Summary of the White Paper on Land, Infrastructure, Transport and Tourism in Japan, 2025

Policy Division, Policy Bureau, Ministry of Land,
Infrastructure, Transport and Tourism (MLIT)

Composition (Part I: Working toward a vibrant society where everyone supports one another)

MLIT Ministry of Land, Infrastructure, Transport and Tourism

- As Japan experiences a pronounced decline in birthrate and a rapidly aging and shrinking population, there is **growing concern about a declining workforce** across all sectors, including public services.
- In the construction and transportation industries, **the workforce is expected to continue aging, and the number of younger entrants is projected to decline**, making the **medium- to long-term recruitment and development of workers an urgent priority**. In addition to the so-called "2024 problem," the **rising prices of energy and materials, along with other shifts in the social conditions**, are threatening **the maintenance of everyday services**.
- In response to **service supply constraints resulting from worker shortages**, efforts are being made in the field of MLIT to **enhance working conditions by improving the treatment of workers and expanding the workforce**. Initiatives also include the **adoption of new labor-saving technologies** to maintain services as much as possible with fewer workers, the **review of supply methods, and efforts to secure cooperation from service users**. These endeavors are expected to accelerate in the future.
- Against this backdrop, Part I of the White Paper on Land, Infrastructure, Transport and Tourism in Japan, 2025, adopts "**Working toward a vibrant society where everyone supports one another**" as its theme. It broadly presents various initiatives for addressing service supply constraints resulting from worker shortages, frames these initiatives as the basis for developing policy measures to overcome such challenges, and looks ahead to the future.

Chapter 1 Current status and challenges of service supply constraints resulting from worker shortages in the field of MLIT

○This chapter discusses the current status and challenges of service supply constraints resulting from worker shortages, as well as policy trends in Japan and the initiatives expected in the field of MLIT. It also examines public awareness of service supply constraints resulting from worker shortages.

Chapter 2 Initiatives in the field of MLIT and future prospects

○This chapter presents various initiatives as the initial phase of new measures, taking into account the current situation in the field of MLIT, where concerns have been raised about service supply constraints resulting from worker shortages, and looks ahead to future developments.

*The full text of the White Paper on Land, Infrastructure, Transport and Tourism is published on the MLIT website.

https://www.mlit.go.jp/statistics/file000004.html

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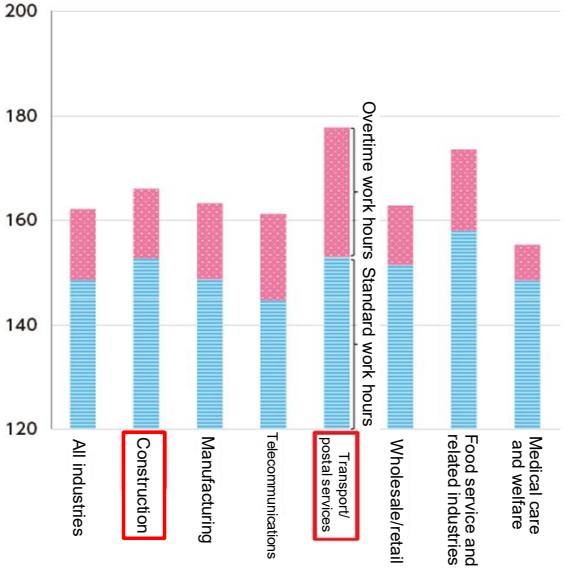
1 Pressing challenges

■ The construction and transportation industries, where **working hours tend to be longer and wages lower than in other industries**, are facing the so-called "2024 problem" related to regulations on the upper limit of overtime work. The workforce is currently aging faster than in other industries. Going forward, **workers are expected to continue aging, while the number of young entrants into the field is projected to decline. Accordingly, medium- to long-term worker recruitment and development have become an urgent priority**. In addition, the rising prices of energy and materials, coupled with **changes in social conditions surrounding the supply of services**, are exerting various effects on those providing such services.

[Measures to address excessive working hours and related issues]

- In the construction and transportation industries, the urgent task is to reduce long working hours and to improve productivity.
- Data on total monthly working hours by industry show that the construction and transportation industries (including postal services) have long working hours compared with other industries.

Total monthly working hours by industry (2024 average)



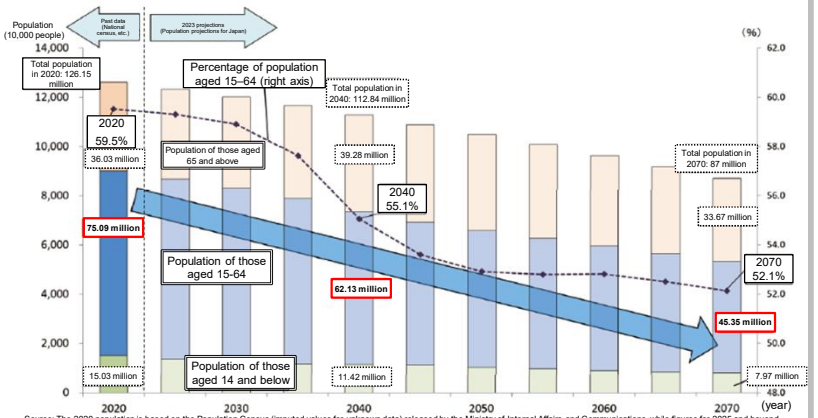
Source: Ministry of Land, Infrastructure, Transport and Tourism, based on the Monthly Labour Survey released by the Ministry of Health, Labour and Welfare.

[Pressing challenges]

[Concerns about a declining workforce associated with demographic changes]

- The nation faces a sharp decline in birthrate and a rapidly aging and shrinking population, with the total population projected to fall below 90 million by 2070. The drop in the working-age population is especially pronounced.
- There are strong concerns about a workforce decline driven by structural factors, which may make it even more difficult to recruit younger workers .

Changes in the working-age population



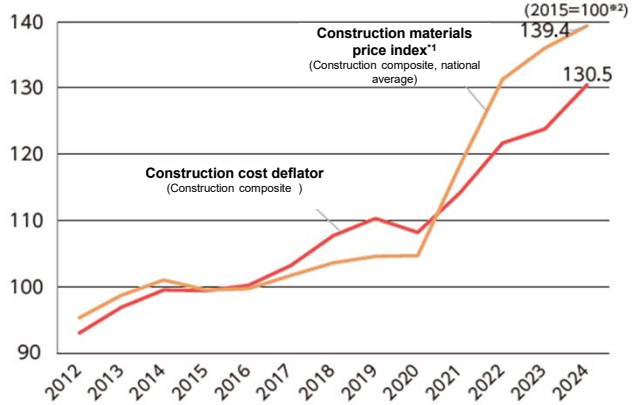
Source: The 2020 population is based on the Population Census (imputed values for unknown data) released by the Ministry of Internal Affairs and Communications, while figures for 2025 and beyond are based on the medium-fertility/medium-mortality projections from the Population Projections for Japan (2023) released by the National Institute of Population and Social Security Research.

Source: Ministry of Land, Infrastructure, Transport and Tourism, based on *Jinko gensho shakai e no taio to hitode busoku no shita de no kigyo no jinzai kakuho ni mukete* [Addressing a society with a declining population and securing corporate workers amid labor shortages], released by the Ministry of Health, Labour and Welfare.

[Changes in social conditions surrounding the supply of services]

- The price of construction materials began to soar in the latter half of 2021, mainly because of the soaring costs of raw materials.
- Since 2021, the overall construction cost deflator has failed to keep pace with the rise in the construction materials price index, with the result that the recent price increases have affected the ability to ensure appropriate labor costs.

Changes in the comprehensive construction cost deflator and the construction materials price index



*1 Ministry of Land, Infrastructure, Transport and Tourism, based on the construction price/construction materials price index released by the Construction Research Institute
*2: The construction cost deflator is based on FY 2015, while the construction materials price index is based on 2015; both indices use the values as of December.

Source: MLIT

2 Future projections for worker supply and the supply-demand gap

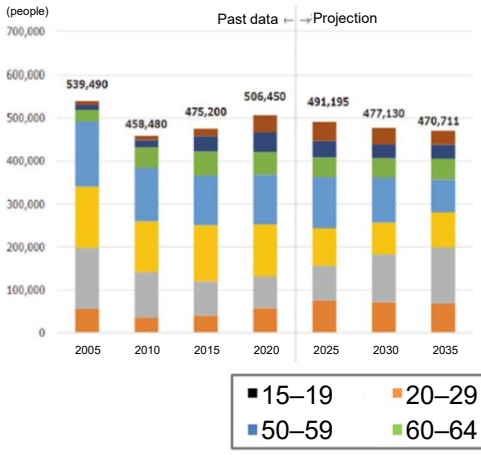
■ Based on various future projections, **the number of construction engineers and skilled construction workers** is expected to continue to decline beyond 2025. Furthermore, **transport capacity in the logistics field** is projected to fall short by approximately 34% in FY2030. By 2030, **the number of bus drivers** is projected to be about 28% below the level required.

[Future projections and the supply-demand gap in the construction industry]

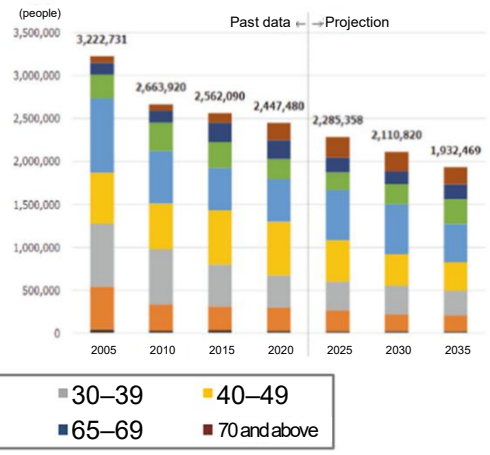
- The graphs below present projections for the number of construction engineers and skilled construction workers, based on national census data and the cohort-change-rate method.
- According to this projection, the number of construction engineers is expected to decrease by about 1.5%–3.0% every five years.*1
- The number of skilled construction workers is expected to decline approximately every five years by about 7%– 8%, and the rate of decline is expected to increase gradually.*2

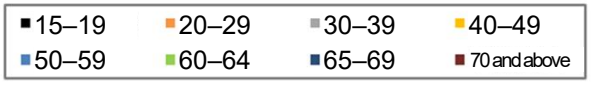
  By age group, those aged 50 and above will account for roughly half in 2025, and the population is expected to age further thereafter.

Future projections for the number of construction engineers (all industries) (by age group)



Future projections for the number of skilled construction workers (all industries) (by age group)





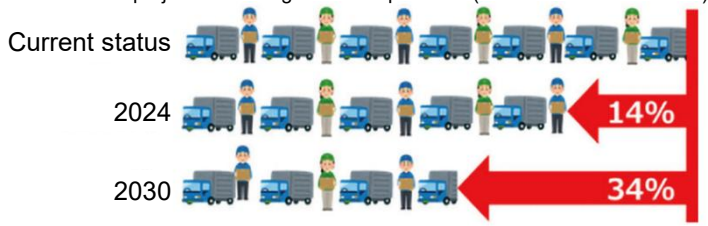
*1 This presents a case using the rates of change that include the period during which construction engineers significantly declined (he average of the rates of change from 2005 to 2010, from 2010 to 2015, and from 2015 to 2020).
*2 This case uses the rate of change for the most recent period, from 2015 to 2020.

Source: Research Institute of Construction and Economy

[Future projections and the supply-demand gap in the logistics field]

- In the logistics field, transportation capacity is expected to fall short by about 14% in FY2024 and by about 34% in FY2030 if no measures are taken.
- Owing to efforts by both the public and private sectors, the shortfall in transportation capacity estimated for FY2024 was largely eliminated. On the other hand, a 34% shortage in transportation capacity is expected in FY2030. Efforts to address this shortfall are already underway.

Future projections for logistics transportation (if no measures are taken)

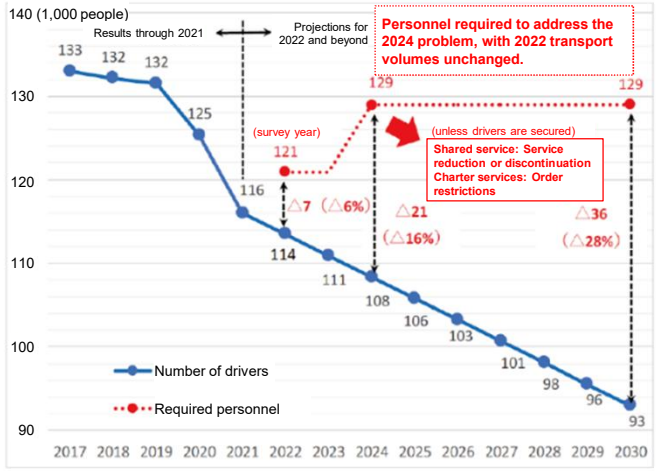


Source: MLIT

[Future projections and the supply-demand gap in regional public transportation (bus services)]

- The number of bus drivers is projected to decline from 116,000 in 2021 to 93,000 in 2030.
- According to this projection, there will be a shortage of 36,000 workers (28% of the total number of workers needed) by 2030.

Future projections for the number of bus drivers and expected shortages



Source: Nihon Bus Association

1 Government measures and expected initiatives in the field of MLIT

■ In light of the current status and challenges of service supply constraints resulting from worker shortages, various initiatives are expected in the field of MLIT. These include **the hiring of personnel by improving the treatment of workers (including through wage increases), initiatives related to appropriate price pass-through and productivity enhancement, and the encouraging broad thinking across different fields**.

[Expected initiatives]

(Secure personnel through improvements in the treatment of workers, including wage increases)

- Improve the treatment of workers, including through wage increases, to motivate workers and support the retention of personnel who will become scarce in the future.

(Pursue initiatives to ensure appropriate price pass-through, improved productivity, etc.)

- Facilitate price pass-through and invest in labor-saving measures to improve productivity in the construction and transportation industries, enabling small- and medium-sized companies to generate the financial resources needed to increase wages. Pass skills on to the younger generation in fieldswhere a shortage of successors is a concern.

(Expand the use of automation technology and introduce autonomous driving into society)

- Expand the use of automation technologies such as AI and robots. Pursue institutional development to accelerate the implementation of autonomous driving, thereby creating a sustainable living infrastructure for the region.

(Build sustainable local communities)

- Promote compact urban development and secure transportation networks to enhance housing and urban functions, thereby ensuring the sustainability of local communities.

(Encourage horizontal thinking that spans different fields)

- Instead of resorting to top-down thinking,foster robust information sharing and collaboration across different fields and tackle challenges through cross-cutting approaches that transcend boundaries. For example, enable individual stakeholders to share and pool their available resources.

(Collaborate with a variety of stakeholders, including residents and community-based organizations)

- In public-private collaboration, to fully leverage the capabilities of the private sector, address challenges through a co-creative approach, with the government working in partnership with a diverse range of stakeholders, including residents, community organizations (such as NPOs), and private enterprises, to shape the community together.

Column: Shuri Castle restoration as an opportunity to pass on traditional skills

- In the Shuri Castle restoration project in Okinawa Prefecture, the project owner and contractor collaborate to train young craftspeople and pass traditional building techniques on to younger generations.
- The construction company hires young skilled workers to perform a wide range of tasks, teaches them traditional construction techniques, and trains them to play an active role in future repair work.

Technical instruction through on-site work

Source: Okinawa General Bureau of the Cabinet Office and Shimizu Corporation

Column: Hakobyun, a package delivery service using the railroad network

- In an effort to solve the worsening labor shortage in logistics, the JR East Group is experimenting with the establishment of a new transportation network utilizing its railway network.
- Hakobyun provides high-quality delivery services for both small- and large-lot shipments by leveraging the unique expertise of rail transport (timeliness, stability, etc.).
- The company transports fresh food, medical supplies, machinery, electronic parts, and other items.

A worker unloading boxes from a shinkansen

Packages loaded in the passenger compartment

Source: East Japan Railway Co. (JR East)

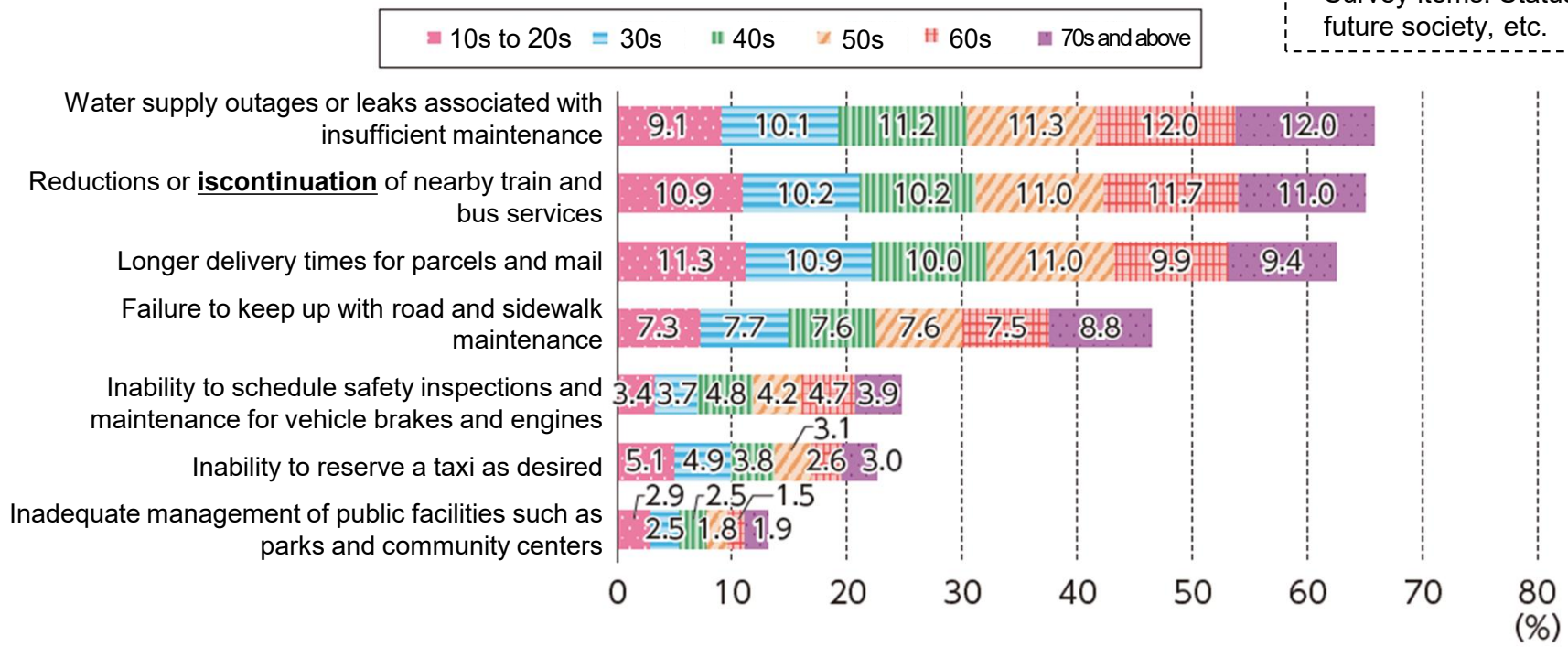
2 Public attitude toward service supply constraints resulting from worker shortages

[Public Opinion Survey]

- When asked **what kinds of inconveniences could result if everyday services were abolished or their service levels declined,** the respondents most frequently cited "**water supply outages or leaks associated with insufficient maintenance**." This was followed by "**reduction or discontinuation of nearby train and bus services**" and "**longer delivery times for parcels and mail**." These findings reveal that people demand uninterrupted everyday services.
- By age group, many respondents in their 20s and younger and those in their 30s cited "longer delivery times for parcels and mail" as a problem, suggesting that **younger generations prioritize reliable logistics services**.

○Public Awareness Survey (online survey)
Survey target: 3,000 people aged 18 and above living in Japan
Survey period: February 2025
Survey items: Status of supply constraints, ideal future society, etc.

[(Question) Regarding inconveniences that could result if everyday services were abolished or their service levels declined]



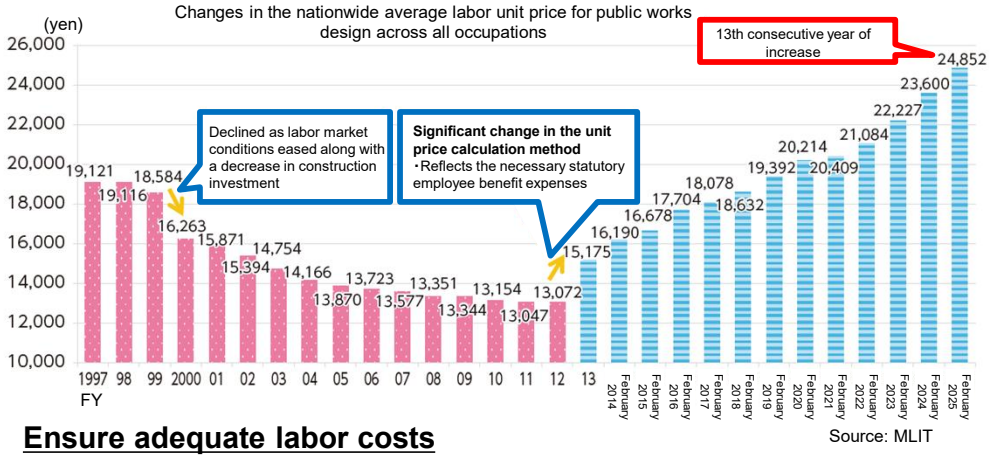
1 Improvements in the treatment of workers and expansion of the workforce

- In the field of MLIT, where the hiring of human resources is a pressing issue, it is important to enhance the treatment of workers, including through wage increases, and improve the working environment in order to make the industry more attractive.
- Such measures are also expected to promote work-style reform, **reduce excessive working hours, and enhance productivity**, thereby **improving operational efficiency**.

[Wage increase]

Wage increases in the construction industry

- Wages in the construction industry have been steadily rising thanks to various initiatives, including an increase in labor unit prices for public works design.



Source: MLIT

Ensure adequate labor costs

- The third phase of the so-called “three worker-support laws” prohibits the submission of bids based on unreasonably low labor costs or any requests to revise bids.
- Ban below-cost contracts.

Wage increases in logistics

- With regard to wage increases for truck drivers, “standard freight rates” have been announced as a benchmark for negotiating freight rates with shippers.
- Freight rates were raised by an average of 8% following the March 2024 revision.
- Non-transportation service fees and subcontracting commissions have been established.

[Appropriate price pass-through]

- In the construction industry, project owners are required to respond to consultations in good faith (best-efforts obligations for private-sector project owners) in the event of a surge in material costs.
- In logistics, shippers optimize transportation costs by clarifying contractual terms. This prevents excessive trading structures and eliminates redundant layers.
- Improper transactions are rectified through investigations and guidance by construction compliance investigators and truck and logistics compliance investigators.

[Ensure appropriate construction period]

- Eight closure days every four weeks are promoted at construction sites. Project owners and contractors are prohibited from setting unrealistically tight deadlines.

[Improve working environment]

- In long-distance trucking, relay transport (swapping tractor heads at relay hubs to allow drivers to return home the same day) is expanding.

[Use of new workers]

- Workforce expansion is being promoted through the hiring of foreign personnel and through measures to enhance women’s participation and retention in order to secure labor resources.

Column: Use of construction directors

- The position of “KENSETSU DIRECTOR” has been newly created. The role of construction directors, who use ICT skills to perform certain tasks on behalf of construction engineers, is expanding.
- At a construction company in Ehime Prefecture, on-site engineers’ overtime has been reduced by about 30% thanks to the hiring of “KENSETSU DIRECTOR” .

“KENSETSU DIRECTOR” in action

Source: KEE

2 Use of manpower-and labor-saving technologies

- Promoting the introduction of new technologies so that service supply can be maintained with fewer workers.
- Three categories were established: technologies that replace human labor (logistics-facility automation and rebar-tying robots), technologies that improve work efficiency (double-articulated trucks and drone logistics), and technologies that complement professional qualifications and task capabilities (autonomous buses and automated construction)

[Technologies that replace human labor]

Column: Efficiency improvement of logistics warehouses in Okinawa Prefecture

- Ryukyu Kaiun Kaisha introduced a machine (sorter) that automatically sorts packages, dramatically improving the accuracy and productivity of warehouse operations.
- The average waiting time per truck has been reduced to less than one-third (from 70 minutes to 20 minutes).

Sorter

Source: Ryukyu Kaiun Kaisha

- Introducing robots that automatically perform rebar-tying tasks in place of human workers.

Rebar-tying robot

Source: Ken Robotech Corporation

[Technologies that improve work efficiency]

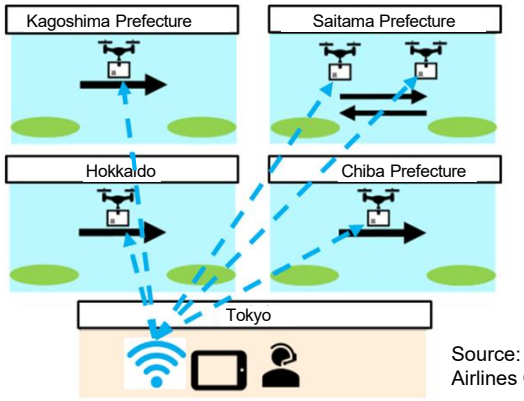
- Promoting the introduction of double-articulated trucks to haul more freight with fewer drivers.

Double - articulated trucks

Source: MLIT

- Use drones to make regional transportation and delivery more efficient and faster .

Demonstration test involving simultaneous operations of multiple drones



Source: Japan Airlines Co., Ltd.

[Technologies that complement professional qualifications and task capabilities]

Column: Commercial operation of Level-4 autonomous local bus services

- In 2024, Iyotetsu Bus inc. became the first in Japan to begin a Level-4 autonomous local bus service.
- The service operates 66 runs per day, covering approximately 800 meters in about two minutes at a top speed of 35 km/h. The maximum capacity per run is 12 passengers.

Autonomous bus in operation

Source: Iyotetsu Bus inc.

Column: Automated construction at Naruse Dam, Akita Prefecture

- Construction was automated partially as a part of i-Construction 2.0.
- This eliminates the need for people who hold a heavy-machinery license.

Automated construction

Source: Kajima Corporation

3 Review of supply method, cooperation by service users (1)

- As the labor supply and demand imbalance worsens, efforts are underway to maintain supply capacity without placing a burden on the demand side. These efforts include the recruitment of personnel and the use of manpower-and labor-saving measures to avoid the worst-case scenario of **service discontinuation or withdrawal**.
- There are cases in which comprehensive efforts are being made through various creative strategies and solutions, such as the **review of service delivery methods and the streamlining of services**, to align with local conditions, **with the understanding and cooperation of service users and consumers (end users)**.

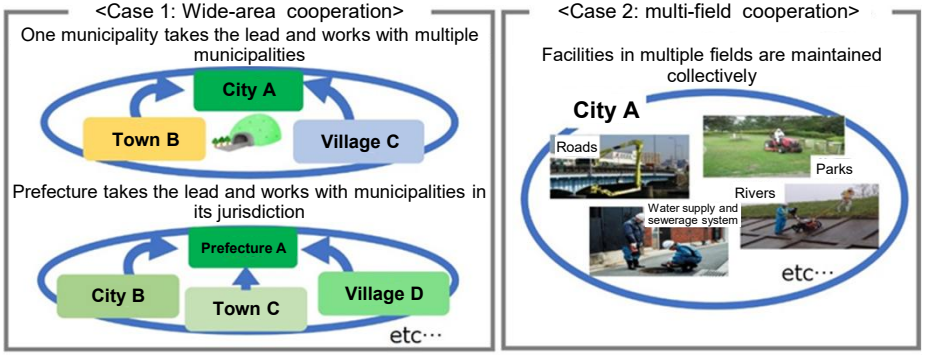
[Limited local government staff covering broad regions and multiple fields

[Strategic management of a group of regional infrastructures for revitalization (group management)]

- A regional infrastructure revitalization strategy (group management) is being promoted to enable efficient and effective management of wide-area, multiple, and multi-field infrastructure as a group.

- In group management, the “bundling of local governments,” “bundling of operators,” and “bundling of engineers,” play a key role. This approach enables facility managers to oversee infrastructure facilities of a certain scale in an integrated and efficient manner, contributing to stable operations and to the securing of necessary resources (personnel, materials, equipment, etc.) in the local construction industry in the private sector.

Strategic management of a group of regional infrastructures for revitalization (wide-area, multi-field approach)



Source: MLIT

[Reevaluating the division of roles between the public and private sectors and expanding the scope of private-sector activities]

- To equalize the financial burdens and address local government staffing shortages, public - private partnership projects are being considered and implemented in accordance with regional circumstances.

Comprehensive outsourcing to the private sector

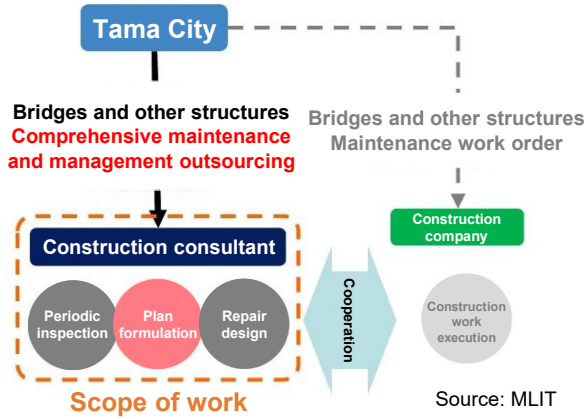
- This refers to the comprehensive outsourcing of multiple operations and facilities to private-sector companies. The aim is to enable private operators entrusted with the management and operation of public facilities to do so efficiently and effectively by applying creativity and know-how.

- In Tama City, as part of bridge maintenance operations, certain administrative functions such as revisions to the service-life extension plan are outsourced to the private sector through multi-year comprehensive contracts.

Water PPPs

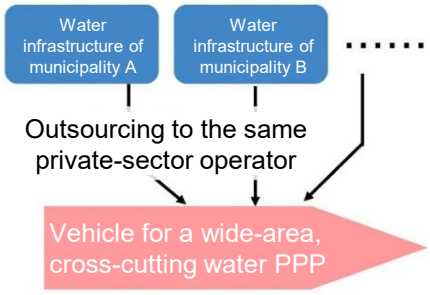
- The formation of wide-area, cross-cutting water public-private partnerships (PPPs) is being promoted. Under PPPs, the management and renewal of the entire water infrastructure are entrusted to a single operator spanning wide areas and multiple fields.

Example of comprehensive outsourcing to the private sector



Source: MLIT

Wide-area, cross-cutting water PPP



Source: MLIT

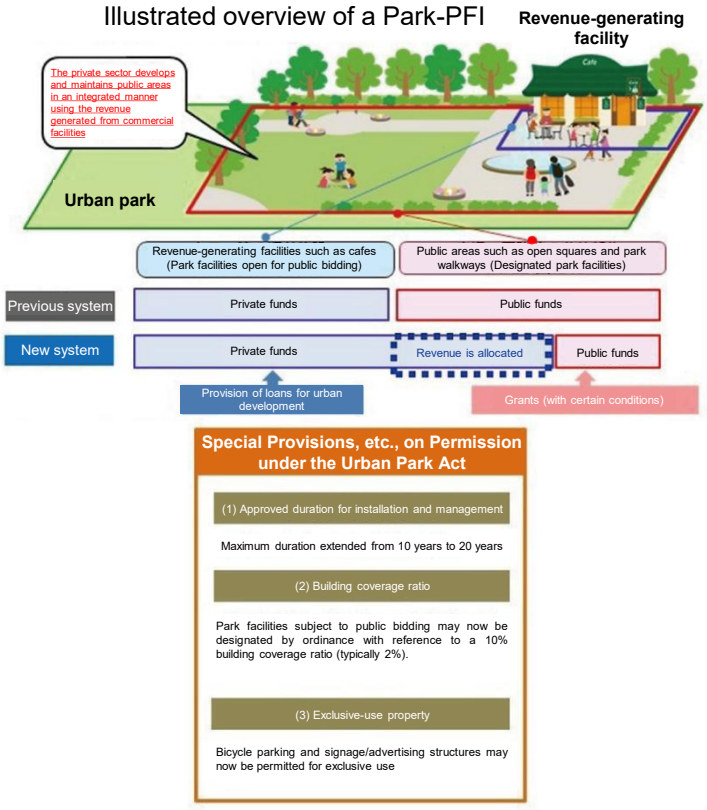
3 Review of supply method, cooperation by service users (2)

[Developing and managing infrastructure as part of private-sector revenue-generating operations]

Park-Private Finance Initiative (Park-PFI)

- In urban parks, private-sector operators establishing or managing park facilities such as restaurants and concession stands are selected through a public bidding process.
- Revenue generated from facilities established by private-sector operators is reinvested in park maintenance and development.

Illustrated overview of a Park-PFI

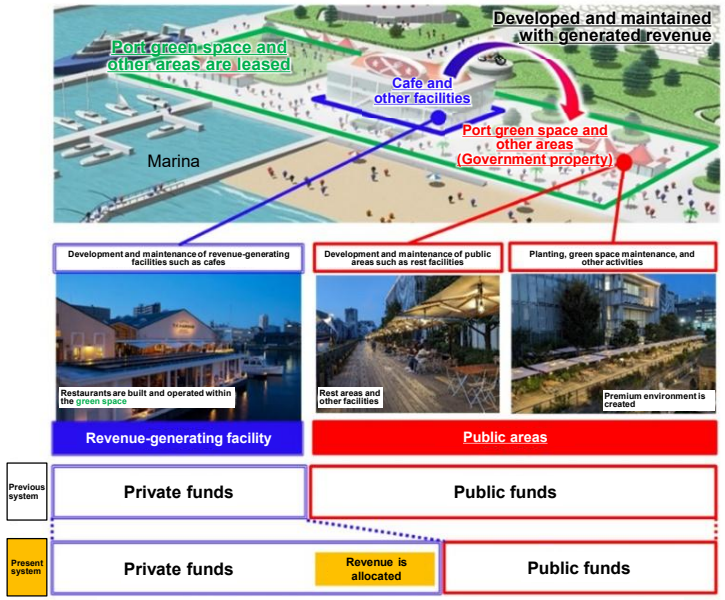


Source: MLIT

Port Environmental Improvement Plan System (port green space PPP)

- Port green spaces and other areas are leased to private-sector operators that develop revenue-generating facilities. These operators also renovate those green areas under a revenue-sharing agreement.
- This will create a favorable port environment and reduce the burden on port administrators.

Illustrated overview of a port green space PPP



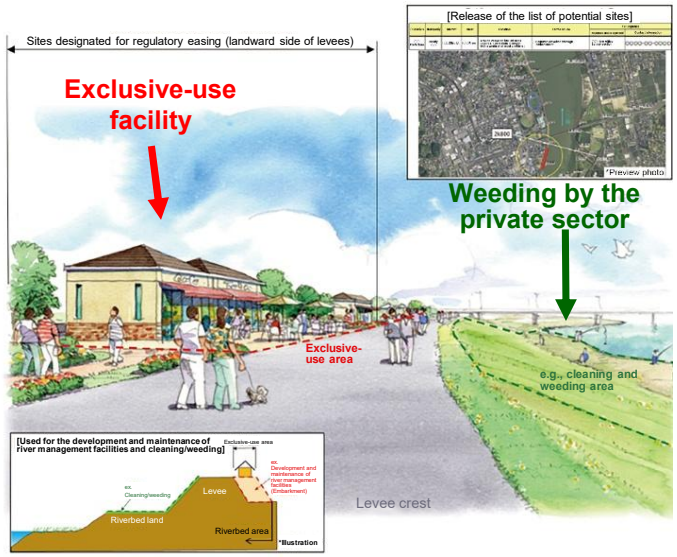
Private-sector operators **develop and manage revenue-generating facilities and public areas in an integrated manner**

Source: MLIT

Further relaxation of regulations on riverbed land (RIVASITE)

- Regulations regarding the “opening of river spaces” initiative are being eased. Under the initiative, private-sector operators that meet certain conditions are granted exclusive rights to use riverbed land as an exception.
- Provided that the private-sector operator maintains river, management facilities and performs cleaning and weeding beyond the exclusive-use area, the exclusive-use period may be extended to a maximum of 20 years, and the scope of exclusive use expanded from individual facilities to the entire area.

Illustrated overview of a RIVASITE



Source: MLIT

3 Review of supply method, cooperation by service users (3)

[Extending similar operations to provide a wider range of services]

- A broader range of services is provided with a limited number of workers through operations that depart from traditional services, including the assignment of staff to dual roles in passenger and freight services and the expansion of responsibilities of skilled construction workers.

Combined passenger and freight transport

- Transport operators are moving beyond the traditional passenger-only or freight-only model and are now leveraging spare capacity to transport both passengers and freight.

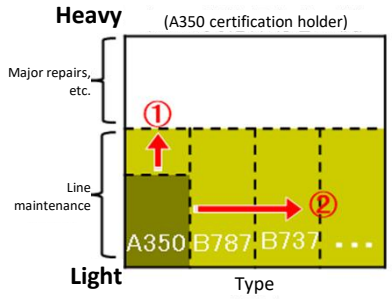
Multiskilling

- The construction industry is promoting the use of multi-skilled workers (“multi-crafters”) who can perform several different tasks in succession.

Review of the aviation mechanic system

- The scope of authorized duties is expanded and type certifications are standardized.

Scope of work for each mechanic



Source: MLIT

[Providing services with the cooperation of existing resources in the community]

- Local resources are utilized to secure transportation and strengthen the function of mobility hubs. These resources include human resources, as well as vehicles owned by the government, private-sector companies, and individuals.

Use of school buses

- Initiatives are underway to utilize school buses for local residents’ shared transportation and to make effective use of idle time, based on the premise that they are regional transportation assets, provided this does not interfere with their primary educational function.

School buses

Source: Shimonita Town

Public rideshare, Japan-style rideshare

- To ensure reliable transportation for local residents and tourists, public rideshare and Japan-style rideshare services have been introduced.
- Public rideshare services are operated by municipalities and nonprofit organizations using privately owned vehicles.
- Japan-style rideshare services provide transportation using privately owned vehicles and non-professional drivers under the oversight of licensed taxi operators.

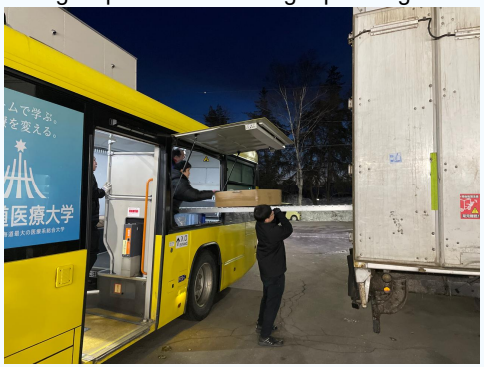
Public rideshare

Japan-style rideshare

Column: Initiative for combined passenger and freight transport using buses

- Tokachi Bus Co., Ltd. in Hokkaido conducted a demonstration test for combined passenger and freight transport by allocating a part of the bus space to freight.
- Over the 10-day demonstration period, the number of drivers decreased by the equivalent of approximately three operations of a 4-ton truck.

Loading shipments into a freight-passenger bus



Source: Tokachi Bus Co., Ltd.

Column: Public-private efforts to enhance bus stop facilities

Mobility hub enhancements

- Private-sector facilities such as convenience stores are used for bus waiting areas.
- The use of private-sector facilities eliminates the need to build new waiting lounges.

Bus waiting lounge using a private-sector facility

Source: Gifu City

3 Review of supply method, cooperation by service users (4)

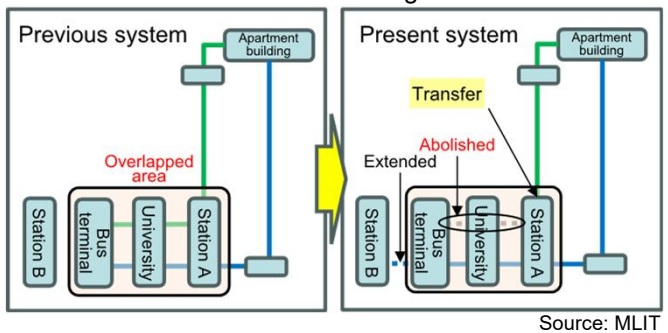
[Role allocation and regional expansion aimed at eliminating duplication]

- For overlapping services, the stakeholders will collaborate to pursue labor-saving measures from the standpoint of overall optimization, through appropriate role allocation and by partially abolishing or integrating services.

Cooperation and joint management among transportation operators

- Transportation operators and local governments collaborate to implement joint management, thereby maintaining transportation convenience and improving operational efficiency.
- The resources generated through the integration of bus routes are used to extend service lines.

An example in which overlapping areas have been consolidated to achieve labor savings and route extension

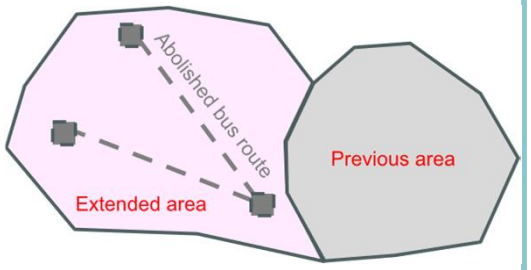


Source: MLIT

On-demand shared transport

- There are cases in which on-demand transportation services have helped improve operational efficiency by broadening their service area, covering locations that were previously served by fixed-route buses and enabling operations under a unified business framework.

Illustration showing the envisioned expansion of on-demand transportation



Source: MLIT

[Service supply reductions with users' cooperation]

- When a shortage of personnel makes it difficult to sustain services, these services are scaled back and consumers handle some of the tasks themselves.

Column: Efforts to reduce the repeat delivery attempts through unattended delivery

- Unattended delivery enables packages to be received even when the recipient is absent, thereby reducing the number of redelivery attempts.
- Yper Inc. conducted a demonstration test in collaboration with local governments, utilizing its OKIPPA unattended delivery bag. In some areas, the number of redelivery attempts have been reduced by 90% or more.

The delivery person is placing a package into OKIPPA.

Source: Yper Inc.

Column: Maintenance of bridges in collaboration with residents

- In Hirata Village, Fukushima Prefecture, a shortage of staff has made it difficult to routinely monitor the condition of its bridges.
- T The village maintains bridges in collaboration with residents.
- Residents conduct simple inspections to routinely monitor age-related changes to the bridge surface. They detect critical damage at an early stage.

Residents conducting inspections

Source: Hirata Village

Column: Water meter reading through resident cooperation

- In Ashikaga City, residents (users of municipal water services) photograph their own water meters and perform the meter reading themselves.
- The procedure is completed in just 2–3 minutes, eliminating the need for meter readers to visit in person.

A resident photographing the water meter

Source: Ashikaga City

1 Vision of the future society that people desire

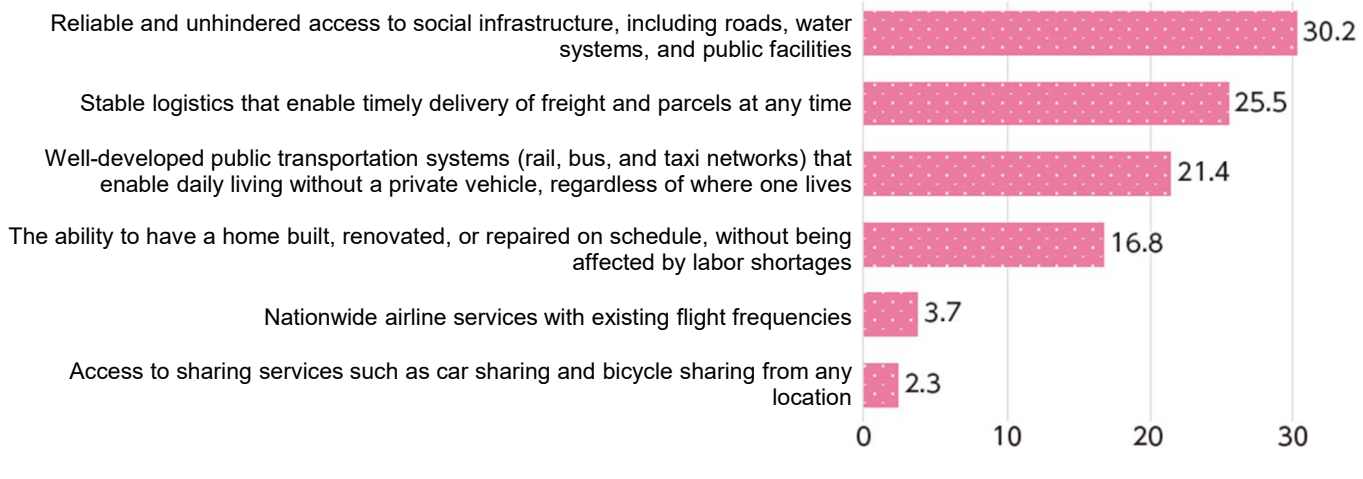
[Public Opinion Survey]

- When asked what services they hoped would be preserved as labor shortages expand in the future, respondents expressed strong expectations for "**reliable access to social infrastructure**," "**secured logistics services**," and "**improved public transportation networks to sustain regional mobility**."

[Column]

- Toward building a vibrant society where everyone supports one another, **suppliers must strive to maintain their service delivery capacity**. In addition, all stakeholders, including consumers, should share awareness of supply constraints and **form a national consensus by accepting a decline in service levels**. This is necessary as we seek to prevent the disappearance of services at all costs.

[(Question) Regarding the services they expect from society in the future]



○ Public Opinion Survey (online survey)
Survey target: 3,000 people aged 18 and above living in Japan
Survey period: February 2025
Survey items: Status of supply constraints, ideal future society, etc.

Column: A vibrant society where everyone supports one another

- **Avoiding discontinuation of services and ensuring their maintenance and continuation**

  In light of the increasing constraints on service provision, it is important not only to rely on efforts by suppliers, but also to involve consumers in aiming for a sustainable society. This includes a review of how services are delivered and an effort to secure consumers' acceptance and cooperation to ensure the preservation and continuity of those services.

- **Forming a national consensus regarding the acceptance of a decline in service levels**

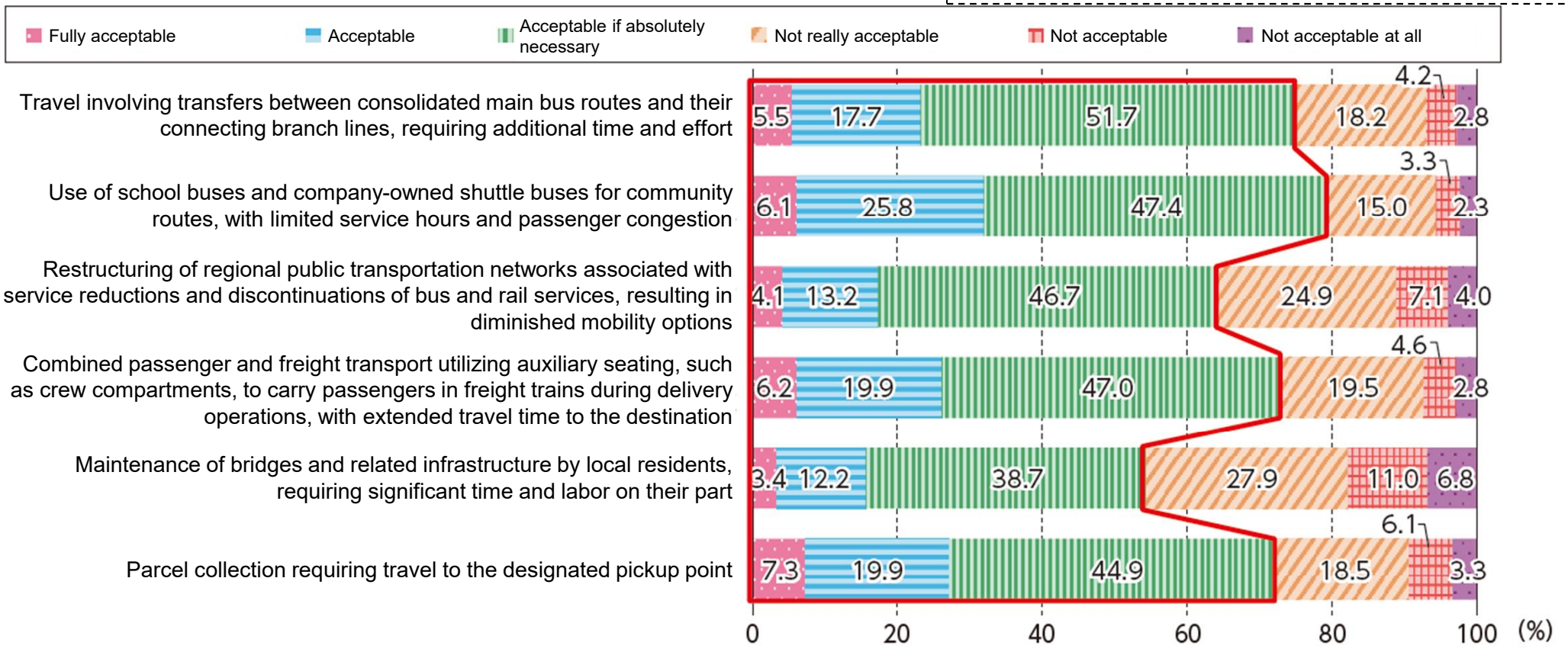
  To ensure the sustainable and reliable supply of everyday services essential to people's lives, suppliers must strive to maintain their delivery capacity. In addition, all stakeholders, including consumers, should share awareness of supply constraints and form a national consensus by accepting a decline in service levels.

[People's level of acceptance]

- In response to a question regarding **initiatives such as revisions to service delivery methods and requests for cooperation from the demand side**, approximately **70% of respondents on average expressed their willingness to accept such initiatives**.
- The questions included scenarios such as "travel involving transfers between consolidated main bus routes and their connecting branch lines, requiring additional time and effort," and "parcel collection requiring travel to the designated pickup point." For each of these questions, **at least half** of the respondents answered that they would **accept such scenarios** (responding that they were fully acceptable, acceptable, or acceptable if absolutely necessary).

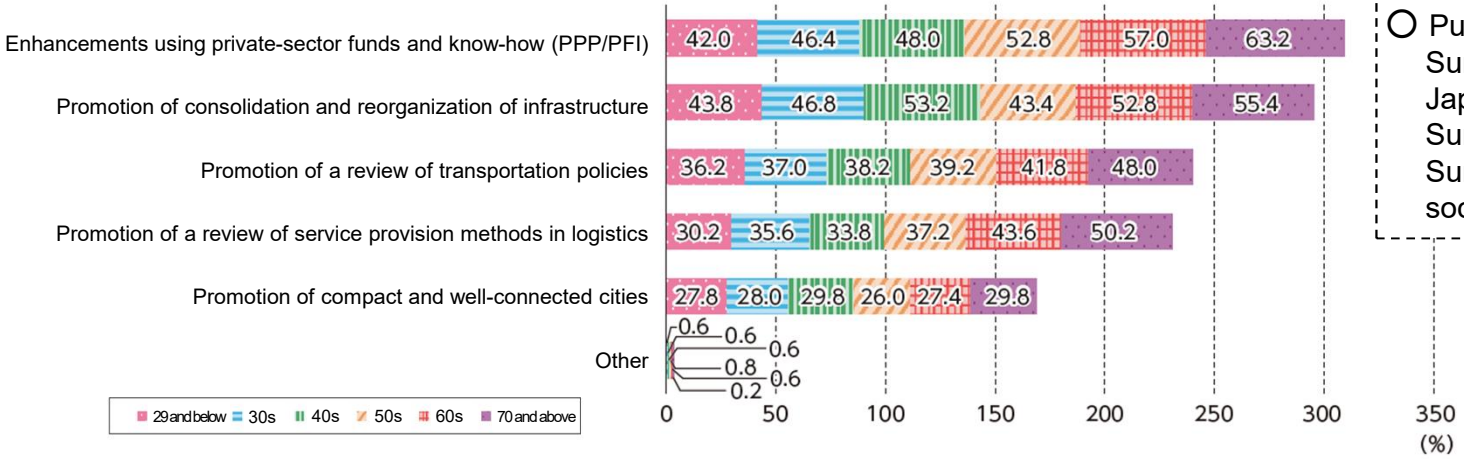
○ Public Opinion Survey (online survey)
Survey target: 3,000 people aged 18 and above living in Japan
Survey period: February 2025
Survey items: Status of supply constraints, ideal future society, etc.

[(Question) Regarding initiatives such as revisions to service delivery methods and requests for cooperation from the demand side]



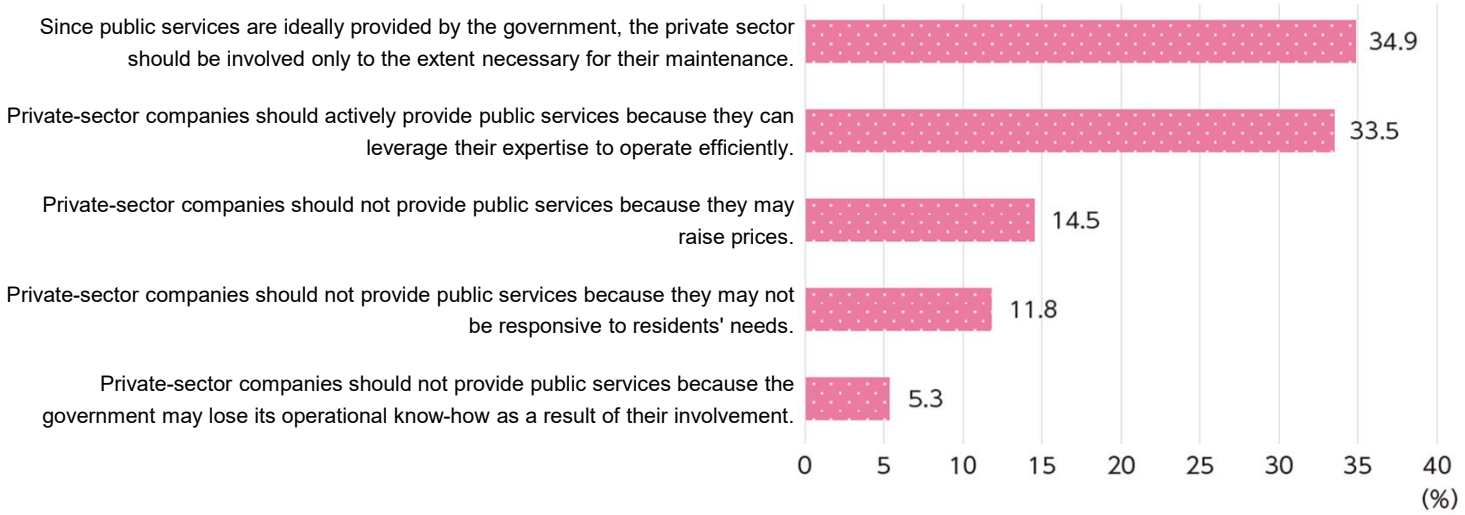
- Regarding the question "What roles do you expect the government to play in efforts to reassess how services are delivered?," many respondents selected **"Enhancements using private-sector funds and know-how (PPP/PFI)" and "Promotion of consolidation and reorganization of infrastructure."**
- In response to the question "Regarding public-private partnerships (PPP/PFI) that utilize private-sector funds and know-how as an initiative to maintain services," **approximately 70% of the respondents answered either that the private sector "should be involved only to the extent necessary" or "should be actively involved,"** indicating that **there was no strong resistance to expanding private-sector involvement in the field of public services.**

[(Question) Regarding the role expected of the government in reviewing services]



○ Public Awareness Survey (online survey)
Survey target: 3,000 people aged 18 and above living in Japan
Survey period: February 2025
Survey items: Status of supply constraints, ideal future society, etc.

[(Question) Opinion on public-private partnership initiatives]



2 Future prospects for a vibrant society where everyone supports one another

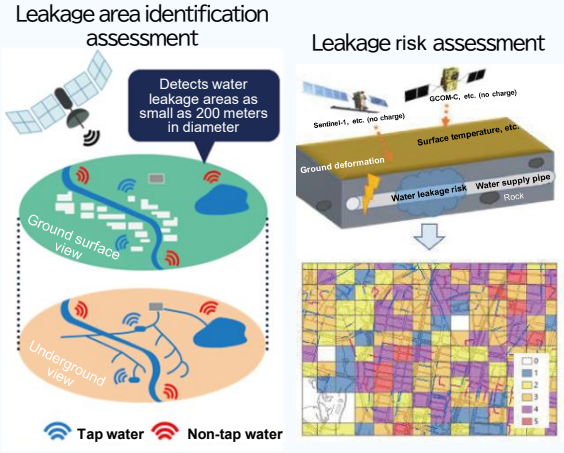
- This section discusses a vision for a vibrant society where everyone supports one another.
- It introduces case studies on operational efficiency achieved through manpower-and labor-saving technologies, featuring advanced innovations in areas such as maintenance and logistics.

[Future manpower-and-labor-saving technologies]

- The development and implementation of manpower-and-labor-saving technologies, along with operational streamlining through ICT and DX, continues to advance. As a result, productivity is achieved in infrastructure construction and maintenance, logistics, and regional public transportation.
- In infrastructure maintenance, as diagnostic technologies utilizing AI, cameras, and various sensors continue to develop, initiatives leveraging satellite imagery and AI are becoming increasingly common, ensuring stable and sustainable management of the efficient maintenance of conduit systems in a wide area.
- In logistics, improved load efficiency is key to making effective use of the limited number of truck drivers. To enable more efficient transportation, AI is used to develop more optimized routing and delivery schedules.

Column: Leveraging satellites and AI to streamline leakage investigations

- In Toyota City, a shortage of skilled personnel is becoming a concern because of the aging of workers, including leakage detection experts. Therefore, the city uses satellite technology and AI to streamline the detection work.
- With the use of satellite imagery, areas with potential water leakage are detected in segments as small as roughly 200 meters in diameter.
- AI analyzes environmental stressors impacting water pipes using data from multiple satellites to further narrow down potential leakage areas.
- Compared with conventional survey methods, the survey range has been reduced to roughly one-tenth, and the survey period shortened from around five years to approximately seven months.

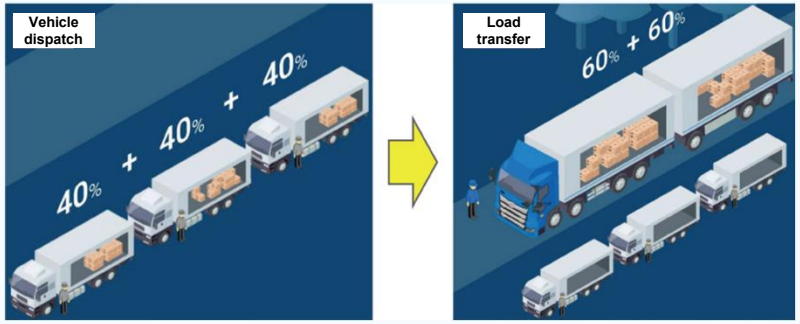


Source: Toyota City

Column: Use of quantum computing in logistics

- This automated high-speed calculation system uses quantum computing technology that combines vehicle dispatching and freight loading.
- Dispatching and loading operations are streamlined with the use of quantum computers that analyze freight data, space availability, vehicle assignments, and load dimensions to improve loading efficiency.

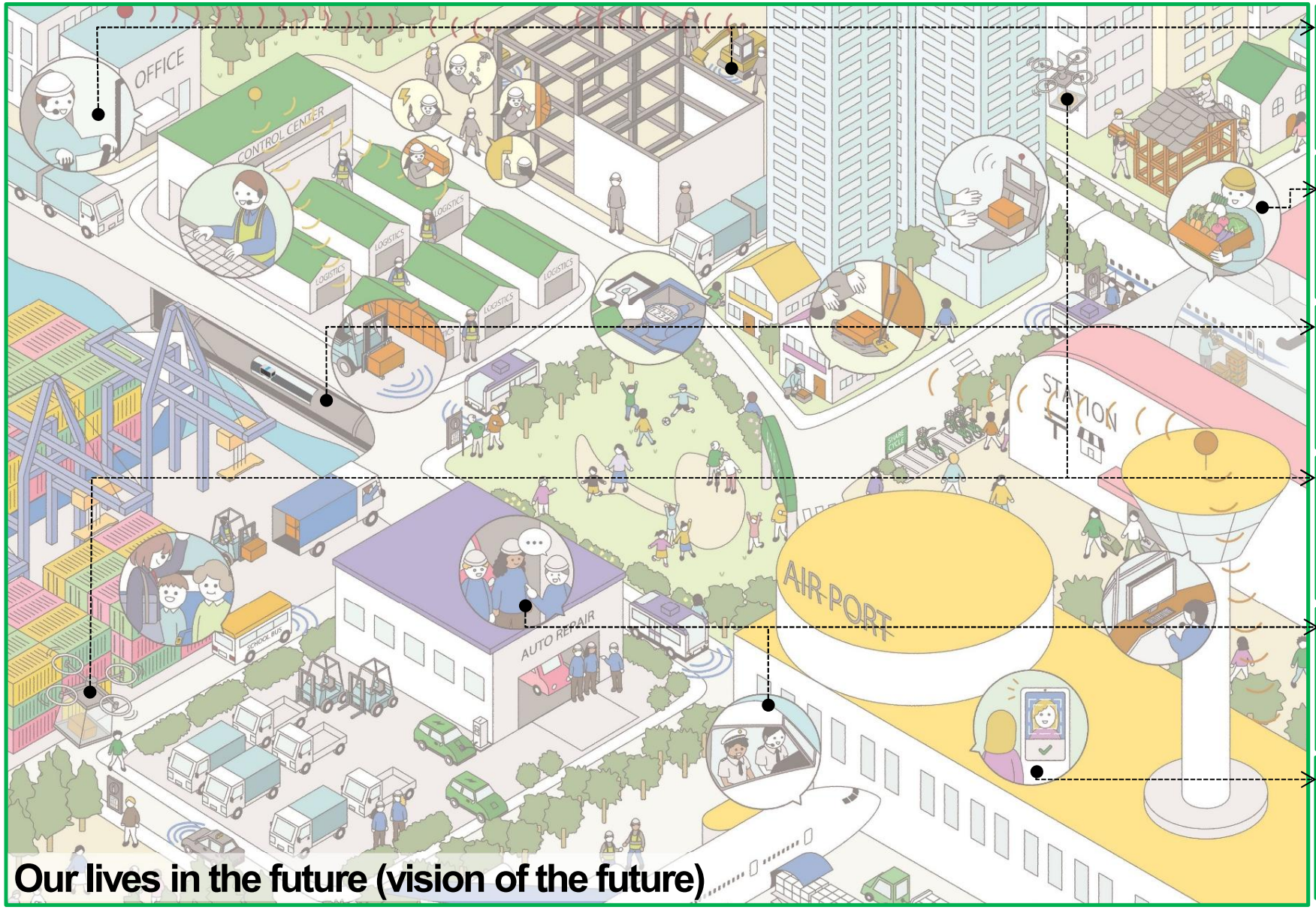
Illustration of vehicle dispatch and load transfer



Source: NEXT Logistics Japan

3 Our lives in the future

- The section titled “Future population decline and an aging society,” presents illustrations depicting future lifestyles. The focus is on how **future work styles**, **future manpower-and-labor-saving technologies**, and **future services** will become widespread and help maintain public services.



Our lives in the future (vision of the future)

[(1) Remote and automated construction]
Remote and automated construction will become commonplace, enabling construction machinery to be operated from the office and enhancing safety.

[(2) Combined passenger and freight transport]
Freight will be transported alongside passengers on shinkansen and other high-speed rail services, swiftly delivering vegetables harvested that morning and freshly caught fish to consumption sites.

[(3) Automated logistics roads]
Highways, local roads, and other spaces will be used to transport shipments around the clock.

[(4) Drone delivery]
With further safety improvements, drones will handle a variety of transport tasks, even in urban areas, and safely carry freight.

[(5) Foreign workers]
Foreign personnel will work in various fields, such as automobile maintenance, bus, taxi and truck driving, and aircraft piloting.

[(6) Facial recognition]
Facial recognition will be used at airports and various other locations, enabling passengers to complete boarding procedures without presenting tickets.

[Reference] Columns featuring interviews with experts (1) (related to Chapter 1)

○Work style reforms in logistics sites and behavioral changes required of shippers and consumers; Wakana Shuto (Professor, College of Economics, Rikkyo University)

◆Current status of the "2024 problem" in logistics
・Factors behind the long working hours among truck drivers

◆Regarding wages, price pass-through, and logistics optimization
・Excessive competition in logistics prevents price pass-through

◆To overcome the logistics "2024 problem" and the labor shortage
・Short-hour regular-employment programs and similar measures should be used to recruit foreign nationals, women, and older workers
・Shippers and consumers should adopt a macro perspective to boost productivity throughout society

○Challenges surrounding the construction industry and the path toward a sustainable construction industry; Hirotake Kanisawa (Professor, School of Architecture, Shibaura Institute of Technology)

◆Current status of the "2024 problem" in construction
・Reforming attitudes toward working conditions, starting with major companies

◆Initiatives to preserve the construction industry
・Building a system for continuing education within the construction industry
・The key to boosting productivity is to review the principle of separating design and construction and to introduce DfMA

◆Toward the realization of a sustainable construction industry
・Passing costs on to end users and raising awareness of compliance

○Toward the restructuring of public facilities and infrastructure in response to population decline and the realization of sustainable public services ; Fumihiko Seta (Associate Professor, Department of Urban Engineering, Graduate School of Engineering, University of Tokyo)

◆Challenges faced by public facilities and infrastructure
・Public awareness failing to keep pace with population decline

◆Restructuring of public facilities and infrastructure required amid population decline
・Debate is needed to determine which services should be maintained at public expense
・Importance of initiatives to promote wide-area cooperation among municipalities

◆Toward the realization of sustainable public services
・Need to have a common understanding that population decline is an unquestionable fact

[Reference] Columns featuring interviews with experts (2) (related to Chapter 2)

MLIT Ministry of Land, Infrastructure, Transport and Tourism

○Toward the dissemination of labor-saving technologies at construction sites; Tatsuya Manabe (Representative Director and CEO, Ken Robotech Corporation)

◆Challenges faced by construction sites
・Significant population aging and attrition of younger workers

◆Measures to address worker shortages with on-site robots
・Robots proficient in repetitive tasks have a significant impact

◆Toward the realization of a sustainable construction industry
・Necessary steps for promoting on-site robot use
・Improvement in design thinking is necessary to establish a robot-friendly work environment

○The future envisioned by the physical internet for sustainable logistics; Ayako Kawai (Professor, Gakushuin University)

◆Challenges faced by the logistics and distribution industry
・Need for personnel capable of optimizing the entire logistics chain, including distribution

◆Initiatives to maintain and improve services
・Product diversification and standardization of the product master
・Process simplification is essential to the adoption of information systems

◆Future outlook for sustainable logistics and the realization of the physical internet
・Reevaluate service offerings and ensure that the demand-side, the shippers and the consumers adapt to supply constraints

○How to achieve sustainable regional public transportation; Hirokazu Kato (Professor, Nagoya University)

◆Challenges faced by regional public transportation
・Severe personnel shortages are impacting all segments of public transportation
・Improve the treatment of workers through fare and subsidy increases, operational streamlining, and enhanced profitability

◆Initiatives to maintain regional public transportation
・Regional public transportation redesign can only succeed with thorough deliberation
・Initiatives and concrete scheduling are more critical than mere “consideration”
・Expectations for seamless connectivity and the establishment of transport hubs as community anchors

◆Toward the realization of sustainable regional public transportation