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Publicly Owned Broadband Networks

AVERTING THE LOOMING BROADBAND MONOPOLY

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Since 1974, the Institute for Local Self-Reliance (ILSR) has worked with citizen groups, governments and private businesses to extract the maximum value from local resources.

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View the full, interactive map at <http://www.MuniNetworks.org/communitymap>

Executive Summary

Quietly, virtually unreported on, a new player has emerged in the United States telecommunications sector: publicly owned networks. Today over 54 cities, big and small, own citywide fiber networks while another 79 own citywide cable networks. Over 3 million people have access to telecommunications networks whose objective is to maximize value to the community in which they are located rather than to distant stockholders and corporate executives.

Even as we grow ever more dependent on the Internet for an expanding part of our lives, our choices for gaining access at a reasonable price, for both consumers and producers, are dwindling. Tragically, the Federal Communications Commission has all but abdicated its role in protecting open and competitive access to the Internet.

Now more than ever we need to know about the potential of public ownership. To serve that need the Institute for Local Self-Reliance has published an interactive Community Broadband Map that gives the location and basic information for existing city owned cable and fiber networks.

The communities featured on the Community Broadband Map have overcome many formidable obstacles to build their networks. The results are impressive: millions of dollars of community savings; some of the best broadband networks in the country offering a real choice to residents and businesses; and increased investment from incumbent cable and phone companies as they respond to a new non-profit competitor.

Yet even now, when publicly owned networks have proven their importance and viability, powerful entrenched telecommunications companies continue to lobby state legislatures to thwart publicly owned networks. Meanwhile, Washington, DC, refuses to protect the right of communities to build the networks on which their futures depend.

For several years ILSR has been tracking telecommunications developments at the local and state level. We have worked with businesses and communities protecting their right to self-determination via the fundamental infrastructure for the information-based economy. This report offers some of our findings.

A Short History of Publicly Owned Networks

Hundreds of communities across the United States own broadband networks and at least 54 of them have citywide fiber-to-the-home (FTTH) networks. Community owned fiber or cable passes more than 3 million people. The nation's best broadband network is in Chattanooga, Tennessee, and is owned by the Electric Power Board, the local municipal electric company. Its citywide capacity is unrivaled; its smart-grid applications surpass those of any investor owned utility; and it has brought gigabit capacity to rural residents who previously only had dial-up Internet access options.

The Institute for Local Self-Reliance has been tracking municipal and county initiatives in the broadband field for several years. Recently, we compiled a comprehensive database and Community Broadband Map of wired community broadband networks, including both publicly owned cable and fiber-to-the-home networks.



PENNSYLVANIA

Lonely Kutztown

Kutztown's Hometown Utilicom is among the oldest FTTH networks in the US. In addition to cutting telecom expenses for the City, the network has saved residents more than \$1.5 million due to both its lower rates and the lower prices charged by the incumbent cable company in response to competitive pressure. Shortly after the Governor gave Kutztown an award for their network, he signed a bill ensuring no other community would be able to duplicate it. While not an outright **prohibition**, the bill has made it all but impossible for communities to invest in citywide networks, decreasing broadband competition in the state.

This map tells an important truth: community networks are not a fad. They have been around for decades and have proven themselves many times over.

Many of these networks were the first to provide broadband in their community. But newer ones have taken on the challenge of overbuilding (creating a new network to compete with an existing one) privately owned networks. No longer content to beg for better treatment from massive cable and phone companies with headquarters in distant states, communities are building next-generation networks that break new ground.

Over the past ten years, communities switched from building cable networks to pioneering citywide fiber-to-the-home networks. The vast majority of these communities have gained much from these new networks — like Bristol, Virginia, having created hundreds of high-paying jobs when the high speed, low cost network lured businesses to the area. Or Kutztown, Pennsylvania, which is not alone in saving millions of dollars in aggregate over the years due to lower prices – both from the community network as well as because competitors lowered prices in response.

Hundreds more communities have started the process of building a citywide network by connecting a handful of schools or businesses and government buildings. Such an infrastructure investment has a quick payback and this phased approach can lead to FTTH networks because the community gains expertise and confidence in provisioning its digital future.

Hundreds of additional communities, big and small, are considering some form of a community fiber network, from Hartsville, South Carolina, to Seattle, Washington. They realize the private sector cannot or will not provide the level of service they need to flourish in the digital economy, including high-reliability, low prices, and blazing fast speeds.

Nonprofit organizations have built networks, such as the Mountain Area Information Network in North Carolina and OneCommunity in NE Ohio. Though these are important community networks, this initial map focuses on wired last-mile networks; that is, networks that are both publicly owned and available either universally or to the vast majority of residents and businesses.

Despite advances in technology, both economics and federal policy ensure a dearth of competition among privately owned networks. Wireless providers may increasingly compete with DSL networks, but cable networks will continue to offer higher capacity connections than either. Fiber-optic networks are the gold standard, but most Americans do not have access to them. Given the present trajectory of technology and policy, community networks offer the best approach to increase competition and improve access to the Internet across the nation.

Convergence

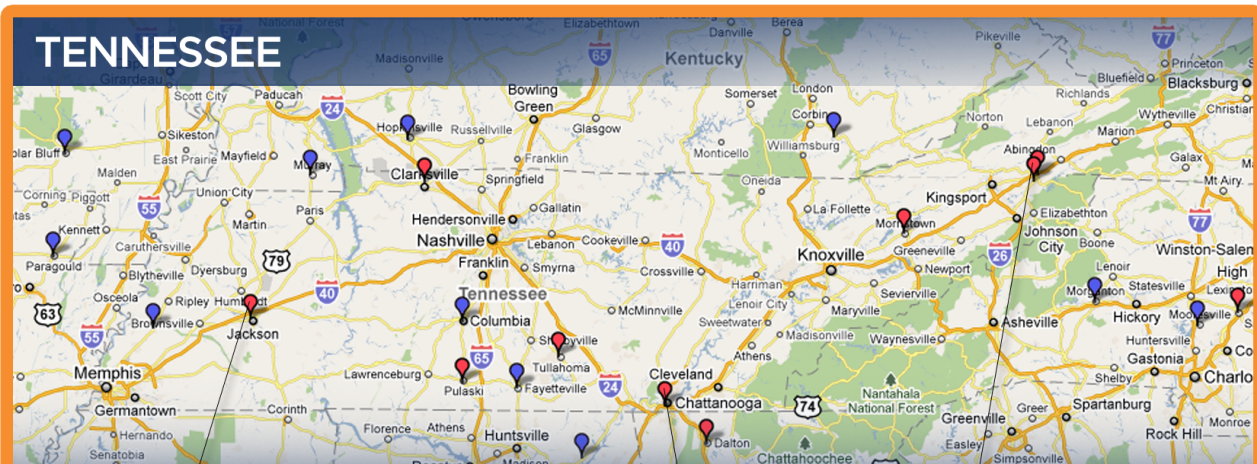
It is useful to remember why these networks are so important. Access to the Internet means far more than gaming, video streaming, and other forms of entertainment. More and more of our economy can be digitized and once digital, will be distributed via the Internet.

For many decades, television and radio were delivered by analog radio waves. Now, just about everything is delivered digitally and the medium no

longer matters. Wired or wireless, copper or fiber-optics, everything has gone digital. One network delivers them all – the same fiber-optic strand can deliver limitless telephone conversations and television channels simultaneously.

Copper phone networks have seen mass desertions as people flock to mobile wireless and cable broadband rather than the slower DSL networks. Upstarts like Hulu, Netflix, and Roku are challenging the very idea of the channel. Ebooks are outselling print books. Skype may be the largest international carrier (and on a personal note, my family Christmas was definitely enriched by 3-way video calling via Skype).

Education and medicine are rapidly transitioning to the connected world, offering the possibility of better outcomes at lower prices, particularly in rural areas. In Sibley County, Minnesota, rural residents stuck on dial-up drive to the library so children can complete their homework online. Job postings and application processes are increasingly only available online. People without fast, affordable, and reliable broadband are slowly being left behind.



TENNESSEE

Jackson

Jackson Energy Authority was a pioneer in open access community fiber networks. They have since decided to offer retail services themselves and have more than 16,000 subscribers. In 2010, JEA began taking advantage of the network for smart-grid applications.

Chattanooga

Chattanooga's Electric Power Board owns and operates the largest community fiber network in the US and offers the fastest citywide tier in the country: 1Gbps. Beyond phone, Internet, and cable television services, the network has become essential for the electrical grid, allowing EPB to pioneer cutting edge smart-grid applications. It started offering triple-play services in Sept 2009 and is exceeding its business plan goals.

Bristol

Bristol Tennessee Essential Services is located across the border from Bristol Virginia Utilities. The BTES network recently attracted a \$20 million newspaper printing plant that required reliable broadband to ensure it would not miss deadlines and could handle all the media that goes into modern news.

Looming Broadband Monopoly

As the Internet shifts from being a luxury to being a necessity – integrated into all aspects of our lives – the number of service providers we can choose from has substantially decreased. In 2000, thousands of Internet Service Providers competed for customers, but most have consolidated or were run out of business by a few massive players (cable companies like Comcast or phone companies like Verizon and AT&T) that today dominate the broadband market.

The vast majority of communities are now served by two broadband providers, but only one advanced technology. As Susan Crawford, former assistant to President Obama for Science, Technology, and Innovation Policy, has explained, cable is now in a position to monopolize the broadband delivery market.¹ Prior to cable's DOCSIS 3 upgrade, more than 80% of Americans could choose from two reasonably similar products (DSL and cable). Upgrading cable networks is far cheaper than for telephone lines (replacing copper lines with fiber-optic) to offer higher capacity connections.

Even as cable technology dominates Internet access, the major cable providers in the U.S. have decided not to compete with one another. E.g. Comcast does not venture into Time Warner territory, a gentlemen's agreement that benefits the cable companies greatly and subscribers not at all.

A popular, but incorrect, belief is that wireless technologies are going to provide new competition. But wireless is a complement to wired connections, not a substitute. Absent fundamental (and unlikely) changes in spectrum policy from Washington, DC, wireless connections will not have adequate capacity even to compete with cable services. As the FCC found in the

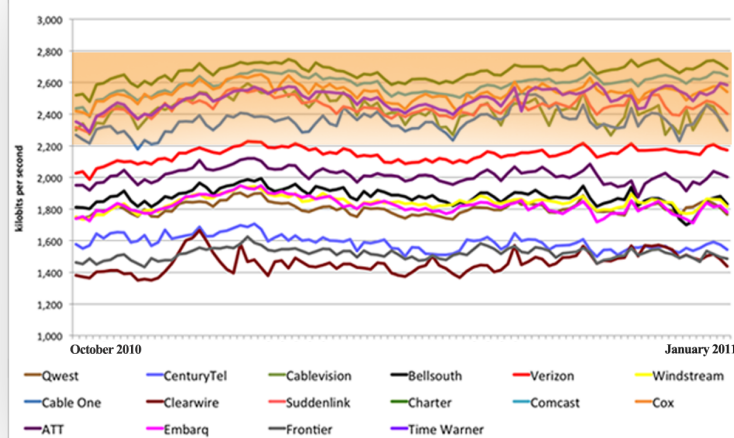
National Broadband Plan, wireless broadband (whether fixed or mobile) is not an effective substitute for high-speed wired service and “may not be an effective substitute in the foreseeable future.”²

Those living in the wealthy neighborhoods served by Verizon's fiber-optic FiOS can choose between fiber-optics and cable, but Verizon has announced it is no longer expanding the FiOS footprint. In the near future, as many as 85% of Americans will have only one option for fast broadband: cable.

How will cable companies use this market power? Crawford writes,

Once the cable digital migration is accomplished, the cable companies' big pipes will be filled with virtual, highly-compressed digital “channels.” Three of those, or so, may be devoted to Internet access. The real growth area for cable is “broadband,” but very little of “broadband” will be recognizable as Internet access. The rest of the transmissions filling the pipe will use the Internet Protocol but will be thoroughly managed, monetized, prioritized, filtered, packaged, and non-executable—much like traditional cable television today. When a monopoly cable

DSL LAGS CABLE CONNECTIONS



Netflix released a graph showing the sustained transfer rates for national Internet Service Providers. It reinforces Crawford's observations: national cable networks have a distinctly higher capacity than national DSL networks. Verizon occupies an interesting middle ground (the red line between DSL and cable networks in the chart), almost certainly the result of Netflix's inability to separate Verizon's slower DSL service from its far more robust FiOS fiber-optic services.

provider can allocate just two or three of its hundreds of virtual “channels” to Internet connectivity, and when only that provider can sell you video-strength speeds, net neutrality becomes a subsidiary issue—a tiny white bird landing on the back of an enormous hippo. Net neutrality matters, but it is a sideshow. As one content executive told me, “Comcast owns the Internet.”³

Each point on the Community Broadband Map represents a place where citizens and businesses are assured the freedom to access the open Internet. Because these networks create competitive pressures, major providers are denied the power to distort the market for their private gain.

Limited FCC Oversight

Given the importance of the Internet and the trend toward less meaningful competition with a handful of providers able to exert considerable influence over the future of the net, one might ask: Where is the government?

Over the course of the last two decades, phone and cable networks have merged, creating a crisis in policy. Both networks began offering the same services, but had different regulatory regimes. Between Congress, the FCC, and the Courts, Washington, DC, embraced a policy of naïve deregulation under the assumption that new technologies would lead to unbridled competition among service providers. Instead, Americans witnessed wave after wave of consolidation and fewer choices for access to the Internet.

With less competition, some massive private network owners recognized an opportunity to increase revenues by charging content distributors for access to “their” subscribers. Then head of SBC (now AT&T), Ed Whitacre famously made the following statement after being asked whether he was concerned about “Internet upstarts like Google” and others.

How do you think they're going to get to customers? Through a broadband pipe. Cable companies have them. We have them. Now what they would like to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's

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*RESTRICTIONS APPLY

going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes?⁴

CEO Whitacre revealed his intention to fundamentally change the nature of the Internet. Remember that Google has made massive investments to put their content on the Internet; it is not free-riding. When SBC users would request certain content on the Internet, SBC would require a toll from the company fulfilling the request. Community networks, which are focused on meeting local needs rather than increasing profits, do not threaten the open Internet as do some of these massive companies. The SBC-AT&T merger required SBC to abandon this scheme, delaying it. Since then, a few companies have violated network neutrality while the FCC and courts wrestled with the issue.⁵

In December 2010, the FCC announced its long-awaited decision regarding net neutrality. It decided against reclassifying broadband as a telecommunications service, rather than a lightly regulated information service.⁶ It cobbled together a weak rule that was immediately challenged in court by multiple major carriers.

Regardless of whether the Courts uphold this FCC ruling, it appears that the federal government is unwilling to stand up to powerful corporations to defend the public good. This is where community owned networks come in. The citizens and businesses in each of the towns on our map have a network that will offer access to the open Internet – because they own the network and they make the rules for it.

State Preemption of Local Authority

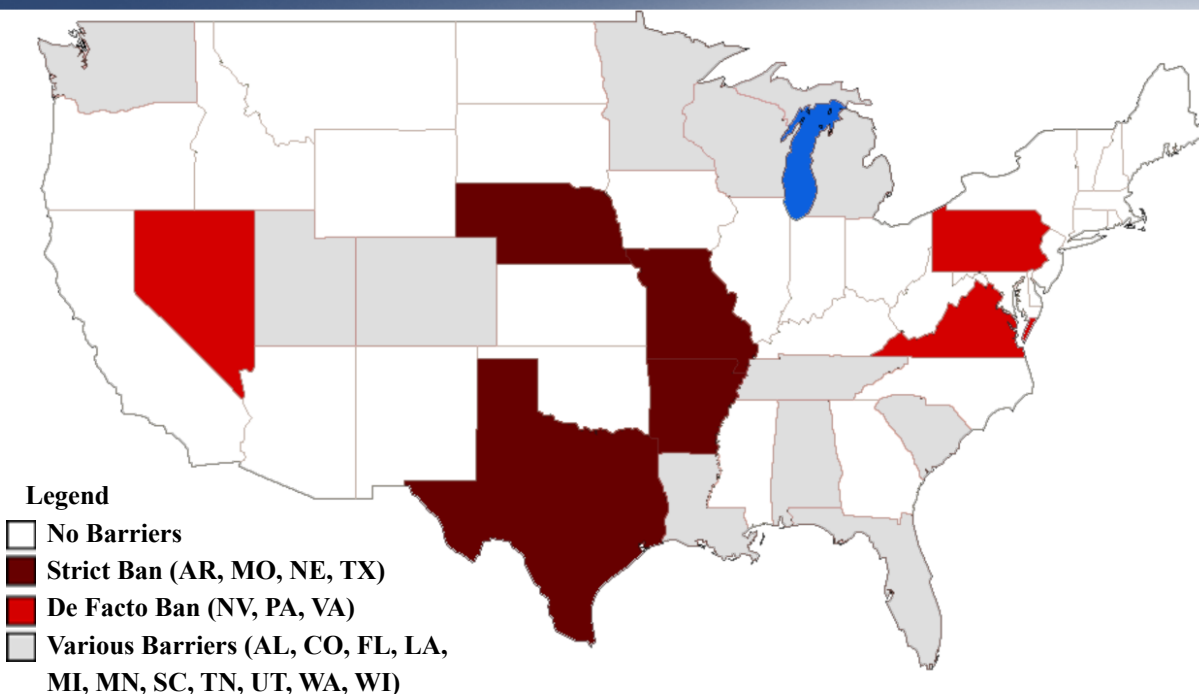
Each community that now owns its own broadband network has a story to tell about the struggles it had to undergo to succeed. Challenging the big, corporate incumbents is never easy. And as municipal initiatives have succeeded, the telecommunications giants have used their political clout to persuade state legislatures to change the rules, barring or significantly inhibiting local efforts.

Eighteen states in the U.S. have enacted barriers to make it difficult or impossible for communities to build publicly-owned networks. The map below displays states with barriers based on our analysis of whether they have an outright ban, a de facto ban, or various barriers to communities owning this essential infrastructure.

These bans are in addition to laws in several states revoking local authority over cable franchises, opting instead for less regulation and oversight from the state. The predictable result has been higher bills, worse customer service, and – unsurprisingly – no change in the level of competition for most communities. Some states have even reversed the long tradition of requiring universal coverage in franchise agreements, allowing providers to determine who gets service.

For years, Time Warner Cable has pushed legislation in North Carolina to either kill community networks outright or sufficiently

COMMUNITY BROADBAND PREEMPTION MAP



“Strict ban” states either ban “telecommunications services” or “exchange” services. This prohibitions make triple-play networks impossible. “De Facto Ban” states effectively also outlaw community networks, but leave some communities with potential authority, however unlikely. States with “Various Barriers” range from strong barriers to relatively weak ones. We did not classify a simple majority referendum as a barrier for the purposes of this map. Visit the interactive map at <http://bit.ly/bb-map>

restrict them that it is all but impossible to create or maintain one. As of mid-March, 2011, they are poised to succeed with the present Legislature.⁷ Other states are also dealing with cable and phone companies that want more regulation for competitors while fighting to be deregulated themselves.

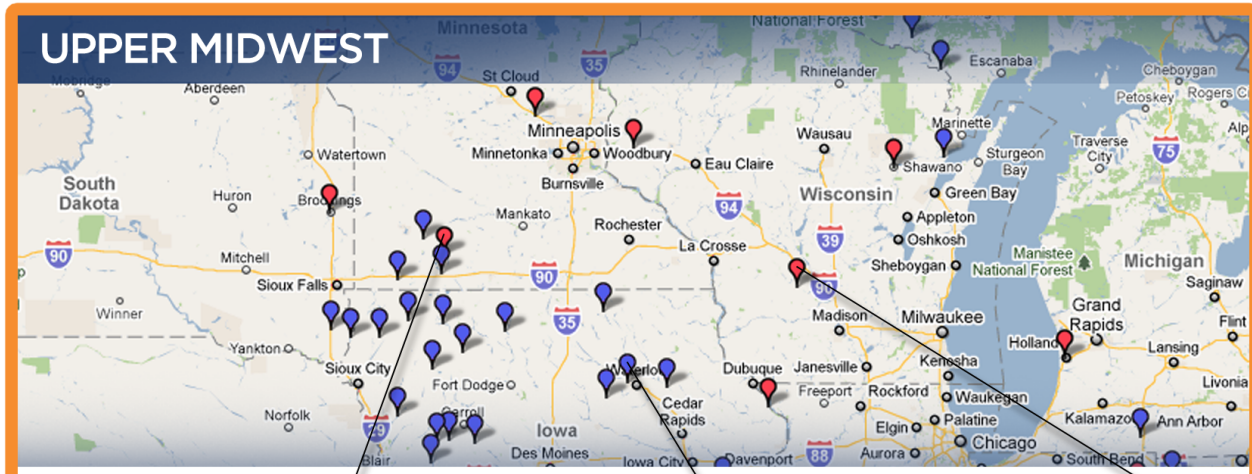
As we can see from the Preemption Map, some states with barriers to community networks actually have the highest number of networks (Tennessee and Washington, for instance) whereas other states with no barriers have no networks. There are a variety of explanations, just as there are a variety of motivations for community networks. Washington and Tennessee have a long history of public utilities that gained the trust of citizens. Other states have created barriers to community networks only after the creation of community networks, causing incumbents to lobby against this supposedly unfair competition.⁸

Since the federal broadband stimulus project began in 2009, major private providers have been more bold – challenging projects that merely have a public partner. Incumbents used to primarily

challenge only last-mile networks that actually offered services to citizens and businesses, not middle-mile projects that were publicly owned but offering data transport to third parties on an equal basis.

In Maine, a project to build middle-mile open access fiber-optics to encourage privately owned networks throughout the state was challenged by FairPoint in the Legislature. FairPoint claimed the project was unfair competition because it included a single public sector partner, the University of Maine University system. After FairPoint was essentially bought off by the Legislature to save the project, it moved on to challenging a similar network in Vermont.

Lawmakers in Wisconsin have challenged the right of communities to use stimulus funds to build fiber-optic networks that would only serve government institutions and schools, because it would supplant overpriced services offered by AT&T. South Carolina has legislation that would derail a large middle mile project owned by Oconee County.



UPPER MIDWEST

Windom, Minnesota

WindomNet is one of the smallest publicly owned FTTH projects in the U.S. It has saved many jobs over the years as companies received advanced services from WindomNet not available from incumbents (or from most rural providers). It is expanding to nearby small towns with help from a broadband stimulus award.

Cedar Falls, Iowa

Cedar Falls Utilities exceeded its cable business plan and is now upgrading to a FTTH network. They chose FTTH over a simpler cable upgrade due to the rapid increases in broadband demand. They are also expanding broadband services to rural areas currently stuck on dial-up with a broadband stimulus award.

Reedsburg, Wisconsin

Reedsburg Utilities originally built a small network to connect city assets and schools, resulting in significant savings to the schools while increasing their available broadband capacity. The network broke even years ago and generates net income for reinvestment in the community. In a survey, some 33 businesses reported annual cost savings of over \$20,000 thanks to the network.

A common refrain from major phone and cable companies, their think tanks and lobbyists, and the politicians who receive their campaign contributions is that the public sector just does not belong in telecommunications. The same claims were made 100 years ago as thousands of cities built their own electrical grids, and they are no more accurate now than then.

Despite the many disadvantages communities have when they overbuild incumbent operators (as detailed in [Breaking the Broadband Monopoly](#)), they continue to succeed. In recent years, communities have created some of the best and most reliable fiber-optic networks available in the United States, often in the face of powerful incumbents and debilitating state laws.

If the FCC cannot summon the will to protect the Internet against monopolies, it should at least use its power to enable communities to make the decision to protect their own information futures. The FCC can overrule state laws that have preempted local authority to build and own this essential infrastructure.

These networks are a long-term, proven solution to an otherwise intractable problem: on matters of essential infrastructure, the interests of a community are fundamentally different than the interests of a profit-maximizing network owner. In short, Wall Street's interests are not aligned with Main Street.

Community Networks: The Future of Telecommunications

States and the federal government should stop solely relying upon the private sector to own the infrastructure communities need for the digital economy. This approach has thus far resulted in fewer choices and slower speeds for subscribers, all at higher costs than international peers. The private sector has many important roles to play in our economy, but communications networks must prioritize community needs, not distant shareholder desires. Networks owned by local governments, nonprofit organizations, or cooperatives are structurally responsive to the community first and should own this essential infrastructure.

Existing cable and phone companies have little incentive to upgrade their networks for higher capacity and more reliable connections because they cannot monetize the benefits resulting from more reliable video chatting, educational benefits in the entire community, or fewer sibling fights over who is using too much of a slow Internet connection. Massive companies like Time Warner Cable do not care if their network in Wilson is insufficient for economic development. But Wilson cares, which is why it built the first next-generation FTTH network in the state and is seeing people move into town to take advantage of it.

In economics jargon, broadband networks create tremendous positive externalities. With a fast, reliable and affordable broadband connection, children have better educational opportunities. Children can video chat with grandparents, creating a tighter family bond. I can occasionally work from home, increasing productivity while lowering emissions and congestion in the transportation system. None of these benefits generate extra revenue for the network owner but they do benefit the community.

Communities are a better fit for network ownership (setting rules like universal access, affordable service, and network neutrality) because their mission is to maximize the general welfare. And communities are more likely to run an open access network, encouraging independent service providers to compete on a level playing field for subscribers, creating a truly competitive market from which citizens and businesses can choose.

Access to the Internet is not a commodity, it is a platform for innovation like roads are for transportation. As such, communities are better off when the network is owned locally by local government, a nonprofit structure, or some form of cooperative. Each of these structures puts the interests of the community first.

We have a choice. As the federal government stands aside and giant corporations move to monopolize information-based commerce, communities can put themselves on the Community Broadband Map and preserve their self-determination in the digital world.

References

¹ Susan Crawford has discussed the Looming Broadband Monopoly in a variety of places, from *Yale Law and Policy Review* - <http://yalelawandpolicy.org/29/the-looming-cable-monopoly> - to presentations on YouTube - <http://www.youtube.com/watch?v=4hl7NmfgcFo>

² Chapter 4 of the National Broadband Plan, available here: <http://www.broadband.gov/plan/4-broadband-competition-and-innovation-policy/>

³ *The Looming Cable Monopoly* by Susan Crawford in *Yale Law and Policy Review* - <http://yalelawandpolicy.org/29/the-looming-cable-monopoly> - December 2010.

⁴ Reported in many places, quoted from *Ars Technica* - <http://arstechnica.com/old/content/2005/10/5498.ars>

⁵ The FCC sanctioned Comcast for a violation but lost in the DC Circuit Court when Comcast challenged its authority to do so. Importantly, the Court did not rule that FCC had no authority, it ruled that the FCC had not properly identified its authority to do so.

⁶ For more information, see the Free Press Report: Restoring FCC Authority to Make Broadband Policy - <http://www.freepress.net/resource/restoring-fcc-authority-make-broadband-policy-way-forward-after-comcast-v-fcc>

⁷ MuniNetworks.org has aggregated its coverage of this legislation in North Carolina under the tag 'hb129' - <http://www.muninetworks.org/taxonomy/term/564>

⁸ The lawyers working for these massive companies will find ways to show any competition is unfair to them, regardless of reality. We discussed this at great length in [Breaking the Broadband Monopoly](#).

For More Information, see

www.MuniNetworks.org

for news and reports discussing communities that have built networks. Also, visit

www.newrules.org/information

for specific laws, ordinances, and other rules communities have used in building networks.

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The Institute for Local Self-Reliance is a nonprofit research and educational organization that provides technical assistance and information to city and state governments, citizen organizations and industry.

Since 1974, ILSR has researched the technical feasibility and commercial viability of environmentally sound state-of-the-art technologies with a view to strengthening local economies. The Institute works to involve citizens, governments and private enterprise in the development of a comprehensive materials policy oriented toward efficiency, recycling and maximum utilization of renewable energy sources.

An ILSR program, The New Rules Project started in 1998 and continues to bring fresh new policy solutions to communities and states to ensure that they are **"designing rules as if community matters"**.

ILSR proposes a set of new rules that builds community by supporting humanly scaled politics and economics. The rules call for:

- Decisions made by those who will feel the impact of those decisions.
- Communities accepting responsibility for the welfare of their members and for the next generation.
- Households and communities possessing or owning sufficient productive capacity to generate real wealth.

