

Are pelican crossings safe?

by N. Lalani, GLC Department of Planning and Transportation

Describes three GLC studies designed to investigate the safety of pelican crossings. Some pelicans had been converted from zebras, others were sited where there was no previous crossing. Shows that accidents increased, unless the crossing had guard rails and the road had been treated with anti-skid surfacing. In particular accidents rose sharply at sites where vehicle-actuated pelican crossings were the first ever crossing facility. Concludes that in London safety performance of pelican crossings has so far been disappointing.

The zebra crossing has been a familiar sight in our streets for many years, but the pelican crossing is a relatively recent innovation. It was introduced by the Department of the Environment in 1968 (see *DoE Circular Roads 20/68*) and in 1974 the Department issued a circular which revised the criteria to make it possible to provide more pelican crossings (Department of the Environment, 1974). This circular also included sections on the quota system of allocating crossings to resident population, revised signal timings, vehicle actuation, monitoring and control, and safety.

The Department of the Environment had studied a sample of sites where zebra crossings had been replaced by pelicans. They found savings in accidents of over 60 per cent. However, the GLC decided to conduct its own study of the effect on accidents of conversion from zebras to pelicans, as there is so little published information which can be used to evaluate the constant stream of requests for new or improved pedestrian crossing facilities, usually originating from groups with local interests, such as residents' associations.

Traffic engineers have been aware for many years of the dangers of providing unsuitable facilities. Not only is there a risk of increased accidents at the particular site, but also the possibility exists of a general loss of respect for similar facilities elsewhere. Thus, if sound advice is to be passed on to the decision makers, accident information must be accumulated and analysed as soon as possible.

The GLC studies — background

In the summer of 1974 there was an investigation into the before and after accident situation at 23 sites where zebra crossings had been converted to pelican crossings. The findings showed significant variations from the results quoted in *DoE Circular Roads 19/74*

(Department of the Environment, 1974). There was only a small overall improvement in safety. Total pedestrian accidents rose but those on the crossings themselves fell. There was a reduction in total accidents of 29 per cent at sites with a guard rail and 34 per cent at sites which had been treated with Shellgrip anti-skid surfacing. It became clear, therefore, that a large urban area needed to be studied in more detail, and sites where previously there was no crossing should be included.

Three studies were undertaken. The first was of 40 pelican crossings converted from zebras, the second of 31 pelican crossing at sites where there was no previous crossing, and the third of 32 pelican crossings with vehicle actuated equipment. The third study included sites analysed in the first two studies. A brief outline of the method and the main results and conclusions are presented below. Full details of the studies, together with results, are given in a GLC Research Memorandum (Lalani, 1975).

Study method

Selection of accidents

All accidents occurring within 50 metres of a pelican crossing, measured in the direction of the road on which the crossing was located, were analysed. Detailed accident data for each pelican crossing were obtained from the GLC's Accident Statistics System (see Turner, 1972) and a 1:1250 scale map, with the exact location of the crossing clearly shown, was used in the precise selection of relevant accidents.

Types of accident

All personal injury accidents were analysed and they were broken down into the following main categories:

- (i) All pedestrian accidents on, or within 50 metres of, a crossing.
- (ii) All vehicle accidents within 50 metres of a crossing or associated with junction movements within 50 metres of a crossing.*
- (iii) All accidents to public service vehicle passengers within 50 metres of a crossing.

*For vehicle accidents data do not distinguish between 'on' and 'within 50 metres'.

Site data

A variety of site conditions, together with any relevant details relating to the conversion to a pelican crossing, were recorded. Note was taken of the presence of anti-skid surfacing, guard rails, central refuges, and vehicle actuation and high intensity signal equipment. The amount by which any crossing had been moved and details of conversions arising from the introduction of bus lanes were also noted.

Statistical tests

Statistical significance tests were carried out on the results of the three studies. Significant variations between before and after accident data at the sites in the studies and changes in a larger sample of similar accidents in Greater London were noted. In the tables changes which are significant at the 5 per cent level i.e. the probability of such a change happening by chance is 1 in 20) are marked * and significant changes at the 10 per cent level by †. The types of

accident which were tested for significance were limited to the following:

- (i) Pedestrian accidents on, or within 50 metres of, a crossing.
- (ii) Pedestrian accidents on crossings converted from zebra crossings.
- (iii) Pedestrian accidents 20 to 50 metres from a crossing.
- (iv) Pedestrian accidents within 20 metres of, but not on, a crossing.
- (v) Vehicle accidents within 50 metres of a crossing.
- (vi) All accidents within 50 metres of, or on, a crossing.
- (vii) Nose-to-tail accidents 20 to 50 metres from a crossing.
- (viii) Nose-to-tail accidents within 20 metres of a crossing.

FIGURE 1 Pelican crossing

In this picture the lights are seen at the amber phase; when flashing the light indicates that traffic may move over the crossing but must give way to pedestrians. The woman on the right has pressed the button (note the boxes on the posts) and is waiting for the 'green man' light to show, when traffic will be subject to the red phase. Pelican crossings are indicated by painted 'studs' on the road, not by the black and white bands used for zebra crossings.

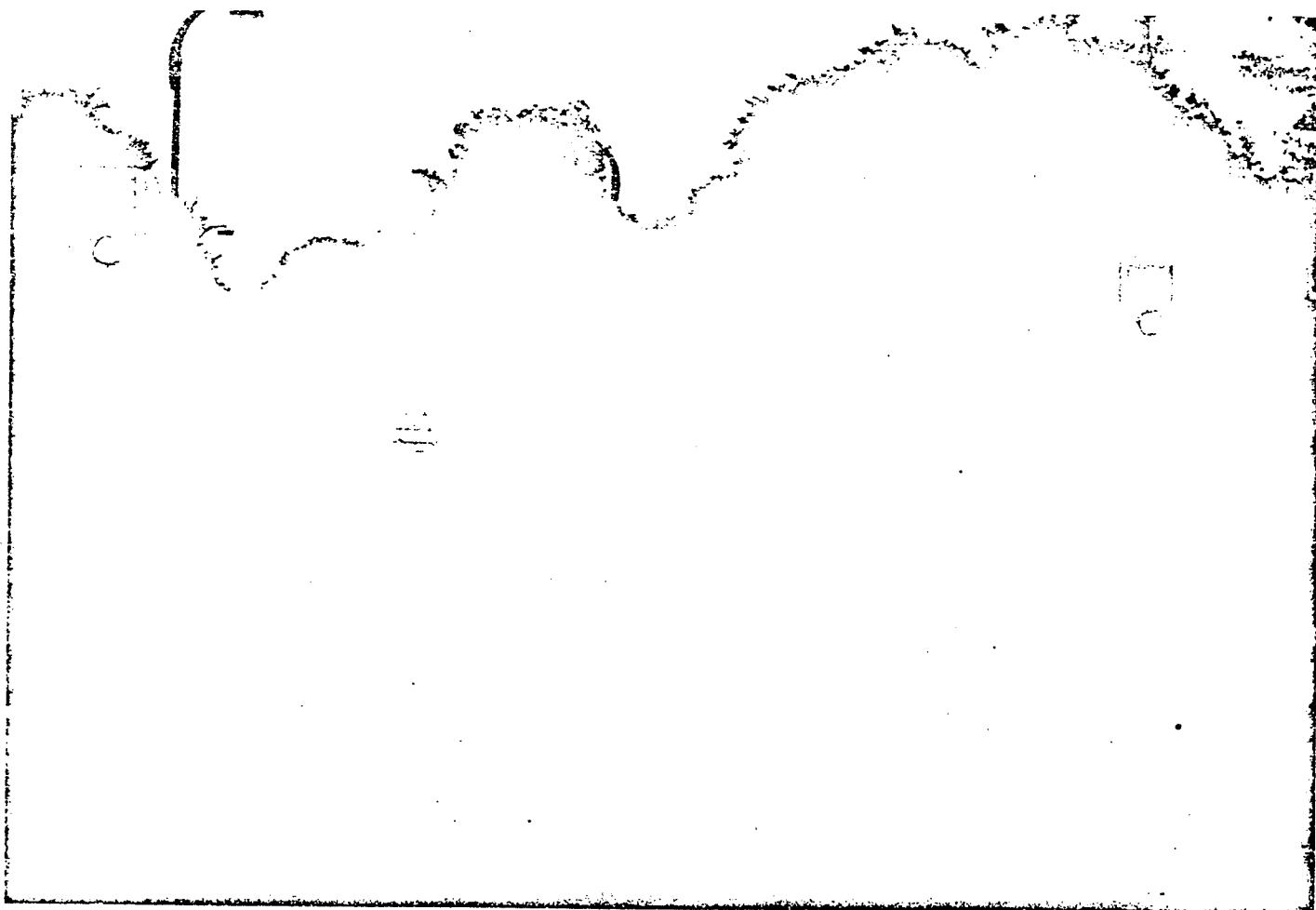


TABLE 1 Study 1: 30 sites with pelican crossings converted from zebra crossings moved by less than 15 metres or not at all

<i>Type of accident</i>	<i>Before</i>	<i>After</i>	<i>Percentage change</i>
Pedestrian accidents at, or within 50 metres of, a crossing	73	84	+
Pedestrian accidents on a crossing	56	33	-
Pedestrian accidents within 20 metres of, but not on, a crossing	10	20	+1
Pedestrian accidents within 20 to 50 metres of a crossing	7	31	+3
Vehicle accidents within 50 metres of a crossing	67	53	-
Nose-to-tail accidents within 20 metres of a crossing	27	19	-
Nose-to-tail accidents within 20 to 50 metres of a crossing	10	4	-
Vehicle accidents associated with junction movements within 50 metres of a crossing	18	17	-
Public service vehicle passenger accidents within 50 metres of a crossing	16	20	+
Public service vehicle passenger accidents within 20 metres of a crossing	7	13	+
Total accidents at, or within 50 metres of, a crossing	156	157	-

Note: *Significant change at the 5 per cent level
 †Significant change at the 10 per cent level

TABLE 2 Study 1: 10 sites with pelican crossings converted from zebra crossings moved by 15 metres or more

<i>Type of accident</i>	<i>Before</i>	<i>After</i>	<i>Percentage change</i>
Pedestrian accidents at, or within 50 metres of, a crossing	35	27	-2
Pedestrian accidents on a crossing	22	13	-4
Pedestrian accidents within 20 metres of, but not on, a crossing	5	6	+2
Pedestrian accidents within 20 to 50 metres of a crossing	8	8	
Vehicle accidents within 50 metres of a crossing	40	29	-2
Nose-to-tail accidents within 20 metres of a crossing	10	9	-1
Nose-to-tail accidents within 20 to 50 metres of a crossing	5	3	-4
Vehicle accidents associated with junction movements within 50 metres of a crossing	13	7	-4
Public service vehicle passenger accidents within 50 metres of a crossing	10	12	+2
Public service vehicle passenger accidents within 20 metres of a crossing	7	7	
Total accidents at, or within 50 metres of, a crossing	85	68	-2

Note: *Significant change at the 5 per cent level
 †Significant change at the 10 per cent level

TABLE 3 Study 2: 31 sites with pelican crossings where there was no previous crossing

<i>Type of accident</i>	<i>Before</i>	<i>After</i>	<i>Percentage change</i>
Pedestrian accidents at, or within 50 metres of, a crossing	36	51	+42
Pedestrian accidents within 20 metres of, but not on, a crossing	17	35	+106*
Pedestrian accidents within 20 to 50 metres of a crossing	19	16	-16
Vehicle accidents within 50 metres of a crossing	57	75	+32
Nose-to-tail accidents within 20 metres of a crossing	3	13	+333*
Nose-to-tail accidents within 20 to 50 metres of a crossing	15	18	+20
Vehicle accidents associated with junction movements within 50 metres of a crossing	16	18	+13
Public service vehicle passenger accidents within 50 metres of a crossing	6	9	+50
Public service vehicle passenger accidents within 20 metres of a crossing	1	2	+100
Total accidents at, or within 50 metres of, a crossing	99	135	+36*

Note: *Significant change at the 5 per cent level
 †Significant change at the 10 per cent level

TABLE 4 Study 3: 10 sites with vehicle actuated pelican crossings converted from zebra crossings

<i>Type of accident</i>	<i>Before</i>	<i>After</i>	<i>Percentage change</i>
Pedestrian accidents at, or within 50 metres of, a crossing	28	36	+29
Pedestrian accidents on a crossing	19	17	-11
Pedestrian accidents within 20 metres of, but not on, a crossing	25	28	+12
Pedestrian accidents within 20 to 50 metres of a crossing	3	8	+167
Vehicle accidents within 50 metres of a crossing	35	24	-31
Nose-to-tail accidents within 20 metres of a crossing	14	2	-86*
Nose-to-tail accidents within 20 to 50 metres of a crossing	8	6	-25
Vehicle accidents associated with junction movements within 50 metres of a crossing	6	11	+83
Public service vehicle passenger accidents within 50 metres of a crossing	13	8	-38
Public service vehicle passenger accidents within 20 metres of a crossing	7	3	-57
Total accidents at, or within 50 metres of, a crossing	76	68	-11

Note: *Significant change at the 5 per cent level
 †Significant change at the 10 per cent level

TABLE 5 Study 3: 22 sites with vehicle actuated pelican crossings where there was no previous crossing

<i>Type of accident</i>	<i>Before</i>	<i>After</i>	<i>Percentage change</i>
Pedestrian accidents at, or within 50 metres of, a crossing	17	28	+6
Pedestrian accidents within 20 metres of, but not on, a crossing	11	24	+11
Pedestrian accidents within 20 to 50 metres of a crossing	6	4	-3
Vehicle accidents within 50 metres of a crossing	41	58	+4
Nose-to-tail accidents within 20 metres of a crossing	1	10	+90
Nose-to-tail accidents within 20 to 50 metres of a crossing	8	8	
Vehicle accidents associated with junction movements within 50 metres of a crossing	21	21	
Public service vehicle passenger accidents within 50 metres of a crossing	1	2	+10
Public service vehicle passenger accidents within 20 metres of a crossing	0	1	
Total accidents at, or within 50 metres of, a crossing	59	88	+4

Note: *Significant change at the 5 per cent level
 †Significant change at the 10 per cent level

Results

- (i) Pedestrian accidents on the crossings generally fell after conversion from zebra to pelican. The more positive method of control and the provision of anti-skid surfacing are the likely reasons.
- (ii) In all three studies pedestrian accidents within 50 metres of, but not on, the crossing showed a dramatic increase. Possible theories for this result include higher vehicle speed and the fact that drivers and even pedestrians have their attention directed towards the signal at the expense of their immediate environment. Whatever the reasons, it is clear that more than ever pedestrians must be urged to use the crossing facilities
- (iii) The sites which were relocated showed an average improvement in safety. The number of sites was, however, small and other changes took place as well as the re-siting. It is not known how much the relocation affected the number of pedestrians using the crossing.
- (iv) In studies 1 and 2 there was a rise in accidents to the passengers of public service vehicles. This rise gives some cause for concern, although the numbers involved are fairly low.
- (v) In general, vehicle accidents fell, although the beneficial effects of other site features, e.g. anti-skid

surfacing, may well have contributed to this. Vehicle accidents associated with junction movements remained fairly constant.

(vi) At the 22 sites where a vehicle-actuated pelican crossings was the first-ever pedestrian crossing facility, accidents rose sharply. This may reflect the poorer use of the pelican crossing due to increased delays to pedestrians caused by the operation of the vehicle-actuated equipment. Additional speed discrimination equipment does not appear to have a beneficial effect on accidents.

Conclusions

On the evidence of the results presented in Tables 1 to 5 it is clear that a safety benefit cannot yet be ascribed to pelican crossings which have no other associated measures. Accidents in the vicinity of such crossings increased whereas sites which were treated with anti-skid surfacing on their approaches, either independently or as part of the conversion, generally had better after accident records and, perhaps more important, showed a much better before-and-after picture when compared with the original zebra crossing. Also, the sites at which guard-rails were provided were, on average, considerably safer, on a before-and-after basis, than those at which no provision was made.

The figures in Tables 1 to 5 give rise to many questions, theories and suggestions for further studies. However, it is possible that as people become more familiar with pelican crossings, safety will improve. Meanwhile their performance is disappointing.

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**Accident Technical Working Party Reports* are unpublished but copies may be obtained on request from the GLC Department of Planning and Transportation Road Safety Section.

Acknowledgement

The author wishes to thank D. S. Rayner for his guidance in drafting this paper.