



## The Switch to LTE: When's the Tipping Point?

As mobile operators experience significant uptake of mobile data services, the next generation of technology offers a compelling business case to unleash the market.

Despite a contracting economy, mobile data consumption continues to post record growth among the world's mobile operators—thanks to smart phones, USB modems and laptop cards. This staggering growth is pushing mobile operators to a crossroad: What sort of investments do they make to continue to cost effectively capitalize on this trend?

Rather than continue investments in the current generation of systems, many operators are taking a hard look at aggressively deploying the next-generation of mobile technology known as Long Term Evolution (LTE), a spectrally efficient, all-IP technology that promises download data rates in excess of 100 Mbps.

According to a new report from Analysys Mason, wireless data traffic is expected to grow tenfold in developed markets until 2015, driving a compelling case for investment in LTE.

“LTE can provide data at a sixth of the price of basic W-CDMA,” said Analysys Mason analyst Helen Karapandžic. “In the long-term, it may be the only way to profitably manage the increasing demand for data traffic.”

Informa Telecoms & Media predicts mobile broadband subscribers will represent nearly one third of total mobile subscribers worldwide by 2013. The research firm said mobile broadband subscribers jumped 84 percent to 186 million at the end of 2008 compared with 101 million at the end of 2007.

What is behind this growth? According to a recent J.D. Power and Associates report, the increasing demand for advanced features in smartphones means users are spending more money on data plans and services. Even in a struggling economy, they are spending about \$80 per month.

Couple that trend with the introduction of cheaper wireless-enabled laptops that are subsidized by operators in many countries, and the mobile data adoption begins to skyrocket.

Emma McClune-Mohr, principal analyst with Current Analysis in Germany, said the practice of laptop subsidies, bundling the cost of a laptop with an access plan, is leading to robust sales in mobile access subscriptions throughout Europe. “There’s no question this is a success story for them,” she said.

A global demand for mobile broadband pushed European operator Orange’s mobile broadband customer base, including smartphone customers, to 23.2 million at the end of September 2008, representing an 81-percent increase from the previous year. Orange is subsidizing laptops.

For U.S.-based AT&T Mobility, which has just begun subsidizing laptops and records brisk sales of smartphones, data revenue jumped 51.2 percent in the fourth quarter 2008 compared with the year-ago quarter. It recorded \$3.1 billion from data revenue alone.

Increasingly, consumers are being conditioned to use the mobile connections in lieu of fixed connections. That means high-bandwidth services such as video and VoIP will grow exponentially.

“Just a couple of years ago the industry was talking about the dumb pipe syndrome. They didn’t want to position their data services as just a bit pipe,” McClune-Mohr said. “But clearly growth is faster with an access model. People just want to mobilize their Internet experience.”

Moreover, McClune-Mohr believes some operators will begin taking a leadership role in rolling out mobile VoIP as they continue to find more services to bundle with access

plans and laptops. "If they are promoting this as an alternative to DSL, how can they ban VoIP? I think it's going to become a competitive battleground."

As research firm Analysys Mason puts it, for some operators, LTE cannot come soon enough. The Global Mobile Suppliers Association (GSMA) has identified 26 operators that are committed to the LTE 4G standard, and at least 10 operators are vying to become the world's first LTE operator. These include Verizon Wireless, MetroPCS and CenturyTel in the U.S. In Europe, TeliaSonera in Sweden and Norway have announced plans, while Japanese operators NTT DoCoMo and KDDI are planning rollouts. Canada's Rogers Wireless, Telus and Bell Canada will roll out networks in 2010 as well. Sixteen more telecommunications companies will launch their LTE 4G services after 2010.

According to Peter Jarich, research director with Current Analysis, there is no shortage of reasons why an operator might move early to LTE.

"Some are facing spectrum crunches. Some are competing against HSPA services that can offer higher data rates, and some just want to be first to market with a technology that looks to be the future of mobile broadband," Jarich said.

Verizon Wireless, for instance, is facing stiff competition from AT&T Mobility, which is deploying HSPA services that are faster than the operator's 1x EV-DO services. Rather than investing further in EV-DO, Verizon is spending on LTE to not only be first to market with the ultra high-speed technology but compete effectively against HSPA services.

Interestingly, CenturyTel, a telecommunications provider that serves rural markets, plans to utilize LTE to cost effectively deliver high-speed access to its rural customers. The company won spectrum in the 700 MHz band and has enough to cover 53 percent of its service area, said CenturyTel CEO Glen Post during the company's fourth-quarter conference call with analysts.

"We have a plan to try to increase that. We're looking at possible ways to carve out spectrum or work with other carriers to gain access to spectrum because we do think it is a very efficient way to provide broadband access in rural areas," he said.

According to Darren McQueen, vice president with Motorola, there is a good reason why even smaller operators such as MetroPCS and CenturyTel are on the fast-track to LTE: compelling economics. "Continuing down the 3G path when data services are growing exponentially means that an operator's 3G cell sites actually shrink and cover less area as users are continually added on the network."

As a result, the lower cell throughput capacity of 3G technology means that more base station radios and cell sites are needed to support the rising traffic demand. A UMTS network operating in 10 megahertz of spectrum could require up to seven base

station radios, while an LTE network would require just one base station radio. That means LTE can offer, on average, more than three times the average cell capacity of today's HSPA networks.

LTE also has the ability to incrementally enlarge bandwidth. While UMTS is relegated to operating in a 5-megahertz channel, LTE can utilize as little as 1.4 megahertz all the way to 20 megahertz and still use one control channel, which results in greater spectral efficiency. Further, the implementation of MIMO antennas and beam forming technology can improve performance by significantly boosting coverage and data throughput.

As demand for data skyrockets, backhaul costs are another area where operators can gain advantage by deploying LTE. In the 3G world, the only way operators can add more capacity is to add more expensive cell sites. The cost of adding more cell sites includes leasing T-1 lines and reconnecting cell sites back to the central office network. Today, backhaul accounts for about 30 percent of operators' operational expenses, but that amount could skyrocket by five to 10 times more if operators stay on the same trajectory.

LTE, on the other hand, allows operators to more effectively reuse existing sites and add more capacity without adding new backhaul-related costs for each additional site.

Moreover, an all-IP network based on LTE means operators – through advanced Quality of Service (QoS) capabilities – have better control over the types of traffic that travels over their networks, which allows them to both manage the network more efficiently and take advantage of charging more for certain types of traffic. For instance, business users who need the best data speeds and QoS the network can offer would be willing to pay a premium for that service, while other users, such as teenagers, might only require a lower speed offering.

“Operators are finding themselves in the position that requires them to know more about what type of data is going over that pipe so they can prioritize it and incrementally charge for mobile data,” McQueen said.

When should operators make the switch to LTE? McQueen suggests operator executives should ask themselves several questions that include: How much data consumption are they seeing on the network today? How fast are these data services growing? How many 3G carriers are available or have been deployed? And are many of their cell sites already running at full capacity?

Motorola has been developing business tools to assist operators in determining when the time is right to move to LTE. The vendor has the capability to offer its operator customers educated analyses and side-by-side comparisons, allowing operators to

determine factors such as total cost of ownership and network costs if they deployed LTE rather than continuing on the 3G network path.

According to McQueen, understanding the answers to these questions today will have a significant impact on an operator's ability competitively and cost-effectively meet the insatiable demand consumers have for mobile broadband.