

Leased Line Replacement



Utilities have long used leased lines from public telephone companies to connect remote locations such as substations. Recently, utilities have reported increases in leased line fees. According to a survey by West Monroe Partners, one-third of utilities reported year-over-year increases in monthly service charges for leased lines. Some of these increases have been massive – an ABB IOU customer stated that fees for leased lines which cost less than \$200 a month in 2013 will rise to more than \$1,000 a month in 2016.

The Tip of the Iceberg

Leased line fee increases are just the tip of the iceberg. According to media and analyst reports, statements by public telco executives, and telco regulatory filings, public telcos are discontinuing leased line services. It is entirely possible that, within the next five years, leased line services will cease to be available altogether.

And, it gets worse. According to West Monroe Partners, “The alternative to the POTS lines is to convert them to more expensive and larger T1 circuits or Multiprotocol Label Switching (MPLS) circuits over bonded T1s. However...[a major communications carrier] states that in addition to the POTS lines, they will withdraw all non-Ethernet private lines, which include DS0s, T1s, DS3s, on up to OC48s. This means that utilities upgrading to T1 or greater copper circuits will have less than five years to find yet another, more expensive solution.”

In other words, not only are public telcos discontinuing leased line services, they are planning, within five years, to discontinue the services they’re pitching as a replacement for leased line services.

The Root of the Problem

While leased line fee increases and discontinuation may seem like problems, they are actually symptoms of a deeper issue. By relying on public telcos for critical field area data communication needs, utilities have placed too much dependency on arms-length service providers. Issues with relying on public telco networks include:

- **No control over technology lifecycle:** Technology changes are driven by the needs of the telcos’ core consumer and enterprise customer bases. These customers don’t just expect short technology lifecycles, they demand the newest technology every few years. This is antithetical to utilities’ needs to have a 10 to 15 year life expectancy for field networking technology. And, when telcos upgrade technology, it’s very disruptive to utilities’ networks, in terms of the expense to purchase and install new network endpoints and the disruption caused by the deployment process.
- **No influence over pricing:** The demand side of the supply and demand pricing equation is heavily influenced by telcos’ core consumer and enterprise customer bases. Prices are subject to change based on varying demand from these segments, as well as the telcos’ need to maximize average revenue per user (ARPU). Demand, or lack thereof, from utility field networks is simply not enough to move the pricing needle.
- **Poor reliability:** Fixed line scheduled downtime is set by the telco. If a utility needs a maintenance window, it will likely be late at night, increasing the utility’s overtime expense. Telco outage response is based on number of users impacted. If a utility loses connectivity to remote substations as part of a larger outage, the substations will be among the last locations to come back on line. If public wireless is under consideration, note that telco wireless network deliver about 99.9% reliability. That’s just not enough for critical field communications which need 99.99% or even 99.999% system availability.

The bottom line is that utilities operations can be severely disrupted when telco technology evolves or the network goes down because utility field area data communication isn’t a big enough business to drive telco decisions. In the age of grid modernization, utilities must take control of their field data communication networks.

Another Way: Modern Private Wireless Networks

By using modern private wireless networks to replace leased lines, utilities can take control of their field area data communication systems. Private networks can be engineered to meet utilities’ needs along a number of technical and business dimensions including technology lifecycle, reliability and ongoing operations and maintenance (O&M) costs.

- **Control technology lifecycle:** With private wireless networks, utilities control the technology lifecycle. The utility can undertake a one-time project to deploy a modern communication system with a 10 to 15 year lifetime. Modern wireless communication equipment is software upgradeable to keep system modern. A beneficial by-product of lifecycle control is that the project can be structured as a capital project, with minimal on-going O&M costs.
- **Reduce O&M costs:** By choosing, in essence, to purchase rather than rent, utilities can achieve major reductions in O&M costs. The main area of O&M cost savings is the major reduction, if not outright elimination, of the monthly fees paid to telcos for leased line services, fees that are escalating rapidly. Many vendors of modern wireless communication equipment offer multi-year maintenance plans that can be purchased at the same time as the networking gear possibly eliminating O&M costs. Utilities may be able to capitalize these multi-year maintenance plans, building them into their rate base and removing them from the O&M cost line.
- **Enhance reliability:** Modern private wireless networks can be tailored to meet the reliability needs of utility. If the utility needs four or five 9s system availability, a network capable of delivering that level of availability can be designed and deployed. Additionally, both scheduled and unscheduled maintenance controlled by the utility. Maintenance windows can be scheduled to meet the utility's need, not at the convenience of the telco.

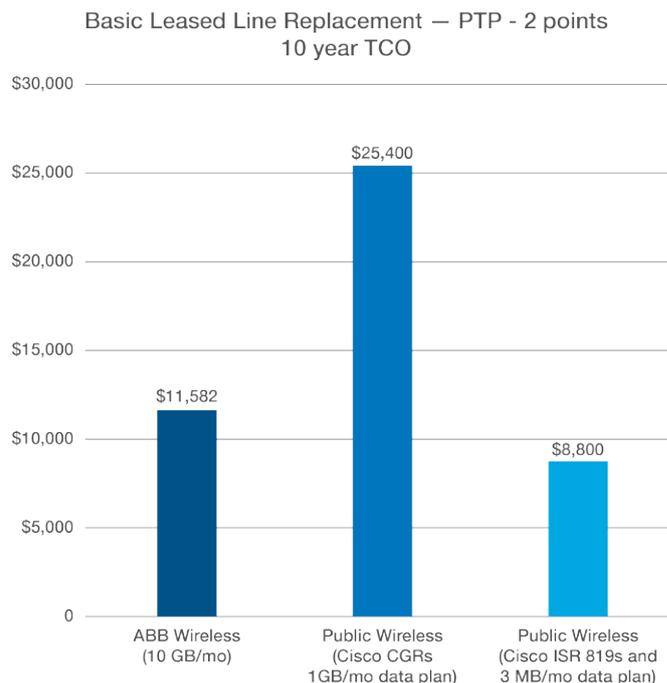
ABB: Comprehensive Leased Line Replacement Solutions

ABB offers comprehensive solutions for leased line replacement solutions. Our offering includes turnkey implementation capabilities for communication and automation systems, a variety of modern unlicensed and licensed band wireless communication products and a network management system that can comprehensively manage the utility's entire field area communication network, including the portions of the network deployed to replace leased lines, as a unified system using a single console.

- **Turnkey implementation capabilities:** ABB offers in-house expertise covering all systems involved in leased line replacement projects, e.g., SCADA DMS, RTUs, grid modernization components. With our global footprint, we can successfully tackle turnkey communication and automation projects around the world. ABB offers a full range of professional services including license facilitation services.
- **Portfolio breadth:** ABB offers a variety of modern wireless communication products suitable for use in leased line replacement applications. These products include ArcheOS licensed 200/400/700/900 MHz PTP/PTMP radios, TeleOS unlicensed 900 MHz PTP/PTMP radios and TropOS unlicensed 2.4/5 GHz broadband mesh.
- **Network management:** ABB's SuprOS communication network management system can manage a utility's entire field area network from a single console. SuprOS provides network-wide visualization tools for fault, configuration and performance management. It can scale to manage thousands of network devices, including end-points as well as network infrastructure such as TeleOS and ArcheOS PTMP radios and TropOS broadband mesh routers.

Economic Value of the ABB Solution

The graph below shows a 10 year total cost of ownership (TCO) comparison between two wireless carrier solutions, one with a 1 GB/mo. data plan, the other with a 3 MB/mo. data plan, and an ABB wireless network for a simple point-to-point (e.g., substation to operations center) configuration.



The ABB solution is cost competitive with the smaller data plan and substantially less expensive than the larger data plan. Further, the ABB solution offer important advantages over the public wireless offerings:

- **More capacity:** The amount of data that can be transported over an ABB wireless network in a month will be at least 10x more than the 1 GB/mo. data plan.
- **Higher availability:** As noted previously, cellular networks are designed to deliver 99.9% uptime while private wireless networks can be designed the deliver the 99.99% to 99.999% system availability demanded by critical field applications.
- **Lower O&M costs:** Private wireless networks can virtually eliminate O&M costs while cellular data plans saddle utilities with recurring monthly charges.

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