

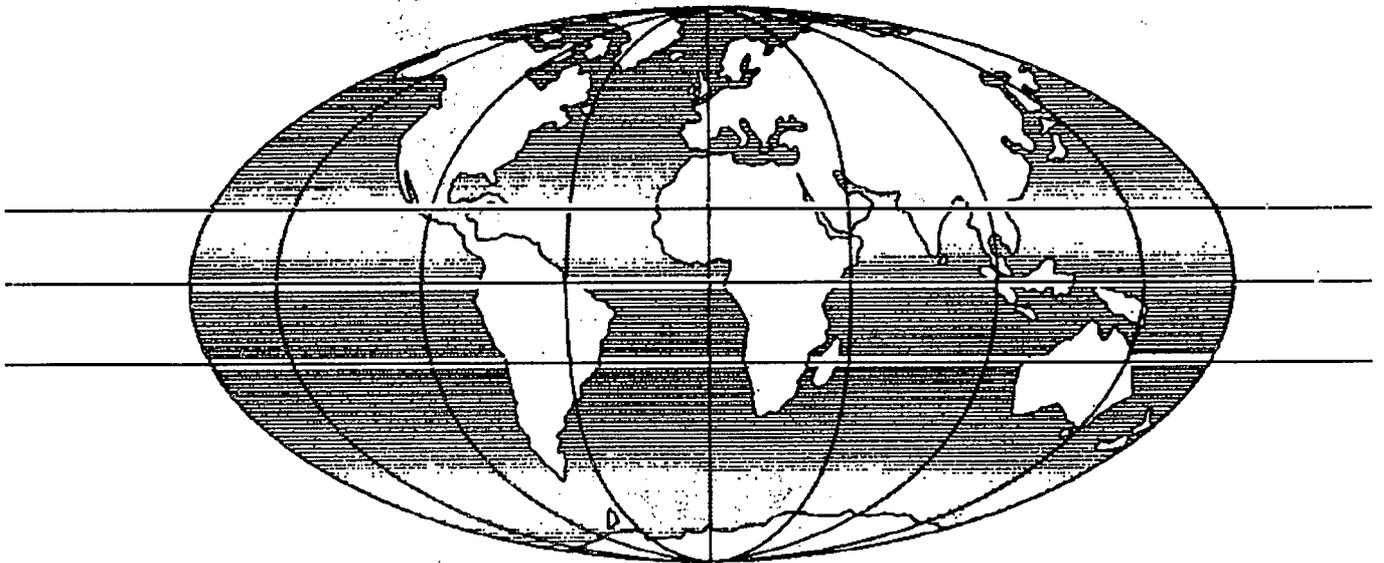


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# Reprint

**TITLE The effectiveness of a retraining programme for bus drivers in Pakistan**

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# THE EFFECTIVENESS OF A RETRAINING PROGRAMME FOR BUS DRIVERS IN PAKISTAN

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## INTRODUCTION

Since 1972 the Overseas Unit of the Transport and Road Research Laboratory (TRRL) has been carrying out studies (Jacobs and Sayer, 1983; Jacobs and Cutting, 1986) to determine the extent and nature of the road accident problem in the Third World. These have illustrated the seriousness of the problem (for example fatality rates in developing countries are very high in comparison with those of developed countries) and they have also highlighted some of the typical accident patterns and conditions found in these countries.

More recently the Unit has developed a road accident reporting and micro-computer analysis package for use in developing countries (Hills and Elliot, 1986) and has begun a programme of evaluating low cost countermeasures. Part of the latter programme was started in 1981 in collaboration with the National Transport Research Centre (NTRC) in Pakistan (Downing, 1985). Because of the high involvement of buses in road accidents (up to 46 per cent of accidents), bus safety was selected as one of five priority areas for research and subsequently a driver retraining course was developed and evaluated. This chapter summarises the results of this research.

## THE BUS ACCIDENT PROBLEM

From figure 1 it can be seen that for most developing countries (with some exceptions in South East Asia and South America), buses are involved in proportionately more reported road accidents than in Great Britain. Countries from the Indian sub-continent seem to have particularly high rates. To some extent this is due to the greater exposure of buses in relation to other vehicle groups when compared with Great Britain. For example, the proportion of all registered vehicles which were buses was 3.1 per cent in Pakistan, 2.6 per cent in India and only 0.6 per cent in Great Britain. However, buses seem to be less safe in developing countries even when total vehicle kilometres travelled are taken into account; for example, a study by Jacobs and Downing (1982) demonstrated that the fatality rates per million kilometres operated in Indian cities were about five to eight times greater than in London and about ten to twenty times greater than in other cities in Great Bri-

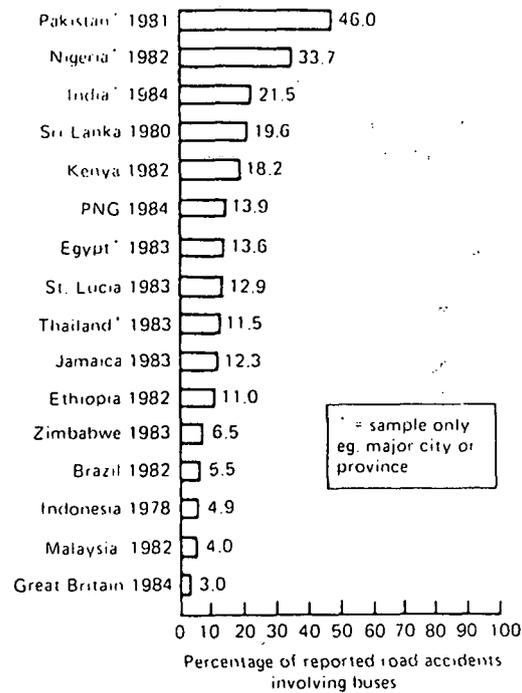


Figure 1: An international comparison of bus accident involvement rates.

tain. Similarly, in Pakistan the fatality rate for a major urban operator was 0.77 per million kilometres in 1981 compared with 0.07 for the United Kingdom (UK). Also in absolute terms the bus safety problem is far more serious in India and Pakistan than the UK as the number of fatal accidents involving buses in just one of their cities (e.g. Delhi or Karachi) is greater than the total for the whole of the UK (227 in 1984).

Why are buses less safe in the Indian sub-continent? A number of factors such as poor bus driver behaviour, inadequate design and maintenance of buses, overloading of buses, poor road user behaviour generally and difficult operating environment (poor road design and a complex traffic mix) could all contribute in some way to increase the risk of bus accidents. The relative importance of each of the latter has not been examined in detail. However, a survey of bus driver behaviour (Downing and Tahir, *in press*) demonstrated that standards of driving were poor in Pakistan (see table 1) and nearly all the bus drivers observed, made errors when stopping, moving off and overtaking (particularly with respect to signalling, positioning and overtaking when oncoming traffic was too near) and just over half of them made errors at intersections.

Table 1: Errors made by bus drivers in Pakistan

Driver error (observation from a following vehicle)	Percentage of drivers making one or more errors (n = 273)
<b>STOPPING</b>	
1. Signals omitted or wrong	97
2. Position wrong	95
<b>MOVING OFF</b>	
1. Signals omitted or wrong	99
<b>OVERTAKING</b>	
1. Signals omitted	100
2. Oncoming traffic too near	95
3. Cut in on another vehicle	83
4. Passed too close to a vehicle	51
<b>INTERSECTIONS</b>	
1. Position wrong	64
2. Signals omitted or wrong	45
3. Disobeyed sign or signal	14
4. Speed too fast	2

Table 2: Bus conditions in India and Pakistan

Vehicle faults	Percentages of buses with faults		
	India (n = 234)	Pakistan (n = 103)	
Lights	-rear indicators	99	14
	rear brake lights	98	73
	rear lights	92	-
	rear reflectors	87	-
	front indicators	97	-
	main beam headlights	8	-
	dipped headlights	14	-
Tyres	-faulty pressure	74	-
	-bald tyre	10	-
Brakes	< 50% efficiency	31	-
Steering	play over 0,75 turn	12	-

Studies in India (Jacobs and Downing, 1982) and Pakistan (Swati and Downing, 1981) have indicated that bus driver knowledge also could be improved as average scores on oral driving theory tests were found to be only 54 per cent and 66 per cent respectively.

In addition the physical condition of buses has been investigated in India (Jacobs and Downing, 1982) and to a lesser extent in Pakistan (Downing and Tahir, *in press*). From table 2 it can be seen that all types of rear light faults

were very common in India as were brake light faults in Pakistan and consequently there is clearly a need to improve the maintenance of buses as well as driving standards.

#### THE BUS DRIVER RETRAINING PROGRAMME IN PAKISTAN

In order to improve bus safety and particularly driving standards, the Government of Pakistan introduced a retraining programme for the drivers of a major urban operator in the Rawalpindi and Islamabad area in 1982 (preceded by a trial course in 1981).

Up to ten drivers at a time were sent on any one course, each of which lasted for six days with the last day being devoted entirely to practical and theory driving tests. Between 30 and 40 courses were completed each year and by the end of 1984, 447 (77 per cent) of the bus drivers working at the Rawalpindi and Islamabad depots had been trained and 303 (68 per cent) had passed.

Two instructors carried out the teaching and the methods used were classroom instruction, demonstration drives and practical driving tuition. For many of the sessions the class of ten was split into two, one half staying in the classroom while the other half travelled in the training bus. In this way it was possible to keep to a maximum ratio of five trainees to one instructor in the bus.

The main objectives of the course were to ensure that drivers:

- 1) Knew the Pakistan Highway Code;
- 2) Knew the stopping distance of their vehicle and that they could use the '2 second rule' to check their following distance;
- 3) Followed the correct procedure for moving off, stopping, overtaking and carrying out manoeuvres at junctions;
- 4) Used the correct "mirror, signal, manoeuvres" (MSM) procedure;
- 5) Positioned their vehicles correctly at all times;
- 6) Corrected any bad steering habits;
- 7) Used the correct gears for all manoeuvres;

and particular emphasis was placed on the teaching of driving procedures rather than vehicle control (more details about the course are given in reports by Downing, 1987 and Swati and Downing, 1981).

The practical driving tests (lasting about 30 minutes) were carried out on a fixed route in Islamabad and the methods of assessment and marking adopted were similar to those used in the UK learner driver test. Every fault committed was marked on an assessment form immediately after it occurred and each was classified as minor, serious or dangerous according to its severity (for more details see Downing, 1987). In addition the drivers were given an oral test on driving rules (100 questions) and another on the principles of the course and road signs.

To pass the course the drivers had to complete the practical test without making a single serious or dangerous error and score at least 95 per cent correct on the theory tests overall. Drivers who failed had to repeat the course at a later date and those who failed a second time were recommended to have their public service vehicle licences withdrawn. In practice the latter recommendation was not very successful as the affected drivers appealed, with the authorities usually deciding in their favour.

### THE EFFECTIVENESS OF THE RETRAINING PROGRAMME

In order to assess the effectiveness of the retraining programme the bus drivers' road accident data were collected from 1980 to 1984 and their driving errors and knowledge tested before and after the initial trial course in 1981. In addition their behaviour was monitored (unobtrusively) by observers stationed at selected junctions (13) and bus stops (6) and along five short routes by an observer in a following vehicle. The main findings were as follows:

- The retraining had no significant effect on the drivers' reported accidents (see figure 2). Fewer of the untrained drivers had accidents throughout the five year period but a regression analysis indicated that this difference could be entirely accounted for by a selection bias, i.e. the less safe drivers (those who were older and from the Islamabad depot) were sent for retraining first leaving many of the safest drivers still untrained by the end of the study.

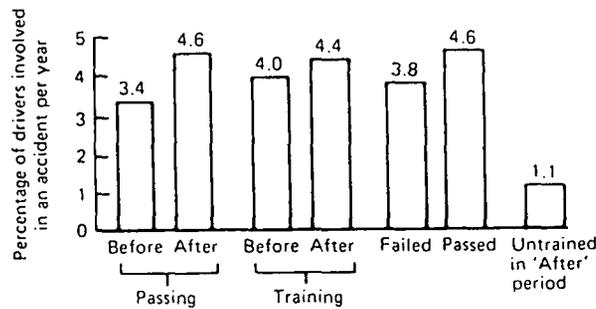


Figure 2: Training and accident improvement rates.

- The retraining brought about an improvement in drivers' knowledge (scores after the trial course increased by 13 per cent) and a reduction in their driving errors under test conditions (67 per cent drop in serious and dangerous errors after the trial course). However the reduction in errors was much less when the drivers were observed unobtrusively under normal operating conditions and the trained drivers made significantly fewer errors than the untrained drivers on only 3 out of 29 ca-

tegies assessed (for more details see Downing, 1987). Therefore retraining on its own was insufficient to improve everyday driving standards.

- Proportionately more of the older and more experienced drivers were involved in accidents (see figure 3) possibly because of medical conditions usually associated with age such as poor eyesight or slower reactions and/or because they had adopted driving techniques which were no longer appropriate. These drivers were also the most difficult to retrain in that they were the least successful at the course tests and their pass rates were at least 20 per cent lower than the youngest and least experienced groups. A study of three transport corporations in India (Vasudevan and Victor, 1987) found the opposite accident trend with age and experience and therefore it is clearly not possible to make any generalisations about such relationships for bus drivers in the Indian sub-con-

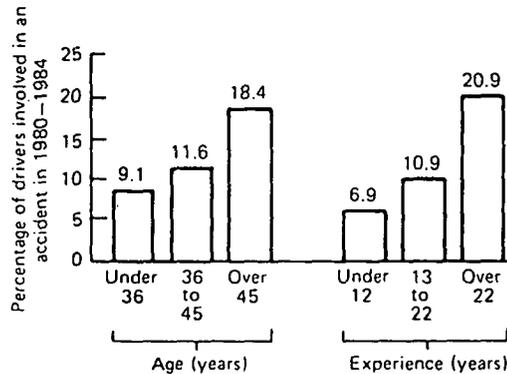


Figure 3: The effects of driver age and experience on road accidents.

continent as a whole.

- The Pakistan data also indicated that more of the bus drivers in Islamabad were involved in accidents than were those from Rawalpindi (18 per cent compared with 9 per cent) even after allowing for differences between the drivers' ages and experience levels at the two depots. Similar accident differences between depots were also found in the Indian study by Jacobs and Downing (1982) and it would appear likely that some depots operate over more hazardous routes than others.

#### RECOMMENDATIONS FOR FUTURE COUNTERMEASURES

As the retraining programme resulted in much improved driver performance under test conditions but not under everyday driving conditions, it seems likely that the drivers were insufficiently motivated to change their

normal driving patterns. Therefore it would appear that such training improvements need to be accompanied by enforcement and/or incentive schemes to encourage drivers to adopt the recommended driving practices and procedures. The retrained drivers may also have been reluctant to change their behaviour because it would have resulted in some of their actions appearing to differ from those of the majority of other road users. Certainly, it has been shown that some violations such as those relating to intersections are common to all groups of drivers in Pakistan (Swati, 1980) and consequently, there is a need to raise the driving standards of all drivers rather than bus drivers alone.

In addition, although driving tests in Pakistan have not been systematically studied, it was noticed by the author that on-road tests were often very short or in some cases not carried out at all. Therefore it was recommended that as well as improving training, driving tests are made stricter for all groups of drivers with particular emphasis placed on the testing of driving procedures. In order to maintain improved driving standards, traffic law enforcement also needs to be improved (see Swati, 1980) and the police effort, currently concentrated on non-moving violations, should be redirected towards preventing moving violations; e.g. in the case of buses - dangerous overtaking, stopping and moving off practices, and overloading.

In addition bus operators could help improve bus safety by introducing incentive schemes, regular training courses and improved vehicle maintenance. In the case of the transport corporation which took part in this study, the transfer of the less safe, older and more experienced drivers to safer routes and the introduction of specialised training on specific hazardous locations to be encountered by the drivers may have some accident reduction potential. However, the problems of the older and more experienced drivers and the accident patterns on different bus routes need to be fully investigated before implementing such measures.

#### ACKNOWLEDGEMENTS

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