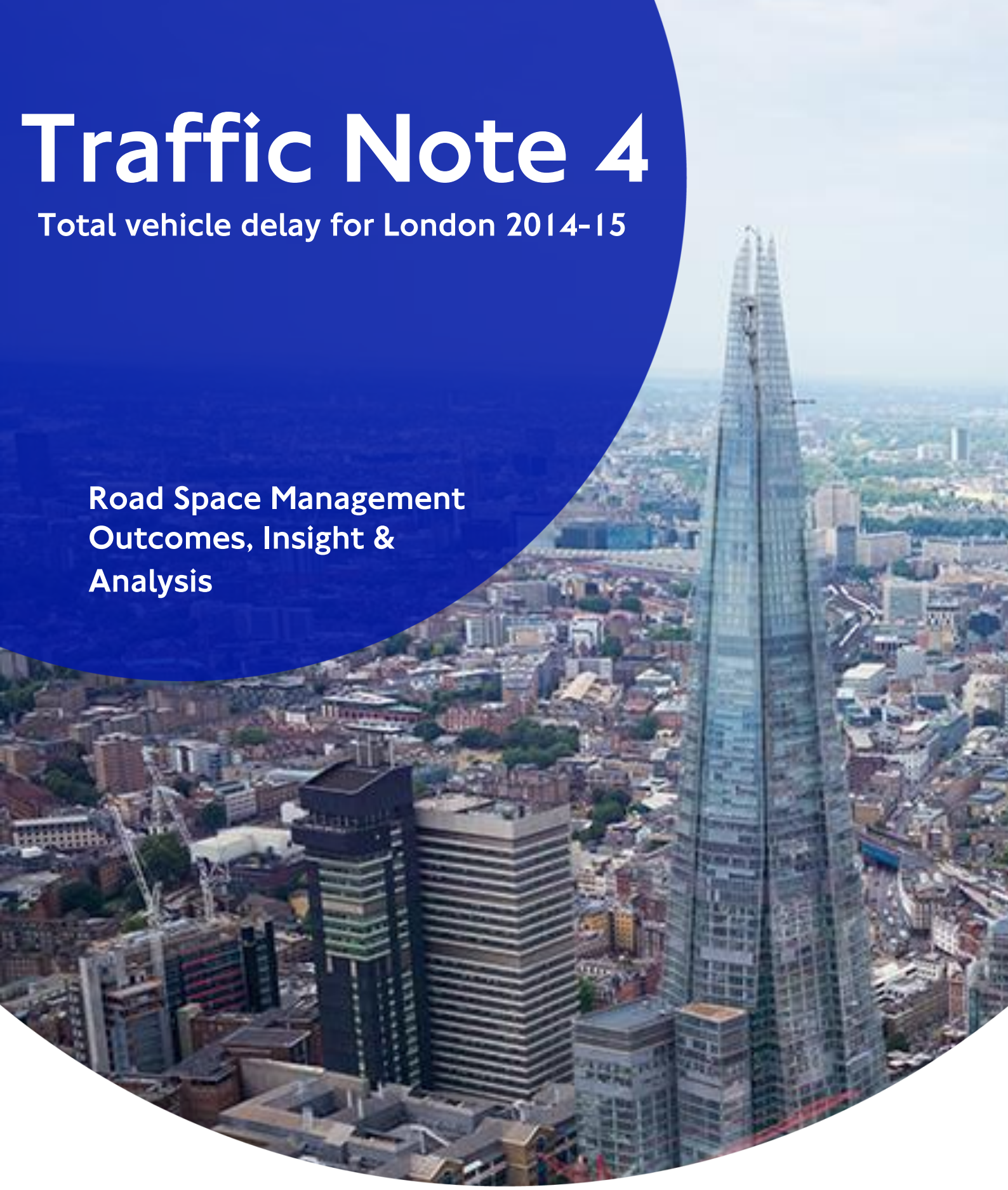
Traffic Note 4

Total vehicle delay for London 2014-15

Road Space Management Outcomes, Insight & Analysis



EVERY JOURNEY MATTERS

0 Document Control

0.1 Author

Nicola Franks
Road Space Management – Outcomes, Insight & Analysis

0.2 Checked by

Martin Obee
Road Space Management – Outcomes, Insight & Analysis

0.3 Approved by

Lee Abbott/Andy Emmonds
Road Space Management – Outcomes, Insight & Analysis

0.4 Document Summary

This traffic note provides a summary and analysis of estimated total vehicle delay in London derived from the TrafficMaster journey time data in conjunction with recorded traffic flows (from DfT traffic counts). It summarises total vehicle delay in 2014-15 for London broken down by different networks, areas and times of day. It also provides an estimated cost of total annual vehicle delay in London.

0.5 Document History

Version	Date	Changes since previous issue
0.1	24/03/16	First draft
0.2	05/04/16	Comments from LA incorporated & Cost of vehicle delay amended
0.3	27/04/16	Comments from MO & JT incorporated
1.1	10/05/16	Approved for release by Andy Emmonds

0.5 Distribution

Internally/externally upon request
OIA Sharepoint site

Contents

Tables

Figures

1 Executive Summary

1.1 The report provides a summary and analysis of estimated total vehicle delay in London derived from TrafficMaster journey time data in partnership with recorded traffic flows obtained from DfT traffic counts. Vehicle delay for London is broken down by different networks, areas and boroughs. Highlights include:

- The total annual vehicle delay on the network of interest for 2014-2015 is 13,135 million minutes.
- The highest proportion of annual vehicle delay occurred within Outer London, however Central London shows the highest annual delay per km with 4.86 million minutes.
- Total annual vehicle delay on the TLRN was 5,186 million minutes, on the SRN was 2,898 million minutes and on the BPRN (non SRN) was 2,871 million minutes.
- City of London shows the highest annual vehicle delay per km of network with 5.4 million minutes. LB Bexley shows the lowest annual vehicle delay per km with 1.6 million minutes.
- The estimated total cost of annual vehicle delay on the network of interest within Greater London is £5.5 billion. The TLRN accounts for £2.16 billion (39%), the SRN accounts for £1.21 billion (22%) and the BPRN (non SRN) £1.20 billion (22%).

2 Introduction

2.1 Traffic journey time data (commonly referred to as 'TrafficMaster data') is supplied by the company TrafficMaster. The basic data results from a GPS-based tracking system that records the position every minute of vehicles that are signed up to the system. Since 2007 the Department for Transport has contracted TrafficMaster to supply data, to be used by highways authorities including TfL. This enables detailed analysis of traffic journey times, speeds & delays, and cross-analysis of these with a variety of land use planning and cartographical features, across the whole of London.

2.2 This traffic note, produced by Outcomes, Insight and Analysis (OIA) within TfL, provides a summary and analysis of estimated total vehicle delay in London derived from the TrafficMaster journey time data in conjunction with recorded traffic flows (from DfT traffic counts). It summarises total vehicle delay for London broken down by different networks, areas and times of day. In Section 5, the total cost of annual vehicle delay for London is estimated.

2.3 Section 6 of this technical note provides a full methodology detailing how the delay figures reported have been estimated. For the purposes of this technical note delay on each network link has been interpreted as the actual speed compared to free flow speed. Free flow speeds have been approximated by using the observed night time speed (10pm to 6am). This takes into account that free flow speeds will vary by area, for instance they are lower in Central London compared to Outer London.

2.4 The aim of this technical note is to provide an estimation of the amount of time and cost vehicle delay causes in London. This note will be updated annually by OIA so that year on year comparisons can be made. This traffic note is based on 2014-15 annualised data.

3 Vehicle delay on the Network of Interest

3.1 The Network of Interest (NOI) is defined as all 'M' and 'A' numbered roads, plus busy minor roads, and busy bus routes. It comprises of around 6000 km of network in total, 4612 km within the Greater London area and is split into approximately 77,000 individual Integrated Transport Network (ITN) links. Note the network lengths reported in this section are based on the ITN and 2 way streets are counted twice to represent both directions.

3.2 Table 1 below shows total vehicle delay within Greater London on the NOI by area, time period and day of the week. On a typical weekday the greatest vehicle delay occurs during the PM Peak, whereas on a typical weekend day the greatest vehicle delay occurs during the Inter Peak. Comparing vehicle delay during the AM Peak shows whilst it is significant on a typical weekday, it is much less so on weekend days.

Table 1 – Estimated total daily vehicle delay within Greater London on the NOI by area, time period and day of the week

		Total vehicle delay (000's minutes)			
		AM Peak per hour	Inter Peak per hour	PM Peak per hour	12 Hour (7am to 7pm) Total
Average weekday	Central	322	408	413	4,653
	Inner	930	673	1,160	10,309
	Outer	2,690	1,571	3,286	27,355
	Total	3,943	2,652	4,859	42,317
Average Saturday	Central	27	145	194	1,534
	Inner	105	595	655	5,852
	Outer	266	1,904	1,334	16,223
	Total	398	2,644	2,183	23,609
Average Sunday	Central	13	144	224	1,574
	Inner	35	473	604	4,753
	Outer	99	1,357	881	11,081
	Total	147	1,973	1,709	17,409

3.3

Table 2 on the next page shows the estimated total annual vehicle delay on the NOI by area and time period. In total, annual vehicle delay on the NOI within Greater London was 13,135 million minutes. As expected the highest proportion of annual vehicle delay occurred within Outer London which makes up the majority of the network. However when the length of network in each area is taken into account Central London shows the highest annual vehicle delay per km with 4.86 million minutes. Compared to 2013-2014 there is a 6.1% increase in the 12 hour total delay per km for Greater London

Table 2 – Estimated total annual vehicle delay within Greater London on the NOI by area and time period

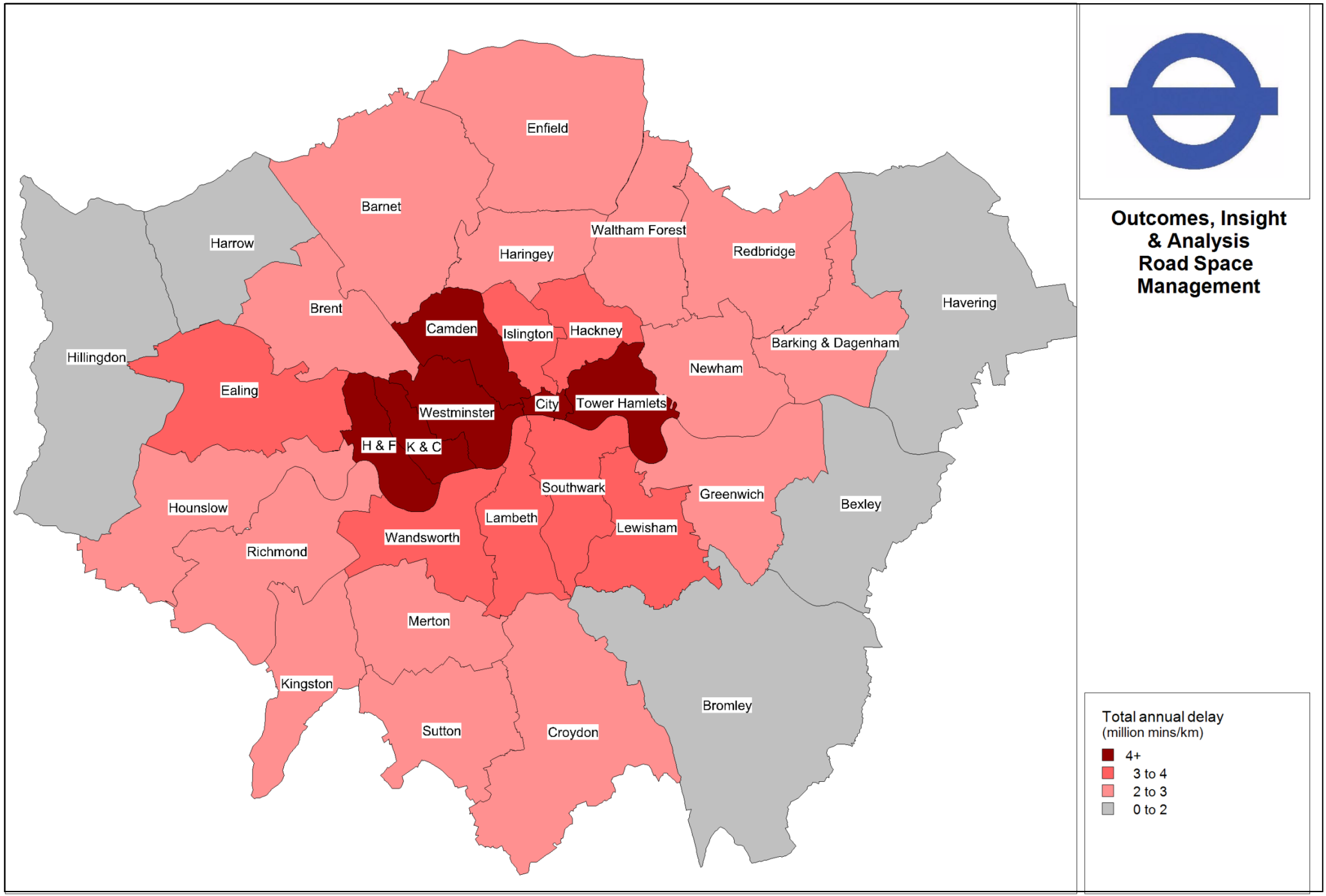
		Total annual vehicle delay (million minutes)					
		AM Peak per hour	Inter Peak per hour	PM Peak per hour	12 Hour (7am to 7pm) Total	12 Hour Total (per km)	Length of 2-way ITN Network (km)
2014-15	Central	85.9	121.0	129.2	1371.3	4.86	282
	Inner	249.0	230.6	366.9	3231.7	3.44	939
	Outer	718.5	577.9	969.6	8532.2	2.52	3391
	Total (Greater London)	**1053.4**	**929.6**	**1465.7**	**13135.2**	**2.85**	**4612**
2013-14	Central	76.8	101.2	111.2	1171.3	4.15	282
	Inner	235.9	220.7	350.0	3081.9	3.28	939
	Outer	681.0	556.9	917.9	8137.9	2.40	3393
	Total (Greater London)	**993.7**	**878.8**	**1379.1**	**12391.1**	**2.69**	**4614**
2012-13	Central	69.6	93.6	102.3	1077.1	3.83	281
	Inner	207.7	202.1	314.9	2780.3	2.96	939
	Outer	595.3	494.3	809.1	7179.2	2.12	3393
	Total (Greater London)	**872.6**	**789.9**	**1226.4**	**11036.6**	**2.39**	**4613**
2008-09	Central	75.8	96.0	100.8	1105.8	3.89	284
	Inner	213.6	222.8	338.2	2992.5	3.20	936
	Outer	581.4	540.9	820.3	7450.7	2.20	3394
	Total (Greater London)	**870.7**	**859.8**	**1259.3**	**11549.0**	**2.50**	**4613**
% change 14-15 from 13-14	**Total (Greater London)**	**6.0**	**5.8**	**6.3**	**6.0**	**6.1**	

3.4 Table 3 on the next page shows the estimated total annual vehicle delay on the NOI by borough and time period. City of London shows the highest annual vehicle delay per km of network with 5.4 million minutes followed by the borough of Hammersmith & Fulham with 4.8 million minutes. Bexley shows the lowest annual vehicle delay per km with 1.6 million minutes closely followed by Havering with 1.7 million minutes. The thematic map (Figure 1) on page 4 shows the total annual vehicle delay per km by borough.

Table 3 – Estimated total annual vehicle delay on the NOI by borough and time period

Borough	Total annual vehicle delay (million minutes)					
	AM Peak per hour	Inter Peak per hour	PM Peak per hour	12 Hour (7am to 7pm) Total	12 Hour Total (per km)	Length of 2-way ITN Network (km)
Barking & Dagenham	23.0	16.3	23.9	238.2	2.65	90
Barnet	66.1	49.7	81.0	739.6	2.97	249
Bexley	20.9	17.5	26.1	246.1	1.55	159
Brent	30.3	27.2	49.5	402.9	2.76	146
Bromley	39.9	33.8	46.1	460.4	1.79	258
Camden	31.4	39.9	48.9	480.5	4.01	120
City of London	14.3	17.8	17.4	202.0	5.41	37
Croydon	38.0	35.8	52.1	485.2	2.41	201
Ealing	55.2	45.4	82.1	684.0	3.84	178
Enfield	47.5	42.2	69.9	605.4	2.88	210
Greenwich	45.7	30.0	56.3	486.3	2.66	183
Hackney	17.8	17.2	27.1	238.0	3.15	76
Hammersmith & Fulham	24.2	26.0	45.5	365.3	4.84	76
Haringey	22.4	22.9	33.4	304.5	2.81	108
Harrow	15.7	14.7	22.4	202.7	1.77	115
Havering	28.6	20.9	32.9	309.9	1.73	179
Hillingdon	45.6	26.1	62.8	481.8	1.89	255
Hounslow	54.1	33.7	64.5	557.9	2.98	187
Islington	18.3	18.3	23.1	233.9	3.08	76
Kensington & Chelsea	19.6	28.8	39.3	349.6	4.82	73
Kingston upon Thames	24.8	18.1	31.4	277.3	2.67	104
Lambeth	36.7	27.4	41.5	398.8	3.08	129
Lewisham	34.0	30.2	44.3	416.0	3.70	113
Merton	28.5	23.0	34.2	325.9	2.76	118
Newham	16.2	20.8	49.5	321.9	2.74	117
Redbridge	34.3	31.1	50.4	440.9	2.77	159
Richmond upon Thames	34.6	27.6	42.9	397.9	2.79	142
Southwark	31.6	28.4	42.0	391.1	3.05	128
Sutton	17.6	14.8	20.1	201.9	2.22	91
Tower Hamlets	31.9	24.4	51.7	396.9	4.04	98
Waltham Forest	23.3	22.7	38.2	320.5	2.45	131
Wandsworth	40.4	33.8	48.1	468.1	3.58	131
Westminster	41.0	63.1	67.4	703.9	4.01	176

Figure 1 – Thematic map of total annual vehicle delay in 2014/15 on the NOI by borough (million minutes per km)



4 Vehicle delay on the TLRN, SRN and BPRN

4.1 The Transport for London Road Network (TLRN), Strategic Road Network (SRN) and Borough Principal Road Network (BPRN) are all subsets of the NOI. The TLRN is comprised of 1195 km of main road network (counting both directions) and makes up around 26% of the NOI within Greater London. It makes up 3.8% of all roads in Greater London but carries approximately 31% of all the traffic. TfL has full operational responsibility for the TLRN.

4.2 A further 902 km of main road network (counting both directions) is as designated as SRN on which TfL has strategic responsibility, through the Traffic Management Act 2004, for coordinating works and ensuring the free flow of traffic (including pedestrians). The SRN makes up 19.6% of the NOI within Greater London.

4.3 A further 1,347 km of main road network (counting both directions) is designated as BPRN, on which local authorities have full operational responsibility. These are the rest of the main roads which are not designated as TLRN or SRN and exclude the motorways managed by the Highways Agency. For the purposes of this report they are referred to as BPRN (Non SRN) and they make up 29.2% of the NOI within Greater London. Note the network lengths reported in this section are based on the ITN and two-way streets are counted twice to represent both directions.

4.4 Table 4 on the next page shows total vehicle delay on the TLRN, SRN and BPRN (non SRN) by area, time period and day of the week. On all networks the weekday delay is highest in the PM peak whereas on a Saturday the delay is highest in the Inter peak period. On a Sunday vehicle delay is highest on the TLRN in the PM peak however the SRN and BPRN (non SRN) show the highest delay in the Inter peak.

Table 4 – Estimated total daily vehicle delay within Greater London on the TLRN, SRN and BPRN (non SRN) by area, time period and day of the week

			Total vehicle delay (000's minutes)			
			AM Peak per hour	Inter Peak per hour	PM Peak per hour	12 Hour (7am to 7pm) Total
TLRN	Average weekday	Central	176	189	212	2,297
		Inner	454	326	587	5,079
		Outer	1,042	479	1,176	9,526
		Total	1,672	994	1,975	16,902
	Average Saturday	Central	14	75	96	782
		Inner	47	268	320	2,709
		Outer	75	592	435	5,083
		Total	136	935	851	8,574
	Average Sunday	Central	4	68	116	772
		Inner	14	222	317	2,322
		Outer	24	428	302	3,548
		Total	42	718	735	6,642
SRN	Average weekday	Central	75	118	101	1,235
		Inner	195	138	231	2,104
		Outer	494	386	676	5,827
		Total	765	642	1,008	9,166
	Average Saturday	Central	6	32	49	355
		Inner	23	142	144	1,353
		Outer	57	473	341	4,037
		Total	86	647	534	5,745
	Average Sunday	Central	3	33	52	359
		Inner	8	107	125	1,038
		Outer	21	347	206	2,764
		Total	31	487	383	4,161
BPRN - Non SRN	Average weekday	Central	33	42	40	469
		Inner	150	120	180	1,714
		Outer	655	438	809	7,018
		Total	839	600	1,029	9,201
	Average Saturday	Central	3	15	18	154
		Inner	18	101	102	965
		Outer	78	512	341	4,329
		Total	99	628	461	5,448
	Average Sunday	Central	2	15	21	158
		Inner	7	81	90	779
		Outer	30	352	209	2,824
		Total	38	448	320	3,761

4.5 Table 5 on the next page shows the estimated total annual vehicle delay on the TLRN, SRN and BPRN (non SRN) by area and time period. In total, annual vehicle delay on the TLRN was 5,186 million minutes, on the SRN was 2,898 million minutes and on the BPRN (non SRN) was 2,871 million minutes. As expected the highest proportion of total annual vehicle delay for each of these networks occurred within the Outer London area which makes up the majority of the network.

4.6 Overall for Greater London, the TLRN network shows the highest total vehicle delay per km with 4.34 million minutes per km which is 9.5% higher than in 2013/14. Within Central, Inner and Outer London the highest total vehicle delay per km is concentrated to the TLRN in Central London with 7.18 million minutes per km. Across all three networks the highest rate of vehicle delay per km occurs within the Central London area. Both the TLRN and SRN show significantly higher rates of total vehicle delay per km compared to the BPRN (non SRN), however the total vehicle delay per km on the BPRN (non SRN) has risen more since 2013/14 than the delay on the SRN. Compared to 2013-2014 there has been a 6.4% increase in the 12 hour total delay per km for the TLRN, SRN and BPRN (non SRN) combined.

Table 5 – Estimated total annual vehicle delay within Greater London on the TLRN, SRN and BPRN (non SRN) by area and time period

		Total annual vehicle delay (million minutes)					
		AM Peak per hour	Inter Peak per hour	PM Peak per hour	12 Hour (7am to 7pm) Total	12 Hour Total (per km)	Length of 2-way ITN Network (km)
TLRN	Central	46.7	56.5	66.2	678.1	7.18	94.4
	Inner	121.1	110.2	185.8	1582.2	4.82	327.9
	Outer	276.1	177.5	344.0	2925.5	3.79	772.3
	Total (Greater London) 2014-15	**444.0**	**344.3**	**596.0**	**5185.8**	**4.34**	**1194.6**
	Total (Greater London) 2013-14	**409.8**	**308.7**	**551.1**	**4735.0**	**3.96**	**1194.6**
	Total (Greater London) 2012-13	**357.4**	**269.9**	**479.7**	**4130.8**	**3.46**	**1195.2**
	Total (Greater London) 2008-09	**352.5**	**299.2**	**481.9**	**4298.2**	**3.59**	**1196.7**
	% Change 14-15 from 13-14	**8.3**	**11.5**	**8.2**	**9.5**	**9.5**	
SRN	Central	20.0	34.0	31.4	358.3	4.82	74.3
	Inner	52.3	48.7	74.1	671.3	3.91	171.6
	Outer	132.6	143.1	204.2	1868.7	2.86	653.8
	Total (Greater London)	**204.9**	**225.8**	**309.7**	**2898.2**	**3.22**	**899.7**
	% Change 14-15 from 13-14	**4.6**	**1.3**	**4.0**	**2.9**	**3.1**	
BPRN - Non SRN	Central	8.8	12.4	12.4	138.1	3.38	40.8
	Inner	40.4	40.7	56.9	536.4	2.38	225.6
	Outer	175.9	158.7	238.8	2196.6	2.03	1080.2
	Total (Greater London)	**225.2**	**211.8**	**308.2**	**2871.0**	**2.13**	**1346.6**
	% Change 14-15 from 13-14	**5.7**	**2.6**	**5.7**	**4.3**	**4.31**	
TLRN, SRN and BPRN non SRN	Central	75.5	103.0	110.1	1174.5	5.61	209.5
	Inner	213.9	199.7	316.8	2789.9	3.85	725.1
	Outer	584.6	479.3	787.0	6990.8	2.79	2506.3
	Total (Greater London) 2014-15	**874.0**	**781.9**	**1213.9**	**10955.1**	**3.18**	**3440.9**
	Total (Greater London) 2013-14	**818.7**	**737.9**	**1140.4**	**10304.7**	**2.99**	**3442.4**
	Total (Greater London) 2012-13	**719.4**	**660.2**	**1012.7**	**9157.7**	**2.68**	**3416.3**
	Total (Greater London) 2008-09	**712.4**	**719.1**	**1039.2**	**9569.8**	**2.8**	**3407.0**
	% Change 14-15 from 13-14	**6.8**	**6.0**	**6.4**	**6.3**	**6.4**	

5 Estimated cost of vehicle delay

5.1 The DfT uses COBA (COst Benefit Analysis) to compare road schemes costs against the derived benefits to road users, and presents the results as a monetary value. COBA attributes a monetary value to time savings, and this can be used to produce an estimation of delay cost.

5.2 The COBA Manual identifies three main travel purposes;

1 - Work (travel in the course of work);
2 - Commuting (travel to and from normal place of work);
3 - Other (travel for non-working reasons).

5.3 These are based on various assumptions which can be found in more detail at: https://www.gov.uk/government/publications/coba-11-user-manual

5.4 The cost of delay for an average vehicle is taken as a function of vehicle proportions, vehicle occupancy, trip purpose proportion and the resource cost for occupants by mode. To generate a figure appropriate for London at 2016 values the following methodology was used:

1. Vehicle proportions have been taken from DfT counts.

2. Vehicle occupancies per km are based on DfT 2000 occupancies per vehicle km (from WebTAG Table A 1.3.3) for all vehicles except buses, where figures from the Travel in London report 8 are used. The DfT 2000 occupancy figures have not been deflated because London Travel Survey trip data suggests occupancies have actually risen in London since 2000 and are now very close to DfT national trip figures for 2000.

3. The 2014 Working Values of Time (Resource cost) for vehicle occupants were generated using WebTAG methodology and a London uplift based on wage differences between London and the UK. The 2016 figures were generated by factoring the 2014 figures based on average real GDP growth and HM treasury's GDP deflator. This gives a London Weighted Value of Time for 2016.

5.5 Using the above methodology, the cost of delay for an average vehicle is given as £20.83 per hour. This cost equates to 35 pence per minute for an average vehicle. By applying this to the figures for total delay in million minutes for each network the total annual cost of vehicle delay can be estimated:

Table 6 – Estimated cost of annual vehicle delay on the NOI, TLRN, and BPRN (2014/15)

	Estimated cost of total annual vehicle delay (£million)				
	NOI	TLRN	SRN	BPRN - non SRN	TLRN, SRN and BPRN non SRN
Central	571.3	282.5	149.3	57.5	489.3
Inner	1346.3	659.1	279.7	223.5	1162.3
Outer	3554.5	1218.8	778.5	915.1	2912.4
Total	5472.1	2160.4	1207.4	1196.1	4563.9

5.6 Table 6 above shows that the estimated total cost of annual vehicle delay on the NOI is £5.5 billion. The TLRN accounts for 39% of this (£2.16 billion), the SRN 22% (£1.21 billion) and the BPRN (non SRN) 22% (£1.20 billion). The estimated cost of annual vehicle delay on the NOI of £5.5 billion supersedes the £4.2 billion previously estimated in the 2012-2013 edition of this report. The key factors in revising this figure upwards are:

1. The increase in cost of delay for an average vehicle which was £19.09 in 2014 compared to £20.83 in 2016. The cost of delay has increased due to a rise in the London value of time (70% from real GDP, 30% from inflation) and re-evaluation of occupancy assumptions.

2. An increase in the underlying amount of total vehicle delay minutes observed on the network since 2012-13, including a 6% increase between 2013-14 and 2014-15.

5.7 The key assumptions made in calculating total vehicle delay are highlighted in Section 6.

6 Methodology for calculating total vehicle delay

6.1 This section provides a step by step methodology describing how the tables and figures contained in this technical note are derived:

1. Summary TrafficMaster data is extracted from the processed raw data using September 2014 to August 2015 period. This shows for each ITN link on the Network of Interest the average journey time and frequency of observations split for (i) working days only (ii) Saturdays and (iii) Sundays for the AM Peak (7am to 10am), Inter Peak (10am to 4pm), PM Peak (4pm to 7pm) and Night time (10pm to 6am) periods. Note the following steps are repeated for weekdays, Saturdays and Sundays separately.

2. For each link the AM, Inter and PM Peak period delay measurements are calculated (measured in minutes per km). This is a measure comparing the actual average peak speed to the actual average night time speed (free flow). Where there are no night time observations the speed limit of the link is used as a proxy for the free flow speed.

3. Links with fewer than 2 observations in each of the daytime peak periods are set to missing. As a sensitivity test this process was repeated but with links with 4 or fewer observations set to missing instead. The overall results showed there is no significant difference between the criteria used in this step and therefore the analysis was completed with links with fewer than 2 observations set to missing.

4. Links which have a negative delay are set to zero delay (ie daytime speed is greater than free flow or nightime speed).

5. For each peak period the average vehicle delay (mins per km) for each link is multiplied by the average vehicle km travelled per hour recorded from DfT National Road Traffic Census Counts. These products are summed for each time period, by area of London, and by road class to calculate the total vehicle delay per hour for each group. Additionally, the length of network which has valid observations is calculated for each group – The ratio of the network with valid observations to the full network is used to factor the estimated delay to reflect the entire network.

Note:

Areas of London used:
Central = TfL Central Cordon Boundary (an area within radius 2.5 – 3 kms from a centre at Aldwych);

Inner = Between Central Area and TfL Inner Cordon Boundary (an area roughly corresponding to the old London City Council, but excluding much of the boroughs of Greenwich and Lewisham);

Outer = Between Inner Area and current GLA Boundary;

Beyond Outer = Area outside GLA Boundary.

Road Classes used:
'A road', 'B road', 'Local Street', 'Minor road', and 'Pedestrianised Street' and 'Private Road'

6. From the extrapolated summary tables, which represent vehicle delay on the entire network for each group, the AM Peak total vehicle delay per hour is multiplied by 3, Inter Peak by 6, and PM Peak by 3. The sum of these represents the total vehicle delay for the 12 hour (7am to 7pm) period. Figures for Central, Inner and Outer London are calculated by summing the relevant groupings. Completing this for weekdays, Saturdays and Sundays gives an average figure for each of these days. An annual delay figure is estimated by multiplying the average weekday delay by 260, average Saturday delay by 52, and average Sunday delay by 52, and summing the products. In order to calculate total vehicle delay estimates for a 24 hour period, a factor of 1.2 is applied to the 12 hour values.

7 Assumptions made for calculating total vehicle delay

7.1 The key assumptions made are:

- The traffic data used to calculate the vehicle kilometres figures are derived from DfT manual classified counts. These are undertaken on neutral months/weekdays (i.e. March, April, May, June, September, and October). There may be scope to apply factors to calculate total annual delay (i.e. not simply weekday average x 260 and each weekend day x 52). However it is anticipated this would not significantly change the summary figures reported in this technical note.
- The recorded traffic flows used to calculate the total delay are carried out on weekdays only. Factors have been applied to estimate the Saturday and Sunday flows using the TfL weekend surveys carried out on the Central, Inner and Boundary Cordons.
- The 10pm to 6am speeds are representative of free flow speeds.
- The delay between 7pm and 7am is assumed to be 20% of the 12 hour (7am to 7pm) delay.

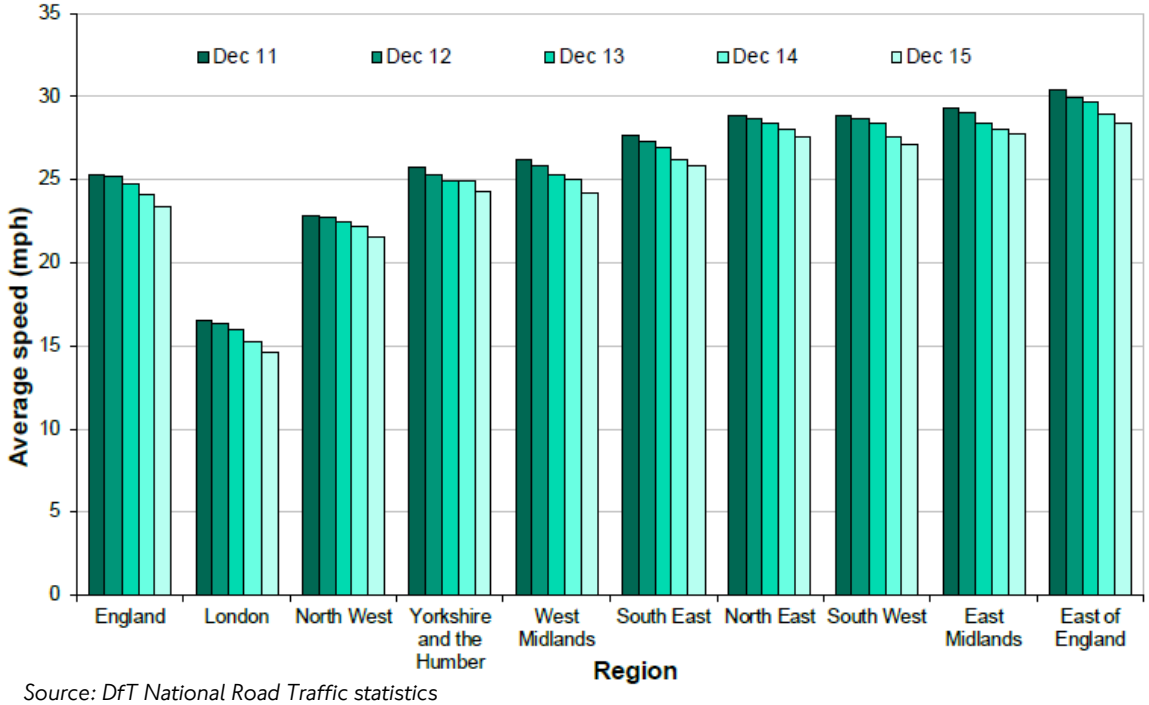
7.2 Some of the assumptions above may introduce positive error in the calculations, so the estimates of delay are likely to be maximum values.

8 Validation of TrafficMaster speed and delay data

8.1 At the end of the academic year 2013/14 it was observed that there had been a reduction in the average speeds and an increase in delay statistics calculated from TrafficMaster data. As a result of this, a series of further validation exercises were carried out at the end of 2014 using 2013/14 TrafficMaster data to ensure data quality and integrity. This involved investigating any new data sources from which the TrafficMaster fleet is compiled as well as the proportions of each vehicle type making up the fleet. The results of these validation exercises showed that despite new data sources being added, and slight changes in the composition of the fleet we can continue to report speed and delay statistics from this data with a high degree of confidence in their validity. TrafficMaster data was also compared against delay data from the London Congestion Analysis Project (LCAP) which showed that the trends seen in the TrafficMaster data were mirrored in the LCAP data. (Q:\Traffic Data\MR\TrafficMaster Data\Validation work\October 2014 Validation Study\Validation of TrafficMaster speed and delay data V1.0pdf.pdf)

8.2 The DfT also independently process and report from the same dataset average speed statistics for London as part of their National road traffic statistics publications. The general decline in average network speeds over the last 5 years that we have observed in the TrafficMaster dataset, are also reflected in the DfT figures published at a regional level. Figure 2 on the next page shows that over the last 5 years average weekday morning peak traffic speeds on local 'A' roads in all regions in England, including London, have shown a reduction (the only period currently reported by the DfT).

Figure 2 - Average vehicle speeds during the weekday morning peak (7am – 10am) on local 'A' roads by region, years ending December from 2011 (Source: DfT)



Source: DfT National Road Traffic statistics

8.3 Reductions in the speeds reported suggest that general congestion levels on these roads have increased over the period. Between 2014 and 2015 London experienced the greatest fall in average speeds across all nine of the DfT regions, followed by the West Midlands and North West. The DfT have suggested that recent falls in average speeds across London may be partly attributed to a reduction in speed limits in some London boroughs due to the introduction of the 20mph speed limits, as well as an increase in traffic levels.

9 Contacts for further information

9.1 If you require further information on this traffic note or have any other related queries please contact:

Andy Emmonds
0203 054 0911
Andy.Emmonds@tfl.gov.uk

Lee Abbott
0203 054 0894
lee.abbott@tfl.gov.uk

Martin Obee
0203 054 0893
martin.obee@tfl.gov.uk

Nicola Franks
0207 027 9080
Nicolafranks@tfl.gov.uk

10 Library of traffic notes

Other traffic notes include:

Traffic Notes

TfL Automatic Traffic Counts

- Traffic Note 2 – Expansion factors for road traffic counts in London (2012/13 update due in Summer 2016)
- Technical Note 4 - Validation of radar traffic monitoring equipment (published as an internal working document)
- Technical Note 6 - Validation of automatic traffic & cycle counters (published as an ongoing internal working documents)

TfL Cordon and Screenline Counts

- Traffic Note 3 – TfL Cordon and Screenlines 1975 to 2014. (Update with 2015 flows due in Summer 2016).
- Traffic Note 5 – Major and Minor traffic flows measured through TfL Cordon surveys

DfT NRTCC Counts

- Traffic Note 1 – Traffic levels on major roads in Greater London 1993-2014 (Update with 2015 flows due Summer 2016)

ITIS/TrafficMaster GPS journey time data

- ITIS – Validation Paper July 2005
- Technical Note 1 – ITIS Speed Survey Data
- Technical Note 2 – Traffic Delays in London on Weekdays, Saturdays and Sundays
- Traffic Note 4 - Total vehicle delay for London 2014-15 (2015/16 update due to be published in 2017)
- Traffic Note 6 – Traffic delays in the London Boroughs 2012-13 (published on GIS SharePoint website)

Cycling

- Traffic Note 7 - Weather conditions and the levels of cycling on the TLRN
- Traffic Note 8 – Proportion of cyclists violating red lights
- Traffic Note 9 – Cycling trends in London (2015 update due in summer 2016).
- Traffic Note 10 – TfL Pedestrian and Cycle Thames Screenline Surveys 2006-2007
- Traffic Note 11 – Cycling journey time reliability

11 Other useful documents

- Travel in London 8 -http://www.tfl.gov.uk/cdn/static/cms/documents/travel-in-london-report-8.pdf
- Transport Statistics for Great Britain 2014 – http://www.gov.uk/government/publications/transport-statistics-great-britain-2014
- For more detailed information on how national road traffic estimates are made by the DfT please refer to their website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/49976/annual-methodology-note.pdf
- Link to DfT website for individual site AADF Estimates - http://www.dft.gov.uk/traffic-counts/

12 References

- Journey time information used in this technical note is derived from data provided by TrafficMaster obtained from vehicles fitted with GPS devices
- Traffic flow data used in this technical note is derived from Department for Transport National Road Traffic Census Counts (NRTCC).

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