

# A Vision for Wireless Broadband Internet “WiBro”

Sept 11, 2004

Ho Tark Hwang, Ph.D.

[hthwang@kt.co.kr](mailto:hthwang@kt.co.kr)

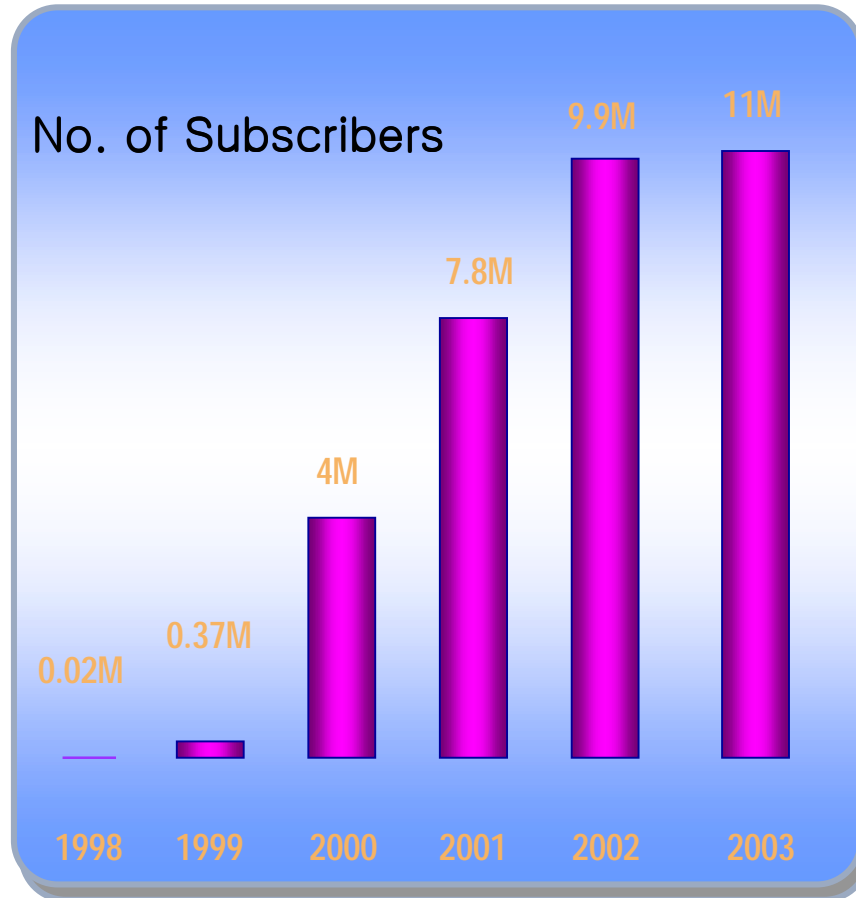
네트워크로 하나되는 나라  
*Let's* **KT**

# Presentation Outline

- ❑ Introduction
- ❑ What is WiBro
- ❑ Service Demand
- ❑ Service Provision
- ❑ Network Strategy
- ❑ Business Model
- ❑ Mobile Devices
- ❑ WiBro's Macroeconomic Effect
- ❑ Standard Issues
- ❑ Future of Telco – Beyond Broadband

# Introduction

## Growth of Broadband in Korea



# Introduction

## Business Environment

Providing convergence services becomes a must regarding customer needs, deregulation, intensifying competition, and digital convergence.

### Competition

- New players (portals, CPs)
- Market saturation
- Intensifying competition for the convergence-driven future market

### Convergence

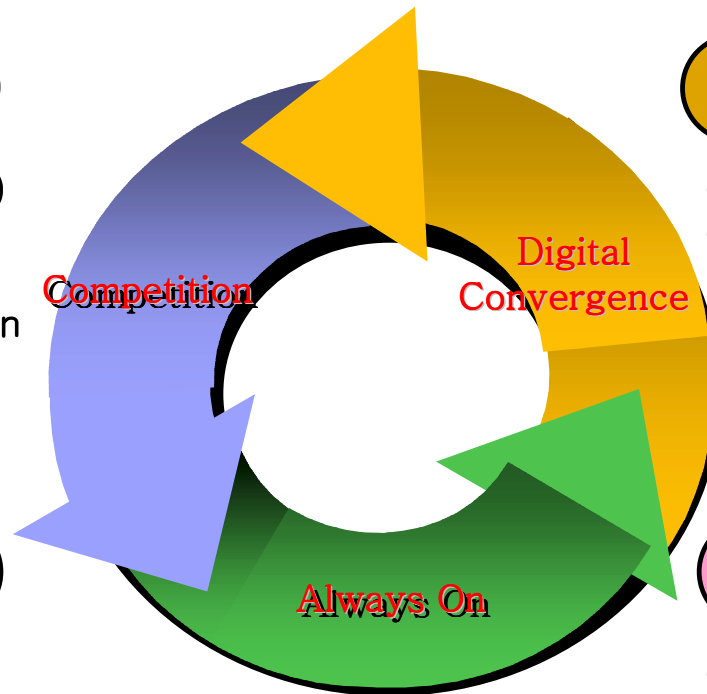
- Fixed-line decline/Mobile growth
- Appearance of hybrid services (W-LAN, "One-phone")

### Customer Needs

- Seamlessness
- Personalization

### Deregulation

- Introduction of Number portability and local line unbundling
- Market-opening policy

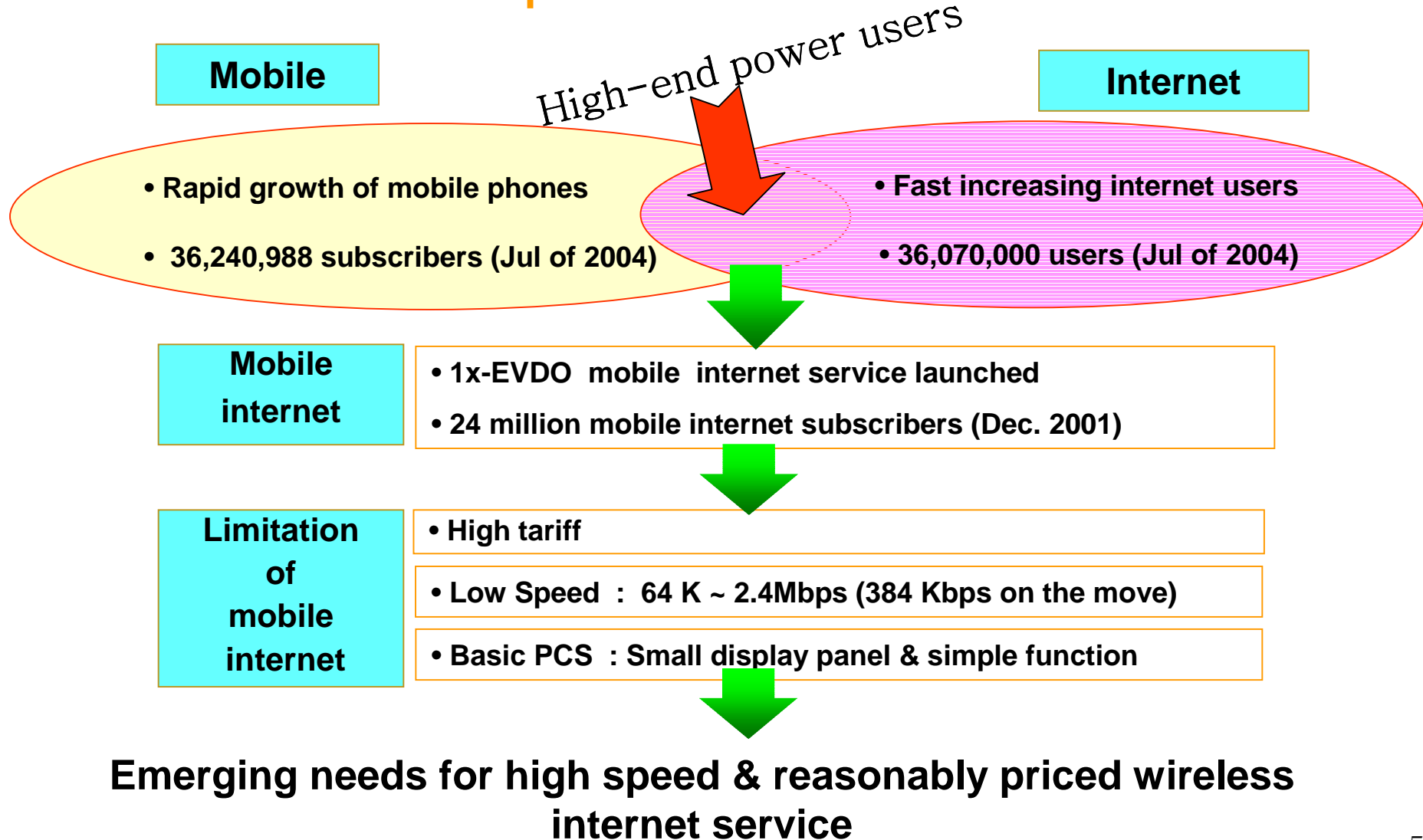


# Introduction



# Introduction

## Same development of Mobile Internet ?



# Introduction

## Government Policy

- Oct. 2002: Re-allocating KT and Hanaro's WLL Frequency for WiBro
- Jun. 2004: Completion of TTA Phase I Standardization
- Aug. 2004: Announcing Time Schedule
  - Sep. 2004: Announcing Operator Selection Policies
  - Dec. 2004: Business Proposal Submission
  - Feb. 2005: Operator Selection

## Principle of Standard

### o Reference Standard

- Satisfy both IEEE 802.16d and IEEE 802.16e/d3 (all versions)
  - If 802.16d conflicts with 802.16e, 802.16e should be satisfied

### o System Requirement

- Minimum data rate
  - UL: 128Kbps, DL: 512Kbps (cell edge, 60Km/h)
- Channel Bandwidth  $\geq$  9 MHz
- Roaming between the systems of different operators
- Frequency reuse factor = 1
- Duplex mode: TDD (Synchronization required)

# What is WiBro

## Service Definition

Carry the High Speed Internet in Your Pocket! – Access the Web, Multimedia Contents and whatever Information you need as you move.

“While on the move”

- ❖ Nomadic service in the early stage (60km/h)
- ❖ Low mobility

“Anywhere at Anytime”

- ❖ Seamless service in the urban streets
- ❖ High mobility

“High Data Rate”

- ❖ 1Mbps per user
- ❖ Even higher data rates will be available later.

“Low Access Cost”

- ❖ Low access cost
- ❖ 30,000–40,000 Won/M

User Terminal

Cell Phone

PDA

Handheld PC

Laptop

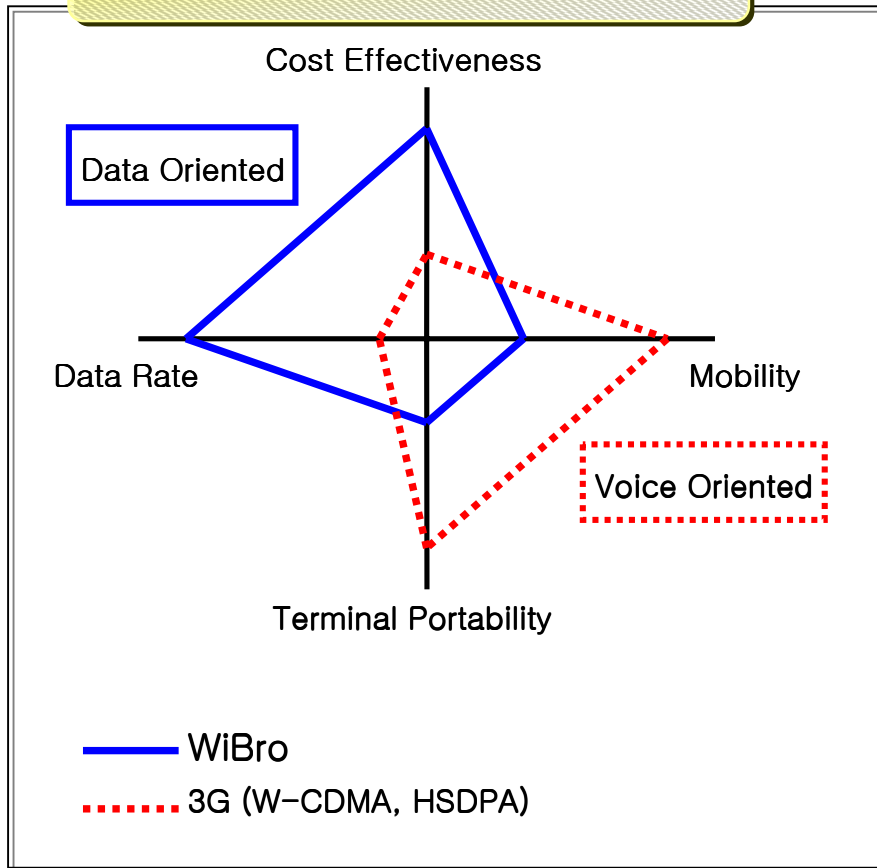
Laptop connected to  
PI Phone

Laptop or PDA with  
PCMCIA modem card

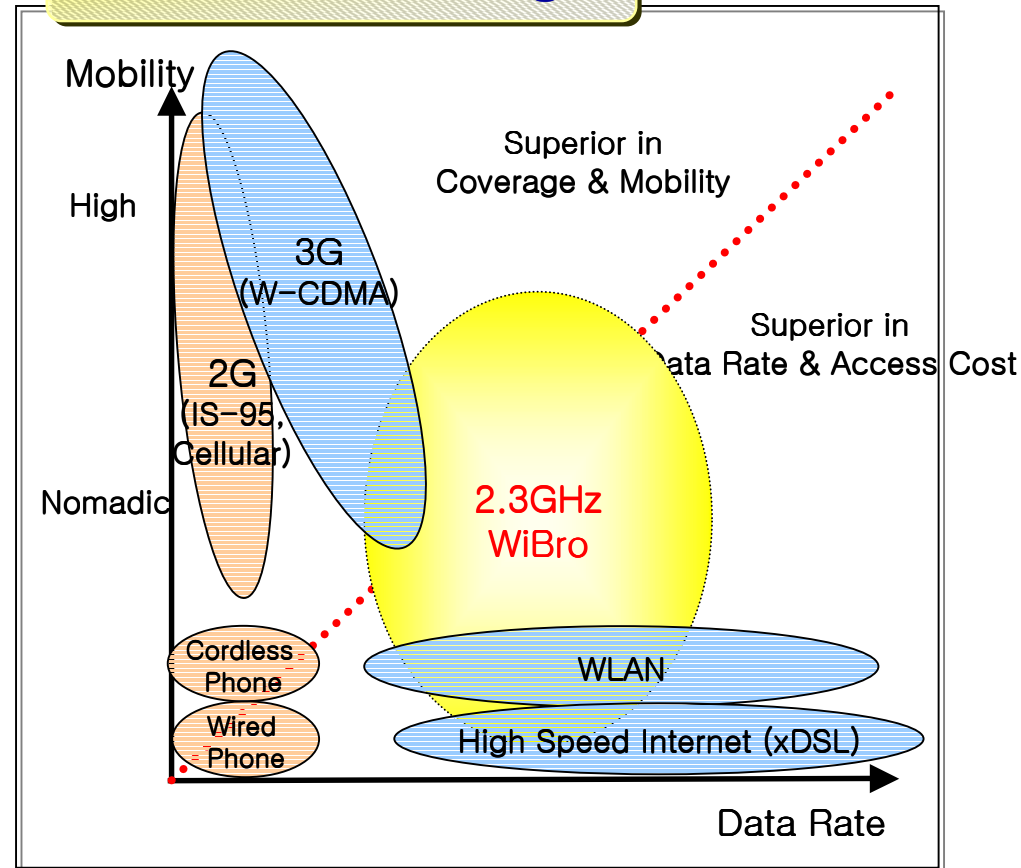


# What is WiBro

## Service Characteristic



## Service Positioning



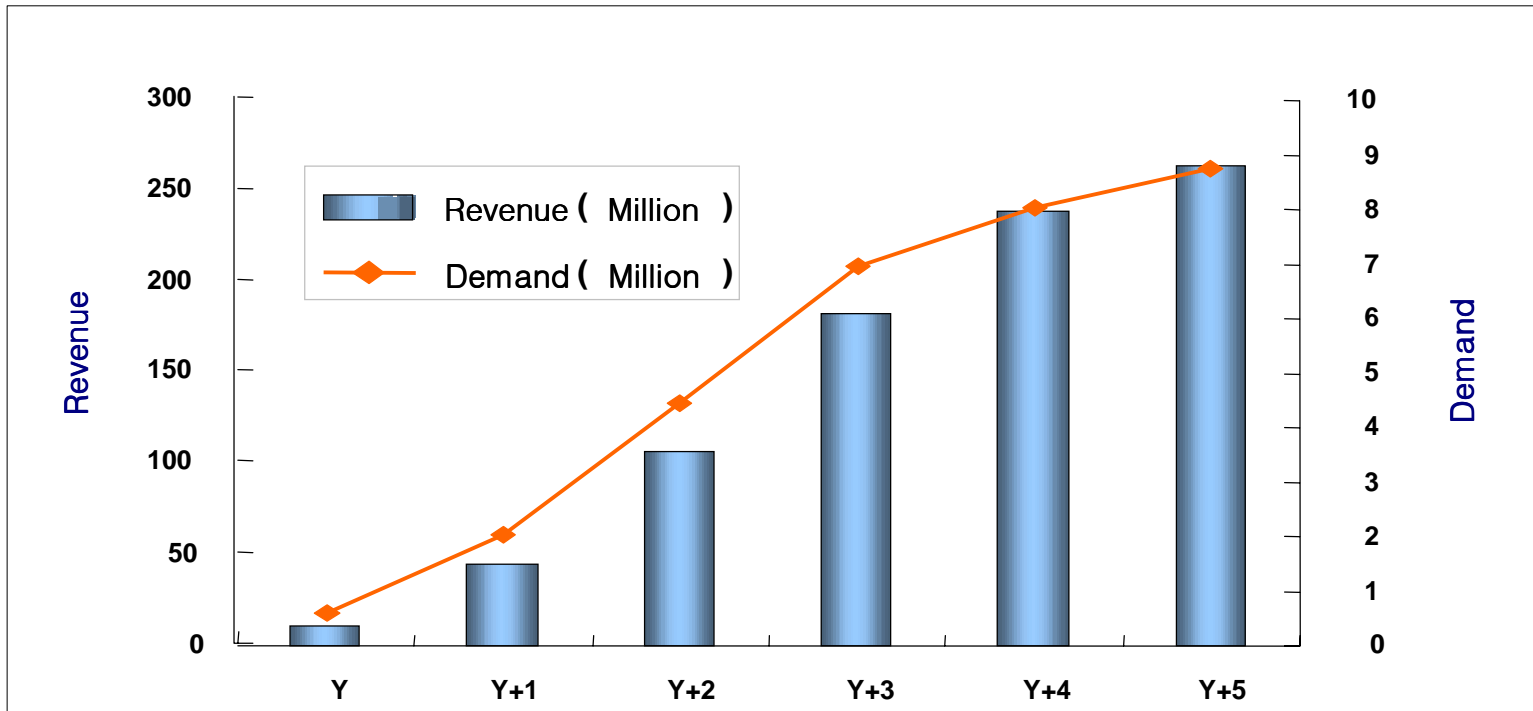
👉 WiBro, 3G and WLAN complement each other.

# What is WiBro

## Comparison to Other Services

	WiBro	xDSL	WLAN	1x EV-DO IMT-2000
Coverage	In-door/Out-door (Hot Zone)	In-door	In-door/Hot Spot	In-door/Out-door
Data Rate	High	Very High	Very High	Middle/Low
Mobility	Low Mobility	No Mobility	Nomadic	High Mobility
Service Contents	Multimedia	Multimedia	Multimedia	Limited Multimedia
Access Cost	Low	Lower	Lower	High
Device Type	PDA, Laptop, Smart Phone, etc	Desktop, Laptop	PDA, Laptop	Cell Phone, PDA

# Service Demand



- ❑ Research predicts that there are tremendous market demand for WiBro.
- ❑ The number of users in the year Y+ 5 is estimated as 8.9 million.
- ❑ The market size in the year Y+ 5 is estimated as \$2.6 billion.  
(c.f. The market size for 2G/2.5G mobile Internet was \$1.5 billion in 2003.)

# Service Demand

## Market Size

\$0.57 Billion  
(Year 2000)

Dial-up modem  
PC communications



\$3.32 Billion  
(Year 2003)

Cable modem & xDSL  
High Speed Internet

\$1.5 Billion  
(Year 2003)

2G/2.5G mobile Internet



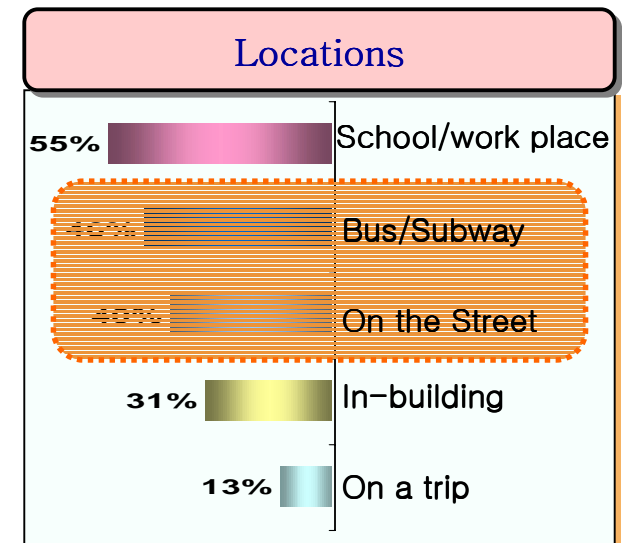
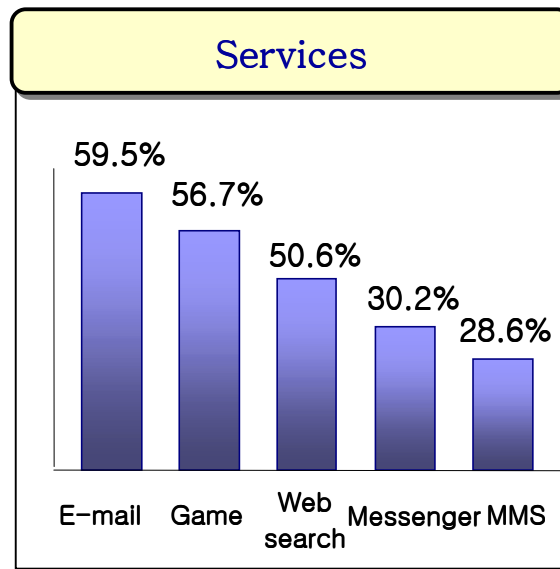
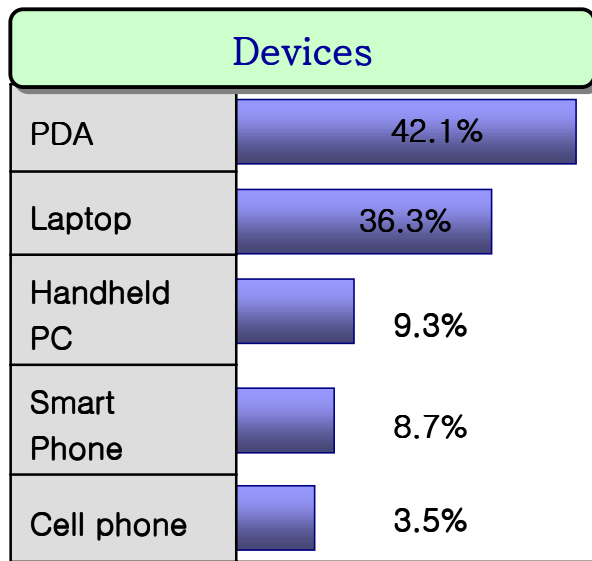
\$2.6 billion  
(Year Y+5)

WiBro

# Service Demand

## User's Needs

- ❑ Service demands of the current 2G/2.5G mobile Internet users are **Entertainment (58%), Communications (17.6%), Business Applications (9.3%).**
- ❑ CDMA 1x EV-DO is suffering from **Low Data Rate, Lack of Contents, and High Access Cost.**
- ❑ WLAN is **limited in coverage and lacks QoS provisioning (ISM band).**
- ❑ WiBro users are those who demand **High Data Rate with Low Access Cost.**

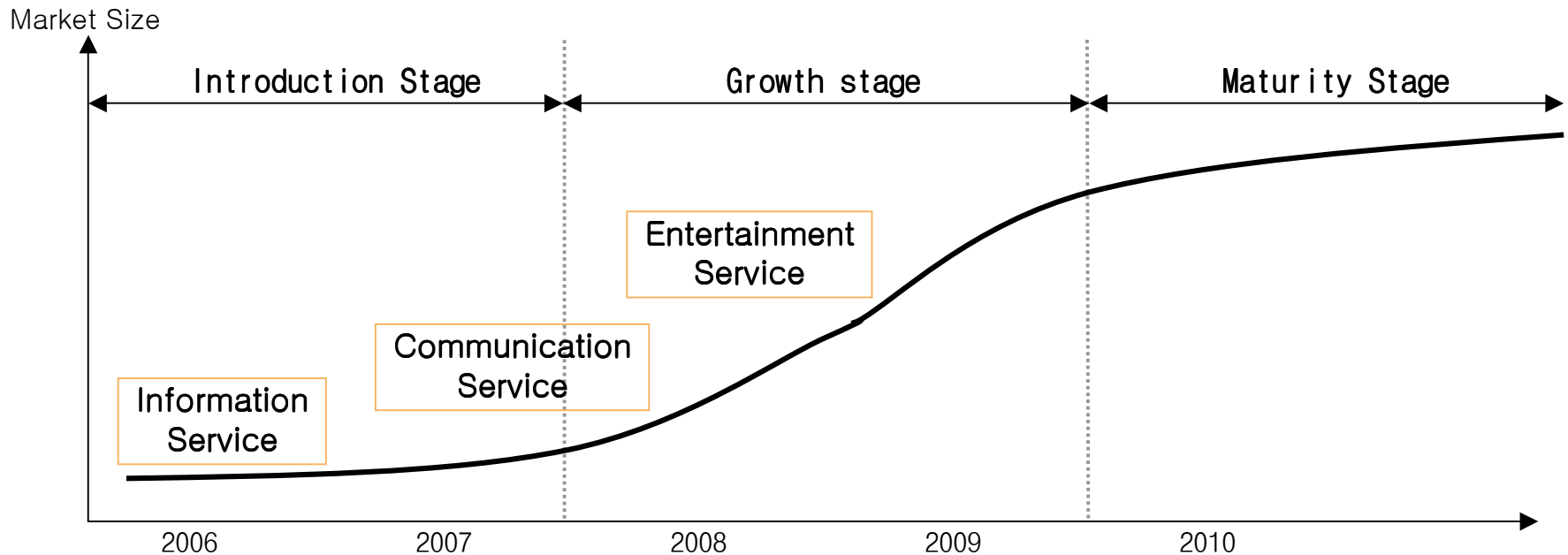


(ETRI, Demand Survey, 2003.10)

(Korea Research, 2003.12)

# Service Provision

- ❑ Offering a variety of distinguished services according to Product Life Cycle



Service	Information Service	Communication Service	Entertainment Service
Killer App.	Web search & download, m-commerce, m-learning community	E-mail, Chatting, MMS (multimedia messaging service)	High quality AOD & VOD, IP-based network game, LBS, Telematics

# Network Strategy

❑ In the first three years, WiBro will cover 84 cities in Korea<sup>a</sup>

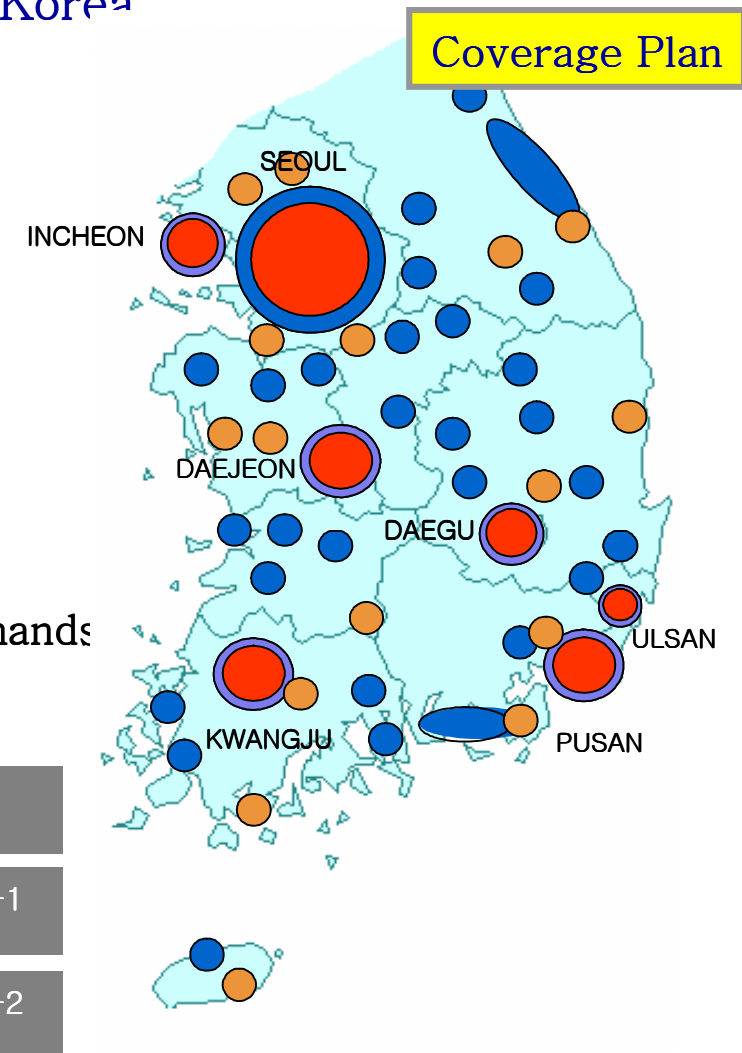
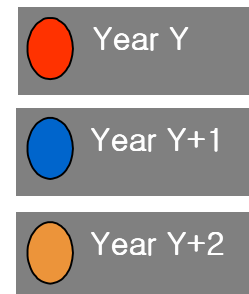
❖ Phase 1 (Year Y) : Seoul and 6 metropolitan cities

❖ Phase 2 (Year Y+1) : Major cities

❖ Phase 3 (Year Y+2) : Small cities

✓ 90% of 48 million population will be covered

✓ After Y+2, the coverage will expand as the market demands

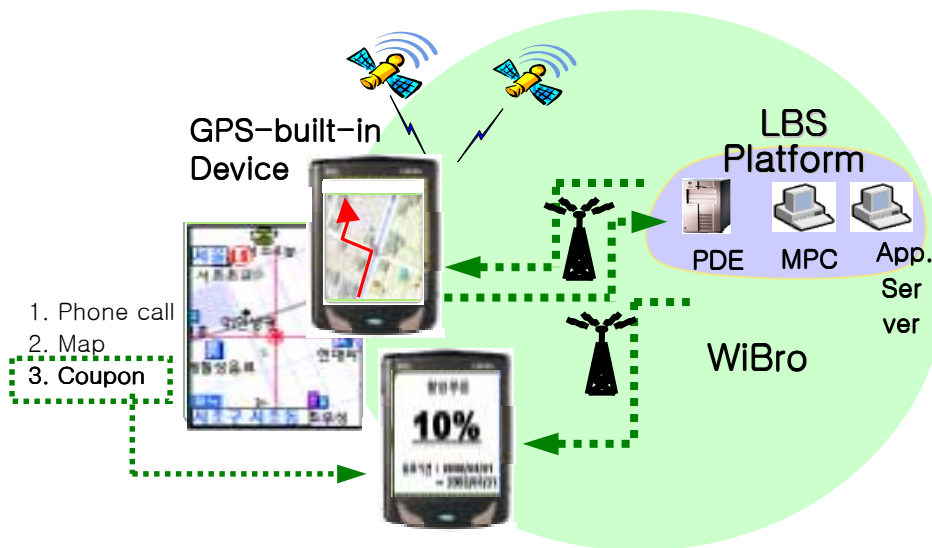


# Business Model

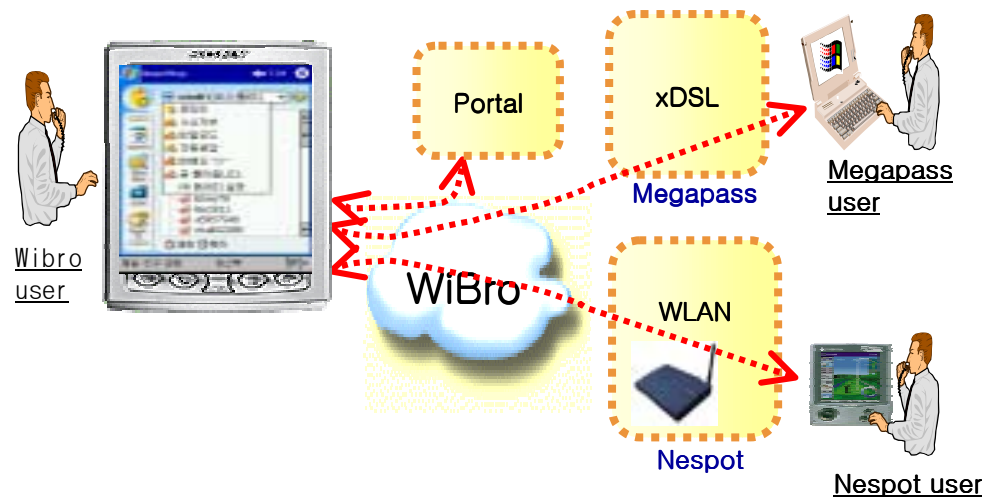
## BM Development

- ❑ Providing Total Network Service: Seamless convergence of xDSL + WLAN + CDMA
- ❑ Targeting the personalized services in mobile environment
- ❑ Providing Multimedia communication services using the broadband access.

## LBS (Location Based Service)



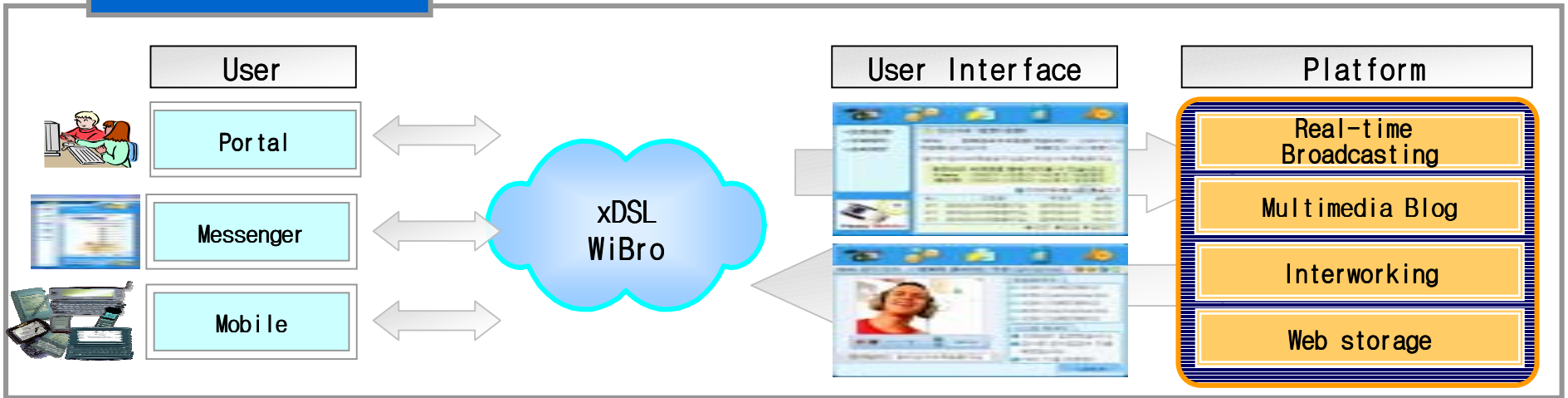
## Message Based Service



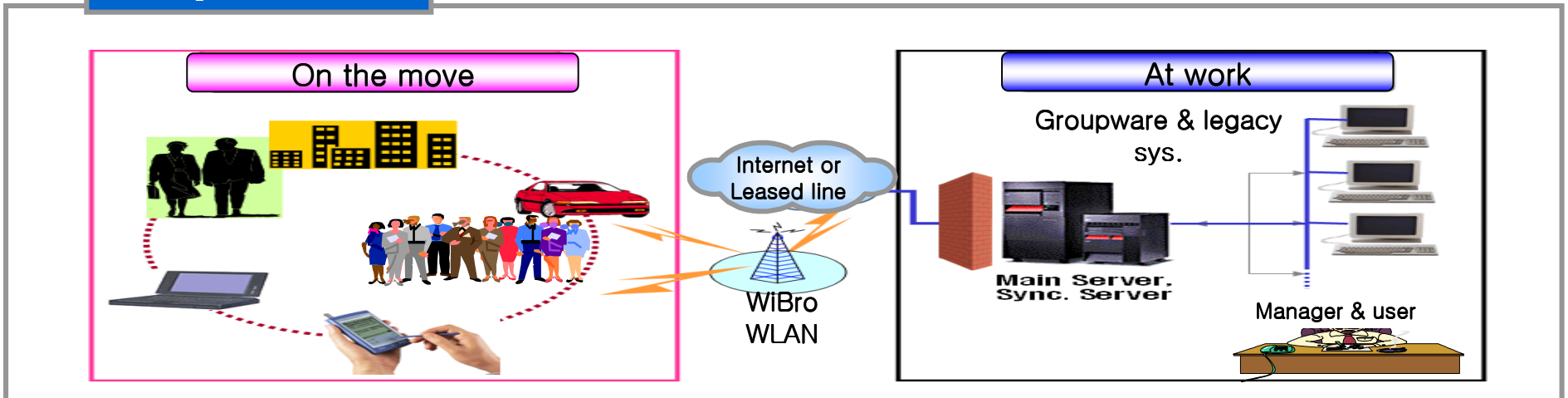


# Business Model

## Individual Service

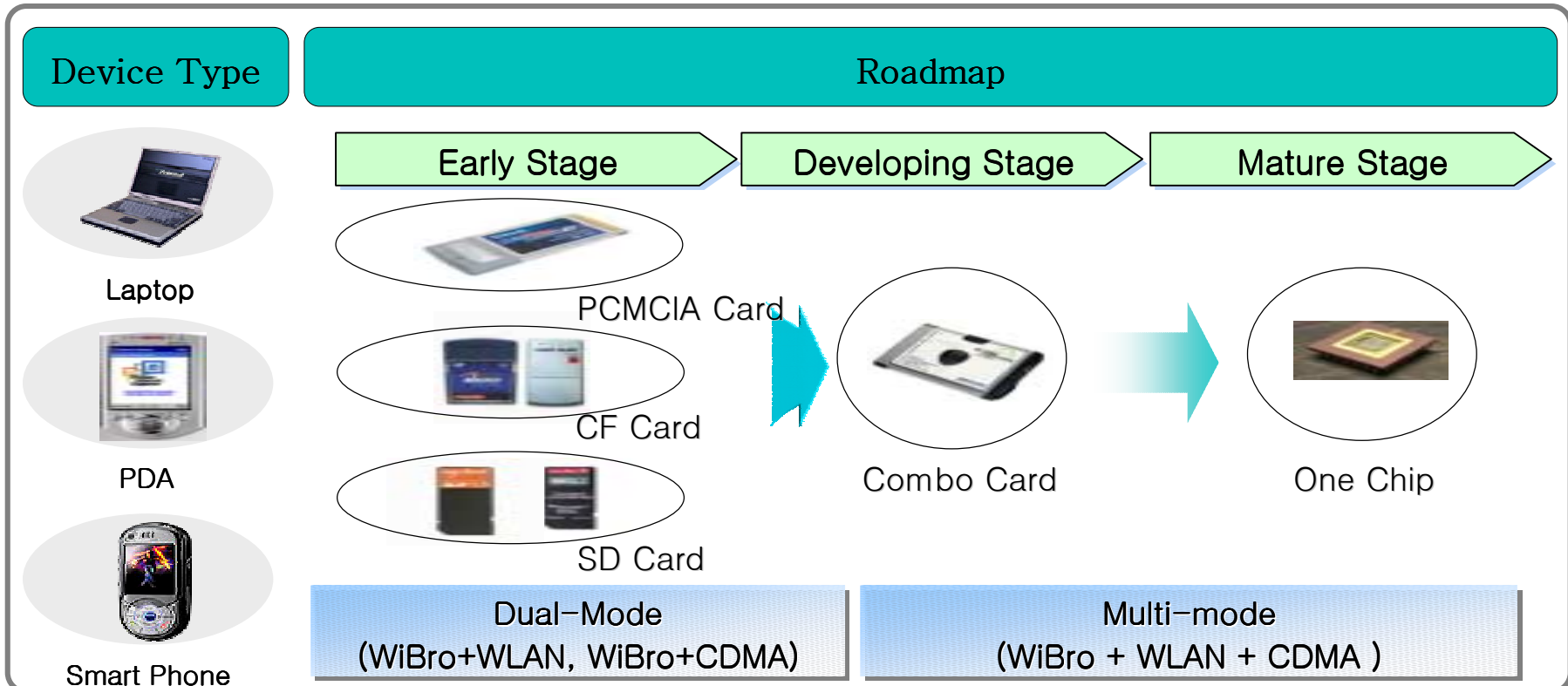


## Enterprise Service



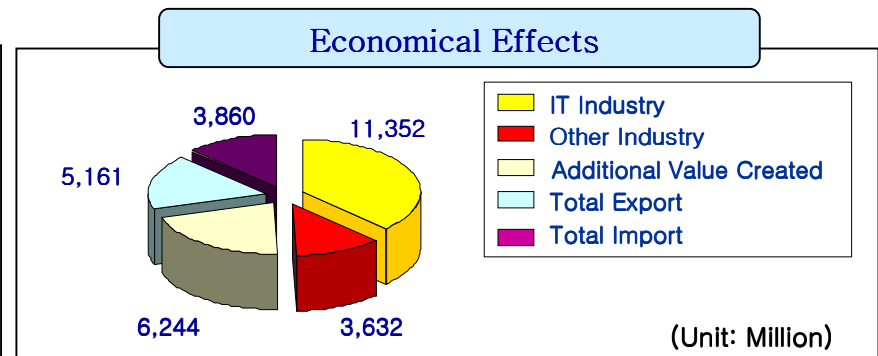
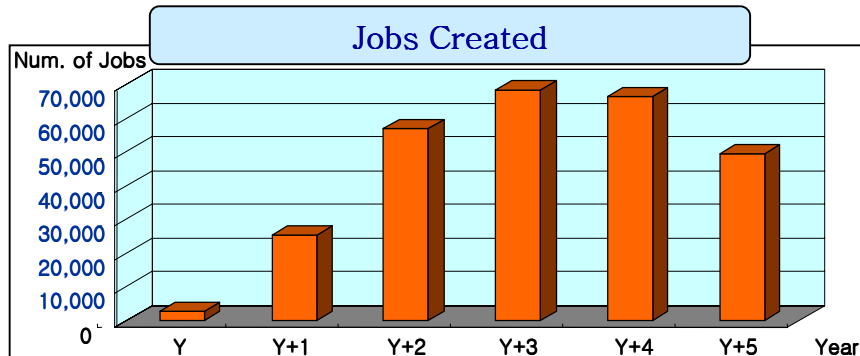
# Mobile Devices

- According to the user's needs and the evolutionary trend of mobile devices,
  - Different types of user devices are required.
- In the earlier stage of WiBro,
  - PCMCIA type modem card (for laptops and PDAs), dual mode smart phones
- In the later stages,
  - Multi-mode smart phones and user device with dedicated or compound functionalities



# WiBro's Macroeconomic Effect

- ❑ WiBro will boost the economy by creating jobs and leading technological advances.
- ❑ During the first 5 years, the gross product will be \$15 billion while the number of jobs created is 270,000.
- ❑ The size of market for WiBro systems and user devices is more than \$11 billion.



(Reference: ETRI, "IT Technology Trend Analysis", Dec. 2003)

(Unit: Million)

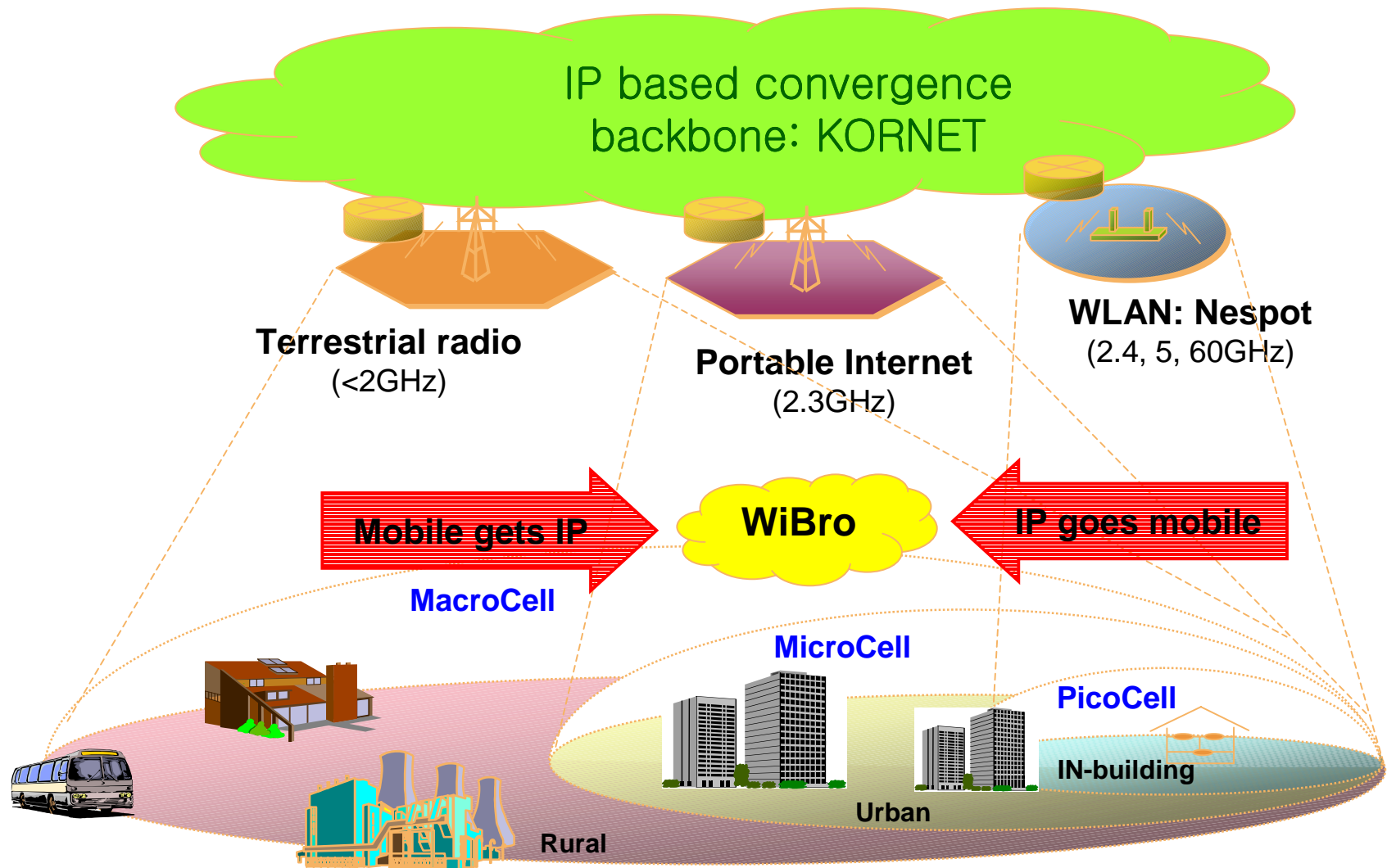
Year		Y	Y+1	Y+2	Y+3	Y+4	Y+5	Total
Gross Product	IT Industry	116	1,068	2,397	2,890	2,794	2,086	11,352
	Other Industry	36	342	767	925	894	667	3,632
	Sub Total	152	1,411	3,165	3,815	3,688	2,753	14,984
Additional Value Created		64	588	1,319	1,590	1,537	1,147	6,244
Amount of Export		53	424	1,104	1,331	1,288	961	5,161
Amount of Import		40	363	815	983	950	709	3,860
Number of Jobs created		2,746	25,395	56,960	68,666	66,392	49,555	269,713

# Standard Issues

- ❑ Korean National Standard for WiBro
  - ❖ Major specification approved (Jan 2004)
  - ❖ Detailed specification approved (Apr 2004)
  - ❖ Final approval (June 2004)
  
- ❑ Commercial Service Schedule

	2004 1H	2004 2H	2005 1H	2005 2H	2006
Technology	Technical Standard	Deployment of Commercial Service system		Field Trial Test	Commercial Service
Service Schedule		Selection of Service Carrier		Pre-commercial Service	

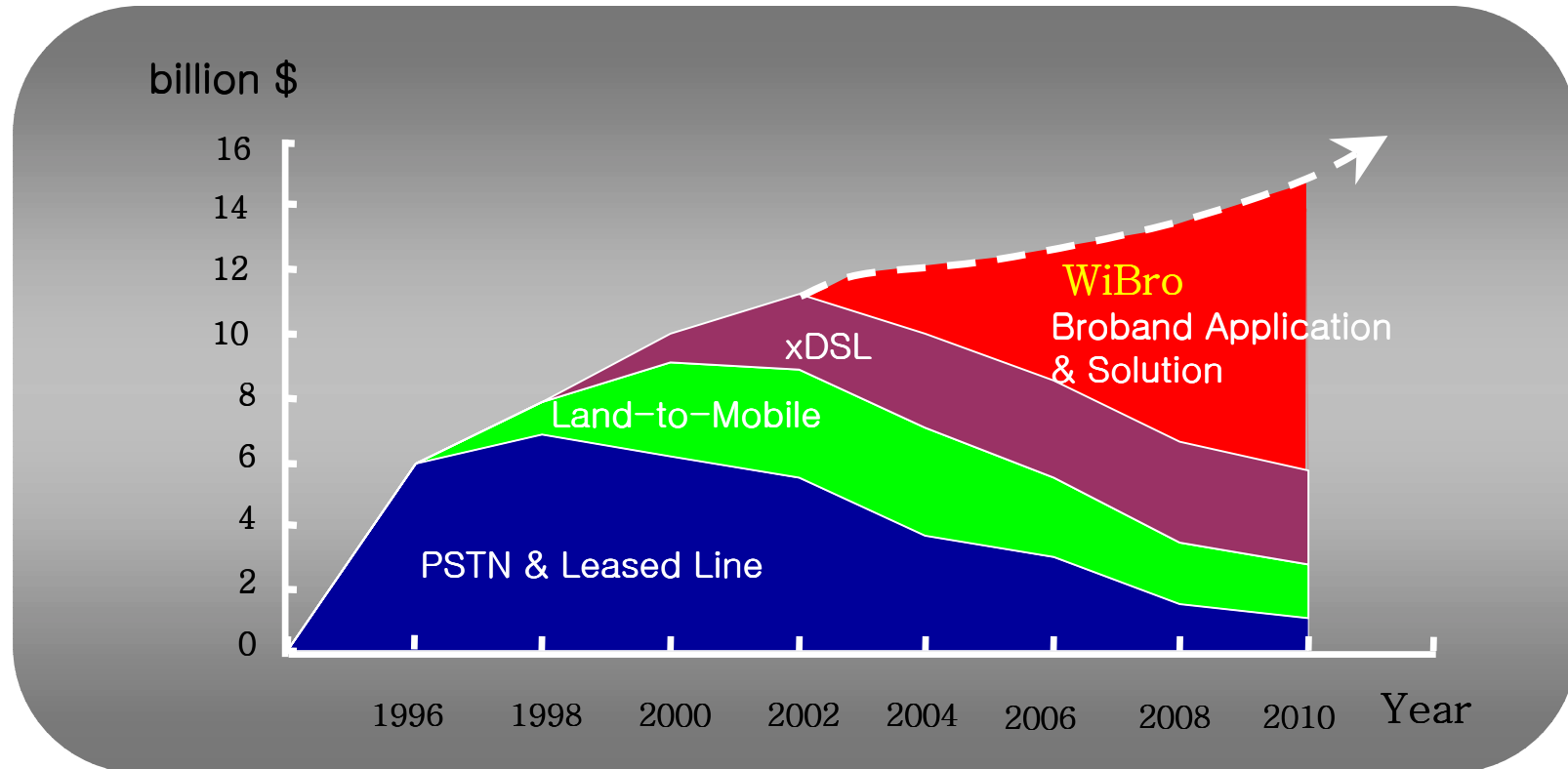
# Wireless & Broadband Convergence In the near Future



# Future of Telco – Beyond Broadband

## Profitable Broadband Services

- ❑ “Single-Service Provider” → “Multiple-Service Provider”
- ❑ Revenue Stream : fixed & wireless Internet, devices, application services



The logo consists of the letters 'K' and 'T' in a bold, white, sans-serif font. The 'K' and 'T' are connected at the top, with the 'K' having a distinctive shape where the top bar is slightly offset to the right.

**KT**

"The Value Networking Company"