

## Development and application of a vehicle safety rating scale for public transport minibuses

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### Abstract

An innovative system was developed to assign a 'vehicle safety score' to minibuses used for public transport, based on a set of variables quantifying primary and secondary safety characteristics. A sample of in-service minibuses was inspected and each assigned a safety score using the system. The results highlighted generally low levels of both active and passive safety, with the study outcomes currently being used to drive the implementation of new safety standards aimed at reducing the burden of death and serious injury from minibuses in the United Arab Emirates.

### Objectives

Minibus crashes worldwide have been shown to be problematic in terms of their ability to protect their occupants. One of the difficulties in assessing their level of safety is the inability to quantify safety using a visual inspection process, such as is required by trained vehicle inspectors. This study set out to develop such a system aimed at generating a vehicle safety score.

### Method

A set of variables was identified including both active and passive safety based on international best practice. Twelve inspectors were trained in the assessment process. Locations for inspections were identified in several suitable locations and permission obtained to carry out inspections in situ. In total, more than 550 vehicles were inspected encompassing a representative sample of the fleet in the United Arab Emirates. Results were analysed using standard statistical techniques.

### Results

Many of the vehicles were not fitted with seat belts or head restraints, had poor seat design and inadequate attachment with cramped seating conditions. Apart from the very best minibuses, there were few active safety features and low rates of fitment of key secondary safety features such as airbags.

The safety rating score assigned a weighting to each group of active and passive safety characteristics and, within each of these major categories, weightings to the individual features and characteristics. Individual weightings were assigned based on an expert assessment of their approximate relative risk.

Applied to the benchmarking sample, scores ranged from five points and lower for the least safe vehicles to 41 points for a small number of the best-performing vehicles. Overall, the study showed that the majority of vehicles inspected scored less than 20 points on the zero to 50 point scale developed.

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#### 49 **Conclusions**

50 The safety rating scale developed provides an effective and practical means of assessing the vehicle  
51 safety characteristics of a specific vehicle fleet, in this case minibuses, but could also be adapted to  
52 other applications. The results of this study are being used currently to justify a new minibus safety  
53 standard in the UAE with the goal of significantly reducing death and serious injury among the  
54 many passengers using this service, the majority of whom have few economic transport alternatives.