

**Powered Two Wheelers in Bus Lanes: Progress
on experiments
Project Development
(Network Performance Division)**

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report

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0.0 Document Control

0.1 Author(s)

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0.2 Document Summary

This paper provides an update on the trials to permit powered two wheelers to share bus lanes at three sites in London.

The primary purpose of this document is to set out the results of the monitoring that has been undertaken to determine the impact of the trials in respect of:

- casualties
- usage
- speeds
- bus journey times
- cyclists attitudes

The report examines each of the three trial sites under each of these monitoring categories and considers two control corridors as a comparison. The report concludes that further consideration of casualty data is needed. Therefore, a further 18-months of casualty data is to be collected for the trial sites, together with the control corridors. In addition, casualty analysis will be undertaken at the four borough routes that have been introduced since the TfL trials commenced.

0.3 Document History

Ver.	Date	Changes since previous issue	Distribution
00	11 Sept 04	➤ Draft based on initial discussion with Head of Project Development	David Rowe Francesco Cioffi
01a	25 Sept 04	➤ Format revised ➤ Updated information provided for casualties ➤ Structure defined	David Rowe Peter McBride Francesco Cioffi

0.4 Document Quality Assurance

Step	Step Description	Undertaken By	Date	Remarks
01	Quality Review	David Rowe	11 Sept 04	
02	Quality Review	David Rowe	28 Sept 04	
03	Quality Review	Peter McBride	29 Sept 04	
04	Quality Review	David Rowe	11 Nov 04	Final version for release



1.0 INTRODUCTION

1.1 Background

1.11 In September and October 2002, TfL introduced three pilot schemes on the TLRN whereby riders of powered two wheelers (motorcycle, scooters and mopeds, hereafter referred to as ptws) were permitted to use bus lanes during the times of bus lane operation. The pilots operate in the following locations:

- the A13 East India Dock Road (between Leamouth Road and Butcher Row East); the hours of operation of the bus lanes are 7am-7pm Monday to Friday. It should be noted that the carriageway alignment and operation of the A13 has been disrupted throughout the period of the pilot study owing to the A13 DBFO works. These are scheduled for completion during December 2004.
- the A23 Streatham High Road/Brixton Hill/Brixton Road (between Streatham Common and Camberwell New Road); the hours of operation of the bus lanes are 7-10am and 4-7pm Monday to Friday. It should be noted that there have been changes to the bus routes operating on this route.
- the A41 Finchley Road (between Marlborough Place and Platt's Lane). The hours of operation of the bus lanes are 7-10am and 4-7pm.
- Maps of each location are included in Appendix A.

1.2 The context of the project

1.12 The Mayor's Transport Strategy (Proposal 4G.1) committed TfL to consider trials allowing ptws into bus lanes, as a means of potentially reducing the exposure of riders to general traffic in order to improve safety. Arguments against permitting ptws into bus lanes centre on the principle of private motorised vehicles being allowed access to bus lanes, additional vehicles in bus lanes having a negative impact on other users (notably buses and cyclists), and a potential increase in road safety conflicts between ptws and pedal cyclists and between ptws and unaccustomed pedestrians.



2.0 MONITORING METHODOLOGY

- 2.1 Several towns and cities outside London permit ptws to use bus lanes. However, it is more usual for ptws to be prohibited from using bus lanes. The Government's Traffic Signs Regulations and General Directions (TSRGD) 2002 do not allow the use of bus lanes by ptws and therefore authorisation is required from the Department for Transport (DfT) to use bus lane signs that incorporate a ptw symbol. Where ptws have been allowed to use bus lanes outside of London there has been little monitoring to date and the relevance of any monitoring elsewhere to conditions in the Capital could, in any event, be questionable.
- 2.2 The Department for Transport (DfT) is keen to develop a better understanding of the effects of allowing ptws into bus lanes. The purpose of the TfL trials is therefore to ascertain whether or not permitting ptws to use bus lanes has a positive impact on ptw safety without causing negative impacts to other users – particularly buses, cyclists and pedestrians. Authorisation for the London pilots was initially granted for two years, with an understanding that TfL would undertake monitoring to complement the DfT's own work on this issue. The three bus lanes have now been made permanent, through the use of road traffic orders, as a temporary order cannot be extended. However, the orders can be removed if the schemes are deemed unsafe.
- 2.3 There has been a lot of interest in the trials and the potential application of allowing ptw's to use bus lanes. Four further schemes in London, two in Richmond and two in Kingston have recently been introduced by the relevant London Boroughs (not as part of TfL's trials).
- 2.4 Two additional corridors have been identified by TfL to act as "control corridors" (i.e a standard against which others can be compared) for the three trial routes. These are the A5 from Oxgate Lane to Minster Road and the A10 between Tile Kiln Lane and Empire Way. Maps of the locations are provided in Appendix B. (Note: the bus lanes on both control corridors operate between 7-10am and 4-7pm).
- 2.5 TfL has undertaken "before" and "after" surveys of the pilots. These surveys have concentrated on the following factors:
- Casualties (all users)
 - Usage (all users)
 - Speeds (all users)
 - bus journey times
 - cyclists attitudes



- 2.6 Note: the congestion charge was introduced after the ptw trials started, on 17 February 2003. It is considered highly likely that the charge will have had by far a greater impact on road conditions, journey times, speeds and mode choice (e.g. any increase in powered two wheelers) than any short-term impact of permitting powered two wheelers to use bus lanes. For example, traffic entering the congestion charging zone is down by 18%, and inbound PTW traffic is up by 15% on 2002 (Impacts Monitoring Second Annual Report, April 2004).



3.0 CASUALTIES

3.1 For the trial sites, in the seventeen months since the beginning of the experiments the overall number of collisions fell by 9% and those involving ptws fell by 11%. In comparison on the control corridors the overall number of collisions fell by 6.5% and those involving ptws remained constant. For the TLRN as a whole the overall number of collisions fell by 14% and those involving ptws fell by 18%.

3.2 The casualty data is summarised in the following table:

SITE	Collision details (all severities)	After		Before		% Change
		Total	In bus lane	Total	In bus lane	Total
A13	Ptws involved in collisions	36	4	36	2	0
A13	All collisions	113	N/a	119	N/a	-5%
A23	Ptws involved in collisions	130	10	141	6	-8%
A23	All collisions	460	N/a	505	N/a	-9%
A41	Ptws involved in collisions	27	3	39	1	-31%
A41	All collisions	126	N/a	143	N/a	-12%
Total	Ptws involved in collisions	193	17	216	9	-11%
Total	All collisions	699	N/a	767	N/a	-9%
TLRN	Ptws involved in collisions	3368	54	4097	32	-18%
TLRN	All collisions	12630	N/a	14664	N/a	-14%
London wide. All roads	Ptws involved in collisions	9706	9213	11953	11365	-19%
London wide. All roads	All collisions	46469	N/a	53529	N/a	-13%
Control route totals	PTWs involved in collisions	26	20	26	24	0%
Control route totals	All collisions	124	N/a	132	N/a	-6.5%

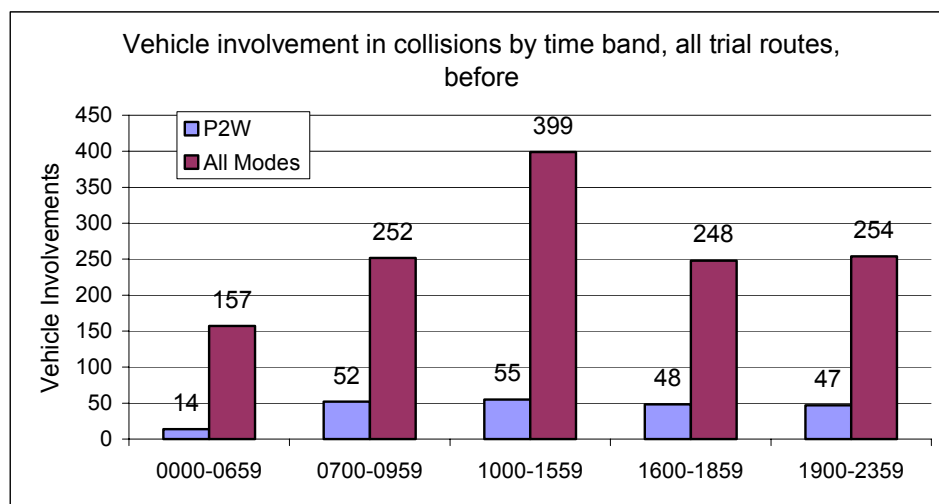
- based on seventeen months (Nov-Apr) "before (Nov 00 to Apr 02)" and "after (Nov 02 to Apr 04)" data for A13 and A23, eighteen months (Oct - Apr) "before (Oct 00 to Apr 02)" and "after (Oct 02 to Apr 04)" data for A41.

3.3 On the A41, the number of ptws involved in collisions has fallen further than on the TLRN as a whole, as has the total number of collisions. On the A23, the number of ptws involved in collisions has fallen, but at a lower rate than on the TLRN. On the A13 the total number of collisions involving ptws has remained the same, while the total number of collisions has fallen slightly. For the control sites there has been no change in the number of collisions involving ptws and a small decrease in the total number of collisions.

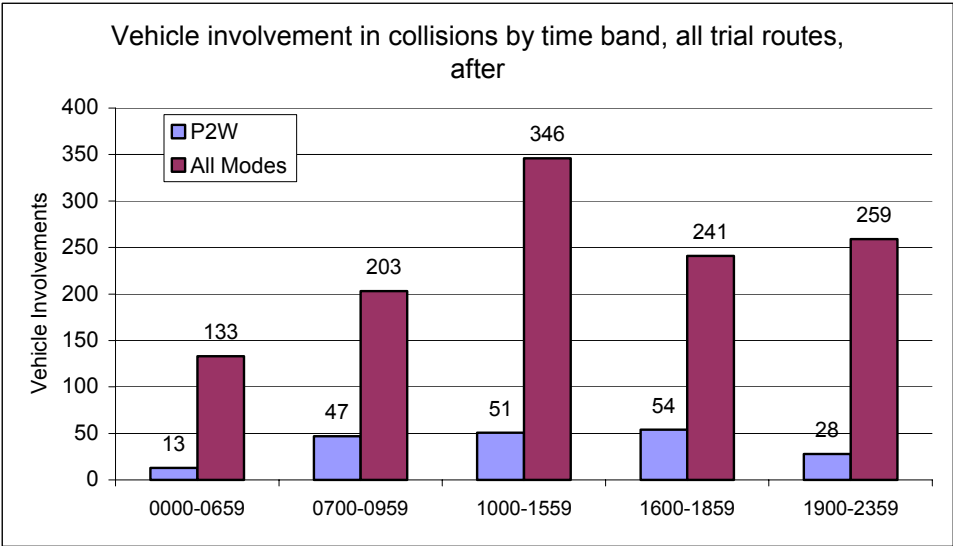


- 3.4 Permitting ptws to use bus lanes during the times of their operation would by definition be expected to lead to an increase in collisions in bus lanes involving ptws. The risk of conflicts with other vehicles turning into the path of ptws (which is a common form of collision involving conflict with another user and causing serious injury to the ptw user in London) would appear reduced if ptws are permitted to use bus lanes.
- 3.5 Many collisions on the trial routes occur outside the times that the various bus lanes operate and a positive or negative effect on collisions on the trial routes may have little relevance to the trials (note: all routes within the study operate between 7-10am and 4-7pm, except the A13, which operates between 7am-7pm). The graphs below and over page compare the distribution by time of day of collisions involving ptws in comparable eighteen month periods before and after the introduction of the trials.
- 3.6 Permitting ptws to use bus lanes enables them to use the facility during peak periods when (as shown by the “before” data) many collisions involving ptws occur. 100 collisions involving ptws occurred during the combined six hours of peak time (7-10am and 4-7pm) compared to 116 during the 18 hour off-peak periods.
- 3.7 There has been a small reduction in the number of collisions involving ptws in the morning peak since the introduction of the trials and a small increase in the number of collisions involving ptws in the evening peak. The proportion of collisions involving ptws would be expected to increase in the event of ptws increasing as a proportion of total traffic.

Before (A23 and A13 Nov 00 to Apr 02; A41 Oct 00 to Apr 02)



After (A23 and A13 Nov 02 to Apr 04; A41 Oct 02 to Apr 04)



4.0 USAGE

4.01 Traffic cameras have been used to record classified counts (by traffic lane) at various points on the trial routes. These surveys cannot determine total usage of the affected bus lanes as vehicles may enter or leave the affected bus lanes many times during a journey and may enter or leave the route at any adjoining junction.

4.1 Powered two wheeler usage

4.11 The results of camera surveys are very much dependent upon the traffic conditions on the days during which surveys are undertaken and a time series of data would need to be built up to provide reliable analysis. Comparing results on a 'like for like' camera basis, usage by ptws on the trial routes has changed thus:

Vehicles in bus lanes			Vehicles in other traffic lanes		
PTWs (not permitted before, permitted after)			PTWs (permitted at all times)		
A13	A23	A41	A13	A23	A41
+36%	+671%	+183%	-40%	-29%	-31%

4.12 The number of ptws using bus lanes has increased at all three sites while the number of ptws using other traffic lanes has reduced.

4.2 Other traffic

4.21 In terms of other traffic comparing results on a 'like for like' basis shows the following:

Vehicles in bus lanes, all trial sites								
Permitted vehicles (buses, cycles, taxis)			PTWs (not permitted before, permitted after)			Other vehicles (not permitted)		
Before	After	Change	before	after	change	before	after	Change
1539	3083	100%	444	1932	335%	409	233	-43%

4.22 Based on the above, it can be seen that overall there has been a significant increase (up 100%) in permitted vehicles using the bus lanes and a notable decrease (down 43%) in prohibited vehicles using bus lanes. This is possibly due to improved enforcement.



- 4.23 For the A13, the total volume of traffic has reduced by 13% in the bus lane and increased by 13% in the other lanes. Specifically, there have been large reductions in non-permitted traffic in bus lanes (especially cars) and increases in permitted traffic, particularly ptws and buses.
- 4.24 For the A23, there has been an increase of 34% in the volume of traffic in the bus lane, but there has also been a reduction 35% in other lanes. Specifically, there has been a large reduction in the number of cars in the bus lanes, and a large increase in ptws in the bus lanes.
- 4.26 For the A41, there has been an increase of 50% in vehicle volumes in the bus lane, and a reduction of 1% in other lanes. Specifically, increases have been seen in ptws, buses and taxis in the bus lane and reductions for goods vehicles. For other lanes, increases have been seen for most classes of vehicles (off-set by the transfer of ptws to the bus lanes).
- 4.27 For the control corridors, the A5 has shown a reduction of 37% of traffic in the bus lane. Specifically, there has been a decrease of 36% ptws in the bus lane, and a reduction of 29% ptws in other lanes. There have been reductions for almost all other classes of vehicles for both the bus lanes and general traffic lanes. For the A10, there were insufficient comparable data-sets.
- 4.28 As can be seen from the summary table below the overall levels of traffic outside the bus lanes (i.e. in the general traffic lanes) has increased by 13%.

Vehicles in general traffic lanes, all trial sites		
Before	After	Change
19042	21434	13%

- 4.29 Section 6 of the report sets out the impact of the trials on cycle usage (and attitudes).



5.0 SPEEDS AND BUS JOURNEY TIMES

5.1 Spot surveys of speeds have been undertaken. As powered two wheelers were previously prohibited from using bus lanes, the data set for powered two wheeler speeds in bus lanes prior to the introduction of the trials is based on illegal usage and cannot therefore be considered truly representative. The results of surveys to date are as follows:

	Bus lanes						Other traffic lanes					
	Buses (mph)			PTWs (mph)			PTWs (mph)			General traffic (mph)		
	Before	After	Change	before*	after	change	before	After	Change	before	after	change
A13	21	26	+20%	34	31	-9%	31	33	+7%	30	29	-3%
A23	20	24	+17%	25	30	+17%	25	23	-8%	23	26	+12%
A41	23	27	+15%	28	31	+9%	28	27	-3%	25	29	+14%
A5	22 mph average			31 mph average*			32 mph average			31 mph average		
A10	27 mph average			32 mph average*			29 mph average			30 mph average		

Spot survey average speeds (in free-flowing traffic)

* = illegal

5.2 Overall, results to date show a small increase in speeds for road users between 2002 and 2004. The A23 and A41 have seen a noticeable increase in ptw speeds in bus lanes, whilst there has been a decrease on the A13. There has been a reduction in ptw speeds in other lanes on the A23 and A41, and an increase on the A13.

5.3 Bus journey times have fallen by 1-2 minutes on the A13 and A41, with similar reductions on the control corridors. There has been an increase by 1 minute on the A23. However, it is important to note works on A13 and changes to bus route on A23 affected bus journey times. Specifically, Route 115 on the A13 has been subjected to numerous diversions and route changes as a result of the A13 DBFO works. Route 159 on the A23 terminates at Streatham bus stand, however, several buses now terminate/stop at Brixton bus depot, impacting on route journey times. Further analysis is underway to determine whether the impacts of the 159 route changes can be separated out from the data.



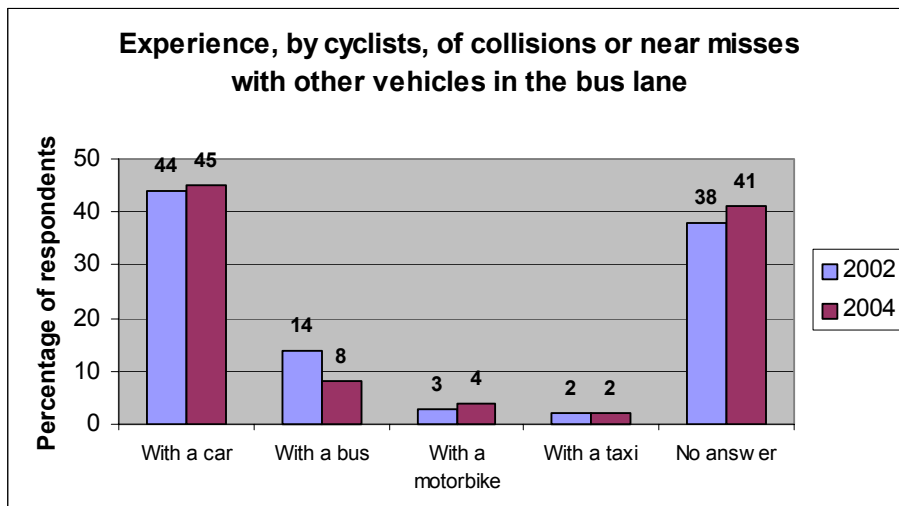
6.0 IMPACT ON CYCLISTS

- 6.1 Pedal cyclists have been the most vociferous opponents of permitting powered two wheelers into bus lanes. Consequently, cycle counts have been undertaken at all trial sites and attitudinal surveys of pedal cyclists have been carried out on the A23 route - as it is relatively heavily used by cyclists.
- 6.2 The following table indicates the average number of pedal cyclists for peak hours crossing an inbound screenline during the morning peak, and outbound during the evening peak for each of the three trial sites. Overall, there has been a 19% increase in cycle flows across the three trial sites, although there are considerable variations between the trial sites.

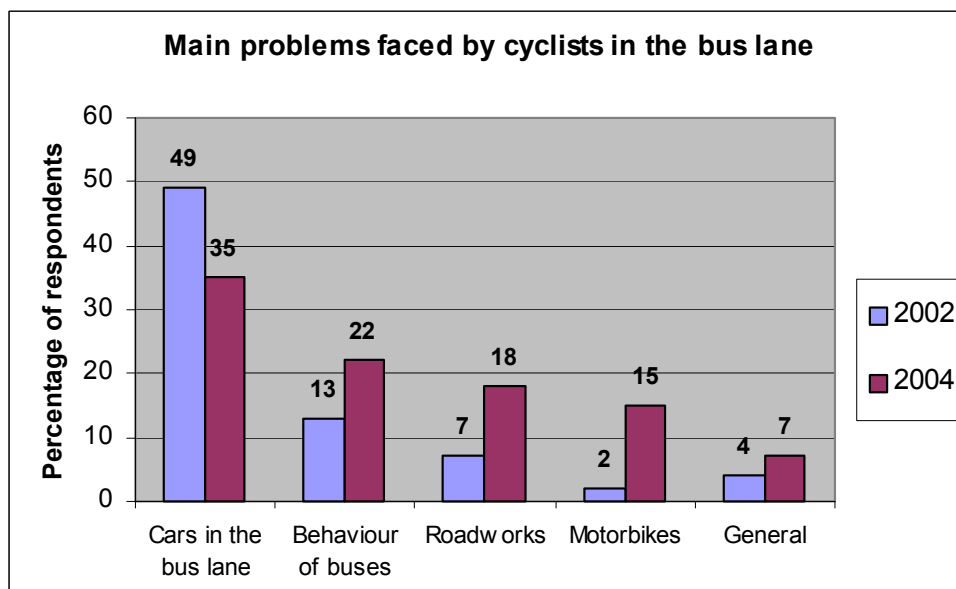
Monday to Friday Peak Hour Average Cycle Flows			
Mon – Fri Average flows	May 2002	May 2003	May 2004
A23 Streatham Hill			
AM Hour Northbound	56	40	50
PM Hour Southbound	18	20	44
A41 Finchley Road			
PM Hour Northbound	4	5	6
AM Hour Southbound	8	5	7
A13 East India Dock Road			
AM Hour Westbound	11	16	25
PM Hour Eastbound	30	16	20

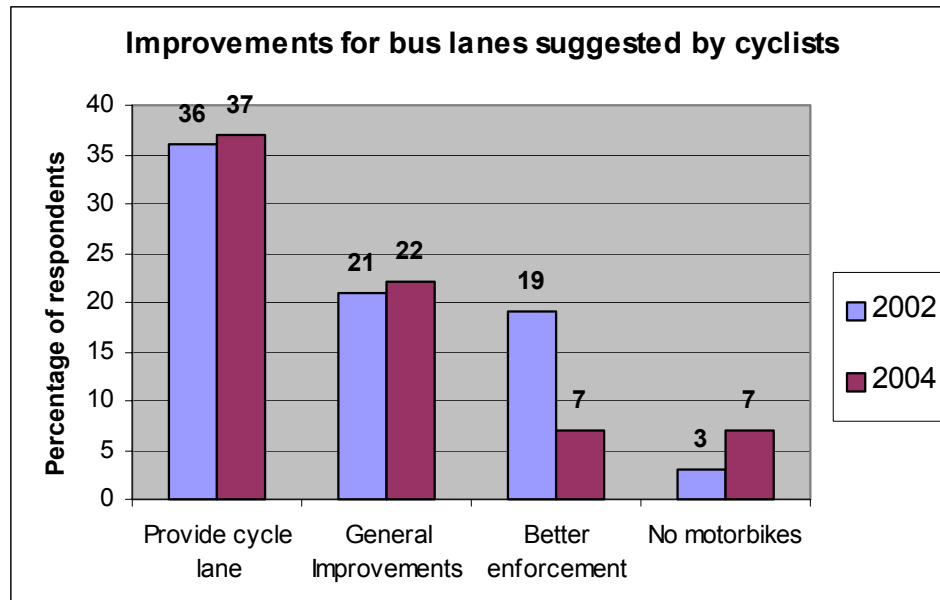
- 6.3 A questionnaire survey was carried out of cyclists on the A23. In 2002, 212 stopped to take a questionnaire, and 128 (60%) responded. The survey was repeated in 2003 and in 2004. In 2004, 92 questionnaires were handed out and 49 (53%) were returned. The reduction can be partly attributed to the fact that many of the cyclists who took a survey said that they had already completed one in 2002, and 2003.
- 6.4 In 2004, 59% of respondents indicated that they had been involved in a near miss with another vehicle whilst cycling in a bus lane compared with 63% in 2002. 4% of respondents were involved in a near miss with a ptw in 2004 compared to 3% in 2002. 8% of respondents in 2004 were involved in a near miss with a bus compared to 14% in 2002. The chart over the page helps to illustrate this.





6.5 Cyclists were asked what they consider to be the main problems they face while using the bus lane. The graph below shows that cars in the bus lane remain the biggest problem for cyclists (although the proportion has fallen between 2002 and 2004). The percentage of respondents commenting on problems with powered two wheelers increased from 2% in 2002 to 15% in 2004.





6.6 When asked what improvements would make the bus lane a more attractive facility for cyclists a varied range of suggestions was provided, as can be seen in the chart above. The percentage of respondents commenting on the problems of sharing with ptws in 2002 (3%) increased in 2004 (7%), with these respondents suggesting removing ptws from using bus lanes.



7.0 CONCLUSION

7.1 This report has considered the results of monitoring the three trial sites, in respect of:

- casualties
- usage
- speeds
- bus journey times
- cyclists attitudes.

7.2 It is considered that further casualty data is needed in order to make a more robust assessment of the impacts of the trials. The report has examined casualty data for a period of 18-months both 'before' and 'after' the trials were introduced. Studies, such as these, usually require three years of casualty data, and so it has been decided to continue the trials for the further 18-months (to enable 36-months of casualty data to be collected).

7.3 In addition, casualty data will be analysed for the four borough routes, which have been implemented since TfL's trials began (two sites in Kingston that were introduced in March 2003 and two sites in Richmond introduced in June 2004).

