Broadband Policy in Japan

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Utilization environment of broadband (estimation)
(Household coverage rate of service area ※1)

### Ultra high-speed broadband ※2
- **The end of March, 2011**: 92.7%
- **The end of March, 2012**: 97.3% (96.5%)
- **The end of March, 2013**: 99.4% (97.5%)
- **The end of March, 2014**: 99.9% (98.7%)

### Broadband ※2
- **The end of March, 2011**: 100% (99.2%)
- **The end of March, 2012**: 100% (99.7%)
- **The end of March, 2013**: 100% (99.8%)
- **The end of March, 2014**: 100% (99.9%)

**The end of March, 2015**
- **about 100%** (99.0%)
- **55.94 million households**

**The end of March, 2014**
- **100%** (99.9%)
- **55.95 million households**

【Total households: 55.95 million】

※1 The number of potential households in the area, which is estimated under a certain assumption using information from business operators based on the Basic Resident Register, divided by total households (rounded off to one decimal place).

※2 Focusing on the functions of Broadband infrastructure, broadband is classified into the following categories. Transmission speed is best-effort, and the maximal rate may not be possible depending on the conditions of line usage and Entrance link.

**Ultra high-speed broadband**: FTTH, Cable internet, FWA, BWA, LTE (limited to downstream transmission speeds of 30Mbps or more, except for FTTH and LTE) The numbers in parenthesis are data for only fixed broadband service.

**Broadband**: FTTH, DSL, Cable internet, FWA, Satellite communication, BWA, LTE, 3.5th generation. The numbers in parenthesis are data for only fixed broadband service.
As of the end of December 2015, the number of the subscribers to FTTH is 27.6 Million. (4.7% increase from the previous year)

As of the end of December 2015, the number of the subscribers to LTE is 82.8 million. (33.7% increase from the previous year)

- **FTTH**: 27.9 Million
- **DSL**: 3.2 Million
- **CATV**: 6.7 Million
- **FWA**: 10,000
- **LTE**: 82.8 Million
- **BWA**: 35.2 Million
Policy targets on broadband deployment

2001

- Basic Law on the Formation of an Advanced Information and Telecommunications Network Society (January 2001)
- e-Japan Strategy (January 2001)
- e-Japan Strategy II (July 2003)

Target: Connect 30 million households to high-speed Internet and 10 million households to Ultra high-speed Internet in 5 years

2005

Target: Elimination of areas where broadband remains unavailable by FY 2010

- IT New Reform Strategy (January 2006)

Target: (a) Ensure that all households have access to broadband by the end of FY 2010
(b) Ensure that 90% households have access to Ultra high-speed broadband by the end of FY 2010

2010

- Strategy for bridging digital divide (June 2008)
- New Broadband Super Highway (Hikari no Michi)

2015

Target: All households have access to Ultra high-speed broadband by around 2015

- Declaration of the Creation of the Most Advanced IT Nation in the World (New IT Strategy)
- 2013.6

Bridging the digital divide (benefits from facilitation and utilization of data distribution)
In order to make a secure environment for all people who want to utilize IT, improve and secure the infrastructure such as with Ultra high-speed broadband and mobile in local areas, while taking into account regional characteristics, even in unprofitable areas such as remote islands.
The Basic Act on the Formation of an Advanced Information and Telecommunications Network Society (Act No. 144 of 2000) provides the division of roles among the Government of Japan, local public entities and the private sector in the formation of an advanced information and telecommunications network society.

**Private Sector**

In principle, the Private Sector plays the leading role in the formation of an advanced information and telecommunications network society.

**Government of Japan**

- Take actions for creating an environment more reciprocative to enabling the private sector to exert its full vitality, for example by encouraging fair competition.
- Take actions to reduce the disparity in the opportunities for using information and telecommunications technologies and in the ability to use them derived from geographical constraints, age, physical circumstances and other elements.
- Implement legislative, financial and other measures necessary to execute the above-mentioned strategies.

**Local Public Entities**

- Take actions for creating an environment more reciprocative to enabling the private sector to exert its full vitality.
- Develop and execute autonomous strategies that reflect the distinctive features of their own areas.
To promote the deployment of ultra high speed broadband infrastructure that is important and indispensable for local vitalization, the central government gives subsidies toward project costs to local governments that have **areas under disadvantageous conditions** such as sparsely populated areas and remote islands.

### Summary

- Subsidizing 1/3 of the installation cost of optical fiber lines and accessories in **areas under disadvantageous conditions**, such as sparsely populated areas and remote islands, (1/2 in the case of local governments whose financial capability index is less than 0.3, 2/3 in the case of remote islands) if such optical fiber lines are installed by local governments.
- The local governments usually loan the installed optical fiber lines and accessories to telecommunications carriers that use the facilities and provide public facilities (educational/medical facilities), local residents with Internet services.

### Image

[Diagram showing broadband deployment with nodes such as Internet, Telecom Operator, Medical Institutions etc., Houses, City Hall etc., Education Facilities etc.]
Although fiber to the home (FTTH) covers a large part of the city, the development of FTTH in some mountainous areas requires a large amount of money. Therefore, these areas are covered by fixed wireless access (FWA) for cost reduction.

- Transmission speed:
  - FTTH: Uplink: up to 200 Mbps; Downlink: up to 200 Mbps
  - FWA: Uplink: Up to 150 Mbps; Downlink: Up to 150 Mbps
- Maintenance period: March 16, 2012 - March 31, 2014
- Total project cost: About 2.8 billion yen (including a state subsidy of approximately 900 million yen)
Deployment case (laying of submarine optical fiber)

Only submarine optical fiber as a relay line is maintained in a municipality on a remote island

[Kikai-cho]
Population: 7,293; Number of households: 3,453 (as of October 1, 2015)

Features

The local government on remote islands deploy the laying of trunk lines, including submarine optical fibers, to provide ultra high-speed broadband services by using the subsidy.

- A private business is currently developing access lines in the island.
- Maintenance period: March 2014 - March 2015
- Total project cost: Approximately 1.2 billion yen (including a state subsidy of approximately 800 million yen)
Increase of Mobile Data Traffic

Average Monthly Mobile Data Traffic

Increased approx. 13 times over the past 5 years!
Key Capabilities of 5G

✓ Key Capabilities for 5G (IMT-2020):

1. Ultra high speed data (eMBB) – Peak data rate **10Gbps** (100 x current LTE)
2. Ultra Low Latency (URLLC) – Ultra Low Latency **1ms** (1/10 of current LTE system)
3. Massive Machine Type Connections (mMTC):
   - Connection Density **100 devices/km²** (100 x current LTE)

✓ 5G is expected to **create a new market as a key infrastructure of IoT**

Ex: Quick transmission of Ultra high definition TV (4K/8K). comparable to optic fiber

Large numbers of devices, sensors and terminals

Ex: Massive Simultaneous Connections for **sensor networks** in small area, Smart Meters, Infrastructure Maintenance etc.

Ultra High Speed Data (eMBB)

Key Capabilities for 5G

Massive Machine Type Connections (mMTC)

Ultra Low Latency (URLLC)

Self Driving Cars

Ex: Self Driving, Remote control Robots (**real-time remote control**, IoT for mission critical)

Source: MIC, Nikkei Communications 4/2015
5G Roadmap towards 2020

✓ Promote three activities to support 5G realization for 2020 and beyond
  1. Support activities by Fifth Generation Mobile Forum (5GMF)
  2. R&Ds on 5G Technologies through Industry-Academic-Government Cooperation
  3. Standardization Activities at the ITU and 3GPP
✓ The 5G System Trial to test radio access, networks, and applications for 5G will be started in Tokyo and local cities of Japan in FY2017
Promoting the following projects from 2017 for the achievement of 5G services in 2020 ahead of the rest of the world.

**Promotion of 5G implementation project**

**Wireless IoT project**
- Supporting a large number of simultaneous connections.
- Achieving the world of the IoT where the number of things (e.g., sensors) connected will increase several hundred times.

**Ultra-broadband project**
- Supporting ultra-high speed.
- Providing broadband services 100 times as fast as the current mobile communications systems.

**Next-generation ITS project**
- Ensuring ultra-low latency.
- The connected cars and cloud on the network will link together and provide new services.

**Research and development for the realization of a pilot model.**
- Promoting research and development with a demonstration of elemental technologies toward the achievement of a pilot model system assuming utilization scenes including wireless realistic performance and next-generation connected cars.

**Development of 5G test beds**
- Developing open test beds of user participation type
- Creating new regional-type services by developing them in regional areas as well as Tokyo.

**Securing global frequencies**
- Securing frequency bands in addition to international standard bands in coordination with major countries promoting 5G proactively.
- Frequency expansion for wireless LAN use

**Promotion of international standardization and international expansion**
- Construction of a strategic partnership with other countries (e.g., an expansion of initiatives, such as the joint declaration of Japan and the EU)
- Promotion of international standardization under public-private cooperation.
New Service Image Brought by IoT/BD/AI

Healthcare
- Detects abnormality with wearable terminal, thus providing usual hospital services at home.

ICT education
- Connecting each person’s terminal over the Wi-Fi network to provide optimum learning tools to everyone according to his/her individual proficiency.

Smart cities
- Connecting a large number of transportation services over the network to support safe automatic driving in urban areas.

Smart farming
- Connecting numerous sensors to farmland and livestock for the management of each individual animal according to the environment and growth with no work force required.

Challenges of achieving social changes

Data utilization and application
- Development of utilization and application rules to promote the proactive use of a vast amount of data.
- Utilization of AI and robots that will ensure highly advanced, instantaneous data processing and distribution.

Human resource development in the future
- A quantitative and qualitative expansion of specialized ICT human resources with skills for the IoT era.
- Proactive utilization of IT, including clouds, Wi-Fi, and programming, for school education.

ICT infrastructure development in the future
- An ultra-high-speed and ultra-high-capacity network to achieve the simultaneous connection of a large number of points with low latency.
- Software control to ensure network operation flexibility.
- Cyber security measures to ensure the safety and security of data.

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G7 ICT Strategy

• Based on the foregoing principles, we support the following strategies to realize the potential of the digitally connected world.

• i. Promoting access to ICT
  (a) bridge digital divides;
  (b) improve the quality and affordability of ICT infrastructure, products and services globally, through investment and fair and transparent policy and legal frameworks that encourage competition;
  (c) promote accessibility and digital literacy for everyone; and
  (d) respect cultural and linguistic diversity.

• ii. Strengthening international collaboration for promoting the free flow of information, privacy protection and cybersecurity
  (a) promote cross-border information flows;
  (b) promote privacy and data protection; and
  (c) promote cybersecurity.

• iii. Fostering innovation
  (a) open markets;
  (b) promote interoperability through standards;
  (c) promote open data policies;
  (d) develop human capital;
  (e) protect intellectual property; and
  (f) facilitate R&D and adoption of emerging technologies.

• iv. Using ICT to address global challenges and opportunities

• v. Strengthening comprehensive international cooperation and collaboration