An Investment Worth Making

Fiber Backhaul:

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You’re driving to your long awaited vacation, cruising down a four-lane highway, when suddenly you come to a halt. Construction is blocking three lanes, causing a huge back up. Now, you and the other 3,000 travellers on the highway are forced into one lane. It is a traffic nightmare.

This analogy describes how mobile data can become congested when traveling through copper from cell sites to a central switching office for transport. And it’s just going to get worse.

According to iGR Research Company, the demand for mobile backhaul in the U.S. market will increase 9.7 times between 2011 and 2016.¹ The cause is the increased capacity demand that comes with 4G upgrades allowing the use of more and more bandwidth hogging mobile apps.

Backhaul is the backbone of mobile networks, serving as the network infrastructure that connects the communication data from end users to nodes to the central network and vice versa.² In order to maintain a healthy network, carriers must be able to provide backhaul that keeps up with the data speed demands of today’s consumer.

Though microwave backhaul is sufficient some of the time, the wireless signal can get disrupted and the line of site can experience interference caused by foliage, heavy storms, new construction, etc. A direct connection to the cell site solution for backhaul is the most optimal.

Fiber backhaul is the solution to the backhaul backup. Imagine that traffic nightmare you were sitting in disappears around you. That’s what fiber does for backhaul.
Cell site based fiber solutions and cell site densification allow significant amounts of data to move through the network at rapid speeds.

Users are not just using 4G on cell phones, but are also connecting to the network on their tablets, e-readers, mobile hotspots and more. On average, a smartphone user is consuming 592 MB of data per month, and this number is supposed to increase up to ten times by 2018.

LTE wireless sites will need at least 500 Mbps of capacity. Microwave capacity can only handle about 400 Mbps because of the permitted limits placed on RF channel bandwidth. There is no way microwave backhaul can keep up.

Fiber backhaul’s endless amount of capacity could sustain mobile backhaul for years and technology evolutions to come. But this kind of investment comes with a price.

Laying down a whole new infrastructure will be expensive and time consuming. In an era of instant gratification, investing in infrastructure that could take years to build is daunting.

But it’s an investment worth making.

The wireless industry is catching on. In 2011 alone, almost 19 million miles of optical fiber were installed in the U.S. That number has only grown since then. Verizon Wireless has installed almost 17,000 miles of fiber optic infrastructure in New York City alone.

Fiber backhaul is a solution to the capacity onslaught that comes with the smartphone boom. Fiber can also serve as a solution to Small Cell backhaul, because of its close proximity to urban areas. In addition, telecom could utilize the fiber that’s already trenched from the tech bubble in the late 1990s.
Small Cells

Small Cells are infiltrating the wireless industry. These low-power nodes offer capacity solutions for escalating data usage, which will grow 10-fold by 2018. Carriers are starting to plan for small cells throughout their networks to bolster capacity for the data boom. But a major problem with deploying small cells is the limited solutions for backhaul. In some cases, the backhaul equipment would be larger than the antenna itself.

As carriers continue to plan for small cells as a part of their HetNet architecture (macro sites, indoor DAS, outdoor DAS, small cells, etc.) they are beginning to explore the different fiber solutions that can be deployed to each small cell. In most cases, fiber direct to each small cell is the most advantageous solution to allow the small cell to transport the most data at the highest speed. Like all deployments, other factors such as time to market and capex costs need to be factored in as well, with the result being that each small cell requires its own analysis and backhaul decision. In fact, within the last few months several carriers have been reviewing project plans that call for small cells to have direct fiber runs back to the closest macro site, allowing the macros sites to be used as a “fiber demarc” point. We shall see how this model looks from a network performance, capex, and time-to-market standpoint; but it demonstrates the creative thinking and solutions being

Dark Fiber

During the dot-com bubble of the late 1990s, the telecom industry zealously laid miles and miles of fiber in anticipation of the boom. But when that bubble burst a few years later, the telecom industry saw more than 60 bankruptcies and a huge pullback in fiber demand, leaving miles and miles of fiber that was not connected to any end-user. The term “dark fiber” was coined.

Now, as the need for capacity grows, carriers and telecom companies are lighting up this dark fiber to connect their networks. The fiber that was laid in the late 90’s can expand capacity to the ever-growing need for data.
Conclusion: Worth the Cost

Phones are just the start of the wireless revolution. The demand for tablets to be connected at all times is growing steadily with smartphones. There might be sticker shock when the industry continues building this nationwide fiber infrastructure, but it's an investment worth making given the other backhaul options and their operational and capacity limitations. By solving this backhaul issue as the data explosion is on the rise, the industry will meet the mobile capacity demands that are increasing monthly as wireless technology evolves and grows.

References

About NB+C

NB+C is an industry leader that has specialized in all aspects of wireless site development for 30 years. NB+C is comprised of experienced industry professionals who understand that client service is the key to its past and future success.

NB+C’s management group assembles top project teams to deliver results and provide tangible value to its clients. NB+C’s entire staff takes pride in meeting client expectations and works diligently to ensure project excellence on all assignments.

We are totally committed.

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