



# ***CDMA Development Group*** ***PCG UPDATE***

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# CDG as an Organization

CDG has more than **135** members including operators, infrastructure manufacturers, device suppliers and other organizations that support and provide various services within the CDMA2000 ecosystem.



Helping to Build the Wireless Industry and Promote Harmonization

# CDMA2000 - Quick Market Facts

CDMA2000 is the second-largest wireless technology deployed in the world, with over **half a billion** subscribers, forecasted to reach **829 million** by 2015.

CDMA2000 networks generated **\$150 billion** in service revenues in 2009.

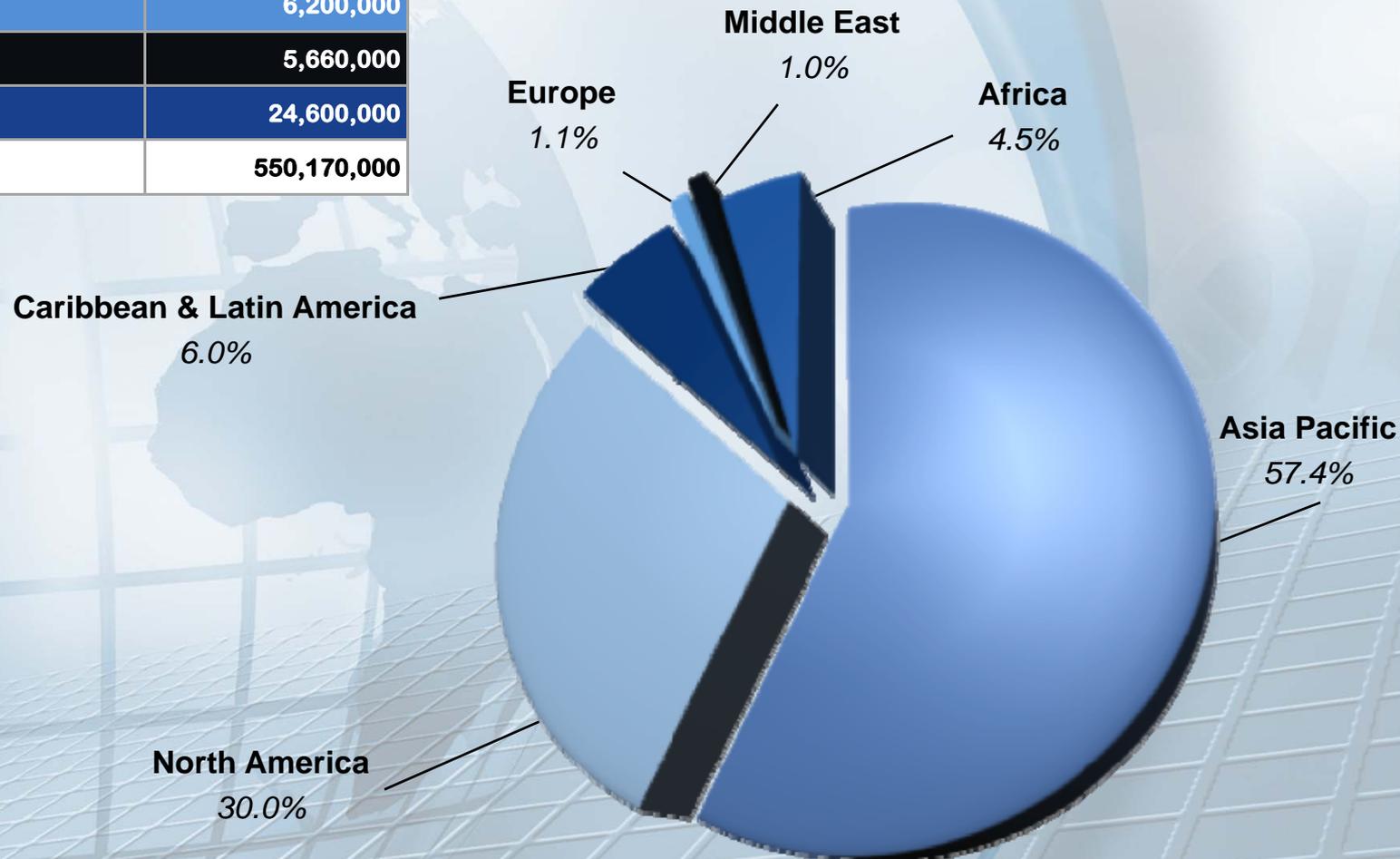
- ❑ **547,220,000** CDMA2000® subscribers
- ❑ **147,814,000** CDMA2000 1xEV-DO subscribers
- ❑ **314** commercial operators in **120** countries/territories
- ❑ **302** commercial CDMA2000 1X networks
- ❑ **115** commercial 1xEV-DO Rel. 0 networks
- ❑ **100** commercial 1xEV-DO Rev. A networks
- ❑ **2** commercial EV-DO Rev. B networks
- ❑ **2,411** devices have been introduced in to the market

CDMA2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), CDMA2000 is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.

# CDMA Subscriber Statistics: June 2010

Asia Pacific	316,060,000
North America	164,850,000
Caribbean & Latin America	32,800,000
Europe	6,200,000
Middle East	5,660,000
Africa	24,600,000
<b>Total</b>	<b>550,170,000</b>

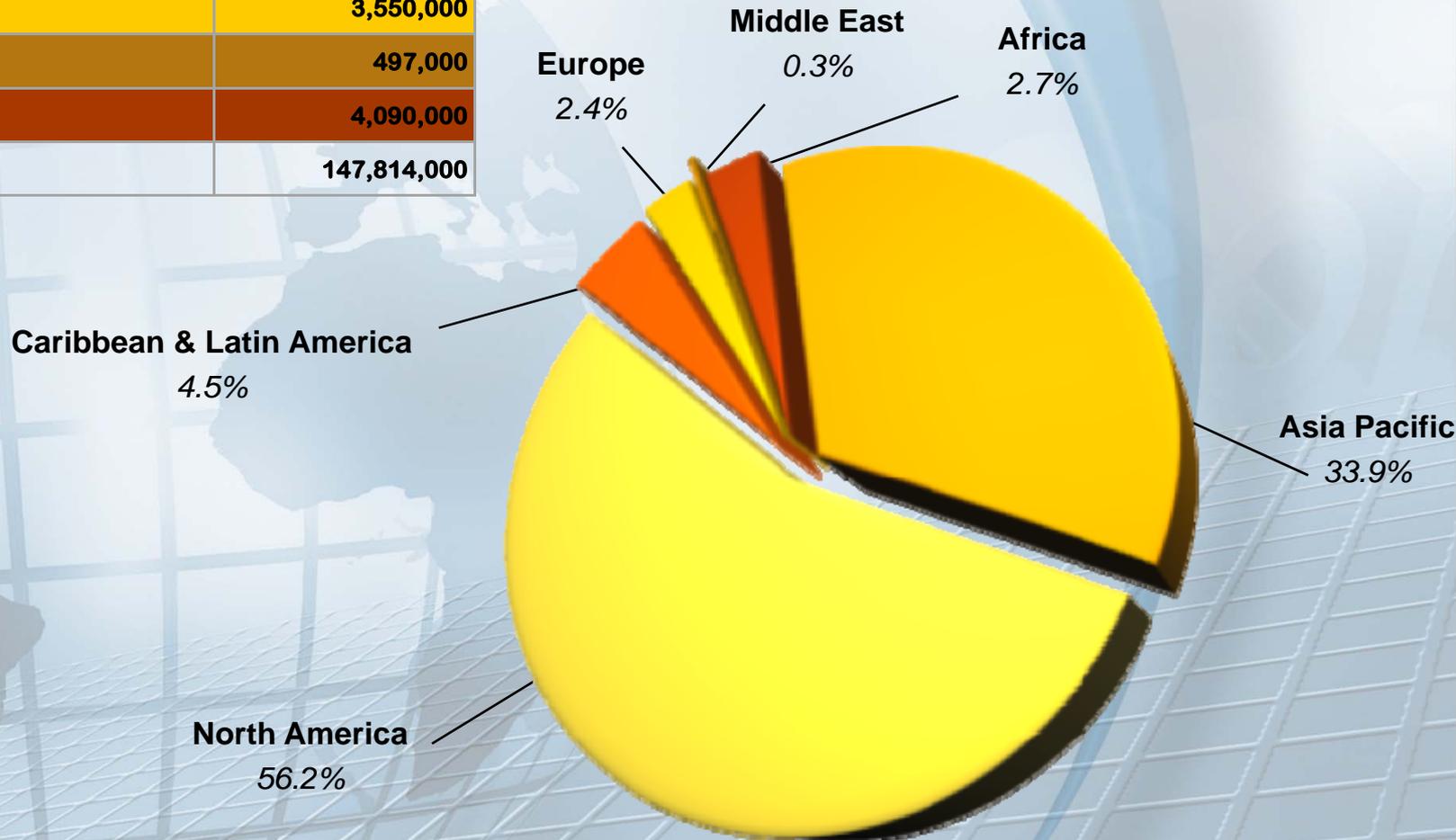
**Worldwide Total: 550,170,000**



# EV-DO Subscriber Statistics: June 2010

Asia Pacific	50,040,000
North America	82,995,000
Caribbean & Latin America	6,642,000
Europe	3,550,000
Middle East	497,000
Africa	4,090,000
Total	147,814,000

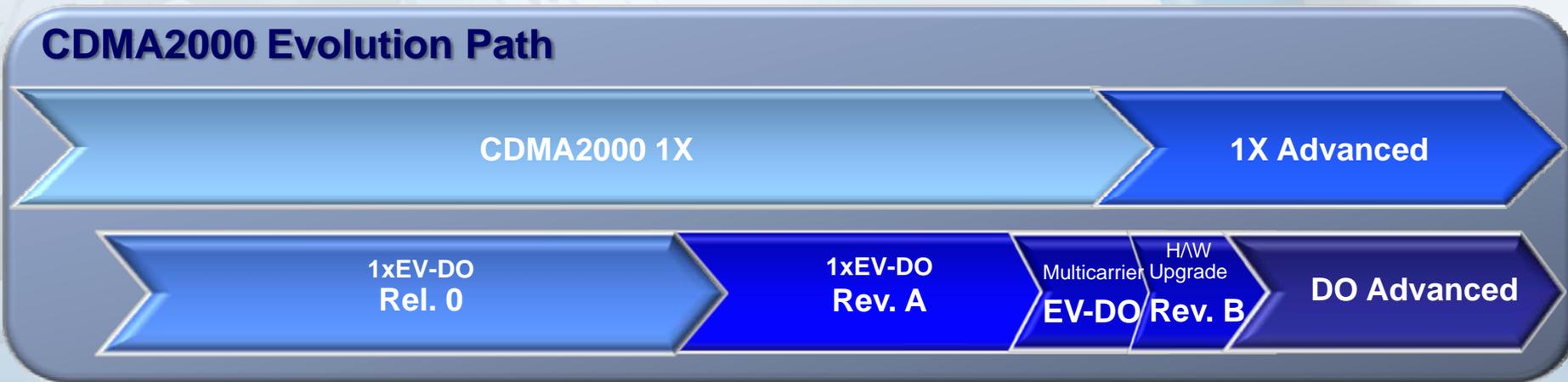
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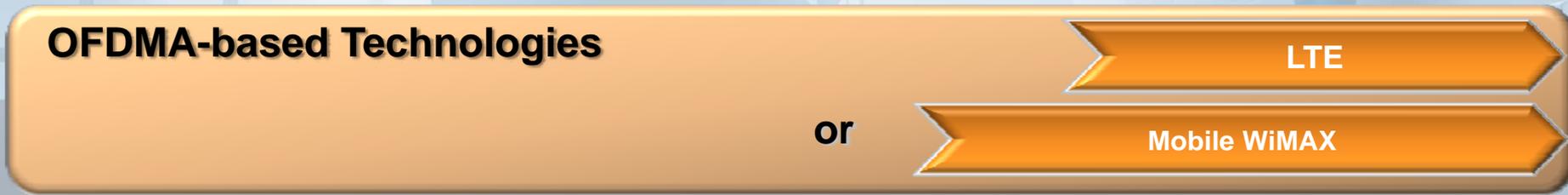
# Coexistence of CDMA and OFDM

*CDMA2000 will be complemented with OFDM-based solutions*

## CDMA2000 Evolution Path

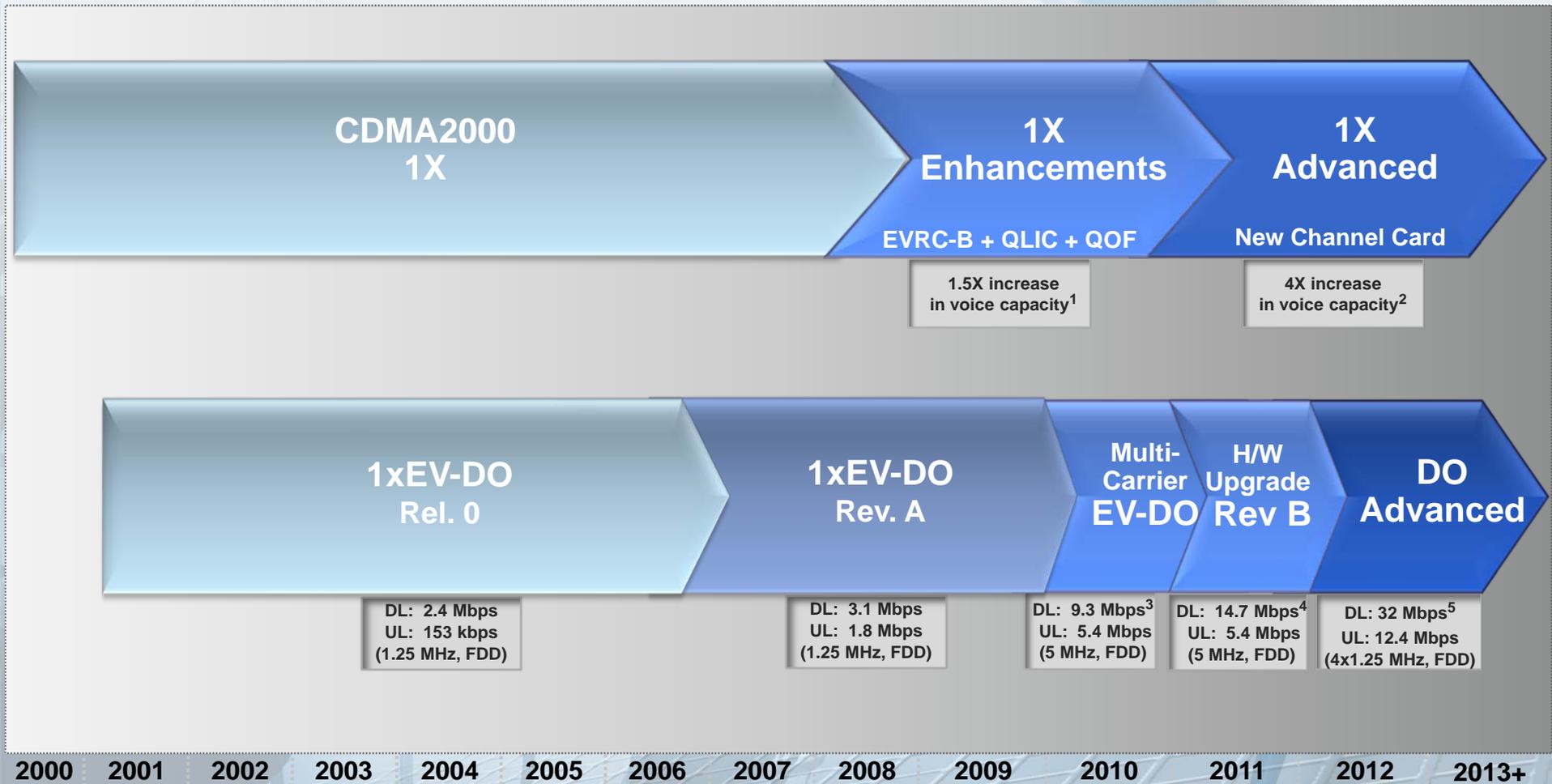


## OFDMA-based Technologies



2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014+

# CDMA2000 Roadmap



<sup>1</sup> Capacity increase is primarily due to new EVRC-B codec, handset interference cancellation (QLIC) and Quasi-Orthogonal-Functions (QOF)

<sup>2</sup> Capacity increase is primarily due to UL and DL interference cancellation and mobile receive diversity

<sup>3</sup> Peak rate for 3 EV-DO carriers with software upgrade. Standard supports up to 15 aggregated Rev. A carriers

<sup>4</sup> Peak rate for 3 EV-DO carriers with hardware upgrade supporting 64 QAM in the DL. Standard supports up to 15 aggregated Rev. A carriers

<sup>5</sup> EV-DO Enhancements include smart network techniques, new device enhancements, 2x2 MIMO support, 64 QAM in the DL and 16 QAM in the UL

<sup>6</sup> Operators have the option to only implement software upgrades

# CDMA2000 Interworking with LTE

## □ **LTE and EV-DO Rev. A:**

The initial set of 3GPP2 specifications has been completed – C.S0087 (TSG-C), X.S0057 (TSG-X), S.R0129 (TSG-S), and A.S0022 (TSG-A).

*Subsequent versions of these specifications are in process and will incorporate additional functionalities such as DO to LTE handoff, DO Rev. B and LTE interworking, etc. Alignment with 3GPP Releases is being performed.*

## □ **Terminal Test Specifications:**

- a) Complete – C.S0095-0 V1.0: Signaling Test Specification for EUTRAN-cdma2000 Connectivity and Interworking
- b) Complete – C.S0097-0 v1.0: E-UTRAN – cdma2000 1x Connectivity and Interworking Air Interface Specification.
- c) In Progress – C.P0100-0 v1.0: Common Test Environment for MS Conformance testing.

*This is aimed at defining all the parameters used in the overhead messages, channel assignment messages, and handoff messages. sent to the phone for testing. Intended user of this doc is RAN4 of 3GPP.*

# Coexistence of CDMA and LTE

**CDMA2000 1X**

**+  
GSM  
+  
GPRS**



Nokia  
2865

**CDMA2000 1X**

**+  
EV-DO Rev. A  
+  
GSM  
+  
GPRS**



RIM BlackBerry  
8830

**EV-DO Rev. A**

**+  
HSPA**



Dell  
Precision Series

**WORLD MODE™**  
CREATING A WORLD WITHOUT BOUNDARIES

**CDMA2000 1X**

**+  
EV-DO Rev. A  
+  
HSPA**



LG  
SH-100



**CDMA2000 1X**

**+  
EV-DO Rev. A/B  
+  
LTE**



Samsung  
Craft

# World's first LTE-enabled CDMA2000



First CDMA2000 1X/EV-DO Rev. A/LTE Smartphone....

## Samsung Craft SCH-r900 4G LTE Smartphone



**CDMA2000 1X  
+  
EV-DO Rev. A  
+  
LTE**

# CDMA2000 Operators and LTE

- Many CDMA2000 operators have committed to LTE, including:



- A number of CDMA450 operators have shown interest in evolving to LTE:

- Russian operator Sky Link,
- Latvian operator Triatel,
- Belarusian operator Dialog,
- Czech operator Ufon,
- Mongolian operator G-Mobile,
- Romanian operator Telemobil

- CDMA2000 will provide voice and 3G broadband data service continuity and global roaming while LTE networks are being deployed
- A vibrant and strong 3G CDMA ecosystem will enable and support new investments in LTE

# *CDG's Role as 3GPP MRP*

- ❑ **Playing a role in facilitating the seamless interworking of CDMA2000 and LTE technologies on behalf of the CDMA community during transition to LTE**
- ❑ **CDG, as an MRP, is strengthening 3GPP's LTE advocacy effort among existing CDMA2000 operators**
- ❑ **Facilitating the harmonization and development of standards that enable a seamless user service experience on 3GPP and 3GPP2 technology platforms during migration**



# *CDG Tech Activities Supporting LTE*

- ❑ **CDG is supporting and monitoring the submission of requirements to the CDMA2000 and LTE interworking standard to ensure the 3GPP2 and 3GPP LTE specifications will enable:**
  - ❑ Seamless mobility – minimizing impact on service quality
  - ❑ Carrier grade authentication, billing, policy and security measures
  - ❑ Voice, SMS, and IM service continuity from switched to full IP environment
  - ❑ Integration of femto cells into 3GPP2 systems and mobility management among CDMA2000 and LTE networks
  - ❑ Emergency and public safety call handling on CDMA2000 and LTE Networks
  - ❑ Signaling and protocol conformance testing for CDMA2000 and LTE interworking and dual mode user terminals

# *CDG Device Activities Supporting LTE*

- ❑ **CDG's GHRC team is developing the global requirements for CDMA2000/LTE multimode devices:**
  - ❑ Devices with single radio and dual radio solutions
  - ❑ Voice and data service continuity
  - ❑ Security, low power consumption, etc.
  
- ❑ **GHRC Doc. 165 – Defines IMS network requirements**
  - ❑ Completed
  
- ❑ **GHRC Doc. 177 – Defines system determination algorithms**
  - ❑ Completed

# *CDG Roaming Activities Supporting LTE*

- ❑ **CDG's International Roaming Team is taking the necessary steps to enable inter-standard roaming across LTE and CDMA2000 networks**
- ❑ **Educating CDMA2000 roaming managers on:**
  - a. CDMA2000 and LTE inter-working
  - b. All-IP backbone and multiple access technology roaming
  - c. Common core network and CDMA2000/LTE roaming
  - d. Overview of standards organizations and how they impact roaming
- ❑ **Working with 3GPP/3GPP2 to ensure the appropriate considerations are taken to enable LTE roaming onto CDMA2000 networks**
- ❑ **Established a task force that is focusing on multi-mode roaming:**
  - ❑ Across CDMA2000 1X, EV-DO, WCDMA, HSPA and LTE networks
  - ❑ Planning to include LTE in the Global Roaming Hub™

# *CDG Educational Activities Supporting LTE*

- **CDG Wireless Academy is developing a course on interoperability between CDMA2000 and LTE (part of the eHRPD course)**

# CDG Advocacy Activities Supporting LTE

- ❑ **LTE is positioned as a complementary technology and part of the long-term CDMA2000 evolution and technology roadmap:**
  - ❑ Marketing materials, press releases, white papers, fact sheets, online, etc.
  - ❑ Paid insert in 2010 CTIA Wireless show daily (*Wireless Week*)
  - ❑ Inserts in *LTE Guide*
- ❑ **Hosted workshops to educate the industry on the CDMA2000 roadmap and interoperability with LTE**
  - ❑ 3G CDMA Forum at CTIA 2010, Las Vegas
  - ❑ CDMA World Forum, Shanghai
- ❑ **Promoting CDMA2000/LTE interoperability in speaking roles at the following industry events:**
  - ❑ 4G World
  - ❑ China LTE World
  - ❑ LTE Forum
  - ❑ CDMA World Forum
  - ❑ 3G CDMA Forum
  - ❑ CommunicAsia



*Thank You*