

# M6 TOLL TRAFFIC MONITORING STUDY

**Traffic Impact Study Report** 

POST OPENING PROJECT EVALUATION

M6 Toll Traffic Monitoring Study – Traffic Impact Study

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## M6 TOLL

### TRAFFIC IMPACT STUDY REPORT

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### 1. Introduction

#### **Overview**

- 1.1 The M6 Toll Motorway, the first toll motorway in the UK, opened in stages over the period 9<sup>th</sup> to the 14<sup>th</sup> December 2003. The scheme is a privately financed three lane motorway and provides a new strategic route to the north east of the West Midlands area (see Figure 1.1) and is 43 kilometres (27 miles) in length.
- 1.2 The M6 Toll offers an alternative route for traffic currently using the congested M6 Motorway between junctions 11 & 4 through the West Midlands Conurbation. This section of the M6 is one of the busiest stretches of motorway in the UK and between junctions 9 and 10, it was carrying around 165,000 vehicles per average weekday. A further aim of the M6 Toll is to provide a distributor to the north and east of the West Midlands region, improving communications to Cannock, Lichfield and Tamworth.



Figure 1.1 – Location of M6 Toll Motorway

1.3 This report represents the Traffic Impact Study for M6 Toll, outlining the initial effects of the opening of the M6 Toll Motorway on traffic patterns in the area. This study compares traffic conditions in November 2003 prior to opening of the M6 Toll with traffic conditions in February/March 2004 (depending on data availability) after opening. It considers traffic volume changes on the motorway network and across screenlines and changes in operating conditions, in terms of journey times and traffic speeds.

#### **Reporting Requirements**

- 1.4 The planned programme of traffic data collection and reporting to monitor the effects of the M6 Toll Motorway is as follows:
  - Traffic Monitoring Study Before scheme opening Report to understand operating conditions prior to opening of M6 Toll;
  - Traffic Monitoring Report one week after opening;
  - Traffic Monitoring Report **one month after opening**;
  - To undertake a Traffic Impact Study (TIS) Report considering traffic volume changes and changes to journey times in the period three months after opening;
  - To prepare a report **One Year After opening** of the M6 Toll, which will be a detailed Before and After evaluation of traffic movements and journey times in the corridor; and
  - To prepare a report Five Years After opening of the M6 Toll, which will repeat the One Year After format, and will assess the long term change in traffic volumes, journey times, accidents and potential land use changes in the future.
- 1.5 The Before, one week and one month after opening of the M6 Toll reports have been completed, and this Report constitutes the Traffic Impact Study Report.

#### **Organisations Involved**

- 1.6 The parties interested in monitoring the impacts of M6 Toll are the Highways Agency (HA), The West Midlands Chief Engineers and Planning Officers Group (CEPOG representing the Local Authorities)) and Midland Expressway Ltd (MEL the operators of the M6 Toll), together with Consultants working on their behalf, namely Atkins, Mott Macdonald and Steer Davies Gleave (SDG) respectively.
- 1.7 These organisations are working together to provide traffic information derived from all sources, and to assist in preparation of data to ensure the reporting of information is comprehensive. The primary focus of each organisation is as follows.

#### The Highways Agency (HA)

1.8 The Highways Agency is interested in monitoring the effects of the M6 Toll, as part of the Post Opening Project Evaluation (POPE) Commission. This Commission undertakes Before and After Monitoring of all HA Trunk Road Improvement Schemes with a value greater than £5M.

#### The West Midlands Chief Engineers and Planning Officers Group (CEPOG)

1.9 The views of the Local Authorities in the West Midlands conurbation are represented by the Chief Engineers and Planning Officers Group (CEPOG). CEPOG are interested in the impacts of M6 Toll on local roads and how they influence transport, economic and demographic changes that will result after

opening of M6 Toll. CEPOG appointed Mott MacDonald as consultants to assist with traffic monitoring.

Midland Expressway Ltd (MEL)

1.10 Midland Expressway Ltd is responsible for the operation and maintenance of the M6 Toll and is therefore primarily interested in monitoring traffic for commercial purposes and to aid business planning. MEL is represented by Steer Davies Gleave (SDG).

#### **Other Parties**

1.11 In addition, Staffordshire and Warwickshire County Councils (not represented by CEPOG) are interested in examining the traffic flow changes on roads in their counties as a result of opening of M6 Toll.

#### **Report Structure**

- 1.12 Following this introduction:
  - Section 2 discusses the range of data collected for this stage of the monitoring process;
  - Section 3 sets out traffic volume changes, comparing flows in the Before situation with those post-opening of the M6 Toll;
  - Section 4 summarises changes in operating conditions Before & After opening, in terms of journey times and traffic speeds; and
  - Finally Section 5 summarises the main conclusions of this Traffic Impact Study report.

### 2. Data Collected

- 2.1 This Report has been prepared based on traffic volume and operating condition information that is monitored permanently in the area. In order to summarise the impacts of the opening of M6 Toll, the following 'Before' and 'After' traffic data has been collected:
  - Traffic volumes from Automatic Traffic Counters (ATC) on three sections of the M6 Toll itself, to see how the daily traffic volumes on the M6 Toll have changed since opening;
  - Traffic volumes from Automatic Traffic Count (ATC) sites on the motorway network in the West Midlands conurbation;
  - Screenline counts across strategic routes within the potential area of influence of the M6 Toll to assess the extent to which drivers switch routes following scheme opening;
  - Traffic routeing information from around the strategic network using existing Automatic Number Plate Recognition (ANPR) cameras to determine journey times;
  - Traffic speeds derived from Motorway Incident Detection and Automatic Signalling (MIDAS) sensors on the M6 Motorway between junctions 9 and 10, to look at detailed changes in operating conditions on one of the most congested sections of M6.
- 2.2 The changes in traffic volumes due to the opening of M6 Toll are summarised in Section 3 and the changes in operating conditions derived from the ANPR and MIDAS data are summarised in Section 4.

#### M6 Toll

- 2.3 Reliable traffic information from three sections of the M6 Toll has been obtained from MEL. These are on the following sections:
  - T6 T7: Norton Canes to A34 Great Wyrley;
  - T5 T6: Shenstone to Chasetown; and
  - T2 T3: Wishaw to A38.
- 2.4 These locations are shown in Figure 2.1 overleaf.

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Figure 2.1 - Location of Count Sites on M6 Toll

#### Motorway Traffic Volumes

2.5 In order to monitor potential changes in traffic volumes on motorways, monitoring points on the key motorways in the conurbation were selected. Figure 2.2 illustrates the location of these motorway traffic count sites.





#### **Strategic Screenlines**

- 2.6 A number of screenlines were defined to monitor changes in traffic volumes across key links in the study area. These screenlines use existing Highways Agency, West Midlands local authority, Staffordshire and Warwickshire County Council permanently-monitored ATC sites.
- 2.7 The five strategic screenlines across the M6 Toll, M6 Motorway and other strategic routes and on the north west and south east approaches to the scheme are illustrated in Figure 2.3.



Figure 2.3 – Location of Strategic Screenlines

#### Automatic Number Plate Recognition (ANPR)

2.8 The Highways Agency has a system of Automatic Number Plate Recognition (ANPR) cameras at points across the West Midlands motorway network such that all 'through trips' can be recorded on more than one camera, which enables the time taken to travel between camera sites to be identified. The locations of these sites are shown in Figure 2.4 below.



Figure 2.4 – Location of ANPR Cameras

- 2.9 ANPR analysis is based on the assumption that a vehicle recognised by cameras at two or more locations within a reasonably short length of time has travelled along the connecting motorway network. From the times that the vehicle was identified by the ANPR cameras at the start and end of a route, the journey time can be calculated.
- 2.10 The cameras are coded with letters as shown in Figure 2.4. Routes across the motorway network monitored by these cameras are denoted by the sequence of letters which indicate the start and end points and optionally, any intermediate points. Traffic recorded for each route must have passed each camera in sequence. For example, a northbound trip on the M6 will pass through site E to the north east of Coventry, site H to the east of Birmingham and site C north of Junction 12. This trip is labelled EHC. The reverse southbound trip is CHE.
- 2.11 For the purposes of this Traffic Impact Study Report, we have limited our assessment of data to these M6 through movements (routes CHE and EHC) to assess changes in journey times on the M6 at different times of the day, and on different days.

#### **MIDAS Data**

- 2.12 The vehicle detection system called MIDAS (Motorway Incident Detection and Automatic Signalling) is installed on the motorway network primarily for use in traffic management.
- 2.13 However, it can also be used to gather data on traffic flows and speeds at fixed points on the motorway. The system is based on inductive loops in the road surface which sense vehicle movement. These loops enable the measurement of traffic flows, speeds, vehicle lengths and the length of gaps between all vehicles in each lane. The MIDAS information therefore produces comprehensive data for all vehicles and enables change in operating conditions to be assessed.
- 2.14 Traffic data from MIDAS loops between junctions 9 and 10 have been used to provide a snapshot of traffic flows and speeds on the M6 motorway in the conurbation. This section of M6 represents one of the most congested sections with slow moving traffic observed for long periods of the day.

## 3. Traffic Volume Changes

#### Introduction

- 3.1 This section provides a summary of the changes in traffic volumes as a result of the opening of M6 Toll on:
  - M6 Toll itself;
  - Motorways in the West Midlands conurbation; and
  - Strategic screenlines.
- 3.2 The following sections outline these impacts in greater detail.

#### M6 Toll

- 3.3 For the M6 Toll, traffic volumes on three sections of the M6 Toll have been summarised, namely the sections between Great Wyrley and the motorway service station at Norton Canes, between Chasetown and Shenstone (North West of Brownhills) and south of the A38 junction.
- 3.4 All traffic volumes shown in this report represent average daily traffic for the days Monday-Friday (henceforth known as Average Weekday Traffic (AWT)), Saturday and Sunday. Holiday days have been excluded from the calculations of 'average days' results, which means for weekdays the 1<sup>st</sup> to the 2<sup>nd</sup> of January are omitted as well as February half-term days. Saturday and Sunday figures exclude the 3<sup>rd</sup> and 4<sup>th</sup> of January and the days of two weekends around the half term week in February.
- 3.5 Average Weekday, Saturday and Sunday average daily traffic volumes are shown for January February and March 2004 in Tables 3.1 3.3. These tables show the growth in traffic volumes on the M6 Toll since opening. Note that the figures in these tables are *not* seasonally adjusted.

Monday to Friday						
Monitoring Site 24 Hour Traffic Volume					January-	
M6 Toll Junctions	Location	Jan-04	Feb-04	Mar-04	March Increase	
T6 - T7	Norton Canes - A34 Great Wyrley	29,700		37,500	27%	
T5 - T6	Shenstone - Chasetown	29,700	35,400	37,700	27%	
T2 - T3	Wishaw – A38	28,100	33,500	35,700	27%	

#### Table 3.1 – Average Weekday Traffic Volumes on M6 Toll

- 3.6 The main points to note from the weekday M6 Toll traffic volumes are:
  - Weekday traffic volumes show a steady month-on month increase for all three of the sites monitored. Each shows an increase of 27% in traffic volumes from January to March;

- Since weekday traffic volume increases are so similar at various sections of the M6 Toll, this suggests that the growth in traffic is of through traffic rather than local traffic;
- The highest traffic volumes recorded so far for March AWT is 37,300 vehicles per day (vpd) between Shenstone and Chasetown;
- Weekday traffic volumes are around 2,000 higher for the two sites west of A5 Weeford junction compared to the southern section;
- Traffic volumes are significantly higher on weekdays than on weekends; and
- Fridays (although not detailed on the above tables) show the highest traffic volumes of the week.

Saturday						
M	onitoring Site	24 Hou	January-			
M6 Toll Junctions	Location	Jan-04	Feb-04	Mar-04	March Increase	
T6 - T7	Norton Canes - A34 Great Wyrley	20,600		31,400	52%	
T5 - T6	Shenstone – Chasetown	20,400	21,600	31,300	53%	
T2 - T3	Wishaw - A38	19,200	20,100	26,700	39%	

Table 3.2 – Average Saturday Traffic Volumes on M6 Toll

Sunday							
M	onitoring Site	24 Hou	/olume	January-			
M6 Toll Junctions	Location	Jan-04	Feb-04	Mar-04	March Increase		
T6 - T7	Norton Canes - A34 Great Wyrley Shenstone – Chasetown	27,000		32,200	19%		
T5 - T6		28,100	28,400	32,400	15%		
T2 - T3	Wishaw - A38	25,700	27,000	29,500	15%		

Table 3.3 - Average Sunday Traffic Volumes on M6 Toll

- 3.7 The main points to note from the Saturday and Sunday M6 Toll traffic volumes are:
  - Saturday traffic volumes show the largest increases in traffic growth of between 39% and 53%, however this is due to lower volumes in January and February compared the other days of the week;
  - On Saturdays in March, the traffic volume at mid-point count near Brownhills is 4,600 vpd more than the southern section. This indicates that more traffic accessing the M6 Toll at intermediate junctions on the M6 Toll is travelling to and from the M6 in the North than is heading south;

- In January, Sunday volumes were significantly higher than Saturday, but by March they had evened out to a similar level;
- Sunday traffic has, like other days of the week, increased between January and March. The Sunday traffic growth is less than on other days of the week, but is still rapid for a time period of two months; and
- Not shown in the tables is that Sunday traffic features much higher southbound volumes than northbound volumes.

#### Key Impact

- **3.8** The key issues to note from all the above M6 Toll traffic volumes tables are:
  - There has been a significant month on month increase on all days and on all of the three sections of the M6 Toll for which data is available; and
  - Although, seasonal factors and general traffic growth factors have not been applied to these traffic volumes, these would only account for a small part of the traffic growth between the three months shown.

#### **Motorway Traffic Volumes**

- 3.9 In order to show the impacts of M6 Toll opening on traffic volumes on the M6 and other motorways in the West Midlands, traffic volumes from November 2003 have been compared with traffic volumes from the latest available month, March 2004. This enables a before and after comparison to be made.
- 3.10 To make the best comparison between the 'before' and 'after' scenarios, the traffic count data has been adjusted to remove seasonal variations between the two months used. Seasonal adjustment uses a factor of 1.038 to adjust the observed traffic volumes in November 2003 to represent typical volumes for March 2004, i.e. traffic volumes in March are typically nearly 4% higher than those in November.
- 3.11 This adjustment is based on traffic volume changes on the M6 between November 2002 and March 2003.
- 3.12 The following 'before' and 'after' traffic volume comparisons have been made:
  - Daily traffic volumes for an average weekday (Monday-Friday), average Saturday and average Sunday;
  - The AM peak period (07:00-09:00) and PM peak period (16:00-18:00) traffic volumes by direction for an average weekday (Monday to Friday); and
  - Classified daily traffic volume information to identify the impact of M6 Toll on different vehicle types and the proportion of Heavy Goods Vehicles (HGVs) in the total traffic flow.
- 3.13 Each of these is described in more detail in the following sections.

#### Daily Traffic Volumes

- 3.14 Daily traffic volume comparisons for six sections of the M6 and two sections of the M42 from the months of November 2003 and March 2004 are presented in Tables 3.4 3.6 for Average Weekday, Saturday and Sunday respectively.
- 3.15 The traffic volumes shown in Tables 3.4 3.6 include 'before' data based on seasonally adjusted November flows so that any changes in flow are due to the impact of M6 Toll rather than seasonal differences between November and March.
- 3.16 The 'before' and 'after' Average Weekday traffic volumes are also shown in Figure 3.1.



Figure 3.1 - Average Weekday Traffic Volumes on Motorways

Monday – Friday							
		Daily Traffic Volumes					
Motorway	Section	Before (Nov 03)	After (Mar 04)	Difference	% Difference		
	J3-J4E	115,900	124,000	8,100	7%		
MC	J4A-J5	162,500	144,800	-17,700	-11%		
	J9-J10	167,900	155,000	-12,900	-8%		
IVIO	J10-J10A	148,900	137,300	-11,600	-8%		
	J10A-J11	107,600	94,100	-13,500	-13%		
	J12-J13	116,800	123,900	7,100	6%		
M42	J6-J7	131,600	135,200	3,600	3%		
	J9-J10	80,100	75,600	-4,500	-6%		

Table 3.4 – Average Weekday Traffic Volumes on Sections of Motorway

- 3.17 The main points to note on the weekday volumes in Table 3.4 are:
  - All of the four monitored sections on the section of the M6 which is parallel to the M6 Toll have all seen reductions in traffic levels of between 8% and 13%;
  - On the M6 between J4A–J5, daily traffic volumes reduce from 162,500 vehicles per day (vpd) to 144,800 vpd, a reduction of 17,700 trips, or 11%;
  - The section with the highest volumes on the M6 is J9-10, and this section also shows a reduction of 12,900 vpd, or 8%;
  - The next section on the M6 to the north, J10-10A shows a very similar traffic volume reduction of 11,600 vpd (8%);
  - M6 J10A-J11 also shows a reduction in weekday traffic volumes from 107,600 vpd to 94,100 vpd, a reduction of 13,500 vpd or 13%.
  - The M6 site south of the southern end of the M6 Toll, between Junctions 3-4 and shows an increase in traffic of 8,100 vpd (7%);
  - On the M6, north of the M6 Toll between junctions 12 and 13, the recorded traffic volumes also show an increase of 7,100 vpd, or 6% indicating some traffic has been drawn into the M6 corridor from other routes;
  - On the section of the M42 which is near the southern end of the M6 Toll, there has also been traffic growth of 3,600 vpd (3%).

Saturday								
			24 Hour Traffic Volumes					
Motorway	Section	Before (Nov 03)	After (Mar 04)	Difference	% Difference			
	J3-J4E	81,800	82,100	300	0%			
MC	J4A-J5	122,500	102,800	-19,700	-16%			
	J9-J10	142,500	116,600	-25,900	-18%			
IVIO	J10-J10A	125,300	103,000	-22,300	-18%			
	J10A-J11	86,400	72,400	-14,000	-16%			
	J12-J13	81,500	86,600	5,100	6%			
M42	J6-J7	90,600	94,300	3,700	4%			
	J9-J10	54,600	51,900	-2,700	-5%			

Table 3.5 - A	Average Saturd	av Traffic Volumes	on Sections	of Motorway
	average outera	y manne verannee		or motor may

Sunday							
		24 Hour Traffic Volumes					
Motorway	Section	Before (Nov 03)	After (Mar 04)	Difference	% Difference		
MG	J3-J4E	83,900	85,000	1,100	1%		
	J4A-J5	122,600	97,600	-25,000	-20%		
	J9-J10	147,100 <sup>1</sup>	117,700	-29,400	-20%		
INIO	J10-J10A	134,700	105,100	-29,600	-22%		
	J10A-J11	99,300	75,100	-24,200	-24%		
	J12-J13	98,900	97,500	-1,400	-1%		
M40	J6-J7	103,600	98,600	-5,000	-5%		
10142	J9-J10	57,400	52,800	-4,600	-8%		

 Table 3.6 - Average Sunday Traffic Volumes on Sections of Motorway

- 3.18 The main points to note on the weekend traffic volumes on the motorways as shown in Table 3.5 and Table 3.6 are:
  - On Saturdays, the four monitored sections on the part of the M6 which are parallel to the M6 Toll have seen reductions in traffic levels in the range 16% to 18%;
  - On Sundays, the four monitored sections on the part of the M6 which is parallel to the M6 Toll have seen the biggest reductions in traffic levels of the whole week which are in the range 20% to 24%;
  - On Saturdays, the M6 between J4A–J5, daily traffic volumes reduce by 19,400 trips, or 16% of the 'before' traffic volumes;
  - On Sundays, the reduction on M6 J4A-5 is 24,800vpd or 20%;

<sup>&</sup>lt;sup>1</sup> Based on June 2003 data.

- The M6 sections at either end of the M6 Toll show a similar level of traffic volumes in the 'after' scenario compared to the 'before' scenario, suggesting less re-assignment of traffic from other corridors at the weekend; and
- On the section of the M42 which is near the southern end of the M6 Toll, there has also been traffic growth of 3,700 vpd (4%) on Saturdays and 5,000vpd (5%) on Sundays.

#### Peak Period Flows

- 3.19 Tables 3.7 and 3.8 show the 'before' and 'after' motorway volumes during the AM and PM peak periods on the M6 only. Two-way traffic volumes are shown, as the assessment is focused on the how traffic volumes have changed over different times of the day, rather than by direction.
- 3.20 The traffic volumes shown in Tables 3.7 and 3.8 are also based on seasonally adjusted November flows so that any changes in flow are due to the impact of M6 Toll rather than seasonal differences between November and March.

Monday – Friday						
		AM Peak flows (07:00 - 09:00)				
Motorway	Section	Before (Nov 03)	After (Mar 04)	Difference	% Difference	
	J3-J4E	8,200	9,300	1,100	13%	
	J4A-J5	10,900	10,500	-400	-4%	
M6	J9-J10	10,200	9,700	-500	-5%	
	J10-J10A	8,300	8,000	-300	-4%	
	J10A-J11	5,400	5,000	-400	-7%	
	J12-J13	6,900	7,900	1,000	14%	

#### Table 3.7 - Average AM Peak Period Traffic Volumes on Sections of Motorway

	Monday – Friday											
		PM Peak flows (16:00 - 18:00)										
Motorway	Section	Before (Nov 03)	After (Mar 04)	Difference % Difference								
	J3-J4E	7,900	9,200	1,300	16%							
	J4A-J5	10,500	10,300	-200	-2%							
Me	J9-J10	10,200	10,200 10,500		3%							
IVIO	J10-J10A	9,800	9,800	0	0%							
	J10A-J11	6,400	6,200	-200	-3%							
	J12-J13	7,300	8,800	1,500	21%							

#### Table 3.8 - Average PM Peak Period Traffic Volumes on Sections of Motorway

- 3.21 From these peak period tables, the following observations can be made:
  - On the M6 J3-4E during both the AM and PM peak periods, there have been significant increases of 1,100 and 1,300 vehicles representing 13% and 16% of traffic;
  - Likewise at the M6 at J12-13 at the northerly end of the M6 Toll, there have been increases of 1,000 and 1,500 vehicles representing 13% and 16% of traffic; and
  - On the sections of M6 parallel to M6 Toll, there are peak hour reductions of less than 5%, compared to 15% over the whole day, suggesting vehicles have re-routed onto M6 from other corridors to take advantage of the reduction in traffic volumes.

#### Classified Data

3.22 Classified count information is available for some sections of the M6, which shows the impact of the M6 Toll for light vehicles and Heavy Goods Vehicles (HGVs)<sup>2</sup>. Table 3.9 shows these impacts on five sections of the M6 through the conurbation for average weekdays in November 2003 and March 2004.

<sup>&</sup>lt;sup>2</sup> Vehicles longer than 5.2m.

				Мо	nday – Friday	1						
	Section	24 Hour Traffic Volumes										
Motorway		Before (Nov 03)				After (Mar 04	)	Difference				
		Light	HGV	%HGV	Light	HGV	%HGV	Light	HGV	%HGV		
	J3-J4E	80,500	35,400	31%	87,600	36,400	29%	7,100	1,000	-2%		
	J4A-J5	120,400	42,100	26%	101,700	43,100	30%	-18,700	1,000	4%		
140	J9-J10	128,100	40,600	24%	111,200	43,800	28%	-16,900	3,200	4%		
M6	J10-J10A	105,400	43,500	29%	93,900	43,400	32%	-11,500	-100	3%		
	J10A-J11	74,000	33,600	31%	60,300	33,800	36%	-13,700	200	5%		
	Average % HGV			28%			31%			3%		

Table 3.9 - Classified Average Weekday Traffic Volumes on M6 Motorway

- 3.23 The key points about the changes in HGV and light vehicle volumes as detailed in the classified vehicle results table above are:
  - ٠ Clearly, the reduction in traffic volumes on the M6 is almost exclusively from light vehicles;
  - These figures show that light vehicles reduce on different sections of the M6 by ٠ between 12,000 and 19,000 vpd, whereas no reduction in HGVs are shown; and
  - As the number of light vehicles is reduced, the proportion of HGVs in the traffic ٠ mix increases by around 4%.

#### **Key Impacts**

- There are significant reductions in traffic on the M6 through the conurbation between junctions 4 and 11;
- Weekday reductions are shown to be around 10%, increasing to over 15% on Saturdays and to over 20% on Sunday;
- On the M6 at either end of the M6 Toll, and on the M42 approaching the M6 Toll, there are increases in traffic volumes of around 5%;
- The reductions in traffic volumes in the peak hours are significantly less; and
- The reductions are almost entirely due to reductions in the number of light vehicles, with no change to the number of HGVs on the M6 through the conurbation.

#### **Strategic Screenline Flows**

- 3.24 The strategic screenlines have been carefully selected to provide a robust estimate of traffic volumes across key strategic links in the area. All links within the screenline have a permanently monitored count site, and therefore the traffic volumes crossing these screenlines can be used as a basis for assessing future traffic volume changes as a result of M6 Toll opening.
- 3.25 For this study, before and after figures for the strategic screenlines are based on the months of November 2003, the last full month before the opening of the M6 Toll, and February 2004 which is the latest month for which data is available for all the screenline count sites. As shown in the motorway section above, later data for March 2004 is available for trunk roads, but the screenlines also include many nontrunk roads on which traffic count data is less frequently collected.
- 3.26 Figures for November traffic have been seasonally adjusted to February levels using separate factors for motorways and 'Other-roads' and the February data excludes the half term week (weekdays 16<sup>th</sup>-20<sup>th</sup>).
- 3.27 The traffic count data has been adjusted to remove seasonal variations between the two months used. Seasonal adjustment uses the following factors to adjust the observed traffic volumes in November 2003 to represent typical volumes for February 2004.

- Daily Motorway traffic volumes uses a factor of 1.005, i.e. traffic volumes in February 2004 are predicted to be 0.5% higher than in November 2003;
- Factoring for the AM peak period on motorways is1.029 which represents a rise of 2.9% to adjust the November data to February levels;
- Factoring for the PM peak period on motorways is1.041 which represents a rise of 4.1%;
- Seasonal adjustment for daily traffic volumes on A roads is a factor of 0.985, representing a reduction of 1.5%;
- Factoring for the AM peak period on A-roads is 0.998 which represents a reduction of 0.2% to adjust the November data to February levels; and
- Unlike the other two factors used for A roads, factoring for the PM peak period on motorways is 1.004 which represents a small rise of 0.4%.
- 3.28 The following 'before' and 'after' traffic volume comparisons have been made:
  - Daily traffic volumes for an average weekday (Monday-Friday); and
  - The AM peak period (07:00-09:00) and PM peak period (16:00-18:00) traffic volumes by direction for an average weekday (Monday to Friday); and
- 3.29 Each of these is described in more detail in the following sections.

#### 24 Hour Weekday Volumes

- 3.30 The Before, After and differences in 24 hour traffic volumes for an average weekday (Monday Friday) in these two months across each of the five strategic screenlines are shown in Table 3.10 and also illustrated in Figure 3.2.
- 3.31 The detailed breakdown of the traffic flows at each monitoring site on the individual screenlines is provided in Annex A.

	Monday to Friday											
Scroon	24 Hour Total											
Line No.	Before (Nov 03)	After (Feb 04)	Difference	% Difference								
1	276,000	281,800	5,800	2%								
2	205,700	187,100	-18,600	-9%								
3	269,800	253,000	-16,800	-6%								
4	207,700	189,700	-18,000	-9%								
5	303,700	300,100	-3,600	-1%								
Total	1,262,900	1,211,700	-51,200	-4%								

# Table 3.10 - Average Weekday 24-Hour Traffic Flows across Strategic Screenlines



Figure 3.2 - Before and After Weekday Two Way Flows across the Strategic **Screenlines** 

- 3.32 Table 3.10 above clearly shows changes in weekday traffic volumes across the screenline since the opening of the M6 Toll. The key points are:
  - Screenline 1 at the southern end of M6 Toll shows a small increase in traffic ٠ volumes of 5,800 vpd or 2%;
  - Screenlines 2 to 4 which cross the M6 and the M6 Toll (but don't include data for ٠ the M6 Toll) all show reductions in traffic of between 6% and 9%:
  - Screenline 3 which shows a reduction of 16,800 or 6% is less the reductions for screenlines 2 and 4 possibly because it includes roads which feed junctions on the M6 Toll; and
  - Screenline 5 at the northern end of M6 Toll shows a small decrease in traffic of 1%.

#### Peak Period Flows

- 3.33 Table 3.11 and 3.12 show 'before' and 'after' volumes on the screenlines during the AM and PM peak periods.
- 3.34 The traffic volumes shown in Table 3.11 and 3.12 are also based on seasonally adjusted November flows so that any changes in flow are due to the impact of M6 Toll rather than seasonal differences between November and February.

	Monday to Friday											
	AM Peak flows (07:00 – 09:00)											
Screen Line		Sout	hbound		Northbound							
No.	Before After (Nov 03) (Feb 04) Diff % Diff		Before (Nov 03)	After (Feb 04)	Diff	% Diff						
1	22,400	23,100	700	3%	22,400	23,100	700	3%				
2	14,300	13,500	-800	-6%	15,500	14,600	-900	-6%				
<b>3</b> <sup>3</sup>	21,700	21,200	-500	-2%	8,500	8,200	-300	-4%				
4	12,800	12,900	100	1%	13,400	12,200	-1,200	-9%				
5	16,800	18,100	1,300	8%	20,400	19,500	-900	-4%				
Total	88,000	88,700	700	1%	80,200	77,500	-2,600	-3%				

# Table 3.11 - Average Weekday AM Peak Traffic Flows across Strategic Screenlines

	Monday to Friday											
	PM Peak flows (16:00 – 18:00)											
Screen Line		South	bound		Northbound							
No.	Before After (Nov 03) (Feb 04) Diff % Diff			Before (Nov 03)	After (Feb 04)	Diff	% Diff					
1	20,400	21,600	1,200	6%	21,000	22,000	1,000	5%				
2	13,000	13,000	0	0%	13,000	12,300	-700	-5%				
3 <sup>4</sup>	17,400	16,700	-700	-4%	10,200	9,800	-400	-4%				
4	12,400	12,100	-300	-2%	16,400	15,800	-600	-4%				
5	19,100	19,800	700	4%	21,700	21,700	0	0%				
Total	82,300	83,200	900	1%	82,300	81,600	-700	-1%				

# Table 3.12 - Average Weekday PM Peak Traffic Flows across Strategic Screenlines

<sup>&</sup>lt;sup>3</sup> Northbound data was not available for the M6 site on screenline 3, therefore peak period totals are omitted. 24 hour total for northbound includes an estimated total for the M6.

<sup>&</sup>lt;sup>4</sup> Northbound data was not available for the M6 site on screenline 3, therefore peak period totals are omitted. 24 hour total for northbound includes an estimated total for the M6.

- 3.35 From the AM and PM peak period tables above, the following observations can be made:
  - Screenline 1 at the southern end of M6 Toll shows increases in traffic volumes in ٠ both directions during the AM and PM peak periods;
  - The PM peak period traffic growth is 1,200 vehicles (6%) southbound and 1,000 ٠ vehicles (5%) northbound. This is higher than the 2% increase over the 24 hour period as shown in Table 3.10;
  - Screenline 2 shows significant reductions in traffic in both directions in the AM period of 800 vehicles southbound (6%) and 900 northbound (6%), but in the PM period there is only a reduction in northbound traffic of 700 vehicles (5%);
  - Screenline 3 southbound shows a reduction of 500 (2%) vehicles in the AM period and 700 (4%) in the PM period;
  - Screenline 4 shows a significant decrease in traffic of 1,200 vehicles northbound ٠ in the AM peak;
  - Screenline 5 at the northern end of M6 Toll shows increases in southbound traffic of 8% and 4% for the AM and PM peak periods which could represent extra traffic routed towards the M6 Toll; and
  - However, on screenline 5 northbound there is a decrease of 4% during the AM period and no change in the PM period.
- 3.36 Detailed results for each screenline are contained in Annex A, and these show significant changes for individual roads within each screenline, and thus discussion of the changes in traffic flows within each individual screenline are contained in the sections below.

#### Screenline 1

- 3.37 Screenline 1 is at the southern end of M6 Toll and includes traffic volumes on the M6. A446 and M42. The detailed results of the count sites on this screenline are shown in Annex A and the key points of interest are as follows:
  - The daily total across the three routes on this screenline shows an increase from 276,000 vpd in November 2003 to 281,800 vpd in February 2004, a difference of 6,400 vpd which is a rise of 2%;
  - The AM and PM peak periods on this screenline show total increases of 1,400 ۲ and 2,100 vehicles:
  - Thus, traffic growth over these four peak hours account for over half of the 24 hour increase;
  - The section of the M6 between J3 and J4 which directly connects with the southern end of the M6 Toll shows the most significant increases in traffic;
  - The AM peak period traffic on this section increased from 16,400 to 18,100 ٠ vehicles, a rise of 10%. The PM peak period showed an increase in traffic from 15,800 to 16,900, a rise of 7%;
  - The M42 J6-7 which shows higher traffic volumes than the M6 J3-4 and also ٠ connects to the southern end of the M6 Toll, shows only a small increase of 1,000 vpd equivalent to 1%; and

This small increase in the 24 hour total on the M42 hides changes in flow during ٠ the day. During the PM peak there has been an increase of 6% whilst in the AM peak traffic is down by 3%.

#### Screenline 2

- Screenline 2 covers the A4091 south of Tamworth, as well as A446, A4097 and M6 3.38 west of the southern end of the M6 Toll. The detailed results of the count sites on this screenline are shown in Annex A and the key points of interest are as follows:
  - The average weekday daily total across the four routes dropped from 205,700 in ۲ November 2003 to 187,100 vpd in February 2004, a reduction of 18,600 or 9%;
  - The majority of this reduction is observed from the section of the M6 between ٠ J4A-5 shows a significant drop from the very high level of 155,600 to 139,700 vpd, a reduction of 15,900 vpd (10%);
  - The AM and PM peak periods on this part of the M6 also show decreases of ٠ 1,400 and 1,600 vehicles (-6% and -8%).
  - Running parallel to the M6 Toll on this screenline is the A446 which shows large reductions in traffic down from 21,800 to 19,000 vpd, a drop of 2,800vpd (13%).
  - Unlike the other routes in this screenline, the A4091 between Tamworth and the A446 shows small increases in daily traffic from 12,700 to 13,200 vpd.

#### Screenline 3

- Screenline 3 includes seven routes east of Lichfield and Sutton Coldfield and 3.39 includes M6 between junctions 6-7. The detailed results of the count sites on this screenline are also shown in Annex A and the key points of interest are as follows:
  - The average weekday daily total across the seven routes dropped from 269,800 in November 2003 to 253,000 vpd in February 2004, a reduction of 16,800 or 6%.
  - The majority of this reduction was from the M6 J6-7, which fell from 144,100 to ٠ 132,500 vpd, a (11,600 vpd or 8%);
  - The second major route on this screenline is the A38 (north of Bassett's Pole ۵ and parallel to the M6 Toll) which showed a significant drop from 37,600 to 33,400 vpd (4,200 vpd or 11%);
  - The section of the A5 east of Weeford which connects with junction T4 of the M6 ٠ Toll shows insignificant change over 24 hours but during the AM peak, there was an increase of 400vpd (15%) caused by extra traffic accessing the M6 Toll;
  - The extra traffic on the A5 during the AM peak period are balanced out by reductions at other times of day, e.g. during the PM peak there is a reduction of 3%, probably due to traffic using the M6 Toll instead of the A5;
  - The A453 showed increased traffic, especially at peak periods (8% in the AM, 13% in the PM); and
  - The roads A5127 and A453 showed no real change.

#### Screenline 4

- 3.40 Screenline 4 includes four key links to the north and west of Walsall. The detailed results of the count sites on this screenline are shown in Annex A and the key points of interest are as follows:
  - The average weekday daily total across the four routes dropped from 207,700 in November 2003 to 189,700 vpd in February 2004, a reduction of 18,000 or 9%.
  - The reduction on the section of the M6 in this screenline (J10-10A) makes up the majority of this reduction, where traffic reduced from 144,900 to 132,700 vpd, a drop of 12,200 vpd or 8%;
  - The A5 (between the A34 and Norton Canes) which runs parallel to the M6 Toll here, also shows a daily reduction of 1,700 vpd or 6%; and
  - The biggest change on this screenline is on the A5190 Burntwood Bypass where daily traffic volumes are down by 3,600vpd (24%).

#### Screenline 5

- 3.41 Screenline 5, which stretches from the A50, east of Stoke on Trent to the M54, and includes eight sites. The detailed results of the count sites on this screenline are shown in Annex A and the key points of interest are as follows:
  - The average weekday daily total across the eight routes was little changed between November 2003 and February 2004 but there were significant changes within the individual roads;
  - The M6 J12-13 which is north of the northern end of the M6 Toll, showed traffic growth from 112,800 to 119,800 vpd, an increase of 7,000vpd (6%);
  - The AM and PM peak periods on the M6 show higher increases of 12% and 15% respectively;
  - The A5 east of Gailey is similar to the M6 J12-13 in that it is located north of the northern end of the M6 Toll and shows similar increases in traffic volumes of 5% in 24 hours and 17% and 10% during the AM and PM peak periods;
  - The A50 near Stoke on Trent shows significant reductions in daily traffic volumes from 69,000 to 56,400, a drop of 12,600vpd or 18%<sup>5</sup>; and
  - The AM and PM peak periods on the A50 also show reductions of 15% and 16%.

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<sup>&</sup>lt;sup>5</sup> This drop in traffic may be due to roadworks on the A500 in Stoke-on-Trent which started in February 2004. This part of the A500 is the link between the A50 and M6 J16. to the north of Stoke on Trent The A500 linking the A50 with the M6 J15 to the south of Stoke on Trent is not subject to roadworks.

#### Key Impacts

- Screenlines 1 and 5, south and north of the M6 Toll tie-in junctions show a small increase in traffic volumes, suggesting some vehicles have re-routed into this corridor from other wider corridors;
- Screenlines 2 4 show reductions of around 5% in daily traffic; ٠
- Across individual routes however, significant changes are shown;
- The M6 shows an increase at either end of the M6 Toll, but reductions between junctions 4 – 11;
- Other A-Roads parallel to the M6 Toll also show significant traffic volume reductions as a result of M6 Toll opening;
- Screenline 5 shows significant reductions of traffic on the A50 at Stoke-on-Trent. The A50 is a recognised strategic route linking the M6 and M1 corridor, and the opening of M6 Toll does seem to have re-routed some of this more strategic long distance traffic back into the M6 Corridor.

#### 4. **Operating Condition Changes**

- As well as traffic volume changes as a result of M6 Toll opening, an important effect 4.1 of M6 Toll is the impact on journey times and speeds on the other roads in the area, particularly the M6 through the West Midlands conurbation.
- 4.2 This section summarises the operating conditions on the M6 Motorway before and after opening of the M6 Toll and on the M6 Toll itself. Journey times have been derived from ANPR cameras and vehicle speeds from MIDAS road sensors on the M6 Motorway.
- 4.3 The following sections outline the changes in operating conditions from these two sources.

#### Automatic Number Plate Recognition (ANPR)

- 4.4 As outlined in Section 2, Automatic Number Plate Recognition (ANPR) cameras are located on the M6 Motorway at Coventry (E), Birmingham (H) and Cannock (C). Journey times have been derived for journeys between E & C and C & E on the motorway network by matching number plates observed at these cameras.
- 4.5 The ANPR routes EHC & CHE (where the number plate is also recognised at H) is the route of the M6 northbound & southbound through the West Midlands area AND the distance between the cameras is 68.5 kilometres (42.5 miles).
- 4.6 The ANPR routes EC Toll and CE Toll (where the vehicle number plate is matched at E & C or C & E, but not at H) has been used as a proxy for the route along the M6 Toll (69.5 kilometres or 43 miles), in the absence of a camera installed on the M6 Toll Motorway itself.
- 4.7 It is noted that the installation of a camera on the M6 Toll will improve the reliability of the results for routeing using the toll road.
- 4.8 ANPR Before data for the M6 Motorway presented in this study is June 2003. November could not be used, to keep consistency with other data sets, because a poor data set was obtained in November. ANPR After data after scheme opening is from March 2004 for both the M6 Motorway and M6 Toll.
- 4.9 The results exclude any data mismatch and when journeys take an excessively long amount of time compared to other vehicles travelling at the same time. The ANPR has shown 52% pick up of southbound vehicular traffic flows and 37% of northbound traffic in March 2004. The pick up in June 2003 was 56% for southbound and 51% for northbound traffic.
- 4.10 Throughout this section, information from ANPR cameras is illustrated graphically. The ANPR graphs depict the average journey time throughout the day on the M6 Motorway before & after scheme opening and on the M6 Toll.
- 4.11 Results are provided for midweek days, Fridays and Sundays northbound and southbound. The horizontal axis on all the graphs shows the starting times of journeys i.e. the time at which the vehicle number plate was identified at the first

camera. Journeys between midnight and 06:00 are omitted as there are too few vehicles travelling at this time. The vertical axis is the time in minutes for the vehicle to make the total journey to the final camera. A time of 40 minutes represents around 60 mph (97 kph) for this journey.

4.12 The following observations are noted before & after opening of M6 Toll:

Midweek – Tuesdays, Wednesdays & Thursdays (Northbound)

- 4.13 Figure 4.1 shows the journey times northbound on the M6 for the Before and After scenario, as well as between cameras E & C, excluding H, which is used as a proxy for M6 Toll traffic. The main points to note are:
  - The journey time profile for midweek days (Tuesdays, Wednesdays & Thursdays) on M6 northbound in June 2003 demonstrates that traffic congestion is experienced in the morning and evening peak periods, where journey times increase by around 20 minutes in the AM and PM peaks. The overall journey time from junction 2 (Coventry) to 13 (Cannock) during these periods is in the region of one hour, compared to an average 43 minute journey in the inter-peak period;
  - Post opening of the M6 Toll, journey time delays in the AM and PM peak periods are reduced slightly, with more noticeable effects in the PM peak, when delays are reduced by around 15 minutes; and
  - In comparison, the M6 Toll route shows improved reliability for traffic using the toll road with journeys taking a constant 34 minutes through the day.



Figure 4.1 – Midweek Journey Times on M6 Motorway & M6 Toll Northbound

Midweek – Tuesdays, Wednesdays & Thursdays (Southbound)

- 4.14 Figure 4.2 below shows the same comparison for the M6 southbound movement on an average weekday:
  - The journey time profile for midweek days (Tuesdays, Wednesdays & ٠ Thursdays) in June 2003 illustrates congestion on the M6 Motorway southbound in the morning and evening peak periods represented by delays of 20 minutes compared to free flow conditions in the inter-peak period, when the journey takes an average of 40 minutes;
  - After opening of the M6 Toll in March 2004, AM peak journey times show little difference, with reductions in the PM peak (consistent with the pattern for northbound traffic). The journey time in the inter-peak period is still 40 minutes; and
  - In comparison, the M6 Toll route (CE Toll) again demonstrates improved journey time reliability with a journey time of 34 minutes between C & E for the entire day.



Figure 4.2 – Midweek Journey Times on M6 Motorway & M6 Toll Southbound

#### Fridays (Northbound)

- 4.15 Figure 4.3 shows the Before and After journey times on the M6 and the proxy for M6 Toll, and the main points to note are:
  - M6 northbound on Fridays featured some of the worst traffic congestion on the M6 Motorway prior to opening of the M6 Toll. Longer journey times were not just limited to the two peak commuting periods, but extended through most of the afternoon;
  - It could take two hours to travel the 68.5 kilometres (42.5 miles) between junction 2 (Coventry) and 13 (Cannock) of the M6 Motorway. Journey time delays throughout the day on Fridays confirms this pattern not only relates to commuter traffic, but longer distance traffic movements on the motorway network;
  - Post opening of the M6 Toll, the journey time profile shows delays on the M6 Motorway in the afternoon have reduced by up to one hour; and
  - The M6 Toll route shows a quicker journey and improved journey time reliability, but a slightly longer journey in the PM peak compared to other days (average 43 minutes).



Figure 4.3 – Friday Journey Times on M6 Motorway & M6 Toll Northbound

#### Fridays (Southbound)

- 4.16 Figure 4.4 illustrates the same operating condition information for southbound Friday movements and shows:
  - As with northbound, M6 southbound on Fridays experienced some of the worst traffic congestion on the M6 Motorway. In June 2003, extended journey times were not just limited to the two rush hour periods, but extended through most of the day. It could take up to one hour and a half to travel the 68.5 kilometres (42.5 miles) between junction 13 (Cannock) and 2 (Coventry) of the M6 (cameras C to E);
  - After scheme opening in March 2004, the extended peak period has disappeared and traffic delays are limited to a two hour PM peak period from 15:00 - 17:00; and
  - Journey time reliability is significantly improved for traffic using the M6 Toll, as the time to undertake journey CHE is a constant 34 minutes throughout the day.



Figure 4.4 – Friday Journey Times on M6 Motorway & M6 Toll Southbound

#### Sundays (Northbound)

- 4.17 Figure 4.5 shows that the M6 northbound on Sundays prior to opening of the M6 Toll did not experience any journey time delays in June 2003. The journey time between E & C is on average 37 minutes through the day.
- 4.18 Post opening of the toll road, journey times on the M6 show a slight improvement of 3 minutes and a further minute time saving for traffic routing on the toll road.



Figure 4.5 – Sunday Journey Times on M6 Motorway & M6 Toll Northbound

#### Sundays (Southbound)

- 4.19 Figure 4.6 shows the southbound Sunday journey times through the conurbation, when many vehicles are heading back towards London and the South East and shows:
  - Sundays in June 2003 demonstrated traffic congestion on M6 southbound in the afternoon. Traffic delays of up to 20 – 30 minutes were experienced for a six hour period from 15:00 – 21:00. This pattern is attributed to weekend traffic returning on M6 south towards London;
  - After opening of the M6 Toll, the results indicate no traffic delays on the M6 and little difference in journey times between the M6 and M6 Toll routes. Journeys take on average 34 minutes on the M6 and 33 minutes on the toll motorway; and
  - The trend confirms that drivers are selecting the M6 Toll, to avoid the traffic congestion previously experienced on the M6 on Sundays. Traffic data indicates a decline in Sunday two-way daily traffic volumes of 25,000 vpd between junctions 4A & 5 and 30,000 vpd using the toll road between T2 (Wishaw) & T3 (A38). This switch in traffic provides sufficient relief, such that journey times are also improved for traffic (98,000 vpd) remaining on the M6.



Figure 4.6 – Sunday Journey Times on M6 Motorway & M6 Toll Southbound

Key Impacts

4.20 In summary, the following points are noted from the ANPR data:

- Journey time delays experienced in rush hour periods on the M6 Motorway on week days (Tuesdays, Wednesdays & Thursdays) have reduced following opening of the M6 Toll. The more noticeable effect is on the evening peak period;
- Traffic using the M6 Toll on weekdays has improved journey reliability as the journey takes a constant 34 minutes throughout the day;
- Prior to opening of the M6 Toll, the M6 Motorway on Fridays showed an extended afternoon peak period with significant congestion, related to commuter traffic and longer distance traffic movements on the motorway network;
- Post scheme opening, the extended afternoon peak on Fridays is significantly reduced, with delays reduced by up to one hour for northbound traffic and a shortened two hour peak period of traffic delay for M6 south;
- Sunday journey time delays shown on M6 southbound for weekend traffic returning to London are not experienced on the M6 Motorway post opening of the M6 Toll. The transfer of a proportion of traffic to the toll road route provides relief, such that journey times are also improved for M6 traffic; and
- There is little difference in journey times for traffic now using the M6 or M6 Toll on Sundays. It takes 34 minutes on the M6 and 33 minutes via the M6 Toll.

#### Time Savings

- 4.21 The overall effect of the opening of the M6 Toll on journeys on the M6 in the West Midlands can be assessed by looking at time savings. The two tables below indicate the time savings, both on the M6 and M6 Toll over the times on the M6 before opening of M6 Toll.
- 4.22 Tables 4.1, 4.2 & 4.3 show midweek, Friday and Sunday journey time savings respectively for traffic in March 2004 post scheme opening, compared to before opening in June 2003.

	Time Savings (March 2004 v June 2003)									
	North	bound	South	bound						
Time	M6 (EHC)	M6 Toll (EC Toll)	M6 (CHE)	M6 (CE Toll)						
06:00 - 07:00	-2	7	-3	7						
07:00 - 08:00	4	17	3	26						
08:00 - 09:00	6	21	3	16						
09:00 – 10:00	2	11	1	6						
10:00 – 11:00	-3	6	-1	3						
11:00 – 12:00	-3	7	-3	3						
12:00 – 13:00	-1	8	-1	5						
13:00 – 14:00	1	11	0	5						
14:00 – 15:00	7	13	1	8						
15:00 – 16:00	10	20	3	11						
16:00 – 17:00	16	31	10	20						
17:00 – 18:00	14	26	5	14						
18:00 – 19:00	2	10	0	3						
19:00 – 20:00	-1	4	-2	0						
20:00 - 21:00	0	2	-1	0						
21:00 – 22:00	2	4	-3	0						
22:00 - 23:00	-3	3	-1	2						
23:00 - 24:00	-1	4	0	3						
Average (weighted by number of vehicles)	3	12	-1	7						

#### Table 4.1 – Midweek Time Savings for M6 and M6 Toll Traffic

	Ti	me Savings (Marc	h 2004 v June 200	3)
	North	South	bound	
Time	M6 (EHC)	M6 Toll (EC Toll)	M6 (CHE)	M6 (CE Toll)
06:00 - 07:00	5	11	2	7
07:00 - 08:00	5	18	13	21
08:00 - 09:00	-6	-4	26	32
09:00 – 10:00	-6	3	24	27
10:00 – 11:00	4	10	20	21
11:00 – 12:00	8	14	9	13
12:00 – 13:00	25	34	25	30
13:00 – 14:00	34	46	40	44
14:00 – 15:00	46	62	41	50
15:00 – 16:00	59	70	23	53
16:00 – 17:00	60	67	17	46
17:00 – 18:00	48	52	50	57
18:00 – 19:00	20	35	26	28
19:00 – 20:00	-2	21	3	5
20:00 – 21:00	2	18	3	4
21:00 – 22:00	-4	6	-2	1
22:00 – 23:00	2	3	1	2
23:00 - 24:00	-8	4	-1	1
Average (weighted by number of vehicles)	18	27	17	24

Table 4.2 – Friday Time Savings for M6 and M6 Toll Traffic

	Ti	Time Savings (March 2004 v June 2003)									
	North	bound	South	bound							
Time	M6 (EHC)	M6 Toll (EC Toll)	M6 (CHE)	M6 (CE Toll)							
06:00 - 07:00	-3	2	-4	0							
07:00 - 08:00	2	4	0	2							
08:00 - 09:00	1	3	-1	1							
09:00 - 10:00	2	3	1	1							
10:00 - 11:00	1	4	0	2							
11:00 – 12:00	0	5	1	3							
12:00 – 13:00	3	6	2	4							
13:00 – 14:00	2	5	-1	4							
14:00 – 15:00	2	4	6	9							
15:00 – 16:00	0	0	14	16							
16:00 – 17:00	5	6	24	26							
17:00 – 18:00	6	8	30	31							
18:00 – 19:00	6	7	24	25							
19:00 – 20:00	6	6	18	19							
20:00 - 21:00	3	4	6	7							
21:00 - 22:00	3	3	4	4							
22:00 - 23:00	4	3	1	2							
23:00 - 24:00	2	4	2	4							
Average (weighted by number of vehicles)	3	5	11	12							

Table 4.3 – Sunday Time Savings for M6 and M6 Toll Traffic

#### Key Impacts

#### 4.23 In summary:

- Significant time savings are shown for both northbound and southbound movements between Coventry and Cannock on both the M6 and M6 Toll;
- Comparing the journey times on M6 Toll and M6 before opening, the average weekday journey time savings are 12 minutes northbound and 7 minutes southbound;
- However, maximum time savings of around 30 minutes are shown in the peak hours for a midweek day;
- On Fridays, the M6 Toll time savings suggest some journeys are now up to 70 minutes faster than the Before scenario;
- On Sundays, southbound journey times for this through movement are up to 30 minutes faster than the same journey before the M6 Toll opened;
- However, the M6 Toll has removed a significant level of traffic away from the M6, such that the M6 itself has improved operating conditions and journey times. The reduction in traffic has meant that the through journey times on the M6 have also improved;
- For example, on weekdays, journey time improvements of up to 16 minutes are shown, however this journey could still be made up to a further 15 minutes quicker on M6 Toll;
- On Fridays, the time savings on M6 are up to one hour compared to the Before scenario, and M6 Toll saves an additional 10 minutes;
- Similarly, on Sundays, southbound, the reduced traffic volumes southbound does lead to time savings for vehicles remaining on the M6; and
- Thus the M6 Toll does provide significantly reduced journey times for M6 through movements, compared to the M6 before opening, and still offers time savings for many hours of the day over the time taken on the improved M6.

#### Vehicle Speeds from MIDAS Data

- 4.24 Motorway Incident Detection and Automatic Signalling (MIDAS) data has been used to determine vehicular speeds on the M6 Motorway Before and After Opening of the M6 Toll. Before data is from November 2003 and After data is taken from March 2004.
- 4.25 MIDAS data from between junctions 9 (Wednesbury) & 10 (Walsall) of the M6 Motorway (site 5964), the section of the M6 with the highest traffic volumes, has been analysed. The following information from MIDAS is presented in Figures 4.7 4.12:
  - Traffic flow (vehicles/minute) the number of vehicles across all lanes passing the sensor per minute; and
  - Vehicle speed (kilometres per hour) the average speed of traffic across all lanes.
- 4.26 The graphs show the average traffic flow and vehicular speed on a midweek day (Tuesday, Wednesday & Thursday), Friday and Sunday. All graphs show higher traffic flows during the daytime, typically over 20 vehicles per minute across three lanes (on average 7 vehicles per minute per lane).
- 4.27 Traffic speeds above 80 kph (50 mph) represent free flow conditions on this section of the M6. It is recognised that there is some variation from day to day, but the information contained in these graphs has been taken from a number of days, and therefore is representative of average conditions.
- 4.28 The following observations are noted:

Midweek – Tuesdays, Wednesdays & Thursdays (Northbound)

- Before opening of the M6 Toll, the MIDAS results show free flow speeds of around 80 kph (50 mph) for northbound traffic until 16:00. For the evening peak (16:00 - 19:00), traffic speeds drop to around 30 kph (19 mph). This effect is typically noted for M6 northbound traffic from Birmingham; and
- After opening of the M6 Toll, traffic speeds are around 5 20 kph (3-12 mph) higher through the whole day compared to before opening. During the evening rush hour, traffic speeds decline to only 50 kph (31 mph) and the extent of the peak is reduced to one hour.



Figure 4.7 – Midweek Traffic Speed on M6 J9 – 10 Northbound Before & After Opening of M6 Toll

Midweek – Tuesdays, Wednesdays & Thursdays (Southbound)

- The pattern for southbound traffic is typically worse than northbound for this site on the M6 (junctions 9 – 10). Southbound traffic speeds are around 20 kph (12 mph) lower than northbound in the middle of the day in November 2003;
- The AM peak is particularly pronounced, when traffic speeds have dropped to 25 kph (16 mph). This is traffic on the M6 approaching Birmingham from the north. There is also a noticeable decline in traffic speeds in the PM peak; and
- In March 2004, average traffic speeds are higher throughout the entire day. The AM peak is still evident, demonstrating a sharp drop in traffic speeds for southbound traffic towards Birmingham. However, the congestion in the PM peak is significantly reduced, with traffic speeds fluctuating around 80 kph (50 mph).



Figure 4.8 – Midweek Traffic Speed on M6 J9 – 10 Southbound Before & After **Opening of M6 Toll** 

Fridays (Northbound)

- Fridays in November 2003 demonstrated an extended afternoon peak with slow traffic speeds (below 80 kph/50 mph) on the M6 northbound for eight hours of the day from around 13:00 – 21:00; and
- After opening of the M6 Toll, traffic speeds are typically higher throughout the whole day. The afternoon peak with traffic speeds below 80 kph (50 mph) is shortened significantly to a two hour period from 15:30 – 17:30.



Figure 4.9 – Friday Traffic Speed on M6 J9 – 10 Northbound Before & After Opening of M6 Toll

#### Fridays (Southbound)

- In November 2003, Fridays show congestion in the morning peak, a short recovery mid morning and extended afternoon peak for eight hours from around 10:30 – 18:30; and
- In comparison in March 2004, overall traffic speeds are higher and congestion in the PM peak is reduced with speeds below 80 kph (50 mph) limited to a three and a half hour period from 13:30 – 17:00.



Figure 4.10 – Friday Traffic Speed on M6 J9 – 10 Southbound Before & After Opening of M6 Toll

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#### Sundays (Northbound)

- Sundays in November 2003 show a decline in traffic speeds in the afternoon for northbound traffic; and
- In March 2004, traffic speeds are at free flow conditions over 100 kph (62 mph) throughout the entire day, except for a short period in the late afternoon.



#### Figure 4.11 – Sunday Traffic Speed on M6 J9 – 10 Northbound Before & After Opening of M6 Toll

#### Sundays (Southbound)

- Prior to opening of the M6 Toll, the results demonstrate the typical Sunday afternoon pattern for M6 south towards London. Traffic speeds decline through the afternoon to a low of 25 kph (16 mph) and are below 80 kph (50 mph) for an eight and a half hour period from lunch until late evening. This is consistent with the pattern observed for journey times derived from ANPR cameras; and
- After M6 Toll opening, afternoon traffic speeds are significantly higher than those shown in November fluctuating around 100 kph (62 mph), except for a brief reduction in speeds in the late afternoon.



Figure 4.12 – Sunday Traffic Speed on M6 J9 – 10 Southbound Before & After Opening of M6 Toll

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#### Key Impacts

Similar to the improvement in operating conditions observed from the ANPR Camera information, the MIDAS data shows improvements in operating conditions on the M6 Motorway between junctions 9 and 10 that would also relate to other sections of M6. The main issues to note are:

- Average traffic speeds on the M6 Motorway have increased following opening of the M6 Toll. This pattern is demonstrated northbound and southbound for midweek days, Fridays and Sundays;
- Reduced speeds on M6 southbound into Birmingham in the AM peak and M6 northbound in the PM peak on week days are still observed, as the M6 Toll does not cater for this movement;
- However, reduced speeds on M6 southbound in the afternoon peak show a marked improvement after opening of the M6 Toll;
- The extended Friday afternoon peak on the M6 Motorway is limited to a shorter PM peak following scheme opening;
- The severe delays on the M6 Motorway northbound and particularly southbound on Sundays are not observed following opening of the toll road. Traffic speeds of 100 kph(62 mph) indicate free flow conditions; and
- In summary, operating conditions improve when the proportion of longer distance traffic is largest. This is observed on Fridays and Sundays when part of the weekend traffic using the M6 Motorway now takes the M6 Toll to bypass the M6 Motorway through Birmingham.

#### Change in Congestion

- 4.29 The MIDAS information enables average speeds to be calculated for different hours of the day, and thus, the change in congestion on the M6 Motorway has been ascertained by assessing the average number of hours per day vehicular speeds are within five speed bands on the M6 between junctions 9 & 10.
- 4.30 These speed bands have been selected to indicate free flow conditions, and degrees of congestion.
- 4.31 Thus, a comparison has been made for the number of hours in each speed band for the Before scenario (November 2003) and the After scenario (March 2004). This comparison is shown in Tables 4.4 and 4.5.

		Av	erage Ho	ours in S	peed Ba	nd
Direction	Speed Band	Mon	Tue Wed Thu	Fri	Sat	Sun
Northbound	Greater than 100 kph (62 mph)	14.4	12.7	10.3	19.0	16.4
	80 – 100 kph (50 – 62 mph)	7.3	8.0	7.3	4.4	4.4
	60 – 80 kph (37 - 50 mph)	1.0	1.1	1.4	0.1	1.1
	40 – 60 kph (25 – 37 mph)	0.8	1.1	2.1	0.2	1.1
	Less than 40 kph (25 mph)	0.3	0.9	2.7	0.2	0.6
	Ungraded	0.2	0.2	0.2	0.2	0.4
Southbound	Greater than 100 kph (62 mph)	8.4	6.9	6.9	14.5	11.2
	80 – 100 kph (50 – 62 mph)	5.8	7.2	8.4	7.3	5.6
	60 – 80 kph (37 - 50 mph)	1.6	2.2	1.9	1.0	1.0
	40 – 60 kph (25 – 37 mph)	3.0	3.3	3.1	0.3	2.6
	Less than 40 kph (25 mph)	5.2	4.3	3.6	0.8	3.5
	Ungraded	0.0	0.1	0.1	0.1	0.1

NB Results exclude 11 & 19 November 2003 when loops not working for proportion of day

# Table 4.4 – Average Hours M6 Traffic (Junction 9 - 10) Within Speed Bands (November 2003)

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		Av	verage Ho	ours in S	peed Ba	nd
Direction	Speed Band	Mon	Tue Wed Thu	Fri	Sat	Sun
Northbound	Greater than 100 kph (62 mph)	17.8	15.3	14.1	19.7	21.8
	80 – 100 kph (50 – 62 mph)	5.3	7.3	7.9	3.3	1.6
	60 – 80 kph (37 - 50 mph)	0.2	0.4	0.5	0.6	0.0
	40 – 60 kph (25 – 37 mph)	0.2	0.4	0.9	0.3	0.0
	Less than 40 kph (25 mph)	0.1	0.2	0.3	0.0	0.0
	Ungraded	0.5	0.3	0.2	0.1	0.6
Southbound	Greater than 100 kph (62 mph)	11.2	8.8	9.6	17.8	17.0
	80 – 100 kph (50 – 62 mph)	9.4	11.9	10.7	6.0	6.7
	60 – 80 kph (37 - 50 mph)	0.9	0.9	1.1	0.1	0.1
	40 – 60 kph (25 – 37 mph)	1.2	1.2	1.1	0.0	0.0
	Less than 40 kph (25 mph)	1.2	1.1	1.5	0.0	0.0
	Ungraded	0.1	0.1	0.0	0.0	0.1

NB Results exclude 6, 9, 10, 28 & 31 March 2004 when loops not working for proportion of day

#### Table 4.5 – Average Hours M6 Traffic (Junction 9 - 10) Within Speed Bands (March 2004)

#### Key Impacts

- After opening of the M6 Toll, midweek (Tuesday, Wednesday & Thursday) traffic speeds on the M6 show a significant improvement southbound. Traffic speeds are on average above 80 kph (50 mph) for over twenty hours of the day, compared to fourteen hours in November 2003;
- The Before scenario also shows southbound speeds are below 80 kph (50 mph) for an average of ten hours per day, reducing to three hours per day after opening of M6 Toll;
- On Fridays, northbound traffic is travelling less than 80 kph (50 mph) for an average of 6.2 hours, before opening, and this reduces to only 1.7 hours after opening;
- On Sundays, there is a marked improvement for M6 southbound traffic towards London. Before opening, there was an average of seven hours per day where the speed reduces below 80 kph (50 mph), but no hours afterwards shown for these speeds.

#### 5. **Summary of Conclusions**

#### Background

- 5.1 This report represents the Three-month assessment of impacts of M6 Toll, and is the summary of changes in traffic volumes and operating conditions on key roads in the West Midlands conurbation and other areas that are likely to be affected by the opening of M6 Toll.
- 5.2 The Report has two key purposes, namely.
  - First, to evaluate changes in traffic volumes on the M6 Toll and other roads likely to have been affected by the opening of M6 Toll; and
  - Secondly, to provide an assessment of changes in journey times and speeds on the M6 and the M6 Toll for through journeys and an indication of speeds on key section of the M6 in the conurbation.

#### **Results**

5.3 A number of quantitative assessments have been made to evaluate the initial impacts of the M6 Toll, and these are summarised below:

#### M6 Toll

- 5.4 The key issues to note from all the above M6 Toll traffic volumes tables are:
  - Daily Traffic volumes of up to 37,000 vehicles per day are shown on the M6 Toll;
  - There has been a significant month on month increase on all days and on all of the three sections of the M6 Toll for which data is available; and
  - Although, seasonal factors and general traffic growth factors have not been ٠ applied to these traffic volumes, these would only account for a small part of the traffic growth between the three months shown.

Impacts on Other Motorways

- There are significant reductions in traffic on the M6 through the conurbation between junctions 4 and 11;
- Weekday reductions are shown to be around 10%, increasing to over 15% on Saturdays and to over 20% on Sundays;
- On the M6 at either end of the M6 Toll, and on the M42 approaching the M6 Toll, there are increases in traffic volumes of around 5%;
- The reductions in traffic volumes in the peak hours are significantly less; and
- The reductions are almost entirely due to reductions in the number of light vehicles, with no change to the number of HGVs on the M6 through the conurbation.

#### Impacts on Other Roads

- Screenlines 2, 3 and 4 which cross the middle of the region but exclude the M6 Toll counts all show reductions in weekday traffic volumes of between 16,800 and 18,600vpd;
- The AM and PM peak periods also generally show traffic reductions on these screenlines:
- Screenline 1, to the south of the M6 Toll tie-in junction, shows traffic growth in both directions at the AM and PM peak periods;
- On individual roads within the screenlines, significant changes are shown reflecting complex changes in traffic patterns; and
- On Screenline 5, the most significant reduction on any A road occurs on the A50 near Stoke on Trent. This road which is used by some drivers as part of a alternative route long distance route between the south east and the north west (thereby avoiding the section of M6 through the West Midlands), shows a significant drop of 12,600 vpd.

#### Journey Times for Through Movements

- Journey time delays experienced in rush hour periods on the M6 Motorway on week days (Tuesdays, Wednesdays & Thursdays) have reduced following opening of the M6 Toll. The more noticeable effect is on the evening peak period:
- Traffic using the M6 Toll on weekdays has improved journey reliability as the ٠ journey takes a constant 34 minutes throughout the day;
- Prior to opening of the M6 Toll, the M6 Motorway on Fridays showed an extended afternoon peak period with significant congestion, related to commuter traffic and longer distance traffic movements on the motorway network;
- Post scheme opening, the extended afternoon peak on Fridays is significantly reduced, with delays reduced by up to one hour for northbound traffic and a shortened two hour peak period of traffic delay for M6 south;
- Sunday journey time delays shown on M6 southbound for weekend traffic ٨ returning to London are not experienced on the M6 Motorway post opening of the M6 Toll. The transfer of a proportion of traffic to the toll road route provides relief, such that journey times are also improved for M6 traffic; and
- There is little difference in journey times for traffic now using the M6 or M6 Toll ٠ on Sundays. It takes 34 minutes on the M6 and 33 minutes via the M6 Toll.

#### Time Savings

- Significant time savings are shown for both northbound and southbound ٠ movements between Coventry and Cannock on both the M6 and M6 Toll:
- Comparing the journey times on M6 Toll and M6 before opening, the average weekday journey time savings are 12 minutes northbound and 7 minutes southbound:
- However, maximum time savings of around 30 minutes are shown in the peak ٠ hours for a midweek day:
- On Fridays, the M6 Toll time savings suggest some journeys are now up to 70 minutes faster than the Before scenario;

- On Sundays, southbound journey times for this through movement are up to 30 ٠ minutes faster than the same journey before the M6 Toll opened;
- However, the M6 Toll has removed a significant level of traffic away from the M6, ٠ such that the M6 itself has improved operating conditions and journey times. The reduction in traffic has meant that the through journey times on the M6 have also improved;
- For example, on weekdays, journey time improvements of up to 16 minutes are shown, which means that this journey could still be made up to 15 minutes quicker on M6 Toll;
- On Fridays, the time savings on M6 are up to one hour compared to the Before ٠ scenario, and M6 Toll saves an additional 10 minutes;
- Similarly, on Sundays, southbound, the reduced traffic volumes southbound ٠ does lead to time savings for vehicles remaining on the M6; and
- Thus the M6 Toll does provide significantly reduced journey times for M6 through movements, compared to the M6 before opening, and still offers time savings for many hours of the day over the time taken on the improved M6.

#### Journey Speeds on the M6

- Average traffic speeds on the M6 Motorway have increased following opening of the M6 Toll. This pattern is demonstrated northbound and southbound for midweek days, Fridays and Sundays;
- Reduced speeds on M6 southbound into Birmingham in the AM peak and M6 ٠ northbound in the PM peak on week days are still observed, as the M6 Toll does not cater for this movement;
- However, reduced speeds on M6 southbound in the afternoon peak show a ٠ marked improvement after opening of the M6 Toll;
- The extended Friday afternoon peak on the M6 Motorway is limited to a shorter ٠ PM peak following scheme opening;
- The severe delays on the M6 Motorway northbound and particularly southbound ٠ on Sundays are not observed following opening of the toll road. Traffic speeds of 100 kph (62 mph) indicate free flow conditions; and
- In summary, operating conditions improve when the proportion of longer distance traffic is largest. This is observed on Fridays and Sundays when part of the weekend traffic using the M6 Motorway now takes the M6 Toll to bypass the M6 Motorway through Birmingham.

#### **Issues and Caveats**

5.5 The observations presented in this Traffic Impact Study Report should be considered in line with the following issues and caveats.

#### Issues

5.6 Firstly, the data from the M6 Toll/MEL has been supplied to the HA and CEPOG on a confidential basis. However, the April data for the M6Toll is now available, and shows that traffic on the M6 Toll has risen by 12% compared to March. This emphasises two things, namely:

- That the traffic on the M6Toll is still growing strongly (i.e. ramp up is continuing); ٠ and
- That the ramp up profile is likely to be erratic over the following months (because ٠ of seasonality, the drawing in off traffic from a wider area and the inevitable oscillations of traffic between the two routes (M6 and M6 Toll) as traffic seeks to achieve a new equilibrium).
- 5.7 Thus, the significant changes shown in this report for traffic volumes and operating conditions may take many months (or maybe years) to settle down.
- 5.8 The second issue is the erosion of the reported time savings on the M6. Initial results from the M6 in January showed greater time savings (compared to the 'before' situation) than shown in March, suggesting that traffic continues to be drawn back onto the M6. Thus, the reported time savings on the M6 may be short lived.
- 5.9 The changing operating conditions suggest that traffic on the M6 is oscillating, and thus, the following pattern may currently be happening:
  - The existing M6 is heavily congested the M6 Toll opens traffic decides it is ۲ worth paying a toll to save time, achieve reliability etc and diverts to the M6Toll;
  - Hence, conditions on the M6 improve;
  - However, if it becomes widely known by those using the M6Toll that the M6 is ٠ free flowing, then they will start to divert back to the M6 - resulting in a return to congestion and delays on the M6; and
  - This process then oscillates until equilibrium is achieved.
- 5.10 This Report has shown that a 10% reduction in traffic has been achieved on the M6 through the West Midlands conurbation, with significant improvements in operating conditions. As M6 traffic volumes oscillate, it is not clear at present how much of a switch back from the M6 Toll to the M6 would cause major congestion on the M6.
- 5.11 Therefore, it is beneficial to all parties for through traffic to use the M6Toll, so that the M6 does not revert back to the serious congestion and unreliable journey times. The HA have a direct and active part to play in this process through signing policy and the operation of Variable Message Signing (VMS).

#### Caveats

- 5.12 The methods used to calculate the statistics herein are subject to a number of caveats:
  - First, there are some issues surrounding the imprecise science of seasonal ٠ adjustment. Seasonal adjustment has been done on the basis on using average factors for motorway traffic counts for November-March and for motorways and A-road counts for November-February. There is inadequate historical data to calculate factors for individual count sites which would provide more accurate results. Motorway factoring also does not allow for variation by day of week. There is also no seasonal factoring for vehicle classification;

- Vehicle speeds and journey times are not seasonally adjusted. Traffic levels in ٠ June are higher than those in March, therefore if seasonally adjusted, the time savings shown in this report may have been lower; and
- The AM and PM peak periods of 07:00-09:00 and 16:00-18:00 may not represent the whole of the peak traffic levels at some sites, particularly on the motorways where there can be high levels of commuter traffic before 07:00 and after 18:00.
- This report presents traffic volumes from March 2004, which is only 3 months after 5.13 opening of M6 Toll. The shortness of the timescale means that the conclusions in this report presented need to be read with the following caveats in mind:
  - In the first three months, significant traffic growth of 27% has been shown on M6 ٠ Toll indicating that the traffic patterns have not stabilised
  - Thus, the level of driver awareness of the opening of M6 Toll may not be fully appreciated in the first few months after opening;
  - Seasonal factors in drivers' route choices for through traffic remain unknown;
  - There may also be seasonal factors in the attraction of new traffic to the M6 Toll.
  - While traffic continues to grow on the toll road, there will also continue to be changes on other parts of the road network;
  - This report is a study of traffic flows under normal conditions. The effects of holiday periods, accidents and roadworks are specifically excluded. The effect of the latter is likely to be very significant in the summer of 2004 when major roadworks are planned on the M6 J5-6 and J8-7.
  - Experience from other toll roads around the world shows that HGV volumes normally ramp up a lot more slowly than light vehicles, and given the particular issues of HGV use on M6 Toll, there is considerable scope for increased HGV use over time;
  - Clearly therefore, it is still too early to identify the full and long-term impact of the M6 Toll on the M6 and other roads a the impact of the M6 Toll is likely to be more profound and complex than a simple diversion from one road to another; and
  - A detailed one-year after report will be produced based on data collated in October 2004, which may provide more information on how traffic volumes have changed over the first year of operation.

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### 6. Annex A - Strategic Screenline Results

	Monday to Friday												
Screenline 1		АМ			РМ					24 Hour Total			
M	onitoring Site Location	Before	After	Diff	% Diff	Before	After	Diff	% Diff	Before	After	Diff	% Diff
M42	Junc 6 - 7	19,300	18,800	-500	-3%	18,900	20,000	1,100	6%	127,400	127,800	1,000	1%
A452	Chester Rd	6,600	6,800	200	3%	6,800	6,700	-100	-1%	36,600	36,000	-1,200	-3%
M6	Junc 3 - 4	16,400	18,100	1,700	10%	15,800	16,900	1,100	7%	112,000	118,000	6,600	6%
Total		42,300	43,700	1,400	3%	41,500	43,600	2,100	5%	276,000	281,800	6,400	2%

Table 6.1 - Strategic Screenline 1 Weekday Traffic Count Results

	Monday to Friday												
Screenline 2		AM			РМ					24 Hour Total			
Мо	nitoring Site Location	Before	After	Diff	% Diff	Before	After	Diff	% Diff	Before	After	Diff	% Diff
M6	Junc 4A - 5	21,600	20,200	-1,400	-6%	20,900	19,300	-1,600	-8%	155,600	139,700	-15,900	-10%
A4097	Kingsbury Rd	2,400	2,200	-200	-8%	2,600	2,600	0	0%	15,600	15,200	-400	-3%
A446	A38 - A4091 (Allen End)	3,500	3,000	-500	-14%	3,600	3,200	-400	-11%	21,800	19,000	-2,800	-13%
A4091	North of A446	2,400	2,500	100	4%	2,200	2,400	200	9%	12,700	13,200	500	4%
Total		29,900	27,900	-2,000	-7%	29,300	27,500	-1,800	-6%	205,700	187,100	-18,600	-9%

 Table 6.2 - Strategic Screenline 2 Weekday Traffic Count Results

Monday to Friday													
Screenline 3		АМ				РМ				24 Hour Total			
Monitoring Site Location		Before	After	Diff	% Diff	Before	After	Diff	% Diff	Before	After	Diff	% Diff
M6	Junc 6 - 7 <sup>6</sup>									144,100	132,500	-11,600	-8%
A452(T)	Chester Rd	2,600	2,600	0	0%	2,700	2,700	0	0%	20,900	20,700	-200	-1%
A5127	Birmingham Rd	2,400	2,400	0	0%	2,800	2,800	0	0%	20,400	20,500	100	0%
A453	SW of Bassett's Pole <sup>7</sup>	2,500	2,700	200	8%	2,400	2,700	300	13%	15,000	15,600	600	4%
A38	North of A453	6,400	5,700	-700	-11%	6,000	5,400	-600	-10%	37,600	33,400	-4,200	-11%
A5	East of A38 Weeford	2,600	3,000	400	15%	2,900	2,800	-100	-3%	17,400	17,500	100	1%
A51	NW of Barracks	2,700	2,400	-300	-11%	2,700	2,400	-300	-11%	14,400	12,800	-1,600	-11%
Total		19,200	18,800	-400	-2%	19,500	18,800	-700	-4%	269,800	253,000	-16,800	-6%

Table 6.3 - Strategic Screenline 3 Weekday Traffic Count Results

<sup>&</sup>lt;sup>6</sup> No Northbound data available for M6 J6-7 Nov 2003 and Feb 2004, so peak period figures are omitted. 24 hour totals are based on a doubling of the southbound figures. No data was available for Fridays in February 2004 so Fridays in November 2003 are also omitted from the averages. <sup>7</sup> Before figures are based on June 2003 data factored accordingly.

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Monday to Friday													
Screenline 4		AM				РМ				24 Hour Total			
Monitoring Site Location		Before	After	Diff	<u>% Diff</u>	Before	After	Diff	% Diff	Before	After	Diff	% Diff
M6	Junc 10 - 10A	15,900	15,700	-200	-1%	18,900	18,500	-400	-2%	144,900	132,700	-12,200	-8%
A34	Stafford Rd	3,000	2,900	-100	-3%	2,700	2,800	100	4%	17,600	17,100	-500	-3%
A5	A34 - A452 (Norton Canes)	4,500	4,500	0	0%	4,800	4,600	-200	-4%	29,900	28,200	-1,700	-6%
A5190	Burntwood Bypass	2,600	1,900	-700	-27%	2,700	1,900	-800	-30%	15,300	11,700	-3,600	-24%
Total <sup>8</sup>		26,000	25,000	-1,000	-4%	29,100	27,800	-1,300	-4%	207,700	189,700	-18,000	-9%

Table 6.4 - Strategic Screenline 4 Weekday Traffic Count Results

 <sup>&</sup>lt;sup>8</sup> This screenline should also include data for count sites on the B4154 south of Heath Hayes and the A5190 Cannock Road. They are omitted in this report because no data was available for the After period at these sites.
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Monday to Friday													
Screenline 5		AM					Р	М		24 Hour Total			
Monitoring Site Location		Before	After	Diff	% Diff	Before	After	Diff	% Diff	Before	After	Diff	% Diff
A50	Blythe Bridge	10,500	8,900	-1,600	-15%	11,200	9,400	-1,800	-16%	69,000	56,400	-12,600	-18%
A518	West of Weston	2,200	2,200	0	0%	2,700	2,700	0	0%	15,600	15,600	0	0%
A513	Milford	1,500	1,400	-100	-7%	1,700	1,600	-100	-6%	10,000	9,400	-600	-6%
A34	South of A513	2,400	2,300	-100	-4%	2,600	2,600	0	0%	14,600	14,600	0	0%
M6	Junc 12 - 13	13,600	15,200	1,600	12%	14,600	16,800	2,200	15%	112,800	119,800	7,000	6%
A5	E of A449 (Gailey)	3,000	3,500	500	17%	3,100	3,400	300	10%	18,200	19,200	1,000	5%
A460	Cannock Rd <sup>9</sup>									21,500	22,900	1,400	7%
M54	Junc 1 - M6	5,400	5,800	400	7%	6,200	6,600	400	6%	42,000	42,200	200	0%
Total <sup>10</sup>		38,600	39,300	700	2%	42,100	43,100	1,000	2%	303,700	300,100	-3,600	-1%

Table 6.5 - Strategic Screenline 5 Weekday Traffic Count Results

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<sup>&</sup>lt;sup>9</sup> No Southbound data available for A460 Cannock Road during February. 2004 so peak period figures are omitted and 24 hours figures for After are based on a doubling on the northbound data. <sup>10</sup> This screenline should also include count sites on the B5012 NW of Cannock and the A51 NW of Weston. They are omitted in this report

because no data was available for the After period at these sites.