

## **Vehicle safety performance improvements using a performance-based standards approach: four case studies**

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### **Abstract**

As part of a performance-based standards (PBS) research programme for heavy vehicles in South Africa, a need was identified to design, manufacture and operate a number of PBS or Smart Truck demonstration vehicles. The purpose of the demonstration programme is to gain practical experience in the PBS approach and to quantify and evaluate the potential infrastructure preservation, safety and productivity benefits for road freight transport. The Smart Truck demonstration vehicles have been designed and manufactured to comply with the safety standards of the Australian PBS scheme. These include directional and non-directional manoeuvres such as low-speed swept path, tail swing, acceleration capability, static rollover threshold and rearward amplification. Four comparisons between baseline and PBS vehicle assessment results are presented in this paper to highlight some of the safety performance improvements that have resulted through the implementation of the PBS demonstration project. The demonstration vehicles include a timber truck and drawbar trailer, a mining side-tipper road train, a truck and tag-trailer car-carrier and a bi-articulated bus train.

**Keywords:** Performance-based standards for heavy vehicles, Smart Trucks, Road Transport Management System (RTMS), heavy vehicle productivity, heavy vehicle safety