Executive roundtable: Future of mobility

We need a paradigm change to organize future mobility: What is missing?

Urbanization has been growing continuously, and already today more than 50 percent of the global population is living in urban areas. How are conventional practices to organize mobility coping with this? In fact, urban mobility systems mostly reached their capacity limits long ago, and demand will further increase. We face a massive challenge. Initiatives aimed at helping to improve the system are often ineffective. The result is endless traffic jams, unreliable inner-city transportation and congestion. Simple additions to existing capacity will soon hit spatial and financial limits – a system is at its end. So what are the options now? What can we do to push innovation forward to quickly relieve our mobility systems? What will drive potential disruption? Arthur D. Little, passionate about change and innovation, invited major stakeholders in urban mobility to an executive roundtable in Frankfurt.

The problem: A traffic infarct

“We have reached a point, which is harmful.” With this clear statement, Ralf Baron, Partner and Global Leader of Arthur D. Little’s Travel & Transportation Practice, opened the executive roundtable in Frankfurt. It was not surprising that some participants arrived late. Flights were cancelled, long traffic jams arose in the Rhein-Main area, and train services suffered from a point failure. This was a normal morning here – and also for other metropolitan areas in Germany. And despite possibilities for decentralized working and communication, indicators suggest further growth in mobility.

Our transportation system is at the edge of what it can provide for us – and considering the outlook, mobility providers are looking ahead at bleak times. But somehow, it still is working and surprisingly tolerated by German commuters, since they still get from A to B. The situation is different, though, regarding megacities in other countries. When a bus ride in Istanbul takes hours for two kilometers, it is clear that the system does not work anymore. In many countries, the population suffers from a traffic infarct – and it is only a matter of time until we will have the same problem in Germany. Do we have anything to oppose? In fact, in times of digitalization, converging industries and technological innovation, we can actually build on numerous possibilities that could contribute to improving our systems.

A wide range of progressive initiatives have already been implemented across the country – but rarely with relevant improvements, and often barely noticed by the public. The impression that little has changed in the last decades remains. What, or who, is to blame for the lack of progress? In fact, it does not make sense to look for single culprits, because in the end there are many influencers. Technological advancements and mobility solutions are the foundation for progress. But these can only work when there are customers using them, legislators providing favorable regulatory conditions, and all other relevant businesses and parties are aligned – which would be a highly complex environment.

However, there is no reason for pessimism, since examples such as China prove that the transformation of mobility systems is possible. The state has created favorable regulatory conditions and set the course for new mobility, which has resulted in large-scale and systematic expansion of smart initiatives. In Germany, we are still far from achieving this. Which hurdles do we have to take? What can we do to prevent an infarct? And – at the end of the day – what will lead to disruption and the future of mobility in Germany?

The executive roundtable, organized in a format combining impulse speeches with lively debates between influential industry experts, aimed to find answers to those questions. Among the speakers was Gunnar Heipp, a well-known expert in urban mobility specifically and smart cities in general. Through his former activities as director of strategic planning at Stadtwerke München and his time as chairman of the sustainable development commission at UITP, he has experienced the mobility system in its entirety, and developed a vision of how it is likely to develop in the future. A crucial element of urban mobility are railway services, as represented by Simon Daum. Having spent most of his lifetime in the railway industry, he is responsible for digital collaboration and products for Siemens Mobility. He knows the significance of digitalization and how it can transform the industry. The third speaker was
In addition, new mobility business models gained a lot of attention in the group, as further options for preventing a traffic infarct. Besides well-known car-sharing services such as DriveNow and Car2Go, mobility integrators such as Moovel and Qixxit are putting together intermodal, door-to-door connections – ideally with direct-booking functionality and ticketing. A significant extension of this idea, mobility-as-a-service (MaaS), shifts the focus from the transport medium to travelers themselves. Projects such as “Whim” and “UbiGo” open up the entire spectrum of urban mobility (e.g., buses, rail, taxi, bicycle) to users, and make it available on their own platforms via flat-rate or pay-per-use models.

Finally, autonomy in rail and road transportation was discussed and declared a special enabler of the future of mobility. A recent ADL study, in which the influence of autonomous passenger cars on the capacity of an inner-city main road was investigated, provided arguments. The astonishing result: assuming the traffic was fully autonomous, the street capacity increased 10-fold.

So what are the learnings? Not only are technologies, solutions and business models available to significantly improve today’s system, but we are also equipped with well-thought-out concepts that enable the mobility of the future. Getting to the heart of it: technically, we can do everything – that’s not the problem. The rest is more difficult.

**Street capacity with autonomous driving**

![Image](Image)

Source: Arthur D. Little (2018)

**The users: Subconscious tolerance and readiness for alternatives**

Another crucial, if not the most important element in the system of mobility, is the traveler. People do not use transportation just for entertainment. It “only” allows its users to perform certain other activities. But still, people have specific expectations of transportation that must not be neglected when designing the future of mobility. The roundtable agreed that the system is far from user-centric. In fact, millions of people in Germany suffer from traffic jams, disruptions or congestion every day.

Quite paradoxically though, it seems that such inadequacies are still being subconsciously tolerated or taken as normality. Bad attitudes towards public transportation have not stopped people from using them. Some participants reported that alternative mobility offerings have not stimulated great enthusiasm in their target users. Engagement with new forms of mobility is often limited, sometimes yielding wrong knowledge or even refusal. This, combined with subconscious tolerance of the current mobility situation, has created little pull for something new.
But how to succeed? Suggestions from the participants led to
the conclusion that one central problem could be the lack of
education about new possibilities. Creating enthusiasm and,
likewise, demand was found to be a key enabler for adoption
of new solutions. Some participants commented that societal
trends, including megatrends, additionally impact the pressure
on the actors involved. The point, at which the currently
offered security, reliability and sustainability will fall below the
acceptance limit of the users, is likely to be reached soon.
Particularly in cities, where CO₂ emissions amount to a societal
problem, the call for environmentally friendly alternatives is high —
as China has demonstrated.

Regulation and bureaucracy: The core of stagnation?
There is no doubt that mobility is a regulatory-driven market. In
the discussions, regulation was suspected of being the central
source of development stagnation in the mobility sector – for
multiple reasons. Gunnar Heipp explained: “The methodologies
used to plan traffic are more than outdated.” Static and
ineffective models are still used to calculate transport capacities,
leading to ineffective measures. Visioning, development and
implementation of new mobility projects are made more difficult
by regulation. The participants made this clear by pointing to
sluggish political decision-making combined with alarming
degrees of complexity. Even the mere creation of a target image
is often close to impossible. Political planning processes that
take decades are no longer unusual. Complex micro-work leads
to endless discussions with different decision-makers.

An example how static legal requirements prevent the positive
effect of new technologies are the regulations on maintenance
intervals, which have been static at all times. “Our sensors and
materials would not only allow longer running performance;
they would also allow variable maintenance intervals without
any loss in safety,” says Simon Daum. Introducing variable
permissible-limit values seems difficult to implement. Despite
the existing technological possibilities, neither the operator nor
the train manufacturer can currently benefit from it. Innovations
developed in Germany are increasingly piloted abroad, sold, and
then brought home when favorable legal conditions are created.

But what are the ways out? A consensus among the group
was that “overregulation” could only be countered by radical
rethinking. One participant suggested, “The pain is simply not
yet big enough. But we are already in the atrium of the heart.”
What happens when the “pain” gets bigger can be seen in
London. Here authorities had vehemently tried to ban vehicles
from the city center by using camera systems and penalties.
The diesel bans in German cities are also increasing. In the
end, however, both measures can be considered as drops
in the ocean. In contrast, a meaningful example for future-
oriented regulation could be market adapted pricing for the use
of public infrastructures of roads. Prices that take permanent
capacity restrictions into account could foster innovation and
effectiveness of transportation.

But is regulatory reorientation the only solution to new mobility
in Germany, and will it have the power to bring about a radical
change in the system? One participant referred to China: “The
traffic infarct is one of the biggest there. If new technologies are
mature enough, a simple prohibition can cause a system jump.”
Soon there might be no combustion engines in large Chinese
cities at any time. For sure, regulation is needed to stimulate
development. But one thing was also clear: it is not the only
card in the game.

Interdisciplinary collaboration: When enemies become
friends
We must deal with much more if we want to succeed with
mobility. In his impulse speech, Gunnar Heipp focused on a
topic, which, in his view, was one of the root causes of the lack
of transformation in mobility: cooperation between friend and
foe. Current and future mobility addressed many more areas
that historically had little overlap. For example, comprehensive
and sustainable charging infrastructure for electric vehicles
could only be achieved by involving real estate owners. Traffic-
generating entities such as schools, event businesses and
retailers with delivery services would need to be involved in
traffic planning. Municipal administrations and politicians would
need to provide appropriate regulations and facilitation to make
development possible. In practice, however, roles are unclear
and there is still little cooperation, which risks friction losses if
the singular channels are not brought together.

Indeed, some participants provided evidence from personal
experiences. Due to the large number of people with own
interests, it was considered very difficult to reach a consensus
with both public and private parties. A huge variety of egoistic
interests, endless bureaucracy, serious financial issues and
intensive alignment rounds not only have delayed or prevented
new initiatives, but also often led to the achievement of only the
lowest common denominator, with projects rarely reaching the
envisaged innovative power.

How to resolve? First of all, it was considered important that
mobility is understood as a cross-sectional task, articulated
in a common approach – a target image – regardless of self-
interests. A new form of collaboration building on new (digital)
methodologies, would need to function across all relevant
parties, and also encourage thinking through all interdisciplinary
process chains – without taking the classical detour via
backroom politics. This approach would create a basis for simultaneous change of the individual systems – in the interest of new mobility.

Although the participants agreed with this hypothesis, many doubted that participating players would be incentivized strongly enough to overcome the rules of the market and competition. On the other hand, they agreed that it was also conceivable that companies underestimated the commercial potential of new mobility. Strong and courageous players are needed to actively and openly approach the “enemies” in order to find common sources of revenue, as well as common ground for more open and intensive collaboration. Although regulations could facilitate such cooperation, companies will need to learn how to deploy their radar in uncomfortable areas.

In addition to the format of cooperation, the large number of small pilots and the little scaling of good initiatives was criticized. Too often, entirely new things are tried instead of advancing available ones. Existing projects including the large number of pilots in Germany would therefore need to be further developed and expanded. Only this would create a critical mass of case numbers and experience over time, which would be fundamental for the implementation of large-scale mobility solutions in the future.

The search for disruption

The current mobility system lags behind our capabilities – especially in Germany. Innovative technologies and solutions are available, but they are not implemented on a large scale. The question of what is missing to drive the mobility of the future has many answers:

- The narrow leading regulation is often seen as a large obstacle to development and implementation. Radical reorientation of regulations is required so new mobility initiatives will have lower hurdles to being rolled out successfully with envisaged targets. However, eliminating regulatory barriers alone will not lead to sure-fire success.
- In addition, new types of cooperation between different disciplines and industries are required. Mobility of the future must be understood as an interdisciplinary task – rather than simple transportation services from A to B. Parties such as city planners, real estate owners, traffic-generating entities and other businesses must think openly across individual system boundaries, striving for common goals and implementing them simultaneously. Regulations can also help here as an initial spark.
- Finally, travelers themselves do not exercise a strong enough pull for new developments, as the current situation is still subconsciously tolerated. New initiatives should therefore aim at stimulating the user’s enthusiasm to use innovative solutions and, in the long run, adapt to new mobility behavior. The missing pull, however, must not discourage other mobility stakeholders from driving new initiatives forward.

Considering the above-mentioned recommendations will ease the emergence of effective solutions and take us forward on the path to future mobility. A central challenge, however, remains. Although in the near future an increasing number of initiatives that will lead to improvements is expected, most enable better utilization of existing transportation capacities. Recalling that the current system is at a physical limit, the potential for further improvements is narrow. A change of paradigm – a disruption – is required to make mobility of the future a reality. But what will be the missing card in the game? Referring back to the findings about the potential of autonomous operations in new mobility, it is conceivable that autonomy will be one game changer in the industry. At the end of the roundtable, all participants agreed: an autonomous system, constantly learning and optimizing itself, would bring about a paradigm shift. Effects on available capacities of rail and road, user-friendliness and operational performance would be far-reaching.

Together with seamless interdisciplinary cooperation, favorable regulatory conditions and technological excellence, we at Arthur D. Little believe that the next generation of mobility can be made possible and we feel obliged to contribute and drive the transformation to urban mobility of the future.

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Arthur D. Little

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