TU Graz

Technische Universität Graz
Erzherzog-Johann-Universität

FTG **Institut für Fahrzeugtechnik**

Master Thesis

Commercial vehicle analysis in forestry:

Increasing efficiency by optimizing the weight of commercial vehicles for timber transport in forestry

Motivation & Goals:

The increasing demands for sustainability, cost-effectiveness and environmental friendliness in timber transportation require innovative approaches to increase efficiency. The weight optimization of commercial vehicles in particular plays a decisive role, as it has a direct influence on fuel consumption, transport capacity and emissions. By reducing the tare weight of vehicles, more timber can be transported per journey, which leads to better use of resources and cost savings. At the same time, lighter vehicles contribute to reducing CO_2 emissions and soil pollution in sensitive forest areas.

Goal: This work aims to investigate a scientifically sound approach to weight reduction in timber transport vehicles in order to develop sustainable and economical solutions for the industry.

Work Tasks:

- **Analysis:** Examination of existing commercial vehicles for timber transport with regard to their material composition and design and subsequent identification of potential for improvement in terms of weight optimization.
- **Identification and evaluation of optimization measures:** Investigation of alternative materials (e.g. high-strength steels, aluminum, composites, etc.) for use in commercial vehicles and subsequent analysis of the effects of these on stability, safety and durability. Final consideration of modifications to the chassis, frame and body to optimize weight.
- **Economic and ecological analysis:** calculation of possible savings in fuel and operating costs and additional analysis of the environmental benefits of reducing CO_2 emissions. Consideration of long-term economic profitability.
- **Implementation options:** Development of an optimization concept with concrete measures for weight reduction and additional development of recommendations for action for manufacturers and operators of timber transport vehicles.

Duration:	6 Months
Start:	As from now
Workplace:	Institute of Automotive Engineering & Industry partner

A **scholarship of € 3.500** will be granted for the successful completion of the master's thesis.

Contact: Research Group Automotive Mechatronic Product Development
Dipl.-Ing. Dr.techn. Alexander Kreis, alexander.kreis@tugraz.at, +43 664 88878948

10.03.2025

http://ftg.tugraz.at