



Mobile Service in LTE

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I Mobile Technology

II LTE Market

III Device Trends



I . Mobile Technology

Traffic

Bandwidth = Speed, Consumer satisfaction



Infra and Industry

German Automotive Industry

- ▷ Economy growth engine in 1950s
- ▷ Premium brand: Luxury car M/S higher than 40% (US)

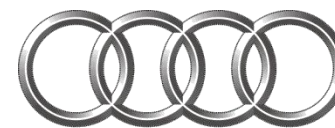
Autobahn



Automobile Industry



Mercedes-Benz



Audi

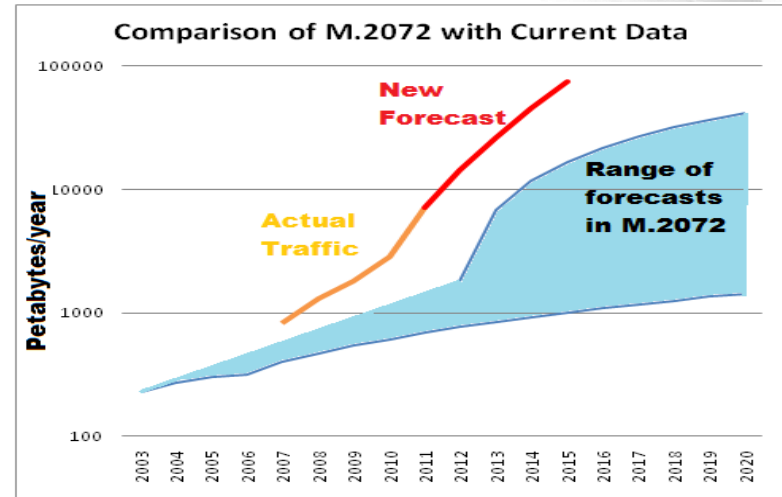
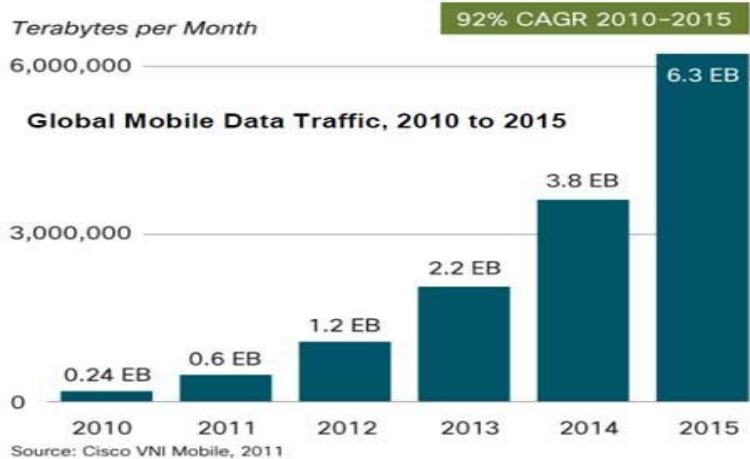


MAYBACH



Technology Challenges

Increasing Mobile Data Volume



[Source: ITU-R Report M.2243]

Increasing Mobile Data Diversity



Mobile Technology

2009

LTE Rel-8

OFDM + MIMO

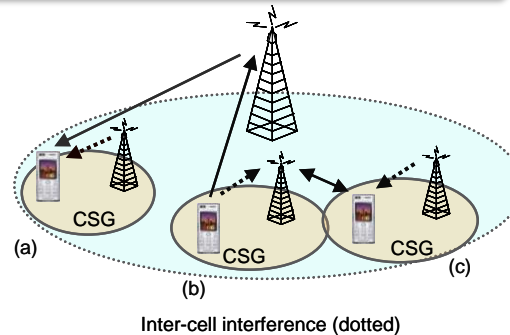


- 300 Mbps peak rate
- First generation mobile broadband
- MIMO, OFDM, SC-FDMA

2011

LTE-A Rel-10

Carrier Aggregation,
Relay, Hetnet



- 1Gbps peak rate
- Carrier Aggregation, Uplink MIMO
- Hetnet

2015

Rel-11 and beyond

COMP, DAS, M2M...



- 100 x improvement?
- Rel-11 (2012)
 - COMP, DAS, TDD enhancement, Energy efficiency
- Rel-12 (2014)
 - 3D channel/FD-MIMO, D2D, small cell

Continue to Improve Capacity & Data rate



II . LTE Market

Samsung's Contribution to LTE

Timely LTE devices for early market development

- ▷ 1st Pre-Commercial LTE Dongle (GT-B3710, for TeliaSonera, Dec 2009)
- ▷ 1st Commercial LTE Dongle (GT-B3730, for TeliaSonera, Jun 2010)
- ▷ 1st LTE Handset (SCH-R900, for Metro PCS, Sep 2010)



Galaxy-Note2 (Nov 2012)



Galaxy-S3 (June 2012)



Galaxy-S2 LTE (Sep 2011)



Galaxy-Note LTE (Dec 2011)

145 operators

62.5 million Subscribers

57 operators

12.0 million

24 operators

0.7 million

2 operators

1st LTE operator
TeliaSonera

Pre-commercial
LTE Dongle
GT-B3710
(Dec 2009)



1st LTE
Dongle
GT-B3730
(Jun 2010)



1st LTE
Handset
SCH-R900
(Sep 2010)



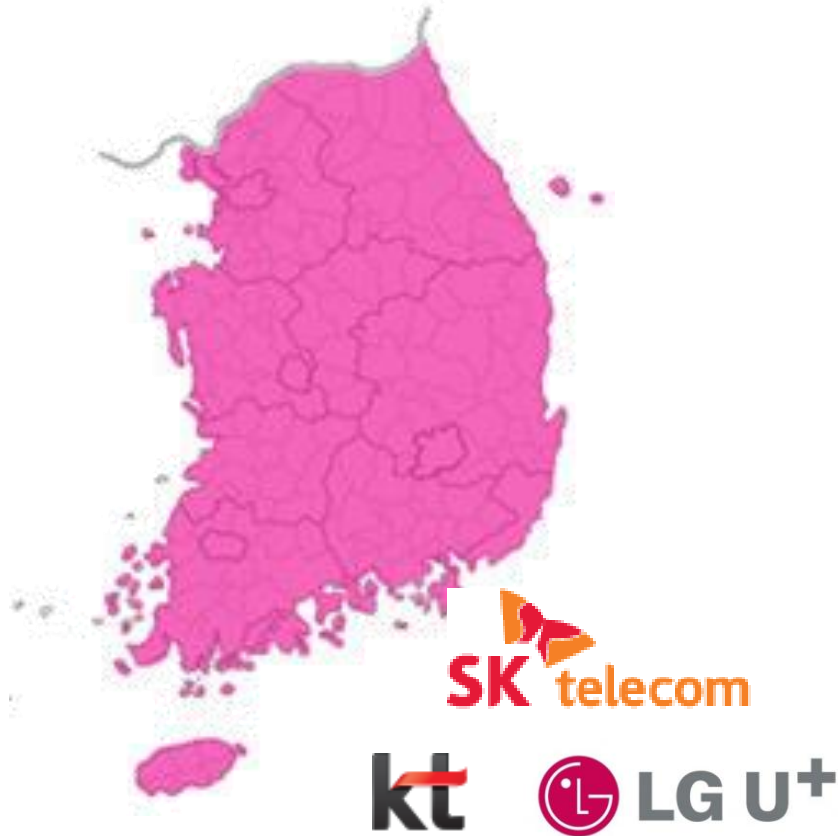
3GPP rel. 8

■ No. of operators
■ No. of subscribers

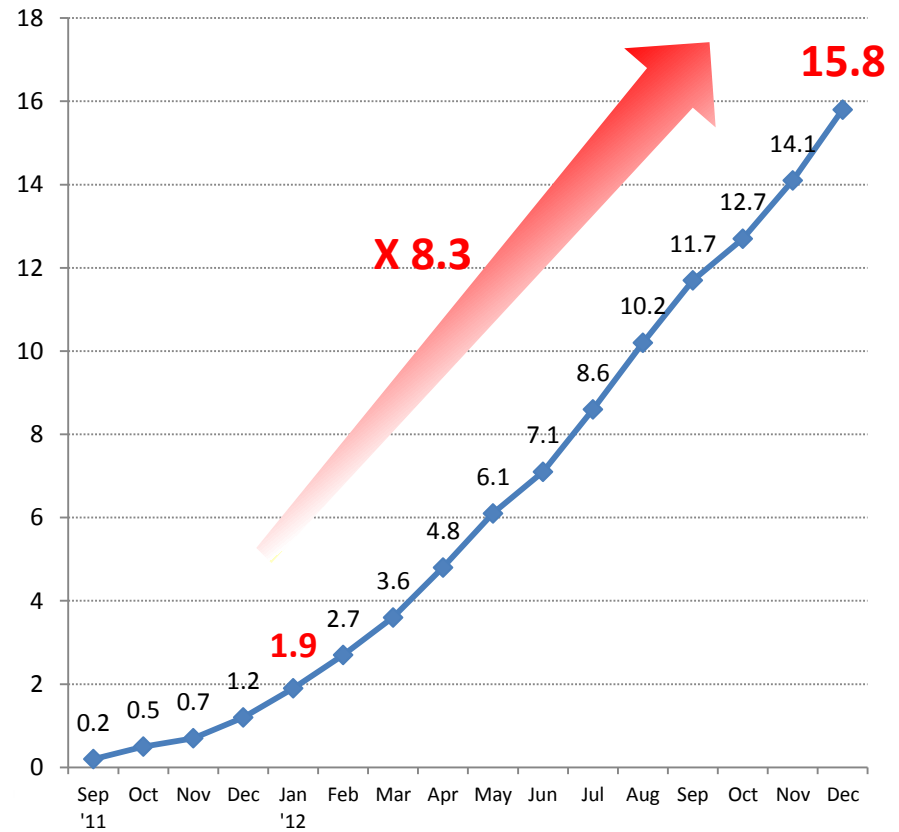
Nov 2004 Mar 2009 Dec 2009 Jun 2010 Sep 2010 Dec 2010 Jul 2011 Dec 2011 Mar 2012 Dec 2012

Korean LTE Market

Nation-wide LTE coverage by



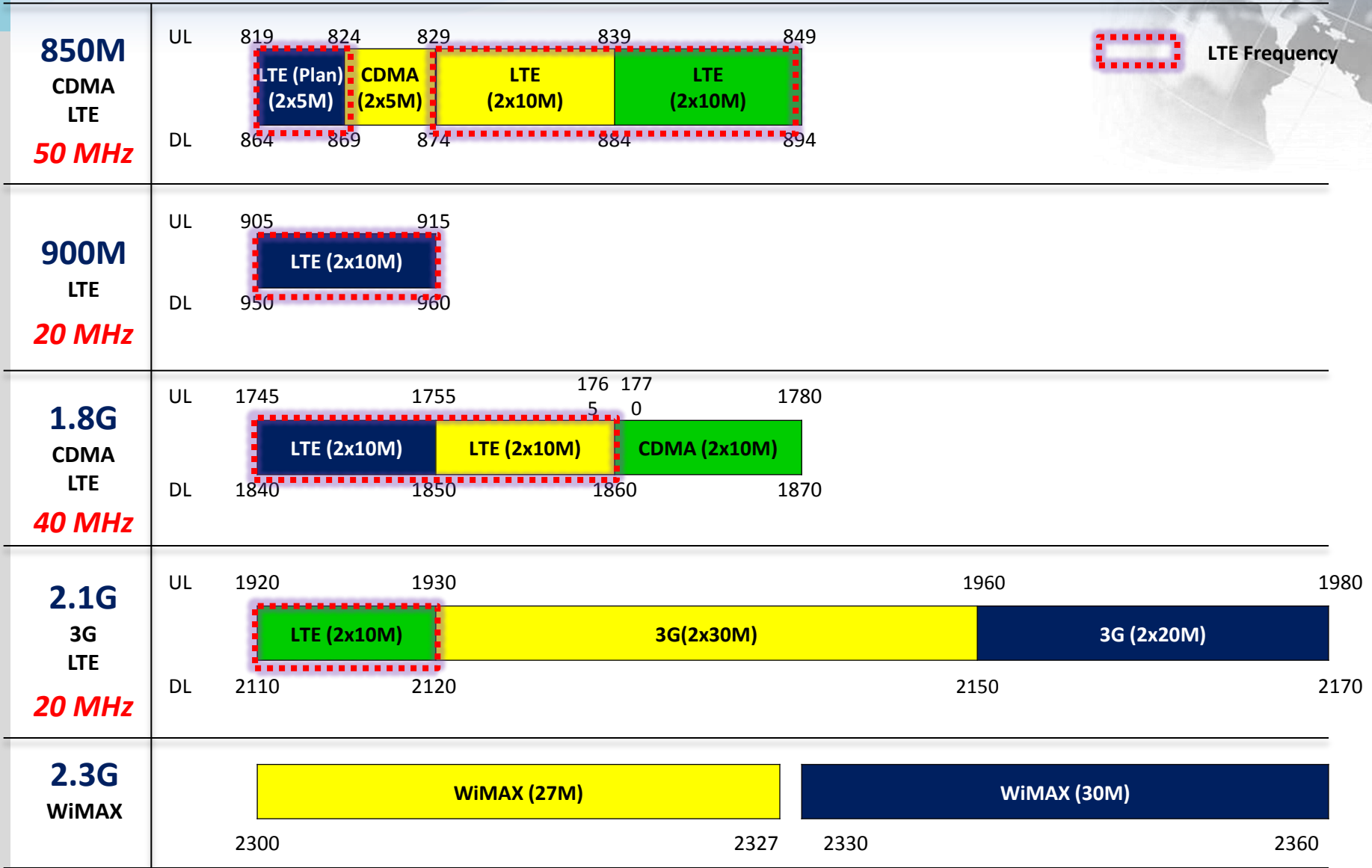
Fast Adoption in Korea



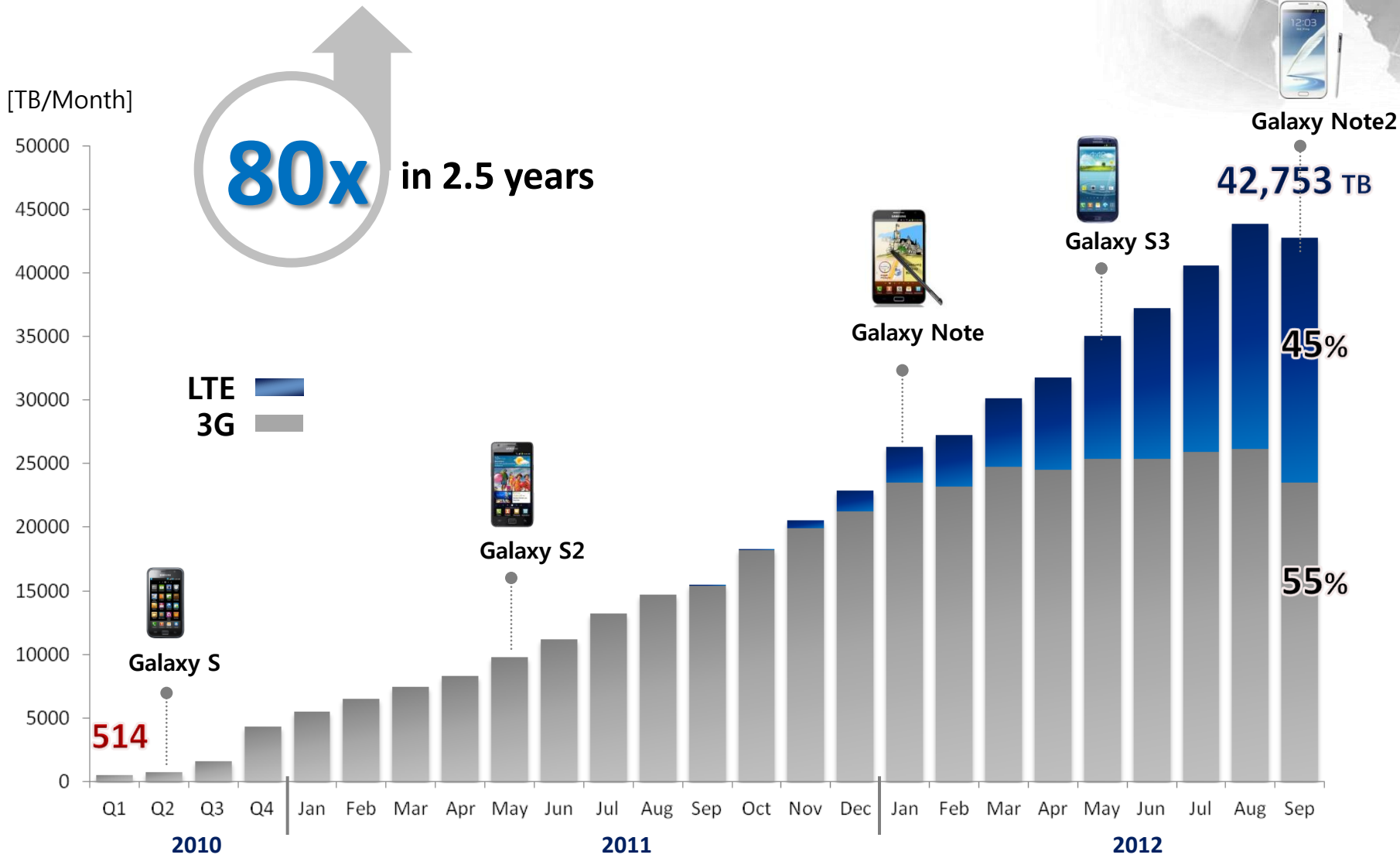
[Source: KCC]

LTE subscribers in Korea (million)

LTE Spectrum in KOREA



Mobile Data Growth by Technology

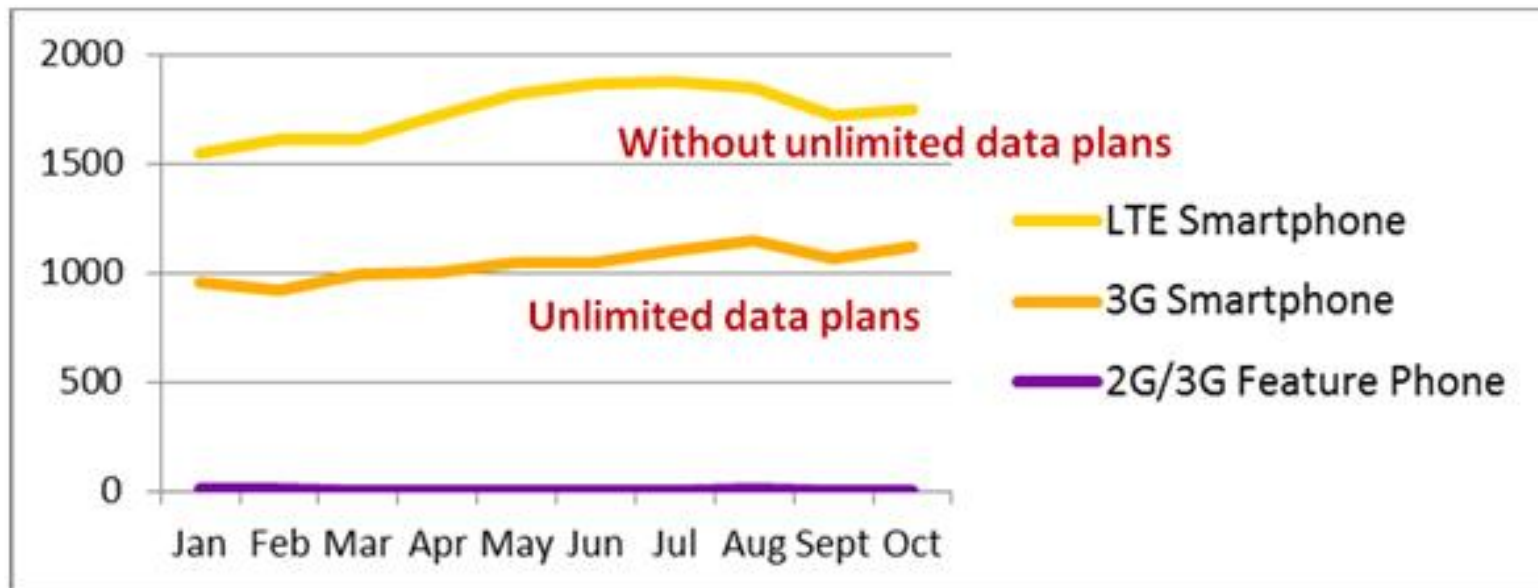


Average Data Usage by Technology

Technology driving mobile traffic

- ▷ Total data traffic by LTE exceeded total traffic by 3G smart phone in 2012

Average Data Usage per Subscriber in 2012, Megabyte (MB)



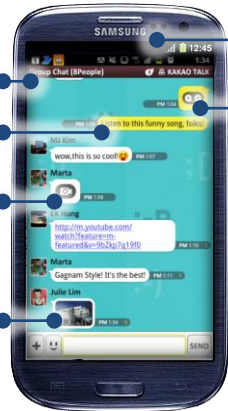
[Source: KCC]

Driving Factors to Increase Data Usage

Rich Multimedia



- Group Chatting
- Message
- Video Clip
- Photo File



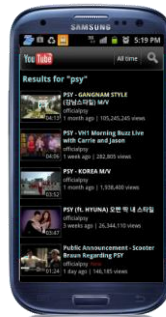
Multimedia Messenger

Internet Link



HD Streaming

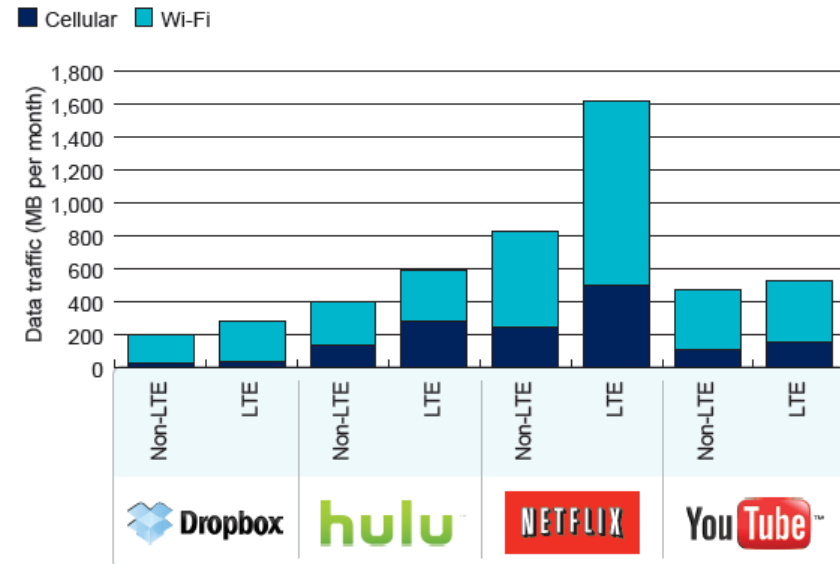
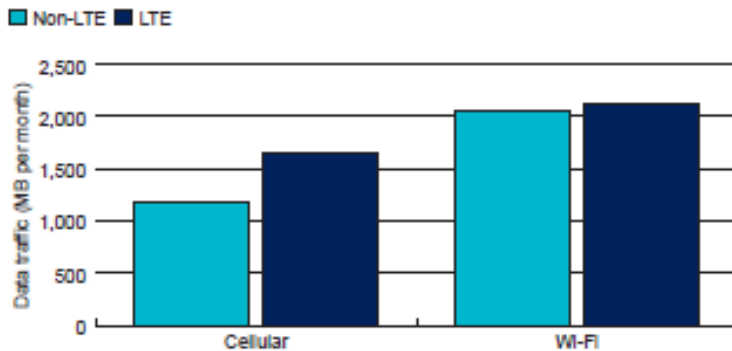
Full HD 1080



US Market

Higher traffic demands from LTE users

- ▷ LTE users more use video streaming than non-LTE users in US market.



[source: Mobidia]

III . Device Trends

Device Trends

Better Performance, Larger View, Open OS for Enriched Services



Smart Phone

CPU

Dual Core 1.2GHz

Various Content Play

Multi Tasking

3D UI

OS

B2B Service

Appl. Download

Customized Smartphone

Display

Super AMOLED+ 3D Display



Easy & Fun



Polymorphic



High Resolution



More Reality

Samsung Device

Tablet



Galaxy Tab 10.1



Galaxy Tab 2



Galaxy Note 800

Smart phone (Android)



Galaxy Note 2



Galaxy Ch@t



Galaxy Beam



Galaxy S III



Galaxy Pocket



Galaxy Ace



Galaxy S II



Galaxy Y



Galaxy Note



Galaxy Y Pro



Galaxy Y DUOS

Smart phone (bada, T[IZEN] etc.)



Wave M



Wave Y



Wave 3

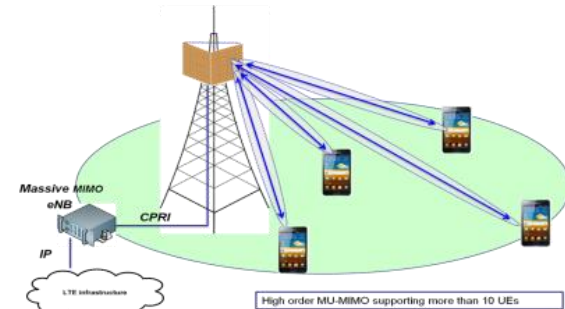


Omnia M

Remarks

Technology drives user's data traffic

Consumer tends to use more data in better device & network



Industry to be ready to accommodate Consumer's Demands
in **technology as well as spectrum** for capacity