Where are we heading in (urban) mobility?

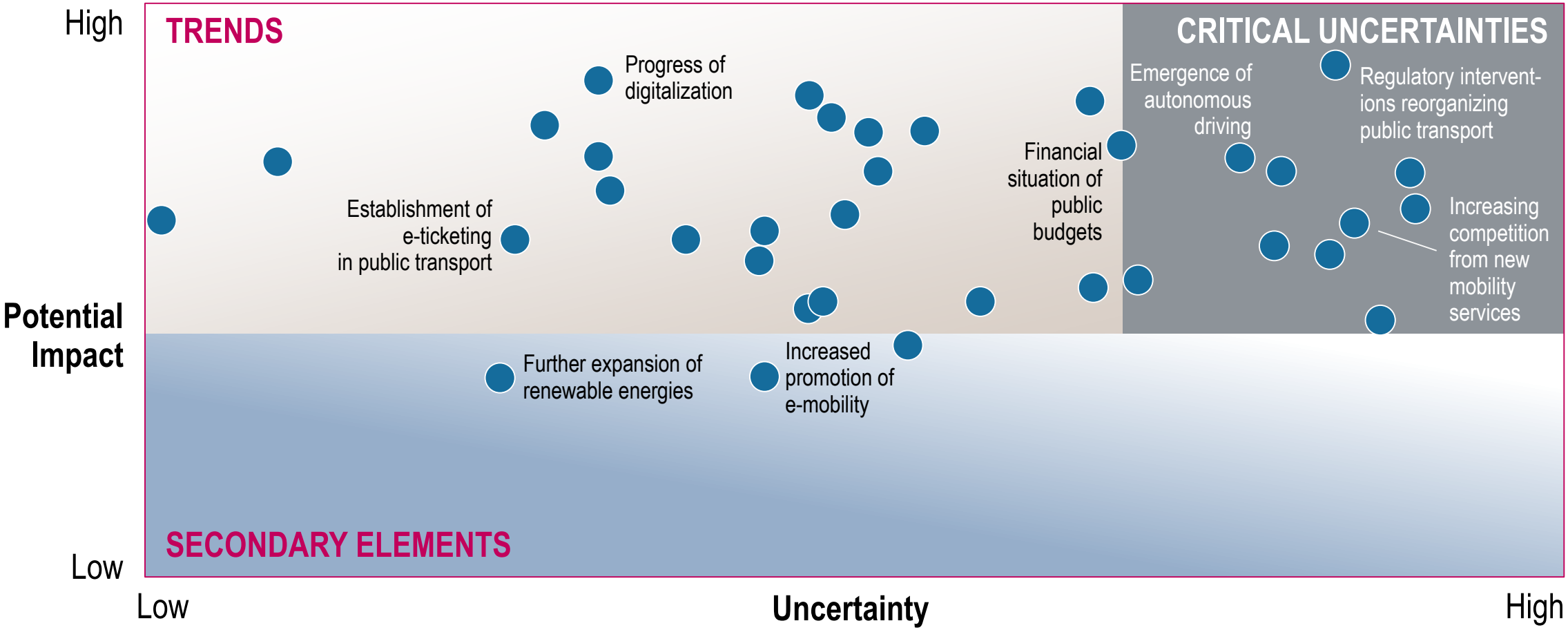
Presentation at Annual Conference Arenguseire Keskus

The Roland Berger
Center for Smart Mobility

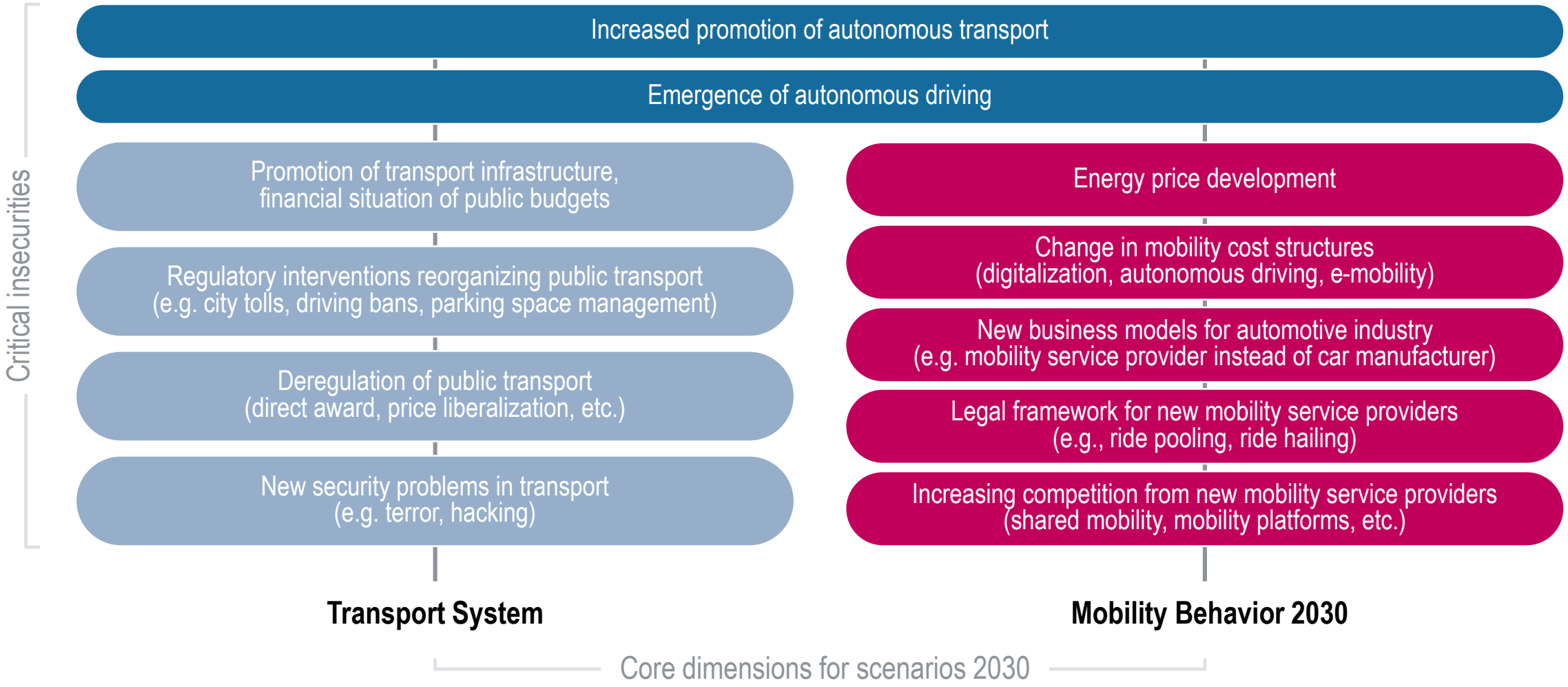
June 2021

We categorized what was perceived as most important mobility developments in an Impact-Uncertainty Grid

Results Delphi study

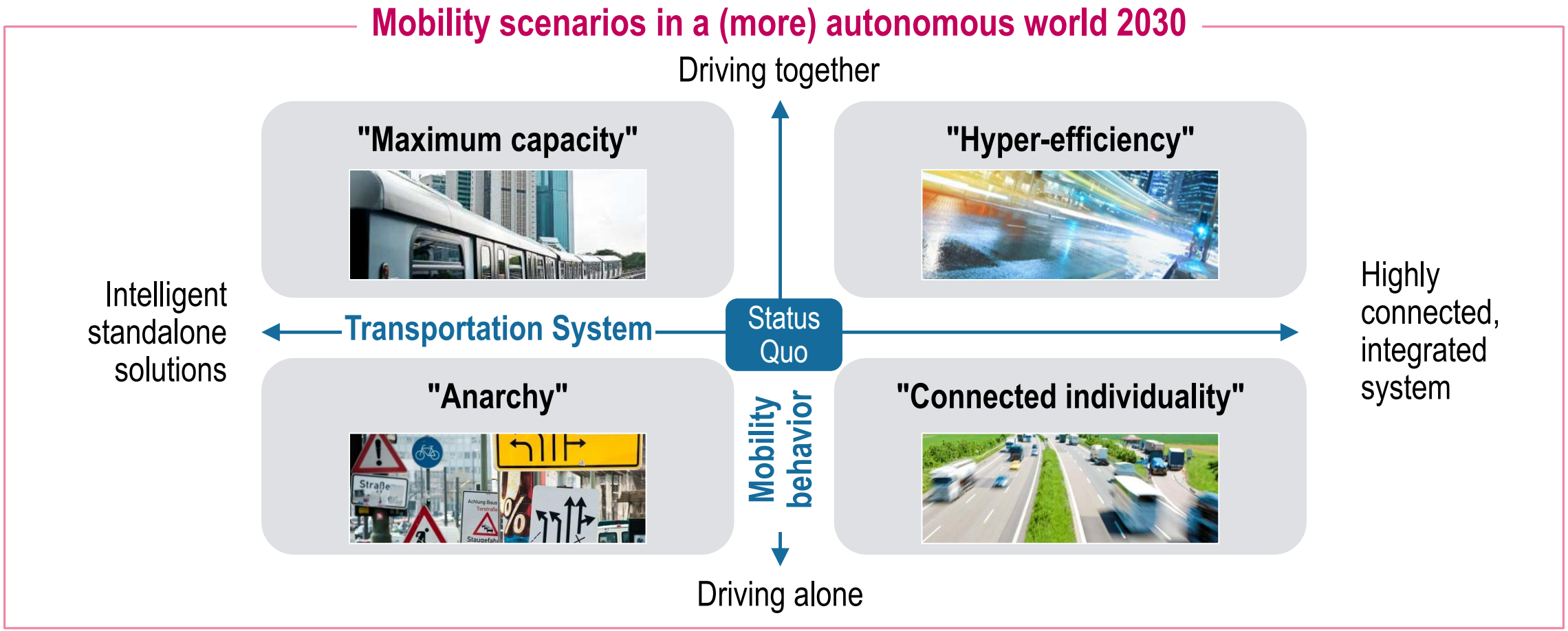


Critical uncertainties can be summarized in two core dimensions: Underlying transport system and distinct driving behavior



To prevent chaotic conditions, a hyper-efficient transport system must be established by 2030 – Ride Pooling will play a key role

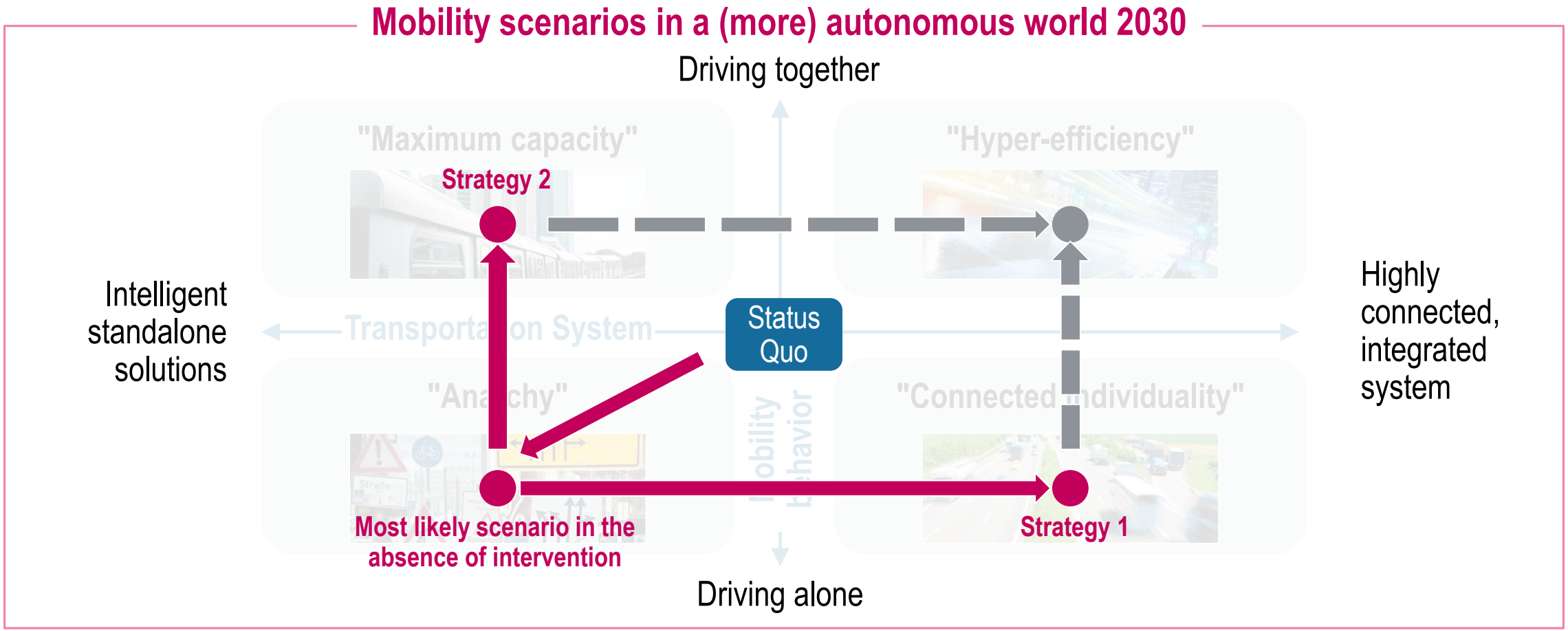
Results Delphi study



Source: Study Roland Berger study "Urban Mobility 2030"

In the absence of any active counter-measures, "anarchy" is the most likely scenario to materialize – Two ways of avoiding it

Strategic directions



Source: Study Roland Berger study "Urban Mobility 2030"

Direction 1: Integration of intelligent island systems into a connected overall system

Courses of action for politics, operators and other companies

Establish an active traffic flow control including parking space management and dynamic price control at peak times (requires regulatory adjustments)

Rethink urban planning to optimize the urban transport system in relation to mixed traffic of electric/ autonomous and conventional vehicles: strategically position charging infrastructure to reduce empty or charging only trips, establish lanes for autonomous vehicles (for an interim period)

Ensure connectivity for collaborative autonomous driving, e.g. tactical planning of autonomous vehicles, which allows for platooning or priority planning at intersections (e.g., via 5G or alternatively Dedicated Short Range Communication (DSRC))

Set or demand uniform systems and standardized technical interfaces as the basis of collaborative autonomous vehicle fleets; clarify roles and responsibilities between public transport and private mobility providers or OEMs

Direction 2: Preventing an uncontrolled increase in individual traffic

Courses of action for politics, operators and other companies

Optimize the "last mile" to increase the utilization of high-performance public transport; provide intermodal mobility also in urban periphery by using autonomous vehicle fleets

Extend public transport services to 24/7 in order to permanently replace individual transport solutions; this can be achieved in particular through the use of autonomous vehicles, since labor (law) restrictions are less relevant

Secure the cost advantage of public transport above all against private autonomous taxi fleets through the specific use of autonomous technology (limited for rail) and through imposing distance-based pricing schemes for robocabs

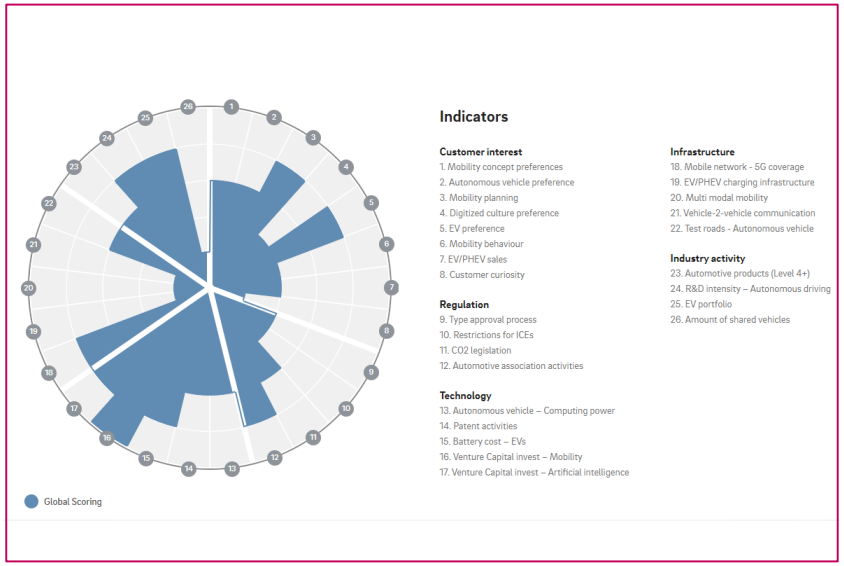
Introduce incentive taxes to steer mobility demand, including the introduction of a dynamic city toll for (autonomous) individual vehicles, which is higher at rush hours and thus increases the price advantage of public transport compared to private transport

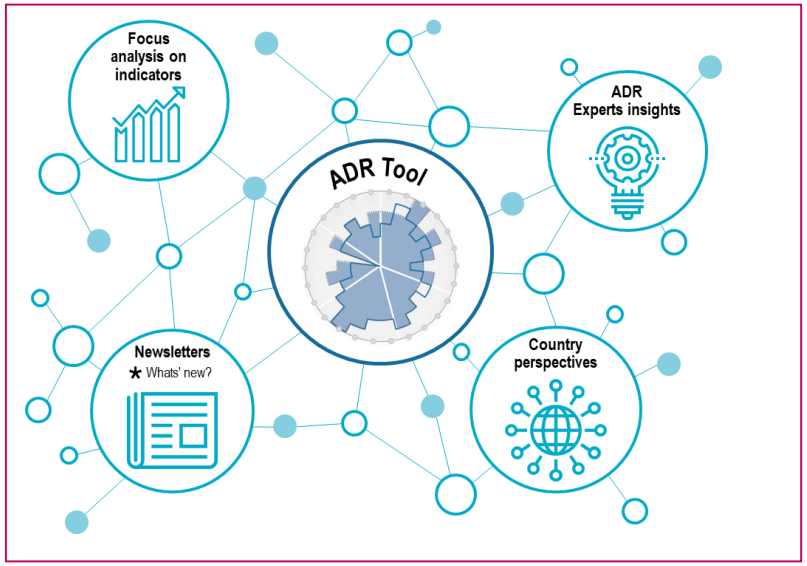
Think about it …

How many people do you know who don't or did not want to buy a car because they exclusively use other mobility concepts?

Roland Berger | The Roland Berger Center for Smart Mobility

Roland Berger has been monitoring Automotive Disruption since 2017, via already 9 editions of the Radar – Now all available on the ADR community!





Since 2017, ADR watches **18 countries** evolving, adapting, leading or lagging behind these changes through **26 indicators**, including a bi-annual **survey** **18 000+ people**

The **ADR community** gathers recognized experts in the disruption fields ; members can navigate through the **ADR data**, customize and download relevant charts, read **experts insights**… **free of charge**

ADR

Join the ADR community now

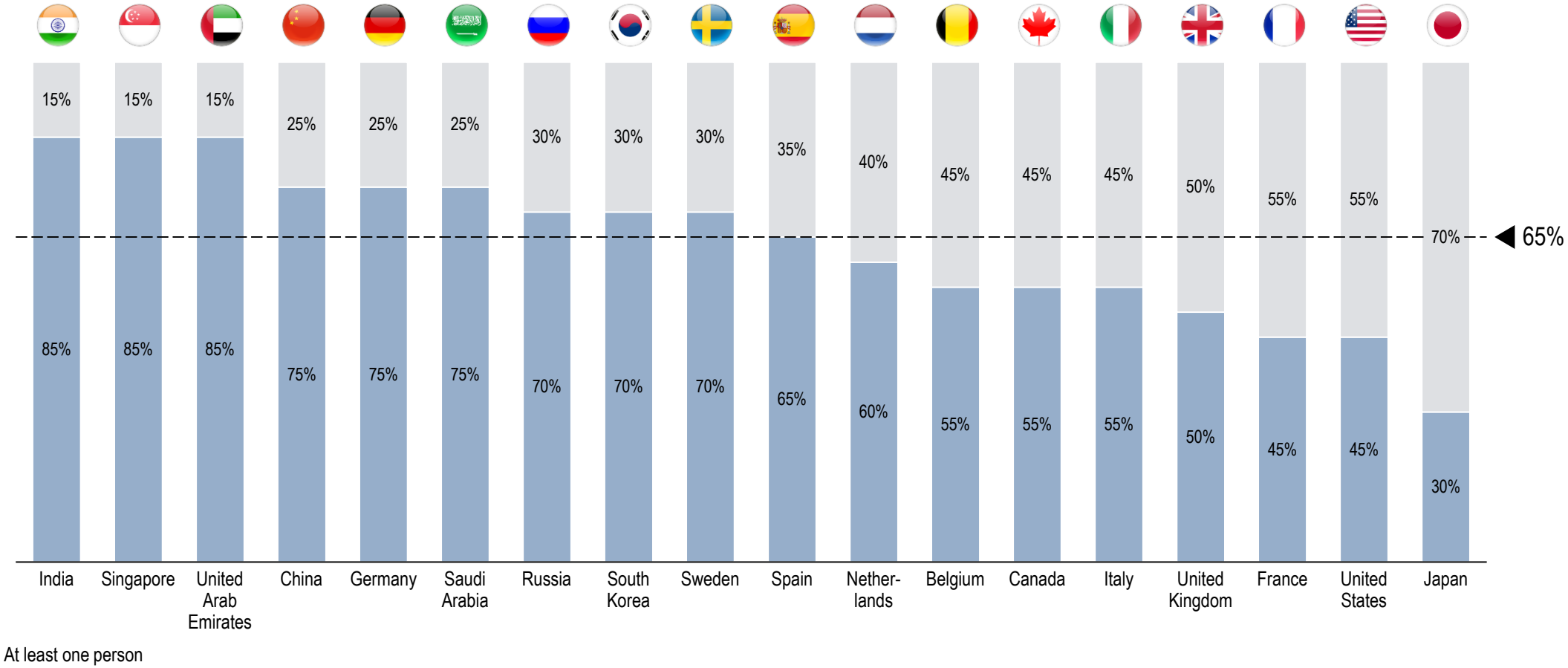
Automotive Disruption Radar

www.automotive-disruption-radar.com

Two-thirds of survey participants know people who could do without cars because of other mobility concepts

"How many people do you know who don't or did not want to buy a car because they exclusively use other mobility concepts?"

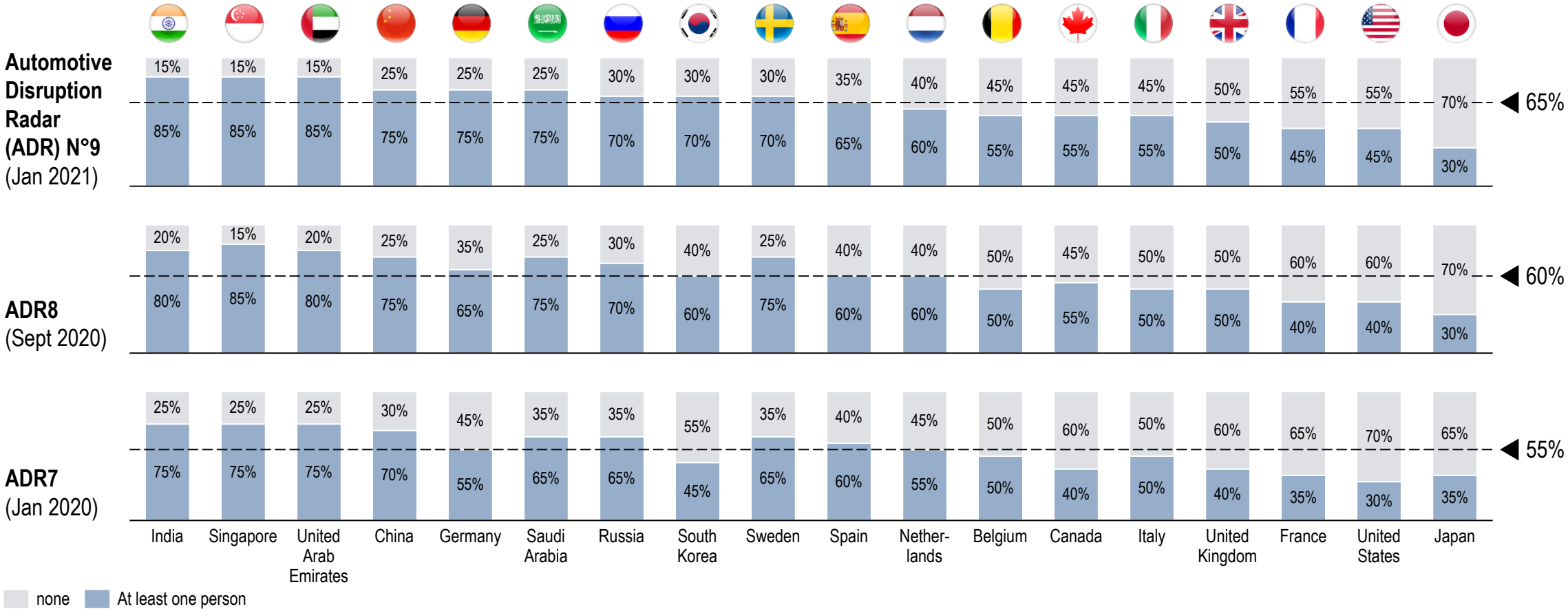
Automotive Disruption Radar (ADR) N°9 (Jan 2021)



Source: RB Automotive Disruption Radar online survey

Interest for different mobility concepts has increased again since our September 2020 survey – in spite of COVID effects

"How many people do you know who don't or did not want to buy a car because they exclusively use other mobility concepts?"

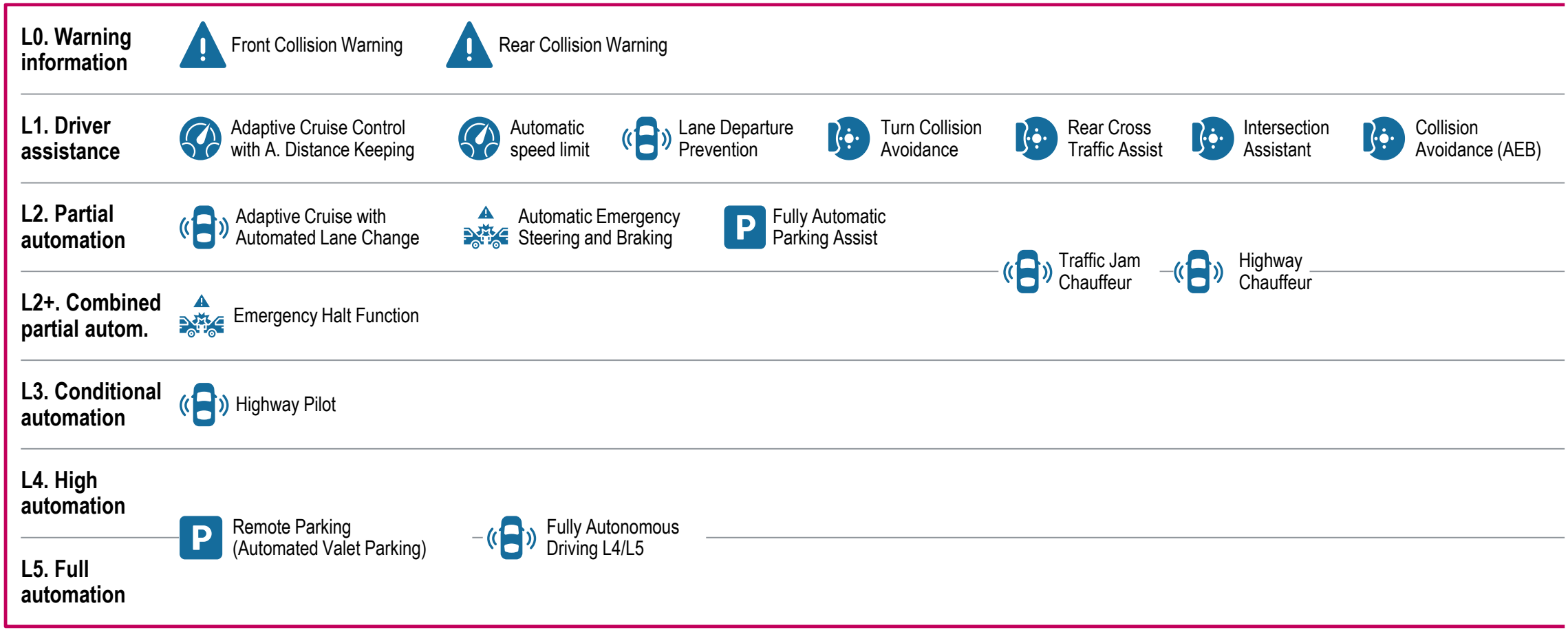


Source: RB Automotive Disruption Radar online survey

THE critical uncertainty is autonomous driving – Various elements contribute to making it happen

We broadly analyzed a total of 18 ADAS features which are either commercially available or expected to be available before 2025

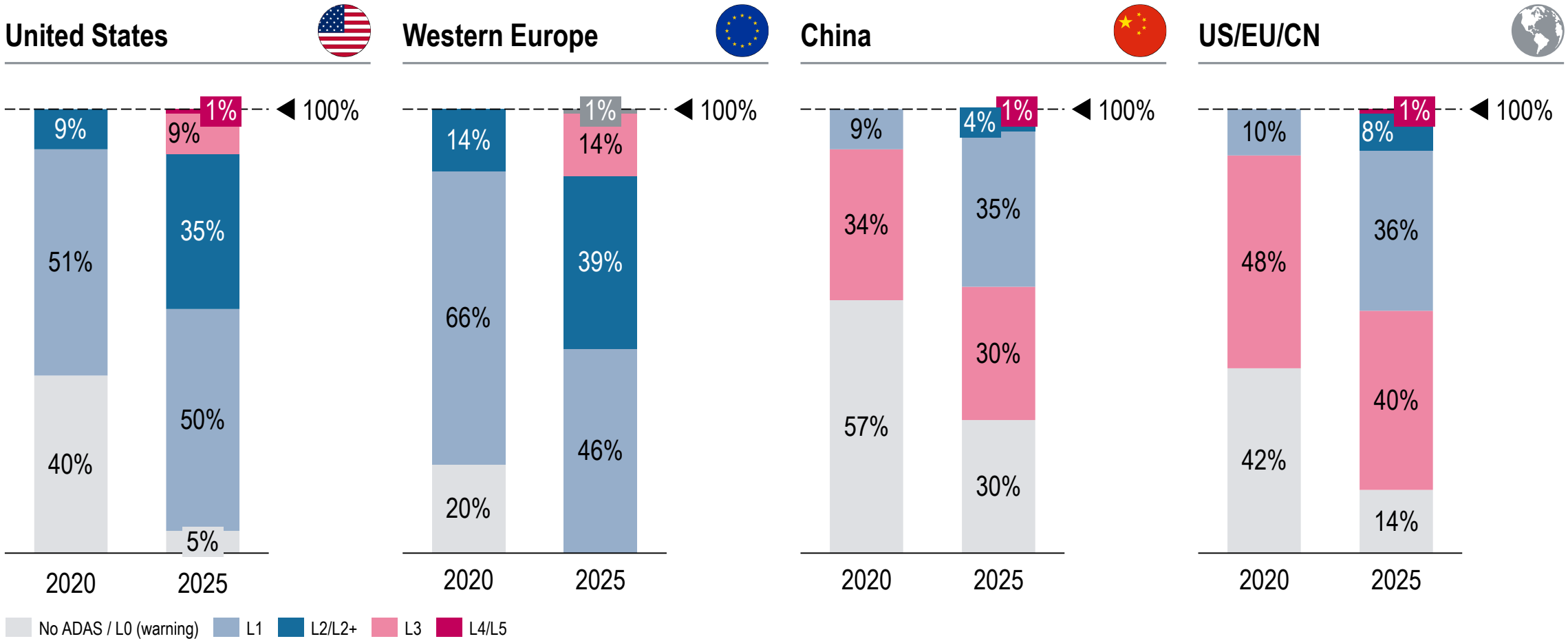
Scope of autonomous features



Source: Roland Berger

Autonomous driving will come to life level by level – By 2025, L3 and above do not comprise more than ~10-15% penetration

RB Forecast – Autonomy levels [% installed on new vehicle sales]

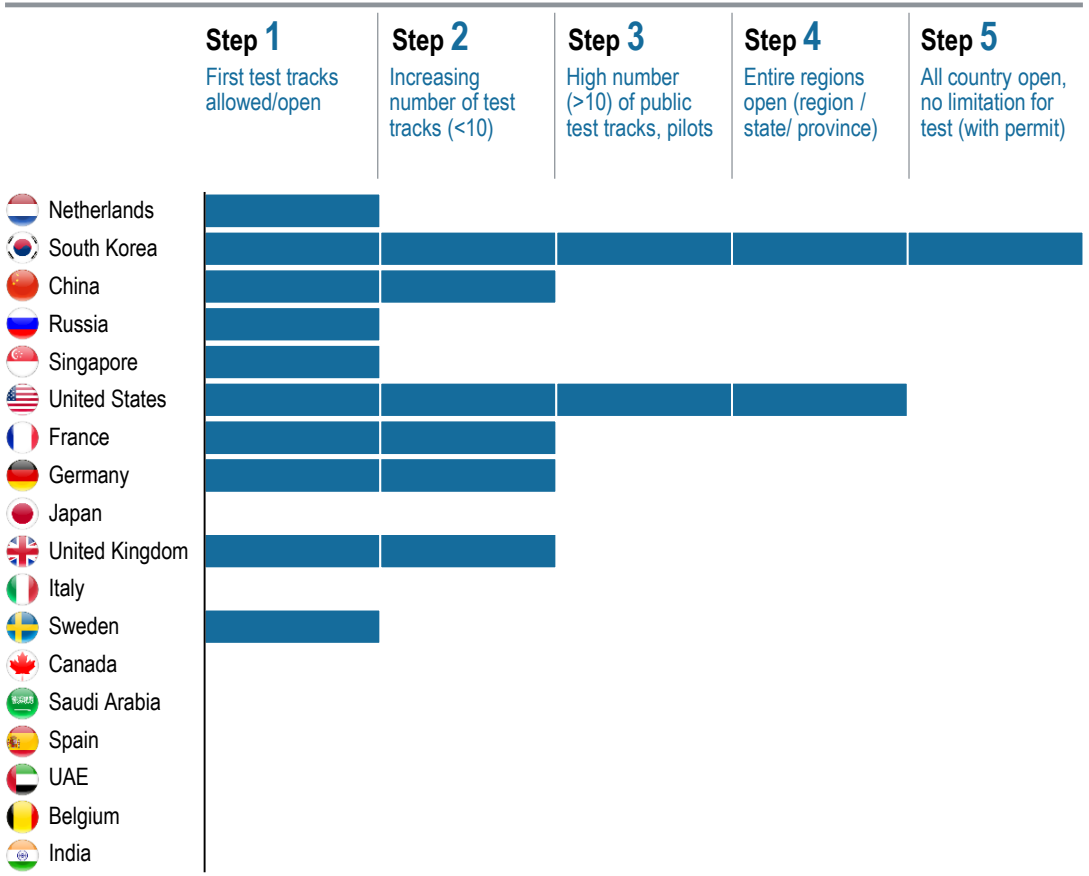


Source: Roland Berger, RB Consumer Survey, RB Industry Survey, SBD, Web Crawling Sources, Regulation Desk Research, Expert Interviews

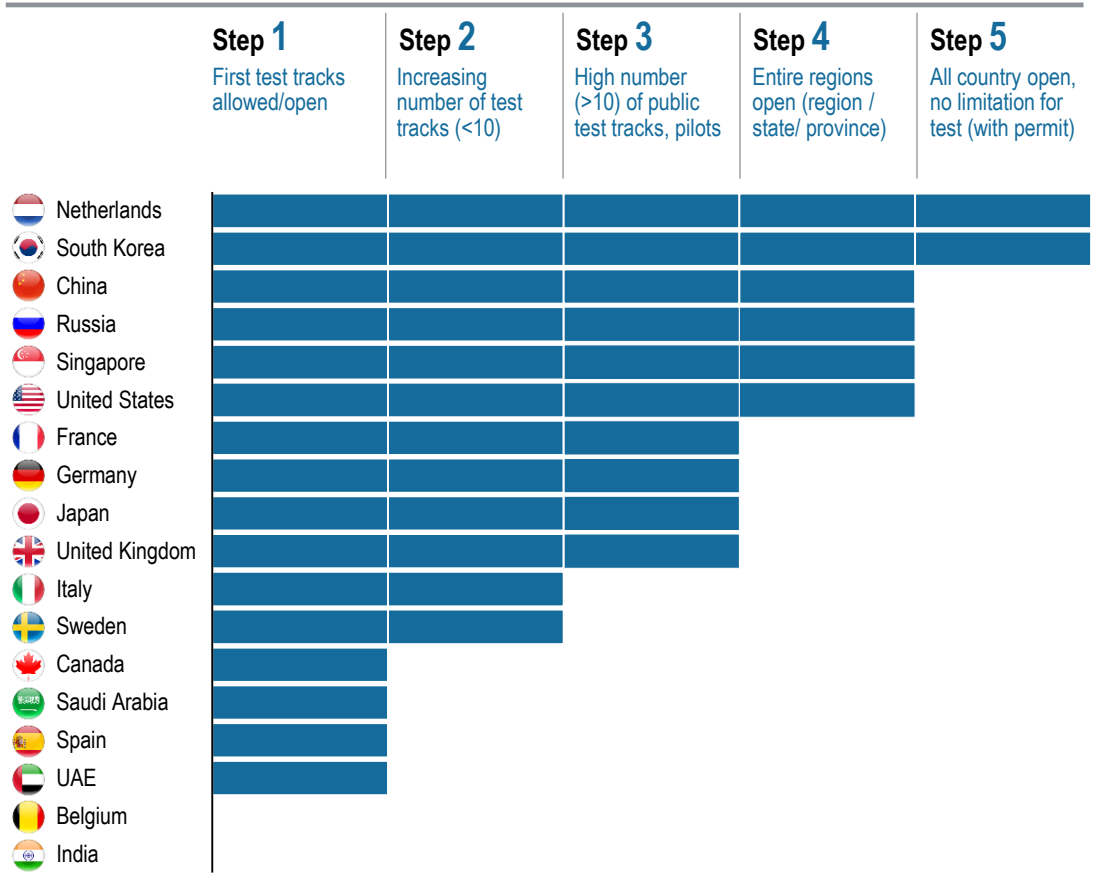
Autonomous testing has hugely progressed since January 2017

Evolution of public test roads

ADR1 (Jan 17)



ADR9 (Jan 21)

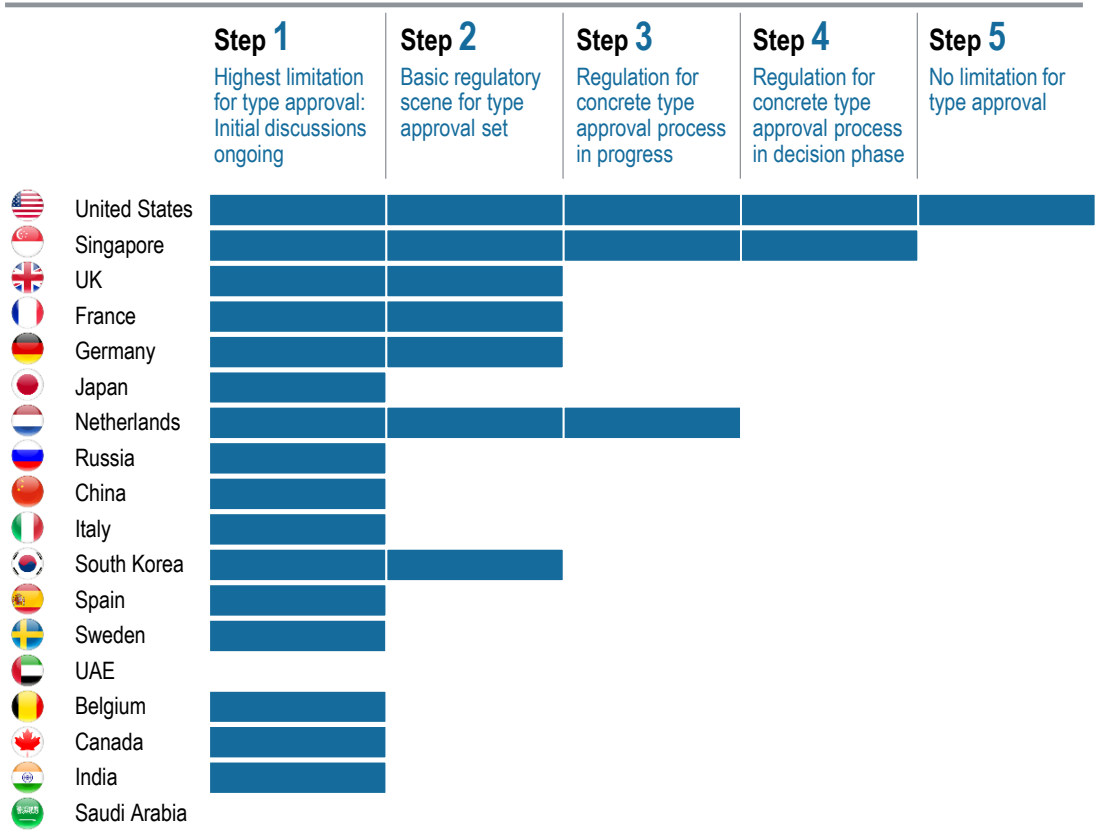


Source: RB Automotive Disruption Radar

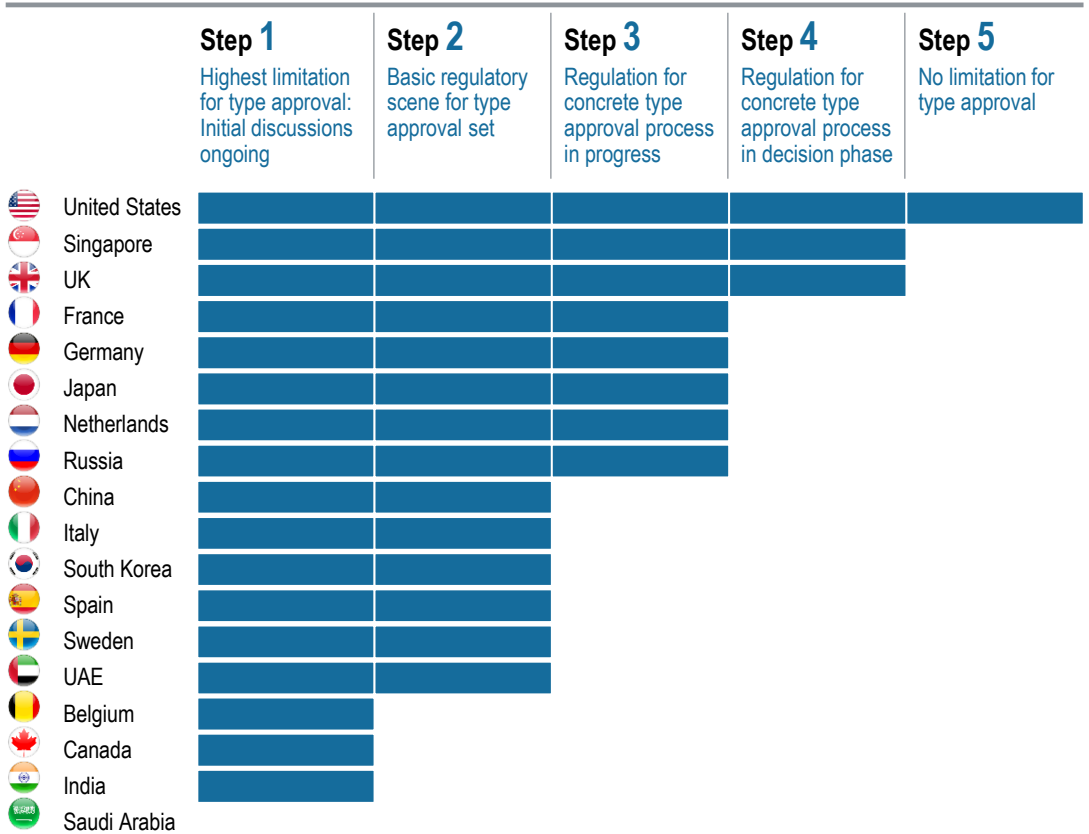
Legal frame for Autonomous vehicle commercialization has globally progressed over the last 4 years

Evolution of approval process for L4 & L5

ADR1 (Jan 17)



ADR9 (Jan 21)



Source: RB Automotive Disruption Radar

The governance framework target picture will define a list of design criteria for the AV regulatory framework development

Design criteria for regulatory framework development

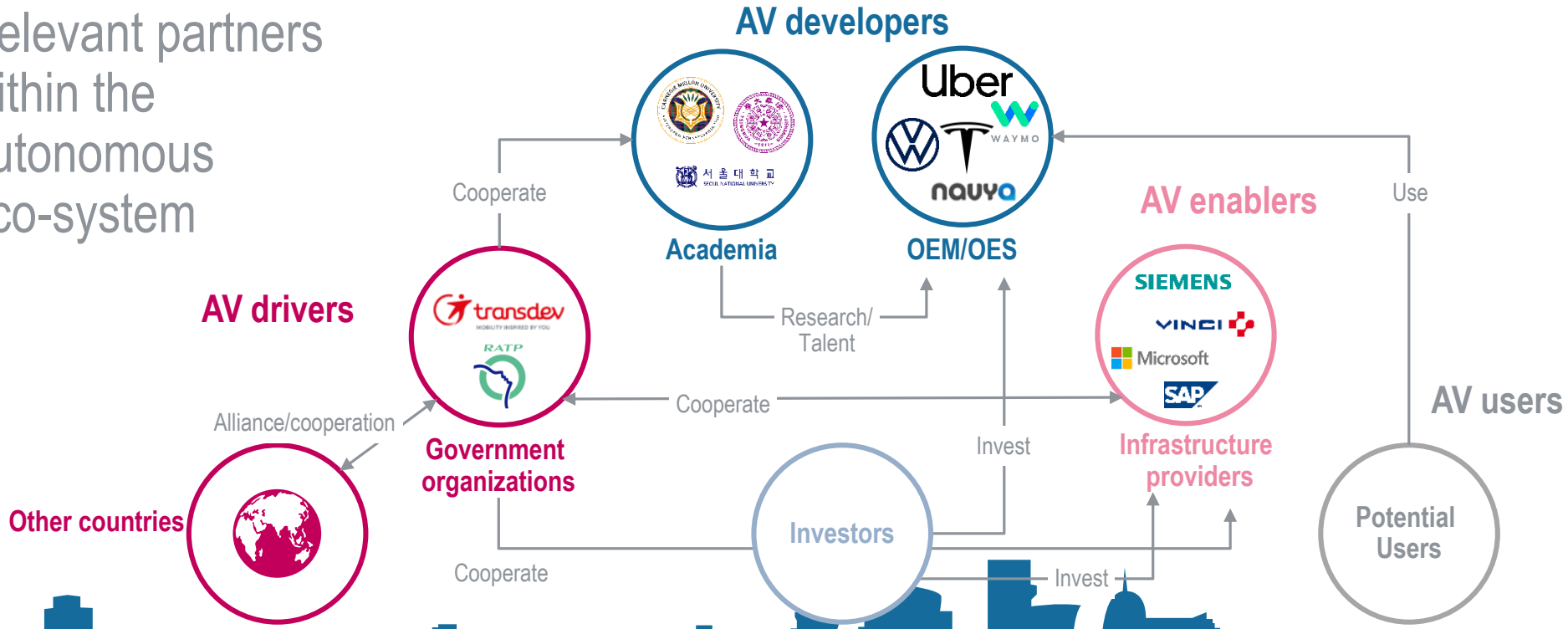
Government process	Demand **up-front** type certification (European approach) or **self-certification** (US approach)?
Rollout approach	**Step-wise** (start with testing and validation and "graduate" to operation) or **all-at-once** approach (single framework for testing and operation)?
Data sharing	What **information is the government** looking to **collect** from AV operators and for what purpose?
Deployment model	AV rollout as a **fleet model** (regulation focus on transportation network companies) or **individual ownership**?
Liability	Develop a **new construct** specifically for AV or regard AVs the **same as existing vehicles**?
Cybersecurity	How to set **requirements for developers** to consider and document cybersecurity protection?
Commercial vehicles	Specific regulation for **platooning, transport of hazmats, highway vs. last-mile distinctions, labor considerations**?
Occupant-less delivery	How to specify regulation for **low speed vehicles, sidewalk robots**, and other quasi-road traffic with autonomy?
Infrastructure	Requirements for **infrastructure** accommodations to be detailed in **traffic manuals, guidelines**, etc.
Monitoring	What structures will be put in place to **monitor adherence to the regulatory framework**?
Innovation	How to **manage development of new features over time** in the regulatory process?
Env. sustainability	How to efficiently promote environmental sustainability of transport through?

Source: Roland Berger

The global race for talent and funding to build an autonomous driving eco-system is on

Relevant partners within the autonomous eco-system

Illustrative



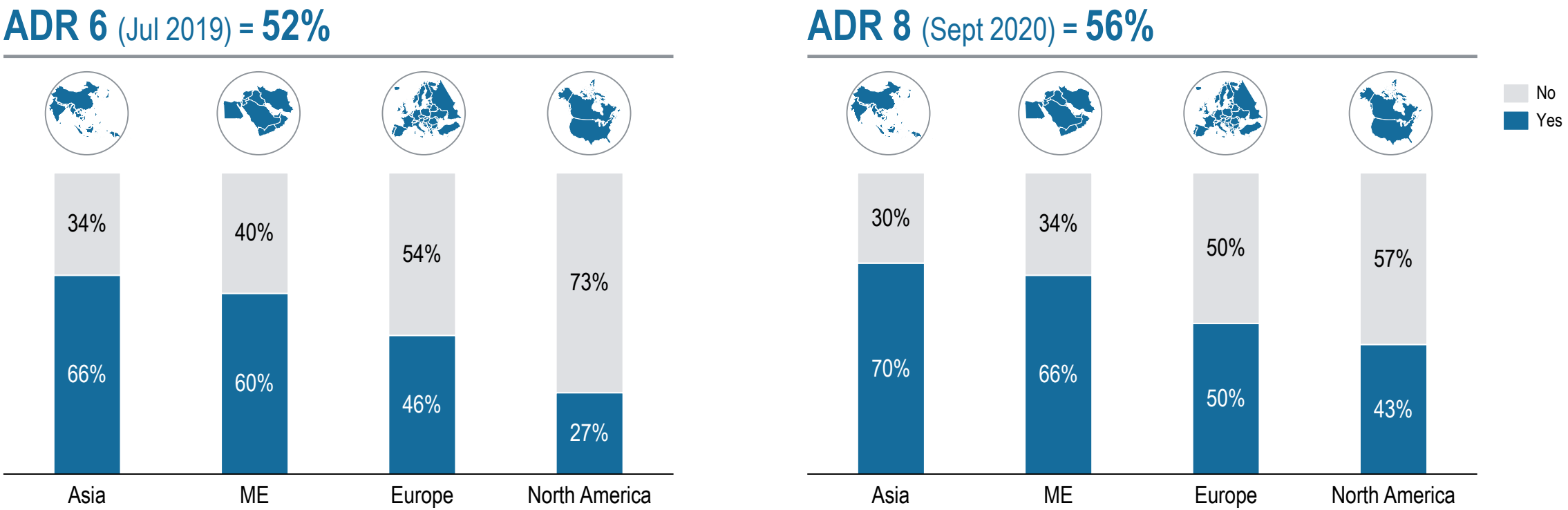
Benefits for new partners in a city:
Excellent conditions for AV trial testing, supportive regulations, worldwide awareness, low taxes, ...

Think about it …

Would you use a mobility service based on a fully autonomous robocab (autonomous driving taxis without a driver in the vehicle)?

Global increase in readiness to use robocab services in last 15 months

"Would you use a mobility service based on a fully autonomous robocab (autonomous driving taxis without a driver in the vehicle)?"

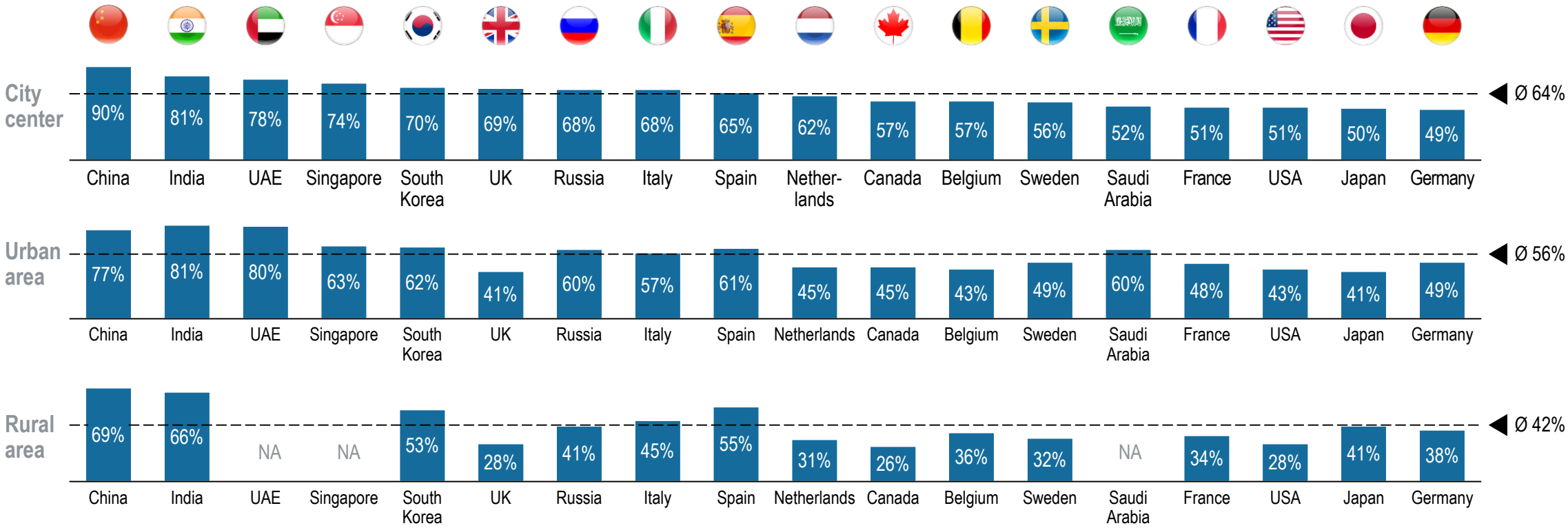


Source: RB Automotive Disruption Radar online surveys

Citizens in China, India and UAE show the highest acceptance towards robocabs – Overall more concerns in urban and rural areas

"Would you use a mobility service based on a fully autonomous robocab (autonomous driving taxis without a driver in the vehicle)?"

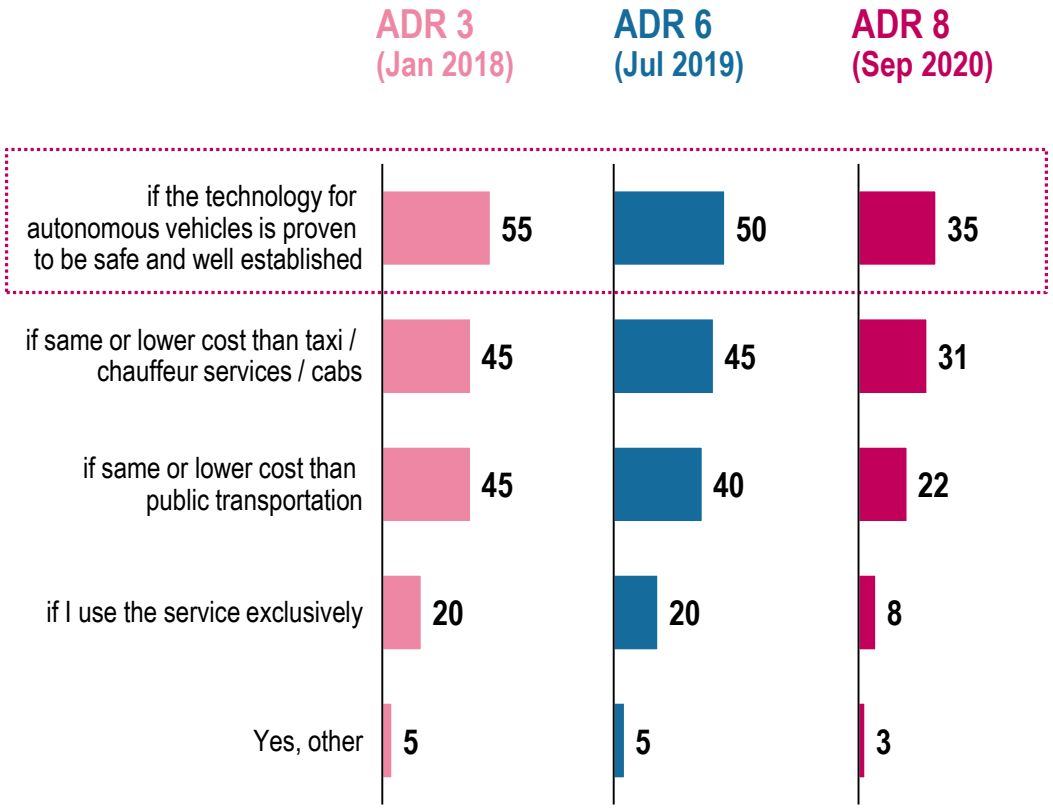
ADR8 (Sept 2020)



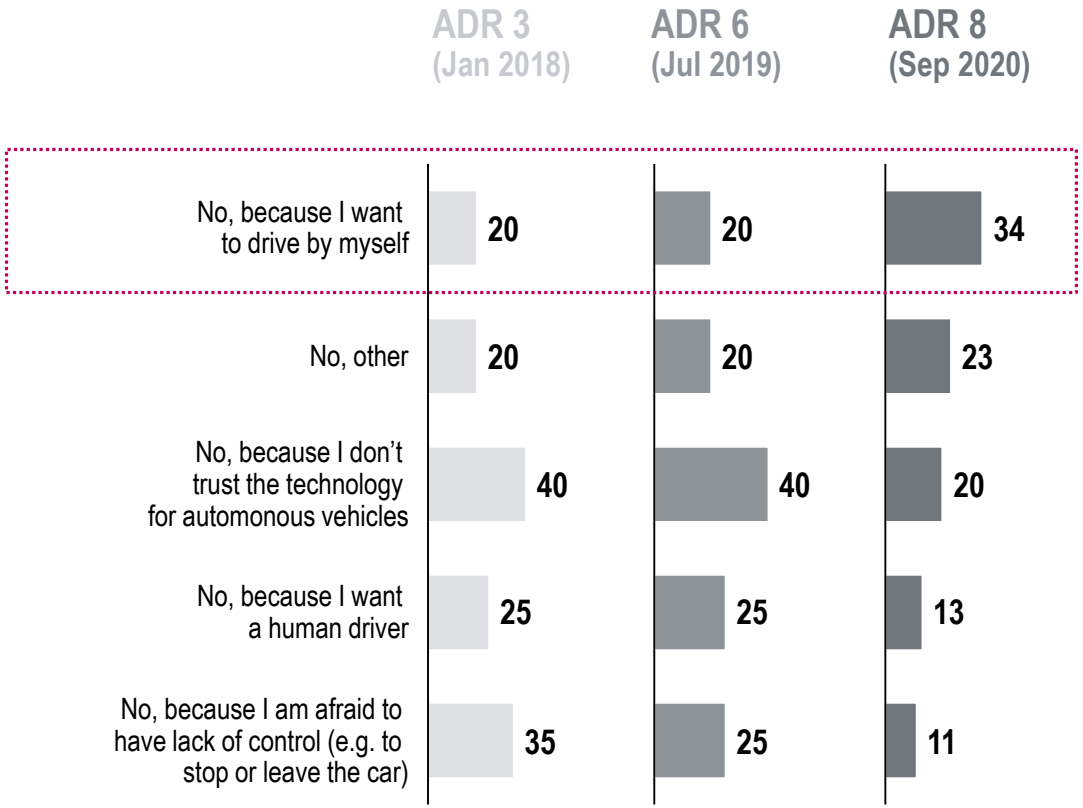
Source: RB Automotive Disruption Radar online surveys

Technology is less an issue than it used to be, but participants' will to drive by themselves has increased in one year

Reasons for Yes (multiple choice possible)



Reasons for No (multiple choice possible)



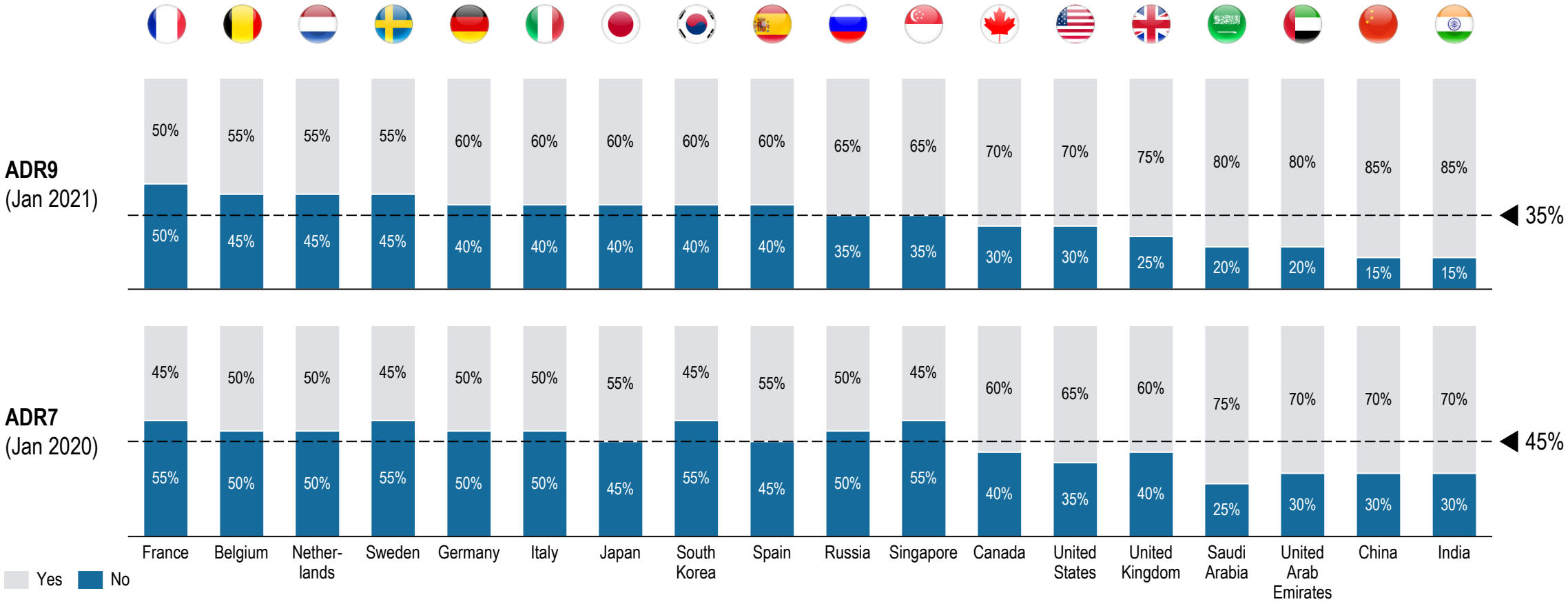
Source: RB Automotive Disruption Radar online surveys

Think about it …

Would you still buy a car again, if fully autonomous robocabs could be used at lower cost per trip compared to your own car?

However, COVID impacted intentions to give up private car for robocabs – only one third of participants would not buy a car again

Would you still buy a car again, if fully autonomous robocabs could be used at lower cost per trip compared to your own car?



Source: RB Automotive Disruption Radar online survey

Who we are

The Roland Berger
Center for Smart Mobility

We are observing and supporting the mobility space with our cross-sectorial "Center for Smart Mobility"

Projects

Cross-functional projects with our clients

Experts

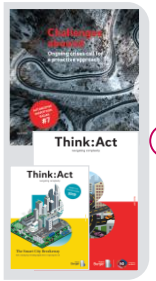
True mobility experts on partner & team level

Solutions

Ready-made tools and approaches

Studies

Leading-edge thought pieces with resonance



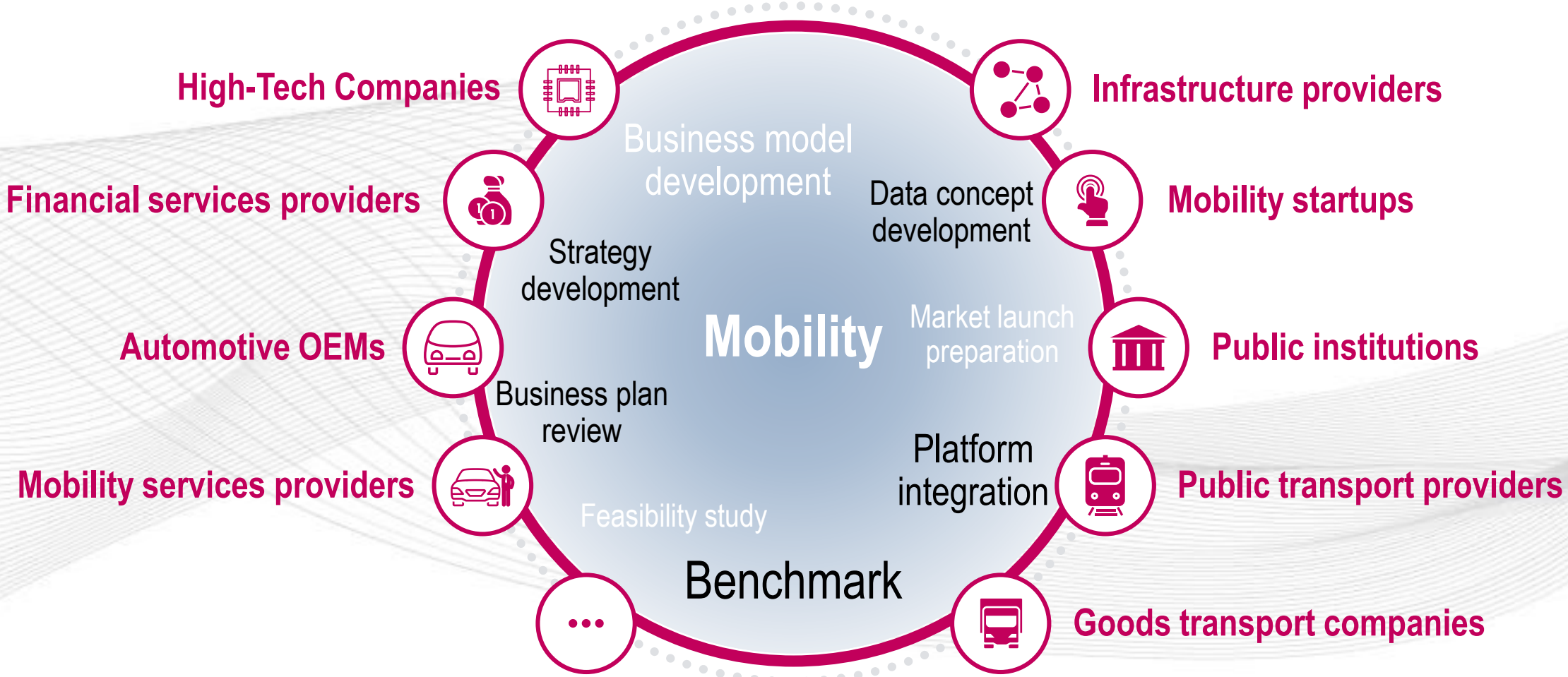
*Contributing to a **more sustainable** and **value-adding state of mobility** for people and goods around the world.*

The Roland Berger Center for Smart Mobility

Partnerships

Close ties with complementary service providers

We serve a diverse set of clients with similar projects and tasks around the topic of moblity



We are the Center for Smart Mobility – A highly international team of experts bundling outstanding experience in all mobility-related subjects

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Cristobal Colón

Asia


Raymond Wang


Ron Zheng


Santiago Castillo


René Seyger


Zhanfu Yu


Timothy Wong


Mario Kerbage

We understand public transport and local mobility from a variety of projects and functional topics

References public transportation (selection)

Mobility concepts

- Launch of an innovative demand driven taxi concept in Amsterdam
- Support to the long-term mobility transformation for the main Russian rail transportation provider
- Market entry for long-distance coach operations for a global logistics company
- Electric vehicle car sharing concept incl. business plan for Tokyo for a leading OEM
- Business model for innovative parking service for a premium German OEM
- Vision for an enabling services platform for the Dutch association of garage holders

Tendering

- Sector design for Dutch railway sector, support to the Dutch government
- Market entry strategy for a UK provider of coach and bus services
- Sector vision for rail freight transportation, including new earning model, for a Dutch infra manager
- Tender support (pre-qualification questionnaire) for a major European bus provider
- New earnings model for a Portuguese public transportation provider
- World-wide rail market study (2x) for the association for the railway supply industry

Operations

- Business strategy for two chinese travel companies
- Cost reduction program for a large German public city transport operator
- Operational performance improvement program for the Dutch railway sector
- Performance improvement for a high-speed train service for a leading French provider
- Cost reduction and operational improvement program for all bus and taxi services for a national Dutch public transportation company
- Restructuring of a Dutch local public railway company

Your contact

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Our publications


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