Radio Policy Vision
&
Strategy for Frequency Liberalization

December 2003

Radio Department, Telecommunications Bureau
Ministry of Public Management, Home Affairs,
Posts and Telecommunications

Process of Spectrum Reform

Information and Communication Council

- Aug. '02 Consultation of Radio Policy
- Jun. '03 Public Comment to Report
- Jul. '03 Report

Study Group on Effective Spectrum Policy

- Jan. '02 Start
- Dec. '02 1st Report
  【Introduction of Compensation Scheme】
- Sep. '03 2nd Report
  【Introduction of Registration】
- Dec. '03(plan) 3rd Report
  【Assignment of Spectrum Reallocation】

Overview of the report of Radio Policy Vision

Basic roles of radio spectrum use

- Realization of comfort and high quality of life
- Revitalization of industrial/economic activities
- Formation of a safe and disaster-tolerant society/country
- Invigoration of local economy

Mid- and long-term outlook of radio spectrum use

- Expectations for realization of a wireless broadband environment

  It is expected that various radio spectrum uses have been drastically expanding in such areas as the home, business, medicine/welfare, security of Japanese nationals, so that the radio spectrum uses contribute to realization of convenient/ safe/secure daily lives and society.

- Expansion of radio-related market sizes

Mid- and long-term outlook of radio policy

Mid- to long-term goals (in 5 to 10 years)

- Contribution to realization of a ubiquitous network society through construction of the world's most advanced wireless broadband environment
- Ensuring national security through use of diversified networks
- Fostering internationally competitive wireless ICT industry

Desirable radio policy

I. Drastic review of radio spectrum allocation

II. Policies for radio spectrum reallocation and radio spectrum use

III. Reform of Spectrum User Fee

IV. Promotion of R&D

V. Facilitating smooth prevalence of radio equipment

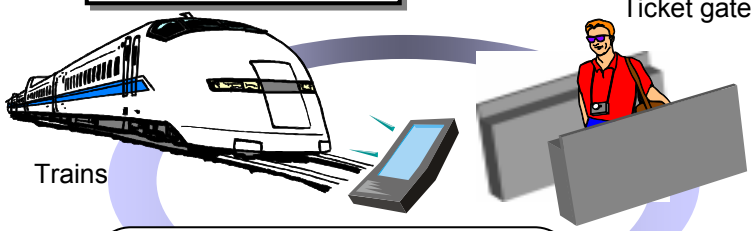
VI. Enhancing international strategy

VII. Building a safer and securer environment for radio spectrum use

Realization of a ubiquitous network society through construction of wireless broadband environment

Examples of Wireless Broadband Environment

Public facilities



Boarding procedures by wireless terminals
- Notification of reserved seats
- Message delivery, such as e-mail
- Obtaining vacancy and destination information easily

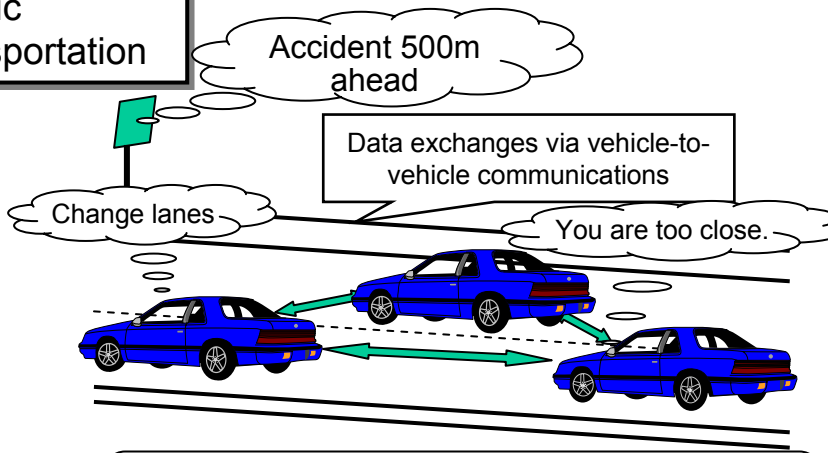
Education

You can check information on anything you cannot understand right here.

Comprehensive learning utilizing cameras, GPS, etc.

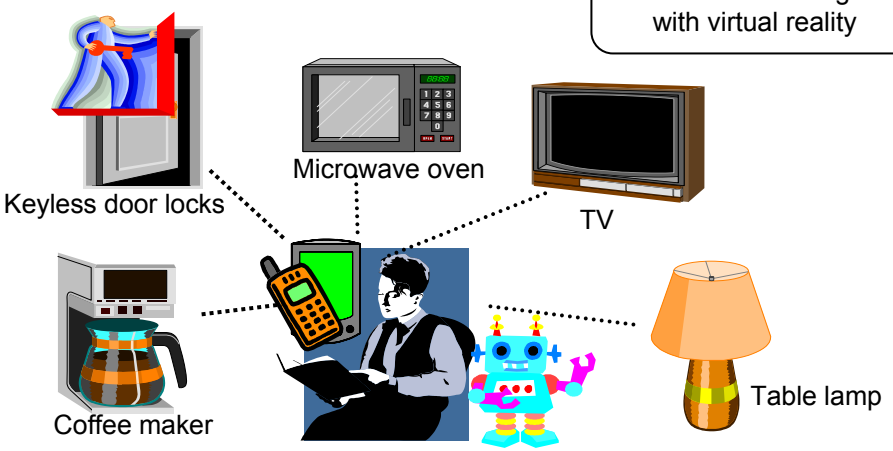
Use of mobile terminals in education
- Outdoor learning through use of mobile terminals with virtual reality

Public transportation



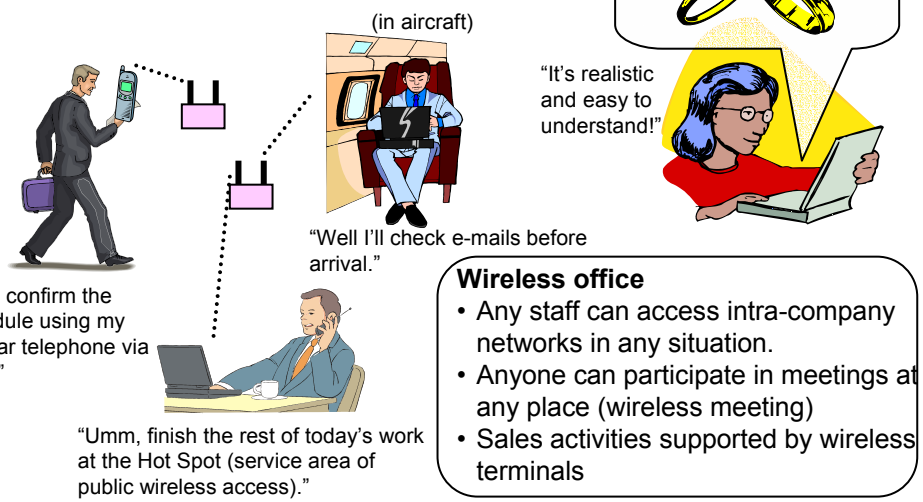
Wireless vehicle-to-vehicle communications
- Accident prevention through exchange of data such as information on speed, braking, road surface, etc.

Daily lives



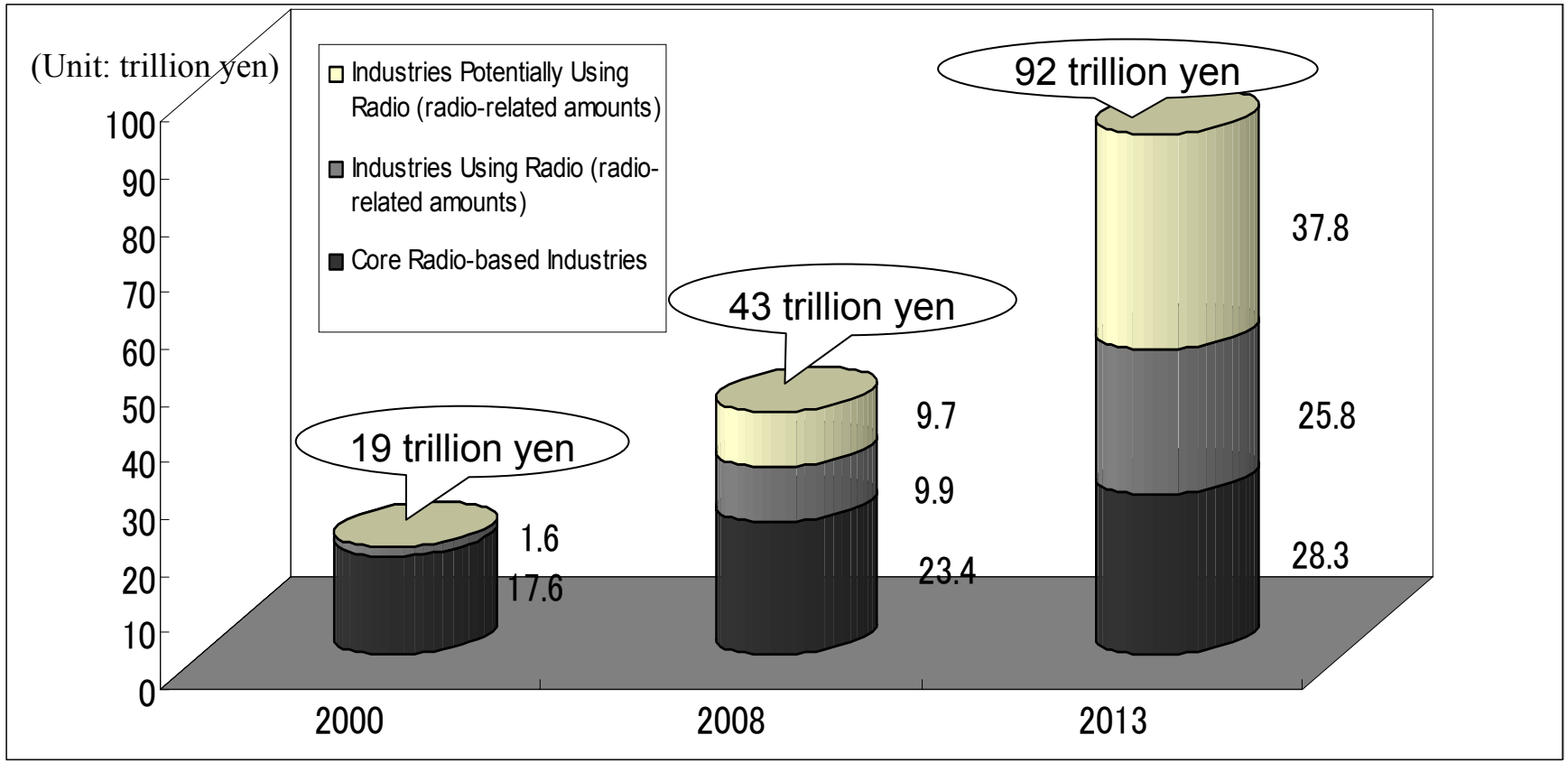
Wireless-controlled home security
- Controlling home electronics through use of favorite remote controllers, voice and gestures
- Home security using watchdog robots connected to wireless network

Business



Wireless office
- Any staff can access intra-company networks in any situation.
- Anyone can participate in meetings at any place (wireless meeting)
- Sales activities supported by wireless terminals

Expansion of Market Sizes of Radio-related Industries



[Definition of market sizes of radio-related industries]

Core Radio-based Industries: Sales amounts of industries in which the usage of radio spectrum plays the central role of businesses (e.g., radio communications carriers/broadcasters, manufacturers of radio communications/broadcasting equipment, etc.)

Industries Using Radio (radio-related amounts)*: Radio-related partial amounts of the total sales of industries in which the usage of radio spectrum does not play the central role in business, but cannot operate business activities without using radio spectrum (energy suppliers, such as power and gas utilities, airline, maritime, railway and automobile transportation services, etc.)

Industries Potentially Using Radio (radio-related amounts) *: Radio-related partial amounts of the total sales of industries whose businesses are not using radio spectrum at present, but whose products and services will be highly improved and become effective through radio spectrum use in the future (distributors, education, medical/nursing care/welfare services, games, etc.)

* Note: Upon estimate, market sizes are calculated by multiplying annual sales amounts (annual growth rates are considered) by degree of dependence on radio spectrum use.

I Drastic Review of Radio Spectrum Allocation

It is necessary to drastically review radio spectrum allocation in order to facilitate the introduction of radio systems required for the world's most advanced Wireless Broadband Environment

(1)Drastic review of radio spectrum allocation in all frequency bands including those assigned to the national government and public corporations.
(2)Encourage licensees to return redundant spectrum not being used efficiently.
(3)Reallocation of radio spectrum, which are used for radio systems actually replaceable with fiber-optic cables etc., to other radio systems such as mobile communications, for which radio spectrum use is indispensable.
(4)Swift reallocation of radio spectrum to new radio systems with higher demand.

	Expansion of usage in the future *1	Concepts for addressing radio spectrum demands	Measures to be taken for promotion
Mobile Communication Systems (below 5-6GHz)	Large increase in demands for radio spectrum (based on forecast methods developed by ITU) - 270 MHz bandwidth (current status) - 330 – 340 MHz bandwidth (5 years later) - 1,060 - 1,380 MHz bandwidth (10 years later)	Based upon results of survey on actual radio spectrum usage including those in the public sector, (1) Create radio spectrum for new use, through efficient use of radio spectrum and transition to fiber-optic cables (2) Swift reallocation of radio spectrum (3) Shared-use with other radio systems	Examples of major candidates for additional frequency bands for mobile communication systems - 800MHz band, 1.5 GHz band (currently in use for MCA)*2 - 1.7 GHz band (currently in use for fixed communications) - 4 GHz / 5 GHz bands (currently in use for fixed communications)
Wireless LAN (mainly in 5GHz band)	Large increase in demands for radio spectrum (based on forecast methods developed by ITU) - 200 MHz bandwidth (current status) - Max. 480 MHz bandwidth (5 years later) - Max. 740 MHz bandwidth (10 years later)		Examples of major candidates for additional frequency bands for Wireless LANs. - 4.9-5.0 GHz band (currently in use for fixed communications) - 5.25-5.35 GHz band (currently in use for radars) - 5.47-5.725 GHz band (currently in use for radars)
Terrestrial Digital Television	Smooth penetration and development of digitalization	- Smooth implementation of measures for conversions of current TV frequencies for digitalization. - Radio spectrum vacated by the termination of conversion process (analog/digital simulcasting) will be used for mobile communications, etc.	- Frequency assignment for facilitating nationwide deployment of digital broadcasting - The UHF band except those used for digital TV will be used for mobile communications after 2012; the VHF band will be used for radio systems with high demand after 2011.
RFID (Electronic Tag)	Advanced utilization of electronic tags will evolve in diversified fields such as physical distribution.	135 kHz, 13.5 MHz, 2.4 GHz bands are currently in use.	Consideration of available frequency bands, based on concrete images of applications using RFID.
ITS, HEO system *3, UWB	Development of these radio systems will progress.	Clarification of available frequency bands, necessary bandwidths, etc. based on considerations concerning trends in R&D, sharing conditions.	Implementation of domestic frequency assignment, considering international spectrum allocation and international harmonization.

*1 The figures of the bandwidths of Mobile Communication Systems and Wireless LAN are round numbers.
*2 MCA: Multi-Channel Access (a trunked radio system.)
*3 HEO system: Highly Elliptical Orbit satellite system used for satellite communication, radiodetermination etc.

II Policies for Radio Spectrum Reallocation and Radio Spectrum Use

Facilitating swift radio spectrum reallocation

- The amendment to the Radio Law in 2002 institutionalized the scheme for conducting surveys etc. on actual radio spectrum usage and publicizing the results. The survey conducted by MPHPT every year is to cover one of three sections of the radio spectrum, such that in three-years' time, the surveys will have covered all of the radio spectrum.
  MPHPT evaluates the extent of efficiency in radio spectrum usage based on the survey results through seeking public comments, and publicizes the results.
  The Council recommends that MPHPT formulate reallocation plans, as appropriate, taking into consideration such evaluations, in order to meet demands for other radio systems such as mobile communication systems and wireless LANs.
- Should reallocation need to be completed in a short term, e.g. three years from the formulation of a radio spectrum reallocation plan, incumbent licensees will be forced to dismantle radio facilities that the licensees purchased and constructed in the past and to purchase and construct alternative facilities.
  The Council recommends that MPHPT conduct studies on establishment of a scheme to compensate incumbent licensees for reallocation costs such as a portion of the remaining book value and the dismantling cost of the radio facilities, etc.

Ensuring transparency of radio spectrum use

- In the introduction of auction systems into licensing procedures, there could be a risk that the introduction hinders effective radio spectrum use, in such a way as the delay/withdrawal of services due to extremely high bidding prices as seen in some European countries. Accordingly, from the viewpoint of promoting effective radio spectrum use by incorporating advantages of market principles, it is necessary to consider other appropriate measures by which such kind of demerits can be avoided.
- The Council recommends that MPHPT conduct studies on introduction of a licensing system incorporating the following assessment items in the process of comparative examination in addition to appropriateness of business plans:
  - A portion within the amount of the radio spectrum reallocation costs to be shared by new licensees.
  - Expansion plans of service areas (i.e., facilities investment amount, etc.) etc.

  It is also appropriate to ensure transparency and fairness in licensing procedures through publication of figures concerning assessment items prior to the assessment.

Scheme for Conducting Surveys on Actual Radio Spectrum Usage Revised Radio Low in 2002

【Survey Items】
- ○ Number of radio stations
- ○ Traffic
- ○ Years in use of radio facilities
- ○ Replaceability with other means of telecommunications such as fiber-optic cables

etc.

Surveys on Actual Radio Spectrum Usage

All of the radio spectrum is divided into the following three sections. Surveys are made every year on one of the sections.
①Below 770MHz
②Above 770MHz/below 3.4GHz
③Above 3.4GHz

Evaluation of the extent of efficiency in radio spectrum usage on each frequency band

Surveys on economic impacts on licensees caused by modification of Frequency Assignment Plan

Reflection

Modification of Frequency Assignment Plan

Swift Reallocation of Radio Frequencies

- Compensation Scheme for Spectrum Reallocation -

New Licensees

<A new entry is possible on vacated frequencies>

《RLAN, etc.》

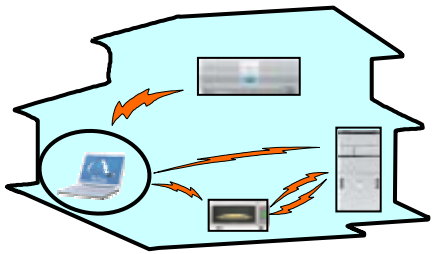
Restaurant

Internet

Base stations of Telecommunications Carriers

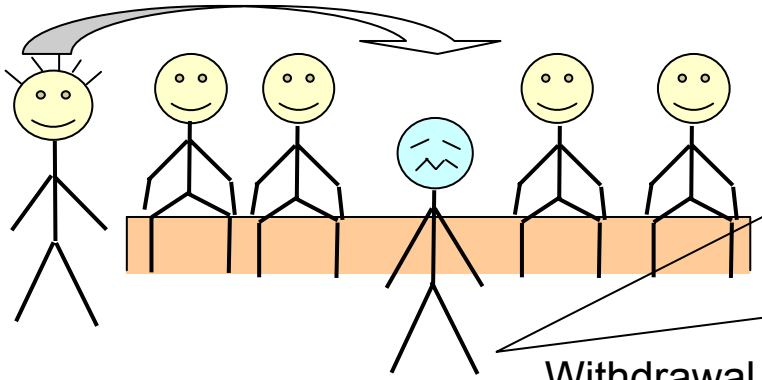
Hotel

《Intelligent Home Appliances》

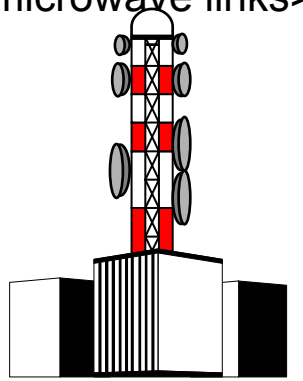


Incumbent Licensees

New entry



<Station for fixed microwave links>



Withdrawal

- No alternative frequencies
- Shorter transition period within 3 years (10 years for the existing scheme)

Economic Costs to Incumbent Licensees (Salvage Value, Removal Cost and so on)

Need for Compensation

Provision of Compensation

Economic benefits to new licensees

New Licensees Bear a Certain Amount of the Economic Costs

Enhancing flexibility of radio spectrum use

The Council recommends that MPHPT:

- Identify more spectra as “Commons” to allow unlimited numbers of unlicensed wireless systems operated at low power to share frequencies under certain conditions;
- Introduce a regulatory scheme such as the registration of radio stations, requiring no licensing process, to allow unlimited numbers of wireless systems such as base stations of wireless LAN systems operated outdoors at relatively high power to share frequencies under certain conditions in order to respond to such expanding installation needs;
- Assign frequencies to wireless systems that will satisfy needs of a specific region, while ensuring the possibility of future nationwide radio spectrum reallocation in the band; and
- Improve efficiency through radio spectrum reallocation in bands assigned to mobile systems operated by government institutions and other entities (including Radio System for Disaster Prevention/Relief).

III Reform of Spectrum User Fee

Review the present Spectrum User Fee system in terms of the character of the system and the appropriate calculation policy of the fee in each category of radio users, etc. to facilitate a more efficient and comfortable radio spectrum use environment;

IV Promotion of R&D

- Focus on R&D of wireless systems such as systems beyond IMT-2000, Wireless LANs, ITS and HEO (Highly Elliptical Orbit) systems;
- Promote R&D of technologies for efficient spectrum use (e.g. software-defined radio technologies and cognitive radio system to search the radio spectrum and operate in a band not in use by others);
- Promote collaboration among the industry, academics and government and foster researchers in the field of radio engineering etc.;
- Introduce an immediate licensing scheme for specified experimental radio stations used for R&D purposes;

V Facilitating smooth prevalence of radio equipment

- Facilitate distribution of radio equipment through smooth introduction of a scheme concerning Supplier's Declaration of Conformity to Technical Regulations;
- Conduct studies on the method for the Technical Regulations Conformity Certification System concerning Software Defined Radio equipment;

VI Enhancing international strategy

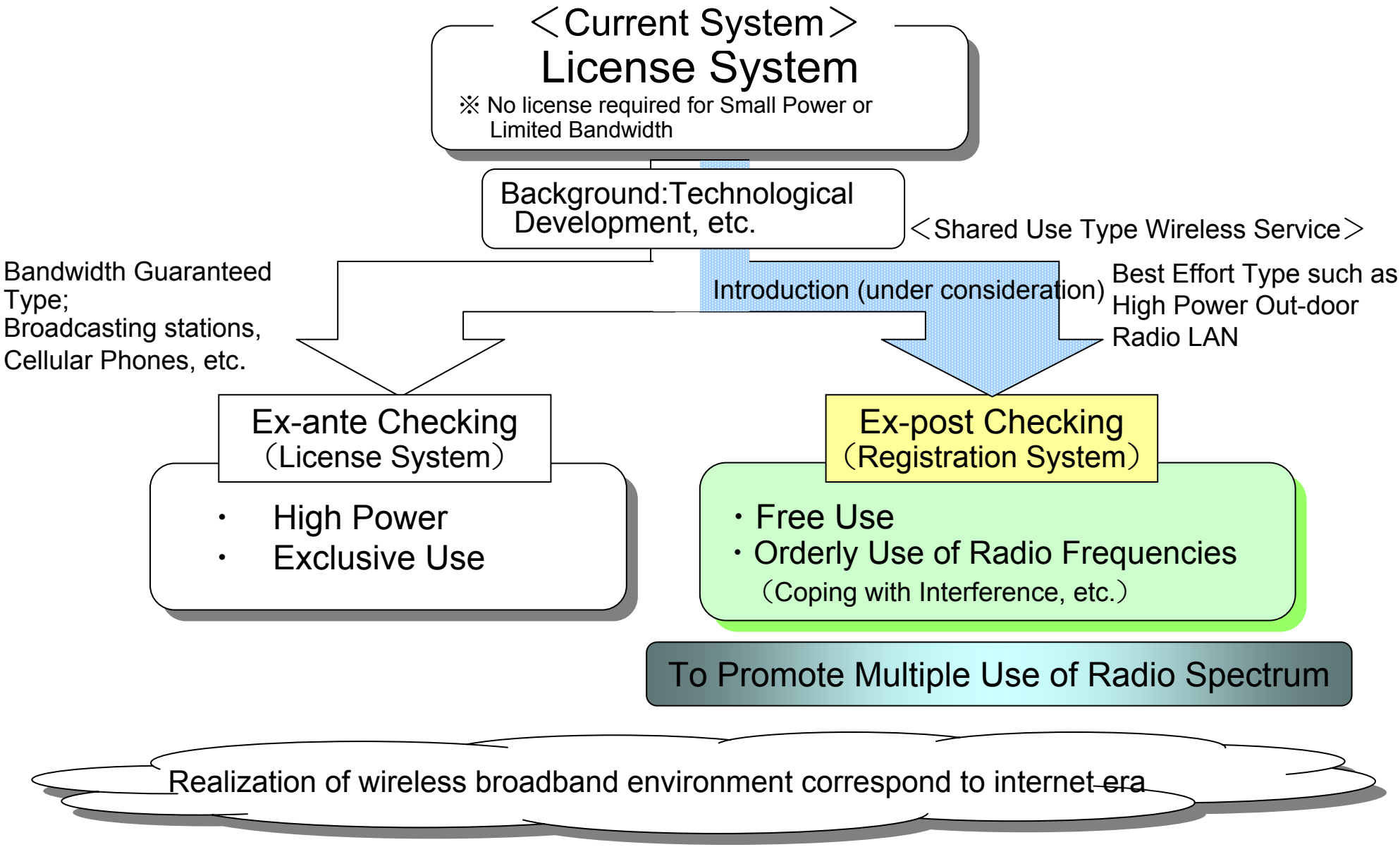
- Promote standardization activities with a view to fostering growth of wireless IT industry;
- Promote cooperation with Asian countries, etc.;
- Take leadership in discussions on radio spectrum at ITU;

VII Building a safer and securer environment for radio wave use

- Promote the measures such as research regarding effects of radio waves on the human body;
- Promote preventive measures to tackle problems of illegal radio stations.
- Ensure security of wireless LANs.

Enhancing Flexibilities in Spectrum Allocation

-Outline of Registration System-



Reform of Spectrum User Fee

1. Basic Character

Commission Fee collecting from license for administrative cost to construct and to maintain favorable radio environment.

2. Example of usage

- Radio Monitoring.
- Operation of Database of Radio Stations.
- Counter Measure for Analog Frequency Change.
- Technical Testing on Survey.

2. Drafting Policy

① From Commission Fee for Administrative Cost To Usage Fee of Radio Spectrum.

a) Expansion of use (Present; not to R & D) taking into account of economic value.

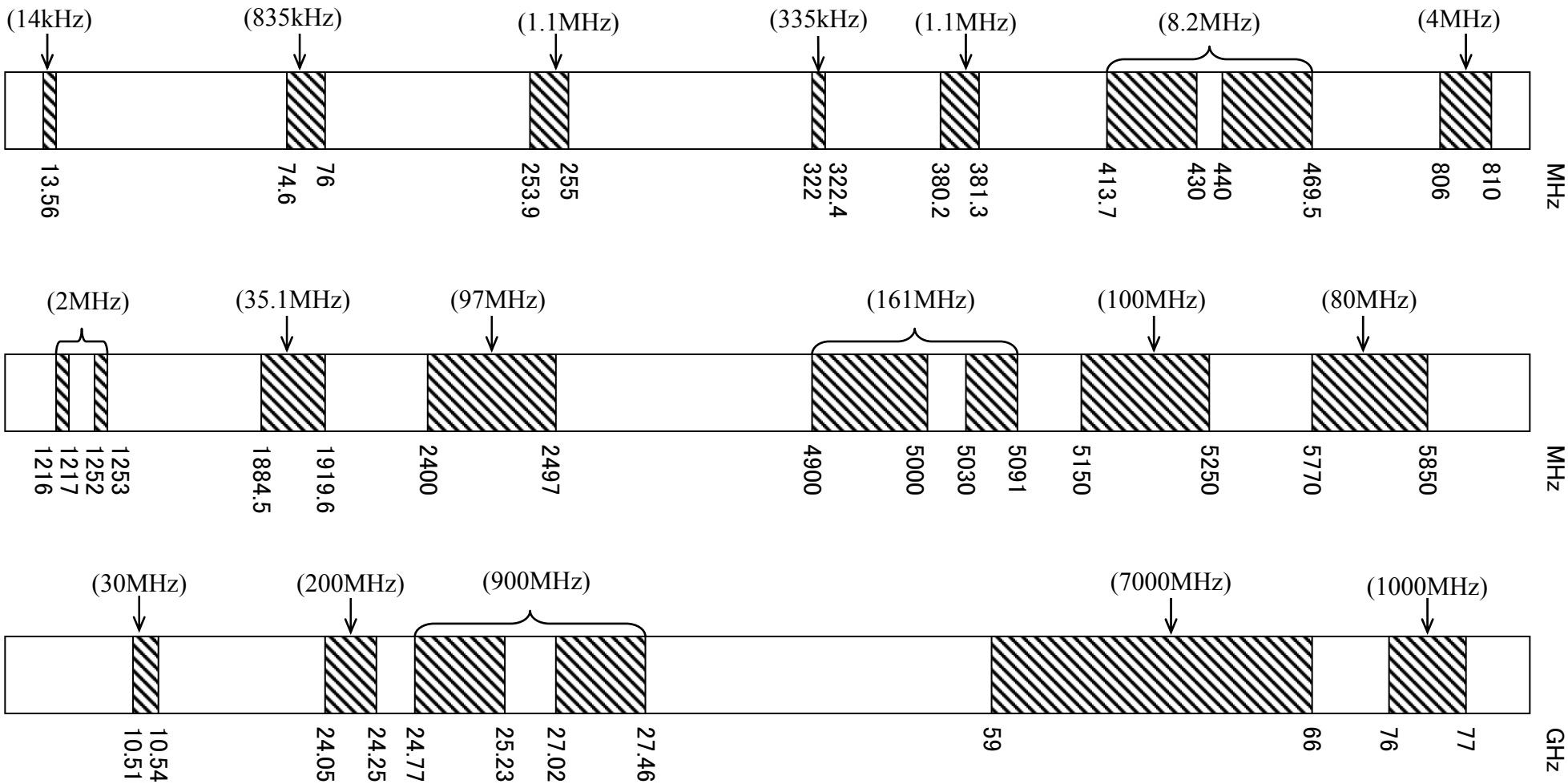
b) Reform of Calculation Method (Present; Regardless of bandwidth of radio, it is proportional to a radio station.)

② Schedule

- Report from Study Group in 2003
- Revision of Radio Low in 2004

Spectrum Expansion of the “Commons”

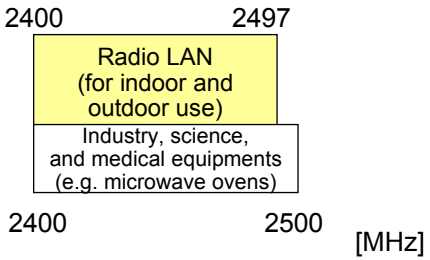
9600MHz bandwidth in 18 bandwidth is allocated to the “Commons”
for RLAN and cordless telephone, etc. (the world most levels)



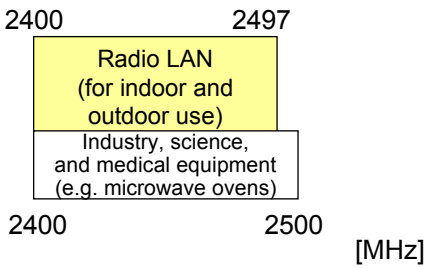
2. Review of the Allocations to Mobile, Fixed, and Other Services in the 5 GHz Band (Agenda Item 1.5)

2.4 GHz band

97 MHz bandwidth

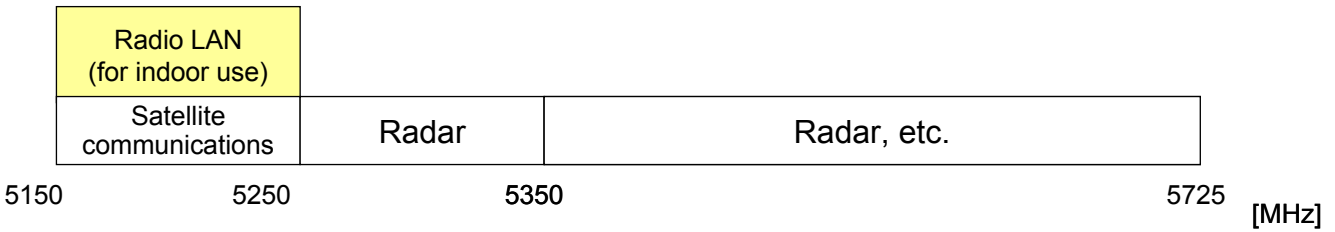


97 MHz bandwidth



5 GHz band

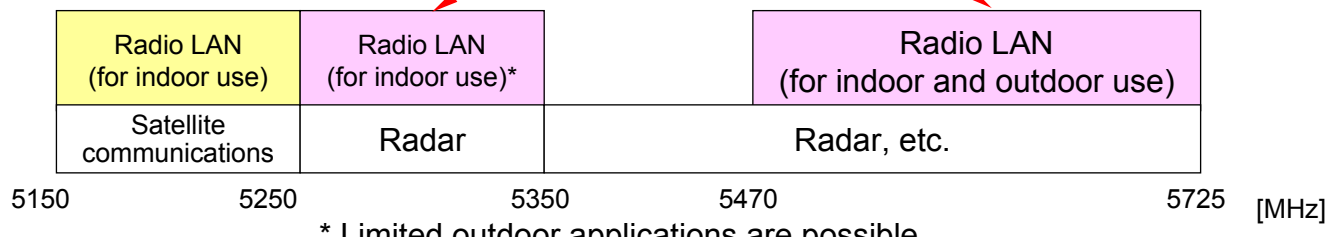
100 MHz bandwidth



New allocations for Radio LAN on a worldwide basis

355 MHz bandwidth

100 MHz bandwidth



* Limited outdoor applications are possible.

Major frequency bands being used now

- The frequency band that can be used for outdoor applications has been greatly expanded.
  ⇒ More users are able to use faster communications.

-Common frequency bands that can be used on a worldwide basis have been expanded.
  ⇒ Users can benefit from improved convenience and less expensive equipment.

Promotion of establishment of experimental radio stations

1 Background & Assignment

＜Background＞ (1) Serious tightness of frequency resources

(2) Developing of New System as well as effective use technology

⇒ ***industrial revitalization***

↓

＜Assignment＞ Acceleration & Simplification of establishment of experimental radio stations

【 experimental radio stations】: radio stations used exclusively for experimentation aimed at scientific or technological development. (Valid term of licenses: 5 years)

2 View point of consideration

＜Assumption＞
- no interference to existing staions
- to specify area and frequency in advance
- short-term limitation (1 year in principle)of license period）

↓ ***(Simplification of procedure, revitalization of activation experimentation)***

Ensuring of frequency for experimental stations & Simplification of licensing procedure

Towards Realization of Ubiquitous Network Society