



Impact of speed on the energy consumption of Sweden's passenger car fleet

The Swedish National Road and Transport Research Institute (VTI) has an opening for two master thesis students at the Vehicle Systems and Driving Simulation unit (FSK). The objective of the thesis project is to investigate impact of maximum speed levels on the energy consumption of Sweden's passenger car fleet

VTI

VTI is an independent and internationally prominent research institute in the transport sector. Its principal task is to conduct research and development relating to infrastructure, traffic and transport and its operations include all modes of transport. VTI has about 200 employees and is located in Linköping (head office), Gothenburg, Stockholm and Lund.

Background

Global warming, caused by emission of greenhouse gases, is one of the biggest threats to our environment. Transport stands for almost a quarter of total greenhouse gas emission in Europe, three-quarters of which is from road-travels. Most of this (about 45%) comes from passenger vehicles – cars and buses – and the rest (about 30%) comes from trucks carrying freight.

It is well known that aerodynamic drag, which is one of the main resistance forces on a vehicle, is proportional to the square of the speed. Therefore, speed has a significant impact on the energy consumption of a vehicle, especially at higher speeds and altering the maximum speed limits on roads will affect the energy consumption of the passenger car fleet.

Purpose of thesis

The purpose of this project is to exemplify (at vehicle level) and quantify (at national level) how much energy/emissions can be saved by lowering the maximum speed on the Swedish road network.

The project will include energy consumption measurements on roads with a selection of vehicles, common in the Swedish passenger car fleets. Both electrical vehicles and vehicle with combustion engines will be tested. Different scenarios should be considered, for instance variations in speed compliance.

Work outline

The thesis work is planned to start in January 2022 and includes the following tasks:

- Literature study
- Running experiments and gathering energy consumption data for a collection of vehicles
- Comparing measurements with theoretical models
- Developing model(s) for quantifying effect of maximum speed on the energy consumption of passenger cars, considering efficiency of different operating points of the engine/motor.
- Investigating the indirect effects on energy consumption, such as modal shift to/from public transports

Qualification

- Educational background in the areas of vehicle engineering, energy management or a similar area
- Experience of programming and simulation
- Driving license
- Ability to work independently and to take initiatives

Application instruction

Send your application with cover letter, CV and transcripts to sogol.kharrazi@vti.se

For more information contact:

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