

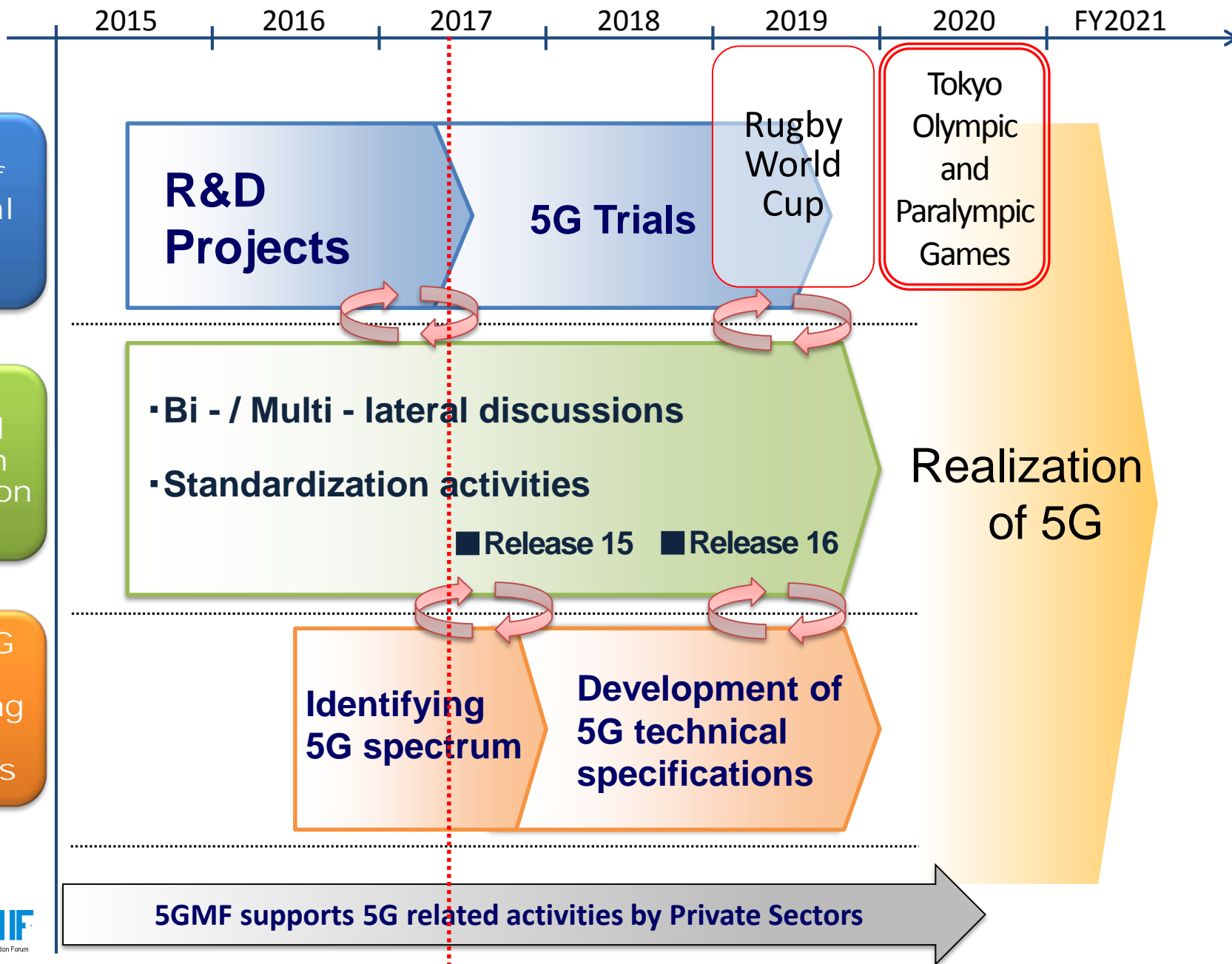
# 5G Initiatives in Japan

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**May 24, 2017**


Ministry of Internal Affairs and Communications (MIC),  
Japan

# 5G Development Roadmap toward 2020 in Japan



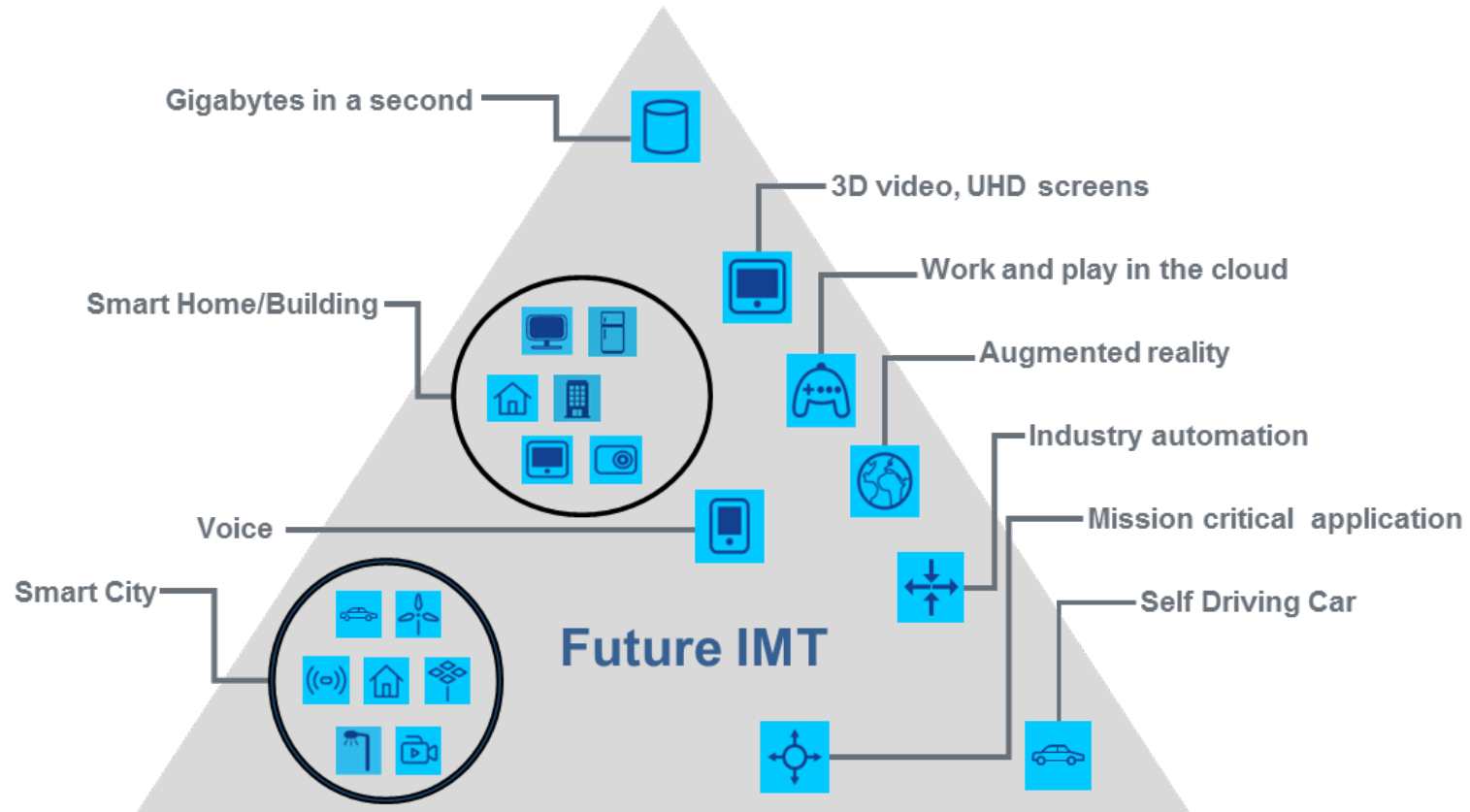
- Information and Communications Council started its study [October 12, 2016]

## (Study Items)

- Key Concepts
  - Network Architecture
  - Use Cases and Models
  - Requirements
  - Migration Scenario (4G to 5G)
- 
- Identification of 5G Spectrum
  - Development of Technical Specifications

- The first report of the Council will be available around Summer 2017. The study will go forward.

(**eMBB** : Enhanced mobile broadband)



(**mMTC** : Massive Machine Type Communication)

(**URLLC** : Ultra reliable and low latency communication)

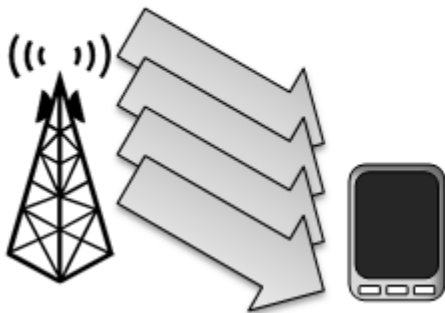
## ~4G: Best effort

- Broadband
- Difficulty to cover every use case

## ~5G: Ultra flexibility

- Providing required quality

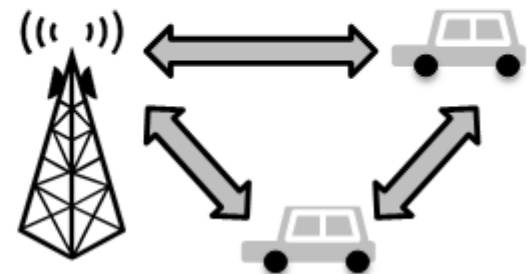
enhanced  
Mobile BroadBand

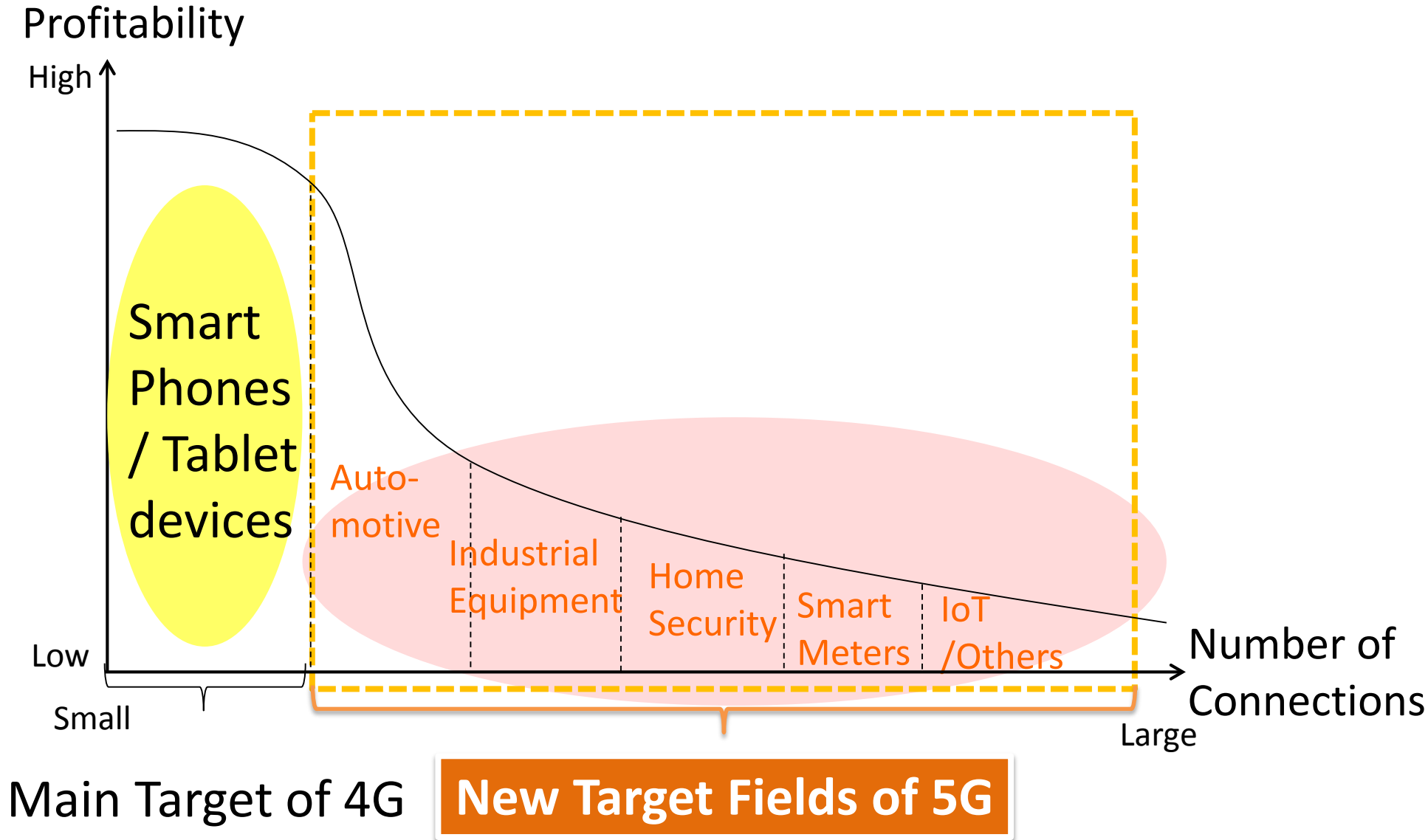


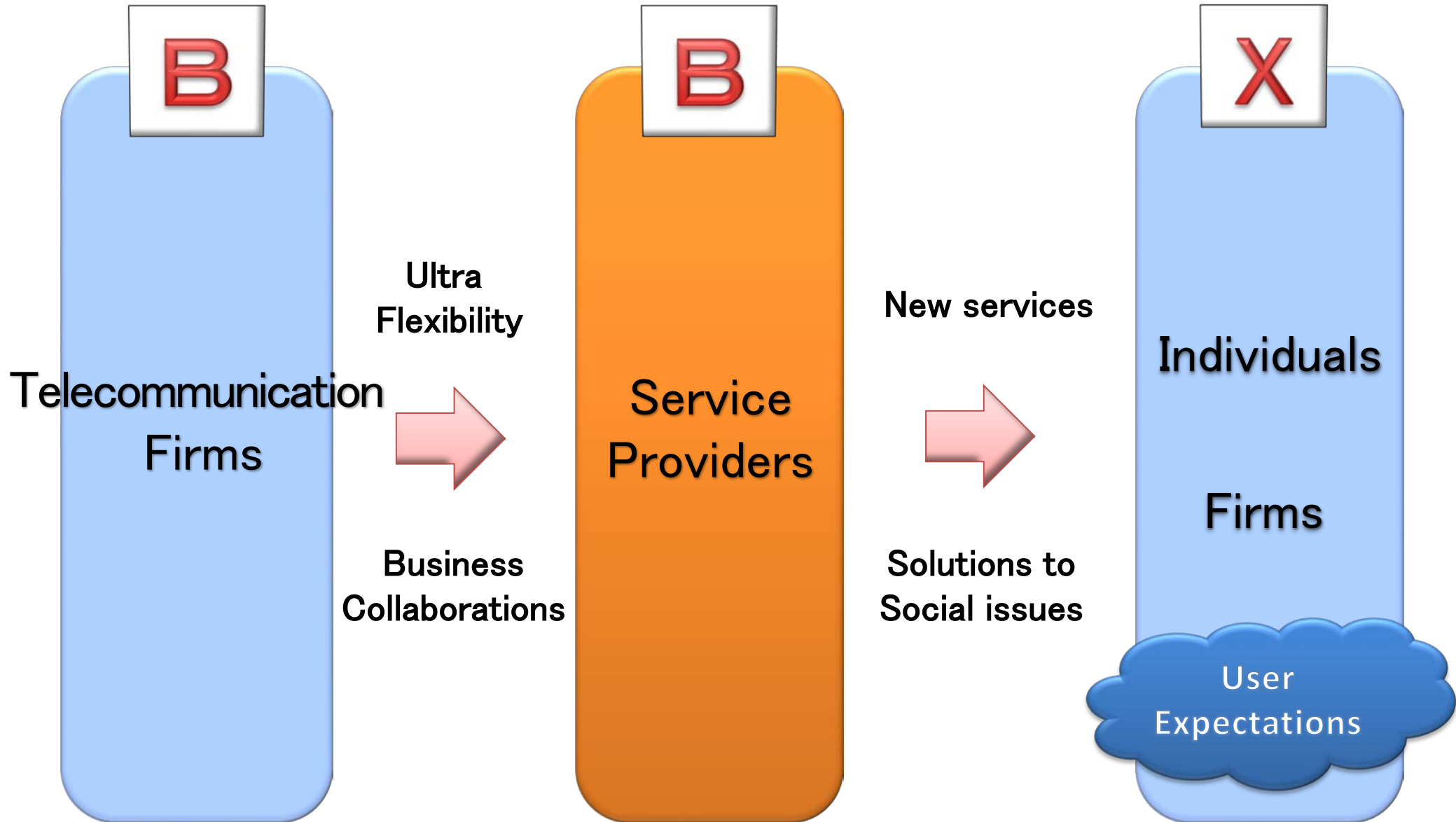
massive Machine Type  
Communication



Ultra Reliable and  
Low Latency Communication







## [Period]

FY 2017 – FY 2019 (3 years)

## [Places]

Tokyo + Local areas

## [Places]

Tokyo + Local areas

## [Radio Spectrum]

below 6 GHz, 28 GHz

## [Test Environments]

- Urban micro-cell or Urban macro-cell
- Suburban macro-cell or Rural macro-cell
- Indoor hotspot

## [Key Capabilities]

- eMBB (10Gbps peak data rate)
- mMTC (1 million connected devices/km<sup>2</sup> )
- URLLC (1ms over-the-air latency)



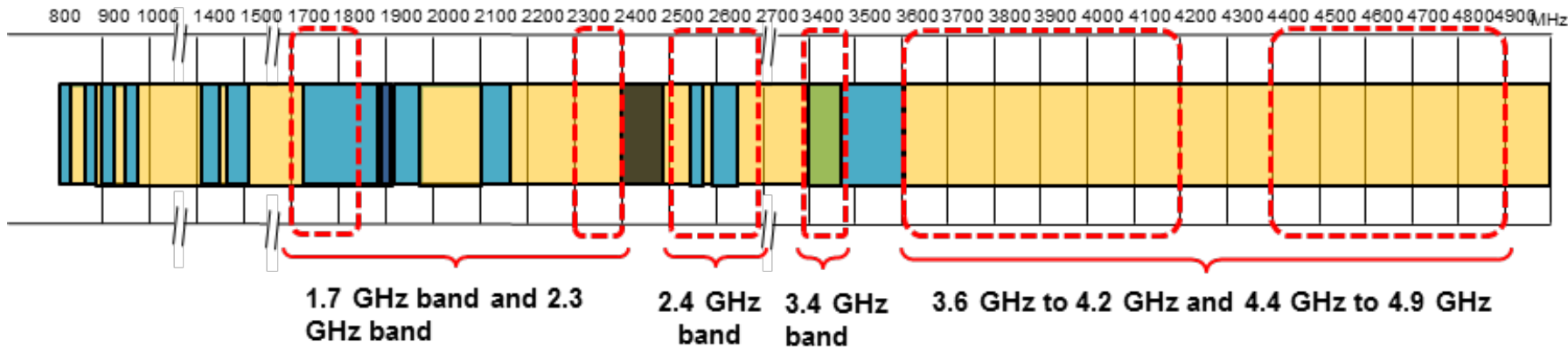
# 5G Field Trials in Japan (2)

	Responsible Organization	Main Partners	Trial Overview	Main Trial Locations	Technology
<b>I</b>	NTT DOCOMO	<ul style="list-style-type: none"> <li>▪ TOBU TOWER SKYTREE</li> <li>▪ ALSOK</li> <li>▪ Wakayama Pref.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sightseeing</li> <li>▪ Smart Cities</li> <li>▪ Medical Services</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tokyo</li> <li>▪ Wakayama</li> </ul>	eMBB
<b>II</b>	NTT Communications	<ul style="list-style-type: none"> <li>▪ Tobu Railways</li> <li>▪ Infocity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Transport</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tochigi</li> <li>▪ Shizuoka</li> </ul>	eMBB
<b>III</b>	KDDI	<ul style="list-style-type: none"> <li>▪ Obayashi Corp.</li> <li>▪ NEC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Saitama</li> </ul>	URLLC
<b>IV</b>	ATR	<ul style="list-style-type: none"> <li>▪ Naha City</li> <li>▪ Keikyu Railways</li> </ul>	<ul style="list-style-type: none"> <li>▪ Entertainment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Okinawa</li> <li>▪ Tokyo/HND</li> </ul>	eMBB
<b>V</b>	Softbank	<ul style="list-style-type: none"> <li>▪ Advanced Smart Mobility Co., Ltd.</li> <li>▪ SB Drive Corp.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Transport</li> </ul>	<ul style="list-style-type: none"> <li>▪ Yamaguchi</li> </ul>	URLLC
<b>VI</b>	NICT	(TBD)	<ul style="list-style-type: none"> <li>▪ Logistics</li> <li>▪ Smart office</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hokkaido</li> <li>▪ Osaka</li> </ul>	mMTC

\* Based on current plans, which are subject to change.

# Candidate Frequencies for 5G

## Below 6GHz



- Assigned (mobile phone)
- Bandwidth during the transition of the frequency band of existing radio
- Assigned (wireless LAN (indoors only))
- Band used by other radio stations (satellites, broadcasting, etc.)
- Studying new allocation to mobile communications

## Above 24GHz

20 - 30 GHz	30 - 40 GHz	40 - 50 GHz	50 - 60 GHz	60 - 70 GHz	70 - 80 GHz	80 - 90 GHz
24.25 - 27.5	29.5	31.8 - 33.4	33.4 - 37	40.5 - 43.5	43.5 - 47	47 - 50.2
52.6	66	76	81	86		

28 GHz band

■ 5G candidate frequency band at WRC-19