

Update on Verizon
4G LTE Deployment

Jacquelynn Ruff
 Vice President, International Public Policy & Regulatory Affairs
 Verizon Communications
 February 2012

VZW Technology Evolution

- 1G Analog AMPS
- 2G CDMA IS95
- 2.5G CDMA 2000 (1xRTT)
- 3G EvDO Rev 0
- 3G EvDO Rev A
- 4G Next Gen (LTE)



Vibrant U.S. Mobile Broadband Marketplace

Mobile Broadband Technologies

Spectrum Assets

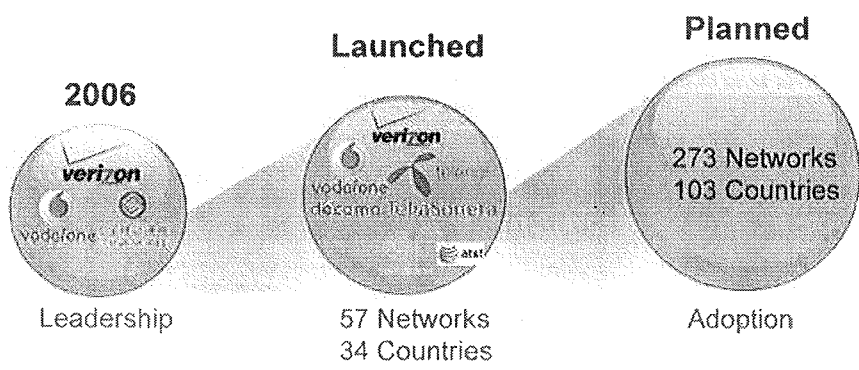
Carrier	Mobile Broadband Technologies	Spectrum Assets
Sprint	CDMA 1xEV-DO (Rev 0 Rev A) 802.16 WIMAX LTE (1H 2012)	1.9 GHz PCS 2.5 GHz EBS/BRS* 800 MHz SMR
Verizon Wireless	CDMA 1xEV-DO (Rev 0 Rev A) LTE	700 MHz 850 MHz Cellular 1.9 GHz PCS 1.7 / 2.1 GHz AWS
T-Mobile	802.11 WiFi HSPA HSPA+	1.9 GHz PCS 1.7 / 2.1 GHz AWS
AT&T	802.11 WiFi HSPA HSPA+ LTE	700 MHz 850 MHz Cellular 1.9 GHz PCS 1.7 / 2.1 GHz AWS

Competition has led to aggressive deployment of mobile broadband and significant capital investment.

* through partnership with Clearwire



LTE Global Adoption

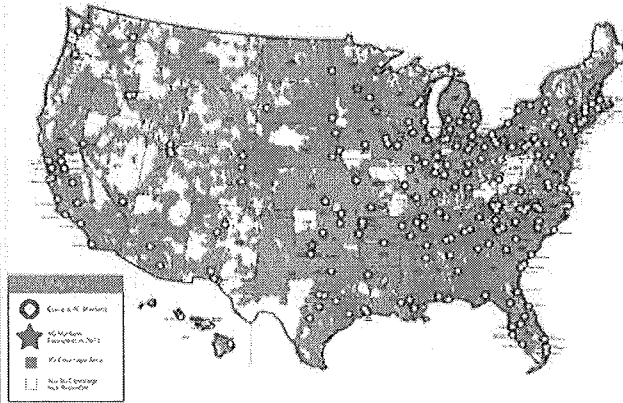


Source: 4G Americas.org (Feb 2012)



4G LTE Rollout

Verizon Wireless 4G LTE Markets Year End 2011: 200m People Covered



2010

4G LTE deployed in 38 markets and 60 major airports, reaching more than 110m people.

2011

4G LTE deployed in 190 total markets by year end, covering more than 200m people.

2012

4G LTE will cover 250m people by the end of the year.

2013

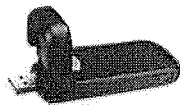
4G LTE will cover the entire Verizon 3G footprint, currently more than 290m people.

First large-scale 4G LTE deployment in the world

5



4G LTE Devices



HTC



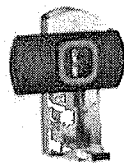
LG



4Q10

1H11

December 2011



Samsung

Samsung

6



4G LTE Network Performance

Expectation

Delivered

Throughput of 5 – 12 Mbps



Real time application latency



Connection Success Rate



Retained Connection



Reliability



7



New Mobile Broadband Services

Applications & Services

4G[™] Ecosystem

REAL. HERE. NOW.

Products

Modules & Enablers

Chipsets

4G[™] LTE

- Video
- Music
- Mobile Gaming
- Augmented Reality
- Energy Management
- Advanced Telematics
- New Consumption Models
- Communications & Sharing
- Wireless Home Management
- Mobile Visual Collaboration
- Full Featured Wireless Office
- Collaborative Tele Healthcare
- Streaming HD Media & Entertainment
- Wireless Video Monitoring & Surveillance



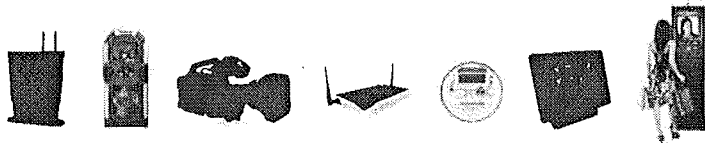
Commitment to Innovation

**Application
Innovation Center**
(San Francisco, CA)



LTE Innovation Center
(Waltham, MA)

4G Venture Forum
(Basking Ridge, NJ)



LTE Enhancements

Service Management

- Bandwidth
- Latency
- Meet Customer Requirements

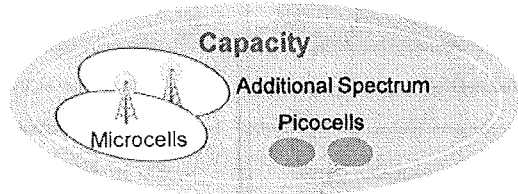
Quality of Service (QoS)

- VoLTE, Public Safety
- Best Effort
- Machine to Machine

Growth Strategy

- Smaller Cells
- More Spectrum
- Technology Enhancements

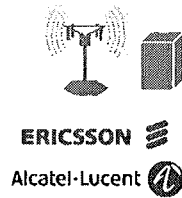
Capacity



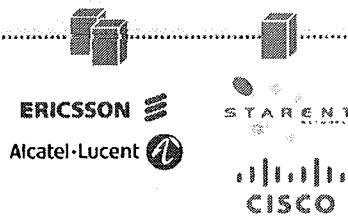


4G LTE Network Architecture & Partners

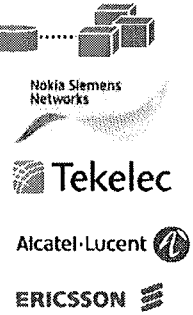
Radio Access



Enhanced Packet Core



IMS



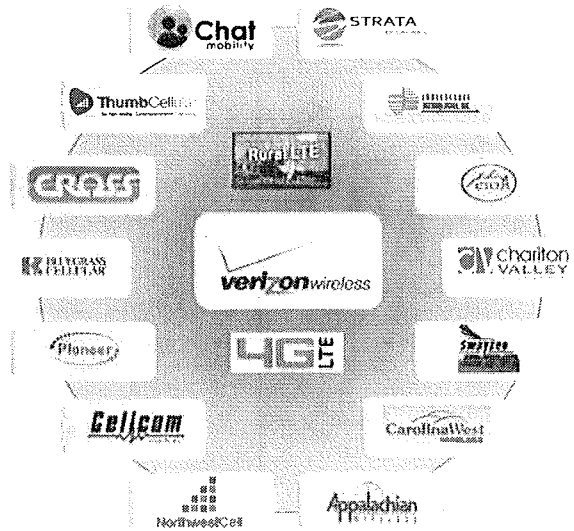
LTE in Rural America – Program Advantages

Attractive Business Model

- Long-term access to 4G spectrum
- National roaming agreement
- Scaled core network access
- Capital and operating cost savings

Operational Synergies

- Local network operational control
- Technology collaboration with VZW
- Hosted provisioning platform
- Local branding and bundling





Program Status – Fifteen Announced Leases

Wireless Carriers

- Bluegrass Cellular – Kentucky
- Cross Telephone – Oklahoma
- Pioneer Cellular – Oklahoma
- Cellcom – Wisconsin
- Thumb Cellular – Michigan
- Strata Networks – Utah
- Clear Stream – North Carolina
- Custer Telephone Cooperative – Idaho
- Chariton Valley – Missouri
- Appalachian Wireless – Kentucky
- NorthwestCell – Missouri
- Chat Mobility 1 – Iowa
- Chat Mobility 2 – Iowa

New Entrants

- Convergence Technologies – Indiana
- S and R Communications – Indiana

8/28/2011

RCA 2011: 4G options abound for rural players

April 21 2011 11:27 pm ET | Don Meyer | RCA Wireless News

Carriers are scrambling to get ahead of the competition in the rural market. The Verizon Wireless Rural Network Expansion Program (RNEP) is a key part of this effort. The program is designed to help rural carriers build out their networks and provide better service to their customers. The program is a win-win for everyone involved.



Six Rural Carriers Join With Verizon Wireless To Deliver 4G LTE Mobile Broadband To Rural Communities

Carriers Share Verizon Spectrum, Build and Operate Networks through LTE in Rural America Program

02/15/2011 BASKING RIDGE, NJ — Customers of six rural carriers will be among the first in rural communities to have access to 4G Long Term Evolution (LTE) networks, the state-of-the-art digital standard for

the program

FierceWireless

Published by FierceWireless.com (http://www.fiercewireless.com)

Rural operators playing leading role in mobile broadband

By Lynette Lura
Created Mar 22 2010 - 2:41pm

It used to be that rural operators were the technology laggards, leveraging technology that rural mobile operators had ignored. But as the need grows for high-speed data networks, many rural operators are taking a leading position thanks to broadband from Verizon Wireless. Verizon Wireless is teaming up with rural operators to build out 4G LTE networks and help them take their service to the next level. Verizon Wireless is a role that rural mobile operators have long understood about their voice services, but now cell internet access.



Lynette Lura



Thank You!

Jacquelynn Ruff

Jacquelynn.L.Ruff@verizon.com

