



Application Brief – Mobile Networks Backhaul

Are you expanding your PCS / cellular network or looking for an alternative to costly leased lines to backhaul your wireless traffic? Are you looking for a quickly deployable solution with scalable bandwidth?

Your answer is Free Space Optical transport with fSONA's SONAbeam™

Even in today's unstable market, PCS / cellular services are growing – with increased bandwidth comes increased cell density. Predictions are that the worldwide number of cell sites will nearly triple over the next 5 years. As wireless networks migrate from second generation (2G) to third generation (3G) technologies, the bandwidth requirements will grow dramatically. PCS / Cellular backhaul will need to be scalable to adapt to this growing demand for bandwidth. SONAbeam™ FSO technology offers a rate adaptable carrier class solution and is a perfect fit for PCS / Cellular backhaul applications.



Wireless Local Access Networks

Today's wireless local access networks consist of cell sites connected to a local hub or switch with low bandwidth T1/E1 leased lines, or licensed microwave radios. While this may be sufficient for existing voice networks, 2.5G and 3G (UMTS) networks will require bandwidth growth. Upgrading leased lines to higher bandwidth E3/DS3 or xDSL will dramatically increase traditional (legacy) transport / backhaul costs because of the high recurring monthly charges. Fortunately there is a less expensive option which offers greater flexibility - high bandwidth wireless backhaul technologies such as free space optics (FSO) or microwave radio.

As providers move to 3G/UMTS networks, the cell radius drops to about 1 km or less. Within the dense urban core, the typical cell spacing will be a few hundred meters. Microwave radio is poorly suited to deployments in the urban core at short ranges. The licensing requirements, frequency planning, and interference issues make microwave a poor choice.

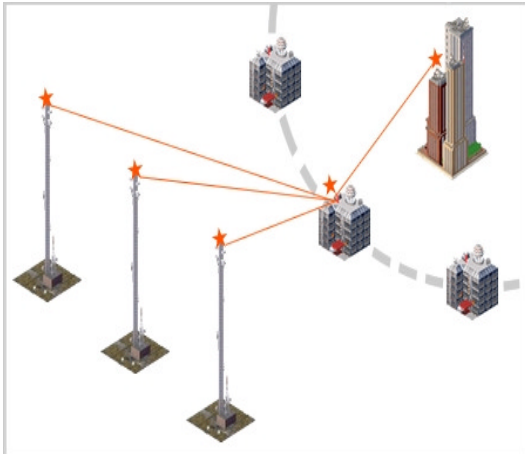
FSO technology is the clear winner. FSO scales to higher bandwidths, is immune to interference in a dense mesh, is free from licensing requirements, and offers higher level of transport security. Shorter links also mean FSO is no longer as susceptible to environmental conditions like fog that can cause temporary outages over longer ranges.

Owning Rather Than Leasing

For wireless service providers, owning rather than leasing is becoming a more desirable alternative. There are three major advantages:

- The return on investment for FSO capital equipment can be realized in time periods of 2 years or less.
- FSO is available today and can be deployed tomorrow. There is no need to wait for leased line upgrades.
- The service provider manages the network link and does not have to rely on a third party with different priorities to repair a connection. Recent data suggests that up to 50% of cellular outages occur in leased backhaul lines, and the time to repair these lines is growing.

The SONAbeam™ Advantage



fSONA products are a perfect fit for PCS / cellular backhaul applications. SONAbeam™ products can be mounted directly to towers and on rooftops, providing high bandwidth connectivity between cell sites or to a central hub. SONAbeam™ products can also provide backhaul transport from the hub to the central office.

If you are faced with longer distances or a climate that is subject to fog or heavy snowfall, the SONAbeam™ can provide high bandwidth the vast majority of the time, with a fallback to lower-capacity unlicensed RF or landlines for the small fraction of the time that severe weather events occur. This also provides an inherent redundancy to permit realization of 5-9's network availability.

fSONA offers scalable bandwidth capacity with a range of products from NxT1/E1 up to Gig-E and beyond. SONAbeam™ is a layer 1 protocol transparent device with integrated network management capability. SONAbeam™ offers true carrier class reliability with the highest power 1550nm eye-safe technology in the industry. Deployment is simple, with installation and alignment in as little as one hour at prepared sites.

Please contact your local fSONA representative for more details on how you can take advantage of the SONAbeam™ PCS/Cellular Backhaul solution.

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