



The future of automotive mobility

Winning the power play in tomorrow's radically changed automotive ecosystem

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Arthur D Little

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Executive summary

Automotive as it has evolved over the last 100 years is perceived by many as leading to massive problems over the world. Driven by wealth, urbanization and increasing car-park pollution and congestion, effects have increased globally and need to be addressed.

Technological development seems to offer solutions: electric mobility leads to much cleaner mobility, car sharing will decrease the number of vehicles in use worldwide and autonomous driving will help boost the capacity of streets - whether this is urban or on highways. Really? To assess the impact of those key trends, we have conducted a 360-degree study incorporating perspectives from customers, industry players and regulators. Here's our conclusion:

Transformation of the automotive industry is no longer driven by customers alone – it will be driven by regulation. In light of the further urbanization worldwide, countries and cities, as the main regulators of mobility solutions, are starting to act stricter in order to maintain environments that are worth living in. On the other side, there are key customer requirements they will need to incorporate into their concepts, including:

- The majority of people worldwide claiming ownership of a car as highly important – mainly due to status,
- Limitations of electric mobility due to limited operating reach, higher purchase price of electric cars compared to internal combustion engines, and insufficient charging infrastructure,
- The fact that autonomous vehicle concepts (mostly) will be introduced in a brownfield environment with legacy car parks, pedestrians and customers willing to accept autonomous and shared concepts as an additional mobility option, not necessarily replacing owned cars.

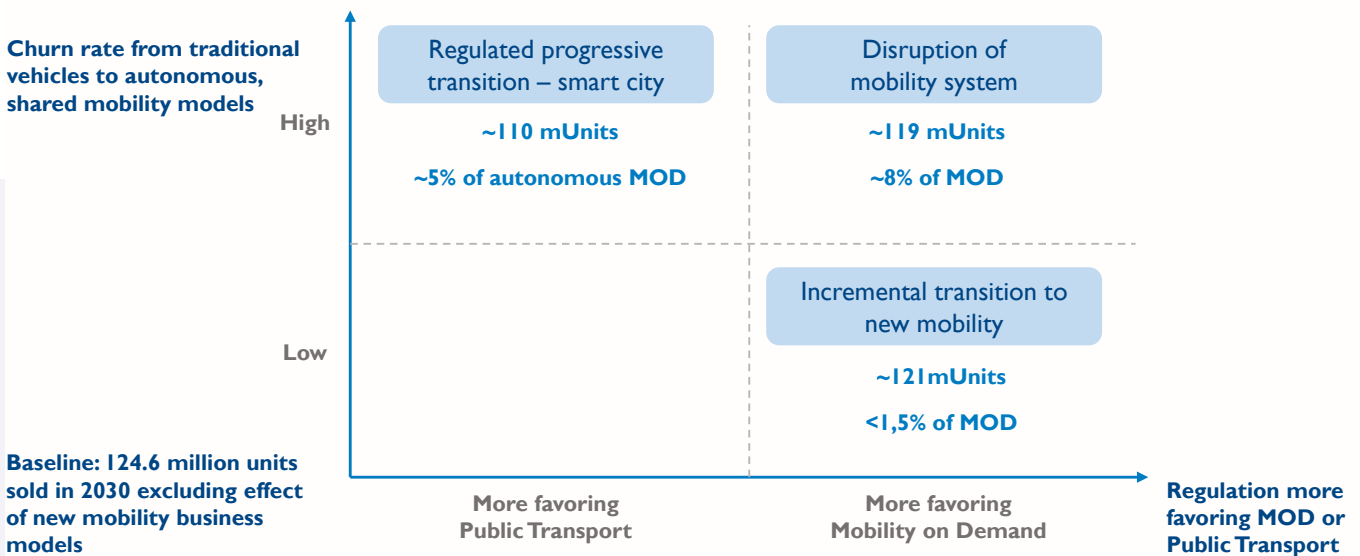
Nevertheless, the introduction of new mobility concepts will significantly change the car park: we expect a share of up to more than 50 percent electrified vehicles (full battery electric or hybrid) by 2030 - depending on segment. We expect the rise of mobility platforms offering mobility on demand through vehicles either produced specifically for this purpose or privately owned and temporarily put into the mobility system by the owner.

It is frequently reported that the overall market size will significantly shrink. This is theoretically true due to effects such as complete car sharing. However, realistic scenarios we have calculated on real urban data and statistically relevant customer preferences suggest a total production volume worldwide of between 110 and 120 million vehicles – which is more than many experts predict.

The advantages of the coming new mobility options attract customers: almost one-third of those customers using public mobility modes such as trains and buses today would change their behavior and switch towards the above-described mobility modes – adding further capacity requirements to the system. We therefore expect, depending on the initial urban status of a city or region (e.g. comparing the completely different public transportation statuses of Hong Kong and Houston), that three key mobility scenarios will prevail:

- Regions which progressively move towards autonomous vehicles based on mobility on demand (“disruptors”),
- Legacy-constrained cities incrementally introducing new automotive mobility systems,
- Cities applying focused regulation to seamlessly integrate new automotive mobility modes into their public mobility system, which they consequently extend (“smart cities”).

Figure 1: Expected vehicle production 2030



MOD: Mobility On Demand
Source: Arthur D. Little analysis

These changes will lead to a significantly changed automotive pyramid. Extending the classic view of the automotive pyramid, three new segments with new roles will develop: above today’s top of the food chain (the manufacturers), a new role of the “automotive mobility provider” will develop – offering mobility services to end customers and therefore capturing the customer interface. Along all levels (“tiers”) of the automotive pyramid, new ecosystems for electrical and automotive modules and components are developing. Therefore, the pyramid of today (consisting of the key roles, manufacturer and supplier, tier levels) will be extended by not less than eight new roles - which will significantly affect strategies of industry players.

For manufacturers the new mobility system requires a significant shift in product portfolios that needs to be managed. A polarization of vehicle segments can be expected, and the middle segments will shrink drastically. Furthermore, manufacturers need to decide on their approaches and how to tackle the new evolving mobility provider segment – since due to the limited respective volume expected, exploitation of the respective profit pool will be challenging. Regional approaches to mobility models will be required. Last, the management of competences and networks, as well as integration of external sources of innovation into the own innovation system, will be the key success drivers for building the right business model while keeping prudence on investments for OEMs.

The impact of the future mobility ecosystem on suppliers depends on the key vehicle technologies those suppliers are focusing. For each key technology, a set of norm strategies applies.

Powertrain suppliers can:

- Further focus on combustion engine-based products and compensate for decreased revenue through portfolio expansion (e.g. appliances, turbos, starters),
- Complement their combustion engine-based product portfolios with key electric modules/products or
- Leverage combustion-engine and electric products and competences and become providers of fully integrated drivetrain solutions.

For electrics and electronics suppliers, four norm strategies are relevant:

- Broaden the electric products and offerings towards electric powertrain technology,
- Build a sustainable proposition in the currently developing autonomous-technology ecosystem,
- Leverage electric capabilities and hardware competence to become providers of fully integrated autonomous solutions or
- Potentially develop mobility interface platforms.

In the chassis segment, large suppliers especially are at an advantage. Chassis suppliers can:

- Focus on technology leadership,
- Offer integrated key modules for autonomous-driving functions (hardware and software) and e-mobility or
- Offer integrated, multipurpose chassis and drivetrain kits.

While interior suppliers will be less affected on volumes, a key challenge is to reinforce their brand perception. They can basically:

- Focus on technology leadership and understanding of interior solutions for new mobility customer segments or
- Offer interior solutions (together with body parts suppliers) to connect to multipurpose chassis & drivetrain kits.

The demands on body structures will change, and a combination of different materials and solutions integrated with interior can be expected. Therefore, exterior suppliers can:

- Focus on cost leadership and technology leadership in lightweight solutions or
- Offer body solutions (together with interior suppliers) to connect to multipurpose chassis and drivetrain kits.

To master the new rules of the game, industry players now need to focus on distinct areas:

- Understand the new roles on the automotive pyramid, anticipate competitor moves within the new pyramid and define scenario-based, flexible strategy approaches,
- Prepare their business innovation to manage a broader spectrum of business models,
- Secure access to required technology and capability through systematic external innovation,
- Accelerate internal innovation capabilities for frequent and fast changes in innovation objectives,
- Adopt agile approaches to innovation,
- Capture market share on relevant electric-mobility products,
- Assess and secure the company's readiness for electric mobility.

Arthur D. Little has been at the forefront of innovation since 1886. We offer a wide range of services to help industry leaders navigate and manage the already-started transition of the industry.

To receive the full study please contact Astrid Busse, busse.astrid@adlittle.com

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