



# ***Factors Driving LTE Adoption***

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***& Device Alliance Ecosystem***  
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# Need For Data is Global



## End-users utilizing increasingly advanced communications services and applications!

- High level of fixed line penetration for
- Multi-Media Content
- Mobile voice penetration at saturation
- Emerging 3G based mobile data
- High-Bandwidth apps
- Latency Dependent
- Digital divide
- Instant Connections
- Mobile broadband service to complement existing fixed broadband
- Peer-to-Peer

Deliver true mobile experience & the low cost per bit for profitable & mass market service

- Limited fixed line infrastructure for both Voice and Data services
- Established/Emerging mobile phone voice services

Wireless broadband provide economically viable Fixed line broadband replacement

Delivering affordable connections to underserved markets

# Mobile Broadband Evolution



## Network Evolution

- **All-IP Network For Fixed-Mobile Convergence**

- **Co-existence of Different Access Networks for Various Needs**

*Coverage, Mobility, Capacity, QoS, Data Rates ...*

## Mobile Device Evolution

- **Convergence of Communication, Computing & CE Platforms**

- **Multi-mode Devices Connect to Various Access Networks**

*Service Requirements, Availability, Cost ...*

## Service Evolution

- **User Behaviors Trend from Wired to Wireless;**
- **Individuals becoming content creators**

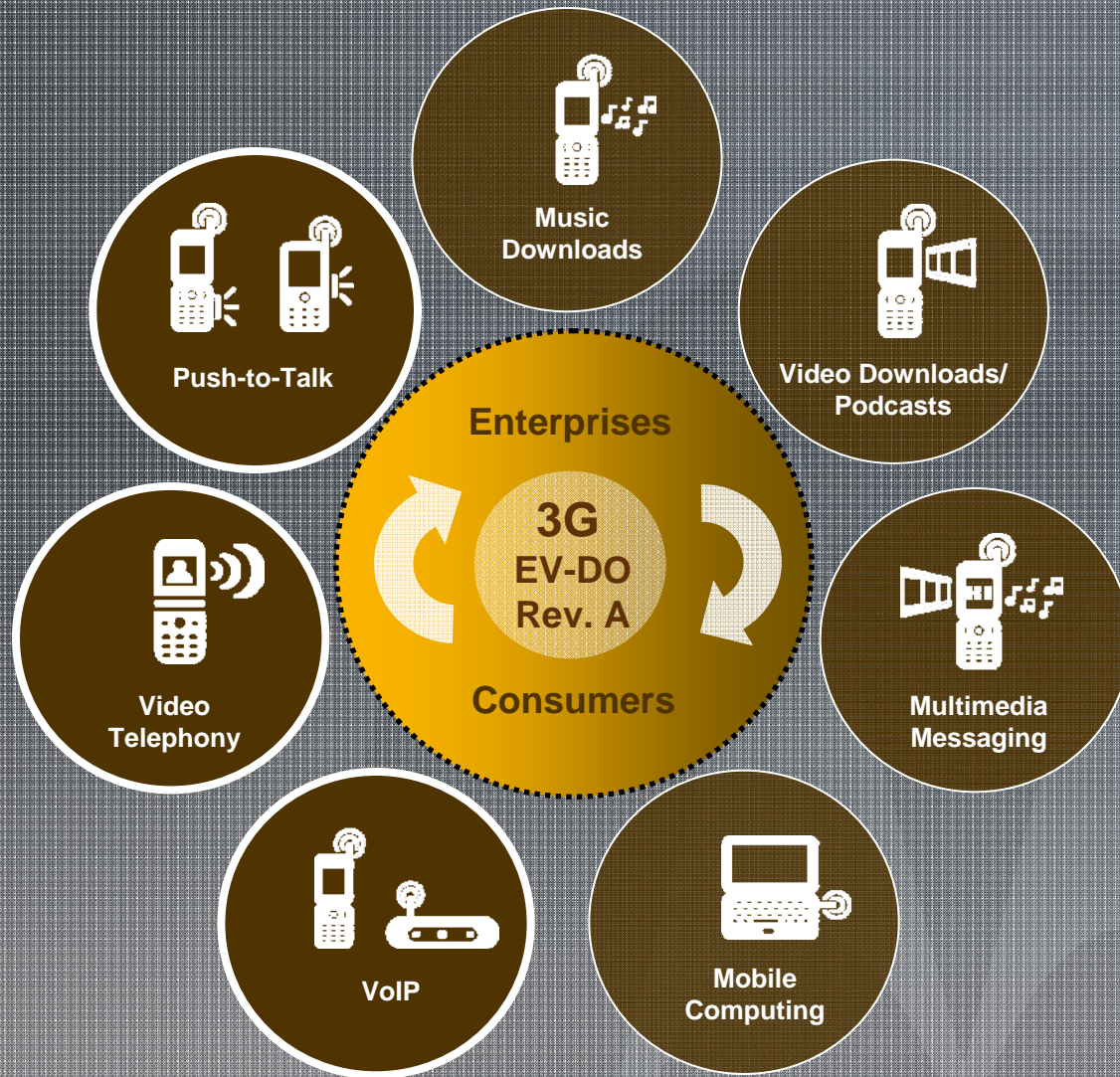
- **Same Rich IP Apps and Services in all Environments**

*Ubiquitous & Consistent Experience Desired*

***CDMA2000 is leading the evolution to next-generation mobile broadband services***

# CDMA2000 1xEV-DO Rev. A

## Meeting Data Needs Today



# Customer demands Evolving

## Streaming Video Fills up the pipes...



Wireless Internet use follows Wired Internet by 3-5 years

75% of users watch online video\*  
 YouTube = 27% of internet traffic  
 120M streams per day

Video Streaming pushes Fixed Line BB users outside their Fair Usage Policy (30-50GB/m)

10% UK Fixed Line BB Subs go over FUP in October 08

Not only laptops... Short clips ideal for Mobile  
 15min of daily YT = 1.2GB/month

## 2011 User Profiles

Road Warrior  
 Laptop + Mobile

APPS	Days / Mo	KB / Day	Hrs /day	Kbps	KB / Mo
VoIP/Conference on Mobile	20				576,000
VoIP on Mobile	1		65		87,750
Netmeeting with attachments		500			450,000
Outlook (100 emails)					220,000
Outlook (100 emails only, 5 attachments)					480,000
Communicator		3			43,200
Link-ed-in, profile down		128			115,200
Comptailor sites, News sites, etc... (Bursty traffic)	4		1	100	180,000
Home recorded movie on hard drive set top box / Sling / Com				1000	1,800,000
Youtube, News					576,000
Radio stream					576,000
					5.1

**Video**  
 2.4GB/month

**5.1GB/month**

Urban Professional  
 Laptop + Mobile

APPS	Days / Mo	KB / Day	Hrs /day	Kbps	KB / Mo
VoIP on Mobile	1				86,400
Outlook (20 emails)					44,000
Outlook (20 emails and down)					330,000
Live Messenger		3			405,000
MySpace/Facebook up and down		128			144,000
General Browsing, Music + News sites, etc...	10		0.5	100	225,000
Home recorded movie on hard drive set top box / Sling / Com				1000	3,600,000
Youtube, News					345,600
Radio stream					864,000
					6.0

**Video**  
 3.9GB/month

**6GB/month**

College Student  
 Laptop + Mobile

APPS	Days / Mo	KB / Day	Hrs /day	Kbps	KB / Mo
VoIP on Mobile	1				172,800
Outlook (10 emails)					315,000
Outlook (10 emails and down)					315,000
Live Messenger		3			405,000
MySpace/Facebook up and down		128			172,800
General Browsing, Music + News sites, etc...	20		1.0	100	900,000
Home recorded movie on hard drive set top box / Sling / Com				1000	5,400,000
Youtube, News					1,152,000
Radio stream					2,304,000
					11.1

**Video**  
 4.5GB/month

**11.1GB/month**

Typical  
 Mobile only

APPS	Days / Mo	KB / Day	Hrs /day	Kbps	KB / Mo
VoIP on Mobile	1				432,000
Outlook (5 emails)					125,000
General Browsing, Price check + News sites, etc...	20		1.0	100	900,000
Youtube, News					1,152,000
Radio stream					115,200
					2.7

**Video**  
 1.2GB/month

**2.7GB/month**

# Clearly, Portable Devices Are Enabling Video & Mobile Data Uptake



Mobile Internet Access is  
“The Killer Data App”



Powerful Multimedia Mobiles are penetrating the mass market with lower price points

Connecting across multiple user experiences



*Network enabled consumer device shipment expected to go from 92M in '07 to 460M by '12 (ABI research)*

# EV-DO Rev. A Mobile Data adoption is driving 4G adoption



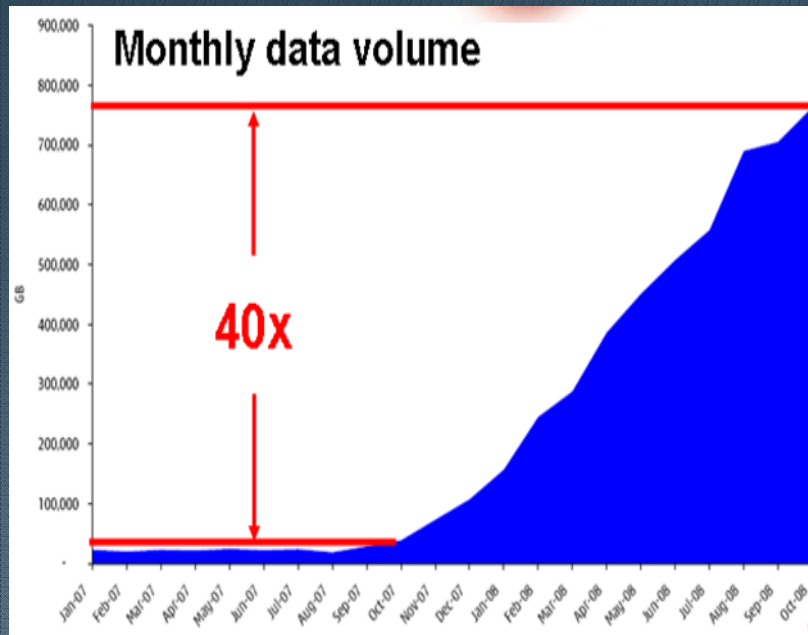
Strong Demand for Mobile BB

4G will complement mass market mobile data adoption

3G Operators Data Usage Increase

2007 - 6-14X

2008 - 20-50x



- Provide urban coverage to satisfy heavy data demand
- LTE will fit naturally in a heterogeneous network

Future Focus

Lower Cost per Bit



# LTE

## Performance and Applications

# Proposition of LTE-Based Solutions



**Faster**

**Broadband Experience  
Anywhere**



**More Responsive**

Per user 10Mbps / 10ms latency



**Lower Cost**

**Improved Business  
Proposition**



**Added Capacity**

Spectrum Flexibility

Capacity

All IP Core

Lower cost per bit

End2End QoS

Media Mobility

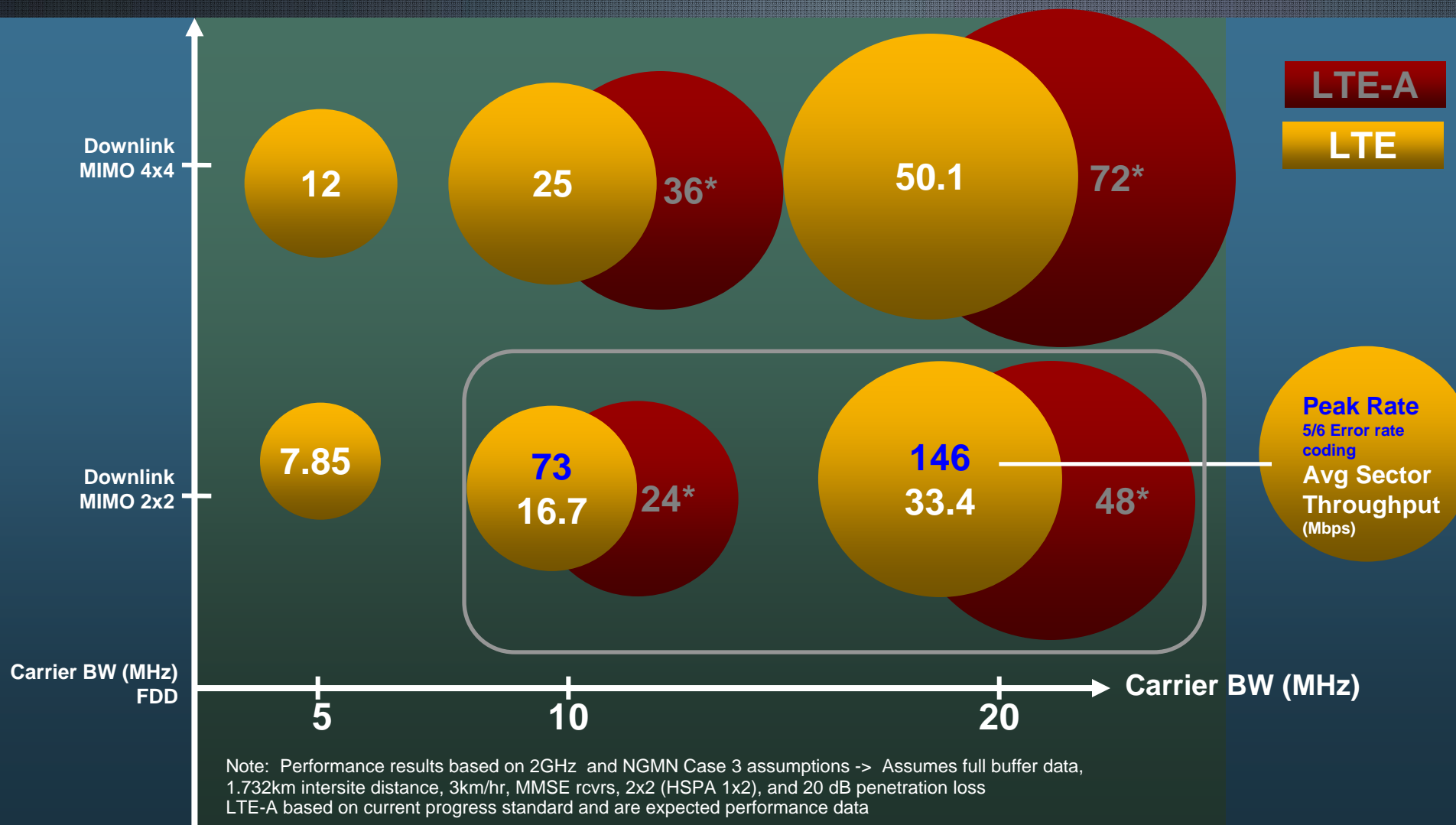


**Flexible**



**Global**

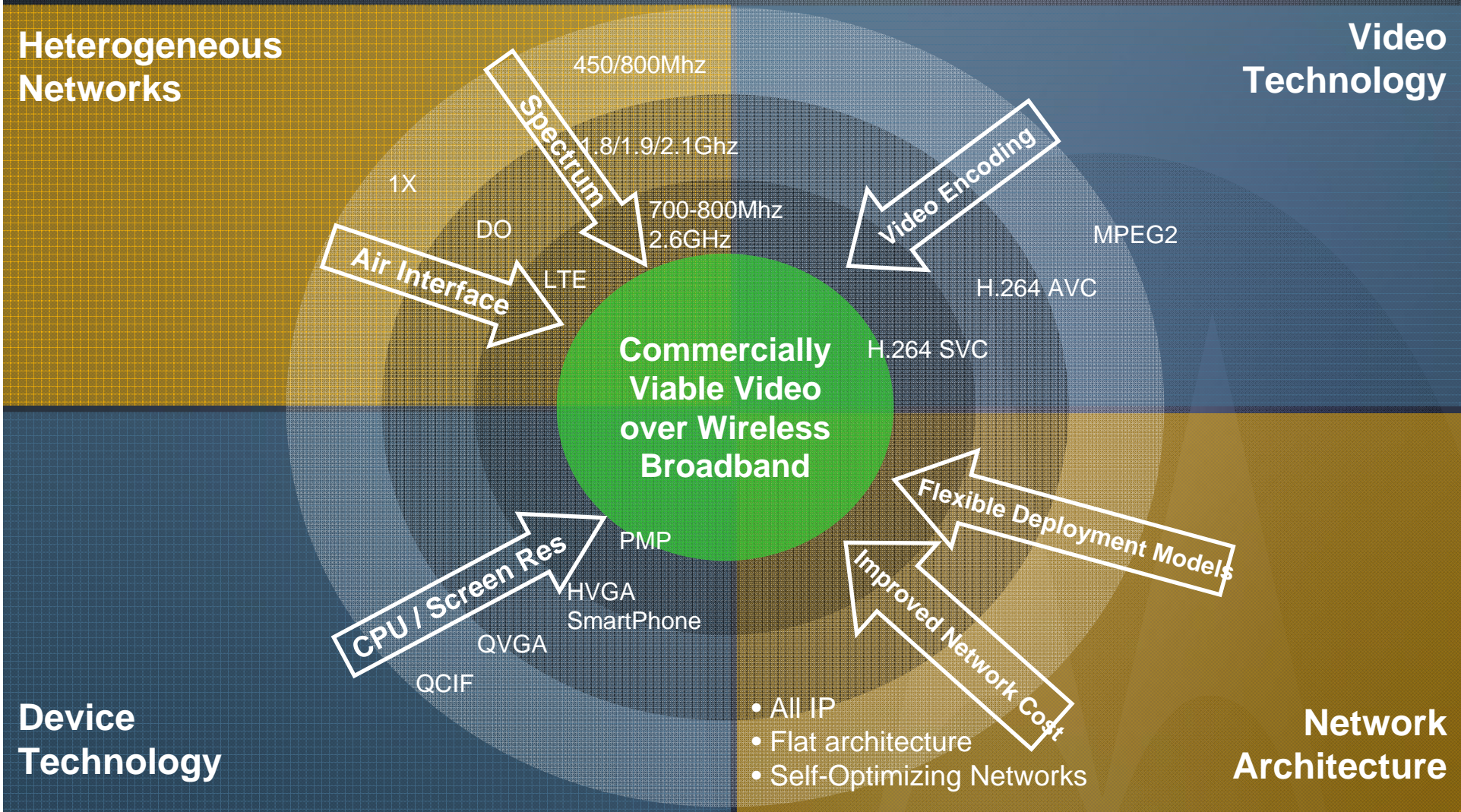
# LTE Sector Throughput (Capacity) – NGMN Case 3



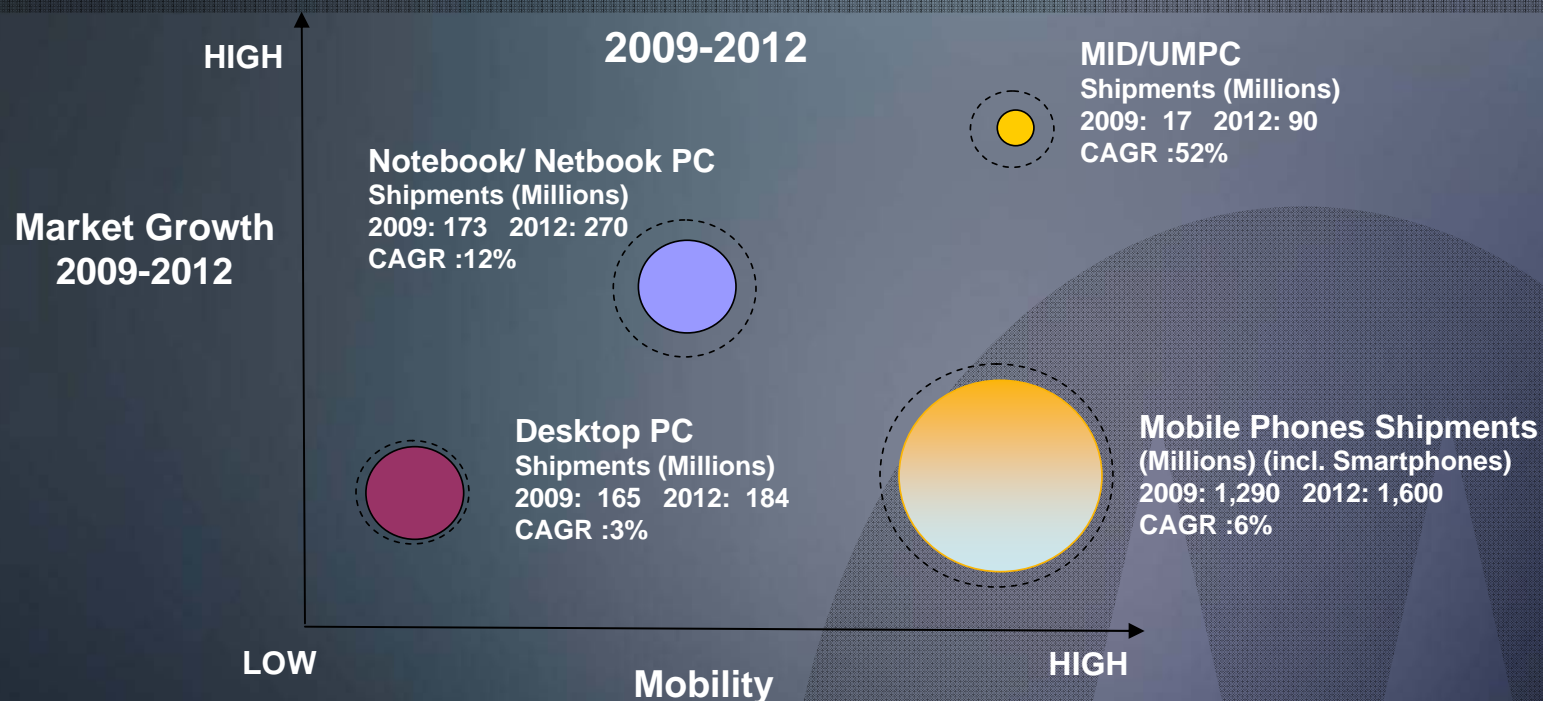
Note: Performance results based on 2GHz and NGMN Case 3 assumptions -> Assumes full buffer data, 1.732km intersite distance, 3km/hr, MMSE rcvrs, 2x2 (HSPA 1x2), and 20 dB penetration loss  
LTE-A based on current progress standard and are expected performance data



# Enablers for Video on LTE



# Worldwide Devices Market Landscape

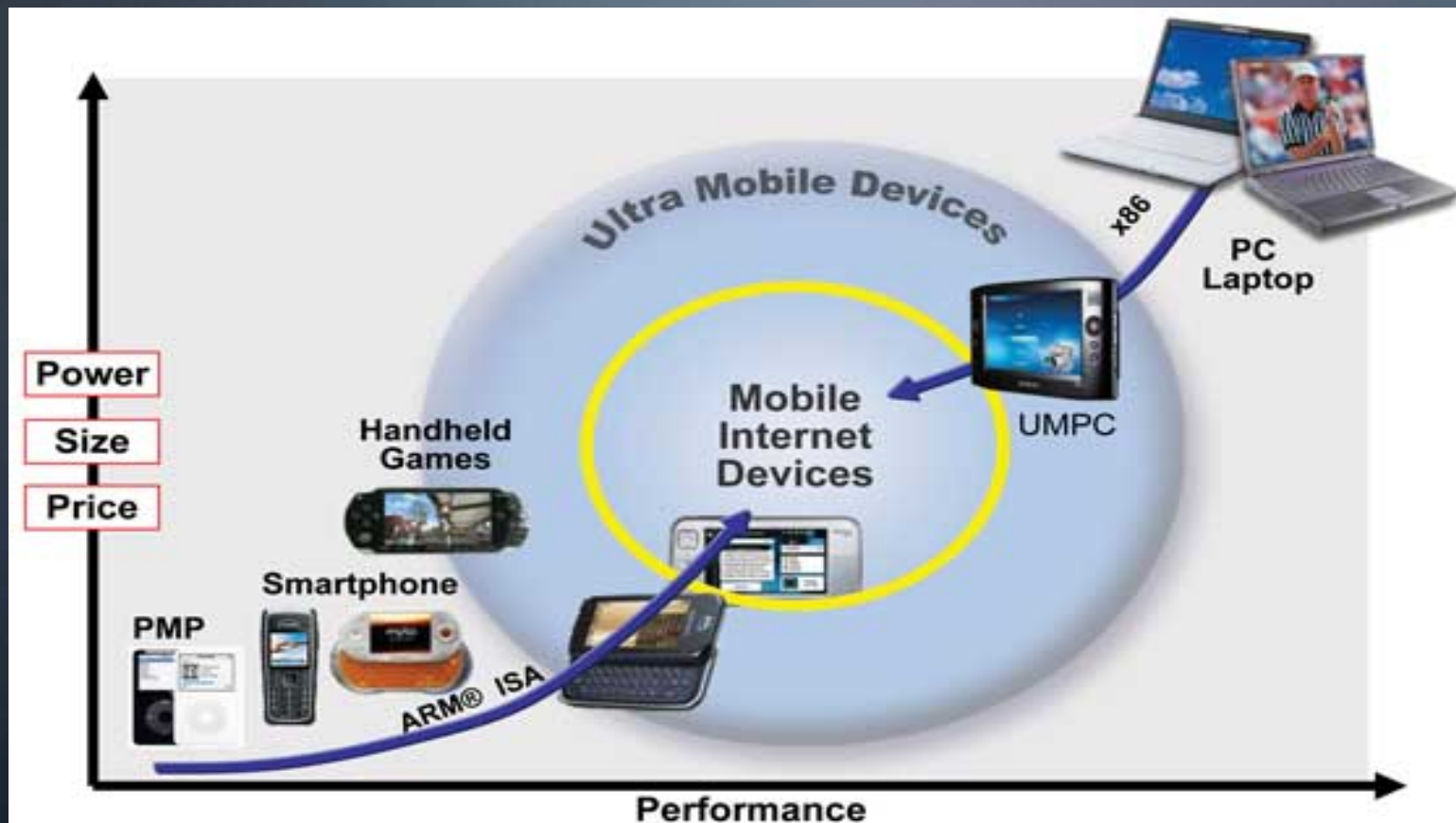


Source ABI Research, IDC, iSuppli, Intel, Gartner, Informa and StrategyAnalytics

## Market Trends

- Market growth: Products providing greater data mobility via Notebook PC and MID/UMPC.
- Increasing Internet connected Notebook PC shipments.
- Cellular phone shipments continue to dominate the market.

# Mobile Internet Devices - *Emerging Products*



MID – Expected to Grow Eight Fold 2008 - 2012

# Devices for Mobile Internet



The device we formerly knew as the cell phone is evolving into an Internet-enabled consumer device



Network-enabled consumer device shipments expected to go from 92M in '07 to 460M by '12, exceeding the 368M home networking devices (ABI research)

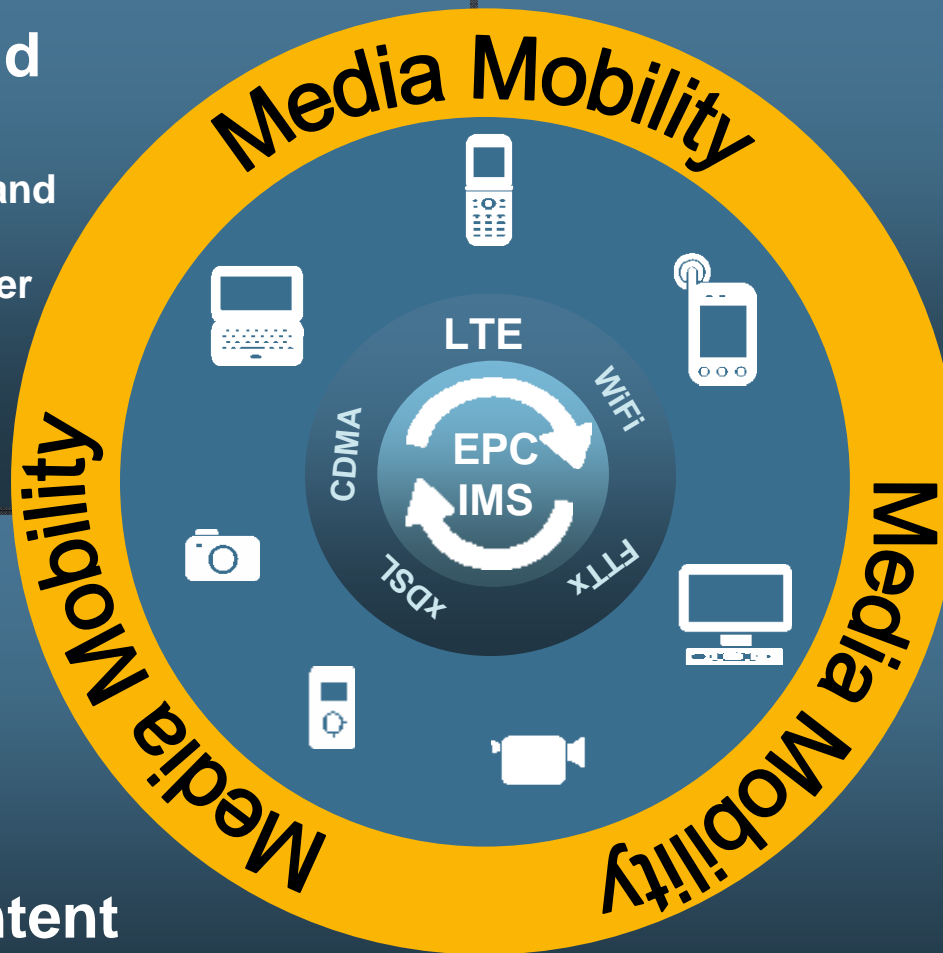
# Media Mobility



## True Broadband Anywhere

Any Fixed line broadband applications  
Video streaming enabler

Access Continuity  
between IP access technologies



Follow-me Content  
Fluid media

Any Devices  
Mobiles, Laptops, CPE + CE

# Motorola CDMA & OFDM-Based Solutions



*Accelerating The Delivery of  
Personal Media Experiences*

**BROADBAND  
EVERYWHERE**

**OPTIMIZED  
NETWORKS**

**CONTENT TO  
THE CONSUMER**