



4G LTE Wireless Local Loop:

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Meeting the Challenges of a Changing Rural Marketplace



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Background

Remarkable changes are taking place throughout the rural telecommunications industry. A long history of certainty and defined business models with manageable risk have now been replaced with uncertainty and considerable risk. In their ongoing attempt to meet the changing demands of the marketplace, rural telecom carriers must explore and evaluate a range of business models and technologies to address this new reality. Flexibility and cost containment are now required to mitigate risk and satisfy tight financial realities.

Connectivity remains a core value that service providers enable. Rural telecom carriers must find ways to deliver connectivity in a cost effective manner, while providing the performance and value that customers now expect. Wireless local loop technology delivers on this by offering a combination of robust broadband performance and next generation voice service that meets the evolving needs of end customers. Indeed, wireless local loop has evolved to become a legitimate broadband and voice bundled offer, rivaling that which can be delivered via traditional landline technology, and at a fraction of the cost. With the increased risk and uncertainty brought on by a changing regulatory and cost support landscape, service providers must consider wireless local loop options as a viable part of a broader long term broadband strategy.

4G LTE Advantages for Wireless Local Loop

Wireless local loop is a fixed wireless technology, delivering both broadband and voice to homes and businesses via a wireless interface. It's a relatively mature approach to delivering bundled services, with a range of service providers utilizing the approach for some time. Wireless ISPs (WISPs), local telephone companies, and wireless carriers, among others, have offered wireless local loop for many years with great success and have proven the business model.

Service providers with access to 700 MHz and AWS spectrum have a tremendous asset in their arsenal. The emergence of 4G LTE as an underlying technology for wireless local loop has just begun, and it promises to revolutionize this established approach to providing bundled voice and data services. The adoption of 4G LTE services is well underway and may represent the fastest adoption of a wireless technology in history. While the majority this momentum is tied to mobile applications, fixed applications are a thriving part of the ecosystem as well. For example, the dominant 4G LTE carrier in North America, Verizon, has committed to wireless local loop utilizing their 4G spectrum.

Verizon's offer, HomeFusion, targets their rural markets and it's widely believed that this technology will eventually replace their landline infrastructure in Verizon's rural territories. Verizon recently announced that HomeFusion will be made available across their entire 4G LTE footprint.¹ With this bellwether committed to a wireless local loop approach, a thriving ecosystem will result, offering carriers of all sizes an additional level of comfort in adding wireless local loop to their long term broadband strategy.

¹ What Verizon's Nationwide Fixed LTE Launch Means for the Industry, <http://www.telecompetitor.com/what-verizons-nationwide-fixed-lte-launch-means-for-the-industry/>

First generation wireless local loop relied on a mish-mash of technologies, across a wide ranging spectrum landscape. Many WISPs utilize unlicensed spectrum, often in the 2.4 GHz or 5.8 GHz bands, to deliver mainly broadband Internet, but increasingly voice service as well. While adequate for service delivery, the use of unlicensed spectrum yields considerable risks. Unlicensed spectrum is subject to interference at any moment, possibly degrading the performance of service and negatively impacting the customer experience. Users of unlicensed spectrum are always on guard against this inherent risk and must engineer their network to mitigate it. Additionally, while there are higher bandwidth exceptions, first generation wireless local loop services typically deliver sub 2 Mbps broadband performance. In today's broadband world, it's increasingly difficult to meet evolving

customer expectations with that limited throughput.



Enter wireless local loop via 4G LTE. This next generation broadband wireless technology is revolutionizing both the fixed and mobile wireless broadband business proposition. Operating in multiple spectrum bands, including 700 MHz and AWS, 4G LTE dramatically improves broadband performance by more than doubling the throughput typically found in first generation wireless local loop applications. 4G LTE enabled wireless local loop easily satisfies the Connect America Fund requirements

of throughput of 4 Mbps downstream and 1 Mbps upstream (4/1). Voice service, via VoIP, is also supported, providing a true local loop alternative to POTS. Quality of Service (QoS) for voice is supported providing a more than acceptable voice product.

4G LTE also improves on first generation wireless local loop offers by mitigating interference thanks to its licensed spectrum. By operating in the spectrum band of 700 MHz, 4G LTE provides greater coverage as well. Service providers can serve up to 250 square miles with broadband and voice bundled offers from a single tower, dramatically improving the cost structure of wireless local loop as an alternative to landline based applications. NetAmerica Alliance Member Panhandle Telephone Cooperative, Inc. (PTCI) began deployment of this wireless local loop solution over a year ago and it has now become an integral part of their overall long term broadband strategy. PTCI now sees 4G LTE wireless local loop as their designated solution to reach customers where Fiber to the Home (FTTH) makes no economic or financial sense. PTCI even evaluates existing Digital Subscriber Line (DSL) markets for 4G LTE and has begun replacing higher cost extended loop DSL markets with lower cost 4G LTE.

But 4G LTE's impact goes well beyond its performance characteristics. It is also an end-to-end all-IP architecture, providing a better end customer experience. By introducing 4G LTE, service providers are positioning their operations to embrace the destined future of the industry – IP networking – and transforming their network and company as a result.

Regulatory Cost Recovery for Wireless Local Loop

A particularly appealing aspect of 4G LTE enabled wireless local loop is its potential qualification for cost recovery through federal and/or state support mechanisms. By providing voice service, 4G LTE wireless local loop service can potentially be a part of a regulated carrier's rate base, subject to universal service support.² The Uniform System of Accounts (USOA), which is one governing factor for support eligibility, generally has no limitation on the type of technology that can be utilized in the provision of regulated telephone services. Investments and expenses placed in the regulated accounts must be used and useful in the provision of services that are a part of the Public Switched Telephone Network (PSTN) to qualify for cost recovery.

Generally speaking PSTN inclusion criteria includes the following:

- The equipment must support the services included on the list of basic services defined as universal telephone service by the FCC.
- The equipment must be capable of connecting to interconnecting telecommunications carriers through standard PSTN interconnection protocols such as access and local interconnection.

Wireless local loop services can certainly meet these criteria. By adding 4G LTE wireless local loop to the regulated rate base, regulated service providers can dramatically improve an already attractive business case.³ Cost containment is a key goal in today's changing business environment. The combination of a lower cost structure and potential eligibility for cost recovery creates a compelling business case for 4G LTE wireless local loop.

The Time to Act is Now

The timing couldn't be better for service providers with access to 4G spectrum to act. From FCC requirements and mandates to shifting market conditions and the need to explore new revenue opportunities, evaluating 4G LTE wireless local loop makes sense today. Here are some key factors to consider:

1. **FCC License Build-Out Requirements** – Holders of 700 MHz and AWS spectrum will eventually face build-out requirements, some of which are approaching quickly, compelling some form of network build-out. The wireless local loop option is a low risk approach to meeting these build-out requirements.

² A company's regulatory support calculation must be viewed in total for each cost study area as a number of total study area factors and limitations can affect the treatment of Will costs and the recovery of those costs

³ Regulated independent service providers should always consult their regulatory consultants/attorneys to verify their eligibility.

2. **Connect America Fund Market Approach** – With Connect America Fund mandates of 4/1 coverage now upon the industry, service providers looking to cover their entire foot print with this mandate can look to wireless local loop as an excellent option. Its lower cost structure and potential cost recovery eligibility make it a compelling alternative to building or upgrading wireline infrastructure. It can also be more quickly implemented than comparable wireline alternatives. Additionally, the FCC seems to favor a wireless approach to meet these mandates than more expensive wireline approaches.
3. **Out-of-Market Opportunities** – 4G LTE wireless local loop should also be evaluated for overbuilding adjacent markets to offer a competitive broadband service (or bundled broadband and voice offer). As service providers look for additional business opportunities that generate all important incremental revenue, out-of-market expansion through a lower cost structure fixed wireless application may be an attractive option. By implementing a wireless local loop strategy, service providers create an expansion window of opportunity.
4. **Path to Mobile Broadband** – Without question, mobile broadband will play an ever increasing role in the future of broadband. While business factors (current lack of devices and roaming) may not make a 4G mobile broadband offer within reach for smaller rural carries today, putting yourself on a path to it still remains critical. By launching wireless local loop, broadband carriers are putting the core infrastructure in place to eventually offer a competitive mobile broadband service in the future, when the ecosystem evolves.

While the above points are significant when evaluating a 4G LTE wireless local loop option, perhaps the most important concern to recognize is the changing landscape of rural telecom. Historically, cost, risk, and customer engagement were very manageable. Costs became part of a rate base that generated a level of regulated support and return on investment which made risk very manageable. Customer engagement wasn't necessarily easy, but wasn't very difficult either, given the limited amount of competition and limited amount of applications in demand from customers. The last few years have changed this scenario significantly, and in the future, change will come at an even quicker pace.

The regulated systems that supported the costs and investments in the network have changed and continue to change going forward. They can no longer be relied on to adequately support the level of investment that the rural industry has historically been accustomed to. These changes compel rural carriers to become more efficient and seek out lower cost alternatives for delivering comparable services to rural subscribers. The risks are significantly higher, and if not managed properly, can have crippling consequences for rural carriers.



Amid this financial risk transition, customers' expectations are only rising. They expect an affordable broadband experience that enables them to interact with a growing number of applications, and on their terms. With growing competitive options, once captive customers are now willing to explore other options, should their current service provider not meet their expectations.

The use of 4G LTE for wireless local loop meets these challenges with confidence. Its lower cost structure addresses the new realities of the marketplace and greatly reduces the financial risks, when compared to wireline technologies. Additionally, it can enable the broadband experience that customers are now coming to expect, allowing rural service providers to continue to provide the level of service their customers deserve.

The NetAmerica Alliance Advantage

Founded by industry veterans, the NetAmerica Alliance creates a democratic, peer-to-peer union of independent carriers joining forces to secure the future of rural America. Alliance Members retain complete independence and control over their territories, licenses and customers while leveraging the power of our "strength in numbers" model to gain the economies of scale needed to profitably compete in today's market reality of reduced federal support and eroding historical business models.

Joining the NetAmerica Alliance helps minimize the many risks inherent in planning, deploying, marketing and supporting compelling, converged services based on 4G LTE. Joining equips Members to move faster and more strategically by leveraging other members' expertise along with the comprehensive tools, capabilities, programs and economies of scale we deliver.

The Alliance Provides:

- The programs, services and capabilities needed to succeed in today's competitive environment
- Branding, marketing & sales programs
- Service creation & implementation
- 24/7 network monitoring and support
- Access to an ecosystem of premier technology partners
- Ongoing innovation
- Access to our world-class IMS-Powered SuperCenter™ and the operational tools needed to provision, monitor and derive revenue from 4G LTE services

Members run the network in their own territories, while NetAmerica empowers advanced revenue generating services and provides the critical mass and economies of scale needed to thrive in an increasingly competitive environment.

The NetAmerica Alliance was founded on the belief that where people live shouldn't limit their access to superior communication technology and services. While mass market providers have historically ignored rural America, Alliance Members have stepped up time and time again, taking risks and doing what was needed to serve their communities with both great services and great service. We believe that commitment needs to continue with the deployment of 4G LTE and we have the model and the services for our Members to enable that to happen.



NetAmerica is the right answer at the right time. In any business, when costs increase and revenue drops, you need a solution which impacts top line revenue while commensurately decreasing capital and operational expense. NetAmerica is doing exactly that for our Members. The Alliance enables Members to significantly reduce the cost of network build-out and operations, arms them to deploy a brand with to drive revenue, and arms them with advanced IP services that consumers demand.

With the FCC's decision now declared and the new funding mechanism sliding into effect, the time is short and carriers impacted by this new model have a decision to make; wait until the changes determine their fate or shape the future themselves as they have always done. That future is waiting to be shaped as a member of the NetAmerica Alliance.

Conclusions

As rural broadband carriers continue to plan and execute their long term broadband strategy, wireless local loop services enabled by 4G LTE technology should be considered. It offers the right mix of cost containment and risk mitigation, with an advanced all-IP infrastructure that puts service providers on the path for the future. Most importantly, it can affordably deliver the right set of products and services that customers now demand, enabling service providers to maintain and even grow their customer base. In addition to being an excellent candidate to meet the FCC's Connect America Fund mandates, and in the most cost effective manner, 4G LTE wireless local loop also allows service providers to confidently consider out-of market opportunities for expansion and revenue growth.

The NetAmerica Alliance has the background, experience, and partners necessary to empower smaller rural carriers to launch and operate a wireless local loop network. Several Alliance Members have already launched, providing valuable and accessible resources of lessons learned and real time operational experience. We're committed to our Member's success and we invite you to let us help you evaluate the 4G LTE wireless local loop opportunity.