XGP Forum Establishment Ceremony

April 2, 2009
Tokyo, Japan

XGP Forum

The Program of Today

1. Congratulatory Speech by Mr. Yasushi Yoshida,
   Director General of the Radio Department, MIC
2. Congratulatory Speech by Dr. Sam Endy,
   Vice Chairman of XGP Forum, President of EMC
3. Congratulatory Speech by Mr. Qian Qiang
   Vice President, ZTE Corporation
4. About XGP Technology by Mr. Yoshioki Chika,
   Vice Chairman of XGP Forum, Exective Vice President of Willcom
5. Organization and Future by Mr. Sean Sugiura
   Secretary General of XGP Forum
6. (Addendum) The Advantages of XGP by Mr. Yasunori Akatsuka
   Chairman of PWG, General Manager of Kyocera

Mr. Yasushi Yoshida, Director General of the Radio Department, MIC 1/2

Congratulations to the establishment of XGP Forum today. I am very glad to have the chance to say a word on this special moment.

＜Environment facing XGP＞

In the field of wireless industry, it is observed that the demand for high-speed large-capacity communication is increasing steadily. It is forecasted in a recent report released by Council of Information and Telecom Industry in December 2008, that the mobile traffic will increase by 200 times of the present by the year of 2017 in Japan.

From the government angle, to correspond to the increasing demand for such mobile communications, we are fully aware of the important role XGP could play as one of the broadband wireless accesses (BWA).

We consider XGP a promising technology, not only because of its realization of the maximum speed of 20Mbps, which has exceeded the best transmission speed provided by 3G mobile. But also because of its realization of broadband environment even in outdoor traveling mood, which is resulted from a longer outreach of radio wave in comparison with wireless LAN.

＜Introduction of XGP in our country＞

Ministry of Internal Affairs and Communications issued BWA licenses to two operators in December, 2007.

One of them is UQ Communication which is a sponsor of WiMAX technology and the other is WILLCOM Inc., which will build network based on XGP technology and offer its service.

WILLCOM is to begin its XGP service in specific area within the month. By expanding the network for commercial service starting this summer, we are looking forward to enjoy wireless broadband access via mobile anywhere and anytime in near future.

Mr. Yasushi Yoshida, Director General of the Radio Department, MIC 2/2

＜Expectation on the Role of XGP forum＞

On the other hand, to make XGP a customer-favored flat-rate service, we understand that it vital to introduce this technology and its service to as many countries as possible.

The XGP forum shall play a key role in pushing forward XGP's standardization process overseas, as well as to diffuse the network itself in more countries and areas. With XGP network introduced overseas, and by realizing international roaming service in future, it can not only provide terminals but also services at low cost to users.

PHS has already been introduced in Asian countries including China, Thailand and Vietnam, owing to the effort of PHS MoU Group, which is the forerunner of XGP Forum. We believe, and sincerely hope that your experience of earlier overseas promotion activities could help with XGP promotion under the name of XGP Forum in future.

＜Support to Overseas Promotion Activities by Ministry of Internal Affairs and Communications＞

Ministry of Internal Affairs and Communications will always stay with the wireless industry to support the international deployment of any Japan-originated superior telecom technology via the existing cooperative system between government and non-government supporters.

Being an important part of Japanese wireless market, XGP's internationalization process is supported by the ministry. It is in accord with the ministry's intention to introduce Japanese-originated technology. To push forward the further and smooth development of XGP, we'd like to make effort to work together with all cooperative parties, including all attending parties today.

＜The Closing＞

Finally I wish the prosperity of XGP Forum. I wish XGP to overcome all possible challengers and difficulties. I wish XGP being introduced to more and more countries with the effort of XGP Forum.

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Dr. Sam Endy 1/2

Good Afternoon! I am very pleased to be here today to participate with you in launching the PHS MOU into the world of 4G – under the organization of the eXtended Global Platform (XGP) Forum!

Since this is also the period of the Cherry Blossom – which, I understand, is an omen of change, love and good fortune, it is a great way to begin this very important event for our community…and I suspect that is why this day was selected.

We are today launching the XGP Forum following 20 years of experience with PHS .

As you know, PHS was developed by NTT Laboratory in 1989 – 20 years ago. Public service began in Japan in 1995 – 6 years later. PHS adoption grew through the next 14 years as the public service in Japan consolidated under the leadership of DDI-Pocket, now called Willcom.

With the support of all of you, the support of the government of Japan, and the overseas expansion to many locations including Thailand, Taiwan, and others; and through the dramatic growth of PHS in China, we had the exciting event in October 2006 when we recognized more than 100 million subscribers worldwide. Those 100 million subscribers required the installation of hundreds of thousands of cell sites, perhaps 250 million handsets (a wild guess on my part) and terminal devices and evolutionary upgrades from voice to low speed data to high speed data and additional attractive features introduced by the operators such as texting and caller ring back tone.

We must remember the lessons learned during these past 20 years – the tough competition in Japan and the difficulty in getting wide, substantial adoption outside Japan until the opening in China. These lessons will help us in launching XGP.

Now, we are at the starting gate with 4G!

In my experience with 1G, 2G, and 3G and with a 3.9G type product called iBurst, I have found that the “easy” part is the technology development. I don’t mean this in a negative sense…but it is something we in the technical and scientific community can do well….almost like sending a man to the moon. It is the next step…successful commercialization… which is the real challenge. Once the technology is in hand, there are many other factors, some beyond our control, that impact commercialization.

For example, is the frequency spectrum available?; and, if so, is it given by the government for free or is there an auction or bidding process which can become very expensive before you ever install the first cell station. We all remember how the 3G licensing process in Europe and the United States, that included spectrum auctions, brought in billions of dollars to governments but also forced some companies into bankruptcy, while the survivors, who won the spectrum auction, had to carry large financial debt and still find the funding for the build out of the network infrastructure. This period became known as the “telecom winter” and many infrastructure and operating companies were severely damaged or went out of business.

Fortunately for us, starting here in Japan, the Japanese government has allocated spectrum, without an auction, for XGP. And, Willcom has an existing installed, nationwide infrastructure base on which to build out XGP according to a transition plan.

We are indeed fortunate to have this situation and it is one any operator would envy. It is a great start and it will help us develop the product marketing, sales and customer transition planning experience, and adjust our strategy and tactics as we learn from the various issues that will inevitably arise! Of course, we will meet competition from WiMAX, the existing 3G networks, and, at some point the coming LTE . But, as we know, that is the real world.

Dr. Sam Endy 2/2

As a reference point, let's take a brief look at the world transition from 2G to 3G (and my facts here may be somewhat off, but I suspect reflect what occurred).

I understand that the first pre-commercial 3G network was launched by NTT Docomo in Germany in May 2001, followed by the commercial launch in Japan on October 1, 2001. Then came Korea, then Europe, then the US, and in the near future we will see China.

By June 2007, 6 years after Docomo's launch, there were 200 million 3G subscribers out of about 3 billion mobile phone subscribers worldwide, or less than 7% of the total. However, in countries like Japan and Korea where 3G was first launched (each under favorable government licensing terms), over 50% of mobile subscribers were on 3G. A recent report by In-Stat, an industry analyst, indicates that at the end of 2008, 3G accounted for 11% of the 4 billion worldwide subscriptions. However, looking at fourth quarter 2008 wireless infrastructure contract awards suggests that 3G and 4G will account for 30% of wireless subscriptions by the end of 2013. Further, Portio Research suggests that 80% of the world population will be on mobile service by 2013…that would be 5.8 Billion subscribers. If 30% of these are 3G-4G, as suggested by In-Stat, then we are looking at almost 2 billion 3G-4G subscribers. A very big opportunity indeed – because clearly the trend in this group will be more toward 4G.

Vendor financing is one of the other keys to success. I was involved in an enterprise in building a 2G network in Brazil…and we needed, and were able to obtain, $1.5 Billion in vendor financing (split among 3 vendors). Given the world-wide recession, vendor financing will become even more important in the sale of infrastructure. This is something for manufacturers of XGP to consider. In addition there will be resistance by incumbent operators in target countries to letting new players into the market. As all of you know, these are the realities when we step off-shore outside of Japan. But, if there is no risk, there is certainly no reward. There is no safe, guaranteed successful business model today in telecommunications. But, if you don't play in the game; for sure someone else will play and win.

Building on the experience learned in the 20 years of PHS from the development by NTT in 1989, I am sure that we have learned lessons on introducing a new technology both inside and outside Japan.

All of us must now apply those hard learned lessons to exploit that 2 Billion 3G-4G subscriber opportunity over the next 4 years. We have a great technology at the right time…we have excellent starting conditions here in Japan with the customer base, the infrastructure base, and the experience of Willcom and the granting of spectrum by the government of Japan.

Successful Implementation and exploitation of the XGP technology must be a cornerstone of our collective future. And now we are at this moment, this time and place, today, to begin the future, the next generation – XGP.

Let's understand the reality – work hard to succeed with XGP in Japan based on lessons learned from PHS – get a lot of favorable world press and excitement and undertake the challenges of going global against 3G, WiMAX, and LTE.

Congratulations to all members of the PHS MOU for this day and to the developers of XGP. This is a new start in a new world….and, with success, in a few years we will begin talking about 5G! But that is for another day!

Thank You!

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Mr. Qian Qiang

Good afternoon, ladies and gentlemen, this is Qian Qiang from ZTE Corporation.

It is a great honor for me to have a chance of this speech in front of everyone in the ceremony today. First of all, I would like to sincerely celebrate the establishment of XGP Forum this time.

As you might already know, ZTE is one of the leading providers of high-tech communication equipments in China, and our company's products have already been launched in global telecom market, providing them with over 500 clients in 140 countries & regions in the world. And, we also have established long-term business cooperation with major global telecom service careers, including Hutchson Telecom, France Telecom, Vodafone, Telefonica, Telus, and so on.

2008 was a remarkable year for us. Under current bad economic situation, we made major breakthroughs and a strong growth in the main products of GSM, W-CDMA, FTTX, and so on. In China, we submitted bids for 3G projects of the three major carriers, especially for TDD technology at China Mobile. We have proven track records in this technical domain, where we have a positive perspective. We are confident that ZTE can become a good partner for Willcom by working on XGP service together as this is technically close to TD-LTE, which we have been working with China Mobile as I mentioned.

Finally, cooperation in XGP service will certainly expand business chances of our company for the future growth. Especially, the revenue by international operations accounted for 60.6% last year – this is an increase of 33.5% compared to the previous year. We plan to further strengthen overseas business for the coming years, too.

Thank you again for the opportunity today. We wish a great success in XGP service by Willcom near the future.

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“XGP”

eXtended Global Platform

is True Mobile Broadband System

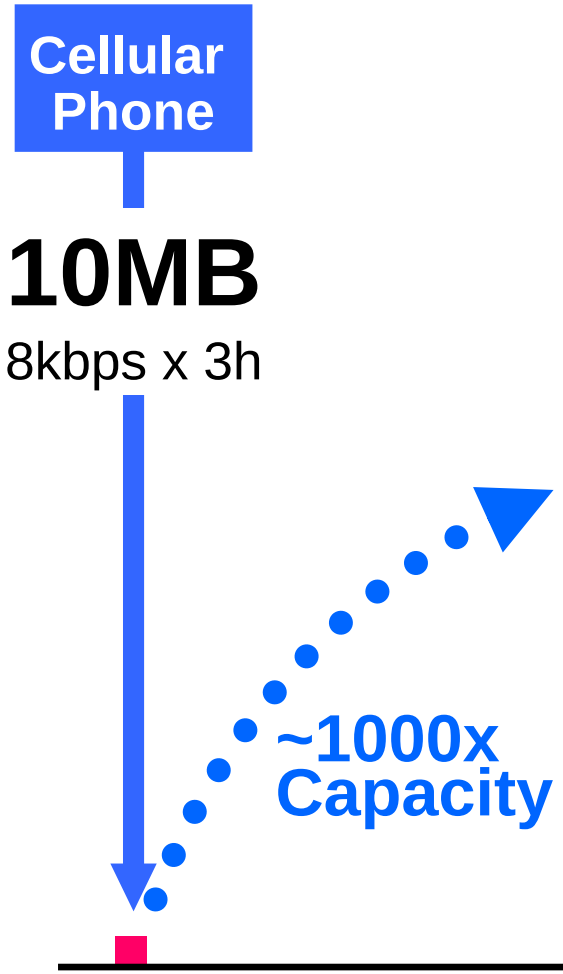
The true BWA XGP eXtended Global Platform

- **Wireless BB Issue**
- XGP

Inconvenient Truth

The true BWA XGP eXtended Global Platform

Why 3G slow down rapidly, when it's busy hours?

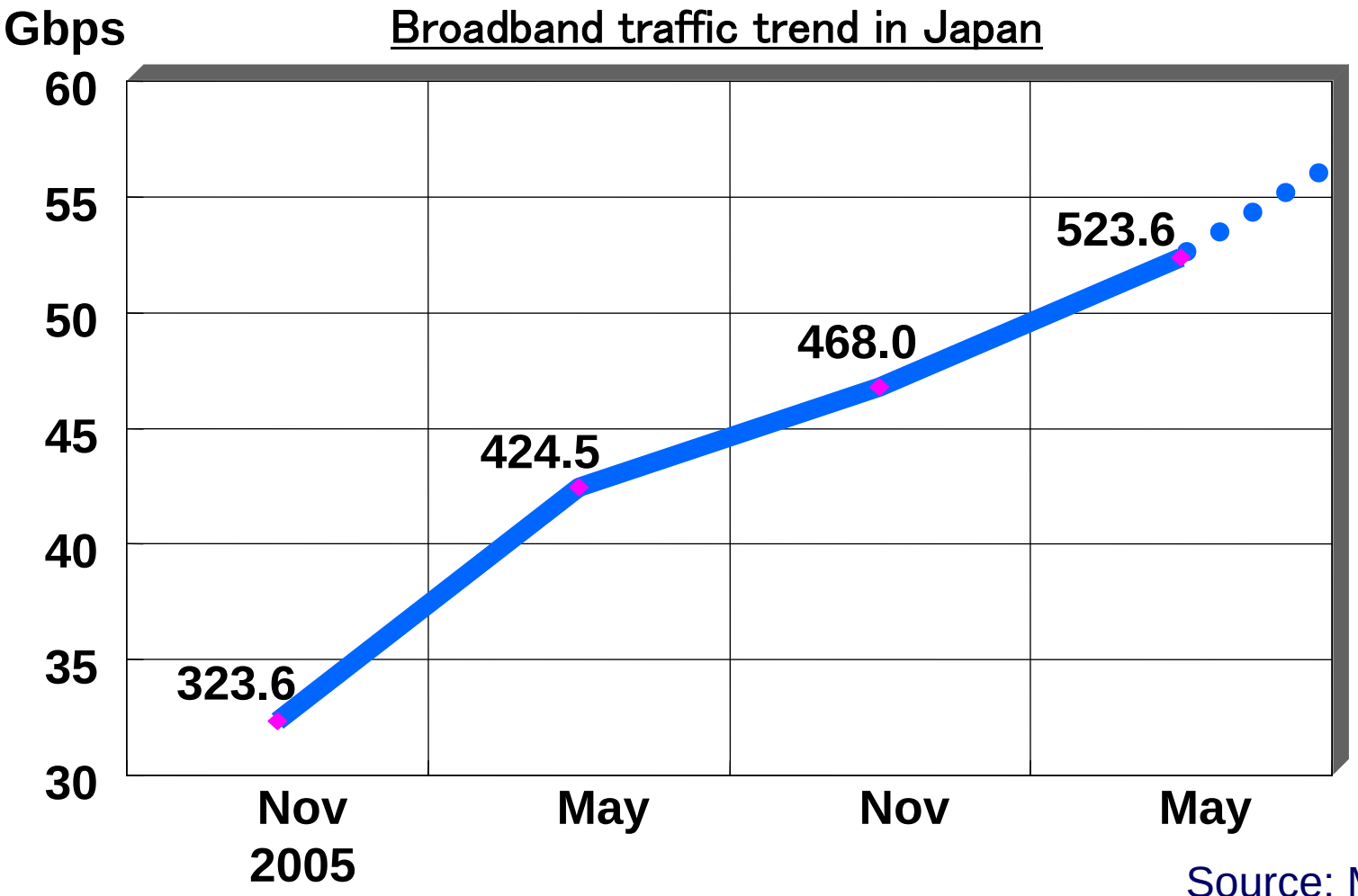


Broadband capacity is enormous!

ADSL, FTTH, Wireless
~10G Byte
/Month/Sub.

Inconvenient Truth

BB traffic is continuously increasing rapidly



Source: MIC 2007

Inconvenient Truth

New Broadband Services are blooming

Dec. 2007

1. Google
2. Yahoo!
3. Microsoft
4. MSN/Windows Live
5. AOL Media Network
6. You Tube
7. Fox Interactive Media
8. Amazon
9. eBay
10. Apple

Dec. 2005

1. Yahoo!
2. Microsoft
3. MSN
4. Google
5. AOL
6. eBay
7. Amazon
8. Real
9. Apple
10. Map Quest

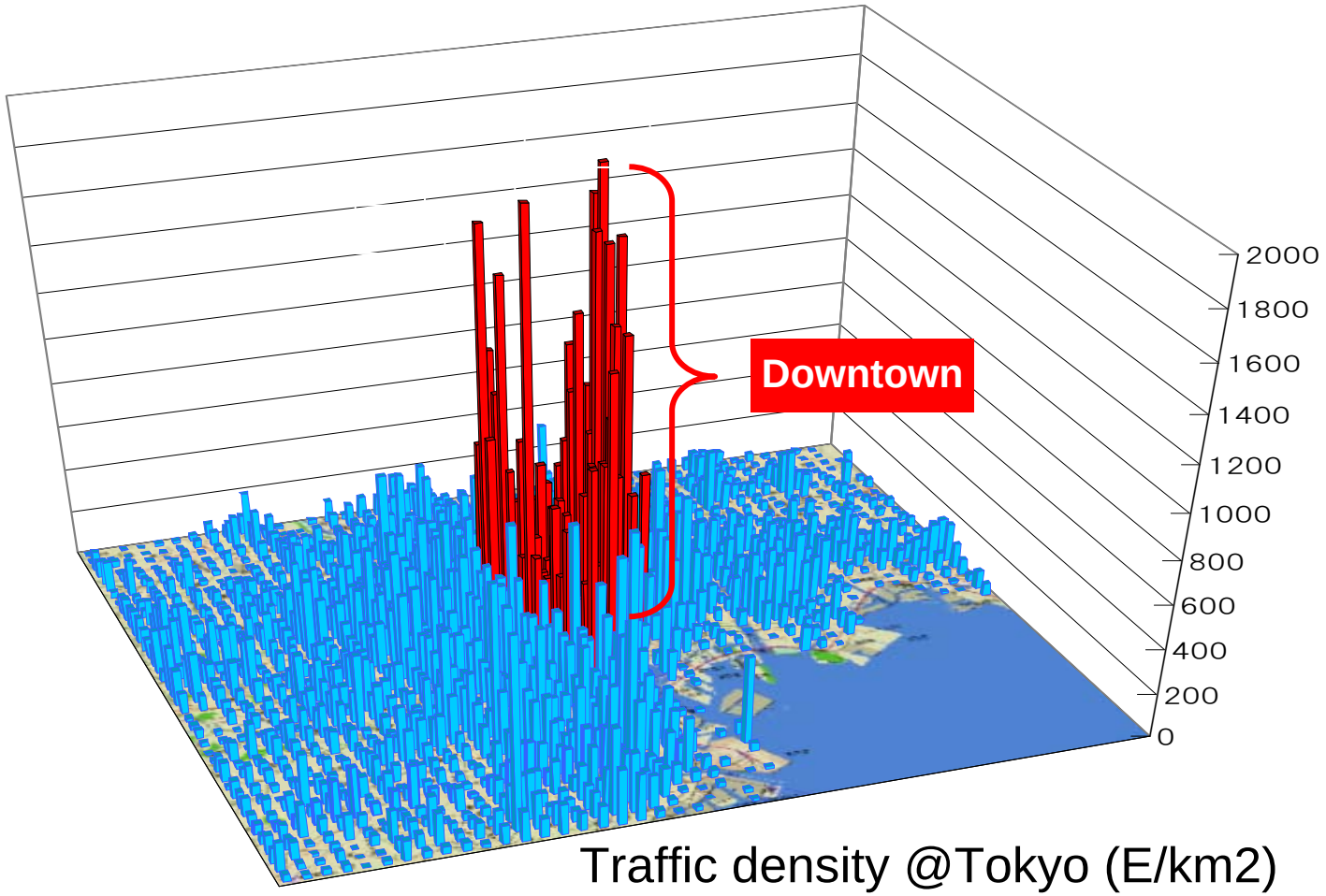
Source: Nielsen Online

Inconvenient Truth

The true BWA XGP eXtended Global Platform

Today, only downtown traffic is busy.

It would be busy anywhere under coming MBB Era.



Traffic density @Tokyo (E/km2)

Inconvenient Truth

To achieve large wireless capacity is difficult

- **Shannon theorem**

$$C = W * \log_2(1+S/N)$$

C: Throughput (Bit/sec)
W: Bandwidth (Hz)
S/N: Signal to Noise ratio

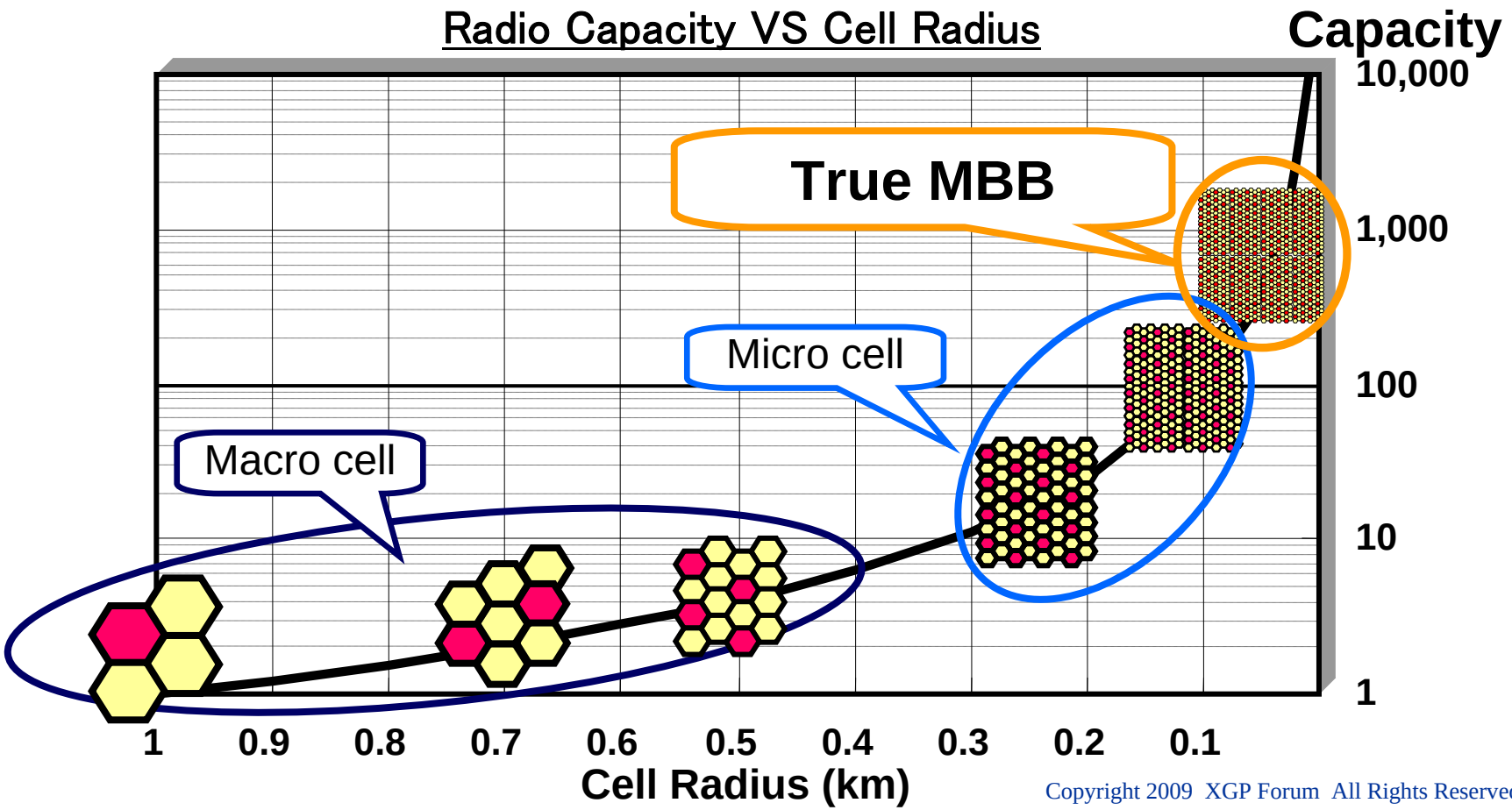
- **Total Bandwidth (W) is limited**
- **Technologies improve S/N**

Micro Cell		**100X ~**	
AMC	(Adaptive Modulation & Coding)	~5x	(HSDPA,EVDO)
AAS	**(Adaptive Antennas System)**	**4x ~**	
MIMO	**(Multi Input Multi Output)**	**1~2x ?**	

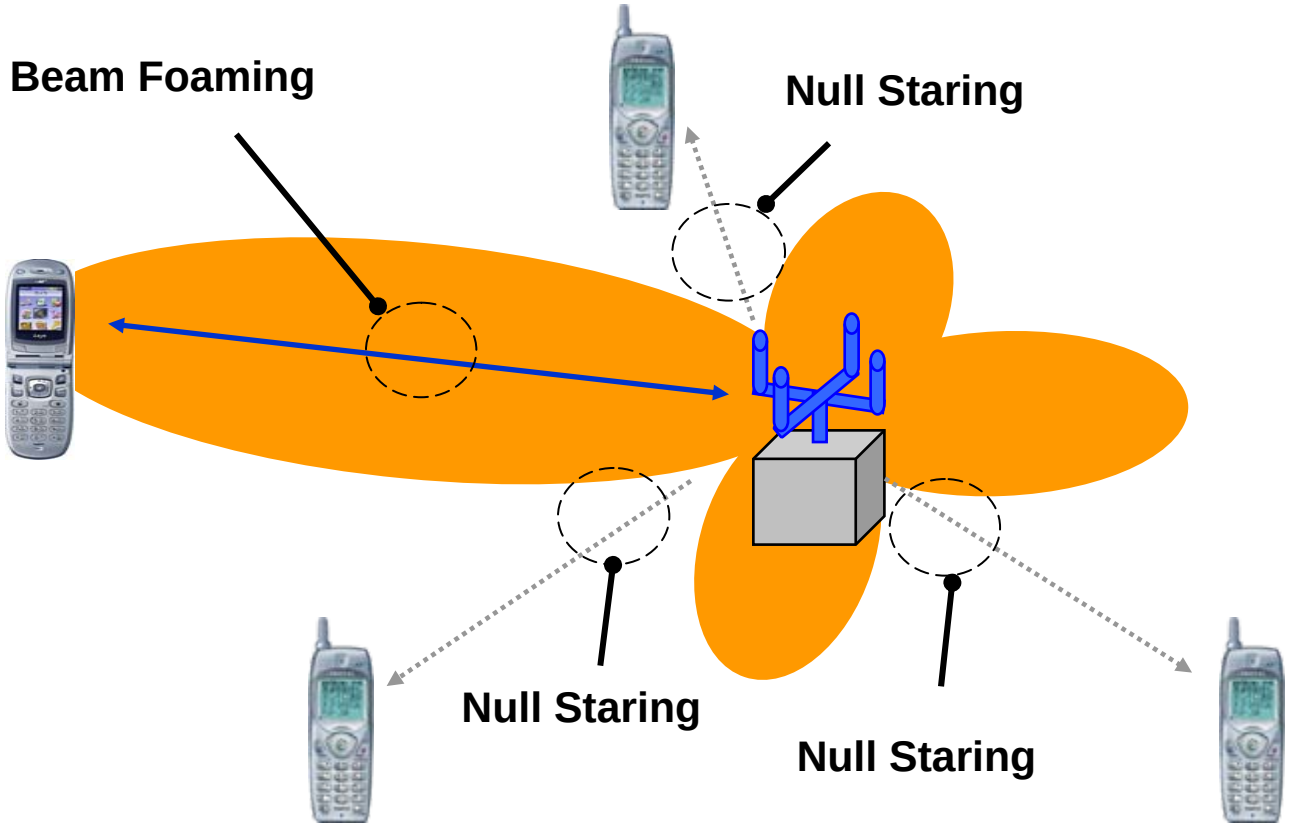
Inconvenient Truth

The true BWA XGP eXtended Global Platform

Only “Micro Cell” gives more than 100x capacity,
and is promising in solving technical issues,
and providing quick service in a partially completed network!



AAS creates better synergy with TDD than FDD



Inconvenient Truth

The true BWA XGP eXtended Global Platform

Higher Throughput requires ;
Higher Tx. Power or Micro Cell

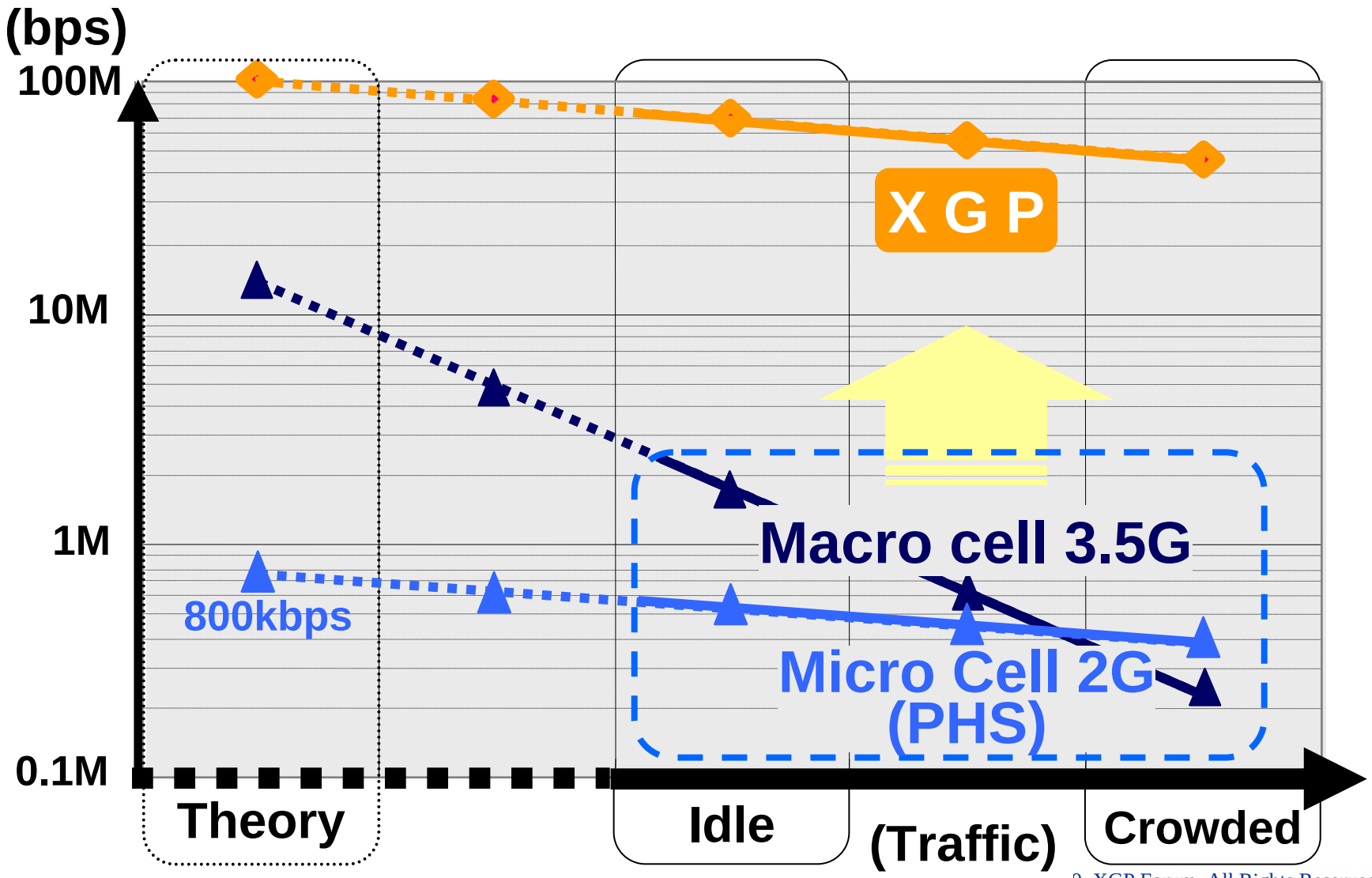
8kbps@2GHz	Tx.= 1W	&	R= 1km

1Gbps@3.5GHz	536kW	or	23m

“Micro Cell” based Mobile Broadband

The true BWA XGP eXtended Global Platform

It is True Mobile BB



- Wireless BB Issue
- XGP

XGP Specifications

The true BWA XGP eXtended Global Platform

Targets

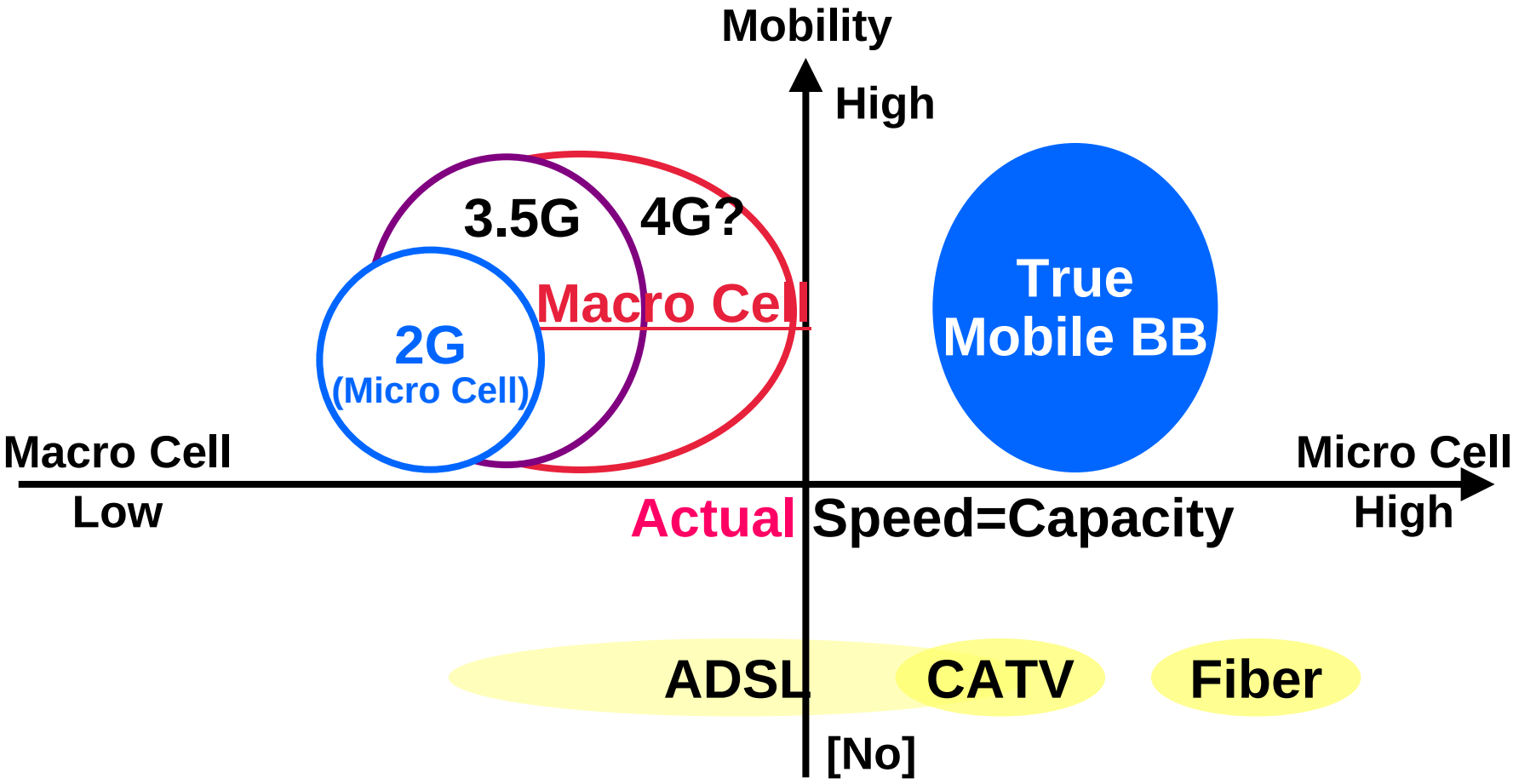
Data speed:	**100Mbps ~**
Mobility:	**300km/h ~**
Cell Radius:	**5km~**
Synergy w/PHS:	**0Hz Guard band @1.9GH Dual mode BS**

XGP Spec.

Access method	OFDMA/TDMA-TDD
Frame structure	5mS Symmetric Frame
#/ TDMA	4
#/ OFDMA	Depends upon sub-channel width
Channel bandwidth	2.5/5/10/20MHz
Sub-carrier bandwidth	37.5kHz
Modulation scheme	BPSK, QPSK, 16/32/64/256 QAM

XGP: Unique Marketing Positioning

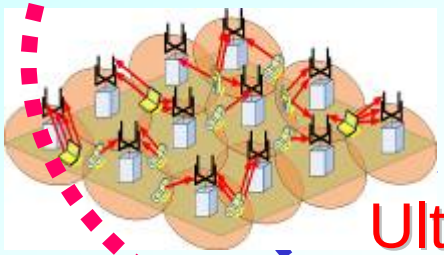
True Mobile BB provides BB Speed & Mobility!



XGP: Technical Advantages

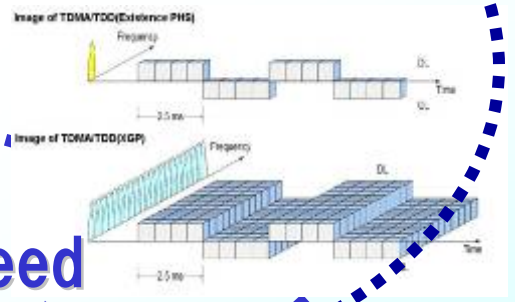
The true BWA XGP eXtended Global Platform

TDD Advantage
- ADCA
- Micro Cell



Cell Plan Free

BB Technology
- OFDMA
- High efficiency Amp.

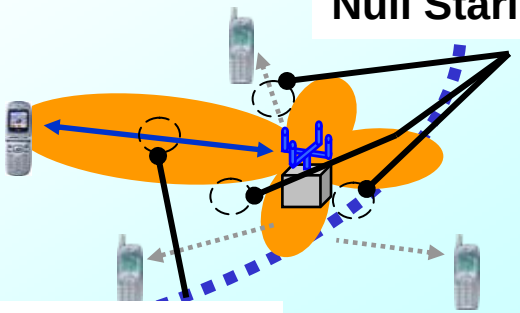


BB Speed
(100Mbps~)

Ultra High Capacity

Macro Cell

High Frequency Efficiency
- **AAS**（Adaptive Array Antenna）
- **SDMA**（Space Division Multiple Access）
- **MIMO**（Multi Input Multi Output）



Null Staring

Beam Foaming

XGP Design Concepts

The true BWA XGP eXtended Global Platform

1. Leveraged by TDD Advantages

- **AAS (Adaptive Array System)**
  - ✓ Macro Cell (+10dB~)
  - ✓ Huge Frequency Capacity (< 1 Freq. Reuse)
- **ADCA (Autonomous Dynamic Channel Assign)**
  - ✓ Ultra High Density Micro Cell
  - ✓ Cell Planning Free
- **Easy to Find Frequency Globally**

2. Low Cost

- **H/W Compatible** **(w/3.9G, 4G)**

3. ALL IP

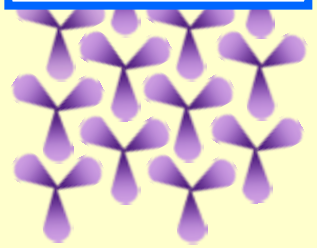
Leveraged by TDD Advantages 1/2

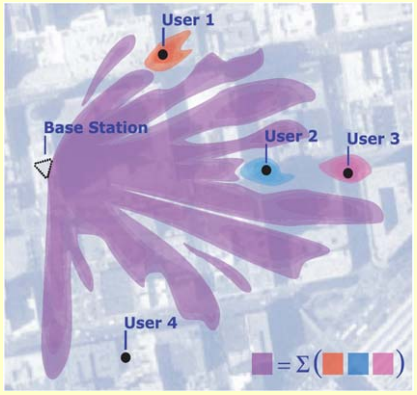
The true BWA XGP eXtended Global Platform

- **Adaptive Array System**
  - **XGP (TDD) has very good synergy with**
    - AAS & OFDM (> FDD > cdma)
  - **XGP industry has longest experience with AAS**
    - More than +10dB gain both link
    - < 1 Frequency Reuse

AAS (Since 1997~)

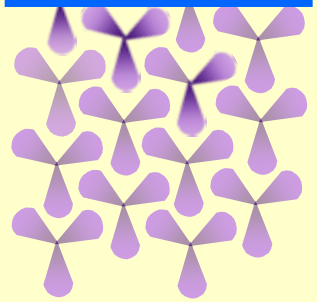
+10dB > By Beam forming

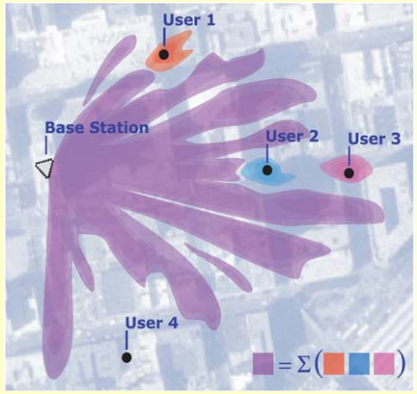




SDMA (Since 1999~)

< 1 Reuse by SDMA

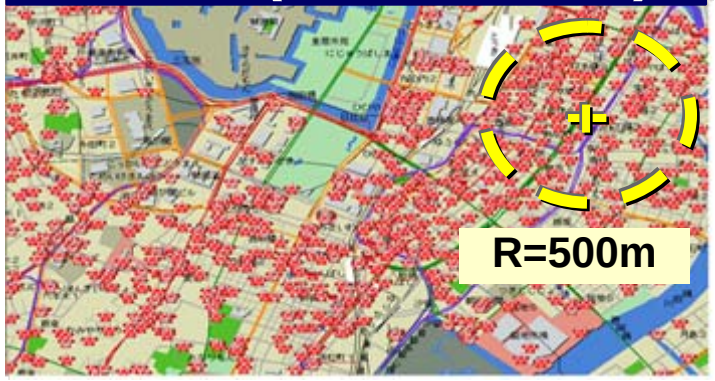




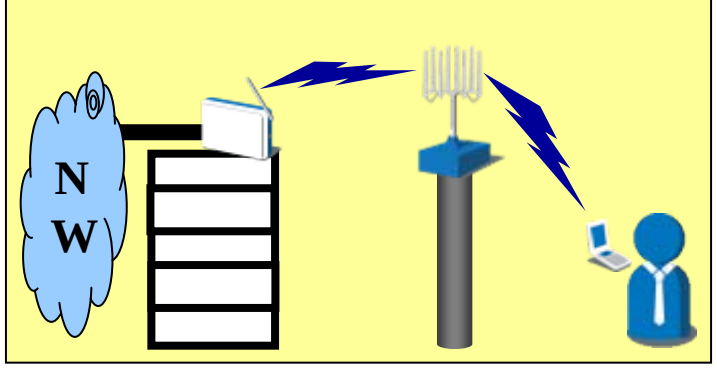
Leveraged by TDD Advantages 2/2

- **Autonomous Dynamic Channel Assign**
  - **Cell Planning Free**
  - **Ultra High Dense Cell**
- **Enable mass deployment of**
  - **Portable Repeater**
  - **Femto Cell**
  - **Wireless BS**

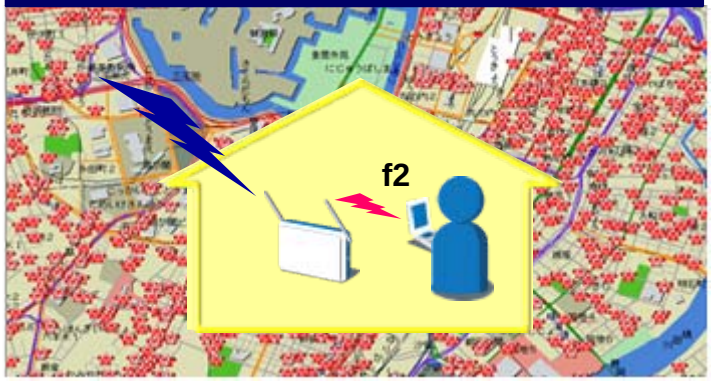
ADCA (Since1995~)



Wireless BS

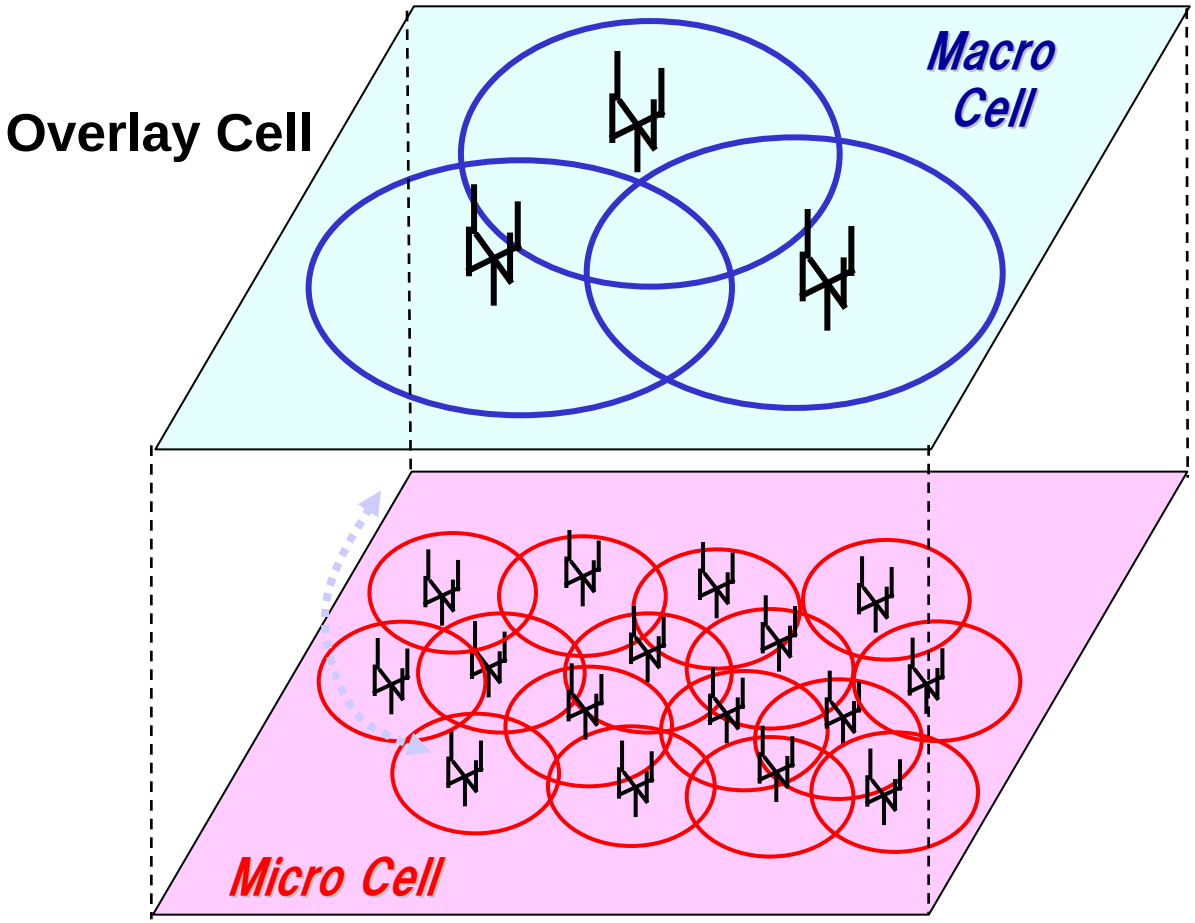


Repeater (Since1997~)



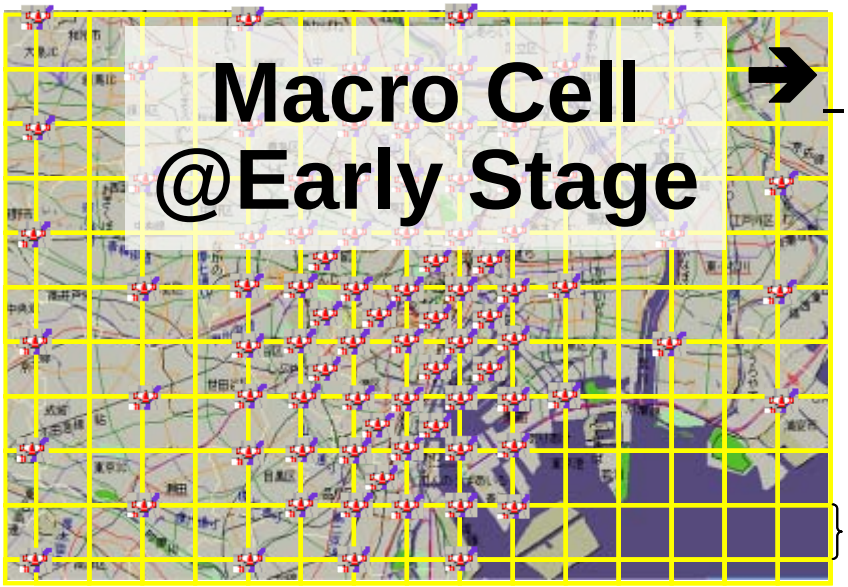
XGP: Flexible Overlay Cell

Macro Cell: Higher Mobility & Rural Area Coverage
Micro Cell: Higher Actual Speed

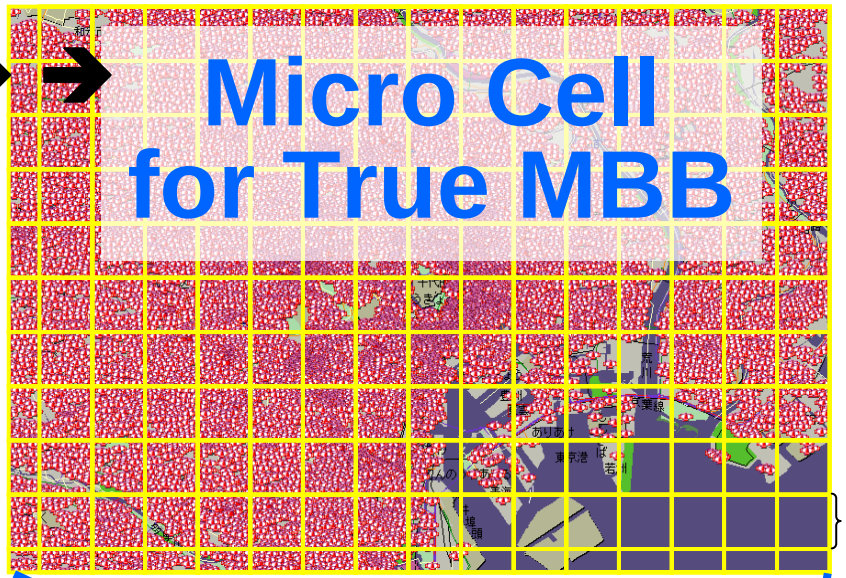


True Mobile BB Infrastructure

The true BWA XGP eXtended Global Platform

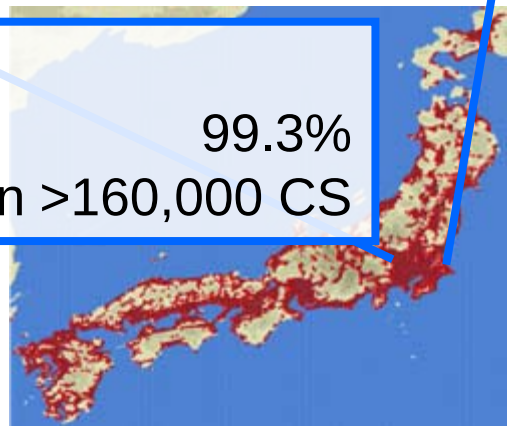


2 km

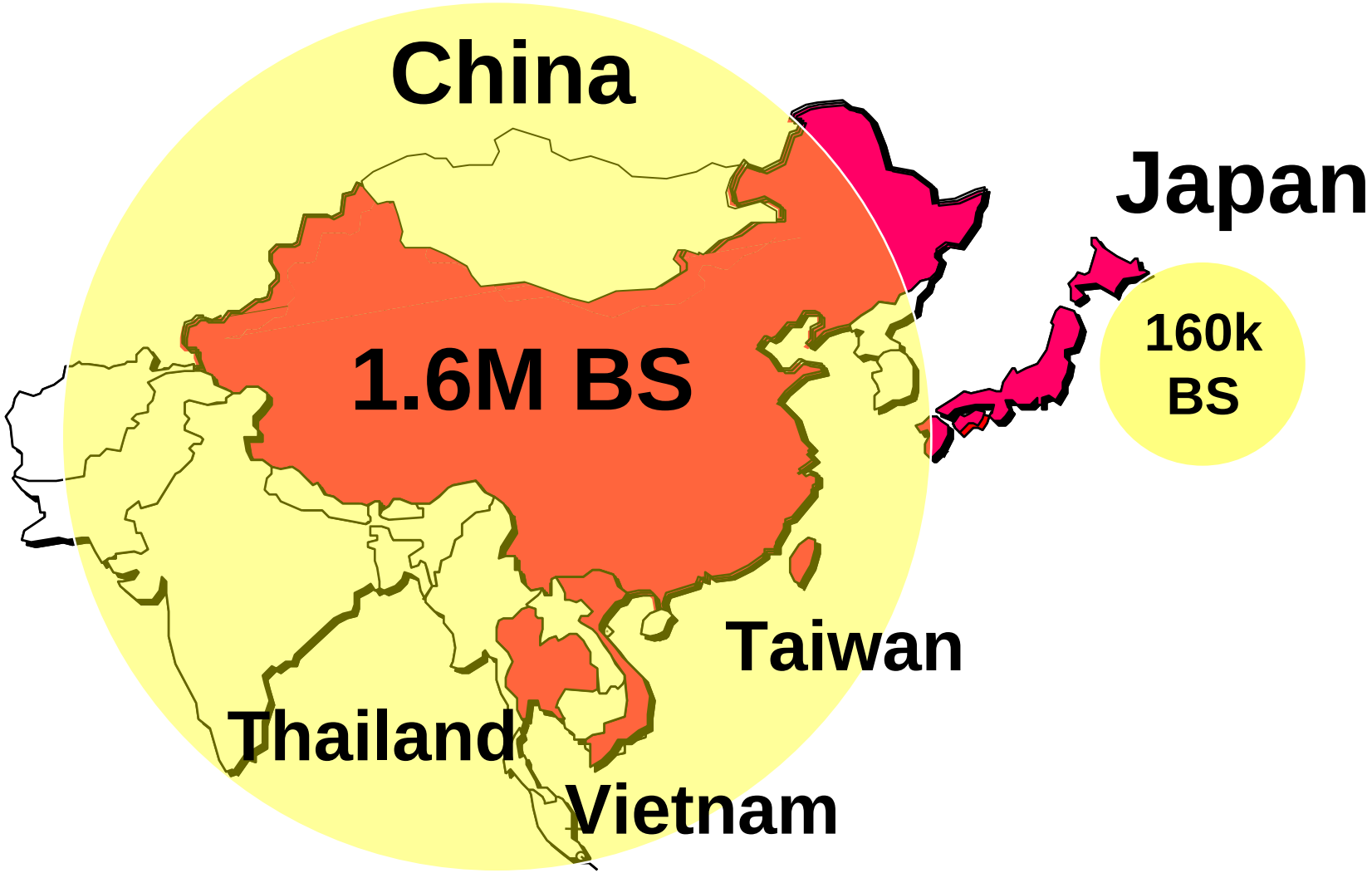


2 km

Population coverage 99.3%
#/Cell station >160,000 CS



Enormous number of PHS has already been deployed



XGP: H/W Compatible w/3.9G, 4G

The true BWA XGP eXtended Global Platform

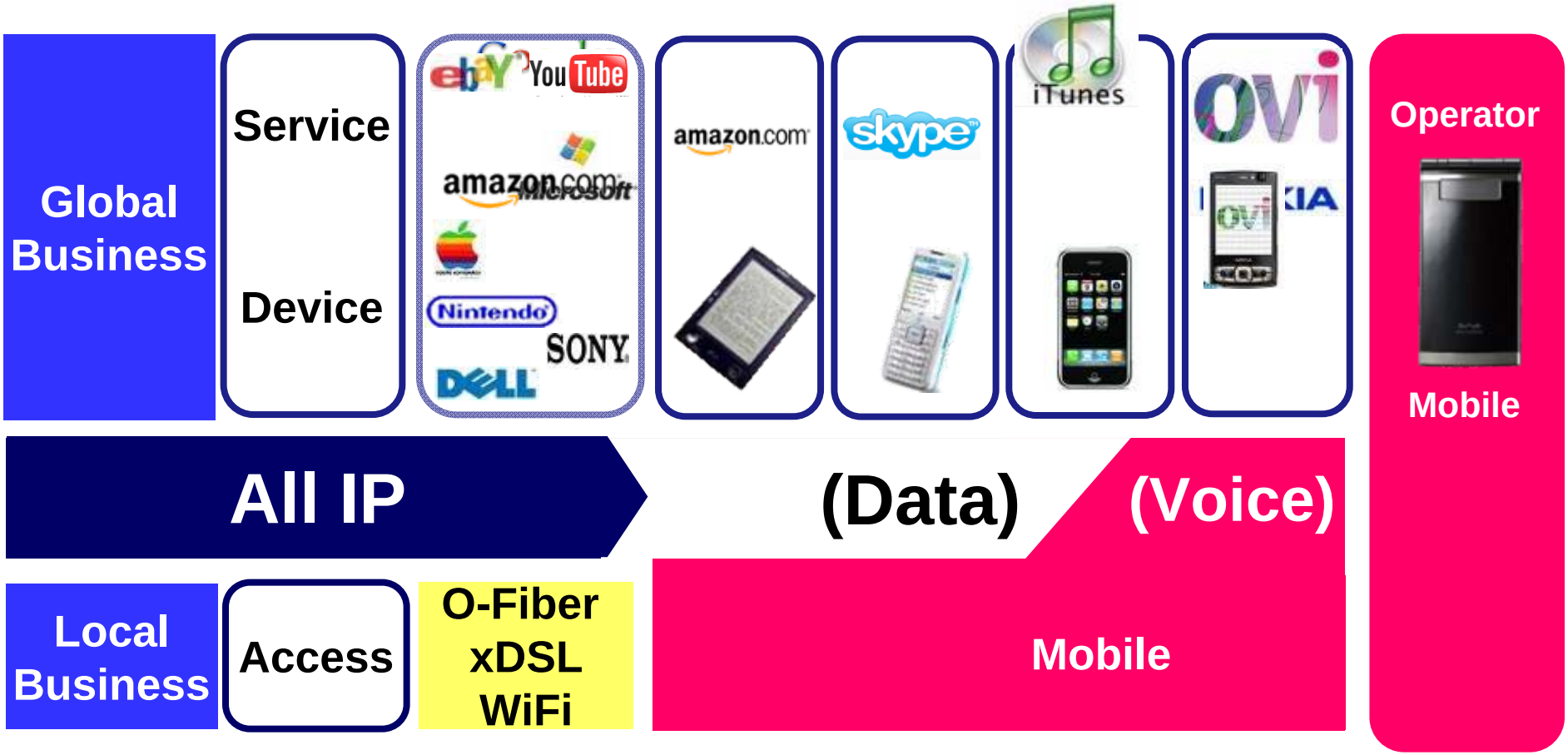
Requirements & technologies are the same after 3.5G
"OFDM" is flexible for Carrier bandwidth

Hardware would be same for all 3.9/4G components

Gen.	Access Method	Requirements	System	Carrier Bandwidth
1G	FDMA	Voice	HICAP	12.5 KHz
			AMPS	30 KHz
2G	TDMA	Voice (Main) + Data	PDC	50 KHz
			GSM	200 KHz
			PHS	300 KHz
3/3.5G	CDMA	Voice (Main) Data: 2Mbps~	Cdma 2000/EVDO	1.25 MHz
			TD-SCDMA	1.6 MHz
			WCDMA/HSDPA	5 MHz
3.9/4G	OFDMA	Broad Band/IP	WiMAX, XGP, LTE	10MHz ~

The true BWA XGP eXtended Global Platform

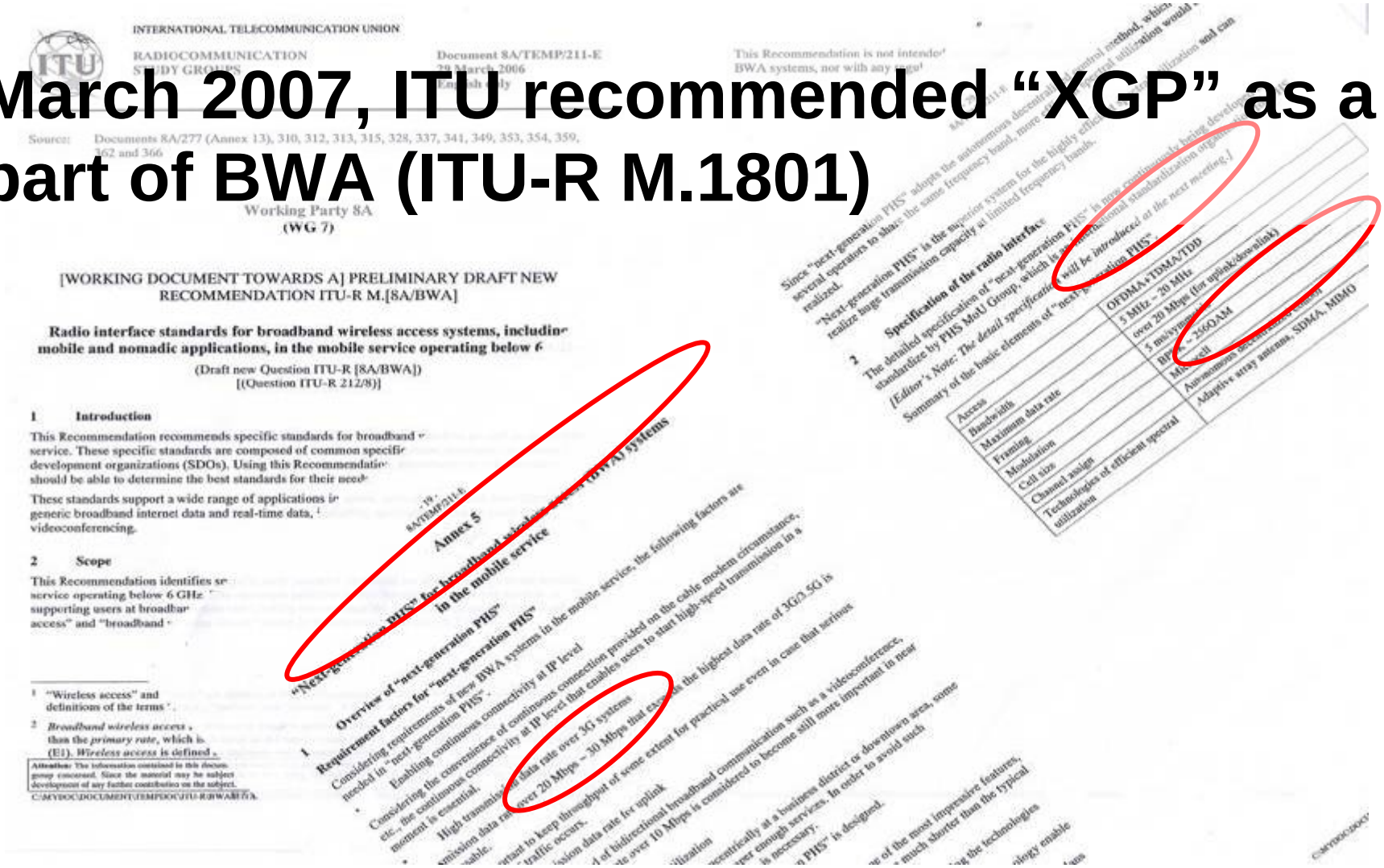
Mobile operator does not want to be a “Pipe”.
But it happened at “Fixed Telecom System” by IP



XGP as ITU-R Recommendation

The true BWA XGP eXtended Global Platform

March 2007, ITU recommended “XGP” as a part of BWA (ITU-R M.1801)



INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Document 8A/TEMP/211-E
30 March 2006

Source: Documents 8A/277 (Annex 13), 310, 312, 313, 315, 328, 337, 341, 349, 353, 354, 359, 362 and 366

Working Party 8A
(WG 7)

[WORKING DOCUMENT TOWARDS A] PRELIMINARY DRAFT NEW RECOMMENDATION ITU-R M.[8A/BWA]

Radio interface standards for broadband wireless access systems, including mobile and nomadic applications, in the mobile service operating below 6

(Draft new Question ITU-R [8A/BWA])
[(Question ITU-R 212/8)]

1 Introduction

This Recommendation recommends specific standards for broadband service. These specific standards are composed of common specifi development organizations (SDOs). Using this Recommendatio should be able to determine the best standards for their need

These standards support a wide range of applications i generic broadband internet data and real-time data, videoconferencing.

2 Scope

This Recommendation identifies st service operating below 6 GHz supporting users at broadbar access" and "broadband

Annex 5

Overview of "next-generation PHS"

Requirement factors for "next-generation PHS"

Considering requirements of new BWA systems in the mobile service, the following factors are needed in "next-generation PHS".

Enabling continuous connectivity at IP level

Considering the convenience of continuous connection provided on the cable modem circumstance, etc., the continuous connectivity at IP level that enables users to start high-speed transmission in a moment is essential.

Specification of the radio interface

The detailed specification of "next-generation PHS" is now continuously being developed standardize by PHS MoU Group, which is a provisional standardization organization.

[Editor's Note: The detail specification will be introduced at the next meeting.]

Summary of the basic elements of "next-generation PHS"

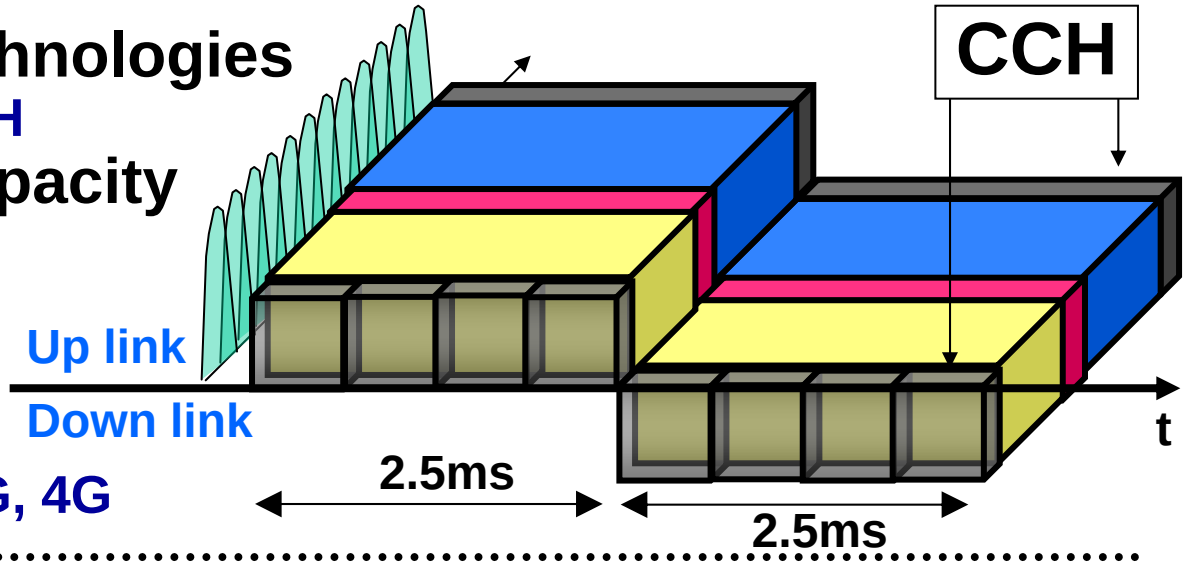
Access	OFDMA+TDMA/TDD
Bandwidth	5 MHz – 20 MHz
Maximum data rate	over 20 Mbps (for uplink/downlink)
Framing	5 ms/symbol
Modulation	BPSK – 256QAM
Cell size	Micro cell
Channel assign	Autonomous decentralized control
Technologies of efficient spectral utilization	Adaptive array antenna, SDMA, MIMO

XGP vs. WiMAX

The true BWA XGP eXtended Global Platform

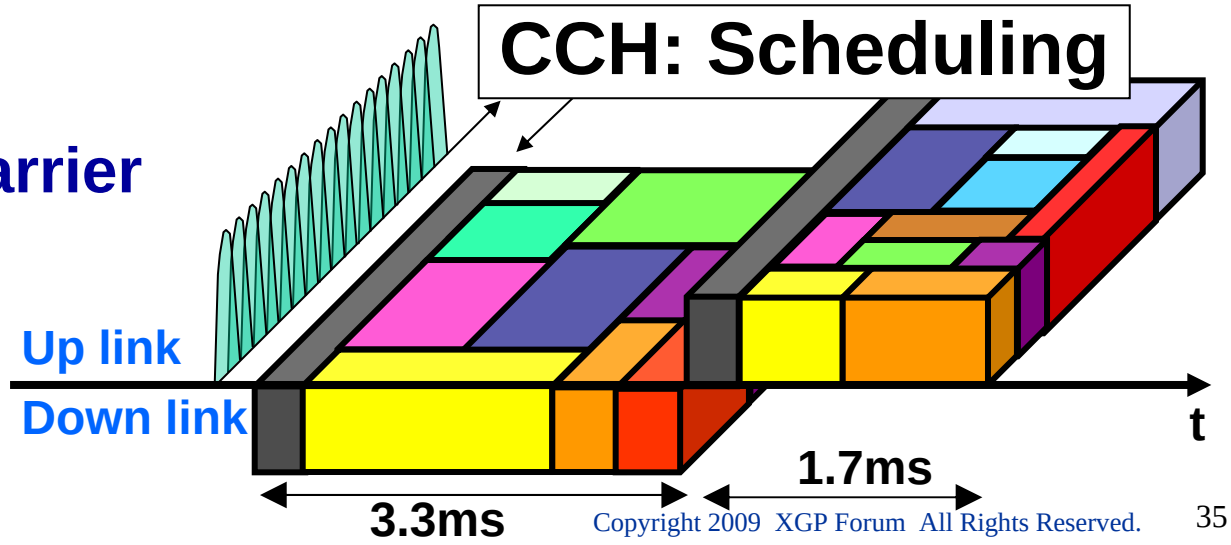
X G P

- **Matured Mobile Technologies**
  - **Dedicated CCH Sub-CH**
- **Macro cell, Huge capacity**
  - **AAS oriented MAC**
  - **Cell planning free**
  - **SC-FDMA (Option)**
- **Low Cost**
  - **H/W compatible w/3.9G, 4G**



WiMAX

- **CCH over entire Carrier**
- Flexible MAC
- Large Echo system

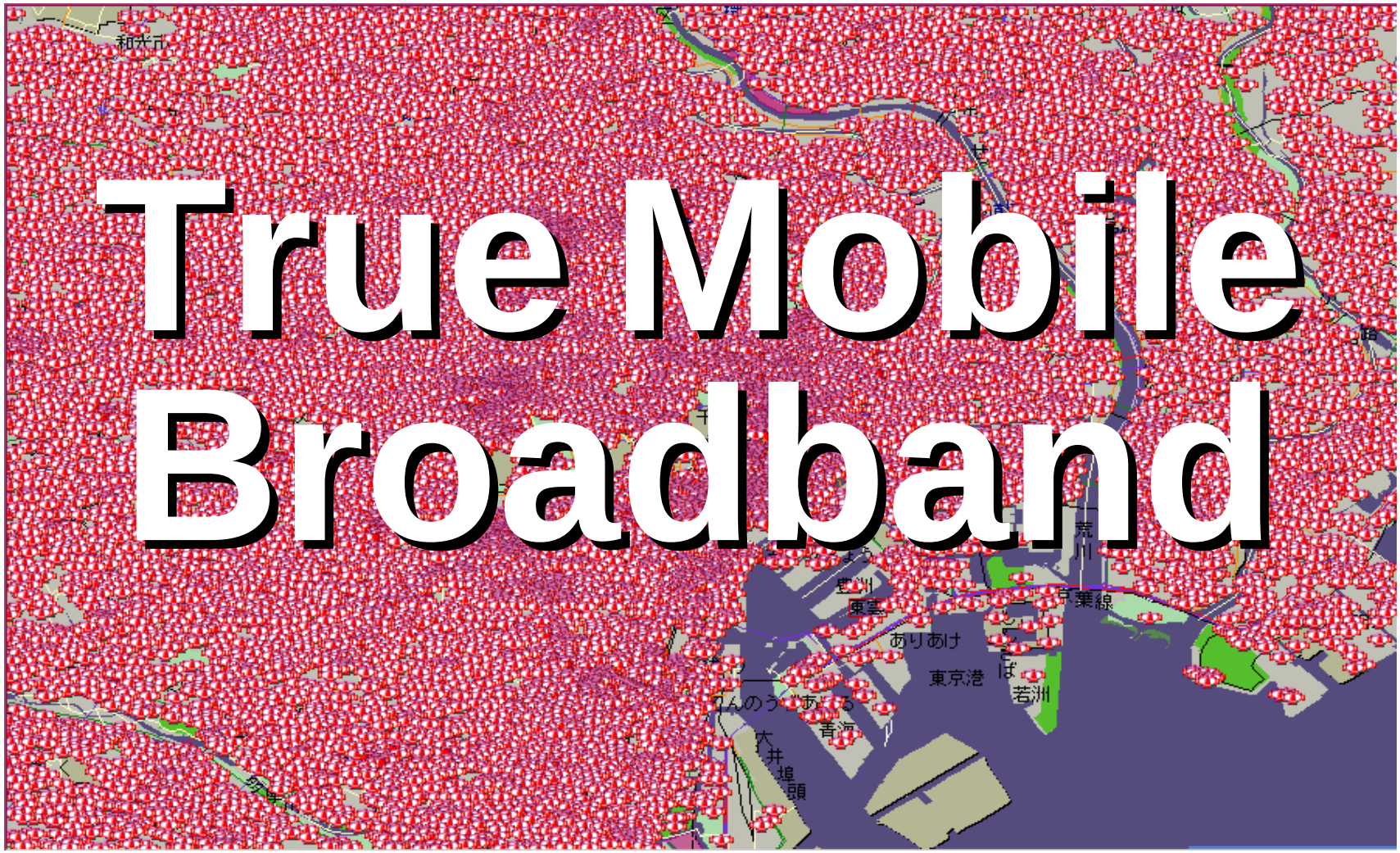


XGP is the True Mobile Broadband System

- **Faster & Stable Actual Speed**
  - Ultra High Frequency capacity
- **Faster Upload Speed**
  - Symmetric TDD Frame
- **Stable Technologies**
  - 15 < Years TDD experience; AAS, ADCA etc…
  - Synergy with 3.9G/4G system; OFDMA

XGP Provides

The true BWA XGP eXtended Global Platform



The Program of today

1. Congratulatory Speech by Mr. Yasushi Yoshida,
   Director General of the Radio Department, MIC
2. Congratulatory Speech by Dr. Sam Endy,
   Vice Chairman of XGP Forum, President of EMC
3. Congratulatory Speech by Mr. Qian Qiang
   Vice President, ZTE Corporation
4. About XGP Technology by Mr. Yoshioki Chika,
   Vice Chairman of XGP Forum, Exective Vice President of Willcom
5. **Organization and Future by Mr. Sean Sugiura**
   Secretary General of XGP Forum
6. (Addendum) The advantages of XGP by Mr. Yasunori Akatsuka
   Chairman of PWG, General Manager of Kyocera

Outline

Organization Name

Name	XGP Forum
Chair	Mr. Yuji Inoue (TTC executive director)
Address	C/O Association of Radio Industries and Businesses 11F. Nitochi Bldg. 1-4-1 Kasumigaseki, Chiyoda District, Tokyo, Japan

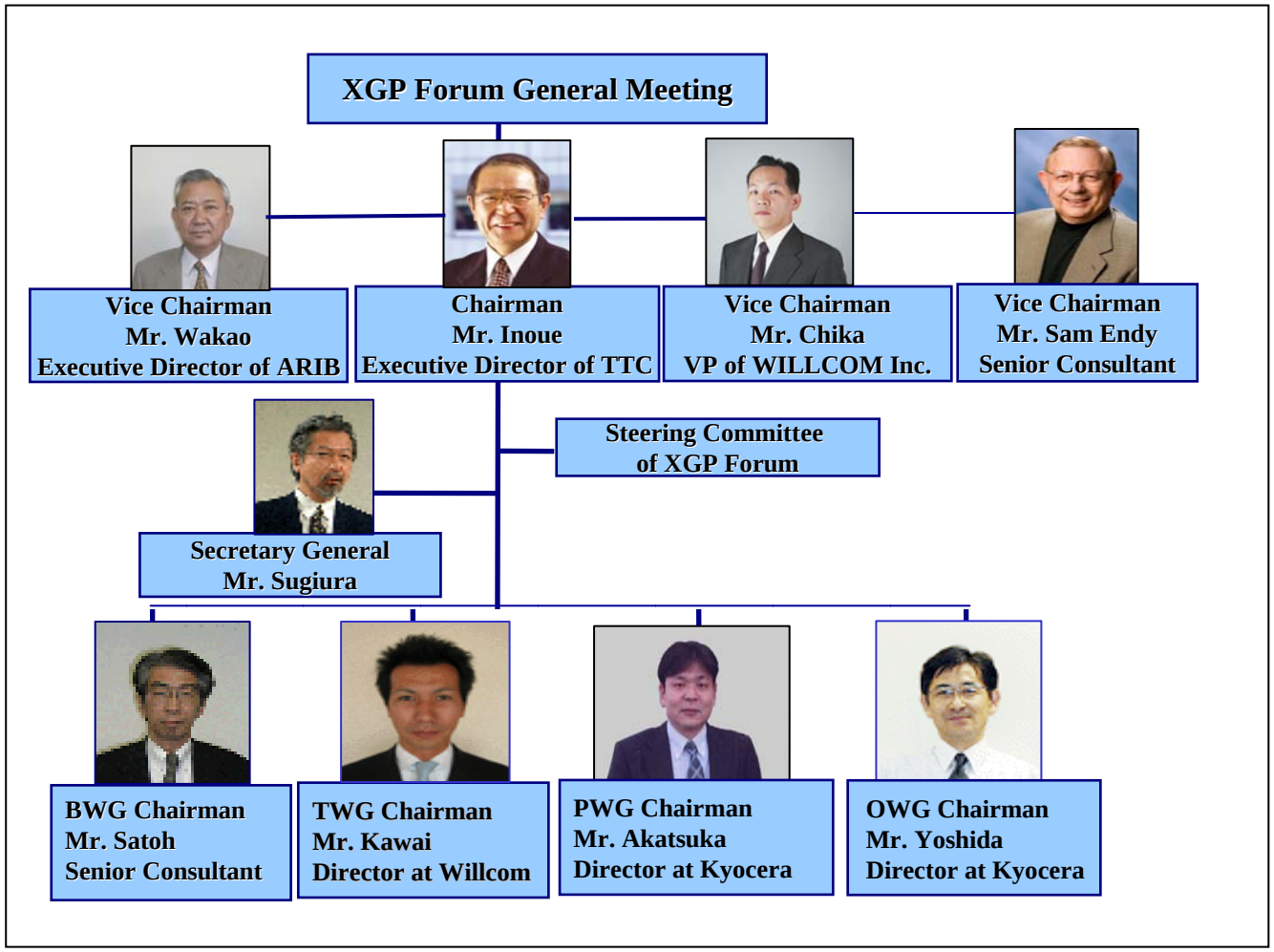
Contact Information

XGP Forum Secretariat	Sugiura, Osawa, Seki	TEL(03)5510-8599

Outline

Technical Name	XGP (eXtended Global Platform)
Purpose	Non-profitable Organization to Standardize Specification and Promote Overseas Service of XGP, a TDD-based mobile broadband telecom method. Major Activities Including Promotion and Acceleration of The Adoption of XGP System Overseas, Provision of Technical Support to Interested Overseas Operators.
Members	40 . (Telecom Operators, Vendors, System Integrators)
Web Site	http://www.xgpforum.com/

Organizational Chart



Function of WGs

- **BWG (Business Working Group)**

  This working group helps to draft policies to be discussed as important strategies of XGP Forum. It examines individual cases too, and executes individual cases with authorization after reporting the result of examination to the steering committee and general meeting. It also acts as a consultant to other working groups and the steering committee by giving proposals regarding business strategies. Therefore, its activities include business trips to relevant countries and areas to hold necessary meetings with other standardization organizations, to develop cooperative relationship with operators and vendors, and to study and incubate new models of applications. Other working groups can carry out examination to the items proposed by business working group.

- **TWG (Technical Working Group)**

  This working group is in charge of the discussion and examination of all XGP technology related cases. Its major task is to standardize necessary technologies to facilitate the development of XGP service. In addition, its activities include the solution of XGP-related technical themes, standardization of technology related with new services, technical exchange with other standardization organizations, and technical instruction to XGP and potential XGP operator. Sub working groups are established under the working group to deal with individual cases. XGP members can apply to join the working group and its sub working groups in a condition to be able to participate in real standard drafting operation. The contents discussed within this working group are not for public access.

- **PWG (Promotion Working Group)**

  This working group is responsible for familiarize the world with the name of XGP technology and its relevant service. By updating website, releasing newsletter, attending exposition and symposium, publishing guidebook and introducing its applications, the working group is aiming to spread XGP technology and service worldwide.

- **OWG (Optimization Working Group)**

  This working group studies and proposes the optimization method in using a telecom network by carrying out diagnose to the existing system. The execution of optimization is carried out with the cooperation of local operators and vendors. By carrying out optimizing engineering project, the quality of the network improves drastically, and the knowhow is shared from individual operator is shared to other operators, which leads to the overall improvement of connected service that XGP vendors and operators can jointly provides.

Signatory Members

Signatory Members

	Company Name	Country/Area
1	ABIT Corporation	Japan
2	ACCESS Co., Ltd.	Japan
3	Alcatel-Lucent China	China
4	Altair Semiconductor Ltd	Israel
5	Altel Inc.	Japan
6	Anritsu Corporation	Japan
7	ArrayComm, LLC.	USA
8	Asia Wireless	Thailand
9	BDA China Limited	China
10	Couei Corporation	Japan
11	Daiwa Institute of Research	Japan
12	First International Telecom	Taiwan
13	Freescale Semiconductor	USA
14	Group Sense Ltd.	China (HK)
15	Hitachi Kokusai Electric Inc.	Japan
*16	Hitachi, Ltd.	Japan
17	HP Japan	Japan
18	Inventec Appliances	China
*19	JAPAN RADIO Co., Ltd.	Japan
20	KAGA Electronic Co., LTD	Japan

	Company Name	Country/Area
*21	KYOCERA Corporation	Japan
*22	Mitsubishi Electric	Japan
23	MobilMax Technology Inc.	Taiwan
*24	NEC Corporation	Japan
25	NEC Infrontia Corporation	Japan
*26	Netindex Inc.	Japan
27	Nokia	Finland
28	Oki Semiconductor Co., Ltd.	Japan
29	Seiko Instruments Inc.	Japan
30	Shenzhen Rockie	China
*31	Toshiba corporation	Japan
32	Toshiba digital media	Japan
*33	UTStarcom, Inc.	USA
34	Wavesat	Canada
35	Xillinx	USA
*36	WILLCOM, Inc.	Japan
37	Wistron NeWeb Corporation	Taiwan
38	ZTE Corporation	China
39	Starent networks corp	USA

XGP Members & Partners

日本無線株式会社

Empowered by Innovation

Innovation Intelligence™

Standardization of XGP

XGP is acknowledged and recommended by the following organizations as a standardized specification of TDD mobile broadband telecom service.

Organization	Code Number
ITU－R	M. 1801
ARIB	STD－95
PHS MoU Group	A-GN4.00-01-TS

Regarding Overseas Promotion

Basic Concept

★Collaboration with operators & vendors using TDD band.

- Introducing our know-how of TDD Mobile Broadband Service
- Concluding Agreement with Operators, Subcarriers and Government Organs
- Co-development under cooperative agreement
- Filed Trial/Commercial Trial
- Business Application
- Introduction to Other Countries and Areas.

Development of Framework in Asia

Japan

Field test in spring and commercial service in autumn of 2009; Overseas introduction afterwards.

China

Introduction of XGP development; Field test based on different application; Constructing combined R&D mechanism regarding TDD mobile broadband.

Thailand

AWC and WILLCOM agreed to carry out technical cooperation regarding XGP; Field trial on 1.9GHz under discussion.

Develop of Framework in detail

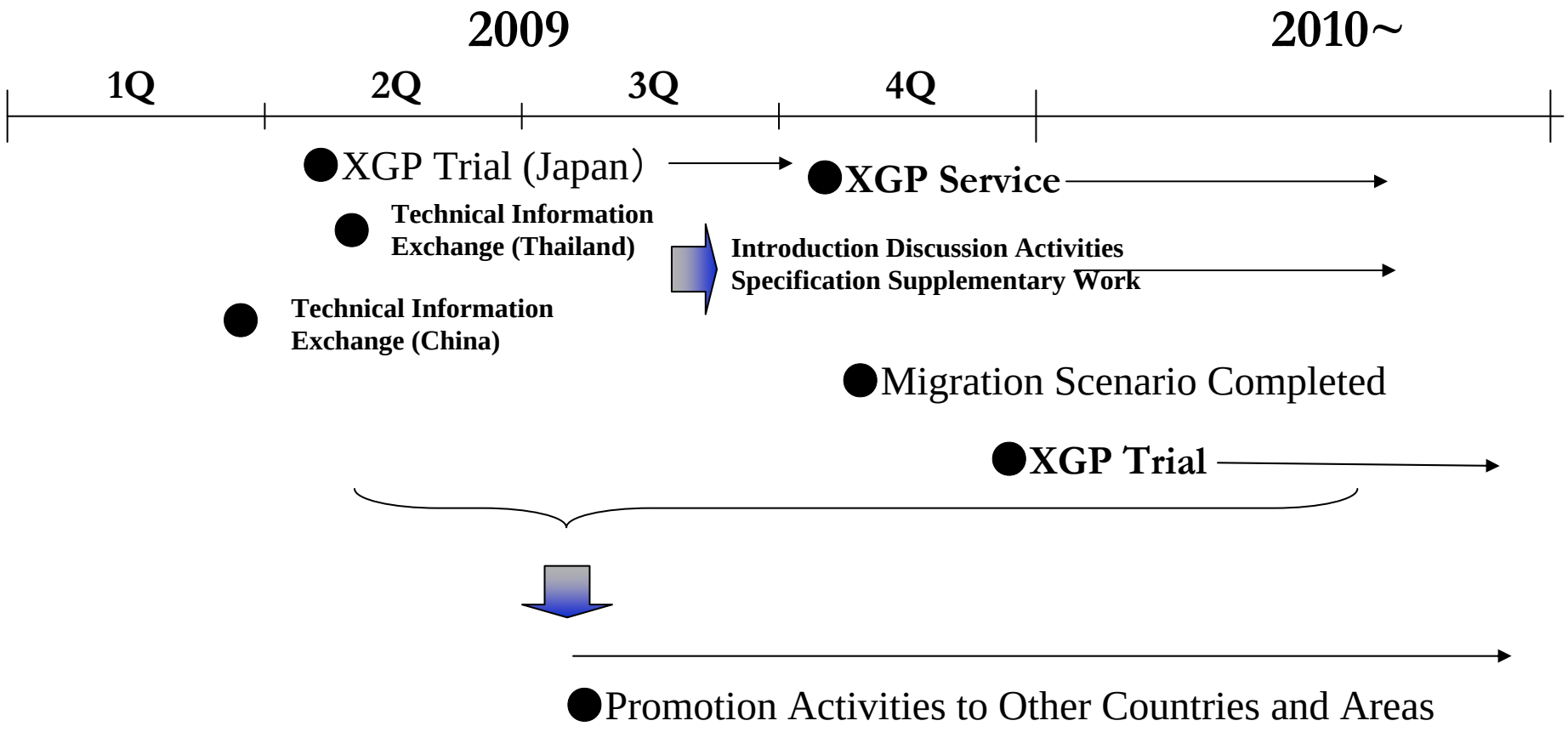
- Providing detailed network migration scenario to existing PHS operators. By making best use of existing resource（CS、NW）, investment risk to XGP is minimized.
  - In case of existing voice service, via data service, to concrete business plan of TDD mobile broadband service.
  - Investigation and information exchange activities for the preparation of scenario.

- Execution of trial operation in Thailand and China.
  - Tie up with local operators.
  - Trial operation of advanced PHS (up to 800kbps with packet method) and XGP.
  - Supportive activities regarding the obtain of radio resource for trial operation.

- Technical discussion and specification supplementary work in order to adopt XGP out of Japan.
  - Investigation of essential technical requirement (Thailand, China). Reflect the requirement in specification and technical documents.
  - Expansion of value-added service and network model regulation.

- Government lobbying activities to gain official support.

XGP Development Plan



Addendum

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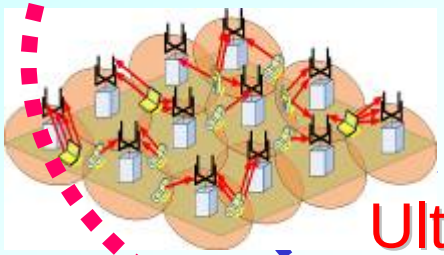
   Chairman of PWG, General Manager of Kyocera

XGP: Technical Advantages

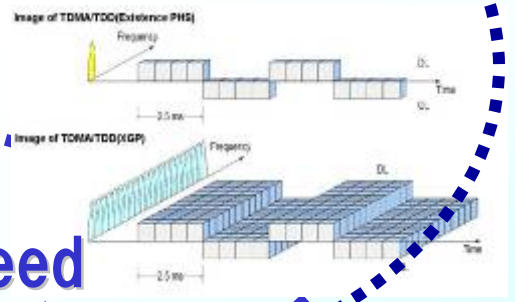
The true BWA XGP eXtended Global Platform

TDD Advantage
- ADCA
- Micro Cell



Cell Plan Free

BB Technology
- OFDMA
- High efficiency Amp.

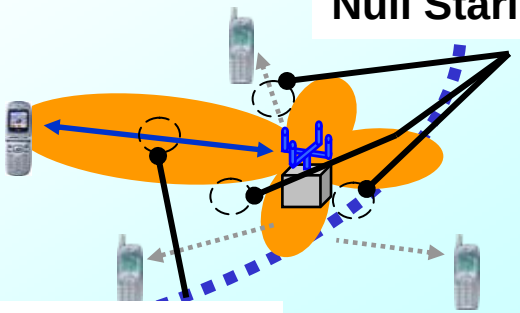


BB Speed
(100Mbps~)

Ultra High Capacity

Macro Cell

High Frequency Efficiency
- AAS（Adaptive Array Antenna）
- SDMA（Space Division Multiple Access）
- MIMO（Multi Input Multi Output）



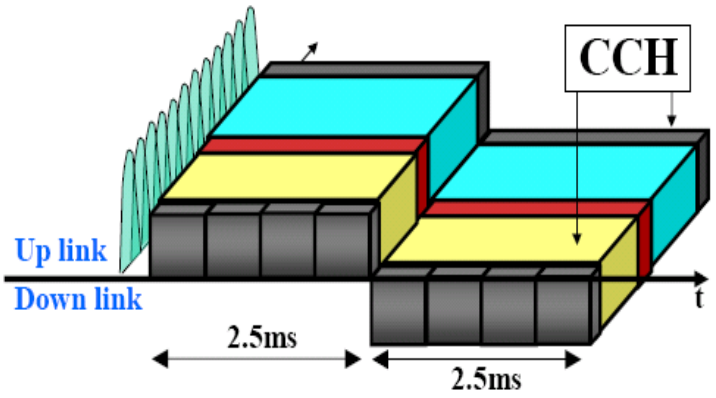
Major Specification

■Target Spec.

Data speed:	100Mbps ~
Mobility:	300km/h ~
Cell Radius:	5km~
Synergy w/PHS:	0Hz Guard band @1.9GH Dual mode BS

※major system elements

Access method	OFDMA/TDMA-TDD
Frame structure	5mS Symmetric Frame
#/ TDMA	4
#/ OFDMA	Depends upon sub-channel width
Channel bandwidth	1.25/2.5/5/10/20MHz
Sub-carrier bandwidth	37.5kHz
Modulation scheme	BPSK, QPSK, 16/32/64/256 QAM

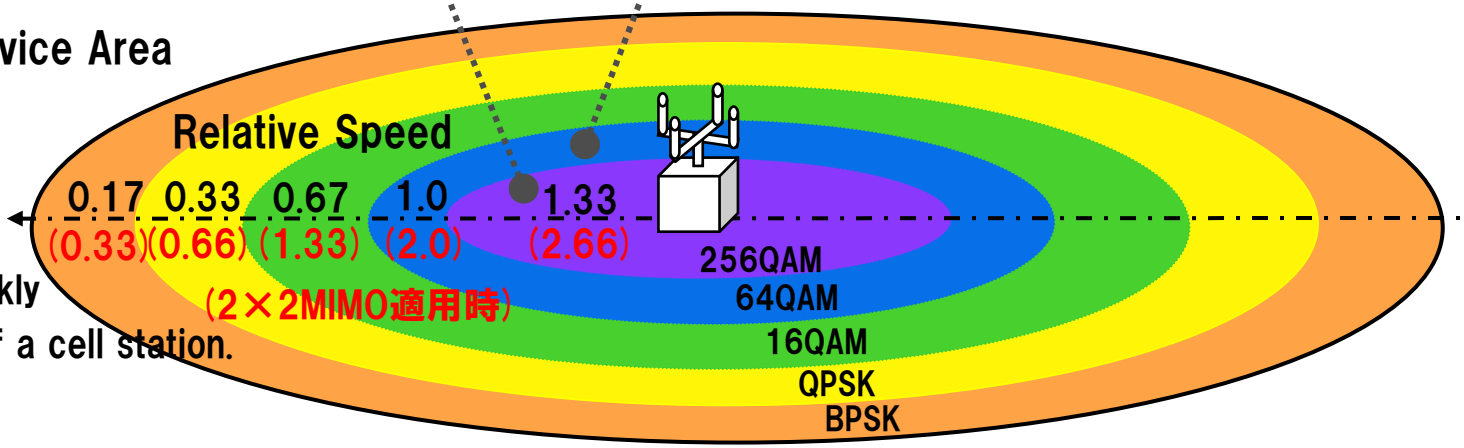


Comparison on Data transmission speed with WiMAX, LTE, and XGP

The true BWA XGP eXtended Global Platform

◇Transmission Speed（Bandwidth 10MHz）（Red（ ） 2×2MIMO in use）

	Data Speed：256QAM	Data Speed：64QAM	Image of Service Area
XGP (256QAM～BPSK)	DL：22.8Mbps (45.6Mbps) UL：20.8Mbps	DL：16.3Mbps (35.6Mbps) UL：14.9Mbps	
WiMAX (64QAM～QPSK)	asymmetric	DL：17.2Mbps (34.4Mbps) UL：10.0Mbps	
LTE (64QAM～BPSK)	asymmetric	DL：23.8Mbps (47.7Mbps) UL：16.8Mbps	



What's the difference between WiMAX, LTE and XGP?

The true BWA XGP eXtended Global Platform

Data transmission speed:

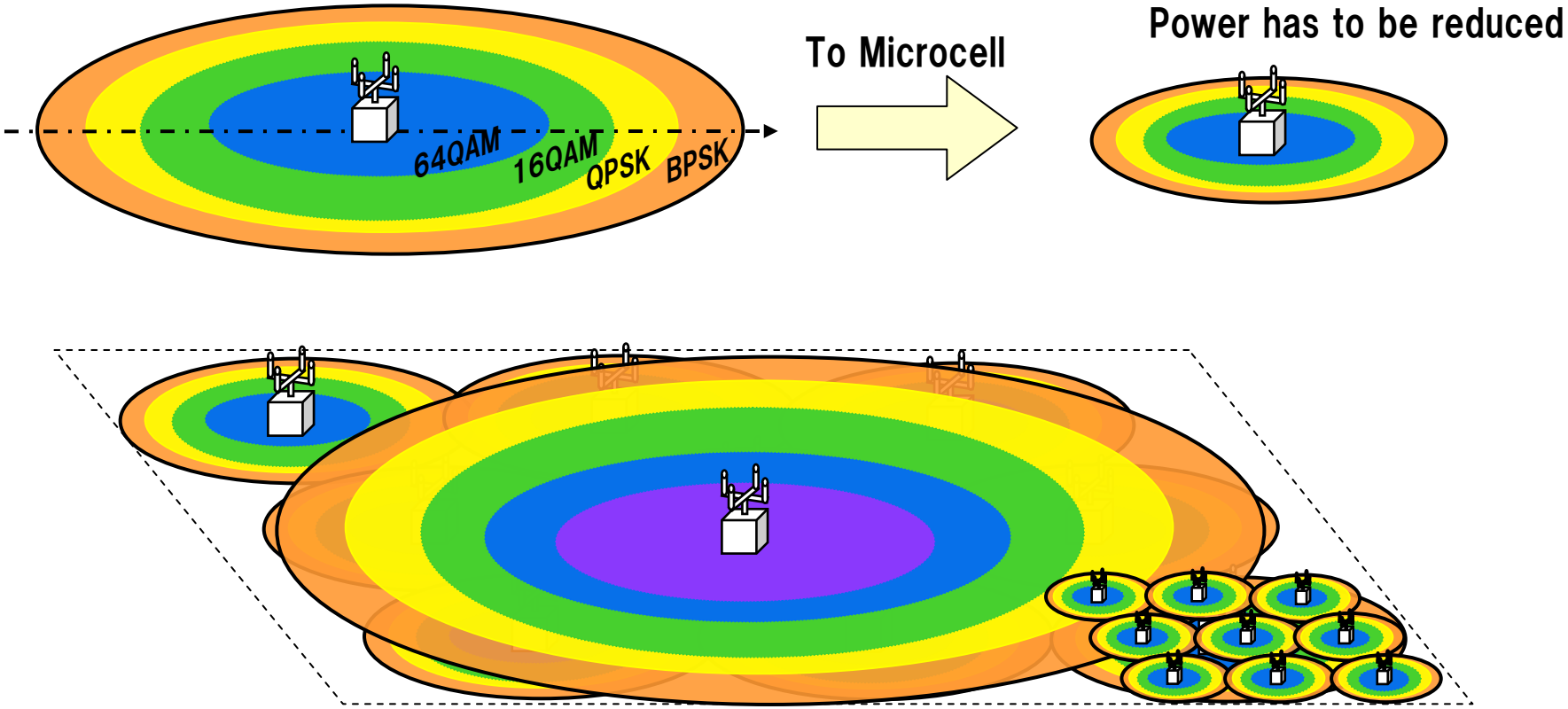
No obvious difference exists. (difference may exist with apportion to DL/UL.）

All systems suffer drop of speed when number of users or distance to a cell station grows.

⇒ The effective speed from several to several tens of Mbps per use, which BWA is striving for, is difficult to be realized technical-wise.

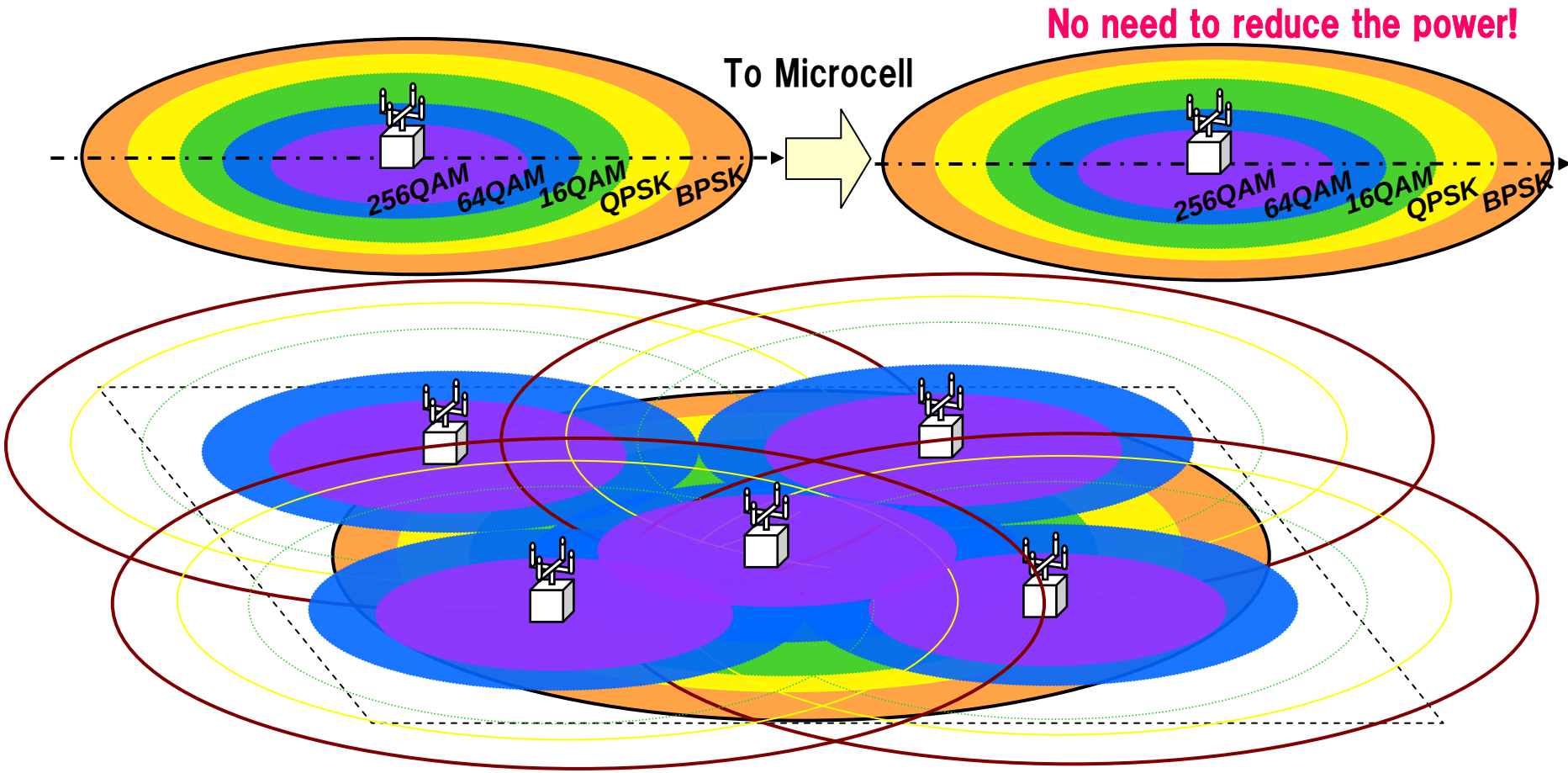
⇒ Microcell system must be adopted to improve the integrated capacity of a BWA system.

BWA without Autonomous Distributed Control - Interference Avoidance Function



By increasing the number of cells, drop of effective speed can be controlled.
But places with low data speed remain.（coverage is unchanged.）
Cells must be continuously added to realize better control of power reduction.

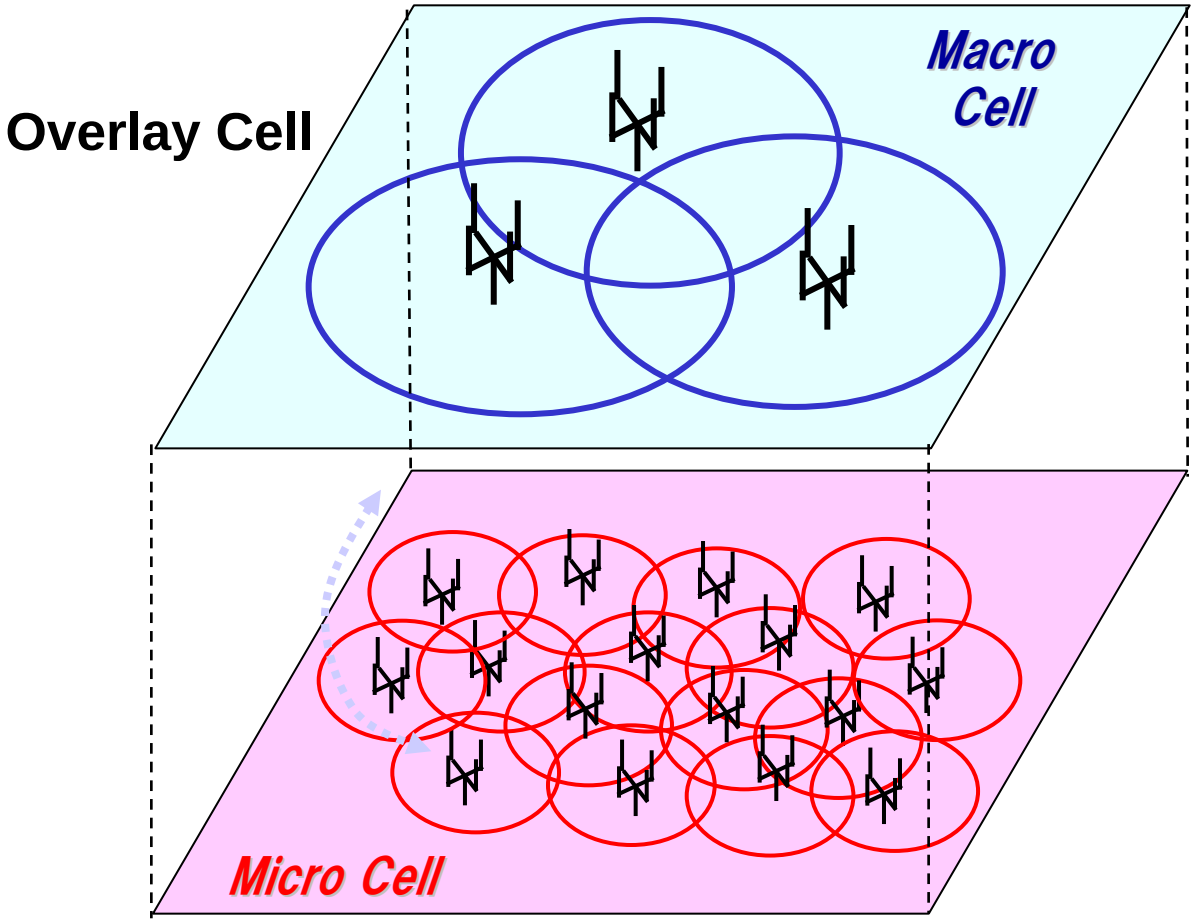
XGP with Autonomous Distributed Control-Interference Avoidance Function



Data speed guaranteed with repeated coverage, and effective speed can be improved with high efficiency.（Both targets of high effective speed and low infra cost are met.）

XGP: Flexible Overlay Cell

Macro Cell: Higher Mobility & Rural Area Coverage
Micro Cell: Higher Actual Speed



Conclusion

- **High Effective Speed with Stable Communication Possible**
  With big channel capacity and good efficiency in frequency usage, drop of data speed is hard to happen when amount of users increase in a certain environment.

- **Big Capacity Data Transmission Possible.**
  High-speed transmission of big capacity date can not only be provided during downlink, but also for uplink.

- **Reliable Technology**
  XGP is designed based on 15 years' experience in research and development of PHS and knowhow of TDD technology such as smart antenna.