



## DELIVERABLE REPORT

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TITLE: **EVALUATION OF SIMULATION**

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PROJECT TITLE: **CONFIGURABLE AND ADAPTABLE TRUCKS AND TRAILERS FOR OPTIMAL TRANSPORT EFFICIENCY**

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COORDINATION: **VOLVO (SE)**  
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## Executive summary

A holistic simulation model was built up during the first part of the project. It represents a generic truck model, rather than being an exact match of the behavior of either the DAF or Volvo trucks used in the project. The trailer model however, should be as close as possible to the behavior of the real TRANSFORMERS Hybrid-on-Demand (HoD) trailer.

The model consists of several smaller components that represent different parts of the vehicle such as the engine, electric motor/generator or the battery. These components are coupled together with AVL Model.CONNECT to achieve a holistic simulation of the complete vehicle. The challenge was to verify not only the different components, but also the behavior of the coupled parts. Therefore, the results of the simulations had to be compared with the measured data of the demonstrator.

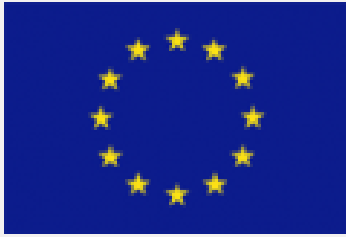
A number of signals were defined as being important to the evaluation, and these were logged when Volvo did the first on-road test runs in Sweden. The simulation model used some of these signals as input (velocity, altitude). Other signals were used to calculate a key performance indicator (KPI) which is needed to compare the results of the on-road tests with the results of the simulations, and also in the evaluation phase.

Since the truck behavior is not the same between tests and simulations, it was not reasonable to compare the absolute values of the key performance indicator. It was decided to look at the differences (delta values) between tests with the HoD system on and off. The same was done for the simulations.

All on-road tests were performed multiple times and therefore the impact of the HoD system varied slightly from one test to the other. The differences in the results can be explained by different weather and road conditions, traffic and other factors. Having multiple results lead to a certain KPI delta range in which all results were considered to be valid.

In a final step the KPI deltas of the simulations were calculated. It can be seen that all simulation results are within measured delta range. This means that the performance of the HoD system in the simulations is comparable with the impact of the HoD system of the TRANSFORMERS HoD trailer. That means that the simulation model can be used as a base line for further simulations.

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