INTERNATIONAL ROAD TRANSPORT RESEARCH

FACTSHEET JAPAN

This series of factsheets highlights main framework conditions as well as goals and significant future trajectories of road transport research (RTR) for China, Korea, Japan, the U.S. and the EU for the next 10 – 15 years. This is an activity of the EU-project FUTURE HORIZON.

Strategic Innovation Policy Goals and Programmes

2030: Cut emissions by 46 % from 2013 levels[2]	Green Innovation Fund: 17 b$ (NEDO)[1]
2050: Reduction of GHG by 70 % compared to 2010 (GGS[1])	2025: Installation of 320 H_2 stations; 2030: 1,000 H_2 stations[4]
2050: Carbon-neutral society (GGS[1])	2030: Domestic introduction of up to 3 Mio t H_2 2050: 20 Mio t H_2[4]
2035: 100 % of the fleet are electric or hydrogen vehicles[1]	2030: Installation of 150,000 charging stations, incl. 30,000 quick chargers
2030: Increase production capacity for in-vehicle batteries to 100 GWh[1]	Subsidies & reduced taxation for EVs, PHEVs, FCVs[1]
2020: Legal recognition of AVs[5]	SIP-adus (106 m$ 2018-2022, NEDO & CSTI)[6]
2024: Renovation of regulatory framework & infrastructure to fit AD[5]	2027: Promotion of commercialisation of Level 4 AVs[5]
Strengthening of industrial competitiveness[2]	
Advanced transport system for elderly & disabled people[2]	SIP-adus (106 m$ 2018-2022, NEDO & CSTI)[6]
Creation of smart & comfortable living spaces[2]	
Innovative streamlining of logistics in era of population decrease[2]	Building decarb. regional system for delivering goods (8 m$, METI)[1]
Reduction of traffic accidents by V2X technologies	
2030: Society with world's safest & smoothest road transport[3]	

Research Activities

Energy & Environment

- R&D on water electrolyser
- Promotion of renewable energy use
- Research on hydrogen generation & other alternative fuels
- Development of wireless power supply technologies
- Promotion project to develop charging infrastructure for next generation vehicles
- R&D on Metal-air / All-solid-state batteries

Electrification

- Data convergence between virtual & real space
- Smart city driverless vehicle pilot for healthcare services in the cities of Kamakura and Fujisawa
- 2020: Installation of inspection regime & permit system for AVs

Automation & Connectivity

- Since 2019: FOTs of AD technology in mixed traffic in Tokyo waterfront city area with a focus on connectivity and ITS
- Traffic environmental data framework & distribution of data
- "RoAD to L4" project: Promotion of driverless AD services by METI & MLIT (2021-03.2026) – 40 locations in rural areas with AVs by 2025
- New cyberattack techniques & countermeasure technologies
- Automated driving architecture for geographical data & high precision 3D maps (PLATEAU project)
- 2024: Model case of smart, automated city build by Toyota
- Realization of smart automated mobility services

Urban Mobility

- Public transportation priority system
- Local public transportation network linked with urban development
- Dynamic traffic information
- FOTs for social implementation of mobility & logistics services in local regions & other areas

Freight & Logistics

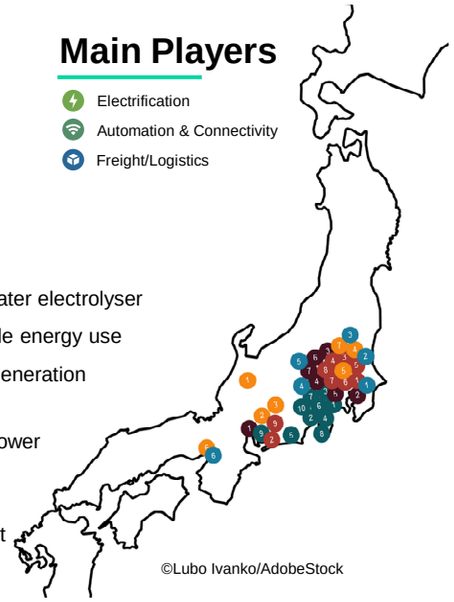
- Logistics digitization
- Last mile delivery stream-lining with robots & drones
- Cyber port
- 2023: Unmanned AD delivery services in specified areas
- By 2025: Fully AD of trucks on expressways
- FOT for truck platooning on expressways with focus on applying infrastructure based sensors

Road Safety

- Sophisticated driving safety support system
- C-ITS pilot project for V2X connectivity
- SAKURA: Safety Assurance Kudos for Reliable Autonomous vehicles (METI, 2018-2025)
- Virtual validation platform for ADS safety assurance – Driving Intelligence Validation Platform (DIVP™)

Main Players

- Electrification
- Automation & Connectivity
- Freight/Logistics



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Research Institutes

1. Kanazawa Institute of Technology
2. Saitama Institute of Technology
3. Japan Automobile Research Institute
4. Nagoya University
5. Chubu University
6. Ritsumeikan University
7. Waseda University ACROSS

Suppliers

1. Pioneer
2. Denso
3. Hitachi
4. Sony
5. Nihon Unisys
6. Solize
7. Nisshinbo Holdings Inc.
8. ITD Lab

OEMs

1. Toyota
2. Mitsubishi Motors
3. Honda
4. Daihatsu
5. Nissan
6. Subaru
7. Mazda
8. Lexus
9. Hino Motors
10. Terra Motors

Mobility Service Providers

1. Tier IV
2. Dynamic Map Platform
3. Ascent Robotics
4. Argus Cyber Security
5. 4R Energy Corp.
6. NExT-e Solutions
7. Smart Drive

Innovation Policy

1. METI
2. MEXT
3. MLIT
4. NEDO
5. JSPS
6. JST

Socio-Economic Developments

- Society 5.0[6]: Cyber & economic spaces converge to promote economic evolution & solutions to social issues
- Aging society needs secure and comfortable means of transport to move freely & save
- Focus on resilience & prevention (resilient value chain) due to experiences with catastrophes & crises

Impacts of COVID-19

- Accelerated development & implementation of next-generation mobility (e.g. smart cities, AV, use of robots & unmanned platooning)
- Accelerated digital transformation → Foundation of a digital agency
- Formation of local public transport plan

Conclusions

The Japanese government emphasises industrial competitiveness as well as solving societal issues with their AV policy, following a mixed approach between technology development (e.g. platform technologies) and practical applications & testing of AVs. The development is often initiated from the application side. ITS and connectivity are considered a prerequisite, whereas some innovative technologies lack behind (e.g. AI). Research goals for electrification are mainly related to charging & refuelling infrastructure. Energy-related research has high importance. The road transport research landscape is shaped by a strong cooperation between public authorities and companies with their traditional value chains.

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References
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[2] MLIT (2021) Summary of the white paper on land, infrastructure, transport and Tourism in Japan
[3] Automobile traffic subcommittee et al (2021) The Future of vehicle safety for a traffic accident-free society
[4] Hydrogen and fuel cell strategy council (2019) Strategic road map for hydrogen and fuel cells
[5] Cabinet Office (2021) Cross-ministerial Strategic Innovation Promotion Program (SIP) Automated Driving for Universal Services
[6] https://en.sip-adus.go.jp/
[7] Government of Japan (2021) Science, technology, and innovation basic plan

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