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Information service for policy and economy

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The future of the automotive industry: artificial intelligence, blockchain, platforms



In the coming years, technological and social mega-trends will revolutionize the automotive industry and traditional business models in the field of mobility, enabling new business opportunities.

The technology fields of artificial intelligence and blockchain as well as the emergence of digital platforms have tremendous potential for innovation. Technological leadership and the establishment of market leadership in these areas will be decisive location factors, and not just for the automotive industry. Politicians have recognized

the importance of these technological game changers: A national strategy for artificial intelligence was presented at the end of 2018. The federal government plans to present its blockchain strategy in the summer of 2019. The Digital Summit of the federal government in October 2019 will focus on digital platforms.

Artificial intelligence: A key technology for mobility

The automotive industry is driving research, development and innovation in Germany like no other business sector. It has become increasingly clear, however, that the development of artificial intelligence (AI) as a key technology is being driven by competitors from outside the automotive industry. There is a strategic need for politics, science and industry to join forces and ensure the international competitiveness of AI systems. That is why the VDA supports the federal government's AI strategy. Machine learning, human-machine interaction and artificial intelligence are revolutionizing the key pillars of automotive value creation like hardly any other technology. In combination with other digitization technologies, learning systems will profoundly change production and logistics as well as the analysis of markets, customer behavior and sales. The goals are greater efficiency, higher quality, a sustainable use of resources and tailored service along the entire automotive value-added chain. If nothing else, AI is the key to networking all modes of transport and thus to creating optimized and customized mobility services.

It is now important that politics and business create the necessary prerequisites together to ensure Germany's status as a leading location for AI development. Above all, these prerequisites include capable communication infrastructures in the public sector (5G), feasible competition law framework conditions for inter-company partnerships and the establishment of a dialog involving all stakeholders to which promote social acceptance of AI-based technologies. The collection and processing of data, being the basis for any artificial intelligence, must be considered a major focal point in the context of this dialog. In addition, fundamental cross-sector and cross-application research, application-oriented research and the transfer of knowledge between science and the business must all be promoted. At the same time, research funding tools should always be developed as needed with the involvement of industry in order to exploit the full potential of collective industrial research.

Secure networking and services through blockchains

In addition to artificial intelligence, blockchain technologies are increasingly the focus of interest not only for mobility and logistics companies, but also for politics. A blockchain is a digital register, which records the transactions between two or more parties in a decentralized manner on all computers authorized to use the respective network, and does so in an encrypted format. All network participants can track the transaction, eliminating the need for legitimating authorities. Blockchains are therefore considered counterfeit-proof and allow a high degree of data security. In the mobility sector, for example, blockchains are used in production, for billing cross-provider mobility services and for the self-management of autonomous vehicles. Efficiency can also be significantly increased in logistics with blockchains, especially when it comes to complex delivery chains. Numerous companies from the automotive and supplier industries have therefore founded the Mobility Open Blockchain Initiative (MOBI) to make mobility and transport safer and more affordable worldwide, helping blockchain technology to break through into the mobility sector. The federal government is currently developing a national blockchain strategy, which will be available in summer 2019. From the perspective of the automotive industry, the key requirements for testing and implementing blockchains include legal certainty in the areas of civil and tax law, early integration of blockchains into the public sector and the recognition of blockchain-based trust services and electronic signatures by public authorities.

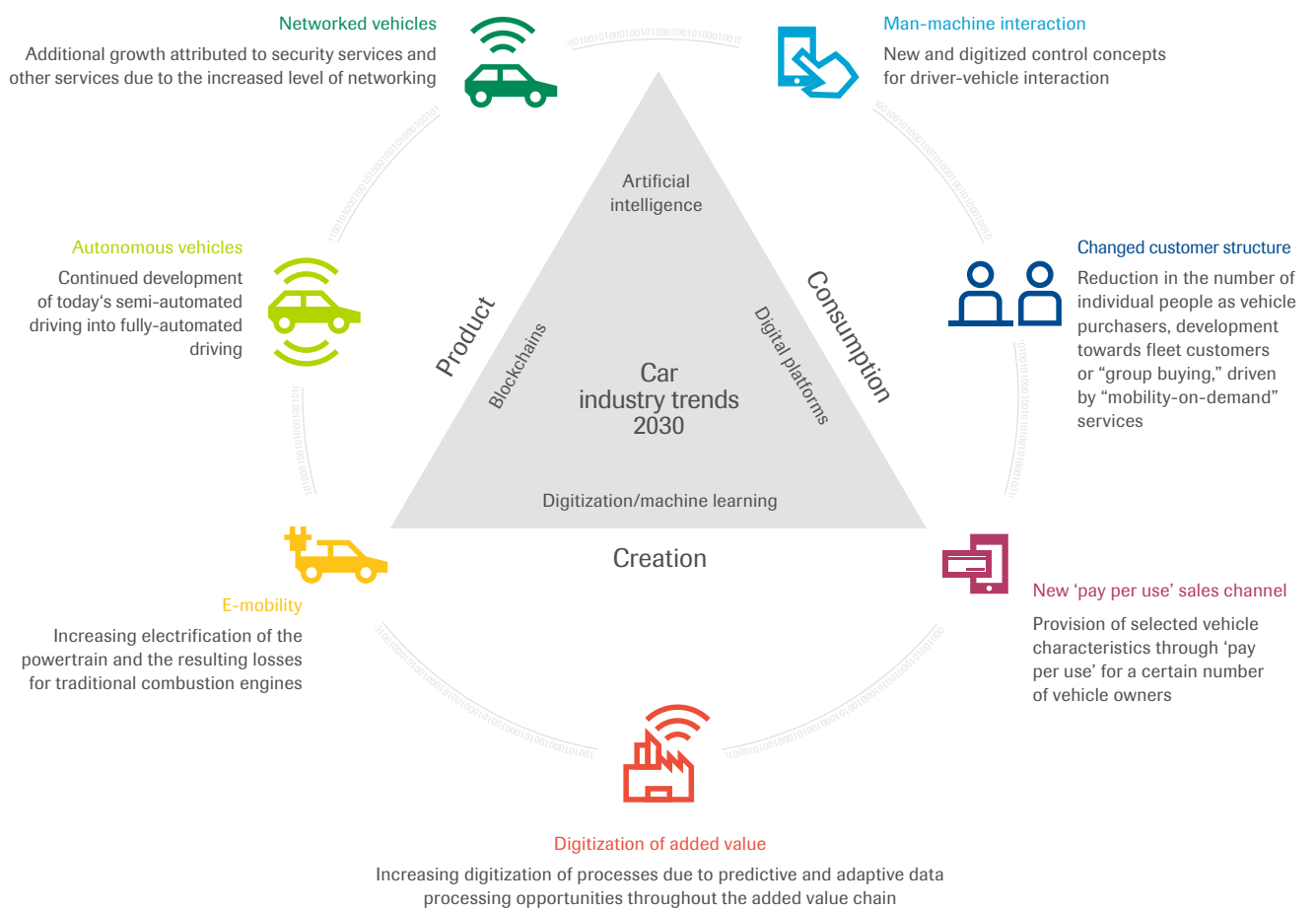
New value creation through digital platforms

Digital sales and service platforms are penetrating markets both in the B2B and the B2C sectors. The major internet platforms from the US and China are collecting and generating the data that AI needs in order to learn. In

this way, the platform economy and artificial intelligence are mutually reinforcing. For their part, the respective platforms are becoming innovation drivers and are changing value-added chains around the world. For a large economy, the added value created by the platform economy is essential to ensure continued success. This is currently not the case in Germany and Europe. While the cards have already been dealt in the area of trade and search engines with platforms such as Google, Amazon, Alibaba and many others, the competition in the mobility, logistics and healthcare sectors is not yet over. It is therefore crucial that Germany remains or further grows as a leader in key industries such as the automotive industry and in key technologies like artificial intelligence. If unsuccessful here, key parts of the industrial value added in Germany are in danger of being lost.

The federal government has therefore given the topic of the platform economy a great deal of attention in the draft of the “National Industrial Strategy 2030” and is dedicating this year’s Digital Summit to this subject. The main challenge for the automotive industry in Germany is to create globally competitive ecosystems from within the industrial core - all consequently based on digital platforms. Politics in Germany and Europe can support this by ensuring the continued expansion of a European digital domestic market, the dismantling of national trade and fiscal restrictions and continuous development of data protection legislation to ensure the full potential of AI and the platform economy can be realized.

Seven fundamental trends that are changing the automotive world



New products, applications and business models dealing with mobility are emerging based on data, networking and artificial intelligence.

The automotive industry is undergoing change – with consequences for industrial policy

The automotive industry is facing radical technological advancements around the world. These pose enormous challenges for companies – on the one hand due to initial investments in new technologies, and on the other, when deciding on which strategic direction to take and which technological approach is the correct one.

There are a few other industries in which the impact of technological changes is as pronounced as it is in the automotive industry. This also applies to the use of artificial intelligence in the form of autonomous vehicles and the networking of traffic participants. This, in turn, gives rise to new questions concerning the use of networked cars as data carriers and data collectors. Future drive and fuel concepts will also bring about major changes.

If nothing else, the automotive industry will also be confronted with a new kind of demand – car usage instead of car ownership! This will require the development of new business models. In addition, the automotive industry is increasingly being confronted with the political goal of limiting the number of private cars on the roads.

Nevertheless, shaping the mobility of the future is a major opportunity for the German economy, especially for the automotive industry. It is a key pillar for economic growth, prosperity and jobs in our country. Our companies face tough global competition. As an industrial location, Germany needs to remain competitive.

The “National Industrial Strategy 2030” championed by the Federal Minister of Economics, Peter Altmaier, has initiated this important discussion.

One thing is clear: The state is not the “better entrepreneur”. An active location policy should create effective incentives for innovation and investments as well as future-oriented, reliable framework conditions for industry and small and medium-sized companies. This includes

- Tax incentives for research and development. An initial impact was made with the publication of the federal government's draft law in February. However, the planned funding volume would have to be significantly higher in order to have a noticeable effect.
 - An affordable and secure energy supply with the smallest possible carbon footprint. Germany has the highest industrial electricity price of all 28 EU countries.
 - Faster expansion of the analog and digital infrastructure. The charging infrastructure in the public and private sectors must be expanded quickly and comprehensively. The goal for the data infrastructure should be to cover the main traffic routes and urban areas with 5G by no later than 2025.
- A competitive tax system – at 31.7 percent, the income tax burden on corporate entities in Germany is significantly higher than the OECD average (24.7 percent).

Summary

Automotive companies are in the middle of the most important transformation in their history. German manufacturers and suppliers are themselves drivers of evolution. At the same time, this change must be shaped intelligently and responsibly by policy. In particular, the framework conditions for the industry, for research and development, for production and innovation as well as for attracting qualified young talent in Germany must be improved. The automotive industry will continue to play an active role in the dialog.

Strategies for an integrated climate and economic policy

The automotive industry is clearly committed to climate protection and the Paris goals. There is no alternative to clean and eco-friendly cars. The Industry will play its part in making transport CO₂-neutral by 2050. This must be accompanied by an effective and far-sighted environmental policy, which strengthens both environmental protection as well as Germany's status as an economic and industrial location.

The EU has set very ambitious CO₂ targets for 2030 to decarbonize transport. By 2030, CO₂ emissions must be reduced in cars by 37.5 percent and in light trucks by 31 percent compared to 2021. For heavy trucks, a 30 percent reduction is prescribed. These goals not only increase the pressure to create eco-friendly and sustainable mobility solutions, they are also initiating structural changes that pose a challenge for society as a whole – and not just the manufacturers, suppliers and development service providers, but also the customers, science, the electricity industry, telecommunications companies and public transport. Not to mention the state itself, including the municipalities, the federal government, the federal states and Europe.

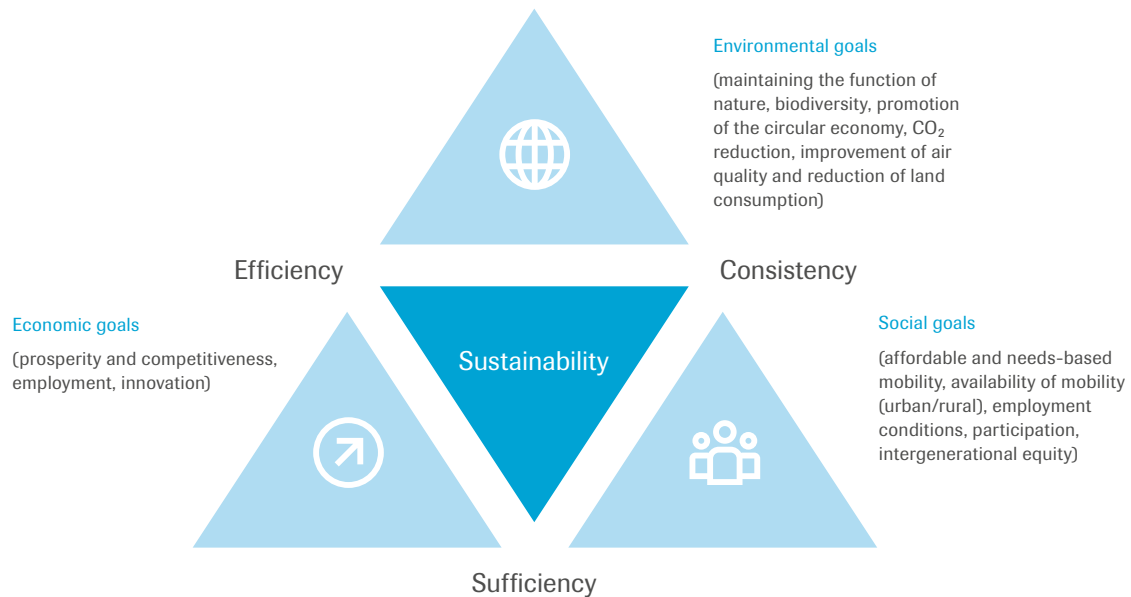
In the year 2030, around 40 percent of the newly registered passenger cars in Europe must be electric vehicles, which means battery-electric or plug-in hybrids. In Germany, 7 to 10.5 million of these vehicles will already be on the road by then. To achieve this, Germany's automotive industry will invest around EUR 40 billion in alternative drive systems, primarily in e-mobility, in the next three years. The number of available electric vehicles will triple to over 100 models.

This electrification will only be successful in the market, however, if the necessary charging infrastructure is built. The prerequisite for this is effective coordination and an impetus at all levels from the federal government to the individual municipalities. This also includes a high-performance power grid and a funding scenario that is as uniform and effective as possible. In short: We need an “e-jolt” in Germany.

In addition, the development of alternative drive technologies must be promoted. This includes the further optimization of combustion engines with an efficiency potential of 20 to 30 percent. It also includes the use of CNG and LNG as well as the development of fuel cells and climate-neutral e-fuels, which could be used to reduce CO₂ emissions in all forms of transport – existing vehicles, heavy trucks, ships and aircraft.

In addition to alternative drive technologies, networking and digitization are making transport more efficient and sustainable. Germany's automotive industry will invest an additional EUR 18 billion in networked and automated driving in the next three years.

Sustainable mobility



Source: NPM

The technological changes to drivetrains need to be accompanied by a parallel transformation of the transport system and its use. Networking intelligent traffic systems helps to reduce traffic jams and the time spent searching for parking spaces, and to improve fleet management. All of this reduces CO₂ emissions. There are also new mobility services, such as carsharing, carpooling or ride pooling, which facilitate environmentally-friendly mobility solutions.

The economy and industry need planning reliability in order to be successful. This has been provided in the form of the EU's decarbonization goals. German politicians, however, are also working on a climate protection law, which is creating new uncertainty.

Discussions are underway with a view to prescribing exactly which savings – down to the ton and in yearly tranches – must be achieved in which sector. This is inevitably hampering innovation and economic dynamism, while also depriving policymakers of any flexibility in achieving the CO₂ targets. For example, how will increased traffic growth be taken into account?

The draft legislation also does not contain any specific measures, which will be prescribed in a separate law, making any discussion as a society about the costs and impact of climate protection measures impossible. In this way, there can therefore be no acceptance of the necessary changes resulting from the climate protection policy.

It should be clear to everyone here that decarbonization has its price. According to the study "Climate paths for Germany by 2050," additional investments of around EUR

1.5 to 2.3 trillion are needed for all sectors to achieve the 2050 target of a 95 percent CO₂ reduction with optimal implementation. In order to create the 2030 transport target, around EUR 250 billion is additionally required.

It's good that politics and business are vigorously dealing with the topic of climate protection. That is why over a dozen high-ranking experts from our industry are involved in the National Platform Future of Mobility (NPM). An NPM working group has identified proposals and tools for investment, innovation and digitization to achieve the environmental protection goals in transport. This is better than restrictions and prohibitions. Modern, individual and affordable mobility is a valuable asset and must be ensured both now and in the future.

The NPM's recommendations also include reviewing a CO₂ pricing system, which the federal government has commissioned. Such a system may make sense if it is socially balanced, spans across sectors and fits into a reform of the levies and tax system.

Instead of bans and price increases, a goal-oriented environmental policy for transport should focus on measures that drive innovation. Socially acceptable paths must be taken, because the success of alternative drive systems and new mobility concepts depends on the market. The goals will only be reached if people are excited about new technologies, new drivetrains, different types of vehicles and new forms of mobility – and if they remain affordable.

Powering electromobility – expanding the charging infrastructure

Companies in the German automotive industry are investing heavily in electromobility. But a rapid market ramp-up also requires the right political framework and an attractive buying environment for customers. The insufficient charging infrastructure is a decisive hurdle for the success of electromobility.

The German automotive industry is committed to climate protection. One important component to achieve the climate protection goals in transport is the ambitious EU fleet limit values. A rapid market ramp-up of electromobility is needed to meet the targets. Manufacturers and suppliers will invest EUR 40 billion in e-mobility in the next three years for this purpose. In addition, the manufacturers will more than triple the number of available models. Companies in the German automotive industry will not be able to reach the ambitious goal of about 7 to 10.5 million electric vehicles by 2030 on their own. This requires the right political framework and an attractive buying environment for customers.

The insufficient charging infrastructure is a decisive hurdle for the success of electromobility. Customers in Germany currently have approximately 17,400 charging points available to them. The coalition agreement of the federal government set the goal of making at least 100,000 additional public charging points for electric vehicles available by 2020. A 40 percent new registration rate for electric vehicles by 2030 will require as many as one million public and private charging points. Compared to China, which already has more than 330,000 public charging points, and the Netherlands and Norway with more than 20,000 charging points, it is clear that we need to act fast at all levels.


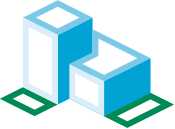
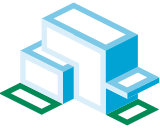


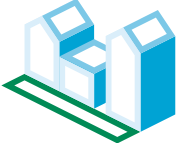
There is no comprehensive coordination of the infrastructure expansion by the federal government, the federal states and the municipalities. No specific overall targets or requirements have been formulated yet and the development is fragmented, differing from region to region. Verifiable targets must be defined, the responsibilities for constructing and expanding the charging infrastructure must be clarified at all levels and regulatory hurdles must be removed.

An extension of the Federal Ministry of Transport's electromobility funding program until the funding volume has been fully utilized would provide an important impetus. In addition to the further expansion of funding for the public charging infrastructure, funding for the private charging infrastructure should also be initiated. About 85 percent of all vehicle charging currently takes place at private charging points. Looking ahead, this proportion should drop to between 60 and 70 percent after 2020. In terms of the area coverage, in addition to charging points in managed parking areas, fast-charging points will be required at main traffic intersections and in metropolitan areas. The ease of charging should also be improved further through simplified digital payment options and permanently connected charging cables. The further expansion of the charging infrastructure also requires legislation

regarding structural measures. It is absolutely necessary to amend the existing rental and residential property laws to include a “toleration clause” with regard to the necessary charging infrastructure and energy management systems, as well as clarification of who should bear the associated costs. Rental law should be expanded to include a proportionate right of the tenant to consent to the installation of the charging infrastructure without an obligation to participate in the dismantling process. The intelligent integration of vehicles into the energy grid must be advanced by funding the design of grid-compatible charging processes.

VDA position paper on the charging infrastructure

The further market ramp-up of electromobility must be accompanied by a demand-based, convenient and available charging infrastructure as well as a positive perception among customers. For this purpose, the VDA has drawn up a position paper with recommendations for a successful ramp-up of the charging infrastructure for electric vehicles by 2030. It is available at www.vda.de

Charging infrastructure						
Percentage of charging processes	Private parking location: currently 85 %, expected to be 60–70 % beyond 2020			Publicly accessible parking location: currently 15 %, expected to be 30–40 % beyond 2020		
Typical locations for charging infrastructure						
	Single/double garage or parking space in your own home	Parking spaces or underground garage of condos, apartment buildings, apartment blocks	Company parking spaces on their own premises	Rest area, highway rest stops	Shopping centers, parking garages, customer parking spaces	Roadside/public parking spaces
Parking time and use	Parking duration: 10–12 h Use: 10–12 h/day	Parking duration: 5–10 h Use: 5–10 h/day	Parking duration: 8–10 min Use: 1–5 h/year	Parking duration: 0–4 h Use: 1–3 h/week		

Adapting the Passenger Transport Act to the requirements of the digital age

Innovative concepts like ridesharing, carsharing as well as bike and e-scooter sharing can contribute to greater efficiency and sustainability in transport in the future. To make this possible, the Passenger Transport Act, which originates from the analog world, must be adapted to the mobility needs of the digital age.

The automotive industry has become one of the leading providers of carsharing, ridesharing and multi-modal information, reservation and booking platforms. As a result, the automotive industry no longer “just” builds cars, but increasingly also acts as a mobility provider. These new mobility concepts make the sector well-equipped for the transport of the future, which will be characterized by multimodality and diversity. A demand-based, socially acceptable and environmentally friendly organization of transport will only be ensured via the largest possible selection of networked mobility solutions.

However, regulatory hurdles must be removed and the legal framework adjusted so that innovative concepts, such as ridesharing, carsharing and not least also bike and e-scooter sharing, can contribute to more efficient and sustainable transport in the future. The Passenger Transport Act (PBefG), for example, is still too focused on the old “analog” world of transport. It has not yet arrived in the digital age where rides are shared and ordered by smartphone and where stops are not necessarily permanently built structures. That is why it is good that the federal government wants to amend the Passenger Transport Act.

A sensible approach would be to classify ridesharing services as a scheduled transport service on the basis of their pooling function. However, this option should then apply to all ridesharing service providers and not just to municipal transport companies. Commercial ridesharing services should therefore not be broadly equated to transport service providers such as taxis, which actually increase congestion in some circumstances.

Classifying these innovative offerings as regular services would make cooperation and competition equally possible. In any case, ridesharing would still be subject to approval. Even after a reform of the Passenger Transport Act, municipalities would still have the option to design the type and scope of the license required for their urban area. They would therefore retain complete control.

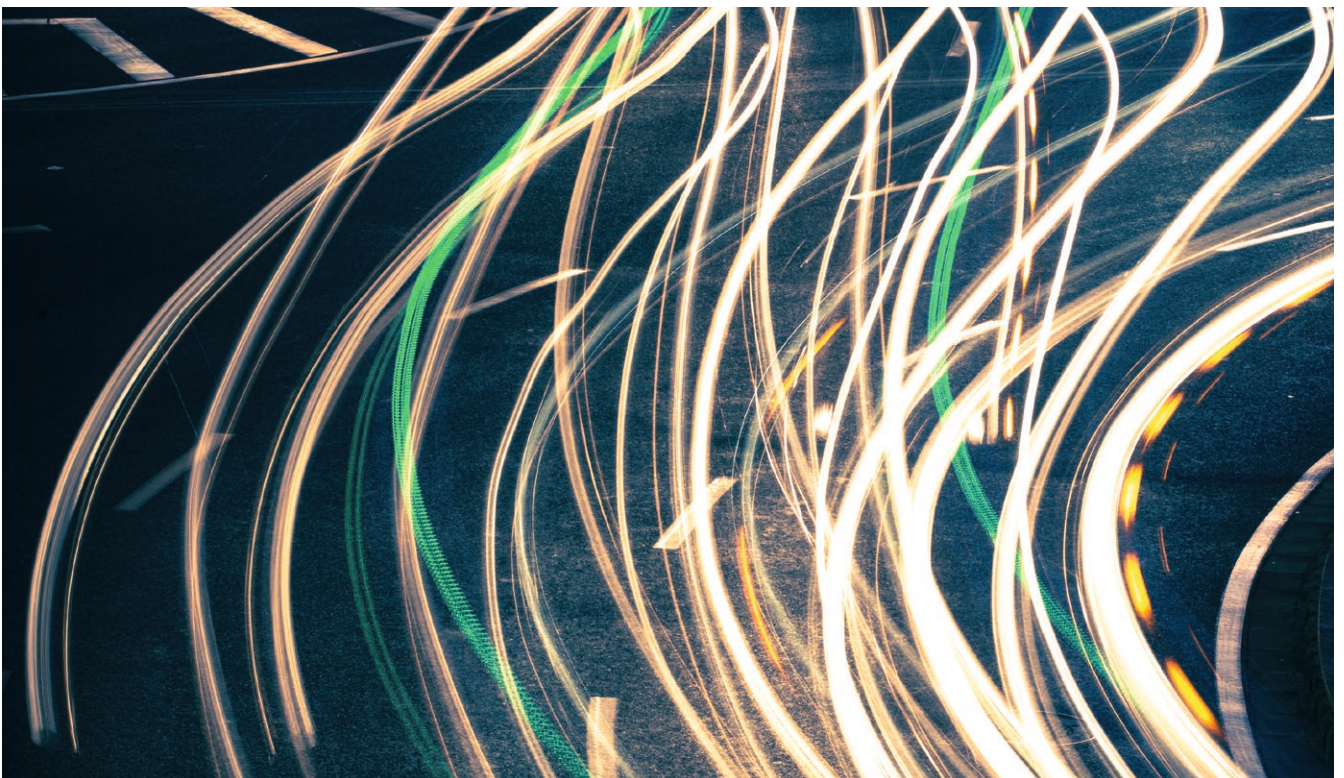
In addition, “virtual bus stops”, which are shown to the customer on a smartphone for example, must be legally recognized stops.

The role of the car in the transport system of the future

Our transport system must meet a wide range of environmental, demographic and cultural requirements in the coming decades. The VDA position paper “The role of the car in the transport system of the future – the need for political action to strengthen new mobility concepts” lists these

requirements. It also shows how the transport system needs to be designed to meet these requirements and what contribution the automotive industry can make in this context. The position paper will soon be available on www.vda.de.

5G – networking people and things in real-time



5G offers a data-transfer rate that is ten times faster than the currently available mobile radio standard, 4G. Smartphone users are not alone in eagerly anticipating this new technology – 5G is also creating an important prerequisite for the transport of the future.

Today, assistance systems that contain networked and automated functions are already in use in many vehicles. A traffic jam assist system, for example, brakes and accelerates in slow-moving traffic to maintain the gap to the vehicle in front, while keeping your vehicle within the chosen lane. However, the speed at which networked and automated driving – beyond individual assistance

systems – will become established in Germany in the coming years significantly depends on the digital infrastructure here. By 2025, comprehensive, dynamic mobile radio coverage should be provided, whereby all main traffic routes and urban areas will be covered with 5G. This is the only way to ensure that the full potential of networked and automated driving can be exploited.

A powerful digital infrastructure is needed not just on the roads, but also currently in industrial vehicle production. Flexible, wireless communication technologies are needed to provide the 5G technology that will enable efficient and agile production. In the age of the Internet of Things, automotive manufacturers and suppliers rely on automated production processes – for example, for real-time control and monitoring of production process. 5G can be used to realize completely new industrial applications with the highest demands in terms of reliability and real-time transmission capability. For example, driverless transport systems can be linked with mobile robots, and wirelessly networked, highly flexible production modules can be combined with each other.

The new approach of the Federal Network Agency to assign frequencies in the range from 3,700 to 3,800 megahertz is the right one. Eliminating distinctions between regional and local networks as well as between indoor and outdoor use (band division) gives

local industrial networks priority. This allocation of 5G frequencies for local applications is globally unique. Local networks complement the comprehensive network expansion of mobile radio operators and guarantee the necessary density of 5G supply for industrial applications. The pending application procedure for local networks must now start quickly, and certainly no later than the second half of 2019. At the same time, the fees incurred for allocation must not exceed the administrative costs. The frequency usage fees should also be based on this so that they can be planned economically in the long term.

5G is the key to the country's digital future. As an innovative user of the technology, the German automotive industry can be a pioneer if the application process for local networks starts soon, thus ensuring a rapid issue of the respective licenses. A rapid introduction of 5G will strengthen Germany as an economic location and help to establish the country as the lead market and leading supplier for this technology.

5G in industrial production



Visit the IAA in September and experience the future of mobility



The automotive industry is experiencing a radical change. This can be seen at the IAA. In the future, the demand will exist for much more than just a product and brand experience. The IAA is therefore positioning itself as a mobility platform. It is a meeting point, a stage, a place for discussion and demonstration at the same time.

Under the motto “Driving tomorrow,” global players in the automotive industry, providers of new mobility solutions, innovative tech companies and up-and-coming start-ups in politics and society will meet from September 12–22 in Frankfurt am Main.

Be part of the biggest mobility event of the year and discover the new formats from the IAA. Let's talk about the future of mobility. We're inviting you to the IAA Conference, where pioneers and experts from the mobility industry meet to talk about the future. Plenty of new experiences await you at the IAA Exhibition and the IAA Experience. We are tackling the increasing shortage of skilled workers by providing IAA Career, which focuses on networking and job prospects.

The IAA Conference forms the substantive foundation of the IAA as one of its four pillars. Exciting talks, stories, debates and keynotes will be offered on four stages from September 11–13. The IAA Conference will kick off the discourse about future-related topics, such as artificial intelligence, infotainment, alternative drives, solutions for

climate change, smart cities and the sharing economy. It will take the dialog to a new level – more than 200 CEOs, visionaries, lateral thinkers and inspiring people from society, science, politics and the international automotive industry as well as the tech scene will share their visions and ideas. High-ranking speakers such as German Chancellor Angela Merkel, IBM CEO Ginni Rometty, Daimler CEO Ola Källenius, Waymo CEO John Krafcik, Formula 1 world champion and investor Nico Rosberg, Microsoft Cloud boss Scott Guthrie and Polestar CEO Thomas Ingenlath have already been confirmed.

With this program, the IAA is not only Europe's most important mobility platform, but also an important stage for political dialogs and forums.

The VDA is once again offering political office holders and ministry and government authority employees individual tours of the IAA. To find out more about these tours, please contact Tineke Geywitz and Sebastian Brunkow from the VDA organization team at tineke.heywitz@vda.de and sebastian.brunkow@vda.de.

Adrenaline?
On.

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Everything
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www.iaa.de

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