



**Department of the Environment, Transport and the Regions**

**MULTI-MODAL STUDY  
A453 NOTTINGHAM TO M1 JUNCTION 24**

**WORKING PAPER No 31**

**THE A453 THROUGH CLIFTON  
NOTTINGHAM**

**OPERATIONAL ASSESSMENT**

**July 2002**

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Prepared for:

Government Office for the East Midlands  
The Belgrave Centre  
Stanley Place  
Talbot Street  
Nottingham  
NG1 5GG

Prepared by:

Pell Frischmann/PTV  
Clarendon Chambers  
32 Clarendon Street  
Nottingham  
NG1 5LN

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*(In this version of the working paper TRANSYT summary results only are shown. the full length numerical analysis of the TRANSYT outputs have been omitted)*

- A A453 Farnborough Road – TRANSYT Node/Link Diagram and Output
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## **1. Introduction**

- 1.1 This Working Paper reports on the operational assessment of the A453 through Clifton on the basis of the preferred option for the corridor. The Preferred Option D proposes a 4 lane single carriageway at grade scheme for the A453 from the Crusader roundabout in the south west of Clifton to the Farnborough Road junction to the north east of Clifton.
- 1.2 The junction improvements assessed as part of this at grade solution are as follows:-
- i) Crusader roundabout modified through the provision of traffic signals;
  - ii) Green Lane modified as an elongated four arm traffic signal roundabout;
  - iii) Farnborough Road as a four arm traffic signal roundabout;
  - iv) Traffic movements along the A453 on the approaches to and between these nodes restricted to left turn in and left turn out of side roads.
- 1.3 Analysis of the proposed junction improvements have been carried out for the AM and PM peak hours utilising hourly traffic flows derived from the A453 Multi-mode transport model assignments for the design year of 2021.
- 1.4 The traffic flows derived from the transport model are quite different to present day due to the influence of the multi-mode transport strategy.

## **2. A453 Through Clifton**

### **2.1 Background**

2.1.1 In modelling the three junction nodes, two present and one proposed, a number of general principles have been established in the context of developing an at grade solution to the traffic congestion in this corridor, these were that:-

- i) all movements to and from side roads where left in and left out;
- ii) the present conflicting turning movements at Green Lane are rationalised and developed into an elongated roundabout with traffic signal control;
- iii) Farnborough road traffic signals are rationalised into a four-arm three-lane approach roundabout with traffic signal control.

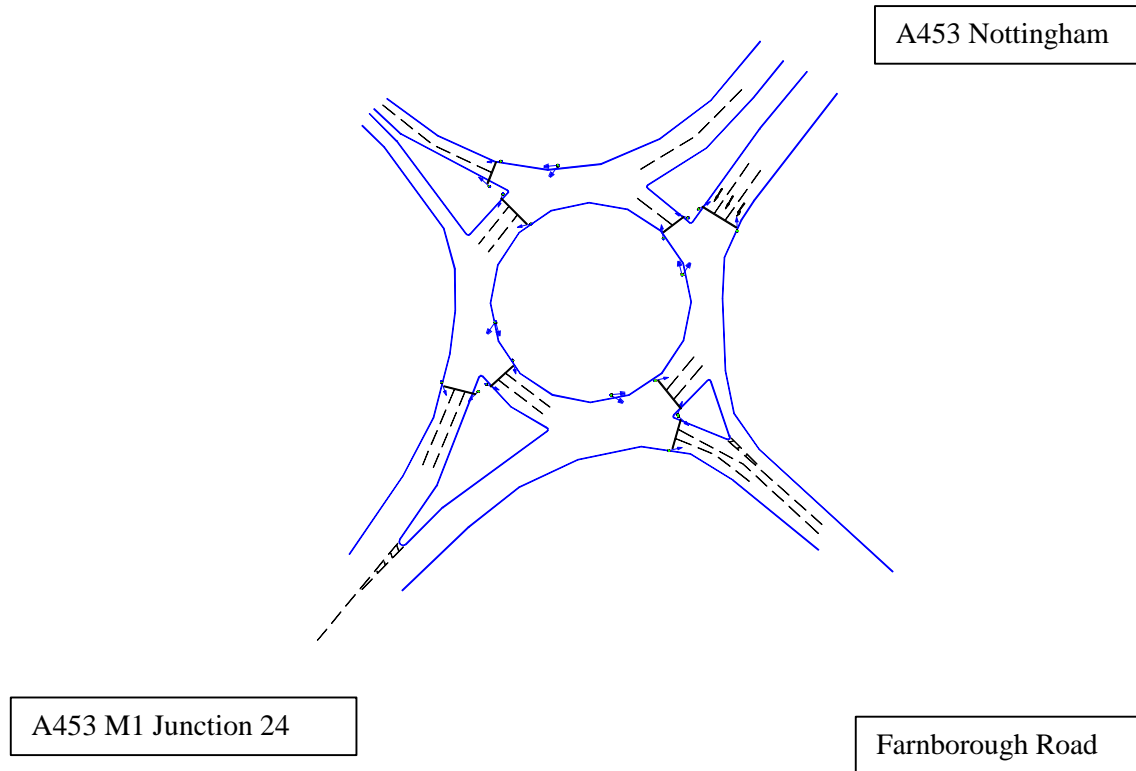
### **2.2 Farnborough Road**

2.2.1 The present traffic signal controlled junction operates adequately outside peak hours, but within either peak, because of the high number of side road vehicle movements, the junction suffers excessive queuing.

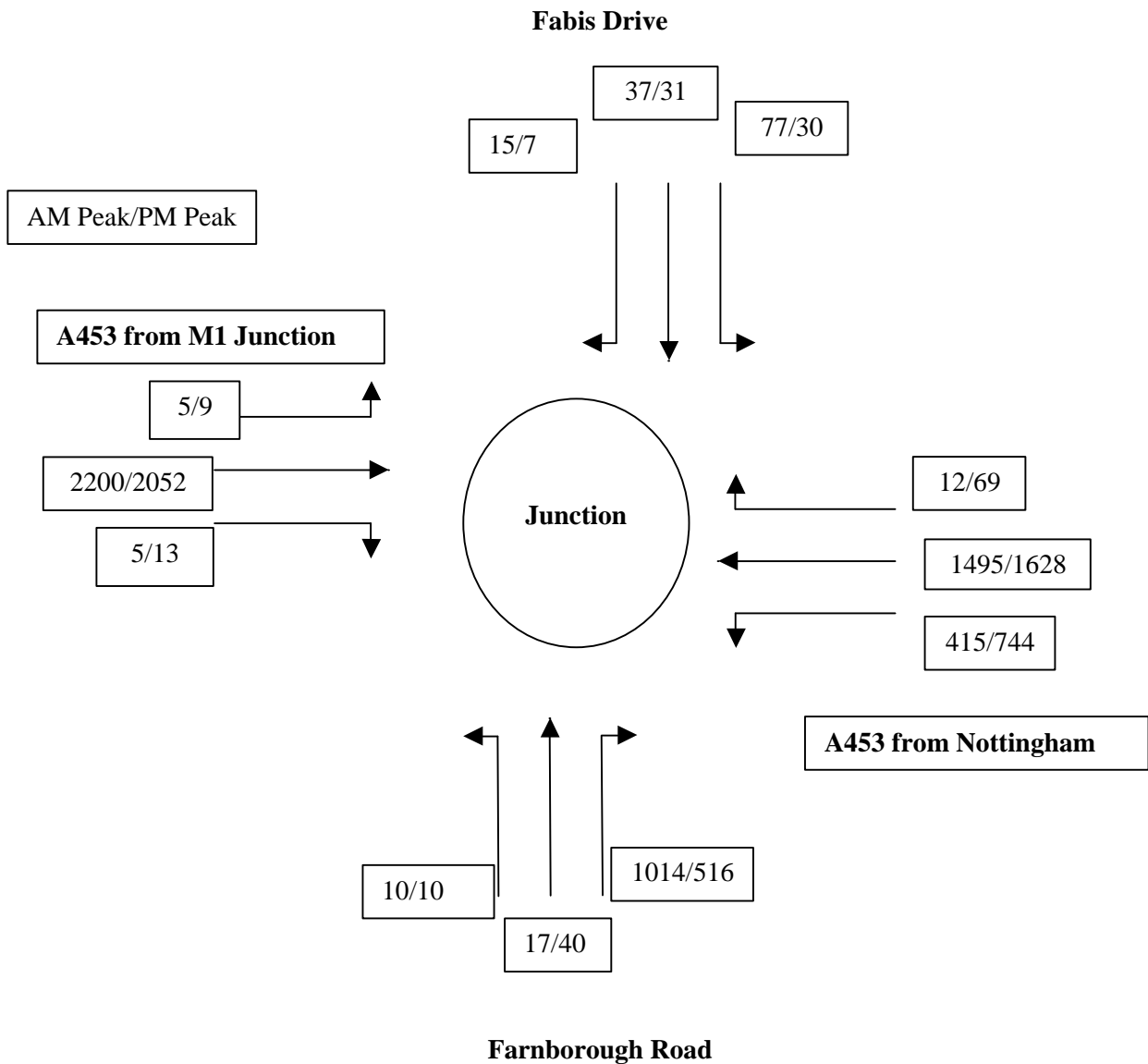
2.2.2 The proposal for this junction is to provide a signal controlled four-arm roundabout. An outline of the proposed layout is illustrated in Figure 2.1:-

#### **Figure 2.1 – Proposed Improvements at A453/Farnborough Road Junction**

2.2.3 The proposed roundabout has been modelled with 2021 hourly traffic flows derived from future year assignments prepared using by the A453 transport model for the AM and PM peak periods. The hourly traffic flows are presented on Figure 2.2.



**Figure 2.1 – Proposed Improvements at A453/Farnborough Road Junction**



**Figure 2.2 – Forecast hourly traffic flows at Clifton Green – 2021 peak periods**

2.2.4 The results of the TRANSYT analysis, summarised on Table 2.1, demonstrate that there are no problems predicted at this junction.

<b>Approach</b>	<b>Period</b>	<b>Degree of Saturation</b>	<b>Max queue</b>
		(%)	(Vehicles)
A453 to Nottingham	AM Peak	86	19
	PM Peak	91	16
A453 from Nottingham	AM Peak	40	4
	PM Peak	64	7
Farnborough Road	AM Peak	73	8
	PM Peak	81	8
Fabis Drive	AM Peak	34	2
	PM Peak	18	1

**Table 2.1 – Proposed A453 / Farnborough Road Junction TRANSYT Results Summary**

### **2.3 Clifton Green**

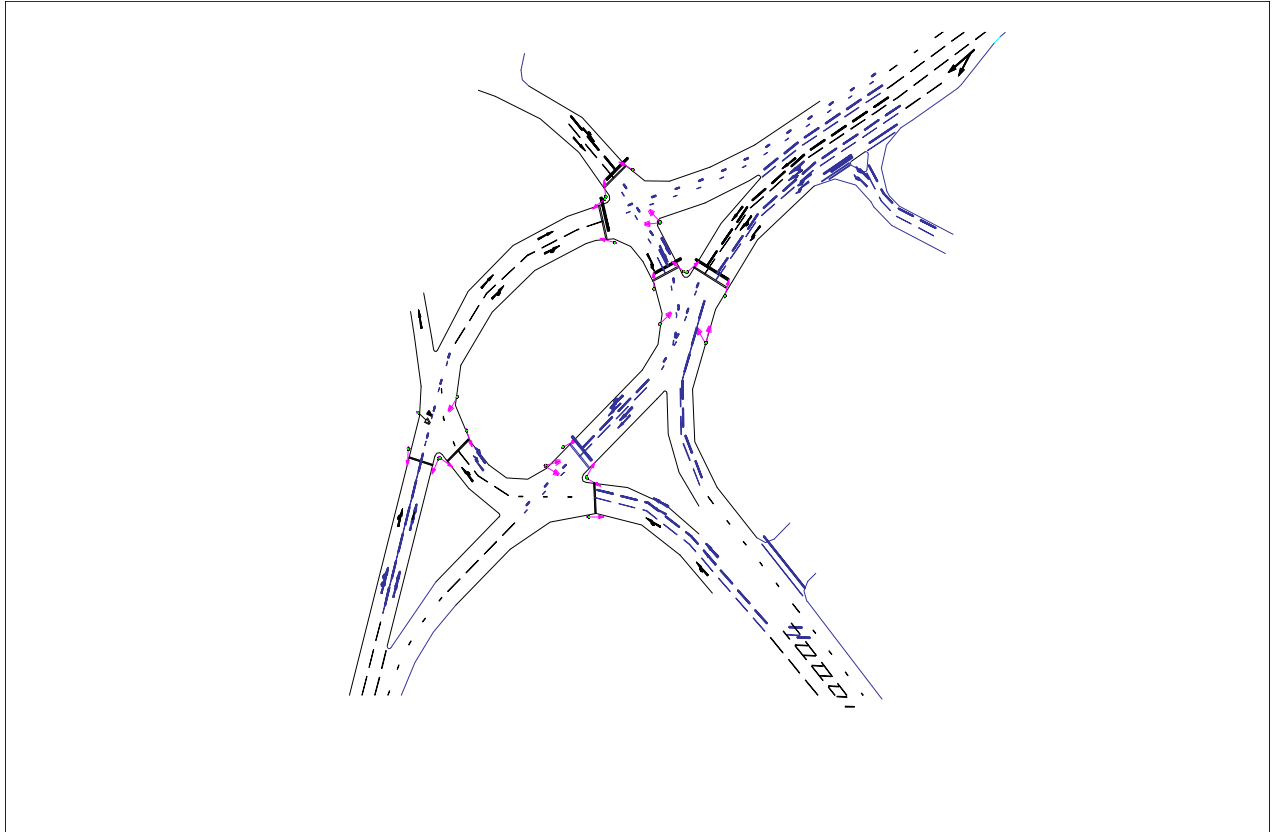
2.3.1 The current junction arrangements between the A453 and side roads at this location lead to significant queuing on the side roads due to the volume of right-turning traffic.

2.3.1 To resolve the current problems at this site a proposal has been developed to implement an oval shaped roundabout operating with full traffic signal control. This would provide:-

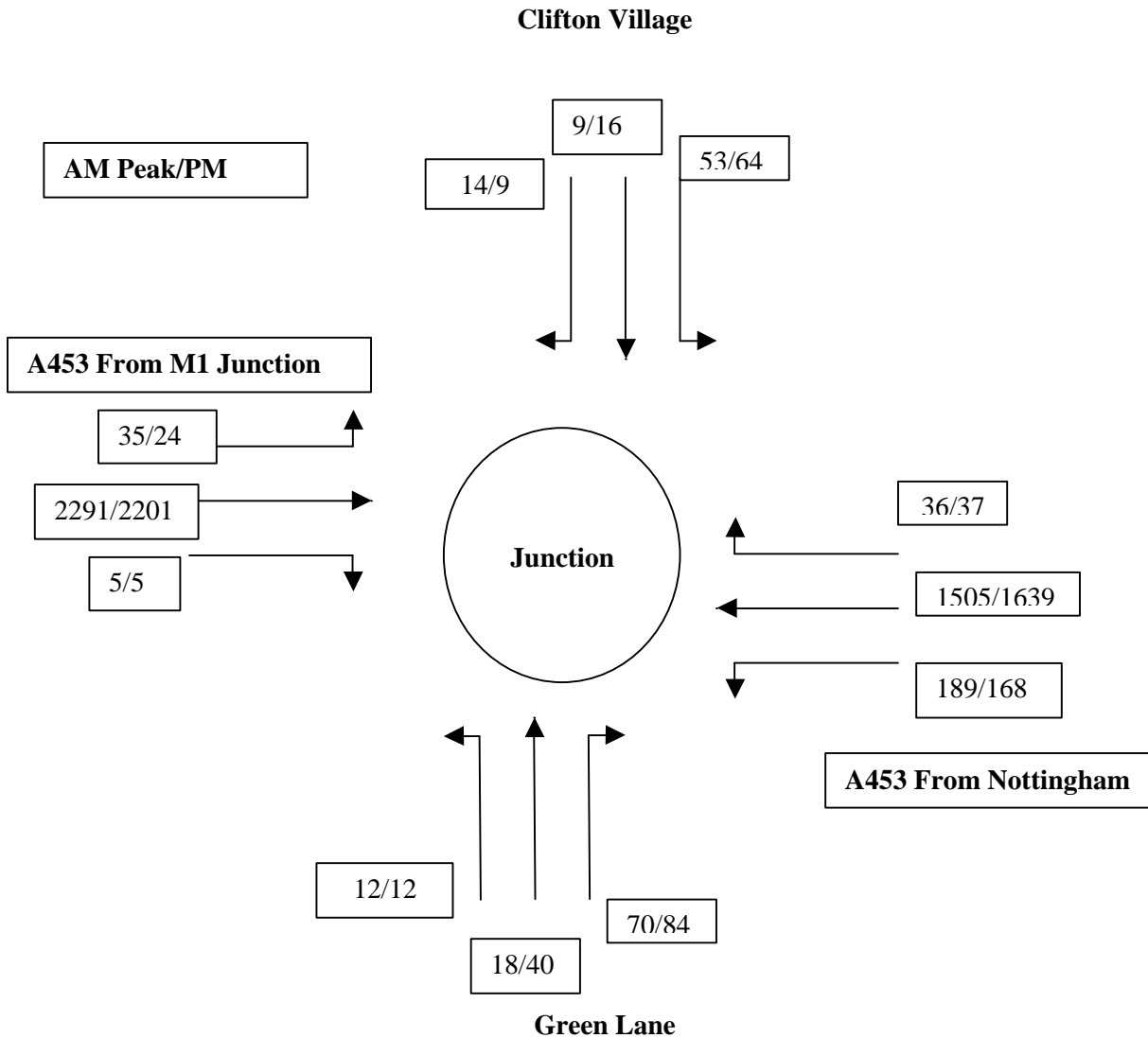
- i) U-turning facilities;
- ii) cater more effectively for right turning vehicles;
- iii) limit the disruption of main road traffic caused by the irregular interaction of right turning vehicles from the side roads.

2.3.2 The proposed junction layout is shown on Figure 2.3.

2.3.3 The traffic flows for the design year of 2021 are presented on Figure 2.4.



**Figure 2.3 – Proposed Junction at Clifton Green**



**Figure 2.4 – Forecast Hourly Traffic Flows at Clifton Green – 2021 peak periods**

2.3.4 The proposed layout has been modelled using TRANSYT and 2021 Option D hourly traffic flows input for the AM and PM peak hours. The summary of the TRANSYT analysis is presented on Table 2.2 and demonstrates that this junction will operate efficiently. The full output can be found in the Appendix B.

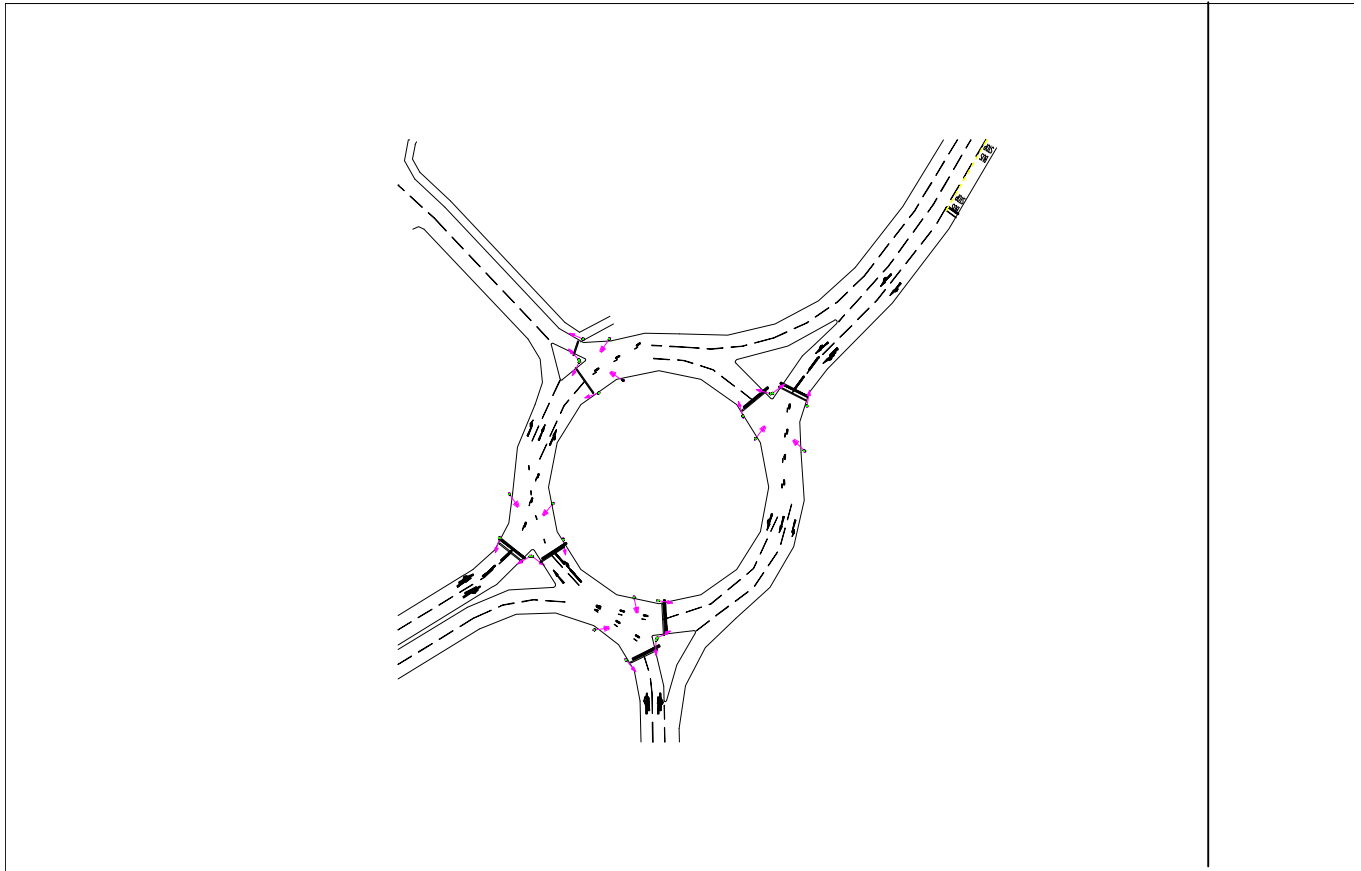
<b>Approach</b>		<b>Degree of Saturation (%)</b>	<b>Max queue (Vehicles)</b>
A453 to Nottingham	AM Peak	91	25
	PM Peak	90	24
A453 from Nottingham	AM Peak	66	11
	PM Peak	68	12
Green Lane	AM Peak	41	3
	PM Peak	76	7
Clifton Village	AM Peak	56	3
	PM Peak	56	3

**Table 2.2 – Proposed Clifton Green Junction TRANSYT Results Summary**

## **2.4 Crusader Roundabout**

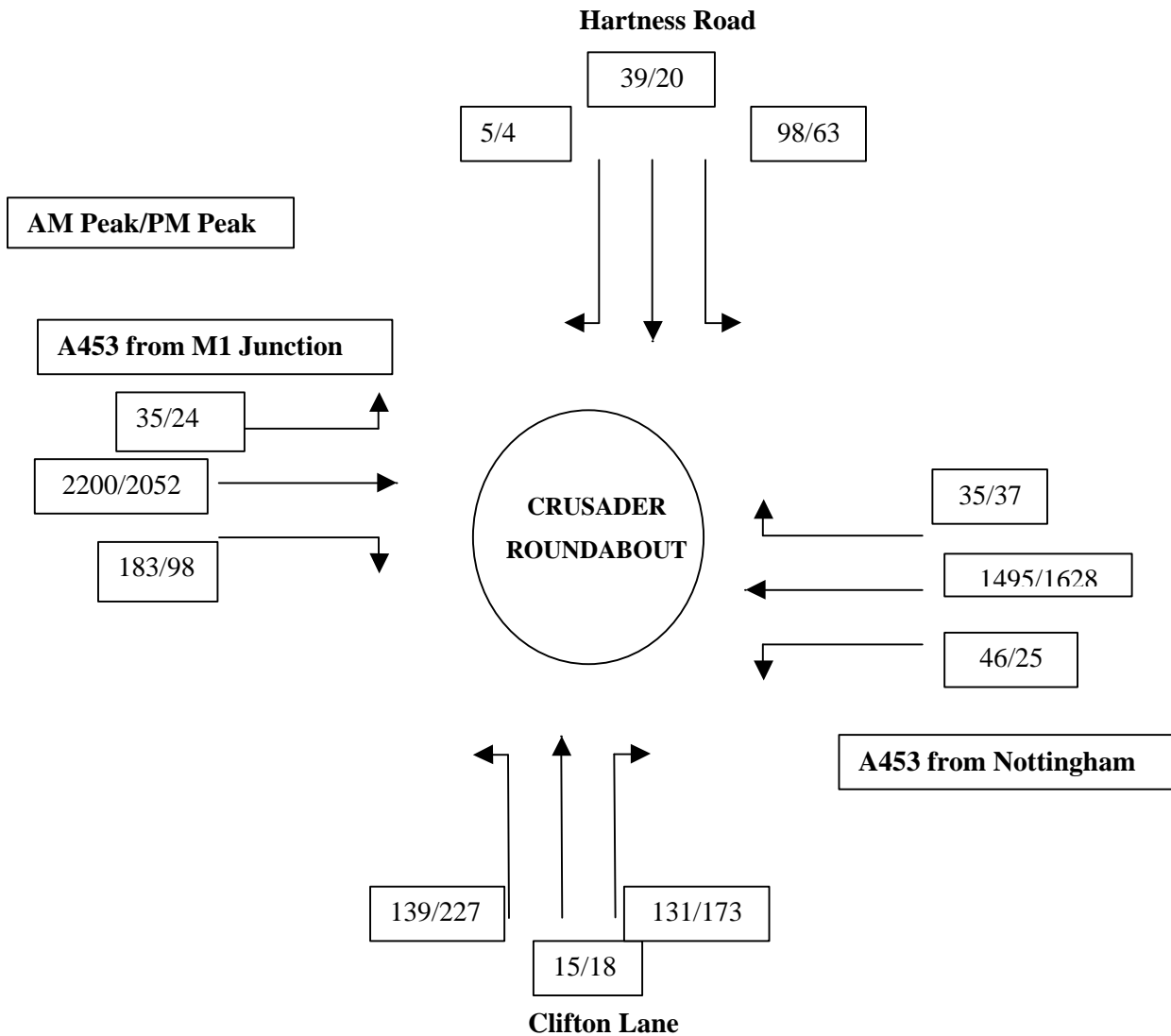
2.4.1 The existing roundabout at this location has been widened on the A453 approaches to accommodate the change in mainline carriageway configuration and the installation of full signal control assessed using a TRANSYT model.

2.4.2 The proposed layout for the junction is shown on Figure 2.5.



**Figure 2.5 – Proposed Improvements to the Crusader Roundabout**

2.4.3 Option D 2021 AM and PM peak hour flows have been input to the model and are presented on Figure 2.6.



**Figure 2.6 – Forecast Hourly Traffic Flows at Crusader Roundabout – 2021 Peak Periods**

2.4.4 The results of the TRANSYT analysis are summarised in Table 2.3 and demonstrate that the proposed junction arrangement can cater for the volumes of traffic predicted.

<b>Approach</b>	<b>Period</b>	<b>Degree of Saturation (%)</b>	<b>Max queue (Vehicles)</b>
A453 to Nottingham	AM Peak	92	22
	PM Peak	87	17
A453 from Nottingham	AM Peak	75	12
	PM Peak	67	9
Clifton Lane	AM Peak	25	1
	PM Peak	57	3
Hartness Road	AM Peak	10	0
	PM Peak	9	0

**Table 2.3 – Proposed Crusader Roundabout TRANSYT Results Summary**

### **3. Conclusions**

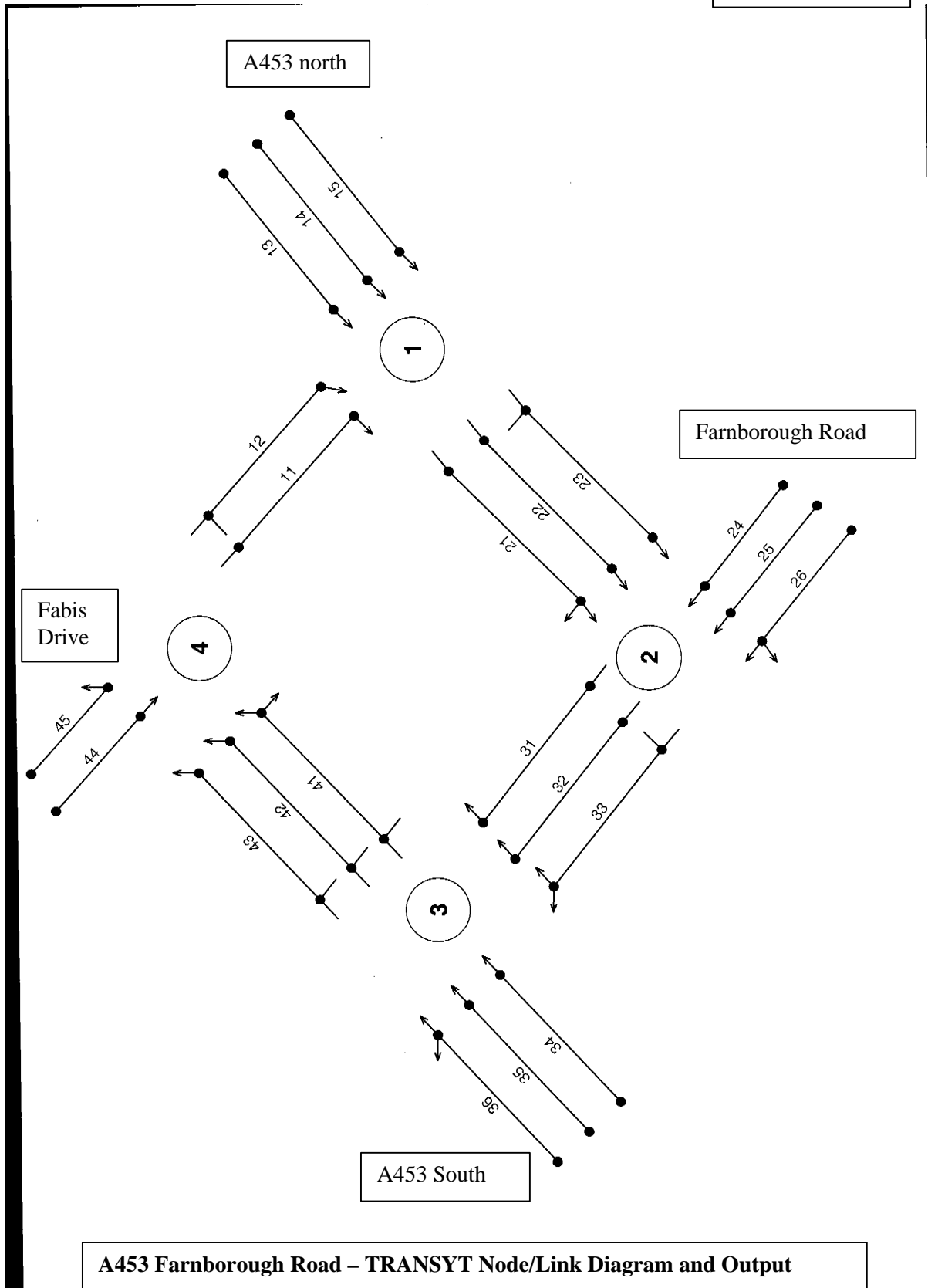
3.1 The preferred option, Option D, identifies a 4 lane single carriageway at grade solution for the A453 through Clifton. This Working Paper describes the assessment of the three proposed at grade junctions which form an element of the solution.

3.2 The junctions considered are as follows:-

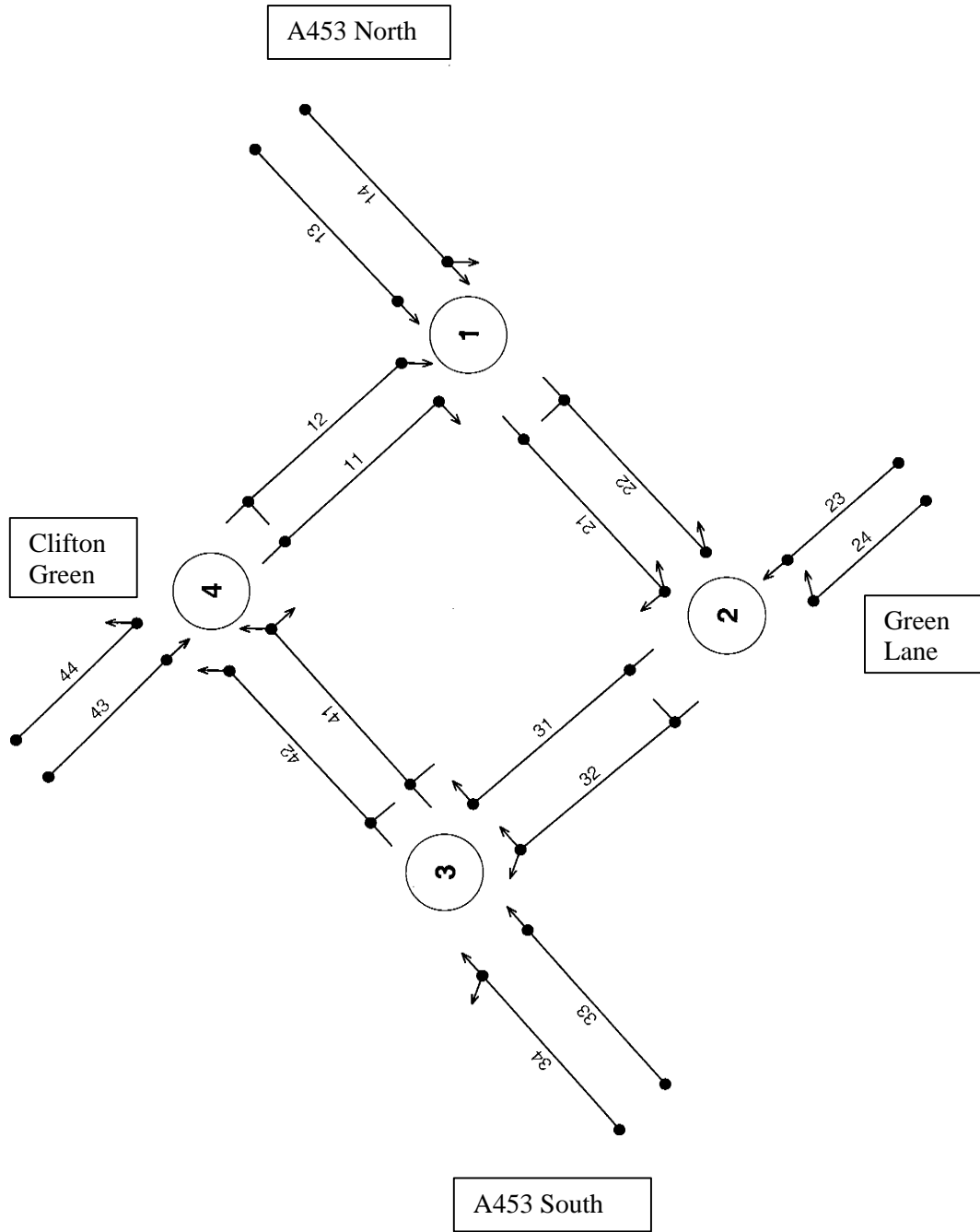
- Farnborough Road as a four-arm traffic signal roundabout;
- Clifton Green modified as an elongated four arm traffic signal roundabout;
- The Crusader roundabout modified by the addition of traffic signals.

3.3 The analysis carried out for the three junctions has demonstrated that, in the design year of 2021 assuming implementation of the preferred strategy, the junctions will operate efficiently as part of an at-grade 4 lane A453 scheme through Clifton.

**APPENDIX A**

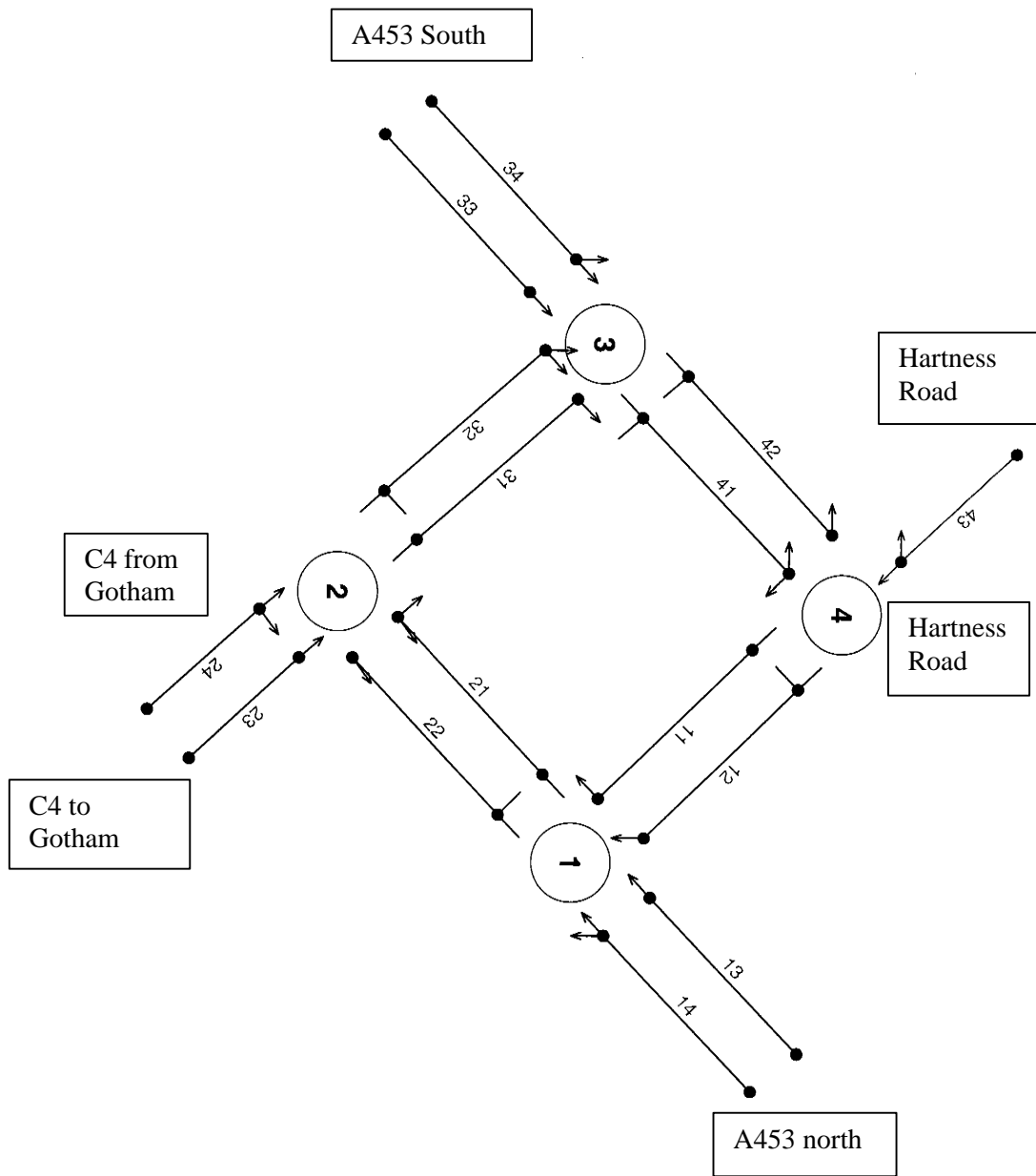


**APPENDIX B**



**A453 Clifton Green – TRANSYT Node/Link Diagram and Output**

APPENDIX C



A453 Crusader Roundabout – TRANSYT Node/Link Diagram and Output