

# NEXT-GENERATION MOBILITY IN “SOCIETY 5.0”



Japan has been a leading manufacturer and exporter of vehicles with a strong global presence since 1980s. With this solid foundation, the Japanese mobility industry has comprised major vehicle manufacturers and their supply chains. However, autonomous driving is fast becoming a reality through technology development and demonstration projects of next-generation mobility systems including automated driving.

In next generation mobility systems, the automotive industry structure is likely to be significantly disrupted. Accordingly, opportunities for foreign companies including start-ups with innovative technologies are increasing.

## Towards the Creation of Next-Generation Mobility Systems

Japan is facing challenges such as a declining birthrate, an aging population, energy and environmental issues. The Japanese government is working towards a blueprint for “Society 5.0”, a social system that solves or mitigates these problems using IoT, robots, and AI. Solving issues in the transportation sector is also on the agenda.

### Expectations for “Society 5.0”

#### ECONOMIC DEVELOPMENT



- Increase of energy demand
- Increase of food demand
- Extension of lifespan and aging of population
- Intensification of international competition
- Concentration of wealth and regional inequality

#### RESOLUTION OF SOCIAL PROBLEMS



- Reduction of greenhouse gases (GHG) emissions
- Increase of food production and reduction of loss
- Mitigation of social cost
- Industrialization that is sustainable
- Redistribution of wealth and correction of regional inequality

Incorporating new technologies such as IoT, robots, and AI in all industries and social activities, providing goods and services that granularly address manifold latent needs without disparity

**TOWARDS “SOCIETY 5.0”**

The creation of next-generation mobility systems is one of the flagship projects to be tackled towards the realization of “Society 5.0”. The Japanese government is promoting institution development, technology development, and demonstration projects with KPIs attached, such as the start of unmanned automated driving transport service on public roads of limited areas in 2020.

Automated driving is expected to help safer and smoother road transportation where more people can travel comfortably, improvement of industrial and efficiency of related industries.

The implementation of “Reform 2020” (Public-Private Projects to Accelerate Growth Strategy)\* is prioritized in the main measures in the “Japan Revitalization Strategy 2015”.

One of the items listed in Reform 2020 is the “Use of next-generation mobility systems and automated driving technology”. Based on Government prioritisation several concrete demonstration projects are being progressed.



BALANCING ECONOMIC DEVELOPMENT  
and RESOLUTION OF SOCIAL PROBLEMS



## Mobility and their Demonstration Projects


In addition to initiatives by relevant Japanese ministries and agencies, trial projects for social implementation are being promoted throughout the country in collaboration with local governments and the private sector.

In the social implementation trial projects, various initiatives such as next-generation urban mobility systems, personal mobility, on-site mobility, mobility for mountainous areas and tourist areas are being undertaken. With a predicted shortage of future truck drivers, one of the trials focusses on truck platooning.

### Mobility Trial Example

OVERVIEW
<b>AREA</b> <ul style="list-style-type: none"><li>Shin-Tomei Expressway, Kita Kanto Expressway</li></ul>
<b>PURPOSE</b> <ul style="list-style-type: none"><li>In the trucking industry, driver shortage and driver aging are major problems. Realizing labor saving by truck platooning of long-distance trunk transportation for which securing of drivers is difficult.</li></ul>
<b>CONTENT</b> <ul style="list-style-type: none"><li>Establishing necessary technologies, fostering social acceptance, and preparing for commercialization, by conducting demonstration projects to realize platooning in which more than 3 unmanned follower vehicles of different makers are electronically connected.</li></ul>
<b>FUTURE IMPLEMENTATION ITEMS</b> <ul style="list-style-type: none"><li>Continuing the demonstration projects (Establish technology for maintaining communication even in bad weather, etc.)</li><li>Realizing unmanned follower vehicle platooning on a highway (Shin-Tomei Expressway) (2020).</li></ul>

PARTICIPATING ORGANISATIONS
<b>PUBLIC INSTITUTIONS</b> METI, MLIT
<b>PRIVATE SECTORS</b> Toyota Tsusho, Nippon Koei, Isuzu Motors, Hino Motors, Mitsubishi Fuso Truck and Bus (Daimler), UD Trucks, Sagawa Express, Seino Transportation, NIPPON EXPRESS, Fukuyama Transporting, Yamato Transport, Japan Trucking Association, Advanced Smart Mobility

RELATED TECHNOLOGY
<ul style="list-style-type: none"><li>Coordinated inter-vehicle distance maintenance support system</li><li>Automated driving control</li><li>Sensor for distance between vehicles &lt;millimeter wave radar&gt;</li><li>Preceding vehicle tracking sensor</li></ul>


## Local Government Incentives for Social Implementation Projects

In addition to demonstration projects, local governments are taking measures to remove barriers to enter into new businesses for social implementation of next-generation mobility systems. Hokkaido and Aichi prefectures are supporting companies by establishing one-stop consultation offices.

## New Initiatives Realizing Next-Generation Mobility Systems

In order to realize next-generation mobility, new initiatives involving various fields are increasing.

Toyota Motor announced “e-Palette Concept” at CES in 2018 as an EV for business operators. They are working in collaboration with several leading companies in order to meet a variety of user needs such as mobility, logistics, sales, etc. by utilizing electrification, connected, and automated driving technology.



Toyota “e-palette concept”

### Toyota partner companies for e-palette

#### Mobility service partners









Amazon.com (U.S)  
Didi Chuxing (China)  
Pizza Hut (U.S)  
Uber Technologies (U.S)

#### Technical partners

Didi Chuxing (China)  
Mazda Motor (Japan)  
Uber Technologies (U.S)

### Target fields for Honda Xcelerator

Honda Motor is promoting a program called “Honda Xcelerator” which provides support including funding to start-ups with innovative ideas including automated driving.

	AI/ Robotics		Personal/ Shared Mobility
	Connected Vehicle		Vehicle Data Business
	Human Machine Interface (HMI)		In-Vehicle Apps
	Production Technology		Energy

## Participating start-ups and their technologies

COMPANY	TECHNOLOGY
<b>BRAIQ (U.S.)</b>	A technology that uses the various sensors to understand the driver's mental state and utilize AI to optimize the driving style at the time of automatic driving to suit the individual.
<b>DeepMap (U.S.)</b>	A technology that enables understanding of the driving environment more accurately and improve safety by providing a high-definition 3D map and real-time high-accuracy position information.
<b>DynaOptics (U.S.)</b>	The next-generation left/right asymmetric lens technology that improves the situational awareness on the road and enhances safety by integrating a lot of light into the camera and performing image edge distortion correction.
<b>EXO Technologies (U.S.)</b>	A technology that receives more accurate GPS information by providing error correction information to the on-board GPS receiver through the internet only by adding software.
<b>Tactual Labs (U.S.)</b>	A technology that enables various operations to be performed without removing the hand from the steering wheel even while driving by recognizing the movement of the skeleton of the hand as real-time 3D data and enabling operation with gestures.
<b>WayRay (Switz.)</b>	A technology that displays navigation information in real time in the driver's field of view without using special tools such as goggles by applying AR (Augmented Reality) to automobiles.

## Next-Generation Mobility Systems Market

The market related to next-generation mobility systems is surging globally as it is in Japan domestically. For the creation of next-generation mobility, including automated driving, in addition to vehicle manufacturers, component companies such as system, sensor, battery, service, and infrastructure-related companies, research institutes like universities and investment funds are involved. It is a global field where many non-Japanese companies are found.

## Global market growth

A U.S. research company signalled growth in the automated driving vehicle market as per below in 2018.



The global self-driving/autonomous cars and trucks market size is anticipated to reach **4,223 thousand units by 2030**, exhibiting a **CAGR of 63.1%** during the forecast period.



U.S., China, and Japan markets are expected to witness significant growth over the forecast period owing to large-scale testing activities and adoption of autonomous cars and trucks in the transportation sector.

Source: Grand view research "Self-driving Cars & Trucks Market Demand To Reach 4,223 Thousand Units By 2030" June 2018

Mobility trends in Japan are changing rapidly. This is a summary of information sourced through JETRO reports. If you are interested in investing or commencing business in Japan in this sector seek the latest updates on the trends and regulations through JETRO and original sources.

JETRO Tokyo publishes online statistics and reports on the [JETRO website](https://www.jetro.go.jp/).

You will find a range of information on the JETRO website to assist you with setting up an office in Japan. Or if you meet the Invest Japan program criteria, you may be eligible for consultations with industry experts.

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A significant number of major foreign companies are participating in the demonstration projects conducted by the Japanese government and the participation of foreign companies in this field is welcomed.

## Japan market growth

### A rise in Japan



According to Nihon Keizai Shimbun's "Survey on R&D Activities", **43.9% of major companies are spending record highs on R&D in 2018.**

In the top rankings are companies related to automated driving.

### 1. Toyota Motor

Focus areas: automated driving, electrified vehicle

### 2. Honda Motor

Focus areas: AI, automated driving, EV

### 3. Nissan

Focus areas: automated driving, EV, connected car

### 4. Denso

Focus areas: connected cars, automated driving, electrification technology

The existing Japanese mobility industry has been a solid system centered on the foundation of major vehicle manufacturers. However, next generation mobility systems, with new, innovative technology are disrupting the traditional industry structure. This enables foreign companies, including startups to access valuable business opportunities in Japan in the autonomous vehicle sector.

## HOW JETRO CAN HELP

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