



Special Report: April 2024

Challenges & Solutions for the Expansion of Robotaxi Services

Analyzing NRI's Global Survey On
Consumers' Perception of
Robotaxi Services



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Trends in Robotaxi Services

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Profitability of Robotaxi Services

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Demand for Robotaxi Services

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Summary

Commercialization of Robotaxi services has started in certain cities as local governments develop legislation.

Legislation on autonomous driving level 4


Countries	Main Movements
Japan	<ul style="list-style-type: none"> Revised Road Traffic Act allows driverless autonomous driving services with remote monitoring. (April 2023)*1
U.S.	<ul style="list-style-type: none"> Department of Transportation adds “vehicles equipped with automated driving systems” to Federal Motor Vehicle Safety Standards. (March 2022)*2 Autonomous driving was permitted by state laws or state executive orders in 40 states. (June 2023)*3
China	<ul style="list-style-type: none"> The Ministry of Transportation formulates guidelines on safe transportation services with autonomous driving to regulate the application of autonomous vehicles to transportation services. (December 2023.)*4 Shenzhen City stipulates where responsibility lies in the event of an accident in the country's first smart connected car management ordinance. (August 2022)*5
Germany	<ul style="list-style-type: none"> The world's first automated driving law including Level 4 was enforced. (July 2021)*6

Regions with advanced Robotaxi services


■ U.S.


Phoenix, San Francisco  *
 Austin *


■ China

Beijing, Shenzhen,
 Chongqing, Wuhan 

Manufacturers

 : Waymo

 : GM Cruise

 : Baidu

*In October 2023, GM Cruise suspended all Robotaxi services due to an accident with personal injury.

Source) *1 Created by NRI from 1 [Metropolitan Police Department website](#), 2 [JETRO business summary](#), 3 [JETRO business summary](#), 4 [China Ministry of Transportation](#), 5 [JETRO business summary](#), 6 [JETRO business summary](#), [Baidu website](#), [Waymo website](#) and [Cruise website](#).

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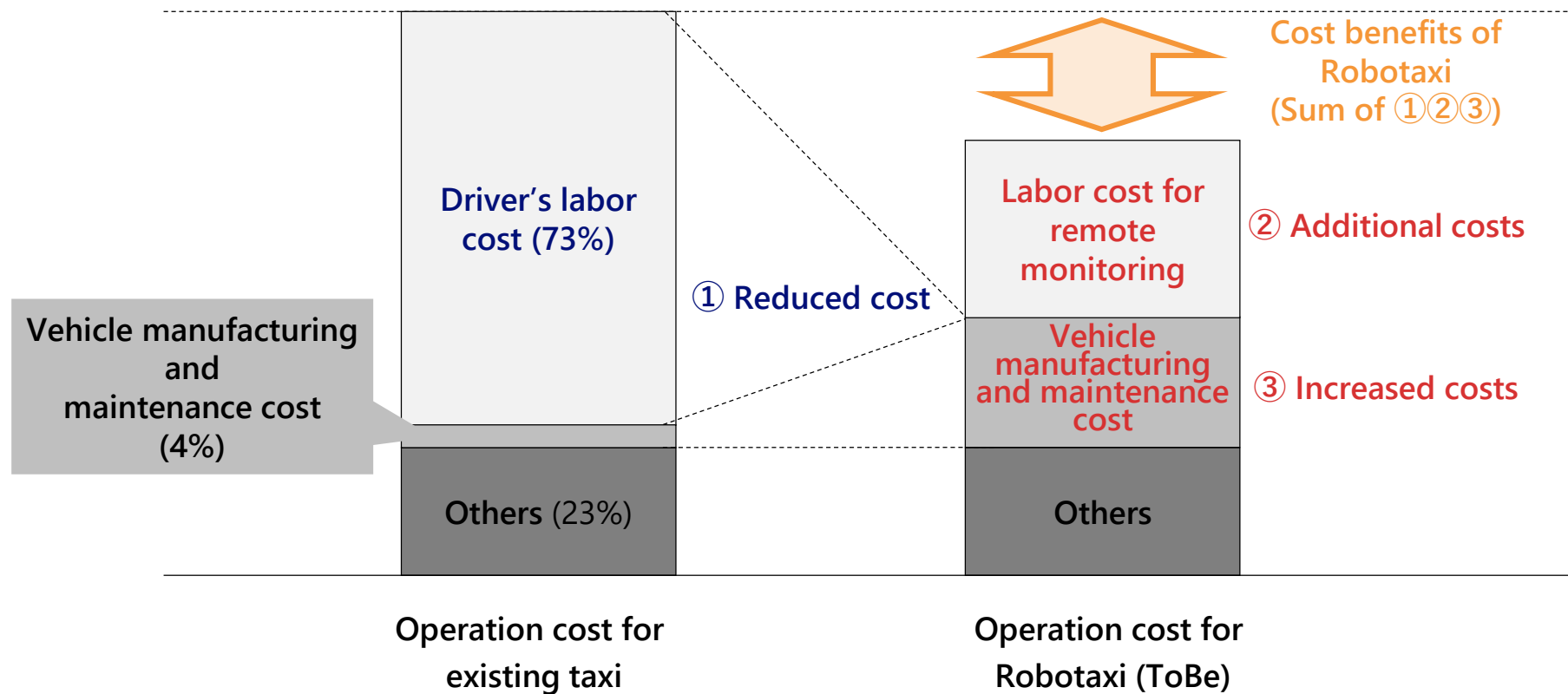
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Summary

Challenges

The Robotaxi business model reduces drivers' labor costs while increasing remote monitoring and manufacturing costs.

Operation cost and cost benefits of Robotaxi (ToBe) compared to existing taxi



To improve cost efficiency, service providers are developing remote monitoring tools and lowering manufacturing costs.

To improve profitability

**Cost
Reduction**

【Reduction of personnel cost for remote monitoring】

In March 2023, SoftBank **conducted a demonstration experiment of remote monitoring systems** using AI, and **one person successfully monitored 10 self-driving cars**.

*To fundamentally resolve, it is necessary to ease regulations on the number of monitoring people by improving autonomous driving technology.

【Reduction in vehicle manufacturing cost】

In July 2022, Baidu released **self-driving car "Apollo RT6"**, **which costs 5 million yen, one-tenth of the conventional price**.

**Profit
Growth**

【Emergence of a new business model】

Waymo is currently considering **a new advertising business** in which **customers are sent to advertisers' stores** by Robotaxis with **advertisers paying the fare**.

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Overview of global consumer awareness surveys for Robotaxi services

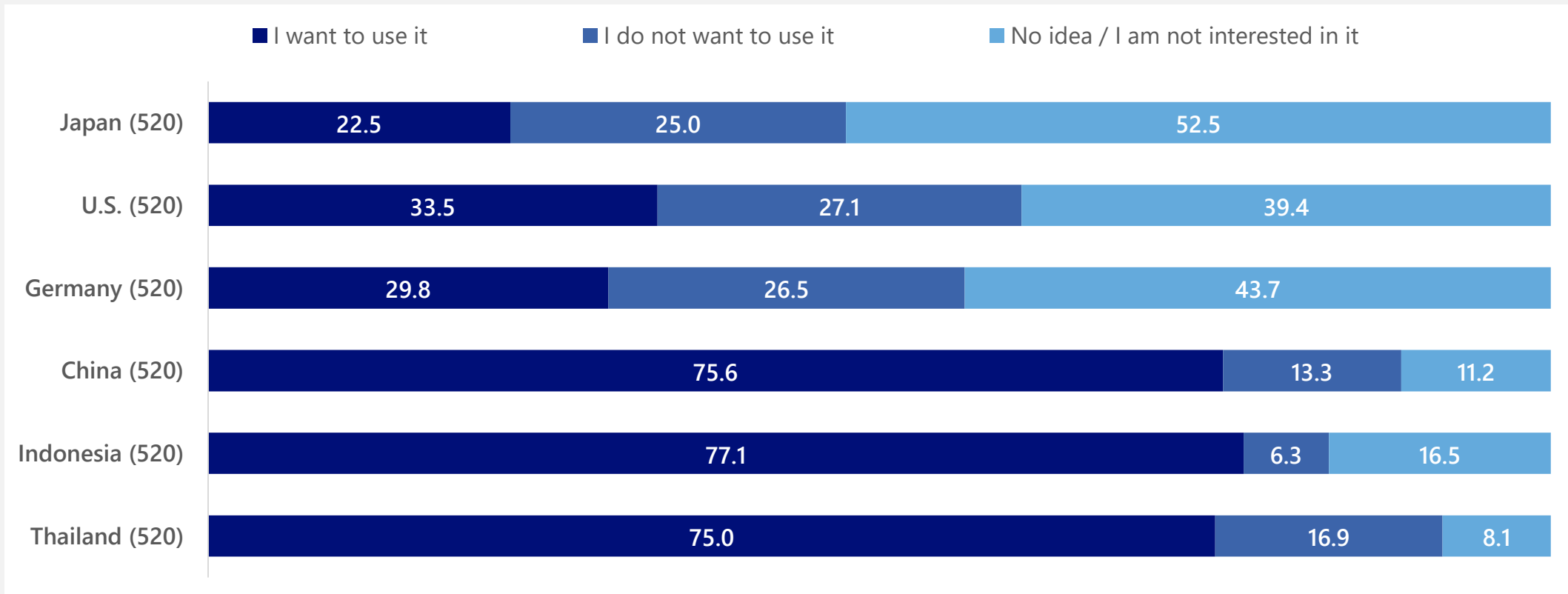
- Period: November 2023
- Countries: Japan, United States, Germany, China, Indonesia, Thailand
- Methods: Web survey
- Targets: Equally allocated by age (20s/30s/50s/60s) and gender (male/female)
- Number of valid respondents: 3,120 people (520 people per country x 6 countries)

Survey results ① : Intention to use Robotaxis

Interest in using Robotaxis is low in developed countries but high in emerging countries.

Intention to use Robotaxis (by country)

Do you want to use Robotaxis in the future?



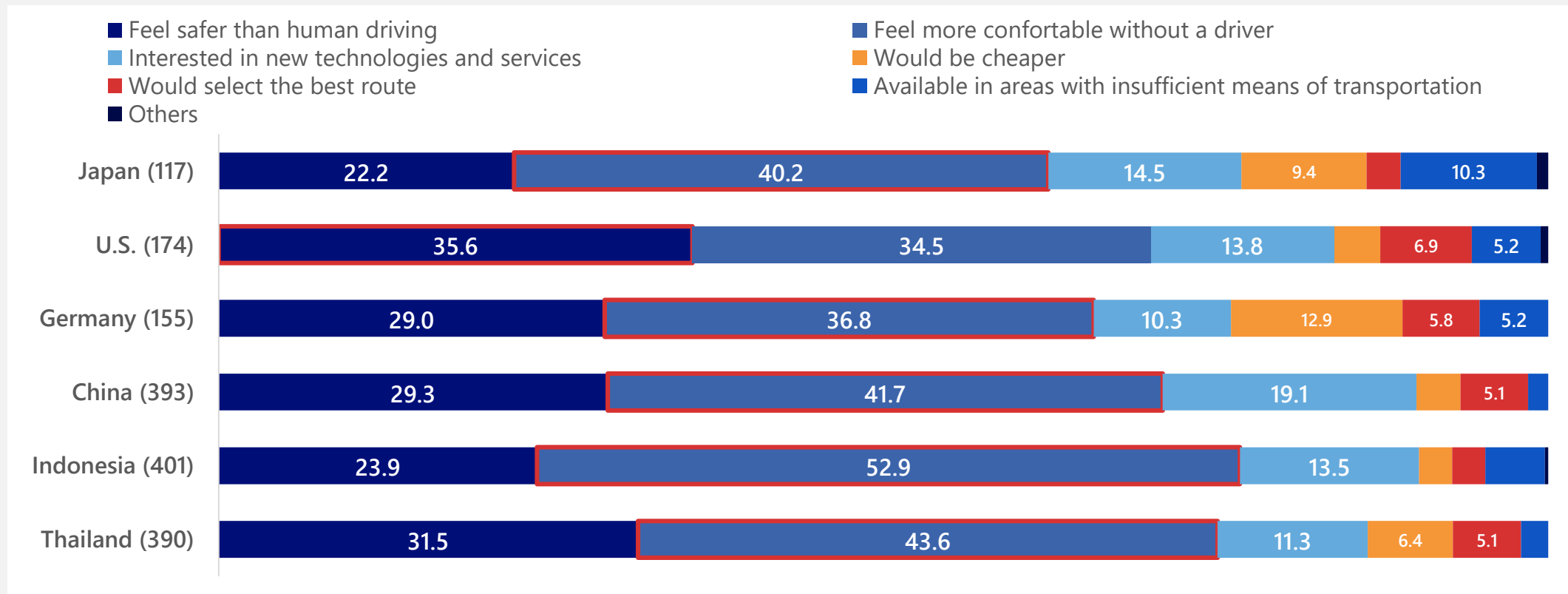
*() is the number of samples.

Survey results ② : Reasons for wanting to use Robotaxis

In five countries outside the U.S., the primary motivation for using Robotaxis is an "interest in new technologies and services."

Reasons for using Robotaxis (by country)

Please select the most appropriate reason you want to use Robotaxis.



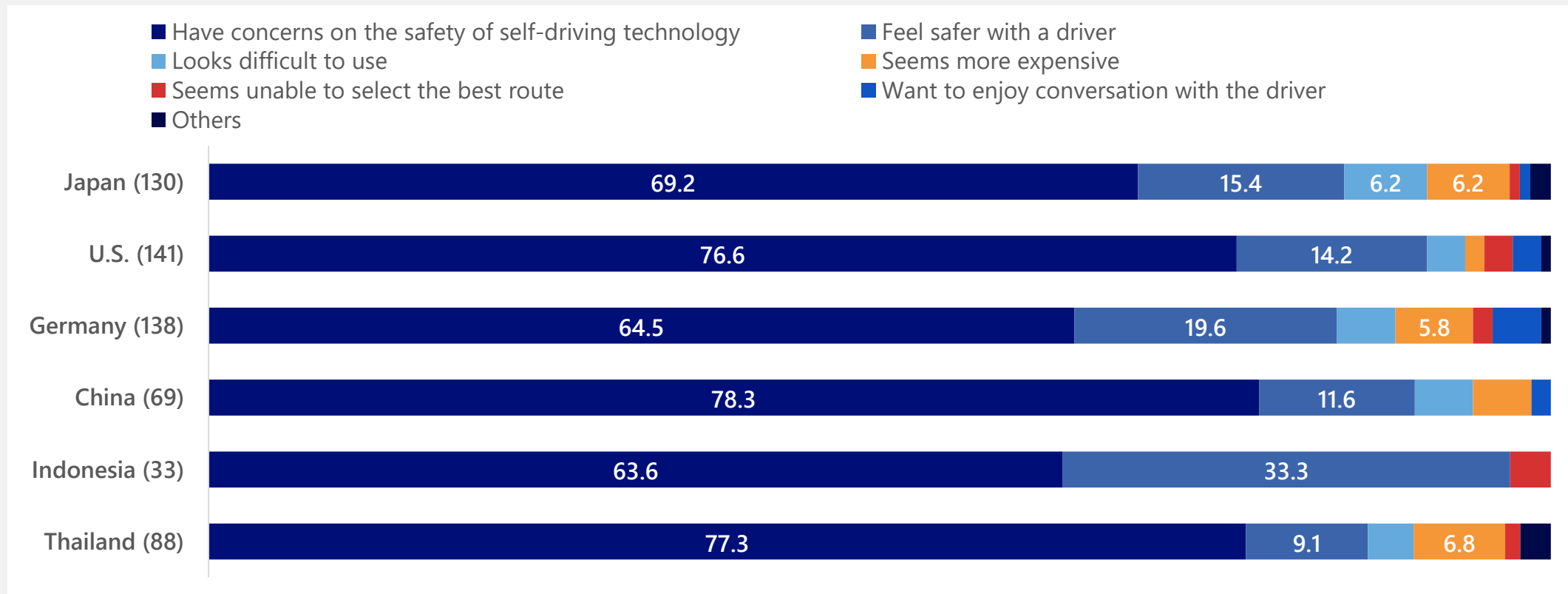
*() is the number of samples.

Survey results ③ : Reasons for not wanting to use Robotaxis

The top reason for not wanting to use Robotaxis is concerns over safety.

Reasons for not using Robotaxis (by country)

Please select the most appropriate reason you do not want to use Robotaxis.



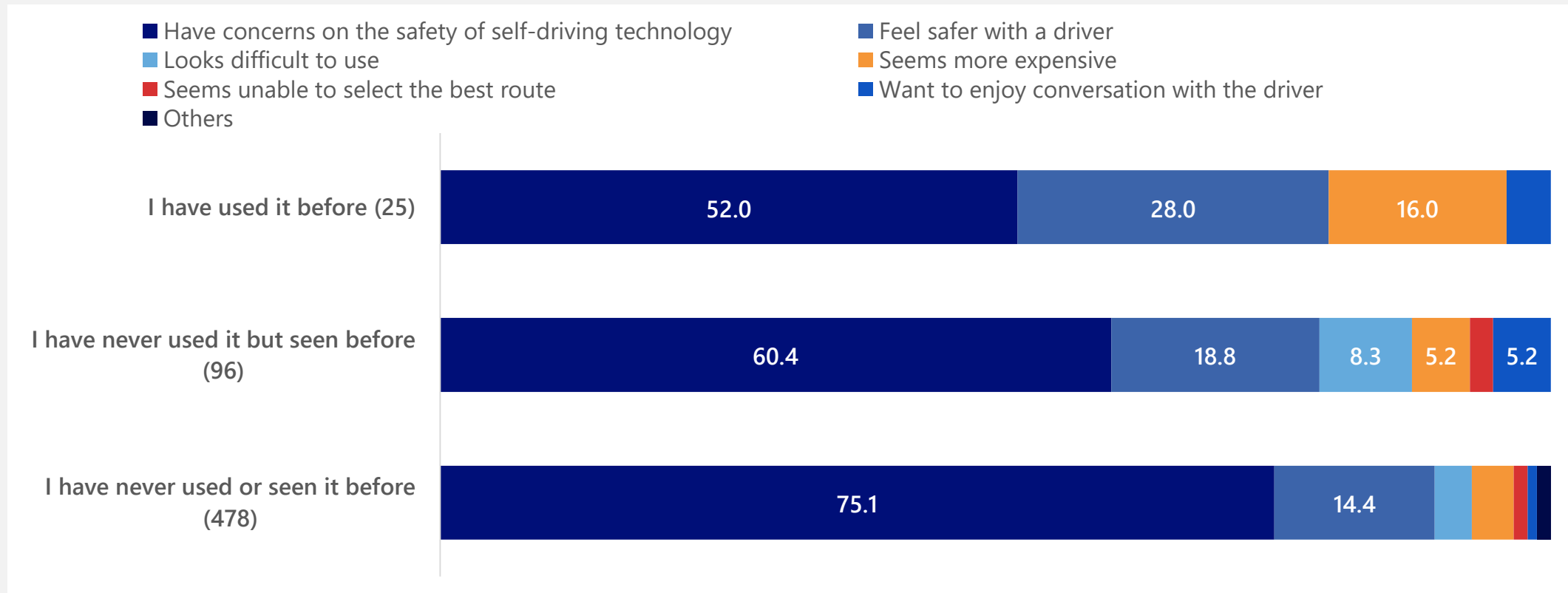
*() is the number of samples.

Survey results ④ : Reasons for not wanting to use Robotaxis (by usage experience)

Individuals who have seen or used Robotaxi services express fewer safety concerns compared to those who have not.

Reasons for not using Robotaxis (all countries summed up and sorted by user experience)

Please select the most appropriate reason you do not want to use Robotaxis.



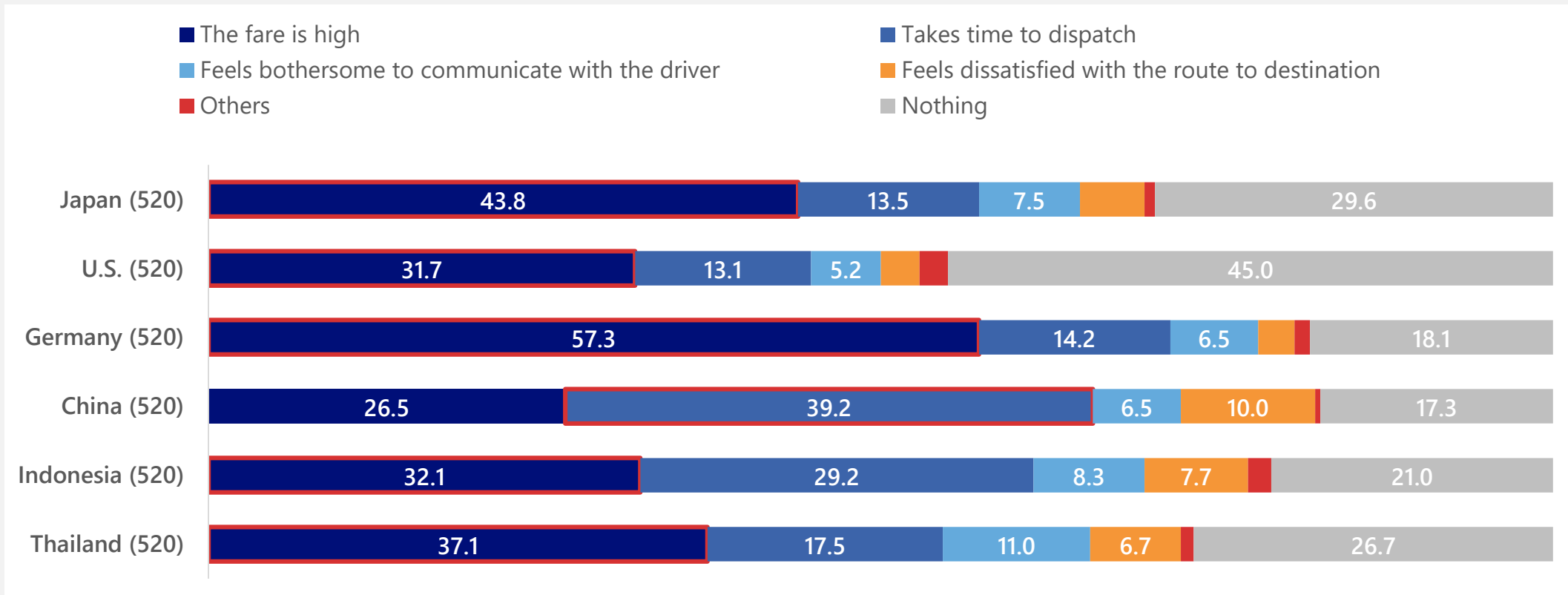
*() is the number of samples.

Survey results ⑤ : Dissatisfaction with existing taxi and ride-sharing services

The common dissatisfying factor with taxi and ride-sharing services is high fares, except in China where wait-time is the biggest issue.

Dissatisfaction with existing taxi and ride-sharing (by country)

Please select the option which best describes your dissatisfaction on existing taxi and ride-sharing.



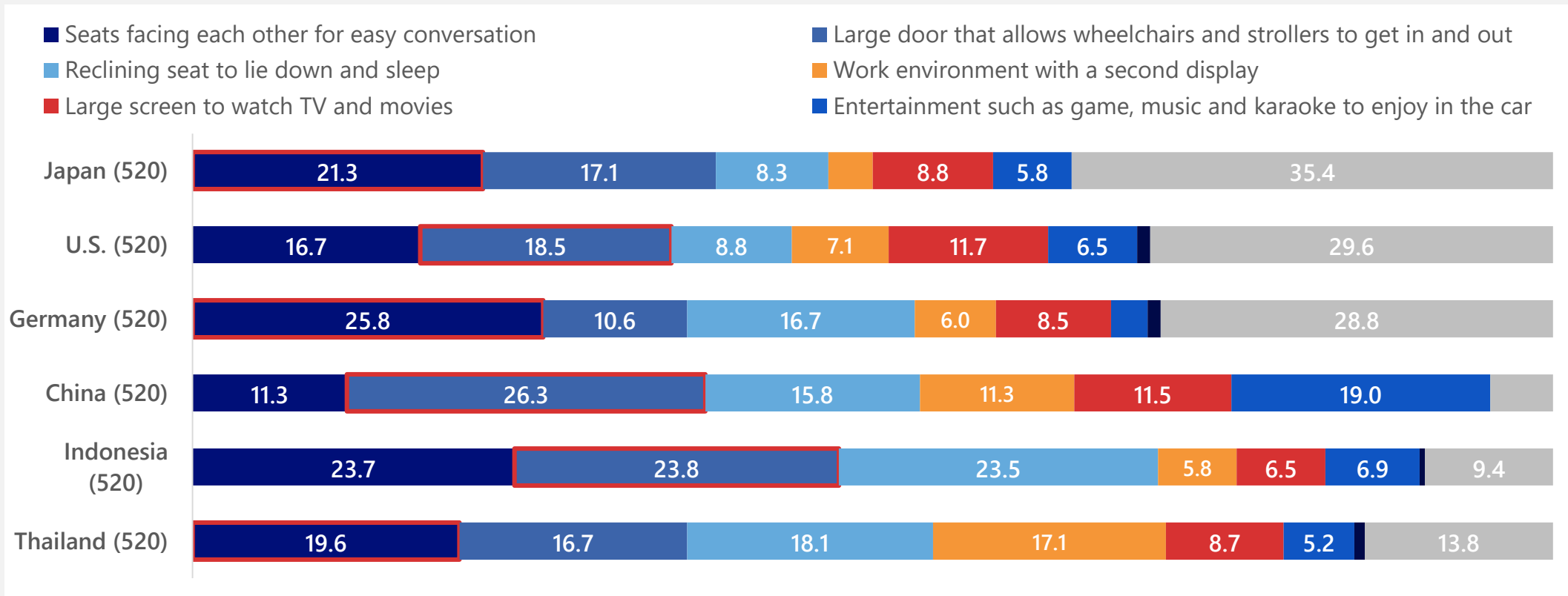
*() is the number of samples.

Survey results ⑥ : Expectations for new riding experiences

Expectations for new riding experiences from Robotaxis vary across different countries.

Expectations for new riding experiences (by country)

In the future, following new riding experiences could be realized for Robotaxi.
Please select the option you find most attractive.









*() is the number of samples.

Clarifying the service benefits motivates interested individuals while improving awareness and addressing safety concerns are crucial for attracting the uninterested.

Attribute	Individuals who like to use the service *People who selected "I want to use it"	Individuals who are not interested *People who selected "I don't want to use it" or "I don't know / I'm not interested"
Reason	Interested in new technologies and services (from survey result ②)	Having concerns about safety (from survey result ③)
Challenges	Clarify the benefit of using Robotaxis	Improve awareness and address safety concerns

Important in **developed countries** (Japan, U.S., Germany), where usage intention is especially low. (from survey result ①)

Competitive fares and locally tailored services are essential for a successful business expansion.

Challenge		How to better clarify the benefits of Robotaxis to people who show interest						
Survey Results	Dissatisfaction with existing services	The fare is high	 Japan 44%	 U.S. 32%	 Germany 57%	 China 27%	 Indonesia 32%	 Thailand 37%
		Takes time to dispatch				39%	29%	18%
	Expectations for new ride experiences	Large door that allows wheelchairs and strollers	21%	17%	26%		24%	20%
		Reclining seat to lie down and sleep	17%	19%		26%	24%	17%
		Seats facing each other for easy conversation			17%	15%	24%	18%
		Entertainment such as game, music and karaoke				19%		
		Work environment with a second display						17%

*Extracted options selected over 15% from survey result ⑤ and ⑥.

*Red indicates the most selected option in each country.

Increasing touchpoints in vehicles helps raise brand awareness and alleviate customer safety concerns.

Challenge

Improve awareness and alleviate safety concerns for uninterested individuals

Survey Results

Those who have used or seen Robotaxis trust their safety more than those who have never encountered them
(based on survey results ④)

Strategies for Solving Issues

Increase touchpoints with actual vehicles such as ride experience events

Example of creating touchpoints with vehicles

Waymo One Tour

In October 2023, Waymo began a tour event visiting multiple areas in Los Angeles, distributing merchandise and test drive tickets to residents and visitors.



Source) Image taken from [Waymo website](#)

For global expansion of Robotaxi services

Needs to clarify the benefits in emerging countries, while improving awareness and alleviating safety concerns are key in developed countries.

Countries	Emerging countries (China, Indonesia, Thailand)	Developed countries (Japan, U.S., Germany)
Usage Intention	High	Low
Challenges	Clarify the benefits of Robotaxis	Improve awareness and alleviate safety concerns
Strategy	Competitive pricing and locally tailored services	Increase touchpoints with actual vehicles such as ride experience events

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For the widespread adoption of Robotaxi services, strategies must address both profitability and demand.

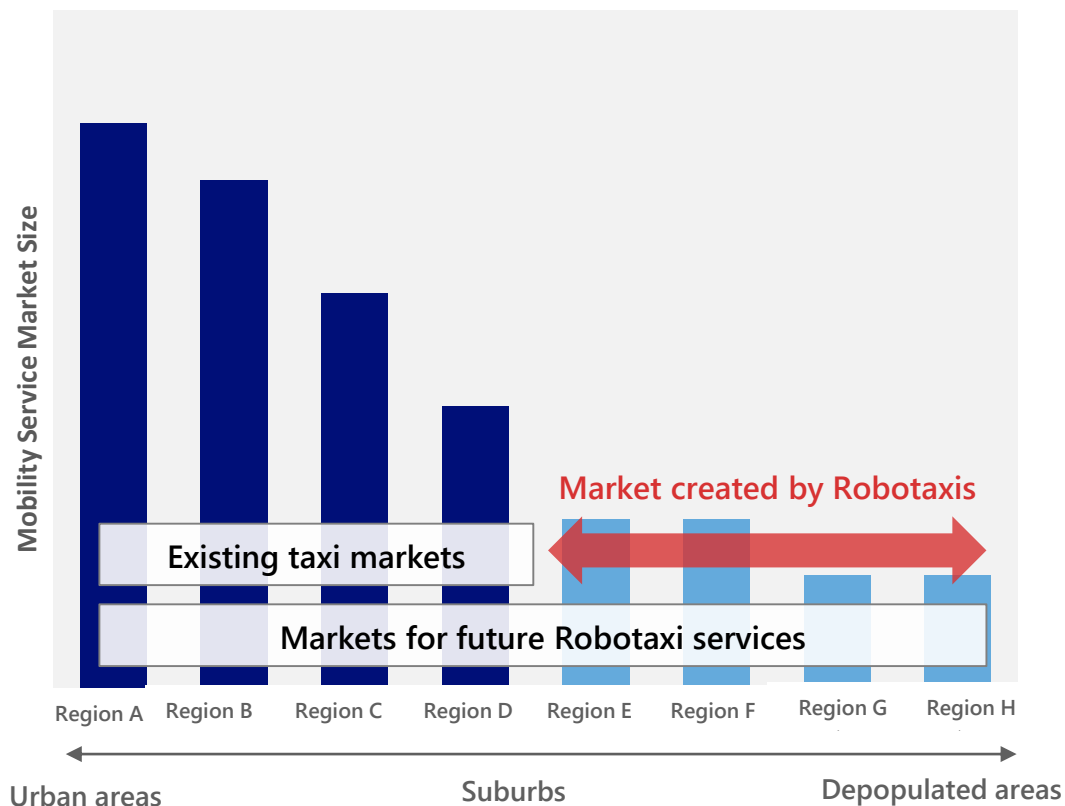
	Challenges	Strategies
Profitability	Improve the profitability of Robotaxi services by taking cost structure into account	<ul style="list-style-type: none">• Reduce labor costs of monitoring by AI-based remote monitoring tools• Reduce vehicle manufacturing and maintenance cost by using low-cost self-driving cars• Increase profits by new advertising businesses
Demand	Clarify the benefits of using Robotaxis	<ul style="list-style-type: none">• Competitive pricing• Locally tailored services
	Improve awareness and alleviate safety concerns	<ul style="list-style-type: none">• Increase touchpoints with actual vehicles, such as ride experience events

Future Outlook for Robotaxi Services: Creating new market

New business opportunities in traditionally unprofitable sectors such as buses and taxis.

- The low operational costs of Robotaxis can transform unprofitable businesses into profitable new markets.
- In car-dependent cities, new transportation and delivery services may emerge.

Markets created by Robotaxi services (image diagram)



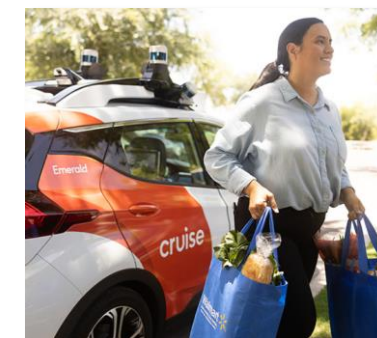
ZEN Connect: Autonomous Driving Transportation Service “ZEN drive”

Services	<ul style="list-style-type: none"> • First self-driving level 4 transportation service approved in Japan in March 2023 • Operation of approximately 2km between districts of Araya and Shih • One person can monitor up to 3 vehicles in a remote monitor room
Achievements	<ul style="list-style-type: none"> • Approximately 50 users per day



GM Cruise, Walmart: Self-Driving Product Delivery Service

Services	<ul style="list-style-type: none"> • Product delivery service using self-driving cars in partnership with Walmart • Unique authentication technology prevents mix-ups and theft
Achievements	<ul style="list-style-type: none"> • Thousands of deliveries in Phoenix, Arizona, USA



Authors



Aoi Sasagawa
Associate Consultant, NRI

nri-syscon-linkedin@nri.co.jp



Mina Hashimoto
Associate Consultant, NRI

nri-syscon-linkedin@nri.co.jp

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