

Advanced technology and rules/regulations for the development of Sustainable and Resilient Road Infrastructure in Japan

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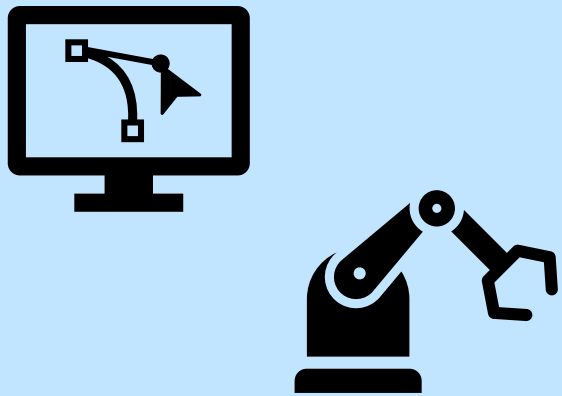
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JAPAN***

Agenda

1 . What is High-Quality Road Infrastructure?	*
2 . Framework for Developing High-Quality Road Infrastructure	*
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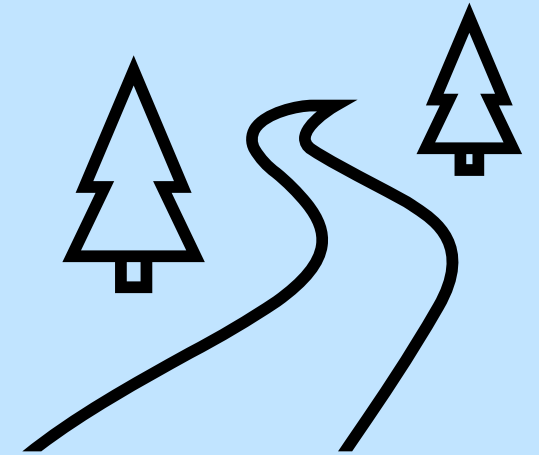
Presentation Overview

- Development of high-quality infrastructure is **supported not only by advanced technology of private sector, but also by effective systems, initiatives, and rules and regulations** to effectively apply these technologies to the planning, construction and operation and management of the road infrastructure.
- This presentation will introduce Government of Japan's efforts in these areas.



Advanced
Technologies

- Rules and Regulations
- Technical Standards
- Procurement methods



Quality Road
Infrastructure

What is Quality Road Infrastructure?

- Endorsed in the 2019 Osaka Summit.
- "Quality growth" requires not only "quantity" but also "quality" of infrastructure investment, even under enormous investment demands..

Principle 1: Maximizing the Positive Impact of Infrastructure to **Achieve Sustainable Growth and Development**

Principle 6: Strengthening Infrastructure Governance

Principle 2: Raising Economic Efficiency in View of **Life-Cycle Cost**

Principle 3: Integrating **Environmental Considerations** in Infrastructure Investments

Principle 4: Building **Resilience against Natural Disasters** and Other Risks

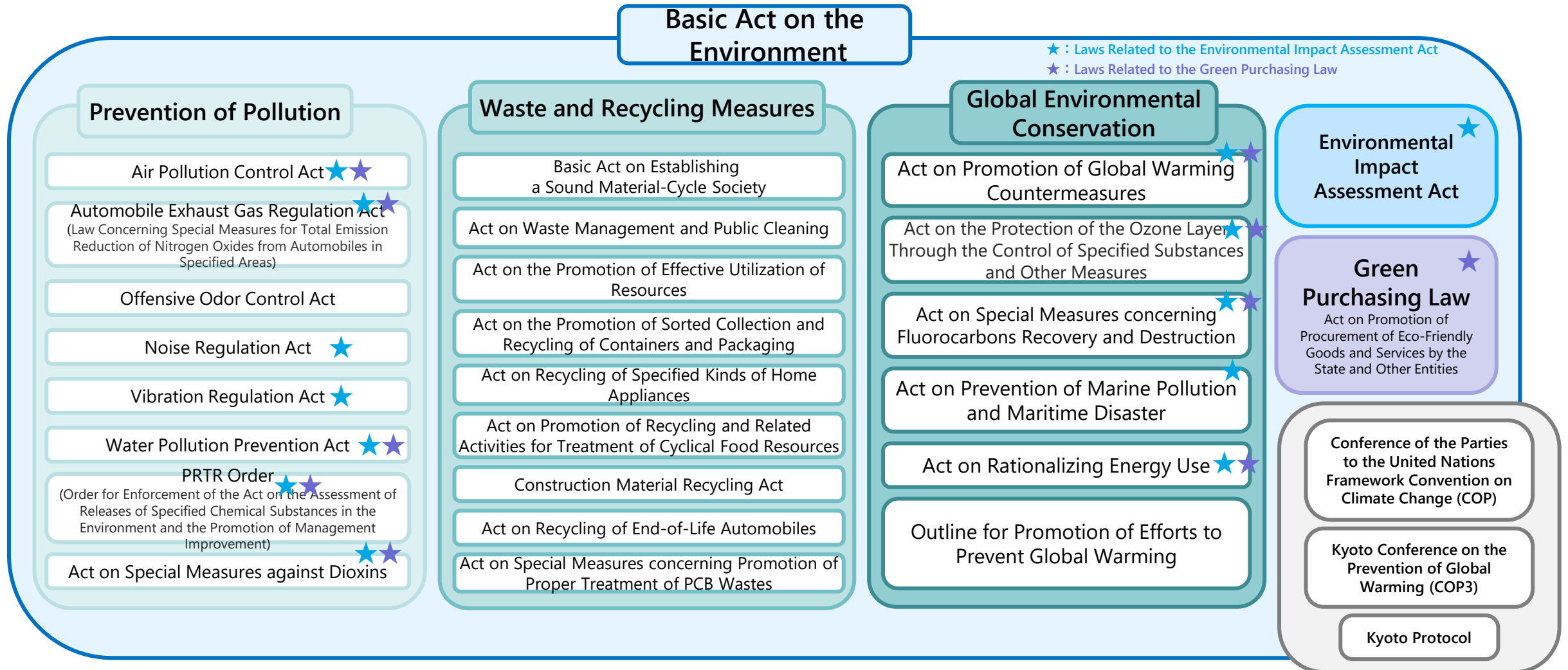
Principle 5: Integrating Social Considerations in Infrastructure Investment



Frameworks for Developing Quality Road Infrastructure

Frameworks for Environment Preservation

- The Basic Act on the Environment encompasses measures for Pollution, Waste and Recycling, and Climate Change.



Prevention of Pollution

Air Pollution Control Act	Aims to protect public health and preserve the environment by establishing emission regulations and vehicle emission standards, while also defining the liability of businesses for health damages caused by pollution
Automobile Exhaust Gas Regulation Act (Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas)	Clarifies the responsibilities of the government, local authorities, businesses, and the public to prevent air pollution from nitrogen oxides and particulate matter emitted by vehicles. Ensures environmental standards through emission reduction plans and setting standards in specific regions, aiming to protect public health and preserve the environment
Offensive Odor Control Act	Aims to preserve the living environment and protect public health by implementing necessary regulations to control unpleasant odors generated by industrial activities in designated areas
Noise Regulation Act	Aims to preserve the living environment and protect public health by implementing necessary regulations to control extensive noise from industrial activities and construction work, while also setting permissible limits for vehicle noise
Vibration Regulation Act	Aims to preserve the living environment and protect public health by implementing necessary regulations to control extensive vibrations from industrial activities and construction work, while also setting required limits for road traffic vibrations
Water Pollution Prevention Act	Aims to prevent water pollution from factories and businesses by regulating wastewater and infiltration water, promoting domestic wastewater measures, and protecting public water bodies and groundwater, while also defining business liability for health damages, thereby ensuring public health protection and environmental preservation
PRTR Order (Order for Enforcement of the Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement)	Aims to promote businesses' voluntary improvement of chemical substance management through tracking emissions and providing information, thereby preventing environmental issues before they arise
Act on Special Measures against Dioxins	Aims to prevent and remove environmental pollution caused by dioxins, setting standards, regulations, and contamination soil measures to protect public health

Waste and Recycling Measures

Basic Act on Establishing a Sound Material-Cycle Society	Aims to establish basic principles and responsibilities for the formation of a circular society and promote comprehensive, planned measures through the development of a basic plan
Act on Waste Management and Public Cleaning	Aims to promote waste emission reduction and proper disposal, thereby improving environmental conservation and public health through the maintenance of a clean living environment
Act on the Promotion of Effective Utilization of Resources	Aims to promote the effective use of resources and waste reduction, encouraging the utilization of recycled resources and parts
Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging	Aims to reduce waste and promote the effective use of resources through the control, separated collection, and recycling of container and packaging waste
Act on Recycling of Specified Kinds of Home Appliances	Aims to promote waste reduction and the effective use of resources by ensuring the proper collection, transportation, and recycling of specific household appliance waste
Act on Promotion of Recycling and Related Activities for Treatment of Cyclical Food Resources	Aims to promote the recycling and heat recovery of food-related resources, as well as the reduction of food waste, by encouraging food businesses to effectively utilize resources and reduce waste emissions, thereby fostering healthy business development
Construction Material Recycling Act	Aims to promote the separation and recycling of specific construction materials and implement a registration system for demolition contractors, thereby encouraging the use of recycled resources and reducing waste, ensuring effective resource utilization and proper waste management
Act on Recycling of End-of-Life Automobiles	Aims to ensure the proper and smooth collection, transfer, and recycling of end-of-life vehicles by manufacturers and related businesses, promoting waste reduction and the use of recycled resources and parts, thereby ensuring proper waste management and effective resource utilization
Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes	Aims to regulate the storage and disposal of polychlorinated biphenyl (PCB) waste, considering its persistence and impact on health and the environment, while promoting the development of a proper disposal system and ensuring appropriate treatment to protect public health and preserve the living environment

Study Group on Environmental Laws and Regulations, "The Six Environmental Laws" (Chuohoki)

Source: Study Group on Recycling-Oriented Society Legislation, "Commentary on the Basic Law for Establishing a Recycling-Oriented Society" (Gyosei)

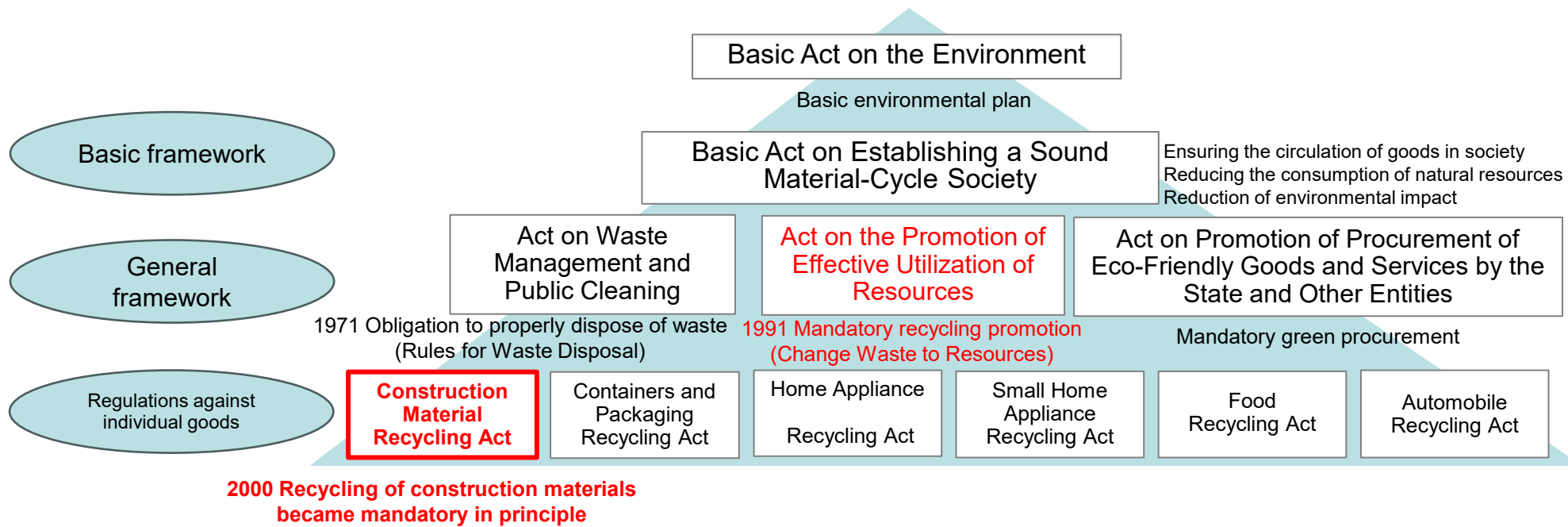
Ministry of the Environment, "White Paper on Establishing a Sound Material-Cycle Society, Fiscal 2004 Edition" (Gyousei)

The Construction Material Recycling Act aims to promote sorted disassembly and recycling of specified construction materials and ultimately to create a recycling-oriented society.

Separation, dismantling and recycling of specified construction material waste are mandatory and there are some penalties for violation of the order.

MLIT has set a recycling rate target for each items in Construction Recycling Promotion Plan (Asphalt Lumps: 99%).

Legal framework for creating a recycling-oriented society

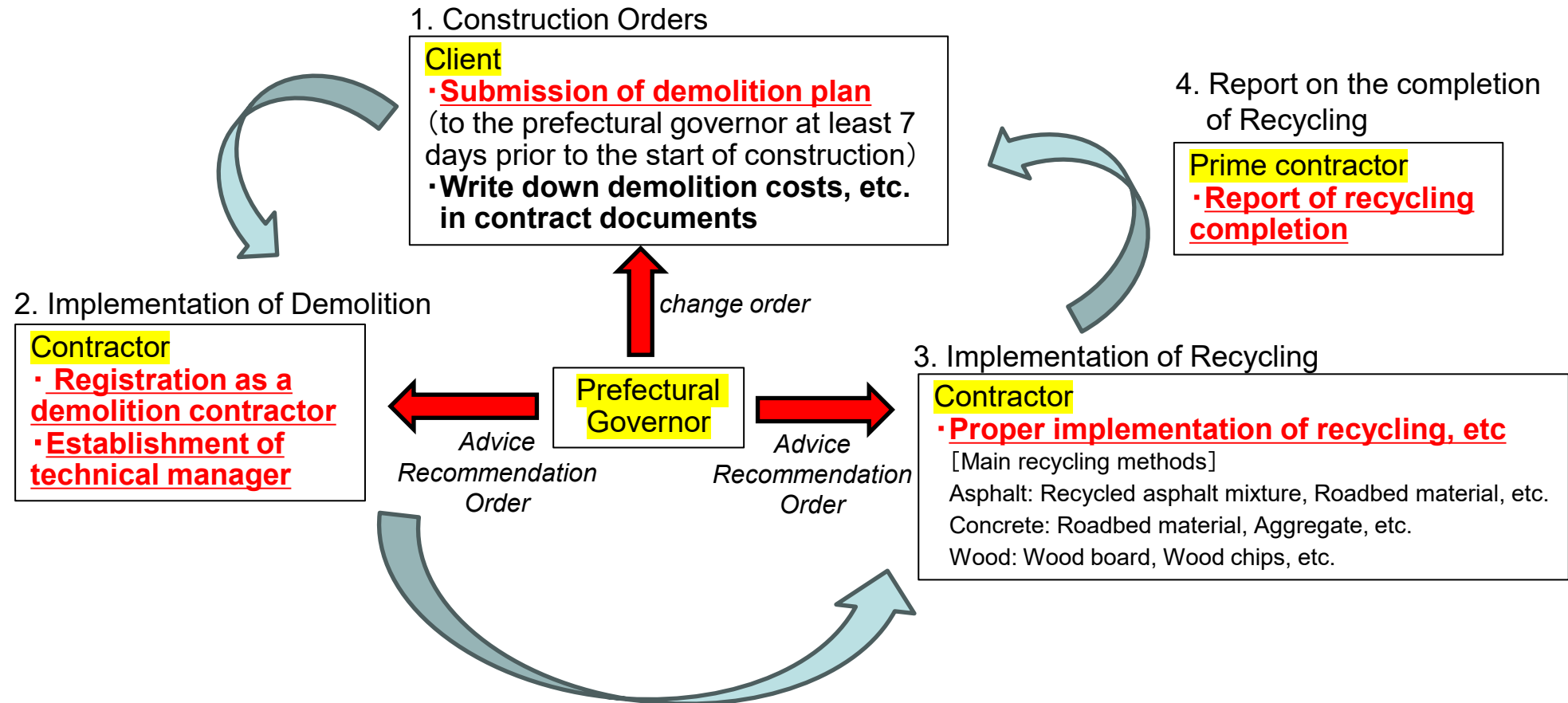


Construction Material Recycling Act covers ;

- Civil engineering work, contract value of 5 million yen(approx. \$30,000) or more
- Materials of Asphalt, Concrete, Wood, and construction materials consisting of Concrete and Steel

Both the ordering party and the contractor are obligated with penalties (ex. Business suspension and fines).

Flow of the Construction Material Recycling Act
(**Red: Obligations with penalties**, **Bold: Obligations**)



Global Environmental Conservation

Act on Promotion of Global Warming Countermeasures	Aims to promote the prevention of global warming and the reduction of greenhouse gas emissions by developing a global warming countermeasure plan and implementing appropriate measures
Act on the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures	Aims to protect the ozone layer by ensuring the effective implementation of the Vienna Convention and the Montreal Protocol based on international cooperation, regulating the manufacture of specific substances, reducing emissions, and rationalizing their use
Act on Special Measures concerning Fluorocarbons Recovery and Destruction	Aims to contribute to the health and cultural well-being of current and future generations, as well as to human welfare, by ensuring the collection and destruction of CFCs used in specific products to prevent their release into the atmosphere
Act on Prevention of Marine Pollution and Maritime Disaster	Aims to ensure the protection of marine environments and the safeguarding of human lives and property by strengthening the regulation of oil, hazardous liquid substances, and waste emissions from ships and marine facilities, preventing marine pollution and maritime disasters, ensuring proper waste oil disposal, and securing the implementation of international agreements
Act on Rationalizing Energy Use	Aims to contribute to the sound development of the national economy by promoting energy efficiency, ensuring the effective use of fuel resources, implementing measures for factories, transportation, buildings, and machinery, and comprehensively advancing initiatives such as the stabilization of electricity demand
Outline for Promotion of Efforts to Prevent Global Warming	Outlines measures and policies to promote climate change mitigation efforts across the nation, aiming to achieve the Kyoto Protocol targets while balancing economic growth and environmental protection through a step-by-step approach

Study Group on Environmental Laws and Regulations, "The Six Environmental Laws" (Chuohoki)

Source: Study Group on Recycling-Oriented Society Legislation, "Commentary on the Basic Law for Establishing a Recycling-Oriented Society" (Gyosei)
 Ministry of the Environment, "White Paper on Establishing a Sound Material-Cycle Society, Fiscal 2004 Edition" (Gyousei)

- Road bureau published a policy paper to promote decarbonization in the road sector targeting 2030.

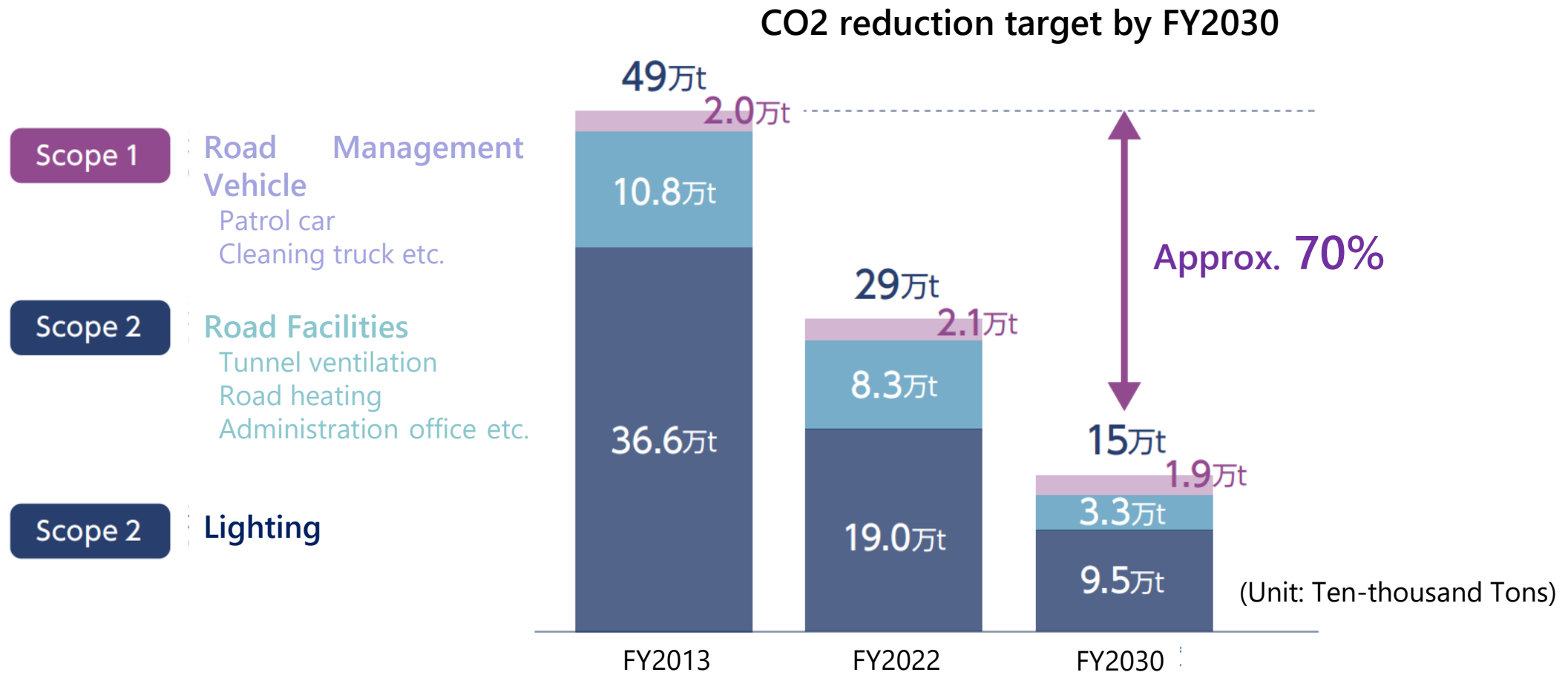
“Road Sector Decarbonization Policy Book Ver. 1.0”



Source : Road Sector Decarbonization Policy Book Ver. 1.0 by MLIT

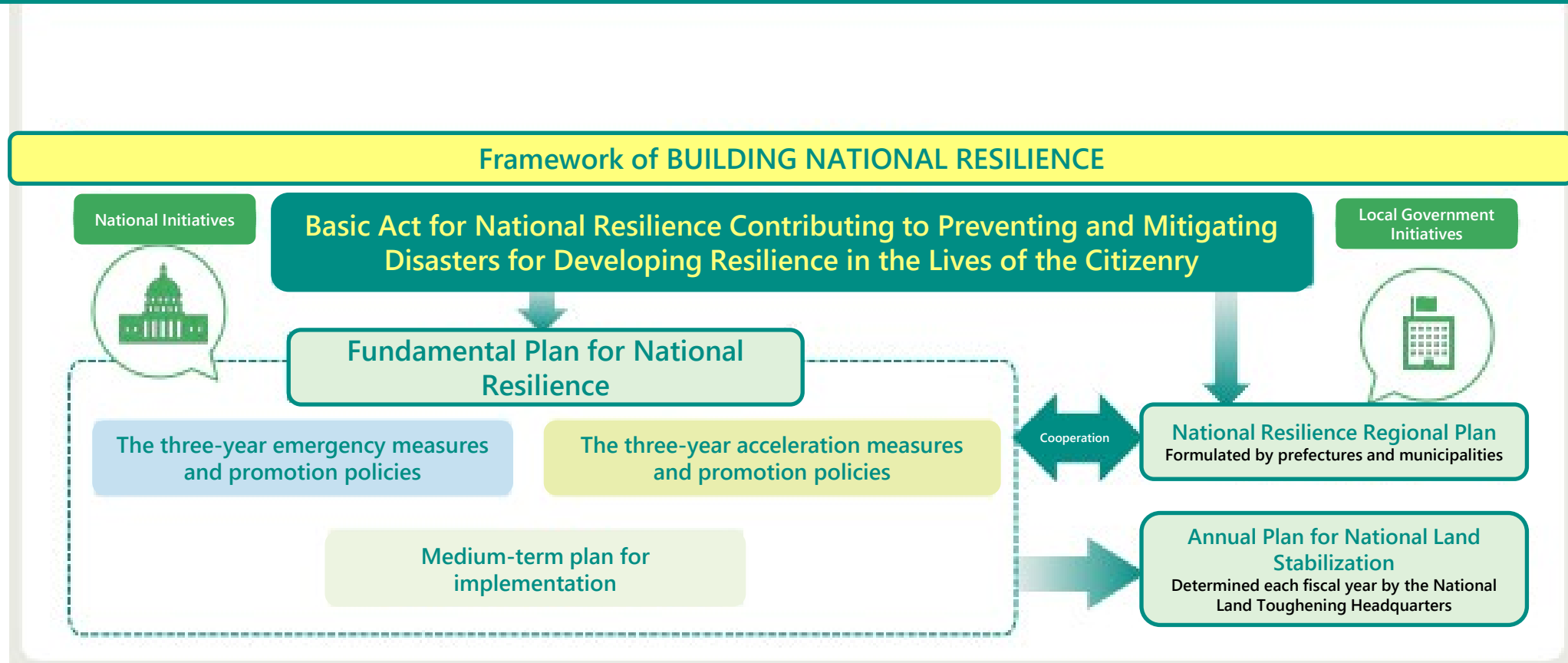
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- Based on the Basic Act for National Resilience, a framework for disaster prevention and resilience enhancement has been established. Under this framework, three-year emergency measures and five-year acceleration measures are being implemented.
- The fundamental plan supports to secure the multiple-year budget to promote proactive disaster prevention and mitigation initiatives.

BUILDING NATIONAL RESILIENCE



Framework for National Resilience

- The multi-year planned budget allocation, such as the three-year emergency measures and five-year acceleration measures, serves as a crucial foundation for achieving sustainable and effective infrastructure development.
- This approach enables not only short-term measures but also strategic infrastructure development based on a medium- to long-term perspective, significantly contributing to addressing urgent issues such as disaster resilience and economic revitalization.

	Basic Act for National Resilience Contributing to Preventing and Mitigating Disasters to Build Strong and Flexible National Life (Act No. 95 of November 2013)	Three-Year Emergency Measures for Disaster Prevention and Mitigation, and National Resilience	Five-Year Acceleration Measures for Disaster Prevention and Mitigation, and National Resilience	Medium-Term Plan for Implementing National Resilience
Outline of Measures	In response to the increasing severity and frequency of natural disasters, sets the basic principles, promotion system, and framework for national resilience measures. The goal is to protect lives and property of the people and create a resilient nation for safe and secure living.	To protect lives, economy, and daily living during disasters, three-years budget was secured for intensive measures over from FY 2018 to FY 2020. I. Maintain functions for disaster prevention II. Maintain functions to support national economy and daily life	To address severe natural disasters, aging infrastructure, and to promote digitalization for efficient national resilience, additional projects and measures are implemented intensively for five years from FY 2021 to FY 2025.	Based on the Second Basic Plan for National Resilience (FY 2019 - FY 2023), this document specifies measures to be intensively addressed over five years.
Business Scale	—	• Emergency Measures: 160 items • I. Approximately 3.5 trillion yen • II. Approximately 3.5 trillion yen	• Number of Measures: 123 measures • Additional Project Scale Required: Approximately 15 trillion yen	• Currently being formulated (a level exceeding the 15 trillion yen of the five-year acceleration measures is considered appropriate).

3-year Emergency Measures

Landslide Prevention

事業者：和歌山県

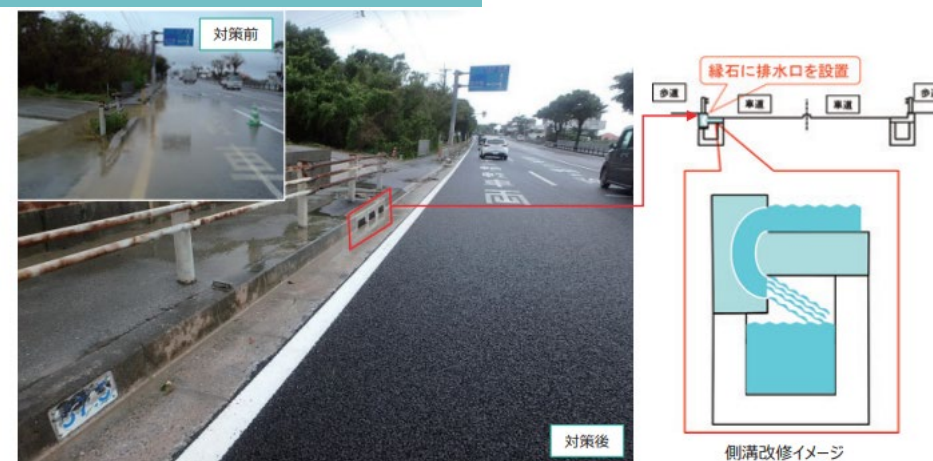
災害時に効果を発揮した3か年緊急対策の事例



Drainage

事業者：内閣府 沖縄総合事務局 南部国道事務所

災害時に効果を発揮した3か年緊急対策の事例



Overtopping wave Prevention

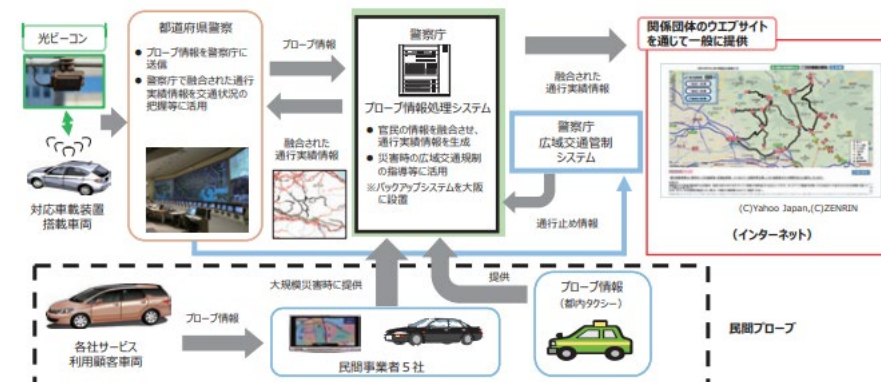
事業者：国土交通省 北陸地方整備局 羽越河川国道事務所

災害時に効果を発揮した3か年緊急対策の事例



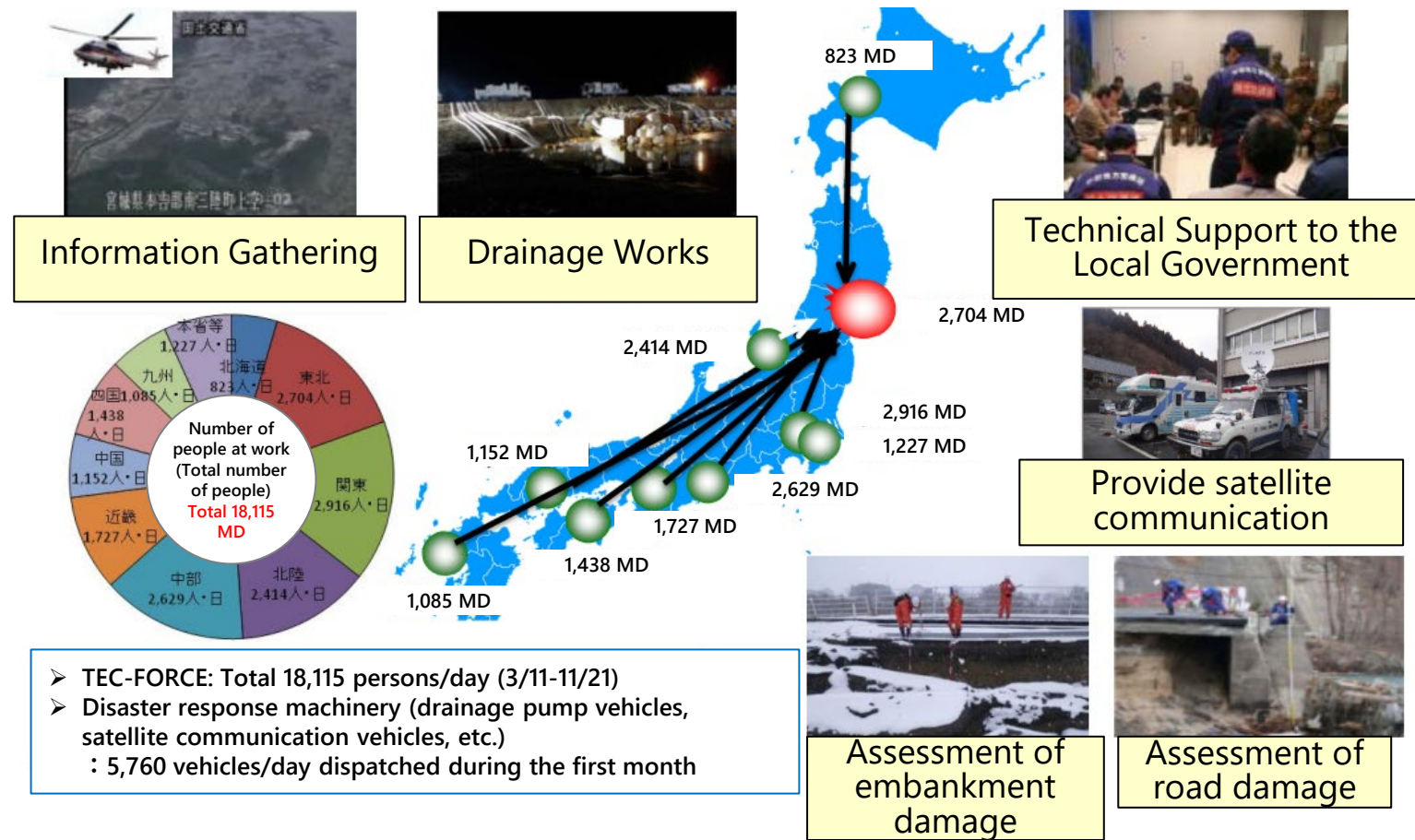
Warning System

事業者：警察庁



- TEC-FORCE (Emergency Disaster Response Team) was established in 2018 to provide prompt support to disaster-affected areas, consisting of staff members from MLIT's regional development bureaus nationwide.
- TEC-FORCE provides technical support on "assessing the damage" "preventing the spread" "early recovery" etc. (as of April 2024, approx. 17,000 members).

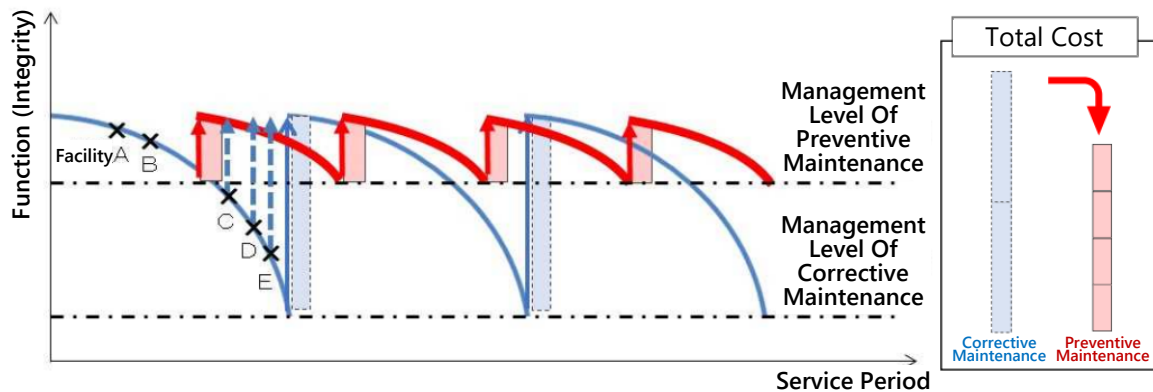
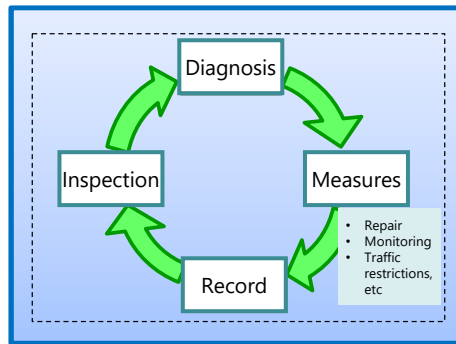
Dispatch of TEC-FORCE to the Great East Japan Earthquake in 2011



Preventive maintenance

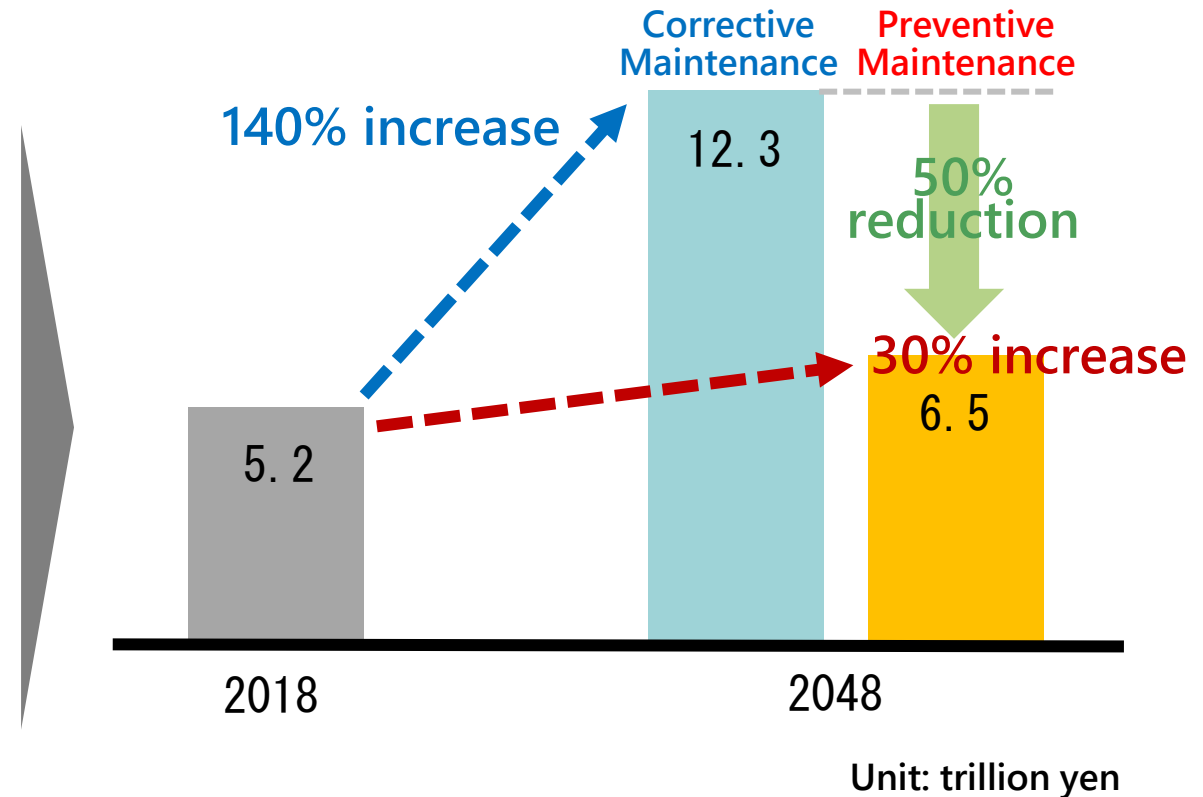
- Maintenance costs will increase by approx. 140% in 30 years through "corrective maintenance"
- By introducing "preventive maintenance," the increase will be limited to approx. 30%. The annual cost will be reduced by approx. 50% compared to "corrective maintenance."

Concept and Scheme of Preventive Maintenance



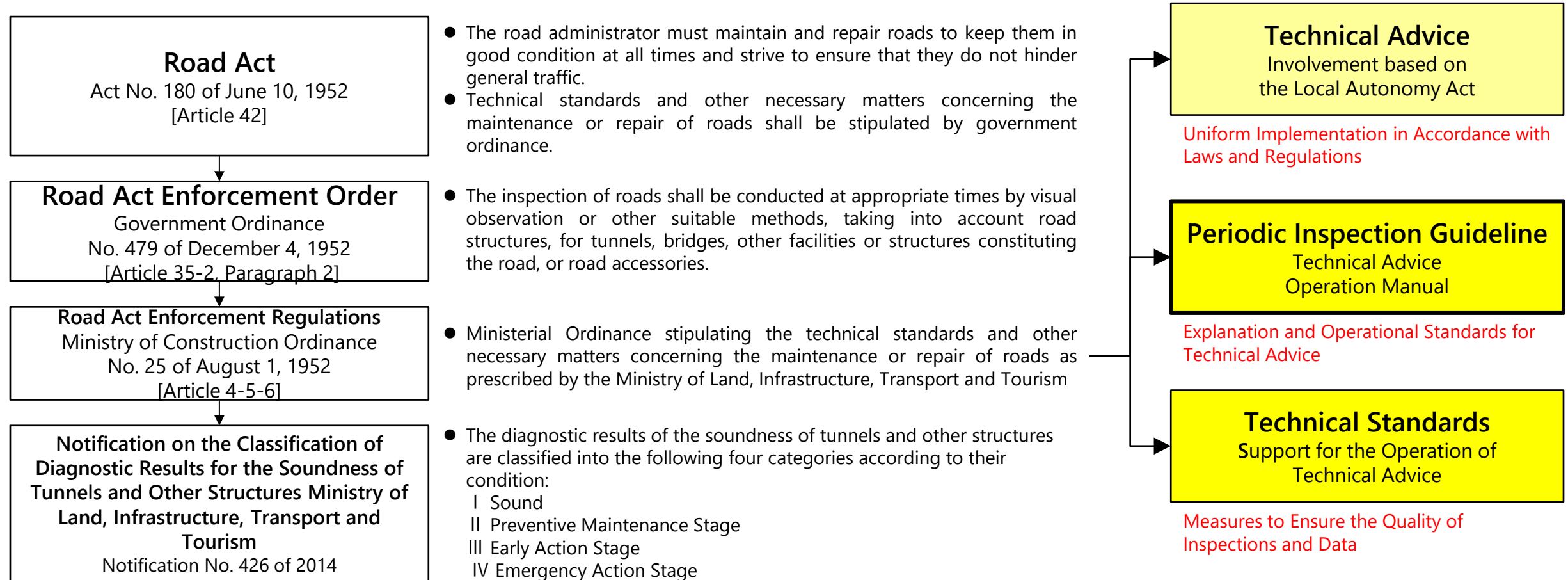
- Preventive Maintenance** Taking measures such as repairs before any issues in the function or performance of the facility occur.
- Corrective Maintenance** Taking measures such as repairs after issues in the function or performance of the facility have occurred.

Effect of Preventive Maintenance



Framework for Periodic Inspection

- The Road Act is a law concerning the management of roads, and the Road Act Enforcement Order is a government ordinance that details the rules specified in the Road Act.
- The Road Act Enforcement Regulations are ministerial ordinances that specifically stipulate the Road Act Enforcement Order and also include notifications for classifying diagnostic results based on the condition of structures such as tunnels.



Furthermore, a mechanism for ensuring the quality and continuous improvement of maintenance management operations, based on the intent of laws and regulations, is also important.

- The Road Act Enforcement Regulations link technical advice, operational manuals, and reference materials deemed appropriate by the national government to local governments and other entities. These are considered the minimum necessary to achieve the objectives of the laws established by the national government.

Technical Advice

Involvement under the Local
Autonomy Law

Technical advice is
uniformly implemented in
accordance with laws and
regulations.

- Technical advice, based on Article 245-4, Paragraph 1 of the Local Autonomy Act or Article 48, Paragraph 1 of the Act on Special Measures concerning Road Construction, is provided to local governments and other entities. It indicates what the national government deems appropriate for the operation of affairs and other matters, as the minimum necessary to achieve the objectives of the laws established by the national government.

Periodic Inspection Guideline

Technical Advice Operation Guide

Explanation and Operational
Standards for Technical Advice
Explanation of Laws and Technical
Advice + Operational Manual

- These guidelines, in accordance with the provisions of Article 4-5-6 of the Road Act Enforcement Regulations, indicate the matters that road administrators are expected to implement at a minimum to achieve the objectives of regular inspections, in line with the intent of such technical advice. Additionally, explanatory notes are provided for reference in the implementation of these matters.

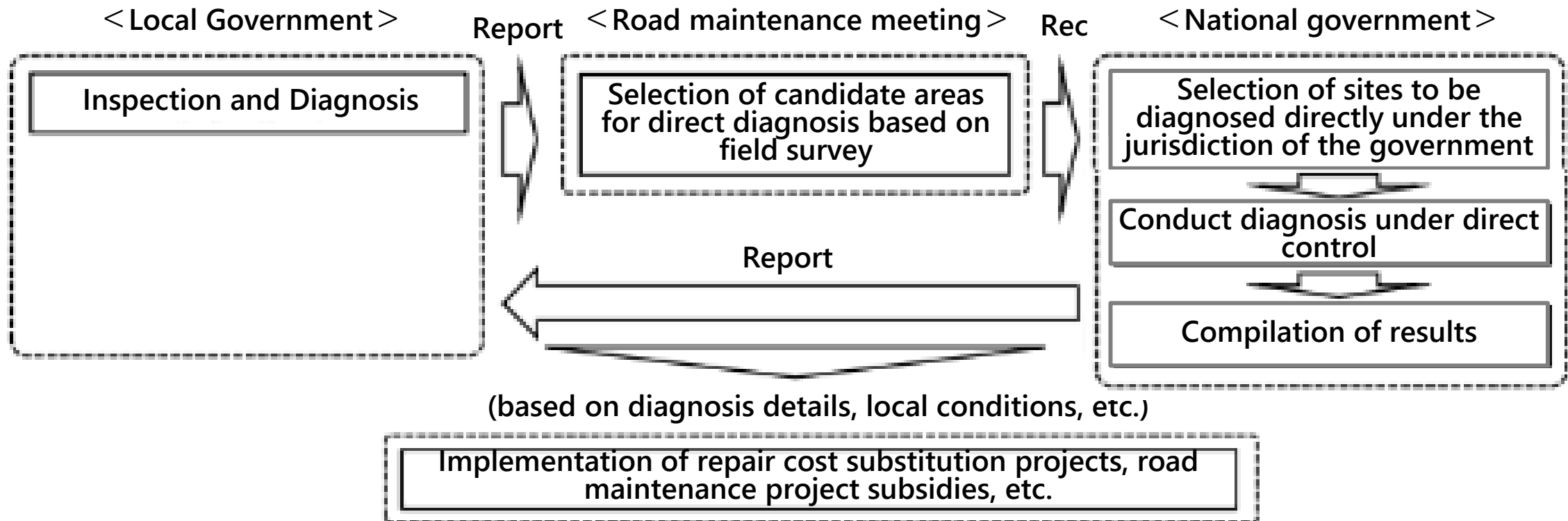
Technical Standards

Technical Advice Operational Support

Measures to Ensure the
Quality of Inspections and
Data (Reference Materials
for Regular Inspections)

- Examples of Damage Severity Records
→ Basic Data Collection Guidelines
NILIM Report No. 381 - Research on Basic Investigation of Road Bridge Health - Basic Data Collection Guidelines for Road Bridges (Draft)
- Examples of Load-Bearing Performance Evaluation, Consideration of Previous Deterioration and Damage Cases
→ Damage Case Collection NILIM Report No. 748 - Reference Materials for Regular Inspection of Road Bridges (2013 Edition) - Photo Collection of Bridge Damage Cases
- Minimum Required Knowledge and Skills → Training Texts
 - NILIM Report No. 829 - Training for Road Structure Management Practitioners (Basic Bridge Course I) - Text for Regular Inspection of Road Bridges
 - NILIM Report No. 1232 - Training for Road Structure Management Practitioners (Basic Bridge Course I) - Text for Regular Inspection of Road Bridges (Part 2)
→ Inspection Manual [Published by Japan Road Association] - Road Bridge Inspection Manual - Reference Materials for Bridge Inspection

- Understaffing, underbudgeting, and lack of technical experience are the crucial issues of local governments.
- To support appropriate inspection, a direct diagnosis by the "Road Maintenance Technical Group," composed of personnel from the Regional Development Bureaus, the National Institute for Land and Infrastructure Management (NILIM), and the Public Works Research Institute (PWRI), is conducted upon request for facilities that require urgent response and advanced technical skills.
- Based on the results, repair works can be directly executed or subsidized by the national government condition to the capacity of the local government and/or technical difficulty.



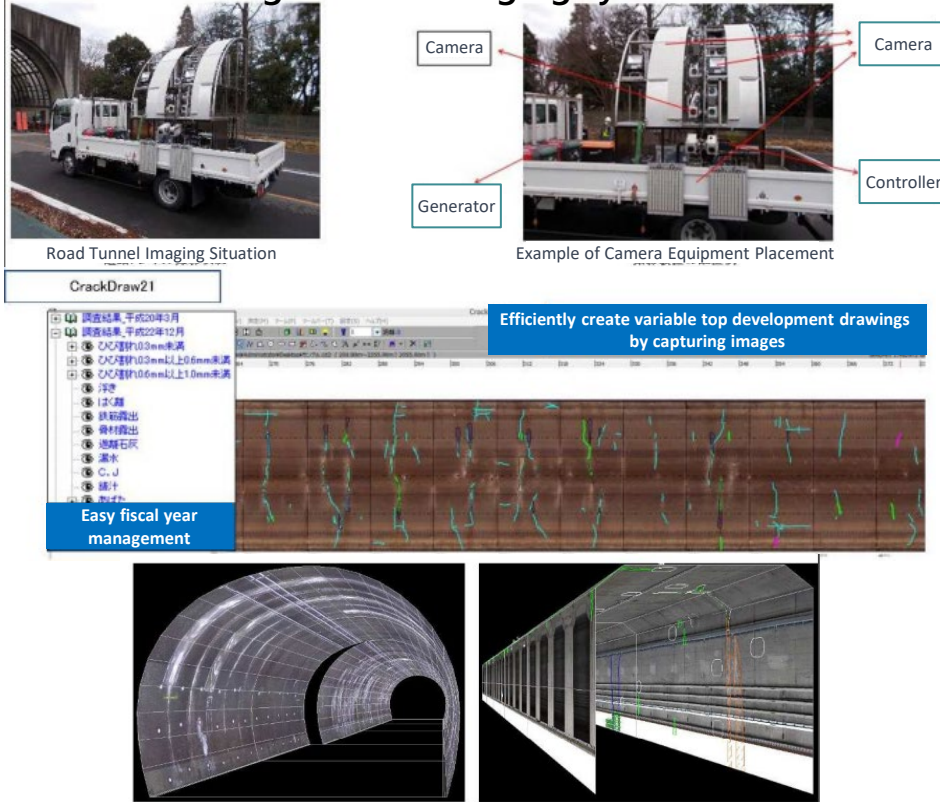
Introduction of Advanced Technologies

Introduction of Advanced Inspection Technology (Technology Catalog)

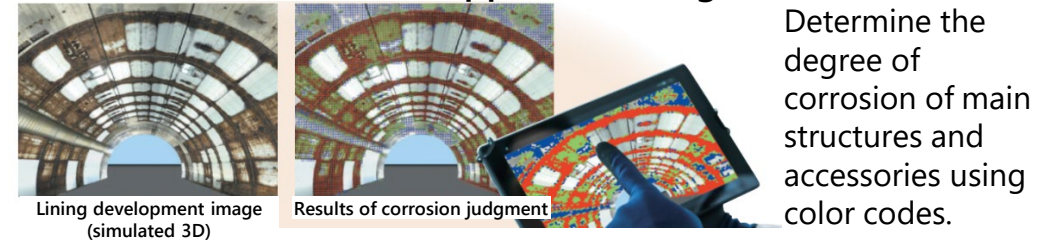
- Certified cutting-edge inspection technologies are successively added to the Inspection Support Technology Performance Catalog. (As of April 2024, 321 technologies)
- Government set the requirement for the performance values.
- Introduction to regular inspections by national and local governments are highly recommended.

Examples of image measurement/analysis technology

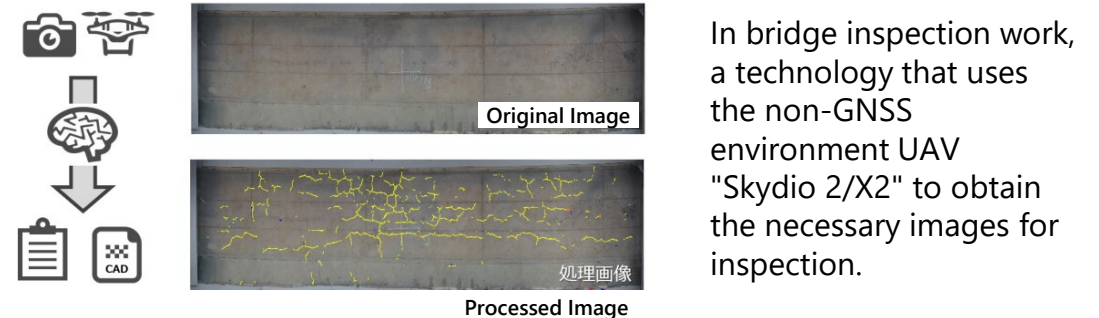
Drive-through tunnel imaging system



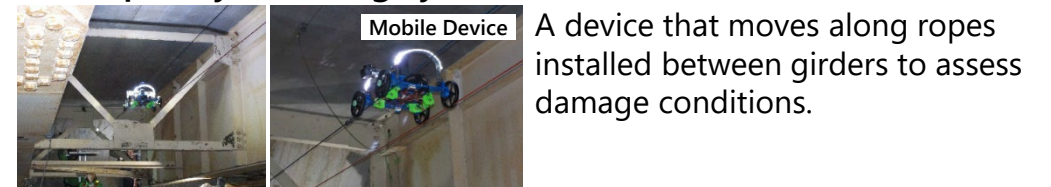
Corrosion assessment app "Color Judge"



Bridge inspection support system by non-GNSS environment UAV.



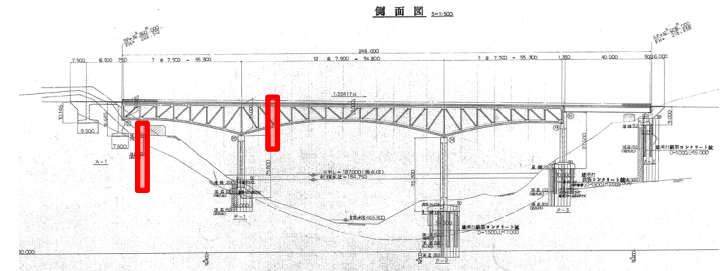
Ropeway scanning system



- Drones replace conventional rope access with traffic control.
- Costs reduced by approximately 50%.

Bridge Overview

- Bridge name: Keiryu Bridge (National Road 452)
- Bridge length: 248.00 m
- Bridge type: 3-span continuous truss + simple composite sheet girder bridge
- Targeted sections/components: Piers
- Type of deformation: Cracks



Conventional Checks

Inspection with Rope Access Technology



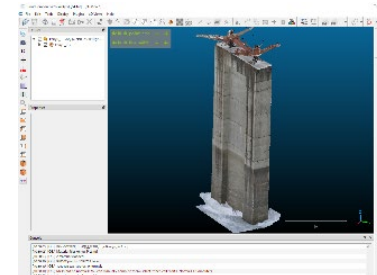
Rope access inspection status Traffic control is necessary

- Road traffic control is required during ascent and descent due to the narrow width of the road
- Requires a qualified rope access surveyor
- Transcribe the damage diagram sketched during the inspection on the desk

New Technology Utilization Inspection



Status of drone photography



Modeling of photographed images

R5 Principle Items:
3D photographic recordings using
inspection support technology

Performance Catalog	Technology
NETIS	Small drone technology with omni-directional collision avoidance sensors 【BR010009-V0323】
Other	

- Inspection costs for high bridge legs can be **reduced by 51% of inspection time for rope access**
- Safety costs related to traffic control are also unnecessary
- After the inspection, the damage can be confirmed on the desk by 3D modeling.

- Remote-controlled boats equipped with multibeam sonar replace conventional underwater pier inspections by divers.

Bridge Overview

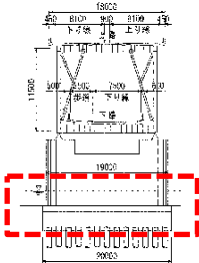
- Bridge name: Shin-Asahi Bridge (Route 2)
- Bridge length: 284.64 m
- Bridge type: Steel 3-span continuous double-deck truss bridge
- Targeted area/component: Foundation
- Type of deformation to be addressed: scour



Panoramic photo



Site conditions (pier foundations)



Scope of Application
of New Technology

Conventional Checks

(Proximity visual inspection and measurement by divers)



Inspection status

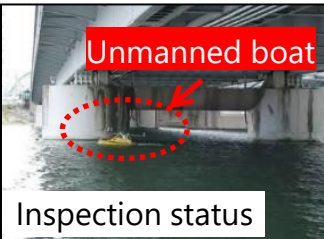
- Underwater sections are inspected by divers through close-up visual inspection.
- Underwater work must be performed by qualified personnel.

New Technology Utilization Inspection

R5 Principle Items:
Measurement of underwater locations of riverbeds, foundations, revetments, etc.



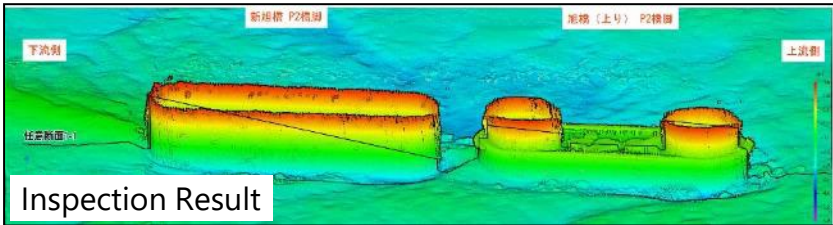
Unmanned boat



Unmanned boat

Inspection status

Performance Catalog	Technology
NETIS	Depth and depth surveying by unmanned boat equipped with multibeam depth finder【KTK-210020-A】
Other	



Inspection Result

This technology uses an unmanned remote-controlled boat equipped with a multibeam sonar to measure the riverbed in planar view and record and display the results in three dimensions.

- Radar-equipped vehicles replace visual and sound inspections with traffic control.

Tunnel Overview

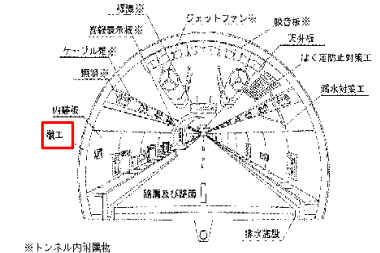
- Tunnel name: Asakawa Tunnel (National Highway No. 20 BP)
- Extension: 1845 m (upstream) 1839 m (downstream)
- Tunnel Classification: Overland tunneling method
- Targeted area/component: Lining
- Type of deformation: Cracks, etc.



Mine entrance
at the starting point (upstream)



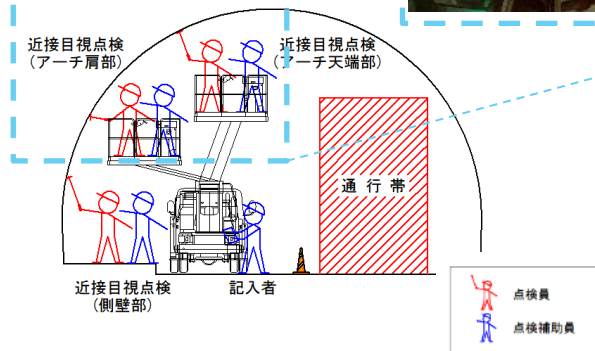
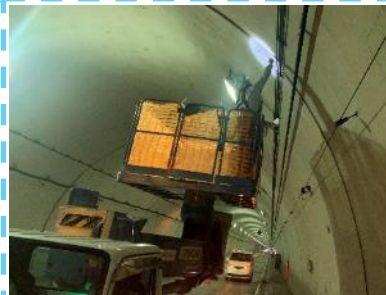
Mine entrance
at the origin (downstream)



※トンネル内設備
□ : Area of application

Conventional Checks

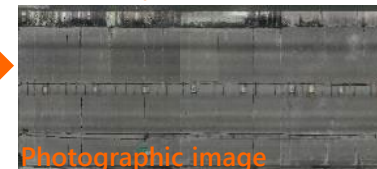
Proximity visual + sound inspection



New Technology Utilization Inspection

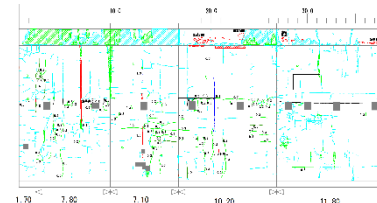


MIMM-R/MIMM



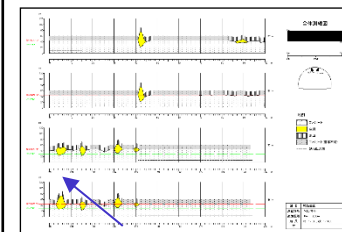
Photographic image

Auto
Create



Deformation development

Tunnel Master



Detection of voids

→ Extraction of percussion inspection points

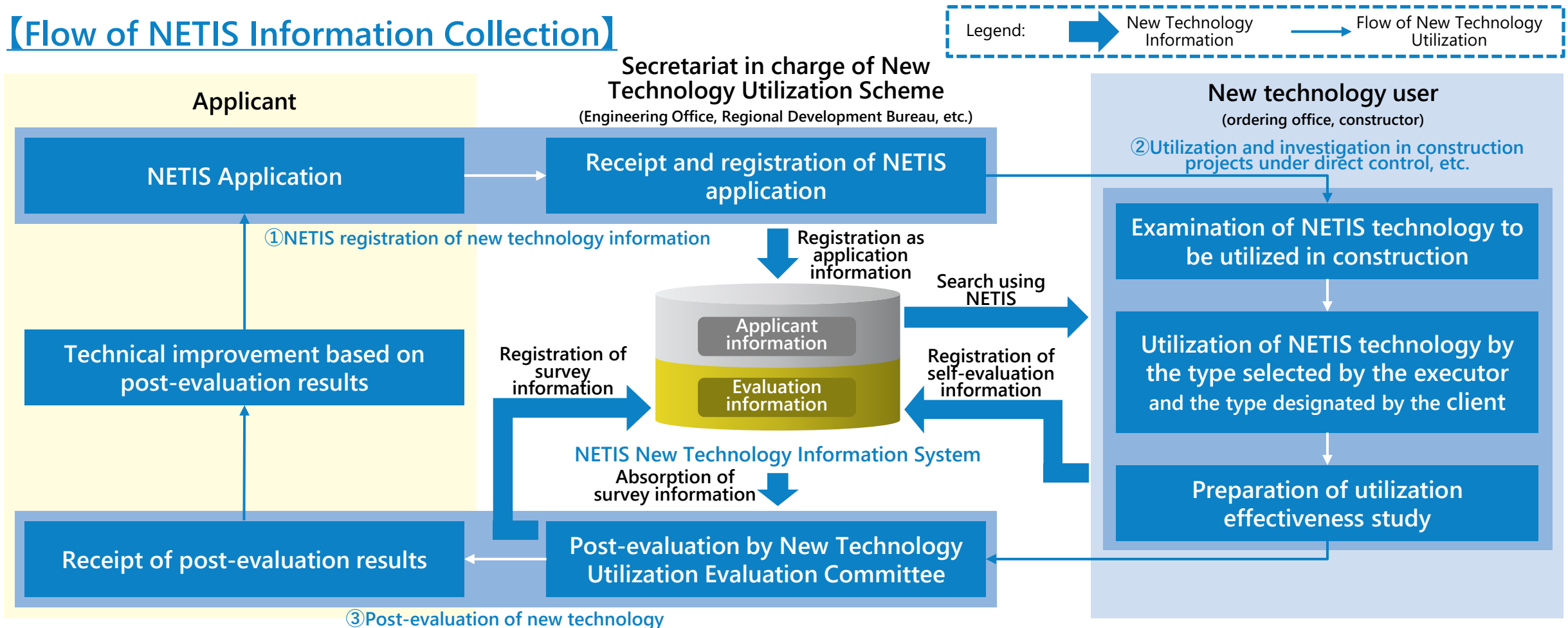
R5 Principle Items:
Measurement and recording of
deformations (cracks, swell,
separation, etc.) of the inner lining
of tunnels by means of images, etc.

Performance Catalog	Technology
NETIS	High-Speed 3D Tunnel Inspection System MIMM-R (MIMM-R)-Radar Inspection Technology
Other	【KK-130026-V】、【TN020006-V0323】 Road Tunnel Disaster Prevention Vehicle "Tunnel Master" 【TN020007-V0223】

Introduction of Advanced Technology (Technology Information System)

- To promote the use of advanced technologies, New Technology Information System (NETIS) was established to share and provide information upon procurement.

【Flow of NETIS Information Collection】



③Post-evaluation of new technology

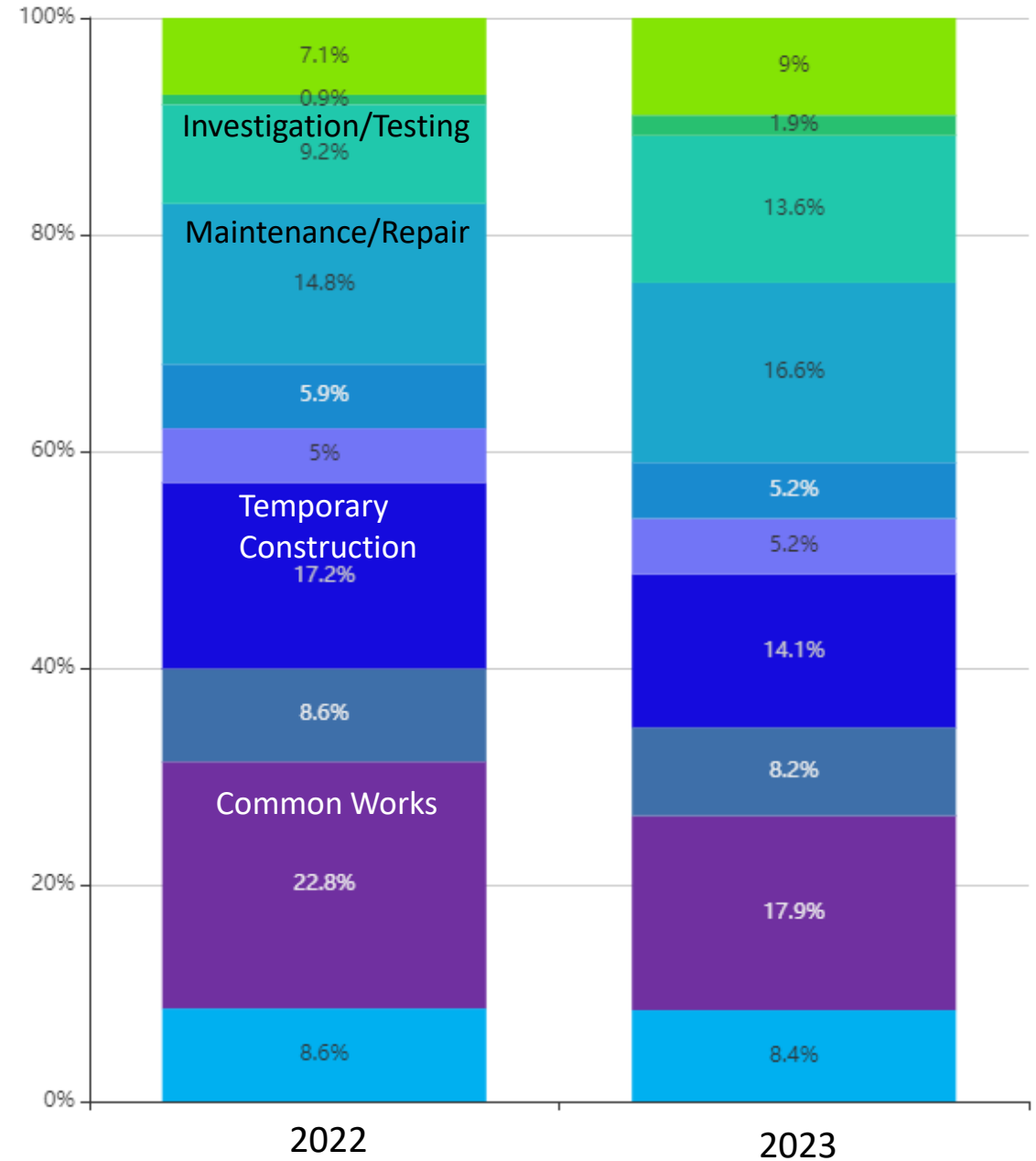
Source: Ministry of Land, Infrastructure, Transport and Tourism Outline of Scheme for Utilization of New Technology in Public Works, etc., with NETIS at the Core
<https://www.netis.mlit.go.jp/InternalNETIS/Files/Manual/1/.pdf>

Composition of NETIS

Percentage of registrations by construction type per year

Number of technologies registered in NETIS (by construction type)

- Earthworks
- Common works
- Concrete work
- Temporary construction
- Pavement
- Auxiliary Facilities
- Road Maintenance and Repair
- Investigation and Testing
- CALS Related Technology
- Telecommunication Facilities



Source: Ministry of Land, Infrastructure, Transport and Tourism New Technology Information System (NETIS)
https://www.netis.mlit.go.jp/netis/pubusagestatus/detail?graph_class_cd=2&graph_term_cd=2&graph_type_cd=5

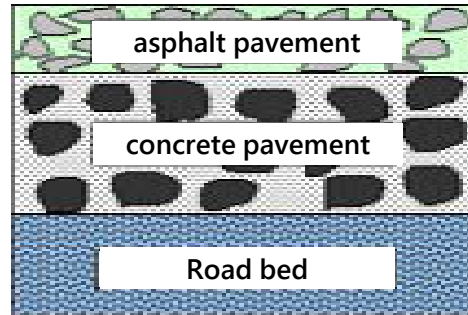
- Long-life pavement technologies contribute to reduction of GHG emission by reducing maintenance frequency and traffic congestion due to maintenance works.

Long-life Pavement Technology

Pavement Composition

Outline

- Pavement using asphalt mixture for the surface/base course and cement-based plates for the layer below



Features

- Structural durability of cement-based pavement enables longer life than ordinary asphalt pavement
- Lower lifecycle costs
- Asphalt pavement for surface/base course provide good runnability and easy maintenance



Asphalt Mixtures

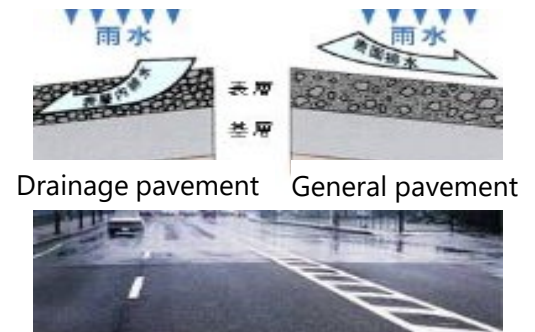
Highly durable asphalt mixture

- Advantage in fluidity, water resistance, oil resistance, torsion resistance, drainage, etc., and durability



Long-life porous asphalt mixture

- Asphalt mixed with special additives to extend life of multi function pavement



Source: <http://www.dohkenkyo.net/pavement/meisyo/>

Source: <http://www.dohkenkyo.net/pavement/meisyo/>

Reduce GHG emission by reducing maintainace frequency

Asphalt Recycling Technology

- Asphalt pavement recycling is widespread all over Japan after the enactment of the Construction Material Recycling Act in 2000 . Recycling rate is 99.5%.
- Estimated CO₂ emissions from production of reclaimed asphalt mixture is 16% lower compared to all new mixtures.

Asphalt Recycling Technology

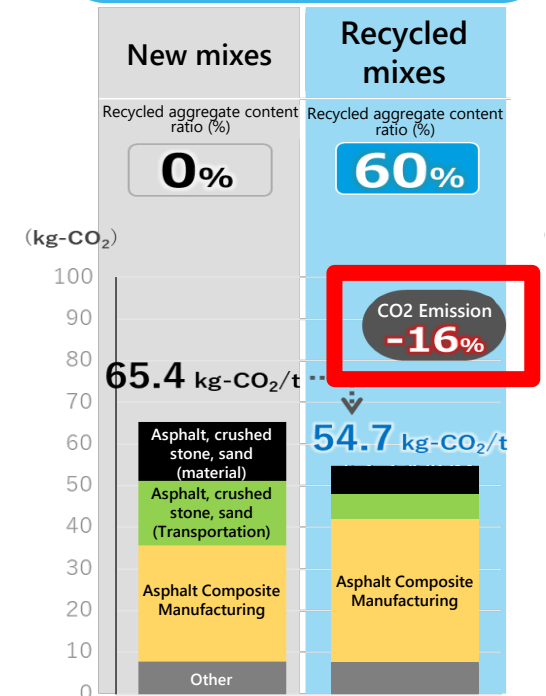


Created based on the source:
 "PWRI: Aiming to establish permanent pavement recycling technology"

Three expected effects

① GHG reduction

Comparison of CO₂ emissions
 per ton of asphalt mix produced in Japan



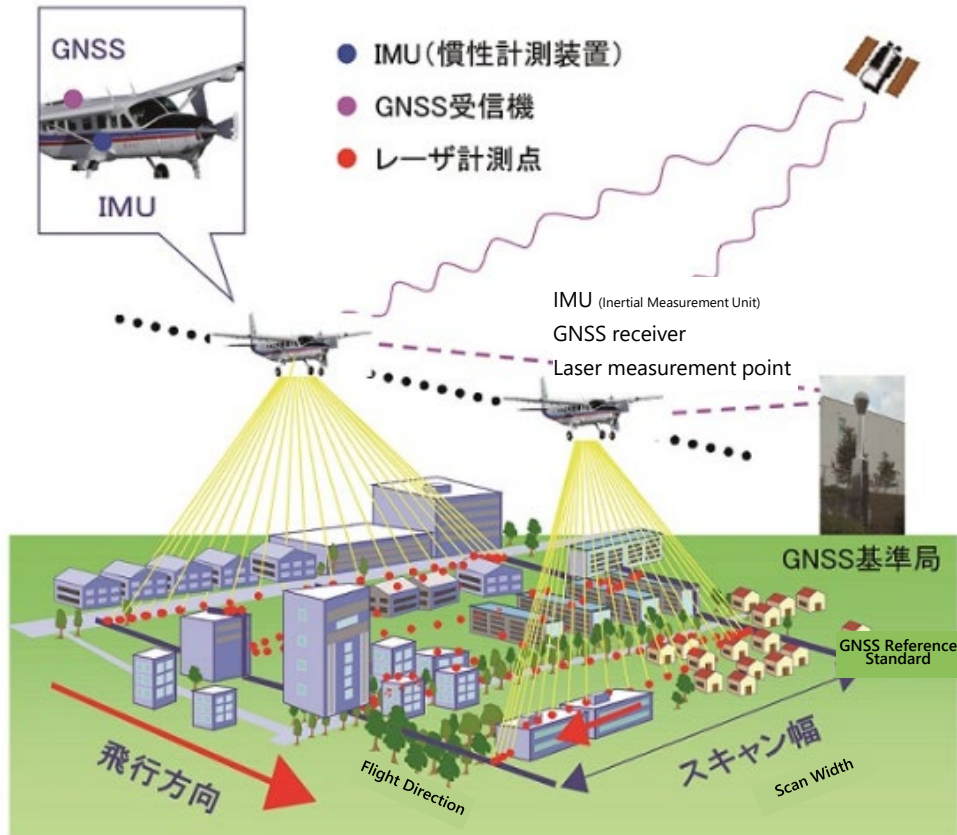
② Resource recycling

③ Maintenance cost reduction

Slope Risk Assessment using 3D Point Cloud Data

- 3D point cloud data provide stable and high precision topographic map to enable disaster risk assessment without omission.

Aerial Laser Surveying



Source: Geographical Survey Institute:
https://www.gsi.go.jp/kankyochiri/Laser_index.html
https://www.gsi.go.jp/kankyochiri/Laser_senmon.html

Effects of using aerial laser surveying

Conventional Survey

Experts decipher and assess manually

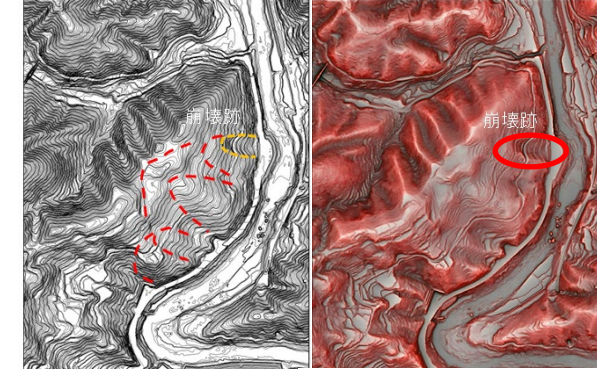


Topographic map

Aerial photographs

Laser Survey

Less inconsistency through high precision

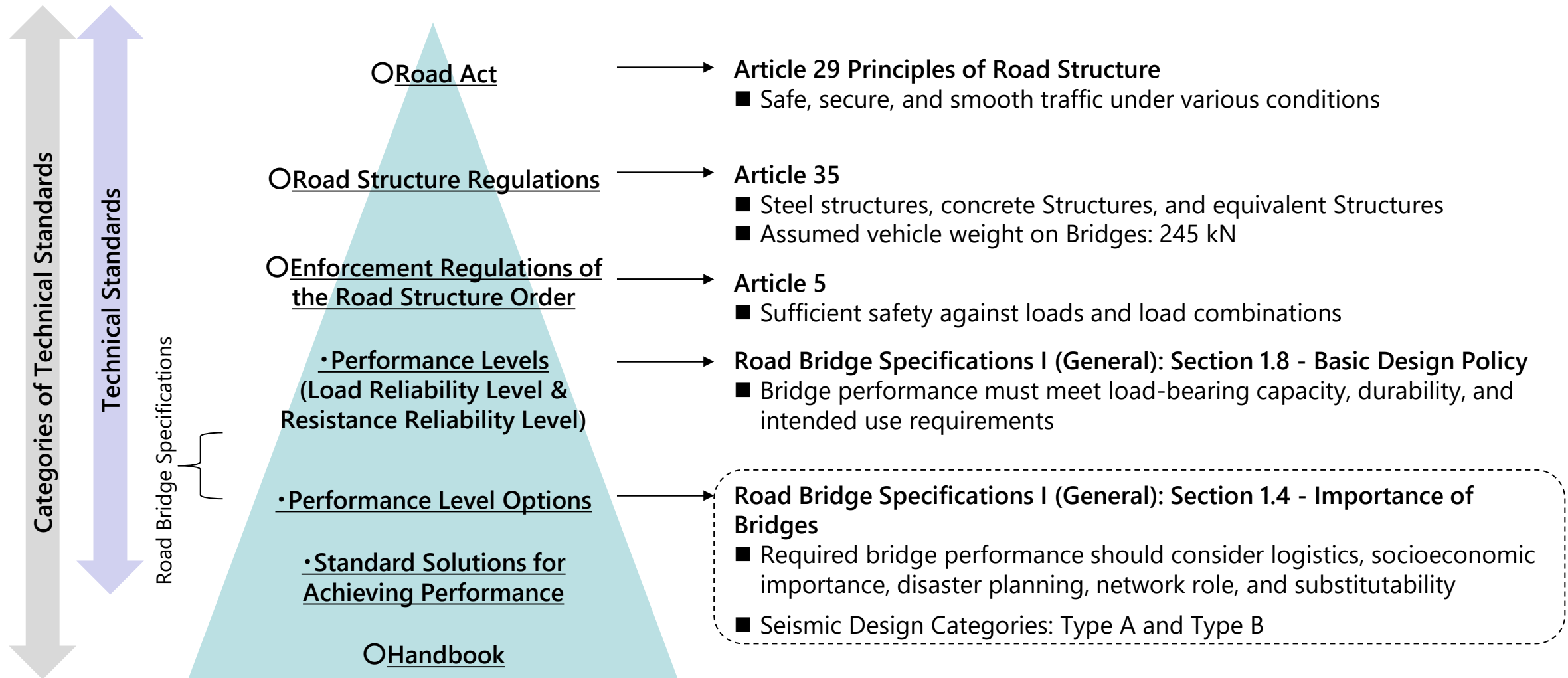


Laser topographic surveying

Microtopography surveying

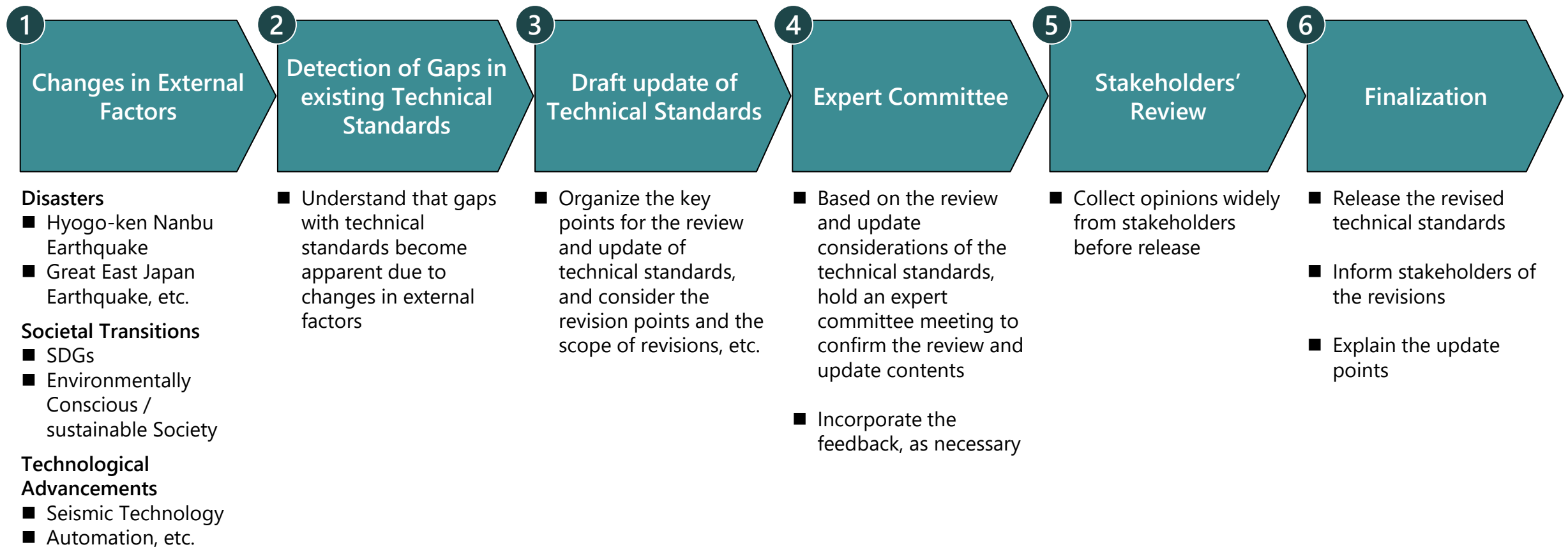
Updating Rules and Regulations

- Laws and regulations are supported by various guidelines, technical standards, and other related documents.



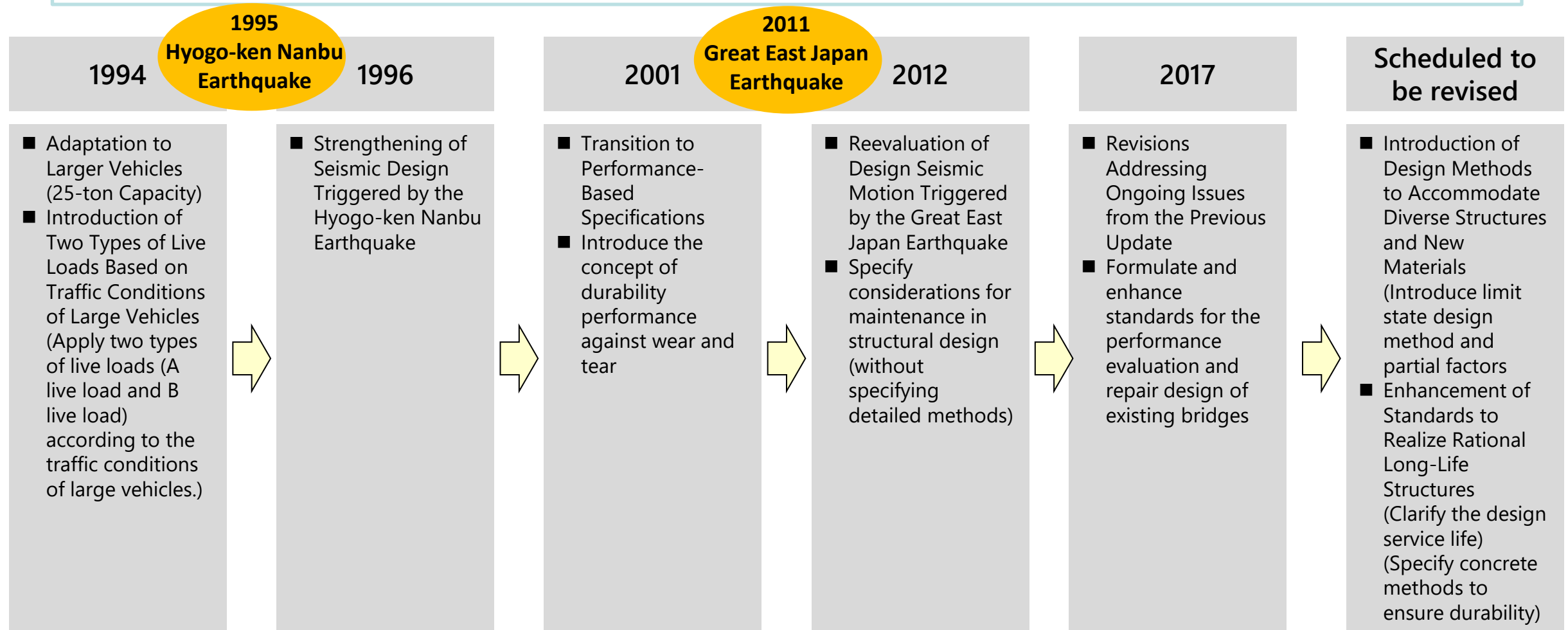
Updating process of Rules and Regulations

- Laws, regulations, standards and various guidelines are updated as necessary in light of disasters and technological advancements to continuously improve the quality of road management.



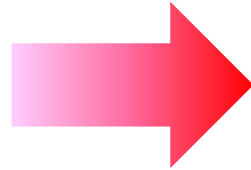
History of Seismic Standards for Bridges

- Experiencing multiple large-scale earthquake, the road bridge standards were revised in a timely manner, and seismic retrofiting of existing bridges were conducted.
- Seismic standards are constantly reviewed and updated to ensure they meet contemporary requirements.





Damage from the Hyogo-ken Nanbu Earthquake



Situation of bridges after countermeasures

Improvement in Public Procurement

Framework to Support Infrastructure Industry

- 3 infrastructure related laws were amended to ensure contractor to continuously contribute to the development of infrastructure.

- The **Three Workforce Acts** were revised to **secure labor force**, **enhance productivity**, and **strengthen regional responsiveness**, ensuring that the construction industry—critical to infrastructure development and regional resilience—can continue to fulfill its essential role

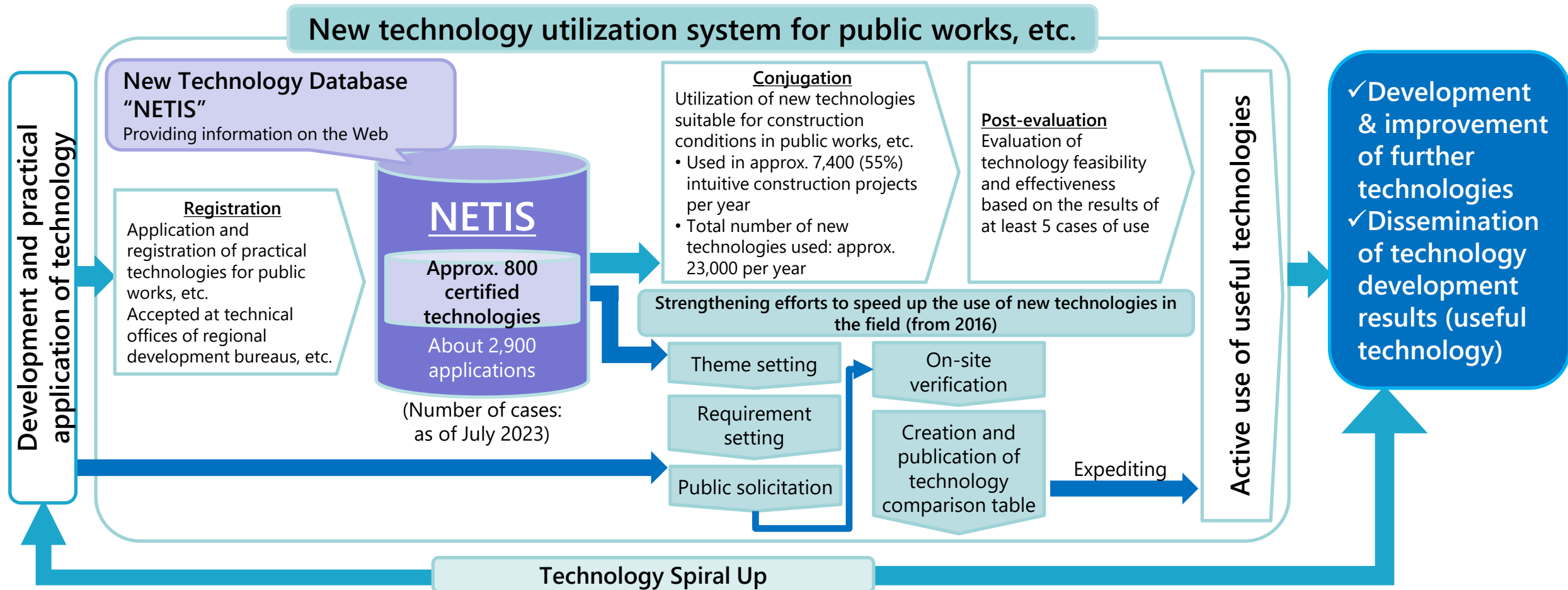
		Legislator-Initiated Legislation Revision of the Public Works Quality Assurance Act	Government Funding Revisions of the Construction Business Act and the Public Works Bidding Properness Act
Securing Labor force	Improvement of Working Conditions	■ Understanding wage payment practices and implementing necessary measures ■ Compensation based on skills and abilities ■ Improvement of employment management for diverse workforce	■ Ensuring and distributing standard labor costs ■ Ensuring fair compensation by construction companies
	Price Adjustment (Preventing Cost Pressure on Labor Expenses)	■ Proper utilization of sliding clauses (Contract Amendments)	■ Facilitating the price adjustment for increased material costs ➢ Contractual terms and conditions ➢ Contractor requests and good-faith negotiations
	Work Style Reform and Workplace Improvement	■ Promoting secured days off ■ Collaboration with schools and public awareness efforts ■ Setting estimated prices with consideration for special circumstances ■ Flexibility in surveying qualifications [Revision of the Survey Act]	■ Strengthening measures against unreasonably short construction timelines ■ Facilitating construction timeline adjustments
Enhancing Productivity		■ Utilization of ICT (Data utilization and data transfer) ■ Incorporation and utilization of new technologies in cost estimates ■ Promotion of technological development	■ ICT guidelines and efficiency in on-site management ■ Optimizing on-site engineer allocation
Strengthening Regional Responsiveness	Maintenance of Regional Construction Companies, etc.	■ Procurement Based on appropriate bidding conditions ■ Strengthening disaster response capabilities (JV method, workers' compensation insurance enrollment)	(Reference) Revision of the Public Works Quality Assurance Act ■ Promoting better initiatives for public works (Top-up approach) Revision of the Construction Business Act and the Public Works Bidding Properness Act ■ Raising minimum standards including private construction projects (Bottom-up approach) ■ Regulatory approaches
	Strengthening the Public Procurement System	■ Training of procurement officers ■ Wide-area maintenance and management ■ Advice and recommendations from the national government [Revision of the Contracting Act]	

Accommodation of New Technologies

- The use of new technologies is encouraged and incorporated into procurement specifications.

【Overview of New Technology Utilization System】

A system (in operation since 2001) to actively utilize and evaluate useful new technologies developed by the private sector in public projects, etc., and to promote technological development.



Overview of Bidding Methods for Public Procurement

- Besides cost competition, several types of bidding method is available to evaluate non-price factors.

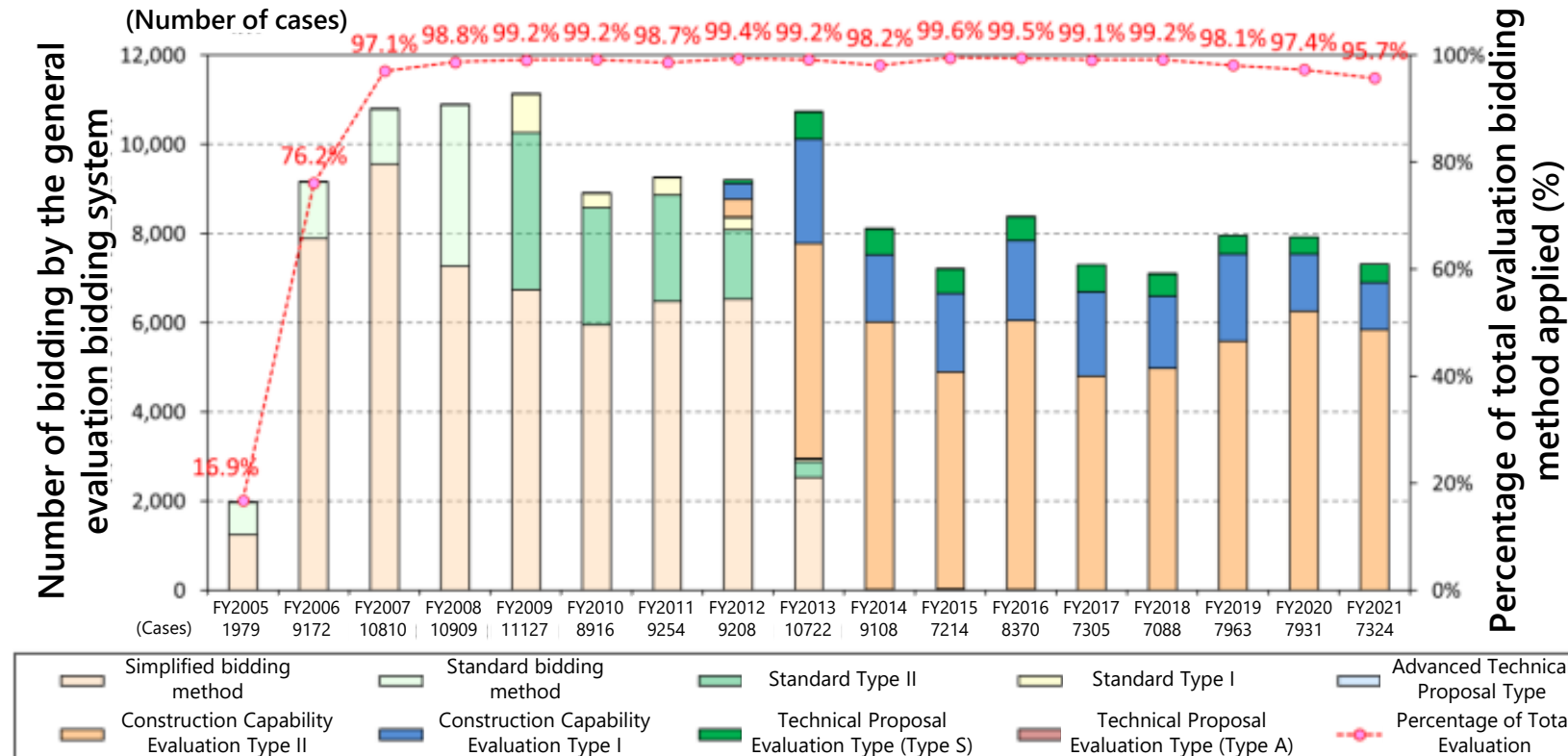
Bidding Methods		Procurement Methods	Characteristics
Negotiated Contract (Utilization of Disaster Agreements)		The procuring entity selects a specific party at its discretion	To ensure rapid recovery during disasters, agreements are made with contractors in advance, allowing work orders to be issued through negotiated contracts without the need for bidding procedures during emergencies. The contents of these agreements are disclosed for transparency, and post-event evaluations are conducted.
Selective Competitive Bidding	Standard	The procuring entity nominates participants for competition from qualified parties	Based on standards set by the Ministry of Land, Infrastructure, Transport and Tourism, multiple contractors are nominated to participate in the bidding process, considering their technical capabilities and financial conditions. Evaluation may include not only price but also technical proposals.
	Public Offering	Those who pass the screening through public offering are nominated	A method that invites participants widely from the general public, with nominated contractors selected through a screening process. This aims to promote new entries and enhance competitiveness.
	Comprehensive Contract	Multiple individual projects within a specified period are awarded to those selected through public offering	Contracts are pre-established with multiple contractors (contract pool), and when individual orders arise, contractors are selected from the pool through a simplified procedure. This leads to faster and more efficient procurement.
General Competitive Bidding • Comprehensive Evaluation Bidding	Type II	Request for technical proposals involving changes to the project objectives	In addition to price, technical proposals (such as construction plans) are evaluated, and the bidder is selected based on a comprehensive evaluation of both price and technical proposals. This is a standard comprehensive evaluation method.
	Type I	Request for technical proposals not involving changes to the project objectives	A method with a higher emphasis on technical proposals. It is adopted for projects requiring advanced technical skills and creativity.
	Type S	Evaluate company and engineer capabilities and require submission of a construction plan	A simplified version of Type I that combines evaluation of price and technical proposals. It is often used for relatively small-scale projects.
	Type A	Evaluate primarily based on company and engineer capabilities (without requiring submission of a construction plan)	A method that focuses on evaluating construction capabilities, particularly suited for projects where quality assurance is critical. Instead of technical proposals, evaluation points for construction systems are considered.
Technical Proposal • Negotiation		Negotiate price, construction methods, etc., with the preferred negotiator who made the best proposal, and if negotiations are successful, contract with them	Used for projects requiring advanced technical skills and creativity, this method evaluates technical proposals, negotiates with the top-ranked bidders, and contracts with the contractor who made the best proposal. The aim is to select the optimal proposal based on technical capabilities rather than price competition.

Source: Ministry of Land, Infrastructure, Transport and Tourism Guidelines for the Application of Bidding and Contracting Schemes for Public Works [this volume]

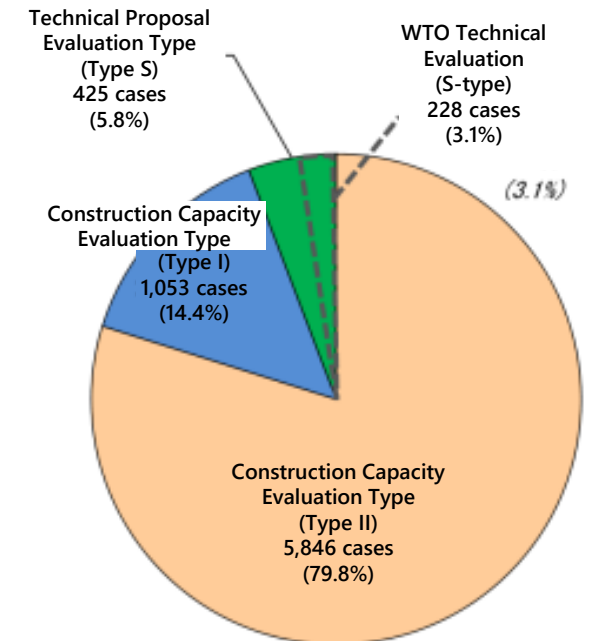
Comprehensive Evaluation Method and New Technology

- The percentage of public works contracts awarded using the Comprehensive Evaluation Bidding Method has been between 97% and 99% since fiscal year 2007 (Negotiated contract excluded).
- Within the Comprehensive Evaluation Bidding Method, the Performance-Based Evaluation type accounts for more than 90% of the contracts, with Type II making up about 80% of these.
- The Technology-proposal Evaluation type is less than 10%.

【Number of cases (FY 2005 - FY 2021)】



【Number Share (FY2021)】



(Note 1) For construction projects in 8 regional development bureaus (including port and airport construction projects)

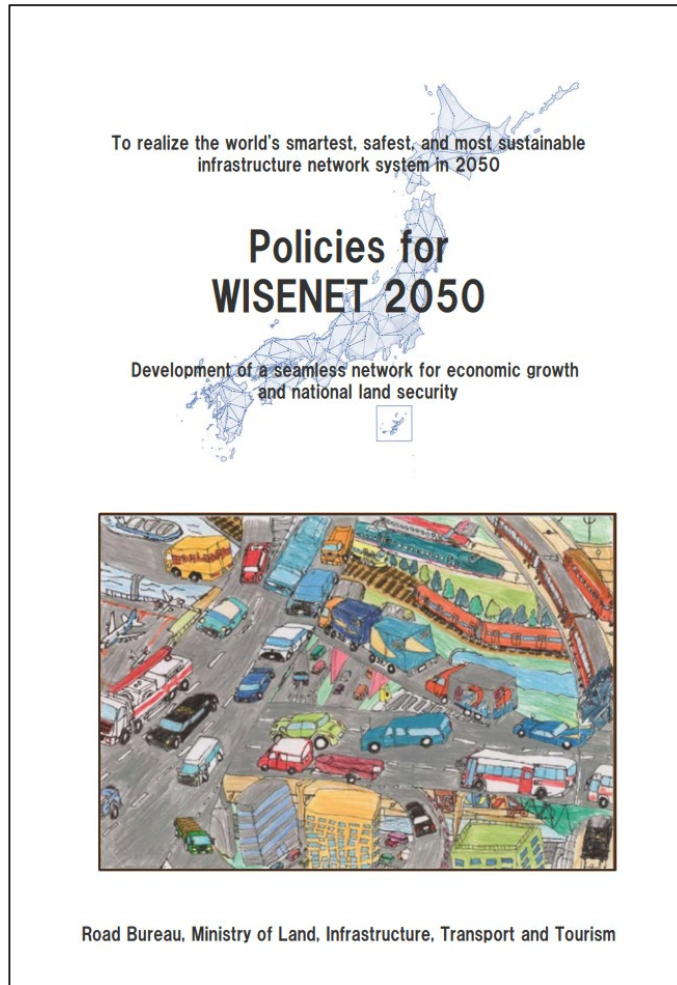
(Note 2) The application rate is the ratio of the number of cases in which the total evaluation bidding method is applied to the number of cases of all ordered works excluding negotiated contracts.

(Note 3) In addition to the above, 326 contracts were concluded in FY2021 for construction work other than the total evaluation bidding method through price competition, negotiated contracts, etc.

- (1) Low rate of application of Technical Proposal Evaluation**
- (2) Introduction of the PDCA Cycle for trials**
- (3) Simplification/streamlining of procedure**
- (4) Prevention of fraud and corruption**

The Future of Roads in Japan

- WISENET 2050 was developed by the Road Bureau of MLIT in response to National Highway Committee's report; "The High Standard Road Network", providing data, case studies, policy actions and initiatives.

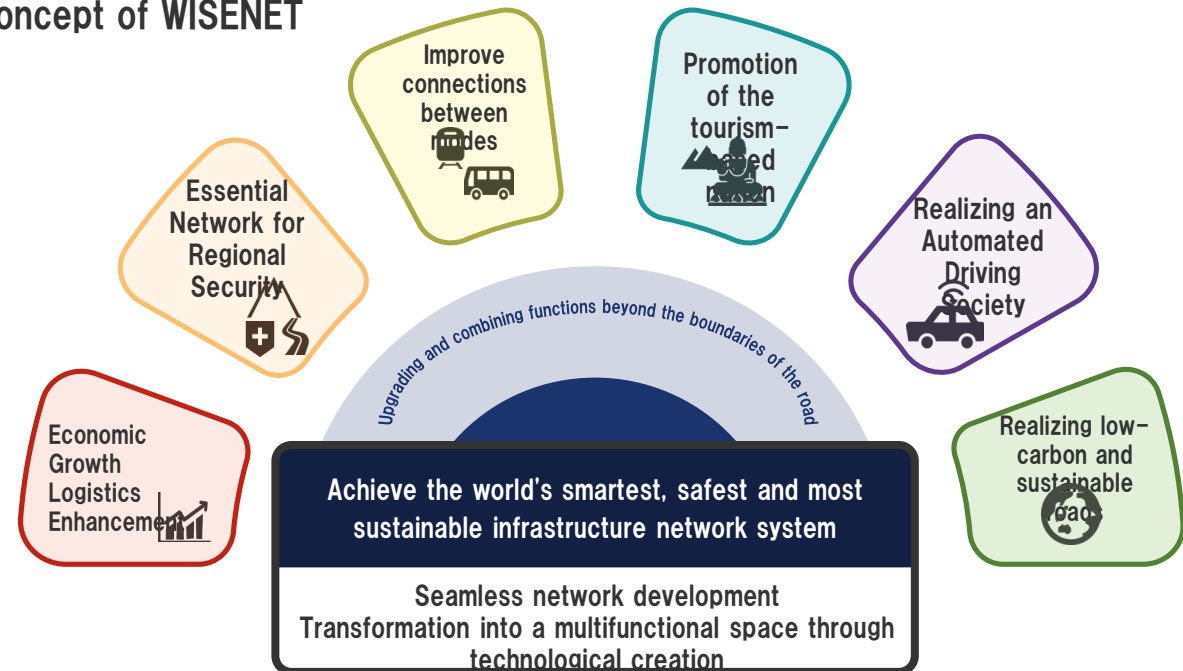


WISENET2050

WISENET* is the world's smartest, safest, and most sustainable infrastructure network system in 2050. We will develop policies to realize this vision, and contribute to problem solving and value creation in the new era.

※ WISENET: World-class Infrastructure with 3S (Smart, Safe, Sustainable) Empowered NETWORK

Concept of WISENET



Thank you for your kind attention!!

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