



Press release
4 May 2018

Rethinking micro-mobility – The BMW Group Personal Mover Concept. Electric, safe, agile – for short distances across sites.

The BMW Group has developed a new kind of micro-mobility concept for employees. The Personal Mover Concept will be available at BMW Group sites worldwide. It can be used for personal transportation both inside buildings and outside and is also suitable for carrying objects.

Munich. The BMW Group's corporate strategy NUMBER ONE > NEXT defines the main future areas of activity (ACES) for the iconic change ahead. With the progress made in these key areas and innovative mobility concepts, the company is consolidating its leading role in the transformation towards sustainable, individual and digitalised mobility. A holistic approach to mobility is called for, with development of tailor-made, unconventional and innovative solutions for special areas of application. Research projects like BMW Motorrad X2City or the BMW Vision E³ Way elevated road concept show how mobility is constantly changing and evolving. New approaches are needed: With this in mind, the Personal Mover Concept was created – an electric one-person means of transport for covering short distances within an operating site.

Challenge.

The task was clear: Employees at BMW Group plants and logistics centres sometimes cover up to 12 kilometres per day on foot – and having to carry small parts and work materials often makes it even harder. Sites such as the BMW Group Research and Innovation Centre in Munich or the BMW Group plants in Dingolfing and Spartanburg are sprawling campuses, where many employees have to cover huge distances to do their jobs.

Experts from the BMW Group Research and Technology House in Garching took up this challenge, together with the staff who run the BMW Group's central aftersales logistics network at the Dingolfing location. Employees at various sites were surveyed on a random basis and their needs recorded. Environment analyses were conducted in parallel and the legal framework, such as site safety guidelines, taken into account. The findings provided a relatively demanding profile of requirements for the mobility solution. Richard Kamissek, head of the Operations Central Aftersales Logistics Network department, sums up: "It had to

Company
Bayerische
Motoren Werke
Aktiengesellschaft

Postal address
BMW AG
80788 München

Telephone
+49-89-382-57185

Internet
www.bmwgroup.com

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be flexible, easy to manoeuvre, zippy, electric, extremely agile and tilt-proof – and, at the same time, suitable for carrying objects. The Personal Mover Concept can do all of this – and is also fun to drive. We hope to start using it as soon as possible!”

Development.

Research into existing options failed to come up with satisfactory solutions. Experts from the Research, New Technologies, Innovations department concluded that only customised in-house development could provide an adequate solution. To generate creative and unconventional concept ideas quickly, they used the in-house design thinking format "think.make.start", whereby interdisciplinary teams use agile methods to develop and evaluate ideas and prototypes. The Personal Mover Concept was born from such a "makerthon". Although the initial ideas met all the requirements, they entailed too much technical and financial effort for simple and straightforward implementation.

Stephan Augustin, who is responsible for special projects in the Research, New Technologies, Innovations department, together with Rainer Daude, describes the process: “Based loosely on the motto ‘fail fast’, we put our heads together again after the makerthon and radically overhauled the concept. Using the "MakerSpace" of UnternehmerTUM, a high-tech workshop for inventors and researchers that is open to the public, we created as simple a prototype as possible, with the help of dedicated apprentices: It meets all the main requirements and can be implemented quickly, easily and inexpensively with the in-house expertise we have.”

Implementation.

The body platform of the Personal Mover Concept is 60 centimetres wide and 80 centimetres long, so that a person can stand comfortably on it and still have room for larger, heavy objects. Two wheels at the rear corners of the platform and two support wheels at the front ensure that it does not tip over, even in tight bends. The two front support wheels rotate 360°, which greatly increases manoeuvrability. The handlebar and drive wheel are sunk into the middle of the

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body platform at the front. The handlebar contains the entire electrical system, the battery and the drive wheel, and can be rotated 90° to the left and right, allowing the Personal Mover Concept to turn on the spot. A thumb throttle for regulating speed is integrated into the right grip. This control is used to start the Personal Mover Concept, switch the light on and off, select the driving mode or check battery status. For safety, there is also a bell for warning other employees. The left grip operates the brake and a dead man's control.

If not accelerating, the Personal Mover Concept recuperates in a similar manner to the BMW i3, by feeding released braking energy back into the battery. The electric drive accelerates up to a maximum of 25 km/h – so it not only moves fast, it is also fun to ride. The installed cells guarantee a range of about 20-30 kilometres. The Personal Mover Concept is charged from a regular household socket using a power adapter. Occupational safety guidelines require a permanent daytime running light, so an LED front light is mounted on the handlebar, with two red LED lights integrated into the bumpers at the rear of the platform for this purpose. The bumpers, basket mount and handlebar mount covering were all fabricated using two different additive manufacturing 3D-printing techniques – the familiar FDM (Fused Deposition Modelling) and a state-of-the-art two-component Polyjet process.

Dimensions:	W 60 x L 80 x H 110 cm
Weight:	20 kg
Speed:	max. 25km/h, freely adjustable for different applications
Range:	20-30 km
Turning circle:	1.20 m

Applications.

Five prototypes of the Personal Mover Concept were presented at an internal international BMW Group aftersales logistics conference and were very well received. The maximum speed is limited to the 12 km/h permitted on plant grounds. The range available in normal operation allows it to be used for a full shift without recharging. The Personal Mover Concept was designed with deployment at FIZ Future in mind. Once completed, the campus will extend for about one kilometre from north to south.

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Alexander Brössler, an apprentice at BMW Group Plant Munich, helped build the five prototypes presented: “This was a fantastic opportunity for apprentices like me to be involved with exciting and innovative projects outside of our regular training programme and to discover new manufacturing processes like 3-D printing. It makes me proud to know that we worked on something that can be used by the BMW Group all over the world in the future and can make life much easier for our colleagues.”

However, it would also be conceivable for the Personal Mover Concept to be used outside of BMW Group locations. Initial discussions with operators of airports, exhibition centres and major shopping centres have shown that it could also be an attractive solution for applications of that kind.

Jochen Karg, head of the department Vehicle Concepts Compact Class and Special Projects: “Our strengths in research, new technologies and innovations leverage possibilities and methods for structuring new ideas quickly and developing them all the way to construction of functional prototypes. As well as meeting customer requirements, our focus is always on inspiring our customers.”

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In the event of enquiries please contact:

Mathias Urban, Press Spokesperson Spokesperson Digital Vehicle and Electronics
BMW Group Innovation and Design Communications
Tel.: +49-89-382-33399, Email: Mathias.Urban@bmwgroup.com

Benjamin Titz, Head of Innovation and Design Communications
BMW Group Innovation and Design Communications
Tel.: + 49-89-382-22998

E-mail: presse@bmw.de
Internet: www.press.bmwgroup.de

The BMW Group

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises 30 production and assembly facilities in 14 countries; the company has a global sales network in more than 140 countries.

In 2017, the BMW Group sold over 2,463,500 passenger vehicles and more than 164,000 motorcycles worldwide. The profit before tax in the financial year 2017 was € 10.655 billion on revenues amounting to € 98.678 billion. As of 31 December 2017, the BMW Group had a workforce of 129,932 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.

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