# “Microduct – Cost Effective Ideas to Deliver Service to Areas Once Considered Unreachable”

# What's the Big Deal?

**AT&T:** In the last 6 years, we have experienced an increase in data traffic of **30,000%**.

Smartphone usage is up **64%** from 2012.

# Meeting the Rising Need of Broadband Usage

- The expectation of today's customer is that they have seamless access to the network, no matter where they are.
- It is incumbent upon the provider to give this access.
- If we don't provide it, someone else will.

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# Challenges in Providing Broadband

## The Concrete Jungle

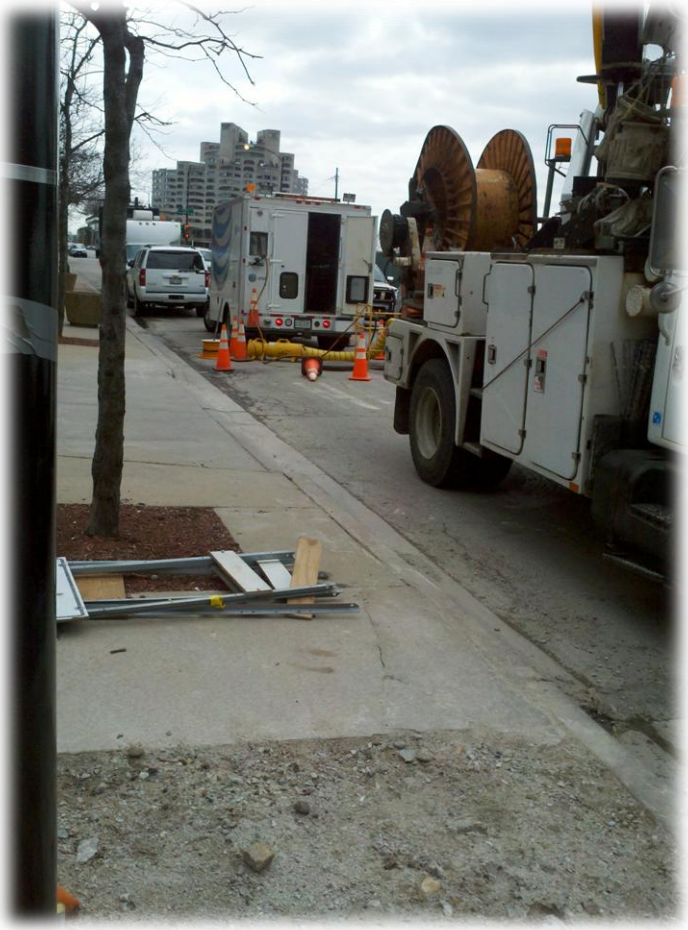
## Occupied Conduit

# Finding the Solution

- Finding the tool in the toolbox that best suits the application is one of the most challenging tasks facing today's providers.
- Balancing the cost of deployment against customer expectations has always been the greatest challenge facing providers.
- The good news is that there is a way to balance costs of deployment with customer expectations.

# The Concrete Jungle

- Hard surfaces such as concrete and asphalt present some specific challenges that, if approached with conventional installation methods, will prove to be too costly to deploy.



# How To Best Handle the Hard Stuff

- Traditionally, hard surfaces have been tackled by either open trenching or directional drilling. The downside of this is that the restoral costs can far outweigh the benefit of the deployment.

# What's the Answer??

The most cost effective answer to the challenges of installing in either concrete or asphalt areas:

Micro-Trenching and Microduct

# Challenges to Micro-trenching

- Specialized equipment needed
- Relies on a quality restoral method
- Requires a robust microduct and fiber solution


# Benefits of Micro-trenching?

- Minimal disruption to traffic
- Quick Deployment
- Easily restored
- Final restoration is almost invisible

# The Good and the Bad

You want this:

Not this:

# Micro-trenching/Microduct Bottom Line

- Much more cost effective than traditional open trenching methods.
- Installers are seeing savings of up to 60%.
- The creation of strong microducts and pushable fiber have allowed this method to be used to its full potential.
- It's not rocket science…It’s just plumbing!

# Just What is Microduct?

- All microducts are not created equal
- Flexibility coupled with high crush ratings are required in a micro-trenching environment
- Traditional microduct designs have and will fail over time in this type of deployment

# Can Yours Do This??


# Or This??

# Make the Right Choice

The choice of the proper microduct and fiber are crucial to having a successful installation that will last over time.

With the advancement of polymers and coatings, today's microducts and fibers (when used as a system) can and will withstand the rigors of direct placement in hard surfaces even with the continued abuse of vehicle traffic.

# Occupied Conduits

- Many times, building owners are not willing to allow the construction of new pathways in their buildings to facilitate a broadband deployment. This can be a challenge for providers.

# Challenges When Using Occupied Conduits

- Multiple bends can sometimes hinder the installation
- Requires “out of the box” thinking
- Microduct with robust crush qualities is a must

# Occupied Conduits: Why Use Them?

- It is more cost effective to use existing routes
- Less disruption to property owner and/or residents
- Allows for quicker deployments with less engineering time

# The Good News is…

- A high quality micro-conduit can be used, just like a fish tape, and the fiber can be pulled in directly after the duct is installed.
- Multiple bends are typically not an issue.

# Things to Consider in an Occupied Conduit

- Sometimes the route can have a lot of sweeps and bends
- Identifying pull points and boxes is important
- It's usually not necessary to cut the microduct in all the pull boxes

# More to Consider

- Sometimes a full conduit actually helps with the installation
- When a conduit is somewhat full, it allows the microduct to be pushed further without coiling

# So What's Next?

Some new technologies are gaining popularity in those unique situations that require an "out of the box" view.

**Conductor Replacement:**

Removing the conductor of either a Coax or twisted pair sheath, relining that sheath with a microduct to ensure a stable pathway, and then placing a fiber inside the protection of the microduct

# Conductor Replacement

# Conductor Replacement

The only thing needed is for the sheathing to stand long enough for the new microduct to be placed inside. Once the microduct has been placed, you have a “no dig” route replacement that will now withstand the rigors of freezing/thawing and vehicular traffic.

The sheathing alone cannot simply stand up to this pressure, so a microduct is a must.

# Distribution Challenges

A by-product of micro-trenching, microduct and pushable fiber has been the solution at the point of handoff.

Distributing the fiber by routing the ducts through a hand-hole, coupling the customer duct to it and then installing the fiber from long distances introduces its own set of challenges.

By moving the distribution points closer to the customer, we avoid the long installation lengths and increase flexibility for the provider.

# Advancement in Distribution Choices

The FieldShield Multiport SmarTerminal

# Distribution Options

There have been some challenges particularly in the urban environment on how to distribute a fiber from a micro-trench.

This is a product that can be used in multiple applications and in many different environments.

It allows for the distribution of multiple fibers in a very small (6”) footprint.

# Distribution Options

- Vault

- Pedestal

- Flowerpot Handhole

# Vault Applications

- Requires very little space
- Allows for multiple SmarTerminals to be deployed with different technologies
- Does not require skilled technicians to connect customers

# Pedestal Applications

- Requires very little space
- Allows for multiple SmarTerminals to be deployed, as in vault applications
- Does not require skilled technicians to connect customers

# Flower Pot/Handhole Applications

- Works very well in tight areas such as inner city/micro-trench deployments
- Very small footprint
- Does not require skilled technicians to connect customers

# What's the Take Away?

There are multiple new "tools" for you to look to when trying to drive costs out of your fiber deployments in those areas that have seemed too costly or simply impossible to attempt.

With the advancement of both fiber, polymers and new distribution techniques, we as an industry can move forward in providing the best services - at manageable costs to our customers.

# Questions??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