadly collaborative digital inclusion strategy that takes advantage of the deep reservoir of local digital inclusion experience and expertise. NDIA's intent is that the information presented in this report will contribute to the creation of such a strategy.

This Executive Summary provides specific high-level recommendations with highlights of our learnings. Full lists of Key Points are available at the beginning of each chapter.

Chapter 1 – Cleveland/Cuyahoga County Home Broadband Access & Use

We learned... With broadband connecting three-fourths of its households to the Internet in 2015, Cuyahoga County was close to the national average in its overall broadband adoption rate. The county overall 2015 Digital Divide Index of 40.75 put it at the high end of the second-lowest quartile among counties nationwide (lower=better).

But the available data show that hundreds of thousands of county residents are far less likely to have broadband access than these county-wide averages suggest.

Available data show that the need is greatest among lower-income Cuyahoga County households and particularly for residents of the communities identified here as Digital Equity High Need Areas (DEHNAs): most East Side Cleveland neighborhoods; the city of East Cleveland; several near West Side Cleveland neighborhoods, including Clark-Fulton, Brooklyn Centre, Stockyards, and Detroit-Shoreway; and additional pockets of need in Euclid and the southeast suburbs. There are also significant levels of non-connection associated with some institutional “customer” groups, including Medicaid, SNAP, and users of senior and veterans' services.

RECOMMENDATION: For maximum benefit, a regional digital inclusion strategy should be designed around increasing the home Internet adoption and entry-level digital literacy within high-need geographic communities and constituencies.

Chapter 2 – Cleveland/Cuyahoga County Home Broadband Available Services

We learned... Fast commercial broadband Internet access (10 Mbps downstream and 1 Mbps upstream) is generally available from at least two wireline providers in communities throughout Cuyahoga County. The main exceptions to this generalization are certain areas of Cleveland and East Cleveland where AT&T's legacy ADSL2 service is limited to 6 Mbps, 3 Mbps, or slower downstream speeds, leaving the cable providers (Charter Spectrum and East Cleveland Cable) the sole wireline providers of 10 Mbps+ household access.

Special broadband discount programs from commercial providers include Access From AT&T, Spectrum Internet Assist, and low-cost Sprint 4G service provided by nonprofit reseller Mobile Citizen.

RECOMMENDATION: Despite limitations, broadband discount programs, while they last, could meet the broadband needs of tens of thousands of greater Cleveland households but would require substantial community outreach, training, and support to do so.

We learned... The county primary broadband “availability” issue is the lack of robust commercial home broadband access at a cost below \$40 a month. At these prices, home broadband is simply not affordable for county residents with household incomes below the poverty level.

RECOMMENDATION: Considering the limitations of the special broadband discount programs and lack of an affordable option, a significant increase in broadband adoption requires creation of a low-cost broadband service, particularly in low-income neighborhoods.

Chapter 3 – Cleveland/Cuyahoga County Inventory of Current Digital Inclusion Programs

We learned... In general, there are places for residents of Cleveland and the county's other documented DEHNAs who lack home computer and Internet access to sit down at public-access workstations, access free basic computer training and make use of free public Wi-Fi. While the library systems are a primary source of training, nonprofit community programs are also a major factor, especially in the poorest and worst-connected Cleveland neighborhoods. We must note the presence of training programs in high-need areas tells us nothing about the current adequacy of those programs to meet the actual needs of neighborhood residents.

By themselves, public-access workstations and free Wi-Fi are insufficient to meet connectivity needs. Home broadband access is a necessity. By far the most important gap in digital inclusion resources and services identified by this inventory is the striking lack of public or community programs offering home broadband adoption assistance to unconnected residents in any of the county's DEHNAs.

RECOMMENDATION: Cuyahoga County, particularly Cleveland and the other identified DEHNAs are in need of neighborhood based broadband adoption programs. These programs should address all aspects of digital inclusion – affordable home broadband access, appropriate affordable devices, digital skills training, and technical support.

Chapter 4 – Comparison Report on Connectivity of Cleveland/Cuyahoga County and Pittsburgh/Allegheny County

We learned... In 2015, only 62% of Cleveland households had broadband Internet access of some kind, while 75% of Pittsburgh households enjoyed broadband connections. Why was Cleveland's home connection rate so much lower? Four factors seem most likely to help explain this disparity:

- Most important, Cleveland is simply poorer than Pittsburgh. Cleveland's poverty rate in 2015 was 34.7%, while Pittsburgh's was just 23%.
- Cleveland residents at all income levels (including the poorest) are much less likely to have postsecondary educational experience than Pittsburgh residents.
- Cleveland was in the depths of its foreclosure crisis during the years (2005-09) when initial home broadband adoption "took off" among lower-income households across the U.S. Thousands of annual home losses may well have suppressed household adoption. Pittsburgh did not experience a comparable crisis and thus may have seen a more "normal" adoption curve.
- The two cities are in states with different legal frameworks for public encouragement of universal broadband deployment. In 2008 the City of Pittsburgh was able to require Verizon to build its new FIOS network out to every neighborhood, while Cleveland had no such power to affect (or even monitor) AT&T's deployment of its fiber-enabled U-Verse VDSL network. AT&T did not extend its new network to most lower-income Cleveland neighborhoods.

Chapter 5 – National Highlights – Community-Wide Digital Inclusion Coalitions

We learned... the very act of convening stakeholders community wide that are interested in digital inclusion serves to foster partnerships, ownership, commitment, and collaborations. The potential for a community-wide strategy and the stretching of limited resources is most likely when dedicated staff coordinate the coalition's efforts.

RECOMMENDATION: Whether located in local government, a community-based organization or a library, it must be someone's job to coordinate coalition meetings, goals, and work.

Chapter 6 – National Highlights – Innovative Digital Literacy Training and Connectivity Solutions

We learned... Digital inclusion programs are evolving to address multiple barriers even if they started out only addressing one barrier (access at home or in public lab, devices, digital literacy). Some programs have already changed services provided, while others are in process. Alternatively, digital inclusion programs are partnering with programs to provide the digital inclusion services that they do not (public access computer labs, affordable home access, low-cost devices, digital literacy training, and/or tech support). The U.S. Department of Commerce National Telecommunications and Information Administration's Broadband Technology Opportunity Program (BTOP) grants were instrumental in increasing digital inclusion capacity for those communities that received the grants and for those who prepared for the grants (yet did not receive them). This tells us significant financial investment strengthens the digital inclusion ecosystem of a metro region.

RECOMMENDATION: Digital inclusion capacity that was built with previous investments should be utilized while also recognizing significant financial investment in digital inclusion will further strengthen the digital inclusion ecosystem.

Chapter #1:

Cleveland/Cuyahoga County Home Broadband
Access & Use



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Key Points

1. Allowing for the limitations of detailed data on household broadband connectivity below the citywide level, it is clear significant digital inclusion interventions are needed. The need is greatest among lower-income Cuyahoga County households, in general, and particularly for residents of the communities identified here as Digital Equity High Need Areas (DEHNAs): most East Side Cleveland neighborhoods; the city of East Cleveland; several near West Side Cleveland neighborhoods, including Clark-Fulton, Brooklyn Centre, Stockyards, and Detroit-Shoreway; and additional pockets of need in Euclid and the southeast suburbs.
2. There are significant levels of non-connection associated with some institutional “customer” groups, including Medicaid, SNAP, and users of senior and veterans' services.
3. For maximum benefit, a regional digital inclusion strategy should be designed around increasing the home Internet connectivity and entry-level digital literacy within DEHNAs.
4. Effective program targeting, as well as strategic program development and evaluation, will require much more granular data than is now available from any public source. Some of this data will be available from the 2018 American Community Survey 5-year Estimates to be released in Fall 2019. Until then, the gathering and dissemination of useful digital inclusion data must be a strategic priority.

Data Sources and Limitations

Data sources. There are three publicly available sources of data on computer and Internet access and use for residents of the county as a whole and for residents of one or more communities within the county.

- The U.S. Census American Community Survey 1-year Estimates for 2015, 2014, and 2013
- The Federal Communications Commission's Form 477 county and Census tract data on fixed Internet access services, published semi-annually
- The *Cuyahoga County Survey of Internet Access and Use*,¹ a county-wide telephone survey conducted in October 2012 by a team of researchers from the University of Iowa, the University of Illinois at Chicago, and the Eagleton Institute of Rutgers University under a contract with OneCommunity's Connect Your Community Project. The principal authors were Dr. Caroline Tolbert of the University of Iowa and Dr. Karen Mossberger of the University of Illinois. The *Cuyahoga County Survey of Internet Access and Use* asked a random sample of more than 1,200 adult residents about their Internet access and use, along with a range of demographic and service participation questions. Respondents' home Internet access was determined in terms of “High speed Internet at home”, i.e., not dial-up or mobile, and “Mobile Internet access.” The survey included a large subsample of respondents living in the city of Cleveland and nine inner suburbs with high participation in the SNAP program.)

Data source limitations. Each of these sources has characteristics that limit its usefulness for particular geographies, types of data, and/or time frames. It's important to keep these limitations in mind when using them in combination, as we do here, to develop a broad picture of digital access and use by Cuyahoga County residents as a whole and within particular communities and demographics.

¹ Caroline Tolbert and Karen Mossberger, *Cuyahoga County Survey of Internet Access and Use*, 2013
<http://connectyourcommunity.org/cuyahoga-county-internet-survey/>

Here are the most important:

- The American Community Survey's 1-year Estimates provide detailed data, including specific broadband-user technologies and demographics, only for whole counties and for “places” with populations above 65,000. In Cuyahoga County, this means only the county as a whole and the city of Cleveland. The ACS also provides “Supplemental Estimates” for places with populations above 20,000; this threshold is met by just sixteen of the county's fifty-nine municipalities and townships – Cleveland and fifteen others – which account for 73% of all county households. The ACS provides no data for Census tracts or other smaller geographies.
- FCC Form 477 Internet access services data is provided for every Census tract throughout the county and for the county as a whole and is the most recent and geographically detailed data available regarding the percentages of households served by “fixed” broadband services. For each tract, the 477 data provides information on connections that are in excess of a minimal “broadband” speed (200 kbps downstream), as well as the number that meet or exceed one or more higher benchmark speeds chosen by the FCC for that reporting period. But this information on household penetration is expressed in broad ranges designed for mapping, not specific numbers or percentages that could be combined to accurately characterize neighborhoods, whole communities, or (with one exception) the county as a whole. In addition, the higher (non-minimal) speed threshold has been increased over the last two years from a modest 3 Mbps to a less modest 10 Mbps; this threshold makes the data considerably less useful for examining Internet penetration rates in a market where one of the two primary Internet Service Providers (ISPs) offers maximum download speeds of 6 Mbps or less to many thousands of households. (A complete explanation of Form 477 data can be found on page 17.)
- The *Cuyahoga County Survey of Internet Access and Use* was conducted four and a half years ago, raising valid questions about its current relevance. Our view is that key high-level findings of the Cuyahoga County Survey (e.g., the percentage share of county households with broadband Internet access, whether fixed or mobile) are sufficiently similar to comparable data from the more recent sources to allay concerns that the survey's findings – especially its detailed demographic analyses – have become seriously outdated. Nonetheless, readers should be aware that data based on the Survey is two to three years older than the other information presented.

I. Broadband Internet Access at Home among All Cuyahoga County Residents

“Broadband access at home” is commonly defined as either *fixed* access (non-mobile, usually wireline services like cable modem, some form of DSL, satellite, or fiber to the premises) or mobile wireless access through a smartphone, 4G-enabled tablet, hotspot, etc. Both are defined as broadband, so a household with either fixed access or mobile access alone must reasonably be counted as having a home broadband Internet connection. We must note that mobile wireless connections often have a data cap so there is a limit as to their usefulness as a broadband connection.

According to the American Community (ACS) Survey 1-year Estimates for 2015, of Cuyahoga County's 533,000 households...

- 66% had fixed broadband Internet subscriptions
- 7% had mobile broadband subscriptions only (a few of these had dial-up connections)
- 4% had something called “Internet access without a subscription,” which might mean a variety of things – including college dorm access, free Wi-Fi in the neighborhood, or non-subscription mobile access of some kind, e.g., buying monthly data cards at Wal-Mart
- 22.1% had no Internet access of any kind at home.

Given the difficulty of interpreting “Internet access without a subscription,” the safest way to state these numbers is: **Between 73% and 78% of Cuyahoga County residents had some kind of broadband Internet access where they lived in 2015, while between 22% and 27% of county residents had no home broadband Internet access of any kind.**

See Table 1 for more detail.

Table 1

*S2802: Types of Internet subscriptions by selected characteristics
2015 American Community Survey 1-year Estimates (Universe: Population in households)*

	Cuyahoga County, Ohio	
Estimate Total:	532,752	
With an Internet subscription	391,791	
Dial-up alone	1,633	0.3%
Fixed broadband		66.2%
DSL:	67,065	12.6%
Cable modem	214,523	40.3%
Fiber-optic	25,048	4.7%
Satellite Internet service:	8,803	17%
Two or more fixed broadband types or other	37,335	7.0%
No fixed broadband at home		33.8%
Mobile broadband alone or with dial-up	37,384	7.0%
Internet access without a subscription	23,091	4.3%
No Internet access at home	117,870	22.1%

II. Geographic Disparities in Household Broadband Access in Cuyahoga County

Broadband access statistics vary widely among the county local communities and neighborhoods. This can be partially seen through two datasets: The ACS' 2015 “Supplemental Estimates” of computer ownership and Internet access for the county's sixteen cities with populations above 20,000 and the FCC Form 477 Census tract data showing the percentage of households in each tract in the county with fixed (not mobile) Internet connections meeting certain benchmark speeds.

The sixteen cities included in the ACS Supplemental Estimates range in size from Solon with 8,500 households to Cleveland with more than 167,000 households. The sixteen cities account for 73% of all households in the county. They represent a wide range of household Internet access statistics – ranging (again) from Solon with no computer,² or a computer but no broadband, in 13% of its households, to Cleveland with 38% of its households without computers or connections.

Table 2 shows the ACS data for all sixteen cities. Map 1 summarizes the cities' ACS non-connection percentages in the form of a map.

² In this case the ACS includes mobile Internet devices in its use of the word “computer.”

Table 2

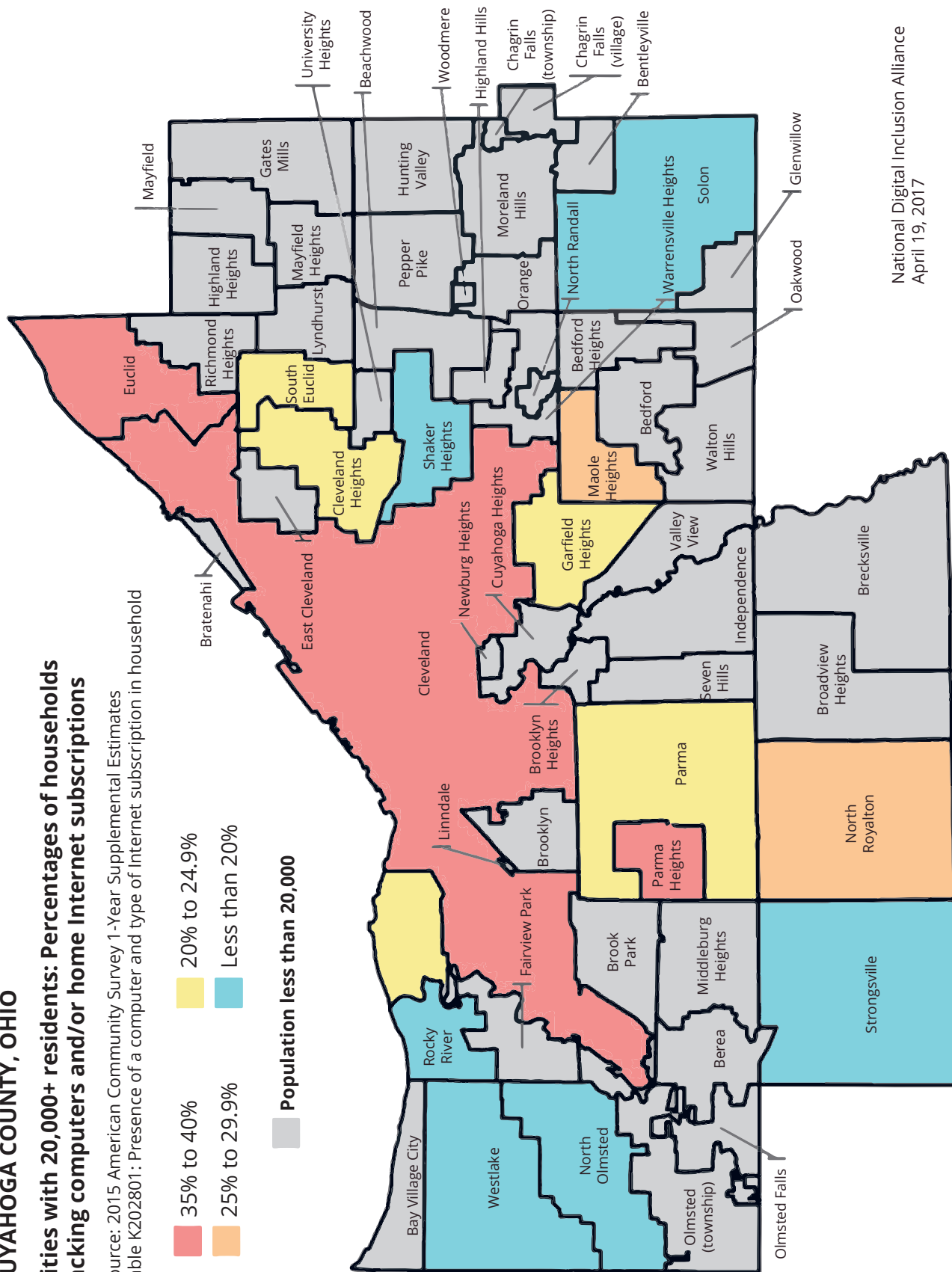
K2801: PRESENCE OF A COMPUTER AND TYPE OF INTERNET SUBSCRIPTION IN HOUSEHOLD (Universe: Households)

NOTE: "Broadband Internet subscription" includes mobile subscriptions; "with computer" includes mobile devices.

City	Households with computer					Households with computer					No home broadband Internet (inc. no computer)		
	Households	Total	Dial-up subscription	Broadband Internet subscription	No Internet subscription	No computer	Total	Dial-up subscription	Broadband Internet subscription	No Internet subscription	No computer		
Cleveland city	167,667	128,175	500	103,228	24,447	39,492	76.4%	0.3%	61.6%	14.6%	23.6%	38.4%	
Euclid city	22,783	16,927	34	14,730	2,163	5,856	74.3%	0.1%	64.7%	9.5%	25.7%	35.3%	
Parma Heights city	8,881	6,875	79	5,702	1,094	2,006	77.4%	0.9%	64.2%	12.3%	22.6%	35.8%	
Maple Heights city	9,121	7,694	51	6,543	1,100	1,427	84.4%	0.6%	71.7%	12.1%	15.6%	28.3%	
North Royalton city	13,200	11,109	0	9,873	1,236	2,091	84.2%	0.0%	74.8%	9.4%	15.8%	25.2%	
Garfield Heights city	11,203	9,058	39	8,428	591	2,145	80.9%	0.3%	75.2%	5.3%	19.1%	24.8%	
South Euclid city	8,842	7,241	32	6,889	320	1,601	81.9%	0.4%	77.9%	3.6%	18.1%	22.1%	
Parma city	32,577	28,492	138	25,771	2,583	4,085	87.5%	0.4%	79.1%	7.9%	12.5%	20.9%	
Lakewood city	24,109	21,054	0	19,200	1,854	3,055	87.3%	0.0%	79.6%	7.7%	12.7%	20.4%	
Cleveland Heights city	19,814	17,791	75	15,822	1,894	2,023	89.8%	0.4%	79.9%	9.6%	10.2%	20.1%	
North Olmsted city	13,012	11,355	0	10,473	882	1,657	87.3%	0.0%	80.5%	6.8%	12.7%	19.5%	
Rocky River city	8,760	7,718	0	7,295	423	1,042	88.1%	0.0%	83.3%	4.8%	11.9%	16.7%	
Strongsville city	17,634	15,855	83	14,875	897	1,779	89.9%	0.5%	84.4%	5.1%	10.1%	15.6%	
Shaker Heights city	10,710	9,963	0	9,120	843	747	93.0%	0.0%	85.2%	7.9%	7.0%	14.8%	
Westlake city	13,418	12,525	0	11,550	975	893	93.3%	0.0%	86.1%	7.3%	6.7%	13.9%	
Solon city	8,527	7,788	27	7,420	341	739	91.3%	0.3%	87.0%	4.0%	8.7%	13.0%	

Cities with 20,000+ residents: Percentages of households lacking computers and/or home Internet subscriptions

Source: 2015 American Community Survey 1-Year Supplemental Estimates
Table K202801: Presence of a computer and type of Internet subscription in household



National Digital Inclusion Alliance
April 19, 2017

The variations in household broadband access across the county are clearly recognizable by mapping the fixed broadband Internet connection rankings provided by the FCC's Form 477 Census Tract Data on Internet Access Services.³

Here's what the maps represent: Every six months, each regulated ISP must submit a Form 477 to the FCC with a variety of information, including the number of residential fixed broadband Internet connections it is currently providing in each Census tract it serves. More specifically, the report must specify the number of connections that are in excess of a minimal "broadband" speed (200 kbps downstream), as well as the number that meet or exceed one or more higher benchmark speeds chosen by the FCC for that reporting period. These are supposed to be actual, real customer counts – not projections.

The FCC staff adds up the numbers in each speed category from all providers for each tract, compares the total to the number of households in that tract according to the recent American Community Survey, and then assigns a numerical code to each tract for each speed category based on the total reported number of connections in that category per 1,000 households. "1" is between 1 and 199 connections per thousand households, "2" is between 200 and 399 per thousand, "3" is between 400 and 599, and so on up to "5." These are easy to convert to ranges of percentage, which is what we've done for these maps.

The FCC staff releases its national list of Census tract codes to the public nine months after they first receive the data.

The key here is: These percentages reflect real, hard numbers reported directly by the Internet providers to the FCC. They're only as vague as they are because that's the form in which the FCC chooses to make them public.

With that said, here are three maps of Form 477 Census tract data showing the variations in fixed household broadband penetration throughout Cuyahoga County and nearby communities at several speed benchmarks.

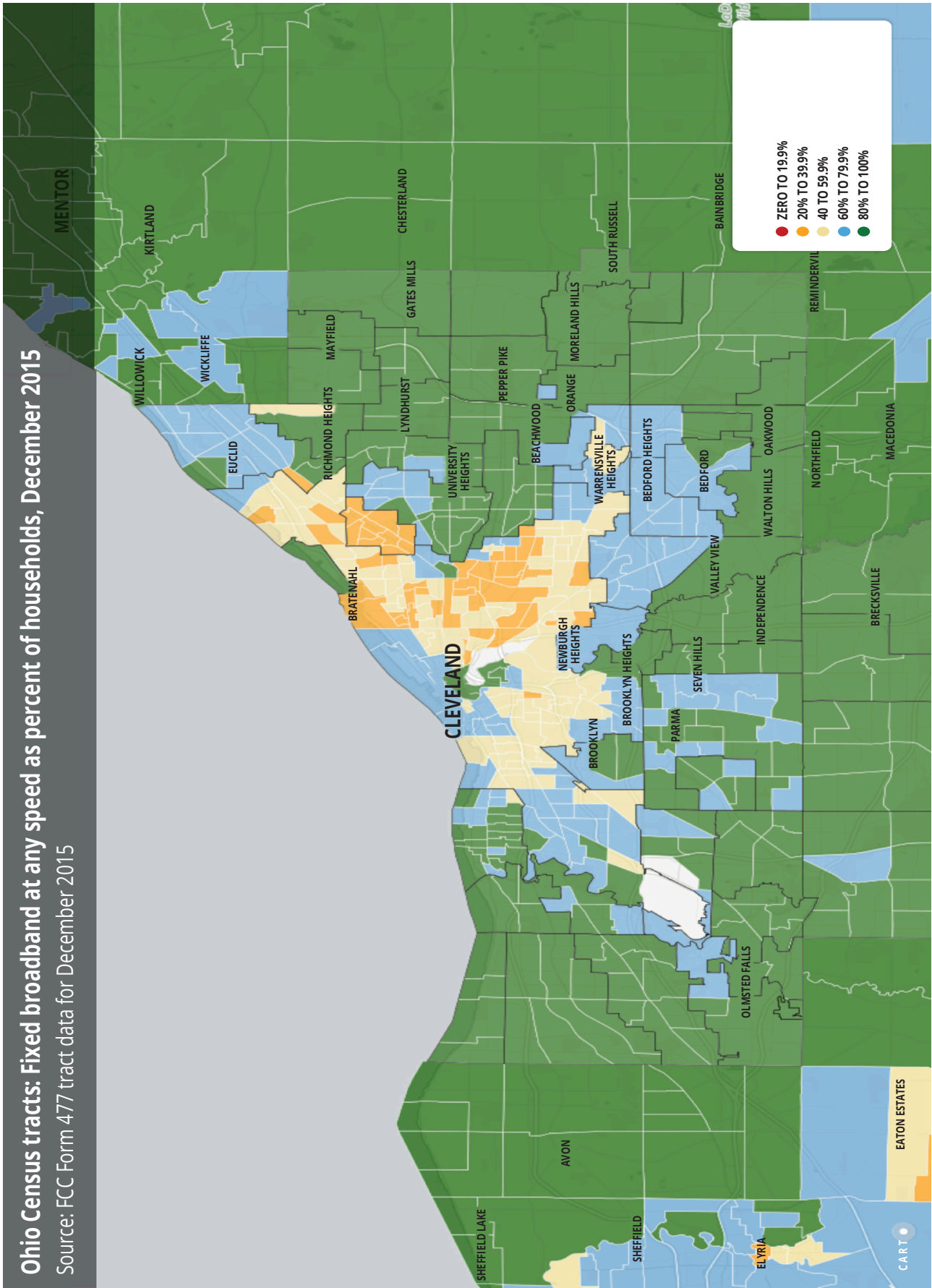
- Map 2 is based on data from December 2015 and shows the percentage of households per tract with fixed Internet connections at 200 kbps down or faster – i.e., at virtually any speed faster than dial-up.
- Map 3 is based on data from December 2014 and shows the percentage of households per tract with fixed Internet connections at 3 Mbps down or faster.
- Map 4 is based on data from December 2015 and shows the percentage of households per tract with fixed Internet connections at 10 Mbps down or faster.

³ <https://www.fcc.gov/general/form-477-census-tract-data-internet-access-services>

Map 2

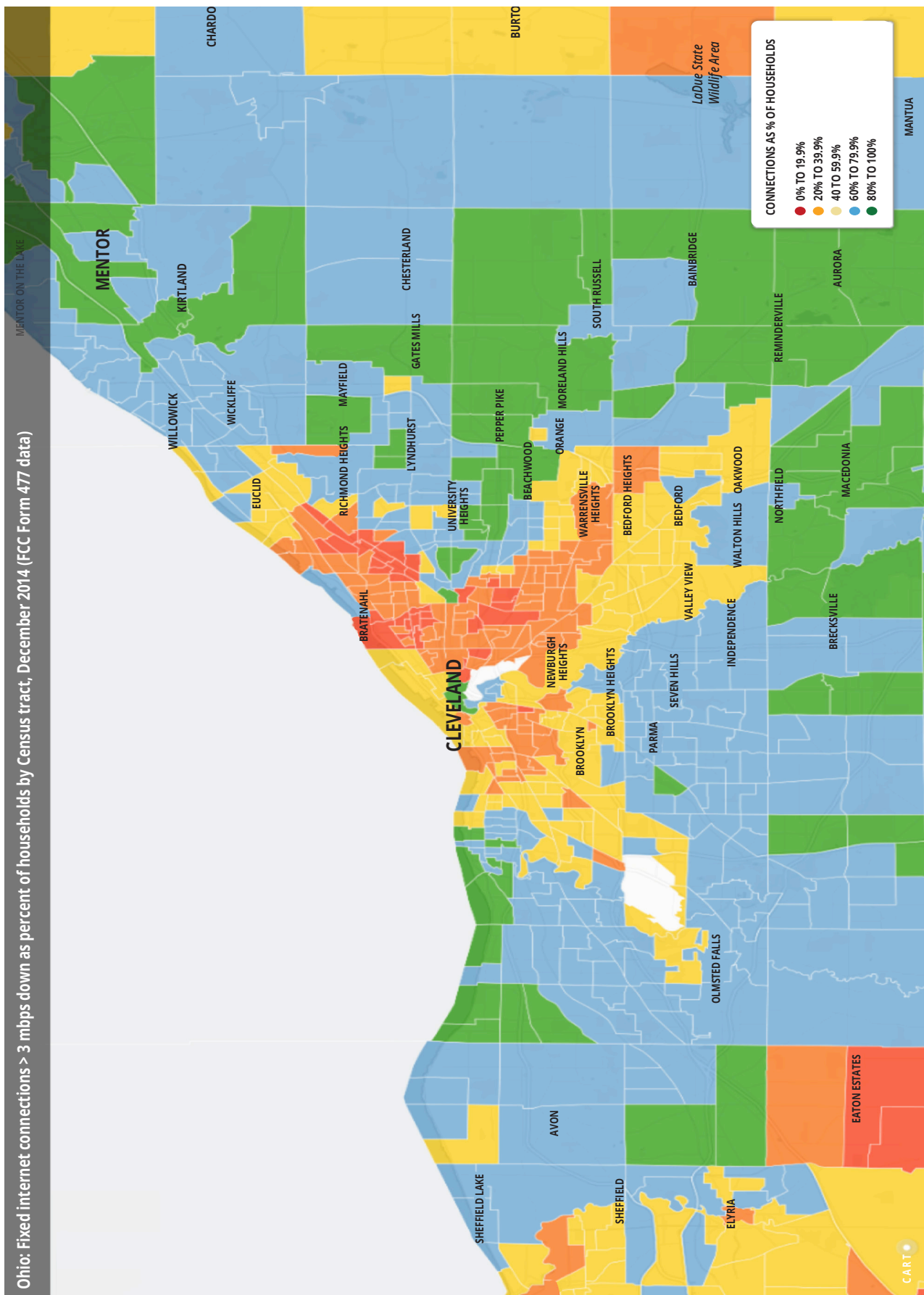
Ohio Census tracts: Fixed broadband at any speed as percent of households, December 2015

Source: FCC Form 477 tract data for December 2015



Map 3

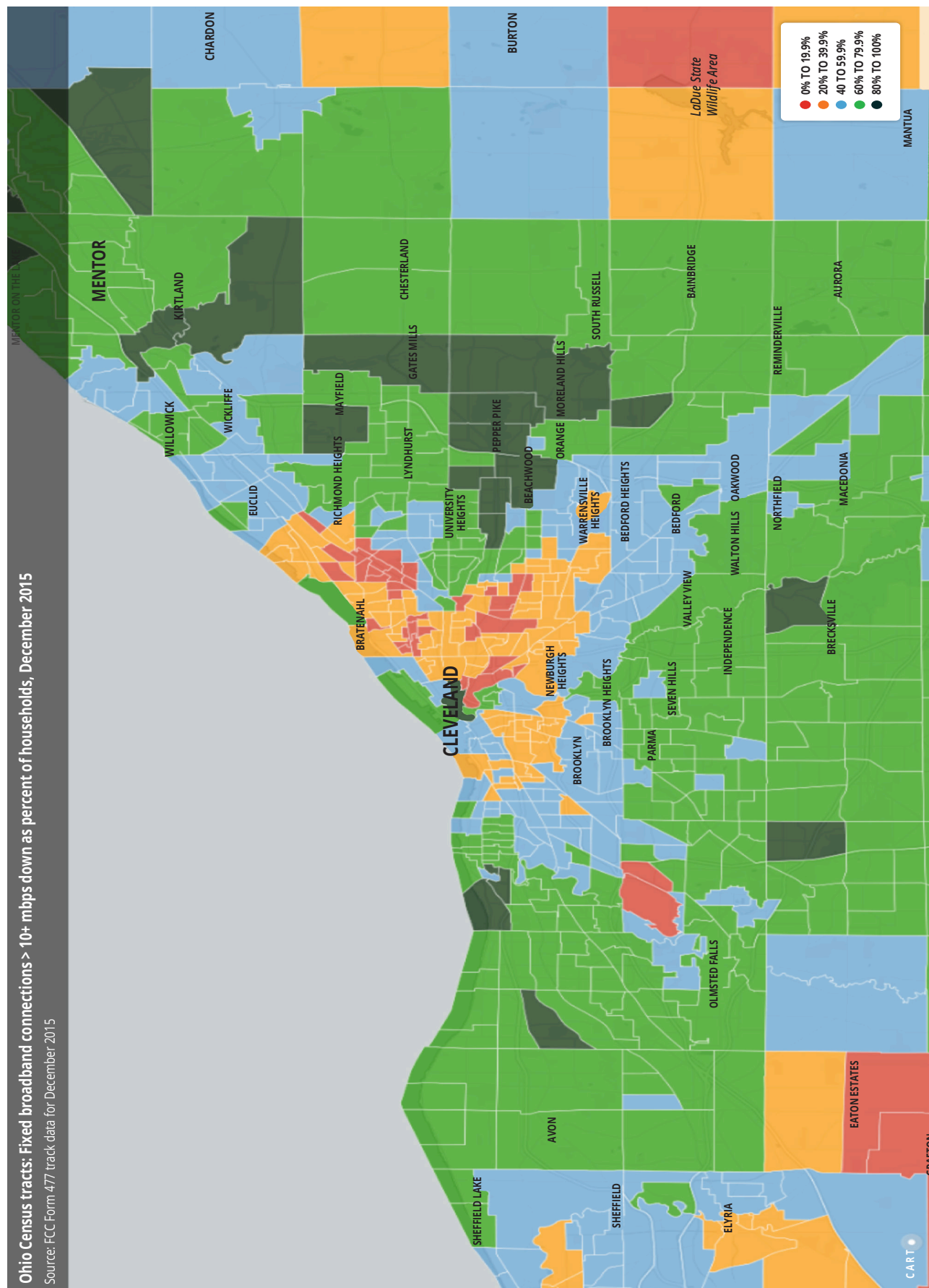
Ohio: Fixed internet connections > 3 mbps down as percent of households by Census tract, December 2014 (FCC Form 477 data)



Map 4

Ohio Census tracts: Fixed broadband connections > 10+ mbps down as percent of households, December 2015

Source: FCC Form 477 track data for December 2015



A glance at these maps by anyone familiar with the county's geography will reveal a simple pattern: The vast majority of Cuyahoga County Census tracts with household broadband adoption ratios in the bottom two quintiles – 0% to 19.9%, and 20% to 39.9% – are located in the East Side of the city of Cleveland and in the city of East Cleveland.

When the maps are based on higher broadband benchmark speeds than the absolute minimum of 200 kbps down, the areas in the second-lowest quintile (20% to 39.9% of households connected) expand to include a number of Near West Side tracts and a few portions of the southeast suburbs.

This tells us the patterns of low household broadband penetration throughout Cuyahoga County made visible by the FCC Form 477 tract data are, essentially, maps of the county's lowest-income neighborhoods.

Is this surprising? Of course not. Low income, along with higher age and low educational attainment, are the three main variables shown by years of national research to be tightly associated with the likelihood of digital illiteracy and lack of Internet connection.⁴ Low educational attainment is itself associated with low income.

It is important to understand how clearly “digital exclusion” is tied to poverty in Cuyahoga County.

III. Demographic Disparities in Broadband Access and Use in Cuyahoga County

a) Income.

As mentioned earlier, according to Table S2802 of the 2015 American Community Survey 1-year Estimates for Cuyahoga County, between 73% and 78% of *all* Cuyahoga County residents had some kind of broadband Internet access where they lived in 2015.

Table S2802 is counting people *living in households*. Table B28004 counts the households directly, by household income cohort, and puts them in three categories: households with dial-up Internet only; households with broadband Internet subscriptions; and households without broadband Internet subscriptions, including mobile connections.

Interestingly, Table B28004's estimated percent of all county households without broadband Internet is lower than Table S2802's estimated percent of people in households with no home broadband – 19.5% compared to 22%-27%. That makes its numbers for the income cohorts (shown in Table 3) that much starker... as demonstrated by Table 4.

⁴ Pew Research Center. August 26, 2013. Home Broadband 2013. Change to See <http://www.pewinternet.org/2013/08/26/home-broadband-2013/>

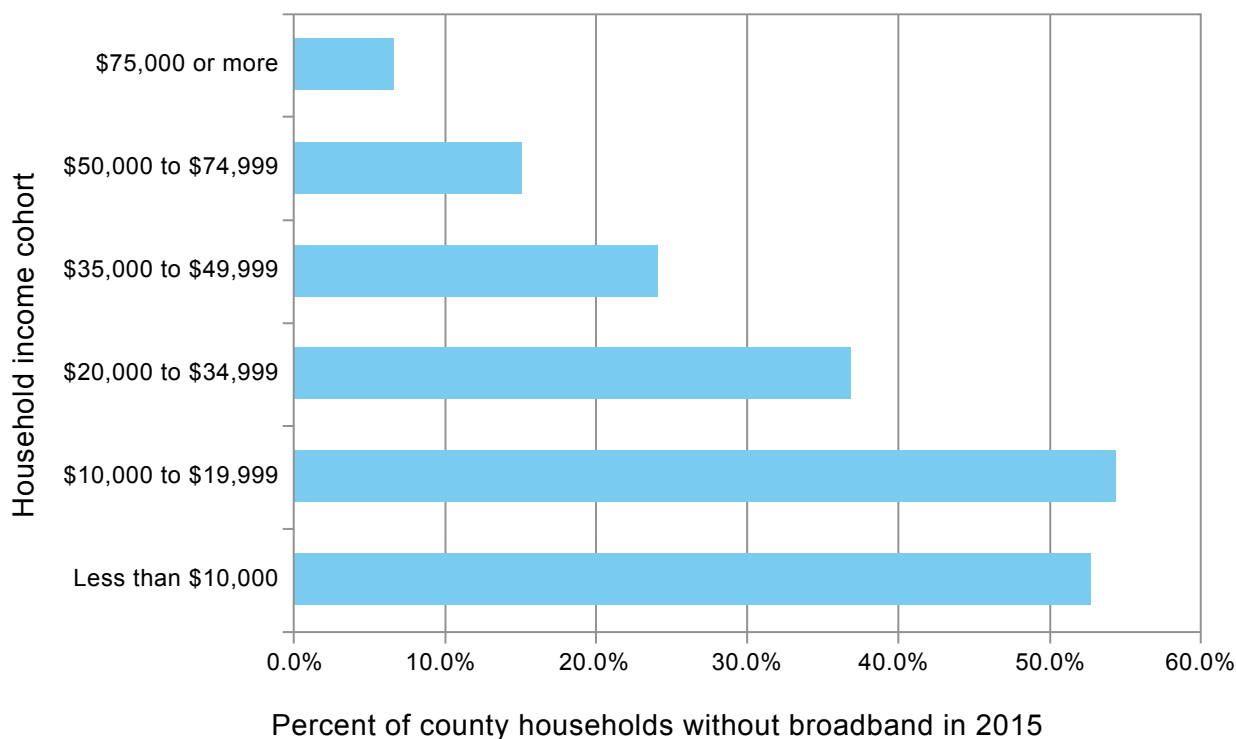
Table 3

B28004: Household income in the last 12 months (in 2015 inflation-adjusted dollars) by presence and type of Internet subscription in household Cuyahoga County, Ohio. 2015 American Community Survey 1-year Estimates (Universe: Households)

		Households in income cohort as percent of county total	Percent of households in income cohort
Total county households	532,752		
Less than \$10,000:	52,731	9.9%	
With dial-up Internet subscription alone	151		0.3%
With a broadband Internet subscription	24,733		46.9%
Without an Internet subscription	27,847		52.8%
\$10,000 to \$19,999:	68,435	12.8%	
With dial-up Internet subscription alone	181		0.3%
With a broadband Internet subscription	30,969		45.3%
Without an Internet subscription	37,285		54.5%
\$20,000 to \$34,999:	91,946	17.3%	
With dial-up Internet subscription alone	335		0.4%
With a broadband Internet subscription	57,690		62.7%
Without an Internet subscription	33,921		36.9%
\$35,000 to \$49,999:	72,814	13.7%	
With dial-up Internet subscription alone	304		0.4%
With a broadband Internet subscription	54,885		75.4%
Without an Internet subscription	17,625		24.2%
\$50,000 to \$74,999:	89,364	16.8%	
With dial-up Internet subscription alone	484		0.5%
With a broadband Internet subscription	75,241		84.2%
Without an Internet subscription	13,639		15.3%
\$75,000 or more:	157,462	29.6%	
With dial-up Internet subscription alone	178		0.1%
With a broadband Internet subscription	146,640		93.1%
Without an Internet subscription	10,644		6.8%

Figure 1

Cuyahoga County households without broadband Internet by income cohort
2015 American Community Survey One Year Estimates, Table B28004



The *Cuyahoga County Survey of Internet Access and Use* found the following in regard to income and Internet connection:

"Income disparities are most visible at the lowest extreme. In the county, for those who have incomes of \$20,000 or less, Internet use anywhere is only 57%. Likewise, only 32% of residents with incomes under \$20,000 have broadband at home. But, smartphone use is highest in this group, at 75%, compared to 65% overall. They are the group most likely to be mobile-only users, but least likely to be fully-connected.

"The Cleveland area has nearly identical results, with Internet use anywhere at 56% and broadband adoption at 29% for residents with incomes less than \$20,000. This group has the highest rates also for mobile-only Internet use (at 11%), and is also least likely to be fully-connected.

"In the outer county, Internet use anywhere at 61% is a bit higher for this lowest-income group (compared to 57% and 56% for the other two areas). Broadband at home is substantially higher, at 44% versus 32% and 29% for county and city area residents with incomes below \$20,000. Mobile access is modest, but this poorest category accounts for 6% of mobile-only users.

"Even the poor do better in communities where poverty is lower. Small black-white disparities in the outer suburbs may be because racial income differences are small there. But, even when income is similar, the poorest residents have higher rates of access in more affluent areas."⁵

⁵ *Cuyahoga County Survey of Internet Access and Use*, pp. 11-12.

Table 4: *Internet Use by Family Income (Percent)*

	Income				
	Less than 20,000	20,000 to 49,999	50,000 to 74,999	75,000 to 99,999	100,000 or more
Cuyahoga County (N=1261):					
Broadband Access at Home (High Speed)	31.80	59.34	74.59	83.33	91.33
Only Mobile Access	9.58	6.78	3.24	2.27	2.55
Total with Broadband Access (Percent)	31.80	59.34	74.59	83.33	91.33
Cleveland and Inner Ring Suburbs (N=686):					
Broadband Access at Home (High Speed)	28.64	56.68	70.00	76.36	91.38
Only Mobile Access	10.68	8.66	3.33	5.45	1.72
Total with Broadband Access (Percent)	28.64	56.68	70.00	76.36	91.38

Excerpted from One Community CYC Project, "Cuyahoga County Survey of Internet Access and Use", 2013 – Table 5.

b) Age. ACS Table S2802 ("Types of Internet subscriptions by selected characteristics") includes a breakdown for three age cohorts: Below 18, 18 to 64, and 65 and above. Here are the table's combined percentages of people in those age ranges who reported either "No computer" or "Computer but no Internet subscription:"

Table 5: *No computer by age (percent)*

Age range	Percent computer but no Internet	Percent no computer	Total
Below 18	8.3%	5.1%	13.4%
18 to 64	9.6%	7.8%	17.4%
65 and older	8.4%	31.3%	39.7%

Clearly and unsurprisingly, there's a big difference in the rate of home broadband access between senior citizens and younger county residents, looking at over-under 65 as a single factor. This is consistent with research and conventional wisdom alike. Indeed, our experience suggests anecdotally that if the 18 to 64 cohort were separated into younger and older working-age adults, the unconnected percentage of those in the older group – say, 50 to 64 – would be significantly higher than for their younger neighbors. (For confirmation, see the excerpt from the Cuyahoga County Survey on the next page.)

What may be surprising is the unique extent to which seniors' high rate of non-connection takes the form of *not owning a home computer*. To the extent that seniors do own computers, their rate of connections seems to be indistinguishable from that of younger residents.

Countywide, the ACS tells us that the incidence of individual poverty among residents over 65 is 11%, compared to 17.5% for 18- to 64-year olds (2011-2015 ACS 5-year Estimates, Table S1701). It is hard to argue that the high level of non-

connection among seniors is driven by poverty (in the Census sense) in any significant way. Older residents who aren't poor but are reliant on fixed income sources may well find economic insecurity a bigger barrier to taking on this new expense than younger people in comparable circumstances.

In any event, the Census points persuasively to old age as a second important demographic factor associated with digital non-connectedness for county residents.

The *Cuyahoga County Survey of Internet Access and Use* found the following in regard to age and Internet connection:

"Table 2 examines forms of Internet access by age. Across all three geographic areas, it is clear that the fault line for falling rates of Internet use is age 65 and older. Internet use anywhere for 18-29 year olds does not vary much across the three areas, as it is around 95 percent in all of them. Overall, the younger the county residents, the more connected they are.

"The variation in the over-65 group across areas is fairly dramatic, demonstrating the confluence of age and poverty. In the Cleveland region only 49% of these older residents use the Internet anywhere, while in the balance of the county, 74% do. The gaps for broadband are similar—33% in the Cleveland area vs. 57% out-county. Older Cleveland area residents use smartphones in the single digits, while in the balance areas mobile phone use is 12% and full connectivity is 10%.

"Use of cell phones to go online skews heavily toward the young, and 18-29 year olds in the Cleveland region actually outpace the rest of the county in this regard. These young Cleveland area residents are highly mobile, with 75% who use smartphones, 14% who are smartphone-only users, and 60 percent who are fully-connected. In the balance of the county, only 62% of 18-29 year olds have mobile access (a 13 percentage point drop), but mobile-only use is similar (only a 2 percentage point drop at 12%). The youngest residents in the balance areas are actually 10 percentage points lower than Clevelanders in full connectivity—only 50% have both mobile and broadband, compared to 60% for the youngest Cleveland residents."⁶

Table 6

	Age			
	18-29	30-49	50-64	65
Cuyahoga County (N=1261):				
Broadband Access at Home (High Speed)	76.00	72.78	70.30	44.39
Only Mobile Access	13.33	11.08	2.79	1.50
Total with Broadband Access (Percent)	89.33	83.86	73.09	45.89
Cleveland and Inner Ring Suburbs (N=686):				
Broadband Access at Home (High Speed)	74.49	64.41	58.62	32.69
Only Mobile Access	14.29	15.25	4.43	1.44
Total with Broadband Access (Percent)	88.78	79.66	63.05	34.13

Excerpted from One Community CYC Project, "Cuyahoga County Survey of Internet Access and Use", 2013 – Table 2.

⁶Cuyahoga County Survey of Internet Access and Use, pp. 6-7.

c) Race and ethnicity

Here are the 2015 American Community Survey numbers, once again from ACS Table 2802:

Table 7

Cuyahoga County person in households	Percent without an Internet Subscription	Percent with no home computer	Total no computer or no Internet
Black or African American alone	14.9%	16.8%	31.7%
Hispanic or Latino origin (of any race)	12.5%	8.7%	21.2%
White alone	6.5%	8.9%	15.4%
White alone, not Hispanic or Latino	6.3%	9.0%	15.3%
Two or more races	11.0%	3.9%	14.9%
Asian alone	3.0%	4.3%	7.3%

The *Cuyahoga County Survey of Internet Access and Use* found the following in regard to race and Internet connection:

“Racial and ethnic differences are visible in Internet use. Only 73% of African Americans in the county use the Internet anywhere, which is 11 percentage points lower than whites (at 84%). There is a striking 21 percentage point difference for broadband at home (48% for African Americans in comparison with 69% for whites). As is the case nationally, non-whites are more likely to access the Internet on their cell phones (Zickuhr and Smith 2012). While only 31% of white county residents use smartphones, 37% of African Americans do. African Americans are much more likely to be mobile-only users at 11%, versus the 3% of whites who rely upon smartphones in the county.

“For the Cleveland area, the black-white gap is slightly smaller because technology use is somewhat lower for both groups. Yet, the patterns are largely the same. Sixty percent of white Cleveland area residents have broadband at home, but only 46% of African Americans do. In contrast, 38% of African-Americans are mobile Internet users, compared with only 27% of Cleveland area whites. Twelve percent of blacks in the Cleveland cluster are mobile-only users, comprising most of those in this category. Because of higher rates of mobile use, a slightly higher proportion of Cleveland area African Americans are fully connected (26%) in comparison with whites (24%).

“Despite disparities in other forms of Internet access, African Americans in Cleveland are at the forefront of the movement toward mobile. As with 18-29 year olds in Table 2, Table 3 shows that **city and inner suburban residents are ahead in smartphone adoption, with and without other forms of access.** In the balance suburbs, black-white disparities are relatively small, with all groups having much greater rates of Internet access. While 88% of out-county whites use the Internet anywhere, 82% of African Americans are Internet users. Broadband gaps are a bit wider, with only 64% of suburban African Americans who have broadband at home compared to 76% of whites. Mobile Internet use is essentially the same for both groups (33%), with small differences in mobile-only access and full connectivity.

“Cuyahoga County Latinos are just as likely to use the Internet as non-Hispanic whites, although broadband adoption is 7 percentage points lower at 57%. **Cell phone use is remarkably higher for Latinos, at 55% compared with only 33% for non-Hispanics, for a 22 percentage point difference.** Fourteen percent of Latinos are mobile-only Internet users, in comparison with 5% of non-Hispanics and 6% of the county.

"Cleveland area Latinos have virtually the same rates of Internet use anywhere and broadband adoption as non-Latinos. The differences are in mobile access. Half of Latinos have a smartphone, in comparison with one-third of non-Latinos. They are twice as likely to be mobile-only Internet users, with 16% of Latinos falling in this category, compared with only 7% of non-Latinos...

"Latino mobile access stands out. In all three areas, Latinos are more mobile-oriented than non-Latinos. Comparisons of the Cleveland cluster and the out-county suburbs are the most informative. In the balance suburbs 67% of Latinos have smartphones, compared with 34% of non-Latinos. This is nearly double. They are also more likely than non-Latinos to be mobile-only users (11% vs. 3%) and to be fully-connected as well (56% versus 31%). In the Cleveland area, Latinos are also more likely than non-Latinos to be smartphone and mobile-only users, but somewhat less likely to be fully-connected (at 23% for Latinos but 35% for non-Latinos). Latinos are embracing mobile access. In some cases they still fall behind in other forms of access, but this is uneven across geographic areas. Nationally, Latinos are the group that is furthest behind in broadband access (Mossberger, Tolbert and Franko 2012), but not in Cuyahoga County.

"Finally, Asians are the most connected group in Cuyahoga County, just as they are around the nation. They rank highest for all forms of Internet use, with 100% who have broadband and 80% who have mobile access in the balance suburbs. Only 89% of Cleveland Asians have broadband at home, and 56% have mobile access, but they still rank first in all forms of access within the Cleveland area."⁷

Table 8: *Internet Use by Race and Ethnicity (Percent)*

	Race			Ethnicity	
	White	Black	Asian	Hispanic	Non-Hispanic
Cuyahoga County (N=1261):					
Broadband Access at Home (High Speed)	69.18	48.49	92.86	56.52	63.79
Only Mobile Access	2.99	10.7	0	14.49	5.2
Total with Broadband Access (Percent)	72.2	59.2	92.9	71.0	69.0
Cleveland and Inner Ring Suburbs (N=686):					
Broadband Access at Home (High Speed)	60.11	45.67	88.89	52.94	54.65
Only Mobile Access	3.42	11.81	0	15.69	7.09
Total with Broadband Access (Percent)	63.5	57.5	88.9	68.6	61.7

Excerpted from One Community CYC Project, "Cuyahoga County Survey of Internet Access and Use," 2013 – Table 3.

d) Other demographic factors. *Cuyahoga County Survey of Internet Access and Use* included an examination of language, education, and parental status as potential factors implicating Internet access and use.

⁷ *Cuyahoga County Survey of Internet Access and Use*, pp.7-10.

IV. Other Significant Groups of Cuyahoga County Residents for Which Low Levels of Home Broadband Access Have Been Identified

Beyond the geographic and demographic disparities in access described above, the *Cuyahoga County Survey of Internet Access and Use* looked at home broadband connection rates for respondents who identified themselves as participants or clients of a number of public services. The authors didn't provide mobile-only rates for these groups, so the numbers below are limited to high-speed home Internet access connections.

Table 9

Among countywide users of	Percent with broadband access at home
Senior/disabled RTA pass	34.0
Supplemental Security Income (SSI)	40.6
Medicaid	42.1
Social Security Disability	42.2
Foster parent services	48.4
Women, infants and Children Nutrition (WIC)	50.0
Home Energy Assistance	50.9
SNAP (Ohio Directions Card)	51.6
Veteran services	58.1
Homestead Property Tax Exemption	59.3
Healthy Start	62.6
Ohio Work First	64.4
Employment Connection	69.2
School lunch	71.6

Chapter #2:

Cleveland/Cuyahoga County Home Broadband
Available Services

Chapter Overview

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Key Points

1. Fast commercial broadband Internet access is available from at least one, and usually two, wireline providers throughout Cuyahoga County. The main exceptions to this generalization are certain areas of Cleveland and East Cleveland where AT&T's legacy Asymmetric Digital Subscriber Line 2+ (ADSL2+) service is limited to 6 Mbps, 3 Mbps, or slower downstream speeds, leaving Charter Spectrum the sole wireline provider of 10 Mbps+ household access.
2. Alternatives to wireline access, including commercial 4G and satellite service, are also available throughout the county but with no cost advantages compared to main wireline providers. Special broadband discount programs from commercial providers to meet this need include:
 - a. Access From AT&T, whose usefulness is limited by the low-speed ADSL2 coverage mentioned above (associated strongly in lower-income neighborhoods), as well as the program's scheduled termination by 2020.
 - b. Spectrum Internet Assist, limited to school lunch families and very low-income seniors, which is new and still untested in this area.
 - c. Mobile Citizen, an affordable, unlimited-data version of Sprint 4G service provided by a national nonprofit reseller through a partnership with the Ashbury Senior Computer Community Center with varying speeds depending upon distance from Sprint cellular tower.
3. Despite limitations, these programs could meet the broadband needs of tens of thousands of greater Cleveland households but will require substantial community outreach, training, and support.
4. The county main broadband "availability" issue is the lack of robust, commercial home broadband access at a cost below \$40 a month. Considering the limitations of the special broadband discount programs and lack of an affordable option, a significant increase in broadband adoption requires creation of a low-cost broadband service, particularly in low-income neighborhoods.

I. Commercial Internet Service Providers

a) AT&T is the Incumbent Local Exchange Carrier for virtually all of Cuyahoga County and a state-authorized Video Service Provider for almost the entire county, as well.

Home Internet technologies: AT&T offers wireline broadband Internet services to household customers throughout the county using three technologies: Asymmetric Digital Subscriber Line 2+ (ADSL2+), Very High Bitrate Digital Subscriber Line (VDSL), and (in a few places) Fiber to the Premises (FTTP). For any customer location, only one of these technologies is used. The speed capabilities of the three are quite different. ADSL2+ is a service delivered entirely over copper wires from one of the company's "central offices" (a.k.a. wire centers); it can achieve download speeds of 18-24 Mbps in the immediate vicinity of the central office (CO) but slows dramatically as the distance to the customer premises increases. Many customers served by ADSL2+ connections at distances of a mile or more from the CO are limited to download speeds of 3, 1.5, or .768 Mbps. VDSL is delivered via a hybrid fiber/copper network (Fiber to the Node), which can support download speeds from 18 up to 100 Mbps or more. FTTP, where it's offered, is a gigabit service.

Maps 1 and 2 show the wide variation in AT&T's "maximum advertised download speeds" throughout the county, as reported to the FCC on the company's June 2016 Form 477 report.

Speed tiers and prices are ever-shifting, and their long-term customer pricing (i.e., what customers pay after their first-year promotional discounts) is hard to track down.

Table 1: *AT&T Speeds and Costs*¹

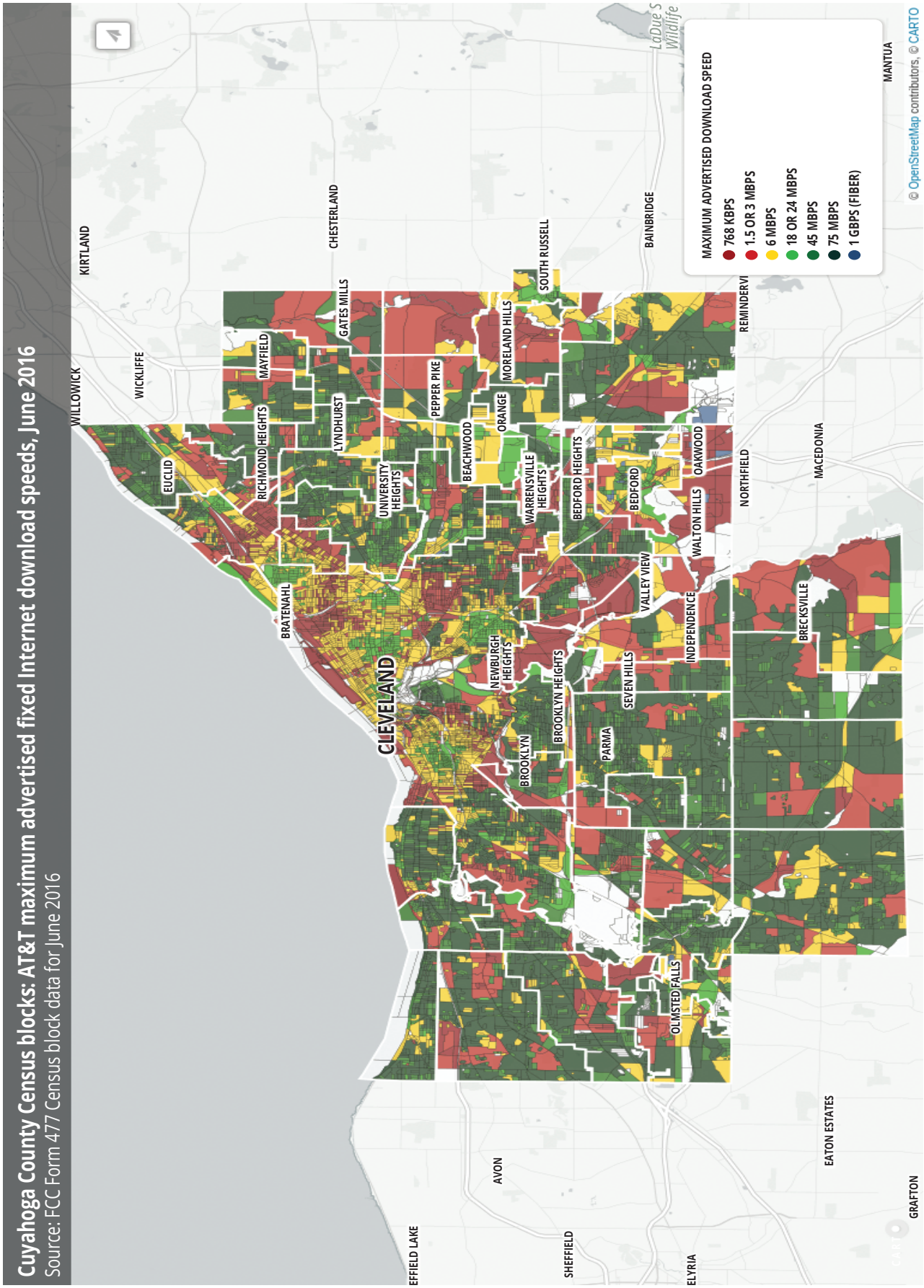
Account	Download speed	Monthly base price		
		First year	Long-term	Contract required?
Internet Basic	"Up to 5 Mbps" (could be 768 kbps, 1.5, or 3 Mbps if that's the system's local limit)	\$30	\$40	No
Internet 25	"Up to 25 Mbps" (could be 6, 12, or 18 Mbps if that's the system's local limit)	\$40	\$50	No
Internet 50	50 Mbps	\$40	\$50	No
Internet 75	75 Mbps	\$60	\$70	No
Internet 100	100 Mbps	\$60	\$70	No

Discounted service for low-income households: As part of its agreement with the FCC in the DirectTV merger case, AT&T agreed to offer special low-cost Internet accounts to households enrolled in the Supplemental Nutrition Assistance Program (SNAP). The [Access From AT&T program](#)² began in April 2016 and will run until 2019. Customers able to receive 10 Mbps or 5 Mbps service can purchase the service for \$10 a month; those whose speeds are limited to 768 kbps, 1.5 Mbps, or 3 Mbps pay \$5 per month. Wi-Fi modems are provided free, and there are no other charges.

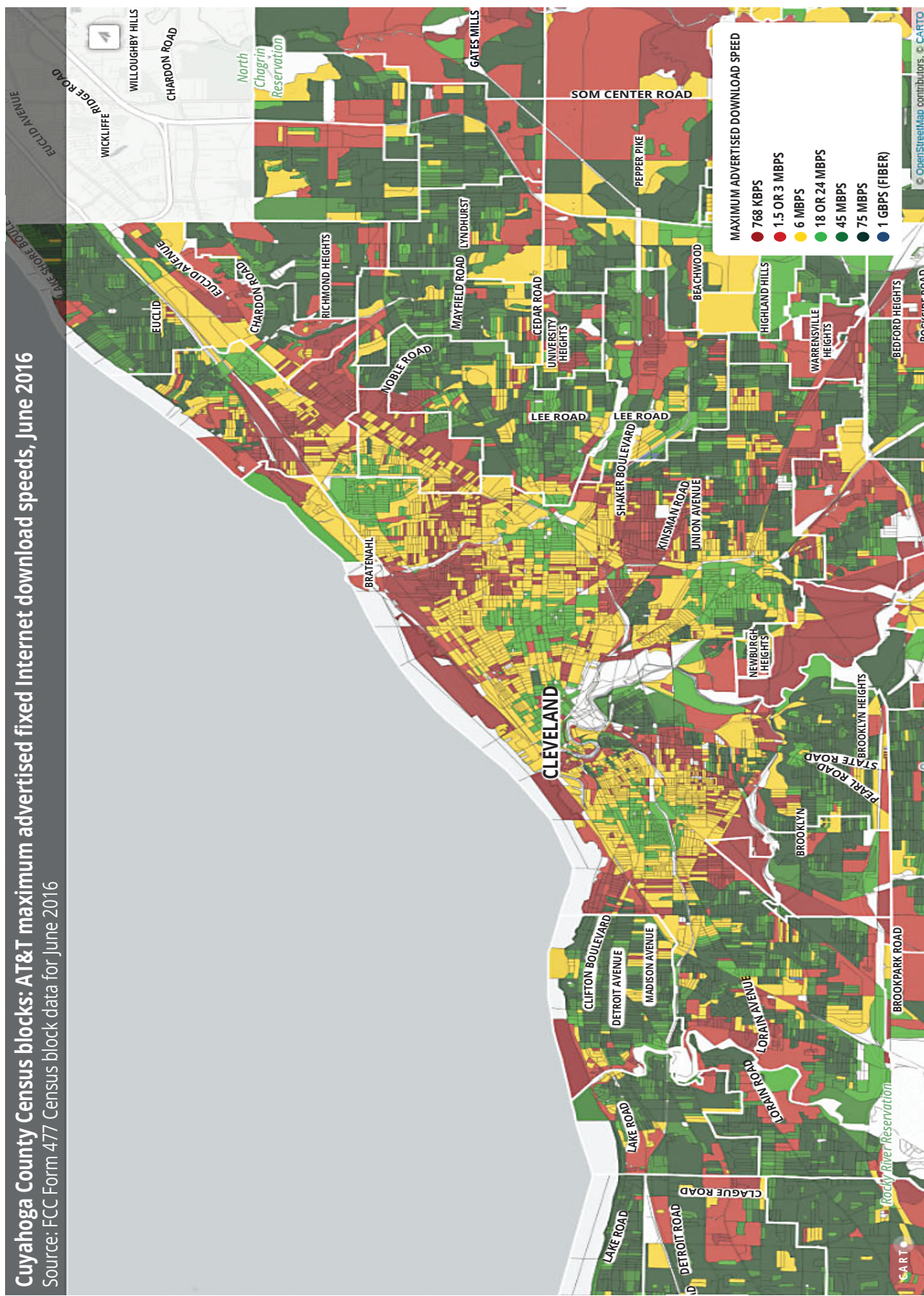
¹ Table content includes prices for stand-alone Internet accounts only and is the best information available on April 27, 2017.

² <https://www.att.com/shop/internet/access/#/>

Map 1 Cuyahoga County Census blocks: AT&T maximum advertised fixed Internet download speeds, June 2016 (FCC Form 477 Census block data)



Map 2 Cleveland and nearby suburbs: AT&T maximum advertised fixed Internet download speeds, June 2016 (FCC Form 477 Census block data)



b) Charter Communications is the incumbent cable television provider for most of Cuyahoga County, including the City of Cleveland (but not East Cleveland). In 2016, Charter acquired Time Warner Cable. In 2017, the merged company began replacing Time Warner cable and broadband services using the “Charter Spectrum” brand.

Home Internet technologies: Charter Spectrum Internet service is offered on either a stand-alone or bundled basis, using DOCSIS 3.0 cable modem technology.

Table 2: *Charter Spectrum Speeds and Costs*³

Account	Max download speed	Monthly base price		
		First year	Long-term	Contract required?
Internet 60/4	60 Mbps	\$44.99	\$64.99	No
Internet 100/4	100 Mbps	\$44.99	\$64.99	No
Internet 100/5	100 Mbps	\$49.99	\$104.99	No
Internet 120/5	120 Mbps	\$49.99	\$104.99	No

Discounted service for low-income households: As part of its agreement with the FCC regarding its acquisition of Time Warner and Bright House, Charter agreed to offer special low-cost Internet accounts to households with children in the National School Lunch Program, as well as to seniors 65 or older who receive Supplemental Security Income (SSI). The [Internet Assist program](#)⁴ began in Cuyahoga County in March 2017. It has no specified end date. Eligible households are offered regular Spectrum Internet accounts with speeds up to 30 Mbps down and 4 Mbps up at a monthly cost of \$14.99.

c) Cox Communications is the cable television provider serving all or most of Parma, Parma Heights, Seven Hills, Broadview Heights, Lakewood, Fairview Park, Rocky Rover, Olmsted Falls, Olmsted Township, and Brooklyn Heights.

Home Internet technologies: Cox Internet service is offered on either a stand-alone or bundled basis using DOCSIS 3.0/3.1 cable modem technology.

Table 3: *Cox Speeds and Costs*⁵

Account	Max download speed	Monthly base price		
		First year	Long-term	Contract required?
Internet Starter	5 Mbps	\$39.99	\$39.99	No
Internet Essential	15 Mbps	\$39.99	\$62.99	No
Internet Preferred	50 Mbps	\$59.99	\$77.99	No
Internet Premier	150 Mbps	\$69.99	\$87.99	No
Internet Ultimate	300 Mbps	\$89.99	\$99.99	No

³ Table content includes prices for stand-alone Internet accounts only and is the best information available on April 27, 2017.

⁴ <https://www.att.com/shop/internet/access/#/>

⁵ Table content includes prices for stand-alone Internet accounts only and is the best information available on April 27, 2017.

Discounted service for low-income households: Cox offers low-cost Internet accounts to families with K-12 children who are eligible for the National School Lunch Program, SNAP, and/or TANF; who receive Tenant-based Vouchers, Project-based Vouchers or Section 8 Project-based Rental Assistance (PBRA); and/or who live in public housing. The [Cox Connect2Compete program](http://connect2compete.org/cox/)⁶ offers cable Internet service at speeds up to 10 Mbps down at a monthly cost of \$9.95.

Map 3 shows the Cuyahoga County service territories of Charter Communications and Cox Communications.

d) Wide Open West (WOW) is a competitive cable provider (commonly referred to as a “cable overbuilder”) that has developed a strong presence in a number of Cuyahoga County suburbs over the past twenty years.

Home Internet technologies: WOW Internet service is offered on either a stand-alone or bundled basis using DOCSIS 3.0/3.1 cable modem technology.

Table 4: *Wide Open West Speeds and Costs*⁷

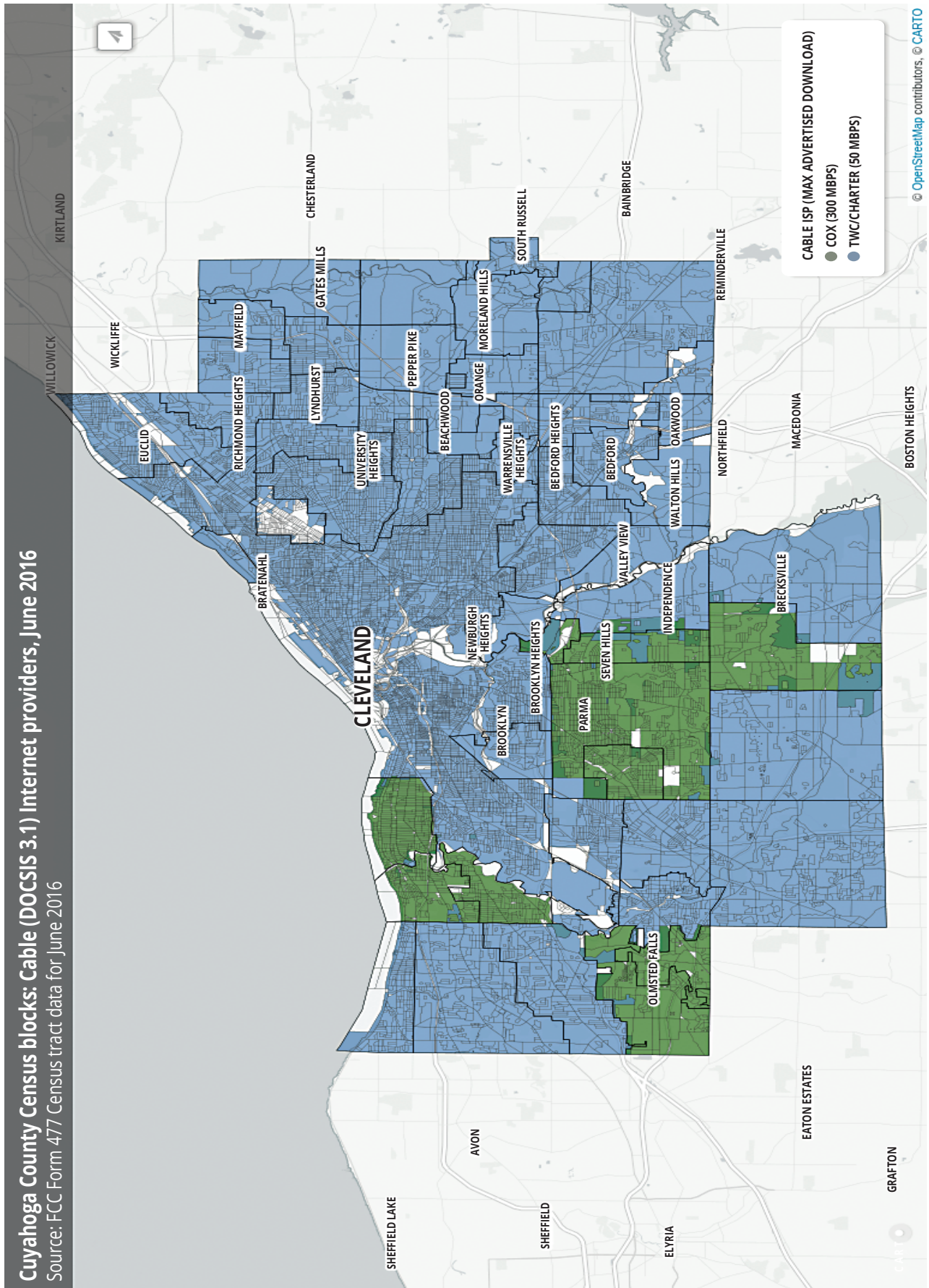
Account	Max download speed	Monthly base price		Contract required?
		First year	Long-term	
Internet 10	10 Mbps	\$29.99		No
Internet 100	100 Mbps	\$39.99	?	Yes (24 mos)
Internet 100	100 Mbps	\$49.99		No
Internet 500	500 Mbps	\$59.99	?	Yes (24 mos)
Internet 500	500 Mbps	\$69.99		No

Discounted service for low-income households: None.

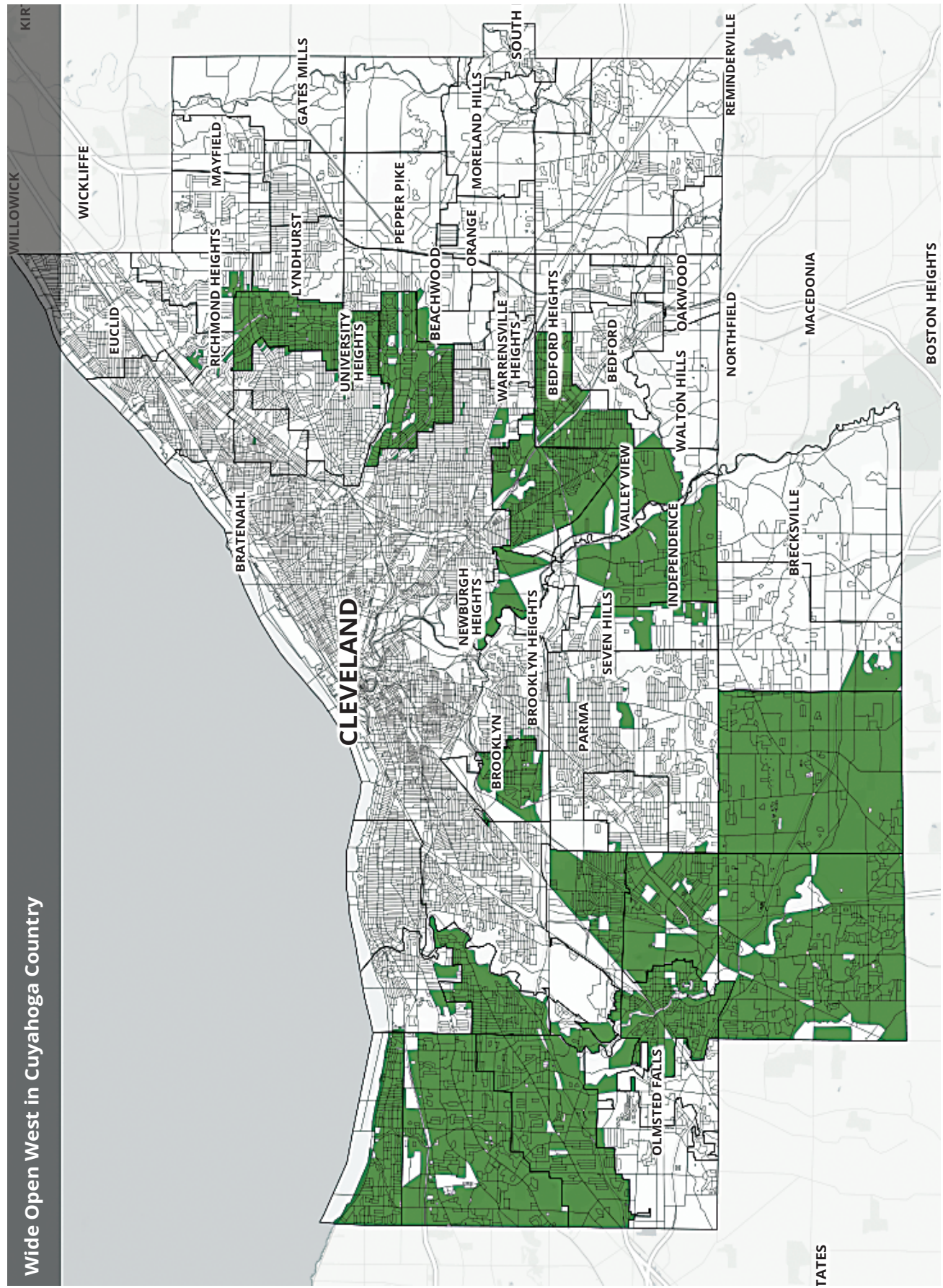
⁶ <http://connect2compete.org/cox/>

⁷ Table content includes prices for stand-alone Internet accounts only and is the best information available on April 27, 2017.

Map 3 *Cuyahoga County service territories of Charter Communications and Cox Communications.*



Map 4 *Wide Open West in Cuyahoga County*



e) East Cleveland Cable (ECC) is a small independent cable provider serving the cities of East Cleveland and Bratenahl.

Home Internet technologies: ECC Internet service is offered on either a stand-alone or bundled basis using cable modem technology (DOCSIS generation unknown).

Table 5: *ECC Speeds and Costs* ⁸

Account	Max download speed	Monthly base price	Contract required?
High-Speed Basic	10 Mbps	\$39.95	No
High-Speed Premium	25 Mbps	\$44.95	No

Discounted service for low-income households: None.

f) Satellite Internet Services

HughesNet offers residential satellite Internet service throughout Cuyahoga County. On its [website](#), HughesNet advertised download/upload speeds up to 25/3 Mbps throughout the county.

Table 6: *HughesNet Speeds and Costs*

([HughesNet's advertised prices](#)⁹ are differentiated by data consumption rather than speed.)

Advertised speed	Monthly data cap	First 12 months	Monthly cost thereafter
25/3 Mbps	10 GB	\$49.99	\$49.99
25/3 Mbps	20 GB	\$49.99	\$69.99
25/3 Mbps	30 GB	\$69.99	\$99.99
25/3 Mbps	50 GB	\$99.99	\$129.99

Discounted service for low-income households: None offered.

ViaSat offers residential satellite Internet service under the “**Exede**” brand throughout Cuyahoga County. On its [website](#),¹⁰ Exede advertises download speeds up to 12 Mbps throughout the county.

Table 7: *Exede's Speeds and Costs*

([Exede's advertised prices](#)¹¹ are differentiated by data consumption rather than download speed.)

Advertised speed	Monthly data cap	First three months	Monthly cost thereafter
12 Mbps	10 GB	\$49.99	\$49.99
12 Mbps	12 GB	\$49.99	\$69.99
12 Mbps	18 GB	\$69.99	\$99.99
12 Mbps	30 GB	\$99.99	\$149.99

Discounted service for low-income households: None offered.

⁸ Table content includes prices for stand-alone Internet accounts only and is the best information available on April 27, 2017.

⁹ <http://internet.hughesnet.com/residential-plans-and-pricing.html#res-plans-box>, accessed April 28, 2017.

¹⁰ <http://www.exede.com/>

¹¹ <http://www.exede.com/plan-results/augliberty12/>, accessed April 28, 2017.

g) 4G Wireless Internet Services

There are numerous companies offering 4G wireless data services, either as part of phone plans or on a stand-alone basis for mobile devices, throughout the county. These companies range from AT&T, Verizon Wireless, Sprint, and T-Mobile to a variety of small resellers, including those specializing in Lifeline-subsidized phone accounts and in off-the-shelf devices using purchased data.

These services are an important part of the “access ecology” for low-income county residents. There are, however, a number of serious obstacles to creating a useful inventory of home broadband options in this space, including:

- wide geographic variations in the data speeds available from the major networks,
- the small niche that Internet-only devices like tablets and Wi-Fi hotspots occupy in the 4G market (as distinct from Internet-over-smartphone), and
- the central but constantly shifting impact of data plans and caps on user costs.

It should be noted that while the FCC's “Lifeline broadband” initiative may eventually result in more significant 4G Internet access opportunities for low-income consumers, this has not yet occurred in Cuyahoga County.

II. Nonprofit ISP services

Mobile Citizen¹² is a nonprofit reseller of Sprint 4G wireless service for nonprofit organizations and anchor institutions. Low-income households are eligible for the service through Mobile Citizen's nonprofit organization and anchor institution resellers/partners, dependent upon the policies of the digital inclusion programs. In Cuyahoga County, Mobile Citizen accounts and devices are offered to eligible lower-income households only by the [Ashbury Senior Computer Community Center \(ASC3\)](#)¹³, a Mobile Citizen reseller/partner.

Mobile Citizen provides commercial Sprint LTE data accounts with no data caps for \$120 per year. ASC3 adds an administrative charge of \$14.16, bringing the annual service cost to \$134.16. Users must purchase Sprint mobile Wi-Fi Internet devices from Mobile Citizen, which currently cost \$89.

The total cost to a participating household for Sprint LTE Internet access through ASC3 is \$223.16 for the first year and \$134.16 for subsequent years.

Mobile Citizen, and therefore ASC3, requires full advance payment of these annual charges.

Speed of Mobile Citizen Sprint service varies widely depending on distance from a Sprint LTE antenna and other network factors. Testing by Connect Your Community and ASC3 has found Cleveland neighborhood locations where download speeds exceed 20 Mbps but also many areas with speeds in the 1-3 Mbps range or less.

ASC3's policy is to accept equipment returns and provide full refunds for two weeks after a new account has been activated to allow new users to test their service and ensure their speeds are acceptable.

¹² <https://mobilecitizen.org/>

¹³ <http://www.asc3.org/>



Free Public Internet

Free public Wi-Fi access is available primarily inside libraries and a few other public and community spaces. The county's only large-scale exterior public Wi-Fi network in a residential neighborhood is Old Brooklyn Connects, serving a single Cleveland ward. Libraries are also the county's most reliable and robust providers of access to public computers with more than a thousand workstations available to residents of the communities with least access at home. See Chapter 3 for a discussion of public-access options.

Chapter #3:

Cleveland/Cuyahoga County Inventory
of Current Digital Inclusion Programs



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Key Points

1. The most important gap in digital inclusion resources and services identified by this inventory is the striking lack of public or community programs offering home broadband adoption assistance (with either equipment or connectivity) to unconnected residents.
2. In general, there are locations for residents of Cleveland and the county's Digital Equity High Need Areas (DEHNAs) who lack home computer and Internet access to sit down at a public-access workstation or connect to public Wi-Fi. For the most part, these sites are fairly well distributed across Cleveland and other communities where the data suggests they are most needed. More than 1,000 public-access workstations are located in public libraries or on Cuyahoga Community College (Tri-C) campuses where they are clearly "open to all;" are professionally maintained; have fast, reliable Internet connections; and have professional staff available to assist users.
3. In general, there are opportunities for free basic computer training distributed broadly throughout Cleveland and the other DEHNAs. While the library systems are a primary source of training, nonprofit community programs are also a major factor, especially in the poorest and worst-connected Cleveland neighborhoods. Map 2, "Public and nonprofit digital skills training locations, May 2017," provides a visual of geographic gaps in free basic computer training.
4. It is important to note that the presence of training programs in high-need areas tells us nothing about the current adequacy of those programs to meet the actual needs of neighborhood residents – a function, not just of proximity, but of staffing and other factors determined largely by funding. Few, if any, of the libraries and nonprofits shown on these maps would have adequate resources to handle a sudden influx of thousands of their neighbors seeking basic digital skills training.
5. The near-total reliance of suburban communities on libraries for both public computer access and training, combined with the large, centralized libraries rather than neighborhood branches serving these communities, may be creating a significant barrier to public access and training services for residents of some DEHNAs that are distant from the central facilities.
6. An important exception to the generally good geographic distribution of public-access computer labs and training centers cited in Key Points 2 and 3 is found in East Cleveland. East Cleveland has very low home broadband penetration rates throughout the city, but its residents must rely on just one East Cleveland Public Library branch for both public access and basic skills training.

I. Definition of Digital Inclusion

NDIA defines "digital inclusion" as the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs). This includes five elements:

1. Affordable, robust broadband Internet service
2. Internet-enabled devices that meet the needs of the user
3. Access to digital literacy training

4. Quality technical support

5. Applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration.

Digital inclusion must evolve as technology advances. Digital inclusion requires intentional strategies and investments to reduce and eliminate historical, institutional, and structural barriers to access and use technology.

This chapter identifies digital inclusion programs serving disadvantaged residents of Cleveland and Cuyahoga County's DEHNAs. In general, the digital inclusion programs provide free assistance to residents seeking one or more of the first four key elements listed above: free or very affordable Internet access, free or very affordable home computing equipment, digital skills training, and/or technical support. Without those four services increasing access and use of the Internet, the fifth (applications and content) may be unusable by the most disadvantaged populations.

The inventory of programs and services of public institutions includes libraries; municipal governments; Cuyahoga Metropolitan Housing Authority (CMHA); and Cuyahoga Community College (Tri-C); as well as community-based organizations, including Community Development Corporations (CDCs), community social service centers, churches, and stand-alone Community Technology Centers (CTCs).

II. Digital Inclusion Programs in Cuyahoga County

In Chapter 1, we identify the areas of Cuyahoga County for which available data shows the greatest need for strategic digital inclusion interventions. These areas are:

- The city of Cleveland, most East Side neighborhoods, and several West Side neighborhoods (Clark-Fulton, Brooklyn Centre, Stockyards, Detroit-Shoreway)
- The city of East Cleveland
- Areas in the city of Euclid, especially along Euclid Avenue
- The village of North Randall and areas of Warrensville Heights, Highland Hills, Garfield Heights, and Bedford Heights.

The following inventory is limited to locations and programs serving identified DEHNAs. The accompanying maps illustrate the relationship between program locations and the neighborhoods of greatest need using one available indicator: The Federal Communications Commission's Form 477 Census tract data for December 2014, which allows us to identify the county's "worst-connected" tracts using a modest home broadband speed benchmark of 3 Mbps downstream. The maps compare the locations of access and training sites to Census tracts where 40% or less of households met the 3 Mbps benchmark. This approach highlights not just which DEHNAs have these services available to residents but whether the resources are located close to concentrations of households that may need them.

This is a particularly important question for suburban residents because the vast majority of their digital access and training opportunities are provided by a small number of public libraries – which, as Maps 1 and 2 show, can be quite distant from the worst-connected neighborhoods.

For example: According to the FCC's data, ten out of eleven Census tracts in East Cleveland have residential broadband penetration rates below 20%, yet the only public computer access site within the city is the main library. Most homes in East Cleveland are further than half a mile from the library, and many are more than a mile away, which means the library's computers have a limited usefulness to area households that own neither computers nor cars.

Tables 1 and 2 are lists of digital inclusion facilities and programs located in these municipalities that offer their residents public-access computers; free (or very cheap) training in basic computer and Internet skills; affordable (usually refurbished) computers to use at home; and/or help connecting to affordable home Internet options such as those described in Chapter 2 (Access from AT&T, Spectrum Internet Assist, and Mobile Citizen). In many cases they also offer free public Wi-Fi access, as shown in Table 3. But public-access computer labs, digital skills training, and home Internet adoption assistance are frequently offered as a single program or a spectrum of services.

The resources listed here are available either to the public at large (sometimes with some income qualifications) or to all the residents of a large local community, such as a public-housing estate or senior complex. The list doesn't include agency computer labs that are used primarily to support the agencies' other programs or school technology centers that are open only to enrolled students and their families.

III. Free Wi-Fi and Public-access Computer Locations

Table 1 (page 48) includes ninety-two sites where a resident can sit down at one of more than 1,600 public access computers and use it for online or offline purposes. Map 1, on the following page, shows the distribution of the ninety-two public-access sites in relationship to the county's worst-connected Census tracts, i.e., those that had fewer than 40% of their households connected to fixed Internet service at 3 Mbps down or faster in December 2014.

Table 2 (page 52) gives the locations and operators of forty-seven public access Wi-Fi sites serving residents of Cleveland and other identified DEHNAs. Map 2, on the following page, shows the distribution of the forty-seven wifi sites in relationship to the county's worst-connected Census tracts. Here's more information about those public-access and wifi sites, followed by the tables and maps.

Libraries

More than 500 of these public-access computers are provided by the Cleveland Public Library, either at its downtown Tech Central facilities or at one of twenty-eight neighborhood branches – each of which generally has at least sixteen public workstations. Libraries are also the county's most reliable and robust providers of access to public computers with more than a thousand workstations available to residents of the communities with least access at home. Residents of Warrensville Heights, Highland Hills, North Randall Garfield, and Bedford Heights have access to 160 public computers at the Cuyahoga County Public Library's Warrensville, Garfield Heights, and Southeast branches. The Euclid and East Cleveland Public Libraries each maintain more than seventy public-use computers.

Cuyahoga Community College

Cuyahoga Community College's Metro Campus (in Cleveland's Central neighborhood) provides free public Wi-Fi throughout the campus and welcomes the public to use 120 workstations located in its Technology Learning Center or campus library. The same services are available to the public at Tri-C's Eastern Campus in Highland Hills and Western Campus in Parma.

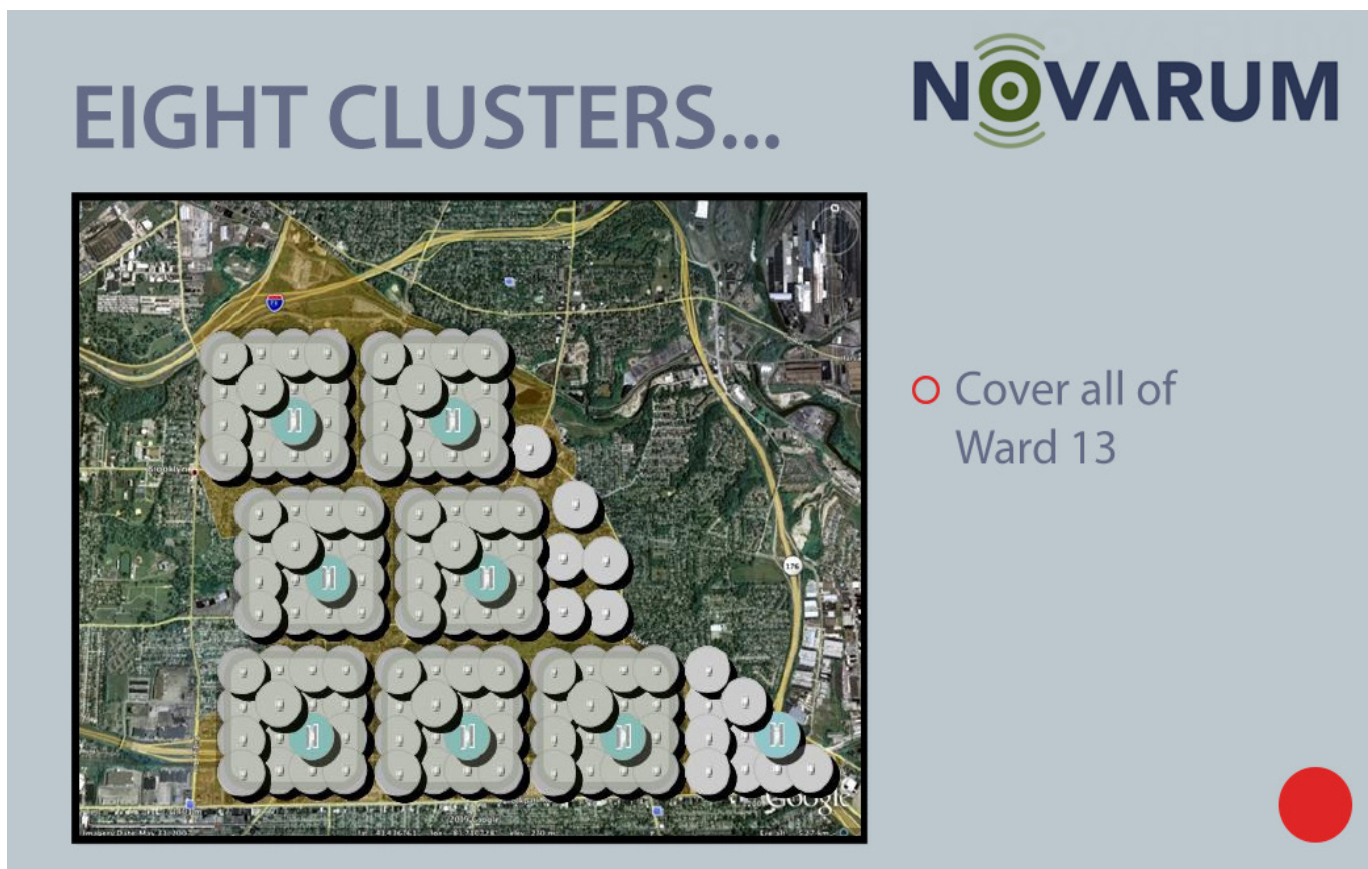
City of Cleveland

The City of Cleveland has maintained public-access computer labs in most of its recreation centers since 1997, but over the years the condition and hours of access (if any) have varied a great deal among the centers. In recent months the City has upgraded all of its rec center labs (with the exception of the relatively new lab at the Collinwood Rec Center) with a consistent “package” that includes six newly refurbished Windows 7 computers and Internet access over the City's own network.

Public Wi-Fi is now available inside the Estabrook, Glenville, Thurgood Marshall, and Zelma George Recreation Centers and may soon be available in other City of Cleveland recreation centers. The City of Cleveland also offers public Wi-Fi in Cleveland City Hall and throughout Public Square, a public park located in the heart of downtown Cleveland.

Old Brooklyn Connected. The county's only large-scale exterior public Wi-Fi network in a residential neighborhood is Old Brooklyn Connects. The City of Cleveland provides public Wi-Fi access throughout a 4.5-square-mile area in Ward 13 (Old Brooklyn west of Broadview), maintaining and provisioning 220 Ubiquiti access points mounted on street light struts. Speed and quality of access vary widely with distance from the nearest access point, line of sight, foliage, inside vs. outside, etc. The system was installed in 2010 at a cost of \$1.3 million, including five years of projected operating costs. It is currently being “refreshed” with new radios.

A fairly accurate graphic of the network from a 2010 slide presentation by Novarum, the City's network developer:



Community Nonprofit Organizations and Low-income Housing

NDIA has identified twenty-seven community computer labs operated by private nonprofits in a variety of Cleveland neighborhood locations that are known to offer computer and Internet access either to the public at large or to all residents of a specific large housing site. The sizes of these labs vary widely, from as small as five workstations to as large as twenty-five.

Most of Cleveland's nonprofit community technology centers have interior Wi-Fi that can be used by members of the public during open-access times, but this is not generally a featured service. Two exceptions are the PNC Fairfax Connection, which provides seating and counters for the public to use its Wi-Fi network on their own devices; and ASC3's Connect Your Community Center, which maintains public Wi-Fi access throughout the neighborhood shopping center in which it is located (Brooklyn Center Plaza).

Eleven CMHA properties and several other affordable-housing complexes offer free computer labs available for the use of tenants.

Table 1: *Public access computer locations in Cleveland*

NAME	ADDRESS	AFFILIATION	COMPUTERS
ASC3 CYC Center	3730 Pearl Rd, Cleveland	ASC3	12
Ashbury Senior Computer Community Center	11011 Ashbury Ave, Cleveland	ASC3	32
Fatima Family Center Community Computer Lab	6600 Lexington, Cleveland	Catholic Charities	12
St. Philip Neri Family Center	799 East 82nd Street, Cleveland	Catholic Charities	8
Central Recreation Center	2526 Central, Cleveland	Cleve Div of Recreation	6
Clark Recreation Center	5706 Clark, Cleveland	Cleve Div of Recreation	6
Collinwood Recreation Center	16300 Lakeshore, Cleveland	Cleve Div of Recreation	6
Cory Recreation Center	10510 Drexel, Cleveland	Cleve Div of Recreation	6
Cudell Recreation Center	1910 West Blvd., Cleveland	Cleve Div of Recreation	6
Earle B. Turner Recreation Center	11300 Miles, Cleveland	Cleve Div of Recreation	6
Estabrook Recreation Center	4125 Fulton, Cleveland	Cleve Div of Recreation	6
Fairfax Recreation Center	2335 East 82nd, Cleveland	Cleve Div of Recreation	6
Glenville Recreation Center	680 East 113th, Cleveland	Cleve Div of Recreation	6
Gunning Recreation Center	16700 Puritas, Cleveland	Cleve Div of Recreation	6
Hamilton Recreation Center	13200 Kinsman, Cleveland	Cleve Div of Recreation	6
John F Kennedy Recreation Center	17300 Harvard, Cleveland	Cleve Div of Recreation	6
Kenneth L Johnson Recreation Center	9206 Woodland, Cleveland	Cleve Div of Recreation	6
Lonnie Burten Recreation Center	2511 East 46th, Cleveland	Cleve Div of Recreation	6
Michael Zone Recreation Center	6301 Lorain, Cleveland	Cleve Div of Recreation	6
Stella Walsh Recreation Center	7245 Broadway, Cleveland	Cleve Div of Recreation	6
Sterling Recreation Center	1380 East 32nd, Cleveland	Cleve Div of Recreation	6
Thurgood Marshall Recreation Center	8611 Hough, Cleveland	Cleve Div of Recreation	6
Zelma George Recreation Center	3155 MLK Jr Blvd., Cleveland	Cleve Div of Recreation	6
Addison Branch CPL	6901 Superior Ave., Cleveland	Cleveland Public Library	16
Brooklyn Branch CPL	3706 Pearl Rd., Cleveland	Cleveland Public Library	16

NAME	ADDRESS	AFFILIATION	COMPUTERS
Carnegie West Branch CPL	1900 Fulton Rd., Cleveland	Cleveland Public Library	16
Collinwood Branch CPL	856 East 152nd Street, Cleveland	Cleveland Public Library	16
East 131st Street Branch CPL	3830 East 131st Street, Cleveland	Cleveland Public Library	16
Eastman Branch CPL	11602 Lorain Avenue, Cleveland	Cleveland Public Library	16
Fleet Branch CPL	7224 Broadway Avenue, Cleveland	Cleveland Public Library	16
Fulton Branch CPL	3545 Fulton Road, Cleveland	Cleveland Public Library	16
Garden Valley Branch CPL	7201 Kinsman Road, Cleveland	Cleveland Public Library	16
Glenville Branch CPL	11900 St. Clair Avenue, Cleveland	Cleveland Public Library	16
Harvard-Lee Branch CPL	16918 Harvard Avenue, Cleveland	Cleveland Public Library	16
Hough Branch CPL	1566 Crawford Road, Cleveland	Cleveland Public Library	16
Jefferson Branch CPL	850 Jefferson Avenue, Cleveland	Cleveland Public Library	16
Langston Hughes Branch CPL	10200 Superior Avenue, Cleveland	Cleveland Public Library	16
Lorain Branch CPL	8216 Lorain Avenue, Cleveland	Cleveland Public Library	16
Main Library – Tech Central	525 Superior Ave., Cleveland	Cleveland Public Library	100
Martin L. King, Jr. Branch CPL	1962 Stokes Boulevard, Cleveland	Cleveland Public Library	16
Memorial-Nottingham Branch CPL	17109 Lake Shore Boulevard, Cleveland	Cleveland Public Library	16
Mt. Pleasant Branch CPL	14000 Kinsman Road, Cleveland	Cleveland Public Library	16
Ohio Library for the Blind & Physically Disabled	17121 Lake Shore Blvd, Cleveland	Cleveland Public Library	16
Rice Branch CPL	11535 Shaker Boulevard, Cleveland	Cleveland Public Library	16
Rockport Branch CPL	4421 West 140th Street, Cleveland	Cleveland Public Library	16
South Branch CPL	2704 Clark Ave., Cleveland	Cleveland Public Library	16
South Brooklyn Branch CPL	4303 Pearl Road, Cleveland	Cleveland Public Library	16
Sterling Branch CPL	2200 East 30th Street, Cleveland	Cleveland Public Library	16
Union Branch CPL	3463 East 93rd Street, Cleveland	Cleveland Public Library	16
Walz Branch CPL	7910 Detroit Avenue, Cleveland	Cleveland Public Library	16
West Park Branch CPL	3805 West 157th St, Cleveland	Cleveland Public Library	16
Woodland Branch CPL	5806 Woodland Avenue, Cleveland	Cleveland Public Library	16
Bellaire Gardens	12555 Bellaire Rd, Cleveland	CMHA (for tenants)	3
Fairfax Intergenerational (Renaissance of Fairfax Park)	8113 Central Ave, Cleveland	CMHA (for tenants)	11
Heritage View	7230 Kinsman Rd, Cleveland	CMHA (for tenants)	10
King Kennedy South Hi-Rise - Stokes Mall	6011 Woodland Ave, Cleveland	CMHA (for tenants)	7
Lakeview Terrace	1302 W 28th St, Cleveland	CMHA (for tenants)	10
Olde Cedar Estates Computer Lab	2202 E 30th St, Cleveland	CMHA (for tenants)	28
Outhwaite – Miracle Village/Jobs Plus	2535 E 43rd St, Cleveland	CMHA (for tenants)	8
Outhwaite – Sara J. Harper Library	2352 E 46th St, Cleveland	CMHA (for tenants)	8
Riverside Park (Bellaire Puritas operated)	4609 Rocky River Dr, Cleveland	CMHA (for tenants)	14
Riverview Towers	1795 W 25th St, Cleveland	CMHA (for tenants)	6
Woodhill Homes (2 labs)	2488 Morris Black Pl, Cleveland	CMHA (for tenants)	18

NAME	ADDRESS	AFFILIATION	COMPUTERS
Garfield Heights Branch CCPL	5409 Turney Road, Garfield Heights	Cuyahoga County Public Library	60
Southeast Branch CCPL	70 Columbus Road, Bedford	Cuyahoga County Public Library	19
Warrensville Heights Branch CCPL	4415 Northfield Road, Warrensville Heights	Cuyahoga County Public Library	50
East Cleveland Public Library	14101 Euclid Avenue, East Cleveland	East Cleveland Public Library	60
Euclid Public Library	631 East 222nd Street, Euclid	Euclid Public Library	78
Arbor Park Village Learning Center	3750 Fleming, Cleveland	Independent	20
Esperanza Computer Resource Center	3104 West 25th St, Cleveland	Independent	15
Fairfax Connection (PNC Bank)	8220 Carnegie Ave, Cleveland	Independent	25
Fairfax Neighborhood Technology Center	8111 Quincy Ave, Cleveland	Independent	11
Gordon Square computer lab (DSCDO)	6516 Detroit, Cleveland	Independent	10
Greater Friendship Baptist Church	12305 Arlington Ave, Cleveland	Independent	10
Harvard Square Center	13510 Harvard Avenue, Cleveland	Independent	10
Lin Omni Computer Center (DSCDO)	3167 Fulton Rd, Cleveland	Independent	8
Lyric Community Center Computer Lab (BPDC)	3847 West 140th, Cleveland	Independent	10
Rainbow Terrace Learning Center (Vesta)	7310 Carson, Cleveland	Independent	16
Scranton Road Ministries CDC Project Connect	3095 Scranton Rd, Cleveland	Independent	15
Senior Citizen Resources	3100 Devonshire, Cleveland	Independent	6
St Colman Parish Computer Center	2027 West 65th Street, Cleveland	Independent	18
Thea Bowman Center	11901 Oakfield Ave, Cleveland	Independent	5
West Park Community Coalition Computer Center	11897 Bellaire Rd, Cleveland	Independent	12
Word of Righteousness Family Life Center	13455 Dressler Ave., Garfield Heights	Independent	10
East End Neighborhood House	2749 Woodhill, Cleveland	Neighborhood Ctrs Assn	12
Friendly Inn Computer Learning Center	2386 Unwin, Cleveland	Neighborhood Ctrs Assn	10
Goodrich-Gannett Neighborhood Center	1368 East 55th, Cleveland	Neighborhood Ctrs Assn	8
Lexington-Bell Community Center	7724 Lexington Ave, Cleveland	Neighborhood Ctrs Assn	10
West Side Community House	9300 Lorain, Cleveland	Neighborhood Ctrs Assn	10
Temple Corps Computer Center	17625 Grovewood Ave, Cleveland	Salvation Army	10
Tri-C Eastern Campus Technology Learning Center	4250 Richmond Rd, Highland Hills	Tri-C	
Tri-C Metro Technology Learning Center and Library	2900 Community College Avenue, Cleveland	Tri-C	120

Map 1

Public and nonprofit locations with public access Internet computers, May 2017

Red areas are Census tracts where fewer than 40% of households had fixed Internet at 3 mbps down or faster in December 2014, according to FCC Form 477 tract data.

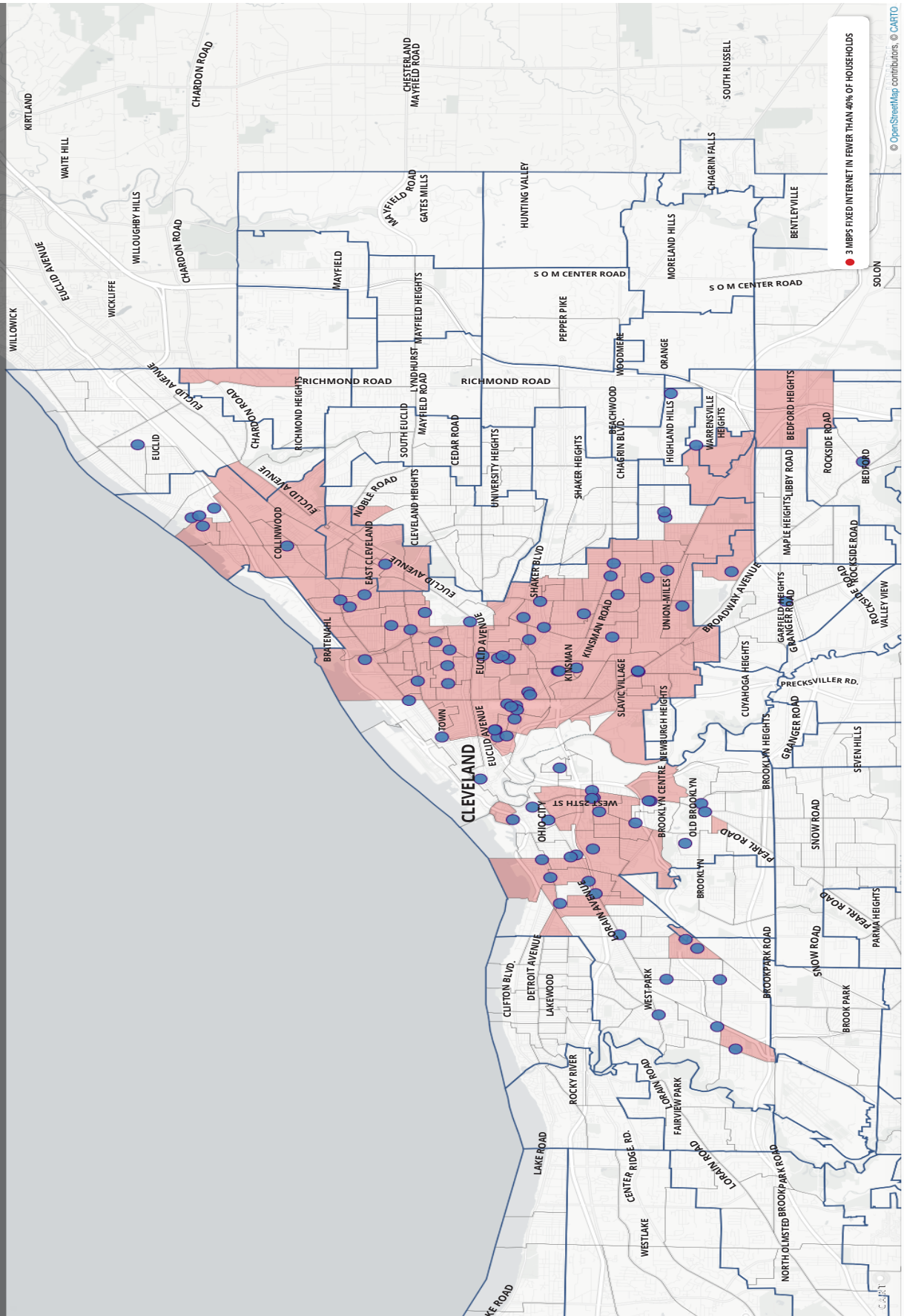


Table 2: *Public and nonprofit locations with public Wi-Fi access*

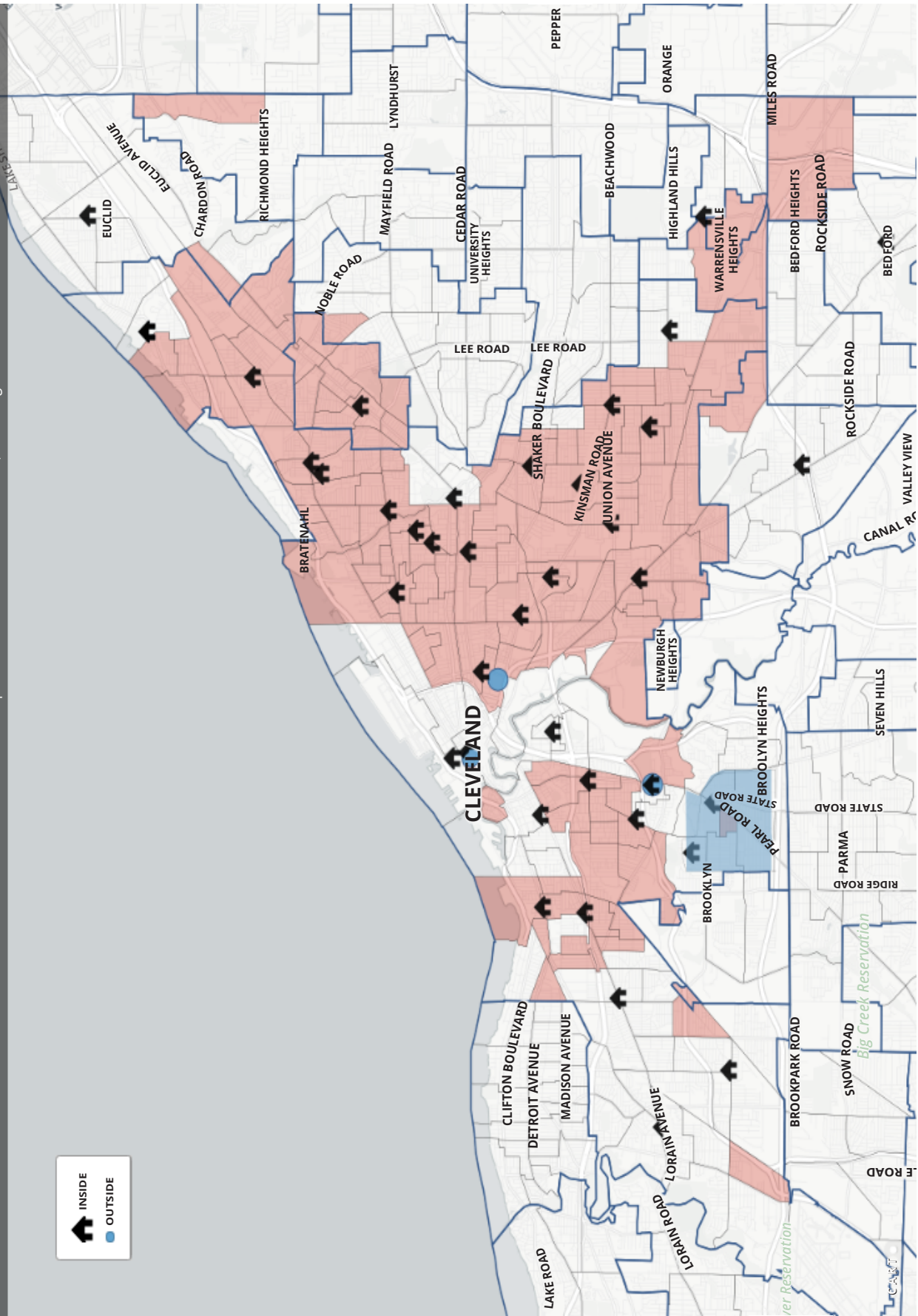
NAME	LOCATION	AFFILIATION	PUBLIC Wi-Fi	
			INSIDE ONLY	OUTSIDE
Brooklyn Center Plaza (CYC Center)	3730 Pearl Rd., Cleveland	ASC3		Shopping plaza
Old Brooklyn Connected	Cleveland Ward 13 (220 access points)	City of Cleveland		Neighborhood
Public Square	Public Square, Cleveland	City of Cleveland		Downtown park
Tri-C Metro Campus	2900 Community College Ave., Cleveland	Tri-C		Campus
Addison Branch CPL	6901 Superior Ave., Cleveland	Cleveland Public Library	Library	
Brooklyn Branch CPL	3706 Pearl Rd., Cleveland	Cleveland Public Library	Library	
Carnegie West Branch CPL	1900 Fulton Rd., Cleveland	Cleveland Public Library	Library	
Cleveland City Hall	601 Lakeside Ave., Cleveland	City of Cleveland	Public building	
Collinwood Branch CPL	856 East 152nd St., Cleveland	Cleveland Public Library	Library	
East 131st Street Branch CPL	3830 East 131st St., Cleveland	Cleveland Public Library	Library	
East Cleveland Public Library	14101 Euclid Ave., East Cleveland	East Cleveland Public Library	Library	
Eastman Branch CPL	11602 Lorain Ave., Cleveland	Cleveland Public Library	Library	
Estabrook Recreation Center	4125 Fulton, Cleveland	Cleve Div of Recreation	Rec center	
Euclid Public Library	631 East 222nd St., Euclid	Euclid Public Library	Library	
Fairfax Connection (PNC Bank)	8220 Carnegie Ave., Cleveland	Independent	CTC	
Fleet Branch CPL	7224 Broadway Ave., Cleveland	Cleveland Public Library	Library	
Fulton Branch CPL	3545 Fulton Rd., Cleveland	Cleveland Public Library	Library	
Garden Valley Branch CPL	7201 Kinsman Rd., Cleveland	Cleveland Public Library	Library	
Garfield Neights Branch CCPL	5409 Turney Rd., Garfield Heights	Cuyahoga County Public Library	Library	
Glenville Branch CPL	11900 St. Clair Ave., Cleveland	Cleveland Public Library	Library	
Glenville Recreation Center	680 East 113th, Cleveland	Cleve Div of Recreation	Rec center	
Harvard-Lee Branch CPL	16918 Harvard Ave., Cleveland	Cleveland Public Library	Library	
Hough Branch CPL	1566 Crawford Rd., Cleveland	Cleveland Public Library	Library	
Jefferson Branch CPL	850 Jefferson Ave., Cleveland	Cleveland Public Library	Library	
Langston Hughes Branch CPL	10200 Superior Ave., Cleveland	Cleveland Public Library	Library	
Lorain Branch CPL	8216 Lorain Ave., Cleveland	Cleveland Public Library	Library	
Main Library – Tech Central	325-525 Superior Ave., Cleveland	Cleveland Public Library	Library	
Maple Heights Branch CCPL	5225 Library Lane, Maple Heights	Cuyahoga County Public Library	Library	
Martin L. King, Jr. Branch CPL	1962 Stokes Blvd., Cleveland	Cleveland Public Library	Library	
Memorial-Nottingham Branch CPL	17109 Lake Shore Blvd., Cleveland	Cleveland Public Library	Library	
Mt. Pleasant Branch CPL	14000 Kinsman Rd., Cleveland	Cleveland Public Library	Library	
Ohio Library for the Blind & Physically Disabled	17121 Lake Shore Blvd., Cleveland	Cleveland Public Library	Library	

NAME	LOCATION	AFFILIATION	PUBLIC Wi-Fi	
			INSIDE ONLY	OUTSIDE
Parma-Snow Branch CCPL	2121 Snow Rd., Parma	Cuyahoga County Public Library	Library	
Rice Branch CPL	11535 Shaker Blvd., Cleveland	Cleveland Public Library	Library	
Rockport Branch CPL	4421 West 140th St., Cleveland	Cleveland Public Library	Library	
South Branch CPL	2704 Clark Ave., Cleveland	Cleveland Public Library	Library	
South Brooklyn	4303 Pearl Rd., Cleveland	Cleveland Public Library	Library	
Southeast Branch CCPL	70 Columbus Rd., Bedford	Cuyahoga County Public Library	Library	
Sterling Branch CPL	2200 East 30th St., Cleveland	Cleveland Public Library	Library	
Thurgood Marshall Recreation Center	8611 Hough Ave., Cleveland	Cleve Div of Recreation	Rec center	
Union Branch CPL	3463 East 93rd St., Cleveland	Cleveland Public Library	Library	
Walz Branch CPL	7910 Detroit Ave., Cleveland	Cleveland Public Library	Library	
Warrensville Heights Branch CCPL	4415 Northfield Rd., Warrensville Heights	Cuyahoga County Public Library	Library	
West Park Branch CPL	3805 West 157th St., Cleveland	Cleveland Public Library	Library	
Woodland Branch CPL	5806 Woodland Ave., Cleveland	Cleveland Public Library	Library	
Zelma George Recreation Cen	3155 MLK Jr Blvd., Cleveland	Cleve Div of Recreation	Rec center	

Map 2

Public and nonprofit locations with public Wi-Fi access

Red areas are Census tracts where fewer than 40% of households had fixed Internet at 3 mbps down or faster in December 2014, according to FCC Form 477 tract data.



IV. Training and Home Adoption Programs

Table 3 identifies fifty-four locations where residents of Cleveland and the county's other high-need communities can receive free, or almost free, basic training in the use of a computer and Internet connection. Forty-one of those locations provide additional, specific training in the use of Microsoft Office applications.

Table 3 also identifies a handful of sites that currently provide regular, advertised assistance to residents who want to get a cheap refurbished computer and/or sign up for one of the discounted commercial home Internet services mentioned in Chapter 2. Other digital inclusion programs have engaged in this “adoption assistance” activity in the past when resources to support it were available through the Connect Your Community Project¹ or some other source. RET3,² the area’s largest nonprofit refurbisher, continues to offer very low-cost refurbished PCs for this purpose.

Map 2 shows the distribution of these training and adoption assistance programs in relationship to the county's worst-connected Census tracts, i.e., those that had fewer than 40% of their households connected to fixed Internet service at 3 Mbps down or faster in December 2014.

Table 3: *Public basic computer skills training and home broadband adoption assistance*

NAME	ADDRESS	AFFILIATION	Digital literacy training		Home adoption assistance	
			Basic	Office	Hardware	Internet
			54	41	7	5
Addison Branch CPL	6901 Superior Avenue, Cleveland	Cleveland Public Library	X	X		
Arbor Park Village Learning Center	3750 Fleming, Cleveland	Independent	X			
ASC3 CYC Center	3730 Pearl Rd, Cleveland	ASC3	X	X	X	X
Ashbury Senior Computer Community Center	11011 Ashbury Avenue, Cleveland	ASC3	X	X	X	X
Brooklyn Branch CPL	3706 Pearl Rd., Cleveland	Cleveland Public Library	X	X		
Carnegie West Branch CPL	1900 Fulton Rd., Cleveland	Cleveland Public Library	X	X		
Cedar Ext High Rise	2320 East 30th, Cleveland	CMHA (for tenants)	X		X	X
Collinwood Branch CPL	856 East 152nd Street, Cleveland	Cleveland Public Library	X	X		
East 131st Street Branch CPL	3830 East 131st Street, Cleveland	Cleveland Public Library	X	X		
East Cleveland Public Library	14101 Euclid Avenue, East Cleveland	East Cleveland Public Library	X			
Eastman Branch CPL	11602 Lorain Avenue, Cleveland	Cleveland Public Library	X	X		
Fairfax Connection (PNC Bank)	8220 Carnegie Ave, Cleveland	Independent	X			

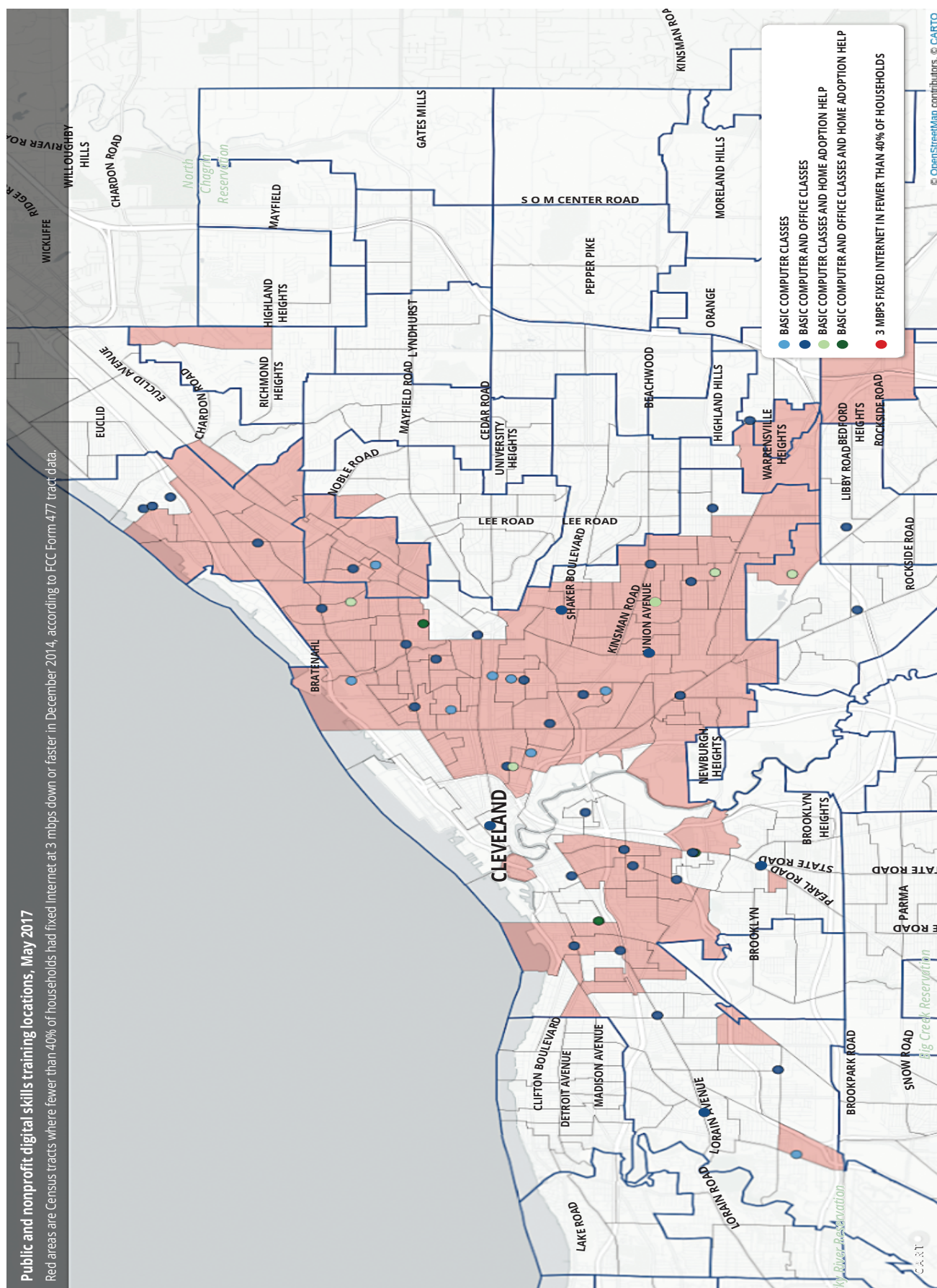
¹ The Connect Your Community Project was a large-scale broadband adoption program operated by OneCommunity and community partners, funded primarily by the federal government, between 2010 and 2013.

² <http://ret3.org/>

NAME	ADDRESS	AFFILIATION	Digital literacy training		Home adoption assistance	
			Basic	Office	Hardware	Internet
Fairfax Intergenerational (Renaissance of Fairfax Park)	8113 Central Ave, Cleveland	CMHA (for tenants)	X			
Fairfax Neighborhood Technology Center	8111 Quincy Ave, Cleveland	Independent	X	X		
Fatima Family Center Community Computer Lab	6600 Lexington, Cleveland	Catholic Charities	X			
Fleet Branch CPL	7224 Broadway Avenue, Cleveland	Cleveland Public Library	X	X		
Fulton Branch CPL	3545 Fulton Road, Cleveland	Cleveland Public Library	X	X		
Garden Valley Branch CPL	7201 Kinsman Road, Cleveland	Cleveland Public Library	X	X		
Garfield Neights Branch CCPL	5409 Turney Road, Garfield Heights	Cuyahoga County Public Library	X	X		
Glenville Branch CPL	11900 St. Clair Avenue, Cleveland	Cleveland Public Library	X	X		
Greater Friendship Baptist Church	12305 Arlington Avenue, Cleveland	Independent	X		X	
Harvard Square Center	13510 Harvard Avenue, Cleveland	Independent	X		X	
Harvard-Lee Branch CPL	16918 Harvard Avenue, Cleveland	Cleveland Public Library	X	X		
Hough Branch CPL	1566 Crawford Road, Cleveland	Cleveland Public Library	X	X		
Jefferson Branch CPL	850 Jefferson Avenue, Cleveland	Cleveland Public Library	X	X		
Langston Hughes Branch CPL	10200 Superior Avenue, Cleveland	Cleveland Public Library	X	X		
Lin Omni Computer Center (DSCDO)	3167 Fulton Rd., Cleveland	Independent	X	X		X
Lorain Branch CPL	8216 Lorain Avenue, Cleveland	Cleveland Public Library	X	X		
Main Library – Tech Central	325-525 Superior Ave., Cleveland	Cleveland Public Library	X	X		
Maple Heights Branch CCPL	5225 Library Ln, Maple Heights	Cuyahoga County Public Library	X	X		
Martin L. King, Jr. Branch CPL	1962 Stokes Boulevard, Cleveland	Cleveland Public Library	X	X		
Memorial-Nottingham Branch CPL	17109 Lake Shore Boulevard, Cleveland	Cleveland Public Library	X	X		
Mt. Pleasant Branch CPL	14000 Kinsman Road, Cleveland	Cleveland Public Library	X	X		

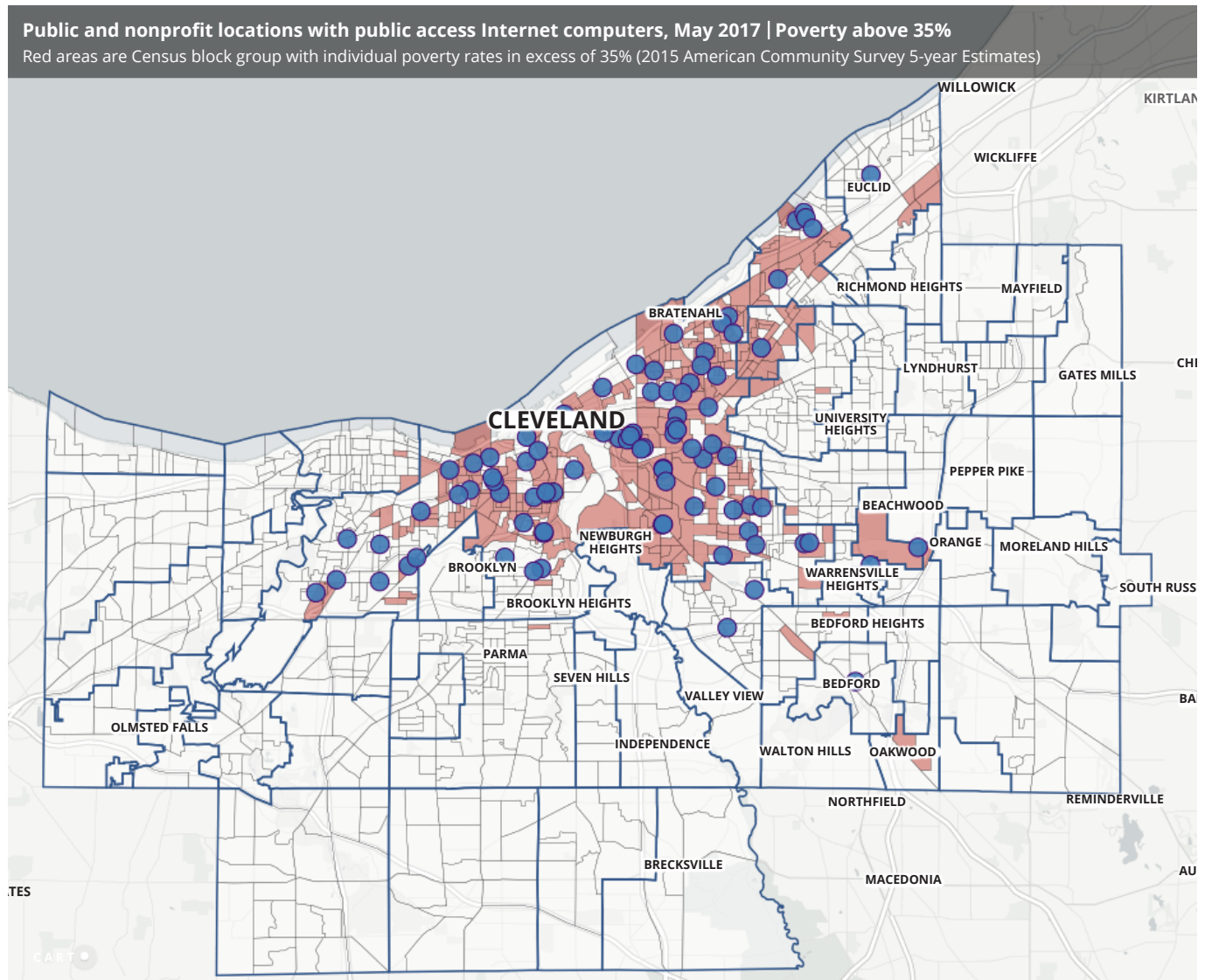
NAME	ADDRESS	AFFILIATION	Digital literacy training		Home adoption assistance	
			Basic	Office	Hardware	Internet
Ohio Library for the Blind & Physically Disabled	17121 Lake Shore Blvd, Cleveland	Cleveland Public Library	X	X		
Rainbow Terrace Learning Center (Vesta)	7310 Carson, Cleveland	Independent	X			
Rice Branch CPL	11535 Shaker Boulevard, Cleveland	Cleveland Public Library	X	X		
Riverside Park (Bellaire Puritas operated)	4609 Rocky River Dr, Cleveland	CMHA (for tenants)	X			
Rockport Branch CPL	4421 West 140th Street, Cleveland	Cleveland Public Library	X	X		
Salvation Army East Cleveland	1507 Doan Ave., East Cleveland	ASC3	X	X		
Scranton Rd. Ministries C.D.C.	3095 Scranton Rd., Cleveland	Independent	X	X		
South Branch CPL	2704 Clark Ave., Cleveland	Cleveland Public Library	X	X		
South Brooklyn	4303 Pearl Road, Cleveland	Cleveland Public Library	X	X		
Southeast Branch CCPL	70 Columbus Road, Bedford	Cuyahoga County Public Library	X	X		
St Colman Parish Computer Center	2027 West 65th Street, Cleveland	Independent	X	X		X
St. Philip Neri Family Center	799 East 82nd Street, Cleveland	Catholic Charities	X			
Sterling Branch CPL	2200 East 30th Street, Cleveland	Cleveland Public Library	X	X		
Temple Corps Computer Center	17625 Grovewood Ave, Cleveland	Salvation Army	X	X		
Thea Bowman Center	11901 Oakfield Ave, Cleveland	Independent	X		X	
Union Branch CPL	3463 East 93rd Street, Cleveland	Cleveland Public Library	X	X		
Walz Branch CPL	7910 Detroit Avenue, Cleveland	Cleveland Public Library	X	X		
Warrensville Heights Branch CCPL	4415 Northfield Road, Warrensville Heights	Cuyahoga County Public Library	X	X		
West Park Branch CPL	3805 West 157th St, Cleveland	Cleveland Public Library	X	X		
Woodland Branch CPL	5806 Woodland Avenue, Cleveland	Cleveland Public Library	X	X		
Word of Righteousness Family Life Center	13455 Dressler Ave., Garfield Heights	Independent	X		X	

Public and nonprofit digital skills training locations, May 2017



V. How the Distribution of Access and Training Sites Compares to Other Indicators of Need in the County

Map 4: Poverty. Map 4 shows the distribution of the ninety-two public computer access sites listed in Table 1 in relationship to Census block groups throughout the county where more than 35% of individuals were living in poverty in 2015, according to the 2015 American Community Survey 5-year Estimates.



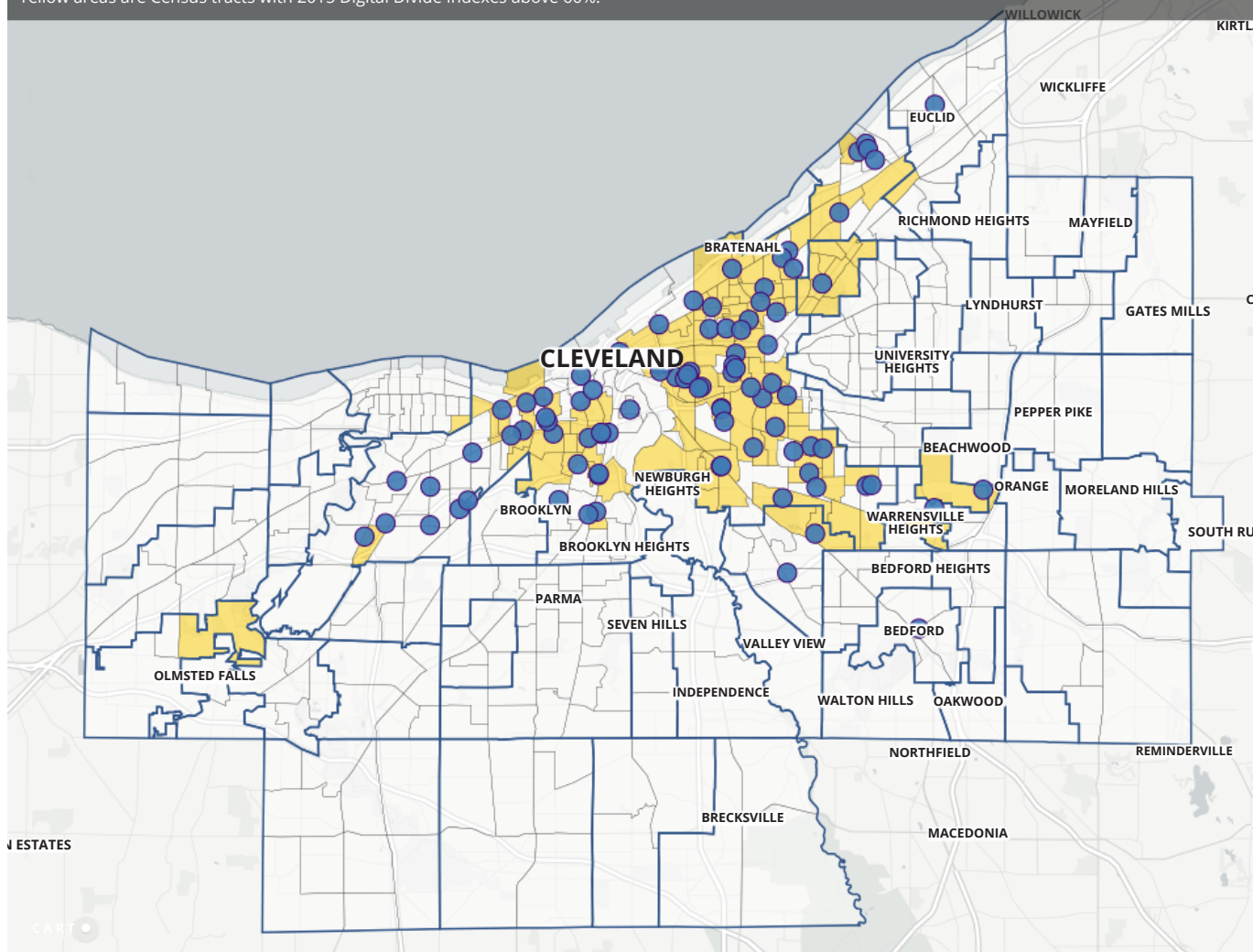
Map 5: The Digital Divide Index. Map 5 shows the distribution of the ninety-two public computer access sites listed in Table 1 in relationship to Census tracts throughout the county that received 2015 Digital Divide Index ratings of 60% or more.

Dr. Roberto Gallardo of the Intelligent Community Institute at Mississippi State University developed the multi-factor "Digital Divide Index" (DDI)³ to help policymakers identify counties and Census tracts with the greatest likelihood of significant disparities in household broadband access. The DDI ranges in value from 0 to 100, where 100 indicates the highest digital divide. It combines data on broadband adoption and deployment with social and demographic indicators of non-connection.

³ See <https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php> for more information about the Digital Divide Index.

Public and nonprofit locations with public access Internet computers, May 2017 | Digital Divide Index above 60%

Yellow areas are Census tracts with 2015 Digital Divide Indexes above 60%.



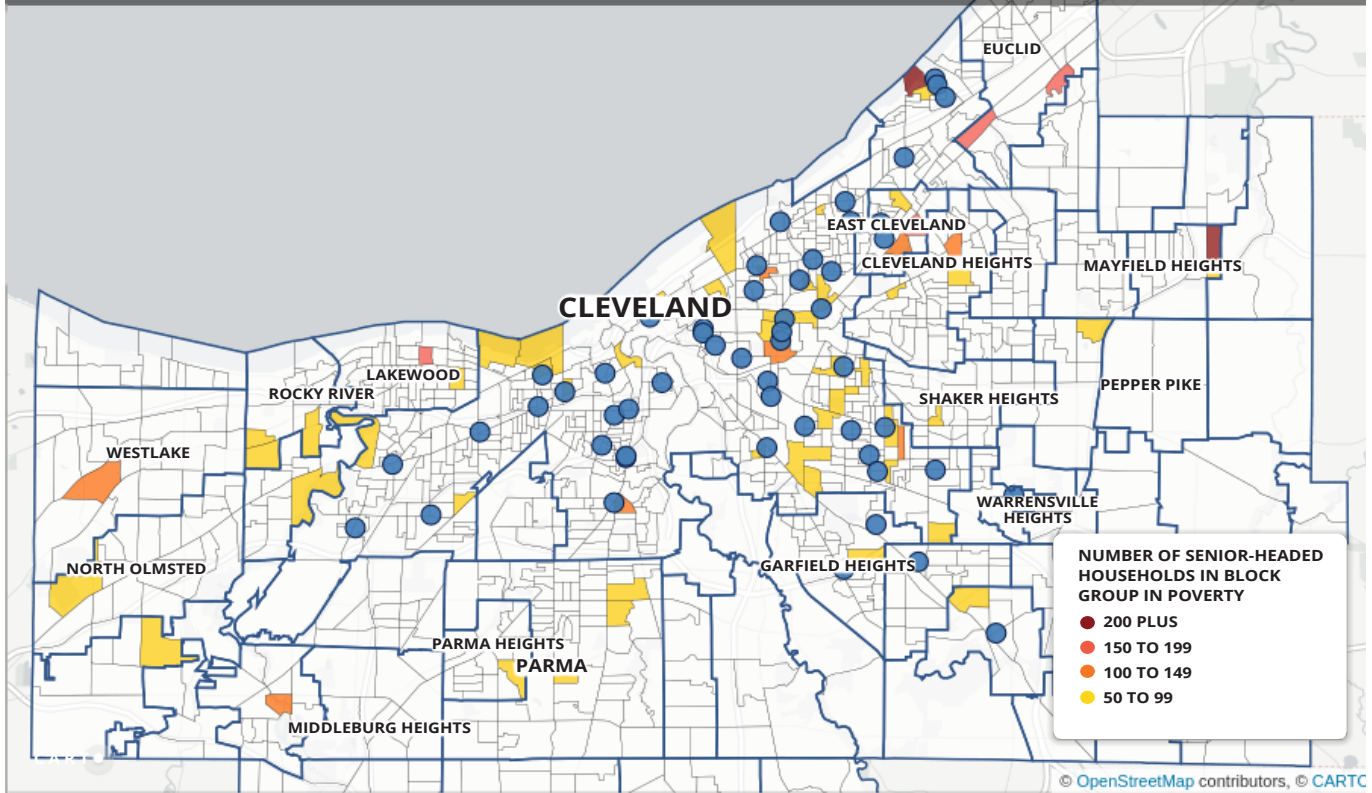
With minor exceptions, both these indicators of likely need for digital inclusion intervention point us toward the same neighborhoods and communities as the low-broadband-connection-rate tract mapping in Maps 1-3 – so the "coverage" provided by existing public computer access and training sites serving these communities is similar.

But when we look at another high-need constituency suggested by the data in Chapter 1 – low-income senior citizens – some differences emerge.

Map 6: Senior households in poverty. Map 6 shows the distribution of the fifty-three training and adoption-assistance programs listed in Table 3 in relationship to Census block groups throughout the county that had fifty or more households in poverty headed by persons over 65 in 2015.

Public and nonprofit computer training sites, May 2017 | Concentrations of poor senior households

Source: 2015 American Community Survey 5-year Estimates



The sixty-one block groups shown in color are only about 5% of all block groups in the county but include almost a third of the county's low-income senior households. The major concentrations (brown and red) correspond to senior apartment complexes, several of which are in identified DEHNAs, i.e., Cleveland, East Cleveland and Euclid. But the map of low-income seniors also extends into Lakewood, Parma, Westlake, Berea, North Olmstead, Cleveland Heights, and even Gates Mills – communities whose residents are generally well-connected to technology and not obvious priorities for a strategic digital inclusion strategy.

We have no evidence that low-income seniors in Westlake, Gates Mills, and Cleveland Heights are less digitally literate or connected than their younger, more prosperous neighbors, other than the nationally recognized associations of age and poverty with lack of broadband access and digital skills. Map 6 simply suggests that there may be a need for digital inclusion services for the county's low-income seniors that goes beyond the high-need communities we've identified.

VI. Discussion

1. Tables 1, 2, and 3 are best viewed as snapshots of the area's public and nonprofit digital inclusion offerings at the time this report is submitted. Our inventory of community computer access and training sites in the DEHNAs is as current and comprehensive as we could make it but should not be seen as exhaustive. New community initiatives in this field emerge frequently, while existing programs often "stop and start" due to fluctuating resources and personnel changes. For example, ASC3 recently began offering its basic skills classes in several additional sites in connection with Digital C's ReStart project, but we haven't added them to our inventory because their future depends on a short-term funding source. Additionally, we are aware of at least two other training locations planned to open by the end of the summer, one in public housing and the other in a church-sponsored family center. Capturing these ongoing changes requires a frequently updated resource (that is not in the scope of this project).

2. There appear to be plenty of places for residents of these communities who lack home computer and Internet access to sit down at a public-access workstation – more than ninety places, with a total of at least 1,600 public computers. These sites are fairly well distributed across Cleveland and other DEHNAs. More than 1,000 public-access workstations are located in public libraries or on Tri-C campuses where they are clearly "open to all;" are professionally maintained; have fast, reliable Internet connections; and have professional staff available to assist users.
3. There are also many opportunities for free basic computer training distributed broadly throughout the county's DEHNAs. While the library systems are a primary source of training, accounting for thirty-four of our fifty-four identified training sites, nonprofit community programs are also a major factor, especially in the poorest and worst-connected Cleveland neighborhoods.
4. East Cleveland is an important exception to this generally upbeat picture. The entire city is high-need by all indicators (low residential broadband penetration, high poverty, high Digital Divide Index numbers), suggesting that as many as 60% to 70% of its 8,000 households may lack home broadband. East Cleveland has just one public library site with no more than seventy workstations providing public Internet access and basic skills training, plus an ASC3 class for seniors at the Salvation Army on Doan Avenue. Most homes in East Cleveland are further than half a mile from the library, and many are more than a mile away; so the library's computers and classes have limited usefulness to households that own neither computers nor cars.

Less dramatic versions of East Cleveland's problem – concentration of resources in a centralized library facility that's fairly distant from the community's high-need neighborhoods – also seem to affect Euclid and Bedford Heights. The Euclid Public Library currently offers robust public access but no computer training classes; the closest training opportunities for the city's residents are in Collinwood. For residents of Euclid's lower-income neighborhoods along Euclid Avenue, the computers at the Library are two, three, or even four miles from home, across railroad tracks and Interstate 90. Bedford Heights residents have excellent public access, as well as training resources through the Cuyahoga County Public Library, but must travel to Warrensville Heights or the Southeast CCPL Branch in Bedford to use them.

5. Probably the most important finding of this inventory process has been this:

With the exceptions just noted, Cleveland and the handful of neighboring suburbs with significant digital inclusion needs are fortunate to have many public-access computer options and many free computer-training resources distributed fairly well throughout the neighborhoods of greatest need. What the community doesn't have is a significant number of home broadband adoption assistance programs.

Out of the fifty-four basic computer-training sites identified in Table 2, we could identify only seven that systematically offer free or affordable home computers to their trainees and only five that offer to help trainees get connected to the Internet at home – either through resold commercial services like Mobile Citizen, special building networks like the one provide by CMHA and Digital C at the Cedar Extension High Rise, or assistance with signing up for ISP discount programs like Access From AT&T.

There may, of course, be other training sites that help trainees with equipment and connectivity in less formal, ad hoc ways. But compared to training and public access programs, home broadband adoption assistance is currently offered by very few public and nonprofit organizations in greater Cleveland.

Chapter #4:

Pittsburgh/Allegheny County and Cleveland/
Cuyahoga County Comparison Report



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This chapter explores some of the reasons behind Cleveland's lower broadband adoption rates when compared to Pittsburgh. The authors interviewed thought leaders in Cleveland and Pittsburgh and researched financial and broadband adoption data.

Key Points

In 2015, Cleveland had almost 168,000 households with 62% served by broadband Internet of some kind. Pittsburgh had 132,000 households with 75% enjoying broadband connections.

Why was Cleveland's home connection rate so much lower? While many factors may have contributed to a higher broadband adoption rate in Pittsburgh over the past decade or more, four seem most likely to help explain this disparity:

1. First, Cleveland is simply poorer than Pittsburgh. Cleveland's poverty rate in 2015 was 34.7%, while Pittsburgh's was just 23%. Additionally, Pittsburgh's poverty is less concentrated—only 21% of the city's Census blocks had individual poverty rates of 35% or more in 2015, compared to 52% of blocks in Cleveland. Household poverty is strongly associated with non-connection.
2. Cleveland residents at all income levels are much less likely to have postsecondary educational experience than Pittsburgh residents. In 2015, 20% of Pittsburgh residents age 26 or older with incomes at or below 125% of poverty held four-year college degrees. In Cleveland it was 7%. Higher education is very strongly associated with Internet access and use.
3. Cleveland was in the depths of its foreclosure crisis during the years when initial home broadband adoption “took off” among lower-income households across the U.S. From 2005 through 2009, Cleveland experienced one of the highest foreclosure rates in the nation, with huge losses in home values and tens of thousands of families displaced. Pittsburgh did not experience this crisis. It is reasonable to hypothesize that going through foreclosure, or its imminent threat, made tens of thousands of poor and blue-collar Cleveland households less likely to sign up for DSL or cable modem service than their more secure counterparts in Pittsburgh.
4. In 2007, local governments in Ohio were stripped by the Ohio General Assembly of their cable-franchising authority and could no longer require deployment of TV systems, including the IP video systems being built by telcos AT&T and Verizon throughout their communities. The same did not happen to local governments in Pennsylvania. In 2008, the City of Pittsburgh was able to require Verizon to build its new FIOS network out to every neighborhood, while Cleveland had no such power to affect (or even monitor) AT&T's deployment of its fiber-enabled U-Verse VDSL network. The predictable consequence – AT&T's failure to extend its new network to the majority of Cleveland neighborhoods – left those neighborhoods with only Time Warner as a provider of 25 Mbps+ Internet and video. Pittsburgh has two companies competing for customers of high-speed service everywhere in the city.

Home broadband availability (including speed and cost)

Pittsburgh's principal home broadband providers are Comcast (Data Over Cable Service Interface Specification or [DOCSIS](#)¹ 3+ cable modem) and Verizon (FIOS [fiber-to-the-premises](#),² as well as asymmetric digital subscriber line or [ADSL](#)³).

Because Pittsburgh retained cable-franchising authority at the time Verizon began FIOS deployment in 2007-08, the City had the authority to require city-wide buildout. The result is that consumers in nearly all neighborhoods can choose

¹ <https://en.wikipedia.org/wiki/DOCSIS>

² http://www.ftthcouncil.eu/documents/Publications/FTTH_Definition_of_Terms-Revision_2015-Final.pdf

³ https://en.wikipedia.org/wiki/Asymmetric_digital_subscriber_line

between competing high-speed services (25 Mbps minimum from Comcast, 50 Mbps minimum from Verizon FIOS, both in the \$60 to \$70 per month range.)

Verizon ADSL remains a somewhat cheaper, slower option for households who are willing to retain landline phone service; speeds vary from 768 kbps to 15 /Mbps, depending on distance from a wire center, at a monthly cost between \$35 and \$45 (plus the phone).

Overall, the costs are similar to comparable services in Cleveland; Pittsburgh consumers' main advantage is probably the bargaining opportunity that comes from being able to switch between high-speed providers.

Digital Divide Index Scores

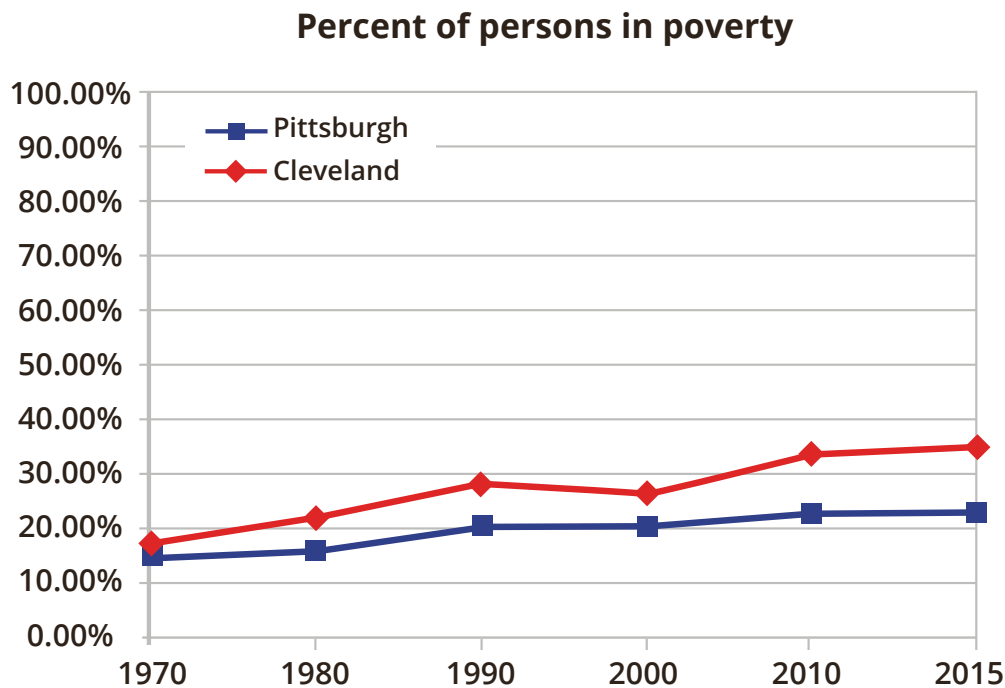
Dr. Roberto Gallardo of the Intelligent Community Institute at Mississippi State University developed a multi-factor "**Digital Divide Index**" (DDI)⁴ to help policymakers identify counties and Census tracts with the greatest likelihood of significant disparities in household broadband access. The DDI ranges in value from 0 to 100, where 100 indicates the highest digital divide. It combines data on broadband adoption and deployment with social and demographic indicators of non-connection.

For 2015 Dr. Gallardo has calculated a DDI for Allegheny County (Pittsburgh) of 28.9, compared to a DDI of 40.75 for Cuyahoga County (Cleveland).

Poverty & Foreclosure

- Cleveland has a higher overall poverty rate than Pittsburgh and has for several decades. The 2015 individual poverty rates were 34.7% in Cleveland vs. 23.0% in Pittsburgh.⁵

Figure 1



Source: U.S. Census

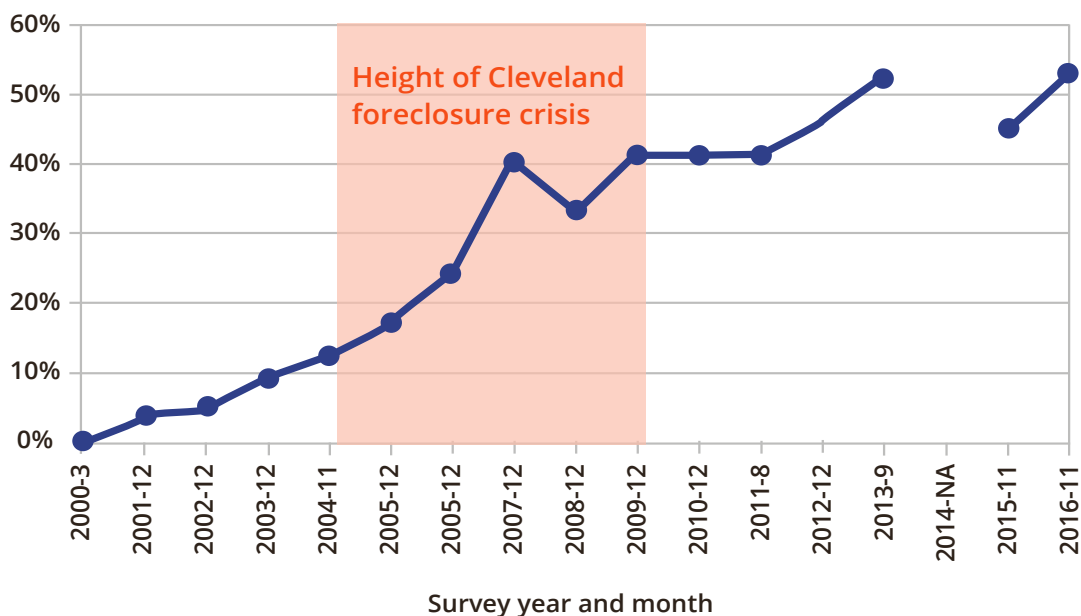
⁴ See <https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php>.

⁵ American Community Survey 2015, 5-year Estimates

- Pittsburgh has fewer neighborhoods with concentrated poverty. 52% of all Census block groups in Cleveland have poverty rates of 35% or more. The percentage of Pittsburgh block groups with this level of poverty is only 21%.
- Cleveland's poverty concentration was aggravated by its catastrophic foreclosure crisis. Five to six thousand mortgage foreclosures were filed against Cleveland homes each year from 2005 through 2009 – the very years when broadband adoption by lower-income households nationally was most rapid, according to Pew Research. Pittsburgh's foreclosure rate was only about a third of Cleveland's.⁶ (A Cleveland Federal Reserve study credited Pittsburgh's good fortune to Pennsylvania's superior consumer protection laws.⁷) It is reasonable to hypothesize that foreclosure, or the imminent threat of foreclosure, discouraged tens of thousands of poor and blue-collar Cleveland households from taking on a new monthly bill for DSL or cable modem service, unlike their more secure counterparts in Pittsburgh.

Figure 2

% of U.S. adults with incomes below \$30,000 who were home broadband users
Pew Research Center, 2017 (last survey date per year)



<http://www.pewinternet.org/chart/home-broadband-by-income/>

Educational

Pittsburgh has more institutions of higher education and enjoys a higher level of education attainment per capita than Cleveland.

⁶ "Height of Cleveland Foreclosure Crisis" (years 2005 through 2009) based on Cuyahoga County foreclosure filing totals for the city of Cleveland, available at <http://neocando.case.edu/cando/housingReport/interface.jsp>.

⁷ <https://clevelandfed.org/en/newsroom-and-events/publications/discontinued-publications/cr-report/crr-20090414-foreclosure-differences-across-state-lines.aspx> and <https://clevelandfed.org/en/newsroom-and-events/publications/a-look-behind-the-numbers/albtn-20081107-foreclosure-patterns-in-allegheeny-county-pa.aspx>

Of particular note in this regard: According to the 2015 American Community Survey,⁸ persons age 26 or older with incomes at or below 125% of poverty in Pittsburgh are significantly more likely to have four-year college degrees (20% vs. 7%) than those in Cleveland and significantly less likely to lack high school diplomas (17% vs. 35%).

Occupational

Pittsburgh interviewees repeatedly made the point that the city had made the transition from dependency on steel manufacturing to high tech quickly. A comparison between Cleveland and Pittsburgh's broad occupation and industry numbers in the 2015 American Community Survey (ACS) support the idea that Pittsburgh has transitioned more rapidly away from blue collar jobs, in the direction of management and professional roles. Here are key comparisons:

Table 1. DP03: SELECTED ECONOMIC CHARACTERISTICS 2015 American Community Survey 1-Year Estimates

Subject	CLEVELAND Percent	PITTSBURGH Percent	Affordable devices Through partner
OCCUPATION			
Management, business, science, and arts occupations	27.2%	47.3%	20.1%
Service occupations	26.1%	19.6%	-6.5%
Production, transportation, and material moving occupations	17.9%	8.4%	-9.5%
INDUSTRY			
Educational services, and health care and social assistance	24.4%	31.5%	7.1%
Professional, scientific, and management, and administrative and waste management services	8.3%	13.5%	5.2%
Manufacturing	13.8%	6.4%	-7.4%

We do not know whether Clevelanders' greater continuing reliance on manufacturing and service jobs, and Pittsburgh's advantage in white-collar occupations and sectors, necessarily imply higher rates of home broadband adoption in Pittsburgh. The difference in Pittsburgh and Cleveland's broadband adoption rates seems to be tied to the two cities' dramatically different levels of educational attainment, especially four-year college graduation as discussed earlier, but the connection to blue-collar vs. white-collar jobs is less clear.

Programmatic

There has been a series of ambitious initiatives to promote computer and broadband access, digital literacy, and home broadband adoption for low-income residents in Cleveland over the last twenty years, including several million dollars in support for community technology centers disbursed by the **Time Warner-Cleveland City Council Neighborhood Technology Council**⁹ and a U.S. Department of Commerce NTIA BTOP Sustainable Broadband Adoption effort that connected upwards of 5,000 households in Cleveland and East Cleveland between 2010 and 2012.¹⁰ The only comparable effort in Pittsburgh prior to 2015, as far as our research has discovered, is a local effort by the Comcast Internet Essentials program that has provided training and broadband connections for 2,900 National School Lunch Program households.¹¹ This is not meant to discount the efforts of the local public library and others but simply to report that there's no apparent history of programmatic efforts to promote digital inclusion in Pittsburgh that exceeded those in Cleveland and thus might help account for the disparities in adoption shown by the 2015 Census and FCC Form 477 data.

⁸ American Community Survey data is available at <https://www.census.gov/programs-surveys/acs/>.

⁹ <https://www.clevelandfoundation.org/grants/committee-advised-funds/time-warner-cleveland-city-council-neighborhood-technology-fund/>

¹⁰ <http://www2.ntia.doc.gov/grantees/OneCommunity>

¹¹ Interview with Comcast Internet Essentials staff conducted May 3, 2017.

There are a variety of **current** plans and efforts to promote digital inclusion in Pittsburgh and Allegheny County, which we believe may offer useful examples to Cleveland for the future, though they don't account for differences in the two cities' adoption patterns up to now. We review these “future programmatic advantages” in a separate section below (“Pittsburgh's potential comparative advantages going forward”).

Policy and Regulatory

On June 25, 2007, Ohio's Governor Ted Strickland signed Senate Bill 117, which created a new state-issued video-authorization process to replace local cable television franchising. Prior to SB 117 local government, franchises could require that all customers within the local government boundaries be served. Once SB 117 became law, local governments could no longer require ISP's to “build out” to the entire community. ISPs could pick their own service areas. Additionally, Ohio communities, including Cleveland, could no longer negotiate provisions to respond to local community needs as allowed by federal law.

[A report by NDIA and Connect Your Community](#)¹² recently documented the degree to which AT&T chose to bypass large parts of Cleveland, including most low-income neighborhoods, when it built its new fiber-enhanced U-Verse VDSL network to provide IP video and high-speed Internet services between 2008 and 2013. Senate Bill 117 left the City of Cleveland without authority to affect this deployment or even monitor it.

Pittsburgh retains local cable-franchising authority, which allows it to require full buildout of the community and negotiate provisions that serve local community needs. Pittsburgh invoked that authority in 2008 when granting a franchise to Verizon to deploy and operate its FIOS network in the city, with the result that almost all of the city now has two competing high-speed broadband Internet and cable video providers – Comcast and Verizon.

In a variation on its franchising role, the City of Pittsburgh led a well-publicized effort to galvanize local stakeholders around the Google Fiber RFP response that raised awareness of broadband issues.

Pittsburgh's potential comparative advantages going forward

1) City government leadership

- Addressing the digital divide and other inclusion issues is a stated priority in Pittsburgh, which is clear in the city's [“Roadmap for Inclusive Innovation.”](#)¹³
- Pittsburgh has dedicated City staff and interest though future funding is not assured.
- There are public initiatives working on building out **community mesh networks**¹⁴ in Pittsburgh.

2) The Library

- The Library system is working to include an explicit digital inclusion statement in their next five-year plan of service, which will be finalized at the end of the calendar year.
- The library is working with adult education programs to lend hotspots and equipment and is looking to expand the program.
- The library is working with the public school system to build a coordinated overlap between school and library digital literacy and education programming.

¹² <https://digitalinclusion.org/blog/2017/03/10/atts-digital-redlining-of-cleveland/>

¹³ <http://pittsburghpa.gov/innovation-performance/innovationroadmap/index.html>

¹⁴ <https://www.metamesh.org/>

3) Higher Ed/Foundation/Nonprofit

- There are programs and initiatives being done in partnership with Carnegie Mellon,¹⁵ from [Digital Equity Capstone Projects](#)¹⁶ to [public educational programs focused on Big Data](#).¹⁷
- Coro Pittsburgh hosts [Public Affairs fellows](#)¹⁸ who may be a good fit for a digital corps or a similar change agent in the future. They also host seed people through Americorps in [community programs](#).¹⁹
- Community funds, including the [Sprout Fund](#),²⁰ have been working in this space for some time (recently with their own "[digital corps](#)"²¹ that is now housed under a spinoff organization, ReMake Learning).
- [Neighborhood Learning Alliance's](#)²² mission is to improve the education and opportunities of African Americans and lower-income families. Core components are digital literacy and technology.
- [Computer Reach](#)²³ offers refurbished computers, low-cost Internet, support, and training, as well as computer recycling.

4) ISP Initiatives/Programs

- Comcast (Pittsburgh) has embraced a multi-faceted strategy to market its low-cost broadband program Internet Essentials (IE) and continues to dedicate staff to the effort. The effort includes direct mail to targeted groups in partnership with school districts, housing authorities, and nonprofits.
- Comcast Internet Essentials subscribers since inception of the program:
 - Pittsburgh – 2,900
 - Allegheny County – 4,800.²⁴

Summary: Pittsburgh's programmatic advantages going forward include:

- City-sponsored initiatives;
- Multiple institutions of higher education, including Carnegie Mellon, which is active in digital inclusion activities;
- Libraries and community organizations active in digital literacy, public access, and home computer distribution;
- ISP-sponsored, low-cost broadband service for families of K-12 students and public-housing residents.

¹⁵ <https://www.nytimes.com/2017/07/22/style/pittsburgh-tech-makeover.html>

¹⁶ <http://digitalequalitypit.wixsite.com/home>

¹⁷ <http://www.fluencyproject.org/>

¹⁸ <http://www.coropittsburgh.org/programs/coro-fellows/>

¹⁹ <http://www.coropittsburgh.org/programs/public-allies-pittsburgh/>

²⁰ <http://www.sproutfund.org/>

²¹ <http://remakelearning.org/project/digital-corps/>

²² <http://neighborhoodlearning.org/>

²³ <http://www.computerreach.org/>

²⁴ Interview with Comcast Internet Essentials staff conducted May 3, 2017.

Lessons for Cleveland

The historic gap between Pittsburgh's home broadband adoption rate and Cleveland's is probably rooted in factors that are beyond the control of digital inclusion advocates in either city. Higher poverty, lower educational attainment, Cleveland's foreclosure catastrophe, and even the two states' differences in local cable-franchising authority are all "things as they are" to be overcome, rather than things we can choose to do differently. With respect to the history of community digital inclusion efforts, Pittsburgh has at least as much to learn from Cleveland as Cleveland can learn from Pittsburgh.

In the "going forward" framework, however, we see at least one big Pittsburgh advantage that's currently missing in Cleveland: A concerted, community-wide effort, led by the City, to bring partners together to tackle the digital divide.

The social and external cost of digital exclusion is great. Without access, full participation in nearly every aspect of American society – from economic success and educational achievement, to positive health outcomes and civic engagement – is compromised.²⁵

Cleveland's full potential in the digital age will not be realized until the City assumes a leadership role ensuring ubiquitous, state-of-the-art broadband throughout the community,²⁶ providing a pathway for everyone to be connected and have a device and the skills to engage in the digital world. Digital equity as a social change issue requires a long-term commitment with sustainable funding and institutionalized as a core local government function.

²⁵ <http://www.brookings.edu/research/reports2/2015/12/07-broadband-adoption-rates-metropolitan-areas-tomer-kane>

²⁶ <https://www.portlandoregon.gov/revenue/article/643890>

Chapter #5:

National Highlights – Community-Wide
Digital Inclusion Coalitions



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In the context of Chapter 6, community-wide coalitions are defined as a group of people, representing organizations, who come together with a common purpose of providing overall policy guidance and coordination for digital inclusion initiatives with a goal of achieving digital equity. In some communities, staff who organize the coalition meetings are part of local government. Examples of this model are the cities of Portland and Austin, which have digital inclusion staff funded by local government. In other communities, the coalitions may be part of a stand-alone organization. Smart Chicago is an example of this type of coalition where staff perform digital inclusion duties housed in a nonprofit organization.

Access to the Internet has become essential for full participation in society, yet most communities are not integrating digital inclusion – broadband access, devices and digital literacy training – into local strategies. The challenge is great, but there is hope. Some communities are recognizing the critical nature of digital equity and have catalyzed resources to address the issue. There are common themes that emerged from the interviews with representatives of these three community-wide coalitions.

We interviewed representatives of the following communities: Austin, Texas; Chicago, Illinois; and Portland/Multnomah County, Oregon. These community-wide coalitions were selected for their diverse approaches to a shared goal: addressing the digital equity through a community-wide approach.

Key Points

1. First, the very act of convening stakeholders interested in digital inclusion serves to foster partnerships, ownership, commitment, and collaborations. Regular in-person meetings help build and sustain the relationships necessary to do the work. The Broadband Technology Opportunity Program (BTOP) made a difference in each of the coalition communities by galvanizing organizations and institutions to coalesce around digital equity.
2. A community-wide approach with many committed partners has the advantage of being strategic and efficient. Because funding is a continual challenge, the ability to be strategic in coordinating resources becomes very important. A community-wide coalition can identify and address program and funding gaps in a strategic, efficient manner.
3. Statistics are important, but stories are compelling. All the coalitions have or are in the process of developing metrics to gauge success, yet stories about how digital literacy changed individual people's lives are memorable, particularly for elected officials and potential funders. Stories also raise awareness and help increase understanding of what digital inclusion is all about.
4. Partners need to be willing to make an investment in the coalition. In each of the community-wide coalitions, a city, foundation, or combination of partners funds at least one dedicated staff person and/or digital inclusion initiatives, while others commit staff to participate in the effort. Having dedicated staff to develop meeting agendas, provide meeting space, facilitate meetings, and provide overall support is critical to success.
5. Know your own environment – political, cultural and socio-economic. What works in Chicago may not work in Portland. Portland and Austin have peer-to-peer coalitions representing all sectors of the community – K-12 and higher education, nonprofit, local government, libraries, Internet service providers (ISPs), technology businesses, and others. Smart Chicago Collaborative is a funder-based approach with the MacArthur Foundation, City of Chicago, and the Chicago Community Trust serving as the decision-making body while facilitating initiatives like Connect Chicago that include all sectors of the community. Understanding how things get done in a community can make the difference between success and failure.

Austin – Digital Empowerment Community of Austin (DECA)

Digital Divide Index (DDI)¹ : Travis County 13.32

Mission

The [Digital Empowerment Community of Austin](#) (DECA)² is a network of nonprofits, educational institutions, and other stakeholders working to improve the community's ability to participate in digital society. DECA developed a list of [short-, medium-, and long-term initiatives](#)³ that could have the highest impact on digital inclusion in 2015.

Organizational Structure

DECA is facilitated by the City of Austin. City staff convene the community-wide meetings, which occur bi-monthly.

There are four working groups that meet bi-weekly and are action-oriented, tackling issues identified at the 2015 community-wide meetings. The working groups are:

- **TechHire** with a goal to equip more people, including those in low-income communities, with the skills they need to land jobs in the tech industry. This is the only working group that isn't in the strategic plan since it was established after the Plan was adopted.
- **Train the Trainer** with a goal to secure professional development opportunities for digital literacy trainers and share what works.
- **Standard Client Survey** with a goal to develop common standards across all local digital literacy organizations. Currently all organizations have their own questions to gauge outcomes. This working group will develop standardized questions that can be analyzed at the city-wide level.
- **Curriculum Standards** with a goal to develop items that should be covered in whatever curriculum an organization decides to use.

Funding

The City of Austin dedicates \$620,000 per year to digital inclusion work. Of that, \$200,000 is available via competitive proposal process through the [Grant for Technology Opportunities Program](#).⁴ A \$197,000 contract plus partial time of a City of Austin information technology staff (contract requires annual renewal) is available to support a public-access and digital literacy skills program. The City of Austin allocates 4.5 staff plus an AmeriCorps VISTA for internal digital inclusion work.

Two Digital Inclusion Fellows with Austin Free-Net, supported by the Nonprofit Technology Network (NTEN), assisted DECA. One helped plan and facilitate meetings, as well manage communication with community members through outreach, recruitment and updates during the fellowship's first year, while during its second year, the next Fellow developed a document showing digital literacy benchmark skills that members used to develop and evaluate curriculum.

¹ The DDI is a county-level index score (from 0 to 100) measuring the digital divide. The higher the number, the larger the digital divide.

See <https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php>

² <http://www.austintexas.gov/page/digital-empowerment-community-austin>

³ <http://austintexas.gov/digital-inclusion-strategy-2014/taking-action-initiatives>

⁴ <https://www.austintexas.gov/departments/grant-technology-opportunities>

Participants: Libraries, education, nonprofits, local government, ISPs, affordable housing, homeless shelters, and technology community.

Strategies and Lessons Learned

- Use Agile Methodology⁵ to co-create the process design to make sure community organizations can participate.
- Continue to evolve to better understand and meet the changing needs of the community.
- Conduct regular check-ins with community members to listen to what their needs are.
- Staff capacity and resources are needed to support the initiatives.
- A [Digital Inclusion Strategic Plan](#),⁶ developed by city staff and approved by City Council on November 20, 2014, provides a common framework to engage disparate organizations.

Change Because of the Coalition

The Digital Inclusion Strategic Plan and DECA provided a place and forum to better understand the needs and generate solutions to the digital equity issues facing Austin. Because of the Digital Inclusion Strategic Plan and DECA, Mozilla selected Austin for its [Digital Hive](#)⁷ initiative, which connects and builds local leaders in education and workforce development who will help learners understand and leverage opportunities made possible by gigabit speed networks. DECA capitalizes on Austin's tech environment. One example is the creation of non-traditional immersive learning experiences using virtual reality. This collaboration, e.g., immersive learning experiences, happened because of DECA's role in bringing together community members.

Local Broadband Adoption Data

The [Austin Digital Assessment](#)⁸ was a local residential technology survey conducted in 2014 to evaluate and assess residents' access to technology resources and literacy and training programs and to identify unmet needs and barriers.

⁵ Agile Methodology—relating to or denoting a method of project management, used especially for software development, which is characterized by the division of tasks into short phases of work and frequent reassessment and adaptation of plans. Agile methods replace high-level design with frequent redesign.

⁶ <http://austintexas.gov/page/digital-inclusion-strategic-plan>

⁷ <https://blog.mozilla.org/gigabit/advancing-the-promise-of-gigabit-internet-for-learning-in-austin/>

⁸ <http://austintexas.gov/department/austin-digital-assessment>

Chicago – Connect Chicago, a Project of Smart Chicago

Digital Divide Index (DDI): Cook County 33.40

Mission

The initiatives in Chicago's Tech Plan⁹ chart a course to realize Chicago's potential as a city where technology fuels opportunity, inclusion, engagement, and innovation for all.

[Smart Chicago](http://www.smartchicagocollaborative.org/)¹⁰ is a civic organization devoted to improving lives in Chicago through technology. Smart Chicago works on increasing access to the Internet, improving skills for using the Internet, and developing meaningful products from data that measurably contribute to the quality of life of residents in Chicago and beyond. Smart Chicago initiates and oversees many projects related to its core mission.

[Connect Chicago](http://connectchicago.org/)¹¹ is a project of Smart Chicago that focuses on digital skills and connectivity. Connect Chicago projects include: computer tutors called CyberNavigators in Chicago Public Library Branches who help provide access to information resources for adults and youth; digital skills training at neighborhood-based Financial Opportunity Centers; Community Technology Forums, in partnership with DePaul University, where community members discuss and learn about hyperlocal digital equity ideas, assets, and needs; and Connect Chicago Meetup Groups.

Organizational Structure and Governance

Connect Chicago is housed at and implemented by the Smart Chicago Collaborative. The Connect Chicago Steering Committee informs the strategy of Connect Chicago and is comprised of representatives from government agencies under the direction of Mayor Rahm Emanuel, institutional funders, and program partner organizations:

- City of Chicago Department of Innovation & Technology
- Chicago Public Library
- LISC Chicago
- Smart Chicago Collaborative
- World Business Chicago
- John D. and Catherine T. MacArthur Foundation
- Chicago Public Schools

Smart Chicago's governance is the responsibility of an Operating Committee and an Advisory Committee, each of which includes representatives of the MacArthur Foundation, the Chicago Community Trust, and the City of Chicago.

⁹ <http://techplan.cityofchicago.org/>, [http://techplan.cityofchicago.org/18-month update and](http://techplan.cityofchicago.org/18-month-update-and) <http://techplan.cityofchicago.org/2014-progress/letters-from-leadership/>

¹⁰ <http://www.smartchicagocollaborative.org/>

¹¹ <http://connectchicago.org/>

Funding

As a project of Smart Chicago, Connect Chicago does not itself raise or manage funds. All funds pledged to Connect Chicago are deposited in the Connect Chicago Trust Fund of The Chicago Community Foundation. The financial relationships between donors and Connect Chicago itself are maintained through the Community Foundation. All Connect Chicago spending flows directly from the workplan developed by the Steering Committee. Smart Chicago staff has primary responsibility for managing funds and reporting to funders, making grants/contracts to other principal partners, managing the evaluation, and leading on the execution of core components of the work plan.

The annual budget of Smart Chicago is about \$1.3 million. Smart Chicago is funded by the MacArthur Foundation, Chicago Community Trust, Hive Chicago, the John S. and James L. Knight Foundation, Cook County, Get IN Chicago, and the Sprague Institute. Smart Chicago is hosted at the Chicago Community Trust, and the Trust serves as the fiscal agent for Smart Chicago's grantmaking.

Strategies and Lessons Learned of Smart Chicago

- Evolve and adapt with the community's culture.
- Pursue a strategic approach in the tech philanthropic space. Prior to Smart Chicago it was difficult for philanthropists to make investments within a very dispersed community and one-off funding requests.
- Incubate new leadership – empower people to do something themselves, to build digital inclusion capacity within their organizations.
- Smart Chicago identifies programs that work and re-mixes the program to fit its community's needs.
- It's easier to be holistic with a coalition. Smart Chicago, as a coalition, supports a holistic approach to digital inclusion by identifying roles and responsibilities of participants.
- The more partners/collaborators the more sustainable the effort.
- The convening role is important as new relationships and partnerships are formed strengthening existing programs.
- BTOP helped catalyze the digital inclusion community.

Portland/Multnomah County – Digital Inclusion Network (DIN)

Digital Divide Index (DDI): Multnomah County 23.93

Mission

The [Digital Inclusion Network](#)¹² bridges the digital divide for excluded members of the community with affordable access, training, and tools. The [Digital Equity Action Plan](#) (DEAP)¹³ encapsulates the work of the Digital Inclusion Network (DIN) since the fall of 2014. DIN is made up of the City, public library, County, nonprofit community-based organizations, K-12 schools, higher education, community media, and ISPs. The plan outlines a series of operational

¹² <https://www.portlandoregon.gov/revenue/73860>

¹³ <https://www.portlandoregon.gov/revenue/article/643895>

and policy proposals for public and private agencies, along with nonprofits, to advance the cause of digital equity in Portland/Multnomah County.

Organizational Structure

Structured as a collective model, the City, Multnomah County Library (MCL), and the County are the backbone organizations providing logistical and staff support to DIN. They do not have a formal charter because the work is organized around the DEAP with monthly check-ins on roles and responsibilities through the DIN.

Governance: City, Library, and County provide staffing and logistical support.

Funding

The City provides one dedicated staff person for digital inclusion work. There are currently two Digital Inclusion Fellows supported by the Nonprofit Technology Network (NTEN) – one at the Library and one at Free Geek. Free Geek is seeking funding to make their fellowship a permanent position. Multnomah County Library has designated a digital inclusion librarian position to carry on the work.

Process

The DIN oversees implementation of the DEAP through monthly meetings and workgroups, as needed.

Strategies and Lessons Learned

- Build on past efforts, e.g., [Portland Broadband Strategic Plan](#)¹⁴ and [Mt. Hood Cable Regulatory Commission community technology ascertainment](#)¹⁵ and grants.
- Engage local philanthropic organizations.
- Organizational infrastructure is necessary for the work to occur. Individual organizations might not be able to achieve strategic actions on their own but collectively have the resources and infrastructure to make it happen.
- A dedicated core group of members – City, Library, County – to convene and do outreach was key.
- Regular, in-person meetings of the DIN creates partnership, ownership, and commitment.
- City Council approved a full-time staff person to lead the implementation effort. This dedicated resource made all the difference.
- Formal approval of DEAP by the City and County secured local government commitment.
- Synergies that develop out of the partnerships have changed digital inclusion programs. By partnering, Multnomah County Library; Free Geek; and Home Forward, Portland’s housing authority, have successfully implemented training in affordable housing complexes.
- NTEN Digital Inclusion Fellows at the Library and Free Geek expanded staff capacity, making it possible to implement a new digital inclusion program at Home Forward, the local housing authority.

¹⁴ <https://www.portlandoregon.gov/revenue/73862>

¹⁵ <http://03a4246.netsolhost.com/yourvoice.html>

- Relationship-building led to collaborations and is still happening at DIN meetings and through DEAP implementation partnerships.
- Strategic planning around collaborative goals augments available resources and reduces duplication of efforts.

Change Because of the Collaborative

- Awareness of digital inclusion as an important issue within the community and among elected officials.
- Strong, productive relationships.
- Trust among many different partners.
- Many partners stepping up to assist with implementing the seventeen DEAP initiatives.
- Partners are dedicating resources to achieve DEAP goals, including a full-time position at the City to facilitate the effort.
- Connecting the dots between other local initiatives (i.e., equity, Smart Cities, sustainability, economic development) and digital inclusion.

Local Broadband Adoption Data

Portland gathered local broadband adoption data through:

- [2014 Portland Broadband Adoption Report](#)¹⁶
- [Digital Equity Action Plan Evaluation/Assessment Tool](#)¹⁷
- [Multnomah County Internet Adoption Rates by Census Tract \(2015\)](#)¹⁸

There are no plans now to continue to gather local broadband adoption data due to lack of funding.

Community-Wide Digital Inclusion Coalitions in the U.S.

NDIA is aware of geographically based, community-wide digital inclusion coalitions (formal and informal) in the following areas within the United States.

Formal coalitions – those that have a name and a defined purpose (most are not legal entities):

- [Digital Empowerment Community of Austin](#)¹⁹
- Charlotte-Mecklenburg Digital Inclusion Steering Committee

¹⁶ <https://www.portlandoregon.gov/revenue/article/504164>

¹⁷ <https://www.portlandoregon.gov/revenue/article/629201>

¹⁸ <http://multco.maps.arcgis.com/apps/webappviewer/index.html?id=a7b2672693404bf599d3a5d76707dc41>

¹⁹ <http://www.austintexas.gov/page/digital-empowerment-community-austin>

- [Connect Chicago](#)²⁰
- [Detroit Digital Justice Coalition](#)²¹
- [Digital Literacy Alliance](#) (Philadelphia)²²
- [Kansas City Coalition for Digital Inclusion](#)²³
- [Technology Literacy Collaborative](#) (Twin Cities)²⁴
- [Get Connected Oakland](#)²⁵
- [Portland Digital Inclusion Network](#)²⁶
- San Antonio Digital Inclusion Coalition

Informal coalitions:

- Durham's Digital Equity Partnership (D-DEP)
- New Mexico Digital Inclusion Network (formal coalition in development)
- New York City
- NC Statewide Digital Equity Leaders
- Salt Lake City

In geographic regions where there is not a community-wide coalition, it is helpful to know of digital inclusion programs that serve other digital inclusion programs in a geographic area and thus serve as a connector. NDIA knows of the following:

- [Community Technology Network](#) (Bay Area)²⁷
- [Tech Goes Home](#) (Boston)²⁸
- [California Emerging Technology Fund](#)²⁹
- [Tech Goes Home Chattanooga](#)³⁰
- [Connect Your Community](#) (Cleveland)³¹

²⁰ <http://connectchicago.org/>

²¹ <https://www.alliedmedia.org/ddjc>

²² <http://www.mayorsfundphila.org/initiatives/digital-literacy-alliance/>

²³ <http://digitalinclusionkc.org/>

²⁴ <http://www.tlc-mn.org/>

²⁵ <http://www.getconnectedoakland.org/>

²⁶ <https://www.portlandoregon.gov/revenue/73860>

²⁷ <http://ctnbayarea.org/>

²⁸ <http://www.techgoeshome.org/>

²⁹ <http://www.cetfund.org/>

³⁰ <https://techgoeshomecha.org/>

³¹ <http://connectyourcommunity.org/>

- [DANEnet](#) (Madison, WI)³²
- [Connect Ohio](#)³³
- [City of Seattle](#)³⁴
- [Connect.DC](#)³⁵
- [WinstonNet](#)³⁶

³² <http://www.danenet.org/>

³³ <http://connectohio.org/>

³⁴ <http://www.seattle.gov/tech/>

³⁵ <http://connect.dc.gov/>

³⁶ <http://www.winstonnet.org/>

Chapter #6:

National Highlights – Innovative Digital
Literacy Training and Connectivity Solutions



Chapter Overview

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Overview

For this chapter, NDIA interviewed staff leadership (across the U.S.) in ten institutions/organizations providing digital inclusion assistance to disadvantaged residents: one public library, one public housing authority, and eight nonprofit organizations. In many communities across the country digital inclusion programs are providing some combination of digital literacy training, devices at no or low cost, low-cost home Internet service, public computing centers and/or tech support. It is widely accepted by digital inclusion policy makers and practitioners that this multi-pronged approach is required to successfully address digital inequity. The approach may differ by community, but it should be collaborative and whole-community based.

- Two offer digital literacy training, affordable connectivity solutions, and affordable devices in a coordinated matter to most or all of their participants.
- Three offer digital literacy training and affordable connectivity solutions, but not affordable devices, to most or all participants.
- One (a major PC refurbisher) offers affordable devices and connectivity solutions but not training.
- Two offer only digital literacy training.
- One is primarily a community computer refurbisher.
- And one is a large-scale neighborhood connectivity partner with a history of extensive training initiatives but no major training program at this time.

It's important to note that digital inclusion organizations often shift the balance of their activities (training and support, connectivity, devices) over time, responding to opportunities and community needs. They may also refer participants to partner organizations for services they don't offer directly. In this report we are focusing only on the organizations' own current, substantive strategic programs that offer possible models for practitioners in Cleveland and elsewhere.

Table 1: *Overview of Organizations Interviewed*

Organization	City	Digital skills training	Connectivity	Affordable devices
Community Technology Empowerment Project	St. Paul	Basic skills, certification		Through partner
Community Technology Network	San Francisco	Basic skills	Other, ISP discount promotion	
Connecting for Good	Kansas City	Basic skills	Multi-tenant, public housing	Refurbisher
Free Geek	Portland			Refurbisher
Free Library of Philadelphia	Philadelphia	Basic skills		
Fresno Housing Authority	Fresno	Basic skills, job readiness	Multi-tenant, public housing	
Older Adult Technology Services	New York City	Basic skills	Other, ISP discount promotion	
PCs for People	St. Paul		Other, EBS discount 4G	Refurbisher
Tech Goes Home	Boston	Basic skills	Other, ISP discount promotion	Through partner
Technology for All	Houston		Neighborhood block, area Wi-Fi	

Types of affordable connectivity. There are four basic “connectivity solutions” represented by these programs:

- **Multi-tenant.** “Multi-tenant” generally means a broadband network provided by a landlord or a partner within an apartment building, for the use of its residents. A technology often used for this purpose is “mesh Wi-Fi.” *“A mesh network is a network topology in which each node relays data for the network. All mesh nodes cooperate in the distribution of data in the network”.*¹ In a Wi-Fi mesh the nodes are inexpensive access points/routers distributed throughout the area being served (e.g., two or three per floor of a building) with one or more nodes serving as “gateways” to a source of Internet service. Connecting for Good and Fresno Housing are both providing mesh Wi-Fi Internet access to residents of multiple public-housing buildings in their cities.
- **Neighborhood/block.** This refers to a wireless broadband network providing Internet access to multiple households, as well as individuals within a residential area, usually by means of access points mounted in exterior locations. Access might be public or limited to users with permission. Our example, Technology For All’s “TFA-Wireless,” is a two-square-mile public Wi-Fi network deployed in 2005 as a research and development environment by Rice University faculty and students in Houston’s Pecan Park neighborhood and operated in partnership with TFA as a free/affordable connectivity resource for the neighborhood’s 19,000 residents.
- **EBS discount 4G LTE.** Two national nonprofits, Mobile Beacon and Mobile Citizen, represent Educational Broadcast Spectrum (EBS) license holders that lease their spectrum to Sprint and in return have the right to resell Sprint 4G LTE accounts very cheaply to nonprofits and low-income households participating in digital inclusion programs. Both of the national resellers partner with local digital inclusion providers for this purpose. PCs for People is one such partner.
- **ISP discount promotion** refers to community programs that help households enroll in affordable home broadband services offered by commercial ISPs in their areas. The three organizations we interviewed that focus on this type of connectivity solution are primarily engaged with Comcast’s Internet Essentials program, which provides \$10 monthly cable modem accounts for families receiving school free and reduced-price, public housing residents, and low-income seniors in the company’s service territories.

Key Points

Common themes emerged from the interviews.

1. First, [United States Department of Commerce National Telecommunications & Information Administration Broadband Technology Opportunity Program](https://www.ntia.doc.gov/category/broadband-technology-opportunities-program)² (BTOP) grants were instrumental in increasing digital inclusion capacity for those communities that received the grants. BTOP grants raised awareness and provided a foundation that allowed some programs to flourish. The grants spawned a more cohesive digital inclusion ecosystem, which helped to evolve the field’s understanding of effective digital inclusion approaches.
2. Partnerships and building and maintaining relationships with grassroots organizations, nonprofits, anchor institutions (school districts, libraries, governments), businesses, and ISP providers enable digital inclusion organizations to be more effective. Not all organizations can excel at all aspects of digital inclusion. By working together, through partnerships, organizations are better able to address all components of digital inclusion. Some

¹ https://en.wikipedia.org/wiki/Wireless_mesh_network

² <https://www.ntia.doc.gov/category/broadband-technology-opportunities-program>

partnerships can help an organization minimize overhead enhancing resources for the core mission. Partnerships do require time and commitment – in-person meetings and well-thought-out agendas with follow-through.

3. Understanding the local digital inequity and digital inclusion resources is necessary to efficiently address the problems. Some communities, like San Francisco, have access to local broadband adoption data gathered by the State of California on an annual basis. Other communities rely on Pew Internet and the FCC's Form 477 data.
4. Attracting and keeping staff in the face of a very competitive tech worker market is very challenging for nonprofits and libraries. For example, those engaged in the refurbishing industry not only are competing for tech-savvy workers but also need to constantly adapt to and learn new technologies, i.e., iPads, Chromebooks, laptops, desktops, etc. Regular training to update skills is critical for any digital inclusion organization.
5. While there are some connectivity options for low-income populations, low-cost access remains a challenge. Some digital inclusion organizations refer constituents to ISPs with low-cost programs. These low-cost programs have eligibility requirements that exclude portions of the marginalized populations in need and may be difficult to successfully navigate for others. Compounding the issue for the majority of communities is a lack of broadband service choice. Others, like PCs for People, partner with Mobile Beacon and help sign up community members who meet eligibility requirements. Another approach is "connectivity through research." Technology for All has partnered with Rice University to upgrade a wireless mesh network in a low-income Houston neighborhood with funding from the National Science Foundation.
6. Having a set of and tracking well-defined outcomes is a work in progress. Digital inclusion organizations are stretched thin, and outcomes-based evaluation requires time and resources. Moreover, there is a lack of shared vocabulary across the field, as well as support and implementation tools.
7. Finally, digital inclusion is about people not technology. Technology is a means to an end so it's important to ask, "What is your end?" Digital inclusion organizations succeed by focusing on innovative and sustainable ways to assist disadvantaged communities to meet their non-technical goals.

Digital Literacy Training and Connectivity Organizations

Community Technology Network

Digital Divide Index (DDI)³: San Francisco 30.32

Mission

Community Technology Network's (CTN)⁴ mission is to unite organizations and volunteers to transform lives through digital literacy. CTN doesn't operate computer centers of its own but rather works with and through community partners such as housing developments, senior centers, and libraries to provide technology access and digital literacy training. CTN's partners contract with CTN for the training.

CTN is helping to connect seniors to the Internet in their homes through Comcast's Internet Essentials program. San Francisco is one of five pilot cities participating in Comcast's senior Internet Essentials program. Where Comcast isn't available, CTN provides information about other low-cost options, such as Access from AT&T and Mobile Beacon.

³ The DDI is a county-level index score (from 0 to 100) measuring the digital divide. The higher the number, the larger the digital divide.

See <https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php>

⁴ <http://ctnbayarea.org/>

CTN is partnering with affordable-housing developers to deliver digital literacy training to thousands of low-income residents through a \$5-million statewide program funded by the California Emerging Technology Fund. California conducts a statewide assessment on broadband adoption each year, which means CTN has data that aids in targeting and honing digital literacy programs. As part of their “Digital Ambassadors” program, select residents of the targeted housing complexes perform community outreach, troubleshoot technology issues, and coordinate digital literacy efforts.

Metrics and Outcomes

In addition to the work in housing, CTN partners with the City of San Francisco to deliver digital literacy training in twenty senior centers, with 6,000 training hours and help for 500 unique individuals per year.

Strategies and Lessons Learned

- Reach out to all ISPs in your community to build a partnership.
- Understand the digital divide in your community.
- Help communities in need understand why they should be online.
- Find others and build a coalition.
- BTOP was instrumental in getting CTN off the ground.
- A relationship with the City of San Francisco is key.
- An entity thoughtfully bringing people together over time will make a difference.
- Someone must be the catalyst and leader.

Connecting for Good

Digital Divide Index (DDI): Kansas City, Kansas Metro Counties

- Johnson County: 10
- Leavenworth County: 32.58
- Wyandotte County: 36.32
- Miami County: 41.92

Digital Divide Index (DDI): Kansas City, Missouri Metro Counties

- Bates County: 62.27
- Cass County: 34.69
- Clay County: 18.75
- Jackson County: 25.37
- Platte County: 18.59

Ray County:	50.41
Clinton County:	50.66
Lafayette County:	57.44
Ray County:	50.41
Linn County:	55.71
Caldwell County:	63.11

Mission

Connecting for Good's⁵ mission is to provide computer training, computers, and Internet access to low-income communities to help create a pathway out of poverty. Connecting for Good's strategy is to focus on both technology (Internet access and refurbished computers) and training (life skills, education skills, career skills) to drive improvements in education, employment, economic impact, and environment for vulnerable populations in low-income communities.

For low-cost connectivity, Connecting for Good provides referrals to existing ISPs or, in some cases, may wire a building for a mesh network and cover the cost (usually about \$200 per month per facility or housing complex).

Connecting for Good operates two public computing centers with twenty-four or more computers, classrooms, and workshops for technology training. It has also built more than sixty computer labs for churches, community centers, and residence complexes over the past four years.

Metrics and Outcomes:

For 2016 Connecting for Good reports the following:

- Trained 7,000 people in digital literacy;
- Established sixty-seven new Wi-Fi connections; and
- Provided one hundred new computers.

Strategies and Lessons Learned

- Build and maintain relationships with grassroots organizations, anchor institutions (school districts, library, government), businesses, and ISP partners.
- Focus on educational attainment and workforce development.
- Communicate with clients and supporters around the balanced needs of technology and training.
- Community organizations will succeed by focusing on innovative and sustainable ways to assist low-income communities.
- Demand is growing for both digital literacy training and low-cost devices.

⁵ <http://www.connectingforgood.org/>

Community Technology Empowerment Project (CTEP)/St. Paul Neighborhood Network (SPNN)

Digital Divide Index (DDI): St. Paul and Minneapolis, Minnesota Metro Counties

Hennepin County:	22.57
Ramsey County:	32.02
Dakota County:	20.08
Anoka County:	24.84
Washington County:	18.88
Scott County:	17.42
Wright County:	26.27
Carver County:	22.32
Sherburne County:	28.23
Chisago County:	35.11
Isanti County:	41.09
Le Seuer County:	37.03
Millie Lacs County:	49.26
Sibley County:	26.97

Mission

The [Community Technology Empowerment Project \(CTEP\)](#)⁶ AmeriCorps bridges the digital divide for new immigrants and low-income communities in Minneapolis and St. Paul. CTEP AmeriCorps members help youth and adults use technology to better access social, civic, educational, and economic opportunities. CTEP is a program of the [St. Paul Neighborhood Network](#).⁷

CTEP focuses on access, basic skills, and relevant content (ABC's) while a partner, [PCs for People](#),⁸ focuses on access and devices. The focus is on very low-income groups who haven't used computers before. CTEP will refer participants to programs and to places where you can get computers and low-cost Internet, but it is not the focus of CTEP.

Funding: \$790,000 annual budget, \$390,000 from AmeriCorps, and remainder from local foundations and partners that host the AmeriCorps members. Partners pay \$7,000 annually to host a CTEP AmeriCorps Member.

Metrics and Outcomes

- 1,711 people became certified in NorthStar⁹ in the last year. NorthStar Certification is a set of ten standards whereby a certificate is given upon completion of training.
- 755 of the 1,711 Northstar-certified individuals found employment after completion of the program in the last year.

⁶ <https://www.spnn.org/watch/channels/ctep>

⁷ <https://www.spnn.org/>

⁸ <https://www.pcsforpeople.com/>

⁹ <https://www.digitalliteracyassessment.org/>

Strategies and Lessons Learned

- Conduct gap analysis/community assessment and then seek out local partners to address the needs. Identify which organization will perform which role(s).
- In-person, twice-per-month meetings are crucial to share learnings and collaborate.
- Proximity of partner sites allows information-sharing and collaboration – visit partner sites.
- Top-notch and consistent professional development for AmeriCorps members and partner organizations is essential.
- Great reputation of well-run and proven program makes fundraising possible.
- Demand is larger than supply.
- The City is not involved, and there is no overall Digital Equity Plan, which hinders progress and tackling digital inclusion holistically.
- Bureaucracy and reporting as an AmeriCorps program and aligning with the AmeriCorps focus can be challenging.

Free Library of Philadelphia

Digital Divide Index (DDI): Philadelphia 39.6

Mission

The mission of the [Free Library of Philadelphia](http://www.freelibrary.org/)¹⁰ is to advance literacy, guide learning, and inspire curiosity. Its vision is to build an enlightened community devoted to lifelong learning. The Free Library has a [strategic plan](https://libwww.freelibrary.org/assets/pdf/about/flp-strategicplan.pdf)¹¹ to guide its work through 2017, and it conducts [periodic reports](https://libwww.freelibrary.org/assets/pdf/about/flp-strategicplan-progressreport2015.pdf)¹² on its progress. The City of Philadelphia provides for the library's facilities and infrastructure, and the Free Library of Philadelphia Foundation – a 501(c)3 organization – supports crucial programs and services.

Thirty-five percent of Philadelphia households do not have Internet in the home. Information on Comcast Internet Essentials, which provides low-cost home broadband Internet, has been available at the library for four years.

In the Free Library's service area, an estimated 550,000 people are considered low literate. Many didn't believe the library was for them. To address this concern, the Free Library partnered with local technology-training centers within community-based organizations to create "hot spots" for connectivity, as well as computer-skill and job-search training. One goal of these technology-training centers is to serve as gateways to the libraries located in every neighborhood. Training in basic computer skills and résumé-writing are provided. The Free Library also has offerings for digital-literacy training, including programs in a few libraries on cord cutting, to help participants lower their monthly cable bills. IT support is available in the form of Digital Resource Specialists at some libraries, and e-gadget help desks at some locations help customers troubleshoot their home computing equipment.

¹⁰ <http://www.freelibrary.org/>

¹¹ <https://libwww.freelibrary.org/assets/pdf/about/flp-strategicplan.pdf>

¹² <https://libwww.freelibrary.org/assets/pdf/about/flp-strategicplan-progressreport2015.pdf>

Strategies and Lessons Learned

- Leaders must work within the system to get the quality of staff needed by the library.
- Staff is encouraged to understand the political and ISP environments of served communities to help develop and implement initiatives.
- Community outreach specialists/organizers – who are engaged in the communities the library wishes to reach – introduce the Library as a safe space.

Free Geek

Digital Divide Index (DDI): Portland, Oregon Metro Counties

Multnomah County:	23.93
Clackamas County:	25.59
Washington County:	21.31
Columbia County:	44.96
Yamhill County:	36.74

Mission

[Free Geek](#)¹³ sustainably uses technology, enables digital access, and provides education to create a community that empowers people to realize their potential. Free Geek has [strategic and tactical plans](#)¹⁴ to guide its work.

There are several ways to get a free computer:

- Nonprofits can apply for a grant;
- Volunteering for twenty-four hours or more qualifies individuals for a free computer or they may grant a computer to someone who can't volunteer; or
- Students can volunteer at any nonprofit to earn a free computer.

Free Geek has a public computing center with six computers available for the public during regular hours that Free Geek is open. Free Geek has a partnership with Multnomah County Library to provide training and computers at Home Forward, the Portland-area housing authority. Two NTEN Digital Inclusion Fellows have been instrumental in launching this initiative.

Outcomes and Metrics

For 2016 Free Geek reports the following:

- 1.3 million pounds of eWaste saved from landfill;
- 42,000 computers went into the community;
- 4,000 hours of tech training were offered;

¹³ <http://www.freegeek.org/>

¹⁴ <https://digitalinclusion.org/free-geek-strategic-planning-2017/>

- 45,000 volunteer hours, 2,000-3,000 each year;
- Thirty-seven staff, 150 volunteers in the building at any one time

Strategies and Lessons Learned

- Strong institutional relationships with the city, county, and state, as well as large corporations, result in significant computer donations to Free Geek.
- Funding is a perennial issue.
- It is helpful to continually discuss how to partner with other nonprofits to minimize overhead and fund the core mission.
- Attracting and keeping talent is very challenging in Portland's competitive tech market.
- There is an ongoing need for technology that is sufficiently young and well cared for that can be refurbished.
- To attract talent, a computer refurbisher must continually train staff and stay abreast of changes in technology.
- A supportive, talented board of directors is critical.

Fresno Housing Authority

Digital Divide Index (DDI): Fresno, California 50.63

Mission

Fresno Housing Authority (FH)¹⁵ is a public agency that supports more than 20,000 families access quality housing, become engaged in their neighborhoods, and build vibrant communities throughout Fresno County by engaging and supporting low-income people to meet their economic and educational goals and encouraging the acquisition of tools to achieve self-sufficiency. FH was one of twenty-eight communities initially selected to participate in the Department of Housing and Urban Development (HUD) collaborative ConnectHome initiative.¹⁶ Participation in ConnectHome facilitates low-cost Internet and digital literacy training for low-income Fresno Housing residents.

FH provides four unique and innovative digital literacy programs:

- FH teamed up with California State University Fresno's Parent University program. Residents attend a six-week course covering topics such as Internet safety and job-readiness skills. The program is funded by a two-year grant from the California Public Utility Commission (CPUC). FH is currently seeking additional funding to renew this partnership.
- FH Summer Tech Camp is a two-week robotics boot camp for high school kids funded through various micro-grants. The camp is an opportunity for youth who live in Fresno Housing developments and/or are residents of the Housing Choice Voucher program to experience Fresno's technology culture. The goal is to educate students about robotics and demonstrate that careers in technology are attainable by anyone, including

¹⁵ <http://fresnohousing.org>

¹⁶ <http://everyoneon.org/connecthome-nation/>

those living in affordable housing. Computers were provided by Merit Partners, a computer recycler who strives to reduce recidivism through market-wage jobs and job-training for incarcerated young adults.

- FH GitHub training focuses on 8th through 12th graders. Students received KANO computers after completing six hours of training. The one-day session offers hands-on training from technology professionals. In addition to coding, students learned how computers impact a variety of jobs and career paths.
- The [Digibus](http://digibus.fresnolibrary.org/)¹⁷ is the by-product of a partnership with the Fresno County Public Library. The Digibus provides mobile digital literacy training in locations where there is a tremendous need but the necessary resources and facilities to provide training are not available. The DigiBus is equipped with twenty laptops and Wi-Fi. The Digibus digital literacy program includes twenty hours of job-readiness training spread over five days. Following this partnership, the Digibus has driven to multiple community locations, providing instant access to computers and Wi-Fi.

FH is setting up property-wide Wi-Fi access via a mesh network at nine properties in the short term and twenty-five properties in the long term. FH intends to have high-speed broadband access in all seventy properties but realizes doing so is not an easy task. While the mesh network model has challenges, including finding affordable backhaul for the network, FH firmly believes the mesh network is the most sustainable and provides the greatest flexibility in relation to the services (access, training, resident engagement events, etc.) being offered at the site.

Metrics and Outcomes

In 2016, FH provided 4,700 hours of training to 110 students and distributed 104 devices. In 2017, FH will explore more ways to use the Memorandum of Understanding (MOU) in place with local school districts to combine data sets to further evaluate performance and impact.

Strategies and Lessons Learned

- Define partner roles early on and adhere to them.
- Fail small is a consistent strategy of FH. Try small programs at one site to determine viability.
- Building partnerships with school districts, libraries, and municipalities combine efforts and have potential for the greatest impact.
- Funding will always be a challenge.
- Consistent resident outreach is key. Plan to contact residents multiple times for each training session.
- Fresno Housing's aspirational goal is to create a platform where residents can develop both an interest and achieve the necessary skills to successfully compete in Fresno's booming tech industry.

¹⁷ <http://digibus.fresnolibrary.org/>

Older Adult Technology Services

Digital Divide Index (DDI): New York City 25.45

Mission

[Older Adults Technology Services](https://oats.org/) (OATS)¹⁸ harnesses the power of technology to change the way we age. Since 2004, OATS has innovated one of the nation's most powerful models to shape the future of aging. Technology is a means to achieving better aging. The OATS strategy centers on five impact areas – social engagement, financial security, health and wellness, civic engagement, lifelong learning, and creative expression.

OATS has a partnership with Comcast whereby it provides curriculum and capacity support to community partners in the [Internet Essentials for Seniors](https://oats.org/client-projects/comcast-internet-essentials/)¹⁹ pilots. OATS is also partnering with the City of New York (NYC) where the City is providing free Wi-Fi in public housing in each of the boroughs, while OATS is providing digital literacy training. OATS is using a community organizing model – knocking on doors, conducting focus groups, listening to residents – as the outreach strategy.

OATS offers many different courses, including computer basics in five languages, advanced computing in two languages, money management, social connectivity, exercise, community organizing, and web design.

OATS received a Broadband Technology Opportunity Grant (BTOP) that allowed it to establish a flagship community center in Manhattan and build twenty-four labs throughout the boroughs. OATS is expanding into other communities and provides consulting services as part of its sustainable funding model.

OATS' digital literacy curriculum is proprietary for two reasons: to protect the brand – they view their work as competing with top universities; and they have unique knowledge, over many years, and monetize it to be sustainable. OATS will provide services to communities for a fee.

Outcomes and Metrics

OATS is building before-and-after surveys (with a researcher at Cornell) to gauge customer satisfaction with a goal of creating a systematic index of impact. OATS intends to share its evaluation data with the larger digital inclusion community.

OATS has 4,700 unique individuals participating in all its programs each year. The Manhattan site has 15,000 visits annually (1,400 unique individuals at this one location). SeniorPlanet.org (OATS website) has 150,000 unique visitors per month.

Strategies and Lessons Learned

- Manage growth. You may be good in your own community but expansion may cause the loss of well-established corporate ethos.
- Know your environment. For OATS, understanding that NYC politics are complex has been essential.
- Continually learn new technology.
- Agility, be nimble as the tech field evolves.
- Know where you are going – tech is means to an end – what is your end?

¹⁸ <https://oats.org/>

¹⁹ <https://oats.org/client-projects/comcast-internet-essentials/>

- There is value and efficiencies to teaching digital literacy at scale.
- BTOP grant was the game-changer in allowing OATS to create a flagship community center in Manhattan.
- Relationships, especially with the City, corporate funders, and philanthropists, are fundamental.
- Staffing – there is fierce competition for qualified workers. As a nonprofit OATS can't offer high salaries and a pension.
- Digital inclusion works best when divided up among audiences—seniors are different from kids are different from college-aged students, etc.
- Partnerships require time and commitment.

PCs for People

Digital Divide Index (DDI): St. Paul and Minneapolis, Minnesota Metro Counties

Hennepin County:	22.57
Ramsey County:	32.02
Dakota County:	20.08
Anoka County:	24.84
Washington County:	18.88
Scott County:	17.42
Wright County:	26.27
Carver County:	22.32
Sherburne County:	28.23
Chisago County:	35.11
Isanti County:	41.09
Le Seuer County:	37.03
Millie Lacs County:	49.26
Sibley County:	26.97

Mission

PCs for People²⁰ creates new opportunities by providing affordable personal computers, computer repairs, and Internet service to people with limited technological experience due to social, physical, or economic circumstances. Any family or individual receiving government benefits or living below 200% of the federal poverty line is eligible for the services. It is a self-funded social enterprise with an annual budget of \$5 million and thirty-five employees.

PCs for People has store fronts in three locations in Minnesota and one in Colorado. Through its online presence it provides computers and low-cost Internet for \$10 per month (through [Mobile Beacon](https://www.mobilebeacon.org/)²¹ and [Mobile Citizen](https://mobilecitizen.org/)²²) in all fifty

²⁰ <https://www.pcsforpeople.com>

²¹ <https://www.mobilebeacon.org/>

²² <https://mobilecitizen.org/>

states. Computers cost from \$0-150, depending on the type. It also partners for special events with schools in low-income neighborhoods and has more than ninety partners nationwide. PCs for People's automated systems for refurbishing computers have been made available to nonprofit computer refurbishers across the country. Currently seven nonprofits are using the system to streamline their processes.

PCs for People provides tech support and repair services for home computers of low-income clients.

Metrics and Outcomes

PCs for People has provided 60,000 computers to those in need since inception. A survey is underway that will provide more detailed information on outcomes.

Strategies and Lessons Learned

- Constantly adapt to and learn new technology.
- Know your environment.
- Becoming a trusted brand has been essential. The trust comes in part to being AAA NAID-certified for data sanitization and developing a proven track record.
- Goal is sustainability to meet community demand.
- Automation is key – being efficient and agile to compete.

Technology for All

Digital Divide Index (DDI): Houston (Harris County) 34.54

Mission

Technology for All (TFA)²³ empowers low-income, underserved, and vulnerable persons with the tools of technology through a strategy of partnering with local community-based organizations, educational institutions, corporations, foundations, technology providers, and the public sector to provide computer access and training. Through this work TFA helps create educational, economic, and personal opportunities for residents.

TFA's current approach is "connectivity through research," funded by the National Science Foundation (NSF). TFA is partnering with Rice University to install an upgraded wireless mesh network in a low-income neighborhood. It is also engaged in additional research with Rice to create the ability to send 1 Terabyte of data per second. Through this project, TFA will facilitate connectivity for the entire neighborhood of 21,000 residents with a per-capita income of \$12,000 annually. In a previous NSF grant, Rice University and TFA created a wireless network that had degraded over time.

TFA has found that most low-income students in the neighborhood have a smartphone but lack a data plan. Thus, creating a mesh network with the ability to use Wi-Fi throughout the neighborhood became of paramount importance. Backhaul is being provided by a reseller.

As part of another research project, sensors are being installed to detect levels of certain petrochemicals in the air. The neighborhood is near a major petrochemical industry facility. A summer intern is creating an app that will allow residents to check levels of particular chemicals in the vicinity. Other potential future applications that may be layered on the wireless network include cameras in parks for public safety and transportation-related projects.

²³ <http://www.techforall.org/programs/programs/>

TFA cultivates individual partnerships – high school, middle school, YMCA, Lopez Tires, and some homes in the neighborhood on which to place equipment. The City of Houston rebuffed TFA's effort to create a partnership to use City poles for wireless attachments.

Metrics and Outcomes

TFA is partnering with the local high school Advanced Placement and STEM programs to share the sensor data, which will allow students to design their own application projects.

Strategies and Lessons Learned

- Understand local culture/politics and “ways of doing things.”
- Identify who works together, who has a relationship with whom.
- TFA has many partners within the targeted neighborhood, including the YMCA, local businesses, the public library, Houston Community College, and the local middle and high school.
- TFA's approach is site-specific, i.e., TFA builds relationships and enters into agreements with individual schools, library branches, and businesses.

Tech Goes Home

Digital Divide Index (DDI): Boston (County of Suffolk) 34.39

Mission

Tech Goes Home (TGH)²⁴ empowers vulnerable communities to access and use digital tools to overcome barriers and advance their lives.

TGH is an entryway into the digital age for under-resourced residents by helping with digital skills, hardware, and access. All courses are run in partner sites that serve TGH's target populations (including schools, libraries, community centers, and small business incubators). Participants receive fifteen hours of instruction with a trainer from the community, exploring a web-based curriculum and tutorials designed to help them address essential needs. Tutorials focus on topics like helping parents become more involved in their children's academic and digital lives and empowering learners of all ages to find educational and employment opportunities. Participants can purchase a new computer/tablet for \$50, receive help securing discounted Internet via www.tghconnect.org,²⁵ and receive free Rosetta Stone subscriptions for improving English skills. TGH guides community members in need of low-cost home broadband service with [Comcast Internet Essentials](https://www.internetessentials.com/)²⁶ or Mobile Beacon (through a partnership with PCs for People).

TGH has an annual budget of \$1.2 million with significant support from Mayor Marty Walsh and the City of Boston. Other funders include Google, Comcast, Verizon, and Capital One Bank.

Metrics and Outcomes

TGH has trained²⁷ more than 23,000 people since 2010, distributing more than 14,000 computers. More than 75% of TGH households have incomes under \$25,000, and 51% of participants in community program are unemployed. Of the

²⁴ <http://www.techgoeshome.org/>

²⁵ <http://www.techgoeshome.org/tghconnect>

²⁶ <https://www.internetessentials.com/>

²⁷ <http://www.techgoeshome.org/impact>

population TGH serves, nearly 90% are people of color, and 45% are English learners. Further, approximately 45% of school-based courses support students with special needs. Nearly 50% of those looking for work reported that participating in the TGH course helped in their current job or helped them find a new job.

Strategies and Lessons Learned

- Use a multi-pronged approach. There are many things needed to close the gap – access, devices, relevant training, and tech support.
- Tailor the information to your target audience and develop a strategy to get the information to them. For example, sending information home with students may work with K-6 but not with older students.
- Take the time to build trust with partners and the larger community.
- Identify community needs.
- Develop resources based on need.
- Listen and ask, “How can I help?” Go into the community and ask what do you need?
- Trainers are the key to success – focus on recruiting teachers, librarians, and community center staff who are dedicated and passionate.
- The BTOP grant was critical to building capacity.

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Appendix

Survey Tools

Community-wide Digital Inclusion Coalitions

- County Digital Divide Index?
- Is there Community Collaboration around connectivity & digital literacy?
- When did it start?
- Who are the participants?
- Organizational structure?
- How often do you meet?
- Mission/Charter?
- Plan?
- Process?
- Community needs?
- Key learnings?
- Recommendations for others?
- What has changed because of the collaborative?
- What are the keys to sustaining the program?
- Community Champion(s)?

National Highlights Digital Literacy Training & Connectivity

- Name of Organization
- Mission
- Strategy

- Type of Organization: e.g., nonprofit, education, local government
- Governance
- Connectivity – Low-cost Broadband Services
 - Are low-cost broadband services available?
 - What are the service terms?
 - Who are the providers?
 - How do(es) the program(s) work?
 - When did the service(s) become available?
 - How did it start?
 - Recommendations for others?
- Low-cost Computers?
- Public Computing Centers?
- Digital Literacy Training and Relevant Content
 - What problem are you addressing?
 - When did the program start?
 - Organizational Chart?
 - Job Descriptions?
 - How long to get operational?
 - What is the funding source?
 - What is the annual budget?
 - Who is the intended audience?
 - What's working well?
 - What are the challenges?
 - What are the key learnings?
 - Recommendations for others?
- Outcomes?

- What outcomes are you measuring?
- What are your metrics? e.g., # of people served?
- Community Champion?
 - Was there a community champion?
 - How did the champion emerge?

Acknowledgement and Appreciation of National Highlights Interviewees

Interviews conducted between March and June 2017.

Pittsburgh Interviewees

- Dan Cohen, attorney hired to negotiate Comcast and Verizon franchises
- Howard Stern, former Pittsburgh CIO who negotiated the franchises and led the Google Fiber RFP response. Currently Director of MBA Program at Carlow University.
- Christine Marty, Civic Innovation Specialist, City of Pittsburgh Department of Innovation & Performance, CIO's Office
- Dave Seveck, Computer Reach
- Jon Peha, Carnegie Mellon
- Comcast Internet Essentials – David Urbanowicz, Mark Depretis, Lane Cigna

Coalition Interviewees

- Denise Linn, Smart Chicago Collaborative
- Rebecca Gibbons, Matt Timberlake and Cindy Gibbons—Digital Inclusion Network, Portland/Multnomah County
- John Speirs and Jesse Rodrigues, Digital Empowerment Community of Austin, City of Austin

Digital Literacy Training and Connectivity Interviewees

- Kami Griffiths, Community Technology Network, San Francisco, CA
- Tom Esselman, Connecting for Good, Kansas City, KS

- Joel Krogstad, Community Technology Empowerment Project (CTEP), St. Paul, MN
- Bruce Clark, Digital Charlotte, Charlotte, NC
- Dan Bartholomew, Free Geek, Portland, OR
- Siobahn Reardon, Jon Meier, Free Library of Philadelphia, Philadelphia, PA
- Bobby Coulter, Fresno Housing Authority, Fresno, CA
- Casey Sorenson, PCs for People, St. Paul, MN
- Thomas Kamber, Older Adult Technology Services, New York City, NY
- Will Reed and Phil Cayton, Technology for All, Houston, TX
- Dan Noyes, Tech Goes Home, Boston, MA
- Sam Drong, PCs for People, Minneapolis, MN