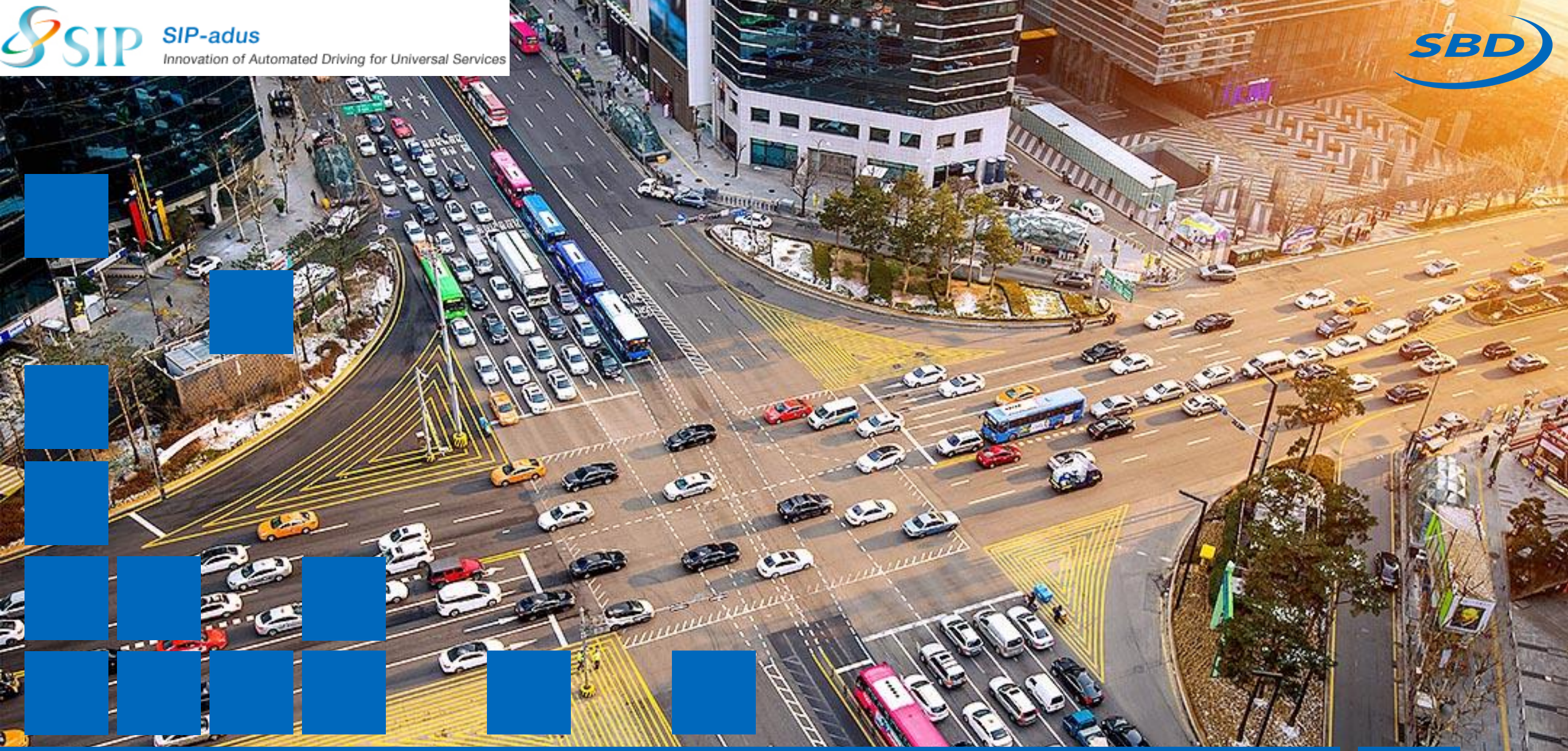
SIP-adus
Innovation of Automated Driving for Universal Services



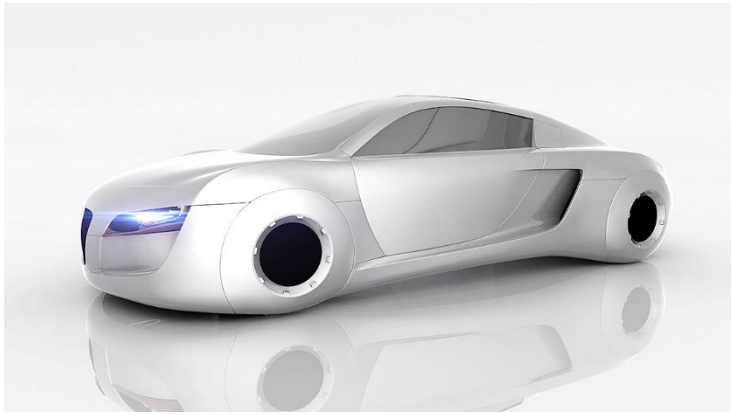
Vehicle Autonomy. Is this the solution to next generation transport systems?

15th November 2017 - Tokyo

Autonomy - Car Sharing Vs Vehicle Ownership

Car Sharing

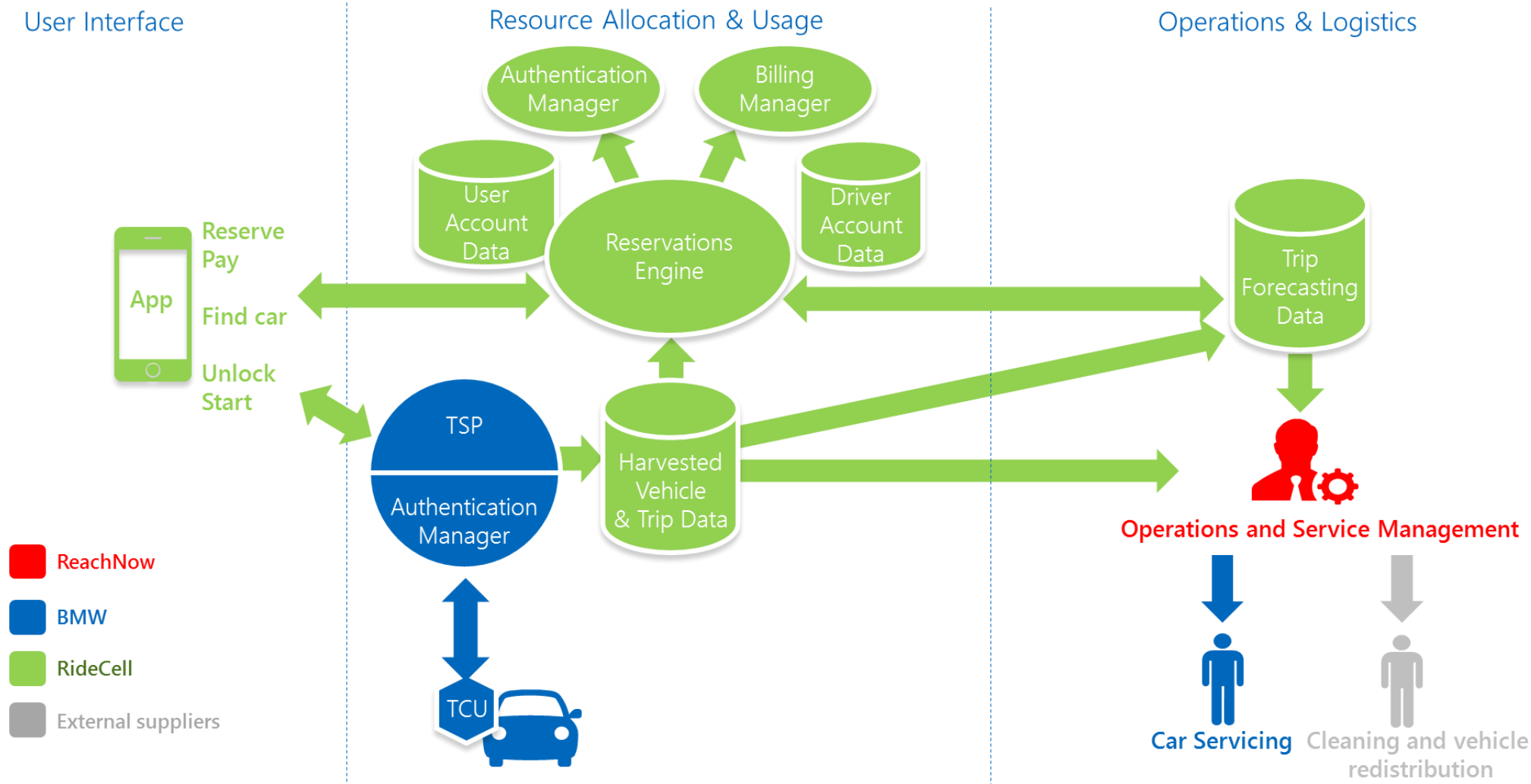
- Unlike bicycle share programmes, where bikes can easily be re-distributed in the city to meet customer needs, **re-distributing cars** can provide a **logistical nightmare**.
- Being able to re-distribute vehicles **autonomously** would therefore present a business model advantage on top of potentially not having any drivers when carrying customers
- Many schemes have now been initiated to investigate feasibility.



Vehicle ownership

- The ultimate scenario for convenience would be the ability to engage full autonomy as and when required.
- Many obstacles (technical and cost in particular) remain.
- Consumer appeal is also unclear, especially if the allowed unsupervised periods are short.

Car Sharing Challenge 1 – A complex ecosystem



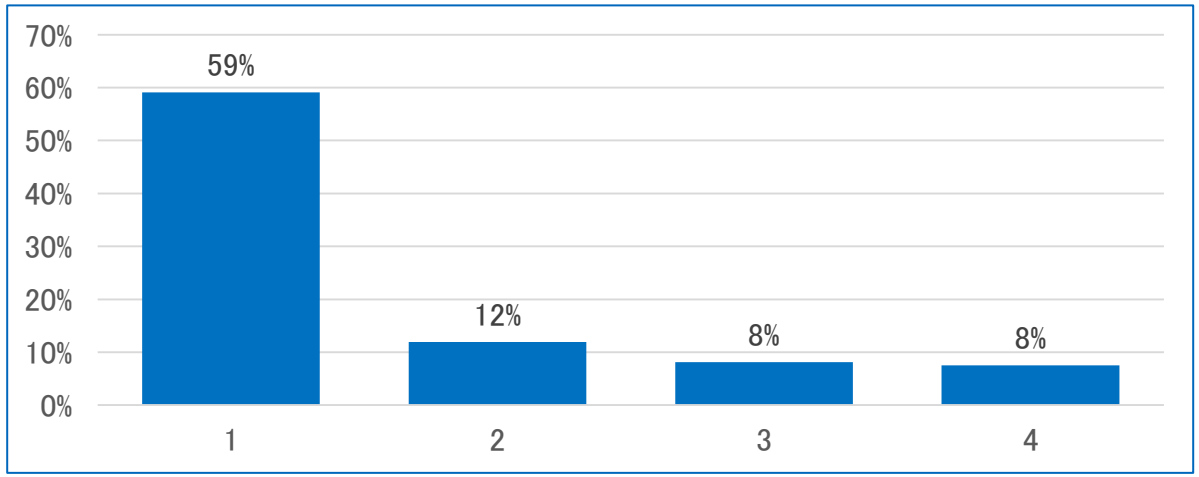
Source: SBD 615 – Automotive Mobility

Car Sharing Challenge 2 – Costs

The preferred type of service requested from the consumer is the free flow (one way ride).

The main impacting costs for determining profitability are:

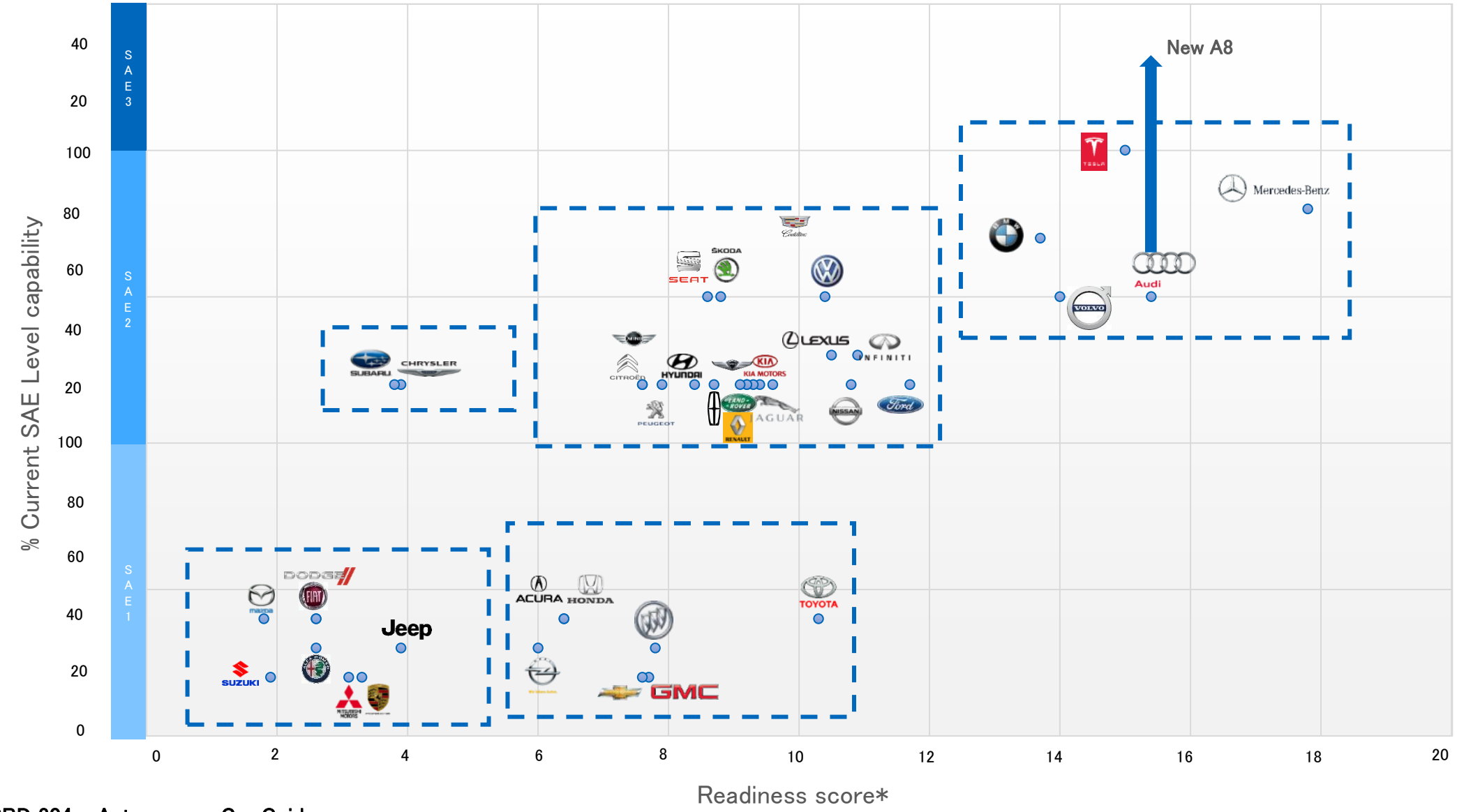
- **Parking**: the top influencing factor for profitability. If the operator has no subsidised parking fee agreement with the local government authority, no scheme appears to be profitable.
- **Fuel**: if fuel efficient vehicles (hybrids or electric) are used, then there is an increase in profitability.
- **Insurance**: significant cost for the operator as they provide insurance cover for all vehicles in the fleet and also for the customers whilst using their service.
- **Car depreciation**: it is directly influenced by the age of the vehicles in the fleet.



List of potential cost

- Leasing fees
- Regular servicing
- Tyres
- Cleaning
- Fuel
- Parking
- TCU installation/retrofitting
- TCU data communication costs
- Reservation solutions
- Background checking
- Car Insurance
- Redistribution of vehicles
- Online transaction payment fees
- Car depreciation
- Admin Payroll
- Marketing and Advertising
- Utility bills
- Office rental
- General insurance
- Standard office software and other generic IT costs
- Profit Taxes

OEM Maturity In Terms Of Vehicle Autonomy – Late 17/Early 18



Source: SBD 804 – Autonomous Car Guide

*Based on current ADAS offering, brand vision, investment and demo vehicle and trials.

What Is Needed To Deliver Comprehensive L3/L4

OEMs are delivering more complex levels of autonomy **without** relying on **infrastructure support.**

Systems are so far only relying on on-board sensors. However, the limitations are as follows:

- Object detection range is up to 200m max with on-board sensors (radar, lidar, camera)
- Current sensors cannot see round corners or can be blocked by road furniture / buildings

One of the solution is to **deploy V2X** to

- Provide collision warnings beyond the range of on-board sensors
- Manage traffic at complex junctions / slip roads
- Deliver platooning
- Provide high accuracy maps with “real-time” updates.
- Etc.

Communications with vulnerable road users (**pedestrians, cyclists, etc.**) will also be needed

Huge Challenges On The Road To Autonomy

Many questions remain to be answered in the quest to deploy autonomous cars

Challenges

Legislative

- How will governments adapt their laws to gradually allow greater levels of autonomy?
- How will the autonomous industry manage if a patchwork of different laws emerge by region?

Technical

- What combination of sensors will be required to enable different levels of autonomy?
- How should those technologies be tested to ensure real-life effectiveness?

Commercial

- How do OEMs price autonomous technologies from Day 1 when they only operate on a small number of roads and countries?

Liability

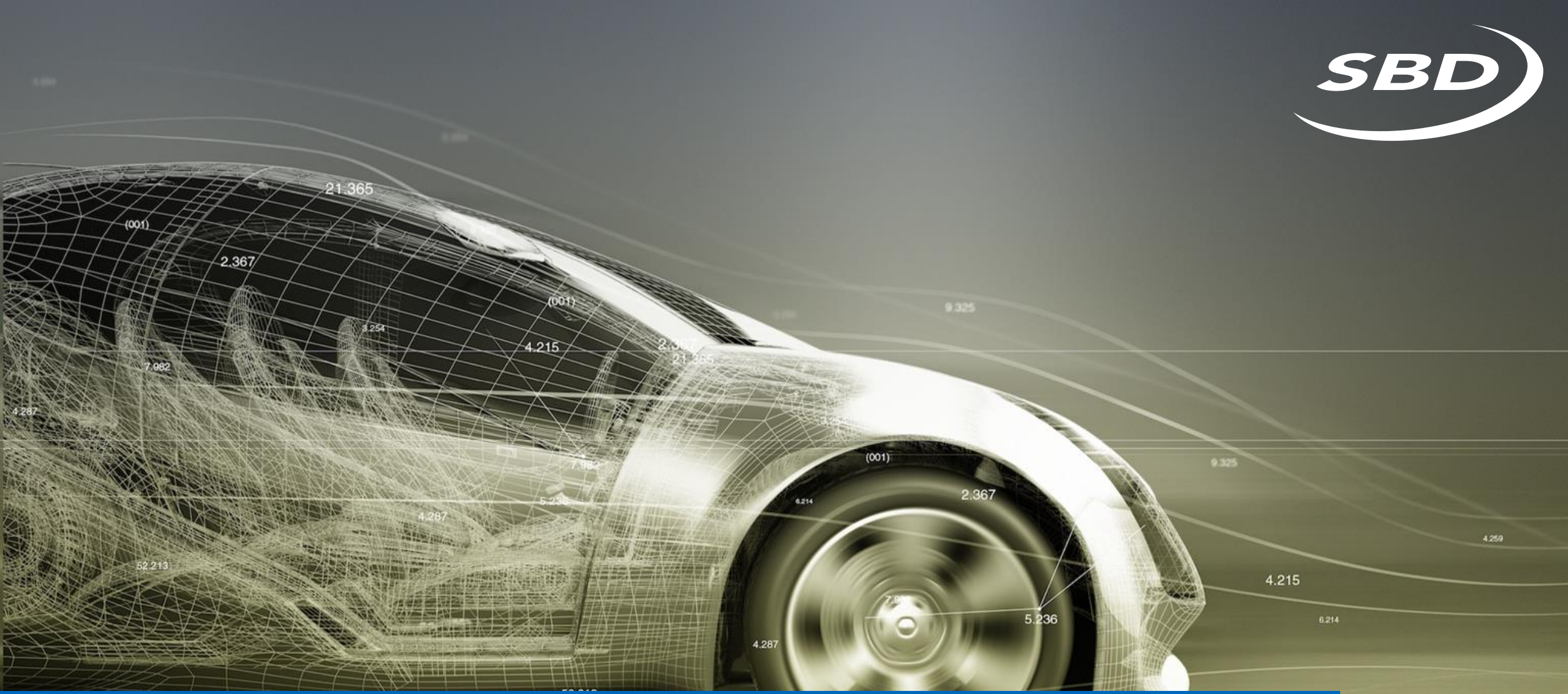
- Who is ultimately responsible if an autonomous car crashes?
- How should insurers adapt their risk/pricing models in order to accommodate greater levels of autonomy?

Should Car Makers Seek A Larger Role In New Mobility Schemes?

Set up an in-house mobility service provider and manage the end to end solution	Provide secure access to vehicle telematics data to mobility service provider(s)	Just focus on the role of supplying vehicle to mobility service provider(s)
Retain **complete control** of the value chain and protect brand	**Potential revenue** from data access fees and (optionally) vehicle maintenance services	Allows carmaker to **focus** on building cars Decreases potential problems from data privacy and cybersecurity threats
•Carmaker is responsible **for all the financial risk** •Offering mobility services is a new business area that the carmaker may have no experience in	Access to, and use of vehicle data needs careful management Potential for damage to **brand image** from poor quality services	Risk of brand being seen as a technology laggard **Missing out** on potential growth business area of mobility

Conclusions

- Beating the convenience offered by private vehicle ownership is very difficult.
- New mobility schemes are still in their infancy.
- Many players are still trying to understand where the business case is.
- For OEMs, this is a potential opportunity, however, the challenges are numerous, especially in terms of viability.
- Best opportunities are mainly in cities where public transport is insufficient.
- Highly automated vehicles do offer some advantages, especially in terms of logistic and business cases.
- However, it remains to be seen how successful such schemes are going to be, especially in the long term.



Thank you!

Dr. Alain Dunoyer
Head of Autonomous Car
alaindunoyer@sbdautomotive.com
+44 1908 305 102
www.sbdautomotive.com
https://uk.linkedin.com/in/alain-dunoyer-phd-01b4546