

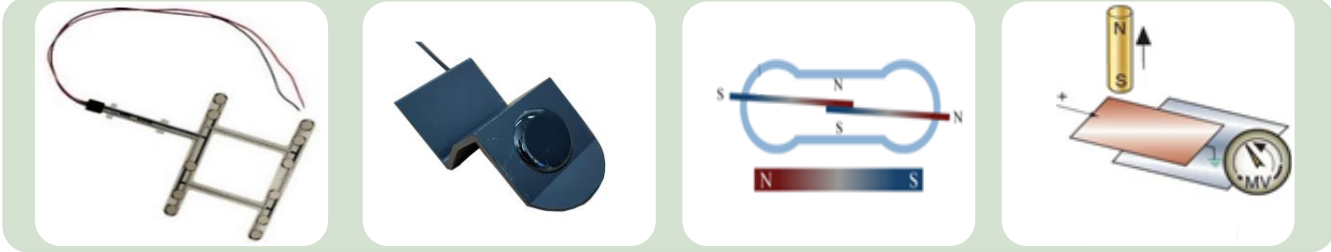
Technical Study on Seat Occupancy and Seat Belt Fastening Detection for Green Minibus

Transport Department (TD) has engaged a technical specialist to conduct a technical study on seat occupancy and seat belt fastening detection for Green Minibus (GMB). While the seat occupancy information would be useful for passengers’ trip planning, we also aim to enhance passengers’ awareness of wearing seat belt by using the seat belt fastening detection system. Proof-of-concept (POC) on-site trial of technical solutions will be conducted in the study.

Technical solutions

In the POC on-site trial, TD will test the performance of pressure-sensitive switch and infrared sensor for occupancy detection, and reed switch and hall effect sensor for seat belt fastening detection.

Seat occupancy detection			Seat belt fastening detection		
Option	Name of technical solution	Illustration	Option	Name of technical solution	Illustration
1	Pressure-sensitive switch		1	Reed switch	
2	Infrared sensor		2	Hall effect sensor	



Pressure-sensitive switch
shall be placed on the seat to detect any change of pressure on its surface.

Infrared sensor
shall be placed between the back and seat of the chair. The transmitter will transmit an infrared wave which will be reflected back to the receiver once it hits an object.

Reed switch
shall be fixed on seat belt buckle to detect if the magnet fixed on the tongue of seat belt is in close proximity to the reed switch (i.e. seat belt is fastened).

Hall effect sensor
shall be fixed on seat belt buckle to detect the voltage difference produced when the magnet fixed on the tongue of seat belt is approaching / leaving the sensor.

Display methods

With the detected seat occupancy and seat belt fastening status, the information can be disseminated in the respective GMB. We will explore and review the effectiveness of the following different display methods in the POC on-site trial.

Display method	Details	
LED signal installed above passenger seats		The LED signal shall display seat occupancy and seat belt fastening status of each seat. A green light signal will be displayed if a seat is not occupied. A red light signal will be displayed if a seat is occupied but the seat belt is not fastened. The light signal will be off if a seat is occupied with seat belt is fastened.
LCD screen installed adjacent to driver's seat (for driver's information)		The LCD screen shows a GMB floor plan with indication of individual seat. Seat occupancy and seat belt fastening status of each seat, and the corresponding numbers in total will be presented.
LCD screen installed adjacent to passenger entrance (for passengers' information)		
Audio alarming system		

We will also study the feasibility to disseminate seat occupancy information in a mobile application. No personal information will be collected in the technical study. The collected data/information shall only be used by TD and the GMB Operators involved in the POC on-site trial internally.