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November 11, 2009

Via ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
The Portals
445 12th Street, SW
Washington, DC 20554

> Re: Notice of Ex Parte Communication
> NBP Public Notice #11
> Docket Nos. 09-47, 09-51, 09-137

Dear Ms. Dortch:

Please accept for filing the attached paper entitled "OneCommunity: An Important Model for America's Broadband Revival." The paper, particularly its appendix, provides extensive, detailed information about numerous successful middle mile and second mile projects. Please contact Mark Ansboury (216-923-2232), Chief Technology Officer of OneCommunity, or me (202-833-1144) if you have questions or would like additional information. Mr. Ansboury would gladly come to Washington if the Task Force would like to meet with him in person.

Sincerely,

Jim Baller

James Baller

cc: Erik Garr
Robert Curtis
Thomas Koutsky
BJ Neal

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OneCommunity: an Important Model for America's Broadband Revival

Over the last 15 years, Baller Herbst has been involved in most of the leading community broadband projects in the United States. These projects have encompassed a wide range of public and private participants, technologies, services, and business models. During the last two years, we have also been deeply involved in the debate on a national broadband strategy, economic stimulus emphasizing broadband connectivity, and related issues.

Aware of our experience in these matters, OneCommunity commissioned Baller Herbst to analyze their programs and suggest ways to enhance or strengthen them. In response, we met with representatives of OneCommunity, read thousands of pages of pertinent materials, asked numerous follow-up questions, and discussed OneCommunity with many individuals outside the program.

We are highly impressed with the work of OneCommunity. Its vision is big enough, bold enough, and pragmatic enough to enable the communities they serve – as well as countless other communities across the United States – to survive and thrive in the increasingly competitive knowledge-based global economy. Its programs are innovative, flexible, copiously documented, and eminently replicable. Its processes guide stakeholders step-by-step through: discovering what advanced broadband connectivity can do for them; developing sound business cases and technology plans, often on a regional scale, with emphasis on the anchor institutions in the area; establishing essential training and support mechanisms; developing creative public and private partnerships that benefit all concerned and avoid or minimize strife; obtaining funding from a variety of sources; etc. In short, OneCommunity strives to do everything necessary to stimulate both the supply of and demand for affordable access to advanced communications capabilities.

Most important, OneCommunity has demonstrated that its programs actually work. OneCommunity has shown that even an economy as mired in America's industrial past as Cleveland/Northern Ohio can transform itself into an epicenter of America's revival through the creative development and use of advanced communications technology.

While we have some project-specific suggestions, we do not believe that the OneCommunity model requires any significant changes. To the contrary, we believe that communities across the United States would benefit from considering the model when developing their own broadband initiatives and that the Federal Communications Commission and Congress should study it carefully in developing America's National Broadband Plan.

***

In Section I, we begin with some background information, including a brief review of OneCommunity's origins and history. In Section II, we examine OneCommunity's philosophies, approaches, and accomplishments, illustrated through numerous examples. In Section III, we offer some observations and conclusions, and in Appendix A, we provide a number of detailed case histories.[1]

I.   BACKGROUND

OneCommunity was founded on the belief that Cleveland's array of world-class institutions could serve the community better by working together. OneCommunity's goal has been to enhance services, save money, and enrich life in Northern Ohio by connecting education, health care, government, arts & culture, and other organizations to each other and to the Internet, through innovative public-private partnerships. OneCommunity is now well on its way to making Northern Ohio the Midwest's hub for technology and innovation.

OneCommunity's roots go back to 2001. At the time, Case Western Reserve University (Case) had a robust fiber-optic communications system and considerable networking expertise, but the rest of Cleveland lacked advanced communications capability. Case's president, Edward Hundert, and its chief information officer, Lev Gonick, believed that broadband connections to the Internet promised to be a major factor in the local economy's long-term health; that broadband could transform Northern Ohio from a manufacturing-based to an information-based economy; and that Case could play a profoundly beneficial role in enhancing Cleveland's broadband future. As a result, Hundert and Gonick reached out to several of Cleveland's leading government, educational, cultural, philanthropic, and other non-profit organizations and persuaded them to join Case in founding a new entity called "OneCleveland" that would provide gigabit connectivity to participating organizations and pave the way for widespread and free wireless service.

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[1]   This paper is being submitted in response to the Federal Communications Commission's NBP Public Notice #11, which seeks comments on the "Impact of Middle and Second Mile Access on Broadband Availability and Deployment." As a result, we will focus here primarily on OneCommunity's experience with such projects. In late 2007, OneCommunity also entered into a dynamic partnership with the John S. and James L. Knight Foundation to create the Knight Center of Digital Excellence in Akron, Ohio. Starting with the 26 communities across the United States that were formerly served by Knight newspapers, the Knight Center's charter was (and is) to create "connected communities" by helping them develop strategies and utilize information technologies to drive civic progress and economic development. The Knight Center provides consultation, research, "best practices," and fundraising opportunities to the Knight Communities to help them develop and implement sustainable, collaborative broadband strategies. More information about the Knight Center is available online at http://www.knightcenter.org.

Early on though, a key element was building broad community support and a sense of ownership across both the public and private sector. From its earliest days, this was not a technology project, but a community transformation project, and adoption, usage, applications, scalability and self-sustainable business models were early considerations.

OneCleveland developed numerous creative applications to address the community-driven needs of its constituent groups. These applications included several ambitious projects for the region's health care facilities; high-definition, two-way interactive video and other services for Cleveland's libraries, museums, and other cultural institutions; and advanced video content for the educational system.

As information about OneCleveland's achievements spread, more and more communities wanted to become involved in the project. In response, the organization expanded to support a number of communities across Northern Ohio, including the Akron area and beyond (soon to be 22 counties). In 2006, the organization changed its name to "OneCommunity," reflecting its broader geographic footprint and new emphasis on serving as a key economic asset for the entire region.

Timeline

2001-2003 – Lev Gonick, with support of Case Western Reserve University and other community leaders, begins roundtable meetings and creates consensus around the need for community revitalization using technology innovation to facilitate transformation.

January 2003 – Community organizations form a coalition of institutions in support of creating OneCleveland, including the City of Cleveland, Cuyahoga County Community College, Case Western Reserve University, Cleveland State University, Cleveland Municipal School District, NorTech (a regional economic development agency), Greater Cleveland Regional Transit Authority, and ideastream (local NPR/PBS).

October 2003 – OneCleveland formally incorporates as a not-for-profit Section 501(c)(3) organization.

November 2003 – OneCleveland accepts donation of 95 miles of dark fiber from City Signal Communications. Cisco Systems donates equipment to light up ring.

January 2004 – Local tech leader/entrepreneur Scot Rourke joins Case Western Reserve University as a loaned telecommunications specialist to launch OneCleveland. In May, regional economic development agency NorTech hires him as its first employee.

August 2004 – Case Western Reserve University joins the OneCleveland network as its first subscriber.

November 2004 - OneCleveland awards network management RFP to IBM and hires leader of second-place finalist, Mark Ansboury, as COO/CTO.

February 2005 – OneCleveland announces the addition of eight leading health care, cultural and educational institutions as subscribers: MetroHealth Systems, Cuyahoga Community College, ideastream, The Cleveland Museum of Art, The Cleveland Institute of Art, Western Reserve Historical Society, The Cleveland Orchestra, and Cleveland Public Art.

August 2005 – Intel Corp. selects Cleveland as a top worldwide pilot community for its Digital Communities Initiative, which seeks to help communities use wireless technology and innovative applications to expand and improve services for municipal governments, businesses, and citizens.

January 2006 – The Intelligent Community Forum names Cleveland one of the top seven intelligent communities in the world, based largely on the OneCleveland initiative.

February 2006 – Reflecting its growth into a regional presence, which began in 2005, OneCleveland is renamed "OneCommunity."

January 2007 – OneCommunity launches a restructured board of directors consisting of top regional public and private leaders led by Rob Briggs and Jeanette Grasselli Brown.

August 2007 – Cleveland Clinic awards $2 million to OneCommunity over four years to support "OneClassroom" to connect region's schools via fiber & provide a Digital Resource Library, shared software, tools, & professional development for teachers.

November 2007 – The Federal Communications Commission awards $11.3 million to OneCommunity and the Northeast Ohio Health Information Organization to expand broadband access to rural health care facilities.

January 2008 – The Intelligent Community Forum names the Northeast Ohio region as one of the top seven intelligent communities in the world, based largely on OneCommunity's work.

April 2008 – OneCommunity announces a partnership with the John S. and James L. Knight Foundation to create the Knight Center of Digital Excellence (with Knight's pledge of $25 million over five years).

May 2008 – To upgrade county networking services, Cuyahoga County awards OneCommunity a five-year, $15 million dollar contract designed to enhance, expand and maintain the County's existing network and voice services.

February 2009 – With the support of local community foundations, OneCommunity establishes a Regional Tech Stimulus Office to help Northern Ohio compete for federal funding under the American Recovery and Reinvestment Act of 2009 (ARRA). The team holds regional meetings, provides research, and offers technical, business case, grant-writing, and advocacy support to foster cross-sector collaboration in pursuit of stimulus dollars.

March 2009 – OneCommunity and Knight Center collaborate on developing ARRA strategies for the Knight Center Communities and support them in applying for ARRA funds.

August 2009 - In the first round of broadband stimulus funding, OneCommunity and Knight Center lead the submission of four requests totaling more than $265 million. The requests receive more than 200 letters of support (including from more than two dozen telecommunications providers), and address markets with a populace of more than 8 million people. The team also supports 8 other proposals totaling $162 million.

The success of these efforts has resulted in many accolades for OneCommunity, including:

- Selection by Intel Corp., as one of three top "Worldwide Digital Communities," to serve as testbeds for new Wi-Fi and broadband applications. (August 2005)
- Receipt of Computerworld's Global Laureate Award for "world's best use of technology to benefit society" in 2004 and 2006.
- Being ranked twice by the Intelligent Community Forum as one of the world's top seven Intelligent Communities (2006 and 2008).
- Receiving *Last Mile Magazine*'s "Smart Community of the Year" award in 2007
- OneCommunity President & CEO Scot Rourke being named the 2008 international Intelligent Community Visionary of the Year, following the founders of Wikipedia.
- CEO Scot Rourke and CTO Mark Ansboury being named Ernst & Young Northern Ohio Entrepreneurs of the Year for 2009 in recognition of their support of entrepreneurship.

OneCommunity's efforts in Cleveland and the Northern Ohio area have been a resounding success and a model for communities in the Unites States seeking to use broadband to deliver innovative services. Some of OneCommunity's broadband success stories are detailed in Section II below. Overall, the OneCommunity network in Northern Ohio now serves numerous carriers and over 200 institutional subscriber organizations, connecting 1,500 public and nonprofit sites, including government, public safety services, urban and rural hospitals, medical clinics, K-12 schools, and institutions of higher education. The network is currently expanding to 22 counties, and stimulus funding would extend it to 58 counties.

Regional Economic Outcomes

- $50 million **in cash and in-kind investment** from foundations, government, private sector and others, most from outside Ohio

- $15 million **in cost savings** for subscribers to save tax dollars

- $18 million **for social and economic development programs leveraging technology** that went directly to community partners

- **180 jobs a year created** through direct and indirect investments in broadband expansion programs, including jobs in construction and IT-related activities

- More than **1,500 sites connected** with ultra-high speed broadband, reaching more than one million citizens

- Rich digital content and professional development available to **more than 1,000 schools**

- More than **6,000 donated computers collected for re-deployment in schools** and community centers

- About **$200 million in stimulus requests pending for Northern Ohio** through OneCommunity's Regional Technology Stimulus Office

II.   ONECOMMUNITY'S APPROACH TO DEVELOPING COMMUNITY-DRIVEN BROADBAND CONNECTIVITY

At an early stage, OneCommunity's founders and community stakeholders realized two basic principles: (1) widely available and affordable high-capacity broadband infrastructure is essential to a community's present and future economic health, global competitiveness, and quality of life; and (2) developing such infrastructure requires a coordinated approach involving both demand-side and supply-side strategies. In response, OneCommunity has developed a four-step approach.

A.   Inspire Digital Vision

OneCommunity helps communities to visualize the opportunities and the impact that high-capacity networks can have, not just within their own organizations, but also for communities as a whole. It then helps them to turn these visions into realities, emphasizing the need to simultaneously address both availability and the adoption/use of broadband connectivity. OneCommunity encourages communities to consider broadband infrastructure and facilities as regional assets, in which participating entities from both the public and private sectors can co-invest to their mutual advantage. Such cooperation produces significantly greater availability and capacity at a lower cost than any participating entity could obtain on its own. This model replaces the often-maligned "build-it-and-they-will-come" approach to broadband deployment with the more realistic and promising "get-them-to-invest-and-they-will-use-it" approach.

B.   Promote and Enable Local Leadership

In Baller Herbst's long experience with community broadband projects, we have never seen one succeed without strong local "champions" who are totally committed to the success of the project and have the skills and resources to make it work. OneCommunity shares this view and devotes substantial resources to building effective local leadership. While some communities are blessed with strong digital leadership, communities more often than not need support in identifying, educating, and supporting local leaders to enable them to develop and articulate their own plans. OneCommunity calls this support "Leadership from Behind." In providing it, OneCommunity tailors its support to the community's particular circumstances, doing whatever may be necessary to enable the local leaders to be successful.

At the same time, OneCommunity recognizes that there are some roles for which local leaders may not have the resources, experience, or interest in playing. For example, a large number of communities and public interest organizations in Northern Ohio do not have, and cannot afford, chief information officers, chief technology officers, or other senior technology staff. In such circumstances, OneCommunity can step in and play these roles, in effect acting as a regional technology authority that offers the technology consulting, subject matter expertise, and analytical tools that communities need to develop programs, applications and shared resources. For example, with support from the George Gund Foundation, OneCommunity has hired a Community Technology Executive to serve the Cleveland schools. OneCommunity supports local leadership, or steps in itself, to ensure that communities will have the ability to take maximum advantage of high-capacity broadband in the following areas: economic development; education; health care; workforce development; safety and emergency response; e-government, community engagement and democratic process; arts and culture; and social services and community-based organizations. Particularly for Knight Communities, this list also includes journalism and news media.

C.   Fill Gaps with Public-Private Partnerships

OneCommunity assists communities in identifying and designing strategies to overcome obstacles to availability of high-capacity broadband connectivity (supply-side) and adoption and use of such connectivity (demand side). In doing so, OneCommunity strives for strategies that are collaborative, inclusive, and beneficial to all concerned, including public- and private-sector carriers. By aligning supply and demand, OneCommunity has been able to help communities understand how and where investments in broadband infrastructure will be of most benefit to public-sector and private-sector investors. This enhances market efficiencies and accelerates returns on private-sector investments and the fulfillment of public-sector goals. OneCommunity is effective in large part because it has carefully cultivated the role of a neutral, honest broker, building public-private partnerships with the best interests of the whole region always in mind.

D.   Serve in a dedicated, neutral capacity for innovation and transformation

As indicated, OneCommunity does not merely act as a matchmaker, but it also plays whatever active role the circumstances may require. We have previously discussed examples of OneCommunity's activities in a supportive role. Here we discuss OneCommunity's role as a direct participant in broadband projects.

On the supply side, OneCommunity has, in some cases, obtained necessary infrastructure extensions or upgrades from public or private suppliers, creating an open exchange for services that leverage local providers' assets where available. In other cases, OneCommunity has made the extensions or upgrades itself, serving as a community-wide, cross-boundary, asset-holder for network infrastructure. On the demand side, with its wealth of experience in dealing with a wide range of users of high-capacity broadband connectivity, OneCommunity has often demonstrated the benefits of such connectivity to prospective educational, health care, and public safety users, among others.

While OneCommunity works closely with many government entities and seeks to fulfill the community-driven goals of these entities, it is not itself a government entity. Rather, OneCommunity acts as a bridge between public and private network providers, high-demand stakeholders (including education, health care, and large businesses), and local governments. As a non-governmental entity, OneCommunity is not subject to the same legal or political constraints that sometimes burden local governments.

These general principles are explored further in the following sections, using examples from OneCommunity's efforts in Northern Ohio.[2] We start with some of OneCommunity's supply-side activities and then turn to various demand-side projects in the health care, education, and government service sectors, as well as economic development generally. Additional detailed information for a number of OneCommunity projects is provided in Appendix A.

1.   Coordinating Broadband Infrastructure and Services

When network connectivity has been unavailable or insufficient to meet identified or anticipated community requirements, OneCommunity has often done whatever the circumstances required to obtain the necessary connectivity, using a variety of sources and models of ownership and control. OneCommunity and its partners, including many government entities, believe that a high-capacity regional network operated under OneCommunity's direction, and in accordance with the principles summarized in this paper, is a tremendous asset to the entire region, regardless of who may hold title to particular portions of the network.

a.   Broadband service offerings

In the Northern Ohio region, OneCommunity facilitated public and private arrangements for the deployment of a gigabit-capacity fiber-optic community network, soon spanning 22 counties and now serving over 200 subscriber entities and 1,500 schools, hospitals, clinics, government, and public safety locations. Over one million citizens are affected by the organizations that OneCommunity serves through the network.

Over this network, OneCommunity offers subscribers four distinct categories of network services, including, but not limited to:

- Transport services (regional transport, local and long-haul transport with partners, connection to partner networks);
- Managed services (Internet, metro Ethernet, wireless, VoIP, data center services, and disaster recovery center services);
- Facility-based services (dark fiber, dim fiber); and
- Wireless (local and regional WiFi and WiMAX, wireless backhaul, diverse connections to primary fiber connection). OneCommunity operates free public Wi-Fi zones in Cleveland, its suburbs, and in Akron.

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[2]   This document provides only an overview of OneCommunity's extensive projects. For a more complete overview, please visit www.onecommunity.org.

b. Cooperation with other providers

OneCommunity will build its own broadband facilities if necessary, but it would prefer not to do so. It typically tries to work cooperatively with the providers that own or control facilities that OneCommunity can incorporate into its regional network. For example, in Northern Ohio, OneCommunity has received donations of fiber from private-sector providers such as Cavalier Telecom, First Telecommunications, and CityNet. OneCommunity has also acquired abandoned or underutilized assets that could be repurposed to facilitate revitalization of distressed communities and serve the needs of public interest institutions. OneCommunity has worked cooperatively with private-sector entities such as AT&T, Cavalier Telecommunications, CityNet, Cox Cable, First Telecommunications, Level 3, Global Crossing, Qwest, XO Communications and Time Warner Cable. OneCommunity has also worked closely with public-sector and community providers such as the Department of Education and Instructional Technology Centers that serve the needs of the region's schools, colleges, municipal wireless projects, county and municipal fiber networks, the statewide academic and research network (OARNet), and various other university and health networks.

c. "Beyond ownership"

OneCommunity is not attached to any particular ownership model for broadband infrastructure, believing that the more important questions are whether the broadband infrastructure is available and whether it is being used most effectively. As long as broadband infrastructure is available on reasonable terms and conditions, broadband infrastructure is an asset to every community in the region, regardless of who owns it. When the value of the asset is increased (through effective and efficient use), it is increased for all concerned, including the community as well as the public or private asset owner. As a result, for OneCommunity and its partners, whether the network is "public" or "private" has little, if any, practical significance. OneCommunity's experience in Northern Ohio proves that, under the right conditions, public-sector and private-sector network assets can creatively be made to work for the community, to the benefit of all concerned.

d. Open, facilities-based, neutral network

In Northern Ohio, OneCommunity has developed an open, carrier-neutral, multi-stakeholder community network. The network serves as a gateway for all network and service providers, for both physical and logical network services. OneCommunity acknowledges that establishing and operating an open and neutral network has not always been easy. The team describes the experience as a "journey." But, somehow, it has found ways to navigate successfully between the requirements of the public and private sectors, developing strategies that benefit all concerned.

OneCommunity's experience illustrates that an open network can be successful. By eliminating traditional barriers and offering everyone access to a single, high-capacity network, OneCommunity has opened the lines of communication among a wide range of people and organizations. OneCommunity's concept of an open network and multi-stakeholder investment creates opportunities for both public and private investment. This, in turn, spurs economic development and job growth, transforms the ways in which citizens interact with their local

institutions, and enhances the quality of their lives at home, at work, and at play within the community.

OneCommunity is enabling local governments to share infrastructure, resources, and services without increasing their burden and costs. It is creating a safer and more secure environment by enabling police forces and fire departments to develop new ways to collaborate and communicate with people in distress. It is enabling doctors throughout the region – in both rural and urban settings – to communicate with each other and access specialists and medical support facilities around the world, in real time, transmitting and receiving complex, bandwidth-rich medical images and improving the quality of health care. OneCommunity is also enabling students of all ages to learn through virtual experiences.

2. Coordinating Demand and Maximizing Network Benefits

Demand-side approaches to broadband development and adoption are crucially important to communities that seek to realize the full economic, cultural, and social benefits broadband may provide. OneCommunity participates actively in visualizing and creating a market for advanced broadband infrastructure, and it maximizes value to major stakeholders by identifying opportunities and tailoring the network to meet them. The more effectively the community uses the network, the more sustainable the project will be. As a result, OneCommunity works closely with the community's institutional stakeholders to ensure that the network infrastructure and services will be of most benefit to current and potential network users. In this section, we focus on health care, education, and government services – three important areas in which OneCommunity is expanding adoption and use of high-capacity broadband connectivity.

a. Health Care

The health care sector has proven to be a particularly strong investor in, and beneficiary of, OneCommunity's efforts, with multiple hospitals and medical clinics actively involved from the nonprofit's inception. The health care community is moving toward an integrated, technology-based health information system. For this to succeed, health care providers and facilities must be able to exchange complete and accurate information instantaneously, including X-rays, CAT scans, MRIs, and other high-bandwidth records. This, in turn, requires affordable access to advanced broadband connectivity. Assisting health care organizations to obtain such connectivity is one of OneCommunity's core competencies.

For example, to encourage collaboration among regional hospitals and clinics, OneCommunity has helped the local health care community form the Northeast Ohio Regional Health Information Organization (NEO RHIO) and the Health Information Exchange, groups committed to the responsible and effective use of telemedicine to enhance patient care. To enable urban hospitals to communicate with their affiliates, rural hospitals, clinics, and underserved health care facilities in distressed communities, OneCommunity has also established "HealthNet," an advanced broadband network that connects health care facilities throughout the region.[3]

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[3]   *See* http://www.onecommunity.org/programs/programs.aspx?id=44.

While many urban health care facilities have been utilizing the OneCommunity network for years, extending broadband access to rural hospitals and clinics required substantial planning and additional resources. In November 2007, OneCommunity and NEO RHIO obtained an $11.3 million grant from the Federal Communications Commission's Rural Health Care Pilot Program (RHCPP) to cover 85% of the costs of connecting 19 rural hospitals to OneCommunity's network. These facilities will join the Cleveland Clinic, University Hospitals, and the more than 60 hospitals already connected to HealthNet. When phase I of the project is completed in the first quarter of 2010, HealthNet will reach nearly 80 hospitals and clinics in 22 counties across Northern Ohio.

HealthNet will enable health care providers to:

- Accelerate research by enabling the sharing of large data files among researchers working at disparate locations;
- Increase access to current research for approved patient protocols;
- Share medical records to improve quality and speed of patient care;
- Direct and secure video access to physicians and specialists;
- Improve care resulting from increased physician collaboration;
- Expand access to public health information through collaborations with community organizations and institutions.

Working with the organizations comprising the Regional Health Information Technology Extension Centers, OneCommunity is also heavily involved in the planning, deployment, training, and support of a state-of the-art e-medical records program for rural hospitals, clinics and private practices. The program will enable doctors throughout the region to communicate remotely with, and manage the care of, patients in managed care facilities, senior citizen centers, and at home, taking advantage of OneCommunity's open wired and wireless network.

b.   Education

Improving education in Northern Ohio is essential for the region's success in the emerging knowledge-based global economy. OneCommunity grew out of a university environment, and it remains heavily involved with the education sector, supporting the state and regional Instructional Technology Centers, K-12 schools, and institutions of higher education.

OneCommunity's experience in Northern Ohio has proven the benefits of aggregation of demand on behalf of the region's Instructional Technology Centers (ITCs) and K-12 schools. Without OneCommunity's support, most ITCs and K-12 schools would only have access to high-cost, low-bandwidth capabilities and services. OneCommunity is providing them far more attractive options. Working with OneCommunity, ITCs and K-12 school districts can now obtain dark fiber (with OneCommunity providing end-to-end physical maintenance), wave services (Dense Wave Division Multiplexing), or managed services, including Ethernet. All services are available on a point-to-point or ring configuration. This increased capacity is enabling schools to access shared infrastructure and new curriculum resources, to conduct virtual field trips, to access rich media resources, to conduct virtual classrooms through high-definition video conferencing, and to create classrooms without walls that enable students to participate in classes from wherever they are in the community, even from their homes.

In addition to offering connectivity, OneCommunity also participates in the development of innovative applications and supports programs serving the region's educational institutions. For example, OneCommunity's OneClassroom initiative,[4] funded in part by the Cleveland Clinic, offers up to 700,000 students in 1,500 schools the digital skills they need to compete successfully. Among other things, the program provides:

- Teacher training using highly innovative techniques and technologies
- Professional development resources for teachers and technical support
- Distance learning opportunities, including live surgeries transmitted into classrooms so students can interact with doctors during the procedure;
- A Digital Resource Library that allows students and teachers to conduct a "safe search" to quickly find and view state-aligned content, including educational videos and other rich digital media from local and national providers;
- Shared infrastructure resourcing, (e.g., virtual desktop services, shared application servers, storage and network services);
- Refurbished computers and other cost-effective technology equipment for classrooms.

OneClassroom can expand students' horizons and prepare them to excel in the 21st century. With access to technology tools and training, and the comprehensive support needed to make a sustainable impact, students can become motivated to explore new career paths and participate in the digital economy.

For higher education, OneCommunity is fostering community connectivity and outreach programs connecting the colleges and universities to their community partners in health care, education, workforce development, and government. In addition, OneCommunity is working with colleges and universities to address the needs of their surrounding underserved communities by creating partnerships among them and providing free broadband access to residents there. These efforts continue to expand as new programs are created to address community needs. OneCommunity has developed the high-capacity data connections needed to conduct data-intensive research, supporting the efforts of Internet2 and the National Lambda Rail.

OneCommunity is also involved in a number of university projects that support community development. The organization is collaborating with Case Western Reserve University to provide gigabit connectivity and multiple services to low-income households using fiber-optic technologies. Partnering with Cleveland's municipal electric utility to deploy "smart house" and "smart grid" infrastructure will facilitate substantial energy management and conservation in these homes. Through an unprecedented health and wellness initiative in conjunction with the Cleveland Clinic, Metro Health, University Hospitals, and the research faculty at Case, data collected in real time in the smart homes will support early detection, intervention, monitoring, and prevention. Finally, OneCommunity is part of a coalition of science educators, gaming and software engineers, libraries and STEM (Science, Technology, Engineering and Math) high schools that is delivering peer-to-peer connectivity, peer mentoring, and at-home problem-

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[4]   *See* http://www.onecommunity.org/programs/programs.aspx?id=38.

solving education to high school students, with the aim of improving graduation rates in STEM subjects.

c.   Government Services

Improving efficiencies and providing enhanced services to citizens is a key objective of government entities. OneCommunity enables local governments to benefit from coordinated and centralized control of network connectivity, services, and support.

More specifically, OneCommunity has partnered with dozens of municipalities to leverage proven technologies, expand and enhance connectivity, lower costs through demand aggregation and increased regional efficiencies, improve productivity, and spur and enable innovation. OneCommunity has also assembled a diverse consortium of technology vendors to address specific government needs and to deliver best-in-class services.

For example, in May 2008, Cuyahoga County announced that it had selected OneCommunity to lead a $15 million initiative to upgrade the County's networking services and address the County's needs for connectivity, security, public safety, and county-wide shared municipal services. OneCommunity responded by developing a partnership with a number of "best-of-breed" technology and broadband providers to facilitate delivery of a range of high-quality broadband capabilities and services. The project provides high-bandwidth connectivity and secure video conferencing to more than 60 county offices and public safety locations; will provide wireless service to the Justice Center, Courthouse, and Administration Building; and will equip County employees with mobile wireless access. This project is not only enhancing the capabilities of municipalities across the County, but will also save the County $10 million over 5 years.

One of the key trends in Northern Ohio is that local governments are increasingly sharing communications infrastructure and services, including GIS, 211, 311, video surveillance, meter reading, and other services that require access to pervasive broadband facilities. OneCommunity is helping local governments to develop strategies that will enable them to benefit collectively from these services to the maximum extent possible.

d.   Public Safety and Emergency Response

OneCommunity has collaborated with the City of Akron and education, health care, community foundations and private-sector partners for a 10-square-mile wireless project that will enhance public safety while providing the public with Internet access. OneCommunity did this by creating a hybrid fiber/wireless network that will simultaneously support public safety (using a 4.9 GHz spectrum) and free public wireless service. As part of this program, which is governed by a community advisory board, the City will obtain enhanced video surveillance for public safety and enhancements to its emergency communications.

Akron's public safety network will:

- Coordinate more effective responses to emergencies across departments and geographies

- Reduce crime with monitoring systems that deter unlawful activity and allow law enforcement officials to react faster
- Enable mobile safety forces to stay in constant communication with control centers, facilitating immediate commands and updates that get responders to the scene quicker
- Allow paramedics to communicate with doctors en route to hospitals.

Meanwhile, the University of Akron is working on a community services program, including help desk services, computer training, and workforce development, in conjunction with the City's community revitalization programs. In Cleveland, OneCommunity is supporting the University Circle Police Department's neighborhood public safety efforts by deploying state-of-the-art fixed and mobile public safety solutions.

e. Economic Development

Economic development does not simply happen on its own. It requires careful planning and community-wide support of strategies that attract and retain desirable businesses. Over the last few years, broadband connectivity has become one of the most important components of an economic development strategy. While the presence of robust broadband connectivity will not necessarily guarantee a community's or region's economic success, the absence of such connectivity will surely impair the community's or region's ability to compete in the emerging global economy. Like roads, electricity and water, robust broadband connectivity has become essential to economic vitality and growth.

At the same time, many communities have come to realize that the interests of private-sector providers of communications services do not always align with interests of the communities they serve. To satisfy the expectations of their shareholders and investors, private entities must generally be able to earn substantial profits (30-40%) on their investments in communications infrastructure within relatively short periods of time (3-5 years). If providers cannot meet these targets in a particular community, they will delay making new investments and continue to rely as long as possible on their aging, existing infrastructure, or they will look for other communities that offer a more favorable investment climate. As a result, communities that want to attract private-sector investments must establish policies that make themselves more attractive than the communities with which they compete in the United States and abroad. OneCommunity has developed strategies that enable communities to do so without sacrificing their own priorities.

More specifically, OneCommunity has reconciled the needs of the public and private sectors concerning the deployment of high-capacity broadband. Rather than create competition among multiple networks, OneCommunity has focused on developing an integrated, open network that is available to multiple stakeholders on a non-discriminatory basis. By creating and aggregating demand, OneCommunity also ensures that its stakeholders will collectively have sufficient "clout" to control network design and to obtain reasonable prices, terms, and conditions from vendors of all kinds, including private-sector communications providers.

Applying these strategies, OneCommunity has, since 2004, raised more than $51 million from foundations, stakeholders, and partners. It has obtained another $18 million to support community programs and initiatives that leverage broadband. It has also produced greater than $15 million in cost savings.

Examples of OneCommunity's efforts to enhance the region's broadband capacity include its partnership with local community providers, public institutions, and private-sector companies. One specific example includes a partnership with Conneaut Telephone Company (CTC), a small regional provider serving rural eastern Ohio that was greatly constrained by the cost of middle-mile access and upstream Internet access. OneCommunity collaborated with CTC to build middle-mile facilities, reducing middle-mile and Internet costs by as much as 70% and enabling CTC to reinvest its net savings in fiber-to-the-home infrastructure and facilities. In addition, CTC and OneCommunity have created a cooperative marketing relationship that enables them to offer low-cost gigabit access to government entities, health care providers, educational institutions, libraries, and non-profit organizations throughout CTC's service area.

As another example, OneCommunity recognized a need to run fiber to 107 public schools in Greater Cleveland. With the schools in financial distress, OneCommunity worked with community leaders to identify sources of funding. The Cleveland Clinic committed $10 million to the project, which served as matching dollars for $8.7 million in federal funds to build out the 18 fiber rings necessary to support the school district. OneCommunity then worked with a local cable company (Adelphia, now Time Warner) to build out the fiber, and OneCommunity purchased the equipment necessary to provide gigabit access to all 107 schools in the district. The schools now routinely conduct high-definition classes, support rich media access, and leverage advanced computer utility programs using virtual desktop strategies. All this greatly increases the quality and reduces the costs of the services available to the schools.

In yet another example, WilTel, Case Western Reserve University, and OneCommunity built much-needed fiber connecting two significant segments of the City of Cleveland in support of programs providing health care, education, and other services to underserved communities in the City. These types of investments have also attracted the interest of private-sector technology vendors that have used OneCommunity programs as test beds to develop new technologies, programs and services. This has brought in tens of millions of dollars in new investments and attracted multiple high-tech and manufacturing businesses to the community.

Additional examples are provided in Appendix A.

The passage of the American Recovery and Reinvestment Act of 2009 (ARRA) has spurred many communities in the region to request OneCommunity's support in developing proposals for federal funding of broadband initiatives. In response, OneCommunity has partnered with more than 50 communities, as well as numerous landline and wireless providers in the region, to develop a middle-mile proposal that would bring 21st century broadband into the rural communities of Northern Ohio. If the proposal is funded, this collaboration of public and private partners will improve the lives of more than 2 million rural Ohioans and will enhance the region's economic viability, affecting over 8 million people.

III.   OBSERVATIONS AND CONCLUSIONS

OneCommunity continues to make great strides toward building and deepening its collaborative efforts and initiatives within Northern Ohio. It has won numerous awards, and its well-

considered and well-executed programs, coupled with its strong record of success in the field, have begun to attract widespread national and international attention. Interest in OneCommunity has mounted with its expansion into new geographic and substantive territories.

We have seen many examples of technology-driven broadband projects in the United States and around the world. These projects often focus on the abstract benefits of high-bandwidth capacity and fail to do what is necessary to enable potential stakeholders to understand and take advantage of these benefits. At the same time, we have also seen a number of broadband projects that emphasize demand-side strategies, albeit at relatively low – some would say obsolete – levels of bandwidth capacity. What sets the OneCommunity model apart is that it combines the best features of both kinds of projects. What's more, the OneCommunity model also replaces traditional involvement models and distinctions (such as the distinction between public and private networks), with creative new vehicles of collaboration that have opened the door to remarkable progress.

The OneCommunity model not only recognizes the intimate interrelationship between supply-side and demand-side issues, but it also promotes aggressive action to address both sides simultaneously. Even more important, the model encourages communities to develop and realize visions of broadband connectivity that are big enough and bold enough to enable them to reap the full benefits of the emerging digital age.

While the OneCommunity model pre-dated the American Recovery and Reinvestment Act by many years, the model's underlying rationale and implementing programs are strikingly congruent with the blueprint for progress that the Obama Administration and Congress set forth in the Act. For example, the Act encourages communities to view broadband connectivity as an increasingly important component of everything that Americans will be doing at work, at home and at play in the years ahead. So does the OneCommunity model. The Act encourages communities to develop trans-sector strategies to use the same broadband infrastructure for as many purposes as possible – particularly for health care, educational, governmental, energy, environmental, and other critical applications – thereby obtaining the greatest value for every dollar of investment, making high-capacity networks affordable, and enhancing long-term sustainability. The OneCommunity model does that too. The Act also emphasizes job creation, economic development, and support for community anchor institutions, public safety, and programs that serve young people, disabled Americans, and populations that have traditionally failed to take advantage of broadband connectivity. The OneCommunity model advances all of these goals and more.

In short, OneCommunity's experience provides an impressive example of what communities and entire regions can do to be successful in the 21st Century. This is not to say that the model will work in all communities or even that the model will continue to be as successful as it has been. Many things could go wrong. For example, as OneCommunity grows and expands, it will have to meet new management and other challenges. Building consensus among key regional and local players may sometimes prove difficult and time consuming. In some communities, the incumbents may be less enlightened and cooperative than the ones with which OneCommunity has been working with so far. Conversely, it is quite possible that the model will work even better in the future, as valuable lessons are learned and incorporated. The one thing we can safely say today is that the OneCommunity model has a good chance of working in

many other communities, and it is certainly worthy of their attention and consideration. Furthermore, as the Federal Communications Commission and Congress develop a comprehensive national broadband strategy, we believe that they should carefully analyze the OneCommunity model as a potential "best practice" for America.

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Appendix A
Examples: Middle Mile Impact on Broadband Availability/Price/Performance

The following mini-case studies are from projects implemented between 2005 and 2009 throughout Northern Ohio and Southern Michigan. These examples are derived from a number of last/middle mile providers and public interest institutions (e.g., government, health, education) that directly benefited from the convergence of last mile and middle mile solutions. In each case, significant value was derived from one or more of the following; increased availability, lower cost, open network providing carrier choice, increased capacity and performance. These case studies are just a few of the representative examples that have played out across our urban and rural footprint.

Last Mile and Regional Service Providers

MMRSP Case Study 1: OneCommunity/Suite 224 Middle Mile Backhaul

Middle Mile Example (Suite 224 - Cleveland – Ashtabula, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Suite 224	OneCommunity/Suite 224
Middle Mile Services	DS3	Fiber/Ethernet 1 G/S
Environmental Situation	High-cost middle mile link driving higher cost to end-users. Reduced internet capacity and increased oversubscription to end-users, affecting their quality of service and upstream capacity; limited upgrade paths due to link saturation	Increased line speed to 1 G/s Ethernet improving backhaul capacity by a factor of 22. Increase Operating Internet Bandwidth to 180 M/s by a factor of 4 improving upstream capacity for Suite 224 end-users
Financial Considerations	$ 7,500 MRC DS3 Backhaul, and $15,000 MRC Internet Service totaling $ 270,000 ARC = to $500 per M/s per month	Reduced cost for Middle Mile Upstream access and Internet by 40% to under $9,000 MRC and $108,000 ARC = to $9 per M/s per month
Middle Mile Alternative	Develop an alternative strategy to backhaul fiber access and Internet. Ability to increase capacity at a marginal cost to Suite 224	Partnership and co-investment to build 30 miles of shared fiber between Cleveland and Ashtabula to Suite 224 data center. Collaboration to extend and aggregate capacity from Ashtabula County through OneCommunity Middle Mile and Suite 224 last mile services to reduce capital expense to manage interconnection
Benefits	Open Network provided choice for upstream network service partners.	Aggregated demand for voice and video services across backhaul to Cleveland. Enabled Suite 224 to invest savings in last mile Fiber-to-the-Home project Enhanced rural Data center access at end point of middle mile network to leverage further cost reductions for ancillary services required

MMRSP Case Study 2: OneCommunity Regional Middle Mile Exchange

Middle Mile Example (Northeast Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	35 Tier 1 & 2 Last Mile Providers	OneCommunity
Middle Mile Services	Fragmented and high cost incongruous last mile services across 22 counties serving the hundreds of hospitals and clinics within the region's health care community	OneCommunity/Suite 224/First Telecommunications with multiple last mile interconnections/services
Environmental Situation	Multi-carrier interconnection requirements with capacity interconnection limitation Limited and fragmented access to lower cost metro Ethernet versus SONET based services High cost middle mile link driving higher cost to end-users Limited choice of providers or upstream service partners throughout the rural community	Multi-carrier interconnection with open gateway and network service exchange capable of expansion at a low marginal cost for service enabling full cost recovery and a return on Investment (ROI) on single point-to-point connections. Deploy shared fiber infrastructure with network services that are capable of increased line speed from 1 G/s up to 10 G/s Ethernet Service where it was not available before. Increase Operating Internet Bandwidth access up to 10 G/s to the regions rural communities.
Financial Considerations	Rural telecommunications costs ranging from 8 to 20 times urban services for 5% to 20% of the network capacity available to urban counterparts (e.g., DS3 at 45 M/s for $8K to $60K MRC in rural Ohio communities compared to 1 G/s Metro Ethernet services from $1.2 to $5K)	Reduced cost for Middle Mile and Upstream access providers by 40% to 60% on average
Middle Mile Alternative	Ability to provide dark fiber, wave or increase ethernet capacity at a marginal cost Create choice of upstream network service partners	Developed 22-county middle mile fiber services strategy with FCC Rural Health Care Pilot Program grant funding along with local multi-stakeholder investment support. Engaged local middle/last mile partners such as like Suite 224 and HomeTown cable for regional middle mile fiber builds/swaps and contracting for local access through an open network exchange to our partners to lower the cost of regional access to the health care and public interest community. Open network exchanges with choice of upstream long haul carriers, Internet, voice and video services. Providing a 1 G/s Ethernet access service access service throughout the region increasing Internet capacity from 10 M/s to 10 G/s
Benefits	Alternative impact on public interest providers throughout the region Leveraged last mile provider access to overcome middle mile barriers for a ubiquitous regional metro Ethernet services	Reduced cost for Middle Mile and Upstream access providers by 40% to 60% on average. Reduced capital expense to manage interconnection Increased Line speed to 1 G/s up to 10 G/s Ethernet Service where it was not available before. Increase operating Internet bandwidth up to 10 G/s in rural Enable connection of public and private networks over a community-wide health information network with public access to the Internet over a shared infrastructure

MMRSP Case Study 3: COMNET Middle Mile Regional Technology Innovation

Middle Mile Example (SONET Middle Mile Transport Network for TDM Toll Trunk Connectivity between BNG Member Offices and Sprint-United/sbc Access Tandem Offices)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Arthur Mutual Telephone Company, Ayersville Telephone Company, Bascom Mutual Telephone Company, Benton Ridge Telephone Company (Benton Ridge, New Bavaria, North Creek Exchanges), Buckland Telephone Company, Farmers Mutual Telephone Company, Fort Jennings Telephone Company, Glandorf Telephone Company, Kalida Telephone Company, Middle Point Home Telephone Company, Ottoville Mutual Telephone Company, Ridgeville Telephone Company, Sherwood Mutual Telephone Association, Vaughnsville Telephone Company	COMNET
Middle Mile Services	Mid-Span Meet Asynchronous OC3 Transport	Need for infrastructure/service upgrade.
Environmental Situation	Financially constrained small tier 1 and tier 2 providers in rural communities building parallel Independent networks across the same geography. Inability for any of the individual providers to justify the Return on Investment to upgrade infrastructure, isolating numerous small rural communities and saddling them with higher-cost, older technology solutions.	Improved Reliability/Survivability of TDM Voice Network for Long Distance Service Improved Reliability/Survivability of TDM Voice Network for Local Services of consumers served by select last mile providers
Financial Considerations	Cost of deployment too significant for any one provider to upgrade middle mile infrastructure.	Neutral. Shared service enabled multiple carriers to justify smaller operational investment rather than a much larger capital investment.
Middle Mile Alternative	Ability to manage carrier common switched access trunk capacity in a timely manner between End Office Independent Operating Companies and Large Tandem Operating Companies Establish Intermediate Hub for effectively managing and accounting for traffic volumes by carrier originating and terminating at the End Office Companies	Partnered with Broadband Network Group Partners and Independents Fiber Network, a Com Net Company Constructed Independents Fiber Network and Leased ~235 route miles of fiber to combine with ~200 Miles of Last Mile Provider fiber facilities. Contracted with Com Net to light and operate an OC12/OC48 Network for carrying carrier common TDM voice trunks between End Office Exchanges and area Access Tandems over a Synchronous, Protected Diverse Route Network Deployed DWDM/Ethernet Mid-Span service offering choice of interconnection and upstream capacity with choice of services.
Benefits	Eliminate Single Points of failure in asynchronous, collapsed fiber routes between end office companies and access tandems Enhanced awareness of network and connectivity with Access Tandems as a collective group with a centralized operating entity for managing carrier relations	Improved reliability of voice network connectivity to rural Independent Operating Companies exchanges Operating Efficiencies through common point for network monitoring and provisioning through a 24x7X365 shared Network Operations Center

MMRSP Case Study 4: COMNET Middle Mile Regional Service Exchange

Middle Mile Example (10Gig Ethernet/1 Gig Resilient Packet Ring (RPR) Transport Network for Enhanced IP Network Connectivity and Services)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Arthur Mutual Telephone Company, Ayersville Telephone Company, Bascom Mutual Telephone Company, Benton Ridge Telephone Company (Benton Ridge, New Bavaria, North Creek Exchanges), Buckland Telephone Company, Farmers Mutual Telephone Company, Fort Jennings Telephone Company, Glandorf Telephone Company, Kalida Telephone Company, Middle Point Home Telephone Company, Ottoville Mutual Telephone Company, Ridgeville Telephone Company, Sherwood Mutual Telephone Association, Vaughnsville Telephone Company, FJ Communications, RTEC, Northwest Net, Wabash Communications, bright.net Ohio, bright.net North, SAA bright.net, TSC, NKTelco, Falcon1, Nova xDSL, Waldron-MI xDSL/WiFi, Ogden-MI xDSL/WiFi and Sand Creek-MI xDSL	COMNET
Middle Mile Services	T1/DS3/OC3 Leased Line Network	Create open network infrastructure environment to interconnect public and private carriers to provide ubiquitous high capacity network services across a cost neutral exchange. T1/DS3/OC3 Leased Line Network Moved to 10G/1G Ethernet Rings
Environmental Situation	Improved Reliability/Survivability of Internet Access Services Availability of Cost Effective Broadband Internet Access Services through Cable Modem, Fiber to the Home, xDSL Service, Unlicensed Wireless and Licensed Wireless Providers Improved Performance through reduced latency made available through cost effective big pipe connectivity to the Internet through Tier 1 Carriers Enhanced customer experience for Broadband enabled services such as VoIP, Streaming Video, IPTV, webinars, etc… Enabled Availability of Linear Cable TV service through MPEG2/MPEG4 Content Delivery System over IP	Developed shared backhaul infrastructure to extend Ethernet services across middle mile service exchange to multiple last mile service partners.

Middle Mile Example (10Gig Ethernet/1 Gig Resilient Packet Ring (RPR) Transport Network for Enhanced IP Network Connectivity and Services)		
	Market Conditions	**Middle/Last Mile Solution**
Financial Considerations	HISTORICALLY-LEASED LINE Unprotected, Non-Diverse Transport Connectivity over Leased line circuits in a Hub and Spoke Configuration. Example: DS3 Leased Line Circuit Wapakoneta Core Router Site to Northwest Net (NWNet) Gateway and T1s from NWNet to Kalida DSL, Ft Jennings DSL, Middle Point DSL, Vaughnsville DSL, Glandorf DSL, Ottoville DSL, NWNet Wireless and NWNet Dial-up PoPs = $17,423.40 MRC for DS3 and T1 Transport Aggregate. Bandwidth = $5,695 for 45 Mbps. For a total of $23,118 MRC = to $513.73 per M/s per Month Ability to reduce or eliminate local loop costs associated with Tier 1/2 DIA Providers.	CURRENT-10G/1G Ethernet Rings Protected, Diverse Route, Diverse PoP Ethernet Connectivity direct from CNI Core PoPs in Lima, OH and Columbus, OH to NorthwestNet (NWNet) Hub, Kalida DSL, Ft Jennings DSL, Middle Point DSL, Vaughnsville DSL, Glandorf DSL, Ottoville DSL, NWNet Wireless and NWNet Dial-up PoPs. Ethernet Transport from 5M-70M per Site = $4,040 MRC Aggregate. Bandwidth =$3,625 per month for 100M Capacity. For a total of $7,665 or $76.65 per M/s per Month. 35%-50%+ Cost Reduction on a per Megabit basis. Ability to secure Aggregate based pricing to reduce the cost for DIA Port and Bandwidth Services from National and Regional DIA providers Ability to reduce or eliminate local loop costs associated with Tier 1/2 DIA Providers. Ability to save Last Mile Broadband Providers significant investment expenses (CAPEX) and monthly recurring operating expenses (OPEX) on feeder network and services allowing them to reinvest in Broadband Infrastructure and offer cost effective consumer broadband access services
Middle Mile Alternative	Ability to establish Network-to-Network Interfaces with National and Regional Tier 1/2 Dedicated Internet Access Port and Bandwidth Providers Ability to aggregate IP Traffic and upgrade connectivity from TDM DS3 and SONET OC3 to Ethernet for delivery to Tier 1 Carriers over Minimum Port Commitment Gigabit Ethernet Connectivity Ability to more effectively manage capacity on Tier 1 and Tier 2 DIA connection by reducing the lead time from 6-18 Months to 30 days or less from date of service order	Partnered with Broadband Network Group Partners, TSC, NKTelco, Wabash Communications, Waldron, Ogden, Sand Creek and Independents Fiber Network, a Com Net Company Independents Fiber Network Constructed and Leased ~235 route miles of fiber to combine with ~200 Miles of Last Mile Provider fiber facilities. Contracted with Com Net to light and operate a 10 Gigabit Ethernet and 1 Gigabit RPR Network for delivering Dedicated Internet Access and Ethernet/IP Enabled Transport services to the Hub of the Last Mile Providers Network through a Synchronous, Protected Diverse Route Middle Mile Network

Middle Mile Example (10Gig Ethernet/1 Gig Resilient Packet Ring (RPR) Transport Network for Enhanced IP Network Connectivity and Services)		
	Market Conditions	**Middle/Last Mile Solution**
Benefits	Eliminate Single Points of failure in asynchronous, collapsed fiber routes in the local loops being utilized to connect rural broadband Network to Tier 1/2 Carrier DIA Points of Presence (PoPs)	Improved reliability of IP Network connectivity to rural Independent Operating Companies exchanges Improved Utilization of DIA Port Connectivity through all Ethernet infrastructure reducing overhead associated with Frame Relay, T1 IMA Groups, DS3 and OCn DIA connectivity Operating Efficiencies through common point for network monitoring and provisioning through a 24x7X365 shared Network Operations Center Enhanced awareness of network and connectivity with Com Net Regional Autonomous Network Number as a collective group with a centralized operating entity for managing carrier relations and Feeder Network/Upstream Connectivity Enabled new service offering with an improved degree of quality and reliability in VoIP and IPTV providing last mile providers with new revenue streams to partially offset declining revenues associated with landline voice services

Public Sector Institutions
PSI Case Study 1: Priority Health Care Connection

Middle Mile Example (Priority Health Care Connection - Cleveland – Ashtabula, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Suite 224	OneCommunity/Suite 224
Middle Mile Services	Long Haul Ethernet Service for IP Voice redundancy	Regional Dark Fiber Connection and fiber swap of last mile/middle mile access
Environmental Situation	High-cost middle mile links compounding costs to organizations requiring facility and path diversity for redundant IP connection for mission-critical data and IP voice Only redundant option available was high cost SONET services at OC-3 level over 60 mile path with mileage sensitive pricing Expensive Capital Expense to terminate and route SONET	Interconnection of networks deploying shared dark fiber and fiber Ethernet equipment services.
Financial Considerations	$ 9,000 MRC $ 108,000 ARC = to $ 58 per M/s	Increased Line speed to 1 G/s Metro Ethernet Service for at $6,000 MRC for 6.6 times greater capacity at a cost savings of 3,000 per month for a 33% reduction = to $ 6 per M/s
Middle Mile Alternative	Leveraged shared middle mile upstream fiber and build to and utilized existing dark fiber in last mile	Partnered with OneCommunity build common link and create network service exchange between middle mile and last mile services. Providing a 1 G/s Metro Ethernet access service access Ability to increase capacity above available SONET speed
Benefits		Reduced Capital Expense to manage interconnection and redundancy Enabled Last Mile Provider to invest revenues to expand last-mile fiber footprint Allow aggregation of member Doctors to communicate regionally when last mile network is complete

PSI Case Study 2: Cuyahoga County Public Safety & Administrative Network

Middle Mile Example (Cuyahoga County, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Time Warner	OneCommunity, at&t , Time Warner, Global Crossing and Level 3
Middle Mile Services	T1s, T3s and Metro Ethernet Services	Providing a 10 M/s to 1 G/s Metro Ethernet access service access based on office needs – matching availability and price Provide open network exchange with choice between upstream providers.
Environmental Situation	Inconsistent availability and pricing of services throughout the county to meet the needs of the over 60 Public safety and administrative offices High cost of last mile and middle mile access links driving higher cost to public safety and county administration offices Reduced Internet Capacity and increased oversubscription to county offices, impacting their quality of service and upstream capacity Limited ability to upgrade to lower cost technology such as VoIP and shared applications such as GIS for county wide deployment	Increasing Internet capacity to 200 M/s up to 1 G/s. Choice of Internet/VoIP upstream providers with redundancy and fail-over architecture
Financial Considerations	$5 Million per year service with 30% reduction in the Cuyahoga County Government IT and Telecommunications budget	Reduced cost for Middle Mile and Upstream access providers by 40%, saving the county $10 Million over 5 years
Middle Mile Alternative	Provide open access gateway to alternative local access and upstream last mile, VoIP, Internet providers enabling the county to aggregate ISP and voice services.	Awarded Competitive contract to OneCommunity Leveraged OneCommunity Middle Mile Fiber to Interconnect best of bread local access last mile providers AT&T and Time Warner based on availability and price to build county wide metro Ethernet network to all the county public safety and administrative offices. Created Choice and multiple low cost options that were unavailable before through a neutral exchange. • Global Crossing and Level 3 as the county's VoIP service partners • Global and Level 3 peering and Internet capacity from 200 M/s capable of 10 G/s.
Benefits		Enabled the Cuyahoga County to interconnect with over 17 municipalities throughout the county to aggregate Internet, VoIP and other municipal services and passing on sharply lower costs as a result of municipal and carrier service aggregation.

PSI Case Study 3: Urban - Cleveland Municipal School District

Middle Mile Example (Cleveland Municipal School District - Cleveland, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	at&t legacy SONET	OneCommunity, Adelphia, Time Warner
Middle Mile Services	T1 & Head-End DS3 with 20 Mbps Internet	New metro fiber network needed to provide upgraded metro Ethernet and the ability to upgrade capacity needs at a marginal cost
Environmental Situation	High cost last mile/middle mile links to connect city wide schools driving higher cost for minimal services to schools and students Reduced Internet Capacity and increased oversubscription to schools, impacting their quality of service and upstream capacity, limited upgrade paths due to link saturation	Need to increase individual school access to 1 G/s for educational and administrative applications and increase operating Internet bandwidth to 200 M/s by a factor of 10 improving upstream capacity for schools and students
Financial Considerations	107 school sites at $ 450 MRC per T1, $5,500 Local DS3 Backhaul, and $1,700 MRC Internet Service totaling $ 664,000 ARC	Reduced cost for Middle Mile Upstream access by 45% to under $3,000 MRC and $36,000 ARC = to $3 per M/s per month Increased Line speed to redundant 1 G/s Ethernet improving backhaul capacity by a factor of greater than 650 times = to $1.65 per M/s
Middle Mile Alternative	Ability to increase capacity at a marginal cost Create choice of data center locations, upstream providers and network service offerings.	Partnered with OneCommunity who collaborated with Adephia and Time Warner to build 18 fiber rings of greater than 100 linear miles throughout Greater Cleveland connecting 107 schools to local data center OneCommunity leveraged the shared infrastructure with Adelphia to create and open 10 G/s gateway for data center, Internet and VoIP access.
Benefits	Reduced Capital Expense to manage interconnection	Attracted $10 Million in local stakeholder investment from the Cleveland Clinic to provide a 15% match to execute $8.7 Million in E-Rate funding for capital and network operating expenses Adelphia invested $18 Million in new fiber construction OneCommunity finance $3.5 Million in network equipment to support network build-out Data center access at end point of middle mile network further cost reductions for ancillary services for the school district Enabled Last Mile Provider to invest savings in last mile Fiber projects throughout the community

PSI Case Study 4: Rural – NOACSC Regional Information Technology Center District Aggregation

Middle Mile Example (Allen, Auglaize, Mercer, Van Wert, Putnam, Allen, Hancock, Paulding K-12 School Districts Connectivity to NOACSC as regional Information Technology Center (ITC))		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Wabash Communication, FJ Communication, KTEC, OTEC, MPHTC, Northwest Net, SAA, GTC, TSC, Fairpoint, Time Warner Cable	COMNET
Middle Mile Services	Channelized DS3 with DS3:DS1 Mux	Provide a Port Rate Limited 1 G/s Metro Ethernet Last Mile Connectivity through partners to the Segment Provider Middle Mile Network.
Environmental Situation	Reduced Capacity due to overhead and increased latency with T1 IMA Groups Inefficient in upgrading capacity and in cost effectiveness as bandwidth demand scaled. Insufficient Transport Capacity and increased oversubscription between school districts and NOACSC as Information technology center (ITC), impacting their quality of service and upstream capacity	Developed shared backhaul infrastructure to extend Ethernet services across middle mile service exchange to multiple last mile service partners. Create open network infrastructure environment to interconnect public and private carriers to provide ubiquitous high capacity network services across a cost neutral exchange.
Financial Considerations	Financially constrained by budget with inability to invest more funding to restructure telecommunications network. T1 Service off State SOMAC Contract 1xT1 P2P $450 @1.5M = to $300 per M/s per Month 2xT1 P2P $900 @ 3.0M = to $300 per M/s per Month 3xT1 P2p $1350 @4.5 M = to $300 per M/s per Month	Reduced cost for Middle Mile and Last Mile transport between NOACSC and school districts while at the same time upgrading them to Ethernet Connectivity end-to-end. School Districts have since been able to justify upgrading bandwidth/increasing utilization of the net due to the volume based reductions Total to reduction on per Megabit basis of 25%-50% E-Line Service BNG Partners 1x2M P2P @ $496 @2M= to $248 per M/s per Month 1x5M P2P @ $816 @5M = to $163.20 per M/s per Month 1x10M P2P @ $1130 @ 10M = to $113 per M/s per Month NOTE: Not included are additional volume discounts that apply on aggregate Network-to-Network Interface with NOACSC at their Hub location in Lima, OH Ability to increase capacity in a timely manner at a marginal cost to NOACSC
Middle Mile Alternative	Established Metro Ethernet between regional Information Technology Center and K-12 School Districts throughout these largely rural counties. Provided for last mile Gigabit Ethernet Connectivity from Segment Provider Middle Mile Network to NOACSC hub in downtown Lima, OH through TSC	Partnered with Broadband Network Group Partners, TSC, New Knoxville and Wabash Communications Provided Port Rate Limiting Minimum Capacity starting at 2 Mbps scaling to 1 G/s Established point-to-point VLANs across 10 Gigabit Ethernet Middle Mile Network of Segment Provider Partners operated and managed under agreement by Com Net, Inc

Middle Mile Example (Allen, Auglaize, Mercer, Van Wert, Putnam, Allen, Hancock, Paulding K-12 School Districts Connectivity to NOACSC as regional Information Technology Center (ITC))		
	Market Conditions	**Middle/Last Mile Solution**
Benefits	Reduced cost for Middle Mile and Last Mile Connectivity associated with point-to-point circuits Reduced NRC Costs and Capital expenses associated with provisioning multiple point-to-point T1s in an IMA Group	Transition fixed and operating expenses so that the transition to a more cost effective high performance service was cost neutral to the ITC and K-12 School District Reduced response time for incremental transport capacity Increased service connection capacity between each school district and NOACSC as network hub Enabled further operating expense savings at school districts by providing cost effective capacity for VoIP services and distant learning application

Public Interest & Economic Development
PI-ED Case Study 1: Urban – City of Akron

Middle Mile Example (City of Akron, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	at&t, Time Warner, Expedient, and Verizon Networks	OneCommunity Public-Private Partnership with the City of Akron
Middle Mile Services	Interconnection across city through multi-provider territory	Needed common infrastructure with gateways to alternative carriers offering a share open and neutral exchange at competitive prices.
Environmental Situation	Fragmented services across carriers driving higher last mile access costs to local public and health care institutions. Competitive environment created gaps in coverage and territory that was only served by one provider and redlining portions of the city.	Need for open network exchange and low cost technology that would expand broadband services throughout the Akron community. Opportunities for aggregation of services to reduce capital and service cost for the public interest instructions throughout the City.
Financial Considerations	High cost middle mile links compounding costs to organizations requiring facility and path diversity for redundant IP connection for mission-critical data and IP voice. Expensive Capital Expense to terminate and route SONET.	Need for comprehensive service created financial barriers for deployment of physical network and City could not manage the integration of multiple networks to cover the gaps in coverage. City of Akron's public safety investment enabled OneCommunity to implement a 4.9 G and 3.65 G WiMax umbrella over the city and provide Free Community WiFi extensions in key underserved and unserved areas of the community.
Middle Mile Alternative	Need for increase capacity above available SONET speed with cost effective pricing. Need to provide ubiquitous citywide broadband solution.	Partnered with OneCommunity leverage existing community assets (e.g., conduit, fiber, buildings) to provide an integrated public safety and community broadband fiber/wireless network. Build utilized existing dark fiber in last mile Providing a 1 G/s Metro Ethernet access service access. OneCommunity w/carrier network exchange with wireless extensions to provide ubiquitous broadband across the City of Akron. Aggregate capacity and provide community access through WiMax/WiFI to underserved and unserved areas of the city. Interconnect local access providers with seamless metro Ethernet
Benefits	Increased fiber line speed to 1 G/s Metro Ethernet Service. Extend wireless access from 3 M/s to 100 M/s.	Reduced Capital Expense to manage interconnection and redundancy. Enabled City extension of fiber to serve the needs of the City while also serving as middle mile aggregation and last mile access for public interest locations. City of Akron's sharing of facilities, conduit and fiber to support the deployment of the city's public safety, Intelligent transportation system, administrative services and community public Internet Access.

PI-ED Case Study 2: Urban – City of Mayfield Village

Middle Mile Example (Mayfield Village, Ohio)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	at&t, Time Warner	OneCommunity
Middle Mile Services	Business park not served directly by local providers.	Need for low cost carrier interconnection throughout business park.
Environmental Situation	Access to broadband in key economic development zones expensive and limited, require expensive fiber builds by carriers to provide site based access for new businesses.	OneCommunity collaborated to build shared business park fiber network that connected individual sites and provides carriers access to lower cost shared fiber infrastructure.
Financial Considerations	High cost last mile access and no means to connect to middle mile infrastructure with expensive site-by-site fiber build for which none of the carriers would invest in.	City of Mayfield Village Contract for one-time fiber construction and interconnection through the OneCommunity Middle Mile network to the regions open network exchange to provide low cost alternatives to multiple local last mile and long haul providers. Fixed cost of entry and new joint venture with OneCommunity to provide alternative broadband and internet access services into the business park.
Middle Mile Alternative	Create attractive broadband solutions that would bring high tech businesses into the Mayfield Village Business Park.	Contracted and partnered with OneCommunity to build and operate the fiber network in the Mayfield Village Business Park. Leverage, share and integrate existing dark fiber with new fiber build connecting the business park and City of Mayfield Village through the county's middle mile fiber infrastructure. Providing a 10 M/s to 100 G/s Metro Ethernet access service access.
Benefits		City of Mayfield Village sharing of facilities, conduit and fiber to support the deployment of the business park development and support the City's need for additional fiber assets. Aggregates fiber facilities and reduces future fiber construction impact to the city roads. Enables businesses to have a choice of broadband services. Attracted multiple high-tech health instrumentation and technology development companies to create a new development focus, creating jobs within the community.

PI-ED Case Study 3: Rural – Coshocton County

Middle Mile Example (Coshocton County)		
	Market Conditions	**Middle/Last Mile Solution**
Provider	Verizon & Time Warner	OneCommunity w/carrier network exchange and Lightspeed Wireless
Middle Mile Services	Interconnection across city through multi-provider territory, limited fiber and virtually no wireless service options.	Common fiber and wireless infrastructure with gateways to alternative carriers offering a shared open and neutral exchange.
Environmental Situation	Small rural county with little to no community fiber and minimal broadband availability at high cost. Businesses threatening to leave unless the county could help bring broadband into the community. (e.g., cheese factory, and multiple small businesses) High cost last & middle mile links compounding costs to organizations requiring facility and path diversity for redundant IP connection for mission-critical data and IP voice. Little to no fiber infrastructure and limited wireless access in parts of the county.	Collaborative shared network infrastructure is needed to aggregate demand and develop a community business model and ROI that would support the deployment of the needed broadband infrastructure.
Financial Considerations	County tried to entice Verizon and Time Warner to build capacity and were told it would take a significant investment by the county to bring additional fiber infrastructure. They were told there was no ROI and nobody need that kind of capacity.	Local aggregation greatly reduced the overall costs and immediately attracted 100's of local businesses at fair market rates from $30 to $800 per month. For 1 M/s to over 40 M/s services.
Middle Mile Alternative	Ability to provide broadband services in any form to local businesses. High capacity fiber needed for local rural hospital and schools and some form of affordable broadband to connect county and municipal offices. High capacity wireless needed to reach remote locations throughout the county.	Partnered with OneCommunity leverage existing community assets (e.g., conduit, fiber, buildings) to provide an integrated public safety and community broadband fiber/wireless network. OneCommunity was able to leverage its Rural Health Care Pilot Program grant to bring fiber to the community and partnered with small wireless provider to connect, the county, city and local hospital as anchor tenants. Build middle mile and last mile dark fiber to provide a 10 M/s to 10 G/s Metro Ethernet access service access along with wireless last mile to public interest, community businesses and consumers.
Benefits		Allow aggregation of public interests to anchor fiber build that would bring broadband to the county, hospitals and schools and in parallel bring broadband to the community businesses and consumers. Was able to provide the needed bandwidth to keep the cheese factory and other local businesses from leaving Coshocton.