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NGC People Mover 2+2 (UMV PM 2+2)

Electric, intelligent, modular, safe

Brief description

People Mover (PM) 2+2, a derivative of the NGC Urban Modular Vehicle (UMV), is an autonomous shuttle for urban/suburban areas. The UMV PM 2+2 can accommodate four passengers facing one another. The prototype is not yet fully autonomous; its 48V powertrain with two electric motors is operated with a by-wire sidestick. The PM 2+2 is built on the modular UMV platform.

Aims

The goals are the representation and development of whole-system vehicle concepts, as well as the development of methods and technologies for road vehicles. The prototype of the UMV PM 2+2 shows the vehicle concept and the new modular platform for electric vehicles from manually driven to autonomous mode with a second body structure.

Parties involved

DLR institutes of Vehicle Concepts, Transportation Systems, Structures and Design, Materials Research, and System Dynamics and Control

Applications

- Vehicle concept
- Vehicle structure
- Vehicle safety
- Modularisation
- Autonomous driving
- Electric powertrain
- New operating concepts for vehicles
- Mobility as a service

Outlook

At DLR, the Next Generation Car (NGC) project is aimed at developing various vehicles that incorporate the trends, technologies and development methods of future vehicles. The main goals: climate protection, ensuring mobility, improved safety for all road users, comfort, managing transformation of the transport system.

Facts and figures

The **UMV derivate are:** Basic, Long, Cargo with driver's workplace, autonomous Peoplemover/ Cargomover and such as Skateboard for flexible people/load carriers

Dimensions PM 2+2: length: 3.7 m; width: 1.7 m; height: 1.6 m.

- electric, intelligent, modular, safe vehicle for urban areas
- four occupants facing one another

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At DLR, the Next Generation Car (NGC) project is aimed at developing various vehicles that incorporate the trends, technologies and development methods of future-generation vehicles.

Part of the NGC family of new road vehicle concepts is the Urban Modular Vehicle (UMV), the focus of which is on urban mobility, electrification, the introduction of highly automated vehicle systems and on safe body structures for urban use.

The NGC UMV offers an intelligent, modular platform concept for the vehicle body structure, the powertrain and the different levels of automation. The UMV has various derivatives – Basic, Long, Cargo with driver's workplace, autonomous People Mover / Cargo Mover and Skateboard for flexible people/load carriers – with 90 percent of shared components for the body-in-white. The body-in-white was construced with simplifications, but the concept is designed for different crash load cases and the vehicle structure is optimised. The floor crash module component has already been successfully tested. Further subcomponents are to follow.

The UMV People Mover PM 2+2 derivative is the first prototype to be constructed and shows the vehicle concept with a second body structure – the new modular platform for electric vehicles, from human driven to fullly autonomous operation. The UMV PM 2+2 is an urban/suburban autonomous shuttle, intended, for example, to be used as part of an on-demand mobility service. The user calls the vehicle via an app. When it, authorisation is accomplished at the vehicle interface located in the side window. After this, the sliding doors open. The design of the PM 2+2 interior is clean and simple. The People Mover vehicles are designed so that they are easy to clean, as is the case with public transport. The occupants can check their driving time, the route or the vehicle status via two monitors which are mounted on the roof in the centre of the vehicle. Two USB ports allow the passengers to charge electronic devices.

The automation sensors, such as lidar, radar and cameras, are integrated into the exterior design. For example, the PM 2+2 has four 3D lidar sensors on the roof and three 2D lidars in the front bumper. The car-to-car and car-to-infrastructure communications units are integrated into the roof and the lidar panels. The UMV PM 2+2 demonstrator is not yet fully autonomous. The 48V powertrain with two electric motors is operated using a by-wire sidestick. The concept and the user experience can be tested at the moment. The next steps for the PM 2+2 are the integration of sensors, hardware and software for autonomous driving.

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