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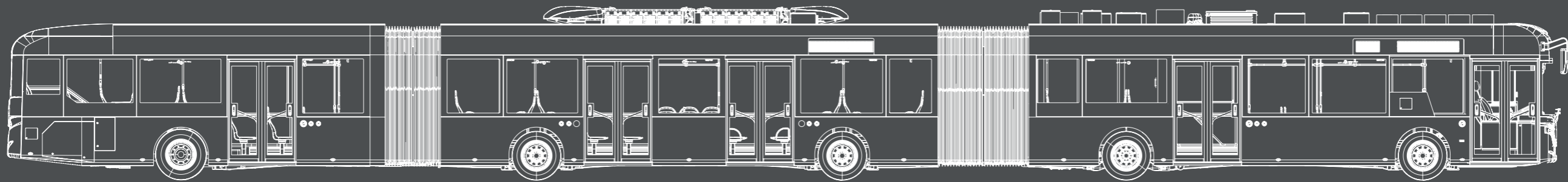
»AutoTram®«  
EXTRA GRAND

TRANSPORT SYSTEM OF THE FUTURE



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## IDEA

It has the capacity of a tram but nevertheless can be manoeuvred on normal roads like an articulated bus – the future AutoTram® Extra Grand.

This new generation of public transport vehicles is based on the AutoTram® concept developed by the Fraunhofer Institute for Transportation and Infrastructure Systems IVI. It combines the advantages of conventional bus and tram technologies into an intermediate public transport vehicle concept.

### Advantages

- High transport capacity (> 250 passengers)
- Diesel-electric hybrid propulsion system
- All-electric operation by means of li-ion batteries
- Range extender for charging processes during operation
- Variably configurable modular concept
- High operational flexibility
- Tram-like swept path (German regulation »BOKraft-Kreis«)
- Low infrastructure costs
- Low environmental impact

With these features, the AutoTram® Extra Grand is an ideal vehicle for the integration into existing public transport systems (e.g. BRT systems).

## TECHNOLOGIES

The drive line configuration of the AutoTram® is designed to meet both the demands of public transport vehicles to be operated in environmentally sensitive areas, and simultaneously provide high availability and suitability for daily use. Using a serial hybrid propulsion system, the AutoTram® is well-equipped for future innovations in the fields of electromobility.

### Drive line characteristics

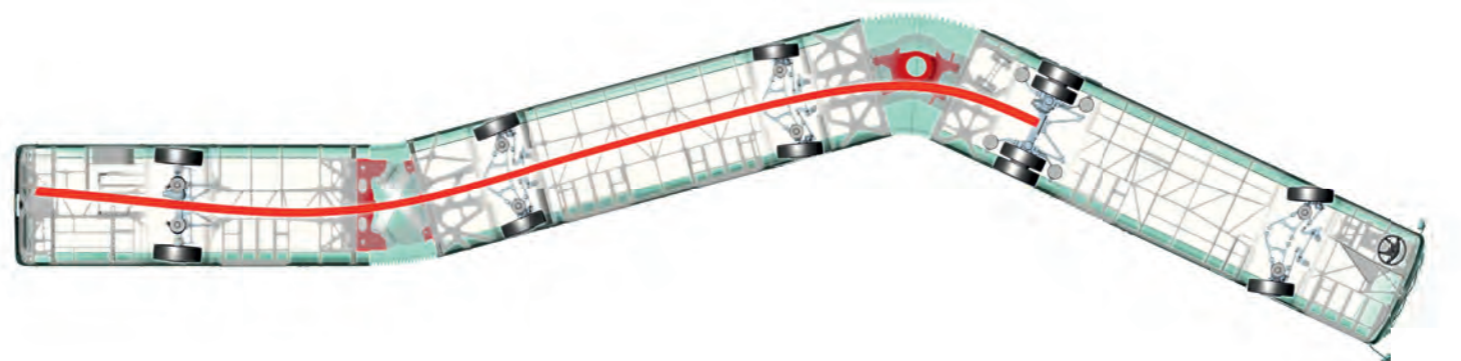
- Serial hybrid propulsion system
- Compact diesel-electric power pack or fuel cell cluster
- Dual energy storage unit for high recuperation rates
- Battery-based partial zero-emission operation ( $\leq 8$  km)
- Highly efficient electric drive engines
- Route-dependent energy management
- Fast charge capability during operation
- High safety standards

## PROJECT

The AutoTram® Extra Grand is developed within a joint project funded by the German Federal Ministry for Education and Research within the framework of »Unternehmen Region – Innovative regionale Wachstumskerne«. In summer 2012, the pilot operation will take place on a bus route in Dresden.

### Participating companies and institutions

- Göppel Bus GmbH, Ehrenhain
- Fraunhofer IVI, Dresden
- Dresden University of Technology TUD
- WITTUR Electric Drives GmbH, Dresden
- Motion Control and Power Electronics GmbH, Dresden
- DEKRA Automobil GmbH, Klettwitz
- Dresdner Verkehrsbetriebe AG



## RANGE OF APPLICATIONS

Due to the advantages of the vehicle concept, a wide range of applications in different fields of public transport is possible. The AutoTram® is a cost-efficient alternative to conventional transport systems if high capacity, low environmental impact and flexibility above average are required.

### Supplement to conventional buses

- Lower environmental impact
- Higher transport capacity
- Low track width requirements
- Higher flexibility

### Alternative to trolley buses

- Comparable environmental standards
- Lower infrastructure costs
- Higher transport capacity
- More suitable for deviations

### Alternative to light rail concepts

- Comparable environmental standards and transport capacity
- Significantly lower infrastructure costs
- Distinctly lower life cycle costs

### Supplement to bus rapid transit systems

- Efficient public transport system
- High manoeuvrability
- Cost-efficient, flexible and environmentally friendly