

STATUS SUMMARY OF RESEARCH INTO THE EFFECT OF INTRODUCING 15M LONG BUSES INTO THE UK

Transmitted by the expert from the United Kingdom.

UN-ECE Regulation 36 and Directive 2002/7/EC make provisions for the use of 15m long buses. (Directive 2002/7/EC amends Directive 97/27/EC.) The UK and Portugal have a derogation on implementing the provisions of Regulation 36 and 2002/7/EC until March 2005; provisions similar to those of 97/27/EC apply until that time. The UK has undertaken research to assess the potential impact of introducing 15m long buses into use in the UK. This paper provides a summary and status of the work done to date.

Phase I – Assess differences between test methods

Regulation 36 (Directive 2002/7/EC) and Directive 97/27/EC each have requirements regarding out-swing of the rear of the vehicle when performing a turning manoeuvre. However, these requirements differ in the manoeuvre performed, and the point at which the out-swing is measured. The UK has investigated the implications of these differences when applied to 15m long buses.

A computer-based analysis and physical tests (at a test ground) were used to assess the differences. The computer based analyses examined various configurations of 15m long bus (number of axles (3 or 4) and steered axles (front and rear, 2, 3 or 4)) for each type of manoeuvre. A 12m long bus was included for comparison (2 axles, front steer only).

The diagrams below illustrate the two manoeuvres.

Figure A: 97/27/EC

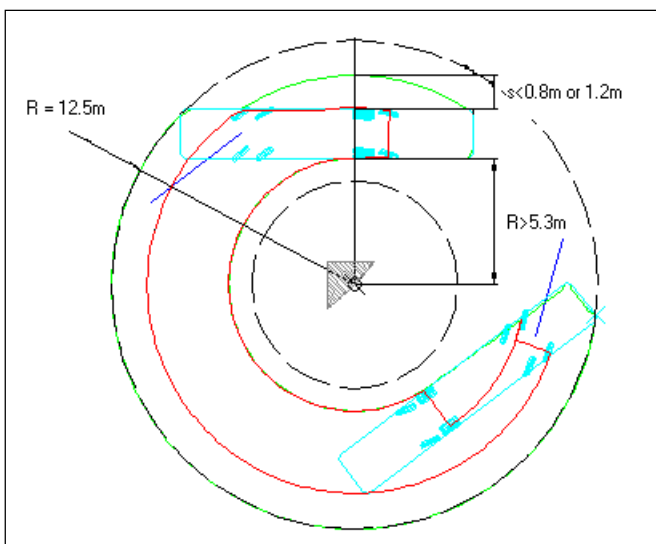
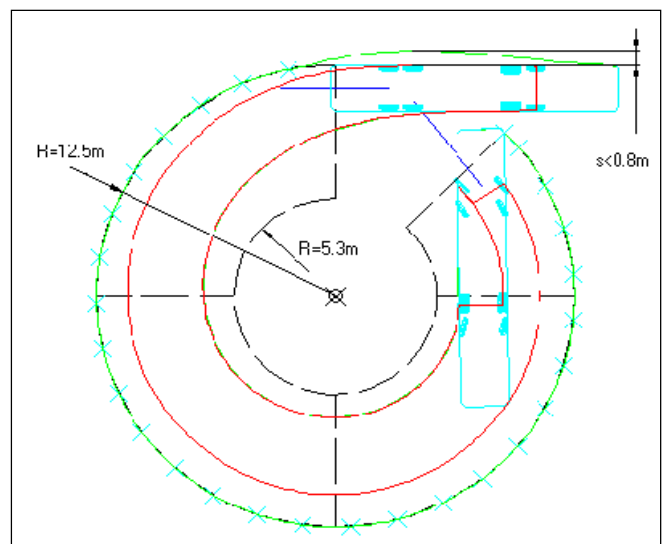


Figure B: Reg. 36 (2002/7/EC)



Each manoeuvre has requirements relating to two concentric circles of radii 5.3m and 12.5m. They are different in the way that the manoeuvre is performed. 97/27/EC requires the vehicle to have steering applied from the outset; Regulation 36 (2002/7/EC) requires the vehicle to have no steering initially, but is then applied as the test progresses.

Since constant steering is required throughout the 97/27/EC manoeuvre, the resulting out-swing will be constant throughout the test. The maximum out-swing allowed is 0.8m (1.2m for vehicles longer than 12m as per derogation requirements).

Steering is not applied constantly during the Regulation 36 (2002/7/EC) manoeuvre, rather the steering increases as the manoeuvre progresses; the resulting out-swing will hence increase as the test progresses. However, out-swing is measured at the beginning of the test, where minimal steering is applied. The maximum out-swing allowed is 0.8m.

Since out-swing increases as the amount of steering applied increases, the measured out-swing for the Regulation 36 manoeuvre is less than that for the 97/27/EC manoeuvre. This was reflected in both the computer-based analyses and the physical tests.

The results showed that only the 12m long bus met the out-swing 0.8m requirement of 97/27/EC (0.54m).

The UK is concerned that:

- None of the 15m long bus configurations investigated met the derogation out-swing requirement of 1.2m (best vehicle 1.38m, worst vehicle 1.82m).
- In contrast, all but one of the vehicles met the 0.8m out-swing requirement for Regulation 36 (2002/7/EC) (12m bus – 0.16m; 15m bus, best vehicle – 0.45m, worst vehicle 0.84m)

The UK is further concerned that:

- The change to the test method, and the point at which out-swing is measured, may mask the effect that the increase in vehicle length would have when used in a “real-world” context.

Phase II – Examine the effect of the increased vehicle length, and resulting manoeuvrability

Efforts were made to assess this potential masking effect by examining similar manoeuvres in a “real-world” context. Various manoeuvres were assessed: departing a bus-stop incorporating an obstruction (e.g. parked vehicle in front of the bus-stop), a lane change and a turn into a restricted junction. A 12m bus and a 15m bus were compared. The 15m long bus showed a greater intrusion over a pedestrian pavement (for the bus stop manoeuvre), more out-swing of the rear of the vehicle (for the lane change manoeuvre) and more invasion of an opposing traffic lane than the 12m vehicle (turn into restricted junction manoeuvre).

Accident data were analysed to assess the potential increased risk to injury as a result of the increased intrusion over a pedestrian pavement. The analysis showed that there would be a slight increase in injury incidents, with the severity of injuries including fatal, serious and slight.

The results for the lane-change and turn-into-a-restricted-junction manoeuvres in this research are consistent with conclusions reached by previous research that 15m vehicles would have little trouble negotiating road layouts designed to current highway standards, but their increased length would lead to larger swept paths into traffic.

Phase III – Assess current UK road infrastructure

Further work was required to establish the proportion of UK roads that are constructed to current highway standards. This task is now underway, and the results are expected at the end of November 2004.

Next steps

The UK is concerned that the combination of a differing test method and an increase in bus length may result in an increase in road traffic accidents involving pedestrians.

Pending the results of Phase III of this work, the UK's perspective on this element of the new Regulation 107 may be influenced.

In addition, the UK may consider approaching the European Commission for an extension to the derogation to Directive 2002/7/EC.

Further details on the research referred to in this summary are available in the report "Long Vehicle Manoeuvrability (15m)", Project reference S0210/VE. The work was done by TRL Ltd under contract from the UK Department for Transport.
