

WiMAX Development and M-Taiwan

Blueprint, M-Taiwan, and Product Development

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June 6, 2006
2006 TAIPEI SUMMIT:
TAIWAN-SOUTHEAST ASIA ICT FORUM

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 - **General Principle**
 - **Spectrum Allocation**
 - **Technology Development**
- **M-Taiwan: A National Program to Implement Taiwan WiMAX Blueprint**
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The Strength of Taiwan ICT Industry

- Taiwanese vendors supply more than 80% of worldwide notebook & desktop PC and 90% of Wi-Fi products
- Taiwan has become a major 2G/3G handset ODM/OEM base. The prominent vendors include, but not limit to, BenQ, Compal, HTC, AnexTEK, Senao, G-Tek, Mitac OKWAP, Dbtel, Foxconn, Arima, Asus, and Quanta
- Taiwanese vendors have been the major force to drive down the cost of CPE, such as, XDSL, cable modem, Wi-Fi, and VoIP, and contribute to the proliferation of their applications
- A majority of WLAN companies in Taiwan have invested in developing WiMAX CPE and base stations with some products available
- Taiwan has a strong Wi-Fi certification industry with three Wi-Fi certification labs, which are crucial in the worldwide success of WLAN industry

Taiwan WiMAX Blueprint

- **WiMAX is a Broadband Wireless Communications Technology based on IEEE 802.16**
- **The Science & Technology Advisor Group (STAG) of Taiwan Executive Yuan has developed a WiMAX Blueprint, which states:**
 - ”WiMAX Technology will be a focus for the future of Taiwan IT industry and will be a preferred technology option to deliver M-Service, M-Learning and M-Life in “M(obile)- Taiwan Program”.*
- **The Blueprint provides guidelines for :**
 - **Product focus for Taiwan industry**
 - **Nationwide R&D projects**
 - **Radio spectrum allocation**

General Principle

- The blueprint proposes the following key system products :
 - **WiMAX Chipset**
 - **WiMAX Systems**
 - **Base Station, Wi-Fi/WiMAX Gateway, WiMAX CPE Fixed Relay station, WiMAX Home/Business Terminals**
 - **WiMAX Application Platform**
 - **VoIP, IPTV Broadcast, On-Line Gaming, e-Health**
- **WiMAX has been selected as an important technology option for the M-Taiwan program.**
- **The planning and recommendations of WiMAX development made in this blueprint are used as references for related government ministries, industrial sectors, and R&D programs, which strongly suggest tight coupling among different projects.**

- **Develop a complete WiMAX Ecosystem, chipset, CPE, network elements, system integration, applications and commercial operations. (M-Taiwan Program)**
- **Develop differentiated applications, e.g. IPTV Broadcasting over WiMAX**
- **Develop a coupled WiMAX / Wi-Fi network to leverage strength of Taiwan Wi-Fi industry (Wi-Fi as access and WiMAX as backhaul)**
- **Leverage public sponsored basic research & development projects for core technologies, i.e., 802.16e chipsets, CPE, BTS and system integration capabilities**
- **Team up with international players to speed up product development, manufacturing, and market development**

Partnership Strategies

■ R&D

- To provide government subsidies to encourage private section investment in R&D and cooperate between private section and non-profit R&D institute

■ M-Taiwan Project

- To encourage strategy alliance of international chip firms and local device firms to apply for M-Taiwan Project

■ WiMAX spectrum policy

- To provide trial spectrum to international and local WiMAX players

■ Service trial bed

- To utilize m-City infrastructure as service trial bed, such as Digital Media Broadcast、VoIP、M-Payment、IPTV

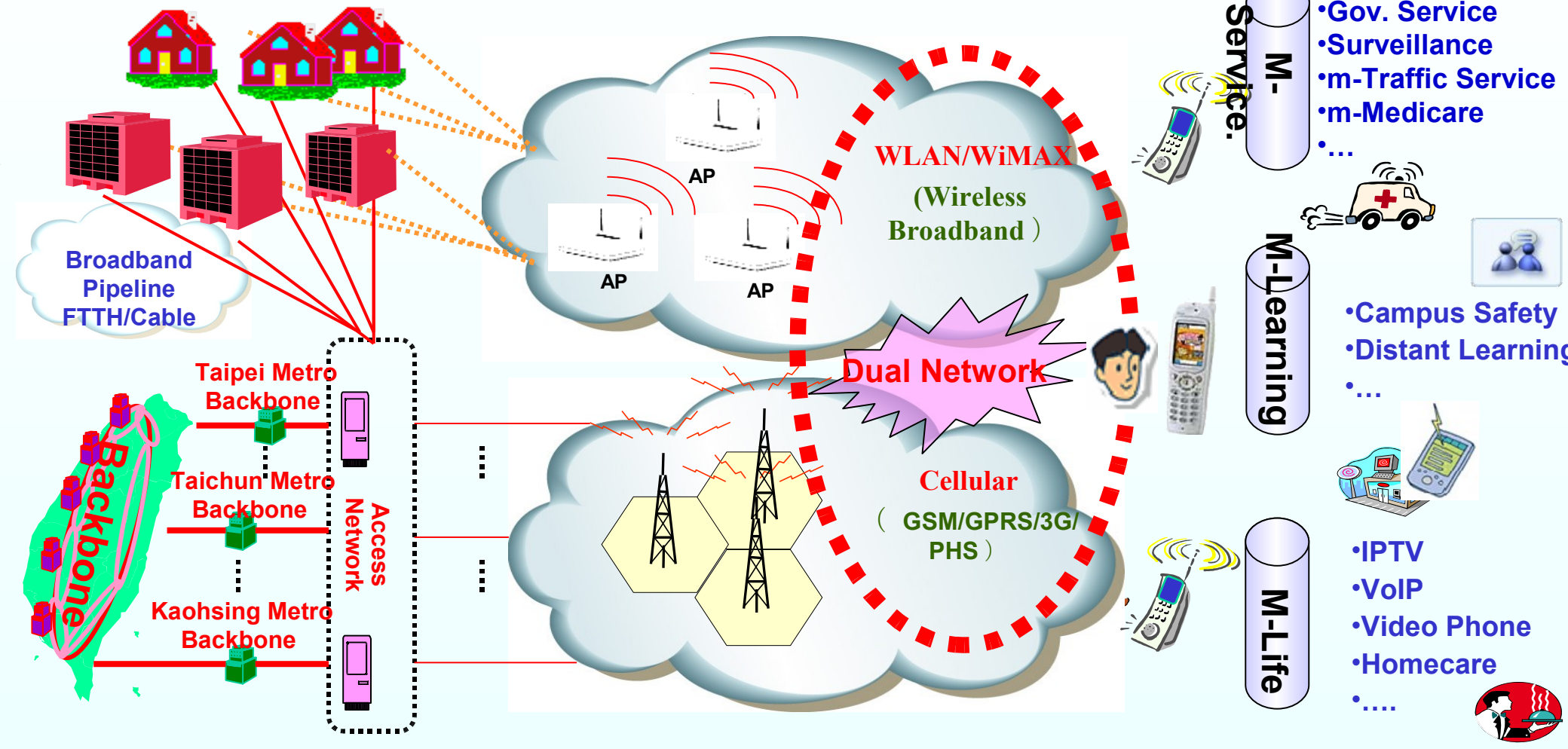


WiMAX Spectrum Issue in Taiwan

1. **608-680 MHz and 686-710 MHz**
 - Although these bands will be used for improvement of reception quality of some poorly received regions, for HDTV, or for new DTV channels, it still can be used for WiMAX experimentation.
2. **3G TDD frequency bands**
 - 3G TDD frequency bands (1915-1920 MHz and 2010-2025 MHz) can be used by 3G mobile operators to carry on WiMAX experimentation or business operation.
3. **2.5-2.69 GHz**
 - Frequency re-farming, cleaning up and licensing preparation will be completed by the end of 2006
4. **3.4-3.7 GHz frequency band**
 - A portion of this band is currently used by radio stations and fixed satellite service (FSS) downlinks. With proper coordination, the remaining portions may be shared by WiMAX
5. **Unlicensed bands**
 - Unlicensed bands in accordance with the ITU planning are 2.4 GHz and 5.8 GHz

M-Taiwan Program

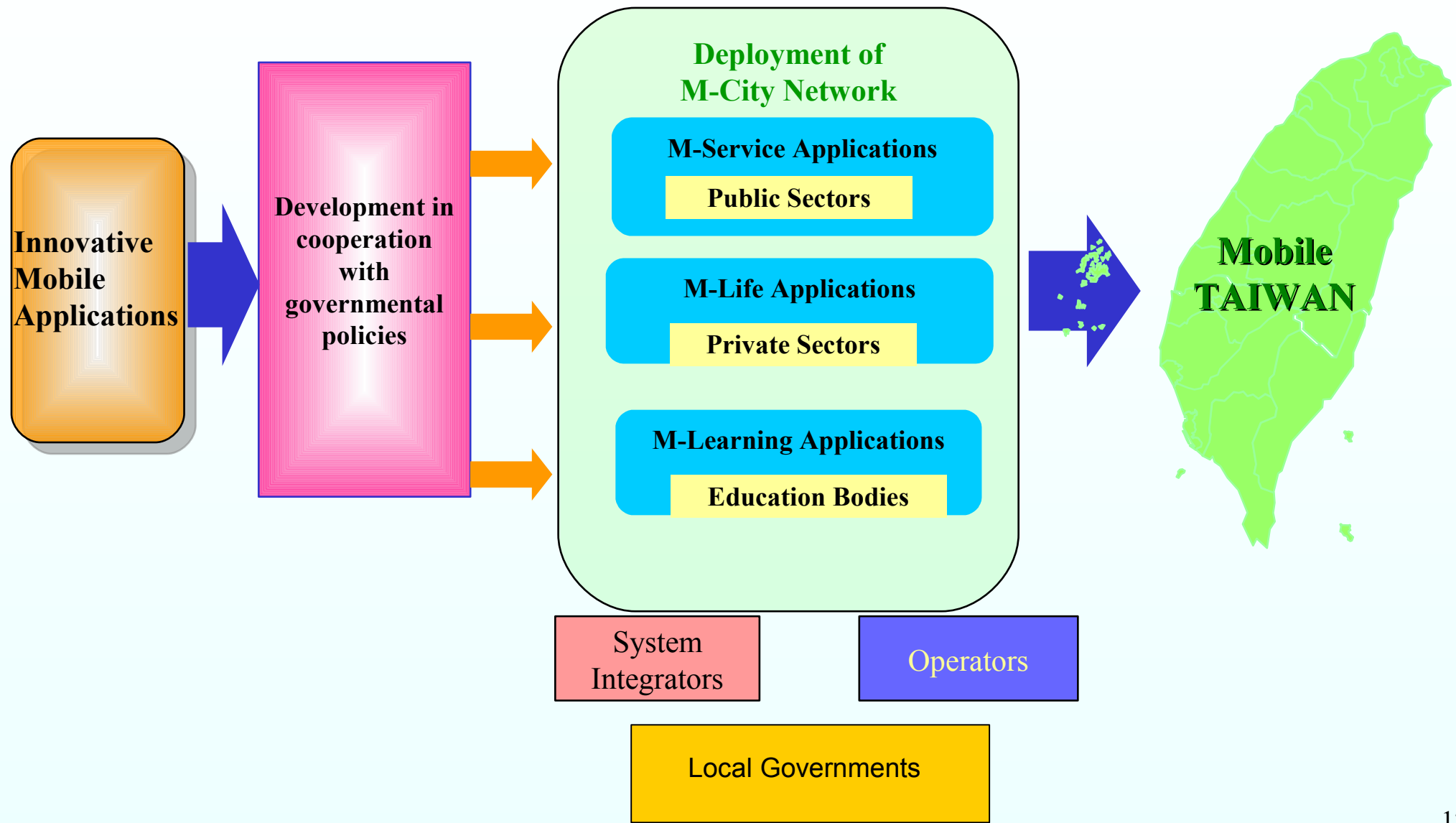
M-Taiwan: A National Program to Realize Taiwan WiMAX Blueprint



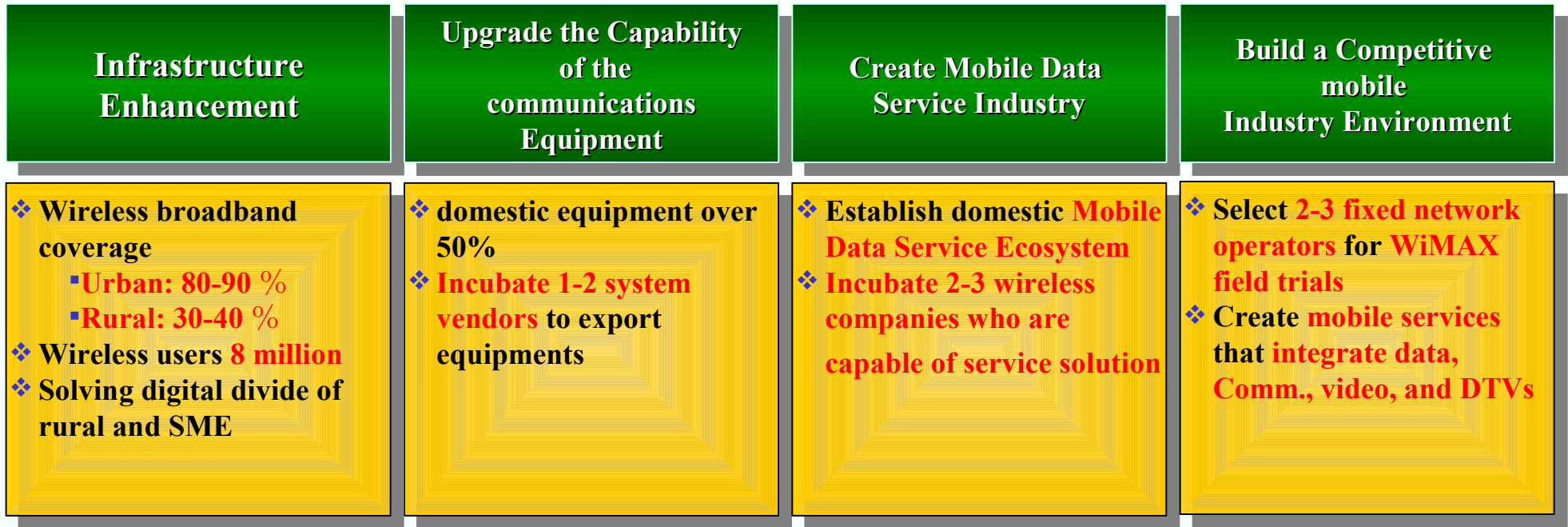
Create New Era for Taiwan Communications Industries

- **Industry: build up business opportunities for Communications Industries**
 - **Promote communications industry to become another ‘Trillion Industry’**
 - **Collaborate with international corporations to stimulate the value chain and enhance technical abilities as well as global business opportunities**
- **Society: create wireless broadband access environment**
 - **Development environment for seamless internet access: 8 million subscribers without surfing barriers**
 - **Roaming service promotion in campus: build up seamless internet access environment for online learning over the island**
 - **Single account: complete setting up single account for each user to roam over the island**
- **Nation: strengthen IT infrastructures and services**
 - **Elevate national competition : become the top 5 nations in global mobile internet applications**
 - **Enhance governmental efficiency: provide real time government services, offer mobile health care applications with efficiency for remote regions**
 - **Develop mobile cites: build up 10 international mobile cities around Taiwan, 2 of 10 mobile cities will be top 10 in the world**

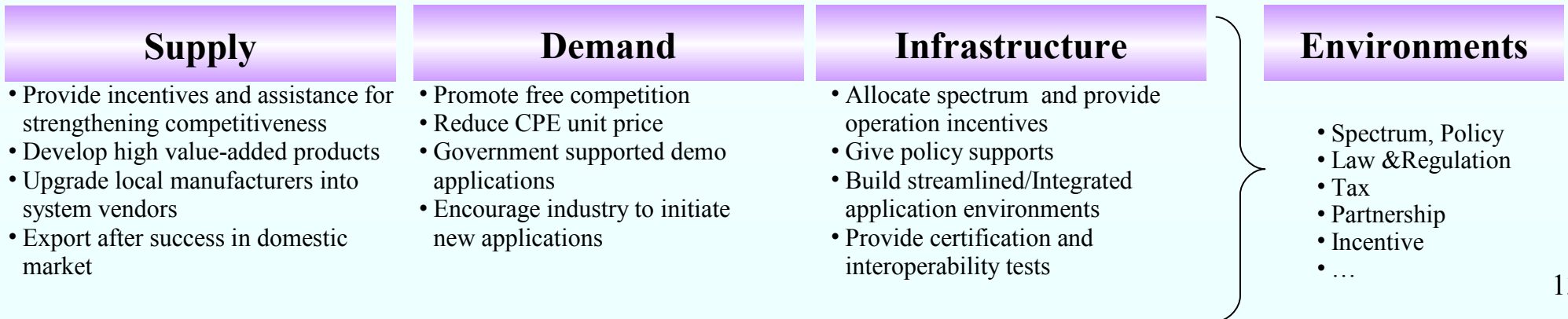
Structure of M-Taiwan Program



M-Taiwan's Objectives



Create fair competitive environments



M-Taiwan Program Status

- Government allocated \$42 million (USD) for the program in 2005
- 23 Proposals were submitted in October 2005, 10 for M-Service (Public sector) and 13 for M-Life
- 4 M-Service and 7 M-Life proposals were funded to build WiMAX infrastructure on various cities. Among them, VoIP, M-Payment, IP TV, and M-healthcare are the major services to be provided
- The contracts for the funded proposals were signed in December 2005
- Work intensively with companies participating in the program and international organizations on building test centers for products to be used in the M-Taiwan program

Achievements in 2005 (1)

■ Establishment of Mobile Cities and Special Zones

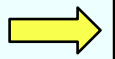
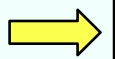
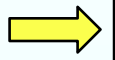
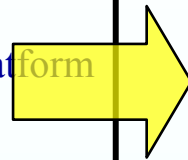
- **2 Mobile Cities for Metro**
 - Taipei 、 Tai-Chung
- **Application services at 3 city governments or special zones**
 - I-Lan (intersection monitoring) 、 Lo-Dong (medical) 、 Hua-Lien (medical)
- **2 Special Mobile Zones for rural areas**
 - Jen-Ai 、 Ho-Pi
- **19 Mobile Life Applications (including dual-net applications)**
- **6 Mobile Learning Applications**

Achievements in 2005 (2)

- **Establish keystone companies**
 - 10 companies joined by broadband providers, 3G operators, and IT companies
- **Promote collaboration with major international corporations**
 - Signed a collaboration MOU with Intel on 10/17/2005 , to promote WiMAX technology jointly
- **Increase number of wireless internet users**
 - Wireless internet users increased to 1.95 M
- **Induce more investment**
 - Resulted in direct investment of US\$ 1.5B and indirect investment of US\$ 2.2B
 - 78 companies in the industry participated in the program, strengthen the overall value chain of the industry

Mobile Services


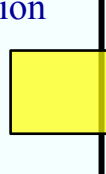

Project Name	Gov.	Participants	The Application Services
Mobile Service and M	Taipei City Government (President Chain Store Corp.)	President Chain Store, Q-Ware, Zyxel, Gemtek, D-Link, Microsoft	<ul style="list-style-type: none"> • Taipei e-Bus Service • Surveillance • Offer an open value-added platform
Mobile Taichung City	Taichung City Government (Asia Pacific Broadband Telecommunication Corp.)	Asia Pacific Broadband Telecommunication Corp.	<ul style="list-style-type: none"> • Mobile Office Services • VoIP Internet telephone • Traffic and Security mobile applications • City tour guidance • Mobile Commerce and Payment
HuaLien Wireless Land	HuaLien County Government (TATUNG Co.)	TATUNG Co., Redline Communications, AirSpan, Vibo Telecom, Savecom International Inc., TSTI, Yam, TIS Net, WeiGen Tech, D-LINK	<ul style="list-style-type: none"> • M-Portal • M-Care • VoIP
M-Yilan Broadband Wireless /	Yilan County Government (Chunghwa Telecom. Co. Ltd.)	Chunghwa Telecom Co., Ltd. , eASPN Taiwan Inc. , Sintel ,LTD	<ul style="list-style-type: none"> • Public Security and Traffic Control • Mobile Commerce Platform • Media-on-Demand(MOD) system



Mobile Living & Mobile learning(1)

Project Name	Corp.	Participants	The Application Services
The Mobile Healthcare Se	Chunghwa Telecom Co., Ltd.	Taipei Medical University Hospital, Taichung Veterans General Hospital, Tri-service hospital, Wan-Fang Hospital, Cablessoft Tech Inc., Yam Digital Technology	<ul style="list-style-type: none"> • The Mobile Nurse • The Physical Assistant • The Master of Health Promotion • The Healthcare Angel →
PHS/ WiMAX Integrated Network Service	FITEL	FITEL, FIC Group (LEO Systems Inc./ TelePaq Technology Inc), Taiwan SECOM Group (Aion Technologies Inc.)	<ul style="list-style-type: none"> • High-Speed Internet Access • VoIP • Mobile Security • Mobile Entertainment • Mobile Finance →
Mobile Application Development in Ren-Ai Township, Nantou County	Chunghwa Telecom Co., Ltd.	Central Taiwan Business Group, Chunghwa Telecom Co. Ltd., Chunghwa Telecom Laboratories, Department of Public Health, Nantou County Government, Puli Christian Hospital, National Chi Nan University	<ul style="list-style-type: none"> • VoIP • Wireless Broadband Access • Mobile Treatment • Mobile Commerce • Mobile Learning and After School Tutoring Course • Mobile Sightseeing Guide →
Mobile Taiwan Application in Jhu-sin Village, Hou-ji Township, Tainan County	Chunghwa Telecom Co., Ltd.	Fiber Logic Communications Inc. and Kaohsiung Science Park of STSP	<ul style="list-style-type: none"> • IPTV Trial • M-Learning →

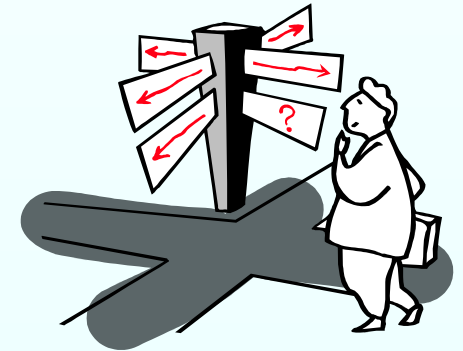
Mobile Living & Mobile learning(2)

Project Name	Corp.	Participants	The Application Services
M Taiwan project of FarEasTone	FarEasTone Telecommunication Co., Ltd.	Far Easter Electronic Toll Collection Co., Ltd	<ul style="list-style-type: none"> • M-Police Service and ATIS (Advanced Traveler Information Service) • Transportation Comm. Mngt. • VoIP Service • PTT Service 
「Mobile New Generation」Application Developer	Acer Inc.,	Taiwan Cellular Corp., Taiwan Fixed Network Corp., Zyxel, iaVista, Rock Mobile, Taiwan Knowledge Bank	<ul style="list-style-type: none"> • Wireless Access and Roaming Service • College Administration Information System Access Service • VoIP-in-Campus Service • Mobile Learning Service • Mobile Entertainment Service 
The Commercial Application	Acer Inc.,	Acer Inc.,	<ul style="list-style-type: none"> • Uploading traceability data • Traceability tracking • Printing labels on agricultural products with authenticated 2D bar code • Reading the traceable records of products by consumers 

WiMAX Products Development in Taiwan

WiMAX Product Development for M-Taiwan

- **Coordination with Taiwan WiMAX Blueprint and M-Taiwan program**
- **Industry Focus**
 - **802.16e terminal chipset**
 - **802.16e base station**
 - **Total solution including WiMAX system and network infrastructure**





Utilize the

Strength of Taiwan ICT-CPE Industry

- Taiwanese vendors supply more than 80% of worldwide notebook & desktop PC and 90% of Wi-Fi products
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Taiwan WiMAX CPE/BTS Companies

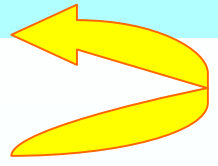
Company	Product	Status	Notes
Gemtek	CPE/BS	Sample ready	One of the biggest Wi-Fi product manufacturers
MiTAC	CPE	Prototype ready	Produce Wi-Fi/GPRS dual mode terminals
Jstream	CPE	Developing	Sample ready for 3.5GHz band in Q2/2006
CyberTAN	CPE/BS	Planning	Focus on 16e, one of the biggest Wi-Fi product manufacturers
ZyXEL	CPE/BS	Sample ready	also interested in BS
Microelectronics Technology	CPE	Sample ready	also interested in BS
Delta Networks	CPE/BS	Sample ready	also interested in BS
Askey	CPE	Planning	Sample will be ready in Q2/2006
Accton	CPE	Planning	Manufacture wireless and wireless products
Alapha Networks	CPE	Planning	A big Wi-Fi product manufacturer
Wistron NeWeb Corp.	CPE	Developing	Sample will be ready in Q1/2006
Z-Com	Gateway	Planning	For Wi-Fi/WiMAX gateway
ASUS	CPE	Planning	Focus on 16e, one of the biggest Wi-Fi product manufacturers
Foxconn	CPE/BS	Sample ready	also interested in BS, a big PC parts/accessory manufacturer

Conclusions

- **“TW-WiMAX Blueprint” is the government’s policy for integrating planning across ministries and programs**
- **The M-Taiwan program will create large scale wireless cities, some of the biggest WiMAX test beds for technology development, operations, and business models**
- **Government and industry are planning on setting up test centers for the M-Taiwan program and WiMAX R&D acceleration project**
- **Taiwan’s world class CPE manufacturing capability will be a critical part of the worldwide WiMAX ecosystem**

Attachment

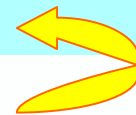
Mobile Service and Mobile Lifestyle Development Project



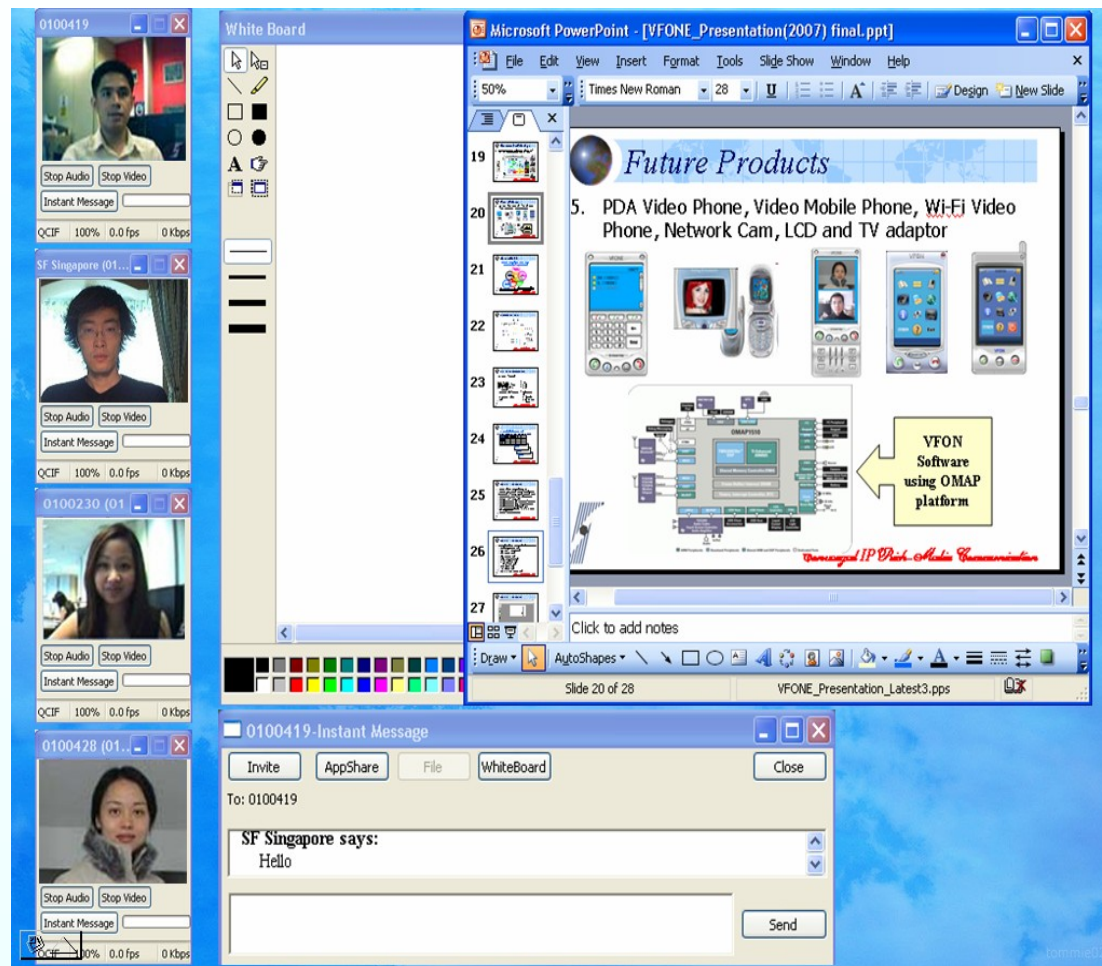
- ❖ The Application Services :
 - ❖ Taipei e-Bus service
 - Taipei travel information
 - Municipal info. bulletin
 - High-speed wireless service
 - ❖ Surveillance
 - ❖ Offer an open value-added platform
 - Daily service
 - Financial service
 - Art and culture service
 - Transaction service
 - Recreation service
 - Learning service
 - Friend matching service



Broadband Wireless Network Application Project



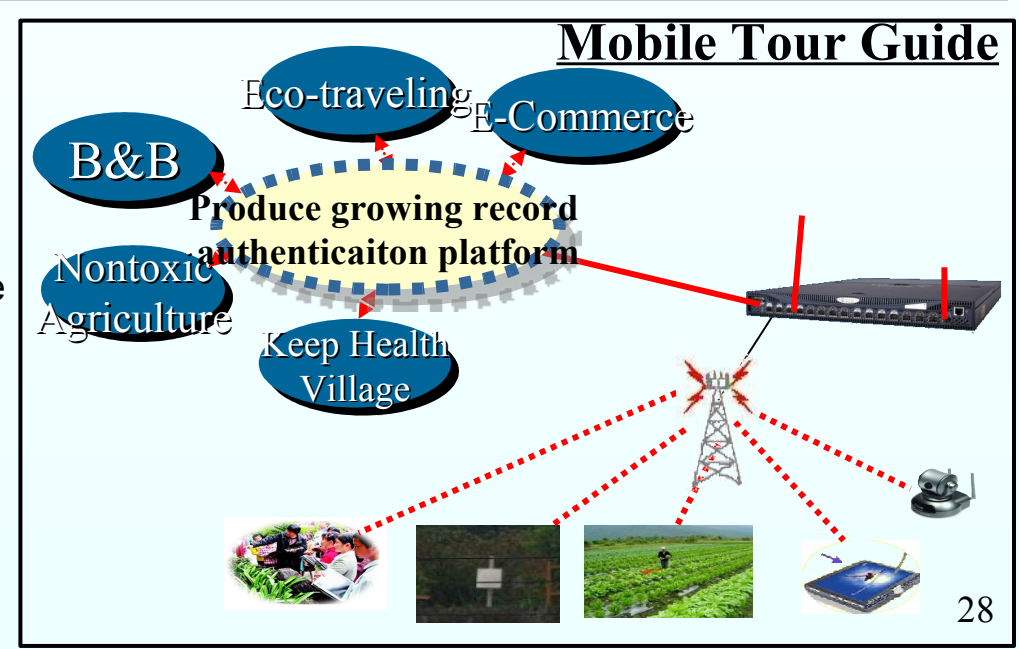
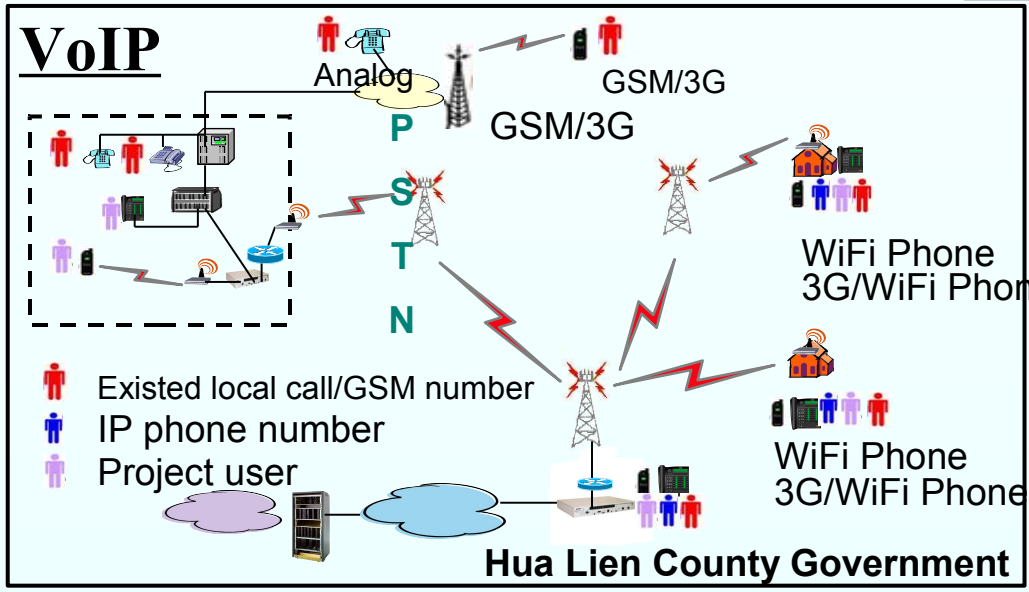
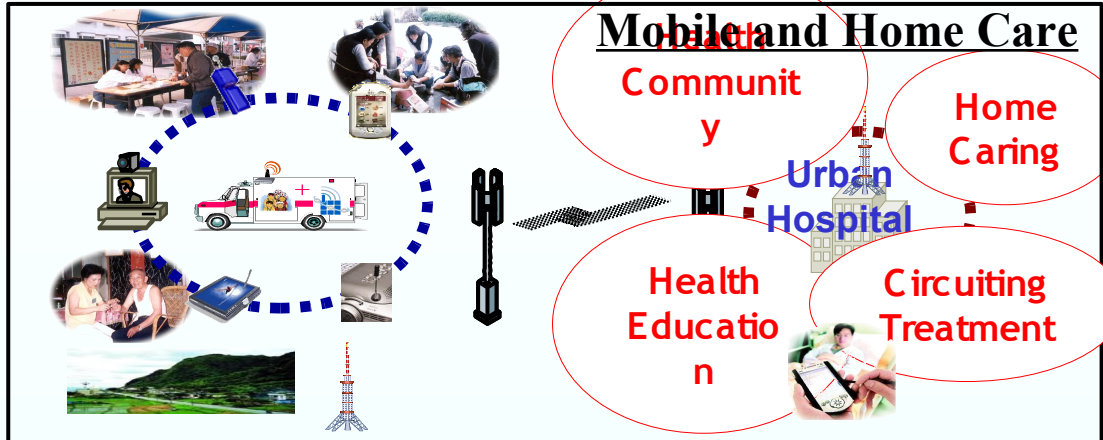
- ❖ The Application Services :
 - ❖ Broadband Wireless Access
 - ❖ Mobile Office Services
 - ❖ VoIP Internet telephone
 - ❖ Traffic and Security mobile applications
 - ❖ Push Mail
 - ❖ M-Taichung Project Portal
 - ❖ City tour guidance
 - ❖ Mobile Commerce and Payment
 - ❖ Community Health Care



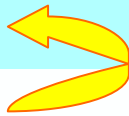
HuaLien Wireless Land



Constructing high bandwidth backbone for the entire county and solving last mile problem for remote areas using WiMAX technology



M-Yilan Broadband Wireless Application Development Project



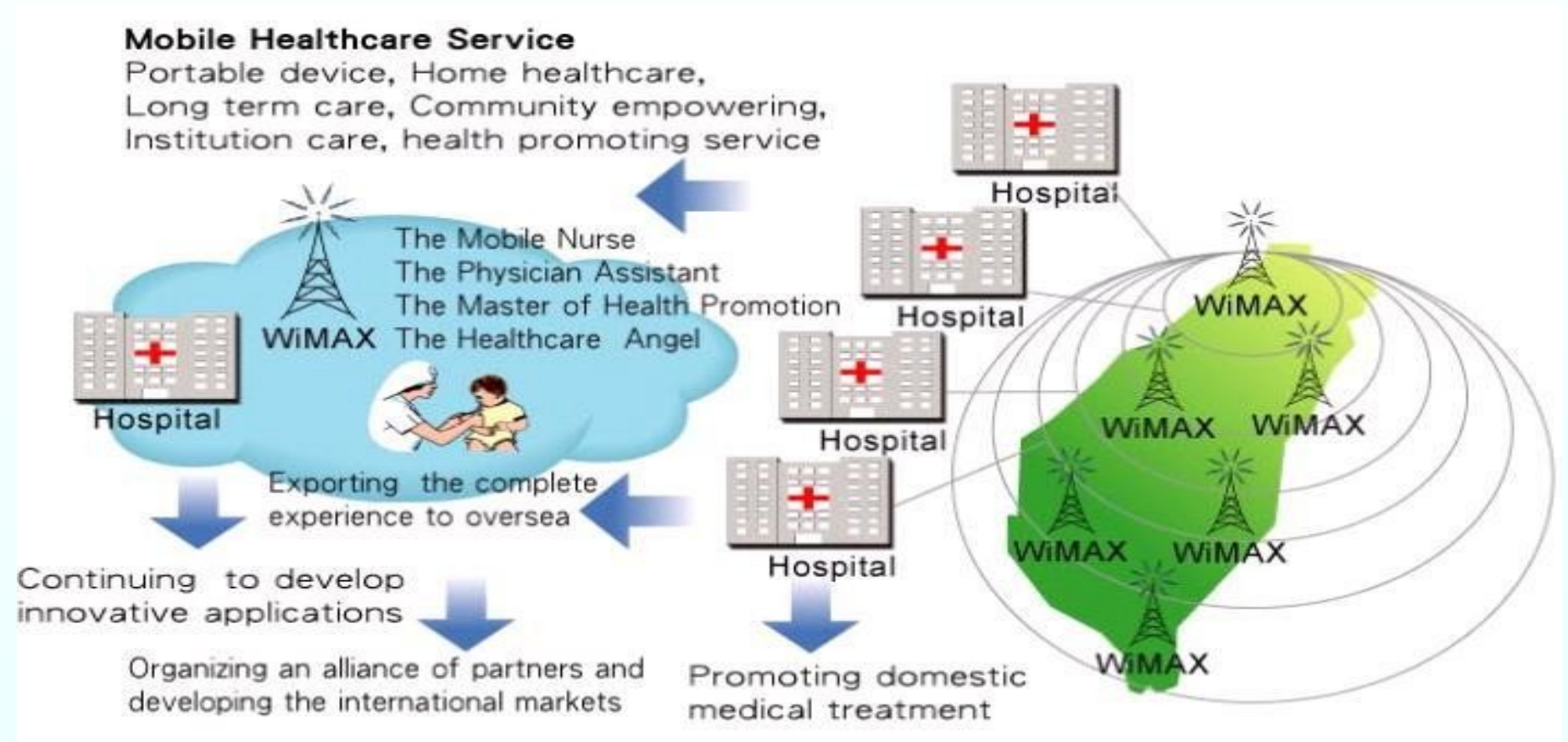
- ❖ The Application Services :
 - ❖ M-Infrastructure : the WiFi/WiMAX broadband wireless access network
 - ❖ M-Life : Mobile Commerce Platform
 - ❖ M-Learning : Media-on-Demand(MOD) system
 - ❖ M-Service : Public Security and Traffic Control



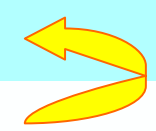
The Mobile Healthcare Service Plan



- ❖ The Application Services:
 - ❖ The Mobile Nurse
 - ❖ The Physical Assistant
 - ❖ The Master of Health Promotion
 - ❖ The Healthcare Angel



PHS/WiMAX Integrated Network Services

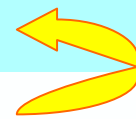


❖ The Application Services :

- ❖ High-Speed Internet Access
- ❖ VoIP
- ❖ Mobile Security
- ❖ Mobile Entertainment
- ❖ Mobile Finance

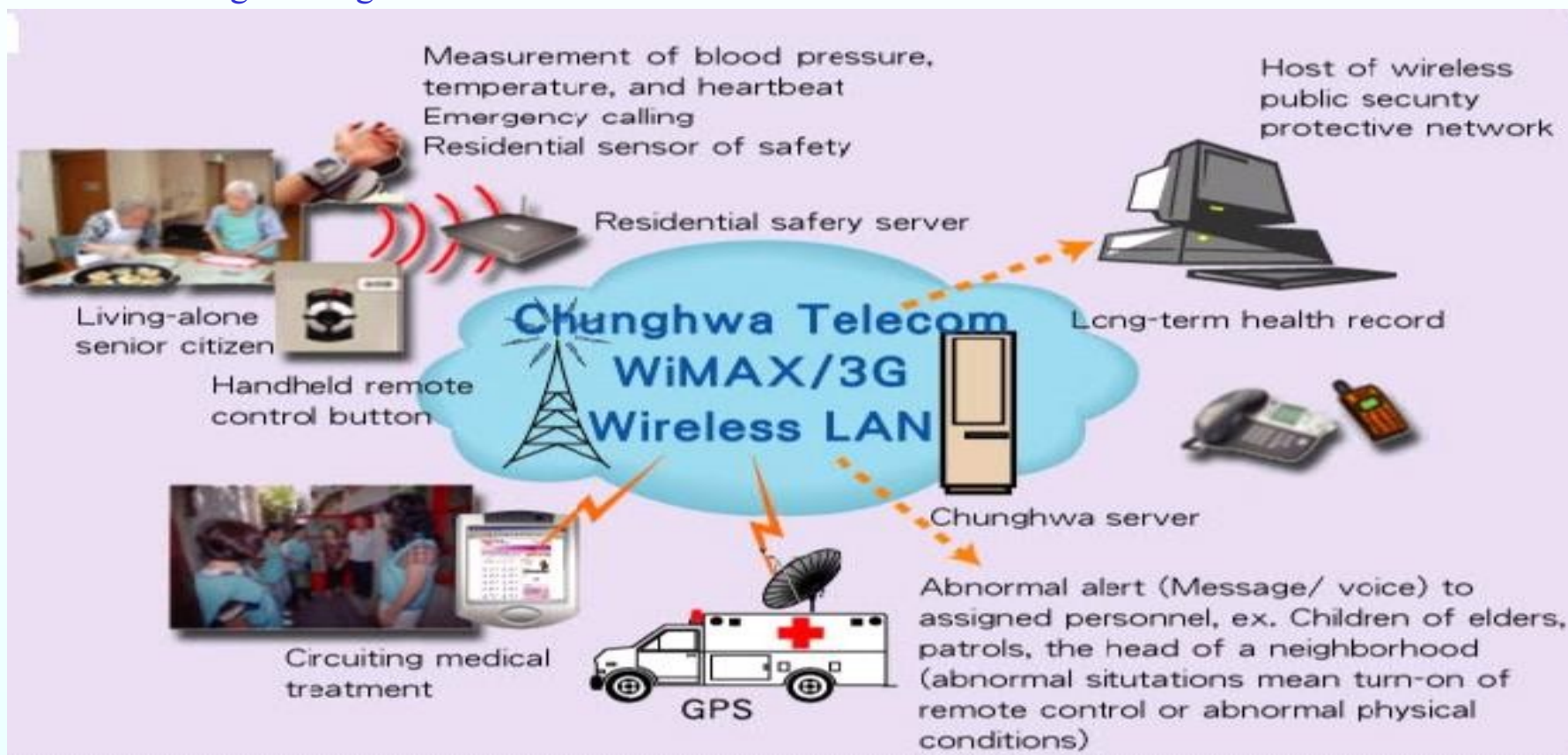


Mobile Application Development Project for Ren-Ai Township, Nantou County



❖ The Application Services :

- ❖ VoIP
- ❖ Wireless Broadband Access
- ❖ Mobile Treatment
- ❖ Mobile Commerce
- ❖ Mobile Learning and After School Tutoring Course
- ❖ Mobile Sightseeing Guide

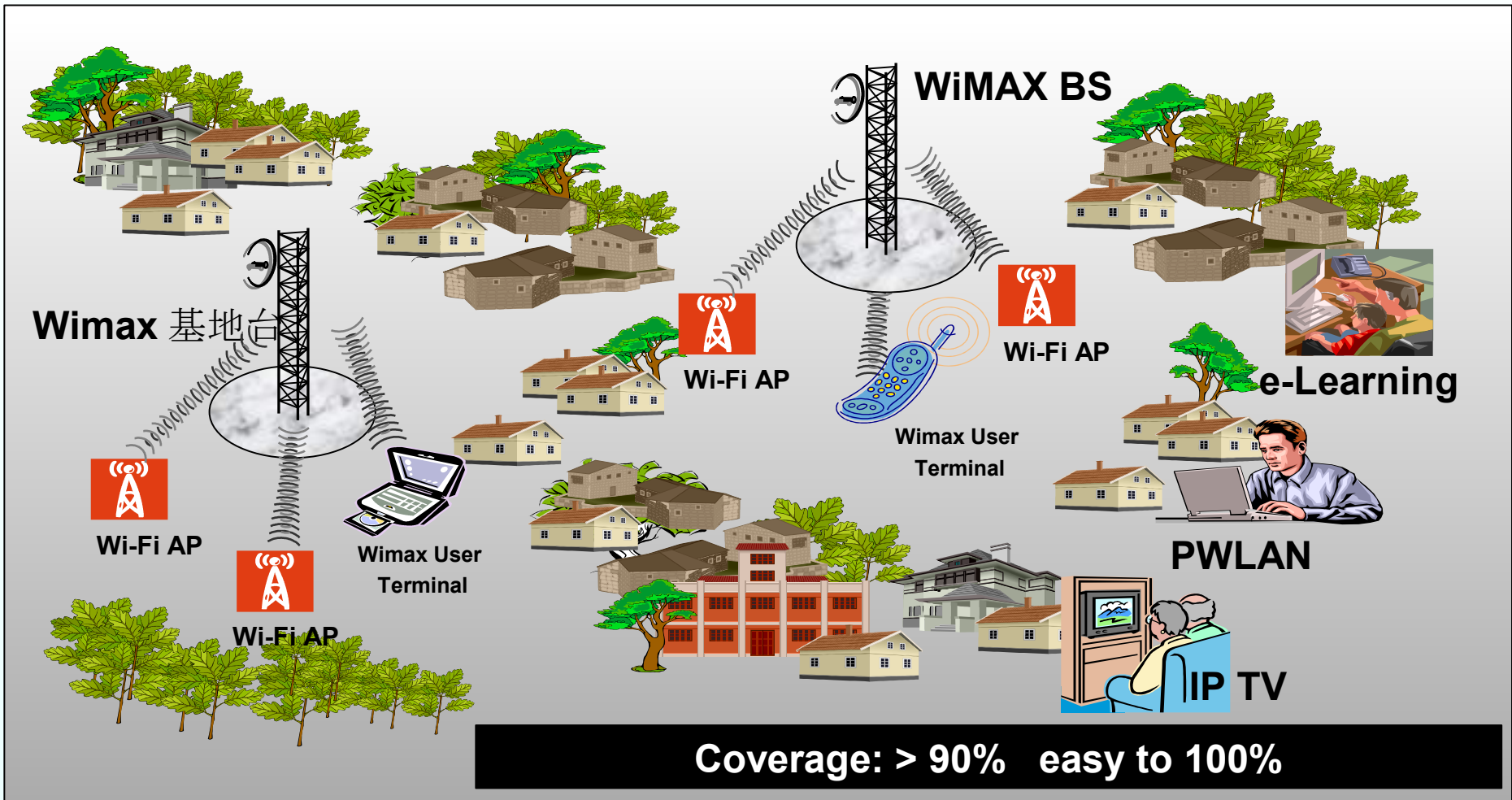


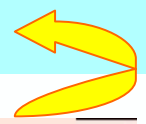
Mobile Taiwan Application

in Jhu-sin Village, Hou-bi Township, Tainan County

❖ The Application Services :

- ❖ M-Learning : After School Tutoring Course
- ❖ IPTV Trial





❖ The Application Services :

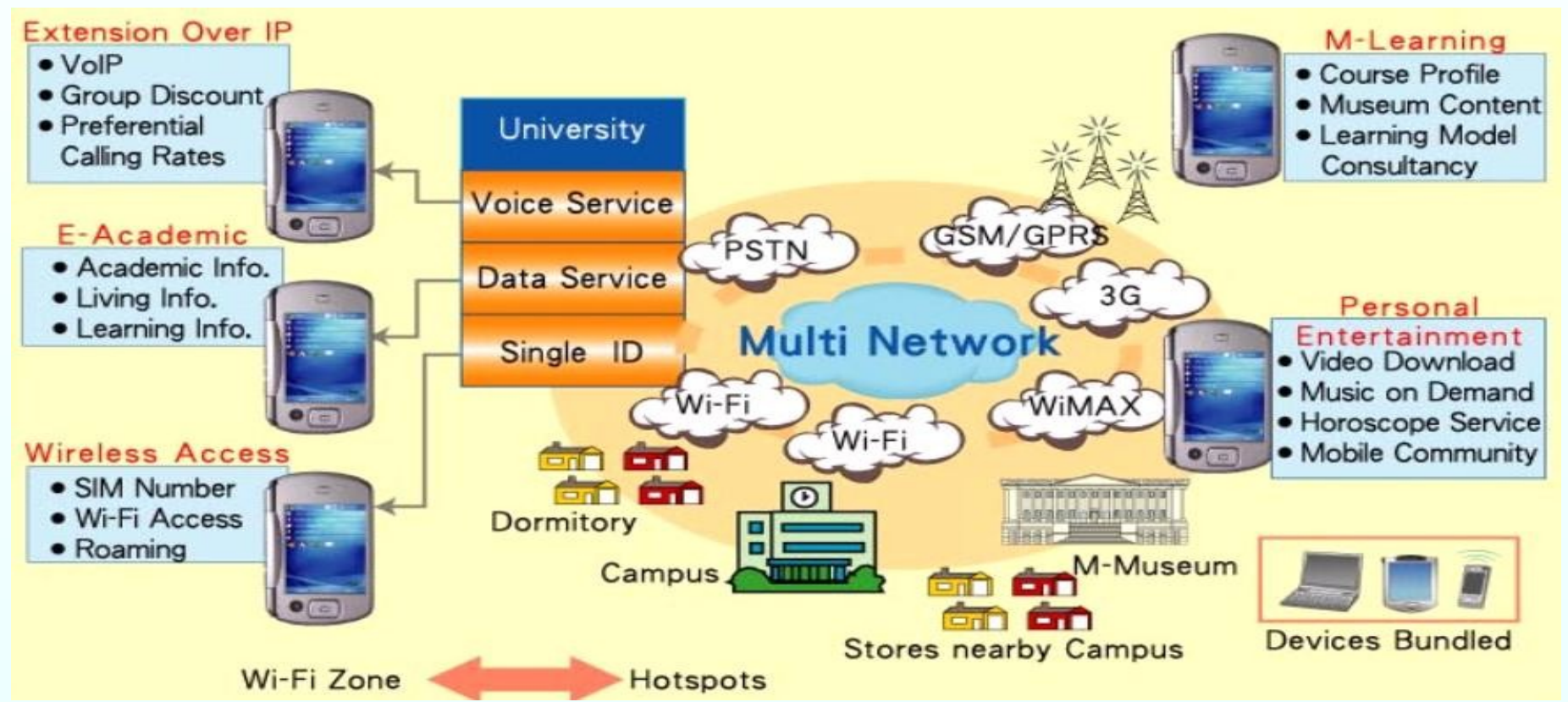
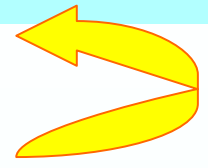
- ❖ M-Police Service and ATIS (Advanced Traveler Information Service)
- ❖ Navigation Ap 、 Wireless Portal 、 Wireless Recreation Serv. Wireless Business Serv.
- ❖ Transportation Comm. Mngt.
- ❖ VoIP Service 、 PTT Service



Application Development and Operation Project

❖ The Application Services:

- ❖ Wireless Access and Roaming Service
- ❖ College Administration Information System Access Service
- ❖ VoIP-in-Campus Service
- ❖ Mobile Learning Service
- ❖ Mobile Entertainment Service



The Commercial Application Integration Project of 2D Bar Code Utilization on Agriculture



❖ The Application services :

- ❖ Traceability data uploading
- ❖ Printing labels on agricultural products with authenticated 2D bar code
- ❖ Reading the traceable records of products by consumers
- ❖ Traceability tracking

