

A network diagram with white nodes and connecting lines on a dark blue background, spanning the top of the page.A white circle containing a black upward-pointing arrow, located on the right side of the page.

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Mobile Backhaul Case Study



1g/10g on a budget: enhancing the customer experience with no new fiber



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Customer Challenge

Develop a cost effective solution to upgrade the mobile backhaul network from legacy TDM to a high-speed fiber optic Ethernet network. To complete this, several unique challenges must be overcome. Additional challenges to overcome were:

1. Lack of fiber to many cell towers.
2. Reliability and network diversity requirements.
3. Non-intrusive optical testing requirements.
4. 1G today, 10G tomorrow and future proofing capability.

Integra Optics Solution

Use long range coarse wavelength division multiplexing CWDM wavelengths along with field deployable passive optical add drop multiplexers (OADM's) to extend the backbone network to the edge. The solution dramatically increases the available bandwidth on the existing backbone, minimizes new fiber construction, provides a protocol agnostic network, and allows for ring diversity.

Project Summary

Rather than perform a complete build out of new fiber to several hundred cell sites, our customer was looking for a solution that could leverage their existing fiber network and maximize the number of cell towers that could be reached. The customer's project was engineered to upgrade their cell tower backhaul links to a 1G/10G solution, providing enhanced performance, additional capacity, and ring diversity. The overall design was required to meet the following criteria:

1. Extremely compact form factor capable of fitting into existing field splice trays regardless of channel count.
2. OADM's must be capable of both stand alone and ring architecture operation.
3. Maximize network testing capabilities by including either an OTDR (optical time domain reflectometer) drop or OTDR pass.

4. Include custom labeling and color-coding to simplify the splicing process.
5. Use a channel plan that is capable of supporting the daisy chaining of up to four towers while allowing additional wavelengths to be passively added to the backbone network.

The customer had budgeted for OEM equipment, but discussions uncovered that Integra offered greater flexibility at a lower cost. Our engineers developed a CWDM channel plan as well as tailored OADM hardware, making the most of existing assets and laying the groundwork for additional waves and 10G.

Compared to other solutions the company had evaluated, the Integra OADM stood out for both its unparalleled design and Integra's history of reliable products. The solution was something that the OEM simply could not offer.

Result

With their new upgraded CWDM cell tower backhaul infrastructure in place, our customer is able to not only satisfy their initial corporate requirements, but also use the scalable architecture to bid on future projects involving cellular backhaul and 10G upgrades.

This solution proved to be a very efficient way to upgrade their fiber optic network while minimizing what could otherwise have been a very labor intensive and costly project.

This solution would also be ideal for:

- Service Providers
- Dark Fiber Providers
- MSOs
- Cellular Service Providers

Integra Optics Equipment Used

- ➔ **IntegraOptics 80km CWDM SFP transceivers**
- ➔ **IntegraOptics custom 2, 4, and 8 channel OADM's.**