Major and Minor Road Traffic Flows

Précis:
A summary and analysis of major and minor road traffic flows as monitored through the TfL cordon survey programme. It investigates the hypothesis that perceived falling traffic levels are the result of traffic opting to divert from congested major road corridors to relatively free-flowing minor roads.
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1 Introduction

1.1 This traffic note, produced by the Road Network Performance and Research (RNPR) Team within TfL, provides a summary and analysis of major and minor road traffic flows as monitored through the cordon survey programme. There is a perception that falling traffic levels are the result of traffic opting to divert from congested major road corridors to relatively free-flowing minor roads. This report sets out to test this hypothesis by comparing traffic flow trends on both major and minor roads collected as part of the TfL cordon survey programme.

1.2 The purpose of the cordon survey programme is to estimate traffic flows on different parts of the network, and to monitor trends in traffic in London. Historically, traffic flows have been counted on defined cordons according to a regular cycle of surveys to contribute to long-run series of traffic trends. The surveys continue a series of counts begun by the Greater London Council in the 1970s, and continued by the Department for Transport before transferring to TfL.

1.3 Regular surveys are undertaken of three different cordons within Greater London. These are shown in Figure 2 on page 4.

1.4 The cordon surveys are formed of the:
   - **Central cordon** within a radius of 2.5 - 3 kms from a centre at Aldwych; surveyed annually since 2001 and once every three years prior to that. (Note – this cordon is not the same as the Congestion Charging cordon);
   - **Inner cordon** enclosing an area roughly corresponding to the old London County Council, but excluding much of the boroughs of Greenwich and Lewisham, surveyed once every three years; and
   - **Boundary cordon** roughly corresponding to the administrative boundary of Greater London and lying entirely within the M25 orbital motorway, surveyed once every three years.

1.5 The cordon survey programme is based on a three-year rolling programme. Consequently, compared periods vary for each cordon.

1.6 Technical information relating to the counting method, vehicle types and time periods can be found in Appendix 1.

1.7 Figure 1 overleaf shows the long term trend in all motor vehicle (AMV) traffic crossing each of the three cordons, based on 24 hr combined direction flows. AMV traffic crossing the central and inner cordons has remained fairly consistent over the last three decades rising steadily and peaking in 1989 and 1990 respectively. More recently AMV traffic has shown a reduction over the last ten years on the central cordon and last five years on the inner cordon. Conversely AMV traffic on the outer cordon has steadily increased throughout, recently slowing in the 3 surveys spanning the last six years.
Figure 1 – Long term trend in cordon crossings for all motor vehicles, 1971 to 2005

1.8 Greater detail about traffic flows in London can be found in RNPR Traffic Note 3 – TfL Cordon and Screenline Surveys 1971-2005.

1.9 The purpose of this report is to investigate whether, despite an overall reduction in cordon traffic levels, there has been any change in major and minor road traffic distribution and if so whether or not such a change can be attributed to time of day.

1.10 A map showing the location of cordon count sites is shown in Figure 2 overleaf.
Figure 2 – Locations of cordon count sites monitored by TfL survey programme
2 Central Cordon

2.1 This section provides a summary and analysis of traffic crossing the central cordon. The cordon itself is made up of 105 count sites; surveyed in autumn each year. Of these, 37 are located on major and 68 on minor roads. Table 1 below shows major road trends for AMV traffic crossing the cordon.

Table 1 – All motor vehicle traffic crossing the central cordon on major roads by time of day and direction, 2001 to 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Morning Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Off Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Evening Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Daytime Total Both</th>
<th>Late Evening Both</th>
<th>Night Both</th>
<th>24 Hour Total Both</th>
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</tbody>
</table>

2.2 Generally, as in the case of the overall trend seen on all roads\(^1\), road traffic levels on major roads crossing the central cordon have fallen since 2001 and continued to do so since the introduction of Congestion Charging in 2003. However, central cordon minor road trends, as seen in Table 2 below suggest flows on these roads may, for certain time periods, be increasing such that 2005 flows are above 2003 (post-Congestion Charging) levels.

Table 2 – All motor vehicle traffic crossing the central cordon on minor roads by time of day and direction, 2001 to 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Morning Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Off Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Evening Peak In</th>
<th>Out</th>
<th>Both</th>
<th>Daytime Total Both</th>
<th>Late Evening Both</th>
<th>Night Both</th>
<th>24 Hour Total Both</th>
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<tr>
<td>2001</td>
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</table>

2.3 Night-time flows are based on counts at only a proportion of sites. As a result they are subject to large sampling variation and therefore must be treated with caution. Daytime traffic flows may therefore be a more reliable trend indicator.

2.4 Major road AMV traffic flow accounts for around 74% of the overall total daytime flow on its 35% share of central cordon roads. The average daytime flow on each major road crossing this cordon is approximately 19,000, whereas the average on each minor road is approximately 4,000 vehicles. Table 3 overleaf shows all motor vehicle traffic crossing the central cordon on major roads by sector, time of day and direction.

\(^1\) RNPR Traffic Note 3 – TfL Cordon and Screenline Surveys 1971-2005
Table 3 – All motor vehicle traffic crossing the central cordon on major roads by sector, time of day and direction, 2001 to 2005

<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
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<td>Both</td>
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<td>52</td>
<td>100</td>
<td>26</td>
<td>30</td>
<td>56</td>
</tr>
</tbody>
</table>

2.5 The quadrants are defined as:

- **North sector**: Shoot up Hill (A5) in Brondesbury round to High Road (A10) in Tottenham.
- **East sector**: Lea Bridge Road (A104) in Lea Bridge round to Loam Pit Vale (A20) in Lewisham.
- **South sector**: Vicars Hill in Ladywell round to Roehampton Vale (A3) in Putney Vale.
- **West sector**: Clarence Lane in Roehampton round to Exeter Road in Brondesbury.

2.6 Individual sectors experience different traffic flow patterns and trends. The table above shows an overall decrease in daytime flow in 2005 for north and southern sectors compared to previous surveys. Eastern sector has seen an increase between 2004 and 2005, whereas western sector flows have remained much the same. It is evident that the introduction of congestion charging in 2003 has had some effect on major road vehicle usage, with a fall of 5,000 (3%) seen in the north and 33,000 (15.6%) in the south between 2002 and 2003. As the majority of the south sector falls within the congestion charging zone, (introduced in February 2003) the large decrease in flow is as expected. Western sector usage remained at the same level over this time period, although fell in 2004. The eastern sector rose by 6,000 vehicles (6%), possibly as a result of roadworks on the A13 and completion of the Shoreditch Triangle scheme.

2.7 Table 4 overleaf shows minor road traffic flows in to and out of central London by sector.
Table 4 – All motor vehicle traffic crossing the central cordon on minor roads by sector, time of day and direction, 2001 to 2005

<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>Morning Peak</th>
<th></th>
<th>Off Peak</th>
<th></th>
<th>Evening Peak</th>
<th></th>
<th>Daytime Total</th>
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<th>Late Evening</th>
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</table>

2.8 The above table for minor roads shows an overall decrease in daytime flow for all sectors in 2003 compared to 2001. This is likely to be attributed to the introduction of congestion charging in 2003. Reductions of as much as 15,000 vehicles in the north and 12,000 in the south are evident between 2002 and 2003. Other decreases of between five and nine thousand vehicles can be seen in east and western sectors. Slight increases in vehicle numbers crossing the cordon on minor roads are evident post 2003 in the north and eastern sectors. However, numbers in south sector have remained the same, whilst those in west decreased.

2.9 Figure 3 and Figure 4 overleaf provide a comparison of 2005 major and minor flows against the base average of 1995-2001 for morning peak and evening peak traffic respectively.

2.10 Figure 3 shows that 2005 morning peak flows have decreased in all sectors compared to 1995-1999 base average. The sharpest decline can be seen in the south where minor inbound traffic has reduced by 61.6%. South sector calculations are however based on low flows. Other reductions vary between thirty and ten percent.

2.11 Figure 4 tells a similar story. All sectors experience a reduction in evening peak flow for both road types, when compared to 1995-1999 base average. The largest decline is evident in the south where minor road outbound traffic has reduced by 49%. Other reductions vary from thirty-five to eleven percent.
Figure 3 – Major and minor morning peak flow - % change in 2005 compared to 1995-1999 base average

Figure 4 – Major and minor evening peak flow - % change in 2005 compared to 1995-1999 base average
3  **Inner Cordon**

3.1 This section provides a summary and analysis of traffic crossing the inner cordon. The cordon is made up of 95 count sites; 40 major and 55 minor roads which are surveyed in June/July each year. Table 5 below shows the trend in AMV traffic crossing the cordon on major roads by time period for 1996 to 2005. Flows for morning and evening peak periods are additionally shown by inbound and outbound directions, when the flows are most tidal.

**Table 5 – All motor vehicle traffic crossing the inner cordon on major roads by time of day and direction, 1996 to 2005**

<table>
<thead>
<tr>
<th>Year</th>
<th>Off Peak Morning Peak</th>
<th>Off Peak Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Out</td>
<td>Both</td>
<td>Both In</td>
<td>Out</td>
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<tr>
<td>1996</td>
<td>166</td>
<td>121</td>
<td>287</td>
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</tr>
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<td>1999</td>
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<td>114</td>
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</tr>
<tr>
<td>2002</td>
<td>166</td>
<td>110</td>
<td>276</td>
<td>489</td>
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</tr>
<tr>
<td>2004</td>
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<td>113</td>
<td>277</td>
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<td>106</td>
<td>265</td>
<td>459</td>
<td>118</td>
<td>156</td>
</tr>
</tbody>
</table>

3.2 It can be seen, as in the case of the overall trend seen on all roads\(^2\), that major road traffic levels have generally fallen since 1999. However, as seen in Table 6 below, minor road flow trends show a small increase from 2004 to 2005. Yet, such flows are still lower than earlier years, contributing to the general downward trend.

**Table 6 – All motor vehicle traffic crossing the inner cordon on minor roads by time of day and direction, 1996 to 2005**

<table>
<thead>
<tr>
<th>Year</th>
<th>Off Peak Morning Peak</th>
<th>Off Peak Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
</tr>
</thead>
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<td>Out</td>
<td>Both</td>
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<tr>
<td>1996</td>
<td>73</td>
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<td>181</td>
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<tr>
<td>2002</td>
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<td>39</td>
<td>103</td>
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<tr>
<td>2004</td>
<td>62</td>
<td>38</td>
<td>99</td>
<td>174</td>
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<td>2005</td>
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<td>39</td>
<td>104</td>
<td>173</td>
<td>47</td>
<td>67</td>
</tr>
</tbody>
</table>

3.3 Night-time flows are based on counts at only a sample of sites. As a result, they are subject to large sampling variation and therefore must be treated with caution. Daytime traffic flows are therefore a more reliable trend indicator.

3.4 Major road AMV traffic flow attributes for around 72% of the overall total daytime flow on its 42% share of inner cordon roads. The average daytime flow on each major road crossing this cordon is approximately 25,000, whereas the average on each minor road is approximately 7,000 vehicles. Table 7 overleaf shows all motor vehicle traffic crossing the inner cordon on major roads by sector, time of day and direction.

---

\(^2\) RNPR Traffic Note 3 – TfL Cordon and Screenline Surveys 1971-2005
<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
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3.5 The quadrants are defined as:

**North sector**: Shoot up Hill (A5) in Brondesbury round to High Road (A10) in Tottenham.

**East sector**: Lea Bridge Road (A104) in Lea Bridge round to Loam Pit Vale (A20) in Lewisham.

**South sector**: Vicars Hill in Ladywell round to Roehampton Vale (A3) in Putney Vale.

**West sector**: Clarence Lane in Roehampton round to Exeter Road in Brondesbury.

3.6 Table 7 above shows an overall decrease for each sectoral daytime flow in 2005 compared to 2004. The smallest reduction is evident in the northern sector whilst other sectors, such as the east, have experienced a decline of up to twenty-four thousand vehicles crossing the inner cordon on major roads.

3.7 North, south and western sectors show a decrease in daytime flow over the ten-year period 1996 to 2005. In contrast, the eastern sector showed an increase from 1996, peaking in 2004, followed by a large decrease in 2005. This is likely to be due to changes in the major road network in this sector.

3.8 Table 8 overleaf shows minor road traffic flows into and out of inner London by sector.
Table 8 – All motor vehicle traffic crossing the inner cordon on minor roads by sector, time of day and direction, 1996 to 2005

<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
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<td>23</td>
<td>39</td>
<td>11</td>
<td>16</td>
<td>27</td>
</tr>
</tbody>
</table>

*too few minor roads in this sector to warrant meaningful analysis.

3.9 The above table for minor roads shows that daytime totals have reduced in both northern and western sectors in 2005 relative to 2004, contributing to the overall downward trend since 1996. In contrast, the south has experienced an increase in minor road traffic flow in 2005 compared to 2004, although flows are lower than those that occurred in 2002.

3.10 Figure 5 and Figure 6 overleaf provide a comparison of 2005 major and minor flows against the base average of 1996-1999 for morning peak and evening peak traffic respectively. There are no other obvious patterns of change when comparing inbound to outbound flows and major to minor road flows.

3.11 Figure 5 shows that almost all road type and direction combinations have experienced a decrease in levels in 2005 when compared to 1996-1999 base average. The exception is outbound minor road traffic flow, which has increased by 16.7% in the south and 1.2% in the west.

3.12 Figure 6 shows that the majority of road type and direction combinations have experienced a decrease in levels in 2005 when compared to 1996-1999 base average. Exceptions to this are a 0.5% increase on eastern sector outbound major roads and 11.1% increase on southern inbound minor roads.
Figure 5 – Major and minor morning peak flow - % change in 2005 compared to 1996-1999 base average

Figure 6 – Major and minor evening peak flow - % change in 2005 compared to 1996-1999 base average
4 Boundary Cordon

4.1 This section provides a summary and analysis of traffic crossing the boundary cordon. The cordon itself is made up of 117 count sites which are surveyed in June/July each year. Of these, 56 are located on Major and 61 on Minor roads. Table 9 below shows the trend in AMV traffic crossing the cordon on major roads. For the morning and evening peak periods the flows are additionally shown by inbound and outbound directions, when the flows are most tidal.

Table 9 – All motor vehicle traffic crossing the boundary cordon on major roads by time of day and direction, 1992 to 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
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<td>1995</td>
<td>258</td>
<td>188</td>
<td>447</td>
<td>655</td>
<td>201</td>
<td>262</td>
<td>462</td>
</tr>
<tr>
<td>1998</td>
<td>259</td>
<td>196</td>
<td>455</td>
<td>679</td>
<td>210</td>
<td>258</td>
<td>468</td>
</tr>
<tr>
<td>2001</td>
<td>252</td>
<td>201</td>
<td>454</td>
<td>682</td>
<td>216</td>
<td>253</td>
<td>469</td>
</tr>
<tr>
<td>2004</td>
<td>244</td>
<td>194</td>
<td>438</td>
<td>703</td>
<td>205</td>
<td>233</td>
<td>437</td>
</tr>
</tbody>
</table>

4.2 Since 2001, AMV traffic crossing the boundary cordon on major roads has fallen during peak times but increased at off-peak, late evening and night time periods. Despite this, the daytime total still remains higher than 1992 and 1995 figures. However, as seen in Table 10 below, AMV traffic on minor roads has decreased at all time periods since 2001, except for at night, with overall daytime flows at their lowest over the period 1992 to 2004.

Table 10 – All motor vehicle traffic crossing the boundary cordon on minor roads by time of day and direction, 1992 to 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In</td>
<td>Out</td>
<td>Both</td>
<td>Both</td>
<td>In</td>
<td>Out</td>
<td>Both</td>
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<tr>
<td>1992</td>
<td>57</td>
<td>39</td>
<td>96</td>
<td>146</td>
<td>44</td>
<td>59</td>
<td>103</td>
</tr>
<tr>
<td>1995</td>
<td>55</td>
<td>40</td>
<td>95</td>
<td>150</td>
<td>45</td>
<td>58</td>
<td>104</td>
</tr>
<tr>
<td>1998</td>
<td>58</td>
<td>41</td>
<td>99</td>
<td>144</td>
<td>47</td>
<td>58</td>
<td>106</td>
</tr>
<tr>
<td>2001</td>
<td>54</td>
<td>44</td>
<td>97</td>
<td>154</td>
<td>48</td>
<td>56</td>
<td>104</td>
</tr>
<tr>
<td>2004</td>
<td>48</td>
<td>38</td>
<td>86</td>
<td>145</td>
<td>46</td>
<td>53</td>
<td>100</td>
</tr>
</tbody>
</table>

4.3 Night-time flows are based on counts at a small sample of sites. As a result they are subject to large sampling variation and must be treated with caution. Daytime traffic flows may therefore be a more reliable trend indicator.

4.4 Major road AMV traffic flow accounts for around 73% of the overall total daytime flow on its 48% share of boundary cordon roads. The average daytime flow on each major road crossing this cordon is approximately 28,000, whereas the coverage on each minor road is approximately 5,400 vehicles. Table 11 overleaf shows all motor vehicle traffic crossing the inner cordon on major roads by sector, time of day and direction.
### Table 11 – All motor vehicle traffic crossing the boundary cordon on major roads by sector, time of day and direction, 1992 to 2004

| Sector | Year | Morning Peak | | | | Evening Peak | | | | Daytime Total | | | | Late Evening | | | | Night | | | | 24 Hour Total |
| | | In | Out | Both | | In | Out | Both | | Both | Both | | | Both | Both | Both | Both | Both | Both |
| North | 1992 | 51 | 31 | 82 | 116 | 32 | 49 | 81 | | | | | | | | | | | 364 |
| | 1995 | 52 | 33 | 85 | 125 | 35 | 53 | 88 | | | | | | | | | | | 393 |
| | 1998 | 49 | 34 | 83 | 126 | 37 | 50 | 87 | | | | | | | | | | | 390 |
| | 2001 | 46 | 32 | 78 | 126 | 37 | 46 | 84 | | | | | | | | | | | 376 |
| | 2004 | 42 | 29 | 72 | 113 | 32 | 39 | 71 | | | | | | | | | | | 349 |
| South | 1992 | 43 | 35 | 79 | 123 | 38 | 46 | 84 | | | | | | | | | | | 373 |
| | 1995 | 44 | 38 | 82 | 116 | 39 | 44 | 83 | | | | | | | | | | | 371 |
| | 1998 | 44 | 39 | 83 | 122 | 40 | 43 | 83 | | | | | | | | | | | 377 |
| | 2001 | 40 | 40 | 80 | 120 | 38 | 43 | 80 | | | | | | | | | | | 369 |
| | 2004 | 41 | 39 | 80 | 132 | 43 | 44 | 88 | | | | | | | | | | | 396 |
| East | 1992 | 69 | 42 | 112 | 161 | 47 | 68 | 115 | | | | | | | | | | | 505 |
| | 1995 | 69 | 45 | 113 | 166 | 50 | 70 | 119 | | | | | | | | | | | 535 |
| | 1998 | 70 | 47 | 117 | 174 | 52 | 69 | 121 | | | | | | | | | | | 549 |
| | 2001 | 76 | 52 | 128 | 192 | 64 | 75 | 139 | | | | | | | | | | | 614 |
| | 2004 | 72 | 53 | 125 | 219 | 57 | 74 | 131 | | | | | | | | | | | 639 |
| West | 1992 | 93 | 69 | 162 | 241 | 72 | 91 | 163 | | | | | | | | | | | 741 |
| | 1995 | 94 | 73 | 166 | 249 | 78 | 95 | 173 | | | | | | | | | | | 771 |
| | 1998 | 96 | 76 | 173 | 256 | 81 | 96 | 176 | | | | | | | | | | | 788 |
| | 2001 | 91 | 77 | 168 | 244 | 77 | 89 | 166 | | | | | | | | | | | 752 |
| | 2004 | 88 | 73 | 161 | 239 | 71 | 76 | 147 | | | | | | | | | | | 749 |

4.5 The quadrants are defined as:

- **North sector**: M1 Yorkshire Motorway in Aldenham round to Sewardstone Road (A112);
- **East sector**: Epping New Road in Epping Forest (A104) round to Sidcup By-Pass (A20) in Sidcup;
- **South sector**: Hockenden Lane in Crockenhill round to Esher By-Pass (A3) in Hook;
- **West sector**: Woodstock Lane in Hook round to The Common (A4140) in Stanmore.

4.6 Individual sectors experience different traffic flows and trends at differing times of day.

4.7 Table 11 above shows a reduction in overall major road daytime total flow for two sectors, northern and western, and an increase for the remaining two sectors, southern and eastern, in 2004 compared to 2001. Longer term daytime trends show that flows in the north have continually fallen since 1992. This is of contrast to the east, where flows have increased with each survey and the south and west, where fluctuations of approximately twenty and sixty thousand vehicles, have occurred respectively over the past five surveys.

4.8 Table 12 overleaf shows minor road traffic flows into and out of outer London by sector.
### Table 12 – All motor vehicle traffic crossing the boundary cordon on minor roads by sector, time of day and direction, 1992 to 2004

<table>
<thead>
<tr>
<th>Sector</th>
<th>Year</th>
<th>Morning Peak</th>
<th>Off Peak</th>
<th>Evening Peak</th>
<th>Daytime Total</th>
<th>Late Evening</th>
<th>Night</th>
<th>24 Hour Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In</td>
<td>Out</td>
<td>Both</td>
<td></td>
<td>Both</td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td>North</td>
<td>1992</td>
<td>6</td>
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<td>7</td>
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<tr>
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<td>1995</td>
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<td>1998</td>
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<td>4</td>
<td>7</td>
<td>26</td>
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<tr>
<td>South</td>
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<td>10</td>
<td>13</td>
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<td>West</td>
<td>1992</td>
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<td>2001</td>
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<td>108</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>15</td>
<td>12</td>
<td>27</td>
<td>15</td>
<td>17</td>
<td>32</td>
<td>104</td>
</tr>
</tbody>
</table>

4.9 Table 12 above for minor roads by sectors shows that three out of the four sectors, southern, eastern and western, have seen reductions in their overall daytime flows in 2004 when compared to 2001. However, the northern sector shows an increase over the same time period, although the flows are relatively low. The same patterns are true for all sectors when comparing 2004 figures to surveys prior to 2001.

4.10 Figure 7 and Figure 8 overleaf provide a comparison of 2004 major and minor flows against the base average of 1995-1998 for morning peak and evening peak traffic respectively.

4.11 Figure 7 shows that 2004 morning peak major road flows for northern, southern and western sectors have reduced in both directions when compared to 1995-1998 base average - the highest reduction of 16.7% for north sector inbound traffic. However, major road flow in the eastern sector has increased in both directions. For comparison, for minor road traffic levels outbound south sector and both directions eastern sector usage have fallen, whilst both directions north and outbound in the west sector and inbound in south sector have increased.

4.12 Figure 8 for the evening peak shows a similar pattern for the east and northern sectors to that seen in Figure 7, with the northern sector recording the highest percentage increase of 25% in inbound minor road flow. It is however important to reiterate that northern sector calculations are based on very low flows. For other sectors, like the south, evening peak major road usage has increased in 2004 compared to 1995-1998 base average, where in the morning peak it was seen to decrease. In the west, only inbound minor road flows have increased.
Figure 7 – Major and minor morning peak flow - % change in 2004 compared to 1995-1998 base average

Figure 8 – Major and minor evening peak flow - % change in 2004 compared to 1995-1998 base average
5 Summary

5.1 It is evident that there have been changes in traffic flows on major and minor roads at the three cordons. However, the trends are varied and because of the differing time periods of survey on each cordon, care must be taken when interpreting the results. Between Year 4 and Year 5 the proportion of traffic on minor roads rose 0.7% across the central cordon, 1.5% across the inner cordon, and fell by 0.8% across the boundary cordon. However the number of actual vehicles comprising these percentages are relatively small, 6,000 more vehicles a day crossing the central cordon on minor roads, 8,000 more a day on the inner cordon and 24,000 fewer a day crossing the boundary cordon. These changes represent a change in the volume of flow of 2.7% growth on minor roads for the central cordon, 2.1% growth for the inner cordon and a fall of 6.8% for the boundary cordon.

5.2 Table 13 below shows the change in proportion of daytime traffic flows on major and minor roads for all three cordons over the past five survey years.

Table 13 – Major and minor road traffic flow – proportion change

<table>
<thead>
<tr>
<th>Year</th>
<th>Major Num.</th>
<th>Minor Num.</th>
<th>Both Num.</th>
<th>Major %</th>
<th>Minor %</th>
<th>Both %</th>
<th>Major Num.</th>
<th>Minor Num.</th>
<th>Both Num.</th>
<th>Major %</th>
<th>Minor %</th>
<th>Both %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>762</td>
<td>261</td>
<td>1023</td>
<td>74.5</td>
<td>25.5</td>
<td>72.4</td>
<td>1105</td>
<td>422</td>
<td>1527</td>
<td>81.5</td>
<td>18.5</td>
<td>1864</td>
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<tr>
<td>Year 2</td>
<td>687</td>
<td>266</td>
<td>953</td>
<td>72.1</td>
<td>27.9</td>
<td>72.7</td>
<td>1085</td>
<td>408</td>
<td>1493</td>
<td>81.8</td>
<td>18.2</td>
<td>1913</td>
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<tr>
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<td>655</td>
<td>225</td>
<td>880</td>
<td>74.4</td>
<td>25.6</td>
<td>72.1</td>
<td>1053</td>
<td>407</td>
<td>1460</td>
<td>82.1</td>
<td>17.9</td>
<td>1951</td>
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<tr>
<td>Year 4</td>
<td>640</td>
<td>222</td>
<td>862</td>
<td>74.2</td>
<td>25.8</td>
<td>73.3</td>
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<td>383</td>
<td>1437</td>
<td>81.9</td>
<td>18.1</td>
<td>1959</td>
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<tr>
<td>Year 5</td>
<td>631</td>
<td>228</td>
<td>859</td>
<td>73.5</td>
<td>26.5</td>
<td>71.8</td>
<td>997</td>
<td>391</td>
<td>1388</td>
<td>82.7</td>
<td>17.3</td>
<td>1910</td>
<td></td>
</tr>
</tbody>
</table>


5.3 Overall, the proportion of boundary traffic on major roads is increasing over time except for year 4 to year 5. For minor roads there is not much change except for a decrease between years 4 and 5. Note years 4 and 5 are more relevant as years 1 to 3 are for 1992 to 1998. It is only at inner and central cordons that there have been 5 years of decreases on major roads and increases on minor, these being more evident from year 4 to year 5. This may indicate a switch from major to minor roads, but the volumes involved are small.

5.4 Table 14 overleaf shows in detail the changes from the calculated base average for each cordon, by sector, by peak period, road type and direction to the most recent survey year. Note that figures are subject to rounding and may differ to those used in earlier calculations.

5.5 Table 14 shows that all sectors within the central cordon have experienced either a decrease or no real change in major and minor road flow in 2005, compared to the cordon base average. The same downward trend is apparent for all peak road types crossing the inner cordon with only the south sector showing growth in minor road flows. The boundary cordon shows similar patterns to this when comparing its base average to last survey year (2004). For example, eastern sector peak time major road flows have increased, whereas all minor road flows decreased.
Table 14 – Net gain/loss in traffic flow for latest cordon survey, by sector and road type against base average

<table>
<thead>
<tr>
<th>Cordon</th>
<th>Sector</th>
<th>Morning Peak</th>
<th></th>
<th></th>
<th></th>
<th>Morning Peak</th>
<th></th>
<th></th>
<th></th>
<th>Evening Peak</th>
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<tr>
<td></td>
<td></td>
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<td>Major Out</td>
<td>Minor In</td>
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<td>Major In</td>
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<td>Minor Out</td>
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<td>Minor In</td>
<td>Minor Out</td>
<td>Major In</td>
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<td>20</td>
<td>20</td>
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<td>45</td>
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<tr>
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<td>1995-1999 (base average)</td>
<td>45</td>
<td>25</td>
<td>7</td>
<td>2</td>
<td>28</td>
<td>40</td>
<td>3</td>
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<td>-4</td>
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<td></td>
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<td>1995-1999 (base average)</td>
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*Too few minor roads in this sector to warrant meaningful analysis.

5.6 The general conclusion is that whilst reductions in major road usage at cordon monitoring sites are evident (for certain time periods, directions and sectors within cordons), the levels of flow increase on minor roads, for the most recent surveys, does not counterbalance major road reductions. As a result, there is no conclusive evidence that significant numbers of motorised journeys are altering routing behaviour to make use of the minor road network as opposed to the major road network.
6 Appendix 1 Counting Methodology

6.1 The studies are based on a sample of 6-minute manual classified traffic counts taken four times each hour over a 16-hour period from 6 am to 10 pm (12 hours prior to the mid 1990’s). Counts are taken on every road site crossing the cordon. On a sample of up to 20 sites the counts are extended to cover 24 hours and the results used to estimate nighttime and 24 hour counts for each vehicle type on other roads. Prior to 1990 overnight counts were made at much smaller numbers of sites. Estimates of night-time flows from this period should be treated with caution.

6.2 The vehicle classification includes All Motor Vehicles (AMV) split into Cars (Car), Taxis (Taxi), Buses and Coaches (Bus), Light Goods Vehicles (LGV), Medium Goods Vehicles (MGV), Heavy Goods Vehicles (HGV) and Powered Two Wheelers (PTWs). These last four categories are defined as:

- LGV: Goods vehicles with 2 axles, 4 wheels
- MGV: Goods vehicles with 2 axles, 6 wheels
- HGV: Goods vehicles with 3 or more axles
- PTW: Motorcycles, scooters and mopeds

In addition Pedal Cycles (Cycles) are also counted. This report will look into All Motor Vehicle (AMV) traffic flows only.

6.3 The time periods referred to and summarised for the purposes of this note are:

- Morning peak: 7:00am – 10:00am
- Off peak: 10:00am – 4:00pm
- Evening Peak 4:00pm – 7:00pm
- Late evening: 7:00pm – 00:15am
- Night: 0:15am – 7:00am
- Daytime: 7:00am to 7:00pm

All count periods are for weekdays.
7 Library of technical notes

Other technical notes in the RNPR series include:

Technical notes
- ITIS – Validation Paper July 2005
- RNPR Technical Note 1 – ITIS Speed Survey Data
- RNPR Technical Note 2 – Traffic Delays in London on Weekdays, Saturdays and Sundays
- RNPR Technical Note 3 – Total vehicle delay for London
- RNPR Technical Note 4 - Validation of radar traffic monitoring equipment (published as an internal working document)
- RNPR Technical Note 6 - Validation of automatic traffic & cycle counters 2006 (published as an internal working document)

Traffic Notes

DfT NRTCC Counts

TfL Automatic Traffic Counts
- RNPR Traffic Note 2 - Expansion factors for road traffic counts in London

TfL Cordon and Screenline Counts
- RNPR Traffic Note 5 - Major and Minor traffic flows measured through TfL Cordon surveys

ITIS and Moving Observer Survey Data
- RNPR Traffic Note 6 – Traffic delays in the London Boroughs 2007 (published on LondonStreetWorks website)

Cycling
- RNPR Traffic Note 7 - Weather conditions and the levels of cycling on the TLRN
- RNPR Traffic Note 8 – Proportion of cyclists violating red lights
- RNPR Traffic Note 9 – Cycling trends in London (due to be published in early 2009)
- RNPR Traffic Note 11 – Cycling journey time reliability (due to be published in early 2009)
Other useful documents

- London Travel Report 2007 –
- Transport Statistics for Great Britain 2007 -

8 Contacts for further information

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

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