The Vision of Autoflow Road
Final Summary
～Turn "Crisis" into "Opportunity" through Autoflow Road～

July 31, 2025

Study Group on Autoflow Road

Contents

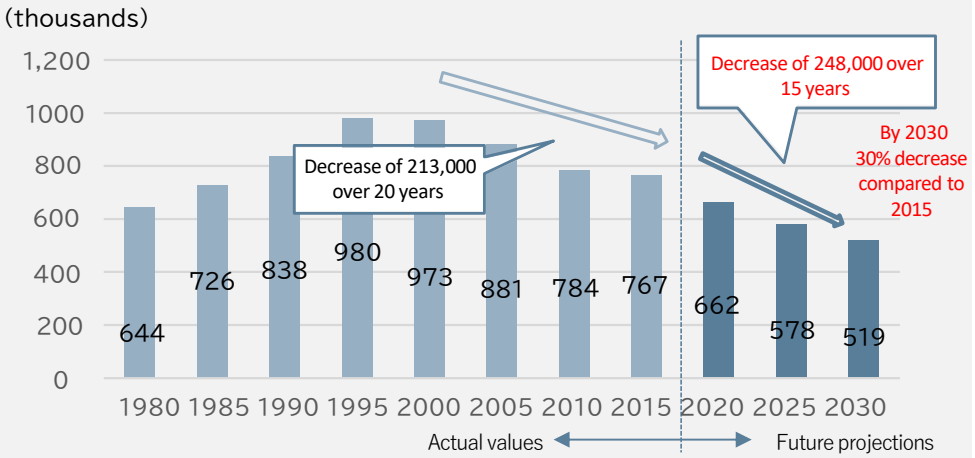
Autoflow Road is a new logistics system that transports goods using unmanned, automated transportation means powered by clean energy, with dedicated logistics spaces within a highway.

1. Background of the Study －Socioeconomic Conditions-

■ Shortage of truck drivers

As Japan faces declining birthrates, an aging population, and overall demographic shrinkage—with the working-age population projected to fall to around 55 million, we are confronting a structural logistics crisis, due to relatively high average driver age compared to other sectors and the anticipated rapid decline in the labor force.

<Trend in the number of drivers in the road freight transport industry>



Source: Japan Institute of Logistics Systems (JILS), "Logistics Concept 2030"

In particular, the so-called "2024 problem" is looming, as overtime work regulations came into effect in 2024, and without any countermeasures, logistics could come to a standstill. It is estimated that by the FY2030, transportation capacity could fall short by 34% (equivalent to 940 million tons), making it impossible to transport goods as before.

<Estimated Impact of Overtime Work Regulations>

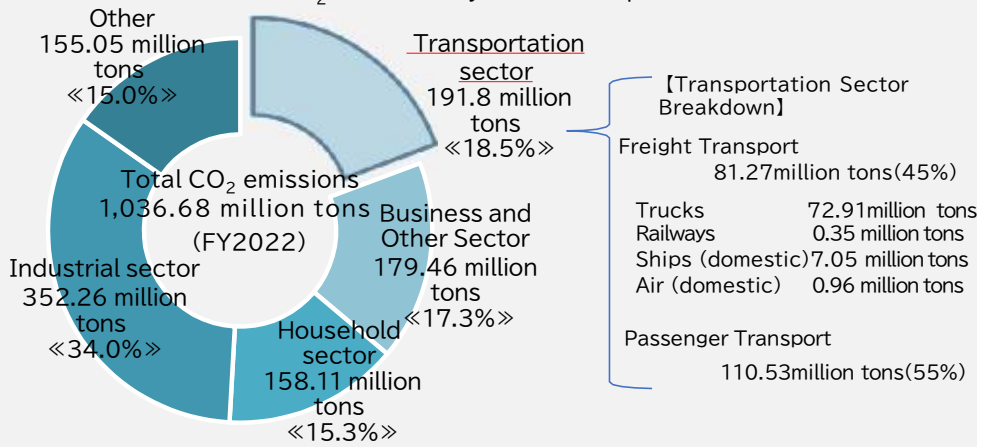
If no further measures are taken → By FY2030, there is a projected shortage of 34% (equivalent to 900 million tons).

Source: Compiled from the "Final Summary" of the Study Group on Achieving Sustainable Logistics (August 2023)

■ Carbon neutral

With the goal of achieving carbon neutrality by 2050, the transportation sector accounts for approximately 20% of CO_2 emissions, with 45% of that coming from the logistics sector. The Plan for Global Warming Countermeasures (approved by the Cabinet on February 18, 2025) sets a target of reducing CO_2 emissions by 35% by FY2030 (compared to FY2013 levels), making the reduction of CO_2 emissions in the logistics sector an urgent priority.

<CO_2 Emissions by Sector in Japan>



Source: Greenhouse Gas Inventory Office , National Institute for Environmental Studies, "Greenhouse Gas Emissions Data for Japan (1990-2022 Fiscal Years)"

■ Others

- Issues of Logistics such as small-volume, high-frequency shipments and inefficient cargo waiting and handling
- Promotion of standardization and modal shift
- Intensification and increased frequency of natural disasters such as heavy rain and snow, and the imminent threat of a major earthquake
- Declining international competitiveness (GDP ranking: 2nd in 2000 → 5th in 2050) etc.

<Small-volume, high-frequency shipments>

	1990	2015	2021
Per shipment Cargo volume	2.43 ton/shipment	0.98 ton/shipment	0.83 ton/shipment
Trends in number of shipments (3-day survey)	13,656 thousand	22,608 thousand	25,080 thousand

<Various cargo types, pallet sizes>

Source: Created based on data from the Ministry of Land, Infrastructure, Transport and Tourism's "National Freight Flow Survey (Logistics Census)"

1a. Interim Summary - The Future of the High-Standard Road Network -

■ Interim Summary on the Future of the High-Standard Road Network ※October 2023, Subcommittee on Roads, National Trunk Roads Division, Council for Social Infrastructure Development

○ In response to the various social challenges facing our country, such as population decline, disaster risks, the decline of our international economic competitiveness, and climate change adaptation, a proposal has been put forward for the future direction of a high-standard road network with a vision toward 2050.

○ The proposal emphasizes that to restore economic growth and build a safe and vibrant national territory, it is crucial to realize **the World's Smartest, Safest, and Most Sustainable Infrastructure Network System (WISENET)**.

○ Two principles for achieving WISENET have been established: "seamless network development" and "transformation into a multifunctional space through technological creation"

○ Taking into account examples from other countries, it is necessary to evolve Japan's road network into a multifunctional space and **consider the construction of Autoflow Road, fully utilizing road space, powered by clean energy as a new logistics form.** It is also proposed to realize this plan **within 10 years, given the pressing logistics situation.**

Realization of WISENET ※ 2050

※ World-class Infrastructure with 3S (Smart, Safe, Sustainable) Empowered NETwork

Through advanced policy initiatives, we will contribute to solving challenges and creating value in the new era.

Switzerland, CST

A logistics system is being planned that will operate autonomous carts through underground tunnels connecting major cities.

Source: Cargo Sous Terrain website

United Kingdom, MAGWAY

A fully automated logistics system using low-cost linear motors is being Planned.

Source: Materials provided by Magway Co., Ltd.

1b. Interim Summary - The Vision of Autoflow Road -

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) established an advisory panel on Autoflow Road (chaired by Professor Hideo Hato of the University of Tokyo Graduate School of Engineering) in February 2024 (hereinafter referred to as the "Study Group"). In July 2024, the Study Group issued an interim summary report on the future direction of Autoflow Road.

■ Concept of Autoflow Road

The concept is to **"utilize road space to create dedicated spaces" and** to **"transport goods using unmanned and automated transportation measures enabled by digital technology."** Furthermore, by achieving unmanned and automated operations, the infrastructure should operate 24 hours a day. The space within Autoflow Road should not only be used for transportation but also as storage areas for goods, thereby providing a "buffering function" to **level out logistics demand** and create an environment conducive to **optimizing the overall logistics system**.

Construction of a new logistics form, "Autoflow Road"

Utilizing road space to create dedicated lanes ✚ Utilizing digital technology to achieve unmanned and automated transportation measures

➢ Target, Cargo Characteristics

- **Focusing on small-volume, high-frequency shipments** that contribute to increased logistics workload, the transport unit is standardized based on palletized load dimensions.
- **The size should comply with the standard specifications** recommended by the Public-Private Logistics Standardization Consultation Committee's Pallet Standardization Promotion Subcommittee.

※Base size: 1,100mm × 1,100mm
※Including roll box-type pallets.

< Image of palletized cargo>

<Image of parcel delivery etc.>

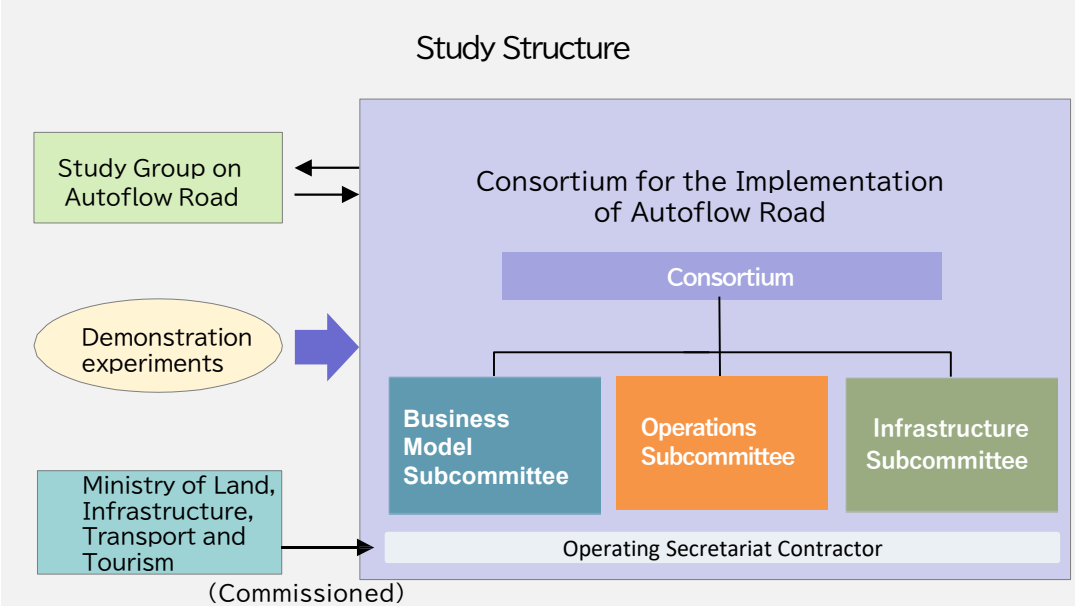
➢ Assumed route

- **Tokyo-Osaka corridor, which has the highest logistics volume**
- **Aiming for implementation by 2030** in sections where experiments or small-scale improvements are feasible, such as the under-construction sections of the Shin-Tomei Expressway.

1c. - Consortium for the implementation of Autoflow Road -

■ Establishment of the Consortium for the Implementation of Autoflow Road

In May 2025, the **"Consortium for the Implementation of Autoflow Road"** was established to promote discussions toward the implementation of Autoflow Road. The consortium aims to facilitate information sharing and discussion among private-sector companies interested in the operation and use of Autoflow Road, public institutions, and entities holding relevant technologies, with the goal of exploring business models, technical demonstrations of operations, strategies to promote technological development, and the appropriate approach to infrastructure development. (As of July 31, 2025, 104 private-sector companies are participating. Membership is open on a rolling basis.)



➢ Items for discussion

	Fiscal Year 2025	Fiscal Year 2026 and beyond
Business Model Subcommittee	・Extraction of issues and challenges for business establishment ・Business simulation	・Services to be provided ・Requirements for Service Operators ・Review of business simulations
Operations Subcommittee	・Setting Use Cases to be verified in this year's demonstration experiments ・Technical development Direction (Roadmap)	・Phase 2 Experiment ・Unverified use cases (Phase 1) ・Specific technical requirements
Infrastructure Subcommittee	・Consideration of infrastructure configuration ・Case studies on infrastructure aspects for specific sections	・Specific route and structural conditions ・Site location/area based on the above

1d.– The Role of the Final Summary -

■ The Role of the Final Summary

Since issuing the interim summary in July 2024, the Study Group has conducted interviews with private-sector companies and market soundings (hereinafter referred to as "MS"), and through five review meetings, we have discussed operational methods, current technologies relevant to Autoflow Road, and institutional issues that need to be addressed.

This final summary will organize the discussions on the future direction of Autoflow Road that held over ten review meetings, taking into account the opinions of the consortium, and outlines the implementation strategy for Autoflow Road for the current fiscal year and beyond.

Review Meeting on Autoflow Road

- 1st Meeting: Background of the study, overseas examples, future direction of discussions, etc.
- 2nd Meeting: Stakeholder interviews (Yamato Transport, Nippon Express), current status of logistics and traffic volumes, etc.
- 3rd Meeting: Stakeholder interviews (Ajinomoto, Asahi, Amazon) , experimental routes, draft outline of the interim summary, etc.
- 4th Meeting: Estimation of effects, cargo specifications, draft outline of interim summary, etc.
- 5th Meeting: Estimation of effects, draft interim summary, directions of further discussion, etc.
- 6th Meeting: Stakeholder interviews (Daihen, Japan Institute of Material Handling, Mitsubishi Estate, Nomura Real Estate Development), Business Scheme MS (Draft), etc.
- 7th Meeting: Stakeholder interviews (Business Scheme MS participants), Business Scheme MS results, Technical MS (Draft), etc.
- 8th Meeting: Stakeholder interviews (Technical MS participants (Infroneer, CUEBUS)), Technical MS results, future course of action, etc.
- 9th Meeting: Stakeholder Interviews (Kajima Corporation, Taisei Corporation), consortium, institutional issues, Final Summary Outline (Draft)
- 10th Meeting: Final Summary (Draft) etc.

Consortium for the Implementation of Autoflow Road

- 1st Consortium Meeting: Joint meeting of all subcommittees: How to proceed with the consortium, etc.
- 2nd Business Model Subcommittee Meeting : Issues for the Business Model Subcommittee, etc.
- 2nd Operations Subcommittee Meeting: Issues on pilot experiments, Operations Subcommittee, etc.
- 2nd Infrastructure Subcommittee Meeting: Road structure record, case studies, issues for Infrastructure Subcommittee, etc.

2. The Role of Autoflow Road

■ The Role of Autoflow Road

In response to the logistics crisis in Japan, it is extremely important to continue reviewing business practices and public-private initiatives for logistics efficiency based on the "Policy Package" approved at the meeting of relevant ministers in June 2023, and to secure transportation capacity. However, it is **also crucial to realize a world where goods are transported automatically, by utilizing Japan's advanced technologies, rather than a world where goods are transported manually,** in order to ensure future logistics. Autoflow Road should aim to realize the following as a new logistics system that addresses medium to long-term transportation capacity shortages and provides stable transportation services. To this end, **we will address technical challenges toward implementation through collaboration between industry, government, and academia.**

Optimization of the entire logistics system

➢ **Standardization・Automation**

Standardize pallets and data to realize the physical internet and optimize overall logistics.

➢ **Flexible transportation planning**

By utilizing 24/7 operation of Autoflow Road, small-lot transportation, and buffering functions, we level out truck transportation demand and enable pre-positioning of cargo with Autoflow Road based on anticipated demand, thereby enhancing transportation planning flexibility and reducing lead times.

➢ **Transforming business practices and improving working conditions**

Reduction of driver's workload by altering the business practice of "transporting goods by truck at night and delivering them the next morning," and by reducing waiting times through the integration of truck location information with hub functions.

Seamless integration of logistics modes

As a strength of the road network, roads are connected to various transportation hubs such as logistics facilities, airports, freight terminals, and ports. Autoflow Road aims to leverage this strength to build next-generation logistics networks that integrate other transportation modes.

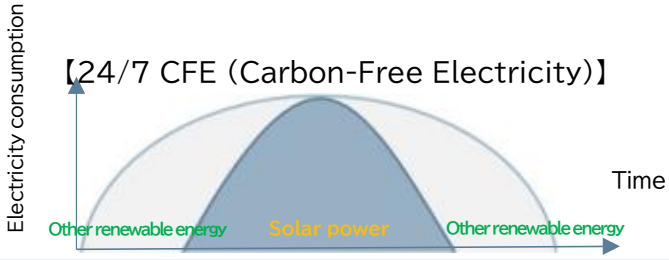
Additionally, it is necessary to consider collaborative approaches that reflect the current development status and future adoption of autonomous trucks, which are currently undergoing pilot tests on expressways.

※ Collaboration with autonomous truck

Achieving Carbon Neutrality

Autoflow Road will be developed and operated based on low-carbon technologies and clean energy, with efforts to facilitate technological development and implementation. In doing so, collaboration will be explored with initiatives for power generation, transmission, distribution, and storage utilizing road space, in accordance with the Road Act lastly revised in 2025.

Additionally, by enhancing transportation efficiency through the physical internet, greenhouse gas emissions will be reduced, and a nationwide carbon-neutral transportation network will be established through collaboration between railways and/or inland waterways, and Autoflow Road.



➢ Ensuring stable logistics during disasters

・We will design infrastructure under the assumption of frequent occurrence of large-scale disasters. **Autoflow Road will secure dedicated logistics spaces, minimizing human access and the impact of wind, rain, and other environmental factors**. This will enable **normal operations unaffected by weather conditions** and serve as **a critical transportation means** to maintain **logistics networks during disasters**, thereby contributing to business continuity planning (BCP) and establishing an effective logistics system.

3a. Required Functions of Autoflow Road

■ Services Provided

Autoflow Road should provide the following services, while meeting the basic requirements of automation, standardization, and carbon neutrality.

Specific details such as routes, hub locations, hub functions, cargo specifications, and transportation speeds are critical issues directly linked to the services and business model of Autoflow Road and should be further discussed within the consortium and refined.

Target section: Tokyo-Osaka as the principal route, with expansion to Kanto, East Kanto, and Hyogo also under consideration

Hubs: Set up multiple hubs, including intermediate points, should be established, with consideration integration with other modes.

Automated loading and unloading between transport equipment and trucks is necessary, and features such as refrigeration and automatic sorting should also be considered.

Cargo shape: Standard specification pallet (flat size) (including roll box-type pallets) and set a height restriction of 2.2 meters.

Speed: Aiming for a service equivalent to the current lead time, targeting 70–80 km/h (technical development required)

Other: Approach to liability for risks such as accidents, advantages compared to other modes, pricing, and reservation methods.

■ Required Technical Development and Establishment of Coordination Area

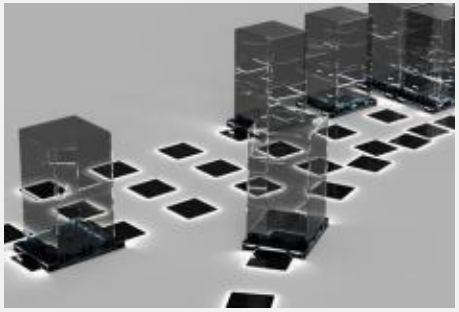
To realize the services provided, **demonstration experiment should be implemented promptly to verify each element of technologies,** and future action items should be organized. To promote technological development in private companies, **establishing a public-private roadmap is also** effective.

In addition, while referring to discussions in the preceding autonomous driving (Autonomous Driving Service Support Road Promotion Strategy Working Group), it is necessary to organize competitive and cooperative areas in Autoflow Road, taking into consideration, for example, safety evaluation methods for transport vehicles, roadside infrastructure, communication environments, and data integration platforms.

【Market Sounding on Technologies for Autoflow Road】(December 2024–January 2025)

22 companies submitted 36 technical proposals. Regarding transportation methods, it was confirmed that further technological development is necessary. Additionally, regarding automated cargo handling technology, issues such as loading and unloading onto transport equipment were identified, and it is necessary to clarify feasibility and challenges through future demonstration experiments.

< Examples of transport equipment (interviews) >



Linear motor-based two-dimensional cargo transport system (Cuebus Co., Ltd.)

Tire-mounted cart (Infroneer Holdings Co., Ltd.)

3b. Required Functions of Autoflow Road

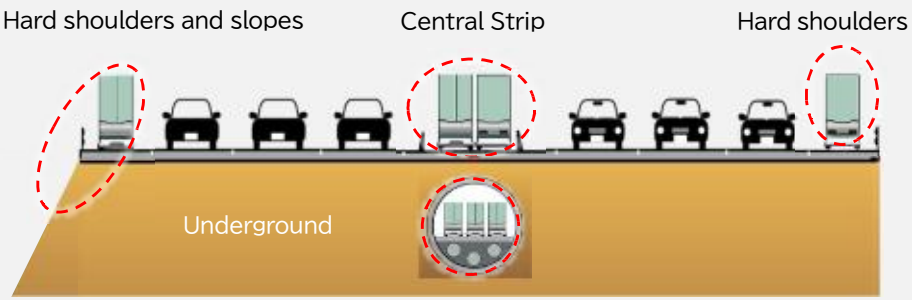
■ Required Infrastructure (Roadway section and Hub)

➢ Roadway Section

When constructing the roadway above ground, it is necessary to accommodate intersections with general traffic at interchanges (IC), junctions (JCT), service areas (SA), and parking areas (PA). Additionally, relocation of underground utilities and above-ground structures, elevation adjustments and alignment modifications at connection points between structures, and particularly in bridge sections, large-scale reinforcement of bridge piers and foundations due to the widening of existing bridges are required, among other construction challenges. Additionally, construction periods may be prolonged due to traffic restrictions. While constructing at sufficiently deep underground levels is relatively advantageous, underground construction entails higher construction costs compared to over ground construction and new challenges such as the disposal of excavated soil must be considered.

Furthermore, Autoflow Road are designed to operate 24 hours a day while minimizing human access, therefore **methods that do not hinder logistics operations** during the maintenance should be established. To achieve this objective, **it is necessary to engage in technological development for sustainable labor-saving and automation, including unification of the structural design of infrastructure.**

【Road Space Utilization Concept】



➢ Hub

A surrounding road network capable of handling a large volume of truck traffic is necessary. When developing new hubs, it is also necessary to consider land use regulations under the Urban Planning Act, etc., and from the perspective of securing land, options such as diversifying hub locations or collaborating with existing logistics facilities should be explored.

Furthermore, since the development of hubs may contribute to addressing disaster prevention and other issues at the municipal level, **collaborative efforts such as social experiments in partnership with proactive municipalities** should also be considered.

3c. Required Functions of Autoflow Road

■ Case Studies

In addition to considering the development of the mainline of the Autoflow Road, it is necessary to conduct a case study for the construction images **by the end of FY2025 using the following four sections as examples. This study should include considerations** such as the connection between the roadway section and hubs, the impact on surrounding road traffic, and the feasibility of establishing hubs of sufficient scale to handle the anticipated logistics volume. The study should also take into account road structure record and route selection criteria, and accelerate the details of routes and structures.

①Tomei Expressway, Atsugi IC area (Isehara JCT, etc.) to Tomei Expressway, Komakado PA or Ashitaka PA (Numazu IC)

②Tomei Expressway Atsugi IC area (Isehara JCT, etc.) ～ Shin-Tomei Expressway Surugawan Numazu SA

③Meishin Yoro JCT area ～ Meishin Sekigahara IC area

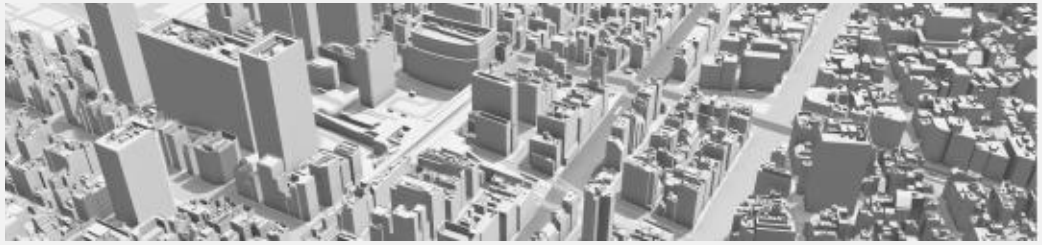
④ Shin-Meishin Jo-yo IC ～ Yawata-Kyotanabe IC

In doing so, it is necessary to consider **conducting business simulations using digital twins** to confirm the feasibility of the project.

Additionally, considerations should be made regarding alternative routes, double-tracking, and other measures to ensure transportation stability during disasters, as well as the potential for intermodal connectivity, and the calculation of estimated project costs to support feasibility assessments.

Furthermore, regarding the specific improvement concepts presented in the case studies, it is necessary to **consider the connection methods between roadway section and hubs** from an operational perspective **(e.g., elevators, gentle slopes, loops, etc.)**.

【Reference: PLATEU VIEW 4.0】



【Case Studies ① and ②】

【Case Studies ③ and ④】

4. Effects of Autoflow Road

■ Direct Effects

Autoflow Road is expected to **cover approximately 8% to 22% of** the future shortage in **transportation volume**, thereby supplementing freight transportation that cannot be handled due to labor shortages.

※ Percentage of the estimated transportation shortage of 940 million tons in FY2030 (as outlined in the "Final Summary" of the Study Group on Achieving Sustainable Logistics)

In that case, the number of driver workdays that can be covered is estimated to be **approximately 20,000 to 57,000 person-days**, and the CO_2 emissions that could be reduced are estimated to be **2.4 million to 6.4 million (t-CO_2/year)**.

【Estimated Effect (Assuming a Loading Rate of 79.3%)】

◆ Coverable working hours

Truck drivers:
21,280 ～
56,747 person-days※1

◆ CO_2 emissions reduction

Truck CO_2 emissions:
2,396,476 ～
6,390,486 (t-CO_2/year)※2

※Estimation Conditions

◆ 0.78 million tons to 2.1 million tons/year of freight transport capacity

Transport speed: 30–80 km/h, per ton,

10-meter vehicle spacing, 24-hour operation
→ Capacity of Autoflow Road (Tokyo–Osaka, 500 km):
216,000–576,000 tons (per day/3 lanes)

[Reference] 2023 fiscal year freight transport volume: 3.8 billion ton
(of which 2.51 billion ton were commercial freight)

(Ministry of Land, Infrastructure, Transport and Tourism, Fiscal Year 2023 (2023) "Automobile Transportation Statistics Annual Report")

<Reference Data>

※1 Total number of truck drivers: 940,000 (Ministry of Health, Labour and Welfare, "2024 Wage Structure Basic Statistics Survey")

※2 Annual CO_2 emissions from trucks: 72,911,083 (t-CO_2/year)
(Source: "Greenhouse Gas Emissions Data in Japan (1990–2022 Fiscal Years)")

■ Other Ripple Effects・Project Viability

It is necessary to proceed with the calculation of economic effects resulting from the development of Autoflow Road.

Regarding the feasibility of the project, case studies and pilot experiments should be conducted to identify and organize the costs that need to be considered, such as estimated project costs, manufacturing and development costs for transport equipment, power supply facilities and costs, and large-scale reconstruction costs, and these should be discussed within the consortium.

5. Implementation of Autoflow Road

■ Sounding-type Market Survey on the Operational Structure of Autoflow Road (October–November 2024)

Regarding the business scheme, 46 companies have submitted their opinions, pointing out various risks in each phase of the business operations for the construction, operation, maintenance, and possession of Autoflow Road.

Risk

Construction

- High costs and long project duration.
- Cost uncertainty
- Funding risk

・Unable to secure financing due to concerns about the viability of the project
・Credit risk from private sector contractors may prevent internal approval

Operations

- Uncertainty of demand

・Deterioration of business revenue due to fluctuations in logistics demand

- Unprecedented business model making funding difficult
- Losses due to downward rigidity in toll fees for Autoflow Road caused by stagnant freight rates

Maintenance

- Deterioration of Autoflow Road
- Road Funding for major reconstructions
- Damage caused by force majeure such as disasters

Possession

- Burden of fixed asset taxes, occupancy fees, etc.
- Force majeure risks
- Asset adjustment with existing road authorities

■ Considerations on the Implementation of Autoflow Road

・From the perspective of logistics sustainability, private funding is assumed, and maximizing the utilization of private-sector vitality.

・To ensure service levels, discussions are necessary regarding the future regulatory framework, structural standards, and safety criteria for Autoflow Road.

6. Issues to Consider for the Future Consideration of Autoflow Road

Infrastructure Strategy for the Future of Logistics in Japan

・Since infrastructure development requires a significant amount of time, Autoflow Road are targeted for implementation by the mid-2030s. However, the realization of benefits derived from enhanced transportation capacity and of carbon neutral transportation will only be materialized after social implementation is completed. Nevertheless, **looking ahead to Japanese society in the next 20 to 30 years, it is essential to adopt a medium- to long-term perspective and begin preparing now to support the future logistics system of our country**.

・ In doing so, while discussions toward the formulation of the Comprehensive Logistics Policy Framework, and the Plan for Global Warming Countermeasures should be taken into account, an infrastructure strategy that integrates logistics and roads should be developed to ensure that the direction of Autoflow Road aligns with the envisioned future of logistics.

Utilization of Logistics-dedicated Spaces, Emergency Response, etc.

・ Considering the unique characteristics of dedicated spaces, we should explore ways **to utilize Autoflow Road spaces** not only for logistics but also **for accommodating infrastructure for electricity and communications, and incorporating disaster prevention functions, among other possibilities**.

Coordination with Other Modes and Fostering a Fair Competitive Environment

・ Seamless integration with other modes is essential to leverage the strengths of Autoflow Road. At the same time, it is important to ensure that the business environment does not unfairly distort competition with other logistics modes.

Logistics Reform through Autoflow Road

・ If Autoflow Road truly become a user-friendly logistics system, integrated transportation services related to Autoflow Road will lead to standardization of cargo specifications and logistics management systems. Efforts should be made to promote changes in business practices among shippers and logistics operators and drive logistics reform through the development of Autoflow Road.

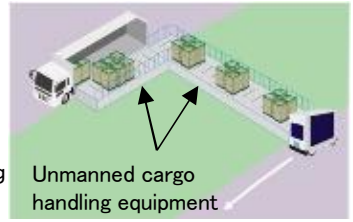
7. Next Steps - Technology for Realizing Autoflow Road -

■ Demonstration Experiments, etc.

In FY2025, the demonstration experiments will be conducted at existing facilities using existing technologies. **Conducting this concept verification is extremely important for establishing a shared vision of the future of Autoflow Road.** The primary focus will be on verifying the operational performance of transport equipment, but it will also be necessary to verify the required width, the length required for acceleration and deceleration, the feasibility of lane changes, and the loading and unloading from trucks to transport equipment at hubs.

Use Case 1
Hub: Streamlining cargo handling operations using unmanned cargo handling equipment

Verify the floor area, operation time, and other factors required for the automation of loading/unloading from trucks and transfer to transport equipment using unmanned material handling equipment

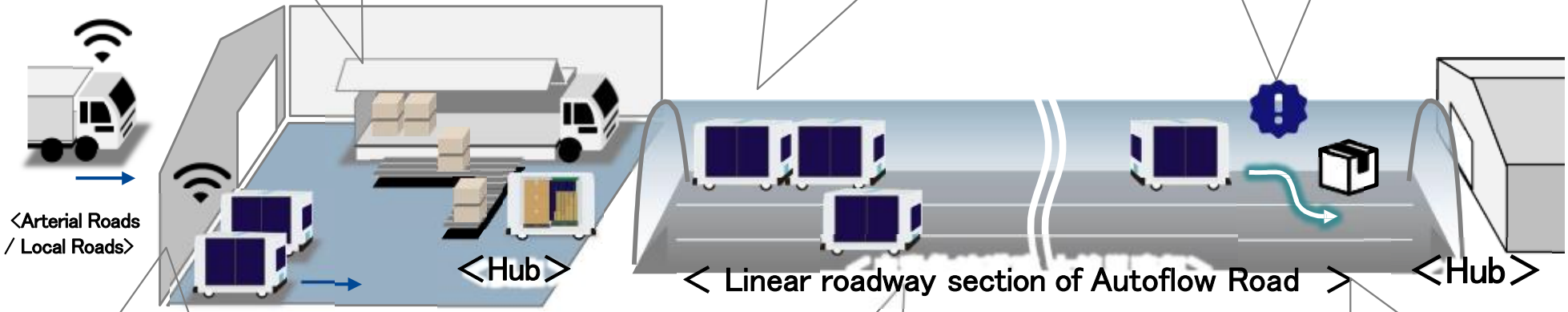


Use Case ②
Roadway section: Automatic conveyance equipment operation

Verify the automatic operation of transport equipment with varying speeds and cargo weights, the required road width, driving environment, and effects on cargo

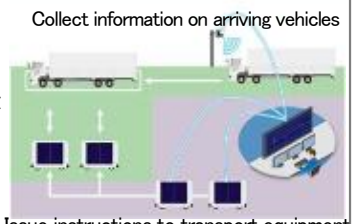
Use case ③
Roadway section : Abnormal condition detection and avoidance action of transport equipment

Verify the detection of abnormalities and the precision of driving technology and control in response to such abnormalities



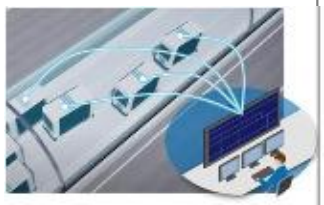
Use Case 6
Hub: Provision of information on arrival schedules for incoming vehicles

Verification of operations to receive vehicle arrival schedule information via the system and instruct transport equipment.
Set transport equipment to standby mode in preparation for vehicle arrival.



Use Case 5
Others: Transport equipment operation management

Verify the effectiveness and challenges of systems for managing the operational status of transport equipment and cargo.



Use Case ④
Roadway section : Communication stability of transport equipment

Verify whether autonomous driving is possible even under unstable communication conditions such as in tunnels.

7. Next Steps

・With the aim of commencing operations by the mid-2030s on sections where implementation is feasible through small-scale improvements, based on experiments conducted by 2027 on sections under construction of the Shin-Tomei Expressway (Shin-Tanabe to Shin-Gotemba), etc., feasibility should be confirmed through demonstration experiments, and efforts should be made to promote the development of a business environment, including institutional frameworks, to enable early transition to the development phase.

・ From the next financial year onwards, it will be necessary not only to conduct verification experiments on the issues identified during this year's demonstration experiments. It will also be necessary to **perform simulations related to intermodal connectivity and other areas**.

・Beyond the consideration of a long-distance trunk route between Tokyo and Osaka, **it is also effective to explore the feasibility of Autoflow Road in short-distance sections or areas where logistics efficiency improvements can be achieved and effects can be realized early,** utilizing existing technologies**, and such efforts** should be advanced.

・Regarding transport equipment and systems, it is necessary to consider international standardization such as JIS and ISO standards in the future, and Japan should take the lead in creating a world where goods are transported automatically.

・Based on the conceptual guidelines outlined in this final summary, steps should be taken to move forward with demonstration and implementation.

3 Approach
(1) Industry and Innovation③

Solve logistics challenges through both technological and institutional approaches to enhance international competitiveness

To address driver shortages and labor hour regulations while optimizing logistics, enabling seamless intermodal connections, and achieving carbon neutrality, Narita Airport is developing an automated logistics road system (Autoflow Road) originating from its on-airport cargo facilities. Through 24-hour operation for stable transport and seamless intermodal connections, this system simultaneously achieves overall logistics optimization, labor reduction, and environmental impact reduction. This logistics infrastructure renewal will establish a "sustainable, smart, safe, and entirely new carbon-neutral logistics innovation platform" originating from Narita.

【Reference】 Narita Airport "Airport City" Concept

[Reference] FY2025 Business Plan (Summary) (Japan Freight Railway Company)

3. Key Initiatives in the "2025 Business Plan"⑩

"Initiatives to Further Enhance the Role of Freight Rail Transportation"
(1) Initiatives Toward Realizing a Decarbonized Society
○ Introduction of a service providing CO_2 emission reduction information
○ Refinement of CO_2 emission calculation methods for rail transportation
○ Introduction of incentives clearly demonstrating customers' Scope 3 reductions
○ Encouraging Scope 1 reductions by transport operators
(2) Initiatives for Introducing New Technologies with Practical Effectiveness and Utilizing/Transporting Next-Generation Energy
○ Development of a Container Handling Management System (CHMS)
○ Studies toward streamlining loading inspections and enabling remote operation of shunting locomotives
○ Conducting demonstration experiments for swap body container transport compatible with both "autonomous trucks" and "freight rail"
○ Deepening studies on linking Autoflow Road, ports, airports, and freight transport via bullet trains

	Present to 2027 (Concept Validation Phase)	2028 to mid-2030s (Technology Development and Implementation Phase)	Mid-2030s (Implementation and Operation Phase)
Long-distance trunk line plan (Tokyo–Osaka)	Demonstration experiments at existing facilities and sections under construction of the Shin-Tomei Expressway, simulations of intermodal connections, etc.	Development (support) of transport equipment	Infrastructure development Manufacturing of transport equipment, etc.
		Consideration of international standardization	

(Other sections where effects can be realized early will be evaluated for feasibility)

[Reference] Study Group on Autoflow Road　Committee Members

(Listed in alphabetical order, titles omitted)

◎Chair

【Study Group Members】(As of July 31, 2025)

Awaji	Takehiko	Member, Planning Subcommittee, Logistics Committee, Japan Business Federation (Keidanren)
Obata	Junko	Professor, Graduate School of Law, Nihon University
Omoda	Masashi	President, Japan Trucking Association
Kato	Hirotaka	Chairman, Distribution Economics Institute of Japan
Sugii	Junichi	Management Planning Department Manager, Management Planning Division, Central Nippon Expressway Company, Ltd.
Takaoka	Mika	Professor, College of Business, Rikkyo University
◎ Hato	Eiji	Professor, School of Engineering, University of Tokyo
Hyodo	Tetsuro	Professor, Course of Logistics and Information Engineering, Tokyo University of Marine Science and Technology
Hojo	Masaru	Council Member, Japan Institute of Logistics Systems
Misui	Yuki	Professor, Faculty of Distribution and Logistics Systems, Ryutsu Keizai University