

**From:** [Tom Hertz](#)  
**To:** [BOCrfc2015](#)  
**Cc:** [Dave Lunemann](#); [Scot J. Eberle](#)  
**Subject:** Re: Broadband Opportunity Council - refiling of comments  
**Date:** Tuesday, June 09, 2015 2:53:31 PM  
**Attachments:** [NFCU 1.pdf](#)  
[ATT00001.htm](#)  
**Importance:** High

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The attached is a one-document compilation in PDF format of the three separate docs sent to you in the email below. Also, please note the op-ed piece was submitted to the Wall Street Journal but not published.



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Date: June 9, 2015

To: Broadband Opportunity Council

From: Fiberutilities Group, LLC  
Cedar Rapids, IA

Re: A National Fiber Utility Plan

Long-time telecom industry veterans Clark McLeod and H. Brian Thompson formed Fiberutilities Group, LLC in 2004. The early days were focused on building consensus for shared-use/open access networks in the central US. Out of the experience gained, and based on research of successful projects outside the US (such as Sweden's Stokab - <http://www.stokab.se/In-english>), FG realized its shared network plans were scalable. Starting in 2009, FG built an engineering-based economic model that allowed testing multiple assumptions and variables to support a plan to meet the growing and difficult-to-meet broadband transport requirements of our nation. The focus remained on treating fiber cable as critical infrastructure, open to all users with direct government involvement in the creation process. For the effort to move forward, FG believed national leadership at the highest level was a threshold requirement.

The approach was based on the premise that if the US were to keep pace with the rapidly increasing national and international requirements for access and transport of broadband data, then leadership and coordination were essential to do something that our existing infrastructure providers were both financially and structurally unable to do. FG developed a detailed plan with specific recommendations (white paper attached) and a strategy for trying to create broad based support for such an effort. They also drafted op-ed pieces to respond to nay-sayers of the developing broadband plans. (one such piece attached).

Clark and Brian began to build a consensus for that effort through a series of high-level meetings and briefings with the FCC, the NTIA, the Department of Transportation, and the White House as well as advisory organizations such as AASHTO in an effort to include state policymakers in the discussions. They met with current and former members of the US House and Senate on appropriate committees related to the topic as well.

The initial meetings started in December 2009 with the Chairman of the FCC Broadband Taskforce. In March 2010 we met with the FCC Wireline Competition Bureau Chief and her staff. The meetings continued in July 2010 with several members of the House of Representatives followed by very detailed meetings with the NTIA Assistant Secretary and his staff at the Department of Commerce followed by a meeting with the Chairman of the FCC.

In August 2010 at the behest of the FCC Chairman, we initiated discussions with the policy staff of the Department of Transportation who have oversight of the national highway programs and

in October 2010 with the White House Chief Technology Officer for Telecommunications and various other White House supporting staff organizations.

In 2011 we held follow-up meetings in January with the NTIA Assistant Secretary and in February with the AASHTO Executive Director and his program staff as recommended by the DoT policy members in an effort to enlist the involvement of the state transportation organizations. That same month we met with members of the Senatorial staff and several senators concerned with telecommunications policy to ensure they supported such an effort. In July we met with Robert Wolf (UBS) who decided to put the program on the agenda of the Productivity Commission of which he was a member, and later that month met with Bill Daley (WH Chief of Staff) in an effort to crystallize White House support for the program.

As detailed above, the meetings and contacts were broad based and extensive throughout 2010 and 2011. While virtually all the discussions were positive and virtually all of the government leaders and their staffs were supportive of the need, no one was willing to sponsor or “champion” the effort in the then-difficult economic environment.

FG believes the need for a national critical infrastructure supporting nationwide connectivity has become more appropriate than before. We believe enough in the approach to dedicate a renewed effort to move the planning forward, so we are pleased to present an update to our proposals for your consideration.

Clark McLeod and Brian Thompson

See attachment: Wall Street Journal Editorial Submission

## Wall Street Journal – Editorial Submission

The Obama Administration has set in motion several initiatives as part of the economic recovery program, focused on enhancing the availability of “broadband” in the nation. Those initiatives are being handled by several departments of the government almost all focused on broadband access and “final mile” networks. The FCC has been tasked to develop a broadband plan that will be completed next month and is assumed to become the policy plan by which this administration will guide those efforts in the future. The WSJ published an opinion piece a few weeks ago suggesting that the FCC plan was headed in the wrong direction. Several ads have been aired by incumbent telecom and cable companies as well as special interest groups in DC, implying that the broadband needs of the nation were and are being well met solely by the private sector and especially these companies.

In our view, all these efforts are directed at the wrong issues at the wrong time. The “elephant in the room” and not apparently addressed in any of these proceedings, is that we are about to fall woefully short in a very short time of the essential facilities needed to sustain the explosive demand for open and available bandwidth and connectivity in our nationwide communications infrastructure, i.e. the backbone we will depend on for decades to ensure technological development and leadership of our country in the world economy, not to mention the jobs that flow from that leadership. The recent announcement of Google’s plan to provide such connectivity in various parts of the country underlines that crying need.

The problem we face as a nation is NOT broadband access, or development of electronic equipment that will “hang” off that access network, or even that there isn’t enough wireless spectrum in the hands of the private sector. The fundamental problem we face and have been trying for more than two decades to solve is that our “information superhighways” are not super, are not highways, and are essentially controlled by large telecom companies hell-bent on maximizing their returns on those now antiquated facilities rather than creating the capacity, coverage, and availability of optical fiber network our nation needs at a reasonable cost.

We are rapidly approaching a train wreck in our telecom business because our policy makers are still talking about the Internet and broadband as the limiting factors. Forget about the internet and how much bandwidth is available at your home or mine. Unless we start now to build an extremely robust nationwide optical fiber network – an Interstate Fiber Utility – we will see huge shortages, or unreasonably highly priced capabilities to communicate effectively in the near future. Our wireless access networks are running out of gas in many cases because of both the lack of efficient use of spectrum as well as the fact that the terrestrial networks that carry all that explosive new traffic to and from those towers are becoming rapidly saturated. And the same seems true about the famous Internet “peering points” across the country and around the world..

This Administration must recognize, as have the governments in Australia and the U.K. most recently regarding their countries, that if the US is going to be a factor at all in the

new broadband world of the 21st Century, we truly need to redirect the nation's attention to leading, stimulating, and supporting a program to create an optical fiber infrastructure build along the breadth and depth of the nation. We have proposed such a program to the FCC, one that must be, for many reasons, in the form of a public sponsored, private corporation, like Comsat was in the 1960's. This would be a major private sector managed initiative to create real jobs in the short term and a significant employment opportunity in the medium and longer term in the highest technology sector imaginable. The public sponsorship would entail forming the company, providing an initial guarantee to its debt requirements, and establishing the parameters of ownership. It could and should be a true utility, built along the Interstate Highway System already in place, providing essential facilities (dark fiber capacity and conduits) for all the nation's needs, public and private, national security, government needs, health care initiatives, our vast education sector, entrepreneurs and content providers, and our telecommunications carriers and service providers wherever they are or want to compete.

We presented just such a proposal to the FCC in December 2009 – in the public record – and we have no way of knowing at this point if they have taken notice of our suggestion. We have begun to circulate the background white paper to people of interest and influence as well. The research on this project is detailed; the cost of about \$20 billion to reach within 5 miles of 90% of the population is incredibly modest and could generate hundreds of billions of added investment to simply take full advantage of this infrastructure. The engineering and estimates are real. The concept is hauntingly simple. And the results could rebuild our economy much as the Interstate Highway System did in the 50's, NASA and Comsat in the 60's and 70's, the Panama Canal at the turn of the century, and the TVA did regionally in the 30's. All were built in difficult economic circumstances and with great negative outcry from powerful interests vested in stopping those initiatives. They all took truly bold support and underpinning by the President and the Administration, and Congress played a major role in each, especially as the public value began to gain awareness.

We need a new policy approach to our telecommunications infrastructure, we need to retake leadership in the country and the world in this sector, and we need to recognize that all good things that create economic leadership in our country don't always come from private sector interest and intelligence. This area is one where public initiatives are truly needed, and the private sector will be the clear beneficiary if it is done properly, both in the US and the rest of the world.

By the way, the vaunted "broadband" and the Internet are simply access and transport technologies, as is wireless. Your call, Twitter, Face book entries, and email all enter and exit a massive, complex and increasingly congested terrestrial network – mostly optical fiber – and also increasingly controlled and allocated by the plans and desires of fewer and fewer companies. We need a national, robust, and economically efficient information backbone in this country and it needs to come very soon.

We invite you to look further at our web site, and to give us the benefit of your thoughts and insights as we try to move this initiative to reality.

# # #

Clark McLeod and H. Brian Thompson are co-founders of Fiberutilities Group, LLC, which provides “high level connectivity solutions” to healthcare providers and to enterprise clients. The “Interstate Fiber Utility” white paper can be found at [www.fiberutilities.com](http://www.fiberutilities.com)



**An Interstate Fiber Conduit Utility (IFCU): Critical Infrastructure for the 21<sup>st</sup> Century**  
*White Paper*  
*January 2011*

*Prepared by:*  
Fiberutilities Group, LLC  
222 Third Street, SE, Suite 500  
Cedar Rapids, IA 52401  
(319) 364-3200  
[www.fiberutilities.com](http://www.fiberutilities.com)

## AN INTERSTATE FIBER CONDUIT UTILITY

*“The basic fallacy is the assumption that broadband service is fundamental. It is not. CFR (Copper, Fiber, Radio) is fundamental.”* Bob Frankston<sup>1</sup>

Without CFR, broadband service doesn't exist. It's that simple. CFR is absolutely fundamental because it is the infrastructure that powers 21<sup>st</sup> century communications and bridges the global community. The purpose of this white paper is to outline how an Interstate Fiber Conduit Utility (IFCU) would serve as an essential, cost-efficient infrastructure to meet the country's broadband needs and, at the same time, help transform the American economy.

### INTRODUCTION

There is no better example of what is meant by “essential infrastructure” than the country's 160,000 mile National Highway System (NHS), comprised of both interstate and national highways. It is open to all, operates on a non-discriminatory basis and offers the physical assets necessary for an agreed upon public purpose. Further, it is priced at cost and its ownership and operation falls within the realm of government.

*Our unity as a nation is sustained by free communication of thought and by easy transportation of people and goods. The ceaseless flow of information throughout the Republic is matched by individual and commercial movement over a vast system of interconnected highways crisscrossing the country and joining at our national borders with friendly neighbors to the north and south.*

*Together, the united forces of our communication and transportation systems are dynamic elements in the very name we bear—United States. Without them, we would be a mere alliance of many separate parts.*

President Dwight D. Eisenhower  
February 22, 1955

Now, the country is at a point in which a new kind of “essential infrastructure” is needed. Creating a low-cost network support infrastructure by leveraging the established rights-of-way of the NHS will empower individuals, businesses, municipalities and countless other entities to fully realize the benefits of very high-speed broadband connectivity anywhere and everywhere.

Based on the utilization of “dark fiber” and the installation of empty conduits for additional dark fiber, an IFCU would have a national presence offering open and virtually unlimited capacity<sup>2</sup>. It would

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<sup>1</sup> Bob Frankston worked on the Multics projects as well as used the predecessor of the Internet beginning in 1969. Commercially, he supported online services since 1966. In 1979, he went from the mainframe world to the PC industry and co-founded Software Arts with Dan Bricklin, where he implemented VisiCalc. He was with Lotus Development from 1986 to 1990 where he created Lotus Express (and started Lotus.com though it was before the Web). He was at Microsoft from 1993 to 1998 where he championed "IP Everywhere" thus making networking accessible to consumers as "Home Networking". He is now pursuing a number of projects among them, trying to explain the larger concept of ambient connectivity. See <http://frankston.com>

provide ubiquitous and affordable connectivity at a fraction of today's costs; dramatically improve the security, stability, and growth of the public Internet; have a profound impact on the economy and creation of new jobs; and position the United States as the global leader in open access fiber infrastructure.

## INTERSTATE FIBER CONDUIT UTILITY

The IFCU would deploy several empty conduits for later deployment of fiber cables within those conduits. It would also utilize at least one of the conduits to install “dark fiber,” which refers to fiber optic cables that are deployed without the electronics needed to activate or “light” the individual fiber strands contained within the cables.<sup>3</sup> The deployment would use the rights-of-way of the entire NHS and the IFCU structure would be specifically designed to allow users to lease empty conduits and/or dark fiber at the individual fiber strand level. Users could be the federal government, other public entities, private entities operating for any public or private purpose, and will specifically include the existing telecom carriers.

The IFCU could be owned and operated by a private, publicly traded company with the federal government providing loan guarantees and buying a substantial portion of the total available capacity.<sup>4</sup> The mission of the IFCU would be to provide dark fiber and empty conduits on a cost-effective basis—with the exception of first/last mile connectivity—to the following networks:

- **Public Purpose Networks** – These networks serve community anchors, such as public safety agencies, health care providers, educational facilities, and libraries, as well as local, state, and federal governments. Depending on their level of need and expertise, these entities would use some combination of dark fiber and empty conduit for network creation.
- **Entrepreneur and Enterprise Networks** – These private, vertical “intranets” provide highly secure, very high capacity connectivity to new and existing businesses, and “unload” their traffic from the public Internet. Private networks would most likely use dark fiber to create highly secure, purpose-built networks for their own use.
- **Carrier (Wireline and Wireless) Networks** – These networks serve existing carriers and would be used for augmenting and enhancing carrier capabilities, especially their ability to expand coverage of next-generation wireless networks with very high speed backhaul (recognizing that

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<sup>2</sup> Capacity is constrained not by the fiber, but by the electronics that “light” the fiber. In addition, using multiple light paths (lambdas) on the same fiber eliminates almost all capacity issues and allows completely separated users on the same physical medium without any possibility of interference. Current theoretical limits are estimated at 200 terabits of data per second per strand of fiber. One Terabit is 1,000 Gigabits per second.

<sup>3</sup> The majority of the cost of construction for any fiber optic network lies in the construction process, with the cost of the fiber itself a significantly smaller portion. By placing fiber in conduits, replacement or upgrading is much less expensive than construction of a completely new fiber route. The industry has developed techniques for “blowing fiber” into previously installed conduit at a significantly reduced cost.

<sup>4</sup> “Capacity,” in this context, is used in its generic sense, with the Federal Government getting access to sufficient dark fiber or empty conduit to meet its current and planned future needs. See footnote 8 below, and also the discussion below in the section entitled “Public Ownership.”

most wireless towers parallel the highway system). Existing carriers would be the most likely customers for empty conduit, given their expertise in fiber installation, activation and operation.

The IFCU approach recognizes that the Federal Government can provide highway rights-of-way and that as a loan guarantor (and ~~anchor tenant~~), it can provide the necessary impetus for state and local government cooperation with a publicly traded company creating and operating the IFCU. Additionally, the cost of constructing the infrastructure is relatively independent of the number of optical fiber strands in a cable or the number of empty conduits installed at the same time. Installing and/or activating dark fiber is left to users and is independent of the dark fiber and conduits that would be provided by IFCU. Moreover, the applications enabled by users can be provided independently from the operation of the dark fiber/conduit infrastructure.

## **JUSTIFICATION**

Creating the IFCU would have a significant, positive impact on a number of fronts. The current approach to network deployment—an illogical and highly inefficient practice involving multiple construction projects and multiple owners throughout the same rights-of-way—would be replaced by a more streamlined, logical, and cost-effective approach. The NHS rights-of-way are a public resource, and an IFCU would take advantage of that resource. By implementing a policy of ~~digging once~~” for construction, installing very high fiber count cables along with empty conduit for those entities that wish to install their own fiber and for future expansion and by limiting the ongoing operational and maintenance complexities of multiple owners building in the same physical rights-of-way, the IFCU would create significant cost and operational efficiencies.

IFCU would also make available an abundant supply of dark fiber and conduit for countless public and private uses, including:

- Enhancing the government’s ability to fully enable Public-Purpose Networks;
- Creating a business-friendly environment for Entrepreneur and Enterprise Networks; and
- Providing an opportunity for Carrier Networks to expand and enhance existing carrier services.

Creating and operating empty conduit and dark fiber as a shared, open, equal access —utility” would firmly establish the basis for much lower cost structures for all networks. The savings from ~~digging once~~” and a single utility approach frees up billions of dollars for government, entrepreneurs, enterprises, and carriers to fund new approaches and applications that will improve the end user’s experience.

## **THE UTILITY CONCEPT**

Utilities, whether owned by the government or by private entities, provide a fundamental service, lower costs because they are shared, are open to all on a neutral basis and empower commerce and connectivity. Just as the NHS was created to meet the very real transportation needs of Americans in the 20<sup>th</sup> century, the IFCU would serve the same essential, unifying purposes in today’s increasingly interconnected global community.

## **EFFECT**

The creation of the IFCU would positively impact nine out of ten Americans. Since 90 percent of the United States population is within five miles of the NHS, interconnection would become more

affordable, allowing private and/or public/private initiatives to create local broadband solutions using very high speeds in a very secure environment for their customers and constituents. Further, because almost 70 percent of the NHS runs through rural areas, an IFCU would remove the rural distance penalty and greatly improve broadband connectivity between rural and metro areas of the country.

Counties that contain NHS highways also host 99 percent of all jobs in our nation, including 99 percent of manufacturing jobs, 97 percent of mining jobs, and 93 percent of agricultural jobs.<sup>5</sup> Because of the high fiber count and potential interconnection points at easily reachable locations, the IFCU would provide the required public access framework for new and existing last mile connections, including critical community anchor institutions.

Through the creation of “fundamental” fiber infrastructure resulting in lower cost and higher speed broadband, the IFCU would positively impact the lowering of green house emissions by reducing the need for personal/business travel.

### PLANNING, BUILDING AND OPERATION

The IFCU will be planned, built and operated by a private, publicly traded utility that is non-carrier affiliated and non-vendor affiliated. This is essential in order to assure neutral, open, non-discriminatory access to any entity wishing to use the conduit or dark fiber to create broadband networks for public or private use. The IFCU would contain empty conduit plus hundreds of individual fiber strands installed in the established rights-of-way of the 160,000 miles of interstate and national highways that comprise the NHS (see Figure 1 below).

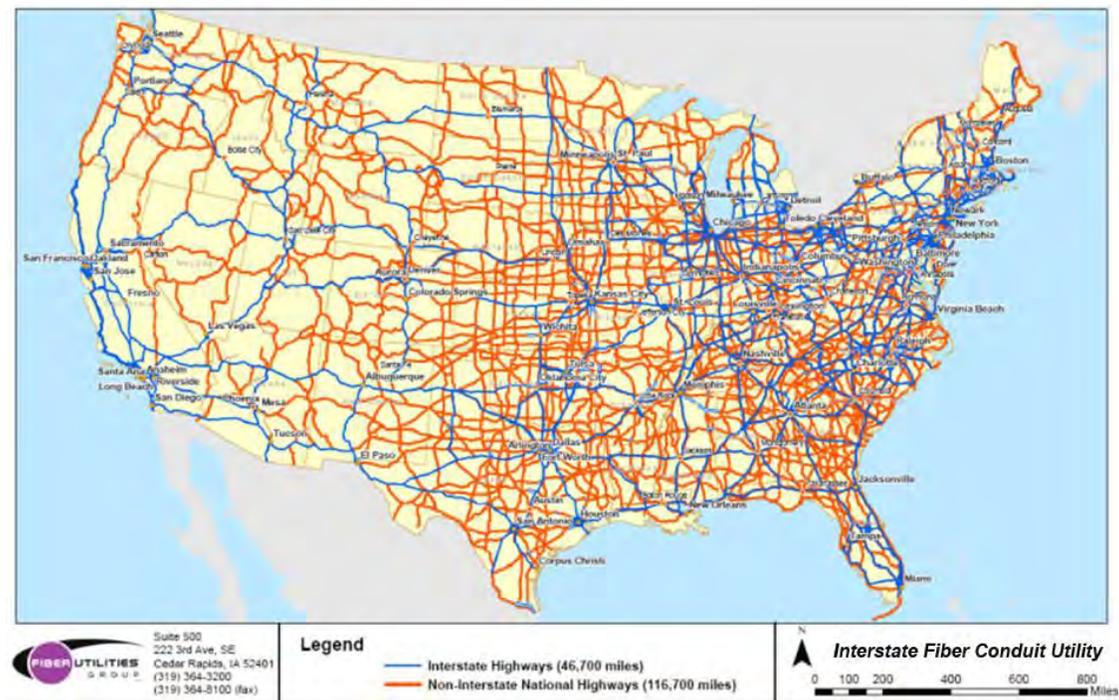


Figure 1

<sup>5</sup> The National Highway System: A COMMITMENT TO AMERICA'S FUTURE by Rodney E. Slater, Federal Highway Administrator, FHWA, PUBLIC ROADS On-Line (Spring 1996). <http://www.tfhr.gov/index.html>

The general approach of the IFCU is to create local access at every conceivable point via “local” conduit and dark fiber cables to enable users to gather traffic and deliver it to access “plazas” or service centers at regeneration sites, approximately every 30 to 60 miles. These plazas could greatly improve the ability of users in rural areas to connect with metropolitan areas. Transit or “express” conduits and dark fiber cables between the plazas could connect to major points of presence in metropolitan areas. The plazas/sites could be established with initial structures/huts, power and generators, but without the electronics needed to activate the dark fiber.

As noted above, the resulting infrastructure would be managed by a private, publicly traded company as a “utility,” with uniform standards for interconnection. As also noted above, users could be Public Purpose Networks created by various levels of government; Carrier Networks created by telecom carriers for augmenting, connecting or extending their existing networks; Entrepreneur and Enterprise Networks, both public and private, creating purpose-built networks for their specified uses and users; and any other entity that needs highly secure, limited access connectivity between two or more geographic points.

- An estimated capital budget of \$19.3 billion to \$21 billion<sup>6</sup> would cover the total capital costs required for deployment of dark fiber plus additional, empty conduits along the 46,700 miles of interstate and 116,700 miles of national highways. Annual IFCU operating costs are estimated at \$114 million per year and would be covered by user fees. The Federal Government could contract with qualified private entities for staged operational support during construction and initial deployment.
- The project can begin immediately upon approval and a commitment by the Federal Government to acquire and pre-pay for a significant portion of the installed infrastructure.<sup>7</sup> If given high national priority, it can be completed within five years.
- The IFCU would be operated on a completely passive basis, meaning the actual activation of any fiber-based connectivity solution would be left to users.<sup>8</sup>
- Typical contracts for the use of fiber strands or conduits would be for five to twenty-five years and would mirror current Indefeasible Right of Use (IRU) agreements used in the telecom

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<sup>6</sup> The lower number is based on three conduits with one 864-count fiber cable; the higher number includes three additional empty conduits along the entire 160,000 miles of the NHS. Lighting one pair of fibers with multiple wavelengths for the entire route for network management purposes would cost about \$800 million, and would, by itself make tens of Gigabits of capacity available for, *e.g.*, the Federal Government.

<sup>7</sup> The Federal Government could, for example, reserve one-third of the conduit, one-third of the installed dark fiber for a pre-payment commitment of one-third of the construction cost.

<sup>8</sup> In current network terminology, the IFCU would consist of empty conduit plus some dark fiber (no electronics) operated and controlled at the physical layer only (Layer 1 for fiber, Layer 0 for empty conduit). Users would add electronics to light their leased fiber strands in a manner and using the technology chosen by them (Layer 2 and above), paying only for the right to use the dark fiber for a period of time, and at an allocated rate (*e.g.*, based on the number of fibers leased to the total number of fibers available) that covers operational costs and provides a reserve for future growth, extensions, moves, adds, and changes. Conduit users could install their own fiber, then light and use it in any manner they choose, paying only for the right to use the conduit for a period of time, and at an allocated rate (*e.g.*, based on the number of conduits leased to the total number of conduits available).

industry. These agreements would be subject to forfeiture if the fiber strands are not activated/installed or in use by or for a designated period of time.

- A neutral (non-carrier) private utility company could operate and maintain the infrastructure, as well as manage and facilitate interconnection to leased dark fiber strands for IRU holders and conduit lessees.
- Depending on the structure of the utility, the Federal Government could have some oversight responsibilities.<sup>9</sup>

The IFCU approach allows for maximum flexibility and control because users provide the electronic and optical equipment technology needed to activate or “light” their leased fiber strands, or provide their own fiber in leased conduit. Because the IFCU would be passive, it would not be subject to obsolescence during the life of the fiber and conduit. As fiber transmission technology changes, users could take advantage of those changes by adjusting the way they use the dark fiber infrastructure without the necessity of new infrastructure deployment.<sup>10</sup>

Although an IFCU would be owned, maintained and managed as a utility open to all users, those that choose to use it will maintain full operational control of the connectivity they create on the dark fiber strands they use and the conduit they lease. This is a profound benefit of the IFCU approach. While other strategies rely on regulatory manipulation of privately owned networks, the IFCU allows individual users to control their own networks and serve as the primary drivers of access and, ultimately, cost.

## **A PUBLIC-PRIVATE PARTNERSHIP**

While it is certainly possible for the Federal Government to choose full ownership and financing of essential infrastructure, the IFCU proposal envisions a public-private partnership approach in which the IFCU is formed as a publicly traded, private company. The Federal Government would act as project catalyst by providing initial loan guarantees. It would also provide partial capital funding by prepaying for a substantial portion of the dark fiber and conduit space, as well as helping to secure uniform access to rights-of-way.<sup>11</sup> The remaining needed capital could be raised via a public stock offering. The FCC crafted such a model of public/private partnership when implementing the Satellite Act of 1962 (see more details on this Act in the Precedents section below). The Federal Government’s contribution should also be measured by its commitment to become the world leader in providing broadband services to its citizens. Ultimately, the price of broadband as delivered depends on the level of federal funding for pre-payment plus the amount of private investment available. The goal of the IFCU approach is to ensure that fiber strands and empty conduits can be leased at a very low price to any public or private

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<sup>9</sup> The Tennessee Valley Authority is one possible model for governmental oversight. Another is the Satellite Communications Act of 1962. See the text in the “Precedents” section below.

<sup>10</sup> The actual life of fiber optic cabling is dependent on many factors but is generally assumed to be at least 25 years. Considering that practically all existing long-haul fiber plant in the U.S. was built in the 1980's and 1990's, A significant portion of this fiber may not be fit for the kind of very high-speed (10 Gbps or more) networks now being deployed. Thus, the IFCU is ripe for implementation.

<sup>11</sup> The intent is to have a self-sustaining operation once deployed, with user fees sufficient to cover operations, maintenance, and upgrades. Initial government investment is the catalyst for infrastructure creation.

entity, while still covering operations and maintenance costs in addition to a regulated return to the public shareholders.

Other nations are aggressively moving ahead with similar infrastructure projects that rely heavily on partial public funding, private partnerships and wholesale open access. Those countries are leading the world in broadband deployment.

- The Australian government intends to spend \$43 Billion (AUS) to subsidize construction of a next-generation, open access fiber optic network. The network will connect 90% of homes and businesses in Australia with speeds of 100 Mbps and will serve the remaining 10% by next generation wireless and satellite. Access to the network will be offered wholesale to all service providers. The Australian government will establish a new company that will own 51% of the network, with private companies invited to invest and provide technical expertise and resources.
- Singapore is developing its next generation fiber-to-the-home National Broadband Network (NBN). Singapore's Infocomm Development Authority selected a private firm to design, build and operate the NBN's fiber passive infrastructure, and will be given a grant of up to S\$750 million. Another private firm, Nucleus Connect, was selected to design, build, and operate the NBN's active infrastructure and provide wholesale broadband connectivity to other operating companies and retail service providers.
- The Netherlands is a leader in European broadband, which is attributed in part to considerable government and municipal investment in fiber broadband infrastructure. While the Dutch government firmly believes in market forces shaping the next generation broadband infrastructure, it also sees the value of public-private partnerships and its role as stimulating development and competition, as well as providing aid and incentives. It established The Nederland Breedbandland, a public-private partnership, as an organization to bring together participants in the broadband industry, trade organizations, and the government to encourage broadband deployment and use. The Dutch government has provided \$155 million in grants for three high-speed networks for research, as well as limited funding for municipal networks.

## **IMPACT ON PUBLIC INTERNET**

Without question, the impact that the IFCU would have on the public Internet is profound. While the consensus is that it is unlikely anyone could bring down the entire Internet, there is little doubt that there are major problems that an IFCU would address. With a newly created fiber infrastructure in place, and countless new independent and unaffiliated networks created, a huge volume of traffic would be "unloaded" from the public Internet onto the IFCU networks—which ultimately would have a positive impact on privacy, piracy and capacity issues.

## **IMPACT ON THE ECONOMY**

There is no way to accurately project the precise impact the IFCU would have on the American economy and jobs. While the creation and growth of the Internet has reshaped and transformed the nation's economy, that impact has only been measured by looking backward. There are numerous studies addressing the impact of "broadband" on economic factors. For instance, two recent studies

project the creation of 50 jobs per each \$1 million invested in broadband. Based on that scenario, an IFCU would create, directly and indirectly, 950,000 jobs.<sup>12</sup>

However one measures the “jobs” impact, there is no doubt that the availability of low cost dark fiber plus empty conduit will spur an enormous amount of entrepreneurial activity, which is the true engine for jobs in the American economy. In the same way that the NHS transformed 20<sup>th</sup> century America, an IFCU would catalyze entirely new categories of employment with incalculable benefits for the 21<sup>st</sup> century and beyond.

## PRECEDENTS

There are at least two instances in U.S. history that demonstrate how government efforts, such as the IFCU proposal, have completely reshaped the American landscape.

- The Interstate Highway System (which is part of the NHS) championed the evolution of efficient, cost effective travel and transport of goods and services. This visionary approach resulted in the largest and most successful public works project in American history, and helped launch the huge economic expansion years of the 1960s, 70s 80s and 90s.
- The Satellite Act of 1962, established during the Kennedy Administration, created a government-sponsored company with partial public ownership (a public-private partnership) for domestic and international satellite deployment that provided Americans with an alternative route and technology to meet their communications needs. This satellite deployment was the forerunner to satellite delivery of TV programming and is credited with the formation of the cable and satellite TV industry as it exists today.

Both of these established precedents could serve as foundational models for the implementation of the IFCU.

## CONCLUSION

An IFCU would set the stage for a new age of global communication and American economic growth. Creating an abundance of dark fiber and empty conduit for new fiber deployment is “fundamental” for providing the infrastructure that supports broadband services, and an IFCU will drive the cost of a new fiber infrastructure to a fraction of what is spent today. In sum, an IFCU would:

- Provide for the logical and efficient use of highway rights of way by “digging once”
- Allow multiple access points to users for simplified networking
- Share essential fiber infrastructure among many users thus spreading costs and ultimately reducing prices for services
- Enable Public Purpose Networks by connecting community anchor institutions as well as local,

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<sup>12</sup> Information Technology and Innovation Foundation, a technology think tank, and Speed Matters, the campaign of the Communications Workers of America: “For every \$5 billion dollars invested in broadband, according to the two groups, 250,000 jobs are created, including 100,000 direct and indirect jobs from telecom and IT equipment spending plus another 150,000 in “network effects” spurring new online applications and services.”

[http://broadbandcensus.com/2009/07/broadband-investment-spurs-business-growth-and-job-creation-studies-find/?utm\\_source=BroadbandCensus.com+Latest+News&utm\\_campaign=effedb47ec-News\\_Alert\\_07247\\_24\\_2009&utm\\_medium=email](http://broadbandcensus.com/2009/07/broadband-investment-spurs-business-growth-and-job-creation-studies-find/?utm_source=BroadbandCensus.com+Latest+News&utm_campaign=effedb47ec-News_Alert_07247_24_2009&utm_medium=email)

state and federal governments, to share resources and become part of the world community

- Enable Entrepreneur and Enterprise Networks by allowing the provisioning of alternative infrastructure for vertical ~~“Intranets”~~ dedicated to various sectors of the economy, thus creating jobs in existing companies and new jobs in entrepreneurial companies
- Enable the focus of private sector Carrier Network construction to be on last mile connections allowing them to provide more and better services based on lowering the cost of ~~“fundamental”~~ inputs/infrastructure for their products, as well as providing a huge increase in the availability of wireless backhaul, thus speeding the adoption of truly expansive, high speed wireless access
- Enable carriers to secure empty conduit for expansion and upgrading and replacement of their existing fiber networks without the necessity for costly construction programs and difficult rights-of- way issues
- Remove the ~~“distance penalty”~~ for rural areas thus encouraging the spread of economic development to those areas and connecting all areas of the country regardless of location
- Make America the world leader in open access, dark fiber infrastructure

By focusing on the fundamental challenge, the IFCU would provide a logical and cost-effective path towards achieving the stated goal of the FCC to provide ubiquitous, high speed, reasonably priced broadband access across America. The IFCU would accomplish this feat by lowering costs in the most direct manner possible—by providing a huge increase in the total supply of dark fiber. The IFCU would provide an essential fiber infrastructure for the entire nation.

The IFCU would also position the United States as the world leader in “open access” fiber infrastructure laying a foundation for 21<sup>st</sup> century jobs, while transforming the way we learn, work and play for the next 100 years.

## **ABOUT FIBERUTILITIES GROUP LLC**

Fiberutilities Group, LLC is a professional utilities management company created in 2003. Its first project was to foster the formation of open access, fiber-optics based utilities by Iowa municipalities. The effort evolved from a focus on local government needs, to assisting health care, education and Fortune 500 clients create purpose built fiber networks, then to the realization of the importance of essential fiber infrastructure for the entire nation. The effort also became the genesis for the current focus on professional management services, and on developing, executing and managing strategic, long-term connectivity solutions for public and private sector clients. Clients own and/or control their underlying connectivity assets (fiber, optics, switching, etc.) and Fiberutilities manages those assets to achieve their specific business objectives. Currently, Fiberutilities Group manages over 8,000 route miles of fiber infrastructure with associated electronics and equipment on behalf of clients in health care, finance, education and government. Its management team has more than 300 years of combined industry expertise in comprehensive network planning, building, operating and management. Fiberutilities Group is pioneering the nationwide initiative, an “Interstate Fiber Conduit Utility,” which will change the “fundamentals” of broadband delivery in America and usher in a new era of entrepreneurial activity and job growth.

## **BIOGRAPHIES**

### **Clark McLeod**

Clark McLeod has been at the forefront of highly-competitive communications companies for three decades and is a recognized leader in the American telecommunications industry. The founder and Chairman of Teleconnect in 1980, Mr. McLeod led the effort to create America’s first transcontinental fiber cable which preceded the later builds of the major carriers, AT&T, MCI and Sprint. By 1988, Teleconnect was the fourth largest long distance carrier in the United States. In 1992, Mr. McLeod founded McLeodUSA, which, by 2002, grew to become the largest independent competitive local exchange carrier in the nation employing over 10,000 people. In 2003 Mr. McLeod founded Fiberutilities Group in Cedar Rapids, Iowa.

### **H. Brian Thompson**

H. Brian Thompson has been involved in the telecommunications industry in the United States and abroad since 1968 when he first served as a consultant to COMSAT and INTELSAT during their startup phases, and then during the 70's with ATT, and GTE. Mr. Thompson was in the executive leadership of MCI during the 1980s and as Chairman and CEO of LCI, and as Vice Chairman at Qwest during the 1990s. As Chairman of CompTel, Mr. Thompson was greatly involved in shaping the Telecommunications Act of 1996. Internationally, Mr. Thompson was Chairman of Comsat International, served as non-Executive Chairman of Telecom Eireann, and Chairman and CEO of GTS. Mr. Thompson was a founder of and later became Chairman of the Global Information Infrastructure Commission. Today, Mr. Thompson serves as Executive Chairman of Global Telecom & Technology (GTT) a worldwide telecommunications network integrator.

**Rob Smith**

Rob Smith has over 20 years of entrepreneurial, marketing business operations experience in the telecommunications and information technology industries. Rob's experience includes management and operations in local telephone service, long distance telephone service, data networking and facilities wireless telephone service, cable television and telephone directory publishing. Rob and a partner formed TeleGuam Holdings LLC in October of 2003 for the purpose of acquiring the Guam Telephone Authority from the government of Guam. TeleGuam Holdings partnered with Shamrock Holdings of Anaheim California to compete with several other bidders to acquire the 70,000 access line local exchange carrier for \$150 million.

**Contact:**

*Rob Smith*

Fiberutilities Group, LLC

222 Third Street, SE, Suite 500

Cedar Rapids, IA 52401

(319) 364-3200

rsmith@fiberutilities.com