Wubbo's Superbus on the starting blocks

Within the near future, a Superbus designed by Prof. Wubbo Ockels will travel around Holland at high speed, on special 'Superbus-lanes'. Speeds will vary, but range between 90 mph - 150 mph (150-250 km/hour). It will be a practical and affordable alternative to the proposed Dutch high-speed trainline, which lacks political support.

Prof. Wubbo Ockels' Superbus will stand for demand-driven and comfortable travel, and competes with the car and the train. Admittedly, it is a futuristic project. However, a professional team is hammering away so that the bus can set off as soon as possible. Transport Company Connexxion is sponsoring the project, and Victron Energy has developed innovative and pioneering technical solutions for the release of electrical power from the vehicle's battery packs.

Concept

Project Superbus is constructing a remarkable vehicle. Simultaneously, they will carry out research into the accompanying infrastructure, logistics, safety, reliability, and economic viability. Freestanding dedicated bus lanes will be developed, which will be kept frost-free by means of geothermal heat. This prevents delays and reduces maintenance costs. An on-line ordering system will enable passengers to travel from A to B. It will match passengers and channel them, thereby minimising the number of stops needed. Many of the technical innovations derive from the world of Formula One and the aviation industry. Lightweight construction techniques and aerodynamic design translate into low drag, which is stable and controllable at high speeds.

The bus will have an advanced pro-active suspension system, an ergonomic interior and individual multimedia-facilities for the passengers. Total costs for the design and development of the prototype are estimated at 8.5 million euros.

Electric power

Time to look at the highly advanced propulsion mechanism. The Superbus is full of eco-friendly innovations: electrically powered, battery banks, lightweight construction with low drag, and the use of a lightweight infrastructure with low environmental impact. What kind of electrics are required to give the bus 150 mph speeds?

Electromotors drive the wheels, since the conversion from electrical power into mechanical power (wheels turning) is more efficient than the conversion from chemical energy (in a combustion engine) into mechanical power. Another advantage is that the powerstation emissions are lower. Victron Energy is advising the construction team on the system's electrical configuration. Electricity for propulsion can be generated and stored in various ways. Within the near future, batteries will have sufficient capacity to provide an acceptable range.

Specials

- Steering is manual at low speeds, automatic at higher speeds.
- 95% of the Superbus will be built from recycleable materials.
- The Cw-value (aerodynamic drag) of an ordinary bus is about 0.6. The Cw-value of a modern car is about 0.3 to 0.4. The goal for Superbus is a Cw-value of 0.3 or less. The results from initial wind-tunnel tests give reason for satisfaction.
- Due to its low weight and aerodynamic design, Superbus will have the same drag coefficient (air and road drag) at 150 mph as an ordinary bus at 70 mph.
- Acceleration and deceleration: the design calculates that, with regenerative braking, a deceleration of more than 1metre/s2 can be achieved. The kinetic energy which is released will be stored and re-used, just as in a Toyota Prius.

Wubbo's Superbus in de startblokken

At the beginning and end of each trip, the battery units will be replaced and re-charged in special 'charging stations'. They will be re-charged with energy from eco-friendly and sustainable sources, such as solar power, wind power or bio-mass energy.

No date has as yet been set for the first test drive, but the build of the full-scale prototype is making steady progress and nears completion.

For more information, see: www.superbus.tudelft.nl

Know how and partners

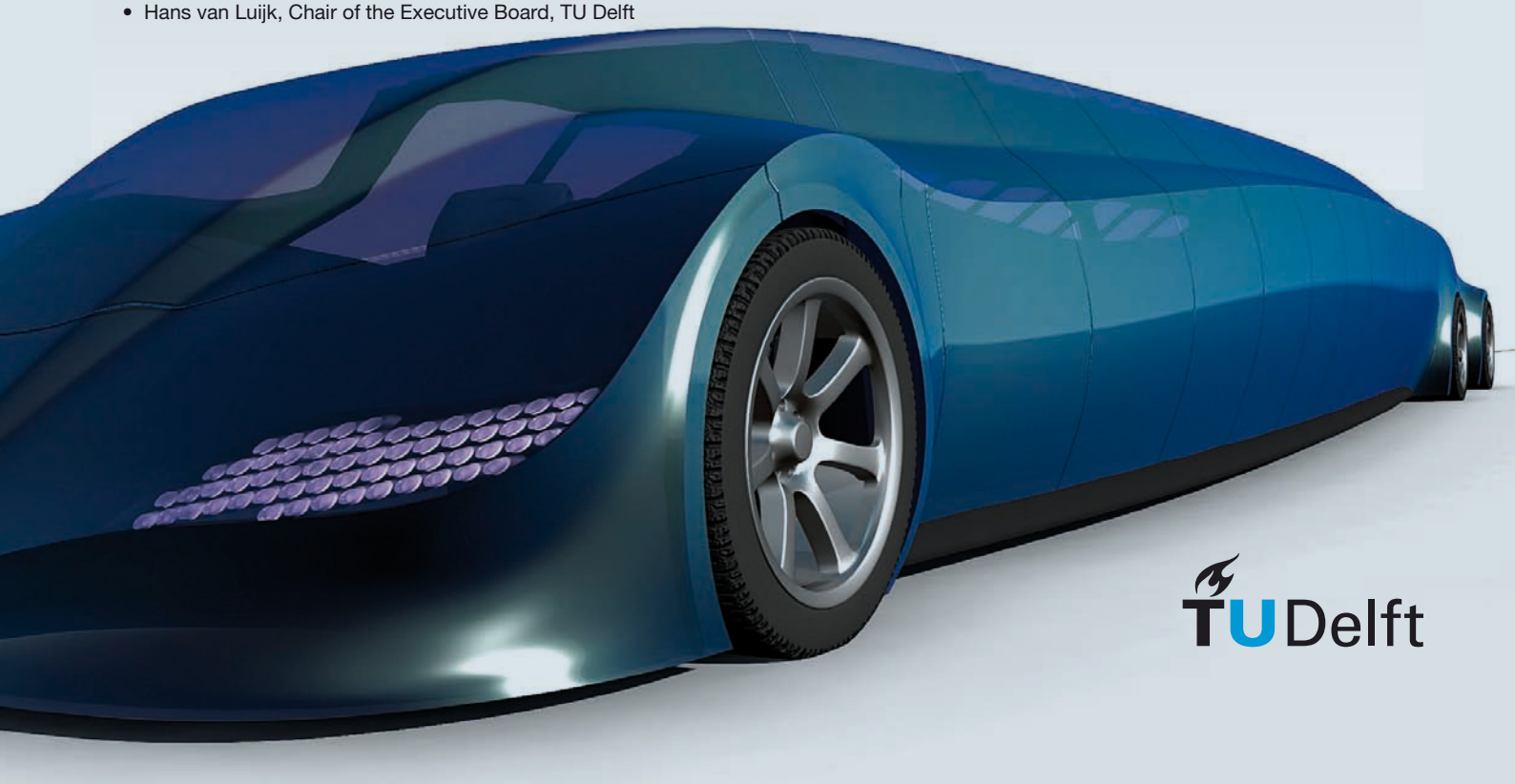
The project is supported by the Dutch Ministry for Transport and Waterways. Transport Company Connexxion is a direct partner in the development of the Superbus. Besides expertise, Connexxion also provides a substantial annual financial contribution towards the development costs of the full scale demonstration model. The Company is participating in order to point out modern transport options and possibilities to passengers.

Leading the project are Dr. Antonia Terzi and Aerospace Engineer Joris Melkert. Both work for Prof. Wubbo Ockels' Chair, ASSET (AeroSpace for Sustainable Engineering and Technology). Prior to this Dr. A. Terzi was chief of Aerodynamics for BMW Williams F-1, and has been appointed Head of Vehicle Design at Delft Technical University (Delft TU). To obtain a broader support base, banks and construction firms are also invited to help in making the system operational.

The development of the Superbus is like a multi-stage rocket. First, Delft TU, together with government support, is developing a full-scale prototype. After test-drives, the Superbus will be prepared for large-scale production.

The Superbus innovations team comprises:-

- Rein Willems, CEO, Shell, the Netherlands
- Peter Bakker, CEO, TNT
- Ad Louter, president, Stork Fokker
- Hans Huis in 't Veld, Chair of the Executive Board, TNO
- Hans van Luijk, Chair of the Executive Board, TU Delft



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