The Fifth Generation Mobile Communications Promotion Forum (5GMF)

5GMF activities for 2020 and beyond in Japan

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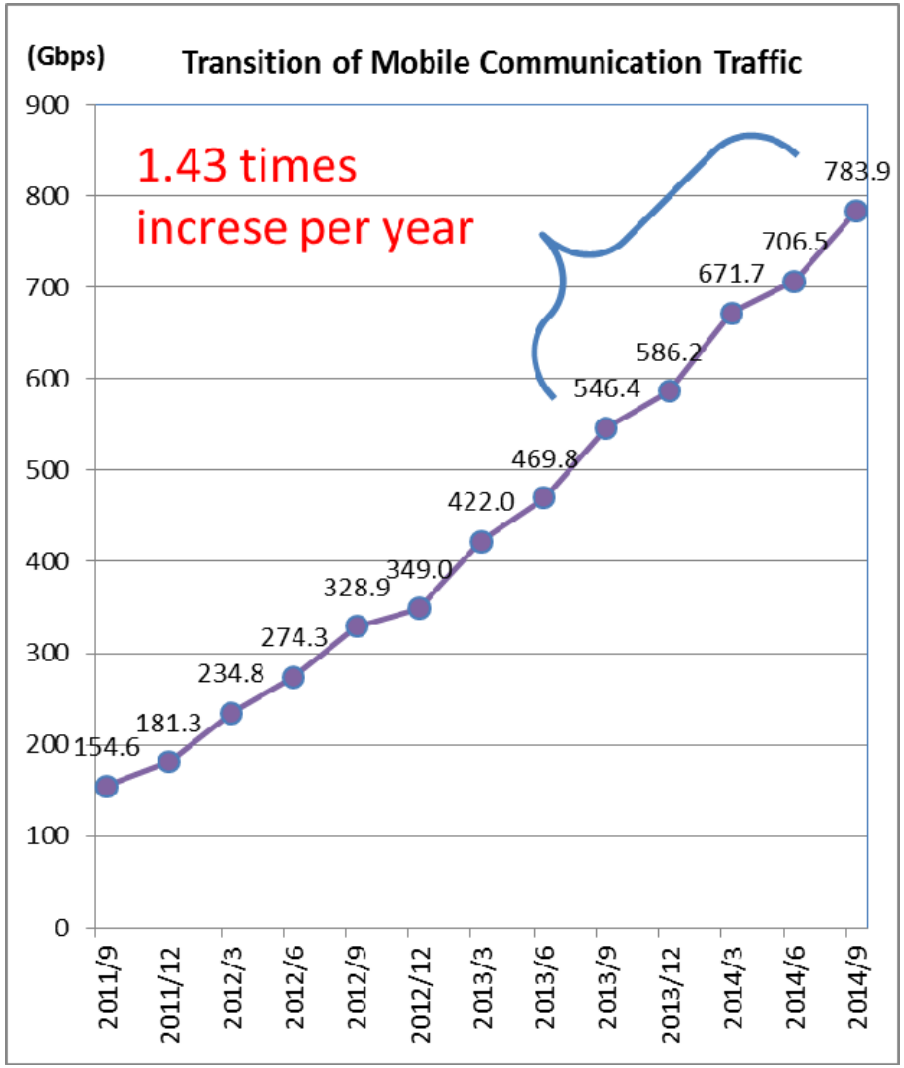
The Fifth Generation Mobile Communications Promotion Forum

5G Workshop between Regional initiatives
Lisbon, Portugal
20 October 2015

Contents

1. Background

Traffic trend of mobile communication



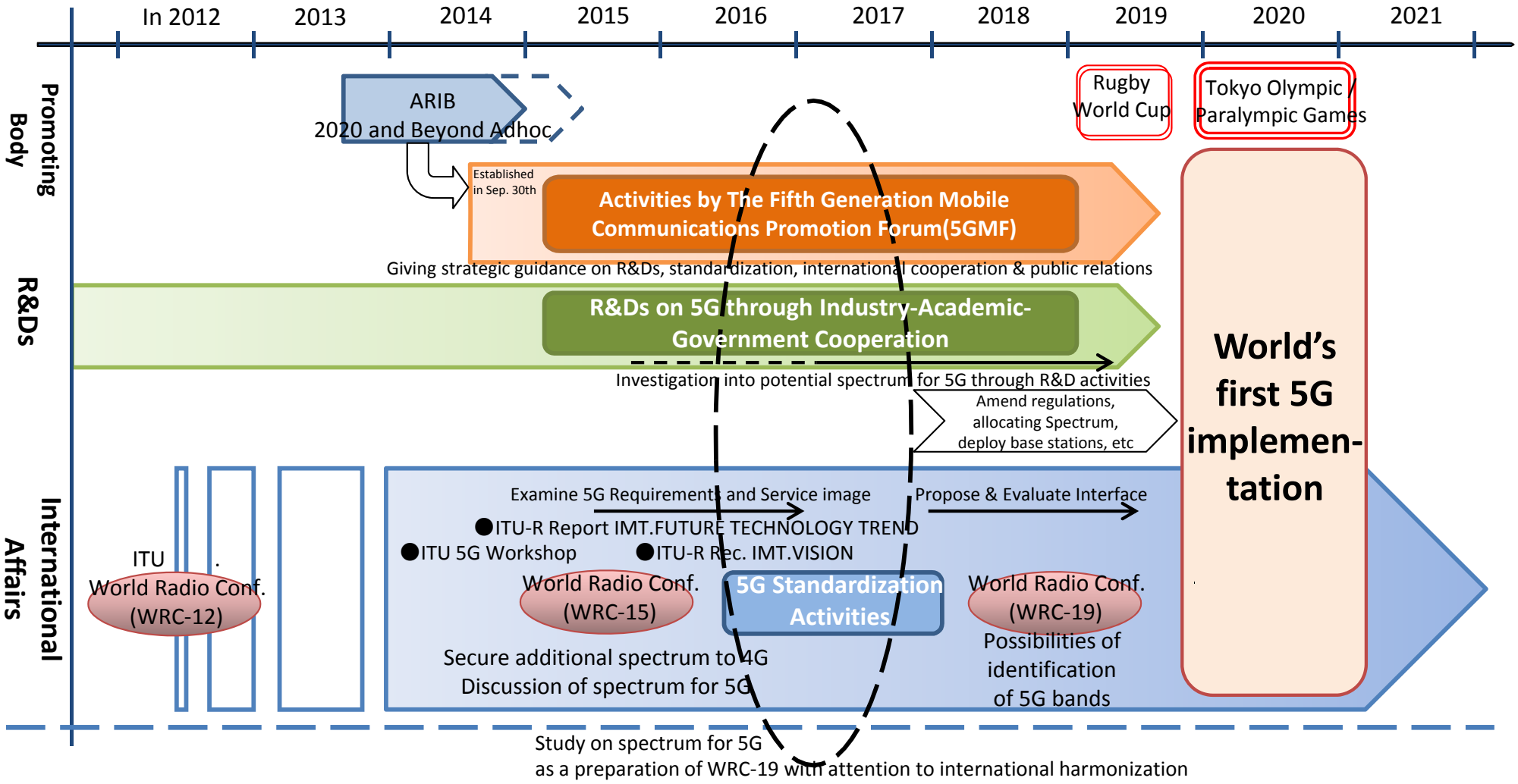
- 1.5～2.0 times increase trend per year

a 2.0 times increase per year equals

- 1,000 times increase within 10 years!!

Translated from “Final Report from the Radio Policy Vision Council", Ministry of Internal Affairs and Communications, Japan, December 2014.

Roadmap towards implementation of 5G mobile in Japan

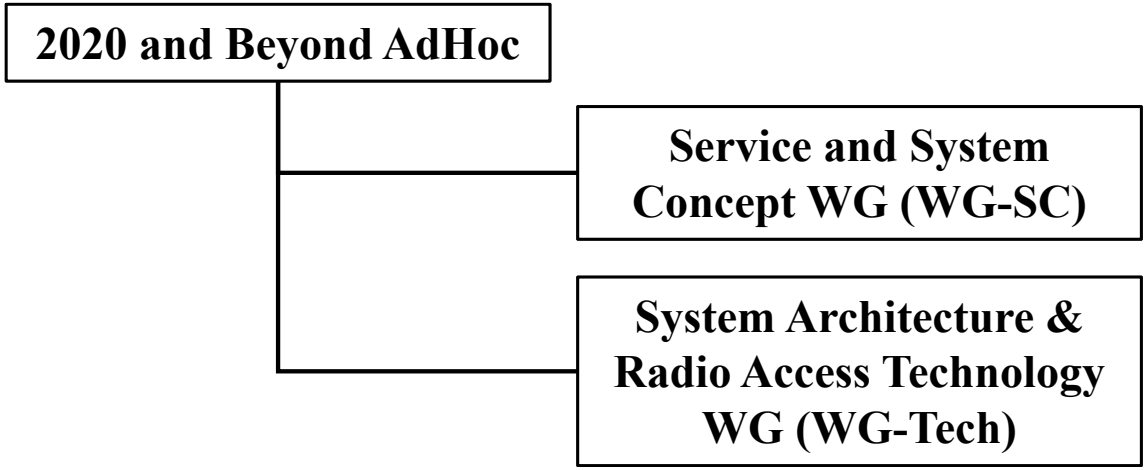


Translated from "Final Report from the Radio Policy Vision Council", Ministry of Internal Affairs and Communications, Japan, December 2014.

Organization and output of the ARIB 2020 and Beyond Ad Hoc

ARIB 2020 and Beyond Ad Hoc (20B AH)

- Established in September 2013
- Leader: Takehiro Nakamura (NTT DOCOMO)
- 31 ARIB Members joining (as of 1 March 2015)
- Organizational Structure



- **White Paper**

"Mobile Communications Systems for 2020 and beyond"
http://www.arib.or.jp/ADWICS/20bah-wp-100.pdf

5GMF takes over and advances the 20B AH's output.

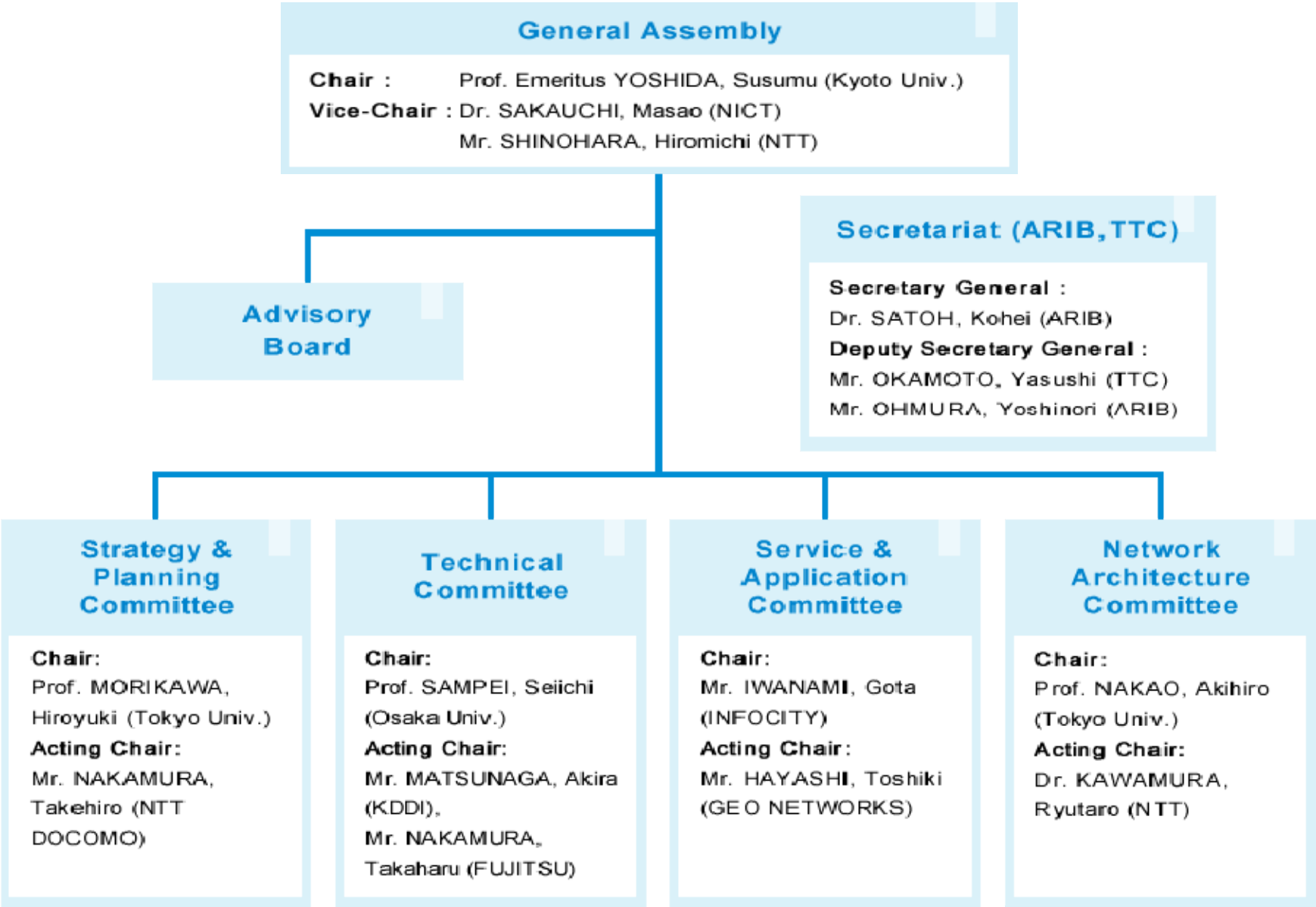
The Fifth Generation Mobile Communications Promotion Forum

2. Organization of 5GMF

Objectives

- **Objectives of 5GMF:**
  - To promote R&D in 5G mobile technology and research and study of 5G mobile standardization
  - To collect information relating to 5G mobile and exchange thereof with other organizations
  - To correspond and coordinate with related organizations on issues related to 5G mobile
  - To promote awareness and disseminate information related to 5G mobile

Organizational Structure of the 5GMF

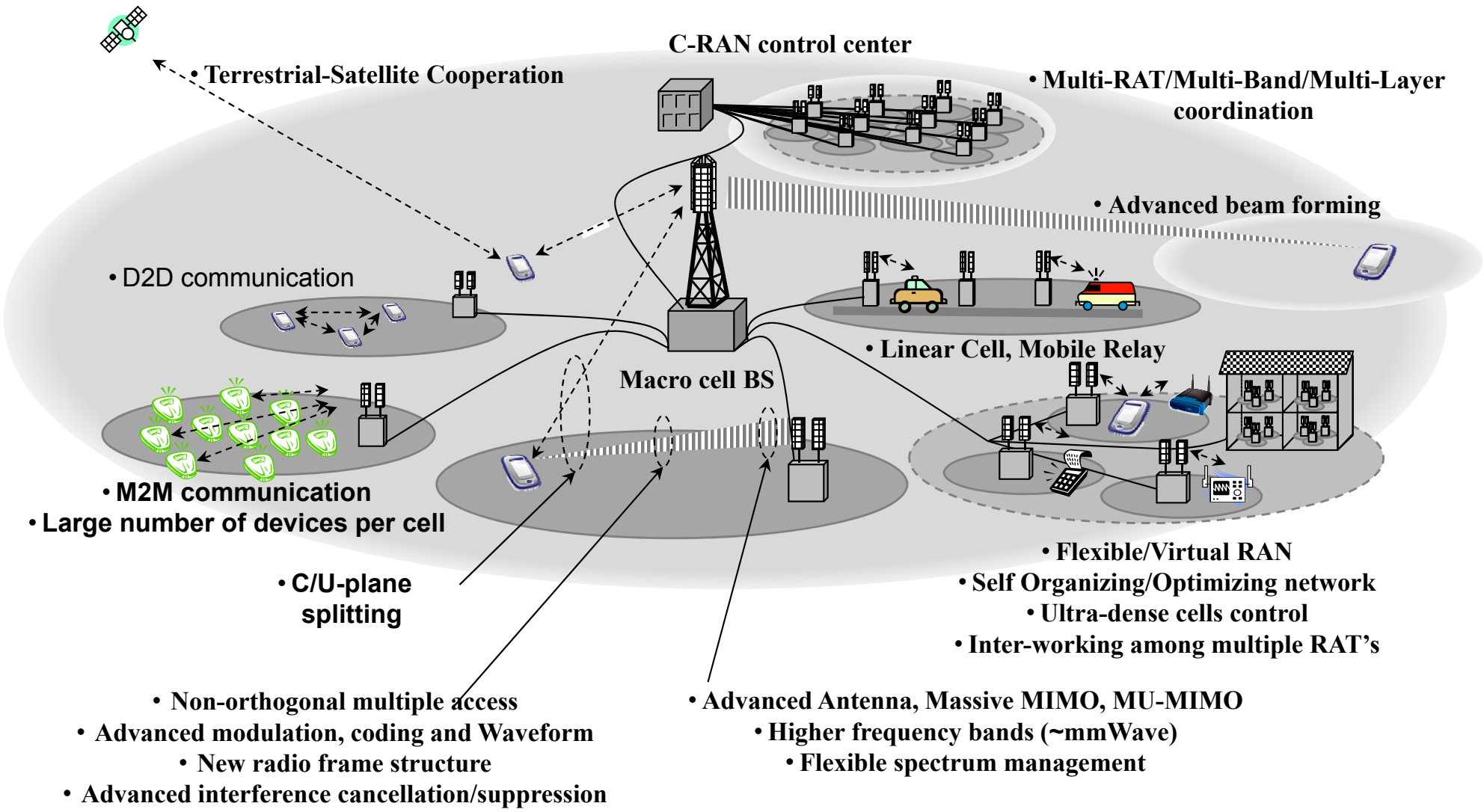


5GMF Members

Members:84 (as of 7 Oct. 2015) Ordinary members:67, Individual members:14, Special members: 3 (MIC, ARIB, TTC)

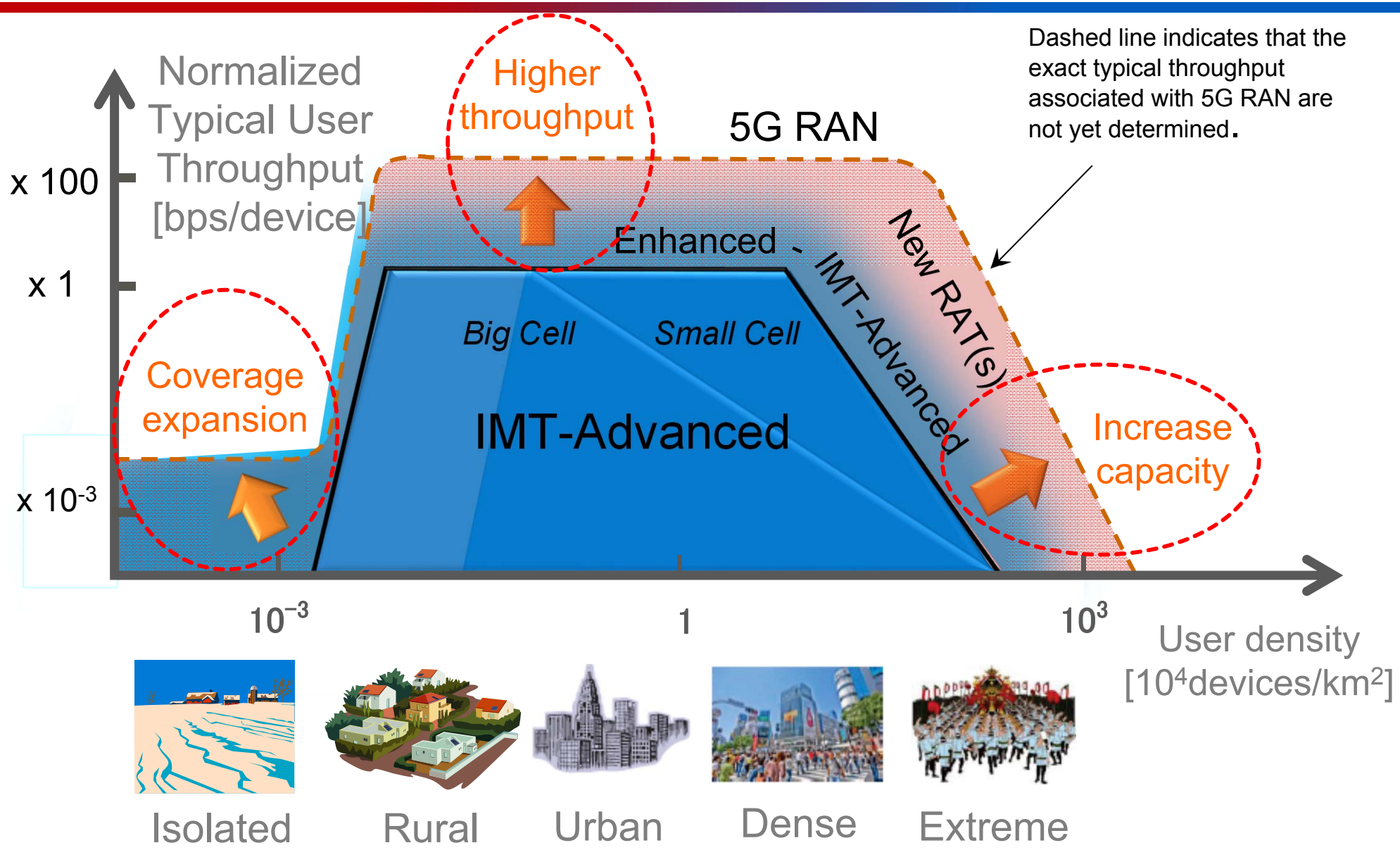
3. 5G mobile Concept in 5GMF

Radio Access Technologies for 5G mobile



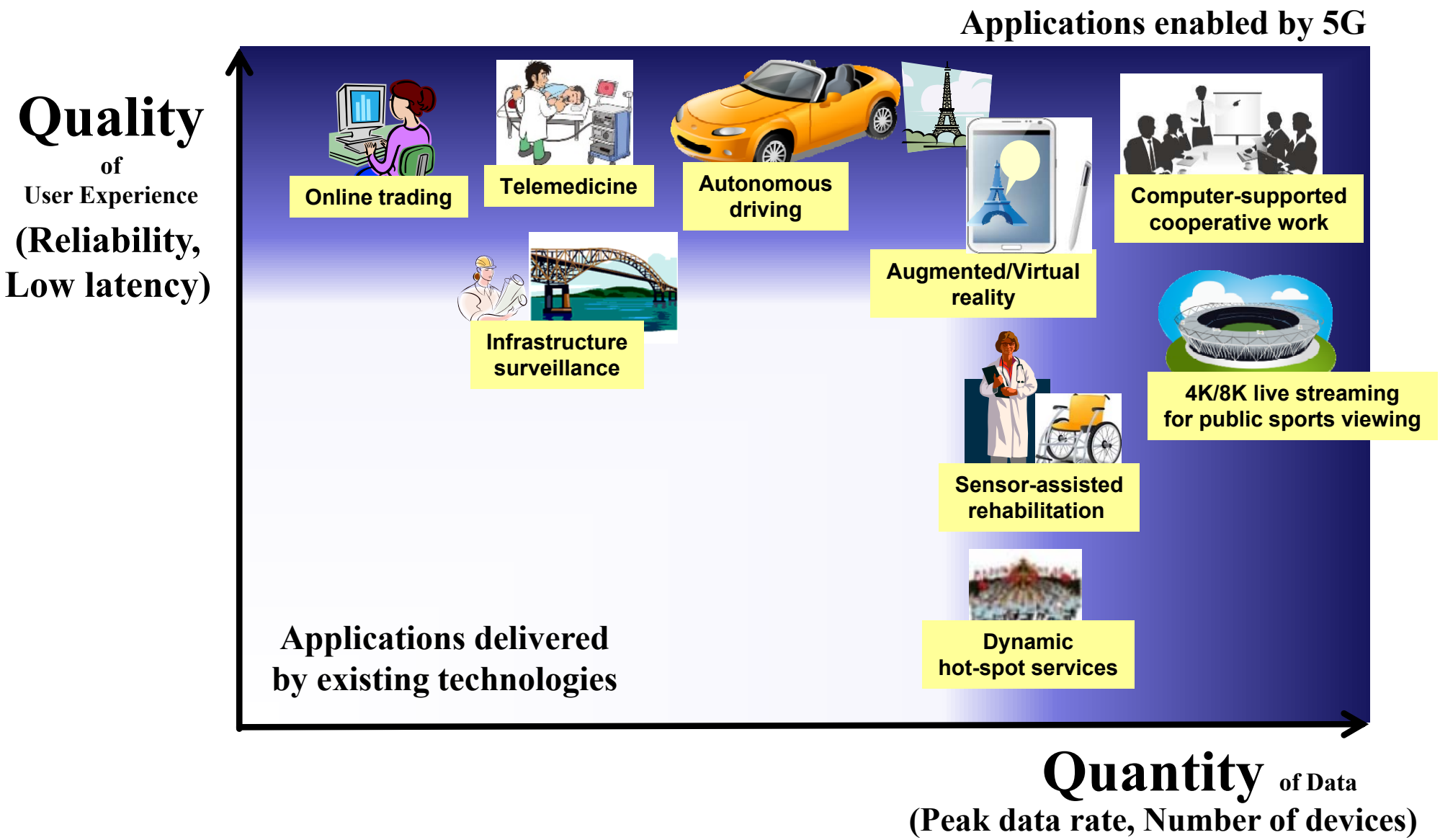
"Mobile Communications Systems for 2020 and beyond", ARIB 2020 and Beyond Ad Hoc Group White Paper, October 2014.

Framework for 5G RAN



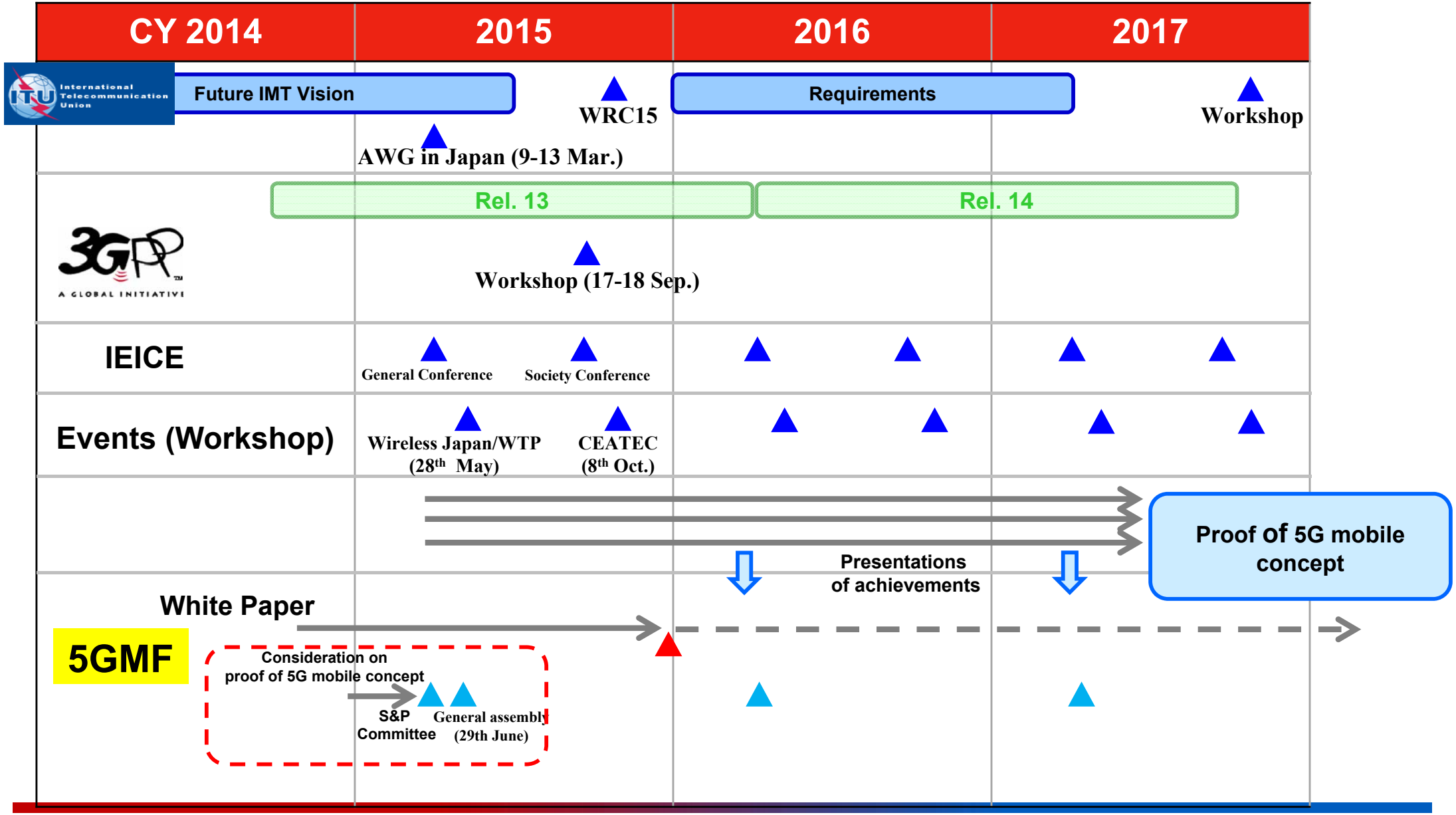
"Mobile Communications Systems for 2020 and beyond", ARIB 2020 and Beyond Ad Hoc Group White Paper, October 2014.

Potential Application enabled by 5G mobile



4. Action plan toward 5G mobile

4.1 Action plan (mid-term) of 5GMF



4.2 5G Integrated Verification Trial

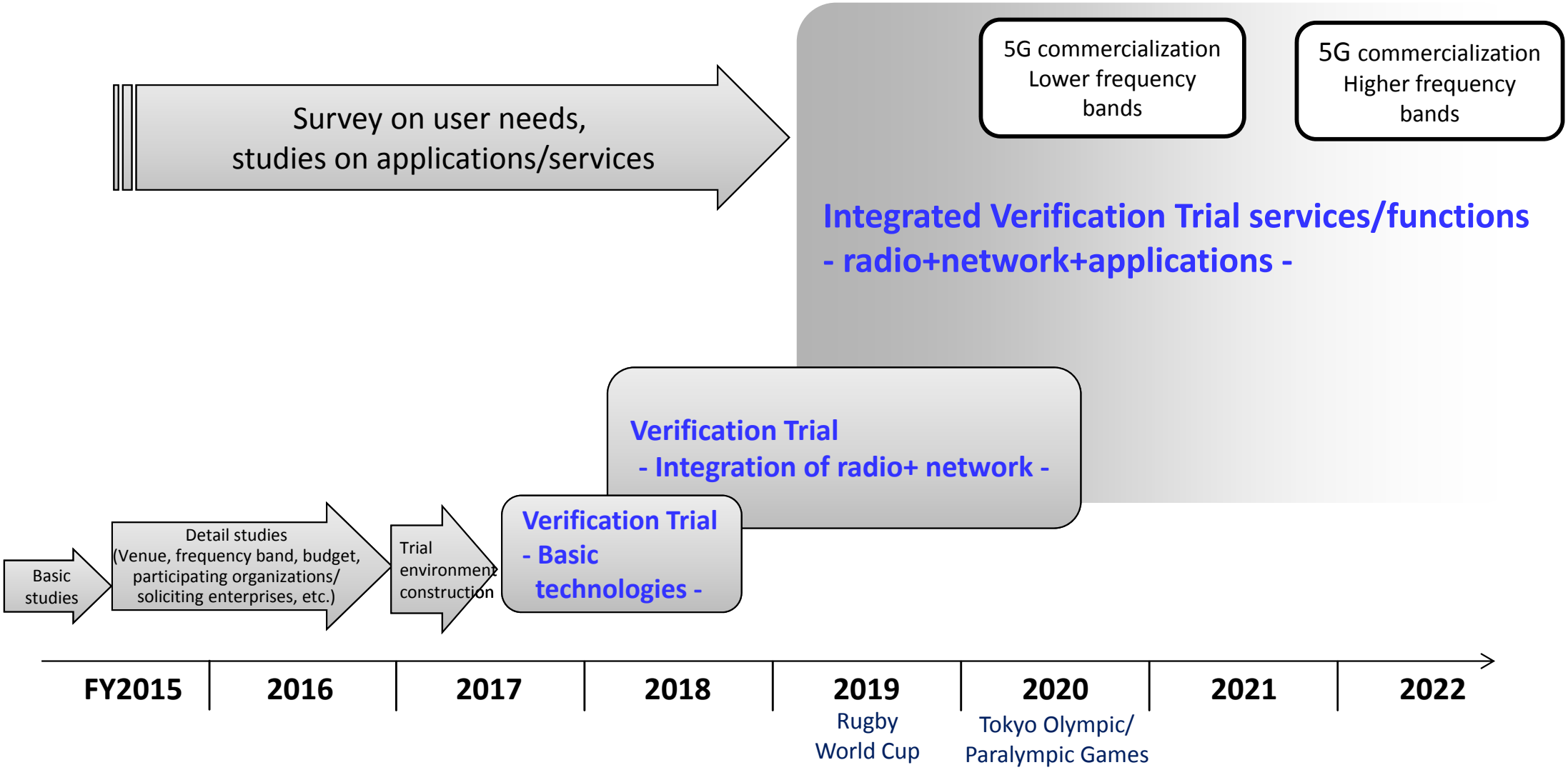
- Objectives：
  - Estimation of research and development result in 5GMF activities
  - Estimation of the operation of an overall 5G mobile
  - Demonstration of outputs on 5GMF to domestic and international organizations
  - Promotion for practical use of 5G mobile

Aims of 5G Integrated Verification Trial

- Launch an integrated verification trial in FY2017 connecting radio access, network, and applications to ensure smooth commercialization of 5G systems by 2020.
- Evaluate 5G services in actual environments, after evaluating basic functions in the initial phase, in order that the views of application developers and users are reflected as research and development efforts progress.
- Contribute to global R&D and standardization efforts of 5G systems by having an open environment for the verification trial in Japan, allowing for participation of relevant parties, enterprises and universities involved in 5G systems research worldwide, thereby accelerating the widespread adoption of 5G systems.

Schedule Overview

Verification to commence from FY2017



Spectrum to be Used for Verification Trial

- Both lower frequency bands (frequency bands used in existing systems, below 6GHz) and higher frequency bands (centimeter, millimeter waves) to be included in the scope of verification trial.
- The specific frequency bands to be used in the verification will be selected in the course of finalizing the details of the system to be evaluated.

Integrated Verification Trial Participants

- Open to general participation by any enterprise agreeing to the "Aims of Verification" in Japan and abroad including:
  - Parties involved in the research and development promoted by the Ministry of Internal Affairs and Communications
  - 5GMF Members
  - Other carriers, vendors, application developers, etc.
- Broad participation of relevant parties is desired in light of the trial's nature: an integrated verification trial combining radio, network and applications

Venue

- Tokyo (In view of the 2020 Tokyo Olympic/ Paralympic Games)
- Local cities

Verification Trial Plans (Conceptual)

- Select typical urban indoor/outdoor environments as venues for the verification trial
  - Outdoor: Vehicular areas, street canyons, open squares
  - Indoor: Shopping mall, offices
- Solicit experiments for speed/capacity enhancement and latency improvement in each environment
- Antenna installations will be shared by multiple trial participants to the extent possible
- Each trial participant will use different frequency bands. Frequency sharing conditions to be confirmed.

5. Global collaboration on 5G

Global Collaboration on 5G (1)

- **Collaborate bilaterally with other organizations**
  - **5G PPP**
    - Meeting, Munich, 11 April 2014
    - MoU signed, Frankfurt, 25 March 2015
  - **Korea 5G Forum**
    - Meeting, Tokyo, 19 August 2013
    - Meeting, Tokyo, 3 July 2014
    - MoU signed, Tokyo, 6 April 2015
  - **Wireless World Research Forum（WWRF）**
    - MoU signed , e-mail, 21 August 2015
  - **Indonesia 5G Forum**
    - MoU signed , Bali (Indonesia), 21 September 2015
    - Meeting, Bali (Indonesia) , 22 September 2015

Global Collaboration on 5G (2)

- **Hold workshops on 5G related issues**
  - CEATEC-Japan, Chiba, 8 October 2014
  - 18th Meeting of the APT Wireless Group, Kyoto, 9 March 2015
  - Wireless Technology Park, Tokyo, 28 May 2015
  - CEATEC-Japan, Chiba, 8 October 2015

Global Collaboration on 5G (3)

- **MOU exchange ceremonies with 5G associations worldwide**
  - 5G Infrastructure Association : 25 March 2015
  - Korea 5G Forum : 6 April 2015
  - Wireless World Research Forum(WWRF) : 21 August 2015 (e-mail)
  - Indonesia 5G Forum : 21 September 2015

6. Summary

Summary(1): Target of 5GMF

- **Lead R&D and international standardization to implement 5G mobile for 2020 and beyond**
  - Publish White Paper and Implementation roadmap
- **Demonstrate verification tests on Proof of Concept**
  - Summarized the results of pre-verification research by the end of June 2015 and call for the participation of 5GMF members
  - Perform verification tests (mobile network + wired network + mobile application) from FY 2017
- **Contribute actively internationally through collaboration with international organizations**
  - Promote the sharing information and vision for 5G mobile with overseas organizations in Europe (5G-PPP), Korea (5G Forum), China (IMT-2020 PA, FuTURE Forum), etc

Summary(2): Goals of 5GMF

International collaboration and Standardization

Innovation by R&D through Industry-Academia -Government Cooperation

The Fifth Generation Mobile Communications Promotion Forum

5GMF leads the discussion of 5G mobile in the world

Thank you
for your kind attention!

http://5gmf.jp/en/