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IAA 2018: Commercial vehicles deliver commercial benefits – Bosch increases mobility sales

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- ▶ Mobility Solutions business sector increases sales from day-to-day business by four percent.
- ▶ Business with solutions for trucks and off-highway vehicles grows between seven and eight percent.
- ▶ Bosch vision: road freight of the future should ideally be as free of emissions, accidents, and stress as possible.
- ▶ Bosch management board member Rolf Bulander: “We want trucks to be beasts of burden, but not a burden for others.”

Stuttgart and Hannover, Germany – Bosch is still on course for growth: this year, the company’s mobility business is expected to increase its sales from day-to-day business by four percent, and will thus continue to grow twice as fast as automotive production. Bosch generates one-fourth of its sales revenue from technology for commercial vehicles, ranging from vans to 40-ton trucks. Its business with solutions for trucks and off-highway vehicles is growing especially rapidly, at a rate of between seven and eight percent. Bosch is active in a growing market. In 2017, sales of heavy trucks grew by almost eight percent in China, 18 percent in the United States, and 45 percent in India (source: VDA). “As road freight evolves to face the future, Bosch offers both commercial and technological strength in equal measure,” says Dr. Rolf Bulander, chairman of the Mobility Solutions business sector of Robert Bosch GmbH. The major driver is its powertrain business for commercial vehicles. Global sales of diesel injection systems grew by one-third in 2017 alone, and even faster in China. In the years ahead, these sales will stabilize on a high level. Bosch has 2,600 engineers alone working on the truck powertrain of the future. By the end of the year, the Mobility Solutions business sector will employ over 54,500 R&D associates – 5,000 more than at the beginning of the year.

Climate protection, air pollution, urbanization, driver shortage: the logistics sector faces a series of major challenges. And as if that were not enough, road freight will increase by another 50 percent by 2040 (source: Shell). “One of the most pressing issues of traffic policy in the light of growth in road freight is what we can do to minimize its impact on the environment, people, and the road network,” Bulander says. Bosch has some technical solutions, and not just under the hood – some are connected services that go beyond the vehicles themselves. “We want trucks to be beasts of burden, but not a burden for others,” Bulander says. Bosch’s vision: road freight of the future should ideally be as free of emissions, accidents, and stress as possible. The path to this goal incorporates electrification, automation, and connectivity for commercial vehicles.

From combustion engines to fuel cells: Bosch is bringing energy to the powertrain

An important milestone for Bosch is to make commercial-vehicle powertrains more efficient and thereby reduce fuel consumption as well as emissions of CO₂ and nitrogen oxides. To achieve this goal, Bosch is working to further develop both diesel and alternative powertrain solutions. “For many years to come, the development of commercial-vehicle powertrains will involve a number of disciplines. We would be well advised to approach their electrification with a technologically open mind,” Bulander says. In 2025, 80 to 90 percent of all trucks will be diesel-powered. But by 2030, one in four new commercial vehicles worldwide – nearly one in three in China – will be electrically driven. “Nobody who wants to give heavy trucks a secure future can afford to rule out the option of producing alternative fuels using electricity from renewables, known as synfuels,” Bulander says.

Bosch has set itself the goal of being the international market leader in electromobility. To this end, the company offers appropriate solutions and has a broad portfolio for the electrification of commercial vehicles – e.g. 36-volt power packs for cargo e-bikes, the e-axle for delivery vans, and fuel-cell powertrains for 40-ton trucks. Bosch is developing the latter in partnership with the U.S. start-up Nikola Motor Company. In addition, Bosch has entered into a strategic partnership with Weichai Power, a Chinese manufacturer of engines for commercial vehicles, to promote the uptake of fuel cells. But Bosch is not only ensuring new vehicles are electrically driven: it also offers electromobility as a retrofit – with an electrified axle that can be integrated into semitrailers. This means they can generate electricity during braking and feed it into the trailer’s power units. In the case of a refrigerated trailer, Bosch calculates that this can deliver annual savings of up to 10,000 euros.

Bosch is teaching trucks to drive

Another major growth area alongside electrification is the automation of commercial vehicles. In both areas, the signs are set for double-digit market growth over the next decade. Bosch sees driver assistance as a step along the way to automated driving. When trucks are involved in accidents, the risk of fatalities is twice as high. For Bosch, this is reason enough to use driver assistance systems to make truck drivers' lives easier and the roads safer. The turn assistant, blind-spot recognition, and predictive emergency braking system help prevent truck accidents – and Bosch offers the necessary radar sensors among other products.

Automation of commercial-vehicle driving also presents further challenges for the transportation industry: even now, there are 50,000 too few truckers in the United States, and that figure is likely to triple within ten years. Europe is in a similar situation. In answering these challenges, Bosch sees a great deal of potential in hub-to-hub automation: driverless trucks shuttling between depots. This technology has the potential to resolve several transportation industry problems at once, increasing logistics companies' economic efficiency, transport volumes, and safety. Platooning, or the automated driving of trucks in each other's slipstream, is in Bosch's view a logical further step in automation. This saves not only labor costs, but also fuel. However, it also means that legislation, technology, and infrastructure have to satisfy stricter requirements. Bosch is involved in major EU research projects in the field.

Digitally connected logistics solutions, from freeway to front door

For Bosch, connectivity means new efficiency for transport systems – and thus relief for our congested roads as well as for logistics companies. When it comes to the logistics of the future, Bosch can contribute twofold technical expertise: on the one hand, its broad knowledge of the commercial-vehicle domain, and on the other its profound IoT expertise. “Bosch enables digitally connected logistics solutions, from freeway to front door,” says Dr. Markus Heyn, member of the Robert Bosch GmbH board of management responsible for the commercial-vehicle business. Today, nearly every new truck in Europe and the United States is part of the internet. In this context, Bosch supplies truck manufacturers with telematics platforms that make things such as software updates or predictive diagnostics possible, which also opens up new business in connected services. Even now, the company's service centers are using the relevant sensor systems to monitor the condition of especially critical deliveries of goods, including vital

goods such as blood plasma – around the clock. Every year, the control centers monitor nearly 40,000 high-value truck loads in transit. Bosch is also using the internet of things to automate delivery tracking: sensors on goods and containers transfer information about position, temperature, and vibration to the cloud. Initial experience in the field shows that these real-time logistics solutions mean that dispatchers can cut their search and inventory effort by more than half. Moreover, they increase the availability of reusable containers by as much as 30 percent. Bosch wants connectivity to make road freight altogether more productive and reduce the burden on the road network. “Whether through electrification, automation, or connectivity, Bosch solutions are helping to ensure that road freight does not come up against the limits to growth,” Heyn says.

Press photos: #1092493, #1163827, #1287729, #1361006, #1452642, #1462165, #1466863, #1467014, #1467188, #1467189, #1467190, #1467191, #1467192, #1467193, #1467214, #1467213

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Bosch at the IAA Commercial Vehicles 2018

- **Press conference: Wednesday, September 19, 2018, 1:20 p.m. – 1:40 p.m.**
with [Dr. Rolf Bulander, chairman of the Mobility Solutions business sector](#), and [Dr. Markus Heyn, member of the board of management of Robert Bosch GmbH](#), at the Bosch booth A01 in Hall 16.
- **Follow the Bosch IAA 2018 highlights** on www.bosch-iaa.com or on Twitter: [#BoschIAA](#)
- **Panels with Bosch experts at the New Mobility World Forum, pavilion 11, section D:**
 - **Wednesday, September 26, 10:00 a.m. – 11:00 a.m.:** Presentation: “The enhancement of automated driving (and AI)” with Dr. Johannes-Jörg Rüger, head of the Commercial Vehicle and Off-Road unit, Robert Bosch GmbH
 - **Thursday, September 27, 11:15 a.m. – 12:15 p.m.:** Panel discussion: “Aftermarket – More than just repair and maintenance”
 - **Thursday, September 27, 2:30 p.m. – 3:30 p.m.:** Presentation and discussion: “Masters of digitalization: digitalizing businesses and mobility ecosystems,” with Dr. Rainer Kallenbach, president of the Connected Mobility Solutions division, Robert Bosch GmbH

Mobility Solutions is the largest Bosch Group business sector. In 2017, its sales came to 47.4 billion euros, or 61 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector pursues a vision of mobility that is accident-free, emissions-free, and stress-free, and combines the group's expertise in the domains of automation, electrification, and connectivity. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,000 associates worldwide (as of December 31, 2017). The company generated sales of 78.1 billion euros in 2017. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 125 locations across the globe, Bosch employs some 64,500 associates in research and development.

To learn more, please visit www.bosch.com, iot.bosch.com, www.bosch-presse.de, twitter.com/BoschPresse.

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**More road freight,
less impact on the environment and road network:
Bosch is enhancing the utility of commercial vehicles**

Presentation by Dr. Rolf Bulander and Dr. Markus Heyn,
members of the board of management of
Robert Bosch GmbH,
at the press conference on September 19, 2018,
at IAA Commercial Vehicles in Hannover

Check against delivery.

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There are moments, ladies and gentlemen,

when we tend to see trucks, the beasts of burden on our roads, as more of a burden than anything else. When they slow down traffic in the freeway fast lane, or block the off-ramps leading to service stations, we see them as more of a curse than a blessing. And as if that were not enough, road freight will increase by another 50 percent by 2040. What can we do to minimize its impact on the environment, people, and the road network? This is one of the most pressing issues of traffic policy. Bosch has some technical solutions, and not just under the hood, but also on the internet. With our hardware and software, we are increasing trucks' utility. We want them to be beasts of burden, but not a burden for others.

More specifically, what are the issues that concern the logistics industry? Let me sketch out six points:

- The first is climate action. The European Union has announced its first ever CO₂ standards for trucks. Regardless of the powertrain technology used, Bosch systems help improve new trucks' carbon footprint.
- The second is clean air. Emissions standards for trucks are becoming tighter – worldwide. In 2020, for example, India will leapfrog from Euro 4 to Euro 6. In the United States, emissions are to be measured in real driving conditions, like in Europe. And the emissions limits will be significantly lower. Bosch offers truck manufacturers the solutions they need to satisfy these ecological demands.
- Third, urbanization. Today, half the global population lives in cities. By 2050, the share will be two-thirds. Road freight will take on a dual role as a result. While heavy trucks will tend to deliver goods to depots on city outskirts, the final mile will be the job of light trucks and vans. Logistics needs to be reimagined, especially in conurbations. And Bosch has solutions for this new-look urban freight transport, including cargo scooters and cargo bicycles.

- Fourth, online commerce. In Germany alone, the number of packages delivered topped three billion for the first time in 2017, and market studies expect the figure to reach 3.8 billion by 2020. This development is being driven by the increasing number of orders over the internet. But it is the internet, or rather the internet of things, that is helping Bosch to make deliveries significantly more efficient.
- Fifth, accident prevention. Trucks are involved in one in ten accidents resulting in personal injury. And when trucks are involved in accidents, the risk of fatalities is twice as high as when only passenger cars are involved. This is reason enough to use Bosch driver assistance systems to make truckers' lives easier and our roads safer.
- Sixth, economic considerations, or more specifically cost pressure on logistics companies. Fuel accounts for one-third of trucks' operating costs, and drivers for roughly another third. Even now, there are 50,000 too few truckers in the United States, and that figure is likely to triple within ten years. There are signs that this lack of drivers will also affect Europe. Bosch's answer to this is to teach trucks to drive – this will prevent accidents, and the fuel savings will reduce CO₂ emissions. What benefits logistics companies will also benefit people and the environment. It's a win-win situation.

Technology for trucks, services for logistics:

Bosch's dual strength

Beyond the question of costs, therefore, the major issues of mobility also concern the commercial-vehicle and logistics industries. The road freight of the future should ideally be as free of emissions, accidents, and stress as possible. To achieve this, we have to increasingly electrify, automate, and connect it. It is not only in passenger cars that we are taking this development path, but also in road freight, with all its peculiar characteristics. We are one of the world's leading IoT providers, as well as one of the biggest suppliers in the commercial-vehicle industry – few other companies can combine logistics services and truck technology the way we can.

For the modernization of freight traffic, Bosch can bring both economic and technological strength to the table. This year, our Mobility Solutions business sector is expected to increase its sales from day-to-day business by four percent, and will thus continue to grow twice as fast as automobile production. It generates every fourth euro of its sales revenue from technology for commercial vehicles, from vans to mega-trucks. Our business with solutions for trucks and off-highway vehicles is growing especially rapidly. Like last year, growth will be between seven and eight percent. Beyond the current year, we will be continuing our growth trajectory by investing in innovations. By the end of the year, Bosch will have over 54,500 R&D associates working on mobility solutions – 5,000 more than at the beginning of the year. This is also the team that will create new solutions for transport and logistics. For example, 2,600 engineers alone are working on the truck powertrain of the future.

Diesel, battery, and fuel cell:

for Bosch, there is more than one alternative powertrain

What will this powertrain be? We can imagine a number of alternatives, but are also deliberately continuing to develop diesel technology. Given that 80 to 90 percent of all trucks will be diesel-powered in 2025, this is not least a matter of necessity. Bosch engineers will play their part in helping diesel-powered trucks meet emissions and consumption standards worldwide. It's a question of combating global warming and protecting the environment – as we already said, these are the logistics industry's top two challenges. Every milligram of reduced emissions counts, and every percentage-point reduction in fuel consumption means an average 700 euro reduction in annual operating costs for a long-distance truck. How do we want to go about this? For us, reducing fuel consumption and CO₂ emissions means increasing the efficiency of injection systems. And when it comes to reducing NO_x emissions, one of our solutions is the same active management of exhaust-gas temperature we have applied in passenger cars. For us, this is both a technological challenge and a business opportunity.

By the start of the next decade, our global business with exhaust-gas treatment systems will have doubled from its 2016 level. And unit sales of our common-rail injection systems grew by one-third in 2017 alone, and even faster in China. In the years ahead, these sales will stabilize on a high level. All this clearly shows that environmental protection is both a challenge and a boost for our truck-diesel business.

Nonetheless, there will be a growth in electromobility in freight traffic over the course of the next decade, and Bosch will be involved. By 2030, every fourth new commercial vehicle worldwide – nearly every third in China – will be electrically driven. Initially, these vehicles will mainly be urban buses and delivery vans. This is a field in which we scored business success early on: our powertrain components are to be found in Europe's largest electric vehicle fleet, the German Post Office's StreetScooters. It is our objective to be the global market leader for electromobility as well. To achieve it, we offer a wide portfolio for commercial-vehicle electrification – from bicycles, as the smallest delivery vehicles, all the way to 40-ton trucks.

- The portfolio starts with our 36-volt powertrains for cargo bikes that can weave flexibly through urban traffic. Our e-bike business alone already supplies them to four cargo-bike manufacturers. And in 2019, our 48-volt powertrain system will debut in an e-trike for mail and package deliveries. Here, we make use of a modular system, which means that it takes a maximum of 18 months from the awarding of a contract to start of production.
- Next in line is our e-axle for vans, which goes into production in 2019. Easy to integrate, this system significantly cuts development times for both established automakers and new market entrants. With this system as well, we are giving urban delivery traffic a new electric look.

- Indeed, we can even electrify today's semitrailers. Here in Hannover, we are showcasing an electrified trailer axle that can be integrated into existing truck trailers. During braking, the axle recuperates energy and feeds it back into the trailer power units. In a refrigerated trailer, this saves nearly 10,000 euros a year. This money-saving electromobility feature can also be retrofitted.
- Finally, the ultimate question to be solved is the electrification of heavy tractor units. For medium-range trucks, we are developing battery-electrical powertrains. But how can heavy, long-haul delivery trucks be electrified? A battery would be too heavy and too expensive, and its range too short – the cost-driven freight transportation business has long regarded trucks that drive electrically over long distances as technically and economically unfeasible. Our solution is the fuel cell. Let's compare the figures. A 40-ton truck capable of driving long distances electrically would have to have nearly ten tons of state-of-the-art batteries on board. A hydrogen tank for a fuel cell would weigh one-tenth of that. Bosch is using two alliances to take up this technology. The first is with the U.S. start-up Nikola Motors, which wants not only to build the necessary vehicles but also to establish a network of hydrogen filling stations. The second is with the Chinese engine manufacturer Weichai Power. Its prospects are good, not least because one million fuel-cell vehicles are expected to be driving on China's roads by 2030. Worldwide, we are making new energy available for trucks.

For many years to come, the development of commercial-vehicle powertrains will involve a number of disciplines. We would be well advised to approach their electrification with a technologically open mind. And let's not forget that we also need to tackle synfuels, where alternative fuels are produced using electricity from renewables. Nobody who wants to give heavy trucks a secure future can afford to rule out this option.

When driverless trucks shuttle between depots:**Bosch is initially focusing automated truck development on the U.S.**

Electrification is one major growth area in commercial-vehicle technology. Automation is another. In both areas, the signs are set for double-digit market growth over the next decade. Driver assistance systems are a stepping stone on the road to automation. They are crucially important for accident prevention, one of the six main points outlined at the start of our talk. Truck turn assistants, for example, help prevent trucks injuring pedestrians and cyclists. Bosch supplies the necessary radar sensors. Not least, we can interface assistance and steering systems. Our new generation of electronically controlled steering systems, for example, supports lane-keeping functions and automation. It is on show in a number of trucks at this year's IAA. As we move toward automated driving over the next five years, demand for smart steering systems in heavy trucks will double annually, and Bosch will lead the way.

In the United States, Bosch sees huge potential for automation in trucks. It is there that the lack of truckers is greatest, and there that every tenth truck sticks to the same highway routes. First of all, let's consider what we call "hub-to-hub" automation. By this we mean driverless trucks that shuttle continuously back and forth between two or three depots. This saves labor costs, increases transport volumes, shortens the payback time for investments in vehicles, and provides security – solving several of the industry's problems in one fell swoop. Even if automation like this is worthwhile, the technical challenges are considerable, whether in terms of computing power, which would have to increase 1,000-fold in a 40-ton truck, or whether in terms of the control center, which would have to resemble air traffic control. Nonetheless, the result could be an unprecedented services business.

One other logical development is platooning, or trucks driving in automated fashion in each other's wind shadow. This saves not only labor costs, but also fuel. However, it also means that legislation, technology, and infrastructure have to satisfy stricter requirements. Bosch is involved in major research projects in the field. And we are developing the telematics components needed for data exchange among platooning trucks. The first prototypes will be tested starting in 2019. We could well see car-to-car communication in trucks before we see it in passenger cars, since platooning is clearly an application that makes economic sense.

Where's the container, where are the goods?

Digitally connected logistics solutions, from freeway to front door

Especially in trucks, connected driving is more than just an essential requirement for automated driving. The internet offers the possibility of a new efficiency for transport systems, and of relief for our congested roads as well as for logistics companies. It's our job to exploit this potential – indeed, this was one of the issues we outlined at the start of our presentation. When it comes to the logistics of the future, Bosch can contribute twofold technical expertise. On the one hand, its broad knowledge of the commercial-vehicle domain, and on the other its profound IoT expertise. These two factors allow us to offer digitally connected logistics solutions, from the freeway to the front door.

But first, we connect trucks with the outside world. Today, nearly every new truck in Europe and the United States is part of the internet. In this context, we supply truck manufacturers with telematics platforms that make things such as software updates or predictive diagnostics possible. All in all, our sales of connectivity control units for trucks are growing by 15 to 20 percent annually.

By means of connected driving, ladies and gentlemen, Bosch is also moving directly into the business of connected services. And it is this business that is taking us beyond our role as a supplier to the commercial-vehicle industry. Even now, our service centers are monitoring the condition of especially critical deliveries of goods around the clock. In some cases, these are vital goods such as blood plasma. Every year, our control centers monitor nearly 40,000 high-value truck loads in transit. In addition, we are expanding our platform that provides secure truck parking along freeways. The Hamburg cruise terminal is the latest example of this. From next month, we will be offering long-haul trucks secure parking spaces there. This service is also intended for truck drivers waiting for their handling slot at one of the container terminals. The internet of things can not only make freight transport more secure than ever – it can also make it even more efficient. If we consider that nearly every fifth truck journey is unladen, there is clearly a lot of potential to be exploited here.

Moreover, Bosch is helping to create clarity in what was previously a logistical blind spot. Using the internet of things, we are automating delivery tracking by making a digital track and trace function possible. Our solution uses sensors on goods and containers that transfer information about position, temperature, and vibration to the cloud. Where is the transport container, and how are the goods doing? Finding answers to these questions used to take several hours: now they can be found in a matter of seconds. Initial experience in the field shows that the real-time logistics solutions we offer mean that dispatchers can cut their search and inventory effort by more than half. Moreover, the availability of reusable containers is increased by as much as 30 percent. We call this logistics 4.0.

This final point is a perfect illustration of the path Bosch wants to take in the logistics industry. Electrifying and automating trucks is one part of the story. Connectivity also contributes to this, but it can also increase the productivity of road freight as a whole. We are using the internet to reduce the burden on the road network. There is no doubt that more and more goods need to be transported. Bosch solutions are helping to ensure that this demand does not come up against the limits to growth.



Also as a retrofit solution **Bosch presents electromobility for semitrailers**

August 28, 2018
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- ▶ Smart, electrified axle recuperates energy during braking
- ▶ Electric refrigerated trailer: significantly quieter, saving up to 9,000 liters of fuel, and thus also CO₂
- ▶ Electricity makes semitrailers independent: important step toward automated semitrailer parking

Bosch is electrifying semitrailers, and thus making electromobility possible for today's semitrucks. At the IAA Commercial Vehicles in Hannover, Bosch will be presenting an electrified axle that can be integrated into semitrailers. The idea behind it is to integrate an electrical machine into the semitrailer's axles, instead of simply allowing them to roll freely, as has been the case up to now. This means they can generate electricity during braking, and feed it into the trailer's power units. In the case of a refrigerated trailer, the saving can be as much as 10,000 euros a year. If the cooling unit is operated using the power generated in this way, Bosch calculates that it can save up to 9,000 liters of diesel a year. An electrical start and acceleration boost function can help save additional fuel. Any fuel saving also reduces CO₂ emissions. One further advantage, especially for deliveries by urban supermarkets, is that electric cooling units make significantly less noise than diesel-powered ones. Deliveries can thus be made early in the morning or late in the evening without disturbing the neighbors.

"Bosch is making trucks' rear axles electric and smart. Our electrification solution for trucks makes economic sense and shows how electromobility can work even in today's trucks," says Dr. Markus Heyn, member of the Robert Bosch GmbH board of management. In addition, the electrical axle is an important step toward automated trailer parking on logistics companies' parking lots. Adding a powertrain to the axle means that the trailer can be shunted around the parking lot without a tractor.

Bosch offers this technology either for new trailers or as a retrofit solution. The potential demand is huge. In Europe alone, roughly a quarter of a million trailers with a gross vehicle weight of more than 10 metric tons are newly registered every year. One in five of these is equipped with a refrigeration unit.

Energy recuperation: passenger-car components work intermittently

In contrast to many other commercial-vehicle projects, Bosch engineers are relying on passenger-car parts for the electrified axle. For example, the SMG180 electric motor already features in hundreds of thousands of hybrid and electric cars worldwide, including the German postal service's StreetScooters. Unlike in electric cars, the motors in the electrified axle work only intermittently, starting only if they can recuperate energy. This may be the case when driving downhill or braking, for example. As a result of this recuperation, which is an established technology in passenger cars, energy is no longer lost when braking, but is stored in a high-voltage battery. The electricity can be fed into the motors during hill starts, or power the trailer's refrigeration unit, and in this way save a lot of fuel. Such demand-driven application has a further advantage: since the electric motors are inactive most of the time, recuperating energy or providing assistance when starting or on ascents for only a few seconds or minutes every hour, significantly less expensive production parts from passenger cars can be used in this trailer application. The motors are still powerful enough to move the trailer or to provide start assistance to construction vehicles.

Automated parking at the depot: electric motor is an invaluable helper

In addition, the electrified axle is an invaluable helper for automated driving – only when a motor is installed in the axle can a trailer maneuver independently at the depot. “Bosch's electrified axle makes trailers independent. By electrifying trailers, Bosch is taking an important step toward automated parking at freight depots,” Heyn says. They also facilitate remote-controlled electric driving on private property such as freight companies' premises or at ports. Up to now, truckers have had to do this task themselves, or a special trailer-shunting unit has done it for them. Now, however, the electric motor makes the trailer into an independent vehicle that can travel short distances. With the help of additional sensors attached to the trailer and installed at various points in the depot, it will be possible for goods trailers to park themselves.

Electrified axle: Q&A

What parts are needed to electrify an axle?

Bosch supplies an inverter and the relevant vehicle control unit (VCU). The separate motor generator (SMG) is available for installation as a complete electric motor, or the active components – rotor, stator, and resolver – can be integrated into the axle. A battery system that can store the energy is also required.

How much does an electrified axle cost?

Bosch cannot provide an exact figure. However, the company's view is that the system must pay back the original investment after two years' operation at the latest. In view of the cost savings the axle offers in applications such as refrigerated trailers, Bosch is confident that this goal is realistic.

Where can an electrified axle typically be used?

The most obvious choice at present is in refrigerated trucks, especially for food deliveries in urban areas. Electrically powered refrigeration units are not only more economical over the medium term, but also make significantly less noise. And there are none of the emissions caused by combustion engines. The construction industry is very interested in the start assistance function in excavation pits, especially when they are muddy.

How do you arrive at your estimate for fuel savings?

The diesel engine that currently powers the refrigeration unit, and that is now being completely displaced by electricity, consumes between two and three liters of diesel an hour. On this basis, annual consumption is roughly 9,000 liters. In addition, there are potential savings resulting from the electrical assistance provided when starting, accelerating, and on ascents. The extra saving may be as much as four percent.

Why does Bosch favor an axle with two electric motors?

Two electric motors can recuperate significantly more energy, and offer a high additional benefit at relatively low extra cost, thus allowing greater savings to be made. In addition, a dual-motor axle is better for automatic maneuvering at a depot: having an electric motor at each end of the axle significantly reduces the trailer's turning radius. If the customer wishes to save costs, electrification with just one motor is possible.

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Presentation “The enhancement of automated driving (and AI),” with Dr. Johannes-Jörg Rüger, head of the Commercial Vehicle and Off-Road unit, Robert Bosch GmbH
 - **Thursday, September 27, 11:15 a.m. – 12:15 p.m.:** Panel discussion “Aftermarket – more than just repair and maintenance”
 - **Thursday, September 27, 2:30 p.m. – 3:30 p.m.:** Presentation and discussion “Masters of digitalization: digitalizing businesses and mobility ecosystems,” with Dr. Rainer Kallenbach, president of the Connected Mobility Solutions division, Robert Bosch GmbH

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To learn more, please visit www.bosch.com, iot.bosch.com, www.bosch-presse.de, twitter.com/BoschPresse.



This Bosch app makes car keys a thing of the past Safe and stress-free key management by smartphone

August 2018

PI10715 BBM Fi/BT

- ▶ Digital, not analog: with Perfectly Keyless, Bosch puts car keys onto smartphones.
- ▶ World first: the first keyless access system for trucks.
- ▶ For fleet operators: they can now flexibly manage which drivers have vehicle access and when.
- ▶ No more hunting for keys: a digital key is always where it is needed.

Stuttgart, Germany – The key of the future is digital, and offers more features than its analog predecessors: impossible to lose or steal, there is never a need to search for it. That is because it is stored securely and specifically for each user in a smartphone app. “Our Perfectly Keyless app is making conventional vehicle keys a thing of the past. Bosch is taking the car key into the digital realm and making it available anywhere, anytime,” says Harald Kröger, president of the Bosch Automotive Electronics division. With Perfectly Keyless, the smartphone replaces the analog vehicle key. This concept can offer owners of private vehicles increased convenience, but where it really shines is in vehicle fleets with multiple drivers. No more key handovers: fleet managers and logistics providers simply use the app to give drivers access to the vehicles. “Bosch’s digital vehicle key gives fleets a boost towards greater connectivity,” Kröger says. The company believes there is a huge market for its solution, which is making its world debut at the IAA Commercial Vehicles in Hannover: potential customers include some 15,000 logistics providers in Germany alone. Most of them manage at least a dozen vehicles and drivers.

A keyless journey

Row upon row of hundreds of keys hanging on large boards – logistics providers still often use this method to organize the keys to their fleet vehicles. A missing key triggers a massive search operation. But every minute counts, especially with commercial vehicles. After all, if a truck isn’t moving, it’s not making any money. At the core of the new system is an app that dispatchers and truck drivers both have on their phones. This makes it possible to grant vehicle access with just a

few clicks. In the future, the Bosch solution will also allow logistics providers to completely integrate digital key management into their dispatch and scheduling systems. As soon as dispatch has assigned drivers and trucks to a route, the system automatically generates digital keys for the vehicles and sends them to the drivers' smartphones. If the route scheduling changes, the software adjusts the keys accordingly. "Thanks to Bosch's fully digital key management, logistics providers enjoy both security and flexibility in their planning. This is the only way the logistics of the future will be able to function efficiently," Kröger says.

Secure key management with app and cloud

Bosch digital key management connects trucks and the smartphone app via the cloud. Dispatchers or fleet managers use the app to assign a truck to a driver for a particular route. Perfectly Keyless generates a personal, secure digital key and sends it via the cloud to the truck and to the driver's smartphone. As the driver approaches the assigned truck, the sensors installed in the truck detect the smartphone via a wireless connection. The vehicle doors will open only if the key on the phone "fits" the digital lock in the vehicle. These sensors can also tell when the driver is in the driver's seat, and the engine starts up as soon as the driver presses the start-stop button. When the driver gets out of the car at the end of the journey, the system detects this and automatically locks the doors.

Battery dead? No problem!

But what happens if the smartphone's battery dies, or the device has gone missing? In the future, the vehicle key in the smartphone will work even if the phone battery is dead. In that case, the phone and truck will communicate using near-field communication (NFC), a wireless protocol for sharing data over short distances. Bosch plans to make it the "double hull" of its solution. If the smartphone is lost or stolen, and the app with it, the digital key can be simply deactivated online, thus blocking access to the vehicle. It cannot be opened and started until the fleet manager uses the app to provide another driver or a new phone with access to the truck.

Press photos: #1452339, #1452340, #1452341, #1452342

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BOSCH AT THE IAA COMMERCIAL VEHICLES 2018

- **Press conference: Wednesday, September 19, 2018**, from 1:20 p.m. to 1:40 p.m., with [Dr. Rolf Bulander, chairman of the Mobility Solutions business sector](#), and [Dr. Markus Heyn, Member of the Board of Management, Robert Bosch GmbH](#), at the Bosch booth A01 in Hall 16.

- **Follow the Bosch IAA 2018** highlights on www.bosch-iaa.com or on Twitter: [#BoschIAA](https://twitter.com/BoschIAA)
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Additional information is available online at www.bosch.com, www.bosch-press.com, twitter.com/BoschPresse.



Fully charged: Bosch is putting electric vans on the road

August 16, 2018
PI10744 BBM IEh/af

- ▶ Bosch solution makes electrical powertrains for delivery vehicles cheaper and more efficient.
- ▶ Huge market potential: three-fourths of Germany's commercial vehicles are vans.
- ▶ Bosch management board member Heyn: "Bosch's electrical powertrain for commercial vehicles has the potential to change the face of urban delivery traffic."
- ▶ More information about the powertrain for electric vans can be found [here](#).

Stuttgart, Germany – Ordered with two clicks and conveniently delivered to your door the same day: the boom in online shopping is stretching delivery traffic in major cities to its limits. Vans and heavy trucks squeeze their way through city centers, where a lack of loading zones often leads them to double park. The result: blocked roads, noise, and emissions. In cities around the world, this is also causing traffic jams and fueling discussions about driving bans. And it's not just delivery services that are affected, but also tradespeople and other small companies that make customer visits in vans. "To keep pace with goods supply in cities, there's no avoiding a rethink of delivery traffic," says Dr. Markus Heyn, member of the board of management of Robert Bosch GmbH. This is one objective Bosch is looking to fulfill with its new electric powertrain for light commercial vehicles. The first vehicles to have this under the hood will launch in 2019.

Quiet deliveries

Deutsche Post has already initiated change in urban deliveries with its StreetScooter, which uses a Bosch drive system. Now Bosch is going a step further by launching an electrical powertrain suitable for the vast majority of delivery vehicles. The idea behind this electromobility campaign is for electric vans to handle last-mile deliveries from distribution centers to recipients. The kind of stop-and-go traffic this entails is one area in which electric vehicles are

particularly efficient, because they can recuperate the energy from constant braking, which increases their range. Most delivery routes amount to less than 80 kilometers a day – a distance easily covered on a single battery charge. Fleets can then be recharged overnight at the depot. Any driving bans in city centers would not affect electric fleets, since their powertrains cause zero local emissions. And it's not just cities that are keen to see package and courier services make resource-sparing deliveries. For 61 percent of Germans, whether an online retailer makes deliveries with electric vehicles is a key criterion in their choice (source PwC). One further advantage is that electric vehicles make less noise, which should also increase people's willingness to accept deliveries later into the evening. This could relieve traffic at peak times and provide for more flexible delivery windows. "Bosch is bringing e-mobility to where it really makes sense – urban deliveries," Heyn says.

Ready for the mass market

There are [two versions](#) of Bosch's eCityTruck powertrain: one with a transmission and one without. The goal is to create solutions that are quick to integrate and accommodate automakers' differing requirements. These powertrain solutions can be scaled for light commercial vehicles weighing two to 7.5 metric tons, making them suitable for a large section of the commercial vehicle market. How? Small vans are very common; approximately three-fourths of all commercial vehicles registered in Germany belong to this class, and that number is on the rise (source: Shell). "Bosch's electrical powertrain for commercial vehicles has the potential to change the face of urban delivery traffic. We're getting electric vans ready for the mass market," Heyn says. With its new eCityTruck powertrain concept, Bosch has taken multiple components such as an electric motor and power electronics and combined them into one unit. This economizes on parts, making the powertrain not only far more efficient, but more affordable as well. Thanks to the easily integrated solution, customers no longer have the time-consuming task of developing new components. One further advantage for automakers, both established names and new players, is that the Bosch solution lets them bring vehicles to market quickly.

Bosch already offers an all-in-one solution for passenger cars – the [e-axle](#) – which significantly shortens vehicle development times. By expanding its product portfolio to include light commercial vehicles, Bosch is taking another decisive step in supporting automakers with their electrification strategies.

Bosch's plans for the electrification of commercial vehicles go beyond vans. Together with the Nikola Motor Company, a U.S. start-up, Bosch is developing a powertrain that raises the bar for electric range. For Bosch, these powertrain technologies for delivery traffic are another milestone on the path toward achieving a leading global position in the electromobility mass market set to emerge after 2020, and toward making its vision of emissions-free, accident-free, and stress-free mobility a reality. Bosch sees the future of mobility as automated, connected, and electrified.

More information about the electrical powertrain for commercial vehicles can be found in the relevant [web special](#).

Press photos: #1452642, #1452382, #1452376, #1452375, #1452377, #1452374, #1152530

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Automated, connected, and electrified: Bosch is blazing new trails in freight traffic Bosch innovations to look out for at the IAA 2018

September 2018
PI10709 BBM Fi/BT

- ▶ Tomorrow's freight traffic will be accident-free, stress-free, and emissions-free
- ▶ Connected services are making life easier for truck drivers and logistics specialists
- ▶ Driver assistance systems for commercial vehicles are making roads safer
- ▶ New powertrains are making trucks more efficient

Hannover and Stuttgart, Germany – Cutting costs, improving logistics chains, and making drivers' lives easier: with technology to automate, connect, and electrify commercial vehicles, Bosch is improving efficiency and safety in logistics. At the 67th IAA Commercial Vehicles in Hannover, the supplier of technology and services is presenting its innovations for tomorrow's freight traffic.

Highlights at the Bosch booth (booth A01 in hall 16)

Electric trailer axle: With the electric axle, energy is no longer lost when braking, but is stored in a high-voltage battery where it can then be reused for a wide variety of applications, such as operating cooling compressors for trailers or providing starting assistance in construction vehicles. Compared with conventional diesel powertrains of the trailer, electric trailer axles can save up to 9,000 liters of fuel annually. They also facilitate remote-controlled electric driving, for example on freight companies' premises or at ports. To implement this, Bosch supplies tried-and-tested parts that are compact and readily available, such as an inverter, the associated ECU, and the vehicle control unit. The separate motor generator is available for installation as a complete electric motor, or the active components – rotor, stator, and resolver – can be integrated into the axle.

eCityTruck solutions: Bosch has developed a new, modular concept for electrical powertrains. eCityTruck solutions, as they are known, are designed for light commercial vehicles up to 7.5 metric tons and enable them to make urban deliveries with low noise and zero local emissions from the powertrain. For the new powertrain concept, Bosch combined an electric motor and power

electronics into a single unit, thus reducing the number of components needed and making the powertrain more efficient and economical.

Perfectly keyless: This keyless access system for trucks will soon let fleet operators manage their vehicle keys digitally. Freight and commercial vehicle rental companies can use a smartphone app to give their drivers access to specific fleet vehicles and to flexibly manage who has access and when. This is made possible by sensors installed in the truck that connect to an app on the driver's smartphone. Once installed on the phone, the app generates a unique security key there that fits the digital lock in the vehicle. If the driver approaches the vehicle, Perfectly Keyless recognizes the smartphone, identifies the security key, and unlocks the door. As soon as the driver moves away from the truck again, the vehicle is automatically securely locked.

Additional highlights at the Bosch booth

New connected services are making life easier for truck drivers and logistics specialists

Connectivity platform for cloud-based services: Bosch uses a new connectivity platform to connect commercial vehicles throughout their service life, providing the technological foundation for such cloud-based services as predictive diagnostics and over-the-air software updates. The platform has two main components: the basic software module is the secure communication interface between the vehicle, the cloud, and the services, while the data management module enables commercial vehicle manufacturers or fleet managers to organize vehicle data, analyze it, and keep the vehicle software continuously updated.

Predictive diagnostics: Vehicle downtime is usually unplanned and, particularly in the case of commercial vehicles, often results in significant economic damage. Bosch's predictive diagnostics registers and evaluates vehicle component and system states and continuously reports them to the cloud. Based on this data, faults can often be predicted and thus resolved in time. This reduces maintenance and service costs for commercial vehicles, and the lower number of breakdowns increases their availability.

Electronic horizon: In the future, Bosch's electronic horizon will become smarter with every trip. This service is based on high-definition maps with topographical data for the route ahead. Engine and transmission management then takes this data into account in order to select the most efficient driving strategy possible and further reduce consumption. The electronic horizon has been available for several years, but now Bosch is enhancing it. In the future, the function will determine whether the information stored in the map agrees with actual

conditions on the road. For example, if the vehicle camera detects a speed limit sign on the road that specifies 30 kph, but the map says the limit is 50 kph, the truck's navigation system will learn the new speed. In the future, this information will also be shared with other trucks via the cloud. The smart electronic horizon is set to go into production in early 2019.

Freight monitoring: Where are my goods and how are they doing? These are questions logistics specialists and customers ask. Bosch's Transport Data Logger provides answers and makes the goods supply chain transparent. Measuring around 10 square centimeters, the small box with integrated sensors monitors the transport of sensitive goods and measures temperature, humidity, tilt, and shock events during transport. The measured values are displayed in a smartphone or tablet app and documented. If certain values are exceeded, the app triggers an alarm and potential damage to the goods can be detected early on and attributed to the person who caused it.

Central gateway: The central gateway controls data exchange between the ECUs in the truck and the outside world across all bus systems, and is therefore the central communication node for connected commercial vehicles. Modern transmission and encryption technologies make the data exchange particularly secure. They prevent unlawful access to the vehicle network using firewalls or the intrusion detection system developed by Bosch subsidiaries ETAS and ESCRYPT.

Digital side-view mirrors and displays improve the driving experience and enhance safety

Digital side-view mirrors: The digital mirror camera system developed by Bosch and Mekra Lang for side-view mirrors is going into production in 2019. It replaces the two large mirrors on the outside of the vehicle's cab with video sensors, which reduces drag and lowers fuel consumption by as much as 2 percent. Images from the cameras are displayed in real time on high-resolution monitors in the driver's cab. The system adjusts the monitor display according to situation: long view on the freeway, large angle of view in city traffic, and high contrast for night driving. And thanks to Bosch's EasyFit camera system, existing truck fleets can also be retrofitted with digital surround view. This system is based on four ultra-wide-angle cameras that show a 360-degree view around the vehicle.

Digital instrument cluster: To ensure easy and distraction-free operation of the ever expanding connectivity, driver assistance, and infotainment functions in trucks, Bosch is bringing digital instrument clusters into the cockpit. In addition to the conventional speedometer view, the display will show function information, route planning graphics, and images from the reversing camera or night-vision

device, prioritized according to the driving situation. Drivers are always shown exactly the information they need at any given moment, which reduces complexity and allows them to focus entirely on the road.

Driver assistance systems enhance the driving experience and improve the safety of commercial vehicles

Turn warning: Especially in downtown areas, truck drivers need to keep an eye on traffic, traffic lights, and road signs, all while also watching out for pedestrians and cyclists. In the future, Bosch's turn warning will assist them with turning maneuvers in complex situations. Radar sensors detect crossing pedestrians and cyclists in ample time and warn truck drivers of an imminent collision, allowing them to promptly brake or take evasive action.

Blind-spot recognition: Whether in the city or on the freeway, it is often difficult for drivers of commercial vehicles to maintain an overview of the areas next to and diagonally behind them. The blind-spot recognition uses radar sensors to monitor the areas next to the vehicle, detect other road users, and warn the driver. This function also alerts drivers of imminent collisions when changing lanes.

Predictive emergency braking: Systems for automatic emergency braking for commercial vehicles have been mandatory across the EU since fall 2015 for all trucks with a gross vehicle weight of more than eight metric tons. Bosch's solution uses a combination of a multi-purpose camera and a radar sensor, both installed at the front end of the truck. The radar sensor detects objects in front of the vehicle and determines their speed as well as their position relative to the vehicle. If there is a risk of collision, the system warns the driver. If the driver doesn't react, the system automatically triggers an emergency braking maneuver.

Lane assistants: These use camera data to ensure that trucks don't unintentionally leave their lane. The lane-departure warning alerts drivers that they are in danger of drifting out of their lane by, for example, vibrating the steering wheel. The lane-keeping assistant keeps the vehicle in its lane by making gentle steering interventions.

Bosch steering systems for commercial vehicles point the way forward

Servotwin: The Bosch Servotwin electrohydraulic steering system improves the efficiency and convenience of heavy commercial vehicles. It offers speed-dependent steering support and consumes less fuel than purely hydraulic steering. Thanks to its electronic interface, the steering system is simultaneously the basis for driver assistance functions such as lane assistants or cross-wind

compensation. The steering system has many fields of application, including in Mercedes-Benz's self-driving Actros.

Rear-axle steering: The electric rear-axle steering system (eRAS) lets commercial vehicles with three or more axles use the leading and trailing axles to steer. This makes the turning radius smaller and reduces wear on the tires. Based on the steering angle of the front axle, transmitted by CAN bus, the steering system determines the optimum steering angle for the rear axle. After driving around a bend, the system also assumes the task of straightening out the wheels. Only when the vehicle is actually being steered does eRAS consume energy.

Bosch is electrifying commercial vehicles

Cargo tricycle with 48-volt powertrain: Light electric vehicles on two, three, or four wheels are playing an increasingly important role in the fast and flexible delivery of goods within cities. Bosch's 48-volt drive system is also used to power the Ligier cargo three-wheeler, which delivery services use to carry letters and parcels the last mile to their destinations in urban areas.

E-cargo bike: Electric cargo bikes are taking cities by storm and making the transport of food and small shipments fast and flexible. Bosch's Performance Line e-bike powertrain powers cargo bikes with a maximum torque of 63 Nm, ensuring a powerful start, even on uphill stretches in the city. With a second battery pack and favorable conditions, these bikes can travel up to 180 km – even when loaded. Nyon, the on-board computer, finds the fastest delivery route, as well as showing drivers the current time, speed, recommended gear changes, operating range, distance, and the current battery charge.

Thermal management for electric vehicles: Bosch uses smart thermal management to increase the operating range of electric vehicles by as much as 25 percent, as selectively distributing temperatures in the battery improves its efficiency. Bosch's thermal management system also lets each powertrain component be operated within its optimum temperature range, and the system always directs the heat and cold for the interior of electric vehicles to wherever it's needed.

Bosch is making the commercial vehicle powertrain more efficient

Exhaust-gas treatment: AdBlue injection systems, in conjunction with selective catalytic reduction (SCR) catalytic converters, support comprehensive exhaust-gas treatment. This plays a major role in ensuring that commercial vehicles can stay within the legal exhaust emission limits. The Denoxtronic 2.2 evo dosing system offers flexible configuration options and quickly pays for itself in fuel

savings. For light commercial vehicles, Bosch offers a particularly compact version, the Denoxtronic 6-5. The 6-HD version, with a dosing rate of up to 15 kg/h, is particularly suitable for high-capacity engines in heavy commercial vehicles.

Modular common-rail system: The modular common-rail injection system (CRSN) for commercial vehicles and off-highway applications ensures efficient fuel supply in diesel engines. It can be used in various configurations in assembled components with up to eight cylinders and outputs of up to 850 kilowatts. Depending on the segment and market, the system can last up to 1.6 million kilometers in on-highway operation, or 15,000 hours off-highway. Compared with conventional systems, it can reduce fuel consumption by as much as 1 percent – in a heavy-duty truck, this corresponds to savings of up to 450 liters of diesel per year. The system is also designed for the electrification of the powertrain.

Baseline common-rail system: Baseline common-rail systems, with up to 2,000 bar system pressure for medium- and heavy-duty vehicles as well as off-highway applications, are perfectly tailored for the requirements of emerging markets. Among other things, the system includes a broad product range of oil-lubricated pumps and Baseline injectors, and because it is standardized, systems integration, calibration, and validation for new applications are fast and efficient.

Variable oil pump: Existing oil pumps work with constant oil pressure to ensure that the engine is lubricated and the pistons are cooled at all times. The new Bosch solution for commercial vehicles can adjust its displacement volume, so it supplies exactly the right amount of oil in any situation. As a result, it requires less torque at certain stages of operation, so it uses up to 1 percent less fuel. The variable oil pump is based on the multi-vane principle and is available in three designs: with oil pan, in a compact front design, and as an engine cover.

Natural-gas drive systems: Global market forecasts for the coming years see double-digit growth rates in natural-gas vehicles, due mainly to their lower emissions of carbon dioxide and particulates compared with liquid fuels, and the fact that these vehicles run much more quietly. The Bosch portfolio includes the ECU, components for fuel injection and air management, and a number of sensors. These components are powerful and compact, and have been tried and tested for many years in the field.

Bosch is turning bus passenger compartments into entertainment centers

Coach entertainment series: Bosch's new Coach entertainment series brings modern multimedia and connected technology to the bus segment. All system components, such as high-resolution monitors and the central head unit, are connected via Ethernet AVB. AVB stands for audio/video bridging – a transmission technology that ensures uninterrupted and synchronous audio-visual rendering in the automotive segment, even for high-definition (HD) films. The new Ethernet wiring is particularly lightweight and saves valuable installation space in the vehicle.

Coach head unit: The central Coach head unit lets bus drivers see all important information at a glance, while a touch screen lets them control the integrated navigation maps and the entertainment in the passenger compartment, and the mySPIN smartphone integration provides access to apps. All functions can also be voice controlled, and phone calls can be made using the integrated hands-free device.

Press photos: #419930, #419933, #419936, #419942, #546312, #1092493, #1235165, #1285607, #1285611, #1287729, #1404248, #1404249, #1404259, #1405104, #1405785, #1435834

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subsidiary and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 125 locations across the globe, Bosch employs some 64,500 associates in research and development.

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Germans would increasingly feel safer with autonomous self-driving trucks on the road Major Bosch survey for IAA 2018

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- ▶ Automated trucks on the road: more than one in three respondents have no preference for a human over a machine.
- ▶ Germans are annoyed by delivery traffic, but don't want frequent package deliveries to stop.
- ▶ Bosch board of management member Dr. Markus Heyn: "Delivery traffic on Germany's roads must become safer and more efficient, because it doesn't affect just logistics companies and retailers, but all road users."
- ▶ [Bosch solutions for commercial vehicles](#) relieve road freight.

Traffic jams, accidents, blocked roads – for many people in Germany, the thought of vans and trucks in traffic leads to just one thing: stress. More and more trucks are flooding the country's freeways and highways, and this inevitably pushes up the number of serious accidents involving commercial vehicles. One result of this is that Germans would increasingly feel safer with fully automated, driverless trucks on the road. This is the outcome of a survey conducted by Bosch and Innofact AG in the lead-up to the IAA Commercial Vehicles in Hannover. While almost 40 percent of respondents would rather that trucks have a human driver at the wheel, already more than one in three (37 percent) no longer have a preference for a human over a machine. In fact, one in four respondents would have more confidence in an autonomous truck than in a human driver. For now, driverless trucks are still an unrealized vision. But the survey shows that in Germany, people increasingly favor automated trucks when it comes to safety. The intelligent technology on board such trucks could prevent a large number of accidents: the reality is that nine out of ten accidents are due to human error.

Annoyed by delivery traffic

“Delivery traffic on Germany’s roads must become safer and more efficient, because it doesn’t affect just logistics companies and retailers, but all road users,” says Dr. Markus Heyn, member of the Robert Bosch GmbH board of management. Bosch has a clear vision: road freight of the future should be not just accident-free, but also ideally as free of emissions and stress as possible – for all road users. At present, most people stuck in traffic find trucks and vans rather annoying. According to 57 percent of respondents, Germans feel particularly unsafe in critical situations involving trucks – for instance, when merging onto the freeway or when a truck is turning. More than one in two (56 percent) believe that there are too many road freight vehicles on the road. Around half of respondents said their biggest complaint is when trucks block traffic while parking. Other annoyances include commercial-vehicle emissions (50 percent) and truck noise (43 percent). Only one in five respondents said that truck traffic didn’t bother them.

Little willingness to compromise

What the survey also highlights is that very few people are willing to do anything themselves to relieve delivery traffic on the road. For instance, three-fourths of Germans (73 percent) don’t want to shop less online. And few of them (49 percent) are willing to compromise by accepting longer waiting times for parcel deliveries as a way to relieve traffic – having parcel delivery just once a week instead of every day. However, one in four respondents (27 percent) did say that they would reduce delivery traffic by returning fewer goods, while 36 percent would have their parcels delivered to a central parcel station or collection point and then pick them up themselves. Paying more for parcels to be delivered – to have, say, more evening deliveries so as to spread traffic throughout the day – is something only 15 percent of respondents would consider.

The survey shows that Germans are highly critical of road freight, both on freeways and in cities. Trucks annoy them. But the fact is that road freight will increase by another 50 percent by 2040 (source: Shell study). That makes it all the more important to tackle pressing challenges such as preventing accidents and relieving road freight. At the 67th IAA Commercial Vehicles in Hannover, Bosch is showing how this can be achieved: there, the company is presenting [solutions for the automation, connectivity, and electrification of commercial vehicles](#).

Additional information on Bosch technologies for commercial vehicles:

<https://www.bosch-presse.de/pressportal/de/en/bosch-at-the-iaa-2017-168192.html>

<https://www.bosch-mobility-solutions.com/en/company/trade-fairs-and-events/iaa/>

Survey design: For the major study entitled “Commercial vehicles in road traffic” conducted on behalf of Bosch, Innofact AG surveyed 1,068 people throughout Germany between the ages of 18 and 69. The interviews were conducted in August 2018.

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