Electromobility-based Land Freight Transport In Singapore

Tharsis Teoh, TUM CREATE, Singapore

Challenge

The urban freight transport system serves as the lifeline of a city. However it also contributes significantly to the city’s air and noise pollution. One mitigation possibility is the substitution of the current fossil-fueled vehicle-dominant transport system with an electromobility-based one. This research aims to assess the potential of various electromobility concepts to be implemented for freight traffic in Singapore. On that basis, the actual potential benefits with regards to emissions reduction would be estimated.

Content

Electric vehicles claim to offer many benefits for freight transport

Examples of existing freight electromobility options are the Cargo Tram in Zurich (left), Port of LA Electric Drayage Truck (below middle), FedEx Electric Courier Truck (below right).

These include reduced fossil fuel usage, reduced local emissions and noise pollution, and lower operating cost.

Of interest is, how to identify the option that best fits the city’s logistics needs, and what the benefits actually are.

Suitable electromobility concepts identified by operational and technical characteristics

An evaluation of whether an electromobility concept is suitable to the different needs of the logistics industry in Singapore will be done on a micro level, i.e. synthetic tours are evaluated individually, as opposed to aggregated freight transport indicators.

Understanding freight transport behavior from bottom-up

The diverse attributes of freight transport demand and the vehicles influence their behaviour in a city, which in turn influences the suitability of different electromobility concepts.

Test the actual benefit of implementing the various concepts in Singapore

The benefits reaped from implementation will vary based on the actual percentage of goods vehicles that could be replaced by electric vehicles.

From a public perspective, the implementation of these freight vehicles concepts could prove worthwhile.

Outlook

Existing freight traffic models are being compared and evaluated for their suitability to the research task and Singapore’s data availability. Once a model has been chosen and adapted to fit the task’s requirements, the process of surveying and collecting data will begin.

An accurately implemented model can be used in different applications for the testing of alternative freight transport policies for future land-use and transport planning in Singapore.

Supported by

Asociación Argentina de Carreteras

November 6th - 8th, 2013 Hotel Panamericano – City of Buenos Aires, Argentina

“URBAN MOBILITY, ROADS NETWORK OPERATION AND ITS APPLICATIONS”

*Values are merely representative of the land transport emissions.