Project Overview

Aiding the elderly and those with disabilities to promote a vibrant and diverse society.
Assisting the organizers and athletes in the 2020 Paralympic Games.

Social Landscape / Social Agenda

As a world leader in addressing the societal challenges of an aging population, Japan must promote a progressive social model.

As the world faces an aging population, Japan is expected to be a role model of an inclusive society. It is necessary to create a social system, including services and hardware, to enable the elderly, the disabled, and everyone else to participate equally in society.

Long-term Vision

Creating a healthy and inclusive society where everyone, including the elderly, those with disabilities, and those receiving and providing care, can live comfortably and enjoy longevity

During the Tokyo Games

Enabling everyone to engage with and enjoy the Games

Three Priorities

1 Social Impact

Demonstrating an inclusive society where the elderly and those with disabilities can engage with the Games

2 Hospitality during the Games

Providing a highly accessible environment to ensure a truly barrier-free experience for everyone

3 Shared Value

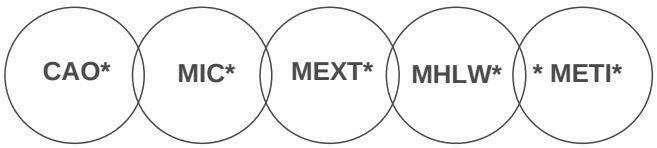
Boosting the development and adoption, both domestically and internationally, of next-generation services and hardware

Concept for 2020

Accessibility Innovation 2020

Social Participation Assistance System

Enabling the elderly and the disabled to participate in society alongside everyone else



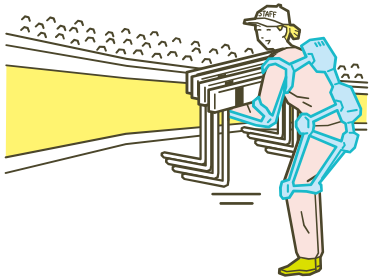
* CAO : Cabinet Office
* MIC : Ministry of Internal Affairs and Communications
* MEXT : Ministry of Education, Culture, Sports, Science and Technology
* MHLW : Ministry of Health, Labour and Welfare
* METI : Ministry of Economy, Trade and Industry

Objective and Conceptualization

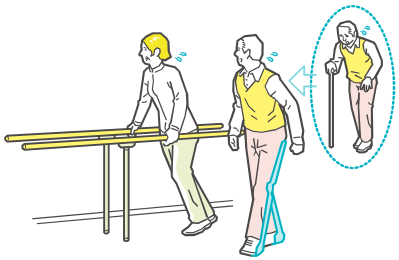
Creating a vibrant, inclusive, and diverse society by 2020, using the opportunity of the Games to showcase such a society

Plan 1 Developing devices for functional support

Example of a power-assist suit



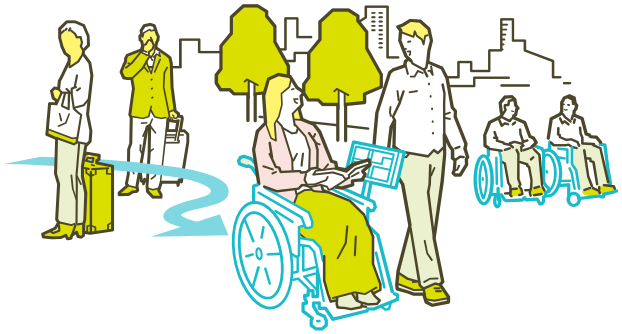
Wider application of function-supporting devices and technologies



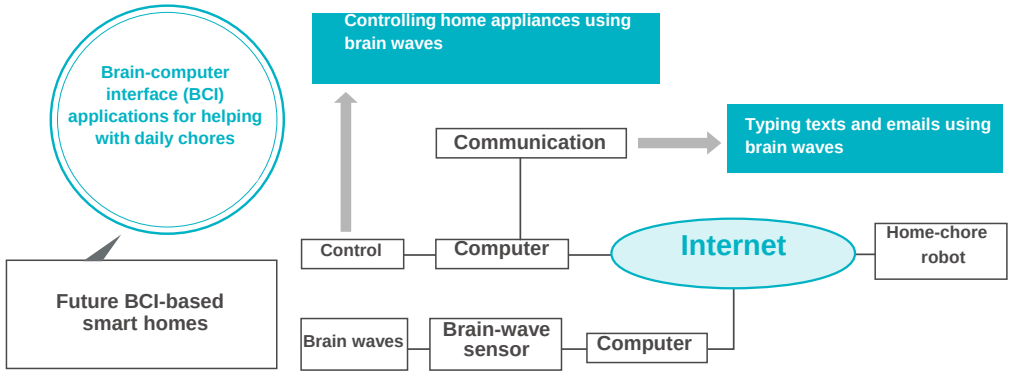
Nursing / Welfare Assisting in nursing and self-support, expanding to other areas in the future

Plan 3 Developing systems and hardware to aid mobility

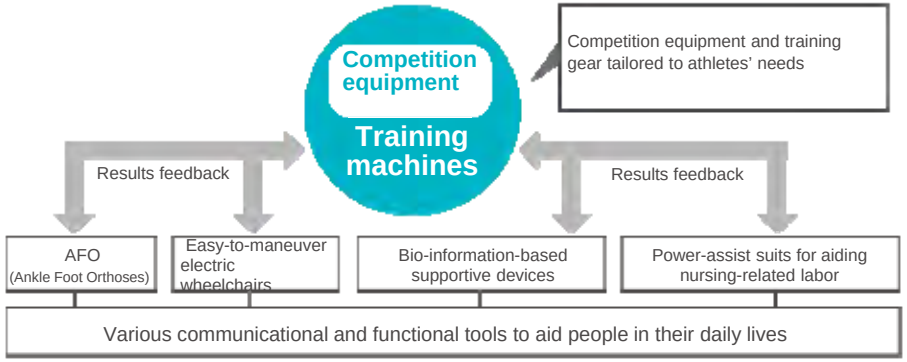
Sensor-equipped autonomous wheelchair enabling safe navigation in crowded areas



Plan 2 Promoting supportive technologies for people with significant disabilities



Plan 4 Developing high-performance gear and thermoregulation systems for all walks of life



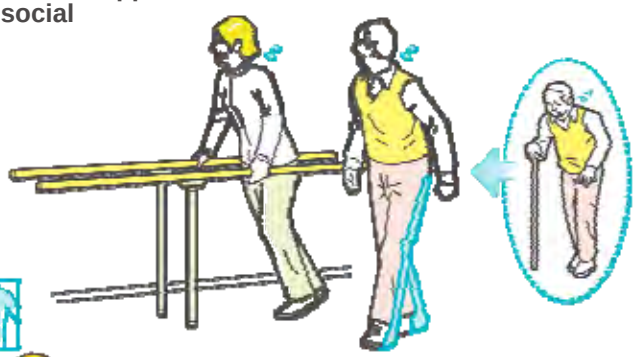
Course of Action Toward 2020

Promoting social participation and engagement with the Games, regardless of age or disability.
Developing training devices to improve the performance of Paralympic athletes.

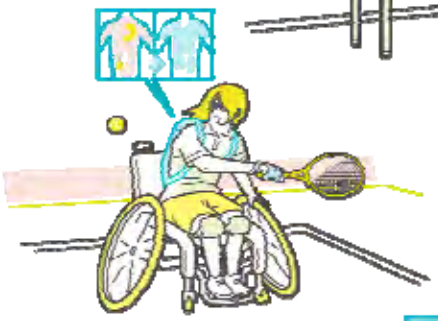
In town

Developing devices to support a wide range of social participation

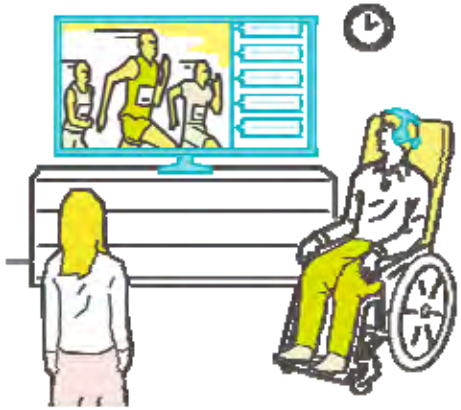
Power-assist suits to allow self-training for rehabilitation purposes



Thermoregulation to ensure safe conditions during both daily and sports activities



New communication technologies to allow everyone to enjoy the Games

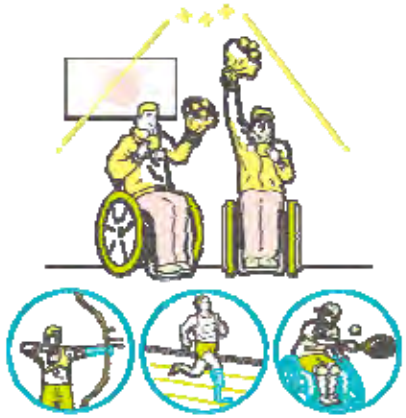


Supporting the Games

Developing equipment to support Paralympic athletes and their competition

Improved training devices to maximize athletes' potential

World-leading competition gear to help win more medals



During the Games

Developing devices to help the efficient operation of the Games
Assisting people between and around venues

Sensor-equipped autonomous wheelchair to enable safe navigation in crowded areas

Power-assist for staff

Conceptual illustrations. Subject to change.

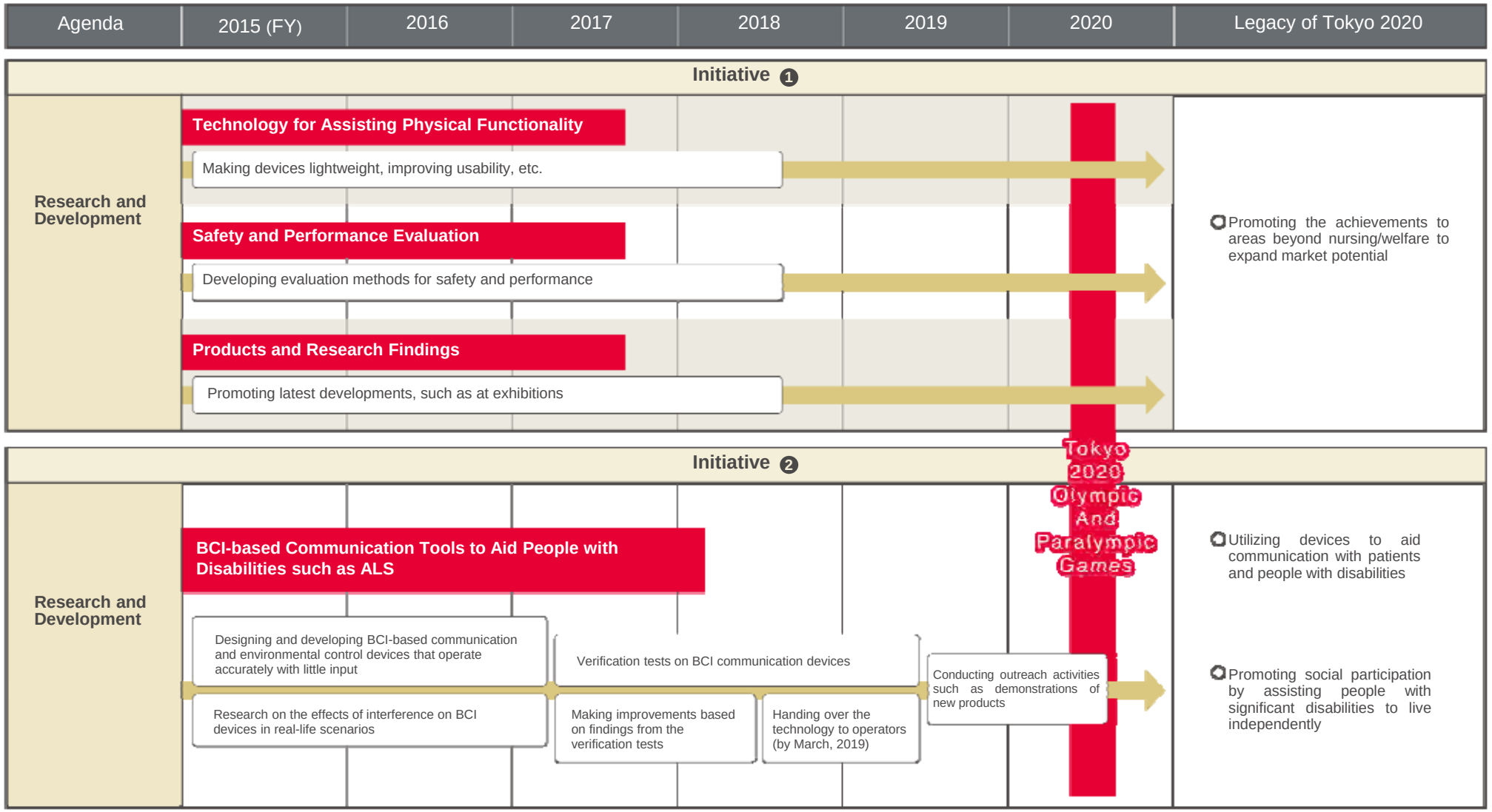
Initiatives and Partners

Initiatives		Cooperating Organizations	Details
Research and Development			
Initiative ❶	Developing technology aimed at assisting physical functions	METI*, NEDO*, AIST*	Improving physical aids — lightweight and with enhanced usability — to take into account different users and circumstances, as more varied and complex technology becomes available.
	Evaluating safety and performance		Developing new methods to evaluate the safety and performance of devices
Initiative ❷	R&D on communication methods using technologies such as BCI (brain-computer interface) for patients with ALS and other communication handicaps	MHLW* Japan Agency for Medical Research and Development (AMED) National Rehabilitation Center for Persons with Disabilities	Developing communication aids using BCI. Developing practical technology to regenerate physical functions, such as restoring cerebral functions of patients with spinal injuries
Initiative ❸	Improving sensor technologies for obstacle detection	MIC*, etc	Developing highly sensitive sensor technologies to detect obstacles, such as tiny bumps on the ground or wet surfaces that may affect the performance of mobility aids
	Developing technology to enable multiple mobility aids to operate in one area		Developing technology to enable multiple mobility aids to operate in crowded areas, such as at the Games venue
	Improving connectivity technology		Improving network technology to provide constant connection so that mobility aids can safely and accurately navigate themselves to their destination. Developing off-line control technology to ensure devices can navigate themselves even when they lose network connectivity.
	Prototyping mobility aids Developing a universal platform for mobility aids (3D map data, etc.)		Prototyping mobility aids that use communication technologies and developing a universal platform to connect such devices for deployment in the 2020 Games.
Initiative ❹	Developing robotic assistive devices	METI, NEDO	Promoting cooperation between private companies that develop robotic assistive devices and organizations/private entities (including welfare institutions) engaged in user evaluation. Supporting the development of user-friendly mobility aids and infrastructure, communication tools that are suitable for the disabled and/or a multilingual environment, and other products with a universal design.
	Developing equipment for competition, training, and conditioning	MEXT*, etc.	R&D to support athletes competing for specific Paralympic sports that are likely to bring medals to Japan. This includes custom-made equipment and uniforms/shoes for each athlete, training and conditioning devices especially designed to strengthen areas where Japanese athletes are particularly weak, and new methods for quick recovery from exhaustion.
	R&D on thermoregulation system	MHLW, National Rehabilitation Center for Persons with Disabilities	Developing a thermoregulation system to enable social participation for people with cervical cord injuries and other symptoms that cause difficulty in controlling body temperature
	Enhancing coordination between developers of competition equipment and robotic assistive devices to share information on elemental technologies	MEXT, MHLW, METI, etc.	Organizing a cooperative environment after the 2016 Rio de Janeiro Olympic and Paralympic Games to enhance coordination between developers of competition equipment and robotic assistive devices to share information on elemental technologies

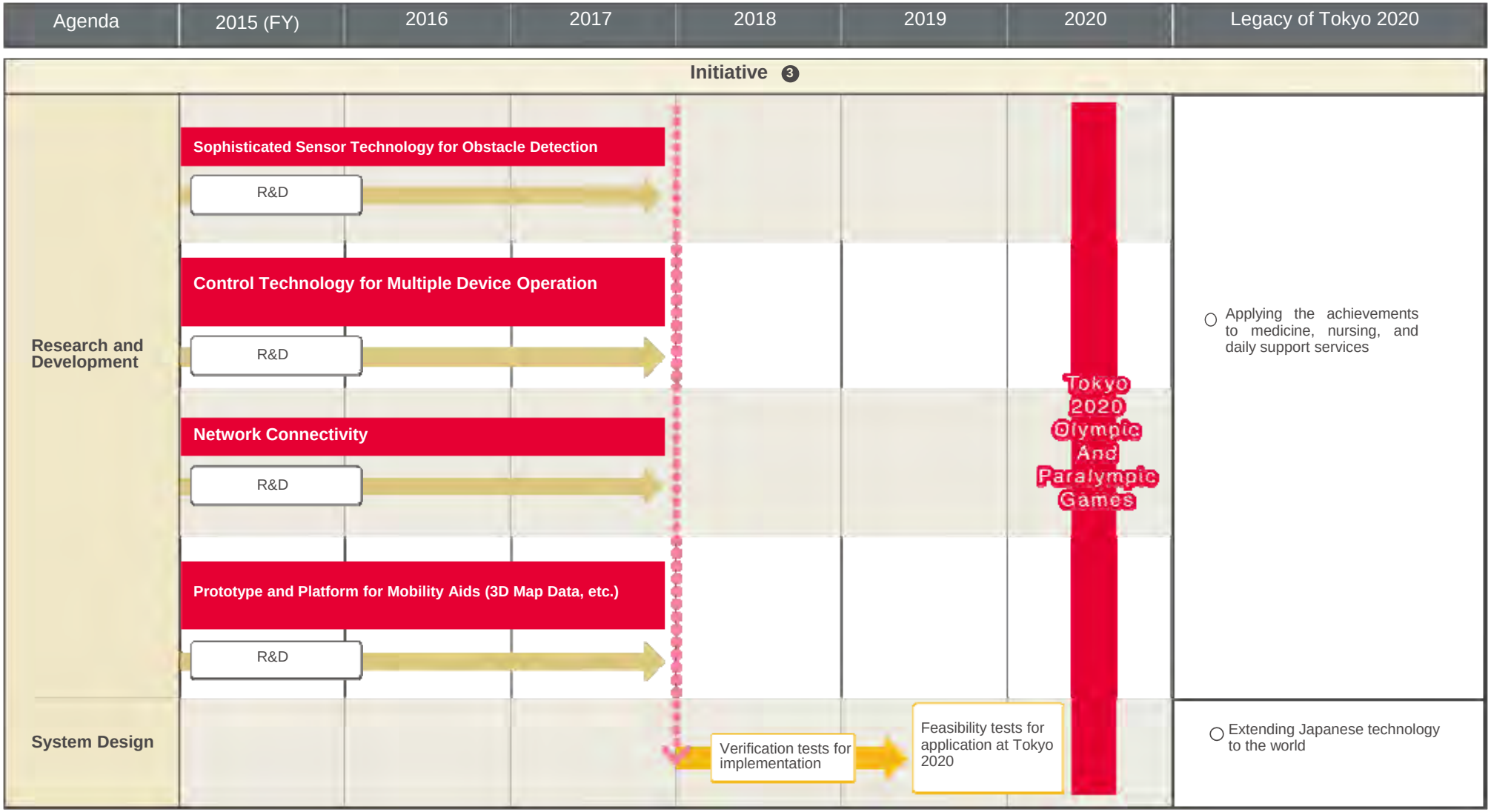
[Initiative ❶] Promoting development of versatile devices by utilizing technologies including power-suits that reduce physical burden ❷ or enhance functionality. [Initiative] Promoting devices to help people with significant disabilities
[Initiative ❸] Developing a network for mobility aid systems ❹ [Initiative] Developing high-performance, user-friendly devices for competition and nursing/welfare purposes as well as developing a thermoregulation system

* METI : Ministry of Economy, Trade and Industry
* NEDO : New Energy and Industrial Technology Development Organization
* AIST : National Institute of Advanced Industrial Science and Technology
* MHLW : Ministry of Health, Labour and Welfare
* MIC : Ministry of Internal Affairs and Communications
* MEXT : Ministry of Education, Culture, Sports, Science and Technology

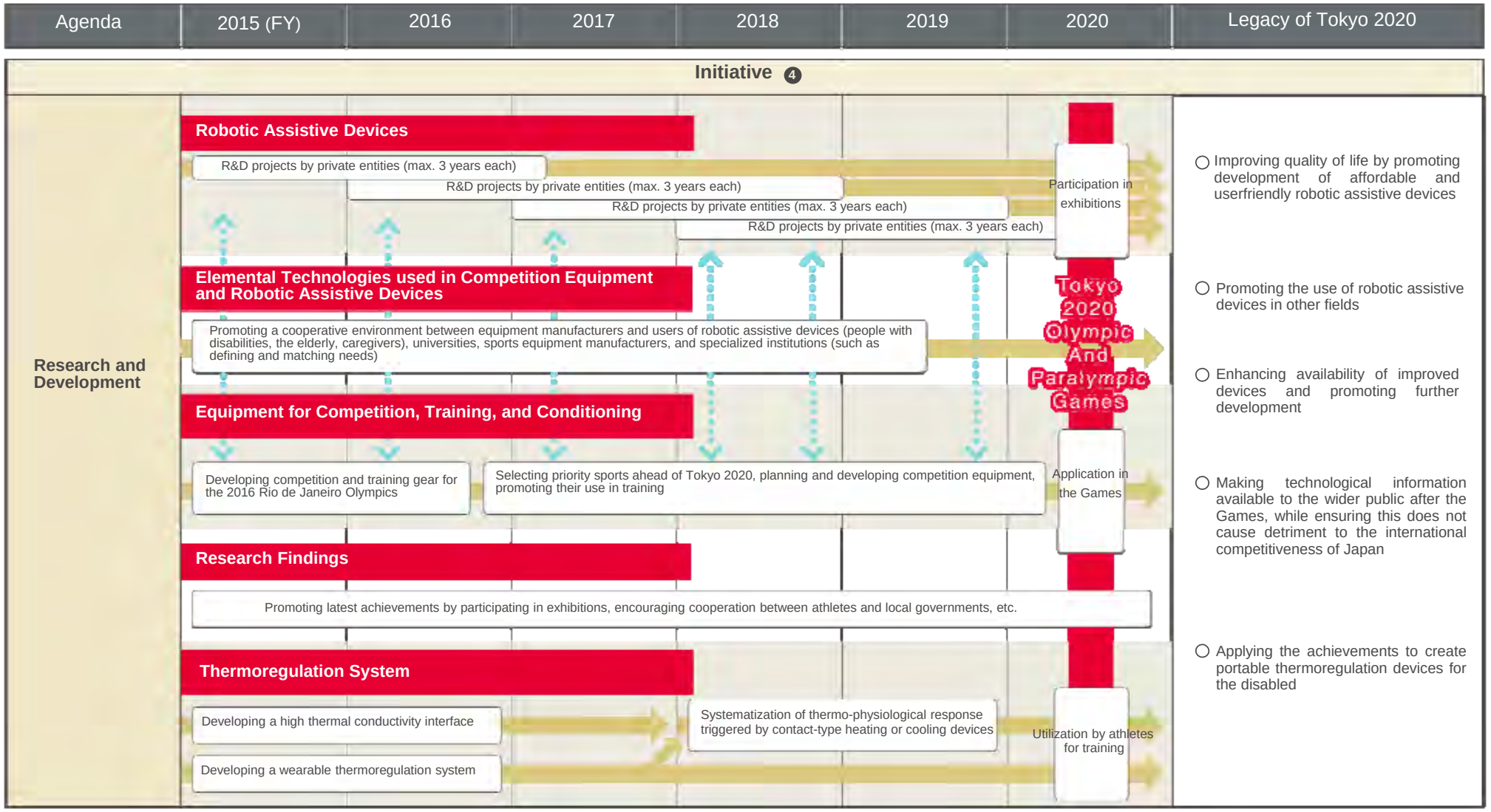
Timeline


Agenda
2015 (FY)
2016
2017
2018
2019
2020
Legacy of Tokyo 2020
Initiative 1
Research and Development
Technology for Assisting Physical Functionality
Making devices lightweight, improving usability, etc.
Safety and Performance Evaluation
Developing evaluation methods for safety and performance
Products and Research Findings
Promoting latest developments, such as at exhibitions
Promoting the achievements to areas beyond nursing/welfare to expand market potential
Initiative 2
Research and Development
BCI-based Communication Tools to Aid People with Disabilities such as ALS
Designing and developing BCI-based communication and environmental control devices that operate accurately with little input
Research on the effects of interference on BCI devices in real-life scenarios
Verification tests on BCI communication devices
Making improvements based on findings from the verification tests
Handing over the technology to operators (by March, 2019)
Conducting outreach activities such as demonstrations of new products
Tokyo 2020 Olympic And Paralympic Games
Utilizing devices to aid communication with patients and people with disabilities
Promoting social participation by assisting people with significant disabilities to live independently

Timeline


Agenda
2015 (FY)
2016
2017
2018
2019
2020
Legacy of Tokyo 2020
Initiative 3
Research and Development
Sophisticated Sensor Technology for Obstacle Detection
R&D
Control Technology for Multiple Device Operation
R&D
Network Connectivity
R&D
Prototype and Platform for Mobility Aids (3D Map Data, etc.)
R&D
Tokyo 2020 Olympic And Paralympic Games
○ Applying the achievements to medicine, nursing, and daily support services
System Design
Verification tests for implementation
Feasibility tests for application at Tokyo 2020
○ Extending Japanese technology to the world

Timeline


Agenda
2015 (FY)
2016
2017
2018
2019
2020
Legacy of Tokyo 2020
Initiative 4
Research and Development
Robotic Assistive Devices
R&D projects by private entities (max. 3 years each)
R&D projects by private entities (max. 3 years each)
R&D projects by private entities (max. 3 years each)
R&D projects by private entities (max. 3 years each)
Participation in exhibitions
Elemental Technologies used in Competition Equipment and Robotic Assistive Devices
Promoting a cooperative environment between equipment manufacturers and users of robotic assistive devices (people with disabilities, the elderly, caregivers), universities, sports equipment manufacturers, and specialized institutions (such as defining and matching needs)
Tokyo 2020 Olympic And Paralympic Games
Equipment for Competition, Training, and Conditioning
Developing competition and training gear for the 2016 Rio de Janeiro Olympics
Selecting priority sports ahead of Tokyo 2020, planning and developing competition equipment, promoting their use in training
Application in the Games
Research Findings
Promoting latest achievements by participating in exhibitions, encouraging cooperation between athletes and local governments, etc.
Thermoregulation System
Developing a high thermal conductivity interface
Systematization of thermo-physiological response triggered by contact-type heating or cooling devices
Developing a wearable thermoregulation system
Utilization by athletes for training
○ Improving quality of life by promoting development of affordable and userfriendly robotic assistive devices
○ Promoting the use of robotic assistive devices in other fields
○ Enhancing availability of improved devices and promoting further development
○ Making technological information available to the wider public after the Games, while ensuring this does not cause detriment to the international competitiveness of Japan
○ Applying the achievements to create portable thermoregulation devices for the disabled