

# Examining the 3GPP Release 8 Standards: What still needs to be done?

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A GLOBAL INITIATIVE

# What is in Release 8?

- LTE and SAE form the basis of 3GPP Release 8
- LTE and SAE are IP based, bringing reduced latency, better spectrum efficiency & flexibility, larger & more efficient cell size, access
- Provides inter-working with legacy standards (GSM, UMTS, CDMA, TD-SCDMA)

## Radio

- 3G Long Term Evolution – Radio Access part (both FDD and TDD)
- UTRAN / GERAN - LTE Inter-working
- Enhancements for HSPA+
- Home NodeB (Femtocell)
- New Spectrum: UMTS 1500, UMTS 700, UMTS 2300, UMTS / LTE 3500
- LTE-Advanced requirements setting

## Core

- System Architecture Evolution - Evolved Packet System
- IMS enhancements
- Mobility between 3GPP and non 3GPP Systems

- Release 8 is the basis for commercial LTE deployment



# LTE: Relationship with SAE



- 📶 A high performance air interface demands a high performance core network
- 📶 Deploying LTE without SAE may be theoretically possible, but it would make no sense to do so!
- 📶 Therefore, the timeline for delivering SAE specifications has been synchronized to the timeline for delivering LTE specifications
- 📶 Hence, the combination of LTE and SAE form the very essence of 3GPP Release 8

# Meeting Industry Requirements

 NGMN Alliance have stated:

*“Based on the results of technology evaluation, the NGMN board concluded in June 2008 that LTE/SAE is the first technology which broadly meets NGMN recommendations. The NGMN Alliance therefore approves LTE/SAE as its first compliant technology”*































NGMN Alliance,  
June 08

 LSTI results from LTE field trials are highly promising:

*“Early LTE equipment is meeting Industry requirements”*

LSTI, 26/Jan 09

# Operator commitment\* to LTE





-  **Aircell**
-  **AT&T Mobility**
-  **Bell Canada**
-  **CenturyTel**
-  **China Mobile**
-  **China Telecom**
-  **Cox**
-  **HK CSL Ltd**
-  **Hutchison 3**
-  **KDDI**
-  **KTF**
-  **MetroPCS**
-  **NTT DoCoMo**
-  **Orange**
-  **PCCW**
-  **Piltel**
-  **Rogers Wireless**
-  **SK Telecom**
-  **SmarTone-Vodafone**
-  **Tele2 Sweden**
-  **Telecom Italia**
-  **Telecom NZ**
-  **Telefonica O2**
-  **Telenor Sweden**
-  **TeliaSonera**
-  **Telstra**
-  **Telus**
-  **T-Mobile**
-  **Verizon**
-  **Vodafone**

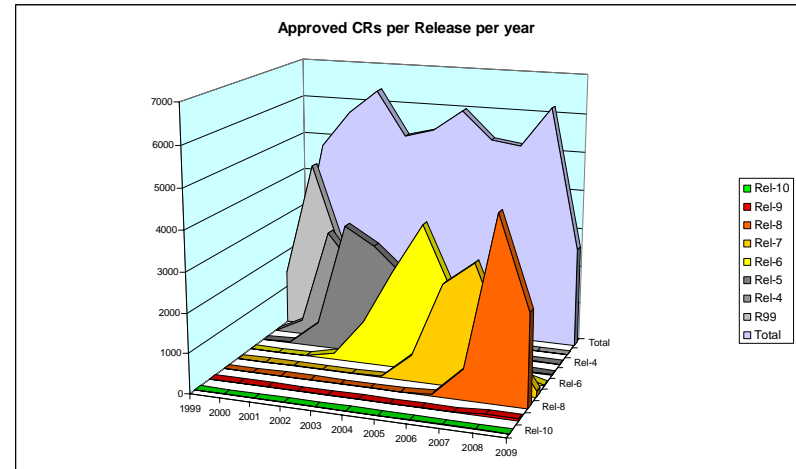
 = not evolving from GSM/UTRA family

\*(LTE operator commitments – April 15, 2009, Source: Global mobile Suppliers Association (GSA) [www.gsacom.com](http://www.gsacom.com))



# Maturing Rel 8

-  Maturity cannot be achieved without deployment
-  Rel 8 is being actively deployed
-  Early deployment leads to early maturity
-  Feedback from deployment meticulously captured within 3GPP specifications through Change Request process



Release	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
R99	1408	4398	2266	1004	581	512	111	42	23	5		10350
Rel-4		376	2828	1900	690	257	122	63	48	22	9	6315
Rel-5		27	644	3274	2842	2162	1357	509	94	25	7	10941
Rel-6				172	1088	2458	3721	2074	1078	212	26	10829
Rel-7					1	20	663	2529	3132	1262	144	7751
Rel-8								49	777	4609	2332	7767
Rel-9										49	52	101
Rel-10											1	1
<b>Total</b>	<b>1408</b>	<b>4801</b>	<b>5738</b>	<b>6350</b>	<b>5202</b>	<b>5409</b>	<b>5974</b>	<b>5266</b>	<b>5152</b>	<b>6184</b>	<b>2571</b>	<b>54055</b>

# A rigorous approach to LTE Testing

- 3GPP invests considerable effort in UE conformance testing
- A very practical approach has been applied, ensuring that only those requirements within the specs which are *essential* for early LTE deployment are tested
- NGMN and UE manufacturers have proposed 450 test cases which they believe are essential for UE signalling conformance. An additional 50 test cases have been identified for UE RF conformance
- GCF has prioritised the 450 test cases (P1-P4, with 100-120 cases in each group)
- The baseline for R8 testing, is March 2009 specifications

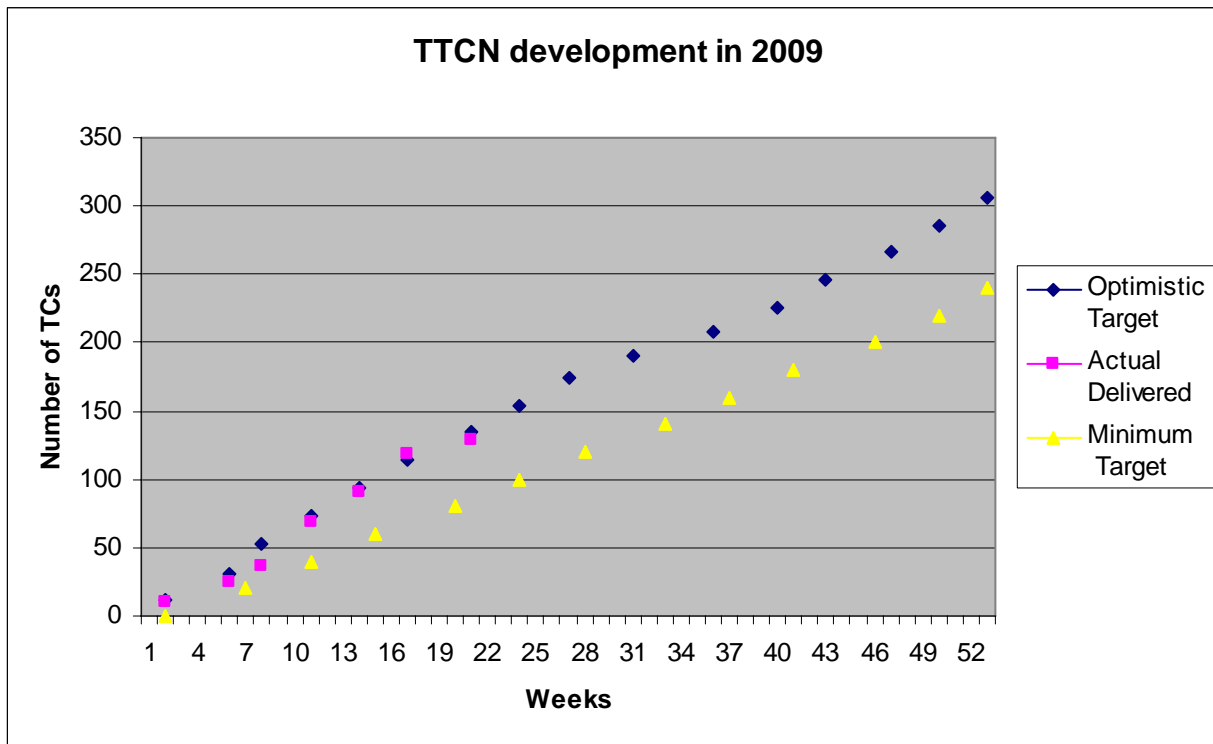
# A rigorous approach to LTE Testing

- 📶 All Test Cases (both FDD and TDD) are described in prose and developed in TTCN3
- 📶 More than 1MEur devoted to LTE TTCN development in 2009, complemented by more than 0,5 MEur of voluntary funding (equating to a total of 18 experts)
- 📶 4 test equipment manufacturers are directly involved in the development of test cases
- 📶 First certified UEs expected by Q4 2010 (based on P1 and P2 TCs)
- 📶 Certified UEs compliant with all Test Cases (P1-P4) expected by 2011



# Are the testing targets realistic?

The actual LTE TTCN development is closed to the ideal optimistic target




# 3GPP provides much more....



- ❧ 3GPP not only produces standards for fast and efficient networks that will enhance the user experience, but produces much more....
- ❧ 3GPP LTE is *the* point of convergence and will unite the World's operators around a common technology
- ❧ This is good news, but also places very high responsibility on 3GPP to take care of societal and public interest issues
- ❧ 3GPP has an active programme of societal work, or work which is believed to be in the public interest

# Examples of New Services in Rel 8

 The following are examples of new services introduced in Release 8 which are in the public interest:

- Earthquake and Tsunami Warning System (ETWS)
- eCall
- In Case of Emergency (ICE)

# Earthquake and Tsunami Warning System (ETWS)

- ETWS introduces a standardised means to deliver Warning Notification simultaneously to many mobile users who should evacuate from an approaching Earthquake or Tsunami. The requirements for this feature (contained in Release 8) have been largely driven by Asia
- This is a subset of a more general Public Warning System which will be introduced in Release 9.
- The introduction of this features requires close cooperation with alerting authorities

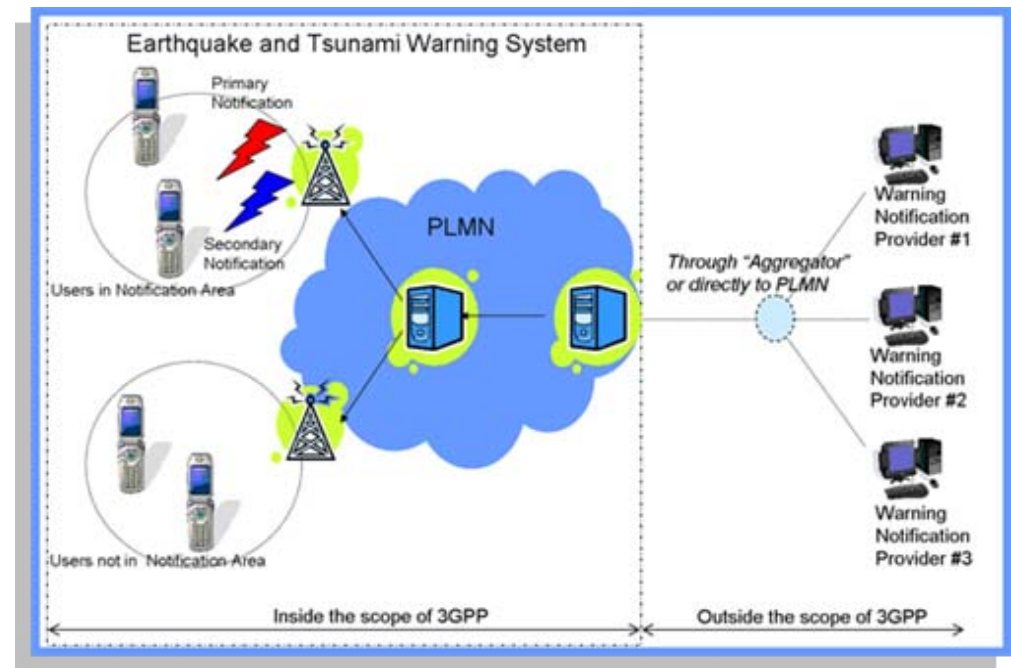


# Earthquake and Tsunami Warning System (ETWS)

ETWS provides:




- 📶 Controlled delivery of notification to affected area
- 📶 Two levels of notification (primary & secondary)
- 📶 Anti-spoofing protection

For more information see:  
3GPP TS 22.168



# eCall

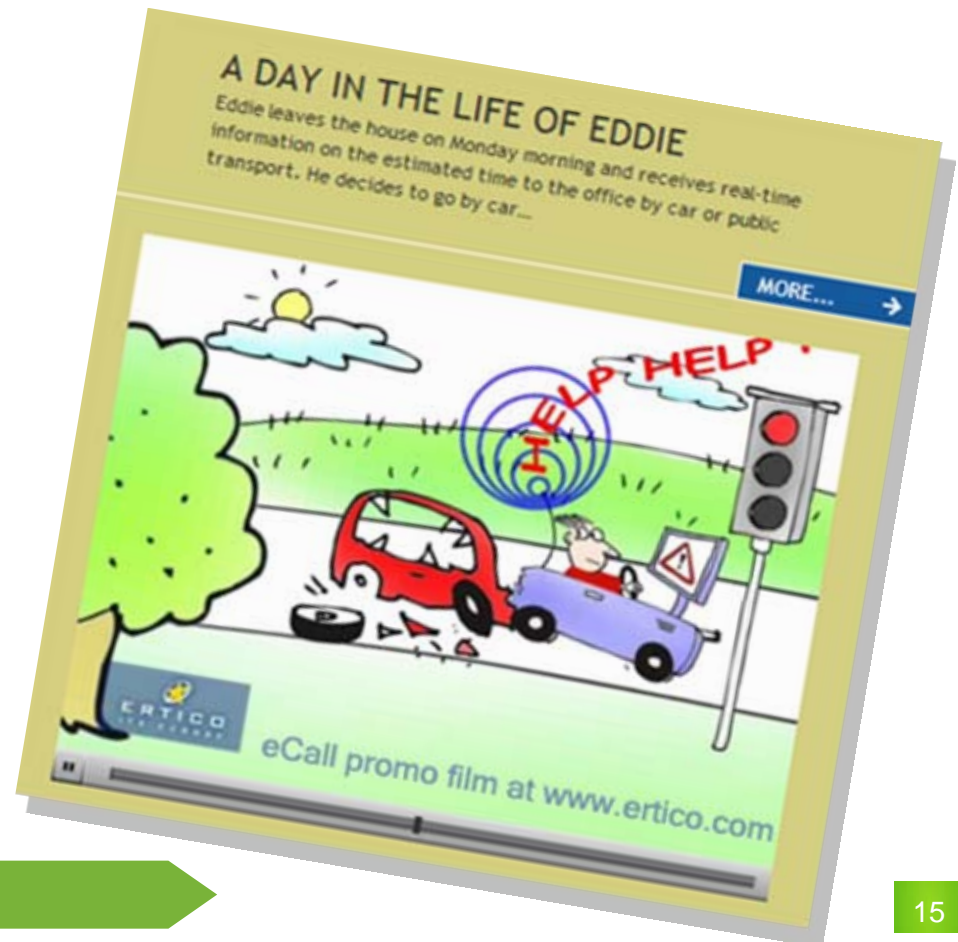
Initially designed to fulfil European requirements, the eCall feature will:

-  Enable the automated delivery of 140 bytes of information in a standardised format to a Public Safety Answering Point (PSAP)
-  Complete that delivery with 4 seconds
-  Provide accurate location information

# eCall

The introduction of this feature will dramatically reduce the time taken for emergency assistance to arrive at the scene of an accident and hence help to save lives

For more information see:  
3GPP TR 22.967  
3GPP TS 22.105  
3GPP TS 24.008



## In Case Of Emergency (ICE)

In Case of Emergency (ICE) numbers storage and easy access on UICC provides:

- 📶 Standardized storage format for emergency data (e.g., contact details, doctors name, blood type, etc)
- 📶 Standardized access mechanism \*\*\* (which overrides SIM PIN, keypad lock, etc by default)

This features (available in 3GPP Release 8) enables first responders, such as paramedics, fire-fighters, police officers, to identify victims and contact their next of kin and to obtain important medical information



# In Case Of Emergency (ICE)

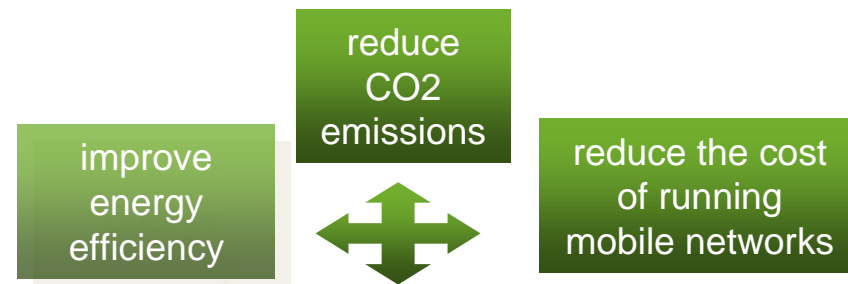
Example of standardised information format:

ICE information type	ICE information type value	ICE information value 1	ICE information value 2
Phone Number	"Contact in case of emergency"	My Wife	+3364566
Phone Number	"Contact in case of emergency"	Family Smith	+3364565
Phone Number	"Contact in case of emergency"	My Family doctor: Dr. Jones	+33643234
Free Format	"Medical Information"	My blood type is A+, I am allergic to etc.	N/A
Free Format	"Home Postal Address"	15 rue de la Paix, Paris, France	N/A
Free Format	"Language"	French	N/A
Free Format	"Travel Information"	Berlin, from 18th to 20th May, 2009	N/A

For more information, see 3GPP TS 22.101 and TS 22.030

# The Green Agenda

- 📶 The Standardization community now has an obligation to look at the impact of technology evolution on Society
- 📶 3GPP is also taking environmental issues very seriously (in both the preparation of the standards themselves as well as the impact of their deployment)
- 📶 Reducing the Carbon footprint and improving energy efficiency are key requirements for 3GPP Members
- 📶 Dedicated Feasibility Study (included in Rel 9) on Energy Savings Management. This will include the study of:
  - Retrieval of energy consumption measurements
  - Retrieval of traffic load measurements
  - Adjustment of Network Resources capabilities



# Availability of Specifications

- 📶 All 3GPP specifications can be freely downloaded from [www.3gpp.org](http://www.3gpp.org)
- 📶 A DVD of the full set of specifications is available to all delegates at the LTE World Summit



# Conclusions

- 📶 LTE is *the* Mobile Broadband technology
- 📶 LTE specification development is meticulously planned and executed
- 📶 Robust specifications will ensure successful deployment
- 📶 Operator and vendor commitment already in place
- 📶 The first commercial contracts for LTE have been announced based on Rel 8
- 📶 There is a bigger picture, LTE contributes to Public Safety and the Green agenda

# Thank you for your attention...



For more information:

Please contact 3GPP directly  
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Or any of the 3GPP Market Representation Partners:  
<http://www.3gpp.org/Management/MRP.htm>

From 28 April 2009



# Release 8 Features (at 11 Mar 2009)

## **3GPP System Architecture Evolution Specification - Evolved Packet System (non RAN aspects)**

**Requirements for evolution of the 3GPP system architecture**

**High level and common (for all accesses) functions**

**SAE for LTE access**

**SAE for Interoperation between LTE and legacy cellular PS accesses**

**SAE for support for non-3GPP accesses**

**Single Radio Voice Call Continuity for 3GPP (SRVCC)**

**Voice Call Continuity for CDMA2000 1X**

**SAE impacts on IMS**

**CS Fallback in EPS**

**System enhancements for the use of IMS services in local breakout**

**EPC Data Definitions**

**EPC Charging**

**Domain Name System Procedures for Evolved Packet System (DEPS)**

**InterWorking Function (IWF) between MAP based and Diameter based interfaces**

**CT6 aspects of SAE**

**IMS Centralized Service Control (ICSRA)**

**IMS Multimedia Telephony and Supplementary Services**

**3GPP2 Input to Common IMS**

**IMS Enhancements for support of Packet Cable access**

**IMS System enhancements for corporate network access**

**Maintenance of TISPAN documentation**

**IMS Service Continuity**

**Security Enhancements for IMS**

**IMS initiated and controlled PSS and MBMS User Service**

**Multimedia interworking between IMS and CS networks**

**IMS Stage 3 IETF Protocol Alignment**

**Interworking between User-to-User Signalling (UUS) and SIP**

**Support of Overlap signalling**

**AS/MRFC Stage 2 and 3**

**IMS Restoration Procedures**

**IMS Application Server Service Data Descriptions for AS interoperability**

**I-WLAN Network Selection Principle (NSP)**

# Release 8 Features (at 11 Mar 2009)



**Mobility between 3GPP-WLAN Interworking and 3GPP Systems**  
**Enhancements for VGCS Applications (EVA)**  
**Personal Network Management**  
**eCall Data Transfer**  
**eCall data transfer Phase 2: Comparison of alternative in-band modem solutions and standardization of one in-band modem solution**  
**IP Interconnection of Services**  
**Support of (G)MSC-S – (G)MSC-S Nc Interface based on the SIP-I protocol**  
**Earthquake and Tsunami Warning System**  
**In Case of Emergency numbers storage and easy access on UICC**  
**Local Charging Zone Requirements**  
**Customized Alerting Tone (CAT) Service**  
**Service-Level Interworking for Messaging Services**  
**Multimedia Priority Service**  
**OSA Rel-8**  
**Paging Permission with Access Control (PPACR)**  
**Charging for multi-phases services**  
**Home NodeB / eNodeB**  
**Stage 1 for HNB\_eHNB**  
**CSG and Idle Mode Mobility for LTE Home eNodeB**  
**CSG and Idle Mode Mobility for 3G Home NodeB**  
**Support of Closed Subscriber Group (CSG)**  
**UTRA HNB**  
**Support of UTRA HNB**  
**FDD Home NodeB RF requirements**  
**UTRAN Architecture for 3G HNB**  
**3G Home NodeB OAM&P (Interface Type 1 Management)**  
**UTRA HNB – UE Conformance Testing**  
**Lawful Interception in the 3GPP Rel-8**  
**Generic Bootstrapping Architecture Push Function**  
**Requirements and Test methods for Wideband Terminals**  
**Extending PSS and MBMS User Services for optimized Mobile TV**  
**Encoding formats, transport formats and media description signalling for interworking, QoS, and other enhancements to MTSI-MHI**

# Release 8 Features (at 11 Mar 2009)



## **OAM&P 8**

**Charging Management small Enhancements**

**Conferencing enhancements for Mp interface**

**Contact Manager for 3GPP UICC applications**

**Contact Manager Conformance Test specifications**

**Rel-8 LTE – 3G Long Term Evolution - Evolved Packet System RAN part**

**E-UTRAN Data Definitions**

Subscriber and Equipment Trace for E-UTRAN and EPC

E-UTRAN Network Resource Model (NRM) Integration Reference Point (IRP)

Performance measurements for E-UTRAN

Key Performance Indicators (KPIs) for E-UTRAN

**Self-Organizing Networks (SON)**

SON Concepts and requirements

Self-Establishment of eNBs, including automated Software Management

SON Automatic Neighbour Relations (ANR) List Management

**Rel-8 LTE – Terminal Conformance Test Specification**

**Rel-8 Improvements of the Radio Interface**

**UMTS 1500 MHz**

**UMTS 700 MHz FDD**

**UMTS 2300 MHz TDD LCR**

**UMTS/LTE 3500 MHz**

**Further Improved Minimum Performance Requirements for HSDPA UE (FDD) - Two-Branch Interference Cancellation**

**CS Voice Service over HSPA**

**Performance requirements for 15 code reception with 16QAM/QPSK**

**UMTS 1880 MHz TDD**

**Rel-8 Improvements of the Radio Interface - UE Conformance Testing**

**Rel-8 RAN improvements**



# Release 8 Features (at 11 Mar 2009)



**Combination of 64QAM and MIMO for HSDPA (FDD)**  
**Improved L2 for uplink**  
**Enhanced Uplink for CELL\_FACH State in FDD**  
**Enhanced UE DRX for FDD**  
**Enhancements for SRNS Relocation Procedure**  
**Enhancements for FDD HSPA Evolution**  
**64QAM for 1.28 Mcps TDD HSDPA**  
**Enhanced CELL\_FACH state in 1.28 Mcps TDD**  
**1.28 Mcps TDD Repeater**  
**Continuous Connectivity for packet data users for 1.28 Mcps TDD**  
**HSPA VoIP to WCDMA/GSM CS continuity**  
**HS-DSCH Serving Cell Change Enhancements**  
**MIMO for 1.28 Mcps TDD**  
**Dual-Cell HSDPA operation on adjacent carriers**  
**Rel-8 RAN improvements - UE Conformance Testing**  
**3.84 Mcps TDD MBSFN Integrated Mobile Broadcast**  
**MBMS - UE Conformance Testing**  
**GERAN support for GERAN - 3G Long Term Evolution interworking**  
**U-TDOA Enhancement**  
**GAN Enhancements**  
**Update TS 51.010 Mobile Station (MS) Conformance Specification for GAN Enhancements**  
**AoIP (A-interface over IP)**  
**New multicarrier BTS class**  
**Support for Additional Navigation Satellite Systems (ANSS) for LCS**  
**A-GNSS Performances and Testing Procedures**  
**Conformance testing for the Latency Reductions feature**  
**MS conformance testing of changes introduced by WI "Support of Packet-switched Handover for GERAN A/Gb mode"**  
**MS conformance testing of Support of Conversational Services in A/Gb mode via the PS domain**

# Rel 8 Feasibility Studies (at 11 Mar 2009)

- Study on Customised Alerting Tone (CAT) Requirements
- Study on Facilitating Machine to Machine Communication in GSM and UMTS (M2M)
- Study on Network Composition
- Study on Requirements of IMS Multimedia Conferencing
- Study on support of a Public Warning System
- Study on Paging Permission with Access Control
- Study on Non 3GPP access NSP
- Study on Value Added Services for Short Message Service
- Study on Service continuity between mobile and WLAN networks
- Study on Services Alignment and Migration
- Study on 3GPP System Architecture Evolution
- Study on Stage 2 aspects of IMS Service Brokering
- Study on IMS utilizing multicast bearer services
- Study on Mobility between 3GPP-WLAN Interworking and 3GPP Systems
- Study on Multimedia Session Continuity
- Study on centralized IMS service control
- Study on Architecture of IMS based Customized Alerting Tone (CAT)
- Study on Home (e)NodeB Security
- Study on Transferring of emergency call data – in-band modem solution
- Study on Element Operations Systems Function (EOSF) definition
- Study on SA5 MTOSI XML Harmonization
- Study on Common Profile Storage (CPS) Framework of User Data for network services and management
- Study on Management for LTE and SAE
- Study on Charging Aspects of 3GPP System Evolution
- Study on AS-MRFC media server control protocol
- Study on IMS Restoration Procedures
- Study on IMS Application Server Service Data Descriptions for AS interoperability
- Study on Customized Alerting Tone (CAT) solution for voice and video call in CS domain
- Study on InterWorking Function between MAP based and Diameter based interfaces

# Rel 8 Feasibility Studies (at 11 Mar 2009)

- Study on Scope of future HSPA Evolution for 1.28Mcps TDD**
- Study on Synchronized E-DCH for UTRA FDD**
- Study on Improved network controlled mobility between LTE and 3GPP2/mobile WiMAX radio technologies**
- Study on 3G Home NodeB/eNodeB**
- Study on HS-PDSCH serving cell change enhancements**
- Study on Dual-Cell HSDPA operation**
- Study on A-interface over IP**
- Study on Multi-User Reusing-One-Slot**
- Study on Optimized Transmit Pulse Shape for Downlink EGPRS2-B**