Cambium Networks™

LEASED-LINE REPLACEMENT APPLICATION BRIEF

CAMBIUM WIRELESS BROADBAND: RELIABLE, COST-SAVING LEASED-LINE ALTERNATIVES

Cambium Networks' fixed wireless broadband solutions are a smart investment when balancing business needs with network performance and budget realities.

CIOs and network operators face a number of challenges. One of the most notable of these includes developing network migration strategies that contribute to competitive advantages. Simultaneously, the ongoing necessity for upgrades to current networks requires astute and cost-effective investments in infrastructure to deliver continuous connectivity and support collaborative efforts.

Formerly part of Motorola Solutions, Cambium Networks' Wireless Broadband Portfolio offers a wide range of wireless solutions that can help you cost-effectively upgrade your network while delivering measurable bottom-line benefits.

CAMBIUM WIRELESS PORTFOLIO

Point-to-Multipoint (PMP) Solutions:
PMP 100 – 900 MHz, 2.4, 5.1, 5.2, 5.4, 5.8, 5.9 GHz
PMP 320 – 3.0, 3.65 GHz (Licensed)
PMP 400 – 4.9 GHz (Licensed)
PMP 430 – 5.4, 5.8 GHz
PMP 450 – 5.4, 5.8 GHz (Dual Band)

Point-to-Point (PTP) Solutions:
PTP 100 – 2.4, 5.2, 5.4, 5.8 GHz
PTP 200 – 4.9 GHz (Licensed)
PTP 230 – 5.8 GHz
PTP 250 – 5.4, 5.8 GHz (Dual Band)
PTP 500 – 5.4, 5.8 GHz
PTP 600 – 2.5, 4.5, 4.8, 4.9 GHz (Licensed)
PTP 600 – 5.4, 5.8, 5.9 GHz
PTP 800 – 6 to 38 GHz (Licensed)
PTP 810 – 6 to 38 GHz (Licensed)

ECONOMIC CHALLENGES

During difficult economic cycles, the business of governments, municipalities and commercial enterprises does not stop. It just gets more challenging. Competition does not lessen. It just gets tougher. To deliver essential services, you have to employ shrewd strategies that will positively impact the bottom line. Your network has to deliver greater performance to allow users to be more productive. And, you need reliable, secure communications that deliver greater diversity, scalability, and capacity even as budgets tighten.

VIDEO DEMANDS

The increasing usage of video dominates the communications landscape today and for the foreseeable future. Whether it's video conferencing, video surveillance, Netflix, or High-Definition TV, bandwidth requirements continue to soar, placing enormous demands on existing networks. This need for speed is one of the many factors driving the migration to IP-based, network performance.

LEASED-LINE PROBLEMS

- **Escalating Costs:** For years IT professionals have relied on leased lines to provide communications between locations. As bandwidth requirements have continued to grow, costs have risen and leased lines have proliferated. Fees for leased-line services can cost from a few hundred dollars per month for a single T1/E1 connection up to thousands of dollars per month for gigabit service. As a result, many organizations that have relied on leased lines are paying expensive lease charges every month.

- **Loss of Control:** Leased lines essentially lessen internal control by making organizations dependent on an outside party for important business functions. Many IT organizations prefer to maintain local control over their network operations. In that way, problems can be quickly diagnosed and resolved, and upgrades can be performed without having to wait for an outside party to respond.

- **Reduced Reliability:** In many instances, the reliability of leased lines is not what it should be, especially in rural and remote areas. When a natural disaster such as an earthquake, wildfire, or hurricane hits, telephone lines are particularly vulnerable to service interruption at a time when communications are extremely critical. Fiber cable is often cut during construction or damaged by traffic and railroad mishaps, resulting in communication outages.

- **High TCO:** Typically, deployment of new services or upgrades in a leased-line environment is both expensive and slow. The cost and manpower required to manage and monitor contracts and service-level agreements, including verifying billing records, can be significant.

In the final analysis, leased lines are fast becoming an expense not worth paying and a risk not worth taking.

CAMBIUM WIRELESS – A PROVEN ALTERNATIVE

A growing number of organizations are discovering the benefits of replacing T1/E1 and fiber lines with wireless broadband communications. With our Cambium Point-to-Point (PTP) and Point-to-Multipoint (PMP) Wireless Broadband solutions, the advantages can be substantial. First, you can eliminate or significantly reduce monthly lease fees. Overall network performance can be upgraded, which is especially important to support today's in-demand, real-time applications such as Voice-over-IP, video surveillance, and video conferencing.

EXAMPLES OF TYPICAL LEASED-LINE CHARGES

Type	Throughput (Mbps)	Typical Monthly Cost (USD)	Typical Annual Cost (USD)
T1/E1 Leased Line	1.544 / 2.048	$200 – $300	$2,400 – $3,600
T3 Leased Line	45	$3,000 – $6,000	$36,000 – $144,000
Fiber Connection	3	$600 – $800	$7,200 – $9,600
Fiber Connection	8	$800 – $1,000	$9,600 – $12,000
Fiber Connection	100	$2,500 – $3,500	$30,000 – $42,000
OC3 Fiber	150	$5,000 – $9,000	$60,000 – $108,000

While T3 lines can provide bigger network pipes, they also have limitations on how high they can scale before additional circuits are required. Additional equipment may be required to install, secure and manage the leased network, and each additional device requires its own rack space. High recurring costs are one major problem with leased lines, but they are not the only issue.

CAMBIUM SOLUTIONS PROVE THEIR VALUE AND PERFORMANCE

In many networks, local access is the most problematic point of network congestion. Wireless broadband can provide a stable, high-performance platform to ease local-access bottlenecks. Wireless also enables agile and flexible bandwidth provisioning that can be easily and quickly scaled up or down to match dynamic traffic patterns. Our unique, problem-solving technology is able to increase reliability and connect remote, hard-to-reach locations while offering exceptional quality of service. Plus, our non-line-of-sight (NLOS) systems communicate steadfastly in some of the most challenging environments on earth.

VERSATILITY

Our PTP and PMP wireless solutions can support a wide range of network applications, including:

- Replacing leased-line service with wireless broadband
- Extending fiber networks with wireless
- Deploying a wireless backup network to ensure business continuity
- Furthering network migration by integrating wireless into hybrid networks

Optimizing network performance and extending network services to additional users while containing costs is an ongoing process. With systems that deliver up to 700 Mbps aggregate throughput, our solutions can transmit high-definition video very efficiently. High quality-of-service and low latency – as low as 1.7 milliseconds – can protect the quality of voice communications.

SCALABILITY AND FAST DEPLOYMENT

Other significant advantages are scalability and fast deployment. You can deploy a fixed wireless network that supports the convergent requirements of voice, video, and data in a fraction of the time it would take to order and provision new leased-line services. In addition, adding new services and upgrades can normally be accomplished in a day or less.

EXTENSIONS WITHOUT TRENCHING

Enterprises and municipalities with wired networks face major challenges when expanding network capacity or extending service to additional locations. The first is financial. Beyond the monthly lease charges, expansion or extension of a wired network to add capacity or new locations can be a major undertaking that carries a high price tag. The biggest contributing factor is trenching to accommodate new wire lines. Cost estimates can range from $30,000 to $40,000 per mile. With fiber networks, the cost of termination also can be a major installation expense for labor and material such as connectors, tools, and consumables.

The next issue is time. Fiber network extensions that involve major trenching efforts typically take months, and in some cases, even years. In areas where water and challenging terrain are present, trenching along water boundaries or through dense foliage or rocky terrain may not be an option. And, trenching on protected lands is not normally permitted. Over long distances, fiber runs may require single-mode fiber to ensure communication reliability at an estimated average cost of $50 per foot - $265,000 per mile.

Our fixed wireless networks are significantly more cost-effective and faster-to-deploy solutions. Systems can be planned and deployed in a matter of days or weeks rather than months or years. Equally important, cost of expansion is significantly reduced. Plus our PTP and PMP systems can perform reliably over long distances, in obstructed environments and high interference, as well as severe weather conditions.

ALWAYS-ON NETWORKS

No organization can afford to have communications interrupted by a network failure. Yet wired networks are especially susceptible to service interruptions in times of calamity. When a natural disaster strikes, wire lines are generally among the first casualties, causing service interruptions at times when connectivity is crucial. Furthermore, it can take hours or even days for wired networks to be repaired. For service providers and vital

institutions such as healthcare agencies, schools, and universities, as well as for municipalities dependent on public safety communications, interruptions of even a few minutes are unacceptable.

Such interruptions are often avoidable. Our fixed wireless broadband solutions offer you the ability to plan and deploy redundant networks in a matter of days… and at a cost that is a fraction of a wired backup. If disaster strikes, a hot switchover can restore communications instantly. For a business enterprise or service provider, this means that connectivity is restored and monetary loss is greatly minimized. For a government agency, crucial public safety communications are restored and lives are saved. For all, the significant cost and unwanted consequences of downtime are eliminated or mitigated.

A real-world example of this application was clearly evident in New Orleans, LA when Hurricane Katrina knocked out the city's wired communications network. A wireless broadband connection was quickly established to the city's temporary headquarters and, through the use of Voice-over-IP (VoIP) technology, supported some of the first phone calls the mayor made following the hurricane.

COST-EFFICIENCY AND ROI

Perhaps the most important advantage is that wireless broadband can virtually eliminate expensive monthly lease costs and provide significant savings. When you choose wireless broadband to replace leased-line connectivity and backhaul, you often can see ROI in one year or less.

BETTER RESULTS WITH LESS COST

There are two major reasons to replace leased-line service with Cambium Wireless Broadband – eliminate or reduce leased-line charges and improve network performance. As requirements for bandwidth continue to increase and budgets continue to shrink, our wireless broadband solutions can offer you significant bottom-line benefits.

With more than 3.5 million PMP units and more than 60,000 PTP systems deployed worldwide, we have the experience to help you design a wireless solution that best meets your specific needs. Working with our global network of authorized partners, we have successfully deployed wireless solutions in a wide variety of business and government organizations. So, we have the solutions, partners, and expertise to help you realize greater value and performance from your communications network.

PTP 600:
- Up to 300 Mbps
- FIPS 140-2 validation
- Up to 124 mi (200 km)
- IP66/67 rated
- ATEX and HAZLOC compliance

PMP 320
Access Point (AP):
- Up to 45 Mbps per sector
- Up to 200 subscribers per sector
- Up to 25 mi (40 km)

PMP 320
Subscriber Module (SM):
- Up to 14 Mbps
- Up to 25 mi (40 km)

ROI EXAMPLE #1 – PTP 600 LEASED-LINE REPLACEMENT*		
ROI Factor	**OC3 Fiber**	**PTP 600**
Throughput (Mbps)	150	300
Estimated Monthly Fee	$5,000	$0
Installation/Equipment Fees	$1,000	$19,995
First-Year Total Cost	**$61,000**	**$19,995**
Ongoing Annual Fees	**$60,000**	**$0**
4-MONTH ROI + ANNUAL SAVINGS OF $60,000 + HIGHER THROUGHPUT		
ROI EXAMPLE #2 – PMP 320 LEASED-LINE REPLACEMENT* (Using One AP and Three SMs To Replace Three T1 Lines)		
ROI Factor	**3 – T1 Leased Lines**	**PMP 320**
Max. Throughput (Mbps)	1.5 per T1 (full duplex)	AP – 45, SM – 14 (per SM) aggregate
Estimated Monthly Fee	$1,800 (3 at $600 each)	$0
Installation/Equipment Fees	$1,050 (3 at $350 each)	$6,300
First-Year Total Cost	**$22,650**	**$6,300**
Ongoing Annual Fees	**$21,600**	**$0**
3-MONTH ROI + ANNUAL SAVINGS OF $21,600 + HIGHER THROUGHPUT		

* All values are in USD. Actual costs and savings may vary based on individual usage, application, environmental, and network requirements.

Let us show you what your leased-line-replacement ROI can be.

Cambium Networks™

www.cambiumnetworks.com

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