

Challenges to Development and Implementation of STI for SDGs Roadmap -Lessons learnt from trials and reference cases-

STI Roadmaps for SDGs – Expert Group Meeting
May 8-9, 2018/Miraikan Tokyo

Kazuhito Oyamada

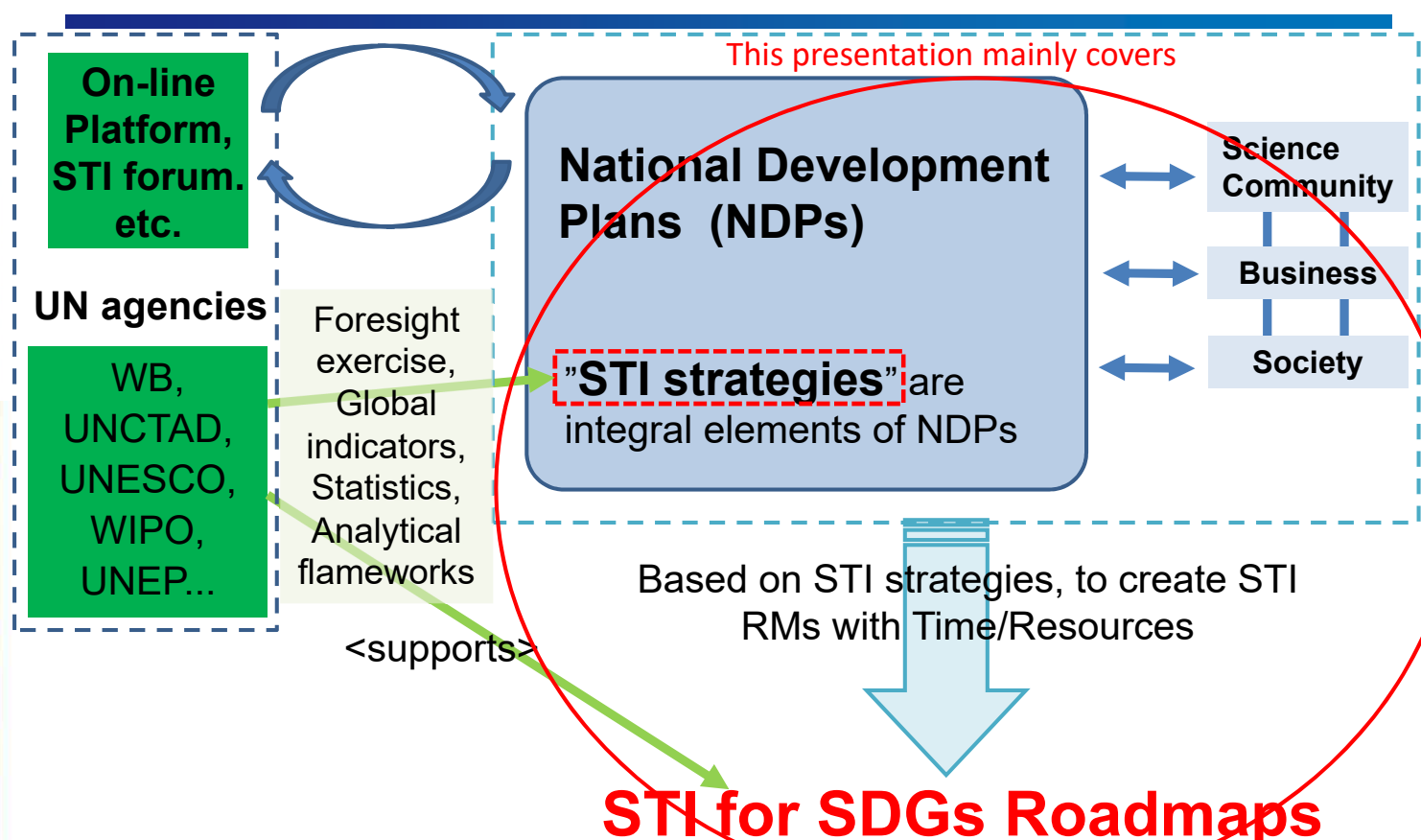
Center for Research and Development Strategy, JST



Japan Science and Technology Agency

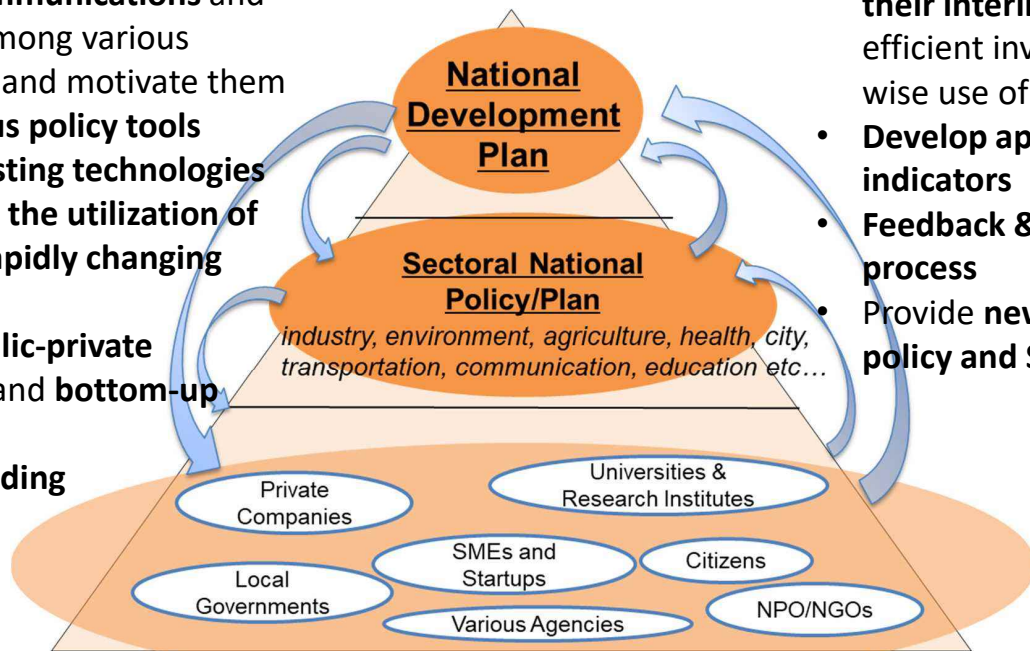
Japan Science and Technology Agency

National Development Plans and STI Strategies



Challenges to STI for SDGs Roadmap

- Enrich existing national development plans/strategies in harmony with SDGs
- Facilitate communications and build trust among various stakeholders and motivate them
- Utilize various policy tools
- Leverage existing technologies and promote the utilization of disruptive/rapidly changing technologies
- Promote public-private partnership and bottom-up initiatives
- Capacity building



Realization of Innovation Ecosystem for SDGs

Japan Science and Technology Agency

3

Trials to Develop STI Roadmap for SDGs

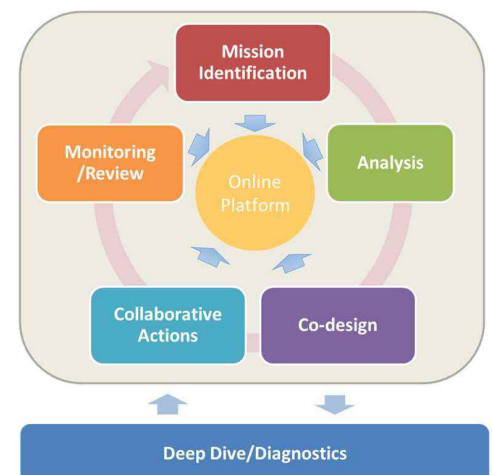
- Japan Science and Technology Agency (JST) and New Energy and Industrial Technology Development Organization (NEDO) collaborated in trials to develop STI Roadmaps for SDGs
- Goal 7: Affordable and Clean Energy
- Goal 11: Sustainable Cities and Communities



Cyclic process of 5+1 steps to develop and implement the RM

1. Mission Identification
 2. Analysis
 3. Co-design
 4. Collaborative Action
 5. Monitoring/Review
- + Deep Dive/Diagnostics

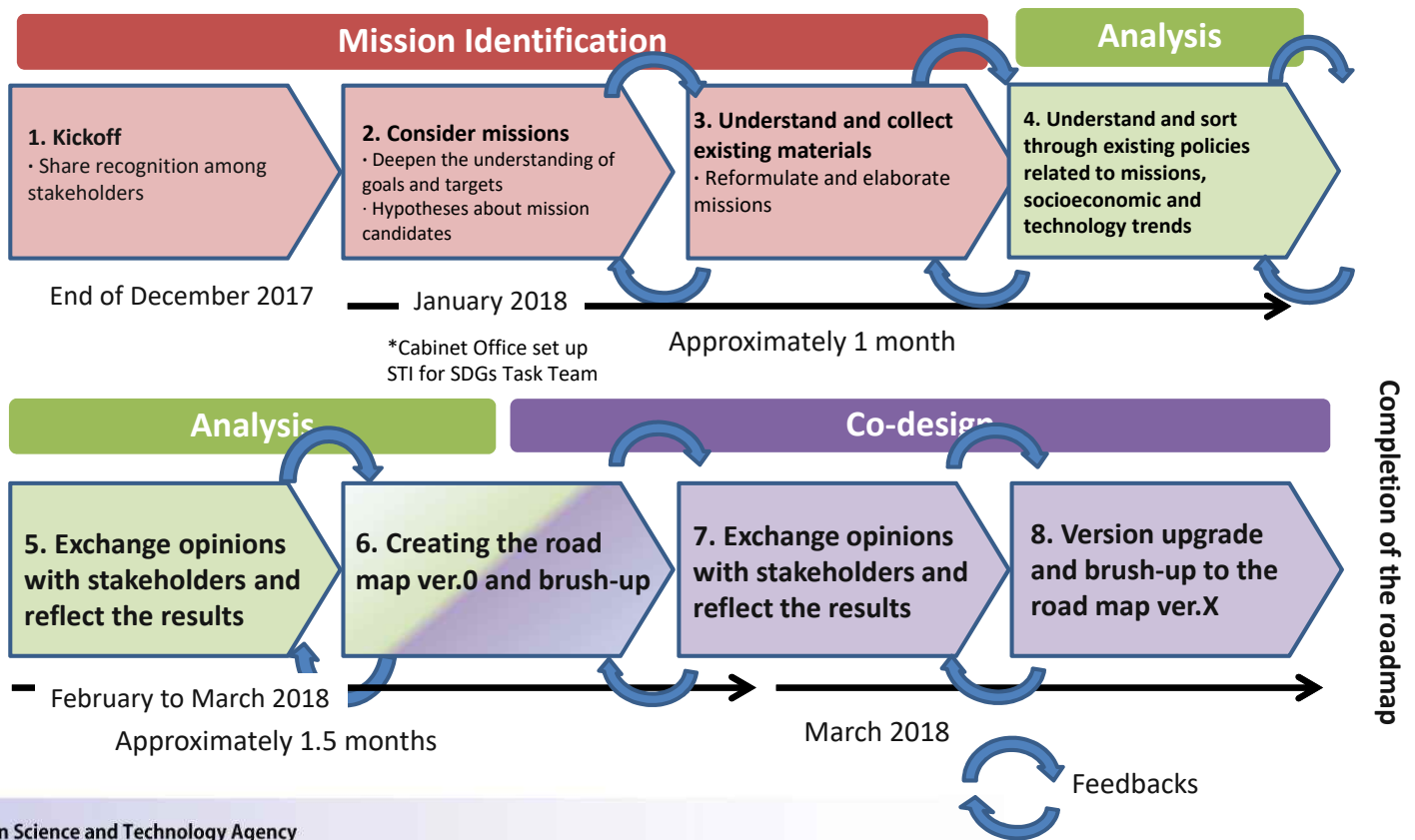
For details of the respective steps, see appendix.



Japan Science and Technology Agency

4

Timeline of the trials



5

Roadmaps for Society 5.0 in urban cities

Common Visions & Values

Diversity x

Creative City

(A city where diversity is respected, and therefore new value creation is generated sustainably.)

Compact City x

Connected Society

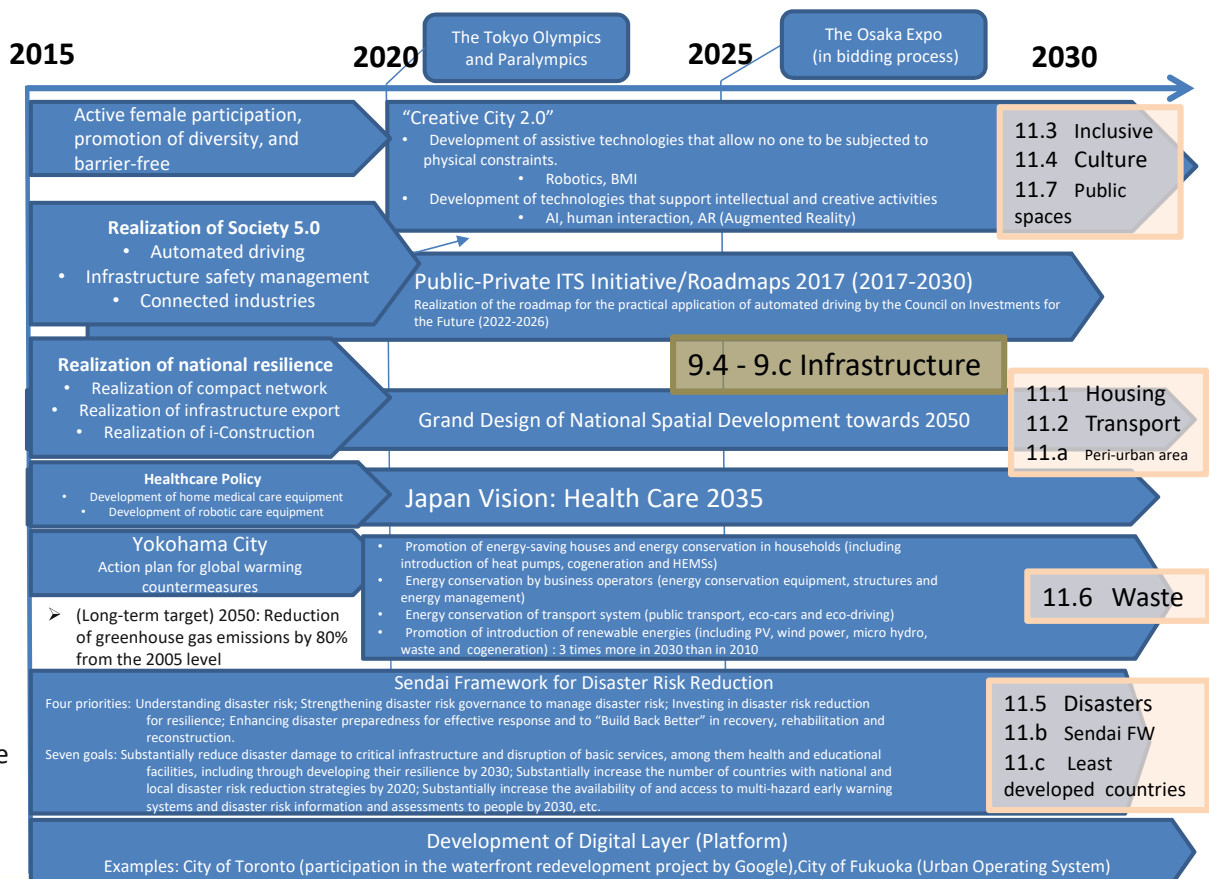
(A city that is compact where new industries beyond industry 4.0 are generated despite declining population)

Zero Emission x

Recycling City

(A city that is sustainable and realizes zero emission and the 3Rs)

Common Base



Items to be considered in the development of STI Roadmap for Future Cities

Visions & Values	Dimension	Elements	
		Ref: World Economic Forum Transformation Maps	
<ul style="list-style-type: none"> • Diversity x Creative City • Compact City x Connected Industries • Zero Emission x Recycling City 	• Human Capital	<ul style="list-style-type: none"> • Infrastructure • Electricity • Water • Telecommunication • Health-care delivery system • Real estate 	<ul style="list-style-type: none"> • Citizen participation • Education, skills • Social innovation • Gender gap • Labor power, employment • Human rights
	• Business & Innovation	<ul style="list-style-type: none"> • Recycling economy • Engineering, construction • Aging 	<ul style="list-style-type: none"> • Immigration • Food security and future of agriculture • Individual investor
	• Society, Environment, Health & Culture	<ul style="list-style-type: none"> • Chemical/materials industry • Forest • Future that lacks environment and natural resources 	<ul style="list-style-type: none"> • Innovation • International trade and future of investment • Entrepreneurship
	• Infrastructure, Security & Resilience	<ul style="list-style-type: none"> • Climate change • Sustainable development • Risk and resilience • Biotechnology • Social media • Cybersecurity • Behavioral change • Information technology 	<ul style="list-style-type: none"> • The fourth industrial revolution • Digital economy and future of society • Corruption • Government finances, social protection system • Future of government • Global governance • Future of corporations

CASE 1: Awareness-Raising Activities on Tsunami Disaster Saved 2,926 Pupils of Elementary & Secondary Schools

➤ Establishing a Foothold for Nationwide Expansion of Tsunami Education Using a Comprehensive Tsunami Disaster Scenario Simulator

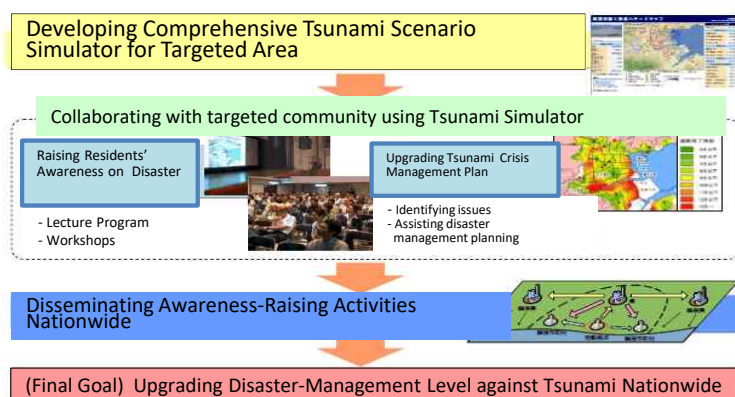
Led by Prof. Toshitaka KATADA, Disaster Research Center, Gunma Univ. * Supported by JST's Mission-Oriented Research Program (FY2001-05) and Implementation-Support Program (FY2007-11)

Outline of implemented R&D Outputs

An education tool "Comprehensive Tsunami Disaster Scenario Simulator" was developed, which can simulate a damage caused by Tsunami, with condition-settings such as crisis-awareness level of local residents triggered by earthquake motion, whether evacuation is recommended or not, daily awareness level of residents on disaster crisis, experience of past Tsunami disaster, in addition to simulating physical reach and height of Tsunami based upon epicenter and magnitude of triggering earthquake.



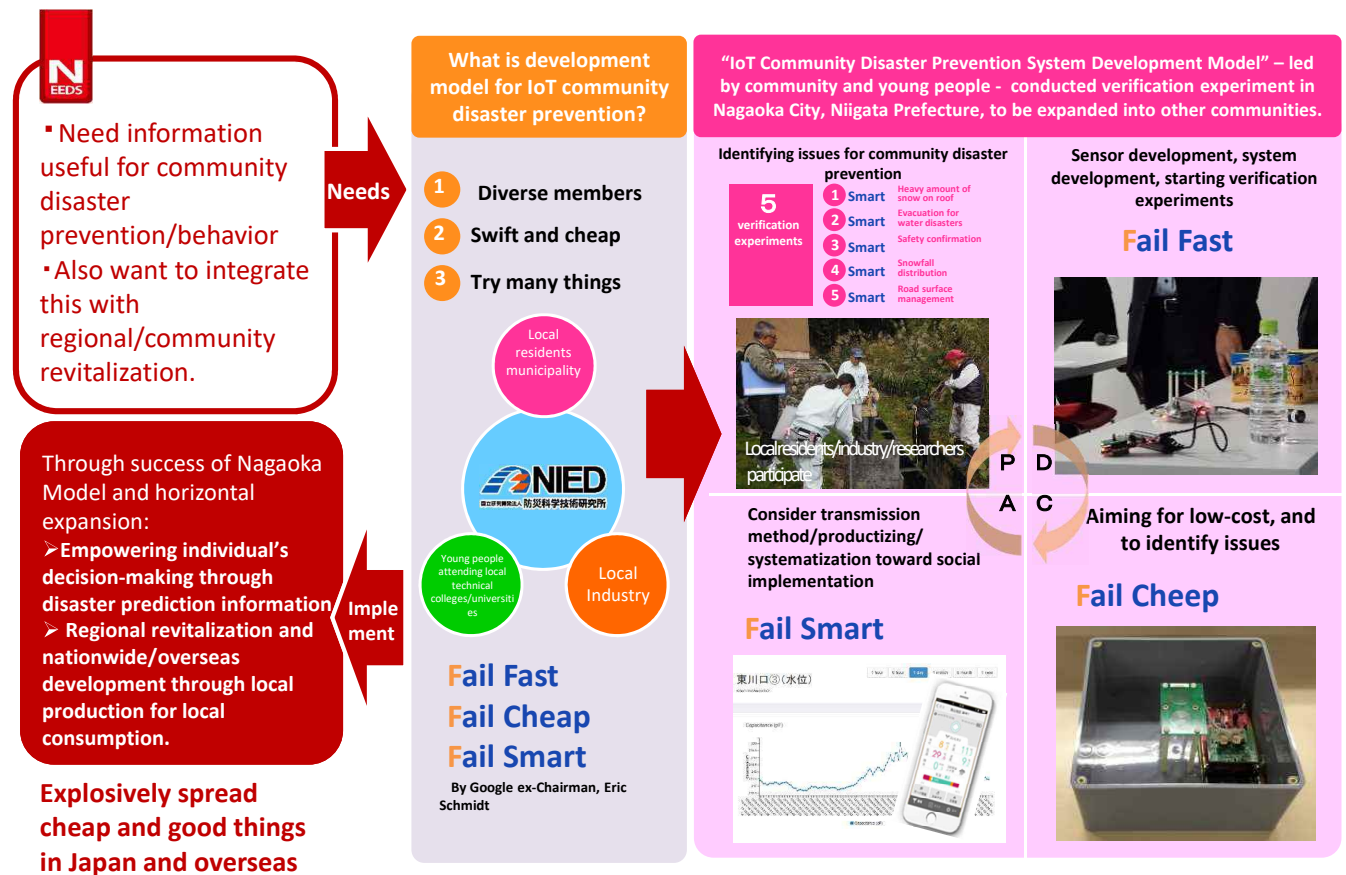
Children in Kamaishi, evacuating from designated facility to a safer hill by their own judgment on 11 March, 2011



Outcomes by Implementation

Continued efforts were made using the simulator, for raising local residents' disaster-awareness level and education in elementary and secondary schools, to create a robust community against Tsunami disaster. Consequently, in the wake of 2011 Great East Japan Earthquake in Kamaishi-City, senior-grade students have taken a leadership in evacuation, assisting junior-grade pupils and elderly persons, and made a further evacuation from a designated facility to a safer hill by their own judgment, not being trapped by initial prediction, thanks to their high awareness level. That has resulted in saving 2,926 students (99.8% of the total elementary and secondary schools) in Kamaishi (widely known as 'Kamaishi-Miracle').

CASE 2: Project to develop community disaster prevention system using IoT (National Research Institute for Earth Science and Disaster Resilience: NIED)

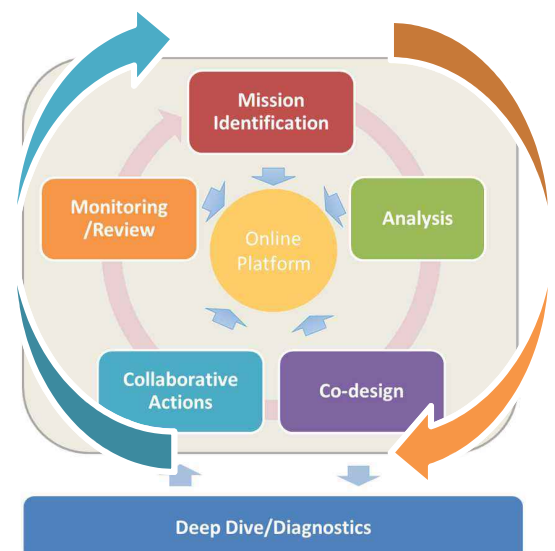


Challenge for further steps

- Consistency with existing domestic governance systems, and embedment in the execution level of policies
- Participation of multi-stakeholders
- Coordination and monitoring of various stakeholders efforts at multiple levels while promoting bottom-up initiatives
- Set and improve appropriate indicators
- Feedback and learning mechanism

Two Reference Cases

- 1) Public-Private ITS Initiative/Roadmap
- 2) SDGs Guideline for Local Governments



Two reference cases

Case 1: Public-Private ITS* Initiative/Roadmap

*Intelligent Transport Systems

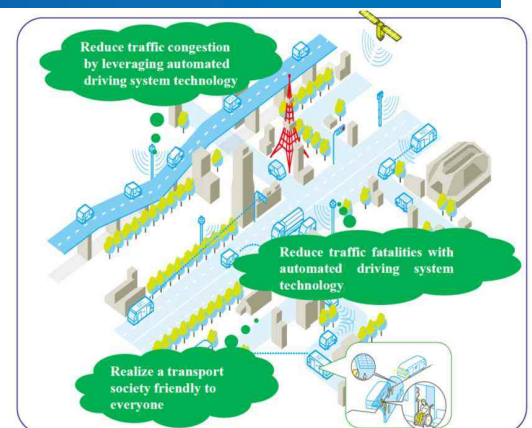
- **Mission-oriented Roadmap:** shared views, clear targets and timelines
- **Communication Tools:** government, industry, STI community and other stakeholders.
- **Embedded feedback process and learning mechanism** to meet technology development and social changes
- Promote **public private partnership:** identifying gaps and areas of cooperation

Case 2: SDGs Guideline for Local Governments

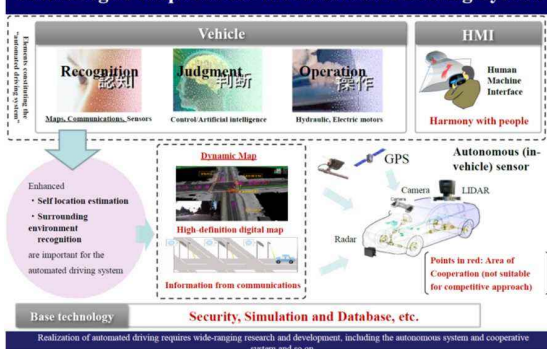
- Aims to **promote bottom-up initiatives** of individual cities/local governments which have different problems and contexts
- **Helps local governments** to plan and implement their own strategies, roadmaps and/or action plans for SDGs
- Provides **standardized procedures (5 steps)** for the planning and implementation, and **check list** and **localized indicators** for monitoring progress

Case1: Public-Private ITS Initiative/Roadmap

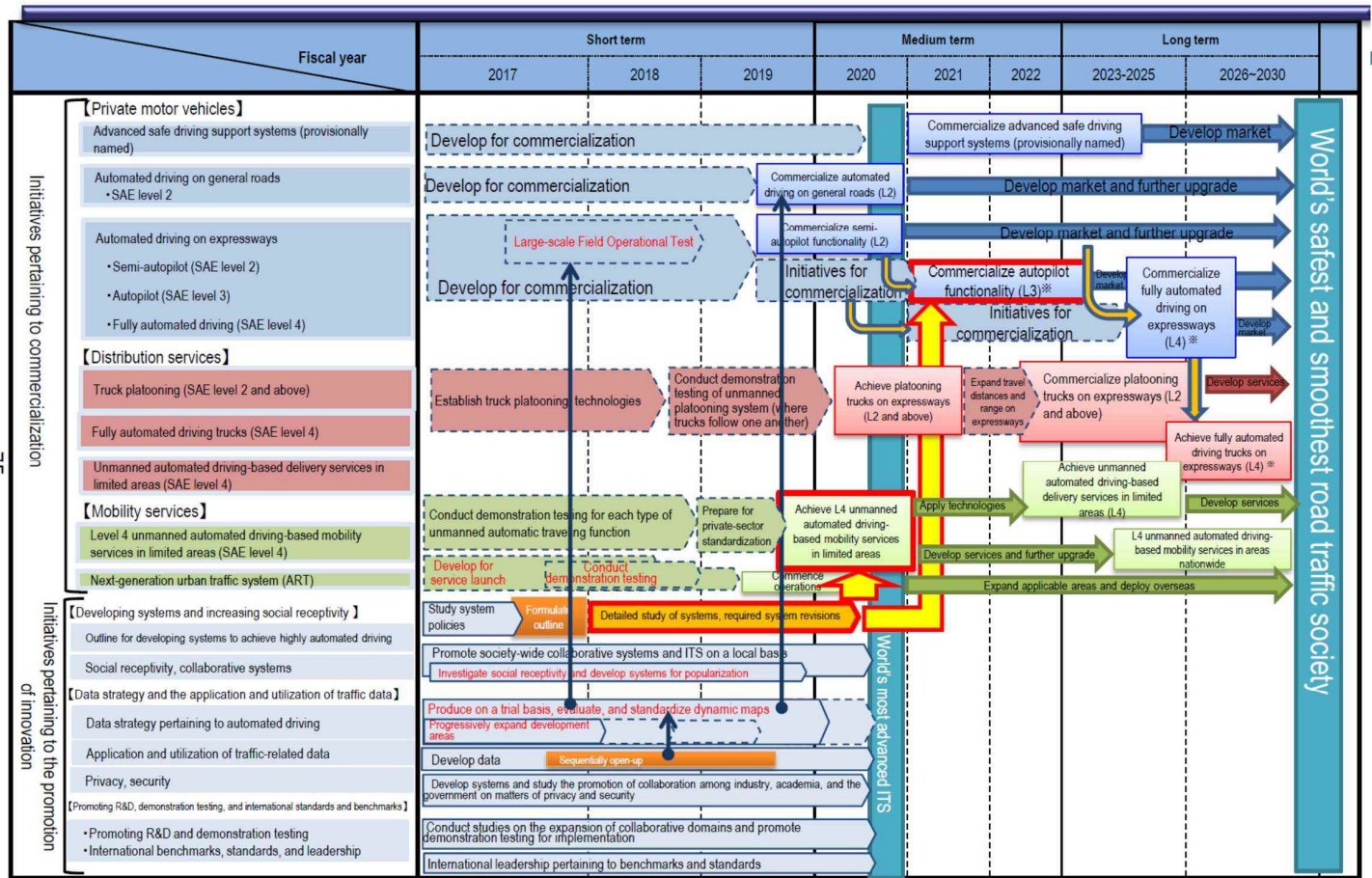
- Vision: *"Japan aims to build and maintain the world's best ITS and thereby contribute to its people and the world."*
- Cross-Ministerial Initiative
- Time line: ~ 2030 (Target year of SDGs)
- Feedback and learning process is officially embedded: the Roadmap is revised every year
- Multi-stakeholder participation
- Identify gaps and promote public private partnership in the areas of cooperation (e.g. development of dynamic map, field operational tests, etc..)
- Regulatory reform in parallel with cross-ministerial R&D program and field operational tests
- Promote dialogues with public
- Global competition and destructive technology provide strong incentive



Technologies Required for the Automated Driving System



Public-Private ITS Initiative/Roadmap 2017 (Roadmap Overview)

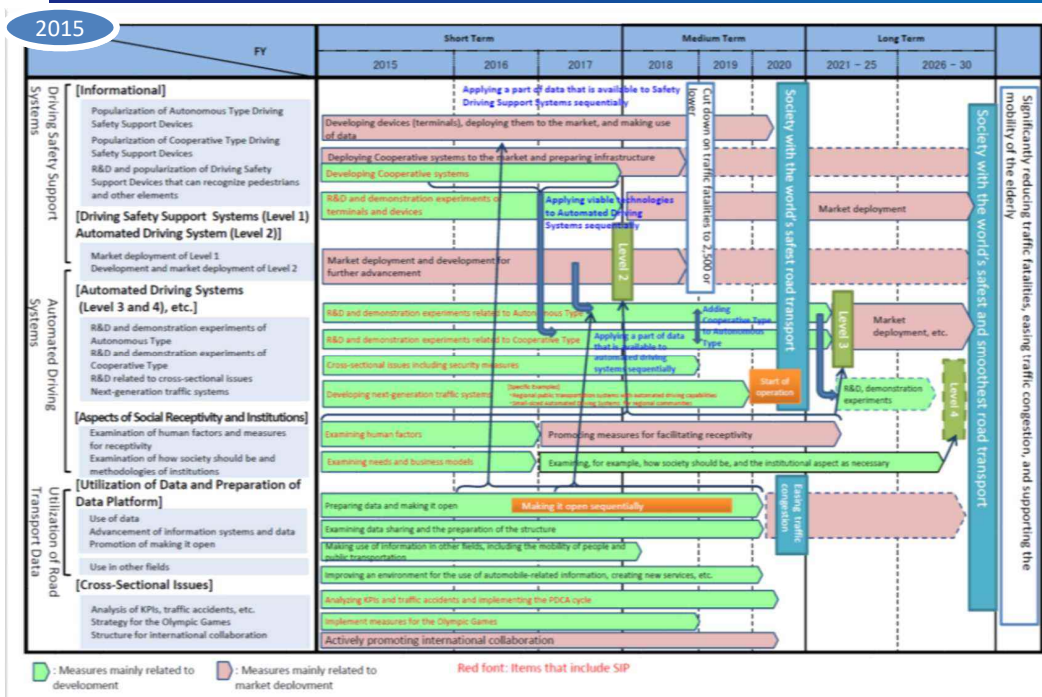


Japan Science and Technology Agency

Source: https://japan.kantei.go.jp/policy/it/itsinitiative_roadmap2017.pdf

13

Updating roadmap to meet technology development and social changes

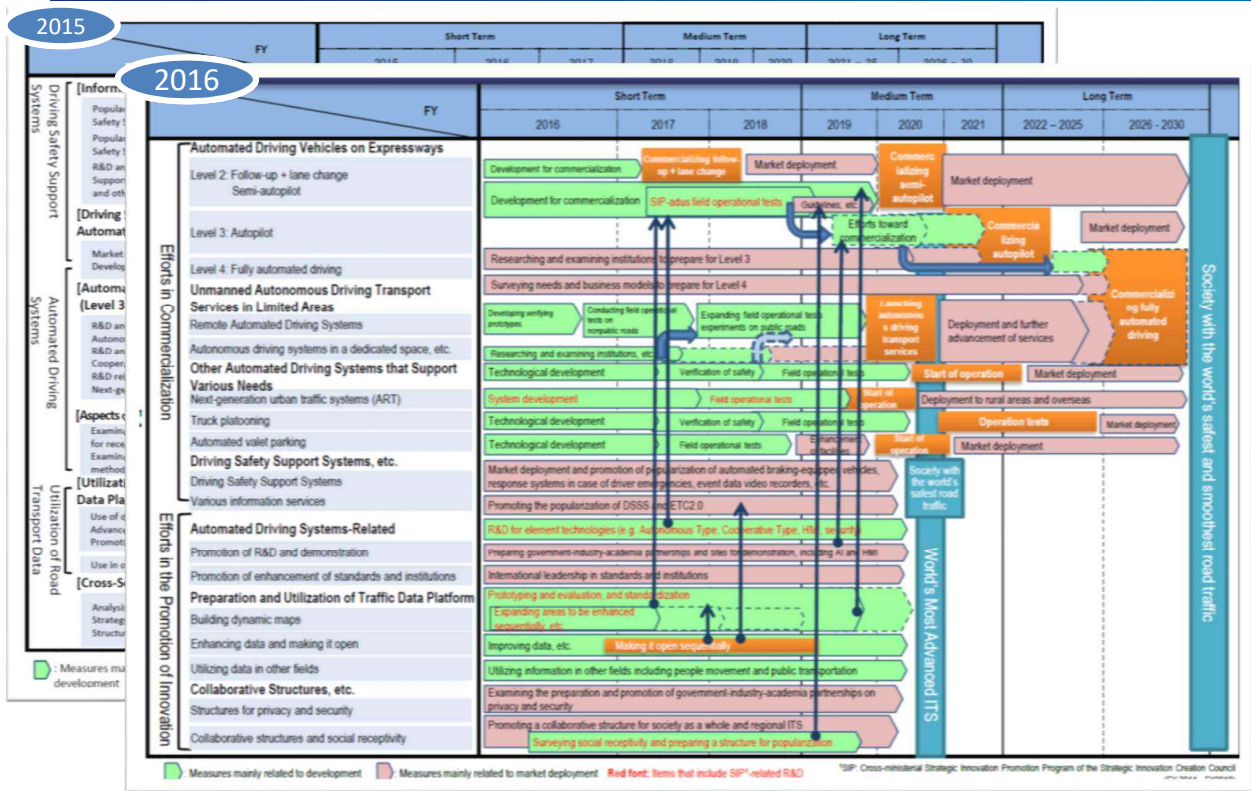


Japan Science and Technology Agency

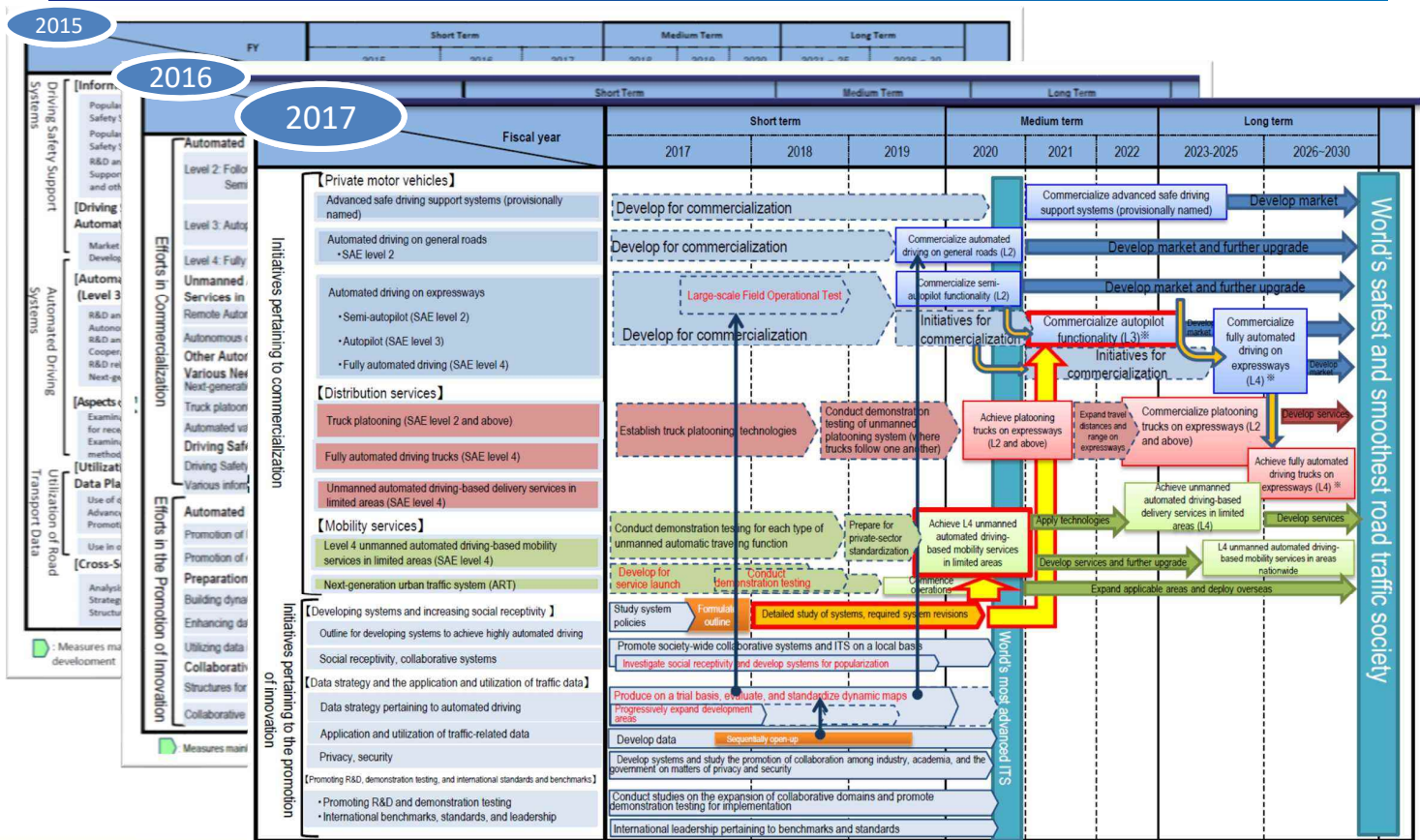
Source: https://japan.kantei.go.jp/policy/it/itsinitiative_roadmaps2015.pdf
https://japan.kantei.go.jp/policy/it/2016/itsinitiative_roadmaps2016.pdf
https://japan.kantei.go.jp/policy/it/itsinitiative_roadmap2017.pdf

14

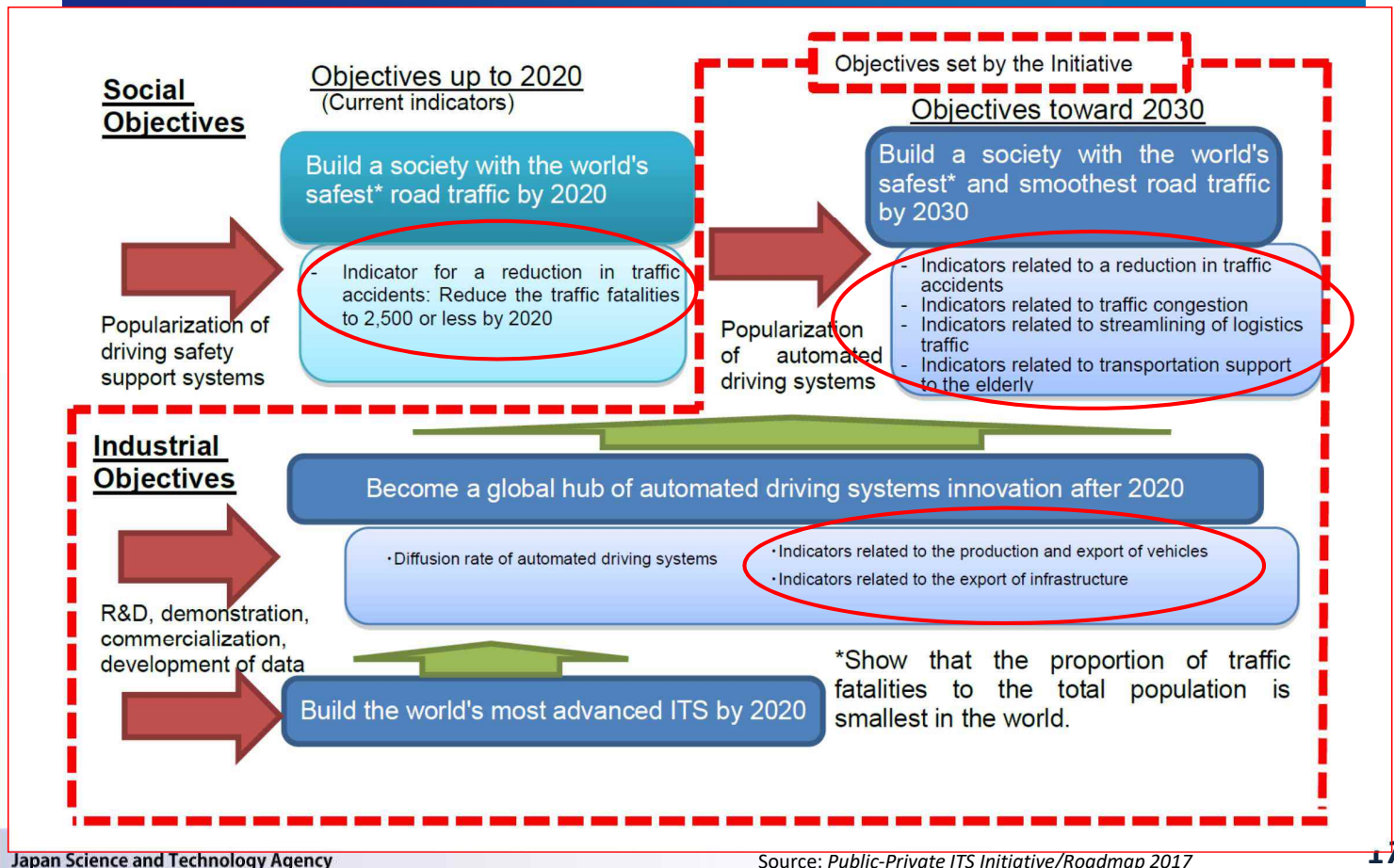
Updating roadmap to meet technology development and social changes



Updating roadmap to meet technology development and social changes



Indicators for Public-Private ITS Initiative/Roadmap 2017

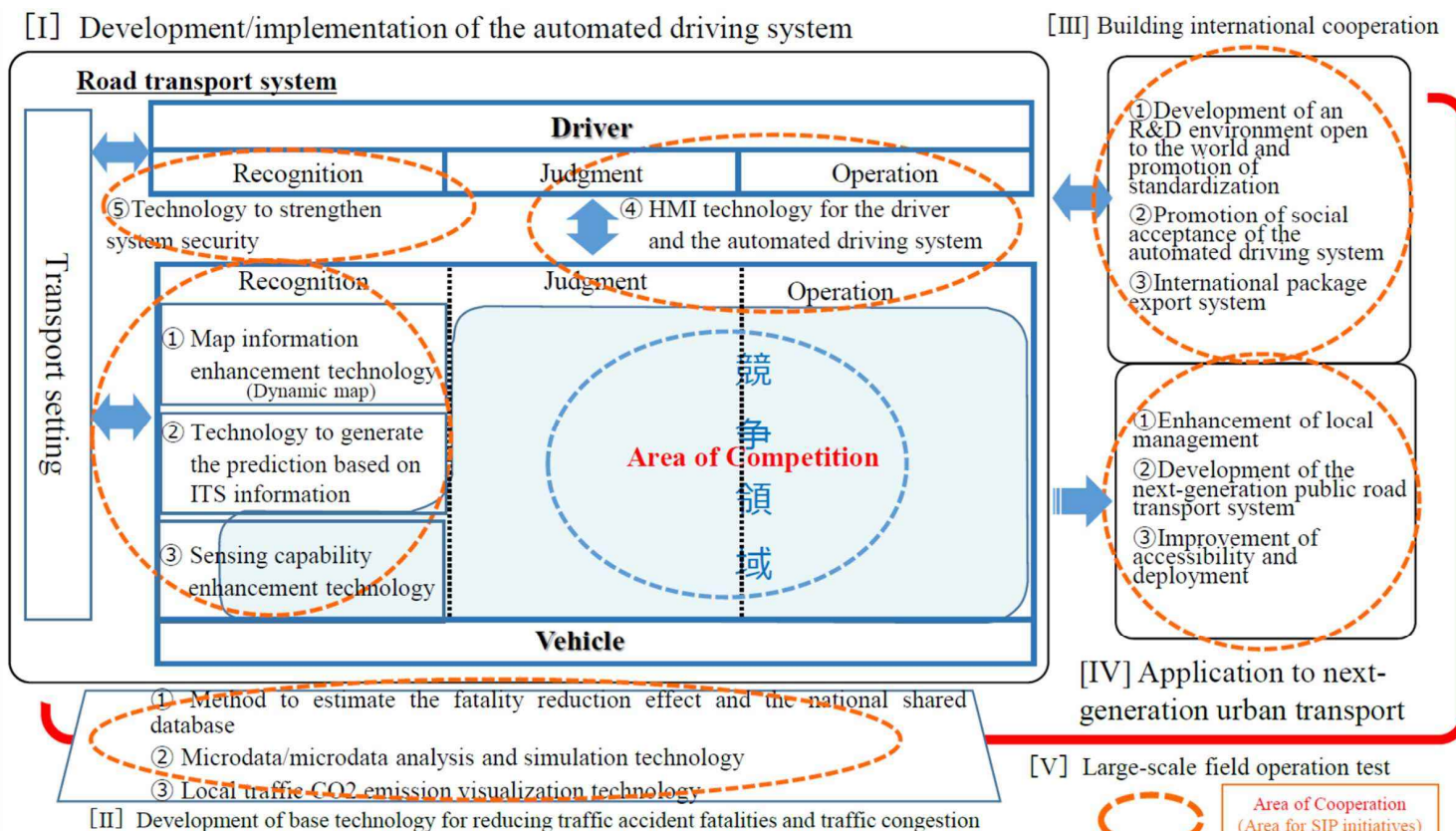


Japan Science and Technology Agency

Source: Public-Private ITS Initiative/Roadmap 2017

17

Public private partnership in the areas of cooperation (areas at the pre-competitive phase)

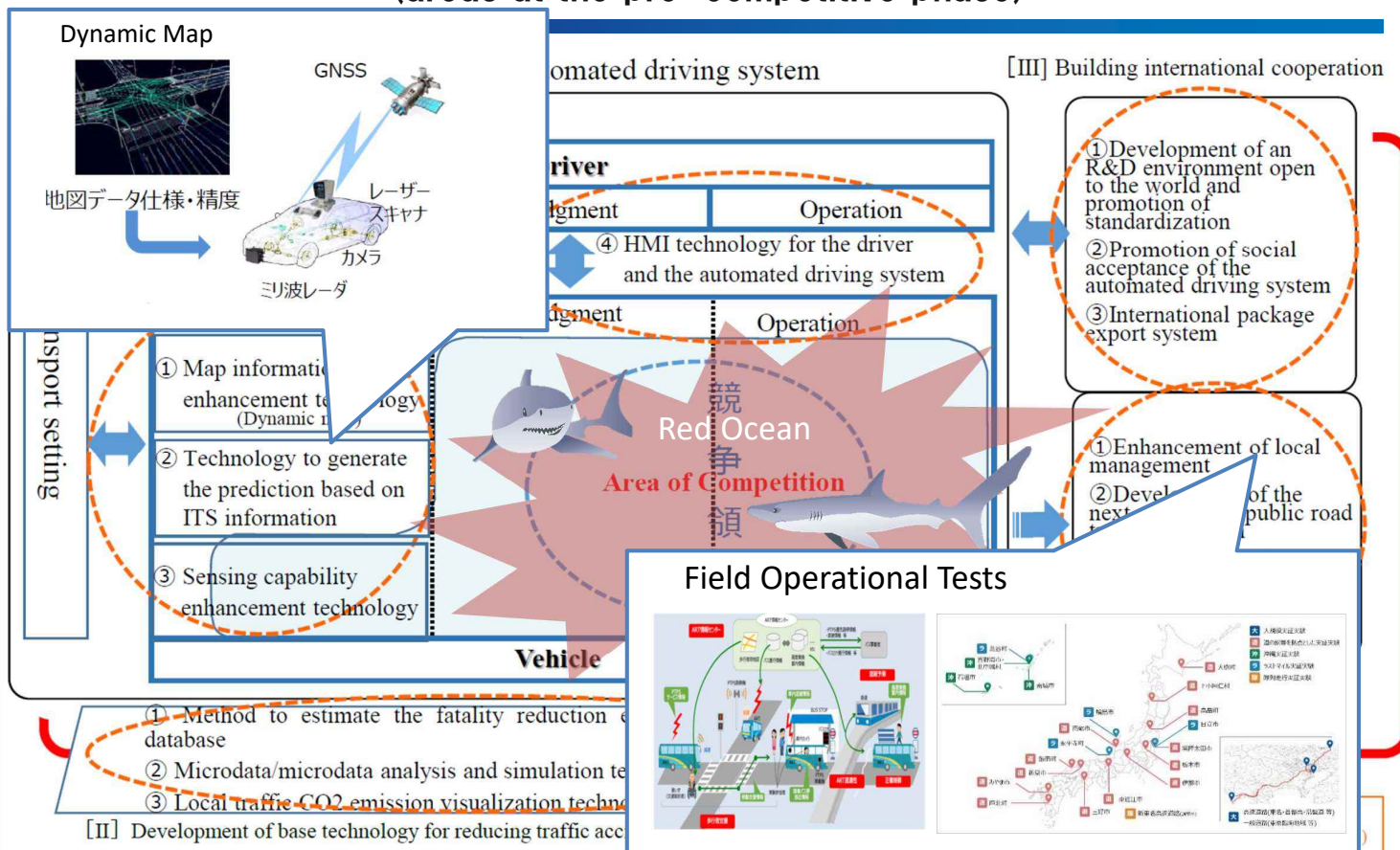


Japan Science and Technology Agency

Source: http://en.sip-adus.go.jp/sip/file/sip_en_2016_achievement.pdf
<http://www.sip-adus.go.jp/fot>
<http://www8.cao.go.jp/cstp/stmain/20171003daikibojishou.pdf>

18

Public private partnership in the areas of cooperation (areas at the pre-competitive phase)



Japan Science and Technology Agency

19

Case2: SDGs Guideline for Local Governments

SDGs for Our Cities and Communities —Introduction Guideline— (2nd Edition, March)*

- Help local governments plan and **implement their own strategies/roadmaps/action plans for SDGs** while considering problems and contexts they face
- Identify **5 steps necessary for the local governments to take on SDGs**
- Proposes
 - Check list for progress monitoring
 - Localized indicators
- Referring the SDSN's "Getting Started with the SDGs in Cities" and other materials, **modified to meet the local context in Japan**

Step 1: Understand SDGs

- 1-1: Understand the general outlines of SDGs
- 1-2: Understand the three-layered structure in SDGs
- 1-3: Understand the relationship between SDGs and local government roles

Step 2: Structure to work towards SDGs

- 2-1: Understand the importance of vertical and horizontal integrations by local governments
- 2-2: Facilitate vertical integration at levels from niches to global scales
- 2-3: Clarify involved stakeholders and facilitate horizontal integration
- 2-4: Establish a structure to promote SDGs

Step 3: Policy goals, specific targets and indicators

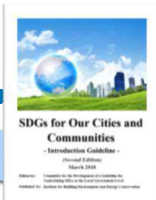
- 3-1: Marshal projects at the local government level
 - 3-1-1. Situating the local governments in the context of the SDGs Implementation Guiding Principles by the national government
 - 3-1-2. Marshalling community-specific challenges
- 3-2: Set policy goals
 - 3-2-1. Points to consider when setting policy goals and specific targets
 - 3-2-2. How to set policy goals and specific targets
- 3-3: Organize indicators to measure the progress in policy goals and specific targets
 - 3-3-1. Having community SDG indicators ready
 - 3-3-2. Examples of existing indicators
 - 3-3-3. Determination of specific targets

Step 4: Action program

- 4-1: Create an action program for community SDGs
- 4-2: Execute the action program for community SDGs
 - 4-2-1. Development of human resources in involved stakeholders
 - 4-2-2. Acquisition of financing for making the project viable
 - 4-2-3. Partnership between local governments

Step 5: Follow-up

- 5-1: Establish a follow-up system
- 5-2: Follow up the progress on a regular basis



* Downloadable from <http://www.ibec.or.jp/sdgs/index.html>
 **Sustainable Development Solutions Network

20

Check List for Monitoring Progress

Table 1 Self-checklist for the assessment of progress in promoting local SDGs

No.	Relevant chapter of the guideline	Step 1: Understand SDGs	Progress		
			×	△	○
1	1-1. (12)	Understand that SDGs constitute the core of the “2030 Agenda for Sustainable Development” and are development goals that are to be achieved by 2030.			
2	1-1. (12)	Understand the importance of integration of three dimensions (economy, society and environment) for sustainable development.			
3	1-1. (12)	Understand that both developed and developing countries need to take up the challenge for SDGs.			
4	1-2. (12)	Understand the three-layered structure in SDGs: 17 Goals, 169 Targets and nearly 230 Indicators.			
5	1-2. (12)	Understand each of the 17 Goals, in general.			
6	1-2. (12)	Have a look through the 169 Targets of SDGs and understand the general direction.			
7	1-2. (12)	Understand the necessity of measuring the progress in SDGs (17 Goals and 169 Targets) based on about 230 Indicators.			
8	1-2. (12)	Obtain the latest information on SDG Indicators through the UN Information Center or UN Statistical Commission websites.			
9	1-3. (17)	Understand the roles that the local government should fulfill to achieve 17 Goals of SDGs.			
10	1-3. (21)	Understand high expectations that are set for local governments contributing to achieving SDGs.			
11	1-3. (23)	Look through and understand the SDGs Implementation Guiding Principles, which were set forth by the Japanese government to promote working towards SDGs.			
12	1-3. (23)	Understand the importance of selecting, from the SDG Goals and Targets, the issues, goals and projects relevant to the situations particular to the community.			
13	1-3. (24)	Understand the possibility of producing positive effects on the community through proceeding with SDG projects, including QOL improvement for the residents, creation of a city with individuality, and promoting global partnerships.			
14	1-3. (25)	Understand the importance of developing an SDG project that can have a synergetic effect on several Goals.			
15	1-3. (25)	Understand SDGs as comprehensive goals ranging across multiple areas and the necessity of working cooperatively in a cross-sectoral manner with various stakeholders inside/outside the local government.			
16	1-3. (26)	Understand that working towards SDGs can lead to rebuilding local communities and contributing to society.			
17	1-3. (-)	Make sure that the above-mentioned issues are adequately understood by the staff in your own department.			
18	1-3. (-)	Make sure that the above-mentioned issues are adequately understood by those in different departments through holding workshops, etc.			

No.	Relevant chapter of the guideline	Step 2: Structure to work towards SDGs	Progress		
			×	△	○
19	2-1. (-)	Decide which department will lead the SDG project. Or find a consensus over the decision.			
20	2-1. (28)	To each of the departments or divisions of a local government: perform self-assessment regarding which goal(s) of the SDGs it can contribute to through its own services.			
21	2-1. (28)	Share the information on SDGs among different departments of the local government and carry out the project through the entire local government.			
22	2-2. (28)	To the SDG project leader (department): have interest in the global trends such as SDGs when setting up a project.			
23	2-2. (28)	To the SDG project leader (department): have an interest in the development of best practices or advanced/experimental operations that will be independently carried out within a community as part of the SDG project.			
24	2-3. (29)	Clarify the roles of each stakeholder involved in SDG promotion.			
25	2-4. (31)	Share the information on SDGs with stakeholders outside the local government and establish an organizational structure to enable collaboration.			
26	2-4. (31)	Share the information on SDGs among the top people (e.g., the head of the local government, and the director of each organization or department) and determine the project direction that each officer in charge will take.			
No.	Relevant chapter of the guideline	Step 3: Policy goals and specific targets	Progress		
			×	△	○
27	3-1. (38)	To the SDG project leader (department): sort out community-specific issues.			
28	3-1. (38)	Weigh these community-specific issues against each other to prioritize them for working on.			
29	3-2. (39)	To the SDG project leader (department): based on the current situations of the community, select the Goals and Targets relevant to local issues and put them together as policy goals. Or:			
30	3-2. (39)	Set long-term policy goals, while having a vision for the future of the community towards the year 2030 (or later years).			
31	3-2. (39)	Set specific targets according to the long-term policy goals.			
32	3-2. (40)	Set policy goals and specific targets which are not too broad to comprehend, and conduct selection and concentration in accordance with the size of the community.			
33	3-3. (42)	Have indicators ready to measure the progress in policy goals and specific targets.			
34	3-3. (42)	Make sure that the data necessary for the aforementioned indicators can be collected (discuss the data collectability).			
35	3-3. (42)	Some of the indicators can be compared with other communities because many local governments also collect the same data.			
36	3-3. (42)	Some of the indicators are unique and can represent the identity of the community.			
37	3-3. (48)	Express specific targets in a concrete manner (with the level or target to be reached in the future).			
38	3-3. (48)	Discuss whether it is better to have key performance indicators (KPIs).			
No.	Relevant chapter of the guideline	Step 4: Action program	Progress		
			×	△	○
		Discuss whether SDG project policies can be incorporated into the action program of the			

Check List for Monitoring Progress

Table 1 Self-checklist for the assessment of progress in promoting local SDGs

No.	Relevant chapter of the guideline	Step 1: Understand SDGs	Progress		
			×	△	○
1	1-1. (12)	Understand that SDGs constitute the core of the “2030 Agenda for Sustainable Development” and are development goals that are to be achieved by 2030.			
2	1-1. (12)	Understand the importance of integration of three dimensions (economy, society and environment) for sustainable development.			
3	1-1. (12)	Understand that both developed and developing countries need to take up the challenge for SDGs.			
4	1-2. (12)	Understand the three-layered structure in SDGs: 17 Goals, 169 Targets and nearly 230 Indicators.			
5	1-2. (12)	Understand each of the 17 Goals, in general.			
6	1-2. (12)	Have a look through the 169 Targets of SDGs and understand the general direction.			
7	1-2. (12)	Understand the necessity of measuring the progress in SDGs (17 Goals and 169 Targets) based on about 230 Indicators.			
8	1-2. (12)	Obtain the latest information on SDG Indicators through the UN Information Center or UN Statistical Commission websites.			
9	1-3. (17)	Understand the roles that the local government should fulfill to achieve 17 Goals of SDGs.			
10	1-3. (21)	Understand high expectations that are set for local governments contributing to achieving SDGs.			
11	1-3. (23)	Look through and understand the SDGs Implementation Guiding Principles, which were set forth by the Japanese government to promote working towards SDGs.			

Localized Indicators

Goal	Target	Indicator	Indicator Number	Localized indicator	Data source
11. Make cities and human settlements inclusive, safe, resilient and sustainable	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Percentage of urban population living in slums or informal settlements	11-1	Percentage of homeless people	Ministry of Health, Labour and Welfare (Social Welfare and War Victims' Relief Bureau); "National Survey on the Actual Conditions of the Homeless"
	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	11-2	Proportion of population that uses railways, trains and buses to commute to school or work (excluding those working at home) and are 15 years of age or older.	Ministry of Internal Affairs and Communications (Statistics Bureau); Statistical Survey Department; Population Census Division; "National Population Census"
	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.	11.3.1 Ratio of land consumption rate to population growth rate	11-3	Rate of population increase or decrease	Ministry of Internal Affairs and Communications (Statistics Bureau); "National Population Census"
		11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	11-4	(Number of births – Number of deaths) / Total population	Ministry of Health, Labour and Welfare; "National Survey on Public Assistance Recipients"
	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Center designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)			
		11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.	11-5	Number of deaths by extrinsic causes such as natural disasters	Ministry of Health, Labour and Welfare "Vital Statistics"
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal waste management	11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people	11-5	Number of deaths by extrinsic causes such as natural disasters	Ministry of Health, Labour and Welfare "Vital Statistics"
		11.5.2 Economic loss owing to disasters in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services	11-6	Local government expenditure breakdown (disaster relief expenditure)	Ministry of Internal Affairs and Communications (Statistics Bureau); "Survey on Municipal Financial Status"
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste	11-7	(Final disposal / Total waste) x 100	Ministry of the Environment; "Information on Waste Disposal"

Japan Science and Technology Agency

Source: “Table3: Examples of localized indicators to measure the progress in Japanese local SDGs projects”
SDGs for Our Cities and Communities –Introduction Guideline-, 2nd Edition, 2018, pp.81-82.

23

Localized Indicators

Goal	Target	Indicator	Indicator Number	Localized indicator	Data source
11. Make cities and human settlements inclusive, safe, resilient and sustainable	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Percentage of urban population living in slums or informal settlements	11-1	Percentage of homeless people	Ministry of Health, Labour and Welfare (Social Welfare and War Victims' Relief Bureau): "National Survey on the Actual Conditions of the Homeless"
	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	11-2	Proportion of population that uses railways, trains and buses to commute to school or work (excluding those working at home) and are 15 years of age or older	Ministry of Internal Affairs and Communications (Statistics Bureau; Statistical Survey Department; Population Census Division): "National Population Census"
	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.	11.3.1 Ratio of land consumption rate to population growth rate	11-3	Rate of population increase or decrease	Ministry of Internal Affairs and Communications (Statistics Bureau): "National Population Census"
		11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	11-4	(Number of births – Number of deaths) / Total population	Ministry of Health, Labour and Welfare: "National Survey on Public Assistance Recipients"

Japan Science and Technology Agency

Source: “Table3: Examples of localized indicators to measure the progress in Japanese local SDGs projects” *SDGs for Our Cities and Communities –Introduction Guideline-*, 2nd Edition, 2018, pp.81-82.

24

Summary: Toward the effective implementation of STI for SDGs roadmaps

- **Mechanism of coordination and monitoring of cross-ministerial/cross-sectoral initiatives:** Strong political leadership is necessary to break silos
 - **Competition and collaboration / private investment / incentive for voluntary initiatives**
 - **Monitoring by indicators is still progressing**
 - Many initiatives/strategies/action plans set indicators for monitoring progress. However, **most of them are set separately from SDGs and do not fully reflect them.**
 - **Upgrading indicators and developing localized indicators** in line with SDGs are necessary*.
 - **Promote the bottom-up initiatives: standardized procedures*** (e.g. guidelines) , which are **flexible enough to allow localization and customization**, may be helpful.
 - **Feedback and learning mechanism*:**
 - **Integration into the official process** is desirable.
 - **Deepening understanding of interlinkages** of SDGs and **diagnostics of effectiveness roadmaps and policy tools** provide a foundation.
- Developed countries, UN family and other international organization can support least developed countries in addressing these challenges (especially in the points with *)
 - Developed countries (including Japan) also can learn lessons from international community so that they can avoid being trapped in the existing systems and overcome institutional inertia.

Japan Science and Technology Agency

25

Thank you



Kazuhito Oyamada

Fellow, Center for Research and Development Strategy (CRDS)
Japan Science and Technology Agency



Center for Research and Development Strategy
Japan Science and Technology Agency

Appendix:

Steps to Develop and Implement STI for SDGs Roadmap

Targets, Time Frames and Other Considerations

Targets and Time Frame

- Targets: Initiatives at the national and local government and sector levels: Goal/Mission-oriented Roadmaps
- Time frames: 2030 and beyond

Other considerations

- STI roadmap and its making process should be based on methods, processes, and technologies that can be utilized in other countries and regions.
- Initiatives leading to achieving SDGs should be realized based on and incorporated with existing national development plans (e.g. long-term plans, strategies, and action plans, etc.) of each country.

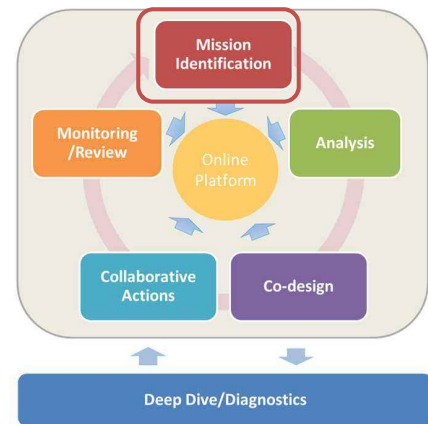
Mission Identification

● Analyses of Goals and Targets of SDGs

- ❑ Deepen the understanding of goals and targets of SDGs and the synergies and trade-offs among them
- ❑ Deep dive of SDGs and diagnostics by UN families and other international organizations can provide useful information and insights to this process.

● Mission Setting

- ❑ Set missions to be addressed for achieving SDGs.
- ❑ Stok taking
 - Existing needs, policy challenges, constraint factors, etc.
 - Existing strategies, roadmaps, and action plans
 - Other policy documents, analysis reports, etc.
- ❑ Consider beyond the boundaries of goals and targets
- ❑ Also consider Interlinkages between goals and targets
- ❑ Set it based on contexts and priorities of each country
- ❑ "No one size fits all" - methodologies/procedures according to each circumstance should be adopted.



Analysis

● Review and analyze existing policies

- ❑ Collect policy documents related to the missions (government's medium to long term plans, strategies, white papers, action plans, local government/municipality plans, etc.)
- ❑ Analyze the correspondence relationship with each missions, timeframe, and targets of policies, etc.

● Understand socioeconomic trends, and review future prospects

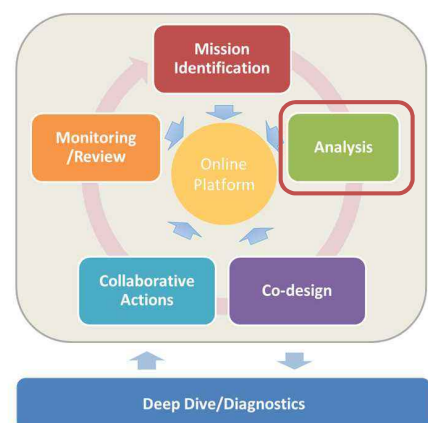
- ❑ Understand trends related to socioeconomic aspects: policy, markets, regulations, and finance, etc.
- ❑ Review various future prospects, etc.

● Understand trends in technological aspects, and review various forecasts

- ❑ Collect and analyze information on technological trends and forecasts(e.g. Technology Foresight/Forecast, Technology Roadmaps, Bibliometrics, Scenario Analysis, etc.)
- ❑ Hearing of experts etc.

● Identify key drivers and key technologies

● Collect and analyze related indicators, statistics and other data.



Co-design

- Create a prototype roadmap based on analysis results

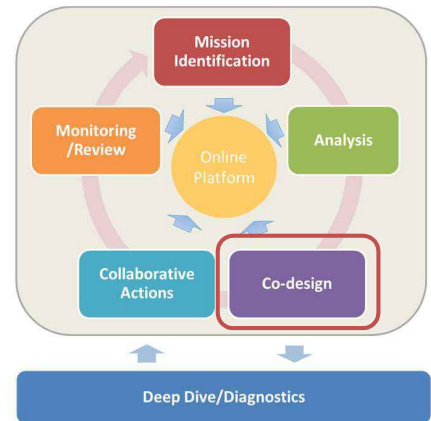
- ❑ Consider milestones and outcomes
- ❑ Consider data sets and indicators for monitoring and reviewing progress

- Consider and describe various policy measures and expected outcomes

- ❑ [Example] Strategies/plans, funding, government R&D, procurement, education/human resource development, taxes, regulations/rules, subsidies/policy finance, promotion of private investments/finance, infrastructure, market development, standards, etc.
- ❑ Pay attention to correspondence relationship between missions – measures – outcomes

- Brush-up through dialogues with various stakeholders

- ❑ Consideration by expert teams
- ❑ Exchange opinions with government officials, related organizations, various stakeholders etc.
- ❑ As appropriate, return to the previous phase (*Mission Identification* and *Analysis*)



Collaborative Actions

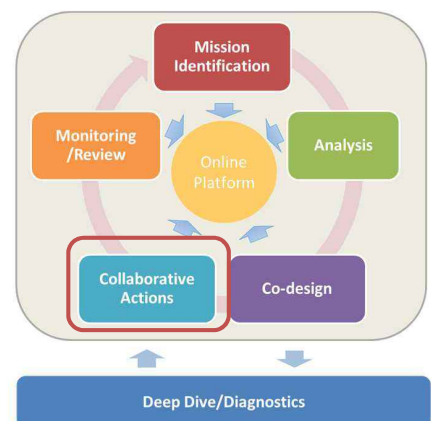
- Implementation based on the roadmap

- ❑ Both of top-down and bottom-up approaches
- ❑ Embed the approach in individual measures

- Roadmap as a communication tool

- ❑ Disseminate and spread knowledge/information
- ❑ Promote cross-sectoral cooperation
- ❑ Promote bottom-up and voluntary initiatives and activities
- ❑ Learning and feedback
- ❑ Interaction between layers

- Utilize networks of various stakeholders



Monitoring and Review

- Monitoring and review the progress

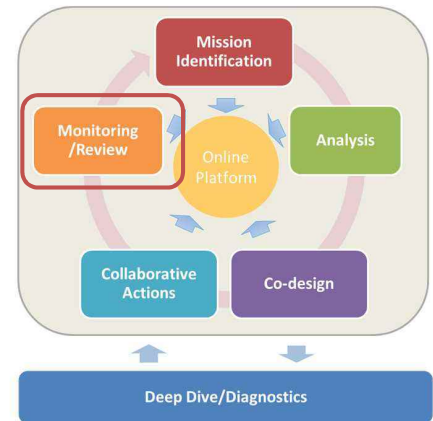
- ❑ By indicators, check list, expert panels, etc....
- ❑ Making indicators and data open so that various stakeholders can use them for their own efforts

- Improve indicators and propose new appropriate indicators

- ❑ Based on the circumstances of each country, improve or customize indicators and data sets (e.g. localized indicators)
- ❑ Propose the indicators to be utilized globally

- Ensuring the reliability, transparency and accessibility of indicators and related data

- Integration of learning and feedback mechanism into the official process



Deep Dive / Diagnostics

- Deepen the understanding of interlinkages between goals and targets

- ❑ Analysis based on scientific knowledge
- ❑ At Global/Regional/National/Sub-national (Local) levels
- ❑ By sector and field

- Understand innovative technologies and consider their applicability

- Identify areas and problems requiring additional policy intervention

- Reflect it in the contents of the roadmap and in the design for the creation and entire implementation process

- In collaboration with the efforts by UN family and international organizations

