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Transport for London
Motorcycle Policy Unit

Evaluation of Journey Time and Emissions of PTWs in Bus Lanes

January 2011

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Client Commission			
Client:	Transport for London	Order No:	
Commissioned By:	T. Duckham	Date Commissioned:	January 2009

LTP Quality Control					
Job No:	LTP/09/608		File Ref:	PTW Emissions study_REVISED	
Issue	Revision	Description	Originated	Checked	Date
1	0	Final Report	SM	AM	23 Apr 2010
1	1	Final Report	SM	AM	10 Jun 2010
1	2	Final Report	SM	AM	20 Jan 2011
			Authorised for Issue:		

LTP PROJECT TEAM

As part of our commitment to quality the following team of transport professionals was assembled specifically for the delivery of this project. Relevant qualifications are shown and CV's are available upon request to demonstrate our experience and credentials.

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TRANSPORT FOR LONDON
EVALUATION OF JOURNEY TIMES AND EMISSIONS OF PTWS IN BUS LANES

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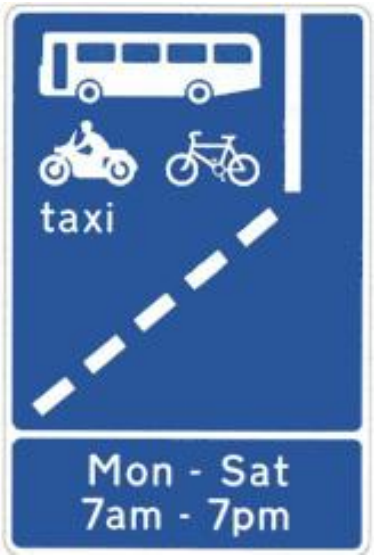


EXECUTIVE SUMMARY

Introduction

Local Transport Projects Ltd. was appointed by Transport for London's Motorcycle Policy Unit to carry out a study modelling typical powered two wheeler (PTW) journeys on main routes into London.

This study seeks to determine whether there are likely to be journey time savings and consequent emission reductions generated by permitting powered two wheelers to use bus lanes. The outcomes of this work are intended to complement the ongoing 18 month trial of motorcycles in bus lanes instigated by the London Mayor's Office in January 2009.

The Surveys

Ten potential routes into Central London where motorcycles are permitted to use bus lanes were initially identified. Of these ten routes, six were then prioritised for survey by taking those routes with the highest proportion of inbound bus lanes.

The Metropolitan Police assigned riders and drivers to survey the routes with one powered two wheeler travelling in bus lanes where available and a powered two wheeler and a car travelling in general traffic lanes. These surveys all started at the same time with one route being surveyed per day.

Every route was recorded onto video showing start and finish times, distance travelled and time taken for all stoppages.

Survey Analysis and Results

The video tapes were converted into DVDs and analysed to find the number of total stoppages; time spent moving and time stopped; and average speed.

Averages were then taken of all of the journey times by mode and this showed that:

- Powered two wheelers using bus lanes where available took an average of **2 minutes 29 seconds per kilometre**;
- Powered two wheelers using only general traffic lanes took an average of **2 minutes 46 seconds per kilometre.**
- Cars using only general traffic lanes took an average of **3 minutes 55 seconds per kilometre.**

The distances travelled by mode and the average journey speeds recorded were used to estimate the emissions and fuel consumption for a sample of 'small', 'medium' and 'large' vehicles (cars and motorcycles) on those routes, using the Department for Transport's 'Road Vehicle Emissions Database'.

Averages were then taken of all of the emissions and fuel consumptions by vehicle 'size', mode, fuel type and lane travelled in and this showed that, **over a comparable route length**:

Emissions: PTW use of bus lanes compared to using general traffic lanes

- PTW use of bus lanes cuts their CO_2 emissions by an average of between 0.4% and 9.0%.
- PTW use of bus lanes cuts their emissions of Oxides of Nitrogen by an average of between 0.4% and 10.1%.

Fuel Consumption: PTW use of bus lanes compared to using general traffic lanes

- PTWs use of bus lanes cuts their fuel consumption by an average of between 0.4% and 9.0%.

Emissions of cars compared to PTWs in bus lanes

- Petrol cars of comparable size to small, medium and large PTWs emit an average of between 2 and 6 times more CO_2 than PTWs using bus lanes.
- Petrol cars of comparable size to small, medium and large PTWs emit an average of between 1.5 and 6.5 times more Oxides of Nitrogen than PTWs using bus lanes.

Fuel Consumption of Cars compared to PTWs in bus lanes

- Petrol cars of comparable size to small, medium and large PTWs consume an average of between 2 and 6 times more fuel than PTWs using bus lanes.

Potential Future Outputs

In addition to the above headline results on journey time and emissions, there are a number of other potential further benefits of permitting powered two wheelers to use bus lanes which could be quantified, including:

- The journey time savings for powered two wheeler riders could be monetised using the DfT's Transport Analysis Guidance (WebTAG);
- Total probable daily reductions in emissions along each route that powered two wheelers are permitted to travel in bus lanes could be estimated;
- Average emissions of Carbon Monoxide, Total Hydrocarbons and Benzene could be estimated for all routes;
- Assessment of any journey times / emissions impacts on other vehicles travelling within bus lanes and on vehicles in general traffic lanes, resulting from permitting powered two wheelers to use bus lanes could be examined.

1.0 INTRODUCTION

1.1 Background

1.1.1 On 5th January 2009, TfL embarked upon an 18 month trial to assess the effects of allowing PTWs to use selected bus lanes on routes into central London. Motorcyclists are recognised by the Department for Transport (DfT) as *"our most vulnerable users"* (DfT, 2005) and, in 2008, published the *"Government's Motorcycling Strategy: Revised Action Plan" (DfT, 2008)* which highlighted the importance of motorcycling policy interventions. Action H3 is to *"Review research reports on motorcycles in bus lanes".* Whilst an understanding of the effects on collisions and on other road users has been a key priority for previous and current research projects, there has not been a comprehensive attempt to assess the potential gains in terms of journey times or affects on vehicle emissions.

1.1.2 In light of the above, it was considered that the 'motorcycles in bus lanes' research agenda would benefit from focusing attention upon modelling a typical ride cycle for PTWs, both using and refraining from using bus lanes where they are available on routes into Central London and comparing the journey time and emissions produced to a similar journey by car.

1.1.3 Local Transport Projects Ltd. was therefore appointed by Transport for London's Motorcycle Policy Unit to carry out a study modelling typical powered two wheeler journeys on a number of main routes into London.

1.2 Aim of Research

1.2.1 The aim of this research project is therefore to:

> ***Model typical ride/drive cycles of PTWs and cars on journeys into central London in order to identify journey time savings and estimate probable emissions using the Department for Transport's 'Road Vehicle Emissions Database'.***

1.3 Objectives

1.3.1 This research project seeks to address the following headline objectives:

- To model a typical ride cycle for PTWs using bus lanes where available, on a range of main routes into central London;
- To model a typical ride cycle for PTWs not using bus lanes along the same routes;
- To model a typical drive cycle for a car using not using bus lanes, along the same routes;
- To use the ride/drive cycle models identified to compare journey times for the PTW using the bus lanes where available, with the motorcycle and car not using bus lanes;

- To use the ride/drive cycle models identified to estimate probable emissions for PTWs and cars travelling into Central London using the Department for Transport's 'Road Vehicle Emissions Database'. This can be accessed through the following link

  http://www.dft.gov.uk/pgr/roads/environment/emissions/

- To identify the likely emissions effects of legally permitting PTWs to use bus lanes.

1.4 Methodology

1.4.1 The research was undertaken as follows:

Stage 1 – Identification of Routes

The routes to be assessed were identified by TfL and are listed in Appendix 1. There were initially 10 routes to be assessed. These were reduced to a total of six following an assessment of the suitability of the routes.

Stage 2 – Ride/Drive Cycle Modelling, Video Capture

Two Metropolitan Police motorcyclists rode each of the routes on the same day, at the same time in the peak travel period for that route, using similar PTWs equipped with forward facing video cameras with time, distance and speed recorders on screen. One used the bus lanes where permitted to do so and the second only used the general traffic lane. The riders were briefed to ride in accordance with standard Metropolitan Police 'Roadcraft' riding/driving guidelines to ensure the results were consistent. The process was repeated using a video equipped car driven by a Metropolitan Police driver on the same route at the same time, using the general traffic lane only.

Stage 3 – Ride/Drive Cycle Modelling, Analysis

Each video was then analysed to provide a model of the ride/drive cycle, including average speed, number and duration of stops and total journey time. Each analysis splits the journeys into sections with similar average speeds.

Stage 4 – Assessment of Emissions Produced

The above data for each journey/mode was used to model the emissions and fuel consumption using the DfT's 'Road Vehicle Emissions Database'.

Stage 5 – Conclusions

The outputs from Stage 4 were used to assess the benefits, in terms of journey times and air pollution of allowing PTWs to use bus lanes on busy routes into central London. It also enabled comparisons to be made with regards to cars versus motorcycle emissions and journey times.

Stage 6 – Recommendations and Potential Future Outputs

The conclusions from Stage 5 have led to some recommendations and potential avenues for further study.

2.0 IDENTIFICATION OF ROUTES

2.1 Preliminary Route List

2.1.1 At the outset of this research project, TfL proposed 10 routes to their headquarters in central London to carry out ride/drive cycle assessments on. These are shown as the yellow lines in **Figure 2.1** below. Superimposed over these yellow lines are the routes that were surveyed with their revised designations. The prioritisation of the routes is discussed in Section 3.2.

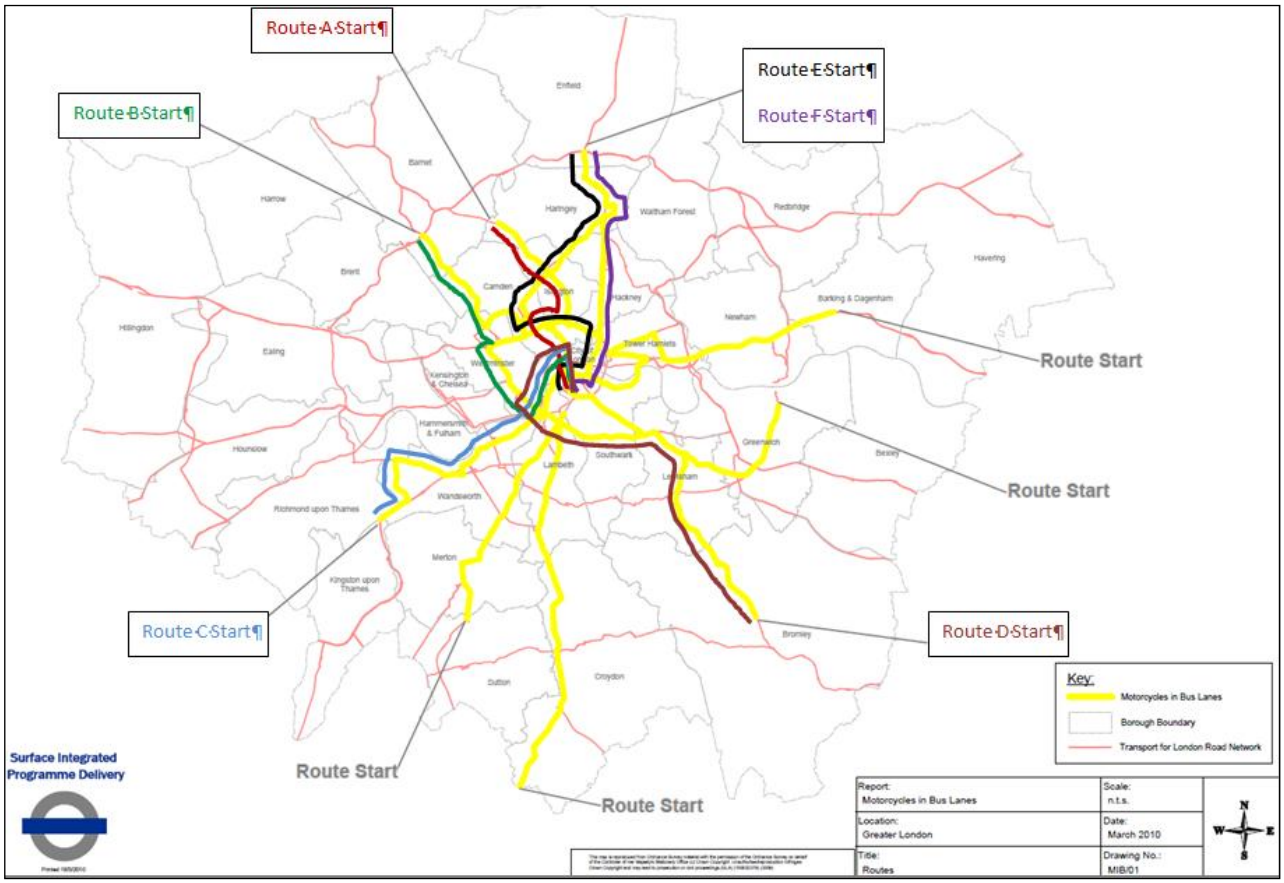


Figure 2.1 – TfL Proposed Routes for Assessment

2.1.2 The TfL Routes list is in Appendix 1. They were as noted below:

- Route 1 Hampstead – A1 Archway Road to Palestra
- Route 2 Tottenham 1 – A10 Great Cambridge Road to Palestra
- Route 3 Tottenham 2 – A10 Great Cambridge Road to Palestra
- Route 4 Ripple Road – A13/A123 Ripple Road to Palestra
- Route 5 Woolwich – A205 Grand Depot Road to Palestra
- Route 6 Bromley Common – A21 Bromley Common to Palestra
- Route 7 Hooley – A23 Brighton Road to Palestra
- Route 8 Sutton – Rose Hill Roundabout to Palestra

- Route 9 Kingston Vale – A3 Robin Hood Roundabout to Palestra
- Route 10 Brent Cross – A41 Hendon Way to Palestra

2.2 Route Assessment

2.2.1 The initial assessment of the 10 routes provided by TfL's Motorcycle Policy Unit involved the use of overhead photographs and a scaled map of Greater London to make estimates of the total route lengths and the lengths and operational hours of the inbound bus lanes on these routes. This assessment is in Appendix 2.

2.2.2 Though the Metropolitan Police were willing to assist with the research, the demands placed on their fleet of vehicles were such that they could not commit to ride/drive cycles on all 10 routes. A decision was then made to prioritise the routes according to those routes incorporating the most significant lengths of inbound bus lanes.

2.2.3 The routes with the proportions of bus lanes and the proposed survey priority are shown in **Table 2.1** below.

Survey Priority	Route	Start Point	Total Route Length (KM)	Total Length of Inbound Bus Lanes (KM)	% of Route with Bus Lanes
1	1	A1 Archway Road	8.7	3.75	43
2	10	A41 Hendon Way	18.25	6.8	37.3
3	6	A21 Bromley Common	23.6	8.35	35.4
4	9	A3 Roehampton Vale	17.5	5.65	32.3
5	3	A10 Great Cambridge Road	24	7.15	29.8
6	2	A10 Great Cambridge Road	17	5.05	29.7
7	5	A205 Grand Depot Rd	19	5.05	26.6
8	8	A297 St Helier Avenue	16.6	4.3	26
9	4	A13 Alfred's Way	17.14	4.0	23.3
10	7	A23 Brighton Road	27.67	3.55	12.8

Table 2.1 – Ride/Drive Cycle Routes Prioritised by % of Inbound Bus Lane

2.2.4 Given that the Metropolitan Police could not commit to carrying out ride/drive cycles on every route, the 6 routes with the highest proportion of inbound bus lanes i.e. Routes 1, 10, 6, 9, 3 and 2 were proposed for survey.

2.2.5 Once the ride/drive cycles had been completed, it was easier to consider the routes in the order of prioritisation. The route designations were therefore changed as shown in **Table 2.2** below.

Route Initial Name	1	10	9	6	3	2
Route Final Name	A	B	C	D	E	F

Table 2.2 – Surveyed Routes Final Names

2.2.6 The selected Routes are discussed in more detail in Section 4, with an indication given of junctions and other areas where it was considered that the Police riders/drivers would experience some delays.

2.3 Road Works

2.3.1 Prior to commencement of the ride / drive cycle surveys, TfL issued a schedule of ongoing and proposed road works for each of the roads on the proposed survey routes. Each of these schedules was reviewed to consider whether any of the route's journey times would be compromised to the extent that a survey would take longer than the maximum length of the police video tape recording equipment using a single tape (90 minutes).

2.3.2 After reviewing the road works schedules for each route, it was considered that there was a similar level of road works along all of the routes and that they all represented a typical ride / drive cycle experience for motorists. This led to the conclusion that the survey routes should still be carried out on the basis of the proportion of route with bus lanes as described in 2.2 above.

3.0 RIDE/DRIVE CYCLE MODELLING, VIDEO CAPTURE

3.1 Methodology

3.1.1 Two Metropolitan Police motorcyclists rode each of the routes on the same day, at the same time in the peak travel period for that route, using similar PTWs equipped with forward facing video cameras with time, distance and speed recorders on screen. One used the bus lanes where they were available and the second only used the general traffic lanes. The riders were briefed to ride in accordance with standard Metropolitan Police 'Roadcraft' ride/drive guidelines which ensured that the results are as consistent as possible. The process was repeated using a video equipped car driven by a Metropolitan Police driver on the same route at the same time, using only general traffic lanes.

3.1.2 A Briefing Note was issued to the Metropolitan Police prior to commencement of the surveys, which gave details of each route, the roads to take on those routes and actions for each surveyor to follow. This briefing note is in Appendix 3.

3.2 Vehicles used for the survey

3.2.1 When the Metropolitan Police were asked for riders and drivers to carry out the ride / drive cycle surveys, a request was made that un-marked vehicles should be used. This was intended to ensure that other motorists alongside the surveyors would not modify their riding / driving behaviour when they noticed the marked police vehicles. When the first DVDs were delivered by the Metropolitan Police riders / drivers, it was identified that a marked motorcycle had been used for the first three bus lane surveys. The Metropolitan Police explained that although they had wanted to use un-marked vehicles for all of the surveys, they were restricted by their fleet availability.

3.2.2 It was crucial that the mode comparisons be like-for-like i.e. they had to start each route at the same time on the same day. The only way to ensure fair comparisons for the first three routes with an un-marked motorbike using the bus lanes would have been for the Metropolitan Police to re-do all of those ride / drive cycle surveys. With half of the surveys already carried out, it was considered wasteful of time and resources to ask the Police officers to carry out all of the first three ride / drive cycle surveys again.

3.2.3 Taking into account that the ride / drive cycle surveys were then at the halfway point, it was agreed that the marked powered two wheeler should use the bus lanes for all of the remaining surveys.

3.2.4 On the final route, F, the DVD analysis showed that the car used was also marked. This was also attributed to fleet availability. The results of the ride / drive cycle analysis showed that the car travelling with general traffic still takes much longer than either of the powered two wheelers. It is not therefore considered that the presence of the marked police car made any appreciable difference to the behaviour of nearby motorists in the AM peak traffic.

3.2.5 Both powered two wheelers used were the BMW RT1200P models (1200cc petrol engines). The car used was the BMW 530D (3000cc diesel engine). These are all considered to be 'large', relatively high-powered vehicles, within their respective categories.

3.3 Survey Discrepancies

3.3.1 During the Ride/Drive Cycles there were a number of minor discrepancies in the conduct of the surveys by the Metropolitan Police riders/drivers. Most of these discrepancies involved very brief halts such as to speak with a motorist who forced their way in across several lanes of traffic. Another PTW survey ride had to be abandoned after the officer was required to deal with a PTW rider who overtook him and drove through a red signal only to collide with a right-turning taxi. Fortunately, the rider in question was not seriously hurt, but the collision served to illustrate that all of the ride/drive cycles were conducted in morning peak traffic in central London. As such, it would be unrealistic to expect that every cycle could be completed without some form of event.

3.3.2 On the whole the ride/drive cycles were conducted according to the established methodology and the notes provided to the Metropolitan Police officers. Two of the car runs had to be omitted from inclusion in the ride/drive cycle modelling analysis. These were the car surveys for routes C and E. In both cases, detours were accidentally taken that made any like-for-like comparison with the PTW rides impossible. For this reason, the data for these two car runs has not been included in the analysis of the average emissions and journey time data, though the PTW bus lane and non-bus lane runs for these routes were unaffected.

3.3.3 The minor discrepancies on each route are discussed in detail in Section 5 with their scale in relation to either the journey time or route length highlighted. For ease of reference, the discrepancies can be categorised as one of four types as shown below:

Discrepancy Type

1. Problems with the video recording, e.g. it was not started at commencement of the journey or the picture was distorted so not all factors such as start time or distance can be identified, or recording stopped prematurely;
2. Rider/ driver stopped briefly to speak to another motorist or for some other reason;
3. Rider of powered two wheeler who was supposed to travel with general traffic but used bus lanes to by-pass some queuing traffic;
4. Driver / rider made a wrong turn and either back-tracked or made a short detour to get back on the survey route.

4.0 RIDE/DRIVE CYCLE MODELLING, ANALYSIS

4.1 Methodology

4.1.1 The analysis of the ride / drive cycle surveys was guided by the stated aim of this research; to derive journey time savings and obtain the inputs needed to model the emissions produced by powered two wheelers in bus lanes, using the DfT's 'Road Vehicle Emissions Database'. The database uses journey distance in kilometres and average speeds in kilometres per hour to model levels of pollutants emitted and fuel consumption. This modelling is covered in detail in the next Section.

4.1.2 As the 'Road Vehicle Emissions Database' only needed distance and average speeds, for every ride / drive cycle survey, we recorded the distance travelled and the time taken to travel between their starting point and Palestra in Blackfriars Road.

4.1.3 It was also our intention to build up a picture of the journey taken for each mode on each route. This was done so that the surveys could each be analysed in detail to identify the number of stoppages each mode experienced; why their journey times varied; where the major delays were experienced and therefore what the travel experience was like for each rider / driver.

4.1.4 For each ride / drive cycle survey, we recorded:

- Route start and end points and times in HH:MM:SS;
- Times vehicles stopped in HH:MM:SS;
- The reasons for stoppages not obviously connected with signalised junctions or pedestrian crossings, such as road works;
- Any unusual activity we could make out from the DVDs that have been recorded as survey discrepancies.

4.1.5 **Route start points** were all identified in the notes for Police Video Survey Team Members and were checked against the evidence on the DVDs using Google. This knowledge should help to determine if bus lanes increased the average speeds for the PTW using the lanes above those of the other PTW and the car when writing the final report.

4.1.6 **Section start and end points**. These are defined by the stoppages in each route. The timing of a section began when the vehicle started and stopped when the vehicle came to a complete halt.

4.1.7 **Time stopped**. A record of each **stoppage** in HH:MM:SS along each of the sections. This was to help us identify whether the PTW in the bus lane experienced less frequent stoppages and/or less total stoppages than the other PTW and car. These stoppages were timed from when the surveying vehicle came to a complete stop until it began moving again.

4.1.8 **Route end point**. This was when the surveying vehicles arrived at Palestra in Blackfriars Road. This was also the final section end point in all routes.

4.1.9 All of the survey analyses for each route and mode are included in Appendix 4.

4.1.10 In each of the following summary results and written analyses, we have abbreviated the mode of transport and the areas of carriageway they used throughout their route. The powered two wheelers are shown as PTWs and they travel in either the bus lane (BL) or with general traffic (GT). The CAR always travels with general traffic (GT).

4.2 Route A - A1 Archway Road to Palestra Summary Results

4.2.1 This route was 11.1km long in total and included **3,750 metres** of inbound bus lane or **34%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **6 minutes and 50 seconds ahead** of the PTW in general traffic and **21 minutes and 19 seconds ahead** of the car. The route is shown in **Figure 4.1** below.

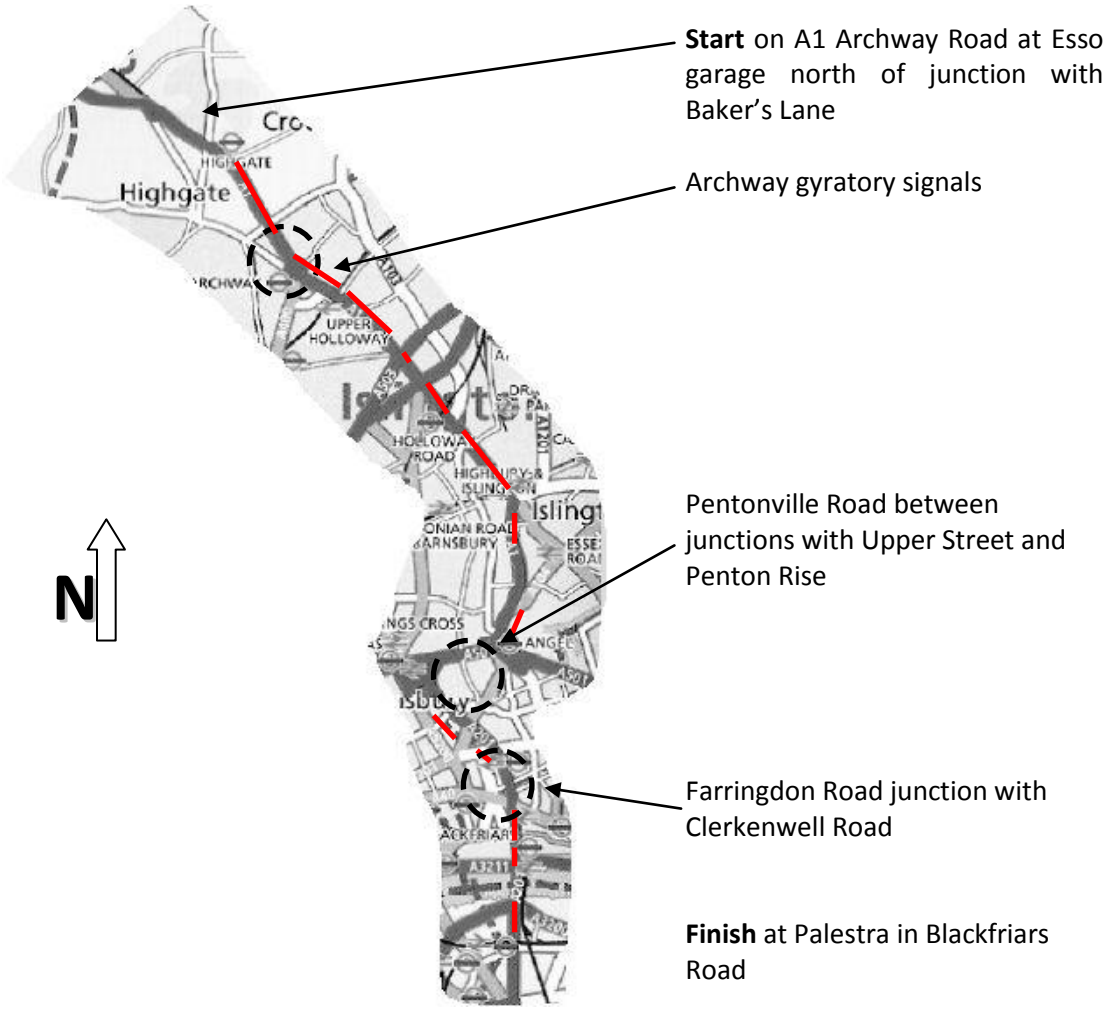


Figure 4.1 - Route A A1 Archway Road to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys.

4.2.2 This route was entirely urban in character and passed through a mixture of residential, commercial, business and town centre areas. The speed limit on all roads travelled was 30mph. The route went through Archway Road; Holloway Road; Highbury Corner; Upper Street; Pentonville Road; Penton Rise; Kings Cross Road; Farringdon Road; Farringdon Street; New Bridge Street; Blackfriars Bridge and Blackfriars Road.

4.2.3 The summary results shown in **Table 4.1** below are derived from the route journey times and average speeds tables for Route A. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:30:20	07:31:49	07:32:16
Time finished (HH:MM:SS)	07:57:25	08:05:44	08:20:40
Total Distance Travelled (Miles)	6.847	6.929	6.952
Total Distance Travelled (KM)	11.017	11.149	11.186
Total Stoppages (Secs)	312	484	1,019
Total No. Of Stoppages	17	26	47
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:27:05	00:33:55	00:48:24
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:21:53	00:25:51	00:31:25
Average Speed (Miles/H) (Inc stoppages)	15.17	12.26	8.62
Average Speed (Miles/H) (Exc stoppages)	18.77	16.08	13.28
Average Speed (KM/H) (Inc stoppages)	24.41	19.72	13.87
Average Speed (KM/H) (Exc stoppages)	30.21	25.88	21.36

Table 4.1 – Route A Summary Survey Results

4.3 Route A – Survey Analysis

4.3.1 The distance travelled is shown in both miles and kilometres as the Police survey videos recorded the surveys in miles and the Emissions Database described in the next Section takes distances in kilometres.

4.3.2 The **6 minutes and 50 seconds** saved by the PTW_BL compared to the PTW_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route A in Appendix 4. The easiest way to see how the journey time savings have been made between the modes is to review these tables in Appendix 4, looking at the cumulative route length and section journey end times columns. These show how much longer it took the PTW_GT and CAR_GT to travel the same distance as the PTW_BL.

4.3.3 The largest delay to the PTW_GT was at the junction of the Archway Gyratory where the A1 Archway Road meets St John's Way and Tollhouse Way at a signalised gyratory. The junction is approached by a significant length of bus lane and buses have the further advantage of the lane continuing through the junction, which allows them and the PTW_BL to by-pass the large queues usually found at the southbound stopline in the AM peak period.

4.3.4 The southbound stopline of the Archway Gyratory junction is approximately 2.2 kilometres from the route start point. The PTW_BL crossed this after approximately 5 mins 24 secs, while the PTW_GT took approximately 9 mins 01 secs, a difference of 3 mins 37 secs.

4.3.5 Another timing 'checkpoint' for Route A is the junction of Upper Street with Liverpool Road at approximately 7 kilometres from the route start point. The PTW_BL took 15 mins 28 secs to cross the southbound stopline at this junction, whilst the PTW_GT took approximately 21 mins 37 secs, a difference of 6 mins 09 secs.

4.3.6 The **21 minutes and 19 seconds** saved by the PTW_BL compared to the CAR_GT can be accounted for in the same manner. The CAR_GT took approximately 11 mins 29 secs to cross the southbound stopline at the Archway Gyratory, 6 mins 05 secs more than the PTW_BL.

4.3.7 At the junction of Upper Street with Liverpool Road at approximately 7 kilometres from the route start point, the CAR_GT took approximately 29 mins 37 secs to cross the stopline, 14mins 09 secs more than the PTW_BL. The CAR_GT experienced two other significant delays; on Pentonville Road heading west toward Penton Rise, which took approximately 5 mins 31 secs; and at the signalised junction of Farringdon Road with Clerkenwell Street, which took 4 mins 20 secs.

4.4 Route A - Survey Discrepancies

4.4.1 **Table 4.2** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_BL	2	00:01:04	00:28:09	4%	N/A	N/A	N/A

Table 4.2 - Route A Discrepancies

4.4.2 The powered two wheeler that rode in the bus lanes did stop on one occasion in central hatching behind a separator island in Pentonville Road. This stoppage would not normally occur so the time was subtracted from the total stoppage time for this route survey run as shown in Appendix 4.

4.5 Route B – A41 Hendon Way to Palestra Summary Results

4.5.1 This route was 17.15km long in total and included **6,800 metres** of inbound bus lane or **40%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **4 minutes and 24 seconds ahead** of the PTW in general traffic and **25 minutes and 10 seconds ahead** of the car.

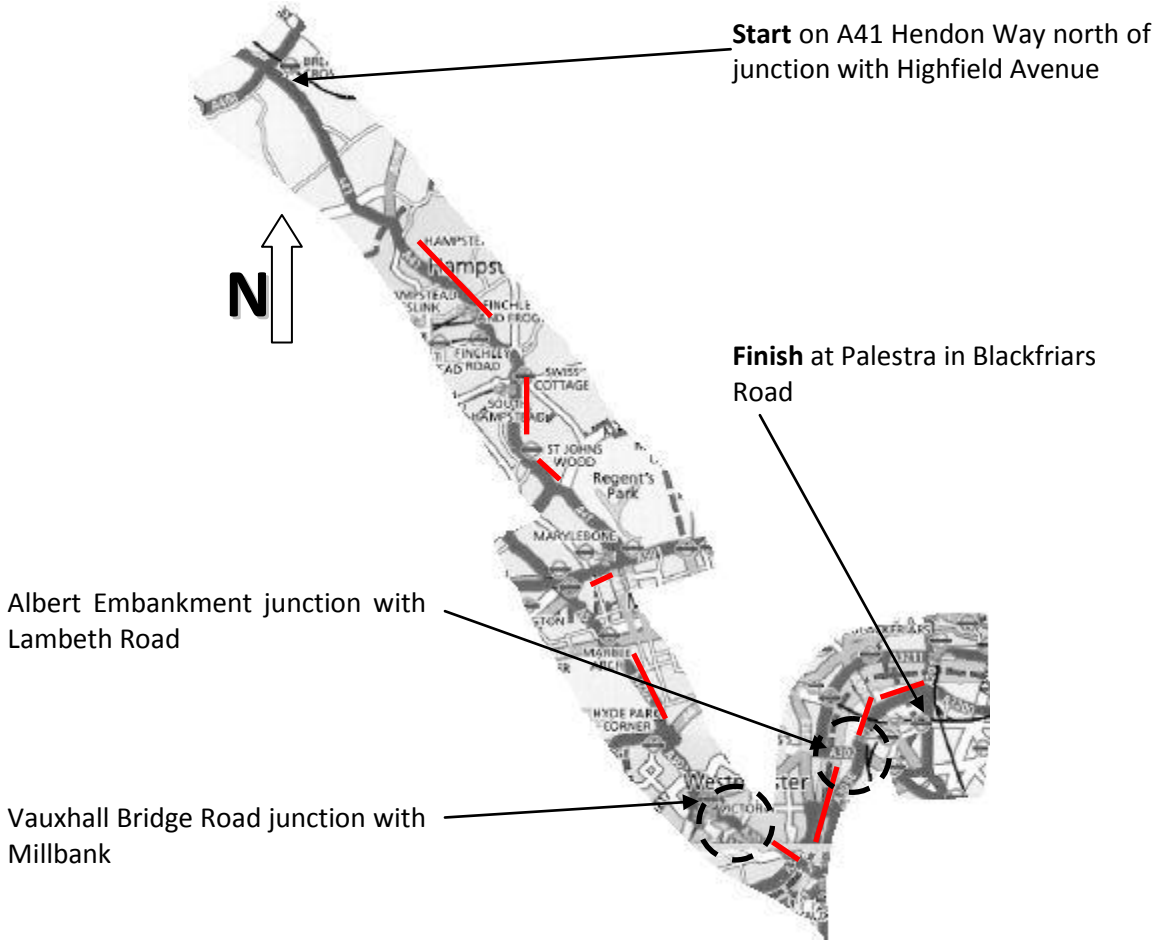


Figure 4.2 - Route B A41 Hendon Way to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys

4.5.2 As with all the other routes, this route was entirely urban in character and passed through a mixture of residential, commercial, business and 'high street' type areas. The speed limit on all roads travelled was 30mph. The route went through Hendon Way; Finchley Road; Wellington Road; Park Road; Baker Street; Marylebone Road; Old Marylebone Road; Edgeware Road; Marble Arch; Park Lane; Piccadilly Arcade; Duke of Wellington Place; Grosvenor Place; Lower Grosvenor Place; Bressenden Place; Vauxhall Bridge Road; Vauxhall Bridge; Albert Embankment; Lambeth Palace Road; York Road; Stamford Street and Blackfriars Road.

4.5.3 The summary results shown in **Table 4.3** below are derived from the route journey times and average speeds tables for Route B. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:29:02	07:30:13	07:30:44
Time finished (HH:MM:SS)	08:13:01	08:18:36	08:39:53
Total Distance Travelled (Miles)	10.581	10.710	10.710
Total Distance Travelled (KM)	17.025	17.232	17.232
Total Stoppages (Secs)	664	679	1,579
Total No. Of Stoppages	31	31	56
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:43:59	00:48:23	01:09:09
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:32:55	00:37:04	00:42:50
Average Speed (Miles/H) (Inc stoppages)	14.43	13.28	9.96
Average Speed (Miles/H) (Exc stoppages)	19.29	17.34	15.00
Average Speed (KM/H) (Inc stoppages)	23.22	21.37	14.95
Average Speed (KM/H) (Exc stoppages)	31.03	27.89	24.14

Table 4.3 – Route B Summary Survey Results

4.6 Route B – Survey Analysis

4.6.1 The **4 minutes and 24 seconds** saved by the PTW_BL compared to the PTW_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route B in Appendix 4.

4.6.2 For much of this route, the PTW_BL and PTW_GT can be seen riding close to one another on the DVDs and it is noted in Section 4.7.2 below that the PTW_GT rode in the bus lanes in Finchley Road and Marylebone Road. Despite this, the PTW_BL did gain on the other PTW after the PTW_GT was delayed at the signals of Vauxhall Bridge Road junction with Millbank for approximately 2 mins 35 secs.

4.6.3 The PTW_GT was also slowed along Albert Embankment from the signalised junction with Lambeth Road, taking approximately 2 mins 30 secs to travel 230 metres.

4.6.4 The **25 minutes and 10 seconds** saved by the PTW_BL compared to the CAR_GT cannot be as easily accounted for as the survey camera in the car had not been calibrated. This is explained in Section 4.7.3 below. The most revealing aspect of the survey analysis as shown in Table 5.3 and in Appendix 4 is that the car stopped 56 times, compared with 31 times for both powered two wheelers. This can be attributed to the car's exclusion from the bus lanes and its inability to filter through queuing traffic. With 25 more stoppages than the powered two wheelers, the car was subject to longer total delays, and travelled at a far slower average speed over the full route.

4.7 Route B - Survey Discrepancies

4.7.1 **Table 4.4** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_GT	3	N/A	N/A	N/A	N/A	N/A	N/A
CAR_GT	1	N/A	N/A	N/A	N/A	N/A	N/A
CAR_GT	4	00:08:05	01:15:43	11%	0.88	17.232	5%

Table 4.4 - Route B Discrepancies

4.7.2 The powered two wheeler that rode in the general traffic lane was also observed to travel in the bus lanes on three separate occasions on Finchley Road and again in the bus lane in Marylebone Road, despite instructions to the Police rider that they were not to do this. The DVD showed the rider by-passing long queues and slow-moving vehicles in the lanes adjacent to the bus lanes; hence this powered two wheeler reduced the overall journey time and increased the average speed over the route. This has compromised the comparison of journey times, speeds and emission rates between the different modes on this route. No 'congestion factor' could be applied to the PTW_GT totals that would accurately approximate the results if the Police rider had stayed out of the bus lane. The results for this route must therefore be viewed with the knowledge that they *are* compromised. Despite this compromise, the powered two wheeler that rode in the bus lanes still arrived at Palestra some 4 minutes and 9 seconds faster than the powered two wheeler that mostly travelled with general traffic. For this reason, it is considered that this survey should still be factored into the final assessment of the relative journey times and average speeds for Route B.

4.7.3 The DVD from the car that travelled in general traffic lanes showed a message indicating "Calib. Required". There was no distance measurement shown on the DVD, so the overall distance measurement used to arrive at the average speed for this survey run comes from the Route B PTW_GT survey. It is acknowledged that the car may have travelled slightly further than the powered two wheeler, but as no accurate 'filter-free' factor could be applied to the total distance travelled by the car, the results must be viewed with the knowledge that the actual average speed for the route may be slightly different from that shown. In comparing the distance travelled by a PTW_GT to a CAR_GT in Route A, it can be seen that the car travelled 37 metres further than the motorcycle. This difference was only 0.3% of the total distance travelled; not a significant proportion of the total route.

4.7.4 The Police driver in the car also mistakenly drove down Allsop Street instead of Baker Street, then paused to check a streetmap and completed a u-turn to get back on route in Marleybone Road. This additional time was not counted towards the total journey time.

At the point where the driver turned down Allsop Street, until they got back to the junction of Baker Street with Marylebone Road, instead of using all of these stoppage and section journey times, we have instead looked at the comparative distances involved between the proposed route and the detour and substituted a comparative journey time.

This comparative journey time was arrived at by:

(i) comparing the Baker Street to Marylebone Road route the driver should have taken with the Allsop Street-Marylebone Road-Marylebone High Street-Marylebone Road route the driver did take. This was approx. 230metres compared to 880metres,

(ii) taking the time the driver took to make the detour and arrive at the junction of Marylebone Road with Baker Street (including stoppages) which was 485 seconds (07:56:34 to 08:04:39),

(iii) subtracting the time stopped looking at the map which was 137 seconds, leaving 348 seconds,

(iv) and then multiplying the Baker Street proportion of the distance actually travelled by the actual journey time i.e. 230/880 = 0.26*348 seconds = 91 seconds,

(v) We then subtracted the total time taken to make the detour from the final Section Journey End Time (HH:MM:SS) and Duration (HH:MM:SS) and added the comparative Baker Street journey time to both i.e. 08:46:27-00:08:05+00:01:31=08:39:53 and 00:49:24-00:08:05+00:01:31=00:42:50,

(vi) We also subtracted the total detour time and added the comparative Baker Street journey time to the Total Duration (secs),

These changes are shown in Appendix 4.

Figure 4.3 below illustrates the proposed route and the detour taken

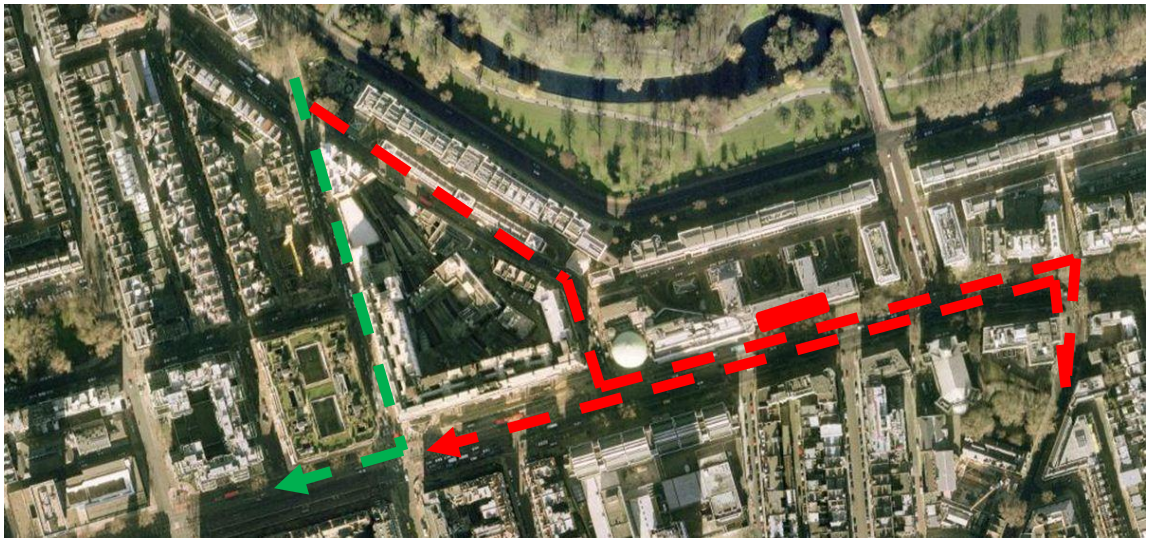


Figure 4.3 - Route B Car Detour ***Photo courtesy of Google Maps UK***

Key

Proposed route

Comparative time taken for section shown (including potential stoppages) = 91 seconds

Detour and Stopped to look at map

Total time taken (including stoppages) = 485 seconds

4.8 Route C – A3 Roehampton Vale to Palestra Summary Results

4.8.1 This route was 17.7km long in total and included **5,650 metres** of inbound bus lane or **31%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **15 minutes and 11 seconds ahead** of the PTW in general traffic. The car survey for this route was invalid for purposes of comparison.

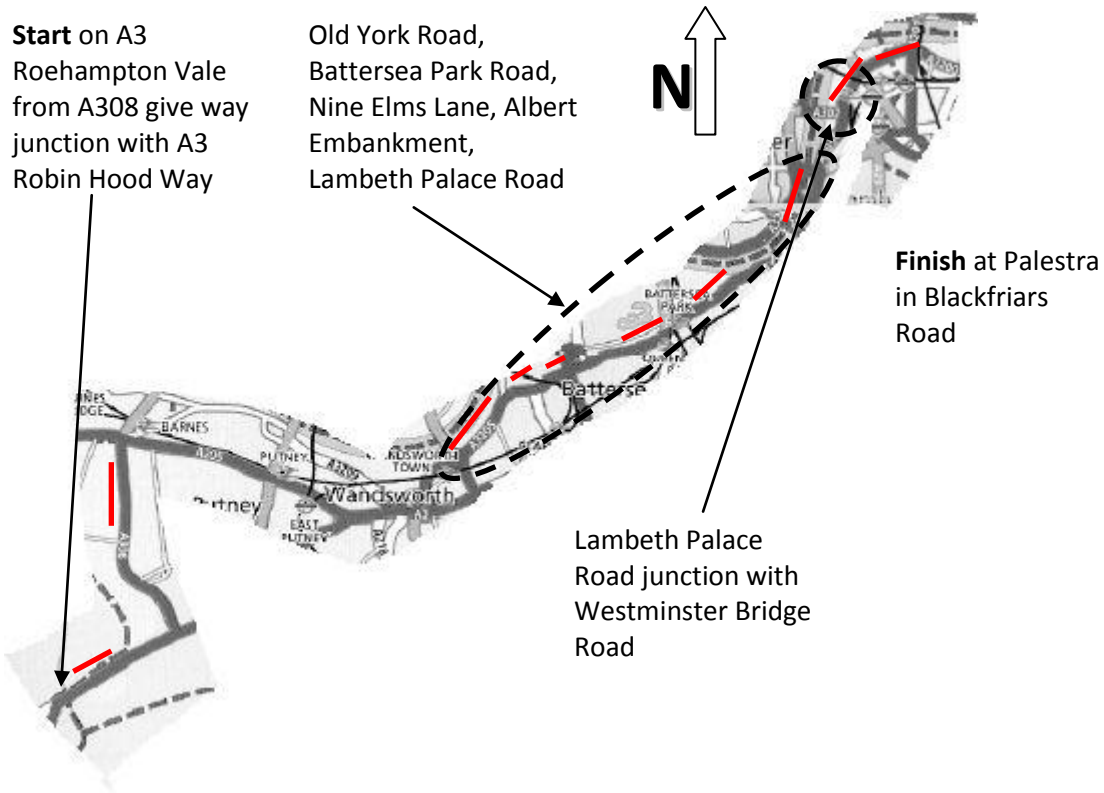


Figure 4.4 - Route C A3 Roehampton Vale to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys

4.8.2 As with all the other routes, this route was entirely urban in character and passed through a mixture of residential, commercial, business and town centre areas. The speed limit on all roads travelled was 30mph. The route went through Roehampton Vale; Kingston Road; Roehampton Lane; Upper Richmond Road; West Hill; Armoury Way; Old York Road; Swandon Way; York Road; Battersea Park Road; Nine Elms Lane; Albert Embankment; Lambeth Palace Road; York Road; Stamford Street and Blackfriars Road.

4.8.3 The summary results shown in **Table 4.5** below are derived from the route journey times and average speeds tables for Route C. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:38:44	07:40:29	Car survey invalid for comparison.
Time finished (HH:MM:SS)	08:22:14	08:39:10	
Total Distance Travelled (Miles)	10.993	11.039	
Total Distance Travelled (KM)	17.688	17.762	
Total Stoppages (Secs)	599	941	
Total No. Of Stoppages	27	50	
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:43:30	00:58:41	
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:33:31	00:43:00	
Average Speed (Miles/H) (Inc stoppages)	15.16	11.29	
Average Speed (Miles/H) (Exc stoppages)	19.68	15.40	
Average Speed (KM/H) (Inc stoppages)	24.40	18.16	
Average Speed (KM/H) (Exc stoppages)	31.66	24.78	

Table 4.5 – Route C Summary Survey Results

4.9 Route C – Survey Analysis

4.9.1 The **15 minutes and 11 seconds** saved by the PTW_BL compared to the PTW_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route C in Appendix 4. As noted in Section 3.3.2, the CAR survey could not be counted for this comparison as it would not be a like-for like comparison.

4.9.2 The PTW_GT was keeping pace with the PTW_BL until approximately 9 kilometres from the route start point at the signalised junction of Swandon Way with Wandsworth Bridge Road. For the next 7 kilometres, the bus lanes on York Road, Battersea Park Road, Nine Elms Lane, Albert Embankment and Lambeth Palace Road gave the PTW_BL a distinct advantage such that it made 15 less stoppages and took approximately 11 minutes less to cover those 7 kilometres than the PTW_GT.

4.9.3 The PTW_GT experienced further delays at the junctions of Lambeth Palace Road with Westminster Bridge Road and Blackfriars Road with Union Street and The Cut (at Palestra). Altogether, the PTW_GT took approximately 3 mins 30 secs longer than the PTW_BL to travel between the junction of Lambeth Palace Road with Westminster Bridge Road and Palestra.

4.10 Route C - Survey Discrepancies

4.10.1 **Table 4.6** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_BL	4	00:03:04	00:46:05	7%	0.26	17.688	1%
PTW_BL	2	00:00:31	00:46:05	1%	N/A	N/A	N/A
CAR_GT	Car survey invalid for comparison.						

Table 4.6- Route C Discrepancies

4.10.2 The powered two wheeler travelling in the bus lanes accidently drove onto Rocks Lane from Roehampton Lane rather than turn right onto Upper Richmond Road. The rider realised their mistake then performed a u-turn and turned left onto Queen's Ride before consulting a roadmap and then turning back onto Upper Richmond Road. This detour would not normally have occurred so the majority of this 3 minutes and 4 seconds total journey time has been removed from the overall journey time and stoppage time. The stoppage time of exactly 1 minute at the junction of Upper Richmond Road with Queen's Ride has been retained, as the rider is likely to have experienced this stoppage if they had made the correct turn.

Figure 4.5 below illustrates the proposed route and the detour taken

Figure 4.5 - Route C Car Detour ***Photo courtesy of Google Maps UK***

Key

Proposed route and stopped at signals

Comparative time taken for section shown (including potential stoppages) = 60 seconds

Detour

Total time taken (including stoppages) = 184 seconds

4.10.3 The powered two wheeler travelling in the bus lanes also stopped on another occasion to read the map in Putney Bridge Road at the junction with Armoury Way. This stoppage would not normally occur and hence the time was subtracted from the overall journey time and stoppage time for this route survey run.

4.11 Route D - A21 Bromley Common to Palestra Summary Results

4.11.1 This route was 24.05km long in total and included **8,350 metres** of inbound bus lane or **35%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **4 minutes and 46 seconds ahead** of the PTW in general traffic and **38 minutes and 55 seconds ahead** of the car.

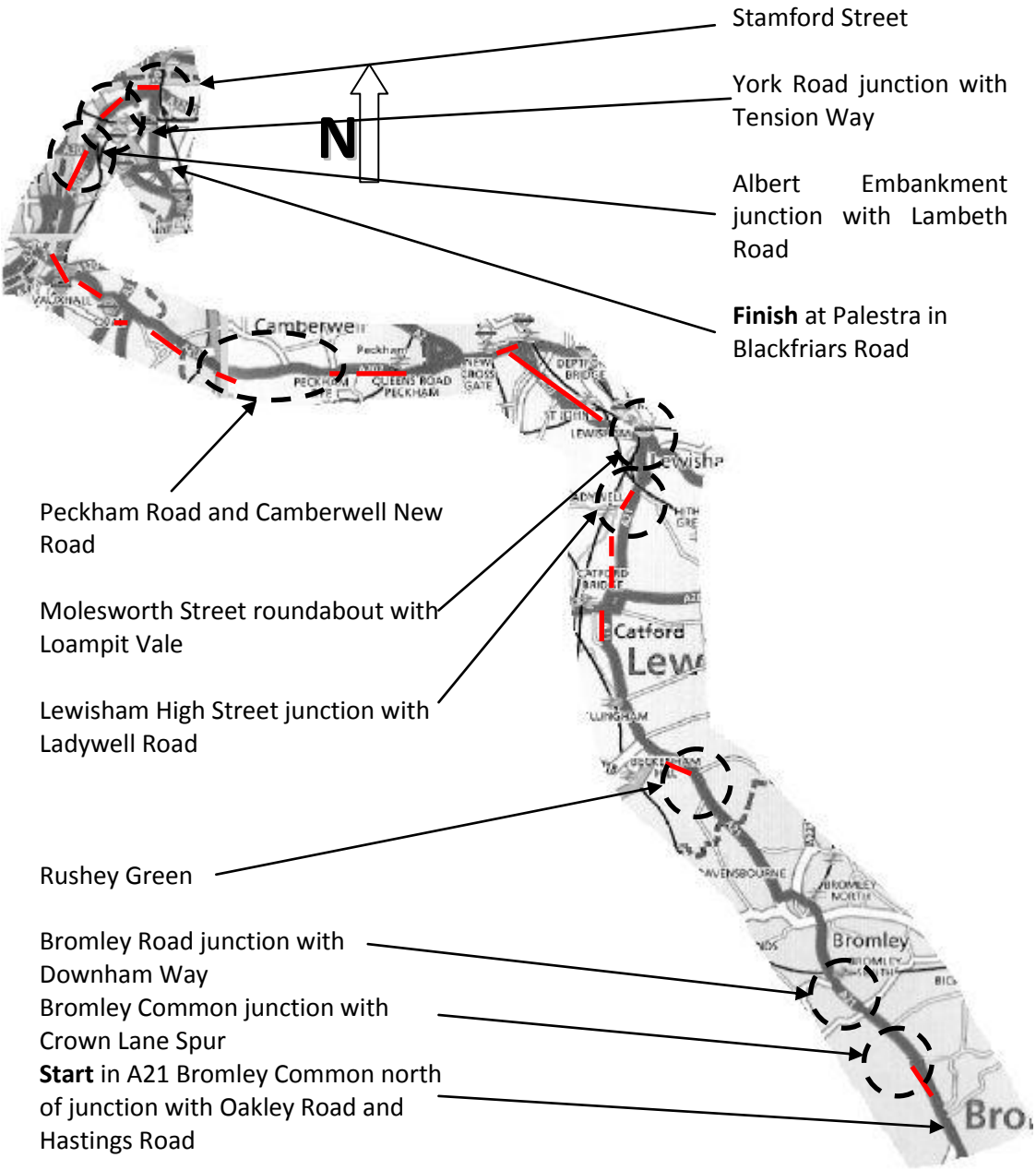


Figure 4.6 - Route D A21 Bromley Common to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys

4.11.2 As with all the other routes, this route was entirely urban in character and passed through a mixture of residential, commercial, business and town centre areas. The speed limit on all roads travelled was 30mph. The route went through Bromley Common; Masons Hill; Kentish Way; Tweedy Road; London Road; Bromley Hill; Bromley Road; Rushey Green; Lewisham High Street; Molesworth Street; Loampit Vale; Loampit Hill; Lewisham Way; New Cross Road; Queens Road; Peckham High Street; Peckham Road; Camberwell Church Street; Camberwell New Road; Harleyford Street; Kennington Oval; Harleyford Road; South Lambeth Road; Parry Place; Wandsworth Road; Albert Embankment; Lambeth Palace Road; York Road; Stamford Street and Blackfriars Road.

4.11.3 The summary results shown in **Table 4.7** below are derived from the route journey times and average speeds tables for Route D. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:29:32	07:30:59	07:31:00
Time finished (HH:MM:SS)	08:26:39	08:32:52	09:07:02
Total Distance Travelled (Miles)	14.925	14.961	14.950
Total Distance Travelled (KM)	24.014	24.072	24.055
Total Stoppages (Secs)	709	664	1,752
Total No. Of Stoppages	38	43	102
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:57:07	01:01:53	01:36:02
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:45:18	00:50:49	01:06:50
Average Speed (Miles/H) (Inc stoppages)	15.68	14.51	9.34
Average Speed (Miles/H) (Exc stoppages)	19.77	17.66	13.42
Average Speed (KM/H) (Inc stoppages)	25.23	23.34	15.03
Average Speed (KM/H) (Exc stoppages)	31.81	28.42	21.60

Table 4.7 – Route D Summary Survey Results

4.12 Route D – Survey Analysis

4.12.1 The **4 minutes and 46 seconds** saved by the PTW_BL compared to the PTW_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route D in Appendix 4.

4.12.2 The PTW_GT is delayed on Lewisham High Street and at the signalised junction of Lewisham High Street with Ladywell Road, taking approximately 2 mins longer to get through the junction than the PTW_BL.

4.12.3 Both the PTW_BL and PTW_GT experience delays in Peckham Road and Camberwell New Road.

4.12.4 The **38 minutes and 55 seconds** saved by the PTW_BL compared to the CAR_GT can be accounted for in the same manner. There are a number of locations along this route where the car is considerably slower than the powered two wheelers. These locations include:

- Bromley Common roundabout with Crown Lane Spur;
- Bromley Road signalised junction with Downham Way;
- Rushey Green;
- Molesworth Street roundabout with Loampit Vale;
- Camberwell New Road;
- Albert Embankment signalised junction with Lambeth Road;
- York Road signalised junction with Tension Way; and
- Stamford Street.

4.13 Route D - Survey Discrepancies

4.13.1 **Table 4.8** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_BL	4	00:00:33	00:57:40	1%	N/A	N/A	N/A
PTW_GT	1	N/A	N/A	N/A	N/A	N/A	N/A
CAR_GT	1	N/A	N/A	N/A	N/A	N/A	N/A

Table 4.8 - Route D Discrepancies

4.13.2 The powered two wheeler travelling in the bus lanes did stop on one occasion to speak to a driver for forcing his way into traffic at the Queens Road junction with Asylum Road. This stoppage was removed from the total journey time as it would not normally occur.

4.13.3 The DVD recording of the powered two wheeler travelling in general traffic lanes ends at 08:26:44. The powered two wheeler had arrived at the junction of Lambeth Palace Road with Westminster Bridge Road. To approximate the remaining stoppages and their durations and the total journey time, we used the sections of route from the PTW_BL survey between the same junction and Palestra as a proxy. On the remaining sections of route there is approximately 300 metres of inbound bus lane on York Road, which could have saved the PTW_BL a few seconds. Overall, it is still considered that using the time taken by the PTW_GT for the remaining roads gives a good indication of the time the PTW_BL took to complete the route.

This resulted in the following changes to the data:

(i) Stoppages = 38 + 5 (stoppages between Lambeth Palace Rd jw Westminster Bridge Rd) = 43,

(ii) Section Length. Although we took the same number of stoppages from the PTW_BL survey we would only be speculating on these lengths, so these were left blank,

(iii) Cummulative Route Length = 13.841 miles + 1.12 miles (remaining distance between Lambeth Palace Rd jw Westminster Bridge Rd and Palestra) = 14.961 miles,

(iv) Stoppage Times = 08:26:40 (final stoppage end time from PTW_GT at LPRd jw WBRd) + 00:01:42 (total remaining stoppages between LPRd jw WBRd and Palestra from PTW_BL survey) = 08:28:22,

(v) (Final) Stoppage Duration = 38 secs + 102 secs (total remaining stoppages between LPRd jw WBRd and Palestra from PTW_BL) = 140 secs,

(vi) (Final) Section End Time = 08:26:40 (original last PTW_GT stoppage end time) + 00:06:12 (remaining total journey time inc stoppages between LPRd jw WBRd from PTW_BL) = 08:32:52.

These changes are shown in Appendix 4.

4.13.4 The time on the camera in the car that travelled in general traffic lanes was not correctly set so the actual start time could not be determined. However, the survey vehicles can be seen leaving shortly after one another on the PTW_BL DVD, the start time for this survey has been taken as the same as the powered two wheeler that travelled with general traffic plus one second. The route journey time analysis sheets then show stoppage and section start and end times as given on the DVD. The journey end time is equal to the start time noted above plus the total journey time including stoppages.

4.14 Route E A10 Great Cambridge Road to Palestra Summary Results

4.14.1 This route was 22.7km long in total and included **7,150 metres** of inbound bus lane or **31%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **4 minutes and 40 seconds ahead** of the PTW in general traffic and **30 minutes and 32 seconds ahead** of the car.

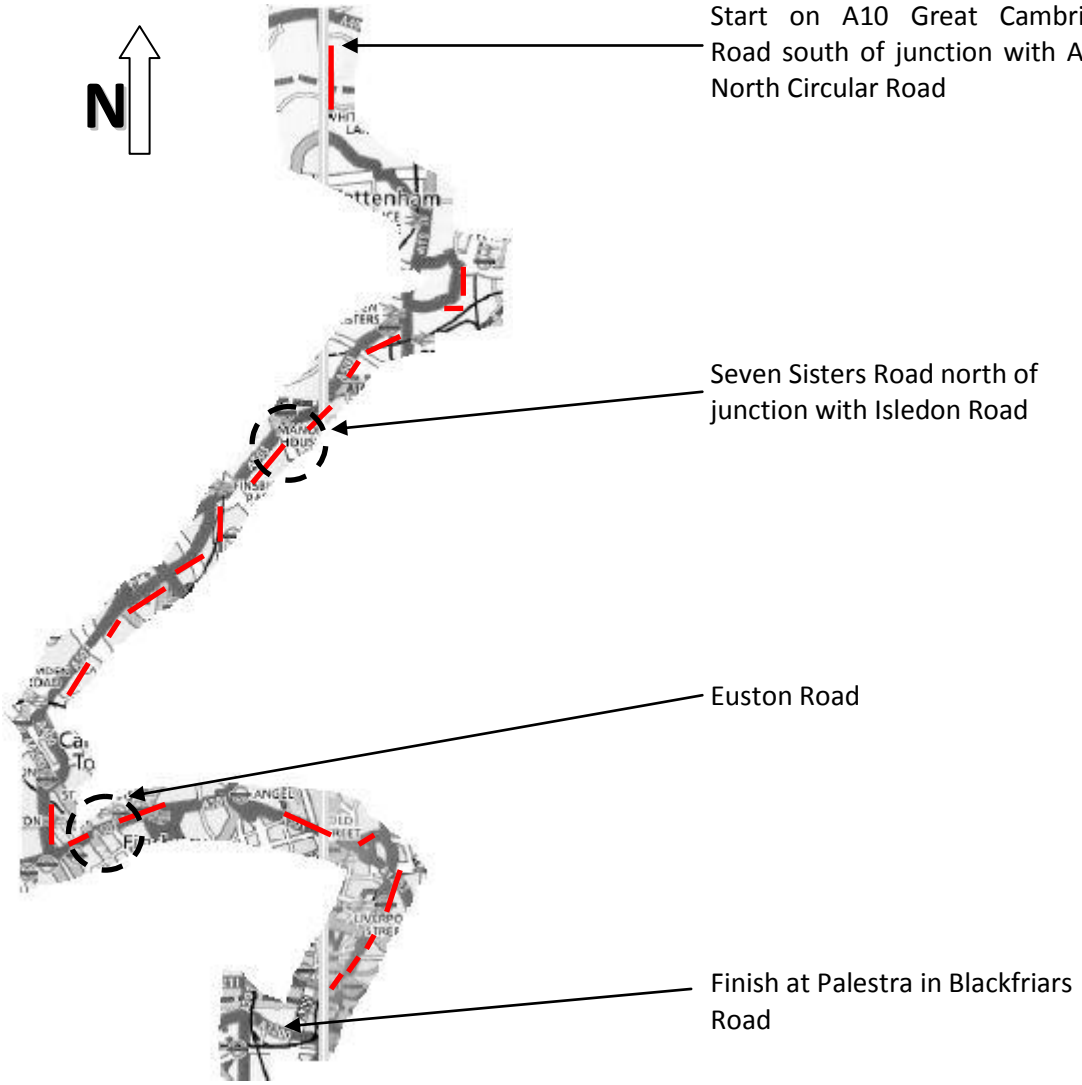


Figure 4.7 - Route E A21 Great Cambridge Road to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys

4.14.2 As with all the other routes, this route was entirely urban in character and passed through a mixture of residential, commercial, business and town centre areas. The speed limit on Great Cambridge Road is 40mph and on all other roads travelled, 30mph. The route went through Great Cambridge Road; The Roundway; Lordship Lane; Bruce Grove; High Road; Monument Way; Broad Lane; High Road; Seven Sisters Road; Isledon Road; Tollington Road; Camden Road; Camden Street; Oakley Square; Lidlington Place; Hampstead Road; Euston Road; Pentonville Road; City Road; Old Street; Shoreditch High Street; Norton Folgate; Bishopsgate; Gracechurch Street; London Bridge (King William Street); Southwark Street; Blackfriars Road.

4.14.3 The summary results shown in **Table 4.9** below are derived from the route journey times and average speeds tables for Route E. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:35:01	07:35:02	Car survey invalid for comparison.
Time finished (HH:MM:SS)	08:34:22	08:39:03	
Total Distance Travelled (Miles)	14.053	14.066	
Total Distance Travelled (KM)	22.611	22.632	
Total Stoppages (Secs)	848	812	
Total No. Of Stoppages	43	41	
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:59:21	01:04:01	
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:45:13	00:50:29	
Average Speed (Miles/H) (Inc stoppages)	14.21	13.18	
Average Speed (Miles/H) (Exc stoppages)	18.65	16.72	
Average Speed (KM/H) (Inc stoppages)	22.86	22.21	
Average Speed (KM/H) (Exc stoppages)	30.00	26.90	

Table 4.9 – Route E Summary Survey Results

4.15 Route E – Survey Analysis

4.15.1 The **4 minutes and 40 seconds** saved by the PTW_BL compared to the PTW_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route E in Appendix 4. As noted in Section 3.3.2, the CAR survey could not be counted for this comparison as it would not be a like-for like comparison.

4.15.2 The PTW_GT is delayed on Seven Sisters Road north east of the junction with Isledon Road, taking approximately 2 mins longer to get through the junction than the PTW_BL.

4.15.3 Both the PTW_BL and PTW_GT are delayed along Euston Road.

4.15.4 Although the PTW-BL makes two more stops than the PTW_GT, its permission to use the bus lanes allows it more opportunity to filter and hence maintain a higher average speed.

4.16 Route E - Survey Discrepancies

4.16.1 **Table 4.10** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_BL	2	00:01:58	01:01:19	3%	N/A	N/A	N/A
PTW_GT	1	N/A	N/A	N/A	N/A	N/A	N/A
CAR_GT	Car survey invalid for comparison.						

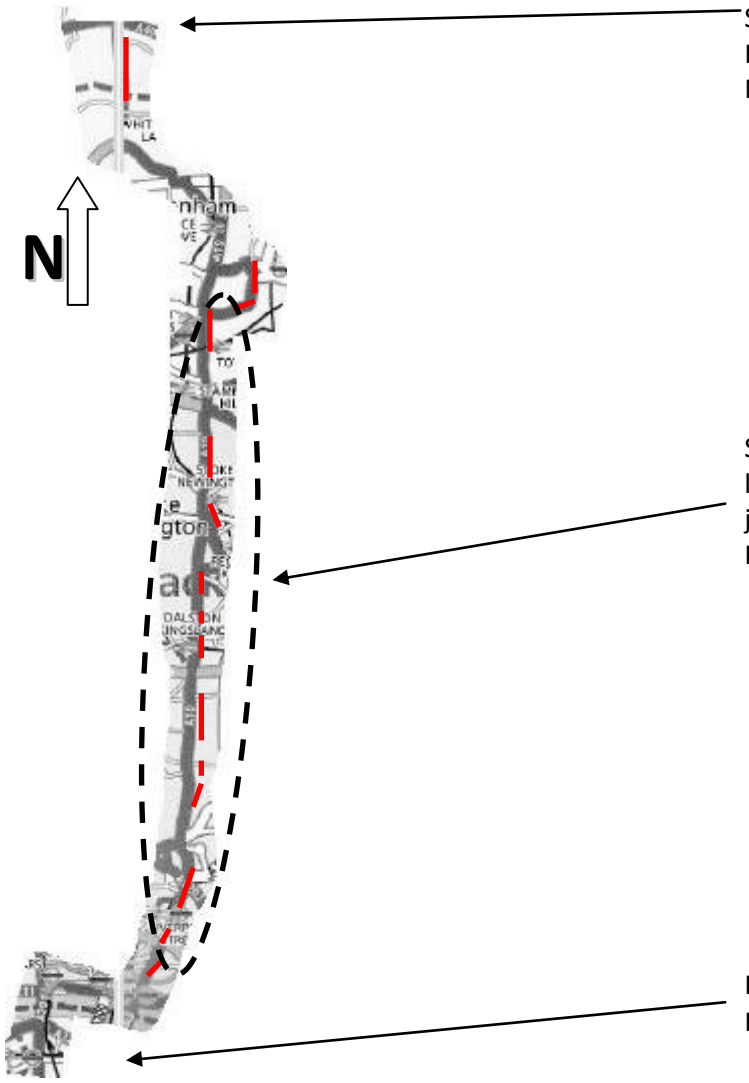
Table 4.10 - Route E Discrepancies

4.16.2 The powered two wheeler travelling in the bus lanes did stop on one occasion in a garage in Shoreditch High Street. This stoppage was removed from the total journey time as it would not normally occur.

4.16.3 The DVD from the powered two wheeler riding in general traffic lanes has a missing section amounting to a matter of seconds at the start of the recording. This has required us to take the start time from the powered two wheeler that travelled in the bus lanes and add one second. The powered two wheeler can be seen to move off immediately after the Police-marked powered two wheeler on the car's DVD, so one second is a good approximation of the difference in start times.

4.17 Route F - A10 Great Cambridge Road to Palestra Summary Results

4.17.1 This route was 16km long in total and included **5,050 metres** of inbound bus lane or **31%** of the total route length. The PTW riding in the bus lane arrived at its destination at Palestra **8 minutes and 0 seconds ahead** of the PTW in general traffic and **14 minutes and 40 seconds ahead** of the car.



Start on A10 Great Cambridge Road south of junction with A406 North Circular Road

Sections of the route with bus lanes provided the most significant journey time savings for the PTW_BL.

Finish at Palestra in Blackfriars Road

Figure 4.8 - Route F A21 Great Cambridge Road to Palestra

Key

Inbound Bus Lane(s) *indicative lengths only*

Links and / or Nodes where delays occurred during the surveys

4.17.2 As with all the other routes, this route was entirely urban in character and passed through a mixture of residential, commercial, business and town centre areas. The speed limit on Great Cambridge Road is 40mph and on all other roads travelled, 30mph. The route went through Great Cambridge Road; The Roundway; Lordship Lane; Bruce Grove; High Road; Monument Way; Broad Lane; High Road; Stamford Hill; Rectory Road; Mase Road; Evering Road; Stoke Newington Road; Kingsland High Street; Kingsland Road; Shoreditch High Street; Norton Folgate; Bishopsgate; Gracechurch Street; London Bridge (King William Street); Southwark Street; Blackfriars Road.

4.17.3 The summary results shown in **Table 4.11** below are derived from the route journey times and average speeds tables for Route F. These tables are in **Appendix 4**.

	Survey Vehicle		
Distance / Time / Speed	**PTW_BL**	**PTW_GT**	**CAR_GT**
Time started (HH:MM:SS)	07:32:18	07:32:18	07:30:20
Time finished (HH:MM:SS)	08:12:04	08:20:04	08:24:46
Total Distance Travelled (Miles)	9.947	9.947	9.831
Total Distance Travelled (KM)	16.005	16.005	15.818
Total Stoppages (Secs)	545	687	908
Total No. Of Stoppages	34	34	46
Total Journey Time (HH:MM:SS) (Inc stoppages)	00:39:44	00:47:44	00:54:26
Total Journey Time (HH:MM:SS) (Exc stoppages)	00:30:41	00:36:19	00:39:18
Average Speed (Miles/H) (Inc stoppages)	15.01	12.49	10.84
Average Speed (Miles/H) (Exc stoppages)	19.45	16.43	15.01
Average Speed (KM/H) (Inc stoppages)	24.15	20.10	17.44
Average Speed (KM/H) (Exc stoppages)	31.30	26.44	24.15

Table 4.11 – Route F Summary Survey Results

4.18 Route F – Survey Analysis

4.18.1 The **8 minutes and 0 seconds** saved by the PTW_BL compared to the PTW_GT and the **14 mins and 42 secs** saved by the PTW_BL compared to the CAR_GT is accounted for when reviewing the Journey Times and Average Speed Tables for Route F in Appendix 4. The time saved by the PTW_BL compared to the PTW_GT and CAR_GT cannot be as easily accounted for as the survey camera in the car had not been calibrated. This is discussed in Section 4.19.2 below.

4.18.2 The Journey Times and Average Speed Tables for Route F in Appendix 4 show that the PTW_BL had reached the end of the route sections with bus lanes (in this case Bishopsgate, south of the junction with Camomile Street) after approximately 27 mins and 54 secs. The PTW_GT is shown to have passed the same point after approximately 40 mins and 6 secs, losing 12 mins and 12 secs to the PTW_BL. The PTW_BL then took a further 11 mins 52 secs to reach Palestra, while the PTW_GT took a further 7 mins 40 secs to reach Palestra, gaining 4 mins 12 secs on the PTW_BL over those sections. This leaves the 8 mins 0 secs total journey time difference between the two surveys.

4.18.3 The CAR_GT is shown to have passed the end of the route sections with bus lanes after approximately 41 mins and 34 secs, losing 13 mins and 40 secs to the PTW_BL. The CAR_GT then took a further 12 mins and 52 secs to reach Palestra. This adds up to the 14 mins 40 secs total journey time difference between the two surveys.

4.19 Route F - Survey Discrepancies

4.19.1 **Table 4.12** below indicates the category of the discrepancy(s) and its scale in relation to either the journey time or the route distance.

Survey	Discrepancy Type	Stoppage /Detour Time (HH:MM:SS)	Total Journey Time (inc stoppages) (HH:MM:SS)	Prop^{n} of Total Journey Time (%)	Detour distance (Km)	Total Route Distance	Prop^{n} of Total Route Distance (%)
PTW_BL	1	N/A	N/A	N/A	N/A	N/A	N/A
CAR_GT	4	00:02:04	00:54:26	4%	0.85	15.818	5%

Table 4.12 - Route F Discrepancies

4.19.2 The powered two wheeler travelling in the bus lanes had a problem with their video camera. There is a gap between the start of their journey and the point at which the police rider reaches the junction of Great Cambridge Road with White Hart Lane, 1.1 kilometres from the survey start point. This powered two wheeler can be seen starting its survey on the DVD taken by the powered two wheeler travelling with general traffic. The start time of both powered two wheelers has therefore been taken from the one that travelled with general traffic. The time taken for the powered two wheeler travelling with general traffic to reach the junction with White Hart Lane has also been used for the powered two wheeler travelling in the bus lanes.

4.19.3 In addition to the gap at the start of the recording, the recording screen view was split into various sections with the portion of the screen that should show the distance and time being frozen. This has required us to also take the total distance travelled from the powered two wheeler travelling with general traffic. On all survey DVDs there is a counter at the base of the screen. Although this does not show hours, this has been used to record stoppage times in MM:SS and to provide the arrival time at Palestra.

4.19.4 The DVD from the car shows that the driver turned right from Southwark Street and drove over Blackfriars Bridge before u-turning at the northern side and driving back onto Blackfriars Road. The detour should not have happened, and it has therefore been removed from the final Section End Time (HH:MM:SS) and Duration (HH:MM:SS).

4.20 Ride / Drive Cycle Survey Conclusions

4.20.1 **Table 4.13** below summarises the total distances travelled, time taken and average speeds of all vehicles on all surveyed routes.

Route / Mode	Total Distance (Km)	Total Journey Time (HH:MM:SS)	Average Speeds (Km/Hr)
Route A PTW_BL	11.017	00:27:05	24.41
Route A PTW_GT	11.149	00:33:55	19.72
Route A CAR_GT	11.186	00:48:24	13.87
Route B PTW_BL	17.025	00:43:59	23.22
Route B PTW_GT	17.232	00:48:23	21.37
Route B CAR_GT	17.232	01:09:09	14.95
Route C PTW_BL	17.688	00:43:30	24.40
Route C PTW_GT	17.762	00:58:41	18.16
Route C CAR_GT	Car survey invalid for comparison		
Route D PTW_BL	24.014	00:57:07	25.23
Route D PTW_GT	24.072	01:01:53	23.34
Route D CAR_GT	24.055	01:36:02	15.03
Route E PTW_BL	22.611	00:59:21	22.86
Route E PTW_GT	22.632	01:04:01	21.21
Route E CAR_GT	Car survey invalid for comparison		
Route F PTW_BL	16.005	00:39:44	24.15
Route F PTW_GT	16.005	00:47:46	20.10
Route F CAR_GT	15.818	00:54:26	17.44

Table 4.13 – All Survey Routes Results Summary

4.20.2 The above table clearly shows that for all ride / drive cycle surveys carried out, the powered two wheelers that travelled in the bus lanes made significant time savings over the powered two wheelers and cars that travelled with general traffic.

4.20.3 These results will now be used in the Section 5.0 in order to assess the likely emission savings of allowing powered two wheelers to use bus lanes.

5.0 ASSESSMENT OF EMISSIONS PRODUCED

5.1 Background

5.1.1 This study does not aim to provide a comprehensive analysis of the issues surrounding motor vehicle emissions and the contribution made by motorcycles. However, some brief background information with regards to the current legislative framework for emissions standards for new PTWs is considered useful.

5.1.2 Motorcycles and mopeds make a very low overall contribution to road traffic pollution because of the relatively low numbers in operation in London. They contribute around 0.1% of NOx emissions and 0.6% of PM_{10} emissions occurring in Greater London, for 2.1% of the vehicle kilometres travelled, (The Mayor's Air Quality Strategy 4D72).

5.1.3 Currently sold mopeds must meet Euro 2 emissions standards (EU Directive 1997/24, effective from 1999), and motorcycles must meet Euro 3 standards, (EU Directive 2002/51). This compares with new passenger cars which currently must meet Euro 5 standards. It is foreseen that Euro 3 standards for mopeds and Euro 4 standards for motorcycles will apply from 2012/13, and 3 years later in 2015/2016, Euro 4 for mopeds and Euro 5 for motorcycles will apply, subject to the EU legislative process, (ACEM Annual Report, 2009).

5.1.4 It is acknowledged that, individually, motorcycles do not necessarily perform better than cars in terms of emissions produced for some types of pollutants, and that the regulation of motorcycle emissions lags behind that for cars. However, moving from the current Euro 3 to Euro 5 standard will result in a 50% reduction of motorcycle pollution emissions, will bring motorcycle emissions regulations towards greater parity with cars and will help to reduce the overall contribution of PTWs to transport related pollution.

5.2 Road Vehicle Emissions Database Modelling

5.2.1 This study seeks to quantify and compare the journey times and probable emissions from PTWs in Bus Lanes and PTWs and cars in general traffic lanes for a number of routes into central London. The emission types and probable quantities generated by the different survey vehicles are defined in this study by the Road Vehicle Emissions Database. This database has been developed by the Department for Transport to review the methodology currently used by the original National Atmospheric Emissions Inventory (NAEI) to estimate emissions from road vehicles. The NAEI is funded by Department of Environment Food Rural Affairs, and the devolved administrations of Wales, Scotland and Northern Ireland. The NAEI also compiles estimates of emissions into the atmosphere from sources in the UK such as cars, trucks, power stations and industrial plant.

5.2.2 For the purpose of this Study, we have used the DfT's 'Road Vehicle Emission Factors 2009 – Regulated' database, referred to as the Road Vehicle Emissions Database. The edition used was published by the DfT on 29th June 2009 and it can be accessed at the following link;

http://www.dft.gov.uk/pgr/roads/environment/emissions/

5.2.3 The **benefits** of using this database are:

- It is publicly available;
- It is relatively easy to understand and use;
- It is a recognised tool with the endorsement of the DfT;
- It allows a comparative assessment of all types of road vehicles to existing and future Euro emissions standards.

5.2.4 The **disbenefits** of using this database are:

- Actual emission levels are only approximations.

5.2.5 The emission types whose probable quantities can be estimated using this database are listed below:

- CO – Carbon Monoxide
- HC – Total Hydrocarbons
- NOx – Oxides of Nitrogen
- PM_{10}[5] – Benzene
- uCO_2 – Carbon Dioxide

Each of these emission types has their rate or Emission Factor (EF) expressed in grammes per kilometre.

5.2.6 The database also provides estimates for fuel consumption in litres per kilometre.

5.3 Applying the model

5.3.1 The Road Vehicle Emissions Database generates the quantities of different emissions and levels of vehicle fuel consumption as a function of a vehicle's average speed. As noted in the previous Section, we have divided each route travelled into sections defined by the number of stoppages. For example, for Route A between A1 Archway Road to Palestra in Blackfriars Road, the PTW travelling in the bus lanes stopped a total of 17 times (not including their final destination); this means there were 17 occasions where the vehicle speed dropped below the database minimum average speed of 5km/hr and 18 sections where the average vehicle speed was generally between 5km/hr and the database maximum for that vehicle type. Sometimes vehicle speeds did drop below the database minimum of 5km/hr without actually stopping; this often occurred at major signalised junctions where queuing meant vehicles would take more than one cycle to cross the stopline.

5.3.2 As noted in previous Sections, the stoppages were recorded to show the proportion of total survey times the survey vehicles spent idling in queues. It is also considered that DFT may find the breakdown of journeys into time moving and time stopped useful when reviewing their database co-efficients.

5.3.3 As the database only considers emissions from moving vehicles and uses the average speed over a whole surveyed route, the database co-efficients must take the effects of acceleration, deceleration and stoppages into account.

5.3.4 For the purpose of comparing the probable emissions and fuel consumption by vehicle type and surveyed route, we have added two columns onto the database sheets. These were to show the total distance travelled in kilometres and the total emissions in grammes or the total fuel consumption in litres. The additional columns can be seen on the database sheets in Appendix 5.

5.4 Journey Times, Emissions and Fuel Consumption by Route and Mode

5.4.1 The aim of this research is 'to model typical ride / drive cycles for powered two wheelers and cars on routes into central London in order to identify journey time savings and probable emissions'.

5.4.2 In order to show probable emissions for a *representative* variety of commuting vehicles, we have firstly taken the journey lengths and average speeds of the three survey vehicles for each ride / drive cycle survey. We secondly selected a number of popular 'small', 'medium' and 'large' vehicle types to enter into the emissions database sheets. The 'small', 'medium' and 'large' powered two wheeler models have stayed constant in each modelling run, but we have carried out two sets of modelling runs for cars. We selected two sets of 'small', 'medium' and 'large' cars to compare the probable emissions of petrol and diesel-engined cars.

5.4.3 The most recently available edition of the Road Vehicle Emission Database model does not yet cater for electric or hybrid-powered vehicles, but the methodology used for this research could be applied to these vehicle types if later editions of the database include them.

5.4.4 For the purposes of this research, we will only carry out detailed comparisons of emissions of Carbon Dioxide and Oxides of Nitrogen as specified by Transport for London. Carbon Dioxide is responsible for approximately 60% of the 'enhanced greenhouse effect' and is toxic to humans and animals when encountered at levels higher than natural atmospheric concentrations. Oxides of Nitrogen can be highly toxic in large concentrations and are known to re-circulate in the urban environment to re-form as corrosive nitric acid.

5.4.5 The other emissions of internal combustion engines are generally produced in smaller quantities as noted below:

- Carbon Monoxide is highly toxic but is produced in considerably lower quantities than Carbon Dioxide;
- Total Hydrocarbons are organic compounds comprising almost entirely of Hydrogen and Carbon. These compounds are toxic but are also produced in considerably lower quantities than Carbon Dioxide;
- Benzene is a known carcinogen and is highly toxic but is produced in relatively low quantities.

5.4.6 **Table 5.1** below shows a sample comparison of all emission types for a powered two wheeler and a car travelling with general traffic on Route A - A1 Archway Road to Palestra. The powered two wheeler and the car were those used by the Metropolitan Police officers for the surveys. They were:

- PTW - BMW RT1200P 4-stroke Euro 3 Rating;
- CAR – BMW 530D Euro 4 Rating.

Route A – A1 Archway Road to Palestra						
Vehicle and Journey	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Carbon Monoxide emissions (total grammes)**	**Total Hydrocarbon emissions (total grammes)**	**Benzene emissions (total grammes)**	**Fuel Consumption (total litres)**
PTW_GT	2,117.682	0.865	26.240	5.268	0.056	0.889
CAR_GT	4,657.665	2.212	6.040	0.124	0.077	1.955

Table 5.1 Sample Emissions on Route A

5.4.7 Table 5.1 above shows that:

- The survey car emits more Carbon Dioxide, Oxides of Nitrogen and Benzene than the survey powered two wheeler;
- The survey powered two wheeler emits more Carbon Monoxide and Total Hyrdocarbons than the survey car;
- The survey powered two wheeler always use less fuel than the survey car.

5.4.8 The vehicles used in the following database emissions modelling as shown in Table 5.2 below, were selected as representative of the different types of vehicle that commuters in London could and do regularly use on a daily basis on trips into and out of the City, in addition to those specifically requested by Transport for London. These choices must only be regarded as indicative examples for a range of vehicle types and not as the definitive answer for the mount of emissions that are likely to be produced by motorists commuting into London each day.

5.4.9 The vehicles listed in Table 5.2 below were chosen in agreement with Transport for London.

5.4.10 The ‘Small’ vehicles were chosen as TfL wanted a moped and two very small cars of the type that some environmentally motivated and/or budget-constrained commuters would purchase due to their engine capacity, low road tax band and low emissions.

5.4.11 TfL made no particular requests for the ‘Medium’ vehicles, so for the purposes of the modelling comparisons, we have selected ‘Medium’ sized vehicles that are popular in the UK.

5.4.12 Again, there were no specific requests for the 'Large' motorcycle or petrol car but TfL did ask that a 'SUV' type vehicle's emissions were modelled, as they are often cited as 'polluters', (hence the inclusion of a Land Rover Freelander). The other 'Large' vehicles are the Police motorcycle used for the survey and another popular UK car.

5.4.13 The database modelling used to arrive at the probable emissions in the next few tables can be carried out for most vehicle types.

5.4.14 It should be noted that the maximum level of emissions of various types permitted under European legislation ("Euro 3, Euro 4" etc), currently differs between cars and powered two wheelers. New cars are generally required to meet more stringent levels of emission regulation than motorcycles.

5.4.15 The vehicles used to demonstrate comparable emissions in the Road Vehicle Emissions Database were:

Vehicles	'Small'	'Medium'	'Large'
Motorcycles	DB50QT-16 50cc Sports Scooter (moped) 4-stroke Euro 3 Rating	Honda 600N CBF 4-stroke Euro 3 Rating	BMW RT1200P 4-stroke Euro 3 Rating
Cars **Petrol**	Peugeot 107 1 litre Euro 4 Rating	Ford Focus 1.6l Zetec 100PS Euro 4 Rating	Ford Mondeo 2.5l Duratec 220PS Euro 4 Rating
Cars **Diesel**	Smart Car Pulse Coupe cdi 799cc Euro 5 Rating	Vauxhall Astra 1.7CDTi 100ps SXI Euro 4 Rating	Land Rover Freelander 2 2.2TD4 Euro 5 Rating

Table 5.2 – Vehicle types used to generate comparable emissions and fuel consumption

5.4.16 The moped scooter was chosen as it is cheap to purchase, fuel efficient, riders do not have to pay the London Congestion Charge, and mopeds can be parked free of charge in some designated bays so it may be attractive to many commuters.

5.4.17 The Peugeot 107 was chosen as it is consistently the bestselling low-emission car in the UK. The source can be accessed at the following link:

Peugeot 107 emissions link

5.4.18 The Diesel-powered Smart Car Pulse Coupe was chosen as an example of a small commuter car.

5.4.19 The Honda 600N was chosen as an example of a popular 'Medium' sized motorbike;

5.4.20 The BMW RT1200P was the 'Large' motorbike as used by the police for the surveys;

5.4.21 The Fords Focus and Mondeo were chosen due to their status as bestselling cars. The Diesel-powered Vauxhall Astra and the Land Rover Freelander 2 were both chosen due to their bestselling status. See the links below:

UK Motor Industry Facts

5.4.22 **Table 5.3** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route A:

Route A – A1 Archway Road to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	11.017	00:26:01	24.41	367.498	0.110	0.154
PTW_GT	11.149	00:33:55	19.72	371.902	0.111	0.156
CAR_GT **Petrol**	11.186	00:48:24	13.87	2,540.413	0.841	1.066
CAR_GT **Diesel**	11.186	00:48:24	13.87	2,017.166	4.014	0.747
'Medium' Vehicles						
PTW_BL	As above			1,362.088	0.477	0.572
PTW_GT	As above			1,544.974	0.544	0.648
CAR_GT **Petrol**	As above			3,146.765	0.812	1.321
CAR_GT **Diesel**	As above			2,472.310	5.947	0.916
'Large' Vehicles						
PTW_BL	As above			1,845.56	0.741	0.775
PTW_GT	As above			2,117.68	0.865	0.889
CAR_GT **Petrol**	As above			4,657.67	2.212	1.955
CAR_GT **Diesel**	As above			2,847.340	4.800	1.054

Table 5.3 – Route A journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.23 Table 5.3 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the powered two wheelers or either of the sample cars in general traffic lanes;
- The sample powered two wheelers in general traffic lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than either of the sample cars in general traffic lanes;
- The sample petrol cars emit more Carbon Dioxide, less Oxides of Nitrogen and use more fuel than the sample diesel cars.

- The sample 'Large' diesel car emits less Oxides of Nitrogen than the sample 'Medium' diesel car, (possibly due to its higher Euro emissions rating), as highlighted with black text.

5.4.24 **Table 5.4** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route B:

Route B – A41 Hendon Way to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	17.025	00:43:59	23.22	567.910	0.170	0.238
PTW_GT	17.232	00:48:23	21.37	574.815	0.172	0.241
CAR_GT **Petrol**	17.232	01:09:09	14.95	3,717.080	1.217	1.560
CAR_GT **Diesel**	17.232	01:09:09	14.95	2,968.416	5.867	1.099
'Medium' Vehicles						
PTW_BL	As above			2,162.227	0.757	0.907
PTW_GT	As above			2,288.470	0.803	0.960
CAR_GT **Petrol**	As above			4,615.154	1.206	1.937
CAR_GT **Diesel**	As above			3,669.565	8.691	1.359
'Large' Vehicles						
PTW_BL	As above			2,938.512	1.185	1.233
PTW_GT	As above			3,124.242	1.269	1.311
CAR_GT **Petrol**	As above			6,827.417	3.176	2.865
CAR_GT **Diesel**	As above			4,246.885	6.920	1.573

Table 5.4 – Route B journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.25 Table 5.4 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample powered two wheelers or either of the sample cars in general traffic lanes;
- The sample powered two wheelers in general traffic lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than either of the sample cars in general traffic lanes;

- The sample petrol cars emit more Carbon Dioxide, less Oxides of Nitrogen and use more fuel than the sample diesel cars.
- The sample 'Large' diesel car emits less Oxides of Nitrogen than the sample 'Medium' diesel car, (possibly due to its higher Euro emissions rating), as highlighted with black text.

5.4.26 **Table 5.5** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route C:

Route C – A3 Roehampton Vale to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	17.688	00:43:30	24.40	590.026	0.177	0.248
PTW_GT	17.762	00:58:41	18.16	592.494	0.178	0.249
'Medium' Vehicles						
PTW_BL	As above			2,187.196	0.766	0.918
PTW_GT	As above			2,568.807	0.909	1.078
'Large' Vehicles						
PTW_BL	As above			2,963.806	1.190	1.244
PTW_GT	As above			3,534.278	1.451	1.483

Table 5.5 – Route C journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.27 Table 5.5 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample powered two wheelers in general traffic lanes;

5.4.28 No assessment could be made for the cars on this route as explained in previous Sections.

5.4.29 **Table 5.6** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route D:

Route D – A21 Bromley Common to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	24.014	00:57:07	25.23	801.044	0.240	0.336
PTW_GT	24.072	01:01:53	23.34	802.979	0.241	0.337
CAR_GT **Petrol**	24.055	01:36:02	15.03	5,170.232	1.691	2.170
CAR_GT **Diesel**	24.055	01:36:02	15.03	4,130.341	8.159	1.530
'Medium' Vehicles						
PTW_BL	As above			2,916.565	1.022	1.224
PTW_GT	As above			3,048.729	1.067	1.280
CAR_GT **Petrol**	As above			6,420.388	1.679	2.695
CAR_GT **Diesel**	As above			5,109.109	12.088	1.892
'Large' Vehicles						
PTW_BL	As above			3,944.066	1.580	1.655
PTW_GT	As above			4,142.061	1.670	1.738
CAR_GT **Petrol**	As above			9,497.590	4.415	3.986
CAR_GT **Diesel**	As above			5,915.019	9.615	2.190

Table 5.6 – Route D journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.30 Table 5.6 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample powered two wheelers or either of the cars in general traffic lanes;
- The sample powered two wheelers in general traffic lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than either of the sample cars in general traffic lanes;
- The sample petrol cars emit more Carbon Dioxide, less Oxides of Nitrogen and use more fuel than the sample diesel cars.

- The sample 'Large' diesel car emits less Oxides of Nitrogen than the sample 'Medium' diesel car, (possibly due to its higher Euro emissions rating), as highlighted with black text.

5.4.31 **Table 5.7** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route E:

Route E – A10 Great Cambridge Road to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	22.611	00:59:21	22.86	754.244	0.226	0.317
PTW_GT	22.632	01:04:01	21.21	754.945	0.226	0.317
'Medium' Vehicles						
PTW_BL	As above			2,895.969	1.014	1.215
PTW_GT	As above			3,017.713	1.059	1.267
'Large' Vehicles						
PTW_BL	As above			3,937.174	1.591	1.653
PTW_GT	As above			4,121.424	1.675	1.730

Table 5.7 – Route E journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.32 Table 5.7 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample powered two wheelers in general traffic lanes, with the apparent exception of the sample 'Small' powered two wheelers where the difference between use of the bus lane or general traffic lane is negligible;
- The sample 'Small' powered two wheelers Oxides of Nitrogen emissions and fuel consumption are shown as identical, though this can be attributed to rounding the emissions database output to 3 decimal places.

5.4.33 No assessment could be made for the cars on this route as explained in previous Sections.

5.4.34 **Table 5.8** below gives the journey times, carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for Route F:

Route F – A10 Great Cambridge Road to Palestra						
Vehicle and Journey	**Journey Length (km)**	**Journey Times including stoppages (HH:MM:SS)**	**Average Speeds (km/hr)**	**Carbon Dioxide emissions (total grammes)**	**Oxides of Nitrogen emissions (total grammes)**	**Fuel consumption (total litres)**
'Small' Vehicles						
PTW_BL	16.005	00:39:46	24.15	533.885	0.110	0.224
PTW_GT	16.005	00:47:46	20.10	533.885	0.111	0.224
CAR_GT **Petrol**	15.818	00:54:26	17.44	3,085.943	0.698	1.295
CAR_GT **Diesel**	15.818	00:54:26	17.44	2,482.84	4.860	0.919
'Medium' Vehicles						
PTW_BL	As above			1,990.092	0.479	0.835
PTW_GT	As above			2,195.903	0.538	0.922
CAR_GT **Petrol**	As above			3,845.417	0.730	1.614
CAR_GT **Diesel**	As above			3,126.457	7.200	1.158
'Large' Vehicles						
PTW_BL	As above			2,698.381	0.747	1.133
PTW_GT	As above			3,007.158	0.855	1.262
CAR_GT **Petrol**	As above			5,680.668	1.789	2.384
CAR_GT **Diesel**	As above			3,656.405	5.560	1.354

Table 5.8 – Route E journey times, uCO_2 and NO_x emissions and fuel consumption by mode

5.4.35 Table 5.8 above shows that:

- The sample powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample powered two wheelers or either of the sample cars in general traffic lanes with the apparent exception of the sample 'Small' powered two wheelers where the difference between use of the bus lane or general traffic lane is negligible;
- The sample 'Small' powered two wheelers Oxides of Nitrogen emissions and fuel consumption are shown as identical, though this can be attributed to rounding the emissions database output to 3 decimal places.

- The sample powered two wheelers in general traffic lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than either of the sample cars in general traffic lanes;
- The sample petrol cars emit more Carbon Dioxide, less Oxides of Nitrogen and use more fuel than the sample diesel cars.
- The sample 'Large' diesel car emits less Oxides of Nitrogen than the sample 'Medium' diesel car, (possibly due to its better Euro emissions rating), as highlighted with black text.

5.4.36 **Table 5.9 below gives the AVERAGE carbon dioxide and oxides of nitrogen emissions and fuel consumption for the above vehicles for ALL ROUTES:**

AVERAGE Values ALL ROUTES				
Vehicle and Journey	Time taken (HH:MM:SS) per km	Carbon Dioxide emissions (total grammes)	Oxides of Nitrogen emissions (total grammes)	Fuel consumption (total litres)
'Small' Vehicles				
PTW_BL	00:02:29 / km	602.435	0.1806	0.253
PTW_GT	00:02:46 / km	605.103	0.1814	0.254
CAR_GT **Petrol**	00:03:55 / km	3,628.586	1.184	1.523
CAR_GT **Diesel**	00:03:55 / km	2,902.278	5.725	1.075
'Medium' Vehicles				
PTW_BL	00:02:29 / km	2,250.641	0.788	0.945
PTW_GT	00:02:46 / km	2,453.497	0.862	1.030
CAR_GT **Petrol**	00:03:55 / km	4,508.393	1.183	1.892
CAR_GT **Diesel**	00:03:55 / km	3,598.056	8.421	1.332
'Large' Vehicles				
PTW_BL	00:02:29 / km	3,052.414	1.228	1.281
PTW_GT	00:02:46 / km	3,355.430	1.366	1.408
CAR_GT **Petrol**	00:03:55 / km	6,668.180	3.081	2.799
CAR_GT **Diesel**	00:03:55 / km	4,170.954	6.722	1.545

Table 5.9 – AVERAGE journey times, uCO_2 and NO_x emissions and fuel consumption by mode, for ALL ROUTES

***** The average journey length shown for both cars are less than that for the powered two wheelers due to the removal of Routes C and E from the comparison process. At 17.6+km and 22.6+km in length, Routes C and E would have raised the average length driven by the cars to over 18.2km; longer than the journeys made by the powered two wheelers. The same would have been true of the average journey times and speeds for the cars, but as those surveys have been discounted, we cannot state what these averages would have been. The average values shown for cars are derived from Routes A, B, D and F.

5.4.37 Table 5.9 above shows that:

- The powered two wheelers in the bus lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the powered two wheelers or the petrol or diesel cars in general traffic lanes;

- The sample powered two wheelers in general traffic lanes emit less Carbon Dioxide and Oxides of Nitrogen and use less fuel than the sample petrol or diesel cars in general traffic lanes;
- The sample petrol cars emit more Carbon Dioxide, less Oxides of Nitrogen and use more fuel than the sample diesel cars.
- The sample 'Large' diesel car emits less Oxides of Nitrogen than the sample 'Medium' diesel car, (possibly due to its higher Euro emissions rating), as highlighted with black text.

6.0 CONCLUSIONS

6.1 Conclusions

6.1.1 Powered two wheelers, when permitted to use bus lanes, have shorter journey times than powered two wheelers in general traffic; they produce fewer emissions of Carbon Dioxide and Oxides of Nitrogen and they use less fuel. The following points indicate the scale of time savings and emission reductions. The calculation of each of the following time savings and emission reductions comes from the **average values** listed in **Table 5.9** in the previous Section.

- PTW journeys in bus lanes take on average **10.2% less time** than PTW journeys in general traffic lanes.

'Small' PTWs in bus lanes compared to 'small' PTWs in general traffic lanes:

- PTW use of bus lanes cuts their emissions of CO_2 by an average of 0.4%.
- PTW use of bus lanes cuts their emissions of Oxides of Nitrogen by an average of 0.4%.
- PTW use of bus lanes cuts their fuel consumption by an average of 0.4%.

'Medium' PTWs in bus lanes compared to 'medium' PTWs in general traffic lanes:

- PTW use of bus lanes cuts their emissions of CO_2 by an average of 8.3%.
- PTW use of bus lanes cuts their emissions of Oxides of Nitrogen by an average of 8.6%.
- PTW use of bus lanes cuts their fuel consumption by an average of 8.3%.

'Large' PTWs in bus lanes compared to 'large' PTWs in general traffic lanes:

- PTW use of bus lanes cuts their emissions of CO_2 by an average of 9.0%.
- PTW use of bus lanes cuts their emissions of Oxides of Nitrogen by an average of 10.1%.
- PTW use of bus lanes cuts their fuel consumption by an average of 9.0%.

6.1.2 It can be seen from the above comparisons that being permitted to travel in bus lanes along routes where they are available saves time for all powered two wheeler riders but it makes little difference to the emissions or fuel consumption of small PTWs such as mopeds. Emission reductions and fuel savings associated with using bus lanes become more notable with larger capacity motorcycles where there may be reductions of between **8%-10%.**

6.1.3 The following points indicate the scale of differences between the emissions and fuel consumption of PTWs and petrol cars on the same routes.

- PTW journeys in bus lanes take on average **36.6% less time** than car journeys in general traffic lanes.

'Small' PTWs using bus lanes:

- Small petrol cars emit an average of 6 times more CO_2 than small PTWs using bus lanes.
- Small petrol cars emit an average of 6.5 times more Oxides of Nitrogen than small PTWs using bus lanes.
- Small petrol cars consume an average of 6 times more fuel than small PTWs using bus lanes.

'Medium' PTWs using bus lanes:

- Medium petrol cars emit twice as much CO_2 on average as medium PTWs using bus lanes.
- Medium petrol cars emit an average of 1.5 times more Oxides of Nitrogen than medium PTWs using bus lanes.
- Medium petrol cars consume twice as much fuel on average as medium PTWs using bus lanes.

'Large' PTWs using bus lanes:

- Large petrol cars emit twice as much CO_2 on average as large PTWs using bus lanes.
- Large petrol cars emit an average of 2.5 times more Oxides of Nitrogen than large PTWs using bus lanes.
- Large petrol cars consume twice as much fuel on average as large PTWs using bus lanes.

6.1.4 It can be seen from the above comparisons that travelling in bus lanes on routes where they are available is considerably quicker for the powered two wheeler riders and that they can expect to complete a route into central London in two-thirds the time it will take a car driver. Emission reductions and fuel savings vary between **33%-85%.**

6.1.5 It should be noted that this report compares emissions from single vehicles and does not account for vehicle occupancy, (i.e. emissions per 'person trip'). However, given that the average car occupancy rate in Great Britain is 1.6, (and only 1.2 for commuting and business purposes), (NTS 2008), PTWs still compare favourably to cars in terms of fuel consumption and CO_2 and NOx emissions produced per person trip.

6.1.6 This study should also be considered in the context of the wider review of the motorcycle in bus lanes trial currently being carried out by Transport for London, (see link below:

Motorcycles in bus lanes | Transport for London

6.2 Benefits

6.2.1 Based upon the surveys carried out as part of this study, it is concluded that permitting powered two wheelers to use bus lanes provides the following benefits:

- PTW journey time savings of approximately 10.5% when comparing PTWs in bus lanes with PTWs in general traffic lanes;
- Reductions in PTW Carbon Dioxide emissions;
- Reductions in PTW Oxides of Nitrogen emissions;
- Reductions in all other PTW emissions including Carbon Monoxide, Total Hydrocarbons and Benzene; and
- Lower PTW fuel consumption.

6.2.2 It is acknowledged that the results of this study are based on 6 single timed runs on 6 different routes. However, the fact that the PTW using the bus lanes and the PTW (and car) using the general traffic lanes all set off at the same time on the same day, with riders and drivers trained to the Police Road Craft system, enables a valid comparison to be made with regards to journey time savings.

7.0 POTENTIAL FUTURE OUTPUTS

7.1 Benefits and Costs

7.1.1 The methodology developed for this study could also be used to quantify:

- The monetised journey time savings for powered two wheeler riders, using the Department for Transport's Transport Analysis Guidance (WebTAG);
- Estimated total probable daily reductions in emissions along each route that powered two wheelers are permitted to travel in bus lanes. As powered two wheeler riders filter in and out of bus lanes and will rarely use bus lanes over whole link lengths, this estimate can only be an approximate figure;
- Average emissions of Carbon Monoxide, Total Hydrocarbons and Benzene can be estimated for all routes.

7.1.2 WebTAG Guidance could be used to apply values of time to each of the riders who benefited from reduced journey times; these values of time could then be multiplied by the bus lanes operational hours, by the estimated numbers of riders benefiting and by the average amount of time each rider would save on those routes. This would provide the approximate journey time benefits for the routes.

7.1.3 Costs could be estimated for:

- Stakeholder and public consultation, (though much of this will already be being carried out through the Motorcycles in Bus Lanes 18 month trial);
- New or amended Signing;
- Road markings;
- TRO processing and consultation.

7.1.4 These will then allow the benefits to costs ratio for a route scheme to be estimated.

7.1.5 The probable daily reductions in powered two wheeler emissions along each route can be estimated from the average values estimated in Table 5.9 multiplied by the PTW numbers as noted in 7.1.2.

Appendix 1 – TfL Proposed Routes

Appendix A

MOTORCYCLES IN BUS LANES
EMISSION EVALUATIONS - PROPOSED ROUTES

ALL ROUTES FINISH AT PALESTRA,
197 BLACKFRIARS ROAD, LONDON SE1 8NJ

ROUTE 1	HAMPSTEAD	A1 ARCHWAY RD/A1000 GREAT NORTH RD
Archway Rd, Holloway Rd, Upper St, Pentonville Rd, Kings Cross Rd, Farringdon Rd, New Bridge St, Blackfriars Bridge, Blackfriars Rd.		
ROUTE 2	**TOTTENHAM 1**	**A10 GREAT CAMBRIDGE RD/A406 NORTH CIRCULAR**
Great Cambridge Rd, The Roundway, Bruce Grove, High Rd, Stamford Hill, Stoke Newington Rd, Kingsland Rd, Bishopsgate, Gracechurch St, London Bridge, Southwark St, Blackfriars Rd.		
ROUTE 3	**TOTTENHAM 2**	**A10 GREAT CAMBRIDGE RD/A406 NORTH CIRCULAR**
Great Cambridge Rd, The Roundway, Bruce Grove, High Rd, Seven Sisters Rd, Isledon Rd, Tollington Rd, Camden Rd, Camden High St, Hampstead Rd, Pentonville Rd, City Rd, Bishopsgate, London Bridge, Southwark St, Blackfriars Rd.		
ROUTE 4	**RIPPLE ROAD**	**A13/A123 RIPPLE RD/A1153 LODGE AVENUE**
Alfreds Way, Newham Way, East India Dock Rd, Burdett Rd, Mile End Rd, Whitechapel Rd, Commercial Rd, Butchers Rd, Rotherhithe Tunnel, Brunel Rd, Jamaica Rd, Druid St, St.Thomas St, Southwark St, Blackfriars Rd.		
ROUTE 5	**WOOLWICH**	**A205 GRAND DEPOT RD/JOHN WILSON ST**
Grand Depot Rd, Woolwich Common, Academy Rd, Well Hall Rd, Westhorne Ave, Eltham Rd, Lee High Rd, Loampit Vale, Loampit Hill, Lewisham Way, New Cross Rd, Old Kent Rd, Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.		
ROUTE 6	**BROMLEY COMMON**	**A21 BROMLEY COMMON/A233 OAKLEY RD**
Bromley Common, Masons Hill, Kentish Way, Tweedy Rd, London Rd, Bromley Hill, Bromley Rd, Rushey Green, Lewisham High St, Loampit Vale, Loampit Hill, Lewisham Way, New Cross Rd, Queens Rd, Peckham High St, Peckham Rd, Camberwell New Rd, Harleyford Rd, Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.		
ROUTE 7	**HOOLEY**	**A23 BRIGHTON RD/STAR LANE**
Brighton Rd, Coulsdon By-Pass, Brighton Rd, Purley Way, Thornton Rd, London Rd, Streatham High Rd, Streatham Hill, Brixton Hill, Brixton Rd, Kennington Park Rd, Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.		
ROUTE 8	**SUTTON**	**ROSE HILL ROUNDABOUT**
St.Helier Ave, Morden Hall Rd, Morden Rd, Merantum Way, Christchurch Rd, High St Colliers Wood, Tooting High St, Upper Tooting Rd, Balham High Rd, Balham Hill, Clapham Common South Side, Clapham High St, Clapham Rd, Kennington Park Rd, Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.		
ROUTE 9	**KINGSTON VALE**	**A3 ROBIN HOOD ROUNDABOUT**
Roehampton Vale, Kingston Rd, Roehampton La, Upper Richmond Rd, West Hill, Armoury Way, Swandon Way, York Rd, Battersea Park Rd, Nine Elms La, Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.		
ROUTE 10	**BRENT CROSS**	**A41 HENDON WAY/A406 NORTH CIRCULAR**
Hendon Rd, Finchley Rd, Wellington Rd, Prince Albert Rd, Hampstead Rd, Euston Rd, Marylebone Rd, Old Marylebone Rd, Edgware Rd, Park lane, Grosvenor Pl, Vauxhall Bridge Rd, Vauxhall Bridge, Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.		

S Connolly
London Motorcycle Policy Unit
3 November 2009

Appendix 2– Proposed Routes Initial Assessment

Transport for London

Journey Times and Emissions of Powered Two Wheelers (PTWs) Using Bus Lanes

Initial Route Assessment

All Routes finish at Palestra, 197 Blackfriars Road, London SE1 8NJ

Notes - Questions and discussion points

***** Google Maps shows no ***Inbound*** bus lane (at 6th January 2010)

ROUTE 1	HAMPSTEAD	A1 ARCHWAY RD/A1000 GREAT NORTH RD	ROUTE LENGTH (Km)
Archway Rd, Holloway Rd, Upper St, Pentonville Rd, Penton Rise, Kings Cross Rd, Farringdon Rd, Farringdon St, New Bridge St, Blackfriars Bridge, Blackfriars Rd.			8.72(TfL estimate) LTP Checked

Notes

Holloway Road south-eastbound

- Delays experienced in AM and Inter Peak periods in south-eastbound bus lane at junction with Tufnell Park Road, caused by blocking back from A1 Holloway Road junction with A503 Seven Sisters Road. This is caused by a combined short link length and the bus stop outside the Post Office between Tufnell Park Road and Seven Sisters Road. Left turning traffic cannot get into the nearside lane past buses so occupy the middle lane. Right turning traffic from Tufnell Park Road sometimes turn into the third lane if faced by queues over the junction and then try to cross over two lanes to turn left, causing further delays to southbound traffic and blocking back over the junction.
  This is likely to affect both proposed PTWs and car jts.
- A proposal to relocate the bus stop to a position immediately south of Windsor Road is being considered by TfL TDE Team (Kwong-Chung Law), as part of the A1 Nags Head Study (an AECOM commission). London Buses think that this will inconvenience passengers.
- No significant southbound delays in between junctions with A503 Seven Sisters Road and south of the junction with Loraine Road.

Holloway Road north-westbound

- Delays particularly in the PM peak period.at the signalised junctions with A503 Tollington Road/Camden Road; A503 Parkhurst Road/Seven Sisters Road; and Tufnell Park Road.

Highbury Corner

- A large-scale traffic management project is being developed for Highbury Corner by AECOM on behalf of TfL Major Projects. Michael O'Callaghan is the TfL contact for the scheme.

Roads on ROUTE 1	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
A1 Archway Road Inbound *Start at junction with Sheldon Avenue*	• Between Hornsey Lane Gardens and Holloway Road **700m**	• At Any Time
Holloway Road Inbound (then south through Highbury Corner, and continue left onto the A1)	• Between St John's Villas and south of junction with Fortnam Road **450m** • South of junction with Kingsdown Road to junction with Tufnell Park Road **400m** • Half of link between junctions with Seven Sisters Road and Tollington Road **100m** • South of junction with Loraine Road	• Mon-Sat 7am-7pm • Mon-Sat 7am-7pm • At Any Time • At Any Time

Roads on ROUTE 1	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
	to junction with Hornsey Road **250m** • Junction with Hornsey Road to Highbury Corner 650m	• Mon-Sat 7am-7pm
Upper Street Inbound	• South of junction with Compton Terrace to junction with Canonbury Lane **300m** • South of junction with Gaskin Street to junction with Liverpool Road **500m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-7pm
Pentonville Road Inbound **(and** Penton Rise (One-way south-westbound)) *****		
Kings Cross Road Inbound *****		
Farringdon Road Inbound	• South of junction with Margery Street to north of junction with Roseberry Avenue **250m** • South of junction with Vineyard Walk to north of junction with Vine Street Bridge **250m** • South of junction with Clerkenwell Road to junction with Cowcross Street **200m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-7pm • Mon-Sat 7am-7pm
Farringdon Street Inbound	• South of the Holborn Viaduct to north of junction with Fleet Place **200m**	• Mon-Sat 7am-7pm
New Bridge Street Inbound *****		
Blackfriars Bridge Inbound	• The Bridge **150m**	• At Any Time
Blackfriars Road Inbound *****		

Total estimated length of Inbound bus lane = **3,750m** out of **8,720m, approx. 43% Inbound route coverage.**

ROUTE 2	TOTTENHAM 1	A10 GREAT CAMBRIDGE RD/A406 NORTH CIRCULAR	ROUTE LENGTH (KM)
Great Cambridge Rd, The Roundway and Lordship Lane, Bruce Grove, High Rd, Stamford Hill, Rectory Road, Manse Road and Evering Road, Stoke Newington Rd, Kingsland Rd, Kingsland High Street, Shoreditch High Street, Norton Folgate and Bishopsgate, Gracechurch St, London Bridge (King William Street), Southwark St, Blackfriars Rd.			22.8 (TfL estimate) 17 (LTP estimate)

Notes

High Road northbound

- Delays experienced Outbound in Inter and PM Peak periods at junction with Bruce Grove, partly due to number of bus services.

High Road southbound

- Contra-flow segregated busway between junctions with Monument Way and Broad Lane should provide consistent journey times. General traffic can re-join High Road at the junction with Broad Lane.

Stamford Hill southbound

- Southbound traffic must divert down Rectory Road at the junction with Stoke Newington High Street, which is one-way northbound, and re-join Stoke Newington Road at the junction with Evering Road.

Roads on ROUTE 2	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Great Cambridge Road Inbound *Start at south side of junction with A406 North Circular* Road	• South of junction with Wilbury Way to junction with Laburnum Avenue **850m**	• Mon-Fri 7am-10am
The Roundway Inbound * and Lordship Lane*		
Bruce Grove Inbound*		
High Road Inbound	• South of junction with Somerset Road to junction with Broad Lane **150m**	• At Any Time
Monument Way		
Broad Lane	• North of junction with Ferry Lane to junction with Cunningham Road **400m**	• Mon-Sun 7am-7pm
High Road Inbound	• Junction with Broad Lane to north of junction with Wargrave Avenue **600m**	• 7am-7pm
Stamford Hill Inbound	• South of junction with Portland Avenue to junction with Windus Road **500m**	• Mon-Fri 7am-7pm
Rectory Road Inbound (One-way southbound)	• Junction with Northwold Road to Stoke Newington Common **200m** • South of junction with Brook Road to north of junction with Evering Road **200m**	• 7am-7pm • 7am-7pm
Manse Road and Evering Road (Both one-way westbound)*		

Roads on ROUTE 2	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Stoke Newington Road Inbound	• South of junction with Amhurst Road to junction with Farleigh Road **150m** • Junction with Prince George Road to junction with Millers Terrace **250m**	• 7am-7pm • 7am-7pm
Kingsland High Street	• South of junction with Sandringham Road to north of junction with Dalston Lane **500m**	• 7am-7pm
Kingsland Road Inbound	• South of junction with Forest Road to junction with Dunston Road **150m** • Junction with Orsman Road to north of junction with Laburnum Street **200m** • South of junction with Whiston Road to north of junction with Cremer Street **550m** • South of junction with Cremer Street to north of junction with Old Street **200m**	• 7am-7pm • 7am-7pm • 7am-7pm • 7am-7pm
Shoreditch High Street Inbound*	•	•
Norton Folgate and Bishopsgate Inbound	• Bishopsgate south of junction with Spittal Square to junction with Houndsditch **100m** • Bishopsgate south of junction with Camomile Street for **50m (est).**	• 7am-7pm • At Any Time
Gracechurch Street Inbound*		
London Bridge (King William Street) Inbound*		
Southwark Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **5,200m -550 + 400m = 5,050** out of **17,000m, approx. 29.7% Inbound route coverage.**

ROUTE 3	TOTTENHAM 2	A10 GREAT CAMBRIDGE RD/A406 NORTH CIRCULAR	ROUTE LENGTH (KM)
Great Cambridge Rd, The Roundway and Lordship Lane, Bruce Grove, High Rd, Seven Sisters Rd, Isledon Rd, Tollington Rd, Camden Rd, Camden High St or Oakley Square and Lidlington Place?, Hampstead Rd, Euston Road?, Pentonville Rd, City Rd, Old Street?, Great Eastern Street?, Bishopsgate, Gracechurch St?, London Bridge, Southwark St, Blackfriars Rd.			29.4(TfL estimate) 24 (LTP estimate)

Notes

A503 Seven Sisters Road north-eastbound (*these SSRd notes should not be applicable to this Inbound assessment*)

- Very high numbers of bus services with a maximum of 66 services hourly throughout the day inclusive of AM and PM peaks. These often result in services stacking back from the bus stops north of junctions with Hercules Place and north of Axminster Road.
- Stacking exacerbated by delays from puffin crossing south of junction with Hercules Place. Platoons of traffic from A503 Parkhurst Road sometimes queues back from this crossing just over the pedestrian crossing at the junction with A1 Holloway Road, delaying north-eastbound traffic.
- The A1 Nags Head Study (an AECOM commission), proposes to widen the northern footway, north of the junction with Hercules Place to the junction with Axminster Road. The existing bus lane will be removed between these points, causing buses to merge with general traffic. The scheme is intended to provide improved space for pedestrians, given current congestion on footways and incidents involving pedestrians stepping off footway and being struck by vehicles. Kwong-Chung Law of the TfL TDE Team is the contact for this work.
- A road safety scheme is proposed at the junction with A103 Hornsey Road, which includes ASLs and surface treatments on junction approaches. This is another AECOM commission and Kwong-Chung Law of the TfL TDE Team is also the contact for this work

A503 Tollington Road south-westbound

- South-westbound bus lane ends at a set-back from the junction with the A1 Holloway Road, after which motorcycles – like buses - will be required to merge with general traffic to cross the junction with the A1 into A503 Camden Road, from lane 1 to lane 3. South-westbound traffic generally queues in lanes 2-4 in Tollington Road at the junction with the A1 Holloway Road for much of the day, past the junction with Hertslett Road. This means crossing two lanes will be difficult for motorcycles, and it is likely that they would merge with lane two where the bus lane meets the junction with Hertslett Road. This will make it easier for them to get over to lane 3.

Camden High Street

- This is one-way northbound; should this be Camden Street and then Oakley Square and Lidlington Place?

Euston Road

- Will the route follow Euston Road to link Hampstead Road to Pentonville Road?

City Road to Bishopsgate

Is the proposed route as shown above, via Old Street and Great Eastern Street?

Roads on ROUTE 3	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Great Cambridge Road Inbound *Start at south side of junction with A406 North Circular* Road	• South of junction with Wilbury Way to junction with Laburnum Avenue **850m**	• Mon-Fri 7am-10am
The Roundway Inbound***** and Lordship Lane*****		

Roads on ROUTE 3	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Bruce Grove Inbound*		
High Road Inbound	• South of junction with Somerset Road to junction with Broad Lane **700m**	• At Any Time
Monument Way		
Broad Lane	• North of junction with Ferry Lane to junction with Cunningham Road **400m**	• Mon-Sun 7am-7pm
High Road Inbound	• Junction with Broad Lane to north of junction with Wargrave Avenue **Buses on this route won't enter this**	• 7am-7pm
Seven Sisters Road Inbound	• South-west of junction with Greenfield Road to junction with St Ann's Road **250m** • 50metres south of junction with St Ann's Road to junction with Vartry Road **200m** • South of junction with Amhurst Park to junction with Woodbury Down **450m** • Junction with Green Lanes to junction with Finsbury Park Road **500m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-7pm • At Any Time • Mon-Sun 7am-7pm
Isledon Road Inbound (One-way south-westbound)	• Start of road to north of junction with Coleridge Road **200m** • North of junction with Yonge Park to Tollington Road **300m**	• At Any Time • Mon-Sun 7am-7pm
Tollington Road Inbound (One-way south-westbound)	• Isledon Road bus lane continuation to north of junction with Hornsey Road **300m** • South of junction with Hornsey Road to junction with Hertsletts Road **250m**	• Mon-Sun 7am-7pm • Mon-Sun 7am-7pm
Camden Road Inbound (One-way south-westbound to junction with A503 Parkhurst Road)	• From junction with Caledonian Road to junction with Hilmarton Road 400m • From junction with Hilmarton Road to south of junction with Hilldrop Crescent 200m	• Mon-Sun 7am-7pm • Mon-Sat 7am-1pm
Camden Road Inbound (One-way south-westbound to junction with A503 Parkhurst Road)	• From junction with Camden Park Road to north of junction with St Pancras Way **350m**	• Mon-Fri 7am-10am
Camden Street Inbound*		
Oakley Square* and Lidlington Place*		

Roads on ROUTE 3	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Hampstead Road Inbound	• From junction with Lidlington Place to north of junction with Cardington Street **250m** • From junction with Netley Street to north of junction with Drummond Road **150m**	• Mon-Fri 7am-10am • Mon-Fri 7am-10am
Euston Road Inbound	• From junction with Hampstead Road to junction with Grafton Place **250m** • From junction with Mabledon Place to junction with York Way **700m**	• At Any Time • At Any Time
Pentonville Road Inbound*		
City Road Inbound	• South of junction with Oakley Crescent to junction with East Street **750m**	• Mon-Sat 7am-7pm
Old Street Inbound	• From junction with City Road to junction with Pitfield Street **100m**	• Mon-Sat 7am-10am 4pm-7pm Sun 10am-4pm
Shoreditch High Street Inbound*		
Norton Folgate and Bishopsgate Inbound	• Bishopsgate south of junction with Spittal Square to junction with Houndsditch **100m** • Bishopsgate south of junction with Camomile Street for **50m (est).**	• 7am-7pm • At Any Time
Gracechurch Street Inbound*		
London Bridge(King William Street) Inbound*		
Southwark Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **7,300m -550 + 400m = 7,150** out of **24,000m, approx. 29.8% Inbound route coverage.**

ROUTE 4	RIPPLE ROAD	A13/A123 RIPPLE RD/A1153 LODGE AVENUE	ROUTE LENGTH(S) (KM)
Alfreds Way, Newham Way, East India Dock Rd, Burdett Rd, Mile End Rd, Whitechapel Rd, Commercial Rd, Branch Rd, Rotherhithe Tunnel, Brunel Rd?, Southwark Bridge Road, Jamaica Rd, Druid St, St.Thomas St, Southwark St, Blackfriars Rd.			22.64(TfL estimate) LTP Checked

Notes

Likely Inbound Route for motorcyclists and drivers not using the bus lane

- Alfreds Way, Newham Way, East India Dock Rd, Commercial Road, Branch Road, Rotherhithe Tunnel, Southwark Bridge Road, Jamaica Rd, Druid St, St.Thomas St, Southwark St, Blackfriars Rd.

The Likely Inbound Route for motorcyclists using the bus lane is as shown above and in the roads on ROUTE 4 column below.

- Motorcyclists will be able to use bus lanes on this route but is seems to go a long way out of a drivers way to cross the Thames by this route. Is this likely to be used and therefore is it worthwhile trying to compare journey times? *(Think local knowledge and advice needed on this one)* **Steven Murray – Spoke with Mark Jessup 13/01/10.** Agreed we should compare like-with-like, so both PTWs and the car will use Commercial Road westbound to the Rotherhithe Tunnel and not the Burdett Road detour.

Brunel Road

- This would only be used heading east, above the Rotherhithe Tunnel, along the south bank of the Thames.

Rotherhithe Tunnel

- Can't see on Google Maps, but don't think it features an Inbound bus lane.

Roads on ROUTE 4	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Alfreds Way Inbound* *Start to west of junction with A1153 Lodges Avenue*		
Newham Way Inbound*		
East India Dock Road Inbound	• East India Dock Road at the Silvertown Way on-slip to the Blackwall Tunnel **900m** • West of junction with Cotton Street to junction with Burdett Road **1,600m**	• At Any Time • Mon-Sat 7am-7pm
Burdett Road northbound	• North of Burdett Road access to south of junction with Thomas Road **400** • North of junction with Seager Place to south of egress from Bargate Avenue **150m** • North of junction with Bow Common Lane to junction with Mile End Road **200m**	• Mon-Fri 7am-10am 4pm-7pm • Mon-Fri 7am-10am 4pm-7pm • Mon-Fri 7am-10am 4pm-7pm
Mile End Road Inbound	• From junction with Burdett Road to junction with White Horse Lane • West of junction with Beaumont Grove to junction with Copbas Street • W[illegible] to Whitechapel Road **Total 1,900m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm Mon-Sat 7am-10am 4pm-7pm

NOT USED

NOT USED

Roads on ROUTE 4	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Whitechapel Road Inbound	• F W **1,900m** NOT USED	Mon-Sat 7am-10am 4pm-7pm
Commercial Road eastbound	• Fi C Row **1,600m** NOT USED	Mon-Sat 7am-10am 4pm-7pm
Commercial Road westbound	• From East India Dock Road to junction with Branch Road.	
Branch Road Inbound*		
Rotherhithe Tunnel Inbound*		
Southwark Bridge Road Inbound	• From junction with Lower Road to west of junction with Drummond Road **Total 1,500m**	• At Any Time
Jamaica Road Inbound	• From junction with St James Road to junction with Sweeney Crescent **Included in 1,500m above**	• At Any Time
Druid Street Inbound* (One-way north-westbound)		
St Thomas Street Inbound (One-way westbound) *		
Southwark Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **4,000m** out of **17,140m, approx. 23.3% Inbound route coverage.**

ROUTE 5	WOOLWICH	A205 GRAND DEPOT RD/JOHN WILSON ST	ROUTE LENGTH(S) (KM)
Grand Depot Rd, Woolwich Common, Academy Rd, Well Hall Rd, Westhorne Ave, Eltham Rd, Lee High Rd, Loampit Vale, Loampit Hill, Lewisham Way, New Cross Rd, Old Kent Rd, New Kent Road Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.			18.69 (TfL estimate) LTP Checked

Notes

A20 Lewisham Way north-westbound

- Very high inbound flows particularly in AM peak periods. Should see benefits through this length of route. Some delays at signalised junction with Parkfield Road as part of the Amersham Gyratory and the point where the A20 merges with the A2, and other prioritised bus routes.

A2 New Cross Road westbound

- Some delays experienced though crossings and signalised junctions at New Cross Gate train station and adjacent Sainsburys entrance and exit.
- Motorcyclists must take care drving through the contra-flow bus gate at the signalised junction with Queens Road. Articulated bus services still use this route and tend to occupy the entire waiting reservoir on a red signal, which will make the manoeuvre difficult for motorcyclists. General traffic is routed west down Queens Road, then north up Kender Street, to re-join the A2 New Cross Road again, or take Kender Street, then east along Besson Street to rejoin the A2 earlier. The short length of New Cross Road between the junctions with Queens Road and Besson Street features a north-eastbound contra-flow bus lane, that merges with general traffic after the junction with Besson Street. The journey times comparison between the motorcycles using the bus lane and that using the alternative route with the car should show a difference.

A2 Old Kent Road

- There are likely to be some delays with westbound traffic queuing back from the junction with Ilderton Road, though on average, motorcyclists would benefit from the westbound bus lane which commences before that junction.
- A casualty reduction scheme has been proposed to introduce a dedicated right-turn phase into the signals sequence for right turning traffic from Old Kent Road into St. James Road. This scheme would require the removal of the length of westbound bus lane between the junctions of Peckham Park Road and St. James Road and a new bus lane set-back from the junction of Peckham Park Road. This was an AECOM scheme delivered to TfL in 2007 through the Route 53 project for the Bus Priority Team, but it is not known whether this scheme is being progressed.

A2 Elephant and Castle

- A bus stop reorganisation scheme was developed for this gyratory by AECOM for TfL. The Bus Priority Team should know some of the details of this scheme and whether the proposals would impact on motorcycle and bus journey times here. David McKenna of the TfL Bus Priority Team may still be responsible for this area.

Roads on ROUTE 5	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Grand Depot Road Inbound***** *Start at junction with John Wilson Street*		
Woolwich Common Inbound*****		
Academy Road Inbound	• From junction with Woolwich Common to north of egress from Academy Place **400m**	• Mon-Sat 7am-7pm

Roads on ROUTE 5	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Well Hall Road Inbound*		
Westhorne Avenue Inbound*		
Eltham Road Inbound	• West of the junction with Westhorne Avenue to east of junction with Sidcup Road **250m** • Addison Drive to junction with Leyland Drive **800m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm
Lee High Road Inbound*		
Loampit Vale Inbound*		
Loampit Hill Inbound*		
Lewisham Way Inbound (One-way north-westbound north of junction with Amersham Way)	• Oscar Street to New Cross Road **1,400m**	• At Any Time
New Cross Road Inbound	• Junction with Lewisham Way to New Cross Gate Railway Bridge **200m**	• At Any Time
Queen's Road		
Kender Street		
Old Kent Road Inbound	• East of junction with Ilderton Road to east of junction with Asylum Road **350m** • Ruby Street to the junction with St Jame's Road **200m** • Malt Street to the junction with Glengall Road **200m** • North east of junction with East Street to the start of New Kent Road **150m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-7pm
New Kent Road Inbound	• From the end of Old Kent Road to East of Elephant and Castle **700m**	• Mon-Sat 7am-7pm
Elephant and Castle Inbound*		
St. Georges' Road Inbound (One-way north-westbound from Elephant and Castle to junction with Westminster Bridge Road)	• From the Elephant and Castle to the junction with Geraldine Street **250m**	• Mon-Sat 7am-10am 4pm-7pm

Roads on ROUTE 5	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Westminster Bridge Road Inbound (One-way eastbound from junction with St. Georges' Road to Blackfriars Road)	• From junction with St George's Road to Gerridge Street **150m**	• Mon-Sat 7am-10am 4pm-7pm
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **5,200m-150 = 5,050m** out of **19,000m, approx. 26.6% Inbound route coverage.**

ROUTE 6	BROMLEY COMMON	A21 BROMLEY COMMON/A233 OAKLEY RD	ROUTE LENGTH (KM)
Bromley Common, Masons Hill, Kentish Way, Tweedy Rd, London Rd, Bromley Hill, Bromley Rd, Rushey Green, Lewisham High St, Loampit Vale, Loampit Hill, Lewisham Way, New Cross Rd, Queens Rd, Peckham High St, Peckham Rd, Camberwell Church St, Camberwell New Rd, Harleyford St, Kennington Oval, Harleyford Rd, South Lambeth Rd and South Lambeth Place (bus-only access), Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.			23.6(TfL estimate) LTP Checked

Notes

Molesworth Street

Appears from Google Maps that buses can enter Molesworth Street, and then left onto Loampit Vale.

A20 Lewisham Way north-westbound

As Route 5 above.

A2 New Cross Road westbound

As Route 5 above.

Likely Inbound Route for motorcyclists and drivers <u>not</u> using the bus lane from Harleyford Rd as they cannot use the bus-only access in South Lambeth Place is;

- Harleyford Road, South Lambeth Road, Parry Street, Wandsworth Road, then over to Albert Embankment.

  IF Buses are not allowed to go straight over Kennington Lane, the PTW using the bus lanes should use the same route.

Roads on ROUTE 6	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Bromley Common Inbound *Start north of junction with Oakley Road and Hastings Road*	• North of Oakley House access to south of junction with Rookery Lane	• Mon-Fri 7am-10am
Masons Hill Inbound*		
Kentish Way Inbound*		
Tweedy Road Inbound*		
London Road Inbound*		
Bromley Hill Inbound*		
Bromley Road Inbound	• South of junction with Oakridge Road to south of junction with Beckenham Hill Road **300m** • North of junction with Canadian Avenue to south of junction with Sangley Road **400m**	• Mon-Fri 7am-10am • Mon-Sat 7am-7pm
Rushey Green Inbound	• From junction with Catford Broadway to Lewisham High Street **500m**	• Mon-Sun 7am-10am 4pm-7pm
Lewisham High Street Inbound (see note on Molesworth St)	• From Rushey Green to south of junction with Romborough Way **350m** • South of junction with Ladywell Road to junction with Whitworth Road **250m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-7pm
Molesworth Street Inbound*		

Roads on ROUTE 6	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Loampit Vale Inbound*		
Loampit Hill Inbound*		
Lewisham Way Inbound (One-way north-westbound north of junction with Amersham Way)	• Oscar Street to New Cross Road **1,400m**	• At Any Time
New Cross Road Inbound	• Junction with Lewisham Way to New Cross Gate Railway Bridge **200m**	• At Any Time
Queens Road Inbound	• West of junction with Burchell Road to Peckham High Street **650m**	• Mon-Fri 7am-10am 4pm-7pm
Peckham High Street Inbound	• From Queens Road to east of junction with Clayton Road **100m**	• Mon-Fri 7am-10am 4pm-7pm
Peckham Road Inbound	• West of access to St Giles Road to east of junction with Wilson Road **200m**	• Mon-Fri 7am-10am 4pm-7pm
Camberwell Church Street Inbound	• West of junction with Wilson Road to junction with Grove Lane **700m**	• Mon-Fri 7am-10am 4pm-7pm
Camberwell New Road Inbound	• West of junction with Lothian Road to junction with Brixton Road **150m**	• Mon-Sun 7am-7pm
Harleyford Street Inbound	• From junction with Kennington Park Road and Kennington Oval **350m**	• Mon-Sun 7am-7pm
Kennington Oval Inbound	• From Harleyford Street to Harleyford Road **400m**	• Mon-Sun 7am-7pm
Harleyford Road Inbound	• From Harleyford Street/Kennington Oval to east of junction with Durham Road **100m**	• Mon-Sun 7am-7pm
South Lambeth Road and South Lambeth Place (Bus-Only access road) Inbound	• Into bus / Underground / rail interchange	• At Any Time
Albert Embankment Inbound	• From junction with Vauxhall Bridge Road to junction with Tinworth Street **750m** • North of junction with Tinworth Street to south of junction with Lambeth Road **250m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-10am 4pm-7pm
Lambeth Palace Road Inbound	• North of entrance to St Thomas Hospital to north of junction with Royal Street **1,000m**	• Mon-Sat 7am-10am 4pm-7pm
York Road Inbound	• North of junction with Chichely Street to south of the Concert Hall Approach **300m**	• At Any Time

Roads on ROUTE 6	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Stamford Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **8,350m** out of **23,600m, approx. 35.4% Inbound route coverage.**

ROUTE 7	HOOLEY	A23 BRIGHTON RD/STAR LANE	ROUTE LENGTH (KM)
Brighton Rd, Coulsdon By-Pass, Brighton Rd, Purley Way, Thornton Rd, London Rd, Streatham High Rd, Streatham Hill, Brixton Hill, Brixton Rd, Kennington Park Rd, Newington Butts, Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.			27.67(TfL estimate) LTP Checked

Notes

Brighton Road

- No view of bus lanes on Google Maps.

Coulsden By-Pass

- Google Maps shows this under construction.

Purley Way

- Likely route from Brighton Road to Purley Way is via Barnstead Road and Foxley Lane around that gyratory.
- No view of bus lanes on Google Maps.

Elephant and Castle As Route 5 above.

Roads on ROUTE 7	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
A23 Brighton Road Inbound *Start at junction with Dean Lane*	• No view of bus lanes on Google Maps.	
Coulsden By-Pass Inbound	• Google Maps shows this under construction.	
Brighton Road Inbound	• North of junction with Purley Rise to south of junction with Purley Road **150m**	• At Any Time
Purley Way Inbound*		
Thornton Road Inbound*		
London Road Inbound	• From St Helen's Road to junction with Roche Road **300m** • From Acacia Road to Streatham High Road **350m**	• Mon-Sat 7am-1pm 4pm-7pm • Mon-Sat 7am-1pm 4pm-7pm
Streatham High Road Inbound	• From the end of London Road to the junction with Colmer Road **400m** • From junction with Green Lane to north of Kempshott Road **200m** • Junction with Lewin Road to Streatham Railway Station **150m** • North of junction with Stanthorpe Road to south of junction with Tooting Beck Gardens **100m**	• Mon-Sat 7am-1pm 4pm-7pm • Mon-Sat 7am-1pm 4pm-7pm • At Any Time • Mon-Sat 7am-1pm 4pm-7pm
Streatham Hill Inbound	• Junction with Telford Hill to south of junction with Streatham Place **250m**	• Mon-Sat 7am-7pm
Brixton Hill Inbound	• North of junction with Felsberg Road to junction with Porden Road **600m**	• Mon-Sat 7am-10am 4pm-7pm

Roads on ROUTE 7	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Brixton Road Inbound	• North of junction with Gresham Road to junction with Stockwell Road **100m** • North of junction with St John's Crescent to the junction with Prima Road **150m**	• At Any Time • Mon-Sat 7am-10am 4pm-7pm
Kennington Park Road Inbound	• North of junction with Magee Street to south of the junction with Kennington Lane **200m**	• Mon-Sat 7am-10am 4pm-7pm
Newington Butts Inbound	• South of junction with Dante Road to south of Elephant and Castle **200m**	• Mon-Fri 7am-10am
Elephant and Castle Inbound*		
St. Georges' Road Inbound	• From the Elephant and Castle to the junction with Geraldine Street **250m**	• Mon-Sat 7am-10am 4pm-7pm
Westminster Bridge Road Inbound	• From junction with St George's Road to Gerridge Street **150m**	• Mon-Sat 7am-10am 4pm-7pm
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **3,550m** out of **27,670m approx. 12.8% Inbound route coverage.**

ROUTE 8	SUTTON	ROSE HILL ROUNDABOUT	ROUTE LENGTH (KM)
St.Helier Ave, Morden Hall Rd, Morden Rd, Merantum Way, Christchurch Rd, High St Colliers Wood, Tooting High St, Upper Tooting Rd, Balham High Rd, Balham Hill, Clapham Common South Side, Clapham High St, Clapham Rd, Kennington Park Rd, Newington Butts, Elephant & Castle, St.Georges' Rd, Westminster Bridge Rd, Blackfriars Rd.			16.57 (TfL estimate) LTP Checked

Notes
Elephant and Castle
As Route 5 above.
Clapham Road

- Including movement around clock tower traffic island on South Lambeth Road and back onto Clapham Road.

Roads on ROUTE 8	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
A297 St Helier Avenue Inbound *Start north of the Rosehill Roundabout*	• From north of Cartmel Gardens to south of Morden Road roundabout **600m**	• Mon-Fri 7am-10am
Morden Hall Road Inbound*		
Morden Road Inbound	• North of Kenley Road to south of junction with Parkleigh Road • North of junction with Jubilee Way to junction with Merantum Way **650m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm
Merantum Way Inbound*		
Christchurch Road Inbound*		
High St Colliers Wood Inbound*		
Tooting High Street Inbound	• North of junction with Carwell Street to junction with Garratt Terrace **150m**	• Mon-Sat 7am-7pm
Upper Tooting Road Inbound*		
Balham High Road Inbound*		
Balham Hill Inbound	• From south of junction with Clarence Mews to south of junction with Hazelbourne Road **700m**	• Mon-Sat 7am-10am 4pm-7pm
Clapham Common South Side Inbound	• From north of the junction with Rookery Road to south of junction with Clapham Park Road **300m**	• At Any Time
Clapham High Street Inbound	• From south of junction with Prescott Place to Clapham Road **300m**	• Mon-Sat 7am-10am 4pm-7pm

Roads on ROUTE 8	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Clapham Road Inbound	• From Clapham High Street to north of junction with Mayflower Road **350m** • North of junction with Jeffreys Road to junction with Stockwell Road **200m** • North of junction with Lansdowne Way to north of junction with Durand Gardens **100m** • North of junction with Caldwell Street to south of junction with Harleyford Street **150m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm
Kennington Park Road Inbound	• North of junction with Magee Street to south of the junction with Kennington Lane **200m**	• Mon-Sat 7am-10am 4pm-7pm
Newington Butts Inbound	• South of junction with Dante Road to south of Elephant and Castle **200m**	• Mon-Fri 7am-10am
Elephant and Castle Inbound*		
St. Georges' Road Inbound	• From the Elephant and Castle to the junction with Geraldine Street **250m**	• Mon-Sat 7am-10am 4pm-7pm
Westminster Bridge Road Inbound	• From junction with St George's Road to Gerridge Street **150m**	• Mon-Sat 7am-10am 4pm-7pm
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **4,300m** out of **16,570m, approx. 26.6% Inbound route coverage.**

ROUTE 9	KINGSTON VALE	A3 ROBIN HOOD ROUNDABOUT	ROUTE LENGTH (KM)
Roehampton Vale, Kingston Rd, Roehampton La, Upper Richmond Rd, West Hill, Armoury Way, Swandon Way, York Rd, Battersea Park Rd, Nine Elms La, Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.			17.5(TfL estimate) LTP Checked

Notes
Swandon Way

- No view of bus lanes on Google Maps.

Roads on ROUTE 9	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
A3 Roehampton Vale Inbound***** *Start past Kingston Vale and junction with Robin Hood Way*		
Kingston Road Inbound	• Alongside Norstead Place to south of access to Alton Road **200m**	• At Any Time (Bus and Goods Vehs Lane)
Roehampton Lane Inbound	• North of junction with Clarence Lane to north of junction with Roehampton Close **900m**	• Mon-Sat 7am-7pm
Upper Richmond Road Inbound*****		
West Hill Inbound***** (and length of Putney Bridge Road)		
Armoury Way Inbound***** (One-way eastbound)		
Old York Road, then Swandon Way Inbound*****		
York Road Inbound	• Opposite Usk Road junction to south of junction with York Place **700m**	• Mon-Sat 7am-7pm
Battersea Park Road Inbound	• East of junction with Winders Road to junction with Balfern Street **400m** • North of junction with Forfar Road to south of junction with Meath Street **150m** • Opposite junction of Savona Street to Nine Elms Lane **550m**	• Mon-Sat 7am-10am 4pm-7pm • Mon-Sat 7am-10am 4pm-7pm • Mon-Sun 7am-7pm
Nine Elms Lane Inbound (and length of Wandsworth Road)	• From Battersea Park Road to Nine Elms Lane Service Station **650m**	• Mon-Sun 7am-7pm
Albert Embankment Inbound	• From junction with Vauxhall Bridge Road to junction with Tinworth Street **650m** • North of junction with Tinworth Street to south of junction with Lambeth Road **250m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-10am 4pm-7pm

Roads on ROUTE 9	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Lambeth Palace Road Inbound	• North of entrance to St Thomas Hospital to north of junction with Royal Street **900m**	• Mon-Sat 7am-10am 4pm-7pm
York Road Inbound, the round the London IMAX cinema	• North of junction with Chichely Street to south of the Concert Hall Approach **300m**	• At Any Time
Stamford Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **5,650m** out of **17,500m, approx. 32 3% Inbound route coverage.**

ROUTE 10	BRENT CROSS	A41 HENDON WAY/A406 NORTH CIRCULAR	ROUTE LENGTH (KM)
Hendon Way, Finchley Rd (including Ave Rd and Adelaide Rd gyratory), Wellington Rd, Prince Albert Rd, Hampstead Rd, Euston Rd, Marylebone Rd, Old Marylebone Rd, Edgware Rd, Park lane, Grosvenor Pl, Lower Grosvenor Place, Bressenden Place, Vauxhall Bridge Rd, Vauxhall Bridge, Albert Embankment, Lambeth Palace Rd, York Rd, Stamford St, Blackfriars Rd.			22.11(TfL estimate) 20.5 (LTP estimate)

Notes
Hampstead Road

- Connecting to Hampstead Road from Prince Albert Road is not straightforward. A route travelled by London Buses is; Prince Albert Road, Parkway, Greenland Road, Bayham Street, Crowndale Road, Harrington Square, Lidlington Place, and then onto Hampstead Road.
- An alternative to this route, and one that could be taken by motorcyclists, is; Prince Albert Road, Albany Street, Osnaburgh Street then straight onto Marylebone Road, bypassing both Hampstead Road and Euston Road altogether.

Roads on ROUTE 10	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
A41 Hendon Way Inbound* *Start after the Brent Cross Flyover*		
Finchley Road Inbound (including Avenue Rd and Adelaide Rd gyratory)	• South of junction with Fortune Green Road to junction with Sumpter Close **1,600m** • South of junction with Adelaide Road to north of junction with Queens Grove **700m**	• Mon-Fri 7am-10am 4pm-7pm • Mon-Fri 7am-10am 4pm-7pm
Wellington Road Inbound*		
Prince Albert Road Inbound* (See Notes above on potential route to Hampstead Road)	**NOT USED**	
Parkway*		
Greenland Road*		
Bayham Street*		
Crowndale Road*	**NOT USED**	
Harrington Square*		
Lidlington Place*		
Hampstead Road Inbound	• From junction with Lidlington Place to north of junction with Cardington Street **250m** • From junction with Netley Street to north of junction with Drummond Road **150m**	• Mon-Fri 7am-10am • Mon-Fri 7am-10am

Roads on ROUTE 10	Length(s) of Inbound bus lane by road (KM)	Hours of Bus Lane Operation
Euston Road Inbound	• From junction with Cleveland Street to Marylebone Road **200m**	• At Any Time
Park Road Inbound		
Baker Street Inbound	• From junction with Allsop Place to junction with Marylebone Road **400m**	• Mon-Fri 7am-10am 4pm-7pm
Marylebone Road Inbound	• From Baker Street to east of junction with Old Marylebone Road **500m**	• At Any Time
Old Marylebone Road Inbound*		
Edgeware Road Inbound*		
Marble Arch*		
Park Lane Inbound	• From junction with N Row to north of junction with Piccadilly Arcade **1,000m**	• Mon-Sat 7am-7pm
Piccadilly Arcade*		
Duke of Wellington Place*		
Grosvenor Place Inbound*		
Lower Grosvenor Place Inbound*		
Bressenden Place*		
Vauxhall Bridge Road Inbound	• From east of junction with Bloomburgh Street to junction with Drummond Street **300m**	• Mon-Fri 4pm-7pm
Vauxhall Bridge Inbound*		
Albert Embankment Inbound	• From junction with Vauxhall Bridge Road to junction with Tinworth Street **750m** • North of junction with Tinworth Street to south of junction with Lambeth Road **250m**	• Mon-Sat 7am-7pm • Mon-Sat 7am-10am 4pm-7pm
Lambeth Palace Road Inbound	• North of entrance to St Thomas Hospital to north of junction with Royal Street **1,000m**	• Mon-Sat 7am-10am 4pm-7pm
York Road Inbound	• North of junction with Chichely Street to south of the Concert Hall Approach **300m**	• At Any Time
Stamford Street Inbound*		
Blackfriars Road Inbound*		

Total estimated length of Inbound bus lane = **6,800m** out of **18,250m, approx. 37.3% Inbound route coverage.**

Appendix 3 – Notes for Police Video Survey Team Members

Transport for London

BRIEFING NOTE
PROPOSED VIDEO SURVEY ROUTES TO PALESTRA – TfL EMISSIONS – MOTORCYCLES STUDY

1.1 Selected Survey Routes

1.1.1 Each of the routes was chosen for the percentage of their lengths with inbound bus lanes that the Metropolitan Police Powered Two Wheeler PTW rider(s) can use for the video surveying.

1.1.2 The routes proposed by TfL's Motorcycle Policy Unit were surveyed by Local Transport Projects Ltd using Google Maps and a TfL-scaled drawing of Greater London to record lengths of bus lane on the routes. Inbound bus lanes cover a third of the lengths of most of the selected routes.

1.1.3 The routes to be surveyed, total bus lane lengths, and the recommended survey order and date(s) are shown in the table below. All survey routes are to finish at Palestra, 197 Blackfriars Road, London SE1 8NJ.

Routes to be surveyed January 19th to January 28th 2010

Survey Priority	Route	Start Point	Total Route Length (KM)	Total Length of Inbound Bus Lanes (KM)	% of Route with Bus Lanes	Proposed survey date(s)
1	1	A1 Archway Road	8.7	3.75	43	**19/01/10**
2	10	A41 Hendon Way	18.25	6.8	37.3	**20/01/10**
3	6	A21 Bromley Common	23.6	8.35	35.4	**21/01/10**
4	9	A3 Roehampton Vale	17.5	5.65	32.3	**26/01/10**
5	3	A10 Great Cambridge Road	24	7.15	29.8	**27/01/10**
6	2	A10 Great Cambridge Road	17	5.05	29.7	**28/01/10**

1.2 Reserve Routes

1.2.1 Ten routes were originally proposed but we believe that the above six will provide the best comparisons of journey times and emissions of PTWs in bus lanes with a PTW and car in general traffic lanes. In addition to these prioritised routes, it is recommended that the following routes are considered as reserves should any of the preferred six prove impossible through planned road-works or other complications.

Reserve Routes which *could* be surveyed January 19th to January 28th 2010

Survey Priority	Route	Start Point	Inbound Route Length (KM)	Total Length of Inbound Bus Lanes (KM)	% of Route with Bus Lanes	Proposed survey date(s)
7	5	A205 Grand Depot Rd	19	5.05	26.6	TBA
8	8	A297 St Helier Avenue	16.6	4.3	26	TBA
9	4	A13 Alfred's Way	17.14	4.0	23.3	TBA
10	7	A23 Brighton Road	27.67	3.55	12.8	TBA

1.2.2 With between 12.8% and 26.6% bus lane coverage, these routes are unlikely to provide as effective journey times and emissions comparisons as the selected routes.

1.2.3 Full details of the Initial assessment of the routes, and all of the starting and finishing points and marked enforcement times for each length of bus lane by route can be supplied on request.

1.3 Selected Survey Route Details

1.3.1 Lists of the roads on each route and supporting notes are detailed on the following pages.

1.4 Survey Refinements

1.4.1 Should there be a requirement to undertake further surveys to verify the findings of this research there are a few improvements that it is recommended could be made before they are undertaken:

- Time must be set aside the day prior to the survey(s) to ensure recording equipment can be checked and substituted if need be;
- Consider the duty start time of Police Officers if the previous day was a day off for them; 06.00 hours. Ideally, the 08.00-09.00 peak hour should be covered during the survey but this means a survey could still start as late as 08.00 hours, until approximately 09.30 hours;
- Police riders/drivers should be briefed by those running the research on each route using a suitably scaled plan, prior to commencement of the first surveys;
- To reduce the likelihood of any wasted survey time due to snow and ice, the months of December, January and February should be avoided;

1.4.2 It must be understood that road works can sometimes cause detours to be made from the proposed route. As previously discussed, this is a normal occurrence on busy urban routes and even traffic management detours should not prevent those surveys from being counted towards average journey times and emission calculations, as long as all survey vehicles experienced the same conditions.

1.4.3 Wherever Police Officers carrying out surveys are required to deal with Road Traffic Accidents, all of the surveys for that route on that day must be abandoned.

1.5 Notes for Metropolitan Police Video Survey Team Members

1.5.1 Route 1: A1 Archway Road to Palestra

Date: Tuesday 19th January 2010

Route Length: 8.7 kilometres

1.5.2 Route to take:

A1 Archway Road (Start at junction with Sheldon Avenue) to

Holloway Road, then south through Highbury Corner, and continue on the A1 to

Upper Street to

Pentonville Road to

Penton Rise to

Kings Cross Rd to

Farringdon Rd to

Farringdon St to

New Bridge St to

Blackfriars Bridge to

Blackfriars Rd and Palestra

1.5.3 Actions for Surveyors

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.5.4 Surveyor's Notes

1.6 Notes for Metropolitan Police Video Survey Team Members

1.6.1 Route 10: A41 Hendon Way to Palestra

Date: Wednesday 20th January 2010

Route Length: 18.25 kilometres

1.6.2 Route to take:

A41 Hendon Way (Start after the Brent Cross Flyover) to

Finchley Road (including Avenue Rd and Adelaide Rd gyratory) to

Wellington Road to

Park Road to

Baker Street to

Marylebone Road to

Old Marylebone Road to

Edgeware Road to

Marble Arch to

Park Lane to

Piccadilly Arcade to

Duke of Wellington Place to

Grosvenor Place to

Lower Grosvenor Place to

Bressenden Place to

Vauxhall Bridge Road to

Vauxhall Bridge to

Albert Embankment to

Lambeth Palace Road to

York Road to

Stamford Street to

Blackfriars Road and Palestra

1.6.3 Actions for Surveyors

- Record mileage at the start and the end of the route.

- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.6.4 **Surveyor's Notes**

1.7 Notes for Metropolitan Police Video Survey Team Members

1.7.1 **Route 6: A21 Bromley Common to Palestra**

Date: Thursday 21st January 2010

Route Length: 23.6 kilometres

1.7.2 **Route to take:**

A21 Bromley Common *(Start north of junction with Oakley Road and Hastings Road)* to

Masons Hill to

Kentish way to

Tweedy Road to

London Road to

Bromley Hill to

Bromley Road to

Rushey Green to

Lewisham High Street to

Molesworth Street to

Loampit Vale to

Loampit Hill to

Lewisham Way to

New Cross Road to

Queens Road to

Peckham High Street to

Peckham Road to

Camberwell Church Street to

Camberwell New Road to

Harleyford Street to

Kennington Oval to

Harleyford Road to

South Lambeth Road to* (SEE 1.6.4 NOTES)

Parry Place to

Wandworth Road to

Albert Embankment to

Lambeth Palace Road to

York Road to

Stamford Street to

Blackfriars Road and Palestra

1.7.3 **Notes on details of the route for the surveyors**:

PTWs using bus lanes could potentially have used the bus / rail / Underground interchange at South Lambeth Place. Instead, all vehicles should use the South Lambeth Road, Parry Place, Wandworth Road route to Albert Embankment.

1.7.4 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.7.5 **Surveyor's Notes**

1.8 Notes for Metropolitan Police Video Survey Team Members

1.8.1 Route 9: A3 Roehampton Vale to Palestra

Date: Tuesday 26th January 2010

Route Length: 17.5 kilometres

1.8.2 Route to take:

A3 Roehampton Vale *(Start past Kingston Vale and junction with Robin Hood Way)* to

Kingston Road to

Roehampton Lane to

Upper Richmond Road to

West Hill to

Armoury Way to

Old York Road to

Swandon Way to

York Road to

Battersea Park Road to

Nine Elms Lane to

Albert Embankment to

Lambeth Palace Road to

York Road to

Stamford Street to

Blackfriars Road and Palestra

1.8.3 Actions for Surveyors

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.8.4 **Surveyor's Notes**

1.9 Notes for Metropolitan Police Video Survey Team Members

1.9.1 **Route 3: A10 Great Cambridge Road to Palestra**

Date: Wednesday 27th January 2010

Route Length: 24 kilometres

1.9.2 **Route to take:**

A10 Great Cambridge Road *(Start at south side of junction with A406 North Circular Road)* to

The Roundway to

Lordship Lane to

Bruce Grove to

High Road to * (SEE 1.8.4 NOTES)

Monument Way to

Broad Lane to

High Road to

Seven Sisters Road to

Isledon Road to

Tollington Road to

Camden Road to

Camden Street to

Oakley Square to

Lidlington Place to

Hampstead Road to

Euston Road to

Pentonville Road to

City Road to

Old Street to

Shoreditch High Street to

Norton Folgate to

Bishopsgate to

Gracechurch Street to

London Bridge (King William Street) to

Southwark Street to

Blackfriars Road and Palestra

1.9.3 **Notes on details of the route for the surveyors**:

Though there is a contra-flow segregated busway on High Road between junctions with Monument Way and Broad lane, both PTWs and the car should use the Monument Way and Broad Lane A10 route and should re-join High Road at the junction with Broad Lane. The segregated busway currently looks too narrow to accommodate a filtering PTW and could put the rider and bus drivers/passengers at risk.

1.9.4 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.9.5 **Surveyor's Notes**

1.10 Notes for Metropolitan Police Video Survey Team Members

1.10.1 **Route 2: A10 Great Cambridge Road to Palestra**

Date: Thursday 28th January 2010

Route Length: 17 kilometres

1.10.2 **Route to take:**

A10 Great Cambridge Road *(Start at south side of junction with A406 North Circular Road)* to

The Roundway to

Lordship Lane to

Bruce Grove to

High Road to * (SEE 1.9.4 NOTES)

Monument Way to

Broad Lane to

High Road to

Stamford Hill to

Rectory Road to

Manse Road to

Evering Road to

Stoke Newington Road to

Kingsland High Street to

Kingsland Road to

Shoreditch High Street to

Norton Folgate to

Bishopsgate to

Gracechurch Street to

London Bridge (King William Street) to

Southwark Street to

Blackfriars Road and Palestra

1.10.3 **Notes on details of the route for the surveyors**:

Though there is a contra-flow segregated busway on High Road between junctions with Monument Way and Broad Lane, both PTWs and the car should use the Monument Way and Broad Lane A10 route and should re-join High Road from Broad Lane. The segregated busway looks too narrow to accommodate a filtering PTW and could put the rider and bus drivers/passengers at risk.

1.10.4 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.10.5 **Surveyor's Notes**

1.11 Notes for Metropolitan Police Video Survey Team Members

1.11.1 Route 5: A205 Grand Depot Road to Palestra

Date: TBA

Route Length: 19 kilometres

1.11.2 **Route to take:**

A205 Grand Depot Road *(Start at junction with John Wilson Street)* to

Woolwich Common to

Academy Road to

Well Hall Road to

Westhorne Avenue to

Eltham Road to

Lee High Road to

Loampit Vale to

Loampit Hill to

Lewisham Way to

New Cross Road to * (SEE 1.10.4 NOTES)

Queen's Road to

Kender Street to

New Cross Road to

Old Kent Road to

New Kent Road to

Elephant and Castle to

St George's Road to

Westminster Bridge Road to

Blackfriars Road and Palestra

1.11.3 **Notes on details of the route for the surveyors**:

Articulated bus services still use this route and tend to occupy the entire waiting reservoir on a red signal, at the junction of New Cross Road and Queen's Road. This will make the manoeuvre hazardous for motorcyclists. All survey vehicles should use the route for general traffic; west down Queens Road, then north up Kender Street, to re-join the A2 New Cross Road again.

1.11.4 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.11.5 **Surveyor's Notes**

1.12 Notes for Metropolitan Police Video Survey Team Members

1.12.1 **Route 8: A297 St Helier Avenue to Palestra**

Date: TBA

Route Length: 16.6 kilometres

1.12.2 **Route to take:**

A297 St Helier Avenue *(Start north of the Rosehill Roundabout)* to

Morden Hall Road to

Morden Road Road to

Merantum Way to

Christchurch Road to

High St Colliers Wood to

Tooting High Street to

Upper Tooting Road to

Balham High Road to

Balham Hill to

Clapham Common South Side to

Clapham High Street to

Clapham Road to

Kennington Park Road to

Newington Butts to

Elephant and Castle to

St George's Road to

Westminster Bridge Road to

Blackfriars Road and Palestra

1.12.3 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.12.4 **Surveyor's Notes**

1.13 Notes for Metropolitan Police Video Survey Team Members

1.13.1 Route 4: A13 Alfreds Way to Palestra

Date: Thursday TBA

Route Length: 17.14 kilometres

1.13.2 Route to take:

A13 Alfreds Way *(Start to west of junction with A1153 Lodges Avenue)* to

Newham Way to

East India Dock Road to

Commercial Road westbound to

Branch Road to

Rotherhithe Tunnel to

Southwark Bridge Road to

Jamaica Road to

Druid Street to

St.Thomas Street to

Southwark Street to

Blackfriars Road and Palestra

1.13.3 Actions for Surveyors

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.13.4 Surveyor's Notes

1.14 Notes for Metropolitan Police Video Survey Team Members

1.14.1 **Route 7: A23 Brighton Road to Palestra**

Date: TBA

Route Length: 27.67 kilometres

1.14.2 **Route to take:**

A23 Brighton Road *(Start at junction with Dean Lane)* to

Coulsden By-Pass to

Brighton Road to

Purley Way to

Thornton Road to

London Road to

Streatham High Road to

Streatham Hill to

Brixton Hill to

Brixton Road to

Kennington Park Road to

Newington Butts to

Elephant and Castle to

St George's Road to

Westminster Bridge Road to

Blackfriars Road and Palestra

1.14.3 **Actions for Surveyors**

- Record mileage at the start and the end of the route.
- Start recording from route start point indicated at 7.30am or as close to that time as possible.
- Only stop the video recording on reaching Palestra.
- All routes should take less than 1 hour 30 mins (length of the survey video tapes). However, if the video finishes prior to reaching Palestra, record the time you have when you arrive at Palestra, and any difference between your time and the video cameras, so we know how long the whole route took to finish.

1.14.4 **Surveyor's Notes**

Appendix 4 – Route Journey Times and Average Speed Tables

Route: A - A1 ARCHWAY ROAD TO PALESTRA
Date: Tuesday 19th January 2010
Survey Vehicle: PTW_BL
Time started (HH:MM:SS): 07:30:20
Time finished (HH:MM:SS): 07:57:25

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:27:05
Total Journey Time (Secs) (Inc stoppages): 1,625
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:21:53
Total Journey Time (Secs) (Exc stoppages): 1,313

Total Stoppages (Secs): 312
Total No. Of Stoppages 17 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 6.847
Total Distance Travelled (KM): 11.017

Average Speed (Mile/H) (Inc stoppages): 15.17
Average Speed (Miles/H) (Exc stoppages): 18.77
Average Speed (KM/H) (Inc stoppages): 24.41
Average Speed (KM/H) (Exc stoppages): 30.21

NOTES
- The PTW for this survey run was observed from the Route 1 PTW_GT DVD to be a marked Police PTW, not un-marked as requested. This may have affected the way other drivers in the traffic stream treated this surveyor. By the time this was picked up from a check of the DVD by LTP Ltd on Monday 25/01/10, the first three survey routes had already been completed. As a consequence of this, Andy Mayo asked Steve Connolly of TfL on 27/01/10 to request that the Met Police use two un-marked PTWs for the final three survey runs on 2nd and 10th and 11th February. The Met Police were unable to comply with this request due to the unavailability of suitable PTWs.
- The survey PTW did not use bus lanes all the time, (for example on the run towards the Archway gyratory), but used the general traffic lanes if they were clear. The survey PTW did enter the bus lane on the Archway Gyratory approach when approaching the southbound queue at that junction.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed down behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW rider missed an opportunity to get ahead of a queue via the bus gate at the junction of Upper Street with Liverpool Street.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.

- Where the PTW stopped in Pentonville Road, we have removed the time taken for this stoppage from the final Stoppage Time Duration (Secs) and the Section Journey Times End Time (HH:MM:SS), as shown in bold **red** text.

Rows coloured like this indicate sections of the route that include lengths of bus lane

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A1 Archway Road (start from ESSO garage north of junction with Baker's Lane)										**07:30:20**						
	1	0.540	0.540	0.869	0.869	07:32:26	07:33:02	00:00:36	36	07:30:20	07:32:26	00:02:06	126	15.43	24.82	
	2	0.822	1.362	1.323	2.191	07:35:10	07:35:44	00:00:34	34	07:33:02	07:35:10	00:02:08	128	23.12	37.20	
	3	0.617	1.979	0.993	3.184	07:38:05	07:38:11	00:00:06	6	07:35:44	07:38:05	00:02:21	141	15.75	25.35	
	4	0.762	2.741	1.226	4.410	07:40:08	07:40:58	00:00:50	50	07:38:11	07:40:08	00:01:57	117	23.45	37.72	
	5	0.605	3.346	0.973	5.384	07:42:36	07:42:44	00:00:08	8	07:40:58	07:42:36	00:01:38	98	22.22	35.76	
	6	0.797	4.143	1.282	6.666	07:44:47	07:44:51	00:00:04	4	07:42:44	07:44:47	00:02:03	123	23.33	37.53	
	7	0.177	4.320	0.285	6.951	07:45:24	07:45:48	00:00:24	24	07:44:51	07:45:24	00:00:33	33	19.31	31.07	Junction Upper Street with Liverpool Road
	8	0.066	4.386	0.106	7.057	07:46:11	07:46:33	00:00:22	22	07:45:48	07:46:11	00:00:23	23	10.33	16.62	
	9	0.175	4.561	0.282	7.339	07:47:22	07:47:26	00:00:04	4	07:46:33	07:47:22	00:00:49	49	12.86	20.69	
	10	0.005	4.566	0.008	7.347	07:47:38	07:47:51	00:00:13	13	07:47:26	07:47:38	00:00:12	12	1.50	2.41	
	11	0.074	4.640	0.119	7.466	07:48:23	07:48:39	00:00:16	16	07:47:51	07:48:23	00:00:32	32	8.32	13.39	
		0.019	4.659	0.031	7.496	07:48:50	07:49:54	00:01:04	64	07:48:39	07:48:50	00:00:11	11	6.22	10.01	Marked PTW sat in central hatching in Pentonville Road behind a separator island. This stoppage will not be counted, as it would not mormally occur.
	12	0.003	4.662	0.005	7.501	07:50:00	07:50:13	00:00:13	13	07:49:54	07:50:00	00:00:06	6	1.80	2.90	
	13	0.074	4.736	0.119	7.620	07:50:28	07:50:46	00:00:18	18	07:50:13	07:50:28	00:00:15	15	17.76	28.58	
	14	0.401	5.137	0.645	8.265	07:51:51	07:52:11	00:00:20	20	07:50:46	07:51:51	00:01:05	65	22.21	35.73	
	15	0.123	5.260	0.198	8.463	07:52:34	07:52:38	00:00:04	4	07:52:11	07:52:34	00:00:23	23	19.25	30.98	
	16	0.809	6.069	1.302	9.765	07:55:06	07:55:07	00:00:01	1	07:52:38	07:55:06	00:02:28	148	19.68	31.66	
	17	0.732	6.801	1.178	10.943	07:57:28	07:58:07	00:00:39	39	07:55:07	07:57:28	00:02:21	141	18.69	30.07	
		0.046	6.847	0.074	11.017	**Final stop at Palestra**				07:58:07	07:58:29	00:00:22	22	7.53	12.11	
ROUTE END Palestra, Blackfriars Road											**07:57:25**	00:21:53				
Totals			**6.847**		**11.017**				312				**1,313**			

Route: A - A1 ARCHWAY ROAD TO PALESTRA
Date: Tuesday 19th January 2010
Survey Vehicle: PTW_GT
Time started (HH:MM:SS): 07:31:49
Time finished (HH:MM:SS): 08:05:44

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:33:55
Total Journey Time (Secs) (Inc stoppages): 2,035
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:25:51
Total Journey Time (Secs) (Exc stoppages): 1,551

Total Stoppages (Secs): 484
Total No. Of Stoppages 26 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 6.929
Total Distance Travelled (KM): 11.149

Average Speed (Mile/H) (Inc stoppages): 12.26
Average Speed (Miles/H) (Exc stoppages): 16.08
Average Speed (KM/H) (Inc stoppages): 19.72
Average Speed (KM/H) (Exc stoppages): 25.88

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A1 Archway Road (start from ESSO garage north of junction with Baker's Lane)										**07:31:49**						
	1	0.543	0.543	0.874	0.874	07:33:47	07:34:21	00:00:34	34	07:31:49	07:33:47	00:01:58	118	16.57	26.65	
	2	0.653	1.196	1.051	1.924	07:36:18	07:36:19	00:00:01	1	07:34:21	07:36:18	00:01:57	117	20.09	32.33	Stopped at 1st set of southbound signals at the Archway gyratory which includes a pedestrian phase (the junction between the A1 and the A400 at St John's Road and Tollhouse Way)
	3	0.018	1.214	0.029	1.953	07:36:33	07:36:34	00:00:01	1	07:36:19	07:36:33	00:00:14	14	4.63	7.45	As above
	4	0.063	1.277	0.101	2.055	07:37:18	07:37:23	00:00:05	5	07:36:34	07:37:18	00:00:44	44	5.15	8.29	As above
	5	0.005	1.282	0.008	2.063	07:37:30	07:37:31	00:00:01	1	07:37:23	07:37:30	00:00:07	7	2.57	4.14	As above
	6	0.002	1.284	0.003	2.066	07:37:34	07:37:43	00:00:09	9	07:37:31	07:37:34	00:00:03	3	2.40	3.86	As above
	7	0.036	1.320	0.058	2.124	07:38:09	07:38:41	00:00:32	32	07:37:43	07:38:09	00:00:26	26	4.98	8.02	As above
	8	0.023	1.343	0.037	2.161	07:38:55	07:39:41	00:00:46	46	07:38:41	07:38:55	00:00:14	14	5.91	9.52	As above
	9	0.029	1.372	0.047	2.208	07:39:57	07:40:50	00:00:53	53	07:39:41	07:39:57	00:00:16	16	6.53	10.50	As above
	10	0.623	1.995	1.002	3.210	07:43:40	07:43:49	00:00:09	9	07:40:50	07:43:40	00:02:50	170	13.19	21.23	
	11	0.329	2.324	0.529	3.739	07:45:03	07:45:17	00:00:14	14	07:43:49	07:45:03	00:01:14	74	16.01	25.75	Ped crossing south of signals at junction with Holloway Road and Seven Sisters Road
	12	0.446	2.770	0.718	4.457	07:46:34	07:47:34	00:01:00	60	07:45:17	07:46:34	00:01:17	77	20.85	33.55	
	13	0.109	2.879	0.175	4.632	07:48:00	07:48:02	00:00:02	2	07:47:34	07:48:00	00:00:26	26	15.09	24.28	
	14	0.082	2.961	0.132	4.764	07:48:26	07:48:29	00:00:03	3	07:48:02	07:48:26	00:00:24	24	12.30	19.79	
	15	0.397	3.358	0.639	5.403	07:49:38	07:49:48	00:00:10	10	07:48:29	07:49:38	00:01:09	69	20.71	33.33	Highbury Corner
	16	0.283	3.641	0.455	5.858	07:50:46	07:51:18	00:00:32	32	07:49:48	07:50:46	00:00:58	58	17.57	28.26	
	17	0.712	4.353	1.146	7.004	07:53:04	07:53:26	00:00:22	22	07:51:18	07:53:04	00:01:46	106	24.18	38.91	
	18	0.080	4.433	0.129	7.133	07:53:58	07:54:13	00:00:15	15	07:53:26	07:53:58	00:00:32	32	9.00	14.48	
	19	0.234	4.667	0.377	7.509	07:55:07	07:55:17	00:00:10	10	07:54:13	07:55:07	00:00:54	54	15.60	25.10	
	20	0.048	4.715	0.077	7.586	07:55:42	07:56:02	00:00:20	20	07:55:17	07:55:42	00:00:25	25	6.91	11.12	
	21	0.062	4.777	0.100	7.686	07:56:24	07:56:30	00:00:06	6	07:56:02	07:56:24	00:00:22	22	10.15	16.32	
	22	0.137	4.914	0.220	7.907	07:57:01	07:57:15	00:00:14	14	07:56:30	07:57:01	00:00:31	31	15.91	25.60	
	23	0.282	5.196	0.454	8.360	07:58:16	07:58:17	00:00:01	1	07:57:15	07:58:16	00:01:01	61	16.64	26.78	
	24	0.300	5.496	0.483	8.843	07:59:22	07:59:45	00:00:23	23	07:58:17	07:59:22	00:01:05	65	16.62	26.73	
	25	0.106	5.602	0.171	9.014	08:00:16	08:00:50	00:00:34	34	07:59:45	08:00:16	00:00:31	31	12.31	19.81	
	26	1.041	6.643	1.675	10.689	08:04:16	08:04:43	00:00:27	27	08:00:50	08:04:16	00:03:26	206	18.19	29.27	Blackfriars Road
		0.286	6.929	0.460	11.149	**Final stop at Palestra**				08:04:43	08:05:44	00:01:01	61	16.88	27.16	
ROUTE END Palestra, Blackfriars Road											**08:05:44**	00:25:51				
Totals			**6.929**		**11.149**				**484**				**1,551**			

Route: A - A1 ARCHWAY ROAD TO PALESTRA
Date: Tuesday 19th January 2010
Survey Vehicle: CAR_GT

Time started (HH:MM:SS):	07:32:16
Time finished (HH:MM:SS):	08:20:40
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:48:24
Total Journey Time (Secs) (Inc stoppages):	2,904
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:31:25
Total Journey Time (Secs) (Exc stoppages):	1,885
Total Stoppages (Secs):	1,019
Total No. Of Stoppages	47
Total Distance Travelled (Miles):	6.952
Total Distance Travelled (KM):	11.186
Average Speed (Mile/H) (Inc stoppages):	8.62
Average Speed (Miles/H) (Exc stoppages):	13.28
Average Speed (KM/H) (Inc stoppages):	13.87
Average Speed (KM/H) (Exc stoppages):	21.36

I.e. Where survey vehicle comes to a complete stop and speed is 0kph.

NOTES

- Due to the car's inability to filter through traffic, it lost ground to the PTWs. The additional time taken to cover the same distance resulted in the car running through part of the busiest hour of the AM peak period when traffic volumes entering Central London are at their peak. This resulted in additional stoppages and delays as shown iin the analysis table below.

Rows coloured like this indicate sections of the route that include lengths of bus lane

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A1 Archway Road (start from ESSO garage north of junction with Baker's Lane)										**07:32:16**						
	1	0.529	0.529	0.851	0.851	07:34:14	07:34:52	00:00:38	38	07:32:16	07:34:14	00:01:58	118	16.14	25.97	
	2	0.193	0.722	0.311	1.162	07:35:48	07:35:52	00:00:04	4	07:34:52	07:35:48	00:00:56	56	12.41	19.96	
	3	0.057	0.779	0.092	1.253	07:36:17	07:36:24	00:00:07	7	07:35:52	07:36:17	00:00:25	25	8.21	13.21	
	4	0.399	1.178	0.642	1.895	07:37:30	07:37:35	00:00:05	5	07:36:24	07:37:30	00:01:06	66	21.76	35.02	Stopped at 1st set of southbound signals at the Archway gyratory which includes a pedestrian phase (the junction between the A1 and the A400 at St John's Road and Tollhouse Way)
	5	0.036	1.214	0.058	1.953	07:38:01	07:38:21	00:00:20	20	07:37:35	07:38:01	00:00:26	26	4.98	8.02	As above
	6	0.003	1.217	0.005	1.958	07:38:27	07:38:36	00:00:09	9	07:38:21	07:38:27	00:00:06	6	1.80	2.90	As above
	7	0.028	1.245	0.045	2.003	07:39:01	07:39:42	00:00:41	41	07:38:36	07:39:01	00:00:25	25	4.03	6.49	As above
	8	0.021	1.266	0.034	2.037	07:39:59	07:40:37	00:00:38	38	07:39:42	07:39:59	00:00:17	17	4.45	7.16	As above
	9	0.024	1.290	0.039	2.076	07:41:02	07:41:38	00:00:36	36	07:40:37	07:41:02	00:00:25	25	3.46	5.56	As above
	10	0.032	1.322	0.051	2.127	07:41:59	07:42:37	00:00:38	38	07:41:38	07:41:59	00:00:21	21	5.49	8.83	As above
	11	0.031	1.353	0.050	2.177	07:42:59	07:43:45	00:00:46	46	07:42:37	07:42:59	00:00:22	22	5.07	8.16	As above
	12	0.247	1.600	0.397	2.574	07:44:57	07:45:02	00:00:05	5	07:43:45	07:44:57	00:01:12	72	12.35	19.87	
	13	0.351	1.951	0.565	3.139	07:46:54	07:47:01	00:00:07	7	07:45:02	07:46:54	00:01:52	112	11.28	18.15	
	14	0.290	2.241	0.467	3.606	07:48:43	07:48:59	00:00:16	16	07:47:01	07:48:43	00:01:42	102	10.24	16.47	
	15	0.217	2.458	0.349	3.955	07:49:42	07:50:12	00:00:30	30	07:48:59	07:49:42	00:00:43	43	18.17	29.23	
	16	0.300	2.758	0.483	4.438	07:51:11	07:51:39	00:00:28	28	07:50:12	07:51:11	00:00:59	59	18.31	29.45	
	17	0.065	2.823	0.105	4.542	07:52:06	07:52:09	00:00:03	3	07:51:39	07:52:06	00:00:27	27	8.67	13.94	On Holloway Road just south of junction with Hornsey Road to junction with Liverpool Road. General traffic unable to pass between vehicles turning right into Liverpool Road and bus lane.
	18	0.066	2.889	0.106	4.648	07:52:39	07:52:44	00:00:05	5	07:52:09	07:52:39	00:00:30	30	7.92	12.74	As above
	19	0.209	3.098	0.336	4.985	07:53:30	07:53:40	00:00:10	10	07:52:44	07:53:30	00:00:46	46	16.36	26.32	
	20	0.186	3.284	0.299	5.284	07:54:25	07:54:35	00:00:10	10	07:53:40	07:54:25	00:00:45	45	14.88	23.94	
	21	0.096	3.380	0.154	5.438	07:55:16	07:55:27	00:00:11	11	07:54:35	07:55:16	00:00:41	41	8.43	13.56	Highbury Corner
	22	0.527	3.907	0.848	6.286	07:57:24	07:57:25	00:00:01	1	07:55:27	07:57:24	00:01:57	117	16.22	26.09	
	23	0.125	4.032	0.201	6.487	07:57:51	07:57:53	00:00:02	2	07:57:25	07:57:51	00:00:26	26	17.31	27.85	
	24	0.143	4.175	0.230	6.718	07:58:23	07:58:24	00:00:01	1	07:57:53	07:58:23	00:00:30	30	17.16	27.61	
	25	0.024	4.199	0.039	6.756	07:58:34	07:59:53	00:01:19	79	07:58:24	07:58:34	00:00:10	10	8.64	13.90	
	26	0.093	4.292	0.150	6.906	08:00:15	08:00:28	00:00:13	13	07:59:53	08:00:15	00:00:22	22	15.22	24.49	
	27	0.095	4.387	0.153	7.059	08:00:49	08:01:53	00:01:04	64	08:00:28	08:00:49	00:00:21	21	16.29	26.20	
	28	0.067	4.454	0.108	7.166	08:02:17	08:02:39	00:00:22	22	08:01:53	08:02:17	00:00:24	24	10.05	16.17	
	29	0.149	4.603	0.240	7.406	08:03:24	08:03:27	00:00:03	3	08:02:39	08:03:24	00:00:45	45	11.92	19.18	Pentonville Road to junction with Penton Rise. Volume of traffic.
	30	0.016	4.619	0.026	7.432	08:03:38	08:04:04	00:00:26	26	08:03:27	08:03:38	00:00:11	11	5.24	8.43	As above
	31	0.019	4.638	0.031	7.463	08:04:16	08:04:33	00:00:17	17	08:04:04	08:04:16	00:00:12	12	5.70	9.17	As above
	32	0.012	4.650	0.019	7.482	08:04:53	08:05:24	00:00:31	31	08:04:33	08:04:53	00:00:20	20	2.16	3.48	As above
	33	0.028	4.678	0.045	7.527	08:05:47	08:06:02	00:00:15	15	08:05:24	08:05:47	00:00:23	23	4.38	7.05	As above
	34	0.045	4.723	0.072	7.599	08:06:33	08:06:46	00:00:13	13	08:06:02	08:06:33	00:00:31	31	5.23	8.41	As above
	35	0.029	4.752	0.047	7.646	08:07:01	08:07:23	00:00:22	22	08:06:46	08:07:01	00:00:15	15	6.96	11.20	As above
	36	0.033	4.785	0.053	7.699	08:07:41	08:08:10	00:00:29	29	08:07:23	08:07:41	00:00:18	18	6.60	10.62	As above
	37	0.152	4.937	0.245	7.944	08:08:41	08:08:55	00:00:14	14	08:08:10	08:08:41	00:00:31	31	17.65	28.40	
	38	0.255	5.192	0.410	8.354	08:09:45	08:10:06	00:00:21	21	08:08:55	08:09:45	00:00:50	50	18.36	29.54	
	39	0.295	5.487	0.475	8.829	08:11:05	08:11:10	00:00:05	5	08:10:06	08:11:05	00:00:59	59	18.00	28.96	Queues from signalised junction of Farringdon Road with Clerkenwell Street
	40	0.020	5.507	0.032	8.861	08:11:23	08:11:26	00:00:03	3	08:11:10	08:11:23	00:00:13	13	5.54	8.91	As above
	41	0.011	5.518	0.018	8.878	08:11:37	08:11:59	00:00:22	22	08:11:26	08:11:37	00:00:11	11	3.60	5.79	As above

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
	42	0.045	5.563	0.072	8.951	08:12:22	08:13:15	00:00:53	53	08:11:59	08:12:22	00:00:23	23	7.04	11.33	As above
	43	0.041	5.604	0.066	9.017	08:13:30	08:14:33	00:01:03	63	08:13:15	08:13:30	00:00:15	15	9.84	15.83	As above
	44	0.464	6.068	0.747	9.763	08:15:56	08:16:02	00:00:06	6	08:14:33	08:15:56	00:01:23	83	20.13	32.38	
	45	0.255	6.323	0.410	10.174	08:16:56	08:17:46	00:00:50	50	08:16:02	08:16:56	00:00:54	54	17.00	27.35	
	46	0.296	6.619	0.476	10.650	08:18:45	08:18:51	00:00:06	6	08:17:46	08:18:45	00:00:59	59	18.06	29.06	
	47	0.290	6.909	0.467	11.117	08:19:50	08:20:21	00:00:31	31	08:18:51	08:19:50	00:00:59	59	17.69	28.47	
		0.043	6.952	0.069	11.186	**Final stop at Palestra**				08:20:21	08:20:40	00:00:19	19	8.15	13.11	
ROUTE END Palestra, Blackfriars Road											**08:20:40**	00:31:25				
Totals			**6.952**		**11.186**				**1,019**				**1,885**			

MODE JOURNEY TIME COMPARISON

Route: A - A1 ARCHWAY ROAD TO PALESTRA

Date: Tuesday 19th January 2010

Survey Vehicle:	**PTW_BL**	**PTW_GT**	**CAR_GT**	**PTW_GT-PTW_BL**	**CAR_GT-PTW_BL**
Time started (HH:MM:SS):	07:30:20	07:31:49	07:32:16		
Time finished (HH:MM:SS):	07:57:25	08:05:44	08:20:40		
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:27:05	00:33:55	00:48:24	00:06:50	00:21:19
Total Journey Time (Secs) (Inc stoppages):	1,625	2,035	2,904	410	1,279
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:21:53	00:25:51	00:31:25	00:03:58	00:09:32
Total Journey Time (Secs) (Exc stoppages):	1,313	1,551	1,885	238	572
Total Stoppages (Secs):	312	484	1,019	172	707
Total No. Of Stoppages	17	26	47	9	30
Total Distance Travelled (Miles):	6.847	6.929	6.952	0.082	0.105
Total Distance Travelled (KM):	11.017	11.149	11.186	0.13	0.17
Average Speed (Miles/H) (Inc stoppages):	15.17	12.26	8.62	-2.91	-6.55
Average Speed (Miles/H) (Exc stoppages):	18.77	16.08	13.28	-2.69	-5.50
Average Speed (KM/H) (Inc stoppages):	24.41	19.72	13.87	-4.68	-10.54
Average Speed (KM/H) (Exc stoppages):	30.21	25.88	21.36	-4.33	-8.84

Route: B -A41 HENDON WAY TO PALESTRA
Date: Wednesday 20th January 2010
Survey Vehicle: PTW_BL
Time started (HH:MM:SS): 07:29:02
Time finished (HH:MM:SS): 08:13:01

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:43:59
Total Journey Time (Secs) (Inc stoppages): 2,639
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:32:55
Total Journey Time (Secs) (Exc stoppages): 1,975

Total Stoppages (Secs): 664
Total No. Of Stoppages 31 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 10.581
Total Distance Travelled (KM): 17.025

Average Speed (Mile/H) (Inc stoppages): 14.43
Average Speed (Miles/H) (Exc stoppages): 19.29
Average Speed (KM/H) (Inc stoppages): 23.22
Average Speed (KM/H) (Exc stoppages): 31.03

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES
- As noted for Route 1 PTW_BL, the PTW used was a marked Police PTW.
- The survey PTW did not use bus lanes all the time, but used the general traffic lanes if they were clear.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A41 Hendon Way (start from north of junction with Highfield Avenue)										**07:29:02**						
	1	0.497	0.497	0.800	0.800	07:30:11	07:30:24	00:00:13	13	07:29:02	07:30:11	00:01:09	69	25.93	41.72	
	2	0.224	0.721	0.360	1.160	07:31:28	07:31:35	00:00:07	7	07:30:24	07:31:28	00:01:04	64	12.60	20.27	
	3	0.625	1.346	1.006	2.166	07:33:25	07:33:41	00:00:16	16	07:31:35	07:33:25	00:01:50	110	20.45	32.91	
	4	0.096	1.442	0.154	2.320	07:34:12	07:34:30	00:00:18	18	07:33:41	07:34:12	00:00:31	31	11.15	17.94	
	5	0.511	1.953	0.822	3.142	07:36:31	07:36:38	00:00:07	7	07:34:30	07:36:31	00:02:01	121	15.20	24.46	Riding in the bus lane in this section
	6	0.501	2.454	0.806	3.948	07:38:17	07:38:21	00:00:04	4	07:36:38	07:38:17	00:01:39	99	18.22	29.31	Riding in the bus lane in this section
	7	0.277	2.731	0.446	4.394	07:39:25	07:39:53	00:00:28	28	07:38:21	07:39:25	00:01:04	64	15.58	25.07	
	8	0.158	2.889	0.254	4.648	07:40:23	07:40:35	00:00:12	12	07:39:53	07:40:23	00:00:30	30	18.96	30.51	
	9	0.551	3.440	0.887	5.535	07:42:26	07:43:00	00:00:34	34	07:40:35	07:42:26	00:01:51	111	17.87	28.75	
	10	0.507	3.947	0.816	6.351	07:43:51	07:44:05	00:00:14	14	07:43:00	07:43:51	00:00:51	51	35.79	57.58	
	11	0.006	3.953	0.010	6.360	07:44:10	07:44:17	00:00:07	7	07:44:05	07:44:10	00:00:05	5	4.32	6.95	End time high?
	12	0.668	4.621	1.075	7.435	07:46:32	07:46:55	00:00:23	23	07:44:17	07:46:32	00:02:15	135	17.81	28.66	
	13	0.133	4.754	0.214	7.649	07:47:29	07:47:44	00:00:15	15	07:46:55	07:47:29	00:00:34	34	14.08	22.66	
	14	0.414	5.168	0.666	8.315	07:49:13	07:49:23	00:00:10	10	07:47:44	07:49:13	00:01:29	89	16.75	26.94	
	15	0.142	5.310	0.228	8.544	07:49:48	07:50:48	00:01:00	60	07:49:23	07:49:48	00:00:25	25	20.45	32.90	
	16	0.127	5.437	0.204	8.748	07:51:25	07:51:33	00:00:08	8	07:50:48	07:51:25	00:00:37	37	12.36	19.88	
	17	0.059	5.496	0.095	8.843	07:52:02	07:52:27	00:00:25	25	07:51:33	07:52:02	00:00:29	29	7.32	11.78	
	18	0.487	5.983	0.784	9.627	07:54:15	07:54:33	00:00:18	18	07:52:27	07:54:15	00:01:48	108	16.23	26.12	
	19	1.098	7.081	1.767	11.393	07:57:02	07:57:30	00:00:28	28	07:54:33	07:57:02	00:02:29	149	26.53	42.68	
	20	0.280	7.361	0.451	11.844	07:58:24	07:58:35	00:00:11	11	07:57:30	07:58:24	00:00:54	54	18.67	30.03	
	21	0.345	7.706	0.555	12.399	07:59:25	08:00:06	00:00:41	41	07:58:35	07:59:25	00:00:50	50	24.84	39.97	
	22	0.416	8.122	0.669	13.068	08:01:14	08:01:28	00:00:14	14	08:00:06	08:01:14	00:01:08	68	22.02	35.44	
	23	0.042	8.164	0.068	13.136	08:01:42	08:03:00	00:01:18	78	08:01:28	08:01:42	00:00:14	14	10.80	17.38	
	24	0.276	8.440	0.444	13.580	08:03:41	08:03:51	00:00:10	10	08:03:00	08:03:41	00:00:41	41	24.23	38.99	
	25	0.515	8.955	0.829	14.409	08:05:07	08:05:19	00:00:12	12	08:03:51	08:05:07	00:01:16	76	24.39	39.25	
	26	0.003	8.958	0.005	14.413	08:05:23	08:05:26	00:00:03	3	08:05:19	08:05:23	00:00:04	4	2.70	4.34	
	27	0.024	8.982	0.039	14.452	08:05:39	08:05:49	00:00:10	10	08:05:26	08:05:39	00:00:13	13	6.65	10.69	
	28	0.483	9.465	0.777	15.229	08:07:17	08:07:31	00:00:14	14	08:05:49	08:07:17	00:01:28	88	19.76	31.79	
	29	0.206	9.671	0.331	15.561	08:08:14	08:08:36	00:00:22	22	08:07:31	08:08:14	00:00:43	43	17.25	27.75	
	30	0.651	10.322	1.047	16.608	08:10:17	08:11:04	00:00:47	47	08:08:36	08:10:17	00:01:41	101	23.20	37.34	
	31	0.220	10.542	0.354	16.962	08:11:46	08:12:41	00:00:55	55	08:11:04	08:11:46	00:00:42	42	18.86	30.34	
		0.039	10.581	0.063	17.025	**Final stop at Palestra**				08:12:41	08:13:01	00:00:20	20	7.02	11.30	
ROUTE END Palestra, Blackfriars Road											**08:13:01**	00:32:55				
Totals			**10.581**		**17.025**				**664**				**1,975**			

Route: B -A41 HENDON WAY TO PALESTRA
Date: Wednesday 20th January 2010
Survey Vehicle: PTW_GT
Time started (HH:MM:SS): 07:30:13
Time finished (HH:MM:SS): 08:18:36

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:48:23
Total Journey Time (Secs) (Inc stoppages): 2,903
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:37:04
Total Journey Time (Secs) (Exc stoppages): 2,224

Total Stoppages (Secs): 679
Total No. Of Stoppages 31 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 10.710
Total Distance Travelled (KM): 17.232

Average Speed (Mile/H) (Inc stoppages): 13.28
Average Speed (Miles/H) (Exc stoppages): 17.34
Average Speed (KM/H) (Inc stoppages): 21.37
Average Speed (KM/H) (Exc stoppages): 27.89

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A41 Hendon Way (start from north of junction with Highfield Avenue)										**07:30:13**						
	1	1.367	1.367	2.200	2.200	07:34:38	07:34:54	00:00:16	16	07:30:13	07:34:38	00:04:25	265	18.57	29.88	
	2	0.091	1.458	0.146	2.346	07:35:26	07:35:45	00:00:19	19	07:34:54	07:35:26	00:00:32	32	10.24	16.47	
	3	0.516	1.974	0.830	3.176	07:37:53	07:37:58	00:00:05	5	07:35:45	07:37:53	00:02:08	128	14.51	23.35	Long run in bus lane in Finchley Road. At least 3 occasions observed during analysis.
	4	0.721	2.695	1.160	4.336	07:40:29	07:40:58	00:00:29	29	07:37:58	07:40:29	00:02:31	151	17.19	27.66	
	5	0.223	2.918	0.359	4.695	07:41:45	07:41:54	00:00:09	9	07:40:58	07:41:45	00:00:47	47	17.08	27.48	
	6	0.741	3.659	1.192	5.887	07:44:06	07:44:18	00:00:12	12	07:41:54	07:44:06	00:02:12	132	20.21	32.52	
	7	0.329	3.988	0.529	6.417	07:45:17	07:45:31	00:00:14	14	07:44:18	07:45:17	00:00:59	59	20.07	32.30	
	8	0.695	4.683	1.118	7.535	07:47:57	07:48:12	00:00:15	15	07:45:31	07:47:57	00:02:26	146	17.14	27.57	
	9	0.127	4.810	0.204	7.739	07:48:47	07:49:04	00:00:17	17	07:48:12	07:48:47	00:00:35	35	13.06	21.02	
	10	0.421	5.231	0.677	8.417	07:50:30	07:50:41	00:00:11	11	07:49:04	07:50:30	00:01:26	86	17.62	28.36	In bus lane on Marylebone Road.
	11	0.148	5.379	0.238	8.655	07:51:15	07:52:05	00:00:50	50	07:50:41	07:51:15	00:00:34	34	15.67	25.21	
	12	0.127	5.506	0.204	8.859	07:52:45	07:52:54	00:00:09	9	07:52:05	07:52:45	00:00:40	40	11.43	18.39	
	13	0.071	5.577	0.114	8.973	07:53:21	07:53:44	00:00:23	23	07:52:54	07:53:21	00:00:27	27	9.47	15.23	
	14	0.485	6.062	0.780	9.754	07:55:37	07:55:52	00:00:15	15	07:53:44	07:55:37	00:01:53	113	15.45	24.86	
	15	1.103	7.165	1.775	11.528	07:58:44	07:58:49	00:00:05	5	07:55:52	07:58:44	00:02:52	172	23.09	37.15	
	16	0.287	7.452	0.462	11.990	07:59:46	07:59:53	00:00:07	7	07:58:49	07:59:46	00:00:57	57	18.13	29.17	
	17	0.251	7.703	0.404	12.394	08:00:42	08:00:45	00:00:03	3	07:59:53	08:00:42	00:00:49	49	18.44	29.67	
	18	0.092	7.795	0.148	12.542	08:01:07	08:01:26	00:00:19	19	08:00:45	08:01:07	00:00:22	22	15.05	24.22	
	19	0.369	8.164	0.594	13.136	08:02:36	08:02:55	00:00:19	19	08:01:26	08:02:36	00:01:10	70	18.98	30.53	
	20	0.083	8.247	0.134	13.269	08:03:19	08:04:24	00:01:05	65	08:02:55	08:03:19	00:00:24	24	12.45	20.03	Vauxhall Bridge Road junction with Millbank
	21	0.011	8.258	0.018	13.287	08:04:33	08:06:03	00:01:30	90	08:04:24	08:04:33	00:00:09	9	4.40	7.08	As above
	22	0.705	8.963	1.134	14.421	08:08:01	08:08:18	00:00:17	17	08:06:03	08:08:01	00:01:58	118	21.51	34.61	
	23	0.082	9.045	0.132	14.553	08:08:42	08:08:54	00:00:12	12	08:08:18	08:08:42	00:00:24	24	12.30	19.79	
	24	0.013	9.058	0.021	14.574	08:09:05	08:09:39	00:00:34	34	08:08:54	08:09:05	00:00:11	11	4.25	6.85	
	25	0.016	9.074	0.026	14.600	08:09:50	08:10:10	00:00:20	20	08:09:39	08:09:50	00:00:11	11	5.24	8.43	
	26	0.029	9.103	0.047	14.647	08:10:33	08:10:44	00:00:11	11	08:10:10	08:10:33	00:00:23	23	4.54	7.30	
	27	0.629	9.732	1.012	15.659	08:12:34	08:12:51	00:00:17	17	08:10:44	08:12:34	00:01:50	110	20.59	33.12	
	28	0.054	9.786	0.087	15.746	08:13:09	08:13:26	00:00:17	17	08:12:51	08:13:09	00:00:18	18	10.80	17.38	
	29	0.107	9.893	0.172	15.918	08:13:49	08:14:11	00:00:22	22	08:13:26	08:13:49	00:00:23	23	16.75	26.95	
	30	0.555	10.448	0.893	16.811	08:16:19	08:17:33	00:01:14	74	08:14:11	08:16:19	00:02:08	128	15.61	25.12	
	31	0.209	10.657	0.336	17.147	08:18:12	08:18:15	00:00:03	3	08:17:33	08:18:12	00:00:39	39	19.29	31.04	
		0.053	10.710	0.085	17.232	**Final stop at Palestra**				08:18:15	08:18:36	00:00:21	21	9.09	14.62	
ROUTE END Palestra, Blackfriars Road											**08:18:36**	00:37:04				
Totals			**10.710**		**17.232**				**679**				**2,224**			

Route: B -A41 HENDON WAY TO PALESTRA
Date: Wednesday 20th January 2010
Survey Vehicle: CAR_GT

Time started (HH:MM:SS):	07:30:44
Time finished (HH:MM:SS):	08:39:53
Total Journey Time (HH:MM:SS)(Inc stoppages):	01:09:09
Total Journey Time (Secs) (Inc stoppages):	4,149
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:42:50
Total Journey Time (Secs) (Exc stoppages):	2,570
Total Stoppages (Secs):	1,579
Total No. Of Stoppages	56
Total Distance Travelled (Miles):	10.710
Total Distance Travelled (KM):	17.232
Average Speed (Mile/H) (Inc stoppages):	9.29
Average Speed (Miles/H) (Exc stoppages):	15.00
Average Speed (KM/H) (Inc stoppages):	14.95
Average Speed (KM/H) (Exc stoppages):	24.14

I.e. Where survey vehicle comes to a complete stop and speed is 0kph.

NOTES
- Due to the car's inability to filter through traffic, it lost ground to the PTWs. The additional time taken to cover the same distance resulted in the car running through part of the busiest hour of the AM peak period when traffic volumes entering Central London are at their peak. This resulted in additional stoppages and delays as shown in the analysis table below.
- At the point where the driver turned down Allsop Street until they got back onto Marylebone Road, instead of using all of these stoppage and section journey times, we have instead looked at the comparative distances involved between the proposed route and the one taken and derived a comparative journey time.

This comparative journey time was arrived at by:
(i) comparing the Baker Street to Marylebone Road route the driver should have taken with the Allsop Street-Marylebone Road-Marylebone High Street-Marylebone Road route the driver did take. This was approx. 230metres compared to 880metres.
(ii) taking the time the driver took to make the detour and arrive at the junction of Marylebone Road with Baker Street (including stoppages) which was 485 seconds (07:56:34 to 08:04:39).
(iii) subtracting the time stopped looking at the map which was 137 seconds, leaving 348 seconds
(iv) and then multiplying the Baker Street proportion of the distance actually travelled by the actual journey time i.e. 230/880 = 0.26*348 seconds = 91 seconds.
(v) We then subtracted the total time taken to make the detour from the final Section Journey End Time (HH:MM:SS) and Duration (HH:MM:SS) and added the comparative Baker Street journey time to both as highlighted in bold **red** text at the base of the table
i.e. 08:46:27-00:08:05+00:01:31=08:39:53 and 00:49:24-00:08:05+00:01:31=00:42:50.
(vi) We also subtracted the total detour time and added the comparative Baker Street journey time to the Total Duration (secs) as highlighted in bold **red** text
i.e. 2,904-485+91=2,570secs

Rows coloured like this indicate sections of the route that include lengths of bus lane

Route Start and End point	Stoppages	Section Length (KM)	Cummulative Route Length (KM)	Stoppage Times: Start Time (HH:MM:SS)	Stoppage Times: End Time (HH:MM:SS)	Stoppage Times: Duration (HH:MM:SS)	Stoppage Times: Duration (Secs)	Section Journey Times: Start Time (HH:MM:SS)	Section Journey Times: End Time (HH:MM:SS)	Section Journey Times: Duration (HH:MM:SS)	Section Journey Times: Duration (Secs)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A41 Hendon Way (start from north of junction with Highfield Avenue)								**07:30:44**					
	1	These values could not be determined as the Police camera showed a message, 'Calib. Required'. There was no distance measurement shown on the DVD, hence the only speed measurements shown for this analysis are averages for the full route. The overall distance measurement used to arrive at these average speeds comes from the Route 10 PTW-GT survey.		07:32:02	07:32:15	00:00:13	13	07:30:44	07:32:02	00:01:18	78	See comments in length columns.	
	2			07:32:54	07:33:13	00:00:19	19	07:32:15	07:32:54	00:00:39	39		
	3			07:34:51	07:34:56	00:00:05	5	07:33:13	07:34:51	00:01:38	98		
	4			07:35:01	07:35:05	00:00:04	4	07:34:56	07:35:01	00:00:05	5		
	5			07:35:53	07:36:04	00:00:11	11	07:35:05	07:35:53	00:00:48	48		
	6			07:36:40	07:36:57	00:00:17	17	07:36:04	07:36:40	00:00:36	36		
	7			07:37:40	07:37:59	00:00:19	19	07:36:57	07:37:40	00:00:43	43		
	8			07:38:30	07:38:53	00:00:23	23	07:37:59	07:38:30	00:00:31	31		
	9			07:39:45	07:39:55	00:00:10	10	07:38:53	07:39:45	00:00:52	52		
	10			07:41:00	07:41:16	00:00:16	16	07:39:55	07:41:00	00:01:05	65		
	11			07:41:45	07:42:18	00:00:33	33	07:41:16	07:41:45	00:00:29	29		
	12			07:42:55	07:43:11	00:00:16	16	07:42:18	07:42:55	00:00:37	37		
	13			07:43:58	07:44:13	00:00:15	15	07:43:11	07:43:58	00:00:47	47		
	14			07:44:45	07:45:22	00:00:37	37	07:44:13	07:44:45	00:00:32	32		
	15			07:47:22	07:47:37	00:00:15	15	07:45:22	07:47:22	00:02:00	120		
	16			07:48:25	07:48:45	00:00:20	20	07:47:37	07:48:25	00:00:48	48		
	17			07:49:17	07:49:24	00:00:07	7	07:48:45	07:49:17	00:00:32	32		
	18			07:51:52	07:52:01	00:00:09	9	07:49:24	07:51:52	00:02:28	148		
	19			07:52:24	07:53:09	00:00:45	45	07:52:01	07:52:24	00:00:23	23		
	20			07:54:59	07:55:22	00:00:23	23	07:53:09	07:54:59	00:01:50	110		
				07:57:55	08:00:12	00:02:17	137	07:55:22	07:57:55	00:02:33	153		Driver mistakenly drove down Allsop Street instead of Baker Street, then paused to check map and how to get back on route in Marleybone Road. Not all of this time will be counted towards total journey time. See Notes above.
				08:00:41	08:01:06	00:00:25	25	08:00:12	08:00:41	00:00:29	29		
				08:01:35	08:02:37	00:01:02	62	08:01:06	08:01:35	00:00:29	29		
				08:02:53	08:03:10	00:00:17	17	08:02:37	08:02:53	00:00:16	16		
				08:03:50	08:04:26	00:00:36	36	08:03:10	08:03:50	00:00:40	40		
	21			08:05:22	08:05:46	00:00:24	24	08:04:26	08:05:22	00:00:56	56		
	22			08:06:45	08:07:05	00:00:20	20	08:05:46	08:06:45	00:00:59	59		
	23			08:07:30	08:08:06	00:00:36	36	08:07:05	08:07:30	00:00:25	25		
	24			08:09:43	08:10:12	00:00:29	29	08:08:06	08:09:43	00:01:37	97		
	25			08:10:36	08:11:07	00:00:31	31	08:10:12	08:10:36	00:00:24	24		
	26			08:11:26	08:11:54	00:00:28	28	08:11:07	08:11:26	00:00:19	19		
	27			08:13:49	08:14:05	00:00:16	16	08:11:54	08:13:49	00:01:55	115		
	28			08:15:02	08:15:28	00:00:26	26	08:14:05	08:15:02	00:00:57	57		
	29			08:18:53	08:19:21	00:00:28	28	08:15:28	08:18:53	00:03:25	205		

Route Start and End point	Stoppages	Section Length (KM)	Cummulative Route Length (KM)	Stoppage Times				Section Journey Times				Average Speeds By Section (KM/H)	Other Occurrences / Notes
				Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)		
	30			08:20:06	08:20:10	00:00:04	4	08:19:21	08:20:06	00:00:45	45		
	31			08:20:28	08:21:13	00:00:45	45	08:20:10	08:20:28	00:00:18	18		
	32			08:22:03	08:22:24	00:00:21	21	08:21:13	08:22:03	00:00:50	50		
	33			08:22:42	08:24:01	00:01:19	79	08:22:24	08:22:42	00:00:18	18		
	34			08:25:13	08:25:20	00:00:07	7	08:24:01	08:25:13	00:01:12	72		
	35			08:26:07	08:26:21	00:00:14	14	08:25:20	08:26:07	00:00:47	47		
	36			08:26:53	08:27:33	00:00:40	40	08:26:21	08:26:53	00:00:32	32		
	37			08:28:16	08:28:28	00:00:12	12	08:27:33	08:28:16	00:00:43	43		
	38			08:29:04	08:29:21	00:00:17	17	08:28:28	08:29:04	00:00:36	36		
	39			08:29:43	08:30:28	00:00:45	45	08:29:21	08:29:43	00:00:22	22		
	40			08:30:34	08:30:46	00:00:12	12	08:30:28	08:30:34	00:00:06	6		
	41			08:30:58	08:31:37	00:00:39	39	08:30:46	08:30:58	00:00:12	12		
	42			08:31:41	08:31:57	00:00:16	16	08:31:37	08:31:41	00:00:04	4		
	43			08:32:20	08:32:42	00:00:22	22	08:31:57	08:32:20	00:00:23	23		
	44			08:32:53	08:33:07	00:00:14	14	08:32:42	08:32:53	00:00:11	11		
	45			08:33:58	08:34:14	00:00:16	16	08:33:07	08:33:58	00:00:51	51		
	46			08:34:27	08:34:56	00:00:29	29	08:34:14	08:34:27	00:00:13	13		
	47			08:35:08	08:35:32	00:00:24	24	08:34:56	08:35:08	00:00:12	12		
	48			08:35:44	08:36:12	00:00:28	28	08:35:32	08:35:44	00:00:12	12		
	49			08:37:35	08:38:34	00:00:59	59	08:36:12	08:37:35	00:01:23	23		
	50			08:39:21	08:39:28	00:00:07	7	08:38:34	08:39:21	00:00:47	47		
	51			08:39:45	08:40:18	00:00:33	33	08:39:28	08:39:45	00:00:17	17		
	52			08:40:29	08:41:08	00:00:39	39	08:40:18	08:40:29	00:00:11	11		
	53			08:42:03	08:42:10	00:00:07	7	08:41:08	08:42:03	00:00:55	55		
	54			08:42:32	08:42:58	00:00:26	26	08:42:10	08:42:32	00:00:22	22		
	55			08:44:28	08:44:38	00:00:10	10	08:42:58	08:44:28	00:01:30	90		
	56			08:45:24	08:46:06	00:00:42	42	08:44:38	08:45:24	00:00:46	46		
				Final stop at Palestra				08:46:06	08:46:27	00:00:21	21		
ROUTE END Palestra, Blackfriars Road									**08:39:53**	**00:42:50**			
Totals			**17.232**				**1,579**				**2,570**		

2,904

MODE JOURNEY TIME COMPARISON

Route: B -A41 HENDON WAY TO PALESTRA

Date: Wednesday 20th January 2010

Survey Vehicle:	**PTW_BL**	**PTW_GT**	**CAR_GT**	**PTW_GT-PTW_BL**	**CAR_GT-PTW_BL**
Time started (HH:MM:SS):	07:29:02	07:30:13	07:30:44		
Time finished (HH:MM:SS):	08:13:01	08:18:36	08:39:53		
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:43:59	00:48:23	01:09:09	00:04:24	00:25:10
Total Journey Time (Secs) (Inc stoppages):	2,639	2,903	4,149	264	1,510
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:32:55	00:37:04	00:42:50	00:04:09	00:09:55
Total Journey Time (Secs) (Exc stoppages):	1,975	2,224	2,570	249	595
Total Stoppages (Secs):	664	679	1,579	15	915
Total No. Of Stoppages	31	31	56	0	25
Total Distance Travelled (Miles):	10.581	10.710	10.710	0.129	0.129
Total Distance Travelled (KM):	17.025	17.232	17.232	0.207	0.207
Average Speed (Miles/H) (Inc stoppages):	14.43	13.28	9.29	-1.15	-5.14
Average Speed (Miles/H) (Exc stoppages):	19.29	17.34	15.00	-1.95	-4.28
Average Speed (KM/H) (Inc stoppages):	23.22	21.37	14.95	-1.85	-8.27
Average Speed (KM/H) (Exc stoppages):	31.03	27.89	24.14	-3.14	-6.89

Route: C - A3 ROEHAMPTON VALE TO PALESTRA
Date: Thursday 21st January 2010
Survey Vehicle: PTW_BL

Time started (HH:MM:SS):	07:38:44
Time finished (HH:MM:SS):	08:22:14
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:43:30
Total Journey Time (Secs) (Inc stoppages):	2,610
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:33:31
Total Journey Time (Secs) (Exc stoppages):	2,011
Total Stoppages (Secs):	599
Total No. Of Stoppages	27
Total Distance Travelled (Miles):	10.993
Total Distance Travelled (KM):	17.688
Average Speed (Mile/H) (Inc stoppages):	15.16
Average Speed (Miles/H) (Exc stoppages):	19.68
Average Speed (KM/H) (Inc stoppages):	24.40
Average Speed (KM/H) (Exc stoppages):	31.66

I.e. Where survey vehicle comes to a complete stop and speed is 0kph.

NOTES
- As noted for Route 1 PTW_BL, the PTW used was a marked Police PTW.
- The survey PTW did not use bus lanes all the time, but used the general traffic lanes if they were clear.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.
- The detour accounted for in note 8 took a total time of 3 mins and 4 seconds. This combined journey and stoppage time over this section would not have been so long had the detour not been taken. Instead the stoppage time at the junction of Upper Richmond Road with Queen's Ride has been substituted as the total journey time for this section; this is equal to 00:03:04-00:01:00 = 00:02:04 subtracted from the final Section Journey End Time (HH:MM:SS) and Duration (HH:MM:SS and Secs) as shown on bold **red** text.
- The stoppage accounted for in note 11 would not normally occur and has been subtracted from the final Section Journey End Time (HH:MM:SS) and Duration (Secs) as shown in bold **red** text.

Rows coloured like this indicate sections of the route that include lengths of bus lane

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times Start Time (HH:MM:SS)	Stoppage Times End Time (HH:MM:SS)	Stoppage Times Duration (HH:MM:SS)	Stoppage Times Duration (Secs)	Section Journey Times Start Time (HH:MM:SS)	Section Journey Times End Time (HH:MM:SS)	Section Journey Times Duration (HH:MM:SS)	Section Journey Times Duration (Secs)	Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A3 Roehampton Vale (start from A308 at give way junction with A3 Robin Hood Way (Kingston Bypass))										**07:38:44**						
	1	0.020	0.020	0.032	0.032	07:39:25	07:39:42	00:00:17	17	07:38:44	07:39:25	00:00:41	41	1.76	2.83	
	2	0.233	0.253	0.375	0.407	07:40:32	07:40:37	00:00:05	5	07:39:42	07:40:32	00:00:50	50	16.78	26.99	
	3	1.264	1.517	2.034	2.441	07:44:52	07:45:15	00:00:23	23	07:40:37	07:44:52	00:04:15	255	17.84	28.71	
	4	0.275	1.792	0.442	2.883	07:46:09	07:46:12	00:00:03	3	07:45:15	07:46:09	00:00:54	54	18.33	29.50	
	5	0.055	1.847	0.088	2.972	07:46:24	07:46:32	00:00:08	8	07:46:12	07:46:24	00:00:12	12	16.50	26.55	
	6	0.072	1.919	0.116	3.088	07:46:47	07:47:13	00:00:26	26	07:46:32	07:46:47	00:00:15	15	17.28	27.80	
	7	0.736	2.655	1.184	4.272	07:48:45	07:48:48	00:00:03	3	07:47:13	07:48:45	00:01:32	92	28.80	46.34	
	8	0.176	2.831	0.283	4.555	07:50:10	07:50:57	00:00:47	47	07:48:48	07:50:10	00:01:22	82	7.73	12.43	Accidentaly drove down Rocks Lane before u-turning and driving down Queen's Ride before stopping to consult a streetmap and then turning onto Upper Richmond Road. This detour will not be counted, as it would not mormally occur.
	9	0.014	2.845	0.023	4.578	07:51:03	07:52:03	00:01:00	60	07:50:57	07:51:03	00:00:06	6	8.40	13.52	
	10	1.781	4.626	2.866	7.443	07:57:18	07:57:33	00:00:15	15	07:52:03	07:57:18	00:05:15	315	20.35	32.75	
		0.291	4.917	0.468	7.911	07:58:51	07:59:22	00:00:31	31	07:57:33	07:58:51	00:01:18	78	13.43	21.61	Stopped to look at map. This stoppage will not be counted, as it would not mormally occur.
	11	0.582	5.499	0.936	8.848	08:00:53	08:01:50	00:00:57	57	07:59:22	08:00:53	00:01:31	91	23.02	37.05	
	12	0.069	5.568	0.111	8.959	08:02:18	08:02:37	00:00:19	19	08:01:50	08:02:18	00:00:28	28	8.87	14.27	
	13	0.060	5.628	0.097	9.055	08:03:02	08:03:27	00:00:25	25	08:02:37	08:03:02	00:00:25	25	8.64	13.90	
	14	0.658	6.286	1.059	10.114	08:05:08	08:05:33	00:00:25	25	08:03:27	08:05:08	00:01:41	101	23.45	37.74	
	15	0.181	6.467	0.291	10.405	08:06:12	08:06:25	00:00:13	13	08:05:33	08:06:12	00:00:39	39	16.71	26.88	
	16	0.147	6.614	0.237	10.642	08:07:23	08:07:30	00:00:07	7	08:06:25	08:07:23	00:00:58	58	9.12	14.68	
	17	1.002	7.616	1.612	12.254	08:10:19	08:10:24	00:00:05	5	08:07:30	08:10:19	00:02:49	169	21.34	34.34	
	18	1.065	8.681	1.714	13.968	08:13:19	08:13:32	00:00:13	13	08:10:24	08:13:19	00:02:55	175	21.91	35.25	
	19	0.164	8.845	0.264	14.232	08:14:06	08:14:17	00:00:11	11	08:13:32	08:14:06	00:00:34	34	17.36	27.94	
	20	0.553	9.398	0.890	15.121	08:15:45	08:16:01	00:00:16	16	08:14:17	08:15:45	00:01:28	88	22.62	36.40	
	21	0.472	9.870	0.759	15.881	08:17:12	08:17:52	00:00:40	40	08:16:01	08:17:12	00:01:11	71	23.93	38.51	
	22	0.158	10.028	0.254	16.135	08:18:33	08:18:43	00:00:10	10	08:17:52	08:18:33	00:00:41	41	13.87	22.32	
	23	0.057	10.085	0.092	16.227	08:19:07	08:19:39	00:00:32	32	08:18:43	08:19:07	00:00:24	24	8.55	13.76	
	24	0.142	10.227	0.228	16.455	08:20:07	08:20:42	00:00:35	35	08:19:39	08:20:07	00:00:28	28	18.26	29.38	
	25	0.025	10.252	0.040	16.495	08:20:51	08:21:07	00:00:16	16	08:20:42	08:20:51	00:00:09	9	10.00	16.09	
	26	0.472	10.724	0.759	17.255	08:22:45	08:23:14	00:00:29	29	08:21:07	08:22:45	00:01:38	98	17.34	27.90	
	27	0.211	10.935	0.339	17.594	08:23:51	08:24:30	00:00:39	39	08:23:14	08:23:51	00:00:37	37	20.53	33.03	
		0.058	10.993	0.093	17.688	**Final stop at Palestra**				08:24:30	08:24:49	00:00:19	19	10.99	17.68	
ROUTE END Palestra, Blackfriars Road											**08:22:14**	**00:33:31**				
Totals			**10.993**		**17.688**				599				**2,011**			

Route: C - A3 ROEHAMPTON VALE TO PALESTRA
Date: Thursday 21st January 2010
Survey Vehicle: PTW_GT
Time started (HH:MM:SS): 07:40:29
Time finished (HH:MM:SS): 08:39:10

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:58:41
Total Journey Time (Secs) (Inc stoppages): 3,521
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:43:00
Total Journey Time (Secs) (Exc stoppages): 2,580

Total Stoppages (Secs): 941
Total No. Of Stoppages 50 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 11.039
Total Distance Travelled (KM): 17.762

Average Speed (Mile/H) (Inc stoppages): 11.29
Average Speed (Miles/H) (Exc stoppages): 15.40
Average Speed (KM/H) (Inc stoppages): 18.16
Average Speed (KM/H) (Exc stoppages): 24.78

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times: Start Time (HH:MM:SS)	Stoppage Times: End Time (HH:MM:SS)	Stoppage Times: Duration (HH:MM:SS)	Stoppage Times: Duration (Secs)	Section Journey Times: Start Time (HH:MM:SS)	Section Journey Times: End Time (HH:MM:SS)	Section Journey Times: Duration (HH:MM:SS)	Section Journey Times: Duration (Secs)	Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A3 Roehampton Vale (start from A308 at give way junction with A3 Robin Hood Way (Kingston Bypass))										**07:40:29**						
	1	0.022	0.022	0.035	0.035	07:40:40	07:40:58	00:00:18	18	07:40:29	07:40:40	00:00:11	11	7.20	11.58	
	2	0.235	0.257	0.378	0.414	07:41:49	07:41:54	00:00:05	5	07:40:58	07:41:49	00:00:51	51	16.59	26.69	
	3	1.248	1.505	2.008	2.422	07:46:33	07:46:43	00:00:10	10	07:41:54	07:46:33	00:04:39	279	16.10	25.91	
	4	0.038	1.543	0.061	2.483	07:46:59	07:47:06	00:00:07	7	07:46:43	07:46:59	00:00:16	16	8.55	13.76	
	5	1.159	2.702	1.865	4.348	07:50:59	07:51:36	00:00:37	37	07:47:06	07:50:59	00:03:53	233	17.91	28.81	
	6	0.329	3.031	0.529	4.877	07:52:52	07:53:02	00:00:10	10	07:51:36	07:52:52	00:01:16	76	15.58	25.07	
	7	0.242	3.273	0.389	5.266	07:53:48	07:54:02	00:00:14	14	07:53:02	07:53:48	00:00:46	46	18.94	30.47	
	8	0.649	3.922	1.044	6.310	07:55:48	07:56:07	00:00:19	19	07:54:02	07:55:48	00:01:46	106	22.04	35.46	
	9	0.258	4.180	0.415	6.726	07:56:55	07:57:01	00:00:06	6	07:56:07	07:56:55	00:00:48	48	19.35	31.13	
	10	0.420	4.600	0.676	7.401	07:58:39	07:58:49	00:00:10	10	07:57:01	07:58:39	00:01:38	98	15.43	24.82	
	11	0.098	4.698	0.158	7.559	07:59:35	07:59:39	00:00:04	4	07:58:49	07:59:35	00:00:46	46	7.67	12.34	
	12	0.326	5.024	0.525	8.084	08:00:52	08:01:04	00:00:12	12	07:59:39	08:00:52	00:01:13	73	16.08	25.87	
	13	0.453	5.477	0.729	8.812	08:02:23	08:03:09	00:00:46	46	08:01:04	08:02:23	00:01:19	79	20.64	33.21	
	14	0.056	5.533	0.090	8.903	08:03:28	08:03:58	00:00:30	30	08:03:09	08:03:28	00:00:19	19	10.61	17.07	
	15	0.020	5.553	0.032	8.935	08:04:09	08:04:37	00:00:28	28	08:03:58	08:04:09	00:00:11	11	6.55	10.53	
	16	0.033	5.586	0.053	8.988	08:04:51	08:04:56	00:00:05	5	08:04:37	08:04:51	00:00:14	14	8.49	13.65	
	17	0.012	5.598	0.019	9.007	08:05:07	08:05:33	00:00:26	26	08:04:56	08:05:07	00:00:11	11	3.93	6.32	
	18	0.100	5.698	0.161	9.168	08:06:17	08:06:39	00:00:22	22	08:05:33	08:06:17	00:00:44	44	8.18	13.16	
	19	0.033	5.731	0.053	9.221	08:07:07	08:07:39	00:00:32	32	08:06:39	08:07:07	00:00:28	28	4.24	6.83	
	20	0.302	6.033	0.486	9.707	08:09:27	08:10:09	00:00:42	42	08:07:39	08:09:27	00:01:48	108	10.07	16.20	Riding in box junction for a long part of this section
	21	0.014	6.047	0.023	9.730	08:10:17	08:10:28	00:00:11	11	08:10:09	08:10:17	00:00:08	8	6.30	10.14	
	22	0.177	6.224	0.285	10.014	08:10:59	08:11:36	00:00:37	37	08:10:28	08:10:59	00:00:31	31	20.55	33.07	
	23	0.232	6.456	0.373	10.388	08:12:16	08:12:37	00:00:21	21	08:11:36	08:12:16	00:00:40	40	20.88	33.60	
	24	0.016	6.472	0.026	10.413	08:12:51	08:12:54	00:00:03	3	08:12:37	08:12:51	00:00:14	14	4.11	6.62	
	25	0.154	6.626	0.248	10.661	08:13:35	08:13:51	00:00:16	16	08:12:54	08:13:35	00:00:41	41	13.52	21.76	
	26	0.088	6.714	0.142	10.803	08:14:27	08:14:37	00:00:10	10	08:13:51	08:14:27	00:00:36	36	8.80	14.16	
	27	0.059	6.773	0.095	10.898	08:15:01	08:15:55	00:00:54	54	08:14:37	08:15:01	00:00:24	24	8.85	14.24	
	28	0.700	7.473	1.126	12.024	08:18:01	08:18:17	00:00:16	16	08:15:55	08:18:01	00:02:06	126	20.00	32.18	
	29	0.004	7.477	0.006	12.030	08:18:23	08:18:37	00:00:14	14	08:18:17	08:18:23	00:00:06	6	2.40	3.86	
	30	0.010	7.487	0.016	12.047	08:18:43	08:18:54	00:00:11	11	08:18:37	08:18:43	00:00:06	6	6.00	9.65	
	31	0.040	7.527	0.064	12.111	08:19:16	08:20:02	00:00:46	46	08:18:54	08:19:16	00:00:22	22	6.55	10.53	
	32	0.429	7.956	0.690	12.801	08:21:37	08:21:38	00:00:01	1	08:20:02	08:21:37	00:01:35	95	16.26	26.16	
	33	0.076	8.032	0.122	12.923	08:21:59	08:22:20	00:00:21	21	08:21:38	08:21:59	00:00:21	21	13.03	20.96	
	34	0.087	8.119	0.140	13.063	08:22:58	08:23:03	00:00:05	5	08:22:20	08:22:58	00:00:38	38	8.24	13.26	
	35	0.270	8.389	0.434	13.498	08:24:05	08:24:15	00:00:10	10	08:23:03	08:24:05	00:01:02	62	15.68	25.22	
	36	0.459	8.848	0.739	14.236	08:25:52	08:26:07	00:00:15	15	08:24:15	08:25:52	00:01:37	97	17.04	27.41	
	37	0.578	9.426	0.930	15.166	08:27:54	08:28:17	00:00:23	23	08:26:07	08:27:54	00:01:47	107	19.45	31.29	
	38	0.392	9.818	0.631	15.797	08:29:33	08:29:36	00:00:03	3	08:28:17	08:29:33	00:01:16	76	18.57	29.88	
	39	0.003	9.821	0.005	15.802	08:29:42	08:29:47	00:00:05	5	08:29:36	08:29:42	00:00:06	6	1.80	2.90	
	40	0.057	9.878	0.092	15.894	08:30:05	08:30:54	00:00:49	49	08:29:47	08:30:05	00:00:18	18	11.40	18.34	
	41	0.174	10.052	0.280	16.174	08:31:30	08:31:35	00:00:05	5	08:30:54	08:31:30	00:00:36	36	17.40	28.00	
	42	0.027	10.079	0.043	16.217	08:31:49	08:32:09	00:00:20	20	08:31:35	08:31:49	00:00:14	14	6.94	11.17	
	43	0.039	10.118	0.063	16.280	08:32:24	08:32:29	00:00:05	5	08:32:09	08:32:24	00:00:15	15	9.36	15.06	
	44	0.007	10.125	0.011	16.291	08:32:34	08:33:00	00:00:26	26	08:32:29	08:32:34	00:00:05	5	5.04	8.11	
	45	0.138	10.263	0.222	16.513	08:33:28	08:34:00	00:00:32	32	08:33:00	08:33:28	00:00:28	28	17.74	28.55	
	46	0.027	10.290	0.043	16.557	08:34:11	08:34:25	00:00:14	14	08:34:00	08:34:11	00:00:11	11	8.84	14.22	
	47	0.355	10.645	0.571	17.128	08:35:55	08:35:58	00:00:03	3	08:34:25	08:35:55	00:01:30	90	14.20	22.85	
	48	0.079	10.724	0.127	17.255	08:36:27	08:36:50	00:00:23	23	08:35:58	08:36:27	00:00:29	29	9.81	15.78	
	49	0.078	10.802	0.126	17.380	08:37:07	08:37:16	00:00:09	9	08:36:50	08:37:07	00:00:17	17	16.52	26.58	
	50	0.202	11.004	0.325	17.705	08:38:07	08:38:57	00:00:50	50	08:37:16	08:38:07	00:00:51	51	14.26	22.94	
		0.035	11.039	0.056	17.762	**Final stop at Palestra**				08:38:57	08:39:10	00:00:13	13	9.69	15.59	
ROUTE END Palestra, Blackfriars Road											**08:39:10**	00:43:00				
Totals			**11.039**		**17.762**				**941**				**2,580**			

MODE JOURNEY TIME COMPARISON

Route: C - A3 ROEHAMPTON VALE TO PALESTRA

Date: Thursday 21st January 2010

Survey Vehicle:	**PTW_BL**	**PTW_GT**	**PTW_GT-PTW_BL**
Time started (HH:MM:SS):	07:38:44	07:40:29	
Time finished (HH:MM:SS):	08:22:14	08:39:10	
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:43:30	00:58:41	00:15:11
Total Journey Time (Secs) (Inc stoppages):	2,610	3,521	911
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:33:31	00:43:00	00:09:29
Total Journey Time (Secs) (Exc stoppages):	2,011	2,580	569
Total Stoppages (Secs):	599	941	342
Total No. Of Stoppages	27	50	23
Total Distance Travelled (Miles):	10.993	11.039	0.046
Total Distance Travelled (KM):	17.688	17.762	0.074
Average Speed (Miles/H) (Inc stoppages):	15.16	11.29	-3.88
Average Speed (Miles/H) (Exc stoppages):	19.68	15.40	-4.28
Average Speed (KM/H) (Inc stoppages):	24.40	18.16	-6.24
Average Speed (KM/H) (Exc stoppages):	31.66	24.78	-6.88

Route: D - A21 BROMLEY COMMON TO PALESTRA
Date: Wednesday 10th February 2010
Survey Vehicle: PTW_BL
Time started (HH:MM:SS): 07:29:32
Time finished (HH:MM:SS): 08:26:39

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:57:07
Total Journey Time (Secs) (Inc stoppages): 3,427
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:45:18
Total Journey Time (Secs) (Exc stoppages): 2,718

Total Stoppages (Secs): 709
Total No. Of Stoppages 38 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 14.925
Total Distance Travelled (KM): 24.014

Average Speed (Mile/H) (Inc stoppages): 15.68
Average Speed (Miles/H) (Exc stoppages): 19.77
Average Speed (KM/H) (Inc stoppages): 25.23
Average Speed (KM/H) (Exc stoppages): 31.81

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES
- As noted for Route 1 PTW_BL, the PTW used was a marked Police PTW.
- The survey PTW did not use bus lanes all the time, but used the general traffic lanes if they were clear.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.
- Roadworks in the bus lane in Bromley Road prevented PTW from by-passing a queue.
- The stoppage where the Police rider stopped to talk to a car driver at around 08.00 has been subtracted from the final Section Journey End Time (HH:MM:SS) as shown on bold **red** text.

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times: Start Time (HH:MM:SS)	Stoppage Times: End Time (HH:MM:SS)	Stoppage Times: Duration (HH:MM:SS)	Stoppage Times: Duration (Secs)	Section Journey Times: Start Time (HH:MM:SS)	Section Journey Times: End Time (HH:MM:SS)	Section Journey Times: Duration (HH:MM:SS)	Section Journey Times: Duration (Secs)	Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A21 Bromley Common (start from)										**07:29:32**						
	1	1.309	1.309	2.106	2.106	07:33:02	07:33:45	00:00:43	43	07:29:32	07:33:02	00:03:30	210	22.44	36.11	
	2	0.346	1.655	0.557	2.663	07:34:45	07:34:49	00:00:04	4	07:33:45	07:34:45	00:01:00	60	20.76	33.40	
	3	0.378	2.033	0.608	3.271	07:35:45	07:36:02	00:00:17	17	07:34:49	07:35:45	00:00:56	56	24.30	39.10	
	4	0.167	2.200	0.269	3.540	07:36:31	07:37:44	00:01:13	73	07:36:02	07:36:31	00:00:29	29	20.73	33.36	
	5	1.699	3.899	2.734	6.273	07:41:40	07:42:21	00:00:41	41	07:37:44	07:41:40	00:03:56	236	25.92	41.70	
	6	0.320	4.219	0.515	6.788	07:43:15	07:43:46	00:00:31	31	07:42:21	07:43:15	00:00:54	54	21.33	34.33	
	7	0.761	4.980	1.224	8.013	07:45:31	07:45:58	00:00:27	27	07:43:46	07:45:31	00:01:45	105	26.09	41.98	
	8	0.532	5.512	0.856	8.869	07:47:10	07:47:19	00:00:09	9	07:45:58	07:47:10	00:01:12	72	26.60	42.80	
	9	0.771	6.283	1.241	10.109	07:49:22	07:49:26	00:00:04	4	07:47:19	07:49:22	00:02:03	123	22.57	36.31	
	10	0.097	6.380	0.156	10.265	07:49:47	07:49:52	00:00:05	5	07:49:26	07:49:47	00:00:21	21	16.63	26.76	Lewisham High Street jw Ladywell Road
	11	0.081	6.461	0.130	10.396	07:50:24	07:50:35	00:00:11	11	07:49:52	07:50:24	00:00:32	32	9.11	14.66	
	12	0.980	7.441	1.577	11.973	07:53:51	07:54:00	00:00:09	9	07:50:35	07:53:51	00:03:16	196	18.00	28.96	
	13	0.699	8.140	1.125	13.097	07:56:02	07:56:15	00:00:13	13	07:54:00	07:56:02	00:02:02	122	20.63	33.19	
	14	0.681	8.821	1.096	14.193	07:58:01	07:58:11	00:00:10	10	07:56:15	07:58:01	00:01:46	106	23.13	37.21	
	15	0.309	9.130	0.497	14.690	07:58:57	07:59:19	00:00:22	22	07:58:11	07:58:57	00:00:46	46	24.18	38.91	
	16	0.159	9.289	0.256	14.946	08:00:02	08:00:09	00:00:07	7	07:59:19	08:00:02	00:00:43	43	13.31	21.42	
		0.097	9.386	0.156	15.102	08:00:42	08:01:15	00:00:33	33	08:00:09	08:00:42	00:00:33	33	10.58	17.03	Stopped to talk to a driver who pulled out of a side road, and forced his way into traffic. This stoppage will be removed as it would not normally occur.
	17	0.548	9.934	0.882	15.984	08:03:05	08:03:39	00:00:34	34	08:01:15	08:03:05	00:01:50	110	17.93	28.86	
	18	0.177	10.111	0.285	16.269	08:04:13	08:04:53	00:00:40	40	08:03:39	08:04:13	00:00:34	34	18.74	30.15	
	19	0.325	10.436	0.523	16.792	08:05:50	08:05:53	00:00:03	3	08:04:53	08:05:50	00:00:57	57	20.53	33.03	
	20	0.290	10.726	0.467	17.258	08:06:57	08:07:28	00:00:31	31	08:05:53	08:06:57	00:01:04	64	16.31	26.25	
	21	0.267	10.993	0.430	17.688	08:08:36	08:08:50	00:00:14	14	08:07:28	08:08:36	00:01:08	68	14.14	22.74	
	22	0.039	11.032	0.063	17.750	08:09:03	08:09:20	00:00:17	17	08:08:50	08:09:03	00:00:13	13	10.80	17.38	
	23	0.042	11.074	0.068	17.818	08:09:38	08:09:43	00:00:05	5	08:09:20	08:09:38	00:00:18	18	8.40	13.52	
	24	0.028	11.102	0.045	17.863	08:10:01	08:10:14	00:00:13	13	08:09:43	08:10:01	00:00:18	18	5.60	9.01	
	25	0.070	11.172	0.113	17.976	08:10:47	08:10:53	00:00:06	6	08:10:14	08:10:47	00:00:33	33	7.64	12.29	
	26	0.007	11.179	0.011	17.987	08:11:03	08:11:30	00:00:27	27	08:10:53	08:11:03	00:00:10	10	2.52	4.05	
	27	0.103	11.282	0.166	18.153	08:11:55	08:11:58	00:00:03	3	08:11:30	08:11:55	00:00:25	25	14.83	23.86	
	28	0.505	11.787	0.813	18.965	08:13:38	08:13:43	00:00:05	5	08:11:58	08:13:38	00:01:40	100	18.18	29.25	
	29	0.450	12.237	0.724	19.689	08:14:57	08:15:09	00:00:12	12	08:13:43	08:14:57	00:01:14	74	21.89	35.22	
	30	0.163	12.400	0.262	19.952	08:15:37	08:16:01	00:00:24	24	08:15:09	08:15:37	00:00:28	28	20.96	33.72	
	31	0.210	12.610	0.338	20.289	08:16:42	08:16:55	00:00:13	13	08:16:01	08:16:42	00:00:41	41	18.44	29.67	
	32	0.048	12.658	0.077	20.367	08:17:09	08:17:40	00:00:31	31	08:16:55	08:17:09	00:00:14	14	12.34	19.86	
	33	0.681	13.339	1.096	21.462	08:19:41	08:19:44	00:00:03	3	08:17:40	08:19:41	00:02:01	121	20.26	32.60	
	34	0.629	13.968	1.012	22.475	08:21:45	08:21:55	00:00:10	10	08:19:44	08:21:45	00:02:01	121	18.71	30.11	
	35	0.209	14.177	0.336	22.811	08:22:47	08:23:17	00:00:30	30	08:21:55	08:22:47	00:00:52	52	14.47	23.28	
	36	0.030	14.207	0.048	22.859	08:23:33	08:23:59	00:00:26	26	08:23:17	08:23:33	00:00:16	16	6.75	10.86	
	37	0.088	14.295	0.142	23.001	08:24:29	08:24:38	00:00:09	9	08:23:59	08:24:29	00:00:30	30	10.56	16.99	
	38	0.071	14.366	0.114	23.115	08:24:57	08:25:24	00:00:27	27	08:24:38	08:24:57	00:00:19	19	13.45	21.65	
		0.559	14.925	0.899	24.014	**Final stop at Palestra**				08:25:24	08:27:12	00:01:48	108	18.63	29.98	
ROUTE END Palestra, Blackfriars Road											**08:26:39**	00:45:18				
Totals			**14.925**		**24.014**				**709**				**2,718**			

Route: D - A21 BROMLEY COMMON TO PALESTRA
Date: Wednesday 10th February 2010
Survey Vehicle: PTW_GT

Time started (HH:MM:SS):	07:30:59
Time finished (HH:MM:SS):	08:32:52
Total Journey Time (HH:MM:SS)(Inc stoppages):	01:01:53
Total Journey Time (Secs) (Inc stoppages):	3,713
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:50:49
Total Journey Time (Secs) (Exc stoppages):	3,049
Total Stoppages (Secs):	664
Total No. Of Stoppages	43
Total Distance Travelled (Miles):	14.961
Total Distance Travelled (KM):	24.072
Average Speed (Mile/H) (Inc stoppages):	14.51
Average Speed (Miles/H) (Exc stoppages):	17.66
Average Speed (KM/H) (Inc stoppages):	23.34
Average Speed (KM/H) (Exc stoppages):	28.42

I.e. Where survey vehicle comes to a complete stop and speed is 0kph.

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)
- Recording ends at 1:04:02 into the DVD, at 08:26:44. The PTW is at the junction of Lambeth Palace Road with Westminster Bridge Road. TO APPROXIMATE THE REMAINING JT, STOPPAGES AND STOPPAGE DURATION(S) WE USED THE PTW_BL SECTION BETWEEN THE SAME JUNCTION AND PALESTRA AS A PROXY.

This results in the following changes to the data as shown in bold **red** text.

Stoppages = 38 + 5 (stoppages between Lambeth Palace Rd jw Westminster Bridge Rd) = 43
Section Length =AS WE HAVE SEVERAL STOPPAGES BUT WE COULD ONLY SPECULATE ON THESE LENGTHS, THIS HAS BEEN LEFT BLANK
Cummulative Route Length = 13.841 miles + 1.12 miles (remaining distance between Lambeth Palace Rd jw Westminster Bridge Rd and Palestra) = 14.961 miles
Stoppage Times = 08:26:40 (final stoppage end time from PTW_GT at LPRd jw WBRd) + 00:01:42 (total remaining stoppages between LPRd jw WBRd and Palestra from PTW_BL) = 08:28:22
(Final) Stoppage Duration = 38 secs + 102 secs (total remaining stoppages between LPRd jw WBRd and Palestra from PTW_BL) = 140 secs
(Final) Section End Time = 08:26:40 (*original* last PTW_GT stoppage end time) + 00:06:12 (remaining total journey time inc stoppages between LPRd jw WBRd from PTW_BL) = 08:32:52.

Rows coloured like this indicate sections of the route that include lengths of bus lane

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A21 Bromley Common (start from)										**07:30:59**						
	1	0.682	0.682	1.097	1.097	07:32:31	07:32:40	00:00:09	9	07:30:59	07:32:31	00:01:32	92	26.69	42.94	
	2	0.617	1.299	0.993	2.090	07:34:53	07:35:00	00:00:07	7	07:32:40	07:34:53	00:02:13	133	16.70	26.87	
	3	0.722	2.021	1.162	3.252	07:37:06	07:37:18	00:00:12	12	07:35:00	07:37:06	00:02:06	126	20.63	33.19	
	4	0.168	2.189	0.270	3.522	07:37:52	07:38:59	00:01:07	67	07:37:18	07:37:52	00:00:34	34	17.79	28.62	
	5	1.704	3.893	2.742	6.264	07:43:01	07:43:46	00:00:45	45	07:38:59	07:43:01	00:04:02	242	25.35	40.79	
	6	1.079	4.972	1.736	8.000	07:46:51	07:47:12	00:00:21	21	07:43:46	07:46:51	00:03:05	185	21.00	33.78	
	7	0.530	5.502	0.853	8.853	07:48:30	07:48:47	00:00:17	17	07:47:12	07:48:30	00:01:18	78	24.46	39.36	
	8	0.068	5.570	0.109	8.962	07:49:09	07:49:44	00:00:35	35	07:48:47	07:49:09	00:00:22	22	11.13	17.90	
	9	0.620	6.190	0.998	9.960	07:51:35	07:51:42	00:00:07	7	07:49:44	07:51:35	00:01:51	111	20.11	32.35	
	10	0.162	6.352	0.261	10.220	07:52:31	07:52:36	00:00:05	5	07:51:42	07:52:31	00:00:49	49	11.90	19.15	
	11	0.106	6.458	0.171	10.391	07:53:16	07:54:00	00:00:44	44	07:52:36	07:53:16	00:00:40	40	9.54	15.35	Lewisham High Street jw Ladywell Road
	12	0.099	6.557	0.159	10.550	07:54:22	07:54:31	00:00:09	9	07:54:00	07:54:22	00:00:22	22	16.20	26.07	
	13	0.528	7.085	0.850	11.400	07:56:01	07:56:10	00:00:09	9	07:54:31	07:56:01	00:01:30	90	21.12	33.98	
	14	0.640	7.725	1.030	12.430	07:58:21	07:58:34	00:00:13	13	07:56:10	07:58:21	00:02:11	131	17.59	28.30	
	15	0.418	8.143	0.673	13.102	07:59:53	08:00:06	00:00:13	13	07:58:34	07:59:53	00:01:19	79	19.05	30.65	
	16	1.136	9.279	1.828	14.930	08:04:22	08:04:24	00:00:02	2	08:00:06	08:04:22	00:04:16	256	15.98	25.70	
	17	0.124	9.403	0.200	15.129	08:04:57	08:05:07	00:00:10	10	08:04:24	08:04:57	00:00:33	33	13.53	21.77	
	18	0.289	9.692	0.465	15.594	08:05:59	08:06:22	00:00:23	23	08:05:07	08:05:59	00:00:52	52	20.01	32.19	
	19	0.059	9.751	0.095	15.689	08:06:39	08:06:55	00:00:16	16	08:06:22	08:06:39	00:00:17	17	12.49	20.10	
	20	0.132	9.883	0.212	15.902	08:07:33	08:07:47	00:00:14	14	08:06:55	08:07:33	00:00:38	38	12.51	20.12	
	21	0.089	9.972	0.143	16.045	08:08:08	08:08:09	00:00:01	1	08:07:47	08:08:08	00:00:21	21	15.26	24.55	
	22	0.136	10.108	0.219	16.264	08:08:45	08:08:49	00:00:04	4	08:08:09	08:08:45	00:00:36	36	13.60	21.88	
	23	0.361	10.469	0.581	16.845	08:09:58	08:10:14	00:00:16	16	08:08:49	08:09:58	00:01:09	69	18.83	30.31	
	24	0.326	10.795	0.525	17.369	08:11:24	08:11:37	00:00:13	13	08:10:14	08:11:24	00:01:10	70	16.77	26.98	
	25	0.076	10.871	0.122	17.491	08:11:57	08:12:08	00:00:11	11	08:11:37	08:11:57	00:00:20	20	13.68	22.01	
	26	0.103	10.974	0.166	17.657	08:12:53	08:13:00	00:00:07	7	08:12:08	08:12:53	00:00:45	45	8.24	13.26	
	27	0.051	11.025	0.082	17.739	08:13:26	08:13:42	00:00:16	16	08:13:00	08:13:26	00:00:26	26	7.06	11.36	
	28	0.059	11.084	0.095	17.834	08:14:01	08:14:03	00:00:02	2	08:13:42	08:14:01	00:00:19	19	11.18	17.99	
	29	0.119	11.203	0.191	18.026	08:14:47	08:14:56	00:00:09	9	08:14:03	08:14:47	00:00:44	44	9.74	15.67	
	30	0.031	11.234	0.050	18.076	08:15:18	08:15:25	00:00:07	7	08:14:56	08:15:18	00:00:22	22	5.07	8.16	
	31	0.151	11.385	0.243	18.318	08:16:07	08:16:11	00:00:04	4	08:15:25	08:16:07	00:00:42	42	12.94	20.83	
	32	0.188	11.573	0.302	18.621	08:16:53	08:16:55	00:00:02	2	08:16:11	08:16:53	00:00:42	42	16.11	25.93	
	33	0.120	11.693	0.193	18.814	08:17:35	08:17:37	00:00:02	2	08:16:55	08:17:35	00:00:40	40	10.80	17.38	
	34	0.927	12.620	1.492	20.306	08:21:01	08:21:19	00:00:18	18	08:17:37	08:21:01	00:03:24	204	16.36	26.32	
	35	0.055	12.675	0.088	20.394	08:21:46	08:21:54	00:00:08	8	08:21:19	08:21:46	00:00:27	27	7.33	11.80	
	36	0.411	13.086	0.661	21.055	08:23:21	08:23:32	00:00:11	11	08:21:54	08:23:21	00:01:27	87	17.01	27.36	
	37	0.189	13.275	0.304	21.359	08:24:05	08:24:20	00:00:15	15	08:23:32	08:24:05	00:00:33	33	20.62	33.17	
	38	0.566	13.841	0.911	22.270	08:26:02	**08:28:22**	**00:02:20**	**140**	08:24:20	08:26:02	00:01:42	102	19.98	32.14	
	43		**14.961**		24.072	**Final stop at Palestra**				08:28:22	**08:32:52**	**00:04:30**	270			
ROUTE END Palestra, Blackfriars Road											**08:32:52**	**00:50:49**				
Totals			**14.961**		**24.072**				**664**				**3,049**			

Route: D - A21 BROMLEY COMMON TO PALESTRA
Date: Wednesday 10th February 2010
Survey Vehicle: PTW_CAR
Time started (HH:MM:SS): 07:31:00
Time finished (HH:MM:SS): 09:07:02

Total Journey Time (HH:MM:SS)(Inc stoppages): 01:36:02
Total Journey Time (Secs) (Inc stoppages): 5,762
Total Journey Time (HH:MM:SS)(Exc stoppages): 01:06:50
Total Journey Time (Secs) (Exc stoppages): 4,010

Total Stoppages (Secs): 1,752
Total No. Of Stoppages 102 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 14.950
Total Distance Travelled (KM): 24.055

Average Speed (Mile/H) (Inc stoppages): 9.34
Average Speed (Miles/H) (Exc stoppages): 13.42
Average Speed (KM/H) (Inc stoppages): 15.03
Average Speed (KM/H) (Exc stoppages): 21.60

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)
- The time on the camera was not correctly set. As the survey vehicles can be seen leaving shortly after one another on the PTW_BL DVD, the start time for this survey has been taken as the same as the powered two wheeler that travelled with general traffic plus one second. The analysis sheet below then shows stoppage and section start and end times as given on the DVD recording. The journey end time is then equal to the start time noted above plus the total journey time including stoppages. These are both shown in bold **red** text.

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A21 Bromley Common (start from)										**07:31:00**						
	1	0.649	0.649	1.044	1.044	09:43:58	09:44:03	00:00:05	5	09:42:24	09:43:58	00:01:34	94	24.86	39.99	
	2	0.006	0.655	0.010	1.054	09:44:11	09:44:19	00:00:08	8	09:44:03	09:44:11	00:00:08	8	2.70	4.34	
	3	0.016	0.671	0.026	1.080	09:44:35	09:44:43	00:00:08	8	09:44:19	09:44:35	00:00:16	16	3.60	5.79	
	4	0.007	0.678	0.011	1.091	09:44:51	09:44:58	00:00:07	7	09:44:43	09:44:51	00:00:08	8	3.15	5.07	
	5	0.592	1.270	0.953	2.043	09:47:15	09:48:06	00:00:51	51	09:44:58	09:47:15	00:02:17	137	15.56	25.03	
	6	0.749	2.019	1.205	3.249	09:50:09	09:50:27	00:00:18	18	09:48:06	09:50:09	00:02:03	123	21.92	35.27	
	7	0.161	2.180	0.259	3.508	09:50:58	09:52:03	00:01:05	65	09:50:27	09:50:58	00:00:31	31	18.70	30.08	
	8	0.144	2.324	0.232	3.739	09:52:34	09:52:43	00:00:09	9	09:52:03	09:52:34	00:00:31	31	16.72	26.91	
	9	0.283	2.607	0.455	4.195	09:53:31	09:53:44	00:00:13	13	09:52:43	09:53:31	00:00:48	48	21.23	34.15	
	10	1.303	3.910	2.097	6.291	09:57:13	09:57:17	00:00:04	4	09:53:44	09:57:13	00:03:29	209	22.44	36.11	
	11	0.025	3.935	0.040	6.331	09:57:33	09:57:50	00:00:17	17	09:57:17	09:57:33	00:00:16	16	5.63	9.05	
	12	0.006	3.941	0.010	6.341	09:57:56	09:58:03	00:00:07	7	09:57:50	09:57:56	00:00:06	6	3.60	5.79	
	13	0.268	4.209	0.431	6.772	09:59:21	09:59:41	00:00:20	20	09:58:03	09:59:21	00:01:18	78	12.37	19.90	
	14	0.502	4.711	0.808	7.580	10:01:08	10:01:10	00:00:02	2	09:59:41	10:01:08	00:01:27	87	20.77	33.42	
	15	0.759	5.470	1.221	8.801	10:03:36	10:03:55	00:00:19	19	10:01:10	10:03:36	00:02:26	146	18.72	30.11	
	16	0.059	5.529	0.095	8.896	10:04:23	10:04:56	00:00:33	33	10:03:55	10:04:23	00:00:28	28	7.59	12.21	
	17	0.390	5.919	0.628	9.524	10:06:23	10:06:25	00:00:02	2	10:04:56	10:06:23	00:01:27	87	16.14	25.97	
	18	0.083	6.002	0.134	9.657	10:06:55	10:07:10	00:00:15	15	10:06:25	10:06:55	00:00:30	30	9.96	16.03	
	19	0.002	6.004	0.003	9.660	10:07:14	10:07:35	00:00:21	21	10:07:10	10:07:14	00:00:04	4	1.80	2.90	
	20	0.009	6.013	0.014	9.675	10:07:44	10:08:29	00:00:45	45	10:07:35	10:07:44	00:00:09	9	3.60	5.79	
	21	0.009	6.022	0.014	9.689	10:08:38	10:08:44	00:00:06	6	10:08:29	10:08:38	00:00:09	9	3.60	5.79	
	22	0.010	6.032	0.016	9.705	10:08:56	10:09:15	00:00:19	19	10:08:44	10:08:56	00:00:12	12	3.00	4.83	
	23	0.006	6.038	0.010	9.715	10:09:22	10:09:30	00:00:08	8	10:09:15	10:09:22	00:00:07	7	3.09	4.96	
	24	0.332	6.370	0.534	10.249	10:11:23	10:11:31	00:00:08	8	10:09:30	10:11:23	00:01:53	113	10.58	17.02	
	25	0.020	6.390	0.032	10.282	10:11:45	10:12:09	00:00:24	24	10:11:31	10:11:45	00:00:14	14	5.14	8.27	
	26	0.108	6.498	0.174	10.455	10:12:38	10:12:42	00:00:04	4	10:12:09	10:12:38	00:00:29	29	13.41	21.57	
	27	0.296	6.794	0.476	10.932	10:13:46	10:13:55	00:00:09	9	10:12:42	10:13:46	00:01:04	64	16.65	26.79	
	28	0.224	7.018	0.360	11.292	10:14:32	10:14:37	00:00:05	5	10:13:55	10:14:32	00:00:37	37	21.79	35.07	
	29	-0.080	6.938	-0.129	11.163	10:14:45	10:14:53	00:00:08	8	10:14:37	10:14:45	00:00:08	8	-36.00	-57.92	
	30	0.097	7.035	0.156	11.319	10:15:01	10:15:03	00:00:02	2	10:14:53	10:15:01	00:00:08	8	43.65	70.23	
	31	0.061	7.096	0.098	11.417	10:15:25	10:15:33	00:00:08	8	10:15:03	10:15:25	00:00:22	22	9.98	16.06	
	32	0.258	7.354	0.415	11.833	10:16:33	10:16:36	00:00:03	3	10:15:33	10:16:33	00:01:00	60	15.48	24.91	
	33	0.293	7.647	0.471	12.304	10:19:49	10:20:00	00:00:11	11	10:16:36	10:19:49	00:03:13	193	5.47	8.79	
	34	0.047	7.694	0.076	12.380	10:20:17	10:20:25	00:00:08	8	10:20:00	10:20:17	00:00:17	17	9.95	16.01	
	35	0.085	7.779	0.137	12.516	10:20:47	10:20:54	00:00:07	7	10:20:25	10:20:47	00:00:22	22	13.91	22.38	
	36	0.027	7.806	0.043	12.560	10:21:11	10:21:28	00:00:17	17	10:20:54	10:21:11	00:00:17	17	5.72	9.20	
	37	0.025	7.831	0.040	12.600	10:21:38	10:21:57	00:00:19	19	10:21:28	10:21:38	00:00:10	10	9.00	14.48	
	38	0.435	8.266	0.700	13.300	10:23:37	10:23:46	00:00:09	9	10:21:57	10:23:37	00:01:40	100	15.66	25.20	
	39	0.180	8.446	0.290	13.590	10:24:43	10:24:56	00:00:13	13	10:23:46	10:24:43	00:00:57	57	11.37	18.29	
	40	0.590	9.036	0.949	14.539	10:26:57	10:27:05	00:00:08	8	10:24:56	10:26:57	00:02:01	121	17.55	28.24	
	41	0.626	9.662	1.007	15.546	10:29:25	10:29:52	00:00:27	27	10:27:05	10:29:25	00:02:20	140	16.10	25.90	
	42	0.012	9.674	0.019	15.565	10:29:59	10:30:40	00:00:41	41	10:29:52	10:29:59	00:00:07	7	6.17	9.93	
	43	0.021	9.695	0.034	15.599	10:30:51	10:31:04	00:00:13	13	10:30:40	10:30:51	00:00:11	11	6.87	11.06	
	44	0.082	9.777	0.132	15.731	10:31:36	10:31:39	00:00:03	3	10:31:04	10:31:36	00:00:32	32	9.22	14.84	
	45	0.023	9.800	0.037	15.768	10:31:58	10:32:33	00:00:35	35	10:31:39	10:31:58	00:00:19	19	4.36	7.01	
	46	0.024	9.824	0.039	15.807	10:32:46	10:32:52	00:00:06	6	10:32:33	10:32:46	00:00:13	13	6.65	10.69	
	47	0.021	9.845	0.034	15.841	10:33:03	10:33:15	00:00:12	12	10:32:52	10:33:03	00:00:11	11	6.87	11.06	
	48	0.053	9.898	0.085	15.926	10:33:35	10:33:44	00:00:09	9	10:33:15	10:33:35	00:00:20	20	9.54	15.35	
	49	0.197	10.095	0.317	16.243	10:34:31	10:35:10	00:00:39	39	10:33:44	10:34:31	00:00:47	47	15.09	24.28	
	50	0.343	10.438	0.552	16.795	10:36:05	10:36:12	00:00:07	7	10:35:10	10:36:05	00:00:55	55	22.45	36.12	
	51	0.264	10.702	0.425	17.220	10:37:10	10:37:22	00:00:12	12	10:36:12	10:37:10	00:00:58	58	16.39	26.37	

	52	0.055	10.757	0.088	17.308	10:37:55	10:38:18	00:00:23	23	10:37:22	10:37:55	00:00:33	33	6.00	9.65	
	53	0.089	10.846	0.143	17.451	10:38:54	10:39:33	00:00:39	39	10:38:18	10:38:54	00:00:36	36	8.90	14.32	
	54	0.038	10.884	0.061	17.512	10:39:51	10:39:58	00:00:07	7	10:39:33	10:39:51	00:00:18	18	7.60	12.23	
	55	0.037	10.921	0.060	17.572	10:40:34	10:40:55	00:00:21	21	10:39:58	10:40:34	00:00:36	36	3.70	5.95	
	56	0.021	10.942	0.034	17.606	10:41:07	10:41:13	00:00:06	6	10:40:55	10:41:07	00:00:12	12	6.30	10.14	
	57	0.034	10.976	0.055	17.660	10:41:36	10:41:55	00:00:19	19	10:41:13	10:41:36	00:00:23	23	5.32	8.56	
	58	0.027	11.003	0.043	17.704	10:42:07	10:42:22	00:00:15	15	10:41:55	10:42:07	00:00:12	12	8.10	13.03	
	59	0.004	11.007	0.006	17.710	10:42:28	10:42:47	00:00:19	19	10:42:22	10:42:28	00:00:06	6	2.40	3.86	
	60	0.009	11.016	0.014	17.725	10:42:59	10:43:03	00:00:04	4	10:42:47	10:42:59	00:00:12	12	2.70	4.34	
	61	0.020	11.036	0.032	17.757	10:43:27	10:43:32	00:00:05	5	10:43:03	10:43:27	00:00:24	24	3.00	4.83	
	62	0.069	11.105	0.111	17.868	10:43:59	10:44:09	00:00:10	10	10:43:32	10:43:59	00:00:27	27	9.20	14.80	
	63	0.021	11.126	0.034	17.902	10:44:30	10:44:37	00:00:07	7	10:44:09	10:44:30	00:00:21	21	3.60	5.79	
	64	0.009	11.135	0.014	17.916	10:44:46	10:44:50	00:00:04	4	10:44:37	10:44:46	00:00:09	9	3.60	5.79	
	65	0.032	11.167	0.051	17.968	10:45:09	10:45:15	00:00:06	6	10:44:50	10:45:09	00:00:19	19	6.06	9.76	
	66	0.012	11.179	0.019	17.987	10:45:26	10:45:36	00:00:10	10	10:45:15	10:45:26	00:00:11	11	3.93	6.32	
	67	0.034	11.213	0.055	18.042	10:46:04	10:46:12	00:00:08	8	10:45:36	10:46:04	00:00:28	28	4.37	7.03	
	68	0.059	11.272	0.095	18.137	10:46:50	10:47:15	00:00:25	25	10:46:12	10:46:50	00:00:38	38	5.59	8.99	
	69	0.683	11.955	1.099	19.236	10:50:01	10:50:12	00:00:11	11	10:47:15	10:50:01	00:02:46	166	14.81	23.83	
	70	0.262	12.217	0.422	19.657	10:51:03	10:51:20	00:00:17	17	10:50:12	10:51:03	00:00:51	51	18.49	29.76	
	71	0.141	12.358	0.227	19.884	10:51:53	10:51:59	00:00:06	6	10:51:20	10:51:53	00:00:33	33	15.38	24.75	
	72	0.237	12.595	0.381	20.265	10:52:53	10:53:16	00:00:23	23	10:51:59	10:52:53	00:00:54	54	15.80	25.42	
	73	0.052	12.647	0.084	20.349	10:53:38	10:53:55	00:00:17	17	10:53:16	10:53:38	00:00:22	22	8.51	13.69	
	74	0.381	13.028	0.613	20.962	10:55:19	10:55:24	00:00:05	5	10:53:55	10:55:19	00:01:24	84	16.33	26.27	
	75	0.233	13.261	0.375	21.337	10:56:54	10:57:20	00:00:26	26	10:55:24	10:56:54	00:01:30	90	9.32	15.00	
	76	0.019	13.280	0.031	21.368	10:57:36	10:57:47	00:00:11	11	10:57:20	10:57:36	00:00:16	16	4.27	6.88	
	77	0.010	13.290	0.016	21.384	10:58:00	10:58:34	00:00:34	34	10:57:47	10:58:00	00:00:13	13	2.77	4.46	
	78	0.007	13.297	0.011	21.395	10:58:41	10:59:07	00:00:26	26	10:58:34	10:58:41	00:00:07	7	3.60	5.79	
	79	0.018	13.315	0.029	21.424	10:59:23	10:59:43	00:00:20	20	10:59:07	10:59:23	00:00:16	16	4.05	6.52	
	80	0.017	13.332	0.027	21.451	10:59:57	11:00:19	00:00:22	22	10:59:43	10:59:57	00:00:14	14	4.37	7.03	
	81	0.017	13.349	0.027	21.479	11:00:31	11:00:58	00:00:27	27	11:00:19	11:00:31	00:00:12	12	5.10	8.21	
	82	0.456	13.805	0.734	22.212	11:02:41	11:02:52	00:00:11	11	11:00:58	11:02:41	00:01:43	103	15.94	25.64	
	83	0.164	13.969	0.264	22.476	11:03:44	11:03:56	00:00:12	12	11:02:52	11:03:44	00:00:52	52	11.35	18.27	
	84	0.066	14.035	0.106	22.582	11:04:34	11:04:47	00:00:13	13	11:03:56	11:04:34	00:00:38	38	6.25	10.06	
	85	0.002	14.037	0.003	22.586	11:04:50	11:04:58	00:00:08	8	11:04:47	11:04:50	00:00:03	3	2.40	3.86	
	86	0.022	14.059	0.035	22.621	11:05:13	11:05:49	00:00:36	36	11:04:58	11:05:13	00:00:15	15	5.28	8.50	
	87	0.023	14.082	0.037	22.658	11:06:06	11:06:46	00:00:40	40	11:05:49	11:06:06	00:00:17	17	4.87	7.84	
	88	0.019	14.101	0.031	22.689	11:07:00	11:07:08	00:00:08	8	11:06:46	11:07:00	00:00:14	14	4.89	7.86	
	89	0.003	14.104	0.005	22.693	11:07:13	11:07:40	00:00:27	27	11:07:08	11:07:13	00:00:05	5	2.16	3.48	
	90	0.046	14.150	0.074	22.767	11:08:08	11:09:18	00:01:10	70	11:07:40	11:08:08	00:00:28	28	5.91	9.52	
	91	0.024	14.174	0.039	22.806	11:09:38	11:10:13	00:00:35	35	11:09:18	11:09:38	00:00:20	20	4.32	6.95	
	92	0.026	14.200	0.042	22.848	11:10:24	11:11:10	00:00:46	46	11:10:13	11:10:24	00:00:11	11	8.51	13.69	
	93	0.325	14.525	0.523	23.371	11:12:15	11:12:30	00:00:15	15	11:11:10	11:12:15	00:01:05	65	18.00	28.96	
	94	0.004	14.529	0.006	23.377	11:12:37	11:12:41	00:00:04	4	11:12:30	11:12:37	00:00:07	7	2.06	3.31	
	95	0.004	14.533	0.006	23.384	11:12:46	11:13:00	00:00:14	14	11:12:41	11:12:46	00:00:05	5	2.88	4.63	
	96	0.009	14.542	0.014	23.398	11:13:13	11:13:59	00:00:46	46	11:13:00	11:13:13	00:00:13	13	2.49	4.01	
	97	0.015	14.557	0.024	23.422	11:14:18	11:14:32	00:00:14	14	11:13:59	11:14:18	00:00:19	19	2.84	4.57	
	98	0.016	14.573	0.026	23.448	11:14:43	11:14:58	00:00:15	15	11:14:32	11:14:43	00:00:11	11	5.24	8.43	
	99	0.059	14.632	0.095	23.543	11:15:29	11:15:38	00:00:09	9	11:14:58	11:15:29	00:00:31	31	6.85	11.02	
	100	0.052	14.684	0.084	23.627	11:15:54	11:16:57	00:01:03	63	11:15:38	11:15:54	00:00:16	16	11.70	18.83	
	101	0.228	14.912	0.367	23.993	11:17:44	11:18:08	00:00:24	24	11:16:57	11:17:44	00:00:47	47	17.46	28.10	
	102	0.038	14.950	0.061	24.055	**Final stop at Palestra**				11:18:08	11:18:26	00:00:18	18	7.60	12.23	
ROUTE END Palestra, Blackfriars Road											09:07:02	01:06:50				
Totals			**14.950**		**24.055**				**1,752**				**4,010**			

MODE JOURNEY TIME COMPARISON

Route: D - A21 BROMLEY COMMON TO PALESTRA

Date: Wednesday 10th February 2010

Survey Vehicle:	PTW_BL	PTW_GT	CAR_GT	PTW_GT-PTW_BL	CAR_GT-PTW_BL
Time started (HH:MM:SS):	07:29:32	07:30:59	07:31:00		
Time finished (HH:MM:SS):	08:26:39	08:32:52	09:07:02		
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:57:07	01:01:53	01:36:02	00:04:46	00:38:55
Total Journey Time (Secs) (Inc stoppages):	3,427	3,713	5,762	286	2,335
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:45:18	00:50:49	01:06:50	00:05:31	00:21:32
Total Journey Time (Secs) (Exc stoppages):	2,718	3,049	4,010	331	1,292
Total Stoppages (Secs):	709	664	1,752	-45	1,043
Total No. Of Stoppages	38	43	102	5	64
Total Distance Travelled (Miles):	14.925	14.961	14.950	0.04	0.03
Total Distance Travelled (KM):	24.014	24.072	24.055	0.06	
Average Speed (Miles/H) (Inc stoppages):	15.68	14.51	9.34	-1.173	-6.338
Average Speed (Miles/H) (Exc stoppages):	19.77	17.66	13.42	-2.104	-6.347
Average Speed (KM/H) (Inc stoppages):	25.23	23.34	15.03	-1.887	-8.311
Average Speed (KM/H) (Exc stoppages):	31.81	28.42	21.60	-3.385	-6.827

Route: E - A10 GREAT CAMBRIDGE ROAD TO PALESTRA
Date: Thursday 11th February 2010
Survey Vehicle: PTW_BL
Time started (HH:MM:SS): 07:35:01
Time finished (HH:MM:SS): 08:34:22

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:59:21
Total Journey Time (Secs) (Inc stoppages): 3,561
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:45:13
Total Journey Time (Secs) (Exc stoppages): 2,713

Total Stoppages (Secs): 848
Total No. Of Stoppages 43 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 14.053
Total Distance Travelled (KM): 22.611

Average Speed (Mile/H) (Inc stoppages): 14.21
Average Speed (Miles/H) (Exc stoppages): 18.65
Average Speed (KM/H) (Inc stoppages): 22.86
Average Speed (KM/H) (Exc stoppages): 30.00

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES
- As noted for Route 1 PTW_BL, the PTW used was a marked Police PTW.
- The survey PTW did not use bus lanes all the time, but used the general traffic lanes if they were clear.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.
- The stoppage where the Police rider stops in a garage at around 08.18 has been subtracted from the final Section Journey End Time (HH:MM:SS) and Duration (Secs) as shown in bold **red** text .

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A10 Great Cambridge Road (start from)										**07:35:01**						
	1	0.105	0.105	0.169	0.169	07:35:24	07:35:28	00:00:04	4	07:35:01	07:35:24	00:00:23	23	16.43	26.44	
	2	0.563	0.668	0.906	1.075	07:36:39	07:37:33	00:00:54	54	07:35:28	07:36:39	00:01:11	71	28.55	45.93	
	3	1.223	1.891	1.968	3.043	07:40:37	07:41:03	00:00:26	26	07:37:33	07:40:37	00:03:04	184	23.93	38.50	
	4	0.943	2.834	1.517	4.560	07:43:15	07:43:21	00:00:06	6	07:41:03	07:43:15	00:02:12	132	25.72	41.38	
	5	1.193	4.027	1.920	6.479	07:47:26	07:47:29	00:00:03	3	07:43:21	07:47:26	00:04:05	245	17.53	28.21	
	6	0.323	4.350	0.520	6.999	07:48:27	07:48:38	00:00:11	11	07:47:29	07:48:27	00:00:58	58	20.05	32.26	
	7	0.257	4.607	0.414	7.413	07:49:17	07:49:20	00:00:03	3	07:48:38	07:49:17	00:00:39	39	23.72	38.17	
	8	0.470	5.077	0.756	8.169	07:51:01	07:51:30	00:00:29	29	07:49:20	07:51:01	00:01:41	101	16.75	26.95	
	9	0.031	5.108	0.050	8.219	07:51:46	07:51:51	00:00:05	5	07:51:30	07:51:46	00:00:16	16	6.97	11.22	
	10	0.126	5.234	0.203	8.422	07:52:28	07:52:30	00:00:02	2	07:51:51	07:52:28	00:00:37	37	12.26	19.73	
	11	0.084	5.318	0.135	8.557	07:52:56	07:53:10	00:00:14	14	07:52:30	07:52:56	00:00:26	26	11.63	18.71	
	12	0.606	5.924	0.975	9.532	07:54:43	07:54:46	00:00:03	3	07:53:10	07:54:43	00:01:33	93	23.46	37.74	
	13	0.066	5.990	0.106	9.638	07:55:04	07:55:51	00:00:47	47	07:54:46	07:55:04	00:00:18	18	13.20	21.24	
	14	0.741	6.731	1.192	10.830	07:57:37	07:57:47	00:00:10	10	07:55:51	07:57:37	00:01:46	106	25.17	40.49	
	15	0.634	7.365	1.020	11.850	07:59:23	08:00:00	00:00:37	37	07:57:47	07:59:23	00:01:36	96	23.78	38.25	
	16	0.515	7.880	0.829	12.679	08:01:21	08:02:00	00:00:39	39	08:00:00	08:01:21	00:01:21	81	22.89	36.83	
	17	0.310	8.190	0.499	13.178	08:02:57	08:03:35	00:00:38	38	08:02:00	08:02:57	00:00:57	57	19.58	31.50	
	18	0.464	8.654	0.747	13.924	08:05:05	08:05:38	00:00:33	33	08:03:35	08:05:05	00:01:30	90	18.56	29.86	
	19	0.398	9.052	0.640	14.565	08:07:14	08:07:40	00:00:26	26	08:05:38	08:07:14	00:01:36	96	14.93	24.01	
	20	0.056	9.108	0.090	14.655	08:07:58	08:08:05	00:00:07	7	08:07:40	08:07:58	00:00:18	18	11.20	18.02	
	21	0.105	9.213	0.169	14.824	08:08:46	08:09:38	00:00:52	52	08:08:05	08:08:46	00:00:41	41	9.22	14.83	
	22	0.332	9.545	0.534	15.358	08:10:42	08:10:45	00:00:03	3	08:09:38	08:10:42	00:01:04	64	18.68	30.05	
	23	0.224	9.769	0.360	15.718	08:11:23	08:11:37	00:00:14	14	08:10:45	08:11:23	00:00:38	38	21.22	34.14	
	24	0.345	10.114	0.555	16.273	08:12:54	08:13:02	00:00:08	8	08:11:37	08:12:54	00:01:17	77	16.13	25.95	
	25	0.822	10.936	1.323	17.596	08:15:15	08:15:19	00:00:04	4	08:13:02	08:15:15	00:02:13	133	22.25	35.80	
	26	0.276	11.212	0.444	18.040	08:16:16	08:16:35	00:00:19	19	08:15:19	08:16:16	00:00:57	57	17.43	28.05	
	27	0.156	11.368	0.251	18.291	08:17:03	08:17:23	00:00:20	20	08:16:35	08:17:03	00:00:28	28	20.06	32.27	
	28	0.286	11.654	0.460	18.751	08:18:17	08:18:26	00:00:09	9	08:17:23	08:18:17	00:00:54	54	19.07	30.68	
		0.013	11.667	0.021	18.772	08:18:36	08:20:34	00:01:58	118	08:18:26	08:18:36	00:00:10	10	4.68	7.53	Stops in garage. This stoppage will not be counted in the total stoppage times or towards the overall journey time including stoppages.
	29	0.035	11.702	0.056	18.829	08:20:52	08:21:13	00:00:21	21	08:20:34	08:20:52	00:00:18	18	7.00	11.26	
	30	0.047	11.749	0.076	18.904	08:21:30	08:21:53	00:00:23	23	08:21:13	08:21:30	00:00:17	17	9.95	16.01	
	31	0.065	11.814	0.105	19.009	08:22:10	08:22:28	00:00:18	18	08:21:53	08:22:10	00:00:17	17	13.76	22.15	
	32	0.169	11.983	0.272	19.281	08:23:07	08:23:17	00:00:10	10	08:22:28	08:23:07	00:00:39	39	15.60	25.10	
	33	0.164	12.147	0.264	19.545	08:23:59	08:24:20	00:00:21	21	08:23:17	08:23:59	00:00:42	42	14.06	22.62	
	34	0.102	12.249	0.164	19.709	08:24:48	08:24:52	00:00:04	4	08:24:20	08:24:48	00:00:28	28	13.11	21.10	
	35	0.211	12.460	0.339	20.048	08:25:48	08:26:09	00:00:21	21	08:24:52	08:25:48	00:00:56	56	13.56	21.82	
	36	0.177	12.637	0.285	20.333	08:26:50	08:27:44	00:00:54	54	08:26:09	08:26:50	00:00:41	41	15.54	25.01	
	37	0.027	12.664	0.043	20.376	08:27:55	08:28:08	00:00:13	13	08:27:44	08:27:55	00:00:11	11	8.84	14.22	
	38	0.042	12.706	0.068	20.444	08:28:26	08:29:08	00:00:42	42	08:28:08	08:28:26	00:00:18	18	8.40	13.52	
	39	0.349	13.055	0.562	21.005	08:30:11	08:30:54	00:00:43	43	08:29:08	08:30:11	00:01:03	63	19.94	32.09	
	40	0.132	13.187	0.212	21.218	08:31:45	08:32:23	00:00:38	38	08:30:54	08:31:45	00:00:51	51	9.32	14.99	
	41	0.467	13.654	0.751	21.969	08:34:33	08:34:42	00:00:09	9	08:32:23	08:34:33	00:02:10	130	12.93	20.81	
	42	0.070	13.724	0.113	22.082	08:34:58	08:35:00	00:00:02	2	08:34:42	08:34:58	00:00:16	16	15.75	25.34	
	43	0.308	14.032	0.496	22.577	08:36:05	08:36:08	00:00:03	3	08:35:00	08:36:05	00:01:05	65	17.06	27.45	
		0.021	14.053	0.034	22.611	**Final stop at Palestra**				08:36:08	08:36:20	00:00:12	12	6.30	10.14	
ROUTE END Palestra, Blackfriars Road											**08:34:22**	00:45:13				
Totals			**14.053**		**22.611**				**848**				**2,713**			

Route: E - A10 GREAT CAMBRIDGE ROAD TO PALESTRA
Date: Thursday 11th February 2010
Survey Vehicle: PTW_GT

Time started (HH:MM:SS):	07:35:02
Time finished (HH:MM:SS):	08:39:03
Total Journey Time (HH:MM:SS)(Inc stoppages):	01:04:01
Total Journey Time (Secs) (Inc stoppages):	3,841
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:50:29
Total Journey Time (Secs) (Exc stoppages):	3,029
Total Stoppages (Secs):	812
Total No. Of Stoppages	41
Total Distance Travelled (Miles):	14.066
Total Distance Travelled (KM):	22.632
Average Speed (Mile/H) (Inc stoppages):	13.18
Average Speed (Miles/H) (Exc stoppages):	16.72
Average Speed (KM/H) (Inc stoppages):	21.21
Average Speed (KM/H) (Exc stoppages):	26.90

I.e. Where survey vehicle comes to a complete stop and speed is 0kph.

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times: Start Time (MM:SS)	Stoppage Times: End Time (MM:SS)	Stoppage Times: Duration (MM:SS)	Stoppage Times: Duration (Secs)	Section Journey Times: Start Time (HH:MM:SS)	Section Journey Times: End Time (HH:MM:SS)	Section Journey Times: Duration (HH:MM:SS)	Section Journey Times: Duration (Secs)	Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A10 Great Cambridge Road (start from)										**07:35:02**						
	1	0.543	0.620	0.874	0.998	07:38:29	07:38:59	00:00:30	30	07:35:02	07:38:29	00:03:27	207	9.44	15.19	The start time cannot be seen as there is a gap on the DVD recording. The start time of the PTW_BL has been used with an additional second added on.
	2	1.239	1.859	1.994	2.991	07:42:06	07:42:25	00:00:19	19	07:38:59	07:42:06	00:03:07	187	23.85	38.38	
	3	0.741	2.600	1.192	4.183	07:44:32	07:44:51	00:00:19	19	07:42:25	07:44:32	00:02:07	127	21.00	33.80	
	4	0.513	3.113	0.825	5.009	07:46:28	07:46:49	00:00:21	21	07:44:51	07:46:28	00:01:37	97	19.04	30.63	
	5	0.126	3.239	0.203	5.212	07:47:34	07:47:49	00:00:15	15	07:46:49	07:47:34	00:00:45	45	10.08	16.22	
	6	0.571	3.810	0.919	6.130	07:50:17	07:50:23	00:00:06	6	07:47:49	07:50:17	00:02:28	148	13.89	22.35	
	7	0.936	4.746	1.506	7.636	07:52:56	07:53:02	00:00:06	6	07:50:23	07:52:56	00:02:33	153	22.02	35.44	
	8	0.014	4.760	0.023	7.659	07:53:12	07:53:29	00:00:17	17	07:53:02	07:53:12	00:00:10	10	5.04	8.11	Seven Sisters Road north east of jw Isledon Road
	9	0.009	4.769	0.014	7.673	07:53:36	07:53:48	00:00:12	12	07:53:29	07:53:36	00:00:07	7	4.63	7.45	As above
	10	0.018	4.787	0.029	7.702	07:54:09	07:54:13	00:00:04	4	07:53:48	07:54:09	00:00:21	21	3.09	4.96	As above
	11	0.050	4.837	0.080	7.783	07:54:47	07:54:58	00:00:11	11	07:54:13	07:54:47	00:00:34	34	5.29	8.52	As above
	12	0.150	4.987	0.241	8.024	07:55:44	07:56:12	00:00:28	28	07:54:58	07:55:44	00:00:46	46	11.74	18.89	
	13	0.120	5.107	0.193	8.217	07:56:41	07:56:59	00:00:18	18	07:56:12	07:56:41	00:00:29	29	14.90	23.97	
	14	0.039	5.146	0.063	8.280	07:57:12	07:57:17	00:00:05	5	07:56:59	07:57:12	00:00:13	13	10.80	17.38	
	15	0.065	5.211	0.105	8.384	07:57:36	07:57:38	00:00:02	2	07:57:17	07:57:36	00:00:19	19	12.32	19.82	
	16	0.750	5.961	1.207	9.591	07:59:52	08:00:39	00:00:47	47	07:57:38	07:59:52	00:02:14	134	20.15	32.42	
	17	1.323	7.284	2.129	11.720	08:04:41	08:04:45	00:00:04	4	08:00:39	08:04:41	00:04:02	242	19.68	31.67	
	18	0.174	7.458	0.280	12.000	08:05:22	08:05:36	00:00:14	14	08:04:45	08:05:22	00:00:37	37	16.93	27.24	
	19	0.175	7.633	0.282	12.281	08:06:09	08:06:31	00:00:22	22	08:05:36	08:06:09	00:00:33	33	19.09	30.72	
	20	1.018	8.651	1.638	13.919	08:09:31	08:09:37	00:00:06	6	08:06:31	08:09:31	00:03:00	180	20.36	32.76	
	21	0.179	8.830	0.288	14.207	08:10:17	08:10:23	00:00:06	6	08:09:37	08:10:17	00:00:40	40	16.11	25.92	
	22	0.007	8.837	0.011	14.219	08:10:31	08:10:35	00:00:04	4	08:10:23	08:10:31	00:00:08	8	3.15	5.07	
	23	0.142	8.979	0.228	14.447	08:11:24	08:12:28	00:01:04	64	08:10:35	08:11:24	00:00:49	49	10.43	16.79	
	24	0.173	9.152	0.278	14.726	08:13:21	08:14:00	00:00:39	39	08:12:28	08:13:21	00:00:53	53	11.75	18.91	
	25	0.281	9.433	0.452	15.178	08:15:02	08:15:28	00:00:26	26	08:14:00	08:15:02	00:01:02	62	16.32	26.25	
	26	1.911	11.344	3.075	18.252	08:21:22	08:21:38	00:00:16	16	08:15:28	08:21:22	00:05:54	354	19.43	31.27	
	27	0.143	11.487	0.230	18.483	08:22:12	08:22:44	00:00:32	32	08:21:38	08:22:12	00:00:34	34	15.14	24.36	
	28	0.015	11.502	0.024	18.507	08:22:54	08:23:12	00:00:18	18	08:22:44	08:22:54	00:00:10	10	5.40	8.69	
	29	0.189	11.691	0.304	18.811	08:23:44	08:23:51	00:00:07	7	08:23:12	08:23:44	00:00:32	32	21.26	34.21	
	30	0.041	11.732	0.066	18.877	08:24:06	08:24:37	00:00:31	31	08:23:51	08:24:06	00:00:15	15	9.84	15.83	
	31	0.066	11.798	0.106	18.983	08:24:52	08:25:10	00:00:18	18	08:24:37	08:24:52	00:00:15	15	15.84	25.49	
	32	0.157	11.955	0.253	19.236	08:25:42	08:26:03	00:00:21	21	08:25:10	08:25:42	00:00:32	32	17.66	28.42	
	33	0.179	12.134	0.288	19.524	08:26:49	08:27:03	00:00:14	14	08:26:03	08:26:49	00:00:46	46	14.01	22.54	
	34	0.102	12.236	0.164	19.688	08:27:25	08:27:35	00:00:10	10	08:27:03	08:27:25	00:00:22	22	16.69	26.86	
	35	0.192	12.428	0.309	19.997	08:28:34	08:28:43	00:00:09	9	08:27:35	08:28:34	00:00:59	59	11.72	18.85	
	36	0.198	12.626	0.319	20.315	08:29:31	08:30:17	00:00:46	46	08:28:43	08:29:31	00:00:48	48	14.85	23.89	
	37	0.077	12.703	0.124	20.439	08:31:00	08:31:36	00:00:36	36	08:30:17	08:31:00	00:00:43	43	6.45	10.37	
	38	0.361	13.064	0.581	21.020	08:32:52	08:33:40	00:00:48	48	08:31:36	08:32:52	00:01:16	76	17.10	27.51	
	39	0.213	13.277	0.343	21.363	08:35:07	08:35:18	00:00:11	11	08:33:40	08:35:07	00:01:27	87	8.81	14.18	
	40	0.146	13.423	0.235	21.598	08:35:53	08:35:55	00:00:02	2	08:35:18	08:35:53	00:00:35	35	15.02	24.16	
	41	0.402	13.825	0.647	22.244	08:37:19	08:38:07	00:00:48	48	08:35:55	08:37:19	00:01:24	84	17.23	27.72	
		0.241	14.066	0.388	22.632	**Final stop at Palestra**				08:38:07	08:39:03	00:00:56	56	15.49	24.93	
ROUTE END Palestra, Blackfriars Road											**08:39:03**	00:50:29				
Totals			**14.066**		**22.632**				**812**				**3,029**			

MODE JOURNEY TIME COMPARISON

Route: E - A10 GREAT CAMBRIDGE ROAD TO PALESTRA

Date: Thursday 11th February 2010

Survey Vehicle:	**PTW_BL**	**PTW_GT**	**PTW_GT-PTW_BL**
Time started (HH:MM:SS):	07:35:01	07:35:02	
Time finished (HH:MM:SS):	08:34:22	08:39:03	
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:59:21	01:04:01	00:04:40
Total Journey Time (Secs) (Inc stoppages):	3,561	3,841	280
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:45:13	00:50:29	00:05:16
Total Journey Time (Secs) (Exc stoppages):	2,713	3,029	316
Total Stoppages (Secs):	848	812	-36
Total No. Of Stoppages	43	41	-2
Total Distance Travelled (Miles):	14.053	14.066	0.01
Total Distance Travelled (KM):	22.611	22.632	0.02
Average Speed (Miles/H) (Inc stoppages):	14.21	13.18	-1.023
Average Speed (Miles/H) (Exc stoppages):	18.65	16.72	-1.930
Average Speed (KM/H) (Inc stoppages):	22.86	21.21	-1.647
Average Speed (KM/H) (Exc stoppages):	30.00	26.90	-3.105

Route: F - A10 GREAT CAMBRIDGE ROAD TO PALESTRA
Date: Wednesday 24th February 2010
Survey Vehicle: PTW_BL
Time started (HH:MM:SS): 07:32:18
Time finished (HH:MM:SS): 08:12:04

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:39:46
Total Journey Time (Secs) (Inc stoppages): 2,386
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:30:41
Total Journey Time (Secs) (Exc stoppages): 1,841

Total Stoppages (Secs): 545
Total No. Of Stoppages 34 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 9.947
Total Distance Travelled (KM): 16.005

Average Speed (Mile/H) (Inc stoppages): 15.01
Average Speed (Miles/H) (Exc stoppages): 19.45
Average Speed (KM/H) (Inc stoppages): 24.15
Average Speed (KM/H) (Exc stoppages): 31.30

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES
- As noted for Route 1 PTW_BL, the PTW used was a marked Police PTW.
- The survey PTW did not use bus lanes all the time, but used the general traffic lanes if they were clear.
- When in the bus lane the PTW was observed to slow before overtaking cyclists.
- The PTW was observed to stay out of the bus lane if the rider could see that the lane width and downstream buses would prevent them from making progress. On ocassions when the rider had used the bus lane and was slowed behind a bus, the rider looked for the opportunity to filter between buses and general traffic in lane 2. A lack of carriageway space between vehicles and the likelihood of riding over the 200mm wide bus lane markings could put riders at risk of collisions or slips.
- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, filtering to the right of slow-moving or stationary vehicles.
- The recording starts at 01:38 but as noted below there is a gap at the start of the route. The journey time (HH:MM:SS) and number and duration of stoppages between the start of the route and the junction of Great Cambridge Road with White Hart Lane has been taken from the Route 2 PTW-GT survey as a proxy for the missing survey information. These amounted to 04:27 MM:SS including 5 stoppages totalling 73 seconds . The final journey time Duration and number of stoppages have been amended accordingly as shown in bold **red** text below. The stoppage duration is acoounted for within the Total Journey Time.

Route Start and End point	Stoppages	Section Length (KM)	Cummulative Route Length (KM)	Stoppage Times: Start Time (MM:SS)	Stoppage Times: End Time (MM:SS)	Stoppage Times: Start Time (HH:MM:SS)	Stoppage Times: End Time (HH:MM:SS)	Stoppage Times: Duration (HH:MM:SS)	Stoppage Times: Duration (Secs)	Section Journey Times: Start Time (HH:MM:SS)	Section Journey Times: End Time (HH:MM:SS)	Section Journey Times: Duration (HH:MM:SS)	Section Journey Times: Duration (Secs)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
ROUTE START A10 Great Cambridge Road (start from)				From DVD		Actual times				**07:32:18**					
	1	These values could not be determined as the Police camera recording was split into two portions; the portion of the screen that showed the distance was frozen, hence the only speed measurements shown for this analysis are averages for the full route. The overall distance measurements used to arrive at these average speeds comes from the Route 2 PTW-GT survey. In addition, there is a gap between the start of the recording and the point where the PTW arrives at the junction of Great Cambridge Road with White Hart Lane. The time taken for the PTW to travel this distance was also taken from the Route 2 PTW-GT survey.		04:20	04:30	07:36:45	07:36:55	00:00:10	10	07:32:18	07:36:45	00:04:27	267	See comments in length columns.	
	2			06:36	07:08	07:39:06	07:39:38	00:00:32	32	07:36:55	07:39:06	00:02:11	131		
	3			08:58	09:08	07:41:28	07:41:38	00:00:10	10	07:39:38	07:41:28	00:01:50	110		
	4			10:36	10:37	07:43:06	07:43:07	00:00:01	1	07:41:38	07:43:06	00:01:28	88		
	5			11:58	11:59	07:44:28	07:44:29	00:00:01	1	07:43:07	07:44:28	00:01:21	81		
	6			13:00	13:45	07:45:30	07:46:15	00:00:45	45	07:44:29	07:45:30	00:01:01	61		
	7			17:08	17:44	07:49:38	07:50:14	00:00:36	36	07:46:15	07:49:38	00:03:23	203		
	8			18:12	18:20	07:50:40	07:50:48	00:00:08	8	07:50:14	07:50:40	00:00:26	26		
	9			18:43	18:45	07:51:11	07:51:13	00:00:02	2	07:50:48	07:51:11	00:00:23	23		
	10			19:45	20:21	07:52:13	07:52:49	00:00:36	36	07:51:13	07:52:13	00:01:00	60		
	11			22:00	22:26	07:54:28	07:54:54	00:00:26	26	07:52:49	07:54:28	00:01:39	99		
	12			22:54	22:56	07:55:22	07:55:24	00:00:02	2	07:54:54	07:55:22	00:00:28	28		
	13			24:12	24:26	07:56:40	07:56:54	00:00:14	14	07:55:24	07:56:40	00:01:16	76		
	14			25:15	25:27	07:57:43	07:57:55	00:00:12	12	07:56:54	07:57:43	00:00:49	49		
	15			25:42	26:02	07:58:10	07:58:30	00:00:20	20	07:57:55	07:58:10	00:00:15	15		
	16			26:31	26:50	07:58:59	07:59:18	00:00:19	19	07:58:30	07:58:59	00:00:29	29		
	17			27:11	27:14	07:59:39	07:59:42	00:00:03	3	07:59:18	07:59:39	00:00:21	21		
	18			27:42	27:44	08:00:10	08:00:12	00:00:02	2	07:59:42	08:00:10	00:00:28	28		
	19			28:16	28:20	08:00:44	08:00:48	00:00:04	4	08:00:12	08:00:44	00:00:32	32		
	20			29:18	29:58	08:01:46	08:02:26	00:00:40	40	08:00:48	08:01:46	00:00:58	58		
	21			29:58	30:00	08:02:26	08:02:28	00:00:02	2	08:02:26	08:02:26	00:00:00	0		
	22			30:10	30:17	08:02:38	08:02:45	00:00:07	7	08:02:28	08:02:38	00:00:10	10		
	23			30:53	31:38	08:03:21	08:04:06	00:00:45	45	08:02:45	08:03:21	00:00:36	36		
	24			32:06	32:56	08:04:34	08:05:24	00:00:50	50	08:04:06	08:04:34	00:00:28	28		
	25			33:45	33:55	08:06:13	08:06:23	00:00:10	10	08:05:24	08:06:13	00:00:49	49		
	26			35:26	36:04	08:07:52	08:08:30	00:00:38	38	08:06:23	08:07:52	00:01:29	89		
	27			37:20	38:18	08:09:46	08:10:44	00:00:58	58	08:08:30	08:09:46	00:01:16	76		
	28			38:28	38:32	08:10:54	08:10:58	00:00:04	4	08:10:44	08:10:54	00:00:10	10		
	29			39:02	39:10	08:11:28	08:11:36	00:00:08	8	08:10:58	08:11:28	00:00:30	30		
				39:38		**Final stop at Palestra**				08:11:36	08:12:04	00:00:28	28		
ROUTE END Palestra, Blackfriars Road											**08:12:04**	**00:30:41**			
Totals			9.947						545				1,841		

Route: F - A10 GREAT CAMBRIDGE ROAD TO PALESTRA
Date: Wednesday 24th February 2010
Survey Vehicle: PTW_GT
Time started (HH:MM:SS): 07:32:18
Time finished (HH:MM:SS): 08:20:04

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:47:46
Total Journey Time (Secs) (Inc stoppages): 2,866
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:36:19
Total Journey Time (Secs) (Exc stoppages): 2,179

Total Stoppages (Secs): 687
Total No. Of Stoppages 34 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 9.947
Total Distance Travelled (KM): 16.005

Average Speed (Mile/H) (Inc stoppages): 12.49
Average Speed (Miles/H) (Exc stoppages): 16.43
Average Speed (KM/H) (Inc stoppages): 20.10
Average Speed (KM/H) (Exc stoppages): 26.44

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- The survey PTW was observed to use the Metropolitan Police-approved filtering procedures, in all but one occasion, filtering to the right of slow-moving or stationary vehicles.
- Other PTWs can be observed using lengths of bus lane according to TfL's trial to permit PTWs to use some bus lanes. They are observed leaving the PTW in general traffic behind.
- No road works were observed on the route that caused any delays, but this could mean that road works on this route commenced after the AM peak. (A list was provided by TfL and reviewed by LTP Ltd)

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A10 Great Cambridge Road (start from)										**07:32:18**						
	1	0.391	0.391	0.629	0.629	07:33:25	07:33:36	00:00:11	11	07:32:18	07:33:25	00:01:07	67	21.01	33.80	
	2	0.014	0.405	0.023	0.652	07:33:51	07:33:57	00:00:06	6	07:33:36	07:33:51	00:00:15	15	3.36	5.41	
	3	0.114	0.519	0.183	0.835	07:34:40	07:34:47	00:00:07	7	07:33:57	07:34:40	00:00:43	43	9.54	15.36	
	4	0.002	0.521	0.003	0.838	07:34:50	07:35:06	00:00:16	16	07:34:47	07:34:50	00:00:03	3	2.40	3.86	
	5	0.125	0.646	0.201	1.039	07:35:51	07:36:24	00:00:33	33	07:35:06	07:35:51	00:00:45	45	10.00	16.09	
	6	1.186	1.832	1.908	2.948	07:39:14	07:39:18	00:00:04	4	07:36:24	07:39:14	00:02:50	170	25.12	40.41	
	7	0.749	2.581	1.205	4.153	07:41:20	07:41:26	00:00:06	6	07:39:18	07:41:20	00:02:02	122	22.10	35.56	
	8	0.564	3.145	0.907	5.060	07:43:33	07:43:36	00:00:03	3	07:41:26	07:43:33	00:02:07	127	15.99	25.72	
	9	0.057	3.202	0.092	5.152	07:44:04	07:44:15	00:00:11	11	07:43:36	07:44:04	00:00:28	28	7.33	11.79	
	10	0.009	3.211	0.014	5.166	07:44:22	07:44:34	00:00:12	12	07:44:15	07:44:22	00:00:07	7	4.63	7.45	
	11	0.093	3.304	0.150	5.316	07:45:12	07:45:25	00:00:13	13	07:44:34	07:45:12	00:00:38	38	8.81	14.18	
	12	0.063	3.367	0.101	5.418	07:45:50	07:46:02	00:00:12	12	07:45:25	07:45:50	00:00:25	25	9.07	14.60	
	13	0.119	3.486	0.191	5.609	07:46:35	07:47:10	00:00:35	35	07:46:02	07:46:35	00:00:33	33	12.98	20.89	
	14	0.302	3.788	0.486	6.095	07:48:15	07:48:21	00:00:06	6	07:47:10	07:48:15	00:01:05	65	16.73	26.91	
	15	1.059	4.847	1.704	7.799	07:51:40	07:52:01	00:00:21	21	07:48:21	07:51:40	00:03:19	199	19.16	30.82	
	16	0.803	5.650	1.292	9.091	07:54:04	07:54:16	00:00:12	12	07:52:01	07:54:04	00:02:03	123	23.50	37.82	
	17	0.406	6.056	0.653	9.744	07:56:11	07:57:26	00:01:15	75	07:54:16	07:56:11	00:01:55	115	12.71	20.45	
	18	1.218	7.274	1.960	11.704	08:01:25	08:01:52	00:00:27	27	07:57:26	08:01:25	00:03:59	239	18.35	29.52	
	19	0.343	7.617	0.552	12.256	08:03:08	08:03:11	00:00:03	3	08:01:52	08:03:08	00:01:16	76	16.25	26.14	
	20	0.061	7.678	0.098	12.354	08:03:28	08:03:45	00:00:17	17	08:03:11	08:03:28	00:00:17	17	12.92	20.78	
	21	0.175	7.853	0.282	12.635	08:04:24	08:04:27	00:00:03	3	08:03:45	08:04:24	00:00:39	39	16.15	25.99	
	22	0.327	8.180	0.526	13.162	08:06:12	08:06:59	00:00:47	47	08:04:27	08:06:12	00:01:45	105	11.21	18.04	
	23	0.070	8.250	0.113	13.274	08:07:21	08:07:32	00:00:11	11	08:06:59	08:07:21	00:00:22	22	11.45	18.43	
	24	0.046	8.296	0.074	13.348	08:08:05	08:08:35	00:00:30	30	08:07:32	08:08:05	00:00:33	33	5.02	8.07	
	25	0.039	8.335	0.063	13.411	08:08:55	08:09:38	00:00:43	43	08:08:35	08:08:55	00:00:20	20	7.02	11.30	
	26	0.179	8.514	0.288	13.699	08:10:17	08:11:01	00:00:44	44	08:09:38	08:10:17	00:00:39	39	16.52	26.59	
	27	0.063	8.577	0.101	13.800	08:11:33	08:12:24	00:00:51	51	08:11:01	08:11:33	00:00:32	32	7.09	11.40	
	28	0.044	8.621	0.071	13.871	08:12:44	08:13:30	00:00:46	46	08:12:24	08:12:44	00:00:20	20	7.92	12.74	
	29	0.329	8.950	0.529	14.401	08:14:18	08:14:46	00:00:28	28	08:13:30	08:14:18	00:00:48	48	24.68	39.70	
	30	0.154	9.104	0.248	14.648	08:15:37	08:15:42	00:00:05	5	08:14:46	08:15:37	00:00:51	51	10.87	17.49	
	31	0.137	9.241	0.220	14.869	08:16:09	08:16:17	00:00:08	8	08:15:42	08:16:09	00:00:27	27	18.27	29.39	
	32	0.296	9.537	0.476	15.345	08:17:41	08:18:05	00:00:24	24	08:16:17	08:17:41	00:01:24	84	12.69	20.41	
	33	0.380	9.917	0.611	15.956	08:19:29	08:19:46	00:00:17	17	08:18:05	08:19:29	00:01:24	84	16.29	26.20	
	34	0.030	9.947	0.048	16.005	**Final stop at Palestra**				08:19:46	08:20:04	00:00:18	18	6.00	9.65	
ROUTE END Palestra, Blackfriars Road											**08:20:04**	00:36:19				
Totals			**9.947**		**16.005**				**687**				**2,179**			

Route: F - A10 GREAT CAMBRIDGE ROAD TO PALESTRA
Date: Wednesday 24th February 2010
Survey Vehicle: CAR_GT
Time started (HH:MM:SS): 07:30:20
Time finished (HH:MM:SS): 08:24:46

Total Journey Time (HH:MM:SS)(Inc stoppages): 00:54:26
Total Journey Time (Secs) (Inc stoppages): 3,266
Total Journey Time (HH:MM:SS)(Exc stoppages): 00:39:18
Total Journey Time (Secs) (Exc stoppages): 2,358

Total Stoppages (Secs): 908
Total No. Of Stoppages 46 I.e. Where survey vehicle comes to a complete stop and speed is 0kph.
Total Distance Travelled (Miles): 9.831
Total Distance Travelled (KM): 15.818

Average Speed (Mile/H) (Inc stoppages): 10.84
Average Speed (Miles/H) (Exc stoppages): 15.01
Average Speed (KM/H) (Inc stoppages): 17.44
Average Speed (KM/H) (Exc stoppages): 24.15

Rows coloured like this indicate sections of the route that include lengths of bus lane

NOTES

- Due to the car's inability to filter through traffic, it lost ground to the PTWs. The additional time taken to cover the same distance resulted in the car running through part of the busiest hour of the AM peak period when traffic volumes entering Central London are at their peak. This resulted in additional stoppages and delays as shown iin the analysis table below.

- At the point where the driver turned right onto Blackfriars Road and u-turned north of Blackfriars Bridge, we have removed the time taken for this detour as it should not have happened from the final Cummulative Route Length (Km), Stoppage Duration (secs), Section Journey End Time (HH:MM:SS) and Duration (HH:MM:SS) A Police driver made an identical wrong turn on Route 3 (E) as shown in bold **red** text.
i.e. 10.357-0.526=9.831 and 908-28=880 and 08:26:50-00:02:04=08:24:46 and 00:41:22-00:02:04=00:39:18.

Route Start and End point	Stoppages	Section Length (Miles)	Cummulative Route Length (Miles)	Section Length (KM)	Cummulative Route Length (Kilometres)	Stoppage Times				Section Journey Times				Average Speeds By Section (Miles/H)	Average Speeds By Section (KM/H)	Other Occurrences / Notes
						Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)	Start Time (HH:MM:SS)	End Time (HH:MM:SS)	Duration (HH:MM:SS)	Duration (Secs)			
ROUTE START A10 Great Cambridge Road (start from)										**07:30:20**						
	1	0.119	0.119	0.191	0.191	07:30:51	07:30:58	00:00:07	7	07:30:20	07:30:51	00:00:31	31	13.82	22.24	
	2	0.274	0.393	0.441	0.632	07:32:03	07:32:08	00:00:05	5	07:30:58	07:32:03	00:01:05	65	15.18	24.42	
	3	0.120	0.513	0.193	0.825	07:32:46	07:33:13	00:00:27	27	07:32:08	07:32:46	00:00:38	38	11.37	18.29	
	4	0.120	0.633	0.193	1.018	07:33:56	07:34:34	00:00:38	38	07:33:13	07:33:56	00:00:43	43	10.05	16.16	
	5	0.884	1.517	1.422	2.441	07:37:10	07:37:12	00:00:02	2	07:34:34	07:37:10	00:02:36	156	20.40	32.82	
	6	0.384	1.901	0.618	3.059	07:38:08	07:38:56	00:00:48	48	07:37:12	07:38:08	00:00:56	56	24.69	39.72	
	7	1.241	3.142	1.997	5.055	07:42:28	07:42:41	00:00:13	13	07:38:56	07:42:28	00:03:32	212	21.07	33.91	
	8	0.157	3.299	0.253	5.308	07:43:27	07:43:40	00:00:13	13	07:42:41	07:43:27	00:00:46	46	12.29	19.77	Junction of High Road with Seven Sisters Road
	9	0.005	3.304	0.008	5.316	07:43:47	07:44:04	00:00:17	17	07:43:40	07:43:47	00:00:07	7	2.57	4.14	
	10	0.015	3.319	0.024	5.340	07:44:17	07:44:20	00:00:03	3	07:44:04	07:44:17	00:00:13	13	4.15	6.68	
	11	0.005	3.324	0.008	5.348	07:44:25	07:44:30	00:00:05	5	07:44:20	07:44:25	00:00:05	5	3.60	5.79	Car broke down in single southbound traffic lane for general traffic in High Street south of the junction with Seven Sisters Road
	12	0.003	3.327	0.005	5.353	07:44:35	07:44:53	00:00:18	18	07:44:30	07:44:35	00:00:05	5	2.16	3.48	
	13	0.050	3.377	0.080	5.434	07:45:44	07:45:57	00:00:13	13	07:44:53	07:45:44	00:00:51	51	3.53	5.68	
	14	0.001	3.378	0.002	5.435	07:46:00	07:46:29	00:00:29	29	07:45:57	07:46:00	00:00:03	3	1.20	1.93	
	15	0.329	3.707	0.529	5.965	07:47:53	07:48:44	00:00:51	51	07:46:29	07:47:53	00:01:24	84	14.10	22.69	
	16	0.419	4.126	0.674	6.639	07:50:25	07:50:36	00:00:11	11	07:48:44	07:50:25	00:01:41	101	14.93	24.03	
	17	0.205	4.331	0.330	6.969	07:51:36	07:51:41	00:00:05	5	07:50:36	07:51:36	00:01:00	60	12.30	19.79	
	18	0.200	4.531	0.322	7.290	07:52:27	07:52:37	00:00:10	10	07:51:41	07:52:27	00:00:46	46	15.65	25.18	
	19	0.426	4.957	0.685	7.976	07:54:00	07:54:09	00:00:09	9	07:52:37	07:54:00	00:01:23	83	18.48	29.73	
	20	0.477	5.434	0.767	8.743	07:55:20	07:55:24	00:00:04	4	07:54:09	07:55:20	00:01:11	71	24.19	38.92	
	21	0.423	5.857	0.681	9.424	07:56:30	07:56:40	00:00:10	10	07:55:24	07:56:30	00:01:06	66	23.07	37.12	
	22	0.227	6.084	0.365	9.789	07:57:37	07:57:53	00:00:16	16	07:56:40	07:57:37	00:00:57	57	14.34	23.07	
	23	0.097	6.181	0.156	9.945	07:58:27	07:59:21	00:00:54	54	07:57:53	07:58:27	00:00:34	34	10.27	16.53	
	24	0.028	6.209	0.045	9.990	07:59:36	07:59:38	00:00:02	2	07:59:21	07:59:36	00:00:15	15	6.72	10.81	
	25	0.373	6.582	0.600	10.590	08:01:14	08:01:29	00:00:15	15	07:59:38	08:01:14	00:01:36	96	13.99	22.51	
	26	0.388	6.970	0.624	11.215	08:03:05	08:03:14	00:00:09	9	08:01:29	08:03:05	00:01:36	96	14.55	23.41	
	27	0.027	6.997	0.043	11.258	08:03:31	08:04:05	00:00:34	34	08:03:14	08:03:31	00:00:17	17	5.72	9.20	
	28	0.034	7.031	0.055	11.313	08:04:23	08:05:12	00:00:49	49	08:04:05	08:04:23	00:00:18	18	6.80	10.94	
	29	0.382	7.413	0.615	11.928	08:06:14	08:06:22	00:00:08	8	08:05:12	08:06:14	00:01:02	62	22.18	35.69	
	30	0.119	7.532	0.191	12.119	08:07:01	08:07:31	00:00:30	30	08:06:22	08:07:01	00:00:39	39	10.98	17.67	
	31	0.336	7.868	0.541	12.660	08:08:58	08:09:04	00:00:06	6	08:07:31	08:08:58	00:01:27	87	13.90	22.37	
	32	0.153	8.021	0.246	12.906	08:09:33	08:09:54	00:00:21	21	08:09:04	08:09:33	00:00:29	29	18.99	30.56	
	33	0.448	8.469	0.721	13.627	08:11:46	08:11:54	00:00:08	8	08:09:54	08:11:46	00:01:52	112	14.40	23.17	
	34	0.046	8.515	0.074	13.701	08:12:20	08:12:38	00:00:18	18	08:11:54	08:12:20	00:00:26	26	6.37	10.25	
	35	0.170	8.685	0.274	13.974	08:13:25	08:14:08	00:00:43	43	08:12:38	08:13:25	00:00:47	47	13.02	20.95	
	36	0.028	8.713	0.045	14.019	08:14:22	08:15:12	00:00:50	50	08:14:08	08:14:22	00:00:14	14	7.20	11.58	
	37	0.080	8.793	0.129	14.148	08:15:40	08:16:28	00:00:48	48	08:15:12	08:15:40	00:00:28	28	10.29	16.55	
	38	0.368	9.161	0.592	14.740	08:17:32	08:17:42	00:00:10	10	08:16:28	08:17:32	00:01:04	64	20.70	33.31	
	39	0.154	9.315	0.248	14.988	08:18:28	08:18:33	00:00:05	5	08:17:42	08:18:28	00:00:46	46	12.05	19.39	
	40	0.027	9.342	0.043	15.031	08:18:45	08:18:59	00:00:14	14	08:18:33	08:18:45	00:00:12	12	8.10	13.03	
	41	0.023	9.365	0.037	15.068	08:19:20	08:19:30	00:00:10	10	08:18:59	08:19:20	00:00:21	21	3.94	6.34	
	42	0.025	9.390	0.040	15.109	08:19:48	08:20:07	00:00:19	19	08:19:30	08:19:48	00:00:18	18	5.00	8.04	
	43	0.060	9.450	0.097	15.205	08:20:32	08:20:36	00:00:04	4	08:20:07	08:20:32	00:00:25	25	8.64	13.90	
	44	0.064	9.514	0.103	15.308	08:21:00	08:21:25	00:00:25	25	08:20:36	08:21:00	00:00:24	24	9.60	15.45	
	45	0.255	9.769	0.410	15.718	08:22:21	08:23:05	00:00:44	44	08:21:25	08:22:21	00:00:56	56	16.39	26.38	
	46	0.689	10.458	1.109	16.827	08:25:26	08:25:54	00:00:28	28	08:23:05	08:25:26	00:02:21	141	17.59	28.30	
	47	0.279	10.737	0.449	17.276	**Final stop at Palestra**				08:25:54	08:26:50	00:00:56	56	17.94	28.86	
ROUTE END Palestra, Blackfriars Road											**08:24:46**	**00:39:18**				
Totals			**9.831**		**15.818**				**908**				**2,358**			

MODE JOURNEY TIME COMPARISON

Route: F - A10 GREAT CAMBRIDGE ROAD TO PALESTRA

Date: Wednesday 24th February 2010

Survey Vehicle:	**PTW_BL**	**PTW_GT**	**CAR_GT**	**PTW_GT-PTW_BL**	**CAR_GT-PTW_BL**
Time started (HH:MM:SS):	07:32:18	07:32:18	07:30:20		
Time finished (HH:MM:SS):	08:12:04	08:20:04	08:24:46		
Total Journey Time (HH:MM:SS)(Inc stoppages):	00:39:46	00:47:46	00:54:26	00:08:00	00:14:40
Total Journey Time (Secs) (Inc stoppages):	2,386	2,866	3,266	480	880
Total Journey Time (HH:MM:SS)(Exc stoppages):	00:30:41	00:36:19	00:39:18	00:05:38	00:08:37
Total Journey Time (Secs) (Exc stoppages):	1,841	2,179	2,358	338	517
Total Stoppages (Secs):	545	687	908	142	363
Total No. Of Stoppages	34	34	46	0	12
Total Distance Travelled (Miles):	9.947	9.947	9.831	0.00	-0.12
Total Distance Travelled (KM):	16.005	16.005	15.818	0.00	-0.19
Average Speed (Miles/H) (Inc stoppages):	15.01	12.49	10.84	-2.514	-4.172
Average Speed (Miles/H) (Exc stoppages):	19.45	16.43	15.01	-3.017	-4.442
Average Speed (KM/H) (Inc stoppages):	24.15	20.10	17.44	-4.045	-6.713
Average Speed (KM/H) (Exc stoppages):	31.30	26.44	24.15	-4.855	-7.147

Appendix 5 – Road Vehicle Emission Database Model Outputs

			Vehicle category					Average-speed emission factors (g/km) - ALL ROUTES Carbon Dioxide (uCO_2)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ALL ROUTES ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	24.05			33.357			18.060	**602.435**
																														Average uCO2 Emissions for ALL ROUTES Small PTW_BL (grammes)	602.435
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	20.65			33.357			18.140	**605.103**
																														Average uCO2 Emissions for ALL ROUTES Small PTW_GT (grammes)	605.103
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.32			212.198			17.100	**3628.586**
																														Average uCO2 Emissions for ALL ROUTES Small CAR_GT (grammes)	3,628.586
ALL ROUTES ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.05			124.620			18.060	**2250.641**
																														Average uCO2 Emissions for ALL ROUTES Medium PTW_BL (grammes)	2,250.641
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.65			135.253			18.140	**2453.497**
																														Average uCO2 Emissions for ALL ROUTES Medium PTW_GT (grammes)	2,453.497
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2532.35791	103.3971572	-0.43166932	0.006677558	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.32			263.649			17.100	**4508.393**
																														Average uCO2 Emissions for ALL ROUTES Medium CAR_GT (grammes)	4,508.393
ALL ROUTES ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.05			169.015			18.060	**3052.414**
																														Average uCO2 Emissions for ALL ROUTES Large PTW_BL (grammes)	3,052.414
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.65			184.974			18.140	**3355.430**
																														Average uCO2 Emissions for ALL ROUTES Large PTW_GT (grammes)	3,355.430
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.85269728	0.010317601	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.32			389.952			17.100	**6668.180**
																														Average uCO2 Emissions for ALL ROUTES Large CAR_GT (grammes)	6,668.180
ALL ROUTES (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.32			169.724			17.100	**2902.278**
																														Average uCO2 Emissions for ALL ROUTES Small Diesel CAR_GT (grammes)	2,902.278
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.32			210.413			17.100	**3598.056**
																														Average uCO2 Emissions for ALL ROUTES Medium Diesel CAR_GT (grammes)	3,598.056
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.32			243.915			17.100	**4170.954**
																														Average uCO2 Emissions for ALL ROUTES Large Diesel CAR_GT (grammes)	4,170.954

			Vehicle category					Average-speed emission factors (g/km) - ALL ROUTES Oxides of Nitrogen (NO_x)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE 1 - A1 Archway Road to Palestra (SMALL PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		24.05			0.0100			18.060	**0.181**
																														Average NOx Emissions for ALL ROUTES Small PTW_BL (grammes)	**0.181**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		20.65			0.0100			18.140	**0.181**
																														Average NOx Emissions for ALL ROUTES Small PTW_GT (grammes)	**0.181**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.887069717	0.009761248	9.90849E-05	1.83658E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.32			0.0692			17.100	**1.184**
																														Average NOx Emissions for ALL ROUTES Small CAR_GT (grammes)	**1.184**
ROUTE F - A1 Archway Road to Palestra (MEDIUM PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.05			0.044			18.060	**0.788**
																														Average NOx Emissions for ALL ROUTES Medium PTW_BL (grammes)	**0.788**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.65			0.048			18.140	**0.862**
																														Average NOx Emissions for ALL ROUTES Medium PTW_GT (grammes)	**0.862**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.516913912	0.034501595	5.49275E-05	4.0848E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.32			0.069			17.100	**1.183**
																														Average NOx Emissions for ALL ROUTES Medium CAR_GT (grammes)	**1.183**
ROUTE F - A1 Archway Road to Palestra (LARGE PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.05			0.068			18.060	**1.228**
																														Average NOx Emissions for ALL ROUTES Large PTW_BL (grammes)	**1.228**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.65			0.075			18.140	**1.366**
																														Average NOx Emissions for ALL ROUTES Large PTW_GT (grammes)	**1.366**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2.634691932	0.003709045	0.000289098	3.11184E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.32			0.180			17.100	**3.081**
																														Average NOx Emissions for ALL ROUTES Large CAR_GT (grammes)	**3.081**
ROUTE F - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	0.675	5	140	Assumption		Code R26 * 0.675	15.32			0.335			17.100	**5.725**
																														Average NOx Emissions for ALL ROUTES Small Diesel CAR_GT (grammes)	**5.725**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	1	5	140	DfT EFs database		Fit to g/h data	15.32			0.496			17.100	**8.481**
																														Average NOx Emissions for ALL ROUTES Medium Diesel CAR_GT (grammes)	**8.481**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	15.89742288	0.114914539	0.000179381	4.42012E-05	-3.3264E-07	2.66432E-09	0	0.3375	5	120	Assumption, based on TA limits		Code R40 * 0.675	15.32			0.393			17.100	**6.722**
																														Average NOx Emissions for ALL ROUTES Medium Diesel CAR_GT (grammes)	**6.722**

			Vehicle category					Average-speed fuel consumption (l/100 km) - ALL ROUTES											URM fuel consumption (l/100km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ALL ROUTES ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	24.05			1.400			18.060	**0.253**
																														Average fuel consumption for ALL ROUTES Small PTW_BL (l/100km)	**0.253**
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	20.65			1.400			18.140	**0.254**
																														Average fuel consumption for ALL ROUTES Small PTW_GT (l/100km)	**0.254**
	CAR in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2260.649	59.444192	0.2926318	0.0030199	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.32			8.906			17.100	**1.523**
																														Average fuel consumption for ALL ROUTES Small CAR_GT (l/100km)	**1.523**
ALL ROUTES ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.05			5.230			18.060	**0.945**
																														Average fuel consumption for ALL ROUTES Medium PTW_BL (l/100km)	**0.945**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	20.65			5.677			18.140	**1.030**
																														Average fuel consumption for ALL ROUTES Medium PTW_GT (l/100km)	**1.030**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2532.3579	103.39716	-0.4316693	0.0066776	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.32			11.065			17.100	**1.892**
																														Average fuel consumption for ALL ROUTES Medium CAR_GT (l/100km)	**1.892**
ALL ROUTES ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000139862	386.4071829	-15.7303557	0.368607573	-0.00434113	2.56371E-05	-5.8387E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.05			7.094			18.060	**1.281**
																														Average fuel consumption for ALL ROUTES Large PTW_BL (l/100km)	**1.281**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000139862	386.4071829	-15.7303557	0.368607573	-0.00434113	2.56371E-05	-5.8387E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	20.65			7.763			18.140	**1.408**
																														Average fuel consumption for ALL ROUTES Large PTW_GT (l/100km)	**1.408**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	3747.3435	155.98913	-0.8526973	0.0103176	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.32			16.366			17.100	**2.799**
																														Average fuel consumption for ALL ROUTES Large CAR_GT (l/100km)	**2.799**
ALL ROUTES (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 34	15.32			6.285			17.100	**1.075**
																														Average fuel consumption for ALL ROUTES Small Diesel CAR_GT (l/100km)	**1.075**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.32			7.792			17.100	**1.332**
																														Average fuel consumption for ALL ROUTES Medium Diesel CAR_GT (l/100km)	**1.332**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 40	15.32			9.033			17.100	**1.545**
																														Average fuel consumption for ALL ROUTES Large Diesel CAR_GT (l/100km)	**1.545**

ROUTE A - A1 Archway Road to Palestra (SMALL PETROL VEHICLES)

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
PTW in bus lane	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	24.41			33.357			11.017	**367.498**
																												Total uCO2 Emissions for Route A Small PTW_BL (grammes)	**367.498**
PTW in general traffic	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	19.72			33.357			11.149	**371.902**
																												Total uCO2 Emissions for Route A Small PTW_GT (grammes)	**371.902**
CAR in general traffic	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	13.87			227.106			11.186	**2540.413**
																												Total uCO2 Emissions for Route A Small CAR_GT (grammes)	**2,540.413**

ROUTE A - A1 Archway Road to Palestra (MEDIUM PETROL VEHICLES)

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
PTW in bus lane	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.41			123.635			11.017	**1362.088**
																												Total uCO2 Emissions for Route A Medium PTW_BL (grammes)	**1,362.088**
PTW in general traffic	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		19.72			138.575			11.149	**1544.974**
																												Total uCO2 Emissions for Route A Medium PTW_GT (grammes)	**1,544.974**
CAR in general traffic	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2532.35791	103.3971572	-0.43166932	0.006677558	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	13.87			281.313			11.186	**3146.765**
																												Total uCO2 Emissions for Route A Medium CAR_GT (grammes)	**3,146.765**

ROUTE A - A1 Archway Road to Palestra (LARGE PETROL VEHICLES)

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
PTW in bus lane	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.41			167.519			11.017	**1845.559**
																												Total uCO2 Emissions for Route A Large PTW_BL (grammes)	**1,845.559**
PTW in general traffic	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		19.72			189.944			11.149	**2117.682**
																												Total uCO2 Emissions for Route A Large PTW_GT (grammes)	**2,117.682**
CAR in general traffic	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.8526972	0.01031760	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	13.87			416.383			11.186	**4657.665**
																												Total uCO2 Emissions for Route A Large CAR_GT (grammes)	**4,657.665**

ROUTE A - A1 Archway Road to Palestra (DIESEL CARS)

SMALL

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	13.87			180.330			11.186	**2017.166**
																												Total uCO2 Emissions for Route A Small Diesel CAR_GT (grammes)	**2,017.166**

MEDIUM

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	13.87			221.018			11.186	**2472.310**
																												Total uCO2 Emissions for Route A Medium Diesel CAR_GT (grammes)	**2,472.310**

LARGE

	Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	13.87			254.545			11.186	**2847.340**
																												Total uCO2 Emissions for Route A Medium Diesel CAR_GT (grammes)	**2,847.340**

ROUTE A - A1 Archway Road to Palestra

Vehicle category / ROUTE A - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x) / URM emission factors (g/km)

			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function: Type	Function: Formula (y=EF in g/km; x=speed in km/h)	Coefficients: a	b	c	d	e	f	g	Adjustment factor (k)	Valid speed range: Minimum (km/h)	Maximum (km/h)	Data source	Report	Comment	Speeds (km/h): Urban	Rural	Motorway	Emissions (g/km): Urban	Rural	Motorway	km	Total g
ROUTE A - A1 Archway Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		24.41			0.0100			11.017	**0.110**
																															Total NOx Emissions for Route A Small PTW_BL (grammes)	**0.110**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		19.72			0.0100			11.149	**0.111**
																															Total NOx Emissions for Route A Small PTW_GT (grammes)	**0.111**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.887069717	0.009761248	9.90849E-05	1.83658E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	13.87			0.0751			11.186	**0.841**
																															Total NOx Emissions for Route A Small CAR_GT (grammes)	**0.841**
ROUTE A - A1 Archway Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.41			0.043			11.017	**0.477**
																															Total NOx Emissions for Route A Medium PTW_BL (grammes)	**0.477**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		19.72			0.049			11.149	**0.544**
																															Total NOx Emissions for Route A Medium PTW_GT (grammes)	**0.544**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.516913912	0.034501595	5.49275E-05	4.0848E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	13.87			0.073			11.186	**0.812**
																															Total NOx Emissions for Route A Medium CAR_GT (grammes)	**0.812**
ROUTE A - A1 Archway Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.41			0.067			11.017	**0.741**
																															Total NOx Emissions for Route A Large PTW_BL (grammes)	**0.741**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		19.72			0.078			11.149	**0.865**
																															Total NOx Emissions for Route A Large PTW_GT (grammes)	**0.865**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2.634691932	0.003709045	0.000289098	3.11184E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	13.87			0.198			11.186	**2.212**
																															Total NOx Emissions for Route A Large CAR_GT (grammes)	**2.212**
ROUTE A - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	0.675	5	140	Assumption		Code R26 * 0.675	13.87			0.359			11.186	**4.014**
																															Total NOx Emissions for Route A Small Diesel CAR_GT (grammes)	**4.014**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	1	5	140	DfT EFs database		Fit to g/h data	13.87			0.532			11.186	**5.947**
																															Total NOx Emissions for Route A Medium Diesel CAR_GT (grammes)	**5.947**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	15.89742288	0.114914539	0.000179381	4.42012E-05	-3.3264E-07	2.66432E-09	0	0.3375	5	120	Assumption, based on TA limits		Code R40 * 0.675	13.87			0.429			11.186	**4.800**
																															Total NOx Emissions for Route A Large Diesel CAR_GT (grammes)	**4.800**

			Vehicle category					ROUTE A - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE A - A1 Archway Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	24.41			1.400			11.017	**0.154**
																														Total fuel consumption for Route A Small PTW_BL (l/100km)	0.154
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	19.72			1.400			11.149	**0.156**
																														Total fuel consumption for Route A Small PTW_GT (l/100km)	0.156
	CAR in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	13.87			9.532			11.186	**1.066**
																														Total fuel consumption for Route A Small CAR_GT (l/100km)	1.066
ROUTE A - A1 Archway Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.41			5.189			11.017	**0.572**
																														Total fuel consumption for Route A Medium PTW_BL (l/100km)	0.572
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	19.72			5.816			11.149	**0.648**
																														Total fuel consumption for Route A Medium PTW_GT (l/100km)	0.648
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2532.3579	103.39716	-0.4316693	0.0066776	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	13.87			11.807			11.186	**1.321**
																														Total fuel consumption for Route A Medium CAR_GT (l/100km)	1.321
ROUTE A - A1 Archway Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.41			7.031			11.017	**0.775**
																														Total fuel consumption for Route A Large PTW_BL (l/100km)	0.775
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	19.72			7.972			11.149	**0.889**
																														Total fuel consumption for Route A Large PTW_GT (l/100km)	0.889
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	3747.34351	155.9891339	-0.85269728	0.010317601	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	13.87			17.475			11.186	**1.955**
																														Total fuel consumption for Route A Large CAR_GT (l/100km)	1.955
ROUTE A - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 34	13.87			6.678			11.186	**0.747**
																														Total fuel consumption for Route A Small Diesel CAR_GT (l/100km)	0.747
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	13.87			8.185			11.186	**0.916**
																														Total fuel consumption for Route A Medium Diesel CAR_GT (l/100km)	0.916
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 40	13.87			9.426			11.186	**1.054**
																														Total fuel consumption for Route A Large Diesel CAR_GT (l/100km)	1.054

			Vehicle category					ROUTE B - Average-speed emission factors (g/km) - Carbon Dioxide (uCO_2)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE B - A41 Hendon Way to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	23.22			33.357			17.025	**567.910**
																														Total uCO2 Emissions for Route B Small PTW_BL (grammes)	**567.910**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	21.37			33.357			17.232	**574.815**
																														Total uCO2 Emissions for Route B Small PTW_GT (grammes)	**574.815**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	14.95			215.708			17.232	**3717.080**
																														Total uCO2 Emissions for Route B Small CAR_GT (grammes)	**3,717.080**
ROUTE B - A41 Hendon Way to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.22			127.003			17.025	**2162.227**
																														Total uCO2 Emissions for Route B Medium PTW_BL (grammes)	**2,162.227**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.37			132.804			17.232	**2288.470**
																														Total uCO2 Emissions for Route B Medium PTW_GT (grammes)	**2,288.470**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2532.35791	103.3971572	-0.43166932	0.006677558	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	14.95			267.825			17.232	**4615.154**
																														Total uCO2 Emissions for Route B Medium CAR_GT (grammes)	**4,615.154**
ROUTE B - A41 Hendon Way to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.22			172.600			17.025	**2938.512**
																														Total uCO2 Emissions for Route B Large PTW_BL (grammes)	**2,938.512**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.37			181.305			17.232	**3124.242**
																														Total uCO2 Emissions for Route B Large PTW_GT (grammes)	**3,124.242**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.8526972	0.01031760	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	14.95			396.206			17.232	**6827.417**
																														Total uCO2 Emissions for Route B Large CAR_GT (grammes)	**6,827.417**
ROUTE B - A41 Hendon Way to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	14.95			172.262			17.232	**2968.416**
																														Total uCO2 Emissions for Route B Small Diesel CAR_GT (grammes)	**2,968.416**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	14.95			212.951			17.232	**3669.565**
																														Total uCO2 Emissions for Route B Medium Diesel CAR_GT (grammes)	**3,669.565**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	14.95			246.453			17.232	**4246.885**
																														Total uCO2 Emissions for Route B Large Diesel CAR_GT (grammes)	**4,246.885**

			Vehicle category					ROUTE B - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE B - A1 Archway Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		23.22			0.0100			17.025	**0.170**
																														Total NOx Emissions for Route B Small PTW_BL (grammes)	**0.170**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		21.37			0.0100			17.232	**0.172**
																														Total NOx Emissions for Route B Small PTW_GT (grammes)	**0.172**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.887069717	0.009761248	9.90849E-05	1.83658E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	14.95			0.0706			17.232	**1.217**
																														Total NOx Emissions for Route B Small CAR_GT (grammes)	**1.217**
ROUTE B - A1 Archway Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.22			0.044			17.025	**0.757**
																														Total NOx Emissions for Route B Medium PTW_BL (grammes)	**0.757**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.37			0.047			17.232	**0.803**
																														Total NOx Emissions for Route B Medium PTW_GT (grammes)	**0.803**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.516913912	0.034501595	5.49275E-05	4.0848E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	14.95			0.070			17.232	**1.206**
																														Total NOx Emissions for Route B Medium CAR_GT (grammes)	**1.206**
ROUTE B - A1 Archway Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.22			0.070			17.025	**1.185**
																														Total NOx Emissions for Route B Large PTW_BL (grammes)	**1.185**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.37			0.074			17.232	**1.269**
																														Total NOx Emissions for Route B Large PTW_GT (grammes)	**1.269**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2.634691932	0.003709045	0.000289098	3.11184E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	14.95			0.184			17.232	**3.176**
																														Total NOx Emissions for Route B Large CAR_GT (grammes)	**3.176**
ROUTE B - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	0.675	5	140	Assumption		Code R26 * 0.675	14.95			0.340			17.232	**5.867**
																														Total NOx Emissions for Route B Small Diesel CAR_GT (grammes)	**5.867**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	1	5	140	DfT EFs database		Fit to g/h data	14.95			0.504			17.232	**8.691**
																														Total NOx Emissions for Route B Medium Diesel CAR_GT (grammes)	**8.691**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	15.89742288	0.114914539	0.000179381	4.42012E-05	-3.3264E-07	2.66432E-09	0	0.3375	5	120	Assumption, based on TA limits		Code R40 * 0.675	14.95			0.402			17.232	**6.920**
																														Total NOx Emissions for Route B Large Diesel CAR_GT (grammes)	**6.920**

			Vehicle category					ROUTE B - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE B - A41 Hendon Way to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	23.22			1.400			17.025	**0.238**
																														Total fuel consumption for Route B Small PTW_BL (l/100km)	**0.238**
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	21.37			1.400			17.232	**0.241**
																														Total fuel consumption for Route B Small PTW_GT (l/100km)	**0.241**
	CAR in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	14.95			9.053			17.232	**1.560**
																														Total fuel consumption for Route B Small CAR_GT (l/100km)	**1.560**
ROUTE B - A41 Hendon Way to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	23.22			5.330			17.025	**0.907**
																														Total fuel consumption for Route B Medium PTW_BL (l/100km)	**0.907**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	21.37			5.574			17.232	**0.960**
																														Total fuel consumption for Route B Medium PTW_GT (l/100km)	**0.960**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2532.3579	103.39716	-0.4316693	0.0066776	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	14.95			11.241			17.232	**1.937**
																														Total fuel consumption for Route B Medium CAR_GT (l/100km)	**1.937**
ROUTE B - A41 Hendon Way to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	23.22			7.244			17.025	**1.233**
																														Total fuel consumption for Route B Large PTW_BL (l/100km)	**1.233**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	21.37			7.609			17.232	**1.311**
																														Total fuel consumption for Route B Large PTW_GT (l/100km)	**1.311**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.85269728	0.010317601	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	14.95			16.629			17.232	**2.865**
																														Total fuel consumption for Route B Large CAR_GT (l/100km)	**2.865**
ROUTE B - A41 Hendon Way to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 34	14.95			6.379			17.232	**1.099**
																														Total fuel consumption for Route B Small Diesel CAR_GT (l/100km)	**1.099**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	14.95			7.886			17.232	**1.359**
																														Total fuel consumption for Route B Medium Diesel CAR_GT (l/100km)	**1.359**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 40	14.95			9.127			17.232	**1.573**
																														Total fuel consumption for Route B Large Diesel CAR_GT (l/100km)	**1.573**

ROUTE C - Average-speed emission factors (g/km) - Carbon Dioxide (uCO_2)

			Vehicle category					Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	URM emission factors (g/km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Speeds (km/h)			Emissions (g/km)			km	Total g
																							Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE C - A3 Roehampton Vale to Putney Heath ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	24.40			33.357			17.688	**590.026**
																														Total uCO2 Emissions for Route C Small PTW_BL (grammes)	**590.026**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	18.16			33.357			17.762	**592.494**
																														Total uCO2 Emissions for Route C Small PTW_GT (grammes)	**592.494**
ROUTE C - A3 Roehampton Vale to Putney Heath ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.40			123.654			17.688	**2187.196**
																														Total uCO2 Emissions for Route C Medium PTW_BL (grammes)	**2,187.196**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		18.16			144.624			17.762	**2568.807**
																														Total uCO2 Emissions for Route C Medium PTW_GT (grammes)	**2,568.807**
ROUTE C - A3 Roehampton Vale to Putney Heath ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.40			167.560			17.688	**2963.806**
																														Total uCO2 Emissions for Route C Large PTW_BL (grammes)	**2,963.806**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		18.16			198.980			17.762	**3534.278**
																														Total uCO2 Emissions for Route C Large PTW_GT (grammes)	**3,534.278**

			Vehicle category					ROUTE C - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE C - A1 Archway Road to Palestra Alley (SMALL - PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		24.40			0.0100			17.688	**0.177**
																														Total NOx Emissions for Route C Small PTW_BL (grammes)	**0.177**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		18.16			0.0100			17.762	**0.178**
																														Total NOx Emissions for Route C Small PTW_GT (grammes)	**0.178**
ROUTE C - A1 Archway Road to Palestra Alley (MEDIUM* PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.40			0.043			17.688	**0.766**
																														Total NOx Emissions for Route C Medium PTW_BL (grammes)	**0.766**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		18.16			0.051			17.762	**0.909**
																														Total NOx Emissions for Route C Medium PTW_GT (grammes)	**0.909**
ROUTE C - A1 Archway Road to Palestra Alley (LARGE* PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.40			0.067			17.688	**1.190**
																														Total NOx Emissions for Route C Large PTW_BL (grammes)	**1.190**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		18.16			0.082			17.762	**1.451**
																														Total NOx Emissions for Route C Large PTW_GT (grammes)	**1.451**

			Vehicle category					ROUTE C - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
								Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE C - A3 Roehampton Vale to Palestra (SMALL PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	24.40			1.400			17.688	**0.248**
																													Total fuel consumption for Route C Small PTW_BL (l/100km)	**0.248**
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	18.16			1.400			17.762	**0.249**
																													Total fuel consumption for Route C Small PTW_GT (l/100km)	**0.249**
ROUTE C - A3 Roehampton Vale to Palestra (MEDIUM PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.40			5.190			17.688	**0.918**
																													Total fuel consumption for Route C Medium PTW_BL (l/100km)	**0.918**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	18.16			6.070			17.762	**1.078**
																													Total fuel consumption for Route C Medium PTW_GT (l/100km)	**1.078**
ROUTE C - A3 Roehampton Vale to Palestra (LARGE PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.40			7.032			17.688	**1.244**
																													Total fuel consumption for Route C Large PTW_BL (l/100km)	**1.244**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	18.16			8.351			17.762	**1.483**
																													Total fuel consumption for Route C Large PTW_GT (l/100km)	**1.483**

ROUTE D - Average-speed emission factors (g/km) - Carbon Dioxide (uCO_2)

			Vehicle category					Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	URM emission factors (g/km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Speeds (km/h)			Emissions (g/km)			km	Total g
																							Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE D - A21 Bromley Common to Pelestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	25.23			33.357			24.014	**801.044**
																														Total uCO2 Emissions for Route D Small PTW_BL (grammes)	**801.044**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	23.34			33.357			24.072	**802.979**
																														Total uCO2 Emissions for Route D Small PTW_GT (grammes)	**802.979**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.03			214.934			24.055	**5170.232**
																														Total uCO2 Emissions for Route D Small CAR_GT (grammes)	**5,170.232**
ROUTE D - A21 Bromley Common to Pelestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		25.23			121.453			24.014	**2916.565**
																														Total uCO2 Emissions for Route D Medium PTW_BL (grammes)	**2,916.565**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.34			126.650			24.072	**3048.729**
																														Total uCO2 Emissions for Route D Medium PTW_GT (grammes)	**3,048.729**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2532.35791	103.3971572	-0.43166932	0.006677558	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.03			266.905			24.055	**6420.388**
																														Total uCO2 Emissions for Route D Medium CAR_GT (grammes)	**6,420.388**
ROUTE D - A21 Bromley Common to Pelestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		25.23			164.240			24.014	**3944.066**
																														Total uCO2 Emissions for Route D Large PTW_BL (grammes)	**3,944.066**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.34			172.070			24.072	**4142.061**
																														Total uCO2 Emissions for Route D Large PTW_GT (grammes)	**4,142.061**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.8526972	0.010317601	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	15.03			394.828			24.055	**9497.590**
																														Total uCO2 Emissions for Route D Large CAR_GT (grammes)	**9,497.590**
ROUTE D - A21 Bromley Common to Pelestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.03			171.704			24.055	**4130.341**
																														Total uCO2 Emissions for Route D Small Diesel CAR_GT (grammes)	**4,130.341**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.03			212.393			24.055	**5109.109**
																														Total uCO2 Emissions for Route D Medium Diesel CAR_GT (grammes)	**5,109.109**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	15.03			245.896			24.055	**5915.019**
																														Total uCO2 Emissions for Route D Large Diesel CAR_GT (grammes)	**5,915.019**

			Vehicle category					ROUTE D - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE D - A1 Archway Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		25.23			0.0100			24.014	**0.240**
																														Total NOx Emissions for Route D Small PTW_BL (grammes)	**0.240**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		23.32			0.0100			24.072	**0.241**
																														Total NOx Emissions for Route D Small PTW_GT (grammes)	**0.241**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.887069717	0.009761248	9.90849E-05	1.83658E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.03			0.0703			24.055	**1.691**
																														Total NOx Emissions for Route D Small CAR_GT (grammes)	**1.691**
ROUTE D - A1 Archway Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		25.23			0.043			24.014	**1.022**
																														Total NOx Emissions for Route D Medium PTW_BL (grammes)	**1.022**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.32			0.044			24.072	**1.067**
																														Total NOx Emissions for Route D Medium PTW_GT (grammes)	**1.067**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.516913912	0.034501595	5.49275E-05	4.0848E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.03			0.070			24.055	**1.679**
																														Total NOx Emissions for Route D Medium CAR_GT (grammes)	**1.679**
ROUTE D - A1 Archway Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		25.23			0.066			24.014	**1.580**
																														Total NOx Emissions for Route D Large PTW_BL (grammes)	**1.580**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		23.34			0.069			24.072	**1.670**
																														Total NOx Emissions for Route D Large PTW_GT (grammes)	**1.670**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2.634691932	0.003709045	0.000289098	3.11184E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	15.03			0.183			24.055	**4.412**
																														Total NOx Emissions for Route D Large CAR_GT (grammes)	**4.412**
ROUTE D - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	0.675	5	140	Assumption		Code R26 * 0.675	15.03			0.339			24.055	**8.159**
																														Total NOx Emissions for Route D Small Diesel CAR_GT (grammes)	**8.159**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	1	5	140	DfT EFs database		Fit to g/h data	15.03			0.503			24.055	**12.088**
																														Total NOx Emissions for Route D Medium Diesel CAR_GT (grammes)	**12.088**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	15.89742288	0.114914539	0.000179381	4.42012E-05	-3.3264E-07	2.66432E-09	0	0.3375	5	120	Assumption, based on TA limits		Code R40 * 0.675	15.03			0.400			24.055	**9.615**
																														Total NOx Emissions for Route D Large Diesel CAR_GT (grammes)	**9.615**

			Vehicle category					ROUTE D - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE D - A21 Bromley Common to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	25.23			1.400			24.014	**0.336**
																														Total fuel consumption for Route D Small PTW_BL (l/100km)	0.336
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	23.34			1.400			24.072	**0.337**
																														Total fuel consumption for Route D Small PTW_GT (l/100km)	0.337
	CAR in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.03			9.021			24.055	**2.170**
																														Total fuel consumption for Route D Small CAR_GT (l/100km)	2.170
ROUTE D - A21 Bromley Common to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	130	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	25.23			5.097			24.014	**1.224**
																														Total fuel consumption for Route D Medium PTW_BL (l/100km)	1.224
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	23.34			5.315			24.072	**1.280**
																														Total fuel consumption for Route D Medium PTW_GT (l/100km)	1.280
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2532.3579	103.39716	-0.4316693	0.0066776	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.03			11.202			24.055	**2.695**
																														Total fuel consumption for Route D Medium CAR_GT (l/100km)	2.695
ROUTE D - A21 Bromley Common to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	25.23			6.893			24.014	**1.655**
																														Total fuel consumption for Route D Large PTW_BL (l/100km)	1.655
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	23.34			7.222			24.072	**1.738**
																														Total fuel consumption for Route D Large PTW_GT (l/100km)	1.738
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.85269728	0.010317601	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.03			16.571			24.055	**3.986**
																														Total fuel consumption for Route D Large CAR_GT (l/100km)	3.986
ROUTE D - A21 Bromley Common to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 34	15.03			6.359			24.055	**1.530**
																														Total fuel consumption for Route D Small Diesel CAR_GT (l/100km)	1.530
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	15.03			7.865			24.055	**1.892**
																														Total fuel consumption for Route D Medium Diesel CAR_GT (l/100km)	1.892
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 40	15.03			9.106			24.055	**2.190**
																														Total fuel consumption for Route D Large Diesel CAR_GT (l/100km)	2.190

			Vehicle category					ROUTE E - Average-speed emission factors (g/km) - Carbon Dioxide (uCO_2)												URM emission factors (g/km)							
								Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE E - A10, Great Cambridge Road to Roundhouse Roundabout ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	22.86			33.357			22.611	**754.244**
																														Total uCO2 Emissions for Route E Small PTW_BL (grammes)	**754.244**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	21.21			33.357			22.632	**754.945**
																														Total uCO2 Emissions for Route E Small PTW_GT (grammes)	**754.945**
ROUTE E - A10, Great Cambridge Road to Roundhouse Roundabout ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		22.86			128.078			22.611	**2895.969**
																														Total CO Emissions for Route E Medium PTW_BL (grammes)	**2,895.969**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.21			133.338			22.632	**3017.713**
																														Total CO Emissions for Route E Medium PTW_GT (grammes)	**3,017.713**
ROUTE E - A10, Great Cambridge Road to Roundhouse Roundabout ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		22.86			174.215			22.611	**3939.174**
																														Total CO Emissions for Route E Large PTW_BL (grammes)	**3,939.174**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.21			182.106			22.632	**4121.424**
																														Total CO Emissions for Route E Large PTW_GT (grammes)	**4,121.424**

			Vehicle category					ROUTE E - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x)												URM emission factors (g/km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Emissions (g/km)			km	Total g
								Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE E - A1 Archway Road to Palestra House (SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		22.86			0.0100			22.611	**0.226**
																													Total NOx Emissions for Route E Small PTW_BL (grammes)		**0.226**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		21.21			0.0100			22.632	**0.226**
																													Total NOx Emissions for Route E Small PTW_GT (grammes)		**0.226**
ROUTE E - A1 Archway Road to Palestra House (MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		22.86			0.045			22.611	**1.014**
																													Total NOx Emissions for Route E Medium PTW_BL (grammes)		**1.014**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.21			0.047			22.632	**1.059**
																													Total NOx Emissions for Route E Medium PTW_GT (grammes)		**1.059**
ROUTE E - A1 Archway Road to Palestra House (LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		22.86			0.070			22.611	**1.591**
																													Total NOx Emissions for Route E Large PTW_BL (grammes)		**1.591**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		21.21			0.074			22.632	**1.675**
																													Total NOx Emissions for Route E Large PTW_GT (grammes)		**1.675**

			Vehicle category					ROUTE E - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
								Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE E - A10 Great Cambridge Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	22.86			1.400			22.611	**0.3166**
																													Total fuel consumption for Route E Small PTW_BL (l/100km)	**0.317**
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	21.21			1.400			22.632	**0.317**
																													Total fuel consumption for Route E Small PTW_GT (l/100km)	**0.317**
ROUTE E - A10 Great Cambridge Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	100	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	22.86			5.375			22.611	**1.215**
																													Total fuel consumption for Route E Medium PTW_BL (l/100km)	**1.215**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	130	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	21.21			5.596			22.632	**1.267**
																													Total fuel consumption for Route E Medium PTW_GT (l/100km)	**1.267**
ROUTE E - A10 Great Cambridge Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	22.86			7.312			22.611	**1.653**
																													Total fuel consumption for Route E Large PTW_BL (l/100km)	**1.653**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	21.21			7.643			22.632	**1.730**
																													Total fuel consumption for Route E Large PTW_GT (l/100km)	**1.730**

ROUTE F - Average-speed emission factors (g/km) - Carbon Dioxide (uCO_2)

			Vehicle category					Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	URM emission factors (g/km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Speeds (km/h)			Emissions (g/km)			km	Total g
																							Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE F - A10 Great Cambridge Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	24.15			33.357			16.005	**533.885**
																														Total uCO2 Emissions for Route F Small PTW_BL (grammes)	**533.885**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0	10.5						3.176894513	5	50			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	20.10			33.357			16.005	**533.885**
																														Total uCO2 Emissions for Route F Small PTW_GT (grammes)	**533.885**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	17.44			195.091			15.818	**3085.943**
																														Total uCO2 Emissions for Route F Small CAR_GT (grammes)	**3,085.943**
ROUTE F - A10 Great Cambridge Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.15			124.342			16.005	**1990.092**
																														Total uCO2 Emissions for Route F Medium PTW_BL (grammes)	**1,990.092**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001302	270.85402	-10.611696	0.2489849	-0.0029103	1.722E-05	-3.901E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.10			137.201			16.005	**2195.903**
																														Total uCO2 Emissions for Route F Medium PTW_GT (grammes)	**2,195.903**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2532.35791	103.3971572	-0.43166932	0.006677558	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	17.44			243.104			15.818	**3845.417**
																														Total uCO2 Emissions for Route F Medium CAR_GT (grammes)	**3,845.417**
ROUTE F - A10 Great Cambridge Road to Palestra ('LARGE PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.15			168.596			16.005	**2698.381**
																														Total uCO2 Emissions for Route F Large PTW_BL (grammes)	**2,698.381**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.10			187.889			16.005	**3007.158**
																														Total uCO2 Emissions for Route F Large PTW_GT (grammes)	**3,007.158**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.8526972	0.01031760	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;petrol = 0.75 kg/l)	17.44			359.127			15.818	**5680.668**
																														Total uCO2 Emissions for Route F Large CAR_GT (grammes)	**5,680.668**
ROUTE F - A10 Great Cambridge Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	17.44			156.963			15.818	**2482.843**
																														Total uCO2 Emissions for Route F Small Diesel CAR_GT (grammes)	**2,482.843**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	17.44			197.652			15.818	**3126.457**
																														Total uCO2 Emissions for Route F Medium Diesel CAR_GT (grammes)	**3,126.457**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.01226381	0	0	0	1	5	140			FC l/100km -> uCO2 (fuel=CH1.85;diesel = 0.85 kg/l)	17.44			231.155			15.818	**3656.405**
																														Total uCO2 Emissions for Route F Large Diesel CAR_GT (grammes)	**3,656.405**

ROUTE F - Average-speed emission factors (g/km) - Oxides of Nitrogen (NO_x)

			Vehicle category						Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	URM emission factors (g/km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard		Type	Formula (y=EF in g/km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Speeds (km/h)			Emissions (g/km)			km	Total g
																								Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE 1 - A1 Archway Road to Palestra ('SMALL': PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		24.15			0.0100			16.005	**0.160**
																															Total NOx Emissions for Route F Small PTW_BL (grammes)	**0.160**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0	0.01						1	5	50	COPERT IV	Elst et al.(2006)		20.10			0.0100			16.005	**0.160**
																															Total NOx Emissions for Route F Small PTW_GT (grammes)	**0.160**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0.887069717	0.009761248	9.90849E-05	1.83658E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	17.44			0.0624			15.818	**0.987**
																															Total NOx Emissions for Route F Small CAR_GT (grammes)	**0.987**
ROUTE F - A1 Archway Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.15			0.044			16.005	**0.696**
																															Total NOx Emissions for Route F Medium PTW_BL (grammes)	**0.696**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	1.738E-07	0.1067209	-0.0048229	0.0001181	-1.296E-06	8.174E-09	-1.93E-11	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.10			0.048			16.005	**0.772**
																															Total NOx Emissions for Route F Medium PTW_GT (grammes)	**0.772**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	0.516913912	0.034501595	5.49275E-05	4.0848E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	17.44			0.065			15.818	**1.032**
																															Total NOx Emissions for Route F Medium CAR_GT (grammes)	**1.032**
ROUTE F - A1 Archway Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		24.15			0.068			16.005	**1.085**
																															Total NOx Emissions for Route F Large PTW_BL (grammes)	**1.085**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	-0.047159	0.1627546	-0.0058996	9.397E-05	-4.168E-07	1.508E-09	0	1	5	140	ARTEMIS WP500	Elst et al.(2006)		20.10			0.077			16.005	**1.227**
																															Total NOx Emissions for Route F Large PTW_GT (grammes)	**1.227**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	2.634691932	0.003709045	0.000289098	3.11184E-07	0	0	0	1	5	120	DfT EFs database		Fit to g/h data	17.44			0.160			15.818	**2.530**
																															Total NOx Emissions for Route F Large CAR_GT (grammes)	**2.530**
ROUTE F - A1 Archway Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	0.675	5	140	Assumption		Code R26 * 0.675	17.44			0.307			15.818	**4.860**
																															Total NOx Emissions for Route F Small Diesel CAR_GT (grammes)	**4.860**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	5.4852588	0.123076	0.000670753	2.07703E-05	-9.9725E-08	8.49508E-10	0	1	5	140	DfT EFs database		Fit to g/h data	17.44			0.455			15.818	**7.200**
																															Total NOx Emissions for Route F Medium Diesel CAR_GT (grammes)	**7.200**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5		Polynomial	y=k*(a+bx+cx²+dx³+ex⁴+fx⁵+gx⁶)/x	15.89742288	0.114914539	0.000179381	4.42012E-05	-3.3264E-07	2.66432E-09	0	0.3375	5	120	Assumption, based on TA limits		Code R40 * 0.675	17.44			0.352			15.818	**5.560**
																															Total NOx Emissions for Route F Large Diesel CAR_GT (grammes)	**5.560**

			Vehicle category					ROUTE F - Average-speed fuel consumption (l/100 km)												URM fuel consumption (l/100km)							
			Code	Vehicle type	Fuel type	Engine capacity (cc) or weight limit (tonnes)	Emission standard	Function		Coefficients							Adjustment factor (k)	Valid speed range		Data source	Report	Comment	Speeds (km/h)			Fuel consumption (l/100km)			km	litres fuel
								Type	Formula (y=FC in l/100km; x=speed in km/h)	a	b	c	d	e	f	g		Minimum (km/h)	Maximum (km/h)				Urban	Rural	Motorway	Urban	Rural	Motorway		
ROUTE F - A10 Great Cambridge Road to Palestra ('SMALL' PETROL VEHICLES)	PTW in bus lane	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	24.15			1.400			16.005	**0.224**
																													Total fuel consumption for Route F Small PTW_BL (l/100km)	**0.224**
	PTW in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R241	Moped	Petrol	< 50 cc	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0	10.5						0.1333333	5	50	COPERT IV		Conv. to l/100km (petrol = 0.75 kg/l)	20.10			1.400			16.005	**0.224**
																													Total fuel consumption for Route F Small PTW_GT (l/100km)	**0.224**
	CAR in general traffic	Fuel consumption over total route (Average speeds including stoppages)	R005	Car <2.5 t	Petrol	<1400 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	2260.64896	59.44419222	0.292631778	0.003019904	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	17.44			8.188			15.818	**1.295**
																													Total fuel consumption for Route F Small CAR_GT (l/100km)	**1.295**
ROUTE F - A10 Great Cambridge Road to Palestra ('MEDIUM' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	130	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.15			5.219			16.005	**0.835**
																													Total fuel consumption for Route F Medium PTW_BL (l/100km)	**0.835**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R261	M/cycle, 4-stroke	Petrol	250-750	Euro 3	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	0.000130236	270.8540169	-10.6116958	0.248984889	-0.00291032	1.72236E-05	-3.9009E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	20.10			5.758			16.005	**0.922**
																													Total fuel consumption for Route F Medium PTW_GT (l/100km)	**0.922**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R012	Car <2.5 t	Petrol	1400-2000 cc	Euro 4	Polynomial	y=k*(a+bx+cx2+dx3+ex4+fx5+gx6)/x	2532.3579	103.39716	-0.4316693	0.0066776	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	17.44			10.203			15.818	**1.614**
																													Total fuel consumption for Route F Medium CAR_GT (l/100km)	**1.614**
ROUTE F - A10 Great Cambridge Road to Palestra ('LARGE' PETROL VEHICLES)	PTW in bus lane	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	24.15			7.076			16.005	**1.133**
																													Total fuel consumption for Route F Large PTW_BL (l/100km)	**1.133**
	PTW in general traffic	Emissions over total route (Average speeds including stoppages)	R265	M/cycle, 4-stroke	Petrol	>750	Euro 3	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	0.0001399	386.40718	-15.730356	0.3686076	-0.0043411	2.564E-05	-5.839E-08	0.041969697	5	140	ARTEMIS WP500	Elst et al.(2006)	uCO2 conv. to l/100km (fuel=CH1.85;petrol = 0.75 kg/l)	20.10			7.886			16.005	**1.262**
																													Total fuel consumption for Route F Large PTW_GT (l/100km)	**1.262**
	CAR in general traffic	Emissions over total route (Average speeds including stoppages)	R019	Car <2.5 t	Petrol	>2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	3747.34351	155.9891339	-0.85269728	0.010317601	0	0	0	0.041969697	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	17.44			15.072			15.818	**2.384**
																													Total fuel consumption for Route F Large CAR_GT (l/100km)	**2.384**
ROUTE F - A10 Great Cambridge Road to Palestra (DIESEL CARS)	'SMALL'	Emissions over total route (Average speeds including stoppages)	R027	Car <2.5 t	Diesel	<1400 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	105.9591303	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 34	17.44			5.813			15.818	**0.919**
																													Total fuel consumption for Route F Small Diesel CAR_GT (l/100km)	**0.919**
	'MEDIUM'	Emissions over total route (Average speeds including stoppages)	R033	Car <2.5 t	Diesel	1400-2000 cc	Euro 4	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	146.6478778	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	DfT EFs database		Fit to l/h data, conv. to l/100km	17.44			7.319			15.818	**1.158**
																													Total fuel consumption for Route F Medium Diesel CAR_GT (l/100km)	**1.158**
	'LARGE'	Emissions over total route (Average speeds including stoppages)	R041	Car <2.5 t	Diesel	>2000 cc	Euro 5	Polynomial	$y=k*(a+bx+cx^2+dx^3+ex^4+fx^5+gx^6)/x$	1298.84287	180.1506901	-1.55969189	0.012263812	0	0	0	0.037032086	5	140	Assumption		As Code 40	17.44			8.560			15.818	**1.354**
																													Total fuel consumption for Route F Large Diesel CAR_GT (l/100km)	**1.354**