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Motorcycles in Bus Lanes - Monitoring of the Second TfL Trial

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Executive summary

Motorcyclists could use the majority of bus lanes on the TLRN (Transport for London Road Network) in a trial scheme after January 2009. This scheme (Previous Trial) achieved many of its objectives, but two potential concerns were identified: motorcycle speeds had increased and there were indications that the number of collisions involving motorcyclists had increased.

A new trial (Current Trial) was initiated to address these issues. TfL implemented targeted speed enforcement on TLRN corridors and a road safety awareness campaign.

The study was conducted on five different geographical levels:

- The **London Road Network**; consisting of the TLRN Road Network and Borough Road Network, these are termed the TLRN Bus Lanes and the Remainder of London's Road Network in the collision analysis. Also, the TLRN Bus Lanes are sections of road containing a bus lane. This London wide analysis is the key source of information on the effect of the trial.
- **Network Sites** (used in the Previous Trial evaluation report) located on the TLRN Bus Lanes and the Remainder of London's Road Network
- **Corridors** (main arterial roads) are located within the TLRN Road Network, some of which were targeted by the police for enforcement
- **Corridor Sites** are located on Corridors with and without enforcement
- **Speed Assessment Sites** are Corridor Sites with and without enforcement on which video surveys (and speed data collection) took place.

This report examines the results of a monitoring program to assess the effect of these activities. The monitoring found that between the Previous and the Current Trial:

Collision rates involving motorcycles, cyclists and pedestrians over the whole network

1. Collision rates of motorcyclists on the 418 sections of road containing a bus lane used by motorcycles compared to elsewhere on London's roads during the Current Trial had not changed significantly.
2. Collision rates of cyclists on the 418 sections of road containing a bus lane compared to elsewhere on London's roads during the Current Trial had not changed significantly.
3. Cycle collisions involving a motorcycle account for less than 6% of all such collisions in sections of road containing a bus lane. However, the collision rates of cyclists with motorcyclists on TLRN bus lane network compared to elsewhere on London's roads during the Current Trial significantly increased, albeit the numbers are small (10 to 25).
4. Collision rates of pedestrians on the 418 bus lanes used by motorcycles compared to elsewhere on London's roads during the Current Trial had not changed significantly.

Collision rates on Network Sites and Enforcement Corridors involving motorcycles, cyclists and pedestrians

5. Motorcycle collision rates on the bus lane sites, and Enforcement Corridors had not changed significantly compared to their controls, but had increased significantly on Enforcement Corridor Sites.
6. Cyclist collision rates on the TLRN bus lane sites had not changed significantly.
7. Pedestrian collision rates on the TLRN bus lane sites had not changed significantly.
8. Collisions predominantly involved cars and over 80% were slight injuries.

Motorcycle speeds

9. The percentage of motorcyclists exceeding the speed limit varied between 40 and 50% in all surveys. This percentage remained consistent from the Previous Study (September/October 2008) and throughout the majority of the Current Trial: until at least March/April 2011.
10. There was a reduction from 51 to 41% of motorcycles speeding and a 2mph reduction in their average speed in the final survey of the Current Trial: September 2011.

1 Introduction

Motorcycles were permitted access to the majority of bus lanes on the TLRN (Transport for London Road Network) from January 2009. This network consists of approximately 580 kilometres of road with 478 bus lanes. TRL performed a detailed monitoring of this scheme during 2009, examining the effect on speeds, safety, pedal cycle use and re-routing.

The monitoring showed that the scheme achieved many of its objectives, but also indicated two potential concerns. Firstly, the analysis indicated that motorcycle speeds had increased, and in particular a higher percentage of motorcyclists were exceeding the speed limits. Secondly, there were indications that the number of collisions involving motorcyclists had increased with particular concern over conflicts occurring between motorcyclists in the bus lane and vehicles turning into, or out of, side roads.

In light of the findings, a new trial was initiated to address the issues raised in the monitoring report. TfL implemented targeted speed enforcement on TLRN corridors and a road safety awareness campaign.

This report examines the results of a monitoring program to assess the effect of the activities. In considering the effect of the trial, particular attention was given to:

- Changes in motorcycle collision rates in the trial areas
- The incidence of motorcyclists exceeding the speed limit
- Changes in pedal cyclist and pedestrian collision rates

TRL has performed three sets of surveys to monitor the effect of TfL's activities. These were performed at the start of the trial, 6 months later and a year after the start. The methodology developed aimed to build upon the previous study, and to ensure that a high degree of backwards compatibility was retained in order that results from this study could be compared and contrasted to those from the earlier study. The reports structure contains the collision results and the results of the trial on motorcycle speeds.

2 Methodology

2.1 Overall Approach

The survey design took account of the previous monitoring performed by TRL, as well as the details of the new safety campaign. The purpose was to provide a statistical design that could examine the effect of the targeted activity, but that was also capable of being compared and contrasted with the previous monitoring results to examine longer term trends. The component elements that are described in more detail below are summarised in Figure 1.

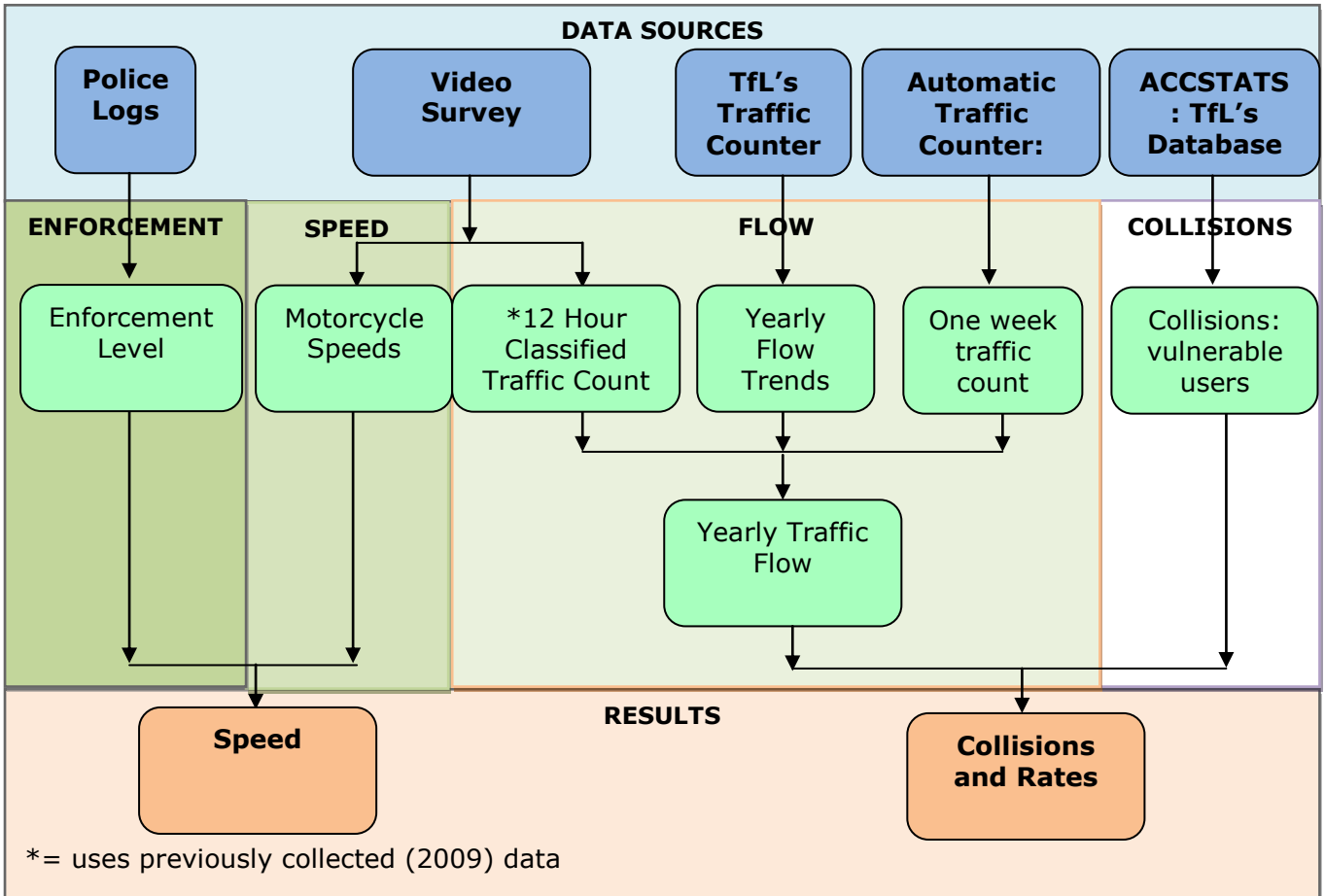


Figure 1: Development of Collision Rates and Speed Data

2.2 Network, Corridors and Sites

The study was conducted on five different geographical levels:

- The **London Road Network**; consisting of TLRN Roads and Borough Roads, these are termed the TLRN Bus Lanes and the Remainder of London's Road Network in the collision analysis.
- **Network Sites** (used in the Previous Trial evaluation report) located on the TLRN Bus Lanes and the Remainder of London's Road Network

- **Corridors** (main arterial roads) are located within the TLRN Road Network, some of which were targeted by the police for enforcement
- **Corridor Sites** are located on Corridors with and without enforcement
- **Speed Assessment Sites** are Corridor Sites with and without enforcement on which video surveys (and speed data collection) took place.

Figure 2 shows the hierarchical relationship between the network, corridors and sites across London’s road network, with numbers of each type in brackets.

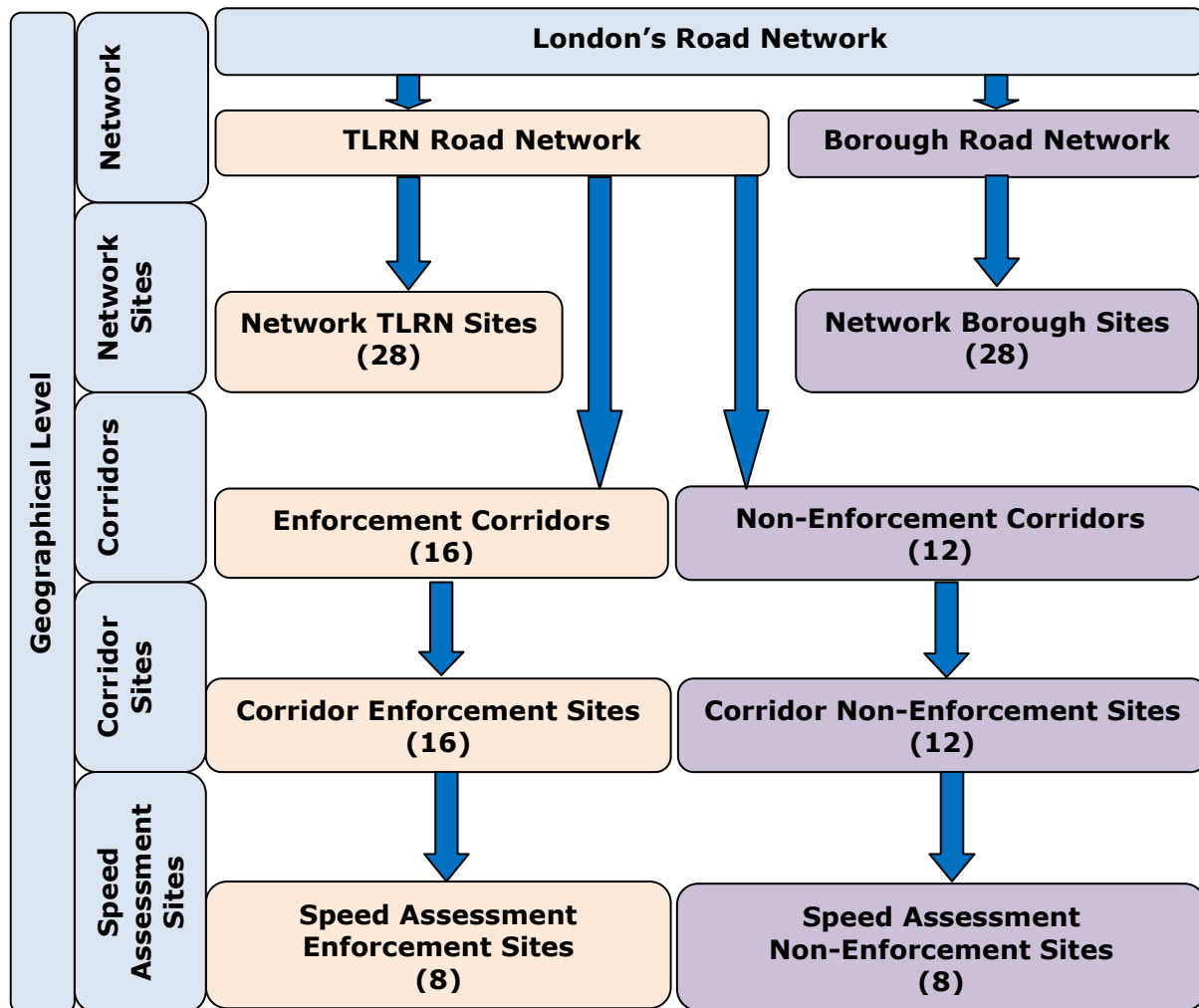


Figure 2: Network, Sites and Corridors

At a London Road Network level changes were investigated between TLRN bus lanes and the remainder of the road network in London, which acted as a control.¹

At a Corridor level the study considered changes in collisions on main TLRN roads where enforcement had been administered, compared to main TLRN roads where it had not been used. There were 28 corridors, 16 of which were targeted for enforcement.

¹ It should be noted that motorcyclists were permitted access to bus lanes in Westminster prior to the previous study and to bus lanes in Ealing at the same time as the previous study. However, it has been assumed that this will not have unduly affected the results.

The Network Sites were monitored in the previous study (York et al, 2010), and were investigated again in this study. In total there were 56 Network Sites used in the previous analysis, 28 of these on the TLRN Road Network with a bus lane, and 28 on the Borough Road Network. The direction of travel for vehicles involved in collisions is discernible in this dataset, allowing a more in-depth collision analysis to be studied at these sites.

A Network Site is a section of carriageway with no major junctions within its length: the length of the sites ranged from 200 to 1500 metres. A Network TLRN Site contained a bus lane. Each Network Borough Site was reasonably close to, and in approximately the same direction, as a Network TLRN Site. Therefore each Network TLRN Site had a “comparable” Borough site, as a control.

The Corridor Sites used in the collision analysis were selected from the previous study’s Network Sites where possible. However, the previous sites were randomly selected across the network, so five new sites were introduced into the study. In total there were 28 Corridor Sites, 16 on Enforcement Corridors (Corridor Enforcement Sites) and 12 without enforcement (Corridor Non-enforcement Sites).

Speed, lane positioning and collision changes were monitored at sixteen Speed Assessment Sites; eight with, and eight without, enforcement.

2.3 Speed and Lane Position Analysis Sites

The speed and lane position data analysis considers trends across the Previous and Current Trial, using Previous Trial sites where possible and introducing sites specific to the Current Trial where necessary.

There were 28 sites on the TRLN studied in the Previous Trial. The Current Trial included 16 sites on the TLRN. Eleven (Common) sites were studied in both trials: 7 with, and 4, without enforcement. To maximise the quality of the results from this data, the speed and lane use analysis has therefore been split into two parts. The first part, referred to as Common Sites, uses the video survey sites where data was collected in the previous trial and also in the current trial. This data is available for the first data collection period in this study (September/October 2010). The second part, referred to as All Sites, includes some additional video survey sites located on enforcement corridors that were not surveyed in the previous trial. This data was collected on three occasions in the current trial to allow trends during the trial to be investigated, see Table 1.

Table 1: Speed and lane position analysis

Analysis	Survey			
	Previous Trial	Current Trial 1	Current Trial 2	Current Trial 3
Variation between trials (Common Sites)	√	√		
Variation from enforcement (All Sites)		√	√	√

2.4 Data Collection Periods

The Current Trial examined the trends since the start of TfL’s activities, which included targeted speed enforcement on certain TLRN corridors. In all cases a treatment-control design is used. This examines the effect of the Current Trial and (where possible) removes underlying trends in the population. The general road safety campaign could have affected safety on the whole network, and in the proximity of all bus lanes in

general. However, the speed enforcement would only be expected to influence safety on (or close to) the TLRN corridors with bus lanes on which it was administered.

The timings of these surveys are shown in Table 2 below:

Table 2: Survey Dates

Survey	Dates ²
Before motorcycles permitted access to TLRN bus lanes	September/October 2008
Previous Trial	September/October 2009
Current Trial 1	September/October 2010
Current Trial 2	March/April 2011
Current Trial 3	September 2011

The purpose of the first of the new surveys (Current Trial 1) is therefore to provide a link between the Previous, and Current Trials, whilst the Current Trial 2 and 3 surveys provide information of the trends in speeds and collisions during the Current Trial. The Before period is included in the Appendices where overall trends are discussed.

The periods of collision (ACCSTATS) data extracted are listed below³.

- **Before motorcycles were permitted into TLRN bus lanes:**
 - 1st August 2007 until 31st May 2008, excluding December 2007.
- **Previous Trial:** Before enforcement and other road safety measures were introduced
 - 1st August 2009 until 31st May 2010, excluding December 2009.
- **Current Trial:** After enforcement and other road safety measures were introduced
 - 1st August 2010 until 31st May 2011, excluding December 2010.

The previous study's collision analysis (2009/2010 trial) took place on data from January to October 2008 and for the same period in 2009, after motorcycles were permitted access to bus lanes in January 2009. Consequently, the findings of this study do not fully correspond with those of the previous study's report. The Previous Trial time period is later in the year than the originally investigated periods and therefore constitutes a time period after motorcyclists (and other road users) had 9 months to become used to the previous trial.

2.5 Data Collected

2.5.1 Video Surveys

The video surveys were conducted on the 16 Corridor sites for two weekdays between 07:00 and 19:00. Two cameras, approximately 250 metres apart, were used to time motorcyclists. Up to 50 motorcycles were timed for each of six hours in all survey days: up to 600 motorcyclists were timed. In addition, both motorcyclist and cyclist lane positions were recorded at one of the timing points.

² Most surveys were conducted in the indicated months. However, a few of those in Autumn surveys were performed at the start of November.

³ The weather in December 2010 was particularly inclement and affected traffic in London. This month has therefore been removed from the analysis to eliminate any confounding effects.

2.5.2 Automatic Tube Counter (ATC) Surveys

The previous study collected information on classified traffic flows from 12 hours of the video tape, and daily variation in flows from Automatic Tube Counters (ATCs).

The current surveys were conducted within a year of the last survey, therefore it was reasonable to assume that the flow compositions would not have altered to a large extent. However, it was possible that some changes could have occurred in daily, or hourly profiles. Therefore, ATC were installed on 14 TLRN sites and 14 Borough sites. This data permitted the flow estimations on sites and on the network to be updated.

2.5.3 ACCSTATS

The ACCSTATS database is maintained by TfL and is an enhanced version of the STATS19 database for London. Information was extracted on the number of collisions involving vulnerable users (motorcyclists, cyclists and pedestrians) for all geographical levels of analysis. Data was extracted with respect to all collisions, vehicles and casualties in the three data collection time periods. The method for extracting collision data cannot accurately identify whether the collision occurred in a bus lane because of the spatial accuracy of collision co-ordinates. Therefore collisions in the London wide analysis were identified for sections of the TLRN that had a bus lane present, and not specifically those occurring in a bus lane.

2.5.4 TfL Traffic Counters

Data was supplied by TfL on data counts of cycles and motorcycles over the past few years. This was compatible with, and extended, the data set provided for the previous 2009/2010 study. Models were formed to assess the variation in flows of these vehicle types through the year.

These relationships are used in the estimation of yearly motorcycle, and cycle, flows. The video surveys from the previous study provided information on the traffic composition on the sites, ATC counters provided information on the hourly and daily variation in volume. All three data sources were combined to estimate the traffic flow by mode in the ACCSTAT study periods on sites and on the network. Further information on the estimation methods and the results are in Appendix C.

2.5.5 Police Enforcement Logs

The police provided details of the dates and number of hours spent on each of the Enforcement Sites. Information was also included on the number of resulting offences found, for example the number of motorcyclists issued with speeding tickets.

3 Results: Collisions and Collision Rates

3.1 Collisions on the Road Network

This section of the report presents an analysis of collision rates that investigates the effect of the Trial in respect to the evaluation criteria set out in Section 1. In order to provide an assessment of the collision rates, an initial analysis of collisions has been undertaken for each vulnerable road user group, motorcycles, pedal cycles and pedestrians. Vehicle flow has been calculated for motorcycles; pedal cycles and for all vehicles. The analysis for each road user group has been carried out in a similar way for consistency of approach, and the section finishes with a further assessment which looks at the collisions between motorcycles pedal cycles and pedestrians

This network analysis is compatible to that in the previous study of motorcycles in bus lanes (York et al, 2010). Data was examined for collision trends over the TLRN network with bus lanes as a whole, and also sections of road (sites) with a bus lane.

Both of these defined areas within the London Road Network were compared to others that were (as far as possible) not affected by motorcycles using the TLRN bus lanes, and therefore acted as controls. The resulting geographical levels of analysis were for:

- **London Road Network:** A study of how **TLRN Bus Lanes** differed from those on the **Remainder of London's Road Network**. This analysis has the largest dataset due to the size of the areas being compared and the volume of data collected. This London wide analysis is the key source of information on the effect of the trial.
- **Network Sites:** A study of Network Sites which include a comparison of **TLRN** sites (all of which have a bus lane) and **Borough** sites, on which motorcycles were not permitted access to the bus lanes. This was studied as it was possible to isolate vehicles travelling in the direction of the bus lane on each site, and to undertake detailed collision analysis.

The locations of the Network Sites are shown in Figure 3.

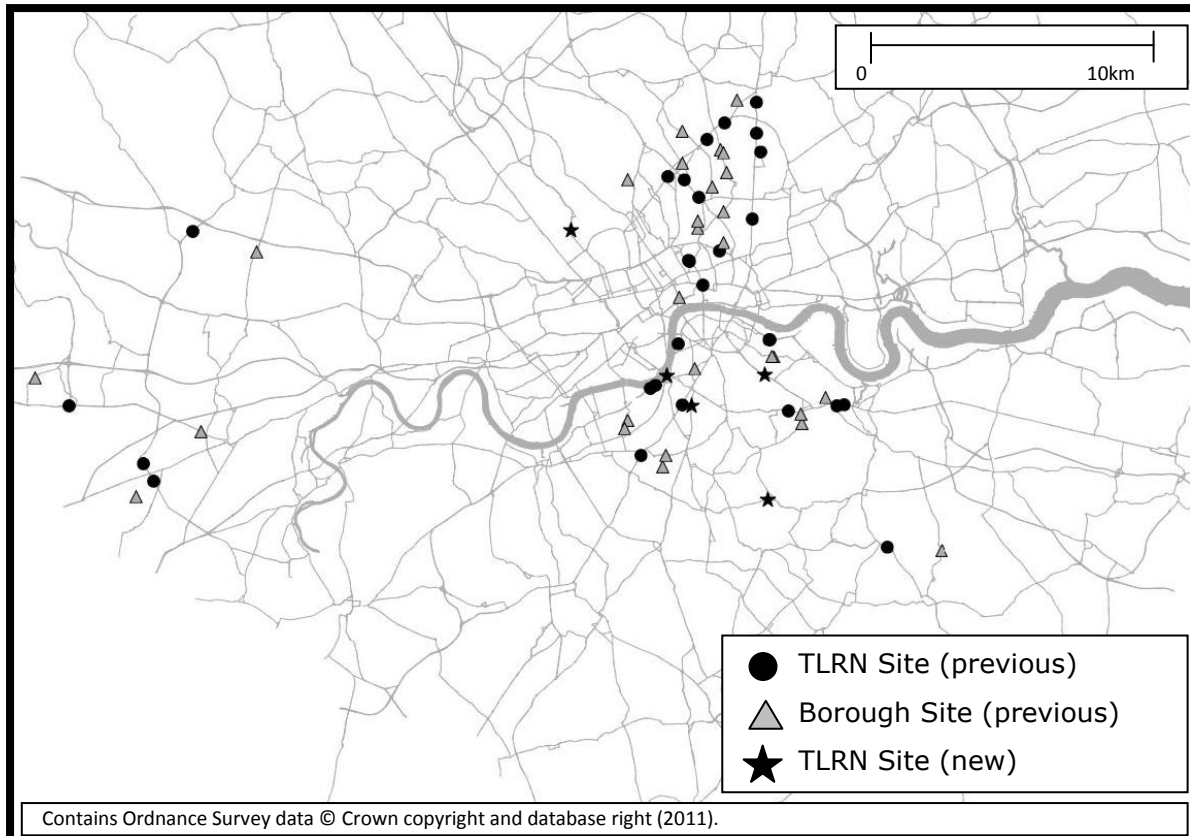


Figure 3: Location of Network Sites

3.1.1 Collision Time Periods

Data was extracted from the ACCSTATS database for all injurious collisions involving vulnerable road users (pedestrians, cyclists and motorcyclists) within London for three time periods, see Section 2.4.

The collision analysis examined overall trends on the TLRN Bus Lanes (or set of Network Sites) during the time period of all actions taken by TfL, compared to the Remainder of London's Road Network (or sites on Borough Roads). It should be noted that the TfL's activities were effectively across the whole network. It is therefore possible that these elements could have affected knowledge and behaviours, and therefore their relative effects on the TLRN Bus Lanes (and Network Sites) could be understated by this analysis. The targeted enforcement activities were limited to certain TLRN corridors and the effect is therefore more likely to be localised on the TLRN Bus Lanes (and Network Sites).

3.2 Motorcycle Collisions

Collisions with motorcyclists have been studied in detail. All collisions involving at least one motorcyclist were investigated for the two levels of analysis described in section 3.1.

3.2.1 Motorcycle Collisions on London's Road Network

The total number of motorcycles involved in collisions on London's Road Network are summarised in Table 3. On the TLRN Bus Lanes the number of motorcycles involved in collisions increased by 1% (553 to 561) between the Previous and the Current Trial. The corresponding value for the Remainder of London's Road Network, where they were not permitted access to the bus lanes, for the same period was a 2% increase (3,129 to 3,201).

Table 3: Motorcycles involved in collisions in TLRN Bus Lanes and on the Remainder of London's Road Network

Network Type	Time Period	All Boroughs	Percentage change
TLRN Bus Lanes	Previous Trial	553	
	Current Trial	561	1%
Remainder of London's Road Network	Previous Trial	3,129	
	Current Trial	3,201	2%

The other vehicles involved in these collisions are summarised in Table 4 below, and the percentage of hourly flows measured in the Previous Trial are summarised in Table 5.

Overall, the percentage of motorcycle collisions involving a given vehicle type is in approximate agreement to the percentage of the flow they represent, with approximately 60% of collisions involving cars. The only notable change between the trials was the relatively large increase in collisions with cycles in the Current Trial, which is examined further in Section 3.5.

Table 4: Motorcycle Collisions Involving Other Vehicles and Pedestrians⁴

Network	Trial		Cycles	Cars	Taxis	Buses	Other	Only Involving Pedestrians	Only Involving Motorcycles	Total
TLRN Bus Lanes	Previous Trial	#	10	306	28	11	77	69	43	554
		%	1.9%	56.7%	5.2%	2.0%	14.3%	12.8%	8.0%	
	Current Trial	#	25	334	27	9	66	51	44	556
		%	4.5%	60.4%	4.9%	1.6%	11.9%	9.2%	8.0%	
Remainder of London's Road Network	Previous Trial	#	85	2018	108	31	296	276	309	3,123
		%	2.8%	65.5%	3.5%	1.0%	9.6%	9.0%	10.0%	
	Current Trial	#	82	2047	119	44	286	298	313	3,189
		%	2.6%	64.8%	3.8%	1.4%	9.1%	9.4%	9.9%	

⁴ The total number of collisions is different to Table 3 because of how road users are identified in the data set

Table 5: Percentage of average hourly flows (Video surveys in Previous Trial)

Network	Motorcycles	Cycles	Cars	Buses	Other
TLRN Bus Lane Lanes	6.3%	6.4%	60.7%	3.8%	22.7%
Remainder of London's Road Network	3.8%	6.3%	66.5%	3.2%	20.2%

Further, more detailed, examination of the motorcycle collisions is contained in Appendix D. This shows that most motorcycle collisions (over 80%) involved only slight injuries. However, while the percentage of serious collisions decreased, the percentage of fatal collisions significantly increased in the Current Trial, although the numbers were small. The collisions generally involved cars, and this did not change over all trial periods. Collisions mainly occurred at, or near to, a junction and the proportions remained constant between the Previous and Current Trial.

Motorcyclists were generally travelling straight on before the collision. In contrast, the cars involved in these collisions were generally turning. It was found that most collisions involved only one car, and the main reason attributed to the collision was a 'failure to look properly'. If a motorcycle collision occurred in a bus lane then it was most likely that the other vehicle was turning left, whilst in other lanes the other vehicle could also be changing lane, overtaking, starting to move or performing a U-turn.

3.2.2 Motorcycle Collisions on the Network Sites

The total number of motorcycles involved in collisions on Network Sites are summarised in Figure 4 and Table 6.

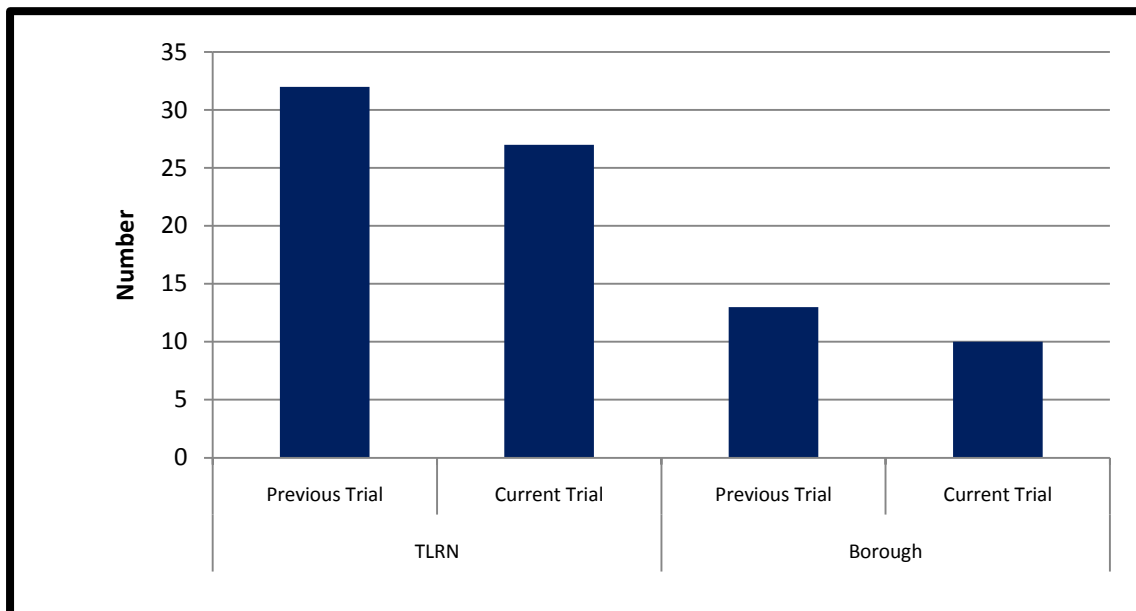


Figure 4: Motorcycle Collisions on the Network TLRN and Borough Sites

Considerably smaller numbers of collisions occurred on the Network Sites, and therefore any observed changes must be treated with caution. On the Network TLRN Sites the number of motorcycles involved in collisions decreased by 16% (32 to 27) in the Current Trial. The corresponding figures for the Network Borough Sites was a 23% reduction (13 to 10).

Table 6: Motorcycle Collisions on the Network TLRN and Borough Sites

Network Site Type	Total	
	Previous Trial	Current Trial
TLRN Sites	32	27
Borough Sites	13	10

Overall, similar patterns in collisions were observed in both the London Road Network and Network Sites analysis. There were no major changes in the number of collisions compared to the Remainder of London's Road Network, and the Borough Sites, respectively in the Current Trial compared to the Previous Trial. The number of collisions were low and were too small for robust results.

3.2.3 Motorcycle Collision Rates

Motorcycle collision rates take account of changes that occur owing to variations in vehicle flows. It is also possible to ascertain the relative changes in collision rates between TLRN Bus Lanes and the Remainder of London's Road Network.

A Hauer test isolated any changes on the TLRN Bus Lanes compared to the Remainder of Road Network. It therefore provides a test whether the measures employed in the Current Trial, on the TLRN with Bus Lane network had a significant effect on the safety of motorcyclists. The collisions, flows and rates are summarised in Table 7 and Table 8.

Table 7: Summary of motorcycle collision and flows on TLRN Bus Lanes and on the rest of London's Road Network

Flows per million vehicle kms	TLRN with Bus Lanes		Remainder of Road Network	
	Motorcycles involved in collisions	Estimated 9 month motorcycle flow	Motorcycles involved in collisions	Estimated 9 month motorcycle flow
Previous Trial	553	857.5	3129	979.6
Current Trial	561	924.0	3201	1027.0
Percentage change	3.3%	7.8%	2.3%	4.9%

Table 8: Summary of motorcycle collision rates on TLRN Bus Lanes and on the rest of London's Road Network

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	0.645	3.194
Current Trial	0.607	3.114
Percentage change	-5.8%	-2.5%

The collision rate for motorcyclists was 5.8% lower on the TLRN with bus lanes, and 2.5% lower on the Remainder of London's Road Network (the control), compared to the Previous Trial. However, the change (according to a Hauer⁵ test relative to the control)

⁵ This Hauer test measures the change on the TLRN Bus Lanes, assuming any changes on the Remainder of London's Road Network are from underlying changes across the whole network. It therefore tests if the relative change between the TLRN Bus Lanes and Remainder of London's Road Network could occur within natural variation, or whether it is the result of the changes made only on the TLRN Bus Lanes.

was not statistically significant. That is, the Current Trial did not change the overall relative safety of motorcyclists in the TLRN Bus Lanes significantly. This finding was in agreement with a Hauer test performed for the Network TLRN Sites, and was found to be robust using a sensitivity analysis.

3.3 Cycle Collisions

Collisions with cyclists have been studied in detail in this section. All collisions involving at least one cyclist were investigated for the two levels of analysis described in section 3.1.

Details of any changes to the lane used by cyclists and their position in lanes are studied further in Appendix F. In summary, this analysis found that cyclists remained in the bus lane, although there was some evidence of a relatively small (less than 20%) change from riding in the left hand side of the lane to using the middle of the bus lane.

3.3.1 Cycle Collisions on London's Road Network

The number of cyclists involved in collisions, and the number of cyclists involved in collisions with other road users is shown in Table 9 for the London Road Network.

Table 9: Cycles involved in collisions in TLRN Bus Lanes and on the Remainder of London's Road Network

Network Type	Time Period	All Boroughs	Percentage change
TLRN Bus Lanes	Previous Trial	391	
	Current Trial	445	14%
Remainder of London's Road Network	Previous Trial	2,473	
	Current Trial	2,809	14%

The number of cyclists involved in collisions increased between the Previous Trial and the Current Trial by 14% (391 to 445) on TLRN Bus Lanes and by the same percentage on the Remainder of London's Road Network (2,473 to 2,809). This does not take account of changes in cycle flow (which were found to have increased), and which is considered further in Section 3.3.3.

Overall, the percentage of cycle collisions involving a given vehicle type is in approximate agreement to the percentage of the flow they represent, see Table 10 and Table 11. Most cyclists were injured in collisions with cars: over 64% of cycle collisions involved a car in all survey periods and on all studied road networks. The changes in collisions with other modes on the TLRN bus lanes were an increase in the number with buses (17 to 24), a decrease in the number with taxis (25 to 12) and an increase in the number with motorcycles (10 to 25).

Table 10: Cycle Collisions Involving Other Vehicles and Pedestrians

Network	Trial		Motor-cycles	Cars	Taxis	Buses	Other	Only Involving Pedestrians	Only Involving Cycles	Total
TLRN Bus Lanes	Previous Trial	#	10	254	25	17	59	16	11	392
		%	2.6%	65.5%	6.4%	4.4%	15.2%	4.1%	2.8%	
	Current Trial	#	25	284	12	24	67	18	14	444
		%	5.7%	64.3%	2.7%	5.4%	15.2%	4.1%	3.2%	
Remainder of London's Road Network	Previous Trial	#	85	1713	126	85	294	84	84	2471
		%	3.5%	69.8%	5.1%	3.5%	12.0%	3.4%	3.4%	
	Current Trial	#	82	1971	132	91	336	99	89	2800
		%	2.9%	70.6%	4.7%	3.3%	12.0%	3.5%	3.2%	

Table 11: Percentage of average hourly flows (Video surveys in Previous Trial)

Network	Motorcycles	Cycles	Cars	Buses	Other
TLRN Bus Lanes	6.3%	6.4%	60.7%	3.8%	22.7%
Remainder of London's Road Network	3.8%	6.3%	66.5%	3.2%	20.2%

Further, more detailed, examination of the cycle collisions is contained in Appendix D. This shows that the seriousness of the collisions did not alter during the trials, and over 84% involved a slight injury. The collisions generally (over 64%) involved cars, and this did not change over all trial periods. As with motorcycles, collisions mainly occurred at, or near to, a junction. Also, the percentage occurring in these locations remained constant between the Previous and Current Trial.

Cyclists were generally travelling straight on before the collision, and this percentage did not change between the trials. In contrast, the cars involved in these collisions were generally turning. The main reasons attributed to the collisions were the same as for motorcycle collisions, however a 'failure to look properly' was only cited in 33% as opposed to 90% of the collisions.

3.3.2 Cycle Collisions on Network Sites

Cycle collisions were also examined on the Network Sites, the numbers were small, and should therefore be treated with caution, and have been summarised in Figure 5 and Table 12.

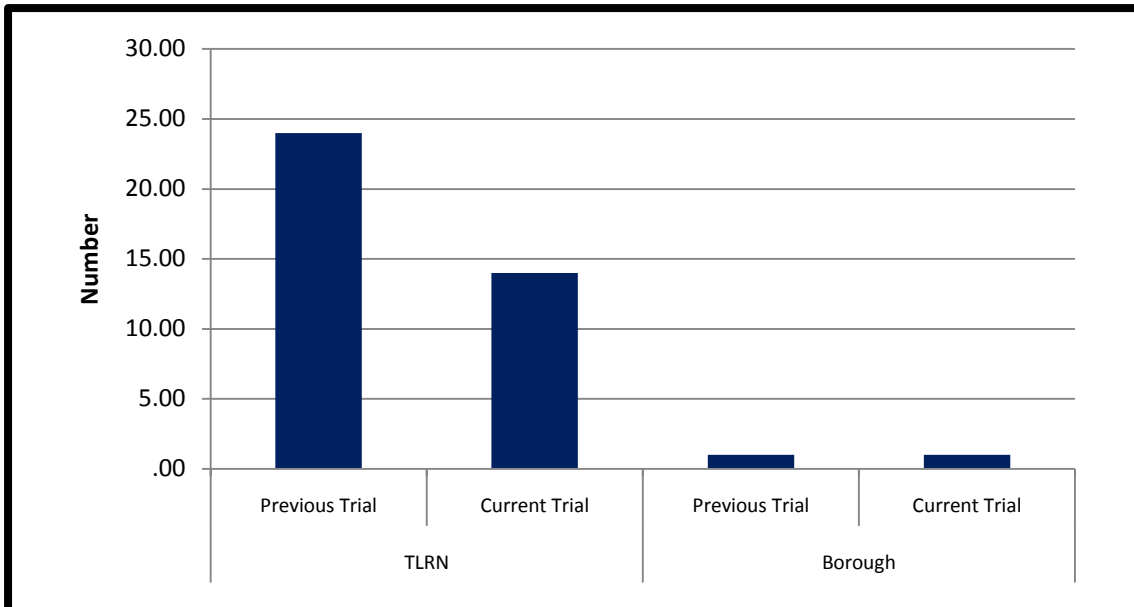


Figure 5: Cycle Collisions on the Network TLRN and Borough Sites

Table 12: Cycle Collisions on the Network TLRN and Borough Sites

Network Site Type	Time Period	All collisions involving a cycle
TLRN	Previous Trial	24
	Current Trial	14
Borough	Previous Trial	1
	Current Trial	1

On the TLRN Network Sites the number of cyclists involved in collisions decreased by 42% (24 to 14) in the Current Trial, and no motorcyclists were involved in these collisions. The number of collisions were low and were too small for robust results.

3.3.3 Cycle Collisions Rates

Cycle collision rates take account of changes that occur owing to variations in vehicle flows. Hauer tests isolated any changes on the TLRN Bus Lanes (or the Network TLRN Sites) compared to the Remainder of Road Network (or the Network Borough Sites). They therefore provided a test whether the measures employed in the Current Trial, on the TLRN with Bus Lane network affected the safety of cyclists.

Flow modelling indicated that cycle flows had increased by 24% on the TLRN bus lanes between these time periods, whilst the increase on the Remainder of the road network was estimated to be 12%. These compared to estimates produced by TfL (TfL, 2011) of a 5% increase between 2008/09 and 2009/10 for the TLRN, and 15% for Central London. This could have been influenced by the position of the sites, and a sensitivity analysis was performed to investigate if this could have affected the collision rate results. However, this found the result to be robust.

A Hauer test found that the collision rate of cyclists on the TLRN Bus Lanes and the Remainder of London’s Road Network did not significantly vary between the Previous and Current Trial, see Table 13 and Table 14. The same was true of the collision rates on the Network TLRN Sites compared to the Network Borough Sites, see Appendix G⁶.

⁶ A sensitivity analysis showed that the statistical test was unaffected by any inaccuracies in the flow estimates.

Table 13: Summary of cycle collisions and flows on TLRN Bus Lanes and on the Remainder of London's Road Network

Flows per million vehicle kms	TLRN with Bus Lanes		Remainder of Road Network	
	Cycles involved in collisions	Estimated 9 month cycle flow	Cycles involved in collisions	Estimated 9 month cycle flow
Previous Trial	391	649.3	2473	1091.2
Current Trial	445	807.3	2809	1217.2
Percentage change	13.8%	24.3%	13.6%	11.6%

Table 14: Summary of cycle collision rates on TLRN Bus Lanes and on the Remainder of London's Road Network

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	0.602	2.266
Current Trial	0.551	2.308
Percentage change	-8.5%	1.8%

3.4 Pedestrian Collisions

Collisions with pedestrians have been studied in detail in this section. All collisions involving at least one pedestrian were investigated for the two levels of analysis described in section 3.1.

3.4.1 Pedestrian Collisions on London's Road Network

The number of collisions involving a pedestrian are summarised in Table 15 for London's Road Network.

Table 15: Pedestrians involved in collisions in TLRN Bus Lanes and on the Remainder of London's Road Network

Network Type	Time Period	All Boroughs	Percentage change
TLRN Bus Lanes	Previous Trial	365	
	Current Trial	380	10%
Remainder of London's Road Network	Previous Trial	3,552	
	Current Trial	3,531	-1%

There was an increase in pedestrian collisions on the TLRN Bus Lanes of 10% (365 to 380) in the Current Trial. On the Remainder of London's Road Network pedestrian collisions decreased by 1% (3,552 to 3,531).

The other vehicles involved in these collisions are summarised in Table 16 below, and the percentage of hourly flows measured in the Previous Trial are summarised in Table 17. With the exception of buses and motorcycles, the percentages of vehicles involved in pedestrian collisions are in approximate agreement with the percentage of the vehicles in the traffic flows.

Table 16: Pedestrian Collisions Involving Other Vehicles

Network	Trial		Cycles	Motor-cycles	Cars	Taxis	Buses	Other	Total
TLRN Bus Lanes	Previous Trial	#	16	70	198	12	49	22	367
		%	4.4%	19.2%	54.2%	3.3%	13.4%	6.0%	
	Current Trial	#	18	56	203	28	40	42	387
		%	4.7%	14.7%	53.4%	7.4%	10.5%	11.1%	
Remainder of London's Road Network	Previous Trial	#	92	293	2428	182	264	356	3,615
		%	2.6%	8.2%	68.4%	5.1%	7.4%	10.0%	
	Current Trial	#	101	316	2400	146	259	359	3,581
		%	2.9%	8.9%	68.0%	4.1%	7.3%	10.2%	

Table 17: Percentage of average hourly flows (Video surveys in Previous Trial)

Network	Motorcycles	Cycles	Cars	Buses	Other
TLRN Bus Lane Lane	6.3%	6.4%	60.7%	3.8%	22.7%
Remainder of London's Road Network	3.8%	6.3%	66.5%	3.2%	20.2%

Further, more detailed, examination of the pedestrian collisions is contained in Appendix D. This shows that the seriousness of the collisions did not alter during the trials. The collisions generally (over 50%) involved cars, and this did not change over all trial periods.

In contrast with the motorcycle and cycle collisions, the cars involved in these collisions were generally travelling straight on (60%), with turning involved in less than 20% of the collisions. Many of the collisions were attributed to the pedestrians with a main contributing factor being the pedestrian crossing when masked by a stationary or parked vehicle.

3.4.2 Pedestrian Collisions on Network Sites

The number of collisions involving a pedestrian are summarised in Figure 6 and Table 18 for the observed Network TLRN, and Borough Sites split according to whether a motorcycle was involved.

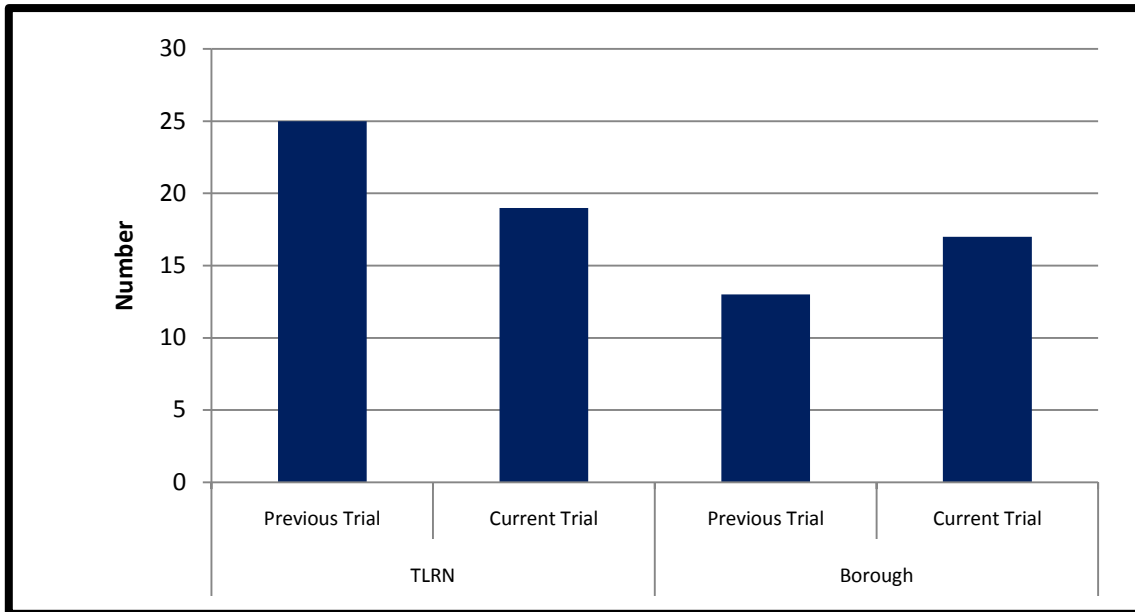


Figure 6: Pedestrian Collisions on the TLRN and Borough Network Sites

Table 18: Pedestrian Collisions on the TLRN and Borough Network Sites

Network Site Type	Time Period	Pedestrian Collisions
TLRN	Previous Trial	25
	Current Trial	19
Borough	Previous Trial	13
	Current Trial	17

There was a decrease of 18% (25 to 19) on the Network TLRN Sites, and an increase of 30% (13 to 17) on the Network Borough Sites. The numbers of collisions were therefore small, and the number that involved motorcycles was too small for meaningful analysis.

3.4.3 Pedestrian Collision Rates

Pedestrian collision rates take account of changes that occur owing to variations in vehicle flows. Hauer tests isolated any changes on the TLRN Bus Lanes (or the Network TLRN Sites) compared to the Remainder of Road Network (or the Network Borough Sites). They therefore provided a test whether there were any significant changes in the Current Trial compared to the Previous Trial, whilst accounting for any underlying changes using a control.

A Hauer test found that the collision rate of pedestrians on the TLRN Bus Lanes and the Remainder of London’s Road Network did not significantly vary between the Previous and Current Trial, see Table 19 and Table 20. The same was true of the collision rates on the Network TLRN Sites compared to the Network Borough Sites.

Table 19: Summary of pedestrian collisions and vehicle flows on TLRN Bus Lanes and on the Remainder of London's Road Network

Flows per million vehicle kms	TLRN with Bus Lanes		Remainder of Road Network	
	Pedestrians involved in collisions	Estimated 9 month vehicle flow	Pedestrians involved in collisions	Estimated 9 month vehicle flow
Previous Trial	365	10946.1	3552	13746.0
Current Trial	380	11352.4	3531	13937.7
Percentage change	4.1%	3.7%	-0.6%	1.4%

Table 20: Summary of pedestrian collision rates on TLRN Bus Lanes and on the Remainder of London's Road Network

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	0.033	0.258
Current Trial	0.033	0.253
Percentage change	0.4%	-2.0%

3.5 Collisions between Motorcycles and Pedal Cycles

The collision numbers in the TLRN Bus Lanes between motorcycles and pedal cycles increased from 10 in the Previous Trial to 25 in the Current Trial. The corresponding figure reduced on the Remainder of the Road Network from 85 to 83, see Table 21. A Hauer test showed that there was a statistical difference in collision rates of cyclists with motorcyclists on the TLRN Bus Lanes compared with the Remainder of the Road Network: at the 95% confidence level, see Table 22.

Table 21: Summary of cycle collisions with motorcycles and flows on TLRN Bus Lanes and on the Remainder of London's Road Network

Flows per million vehicle kms	TLRN with Bus Lanes		Remainder of Road Network	
	Motorcycles involved in collisions	Estimated 9 month motorcycle flow	Motorcycles involved in collisions	Estimated 9 month motorcycle flow
Previous Trial	10	649.3	85	1091.2
Current Trial	25	807.3	83	1217.2
Percentage change	150%	24.3%	-14.1%	11.6%

Table 22: Summary of cycle collision rates with motorcycles on TLRN Bus Lanes and on the Remainder of London's Road Network

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	0.015	0.078
Current Trial	0.031	0.068
Percentage change	101.1%	-22.5%

It is known that these collisions occurred on sections of road containing a bus lane. Therefore, whilst they occurred in the vicinity of the bus lane, they may have only

occurred near it and not within it. However, such collisions could still be attributable to the changes made in bus lane use owing to interactions between vehicles creating behavioural changes near to the bus lane. Also, some caution should be taken as although the change was statistically significant it is based on relatively small numbers.

3.6 Collisions between Motorcycles and Pedestrians

The collision numbers in the TLRN Bus Lanes between motorcycles and pedestrians decreased from 70 in the Previous Trial to 56 in the Current Trial. The corresponding figure increased on the Remainder of the Road Network from 293 to 316, see Table 23. There was no statistical difference between the collision rate of pedestrians with motorcycles on the TLRN Bus Lanes compared to the Remainder of London's Road Network, see Table 24.

Table 23: Summary of pedestrian collisions with motorcycles and flows on TLRN Bus Lanes and on the Remainder of London's Road Network

Flows per million vehicle kms	TLRN with Bus Lanes		Remainder of Road Network	
	Motorcycles involved in collisions	Estimated 9 month motorcycle flow	Motorcycles involved in collisions	Estimated 9 month motorcycle flow
Previous Trial	70	857.5	293	979.6
Current Trial	56	924.0	316	1028.0
Percentage change	20.0%	7.8%	7.8%	4.9%

Table 24: Summary of cycle collision rates with motorcycles on TLRN Bus Lanes and on the Remainder of London's Road Network

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	0.082	0.30
Current Trial	0.061	0.31
Rate change	-25.8%	2.8%

4 Results: Enforcement Corridors

This study has monitored and assessed the second TfL motorcycles in bus lanes trial. The Current Trial allows motorcycles to use the majority of TfL's bus lane network and has seen road safety activity across London and targeted Police enforcement on some of the bus lanes on the TLRN.⁷

The enforcement was targeted on corridors that had high motorcycle collision rates only. Enforcement would be expected to have a much more localised effect within the network and therefore its effect should be detected by the tests in this report. This section therefore concentrates on changes in enforcement that were applied to the Corridor Enforcement Sites.

4.1 Enforcement Corridors

The Enforcement Corridors as a whole were considered, and sections of road (sites) examined within them. Both of these were associated comparable areas that were (as far as possible) not affected by enforcement. The analysis was conducted for:

- **Corridors.** This dataset contained 28 corridors defined by TfL. Sixteen of the corridors had collision rates of 25 motorcycles per kilometre or more and were designated as **Enforcement Corridors**. Twelve had lower collision rates and were designated **Non-enforcement Corridors**. The Motorcycle Tasking Team from the Metropolitan Police were instructed to provide enforcement onto the Enforcement Corridors only. Non-enforcement Corridors were subject to normal levels of police enforcement activity. This segmentation was studied to directly assess the effect of enforcement compared to underlying trends.
- **Sites on corridors.** This dataset contained 16 sites on Enforcement Corridors (**Enforcement sites**) and 12 sites on Non-enforcement Corridors (**Non-enforcement sites**). This segmentation was studied as it was possible to isolate vehicles travelling in the direction of the bus lane on each site.

The locations of the Enforcement, and Non-enforcement Corridors are shown in Figure 7.

⁷ As with the Network analysis it should be noted that the TfL's activities were effectively across the whole network. It is therefore possible that these elements could have affected knowledge and behaviours on all roads. The targeted enforcement activities were limited to certain TLRN (Enforcement) corridors and the effect is therefore more likely to be localised near to these.

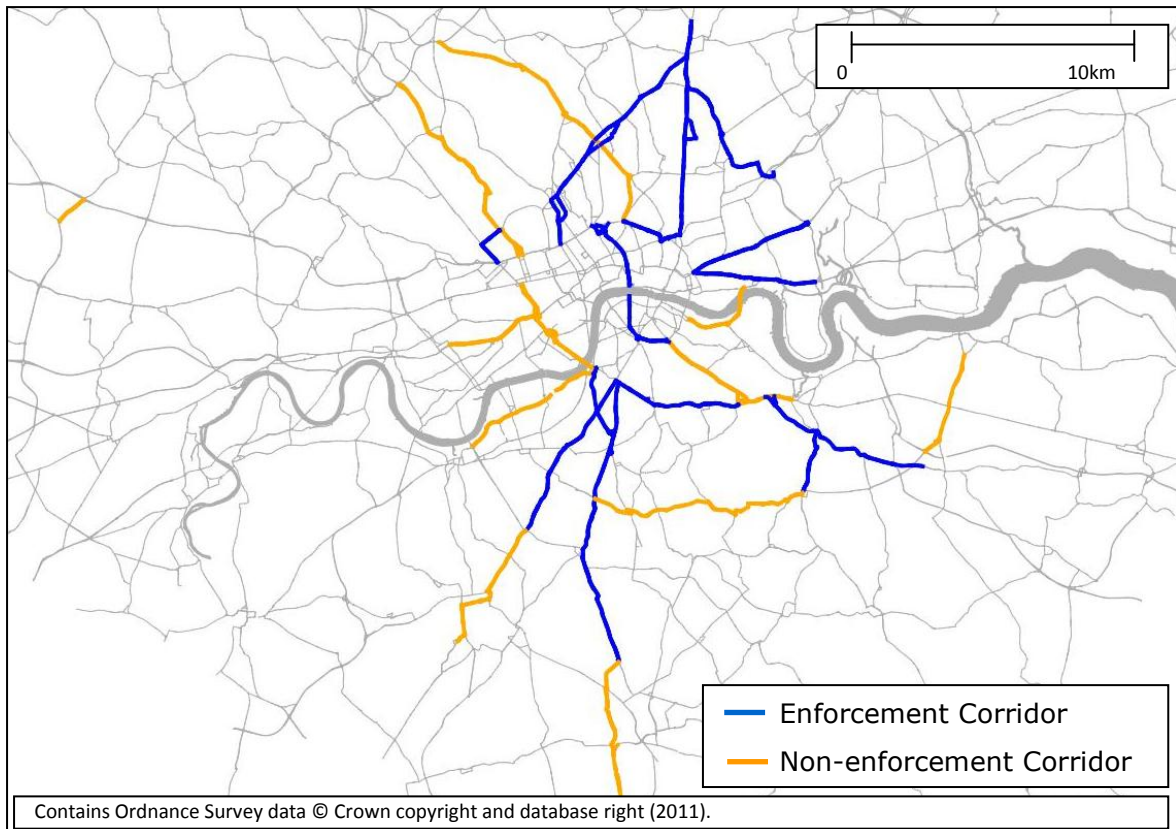


Figure 7: Location of the Enforcement and Non-enforcement Corridors

4.2 Enforcement Levels

The Police enforcement consisted of teams of motorcycle police targeting suitable links on the Enforcement Corridors for varying shifts throughout the study period. The Police therefore had a visible presence on the Enforcement Corridors during the study period and they stopped motorcyclists for a number of offences (including speeding), or to administer publicity material.⁸ The number of hours each month is shown in Figure 8. Also, the number of hours spent on each corridor is shown in Figure 9 and Figure 10.

⁸ Some initial enforcement started before the start of this study, but would not be expected to have affected speeds or compliance rates, as such behavioural changes would be expected to take a while to alter.

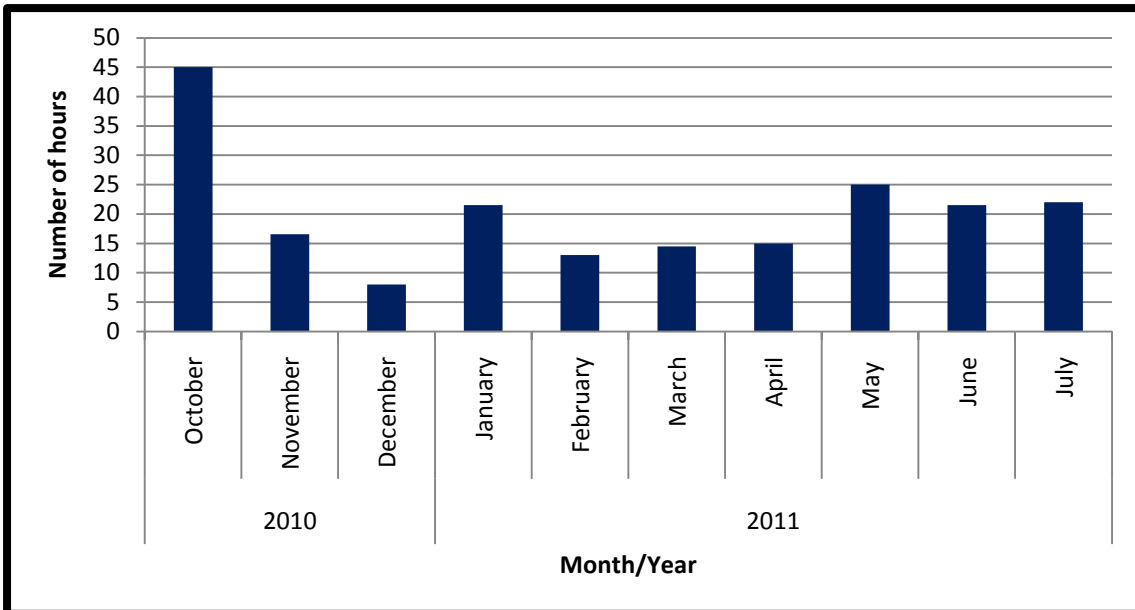


Figure 8: Number of enforcement hours by month

The number of hours of enforcement in December was small owing to a combination of the weather and student riots limiting the police availability.

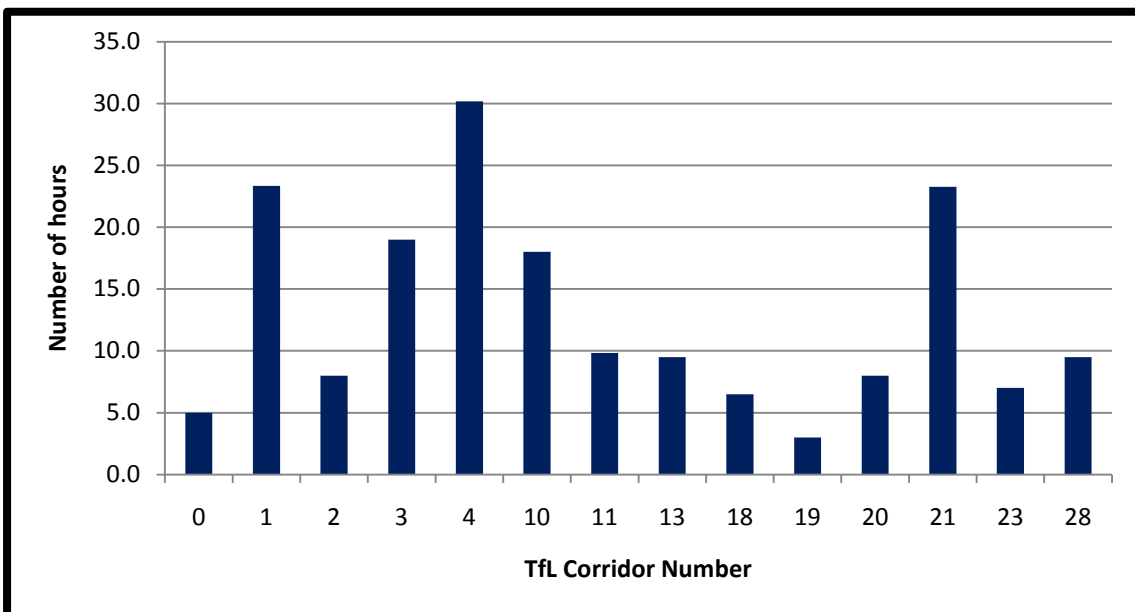


Figure 9: Number of enforcement hours by corridor

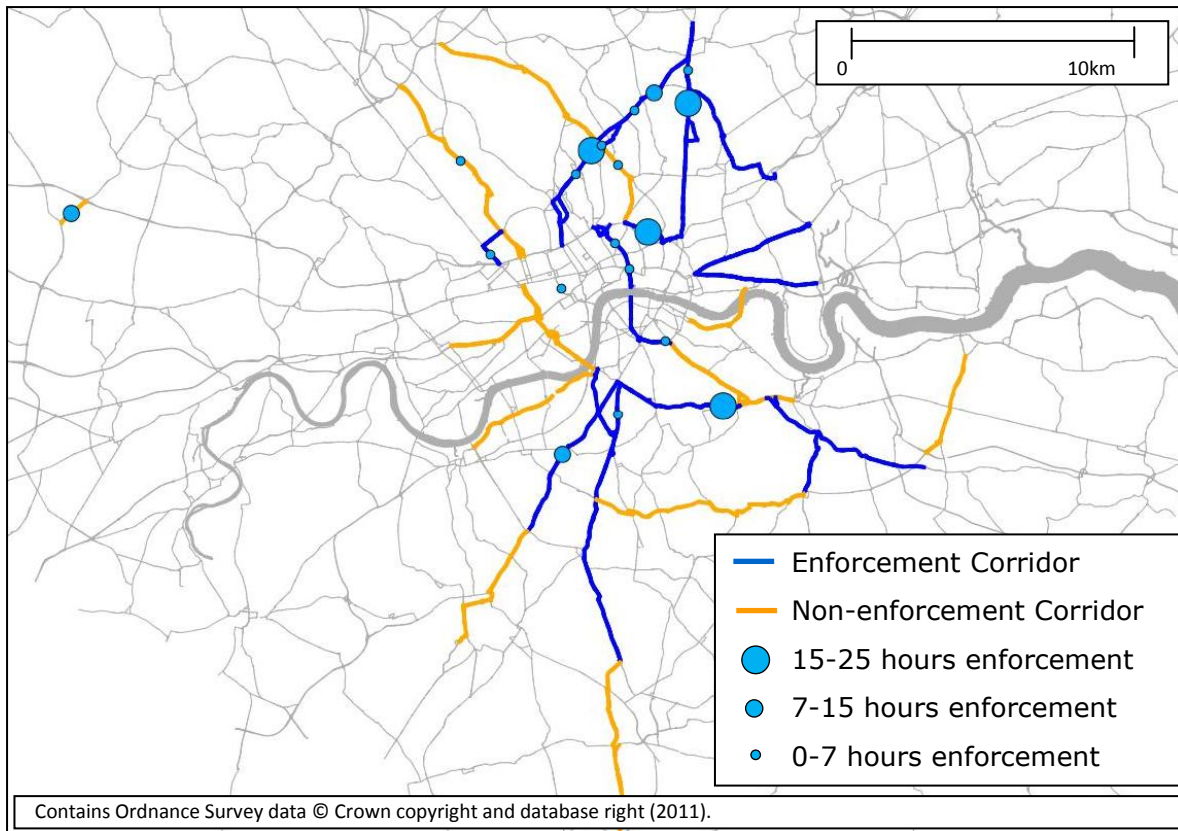


Figure 10: Enforcement used on Corridors

4.3 Collisions on Enforcement Corridors

This collision analysis focussed on the effect of the Current Trial. A network of major Corridors in London, i.e. long sections of carriageway on A roads, were defined by TfL and targeted for enforcement. Collisions were studied on these corridors and on sites on them (sections of road). The analysis considered the changes in collisions between the Previous Trial and the Current Trial on both these corridors and sites.

4.3.1 *Motorcycle Collisions on Corridors*

The number of motorcyclists involved in collisions is summarised in Figure 11 and Table 25 for the Enforcement and Non-enforcement Corridors.

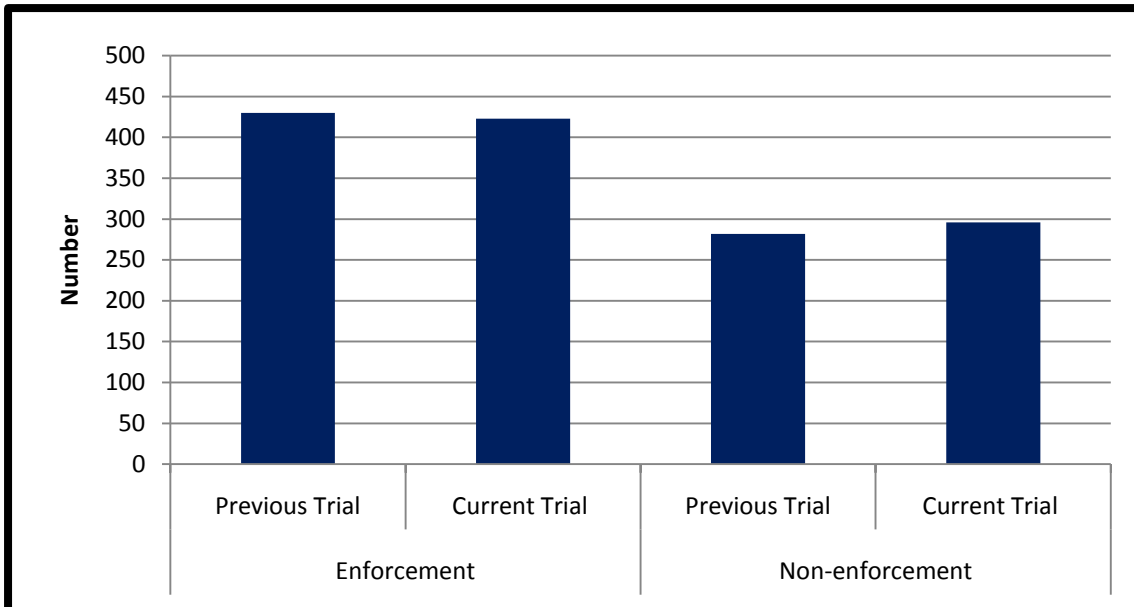


Figure 11: Number of motorcycles involved in collisions on corridors

Table 25: Number of motorcyclists involved in collisions on corridors

Corridor Type	Time Period	All motorcycle collisions	Percentage change
Enforcement	Previous Trial	430	
	Current Trial	423	-2%
Non-enforcement	Previous Trial	282	
	Current Trial	296	5%

There was a decrease of 2% (430 to 423) in motorcycles involved in collisions on the Enforcement Corridors, whilst there was 5% (282 to 296) increase on the Non-enforcement Corridors in the Current Trial.

Further details of when these collisions occurred in relation to the bus lane hours are contained in the appendix.

4.3.2 **Motorcycle Collisions on Corridors Sites**

The number of motorcycle collisions on the Corridor Sites are summarised in Figure 12 and Table 26.

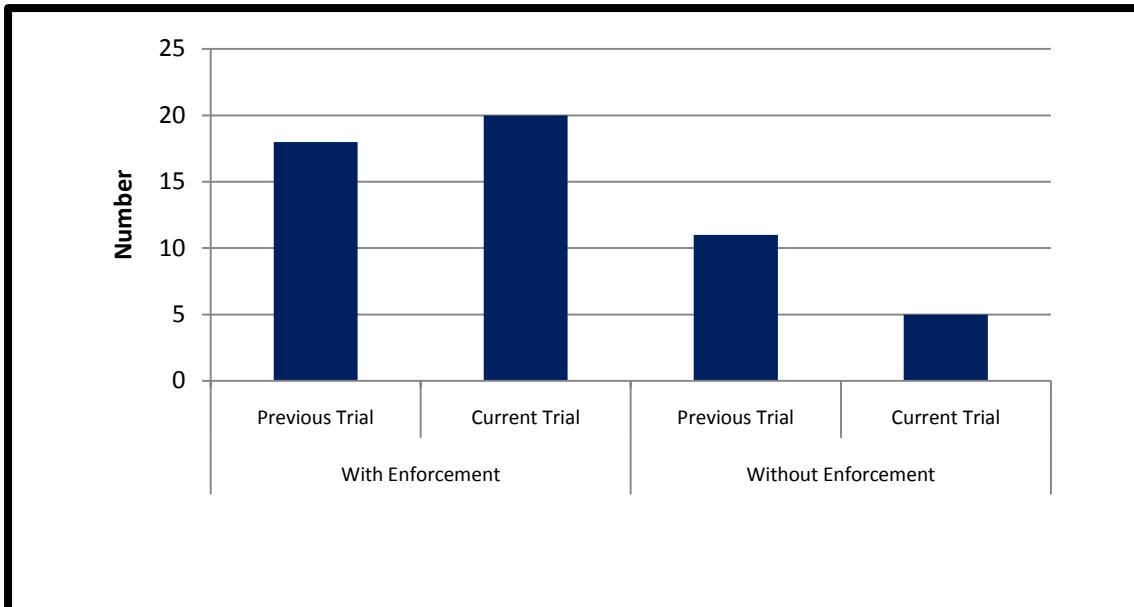


Figure 12: Number of motorcycles involved in injurious collisions on corridor sites

Table 26: Number of motorcyclists involved in injurious collisions on corridor sites

Corridor Site Type	Time Period	Number
Enforcement	Previous Trial	18
	Current Trial	20
Non-enforcement	Previous Trial	11
	Current Trial	5

Although the number of motorcyclists injured in collisions increased by 11% (18 to 20) on the Corridor Enforcement Sites, and decreased by 55% (11 to 5) on Corridor Non-enforcement Sites, these represent changes of only 2 and 6 respectively and should be treated with some caution.

4.3.3 Motorcycle Collisions Rates

Motorcycle collision rates take account of changes that occur owing to variations in vehicle flows. It is also possible to ascertain the relative changes in collision rates between two networks or set of sites.

A Hauer test isolated any changes on the Enforcement Corridors compared to the Non-enforcement Corridors, and another for changes on the Corridor Enforcement Sites compared to the Corridor Non-enforcement Sites. It therefore provides a test whether the measures employed in the Current Trial affected the safety of motorcyclists on the Enforcement Corridors.

The associated changes in collision rates on the Enforcement compared to the Non-enforcement Corridors were not statistically different, and this conclusion was not sensitive to any inaccuracies in the estimated motorcycle flow, see Table 27 and Table 28.

However, the change in collision rate on the Corridor Enforcement Sites was significantly greater at the 90% confidence level than on the Corridor Non-enforcement Sites. This

conclusion was relatively unaffected by any inaccuracies in the flow estimates⁹, see Table 29 and Table 30. The collisions increased from 18 to 20 on enforcement sites and reduced from 11 to 5 on non enforcement sites respectively.

Analysis was also performed for the cycle collisions and pedestrian collisions on the Corridors and on the Corridor Sites. This showed consistent trends to those observed on the London Road Network and TLRN Sites, and there were no significant changes in the collision rates between where enforcement was targeted and elsewhere on the road network.

Table 27: Summary of motorcycle collision and flows on Enforcement Corridors and on Non-Enforcement Corridors

Flows per million vehicle kms	Enforcement Corridors		Non-enforcement Corridors	
	Motorcycles involved in collisions	Estimated 9 month motorcycle flow	Motorcycles involved in collisions	Estimated 9 month motorcycle flow
Previous Trial	430	43.5	282	43.9
Current Trial	423	47.1	296	47.8
Percentage change	-1.6%	8.5%	5.0%	8.8%

Table 28: Summary of motorcycle collision rates on Enforcement Corridors and on Non-Enforcement Corridors

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	9.9	6.4
Current Trial	9.0	6.2
Percentage change	-9.3%	-3.5%

Table 29: Summary of motorcycle collision and flows on Enforcement Corridor Sites and on Non-Enforcement Corridor Sites

Flows per million vehicle kms	Enforcement Corridors		Non-enforcement Corridors	
	Motorcycles involved in collisions	Estimated 9 month motorcycle flow	Motorcycles involved in collisions	Estimated 9 month motorcycle flow
Previous Trial	18	1.9	11	1.9
Current Trial	20	2.1	5	2.1
Percentage change	11.1%	8.7%	-54.5%	8.5%

⁹ The increase in flow on the Corridor Enforcement Sites would need to be approximately 16% higher than the increase on the Corridor Non-enforcement Sites to affect this conclusion. However, it should be borne in mind that this result is based on a relatively low number of collisions.

Table 30: Summary of motorcycle collision rates on Enforcement Corridor Sites and on Non-Enforcement Corridor Sites

Rates per million	TLRN with Bus Lanes	Remainder of Road Network
Previous Trial	9.3	5.8
Current Trial	9.5	2.4
Percentage change	2.2%	-58.1%

4.4 Motorcycle Speeds

Motorcyclists were timed at two points, which were a measured distance apart, on all sites where video recordings took place. In the current study there were a total of sixteen video sites: eight on Enforcement Corridors and eight on Non-enforcement Corridors. However, five of these sites were not included in the original surveys, one of which was on the Enforcement Corridors. Furthermore two sites could not be surveyed in the final survey (Sites 16 and N4) of this study due to unforeseen changes on the site which affected the speeds. Also, the speeds on one site were confounded by queues at the downstream traffic signals (Site 25).

To maximise the use of the available data, comparisons were made between the Previous Study and Current study (first video survey) on sites that were surveyed in both studies, i.e. excluding the five new sites. Also, comparisons were made across all surveys in the Current Study (Current 1, Current 2 and Current 3) for the thirteen sites where unconfounded data was available, to examine trends in motorcycle speeds during the Current Study.

4.4.1 Average Motorcycle Speeds

The average speeds of motorcycles across the sites were calculated from the timing information and are displayed in Figure 13, Figure 14 and Table 31.

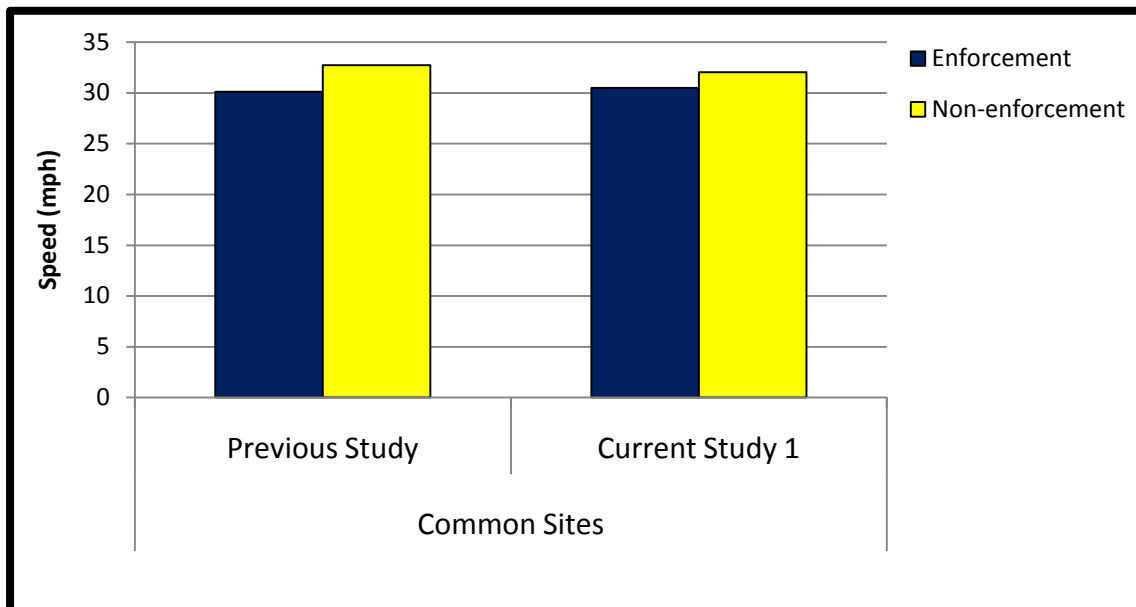


Figure 13: Overall average speeds: Common Sites

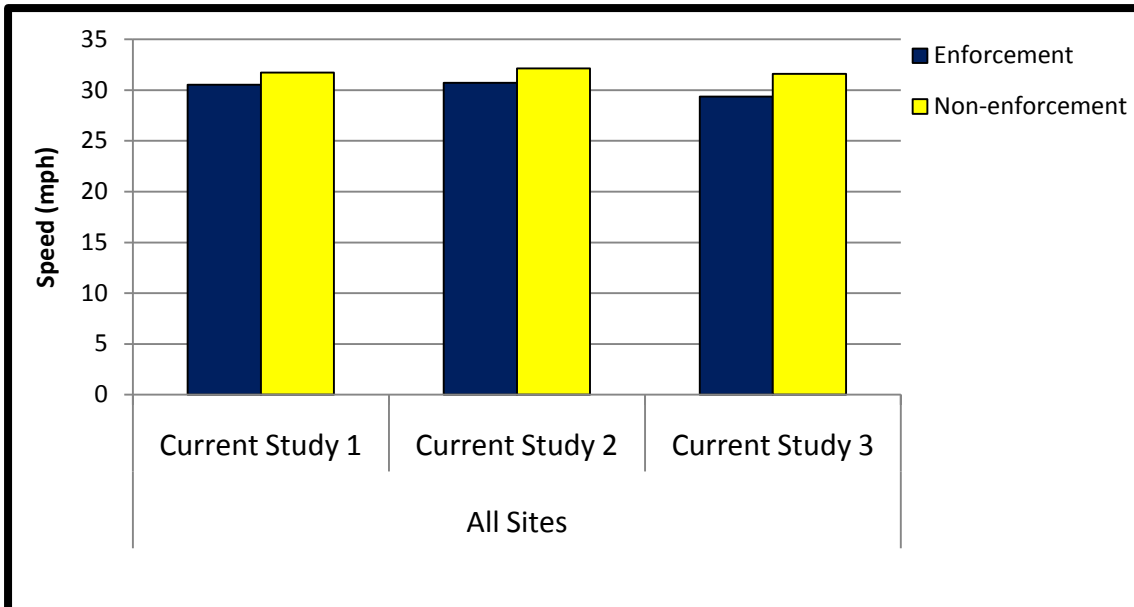


Figure 14: Overall average speeds: All Sites

Table 31: Overall average speeds

	Speed Assessment Site Type	Common Sites		All Sites		
		Previous Study	Current Study 1	Current Study 1	Current Study 2	Current Study 3
Average (mph)	Enforcement	30	30	31	31	29
	Non-enforcement	33	32	32	32	32
Change (mph) (from previous survey)	Enforcement		0.4		0.2	-1.3
	Non-enforcement		-0.7		0.4	-0.5
Percentage change (from previous survey)	Enforcement		1.2%		0.6%	-4.4%
	Non-enforcement		-2.2%		1.3%	-1.7%

Average speeds remained consistent across the surveys, except for the statistically significant decrease (at the 95% confidence limit) in Current Study 3.

Overall, the evidence was that motorcycle speeds generally remained consistent between the Previous and Current Trials, and during the Current Trial. In the last period of speed data analysis it was found that speeds reduced and this change was statistically significant. The statistical evidence that motorcycle speeds decreased at the end of the Current Study was not consistent with to the trend up until that point.

The reductions in individual lanes varied from 4% in the bus lanes to 5% in the non-priority lanes, and so were a general reduction across all lanes, see Table 32 and Table 33.

Table 32: Overall average speeds – Bus Lanes

	Speed Assessment Site Type	Common Sites		All Sites		
		Previous Study	Current Study 1	Current Study 1	Current Study 2	Current Study 3
Average (mph)	Enforcement	30	31	31	30	29
	Non-enforcement	33	32	32	32	32
Change (mph) (from previous survey)	Enforcement		0.9		-0.5	-1.1
	Non-enforcement		-1.3		0.4	-0.5
Percentage change (from previous survey)	Enforcement		2.9%		-1.5%	-3.7%
	Non-enforcement		-4.1%		1.3%	-1.6%

Table 33: Overall average speeds – Non-Priority Lanes

	Speed Assessment Site Type	Common Sites		All Sites		
		Previous Study	Current Study 1	Current Study 1	Current Study 2	Current Study 3
Average (mph)	Enforcement	30	30	30	31	30
	Non-enforcement	33	32	32	32	32
Change (mph) (from previous survey)	Enforcement		0.0		0.9	-1.6
	Non-enforcement		-0.8		0.4	-0.3
Percentage change (from previous survey)	Enforcement		-0.1%		2.9%	-5.1%
	Non-enforcement		-2.4%		1.3%	-0.9%

4.4.2 Motorcycle Speed Limit Compliance

It was hypothesised that the effect of the Current Trial, and particularly speed enforcement, could improve speed limit compliance over time as regular users responded to a police enforcement presence on the Enforcement Corridors.

Individual motorcycle speed data was collected on three occasions during the Current Trial (Current Trial 1, 2 and 3). The average speeds considered in the previous section provide an indication of the overall trends, but not the level of compliance with the posted speed limits. The percentage of motorcyclists exceeding the speed limit in each survey period is summarised in Figure 15 and Figure 16 below.

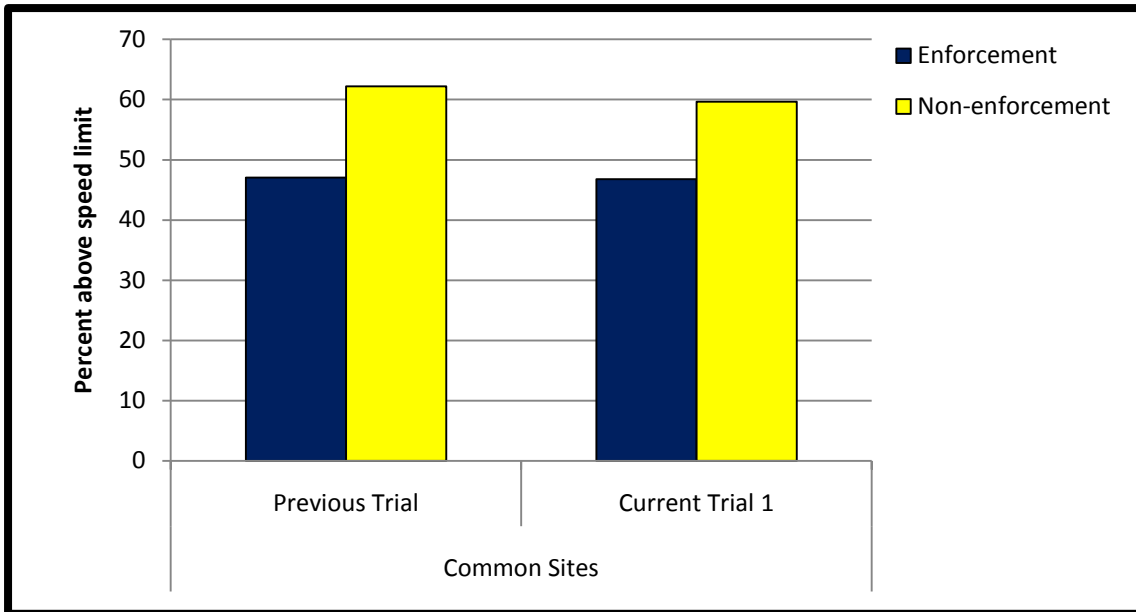


Figure 15: Percentage over speed limit: Common Sites

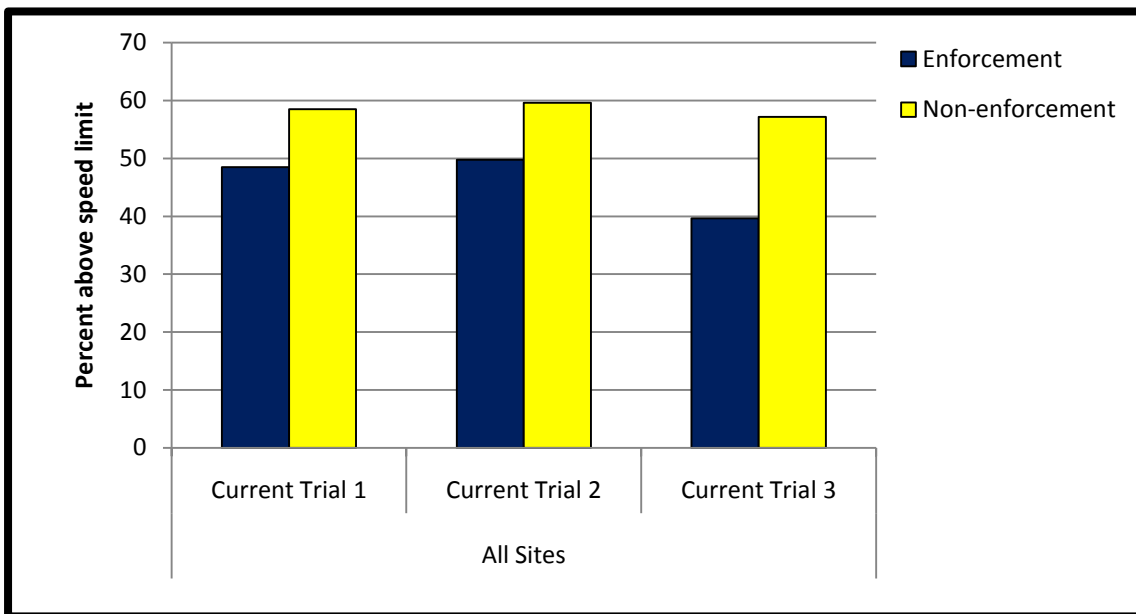


Figure 16: Percentage over speed limit: All Sites

The trends are the same as for the average speeds. Between 40 and 50% of motorcyclists were observed to exceed the speed limit on the Enforcement Sites, and the percentage remained consistent through the surveys apart from a statistically significant decrease (at the 95% confidence level) in the last survey.

4.4.3 Percentage Over the Speed Limit According to Lane

The percentage of motorcyclists exceeding the speed limit according to whether they travelled in the bus lane or a non-priority lane was also examined. The results are in Figure 17, Figure 18, and Table 34 for the priority lanes, and in Figure 19, Figure 20 and Table 35 for non-priority lanes .

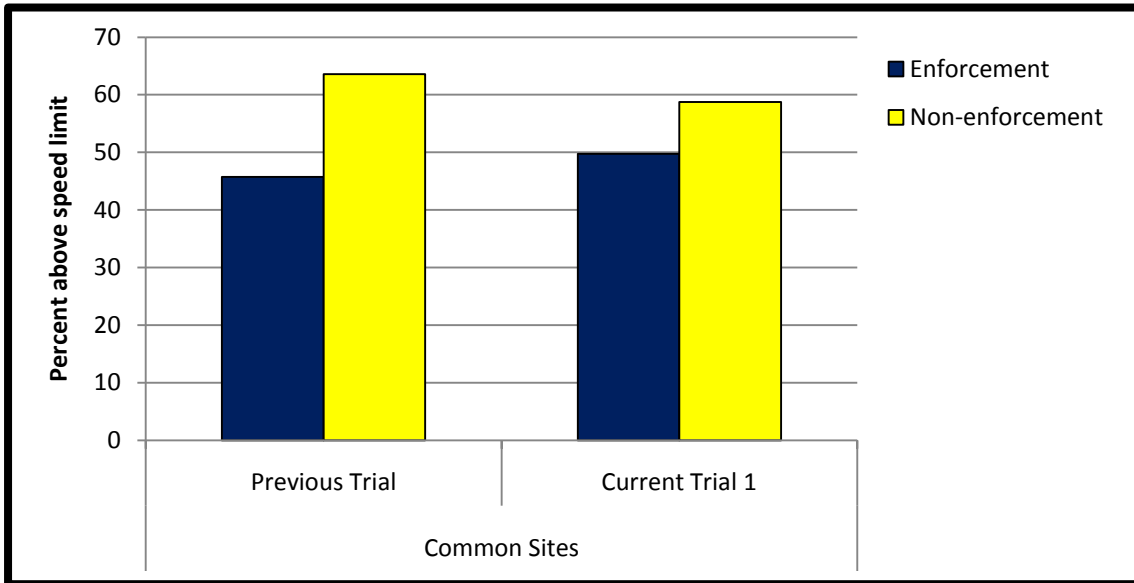


Figure 17: Percentage over speed limit in bus lane: Common Sites

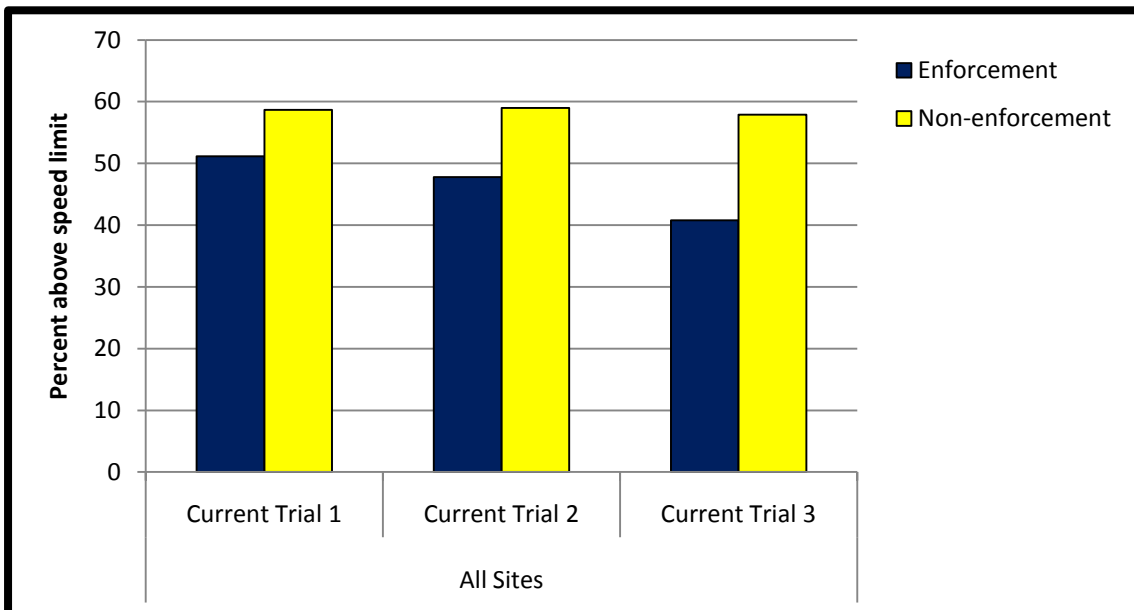


Figure 18: Percentage over speed limit in bus lane: All Sites

Table 34: Percentage over speed limit in bus lane

Speed Assessment Site Type	Common Sites		All Sites		
	Previous Trial	Current Trial 1	Current Trial 1	Current Trial 2	Current Trial 3
Enforcement	46	50	51	48	41
Control	64	59	59	59	58

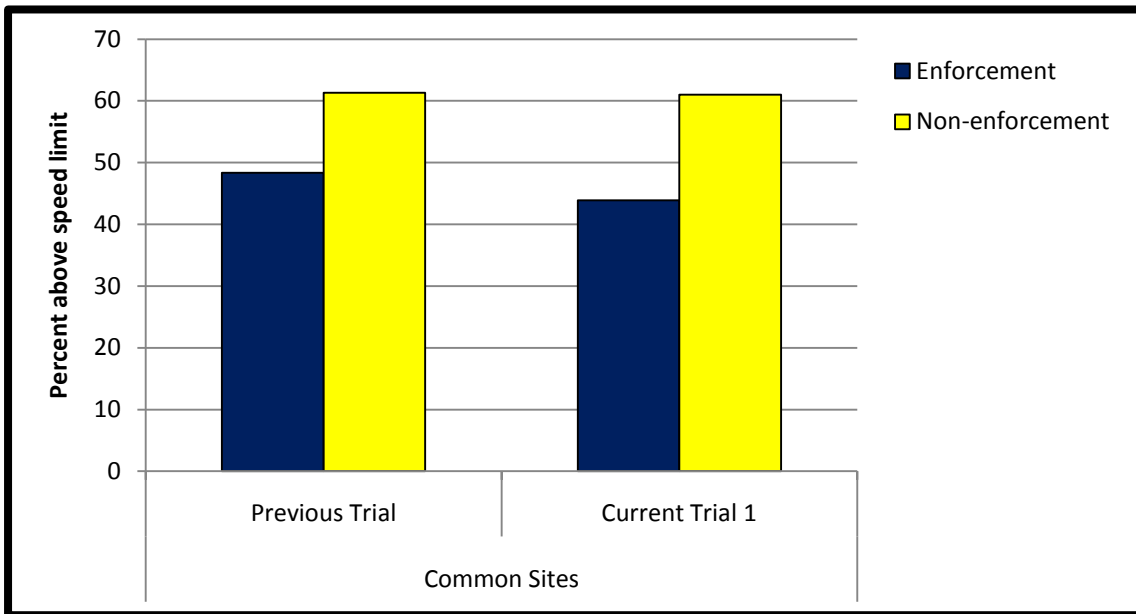


Figure 19: Percentage over speed limit in non-priority lanes: Common Sites

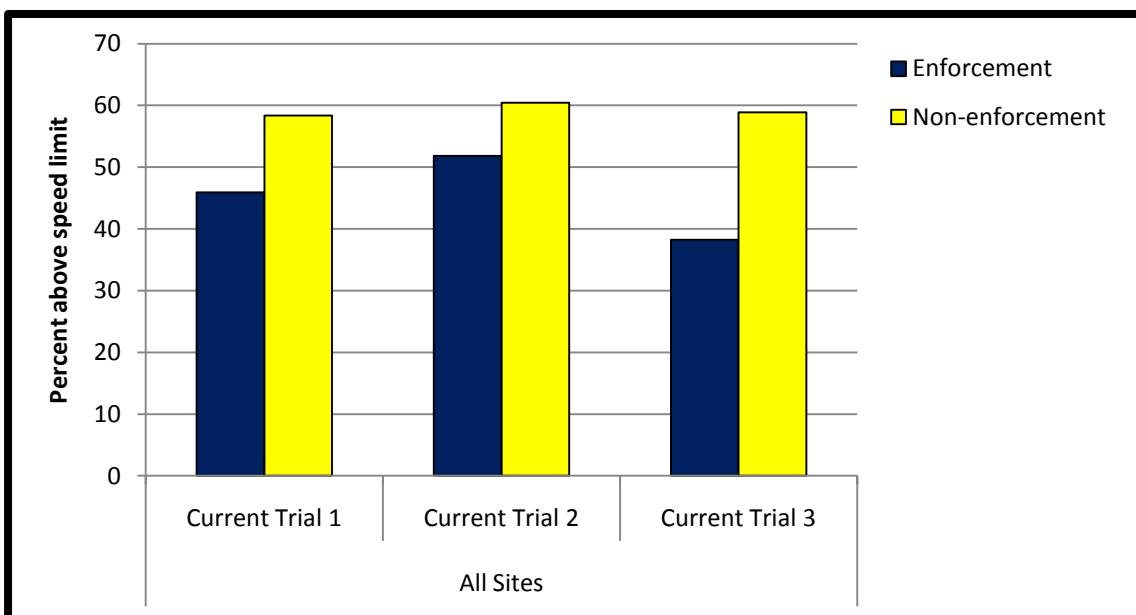


Figure 20: Percentage over speed limit in non-priority lanes: All Sites

Table 35: Percentage over speed limit in non-priority lanes

Speed Assessment Site Type	Common Sites		All Sites		
	Previous Trial	Current Trial 1	Current Trial 1	Current Trial 2	Current Trial 3
Enforcement	48	44	46	52	38
Control	61	61	58	60	59

There was a variation in the percentage of motorcyclists speeding in the bus and non-priority lanes between the Previous Trial and the start of the Current Trial (Current Trial 1), a period covering the start of the enforcement activity. The percentage speeding in the bus lane increased significantly, whilst those in the non-priority lanes decreased significantly.

There were no statistically significant variations between the Current Trial 1 and Current Trial 2 surveys. However, there was a statistically significant decrease in the percentage speeding in both lanes in the final (Current Trial 3) survey. This was not consistent with to the trend up until that point.

5 Conclusions

This report has examined TfL's Current Trial of motorcycle in bus lanes. The trial included general road safety marketing activity and targeted enforcement measures on high motorcycle collision rate corridors on the TLRN.

The purpose of the enforcement measures was to reduce motorcycle speeds and improve their safety.

This study has examined changes in the safety of motorcyclists, cyclists and pedestrians using STATS19 (or ACCSTATS) data, and trends in motorcycle speeds on the TLRN.

The results of this study into the Current Trial compared to the Previous Trial:

Collision rates involving motorcycles, cyclists and pedestrians over the whole network

1. Collision rates of motorcyclists on the 418 sections of road containing a bus lane used by motorcycles compared to elsewhere on London's roads during the Current Trial had not changed significantly.
2. Collision rates of cyclists on the 418 sections of road containing a bus lane compared to elsewhere on London's roads during the Current Trial had not changed significantly.
3. Cycle collisions involving a motorcycle account for less than 6% of all such collisions in sections of road containing a bus lane. However, the collision rates of cyclists with motorcyclists on TLRN bus lane network compared to elsewhere on London's roads during the Current Trial significantly increased, albeit the numbers are small (10 to 25).
4. Collision rates of pedestrians on the 418 bus lanes used by motorcycles compared to elsewhere on London's roads during the Current Trial had not changed significantly.

Collision rates on Network Sites and Enforcement Corridors involving motorcycles, cyclists and pedestrians

5. Motorcycle collision rates on the bus lane sites, and Enforcement Corridors had not changed significantly compared to their controls, but had increased significantly on Enforcement Corridor Sites.
6. Cyclist collision rates on the TLRN bus lane sites had not changed significantly.
7. Pedestrian collision rates on the TLRN bus lane sites had not changed significantly.
8. Collisions predominantly involved cars and over 80% were slight injuries.

Motorcycle speeds

9. The percentage of motorcyclists exceeding the speed limit varied between 40 and 50% in all surveys. This percentage remained consistent from the Previous Study (September/October 2008) and throughout the majority of the Current Trial: until at least March/April 2011.
10. There was a reduction from 51 to 41% of motorcycles speeding and a 2mph reduction in their average speed in the final survey of the Current Trial: September 2011.