

Research title:

Road Tests Investigating Active and Passive Flow Control Methods for Drag Reduction on Blunt Vehicles

Primary Investigator:

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In this study, road tests were conducted comparing the fuel consumption of an unmodified, blunt trailer aft section and a modified, by a reflex shaped add-on aerodynamic device, 25cm long, attached to the trailer rear-end. The fuel consumption was measured using the fuel consumption measurement system of the towing car. A reduction of 10% (1.15 lit/100km) of the combined car-trailer fuel consumption was measured when the device was used passively. An additional 5-7% fuel saving (0.65 lit/100km) was measured when active suction was added to the device passive effect. The energy consumed by the blowers is about 4% of the energy saved by the suction effect. A major effort to measure all car and trailer relevant parameters was completed, including the towing force and all wind and GPS parameters. The clearest additional indication to drag reduction was a small increase in the trailer base pressure when active suction was applied.

Added value to smart transportation research and/or practical implementation:

The device was road tested and proved significant fuel saving capability.

Innovation of the research:

There is no such device in development with such meaningful fuel saving, with active effect and with such relatively short length.

Promoting the vision of “zero externalities”:

A reduction in fuel saving is also a reduction in CO₂ and pollutants emission.

Promoting multidisciplinary research:

The research already lead to another research to develop re-configurable device for fuel savings based on the same nominal shape.