

**Getnet Plan**  
**White Paper**  
**On use of**  
**Passive Coarse Wave Division Multiplexing**  
**For**  
**Promotion of Competition at the Last Mile**

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**Overview**

Most consumers don't have fiber optic communications to the home. It is a very expensive and risky investment for more than one or two providers to install fiber optic communications to all addresses. Consumers (and the economy as a whole) benefit when there is broader competition to provide services. A solution is to allocate responsibility for installation and management of communications transport to municipalities using Coarse Wave Division Multiplexing (CWDM) to promote competition between multiple service companies to the same address.

**Justification for The Plan**

Fiber optic cable is the preferred communications transport. No other transport cable comes close with regards to capacity, distance, and low costs. At some point in the future, fiber optic cable will be installed to every business and home. Consumers will eventually pay for the cost of the network plus a profit for all parties that participate in its operations. Paradoxically, these cables will be in city right of ways (ROW) and we, the taxpayers, own the ROW's. We as consumers want choices and competition. It makes little sense to have multiple carriers run parallel cables to the same properties. The same fiber will work for cable TV, phone and internet because it can carry multiple services on the same fiber. Fiber optic cables are nothing more than dumb pipes.

A solution that meets the above criteria can be achieved if fiber optic communications transport are installed, owned and managed as a city service. Consumers and service providers would be able to order connections as needed. Cable TV, internet connectivity, and phone services would all be able to use this common transport service at the same time. Installations and maintenance will be aligned with other high cost commodity services like roads, water, and sewage.

The following are eight reasons to support this plan. The technology to implement this plan is available now. All we need is the vision and the will to execute this plan.

### **Reason 1: Now is the Time**

Fiber to the home (FTTH) is not widespread—but rapidly becoming so—which allows a decision to be made now avoiding potential regulatory and political issues. Capital expenditure to create a new fiber network to all homes can be made now without significant obstacles if a private entity gets to the table first.

Traditionally, risk-adverse municipalities would want a publicly traded business to bear all of this responsibility. In practice, this could be a potential liability if these companies fail. In bankruptcy, the shareholders will get wiped out, a new buyer will assume the assets in the streets, and the consumers will again pay for the misdeeds of the failing corporation. Separation of these companies from the physical wire in the ground is a natural way to isolate the risk of competitive access carriers. By doing this now before the costs have been incurred to deploy the fiber, our grandchildren will be spared the burden of super normal profits to the owner of the fiber network. There are twisted pair phone wires in the ground that have been generating monthly revenues for the phone company for more than 100 years.

In this communications plan, when a carrier fails, customers could just switch their connection to a new carrier. All the legal issues associated with ownership of wires in the street are gone. All issues associated with a company too critical to fail are gone. Any single service company failure will only affect a portion of the community. Poor service will no longer be rewarded with rate increases. This plan will isolate risks associated with poor management of a communications company. The critical wire infrastructure will no longer be used as leverage to price discriminate.

The full cost of installing fiber to every address has yet to be incurred. It is in the best interest of the community to take the initiative to put a fiber optic network into place. It should be done so in a manner that enables competition. Setup in this way, it can be done in a method that gives ownership to the citizens of the communities it services. It may be managed by the same organization that manages other fixed cost infrastructure like roads and water lines.

### **Reason 2: Fiber Optical Cable is a Vital City Service**

The use of communications has evolved from an optional value added service to become a vital service. A precedent for this recognition may be seen with the Communications Act of 1934 that created the Federal Communications Commission (FCC). The Universal Service Fund was founded to advance the availability of low income, rural, insular and high cost areas at reasonably comparable costs. The Universal Service Fund was funded

internally by the Bell monopoly. These actions clearly recognized the importance of communications and put it into law.

Costs for fiber optical cable, CWDM multipliers, and single mode transceiver are all inexpensive commodity products at this time. This is very similar to commodity pricing for the products that are used to construct roads, water, and sewer services. All of these services require access to each home, are capital intensive to install, and have long expected use lifespan. Regardless of the cost of installation, it is a one-time expense. It may be financed and paid back over time like all other city capital expenditures. The match is undeniably similar. We as residents of a city collectively own our roads and water lines. It just makes sense to make the choice to own our fiber as well before costs are incurred.

Investments in fiber optic infrastructure have the same potential to generate revenues for the new owners for decades, if not centuries, into the future. It would be in the best interests of the consumer to let our children own the wires that we will pay to build. In the past, it made sense to let a monopoly own and run a network to deploy an application specific network. The past business case did not allow for alternate uses. Because technology allows multiple generic uses and competition, it makes sense to change policies to reflect current status of technology.

The precedent for enabling a government organization to perform a service on behalf of the community is seen in the postal service. Allowing neutral government control of last mile fiber transport is no different. In a time where legislatures struggle with declining tax revenues from phone services, it makes sense to shift the focus from regulation of phone service to regulation of transport on fiber optical cables. We are advocating modern policies to reflect the current state of technology and current needs of the community.

### **Reason 3: Alignment of Ownership and Management Interests**

One of the roles that a city manager will perform is to provide fair use of publicly owned roadways. A competing goal of all private utilities is to gain access to all locations that are economically beneficial for their use. By shifting the responsibility of all communications cabling to the city, we are aligning the use of the street with management of space in public streets.

The “right to exist” in a roadway now becomes a new administrative process that needs to be created and managed. This is another source of administrative overhead that we as taxpayers will bear as increased operational costs for a city management.

If we remove competitive fiber optic carriers from having access to the streets, we will not have to repeatedly tear up the street every time a new fiber optic based services provider wants access to the same road. It makes little sense for city managers to allow roads to be torn up every few years. It makes expensive well-paved road look and drive like test tracks.

In a system where there are multiple fiber optic network owners competing for the same space on the roadway as other services like water, sewage, electrical power, etc., things will go wrong. It is the duty of management to define how these failures are handled. It goes beyond an accidental cut with a backhoe. It can progress into outright theft of someone else's conduit. If someone sees an unused conduit and they place services in it, we now have to deal with conflicts and potential litigation.

The city owns the streets. They also own water and sewer line in the roads. It is a natural alignment of responsibility to have the city own the fiber in the ground. Improving operational efficiency in city operations and in removing multiple competitive access carriers installing fiber in the street translates into real operational cost savings. These savings will be passed onto the consumers.

Adopting this plan will align the interests of fiber ownership with the interests of management of the streets and management of fiber cable. This plan will have operational efficiency that will be passed on to consumers. Operational efficiency in this case is beneficial because savings come from reduced administrative overhead.

#### **Reason 4: Passive CWDM Technology Enables Plan**

Coarse wavelength division multiplexing (CWDM) is a means of combining and/or separating multiple signals of different laser wavelengths into or out of a fiber optic transmission cable in a near passive network. This is exciting because it uses no electrical power to operate.

The alternative today is the use of active electronics. This network does the same job but is significantly more expensive to operate due to its use of power. It uses rack-mountable pieces of electronic equipment that may cost \$50,000 per node. The current method of deploying critical communications equipment is to install it with an uninterrupted power supply, air conditioning, and optional back-up power generation. You also need to keep spares parts or service contracts and personnel on staff to operate it all.

Passive CWDM requires almost none of the above. CWDM is a prism that does the same job of combining and splitting different wavelengths onto one fiber. There is no electrical power to operate it. There is no electronic equipment with configuration parameters to set and change. That means there is no engineer to manage it. No need for electricity means there is no need for an uninterrupted power supply, back-up diesel generators, air conditioning, and service contracts to keep it powered and running. It is cheap in comparison to the active alternative.

Each wavelength on a fiber optical cable easily supports current applications. It's safe to say that the majority of the fiber that is currently deployed is using only one wavelength, most likely 1310-nm. A passive CWDM currently costs a few hundred dollars per unit. I predict that it will get as cheap as a few dollars per unit when they are widely accepted and produced in volume.

## **Reason 5: Fiber Cable is a Dumb Pipe**

Any communications transport medium, twisted pair wire, coaxial, or fiber optic is defined by the equipment on both ends. The actual wire has no intelligence. In ideal cases, the transport requires no power. All of the aforementioned transportation mediums have limits. If the distance to be covered exceeds the respective limits, it must have one or more repeaters to boost the signal. This is the most common need for electrical power. To run data communications over any of the above three mediums, matching equipment on both ends is needed with correct medium adaptors. When this is done correctly, a network connection will be constructed.

Because fiber is just a dumb pipe, it should be treated as such. Since the beginning of communications with wire technologies, companies have earned a price premium with regards to the cost of network deployments because there was no alternate use of the wire. Fiber optic cable is the first transport that can replace all current copper communications. The expected use may now be expanded to include multiple carriers doing the same service.

Dumb pipe means that the cities that assume operations of a fiber network will have a limited range of maintenance requirements. Either the cable will carry a laser or it will fail. If it fails, the operators would use an alternate pair or find the cable break and repair it. This is a task that is well defined. It can be managed on a large scale with government grade employees.

There is no magic in the cable. The magic happens in the equipment on the ends of the pipe. Armed with this knowledge, we should adopt a system where there is cost effective fair access to the cable.

## **Reason 6: Enables Competition**

Laissez-faire works great in a system where goods and services are easily exchanged. Near-monopoly control of systems by telcos and CATV providers does not allow for freer competition. The United States Congress passed the Telecommunications Act of 1996 that forced incumbent local exchange carriers (ILEC) to share existing phone lines with competitors. This act of congress has not created a viable ecosystem of competitive local exchange carriers (CLEC). A fiber optical communications network that allows competition will only happen if we design a publicly owned system to support it.

There are currently 17 defined wavelengths in CWDM with 20nm spacing. Dense wave division multiplexing (DWDM) uses the same spectrum with 2nm spacing. The actual limit of how thin the spacing can be sliced is not known. There is a lot of room for growth. By allowing open market access to these wavelengths to all premises, we will have effectively created a system of market competition with no regards to what type of

service that may run on a given wavelength. This is analogous to assigning service providers to different channels on the same fiber.

Single Mode Fiber is the preferred technology to be used in city streets or long haul networks. It has a stated range of 50km (31 miles). Many cable vendors state a range of 70km (43 miles). This means that a single wire center can have all the needed connection in a 30-80 mile diameter go to one location with no need for repeaters. Actual fiber deployments will vary according to specific real estate topography and political considerations.

Networks work best when there is one administrative body for a given network. By allocation of just transport responsibility for the local loop to one organization, we will have the best chance for efficient network deployment, management, and fair competition.

### **Reason 7: Promotes Innovation**

Each wavelength currently can transport 2.5 Gigabits per second for a wavelength. This will yield a 1Gbps bi-directional connection. Single mode gigabit transceivers sell for about \$500.00 new. The leading edge of technology is 10Gbps for a frequency is available off the shelf. However, these speeds are not available until FTTH is deployed.

Existing services like cable TV, telephone, and internet all use much less bandwidth than any single wavelength can carry. The goal of having one service organization that can provide TV, phone and Internet is called a triple play. That means there is room for 17 different triple play providers to all homes with fiber.

Because the actual wavelength is mapped from end point to end point, the choice of line protocol is up the consumer and service provider to choose. This open access to the lowest layer combined with the large bandwidths will maximize opportunity for innovations using existing or yet to be invented protocols.

### **Reason 8: Will Keep the USA Globally Competitive**

Like a personality, all countries retain a different global competitive advantage. The USA has been a market leader in technology. The irony is that a free market economy is at a disadvantage in network construction and operations. Networks are best run and operated by a single organization. By supporting this idea of reallocating responsibility of just the communications transport to neutral party, any nation will become or remain globally competitive.

It is my opinion that the USA must act on this plan to maintain a competitive posture. There are other countries that have nationalized fiber infrastructure to all addresses. This means that the USA is now at a competitive communications disadvantage with these

nations. This is done because we continue allow a handful of companies to use their monopoly status to earn super normal profits.

### **Closing Remarks**

There is a lack of fiber optic communication to the home, a lack of real competition of services to the home, and there is significant capital risk for such a project. We have presented a two-step process for solving all three of these issues. The first step is to allocate the responsibility to build a fiber network to local cities that already have experience in exposure to these risk factors. The second step is to use CWDM to allow multiple competing companies parallel access to the same address.

Historically proven importance of communications is impressive. Looking forward, expanded use of communications may be an alternative to travel. This is important given the current awareness of personal carbon footprints. Other benefits include creating a communications system that keeps our country globally competitive.

### **Company**

Getnet, Inc. is an Internet Service Provider in Phoenix, Arizona. Its primary services are Co-location of services, dedicated servers, Virtual Private Servers, Web Hosting, DSL, and T1 Internet connectivity. Getnet, Inc. specializes in custom hosted solutions for its clients. Examples include custom Dial plans for Voice Solutions, and Hosted services for FOREX trading. Getnet, Inc. is independently owned and operated. For more information on Getnet, Inc. please visit our website at [www.getnet.com](http://www.getnet.com)

### **Jeffrey Gong Bio**

Jeffrey Gong is currently the owner and operator of Getnet, Inc, [www.getnet.net](http://www.getnet.net)

Getnet, Inc. is an Arizona corporation incorporated in 2000. It was started after the sale of his prior company, Internet Access Inc. [www.neta.com](http://www.neta.com). Prior to that, the Getnet.com, getnet.net domain names and other assets were purchased from Getnet International Inc., (Debtor In Possession in 1999). Other Companies and domain names that have chosen to partner with Jeffrey Gong and his company include openlines.com, wixnet.com, inficad.com, infinnet-is.com, azonline.com, and azsites.com.

While operating as Internet Access Inc., highlights include one of Phoenix's first dedicated Internet T1s to Los Angeles (November 1995), support of ISDN dial-up (June 1995), pioneering the use of 56K modems with the US Robotics X2 standard (April 1998), writing and deploying an in-house customer care application (July 1998), and three acquisitions of other Internet Service Providers (including Getnet International) from U.S. bankruptcy courts.

Jeffrey completed an Executive Masters of Business Administration from the University of Arizona in 2007, and a Bachelor of Science degree in Computer Engineering from the

University of Arizona in 1988.

Prior employment before Internet Access Inc. includes Motorola, University of Phoenix, American Express, and First Data Corporation.

### **Support Instructions**

To promote this plan, contact your local city councilman with this information. Tell your friends about this document.

An alternative method to support this initiative is to make a donation. You may do so with Paypal to [jeff@getnet.net](mailto:jeff@getnet.net).

Jeffrey Gong is available for consultation.

### **Notice**

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