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## THE FUTURE OF MOBILITY



Seamless Mobility: Die Auflösung des Modal Split

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# The Push and Pull of Automotive Disruption

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by Dr. Patrick Ayad and Dr. Lance Bultena

The automotive industry is under disruption. The business press heralds that disruption daily as businesses act to position themselves for the future. The direction of transformation is clear but the route there, the pace of change, and the motive forces that will shape the market of the future require more analysis.

In the future, vehicles will be Autonomous, Connected, Electric, and Shared. These elements of the mobility future are so well accepted the only real variance is the acronym chosen to represent them: ACES or CASE. The transition to that future is depicted as the inevitable march of technology with companies competing to own a share of the future market.

Analysis of the pace of change and the path for technological integration is too narrow, however, if it does not encompass the significant impact of consumers or more generally customers as well as governments and regulators. A push-pull analysis of the market from the mobility industry's perspective is helpful.

Technology challenges are most evident in the application of autonomy. In this area consumers are not widely clamoring for autonomous vehicles, but automotive and technology companies see the future and

are rushing to control a new industry. Many see this as an existential issue for traditional automotive companies. The industry is racing to develop market changing technology - a classic technology push scenario. Policy-makers in major jurisdictions will again, however, play a key role. Governments seek a spark for economic growth, but also must keep the public safe.

The connected car or vehicle is often seen as a battlefield between automotive and technology companies for the final, uncaptured screen with vast sums of new revenue and perhaps even dominance at stake in the new mobility sector. Again, the global trend toward connectivity is evident. Consumers demand a robust interface similar to what they have on their mobile phones. The clunky automotive interfaces of the past are not acceptable to increasingly sophisticated consumers - this is a pull situation. At the same time, however, the additional services associated with the connected vehicle are an industry push to achieve new revenue sources. While the battle rages for the consumer, governments will act as mediators by regulating the privacy and the data that generates the revenue.

The dominant force advancing electric vehicles (EVs) is a massive push from regulators, and hence automotive companies; it is not so much a pull from the consumer perspective. Governments all over the world are responding to concerns about global climate change by aggressively increasing limits on green-house gasses (GHG). While the US may take a slight diversion from accelerating stringency at the federal level, the global trend is clear and the regulatory push in Europe and China is unambiguous. Aggressive emission limits and in some parts of the world even ICE or Diesel specific driving bans are forcing the production of EVs on a global basis in major markets.

To meet the regulatory challenge, technological advances are needed to decrease the costs of the battery and to speed charging times. Companies are investing heavily while also developing new supply

chains oriented around batteries. Governments in many locations incentivize consumers to purchase EVs. More charging infrastructure is needed, however, for wide-spread EV adoption. While EV sales are increasing, they are still relatively small. Governments are the primary driver of these shifts so in seeking to understand the pace of change toward an EV future one must analyze governmental action on a global scale.

The shared component of the mobility market is demand driven, a consumer pull. The rise of the sharing economy extends beyond transportation and is a consequence of increased mobile connectivity on a global basis. Ride hailing in some markets is already a viable alternative not only to car ownership but to taxi and parking services as well. Shared mobility is developing even though government regulation favored local taxi companies and historical patterns preferred individual car ownership. Consumer trust in digital platforms rapidly eclipsed both local regulatory structures and decades of entrenched purchasing habits. Further evolutions in the shared nature of the mobility market will also likely be consumer driven.

The mobility market of the future will transform several industries. As the battle continues over technological capacity and consumer appeal, one must not ignore the simultaneous battle over governmental policy. In this evolving marketplace, government policy will impact significantly not merely the rate of development, but also the shape of the market. Eventually, the current disruption in the automotive industry presents huge opportunities for both traditional automotive companies and new entrants.

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