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Growth market: mobility as a service **Bosch establishes division for connected mobility services**

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- ▶ Bosch CEO Denner: “Connectivity is fundamentally changing how we get from A to B.”
- ▶ New ridesharing business: Bosch acquires U.S. start-up SPLT
- ▶ New city: Madrid welcomes e-scooter sharing
- ▶ World-first: system!e – new services make electromobility suitable for everyday use

Berlin and Stuttgart, Germany – Bosch continues to drive forward its transformation into a provider of mobility services. Its new Connected Mobility Solutions division will bring together over 600 associates to develop and sell digital mobility services. These include vehicle sharing, ridesharing, and connectivity-based services for car drivers. “Connectivity will fundamentally change how we get from A to B, and in the process it will help to solve today’s traffic problems. We are using it to realize our vision of emissions-free, stress-free, and accident-free mobility,” said Dr. Volkmar Denner, chairman of the Bosch board of management, at the Bosch ConnectedWorld 2018 IoT conference in Berlin. Connectivity offers tremendous business potential. By 2025, there will be more than 470 million connected vehicles on the world’s roads (source: PwC). Just four years from now, the market for mobility services and associated digital services will be worth 140 billion euros (source: PwC). “Connected driving is a growth area for Bosch. Bosch aims for significant double-digit growth with the solutions it offers,” Denner said. The plan is for the new division to further extend the existing service portfolio. For instance, mobility services from Bosch send alerts about wrong-way drivers and turn smartphones into car keys. The latest of these is the ridesharing service offered by U.S. start-up Splitting Fares Inc. (SPLT). Denner also presented system!e in Berlin. Connected services for electromobility are set to further increase the suitability of electric driving for the mass market.

Bosch enters the ridesharing business

One growth market in the field of connected mobility is ridesharing, which encompasses online services and apps for carpools as well as for arranging driving services and taxis. By 2022, the number of ridesharing users worldwide is set to rise by 60 percent to 685 million (source: Statista). To date, most such services have been directed at people who happen to be traveling in the same direction or who want to book a trip at the last minute; companies and commuters have been seen as less of a priority. This is precisely where SPLT comes in. Recently acquired by Bosch, this U.S. start-up developed a platform that companies, universities, or municipal authorities can use to arrange ridesharing for their staff. This B2B approach is aimed directly at commuters: the SPLT app brings together people who want to share a ride to the same workplace or place of study. One advantage of this is that rides are shared by colleagues, which means users never have to get in the car with complete strangers. Within seconds, an algorithm locates a suitable rideshare, calculates the fastest route through traffic, and thus assumes what used to be the time-consuming task of coordinating the departure point, departure time, best route, and passengers. Sharing a ride is good for the nerves, for the wallet, and for the environment. Companies can also play a role in reducing traffic volume. “Connectivity is a way for us to rethink not just the car but the whole way we use modes of transport,” Denner said.

Digital services for electric vehicles

Bosch subsidiary COUP has provided e-scooters for rent in Berlin since 2016. After introducing e-scooter sharing to Paris last year, the service will launch in Madrid this year. This will bring the total number of e-scooters to 3,500. “Digital services will give electric driving a boost,” Denner said. At the IoT conference, the Bosch CEO presented system!e, a comprehensive system of connected electrified powertrain components and new service solutions for electric cars. To this end, Bosch has connected the electric drive to the [Bosch Automotive Cloud Suite](#). The company is developing web-based services that rely on this interaction. In the future, intelligent electric cars will know precisely when their power will run out, but also where they can find their next charge.

Eliminating range anxiety: Services that encourage everyday use

For many car buyers, the worry that an electric car might leave them stranded is a deal-breaker. It is precisely this problem that system!e is designed to tackle. Because the electric drive is connected to the cloud, the system can produce an “extended range forecast.” An algorithm factors in vehicle data such as current battery charge, energy consumption of heating or air conditioning, and the driver’s driving style, as well as information from the vehicle’s surroundings. This includes the current traffic situation and topographical data for the route ahead.

Based on this information, the system can reliably calculate the vehicle's precise range. For longer journeys in an electric car, the extended range forecast is supplemented by the "charging assistant." This service knows where all the charge spots are on a given journey, say from Munich to Hamburg, so it can plan ahead for necessary charging stops; it also manages the payment process. Thanks to additional information about for example restaurants, cafés, and shopping options, drivers can make the most of the charging time and relax. A third service manages vehicle charging in smart homes, helping to optimize how they use energy. It integrates the electric car into the smart home's electricity grid, meaning the car's battery supplements the stationary storage device for the house's photovoltaic system. During the day, the car absorbs excess solar power and feeds it back at night as necessary. "For Bosch, mobility goes beyond the car. Our breadth of technology expertise in numerous fields puts us in an unparalleled position to develop and operate cross-application ecosystems," Denner said.

4,000 participants, 70 exhibitors, and 140 speakers

Bosch's IoT activities are broadly diversified, encompassing solutions for connected mobility, connected manufacturing, as well as for connected energy systems and buildings. At the Bosch ConnectedWorld forum for the IoT industry in Berlin, more than 70 exhibitors will demonstrate what is already possible with the internet of things, and how it will improve people's everyday lives in the future. On a 10,000 square-meter exhibition space at "Station" in Berlin, some 4,000 delegates will meet from February 21 to 22. In addition to the Bosch CEO Dr. Volkmar Denner, the roughly 140 speakers will include Dr. Dieter Zetsche (CEO Daimler), Dr. Frank Appel (CEO Deutsche Post DHL), and Johann Jungwirth (CDO Volkswagen). At a hackathon, some 700 programmers, start-up associates, and designers will develop new ideas for connected mobility services, automated driving, connected manufacturing and logistics, and connected living. The 2018 Bosch ConnectedWorld will be the fifth event of its kind. It is one of the world's largest conferences on the internet of things.

Press materials: Text, images, videos, and other press materials will be available starting 11:30 CET on February 21, 2018 at www.bosch-press.com

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The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,500 associates worldwide (as of December 31, 2017). According to preliminary figures, the company generated sales of 78 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 62,500 associates in research and development.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

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Entering the ridesharing business **Bosch acquires U.S. carpooling start-up SPLT**

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- ▶ Using an app to share a ride to work: carpooling for commuters
- ▶ Future mobility services market: double-digit growth is the target
- ▶ Board of management member Dr. Markus Heyn: “Smartphones are becoming the most important means of travel”

Berlin and Stuttgart, Germany – Bosch is entering the ridesharing business. The supplier of technology and services has acquired Splitting Fares Inc. (SPLT), a U.S. start-up based in Detroit. SPLT operates a platform that allows companies, universities, and municipal authorities to offer their workforces ridesharing services. The B2B approach is designed especially for commuters. SPLT uses an app to connect people who share the same route to their place of work or study. An algorithm finds the best composition for the ride-share, and computes the fastest route. The aim is to reduce congestion and make the daily commute more relaxed. SPLT was founded in 2015. Some 140,000 users in the United States, Mexico, and Germany currently take advantage of the service. It has been agreed that the purchase price will not be disclosed. “With SPLT, we are extending our portfolio in the growth area of mobility services,” said Dr. Markus Heyn, member of the Bosch board of management. [With connected mobility services, Bosch aims for growth well into double digits.](#)

“Increasingly, smartphones are becoming the most important means of travel,” Heyn added. Connecting road users and modes of transportation is making flexible, multimodal mobility possible: in a matter of seconds, everyone can decide how they want to travel, and make the necessary bookings. “With this sustainable and affordable mobility service, we want to fundamentally change the way people get from A to B,” said Anya Babbitt, the co-founder and CEO of SPLT.

Increasing numbers of commuters

Ridesharing, in which digital services and apps are used to form carpools and to organize vehicle sharing and taxis, is a growth market in the connected mobility sector. By 2020, the number of people worldwide using rideshares is expected to rise 60 percent to 685 million (source: Statista). Up to now, the services available have usually directly targeted people who happen to be traveling in the same direction, and who want to book a ride on the spur of the moment. They have not focused so much on companies and commuters. But it is precisely here that there is huge potential. According to the German Federal Motor Transport Authority, there are more than 45 million cars on Germany's roads alone. And the number of commuters is rising: according to the German Federal Institute for Research on Building, Urban Affairs, and Spatial Development, three out of five workers do not work in their home cities. And for roughly two-thirds of the working population, the car is the first choice of transport for the daily commute, according to the German Federal Statistical Office. Worldwide, the result is the same: rush-hour traffic is frequently gridlocked. Millions of commuters find themselves stuck in traffic every day. A further problem is that drivers usually sit alone in their cars. Carpooling is still the exception. This is where SPLT's solution comes in.

Commuting without stress, at low cost, and with little environmental impact

SPLT is about sharing – and it couldn't be simpler to use. Companies, universities, or municipal authorities enable access to the SPLT platform for their employees, who then download the SPLT app, register, and look for or offer a rideshare. Bookings can be made on the spur of the moment or in advance. Arrival times are displayed in real time, and costs are shared among colleagues and charged online. The B2B service is intended for users who travel the same route each day. One advantage of this is that rides are shared by colleagues, which means users never have to get in the car with complete strangers. As a side benefit, such rideshares encourage communication and offer a chance to network. Company buses can also be integrated into the app, and in this way be used more flexibly and efficiently. The result is a journey to work and back without stress, at low cost, and with little environmental impact. Companies can also play a role in reducing traffic volume. In the years ahead, the number of SPLT users is expected to rise many times over – with new regions also being included. Within Bosch itself, associates in Mexico are already using the app, and it is planned to extend its use to the entire company. "We believe we have a good chance of global growth together with Bosch," Babbitt said. SPLT will remain an independent entity within the Bosch Group and be run as a wholly owned subsidiary.

4,000 participants, 70 exhibitors, and 140 speakers

Bosch's IoT activities are broadly diversified, encompassing solutions for connected mobility, connected manufacturing, as well as for connected energy systems and buildings. At the Bosch ConnectedWorld forum for the IoT industry in Berlin, more than 70 exhibitors will demonstrate what is already possible with the internet of things, and how it will improve people's everyday lives in the future. On a 10,000 square-meter exhibition space at "Station" in Berlin, some 4,000 delegates will meet from February 21 to 22. In addition to the Bosch CEO Dr. Volkmar Denner, the roughly 140 speakers will include Dr. Dieter Zetsche (CEO Daimler), Dr. Frank Appel (CEO Deutsche Post DHL), and Johann Jungwirth (CDO Volkswagen). At a hackathon, some 700 programmers, start-up associates, and designers will develop new ideas for connected mobility services, automated driving, connected manufacturing and logistics, and connected living. The 2018 Bosch ConnectedWorld will be the fifth event of its kind. It is one of the world's largest conferences on the internet of things.

Press photographs: #1351419, #1351420

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BOSCH

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From vision to business:

Connected driving is becoming a growth area

Presentation by Dr. Volkmar Denner,
chairman of the board of management of
Robert Bosch GmbH,
at the Bosch ConnectedWorld press briefing
on February 21, 2018, in Berlin

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Ladies and gentlemen:

Connectivity is the future, and the future of mobility in particular. By that I mean not just modernizing the road and rail networks, but connecting all modes of transport via the internet. We are showcasing this and much more here at Bosch ConnectedWorld in Berlin. BCW is one of the world's largest conferences on the internet of things, and draws players at the forefront of digitalization. Here we can exchange views with nearly 4,000 IoT pioneers and implementers, and display the practical benefits of more than 60 IoT solutions. The German capital is the perfect setting for this: we just opened our IoT campus here one month ago, and the city is also home to 1,000 of the 3,500 e-scooters operated by our sharing service COUP. These Berlin examples demonstrate that we're not concerned with far-off visions of the connected world and the mobility of tomorrow, but are already delivering pioneering solutions for today's traffic problems. It is with these solutions that we plan to grow.

Creating our new division, Connected Mobility Solutions, sends a clear signal: we're converting our many service projects for tomorrow's mobility into a services business. For example, we have collaborated with partners in developing a multimodal mobility assistant that enables the planning, booking, and payment of car- and bike-sharing, rail, and bus services. And this year, our technology is making connected parking a reality for the first time – whether it is cars driving themselves to free spots in parking garages, or using their sensors to detect available curbside parking and feeding that information into an online map. Both of these solutions make city life easier. For realizing services such as these, we have our own software platform: the Bosch Automotive Cloud Suite. We are pooling all of this in our new division, which will be the new home for more than 20 services from shared mobility, multimodal mobility, and connectivity-based service offerings for drivers.

Bosch has over 600 associates in Connected Mobility Solutions at five locations in Germany and China. The business potential arises from the

growing fleet of connected vehicles, which is expected to number more than 470 million by 2025. Digital and mobility services aim to tap that potential. Their worldwide market volume is projected to grow from 47 to 140 billion euros within five years, meaning between 2017 and 2022. It is still a fragmented market. Bosch aims for significant double-digit growth with the solutions we offer.

One part of this plan is an acquisition in the U.S., which I would like to announce today. Bosch is entering the business of web-based ridesharing services: we have acquired the U.S. start-up SPLT, which offers such services specifically for commuters. This kind of connectivity also helps solve traffic problems of the here and now – problems shared by anyone trying to get from A to B. What makes the SPLT service special is that it is a B2B solution aimed not directly at potential carpoolers, but rather at their employers. SPLT operates a platform that can coordinate ridesharing offers for employees of companies, universities, or municipalities. Why does it make sense to offer this solution via the employer? The answer is simple: carpools are based on the idea that multiple people need to get to the same place at the same time. And where and when is that more often the case than on the way to the same workplace? This is precisely where SPLT comes in: an algorithm computes the best grouping of employees for the ride-share as well as the fastest route. Less stress during rush hour, good for the environment and the wallet – these are the objectives. SPLT already has some 140,000 users at companies and public authorities throughout the U.S., Mexico, and Germany – a number that is sure to multiply over the next few years.

Connectivity is not the only development path that Bosch is pursuing towards mobility of the future. In fact, we are moving forward on three paths: connecting, electrifying, and automating driving. The goal is to make driving as stress-free, emissions-free, and accident-free as possible. All in all, we have a comprehensive vision of future mobility in which connectivity is intertwined with the other two paths.

This is plain to see at this year's Bosch ConnectedWorld, especially in the interplay between electric and connected driving. Electromobility – from the beginning, Bosch has seen it as more than an alternative powertrain for cars. We first electrified cycling, and today are a leading supplier of e-bike systems in the premium segment. Our goal is to deliver electric drive solutions for everything from bicycles to trucks. In all that we do, we see ourselves as a systems supplier. For example, we have acquired our first orders for the e-axle, which integrates the transmission, electric motor, and power electronics in electric cars. But our systems expertise goes beyond hardware – we also connect electromobility with the 3 S's so crucial to the internet of things: sensors, software, and services. After all, electric driving, too, is best when connected. To that end, we are introducing a new concept at this Bosch ConnectedWorld: we call it system!e.

I would now like to hand over to Rainer Kallenbach, the president of our new Connected Mobility Solutions division, who will tell you more about it.

February 21, 2018
RF dh

A revolution in the everyday:

How Bosch is seizing the opportunities of connectivity

Presentation by Dr. Stefan Hartung,
member of the board of management of
Robert Bosch GmbH,
at the Bosch ConnectedWorld press briefing,
on February 21, 2018, in Berlin

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Ladies and gentlemen:

We just heard it from Mr. Denner: connectivity is the future. And not just connectivity of cars and mobility – the scope is much broader. The opportunities that the internet of things presents for our roads, our workplaces, and our homes are what we are showcasing at Bosch ConnectedWorld. I want to emphasize that we are not presenting far-off visions of the future; instead, we're demonstrating actual, real-world solutions. A few facts to illustrate this:

- Bosch has already designed, developed, and carried out 250 IoT projects.
- We are currently working on 170 of our own IoT projects, in areas as varied as connected mobility, connected buildings, connected industry, and connected agriculture – all of which are running on our own Bosch IoT Cloud.
- We sold 38 million web-enabled products in 2017.
- Today, the Bosch IoT Suite connects 6.2 million sensors, devices, and machines with users and company applications.

We recognized the potential of connectivity early on, and have been actively shaping the connected world for nearly ten years. We have steadily expanded our software and IT expertise. With over 25,000 software experts, today we are a software company, too. But how do we differ from the internet giants in the U.S. and Asia? Where Silicon Valley connects the digital world, Bosch connects the real world. **We have expertise in hardware as well as in software.** Above all, our IoT approach is aimed at achieving concrete improvements in people's real, everyday lives.

But what does that mean, exactly? Let me give you some examples:

The first concerns the **connected city**. In just about 30 years, two-thirds of the global population – six billion people – will be living in cities. Cities today already cause 80 percent of all greenhouse-gas emissions and consume 75 percent of the world's energy. Going forward, the quality of life in cities will

depend to a large extent on intelligent and connected solutions. Between now and 2020, the **smart-city market** will grow 19 percent each year to reach 700 billion euros. In this sector, we can draw on our broad portfolio and cross-domain expertise, while our customers benefit from our concrete solutions in the areas of energy, buildings, mobility, security, safety, and e-governance. The company is currently involved in 14 extensive smart-city projects in places such as San Francisco, Singapore, Tianjin, Berlin, and Stuttgart. It also won't be the last. Today, we're signing an agreement with the Chinese property developer Country Garden. Together, we will investigate opportunities for planning and building additional connected cities and smart living labs in China. Country Garden has more than 25 years' experience in developing residential areas, and Bosch will contribute its IoT and customer expertise. Over in the exhibition area, you can take a look at our activities in the smart city domain.

Connected homes: We are also showcasing the smart kitchen here at Bosch ConnectedWorld. With Bosch's Home Connect app, users can control a range of models of dishwashers, ovens, refrigerators, and coffee machines. Besides connected appliances, we offer an increasing number of digital services, too. During Mr. Denner's presentation you saw Mykie, the digital kitchen assistant who understands gestures and spoken language. Say you want to make a casserole, but with lamb instead of bacon. Mykie can adapt the recipe for you – in the future, taking into account what you have in the pantry – and can set the oven to the correct temperature as well.

Connected agriculture: Bosch also helps ranchers and farmers with their work. On Fazenda Santa Fé, one of Brazil's largest cattle ranches, Bosch sensors, software, and services help ranchers to monitor the weight gain of their livestock. Brazil alone has 100 million head of cattle, Argentina has 50 million, and the U.S. has another 100 million. We have also found a wide range of uses for smart agriculture here in Germany: our sensor-based solutions already support farmers who are growing tomatoes, asparagus, or potatoes, and our cloud-based milk monitoring system helps dairies and dairy

farmers ensure that their milk doesn't spoil. We decided to forgo the cattle herds today, but you can still learn about our asparagus and strawberry sensors here.

Bosch's newly formed **Connected Industry** business unit began operations in January 2018. It brings together the Industry 4.0 activities of our various departments and units, above all those in the software and services business. The unit's more than 500 associates offer our collective experience in project realization. Our industrial subsidiary Bosch Rexroth is also playing a major role here. It's working on fully-connected factories. These will be able to do much more than just reduce the power consumption of a single machine, for example. In the future, completely connected machines will be able to independently make decisions and organize themselves thanks to artificial intelligence. Whether as a one-off or in large volumes, connected industry and logistics enable us as well as our customers to produce items flexibly and cost-effectively. In about two years, we'll be able to show you what this looks like in our reference factory in Xian, China.

Between now and 2020, we aim to exploit Industry 4.0 to increase sales by more than a billion euros. Tomorrow, I will join with representatives from our partner companies to speak more about fully connected manufacturing, connected logistics, and especially about new services and business models in my keynote. I look forward to seeing you there.

With that, I come to the end of my presentation. We predicted early on that the IoT would change everything. We are visionary thinkers, designers, and partners for multiple aspects of the digital transformation.

Thank you very much. We would be happy to answer any questions you may have.



BOSCH

February 21, 2018
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**Eliminating range anxiety:
New services are making electromobility
fit for everyday use**

Presentation by Dr. Rainer Kallenbach,
president, Connected Mobility Solutions division,
at the Bosch ConnectedWorld press briefing
on February 21, 2018, in Berlin

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Thank you, Mr. Denner.

Ladies and gentlemen,

I would like to offer you a closer look at our system!e concept. In technical terms, system!e connects the electric powertrain to the Bosch Automotive Cloud Suite. This yields web-based services that improve the everyday benefits of electromobility – and lowers the barriers to purchasing an electric car. In the future, electric cars with system!e will know precisely when their power will run out, but also where they can find the next charging station. It will also be easier to integrate them into the owner’s home power grid. Let me illustrate this with three specific applications:

- First, an extended range forecasts. This helps overcome a key concern regarding electromobility. According to all relevant surveys, buying an electric car falls through most often due to “range anxiety” – car buyers rank the limited range of these cars ahead of the high price and long charge times as reasons for their “no.” Our extended range forecasts can allay drivers’ fears that their electric car will leave them stranded somewhere. The forecasts use data from the environment and the vehicle itself – traffic and weather forecasts, current battery charge, energy consumption of heating and air conditioning, tire pressure, and of course the driver’s personal driving style. All this feeds into highly accurate forecasts of the remaining range.
- Second, a charging assistant for longer journeys. This is another service that seeks to counter range anxiety. It starts with a new kind of route planning, which is based on the extended range forecast and makes suggestions according to when charging stops are required. Additional information about, for example, restaurants, cafés, and shopping options near the stop allow drivers to make the most of the charging time. And because the charging stations are connected to the internet, the service can arrange for payment online. As a result, driving even longer stretches

with an electric car is less stressful. Driving electric, yet stress-free – that is the goal.

- Third, our concept of energy management for charging at home, which can cut costs considerably. Specifically, this means that we will be able to integrate the electric car into the smart home's electricity grid. Its battery can then, for instance, supplement the stationary storage device for the house's photovoltaic system. During the day, the car absorbs surplus solar power; the battery feeds it back at night to, say, operate a heat pump. Still, the homeowners will want to drive their electric car again in the morning – all they need to do is tell the car the minimum charge needed for the desired destination. That is an example of how efficiently car and home will work together in the future.

Connecting electric cars with the smart home is a prime example of a cross-domain ecosystem, the supreme discipline on the internet of things.

Implementing it requires a versatile company – a company like Bosch, whose expertise extends beyond the car. That is why we also see system!e as a toolkit; we will use it to derive solutions for established automakers as well as start-ups. This is no far-off vision, either: together with our customers and partners, we will be able to supply the corresponding services within the next few months. Many talk about the future of mobility. We're making it ready for the market.

For more on what we are launching on the market besides mobility, some of which we are presenting here at Bosch ConnectedWorld, I now turn things over to Stefan Hartung.



Bosch is showcasing the following highlights at Bosch ConnectedWorld in Berlin

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Berlin and Stuttgart, Germany – An intelligent glove in the factory, a digital guardian angel for people on the go, and connected kitchens: Bosch is showcasing these and other solutions at Bosch ConnectedWorld in Berlin, where the IoT sector meets to discuss tomorrow's world. Innovative products and services are making everyday life not only more convenient, but also safer and more efficient – at home, at work, and on the move.

Products and solutions for all aspects of connected manufacturing:

[ActiveAssist](#) – the assembly assistant: The assembly assistance system guides users step by step through each individual stage in the manufacturing process. It identifies the next workpiece using RFID (radio frequency identification) and provides information about the required processing steps. For instance, the system uses light signals to mark those grab containers that hold the screws or other parts required to complete the next step. A 3D camera tracks the user's movements. All in all, the system makes it possible to correct errors and prevents the wrong parts from being used. The benefits are a reduction in user strain and an increase in product quality.

[Intelligent glove](#): The iGlove features highly sensitive sensors and is designed for use in connected manufacturing. It maps hand movements and can greatly reduce workforce training times. Furthermore, it helps users learn the correct assembly steps and can document production steps such as the removal of parts. Without any need for physical contact, the data is sent via Bluetooth to a computer or smartphone, where it is compared to previously stored movement patterns.

[ActiveCockpit](#) – the manufacturing assistant: A gigantic screen informs associates in the factory about the current status of production. The benefits are faster information processing, clear analysis, and subsequent definition of tasks

for more efficient processes. As a result, manufacturing becomes transparent. Users and companies benefit thanks to the immediate identification of problems, such as screws that are slightly too small or too large. This reduces downtimes, increases the level of product quality, and avoids any recall costs.

Connected solutions and products for better living:

[Vivatar app](#) – a digital guardian angel: Going jogging in the dark or heading home on foot after the last bus has left is enough to make anyone feel uneasy. This is where the Bosch Vivatar app comes in; it acts as a digital guardian angel for people on the go. It enables users to contact friends and family and be digitally “escorted” home via GPS, and decide for themselves when they should be accompanied and by whom. Vivatar Premium grants users 24/7 access to the Bosch Emergency Assistant, a professionally trained emergency team.

[Climo](#) – a small box for better air quality: It’s the size of a shoebox and measures air quality in real time. Developed by Bosch in collaboration with Intel, Climo is a hundredth of the size and a tenth of the cost of conventional systems. It measures and analyzes a total of 12 parameters, including temperature and humidity as well as carbon dioxide, nitrogen oxide, and even pollen count. Using the information gathered, cities can swiftly take action to improve air quality. They can also use it to help with traffic management, for instance. And by using the app, people suffering from asthma or allergies can find out if they should stay indoors or avoid certain areas of the city.

[Home Connect](#) – a platform for the connected kitchen: The platform for the connected kitchen from Bosch subsidiary BSH is called Home Connect. No matter where users are, they can use devices such as smartphones to control and monitor Bosch household appliances and those of other manufacturers. With some 30 partners around the world, Home Connect already has the largest digital ecosystem in the connected kitchen, and the company is continuously entering into new partnerships and adding helpful functions and services. At the end of last year, BSH acquired a 65 percent stake in Berlin-based start-up Kitchen Stories. The plan now is to integrate the cooking app into Home Connect. Voice control is also among the services provided. In this way, Bosch products can be controlled by the likes of Amazon Alexa (Germany), Google Home (UK), or Ding Dong (China).

[Predictive maintenance](#) – remote diagnostics for elevators: Bosch has already spent over 30 years working on emergency call systems in order to quickly free people trapped in broken-down elevators. Now the company is going a step further by preventing elevators from failing in the first place. The key is predictive maintenance. Connected sensors and cameras are integrated into the elevator

system and wirelessly notify the service team when a breakdown is imminent. Maintenance and repair work can thus be carried out before the elevator stops working.

[Connected building platform](#) – a smart building solution: The sensor- and cloud-based solution analyzes data from a building, for instance regarding occupancy or air quality. In this way, the platform provides a solid foundation for efficient building management. Windows and doors open and close as required, which reduces energy consumption. The platform also provides information about room use and whether workspaces are occupied. In offices that offer flexible workspaces, for example, this allows people to quickly find the nearest free desk, lights can be efficiently controlled, and cleaning services can be utilized to maximum effect. Knowing where people and equipment are helps optimize building processes, for instance in commercial buildings or hospitals. The solution is based on the Bosch IoT Suite, the company's own IoT software platform.

Mobility highlights can be found [here](#).

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The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,500 associates worldwide (as of December 31, 2017). According to preliminary figures, the company generated sales of 78 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 62,500 associates in research and development.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

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



How Bosch is transforming driving with connected services

Bosch will be showcasing these mobility services at Bosch ConnectedWorld 2018

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- ▶ From sharing to multimodal: services for stress-free urban mobility.
- ▶ From smart parking to lifesavers from the cloud: services for connected cars and a relaxed, convenient, and safe drive.
- ▶ Connectivity is a driver to stress-free, accident-free, and emissions-free mobility.

Berlin and Stuttgart, Germany – A smartphone app instead of a vehicle key, a digital parking map instead of the tiresome search for a parking space, and sharing services that allow people to be mobile without having to own a car: connectivity makes life easier for road users, increasing safety and convenience while lowering stress levels on the world's roads. According to market research company Gartner, around the globe a quarter of a billion vehicles will be connected by the year 2020. Bosch continues to drive its transformation into a provider of mobility services. At Bosch ConnectedWorld 2018, the supplier of technology and services will be showcasing its mobility services and connectivity-based service portfolio for car drivers.

Sharing services and multimodal mobility for stress-free urban mobility:

COUP: Reserve, pay, go – [the COUP e-scooter sharing service](#) offers a simple alternative to public transportation, private cars, or taxis. Already on the road in Berlin and Paris, the e-scooters will be coming to the streets of Madrid in summer 2018. Thanks to the COUP app, users have no problem finding and booking the nearest available e-scooter and setting off immediately.

moveBW: In July 2017, Bosch launched the test phase for the multimodal mobility assistant [moveBW](#). The service uses real-time data to find the quickest way through the city. It gets commuters to their destination fast and flexibly, while

allowing cities to manage their traffic density and mobility providers to improve capacity utilization in their modes of transport.

myScotty: With the app from start-up myScotty, users are always ready to move thanks to the various mobility offers – from sharing services for cars, scooters, and bikes, to taxis and rental cars. Users book and pay for the services with a smartphone. To use myScotty, each user verifies their identity in a one-off video chat; the start-up handles the registration and verification process with the various providers.

Connected services for stress-free mobility

Community-based parking: With its parking-space search engine [community-based parking](#), Bosch searches for a suitable parking space so that drivers don't have to. Using the ultrasonic sensors of their parking assist system, cars identify and measure the gaps between parked cars as they drive past them. The data collected is transferred to a digital parking map that drivers can use to guide them to suitable parking spaces.

Automated valet parking: Bosch's [automated valet parking](#) solution means that in the future, cars will park themselves. Drivers leave their vehicle at the entrance to the parking garage and instruct the car to park itself using a smartphone app. The car then searches for a vacant spot on its own and parks there without assistance. One factor making this fully automated parking service a reality is smart parking-garage infrastructure, which connects with the vehicle's on-board software.

Over-the-air software updates: Thanks to Bosch's [over-the-air software update](#) service, vehicles handle repair shop visits digitally. It allows vehicle data to be updated securely and reliably, in the same way as smartphones are now, and makes it possible to download additional functions, such as a digital parking map.

Perfectly Keyless: Bosch is ending the irksome search for car keys with [Perfectly Keyless](#). Drivers use their smartphone to unlock and lock the vehicle and start the engine. Car owners can use the app to grant vehicle access to other app users. In this way, families, companies, sharing providers, and fleet operators can flexibly manage who can access their vehicles and when.

Predictive diagnostics: During regular drives, the [predictive diagnostics service](#) uses data and information from the cloud to analyze the condition of key components such as the battery, fuel filter, and braking system. If the data indicates that a component is wearing down, the driver is notified before it wears

out completely and receives a recommendation for the next repair shop visit. This prevents the car from suddenly breaking down.

Concierge service Thanks to the concierge services, drivers always have a personal assistant in the car with them. It helps them find the nearest post office, assists them in making restaurant or concert reservations, and offers tips for what to do in an unfamiliar city. Once drivers have decided on a destination, the service sends address information directly to the vehicle's navigation system.

Secure truck parking: Available across Europe, [Bosch's secure truck parking](#) booking service helps truck drivers find a suitable and safe place to park. To do so, Bosch monitors in real time which truck parking spaces are occupied. Logistics providers and truck drivers can use a free online portal, and in the future an app as well, to reserve parking spots located along the route – in advance or on the way. The result is improved route and break planning.

Connected services for accident-free mobility

A guardian angel in the data cloud: In Germany alone, some 2,000 warnings about wrong-way drivers are broadcast each year. In most cases, however, the warning comes too late, since one-third of such incidents generally end after the wrong-way driver has traveled an average of 500 meters – in the worst case with fatal consequences. Bosch's [cloud-based wrong-way driver alert](#) is designed to provide a warning within around ten seconds. The alert goes not only to the wrong-way driver, but to all road users in the vicinity. The service thus functions as a guardian angel in the data cloud.

eCall – saving lives: As of April 2018, all newly registered vehicles in the EU will be equipped with a connected, life-saving service as standard. The automated emergency call, eCall for short, automatically calls for help in the event of an accident. This is expected to save some 2,500 lives each year. For its eCall solution, Bosch offers a comprehensive range of services through the Bosch Service Center, in addition to telematics solutions. [Retrofit eCall](#) is designed to plug into the vehicle's cigarette lighter. And an enhanced version is available that also analyzes driving behavior and sends the data to the driver's smartphone via Bluetooth.

mySPIN smartphone integration: Using a smartphone's navigation, streaming services, or a calendar hands-free even while driving a car or riding a motorcycle is possible thanks to Bosch's [mySPIN smartphone integration solution](#). It simply integrates the smartphone and its apps into the vehicle's infotainment system. In the future it will be possible to integrate and display data from the cloud in real time. This data can warn drivers of hazards such as stopped traffic ahead.

Driving app: This app allows drivers to use voice commands and gestures to safely operate telephone, navigation, messaging, and music apps while driving. Now that drivers no longer have to look at or touch their smartphone's screen to do this, they can concentrate more on the road. The driving app offers more convenience and entertainment for drivers whose vehicles are not equipped with an infotainment system.

Connected horizon: The [connected horizon](#) makes driving even safer and more convenient. It supplies traffic data on things such as congestion and accidents, topographical route data including elevation and bends, and infrastructure data such as traffic signs and speed limits – all in real time. This enables a dynamic preview of the upcoming route and corresponding adjustments to driving strategy. The system allows vehicles to think ahead, thus enhancing both safety and convenience.

Radar road signature: High-resolution maps are essential for automated driving. Using information provided by its radar sensors, Bosch developed the [radar road signature](#) localization service. This can be integrated into high-resolution maps and helps self-driving cars to precisely determine their position within a given lane.

Predictive road condition services: This Bosch service improves safety on the roads. A vehicle's grip on road surfaces varies according to season and weather, which requires that drivers, or self-driving cars, modify their driving style to avoid critical situations. Bosch developed its cloud-based service to provide information about the condition of road surfaces. The service uses the sensors of the ESP electronic stability program to determine whether a road is slippery or will provide good grip. Aided for instance by data from weather stations, the service calculates current friction coefficients and forecasts upcoming ones. This data is then passed on to connected vehicles via the cloud in real time.

Connected services for electrified mobility

Charge and pay app: The smartphone is the key to finding charging stations for electric vehicles and pay for the charging process, all with a single click. Bosch developed [charging apps](#) together with automakers including Mercedes-Benz, smart, and Renault. These currently provide customers with access to some 17,400 charging stations in five countries in Europe, and more are expected to be added soon.

Press photographs: #1081920, #1138654, #452462, #1147919, #1152554, #1152553, #1150662, #1-CC-21424, #1-CM-21209, #1068267, #1128260, #1138651

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Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, its 2017 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.

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