ARIB

Association of Radio Industries and Businesses

ARIB Activity and Strategy

22nd August 2017

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Association of Radio Industries and Businesses (ARIB)

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About ARIB

- **Establishment**
  - 15 May 1995 as a public service corporation
  - By merging two organizations, RCR and BTA, who had worked on standardization from 1985 to 1995.
    - RCR : **R**esearch & Development **C**enter for **R**adio Systems
    - BTA : **B**roadcasting **T**echnology **A**ssociation
- **Objectives**
  - To develop technical standards for radio systems as "ARIB Standards"
  - To conduct study and R&D for utilization of radio waves
  - To conduct correspondence, coordination and cooperation with foreign organizations
- **Members** (as of 4 August 2017)
  - Regular members :   187
    - Telecom Operators :   8
    - Broadcasters :   18
    - Manufactures :   133
    - Others :   28
  - Supporting members : 24

ARIB Activity - Work Contents

- **Study/R&D - Standardization**
  - work on telecom (Radio) & broadcasting fields
  - develop Standard by consensus

- **Promotion of Radio Industry**
  - hold special seminars, monthly seminars
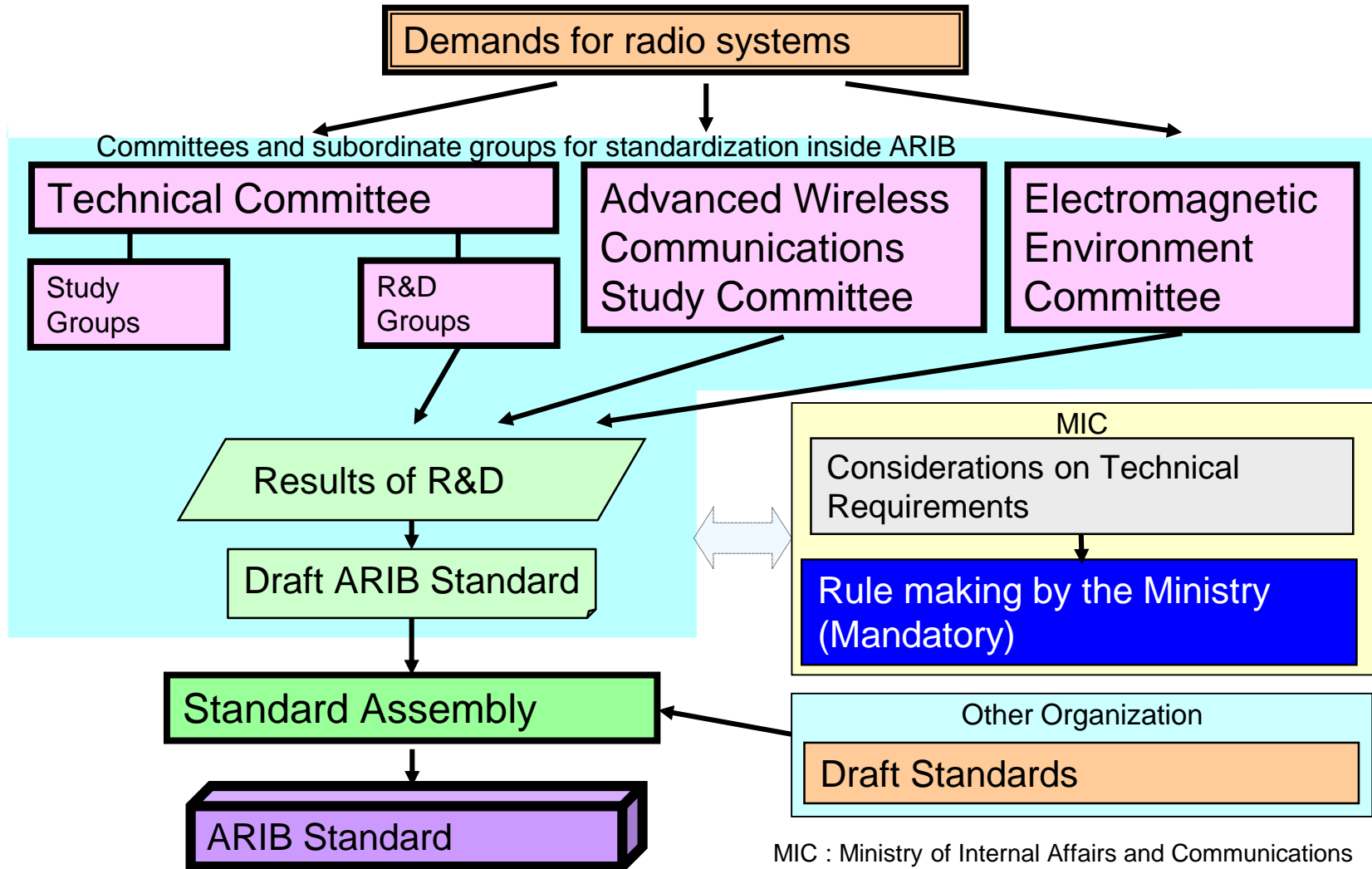 - issue yearbook, quarterly bulletin, weekly news

- **Consultation on Radio Wave Use**
  - design radio links / select best available frequency for microwave and satellite links

- **Cooperation with SDOs**
  - having MoU and Agreement with 16 organizations world wide

Standardization Flow

Demands for radio systems

Committees and subordinate groups for standardization inside ARIB

Technical Committee

Study Groups

R&D Groups

Advanced Wireless Communications Study Committee

Electromagnetic Environment Committee

Results of R&D

Draft ARIB Standard

Standard Assembly

ARIB Standard

MIC

Considerations on Technical Requirements

Rule making by the Ministry (Mandatory)

Other Organization

Draft Standards

MIC : Ministry of Internal Affairs and Communications

Major Issues on Standardization Activities

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■ Big three issues

5G	: Collaborate worldwide through 5GMF
UHDTV	: Promote the system worldwide
ITS	: Harmonized (co-existence of ITS standards, ITS and other systems) frequency bands for the implementation of evolving ITS

■ Close cooperation with Fora / Consortia

- draft standard with complete specification
- full IPR submission
  - · gathering and analyzing information on IPR policy
- English Version of ARIB Standards

Challenges on R&D Activities

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- **Establishment of 5G Trial Project Promotion Center**
  - ・**Actively involved in the 5G Field Trial led by MIC**

- **Development of New Wireless Access System towards IoT**

- **Development of Advanced private wireless communication systems**

Suggestions to ASTAP/APT

- **To facilitate collaboration and cooperation between ASTAP and AWG;**

    - **e.g. Seamless access communication systems, IoT application/ services, security, etc.**

- **To hold a round-table discussion involving developing countries on a specific topic;**

- **To develop recommendations rather than reports in the APT work programs; and**

- **To keep the appropriate interval between ASTAP and AWG meetings more than one month.**

Thank you for your attention!

http://www.arib.or.jp/english/index.html
http://5gmf.jp/en/

Supplementary Slides

ASTAP-29, Bangkok, Thailand　　　　**Copyright © 2017 ARIB all rights reserved**

ARIB in Summary

ARIB

[as of 31 March, 2017 (31 March, 2016)]

- **Membership**
  Regular Member :   189 (195)
  Supporting Member :   13 (4)

- **Standardization**
  Standard (STD) :   165 (166)
  Technical Report (TR):   70 (66)

- **Technical Committee**
  Study Group :   1 (3)
  R&D Group :   4 (4)

- **Advanced Wireless Communications Study Committee (ADWICS)**
  Subcommittee :   4 (4)

- **Promotion Strategy Committee**
  Subcommittee :   1 (1)
  ISDB-T :   19 countries (18)
  (new : El Salvador, January 2017)

- **Electromagnetic Environment Committee**
  Subcommittee :   2 (2)

ARIB Activity - Statistics -

(FY)	2013	2014	2015	2016
Member				
Regular members	208	211	195	189
Supporting members	4	4	4	13
Income (100M¥)				
member fee	2.4	2.4	2.3	2.3
Business	7.1	6.4	5.3	5.2
- consultation	3.0	2.4	1.8	2.0
- others	4.1	4.0	3.5	3.2
Standard				
STD (Standard)	155	159	166	165
TR (Technical Report)	64	63	66	70

Secretariat

ARIB

Secretary General : Mr. Fusaki MATSUI
Managing Director : Mr. Shunsuke KODAMA
Executive Director : Dr. Shigeki MORIYAMA
Executive Director : Mr. Seiji NISHIOKA

Administration Department

・General Affairs
・Personal Affairs
・Accounts

R&D Headquarters

・Investigation and R&D
・Development of Technical Standards

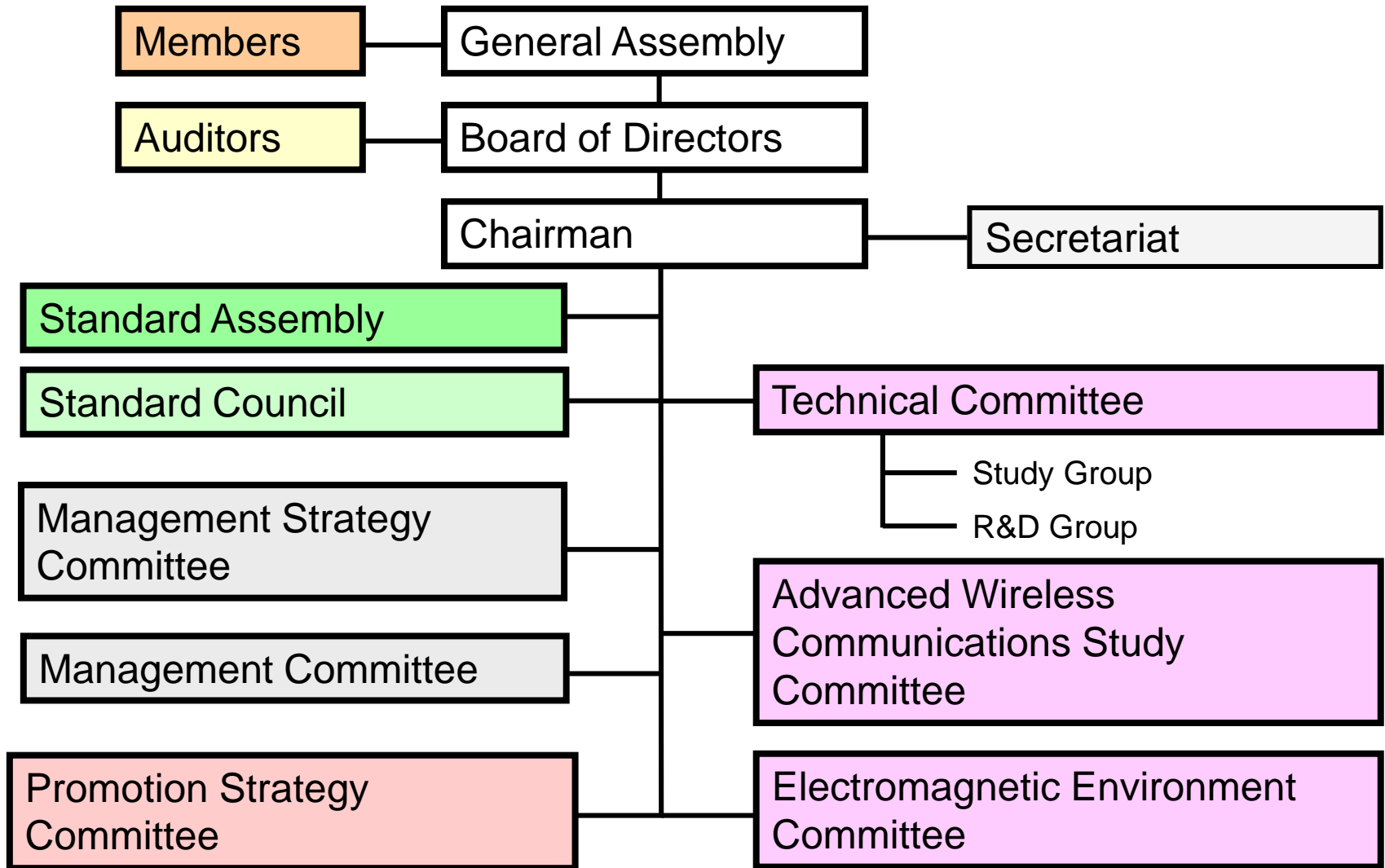Development Center

5G Trial Project Promotion Center

9 Groups

Radio Utilization Consulting Department

・Consultation and Information Services for Spectrum Utilization

Planning and International Affairs Department

・Administrative work related to "ARIB Standards"
・Education and Popularization
・Correspondence with other national/international standards organizations

 12

Structure of ARIB

ARIB

Members — General Assembly

Auditors — Board of Directors

Chairman — Secretariat

Standard Assembly

Standard Council — Technical Committee

Study Group

R&D Group

Management Strategy Committee

Advanced Wireless Communications Study Committee

Management Committee

Promotion Strategy Committee

Electromagnetic Environment Committee

ARIB Standard Assembly

- **Establishment**
  - May 1995
- **Operation**
  - To ensure fairness and transparency
  - To set standards by consensus
- **Membership**
  - Open to any entity, organization and person
  - Independent from ARIB membership
  - Members : 168 (as of 4 August 2017)
    - Telecom Operators: 7
    - Broadcasters: 14
    - Manufactures: 126
    - Others :   21
- **Holding period**
  - 4 times a year

Outcome from Standard Assembly

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- **ARIB Standard (STD)**
  - Technical requirement for radio systems
- **ARIB Technical Report (TR)**
  - Operational guidelines for radio systems
- **Number of STD and TR**

[As of 31 March, 2017]

	STD	TR
Telecommunications	92	24
Broadcasting	73	46

- **ARIB Standard URL**

  http://www.arib.or.jp/english/html/overview/index.html

Big Three Issues on Standardization
- 5G, UHDTV, ITS -

ASTAP-29, Bangkok, Thailand

【5G】 Action plan (mid-term) of 5GMF

Accelerate practical implementations of 5G towards 2020.
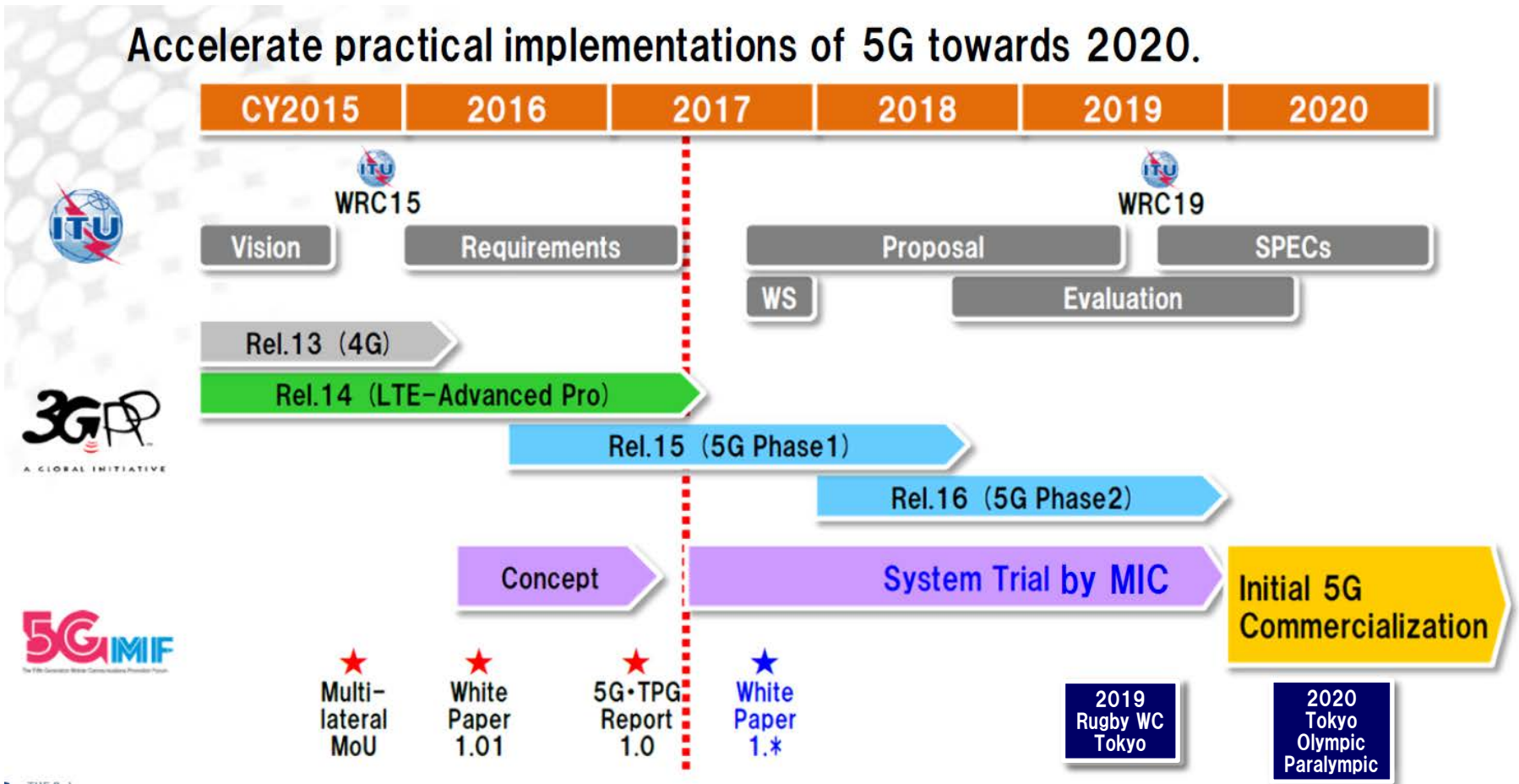
5GMF White Paper

http://5gmf.jp/wp/wp-content/uploads/2016/07/5GMF_WP101_All.pdf

【5G】 Image of 5G Verification Trial

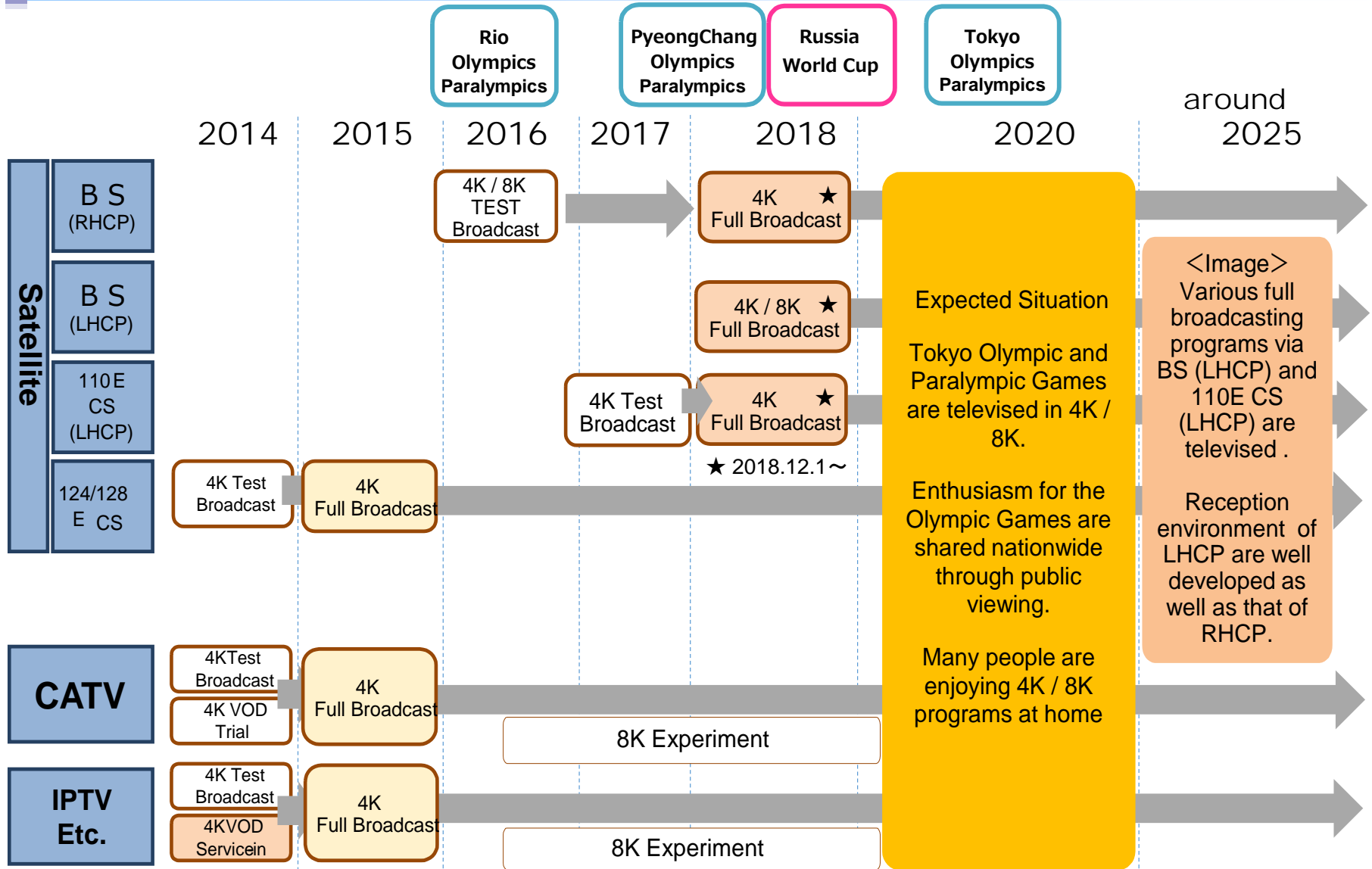|	Outline of experiment	Site	Technology target
I	High-definition video content distribution and wide area surveillance, telemedicine of general hospitals and regional clinics	・Tokyo ・Wakayama	・Enhanced mobile broadband
II	High-definition video delivery to high-speed mobile body (railway, bus)	・Tochigi ・Shizuoka	・Enhanced mobile broadband ・Mobility
III	Real-time data transmission with mobile, such as remote operation of construction machine	・Saitama	・Ultra-reliable and low latency
IV	Simultaneous delivery of free viewpoint images at indoor stadium and collection and distribution of high-definition images at the railway station	・Okinawa ・Tokyo	・Enhanced mobile broadband ・High connection density
V	Running in rows of trucks, remote monitoring and control of vehicles	・Yamaguchi	・Ultra-reliable and low latency
VI	Logistics management and inventory management from production to consumption, smart office and telework	・Hokkaido ・Osaka	・Massive machine type communications

Coverage and outdoor driving experiments in a large premise

Outdoor trial in open square environments crowded with people

Indoor environments crowded with people

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【UHDTV】Japan's Roadmap for 4K/8K

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	Rio Olympics Paralympics	PyeongChang Olympics Paralympics	Russia World Cup	Tokyo Olympics Paralympics	
	2016			**2020**	

	2014	2015	2016	2017	2018	2020	around 2025

Satellite

- **BS (RHCP)**: 4K / 8K TEST Broadcast → 4K Full Broadcast ★
- **BS (LHCP)**: 4K / 8K Full Broadcast ★
- **110E CS (LHCP)**: 4K Test Broadcast → 4K Full Broadcast ★
- **124/128 E CS**: 4K Test Broadcast → 4K Full Broadcast

★ 2018.12.1～

Expected Situation

Tokyo Olympic and Paralympic Games are televised in 4K / 8K.

Enthusiasm for the Olympic Games are shared nationwide through public viewing.

Many people are enjoying 4K / 8K programs at home

<Image> Various full broadcasting programs via BS (LHCP) and 110E CS (LHCP) are televised .

Reception environment of LHCP are well developed as well as that of RHCP.

CATV
- 4KTest Broadcast
- 4K VOD Trial
- 4K Full Broadcast
- 8K Experiment

IPTV Etc.
- 4K Test Broadcast
- 4KVOD Servicein
- 4K Full Broadcast
- 8K Experiment

RHCP: Right Hand Circular Polarization, LHCP: Left Hand Circular Polarization

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UHDTV Broadcasting

Video (Resolution)

2K		Approx. 2 million pixels
4K		Approx. 8 million pixels 4-fold compared with 2K
8K		Approx. 33 million pixels 16-fold compared with 2K

Sound

22.2 Multi-channel Sound

Top Layer ●
Middle Layer ●
Bottom Layer ●
Low Frequency Effects ■

SDR / HDR Contrast

SDR

HDR
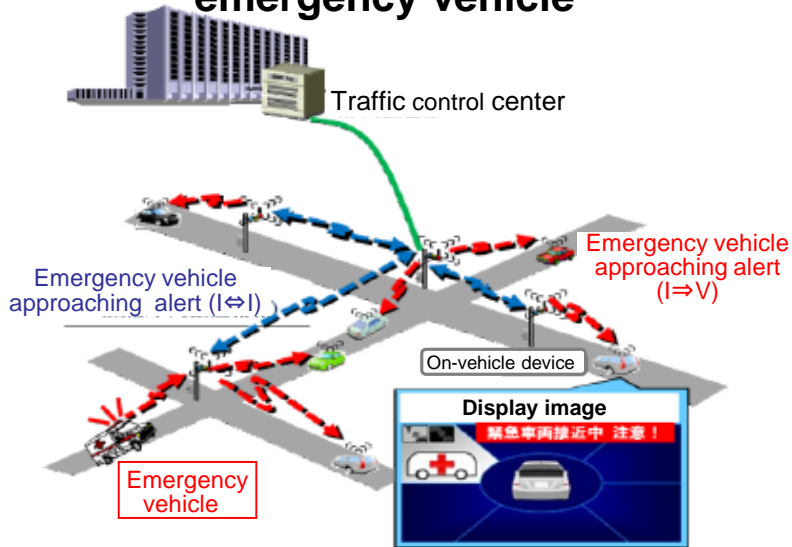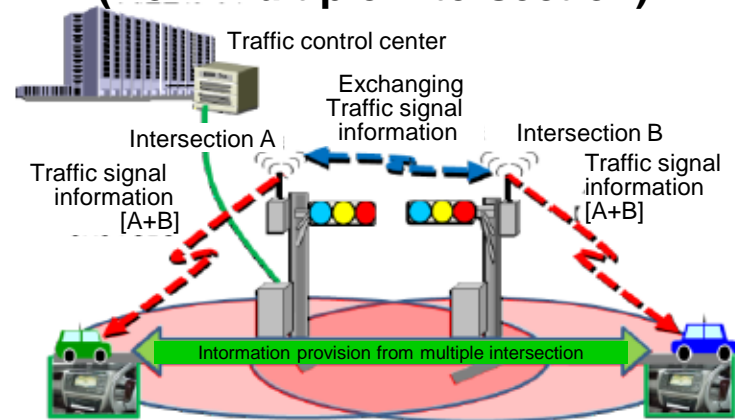
Source: NHK

【ITS】 Enhancement of ITS Connect services

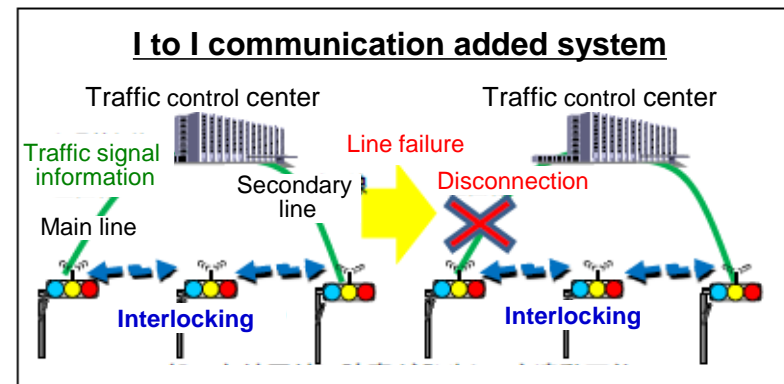## ■ Addition of Infrastructure-to-Infrastructure Communication (700MHz)

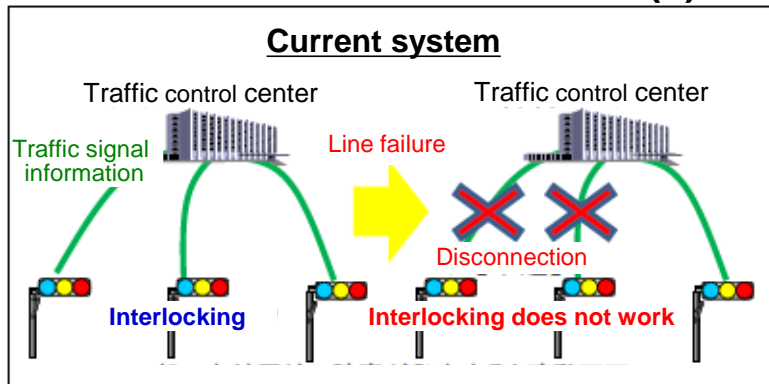### (1) Broad provision of approaching emergency vehicle

Traffic control center

Emergency vehicle approaching alert (I⇔I)

Emergency vehicle approaching alert (I⇒V)

On-vehicle device

Emergency vehicle

Display image

緊急車両接近中 注意！

(2) Broad provision of traffic signal information (from multiple intersection)

Traffic control center

Exchanging Traffic signal information

Intersection A

Intersection B

Traffic signal information [A+B]

Traffic signal information [A+B]

Information provision from multiple intersection

(3) Failure resistant

Current system

Traffic control center · Traffic control center

Traffic signal information

Line failure

Disconnection

Interlocking · **Interlocking does not work**

I to I communication added system

Traffic control center · Traffic control center

Traffic signal information

Main line · Secondary line

Line failure

Disconnection

Interlocking · **Interlocking**

Standards Collaboration (General)

MIC : Ministry of Internal Affairs and Communications, Japan

Relation with other organizations (Specific Projects)

ARIB

Broadcasting

Telecommunications

ARIB/DVB
Regular Meeting

ETSI/DVB

SMPTE

FoBTV

(IMT-2000/Advanced)
3GPP/3GPP2

(IMT-Advanced)
CJK IT Standards Meeting

(Wireless Access/WLAN/ITS)
IEEE 802.11, 16, 20, etc.

WiMAX Forum

XGP Forum

ETSI TC-ITS

oneM2M

23