
# Wimbledon Area Model

## Traffic Model Summary


# The Belvederes and Wider Area Model

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# Contents

# Tables and Figure

# 1 Introduction

## General

1.1 In April 2006, JMP Consulting was commissioned by the London Borough of Merton to prepare a detailed traffic model for Wimbledon Town Centre. The primary objective of the model was to create a robust tool which would allow the realistic and accurate assessment of a wide range of urban interventions and traffic impacts affecting Wimbledon Town Centre.

1.2 A series of traffic surveys were carried out to aid in the development of the traffic models and to establish the existing traffic patterns in Wimbledon Town Centre. A full summary of the survey data are included in the "Traffic Survey Report" issued to the LB Merton on 24/04/2007.

1.3 2006 Base VISUM / VISSIM models were developed by JMP for the AM (07:00 – 10:00) and PM (16:00 – 19:00) peaks. VISUM provides the strategic component for the study, assessing the traffic pattern of the overall strategic network. VISSIM provides a microscopic model, which covers in detail the main arterial road through Wimbledon Town Centre (A219).

1.4 This report provides a summary of the existing traffic condition within Wimbledon Town Centre, as established from the analysis of the traffic survey data and the validated VISUM base model. The calibration and validation report for the base VISUM model is covered in a separate report submitted to the LB Merton in 24/04/2007.

## Study Area

1.5 The study area is shown in figure 1.1. The Wimbledon Town Centre gyratory system, Wimbledon Village, Parkside and the majority of the surrounding residential roads are covered by this study.

**F1.1 Wimbledon Study Area**

# 2 Traffic Surveys

## General

2.1 A number of Junction Counts and Automatic Link Counts were already available as part of a previous study taken during 2004. Although it is preferable to undertake all surveys used in model calibration at the same time, (to eliminate the effects of daily and seasonal variation), it was considered that the 2004 survey were sufficiently recent, and could be used for this exercise. However, since they do not cover a wide enough area for the study, it was necessary to commission a number of new surveys at the northern and southern end of the study area. Some overlapping of the old and new surveys where decided upon to check for any significant differences between the two sets of data. A factoring exercise was carried out to balance the flows, when discrepancy between different sets of data were observed.

2.2 Diagrams of all the survey locations along with their survey year are included in Appendix A.

2.3 All traffic flow data was analysed for the following peak hour periods, which correspond to the simulation period of the VISUM model:

- AM Peak 0700 – 1000 Total 3 hours traffic flows
- PM Peak 1600 – 1900 Total 3 hours traffic flows

## Traffic Flow

2.4 Diagrams of all the survey locations along with their survey year are included in Appendix A. The Origin – Destination survey gives an overview of the traffic pattern through the study area and forms the basis of the matrix development in the models.

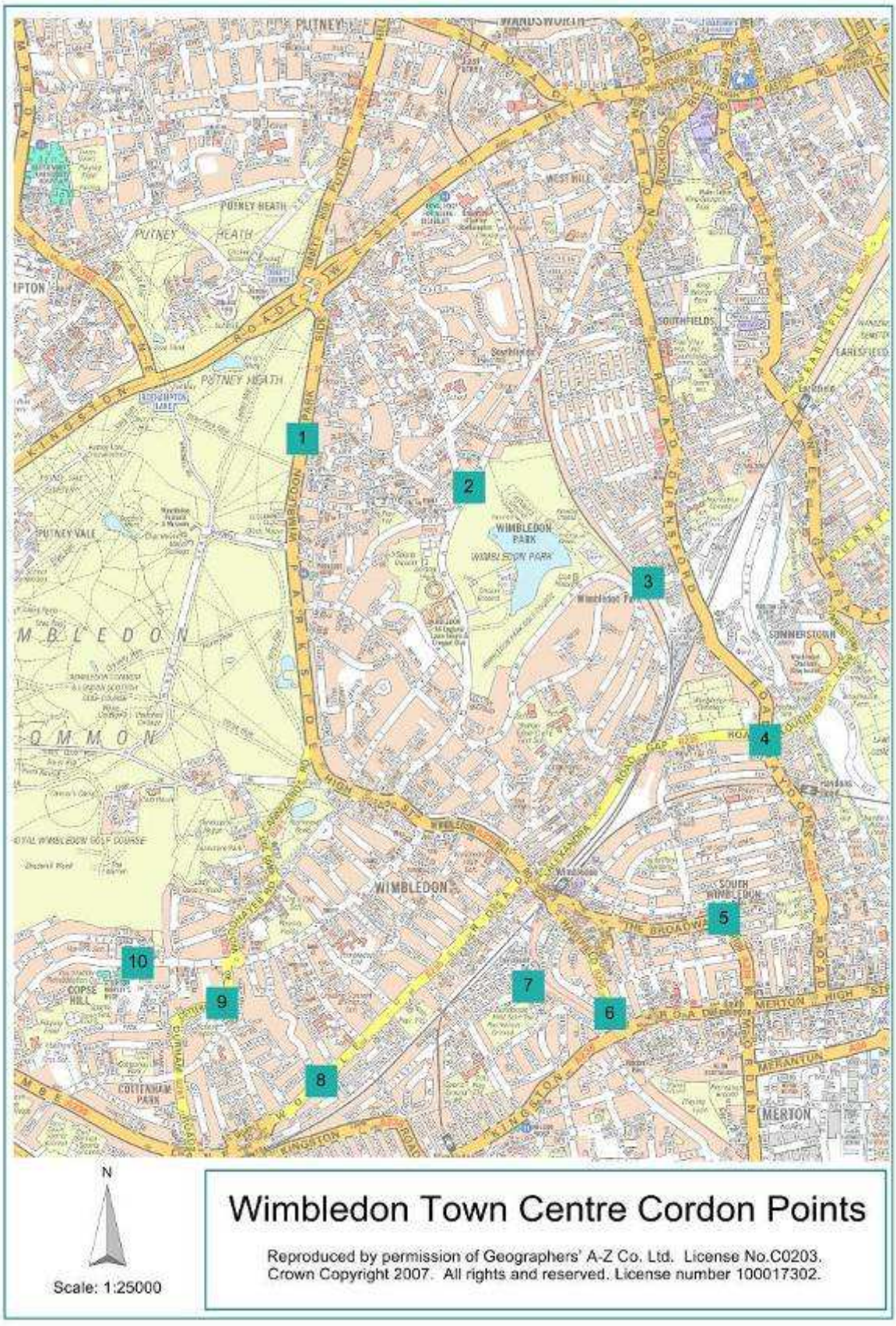
2.5 Traffic counts at individual junctions and links were also used in the model for expanding the matrix and model calibration.

## Origin – Destination Summary

2.6 The Traffic pattern derived from the origin – destination survey is summarised in this section.

2.7 The origin – destination data was analysed over the AM and PM 3 hour periods for the 10 cordon points shown in figure 2.1. The analysed data is shown in Appendix B.

## F 2.1 Wimbledon O-D Cordon Points



2.8 Table 2.1 gives a summary of the analysis for all vehicle types.

**T 2.1 O-D Flow Analysis**

**All Vehicles**

| | |
|---|---|
| OD Movement with Highest Flow | AM: From Cordon Point **4** to **1** with **350** vehicles<br>PM: From Cordon Point **1** to **5** with **502** vehicles |
| Cordon Point with Highest Inbound Flow | AM: From Cordon Point **4** with **1507** vehicles<br>PM: From Cordon Point **1** with **2000** vehicles |
| Cordon Point with Highest Outbound Flow | AM: From Cordon Point **1** with **1692** vehicles<br>PM: From Cordon Point **1** with **1450** vehicles |

2.9 In general, there is a high volume of westbound movement (from Gap Road to Parkside) through the network in the AM peak and reversely a high eastbound movement (from Parkside to The Broadway) in the PM peak.

2.10 The majority of vehicles enter the network from Gap Road in the AM and from Parkside in the PM.

2.11 Parkside has the most vehicles leaving the network in both the AM and PM periods.

2.12 The busiest hours for the AM and PM peak period, defined for each peak as the one hour period during which the highest total inbound flow was recorded, are shown in Table 2.2.

**T 2.2 Busiest Hour**

| | AM Peak | PM Peak |
|---|---|---|
| **Busiest Hour** | **0730 – 0830** | **1645 - 1745** |

2.13 The figures attached in Appendix C provide a summary of the different types of OD trips at each cordon point. Three types of OD trips were recorded during the survey:

Through Trips

Trips recorded during the 3 hours survey period, which enter from one cordon point and exit from another cordon point.

Return Trips

Trips recorded during the 3 hours survey period, which enter from one cordon point and exit from the same cordon point

Non – through Trips

Trips which entered the network during the 3 hours period and stayed inside the network or trips originate from inside the network and were recorded exiting from one of the cordon points.

2.14 In the AM period, the highest volume of inbound through traffic originates from Zone 4 (Gap Road) while Zone 1 (Parkside) generates the most return and non – through trips. Zone 1 also has the highest volume of outbound through trips.

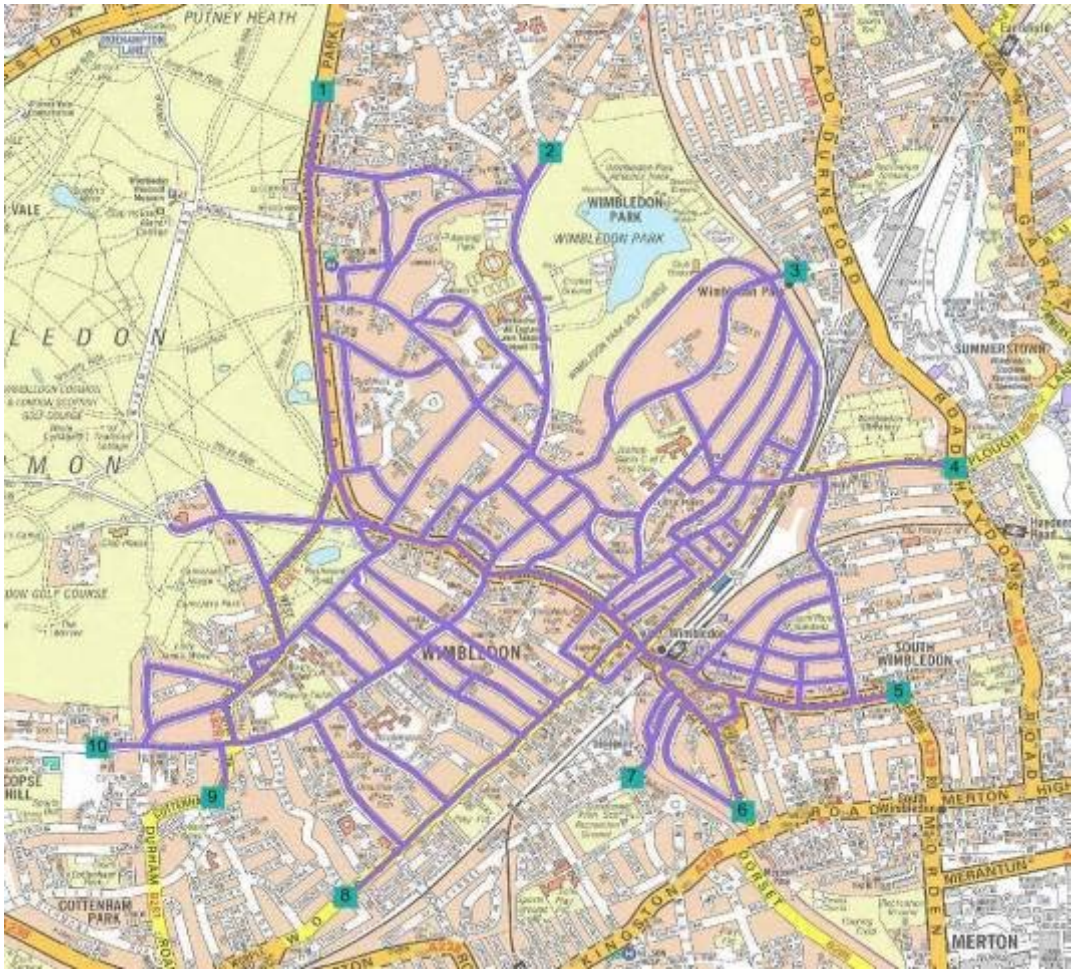
2.15 For the PM period, Zone 1 (Parkside) has the highest number of through trips in both inbound and outbound directions. Similar to the AM period, Zone 1 also generates the highest number of return and non – through trips during the PM period.

# 3 VISUM Traffic Model

## General

3.1 Figure 3.1 shows the area included in the VISUM model for The Belvederes and Wider Area of Wimbledon, together with the location of the boundary cordon points

**F3.1 VISUM Network and Cordon Points**






3.2 VISUM base models have been developed in line with current traffic modelling guidelines produce by the Highway Agency. The AM and PM base models have been calibrated and validated to the "Design Manual for Road and Bridges" criteria and reflect the current traffic conditions within the study area.

3.3 As stated in the DMRB, traffic volumes on links predicted by the model were compared with the traffic survey data for assessing the accuracy of the model. Both the AM and PM models achieved a high accuracy and within the error margins set out in the guidelines. A full summary of the calibration and validation result is included in a separate report submitted to the LB Merton on 24/04/2007.

3.4 The base models show a similar traffic pattern as the one described in section 2 of this report and form a common platform for any future proposals to be tested.

## Future Operational Assessment

3.5 The VISUM model provides a tool to assess the impact on any future proposals for Wimbledon Town Centre. A list of scenarios which can be tested using the VISUM models are listed below:

Effects of road closures

VISUM can predict the redistribution of traffic from road closures, and provide a before and after comparison. Any over saturated links can be highlighted.

Effects of prohibited movements at junctions

Specific turn movements at junctions can be blocked and similar to road closure scenario, VISUM can predict the redistribution of traffic and any capacity issues due to the proposals.

Major traffic management proposals

VISUM can model any traffic management proposals which will affect the capacity and travel cost of any links in the network. Examples of this are: speed restrictions, carriageway narrowing / widening and new signalised junctions

Major changes on parking

For any changes to parking, VISUM can reassign the original parking traffic to the new parking arrangements.

Major development proposals

New development can be included into the model as a new zone. The trip generation / attraction from the development will be input into the model as a new matrix. VISUM can predict the distribution of the development traffic and provide link capacity analysis.

Trip growth / generation

Future traffic growth can be incorporated into the model by applying growth factor to the existing matrix.

3.6 In general, VISUM models can predict the overall changes to traffic pattern and network capacity. They are less sensitive to proposals which requires greater details on the impact on the behaviour of individual vehicles. For scenarios like bus/ cycle lanes, minor changes to signalised junctions and pedestrian facilities which do not have significant impact on the traffic assignment, traffic flow data from VISUM can be imported into the local models base on the TRANSYT or VISSIM (microsimulation) platforms.

# 4 Link Flow Analysis

## General

4.1 This section summarises the result of a study conducted to estimate the percentage of through traffic using a particular link.

4.2 A particular route is classified as a “Through Route” when the corresponding trips enter the network from a cordon point (Zone) and exit the network from a different cordon point.

4.3 All through routes using either the Belvedere Grove link or the Belvedere Drive link were selected in the VISUM model. The respective traffic volumes and the corresponding origin – destination pairs were separately recorded for each direction.

4.4 The total through traffic was calculated by summing all the values for the through routes using a specific link; As part of this process total local traffic values were also obtained. The results of the analysis are summarised in tables 4.1 to 4.4.

4.5 The results of the flow analysis are also presented in the diagrams attached in Appendices E and F.

## Belvedere Grove Flow Analysis

4.6 Table 4.1 showed that during the AM peak, through traffic contributed to 62% of the northbound traffic on Belvedere Grove. The majority of through traffic are between Zone 10 (Copse Hill) and Zone 3 (Arthur Road).

4.7 The situation is reversed for the southbound movement, as 37% of the southbound traffic is through traffic and 63% is local traffic. 27% of traffic on Belvedere Grove appears to travel from Zone 3 (Arthur Road) to Zone 10 (Copse Hill).

**T4.1 Belvedere Grove Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Belvedere Grove N/B | 906 | 10 | 3 | 356 | 39% |
| | | 9 | 2 | 15 | 2% |
| | | 9 | 3 | 175 | 19% |
| | | 8 | 2 | 14 | 2% |
| | | Total N/B Through Traffic | | 560 | 62% |
| | | Total N/B Local Traffic | | 346 | 38% |
| Belvedere Grove S/B | 588 | 2 | 10 | 5 | 1% |
| | | 2 | 9 | 5 | 1% |
| | | 2 | 8 | 4 | 1% |
| | | 3 | 10 | 158 | 27% |
| | | 3 | 9 | 47 | 8% |
| | | Total S/B Through Traffic | | 219 | 37% |
| | | Total S/B Local Traffic | | 369 | 63% |

4.8 The results in Table 4.2 below show that during the PM peak, the proportion of northbound through traffic and the local traffic are split evenly. Similar to the AM peak, the origin – destination pair (10 – 3) contributed to the majority of through traffic on Belvedere Grove in the northbound direction.

4.9 In the southbound direction, 83% of traffic is through traffic.

**T4.2 Belvedere Grove Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Belvedere Grove N/B | 615 | 10 | 3 | 214 | 35% |
| | | 10 | 4 | 19 | 3% |
| | | 9 | 3 | 65 | 11% |
| | | 9 | 4 | 7 | 1% |
| | | 8 | 3 | 1 | 0.2% |
| | | | Total N/B Through Traffic | 306 | 50% |
| | | | Total N/B Local Traffic | 309 | 50% |
| Belvedere Grove S/B | 825 | 2 | 9 | 94 | 11% |
| | | 2 | 8 | 24 | 3% |
| | | 3 | 10 | 388 | 47% |
| | | 3 | 9 | 178 | 22% |
| | | | Total S/B Through Traffic | 684 | 83% |
| | | | Total S/B Local Traffic | 141 | 17% |

## Belvedere Drive Flow Analysis

4.10 The results summarised in table 4.3 show that during the AM peak, the proportion of northbound through traffic is 12% on Belvedere Drive with traffic from Zone 10 (Copse Hill) to Zone 4 (Gap Road) contributing to the majority of the through traffic in the northbound direction.

4.11 There was no through traffic recorded in the southbound direction on Belvedere Drive during the AM peak.

**T4.3 Belvedere Drive Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Belvedere Drive N/B | 394 | 10 | 4 | 29 | 7% |
| | | 9 | 4 | 10 | 3% |
| | | 7 | 2 | 5 | 1% |
| | | 6 | 2 | 2 | 1% |
| | | | Total N/B Through Traffic | 46 | 12% |
| | | | Total N/B Local Traffic | 348 | 88% |
| Belvedere Drive S/B | 331 | | | | 0% |
| | | | Total S/B Through Traffic | 0 | 0% |
| | | | Total S/B Local Traffic | 331 | 100% |

4.12 The results in table 4.4 showed that through traffic contribute to 0.4% of the overall traffic on Belvedere Drive in the northbound direction during the PM peak.

4.13 There was no through traffic recorded in the southbound direction on Belvedere Drive during the PM peak.

**T4.4 Belvedere Drive Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Belvedere Drive N/B | 481 | 7 | 2 | 1 | 0.2% |
| | | 6 | 2 | 1 | 0.2% |
| | | Total N/B Through Traffic | | 2 | 0.4% |
| | | Total N/B Local Traffic | | 479 | 99.6% |
| Belvedere Drive S/B | 339 | | | | 0% |
| | | Total S/B Through Traffic | | 0 | 0% |
| | | Total S/B Local Traffic | | 339 | 100% |

## Ridgway Place

4.14 Table 4.5 showed that 13% of the eastbound traffic on Ridgway Place is through traffic travelling from zone 2 (Church Road) to zone 8 (Worple Road) during the AM peak.

4.15 42% of traffic in the westbound direction is through traffic with the majority travelling from zone 4 (Gap Road) to zone 10 (Corpse Hill).

**T4.5 Ridgway Place Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Ridgway Place E/B | 325 | 2 | 8 | 42 | 13% |
| | | | | | 0% |
| | | Total E/B Through Traffic | | 42 | 13% |
| | | Total E/B Local Traffic | | 283 | 87% |
| Ridgway Place W/B | 261 | 4 | 10 | 74 | 28% |
| | | 4 | 9 | 21 | 6% |
| | | 8 | 2 | 14 | 4% |
| | | Total W/B Through Traffic | | 109 | 42% |
| | | Total W/B Local Traffic | | 152 | 58% |

4.16 Table 4.6 showed that 19% of the eastbound traffic on Ridgway Place is through traffic travelling from zone 2 (Church Road) to zone 8 (Worple Road) during the PM peak.

4.17 There was no through traffic recorded in the westbound direction on Ridgway Place during the PM peak.

**T4.6 Ridgway Place Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Ridgway Place E/B | 321 | 2 | 8 | 62 | 19.3% |
| | | Total E/B Through Traffic | | 62 | 19.3% |
| | | Total E/B Local Traffic | | 259 | 80.7% |
| Ridgway Place W/B | 311 | | | | 0% |
| | | Total W/B Through Traffic | | 0 | 0% |
| | | Total W/B Local Traffic | | 311 | 100% |

## Church Road

4.18 In the AM peak, 16% of the northbound traffic on Church Road is through traffic with the majority travelling from zone 9 (Cottenham Park Road) to zone 2 (Church Road), as summarised in Table 4.7.

4.19 28% of the southbound traffic on Church Road is through traffic during the AM peak with the majority travelling from zone 2 (Church Road) to zone 10 (Corpse Hill).

**T4.7 Church Road Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Church Road N/B | 955 | 9 | 2 | 89 | 9% |
| | | 8 | 2 | 45 | 5% |
| | | 7 | 2 | 11 | 1% |
| | | 6 | 2 | 5 | 1% |
| | | Total N/B Through Traffic | | 150 | 16% |
| | | Total N/B Local Traffic | | 805 | 84% |
| Church Road S/B | 588 | 2 | 10 | 61 | 10% |
| | | 2 | 9 | 55 | 6% |
| | | 2 | 8 | 51 | 5% |
| | | Total S/B Through Traffic | | 167 | 28% |
| | | Total S/B Local Traffic | | 421 | 72% |

4.20 During the PM peak, 13% of the northbound traffic is through traffic travelling from zone 9 (Cottenham Park) to zone 2 (Church Road) and from zone 8 (Worple Road) to zone 2 (Church Road), as shown in Table 4.8 below.

4.21 28% of the southbound traffic on Church Road is through traffic during the PM peak with the majority travelling from zone 2 (Church Road) to zone 10 (Corpse Hill).

**T4.8 Church Road Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Church Road N/B | 704 | 9 | 2 | 44 | 6% |
| | | 8 | 2 | 47 | 7% |
| | | Total N/B Through Traffic | | 91 | 13% |
| | | Total N/B Local Traffic | | 613 | 87% |
| Church Road S/B | 1052 | 2 | 10 | 132 | 13% |
| | | 2 | 9 | 102 | 10% |
| | | 2 | 8 | 38 | 4% |
| | | Total S/B Through Traffic | | 272 | 26% |
| | | Total S/B Local Traffic | | 780 | 74% |

## Woodside Road

4.22 Table 4.9 shows that 50% of traffic on Woodside northbound are through traffic and the majority travel from zone 10 (Corpse Hill) to zone 4 Gap Road).

4.23 For the southbound direction, 6% of traffic are through traffic during the AM peak with traffic travelling from zone 2 (Church Road) to zone 5 (Broadway).

**T4.9 Woodside Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Woodside N/B | 137 | 10 | 4 | 48 | 35% |
| | | 9 | 4 | 21 | 15% |
| | | | Total N/B Through Traffic | 69 | 50% |
| | | | Total N/B Local Traffic | 68 | 50% |
| Woodside S/B | 334 | 2 | 5 | 21 | 6% |
| | | | Total S/B Through Traffic | 21 | 6% |
| | | | Total S/B Local Traffic | 313 | 94% |

4.24 There were no through traffic recorded in the northbound direction on Woodside during the PM peak, as shown in Table 4.10.

4.25 6% of traffic on Woodside southbound are through traffic with the majority travelling from zone 2 (Church Road) to zone 8 (Worple Road).

**T4.10 Woodside Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Woodside N/B | 100 | | | | 0.0% |
| | | | | | 0.0% |
| | | | Total N/B Through Traffic | 0 | 0.0% |
| | | | Total N/B Local Traffic | 100 | 100.0% |
| Woodside S/B | 346 | 2 | 8 | 12 | 3% |
| | | 2 | 7 | 3 | 1% |
| | | 2 | 6 | 6 | 2% |
| | | | Total S/B Through Traffic | 21 | 6% |
| | | | Total S/B Local Traffic | 325 | 94% |

## Alexandra Road

4.26 36% of traffic on Alexandra Road northbound are through traffic during the AM peak with the majority of traffic travelling from zone 8 (Worple Road) to zone 4 (Gap Road).

4.27 The through traffic on Alexandra Road southbound contributed to 43% of the overall southbound traffic. Majority of the through traffic came from zone 4 (Gap Road) and exit at zone 8 (Worple Road).

**T4.11 Alexandra Road Flow Analysis AM Peak**

| AM Peak (07:00 - 10:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Alexandra Road (N/B | 1685 | 8 | 3 | 50 | 3% |
| | | 8 | 4 | 442 | 26% |
| | | 7 | 4 | 65 | 4% |
| | | 6 | 3 | 15 | 1% |
| | | 7 | 3 | 42 | 2% |
| | | Total N/B Through Traffic | | 614 | 36% |
| | | Total N/B Local Traffic | | 1071 | 64% |
| Alexandra Road S/B | 1298 | 4 | 8 | 397 | 31% |
| | | 4 | 9 | 31 | 2% |
| | | 4 | 10 | 109 | 6% |
| | | 3 | 8 | 23 | 1% |
| | | Total S/B Through Traffic | | 560 | 43% |
| | | Total S/B Local Traffic | | 738 | 57% |

4.28 During the PM peak, 18% of the northbound traffic on Alexandra Road are through traffic with most of the traffic coming from zone 8 (Worple Road to zone 4 (Gap Road).

4.29 23% of the southbound traffic are through traffic with most of the traffic travelling from zone 4 (Gap Road) to zone 8 (Worple Road).

**T4.12 Alexandra Road Flow Analysis PM Peak**

| PM Peak (16:00 - 19:00) | | | | | |
|---|---|---|---|---|---|
| **Link** | **Total Flow** | **From Zone** | **To Zone** | **Through Traffic** | **Proportions** |
| Alexandra Road (N/B | 1650 | 8 | 4 | 251 | 15% |
| | | 7 | 4 | 23 | 1% |
| | | 7 | 3 | 5 | 0.3% |
| | | 6 | 3 | 2 | 0.1% |
| | | 6 | 4 | 9 | 1% |
| | | Total N/B Through Traffic | | 290 | 18% |
| | | Total N/B Local Traffic | | 1360 | 82% |
| Alexandra Road S/B | 1285 | 3 | 8 | 19 | 1% |
| | | 4 | 8 | 258 | 20% |
| | | 4 | 9 | 4 | 0% |
| | | 4 | 10 | 17 | 1% |
| | | Total S/B Through Traffic | | 298 | 23% |
| | | Total S/B Local Traffic | | 987 | 77% |