ROSSENDALE DRAFT LOCAL PLAN

Pre-Submission Publication Version

Regulation 19 Consultation

ADDITIONAL COMMENTS AND INFORMATION RECEIVED FROM RESPONDENTS OF THE CONSULTATION

FEBRUARY 2019

Rossendale
BOROUGH COUNCIL

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INTRODUCTION

The additional comments and information shown in this report consist in an update of the comments received during the 6 week consultation period on the Pre-Submission Publication version of the Local Plan.

Those comments have not been included in the "Comments received – December 2018 update" report, nor in the "Overview of the comments received – December 2018 update" document.

The Council will inform the Planning Inspectorate of those additional comments and information received.

ADDITIONAL COMMENTS AND INFORMATION

Representation received on 12 October 2018 by Mr Lester

This representation relates to the Local Plan Highways Capacity Study.

Additional information received in October and December 2018 by Pegasus on behalf of Taylor Wimpey

Additional information includes a Transport Study, a note on land stability and an Illustrative Masterplan in relation to the proposed housing site allocation H72 – Land west of Market Street, Edenfield.

Additional information received by Edenfield Community Neighbourhood Forum in January 2019

Edenfield Community Neighbourhood Forum informed the Council that the number of stakeholders supporting their representation (prior to the consultation deadline) has been updated to 1,235 instead of 1,213 as stated previously.

Updated representation received on 25 January 2019 by Highways England

This updated representation relates to the proposed housing allocation H72 – Land west of Market Street, Edenfield.

Additional information provided by Environment Agency in an email dated 23 January 2019

Environment Agency provided additional comments regarding four proposed housing site allocations.

From:
Sent: 12 October 2018 21:48
To: Forward Planning
Subject: Rossendale Local Plan Highway Capacity Study
Attachments: Local PlanHwyCapStudyComments.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Sirs,

I submitted representations about the Regulation 19 consultation version of the emerging Local Plan. One of these concerned the late publication of key documents.

One such document is the Rossendale Local Plan Highway Capacity Study produced by Mott MacDonald, dated 01 October 2018 and first published on the RBC website in the final week of the consultation period.

The Study declares that it is part of a wider evidence base to support the draft Local Plan through consultation and examination.

I should be grateful for your answers to the following questions, please.

1. Do you agree that the Study is part of the evidence base to support the draft Local Plan through consultation and examination?
2. Is the Study a relevant document to be included when RBC submit to PINS the Plan, the representations and the proposed submission documents?
3. If so, and given that production of the Study had been under way for at least four months, how does RBC justify beginning the Regulation 19 consultation without making the Study available?
4. Do you consider that the Study has fulfilled its stated purpose of supporting the Local Plan through consultation?
5. If so, how has it fulfilled that purpose?
6. How does RBC propose to give the general public the opportunity to make representations about the Local Plan based on the information in the Study, given that Regulation 20(2) of the Town and Country Planning (Local Planning) (England) Regulations 2012 requires representations to be received by the local planning authority by the date specified in the statement of the representations procedure?

I attach the representations about the Study and about the Local Plan based on the information in the Study that I could have made under Regulation 20(1) if RBC had made the Study available throughout the consultation period.

Yours faithfully,
Richard W Lester

Comments on Rossendale Local Plan Highway Capacity Study dated 01 Oct 2018

Introduction

The immediate impression given by the Highway Capacity Study is one of superficiality, inaccuracy and contradiction. These matters are demonstrated by the parts of the study referred to below and cast doubt on the value of the study as a whole. References below to the Plan are to the emerging Rossendale Local Plan. Notwithstanding its many defects, the study identifies difficulties with making the mini-roundabout in Edenfield accommodate traffic from the proposed development nearby. Accordingly, objection to the housing allocation in Edenfield in the Plan is made on highway grounds.

Detailed comments

Executive Summary

This states that highway mitigation would not be required within the first five years of the Plan. but that interventions would *potentially* (my emphasis) be needed at nine locations in order to deliver the remaining build-out of the Plan period to 2034. In the very next sentence, potential becomes an absolute requirement: the study has identified that mitigation will be required at nine specified locations, including Junction 11 Rochdale Rd/Bury Rd Edenfield. It then states the obvious point that some schemes could be delivered on publicly owned land and others would require third party land. In contradiction of the declared requirement for mitigation, it then concludes that there are no highway grounds to object to the Plan.

1.1 Background

The study, or report as it now styles itself, states that it *identifies* the mitigation measures that are required to ameliorate the impact of the Plan. Paragraph 1.4 Report Structure, in contrast, merely states that it *seeks to identify* mitigation measures to provide effective solutions to transport and movement issues over the short term (2024) and long term (2034).

1.3 Policy Background

Reference is made to the NPPF's being subject to a government review which is out to consultation at the time that this report (not study) is being written. The revised NPPF was in fact completed and published in July 2018, over two months before this study was published.

2.2 Junctions

Having assured the reader at 2.1 Preamble that the baseline review has utilised, *inter alia*, Google Live Traffic Data, the study then admits that the inspection thereof was cursory. If it was only cursory, it is of little value, as traffic conditions are by nature variable. There would need to be a systematic analysis of the Data, over different days and times. Even then, it may be questioned whether these Data are sufficiently precise to form a reliable basis for the study. They would not be a good substitute for on-site monitoring.
One general point about the descriptive text for seventeen junctions is that there is no consistency in quoting the road number of a classified road. Some are given, others not, in a haphazard, not to say slapdash, approach.
Another general point is that the descriptive text is inadequate, failing to refer to speed limits, pedestrian crossings and most traffic signals.

2.2.1 J1 The Gyratory Rawtenstall

Haslingden Way is mentioned but there is no road of this name.
Congestion on the A682 and in both directions on Bury Road and St Mary's Way is mentioned. What does this mean? St Mary's Way and part of Bury Road are part of the A682.
The text does not take account of the Fire Station or the McDonald's access road.

2.2.2 J2 Mini Roundabout by Hardman's Mill

How many arms? Not stated. Where is it? It is not shown as a mini-roundabout on the map at Figure 3. The reader could be easily misled into thinking it is at the junction with Swanney Lodge Road. It is not acceptable to blame Google Maps.

2.2.3 Junction of St Mary's Way, Bank Street and Asda, Rawtenstall

The junction is signal-controlled. To describe it as priority is wrong.
Asda is mentioned in the heading but not in the text, and the store is not shown on the map at Figure 4.

2.2.4 Tup Bridge Junction, St Mary's Way, Rawtenstall
Problems with traffic leaving Bank Street should be acknowledged.

2.2.5 Haslingden Road/Tesco roundabout, Haslingden
There are two incorrect spellings of Haslingden.
Tesco is not marked on the map at Figure 6.
It is strange that the A680 and Manchester Road are mentioned separately in the description of the 'insection' (intersection?). They are the same.
On exactly which approach arm of the A680 is the most notable congestion found?

2.2.6 A56 Haslingden Roundabout
If arm means approach arm, there are only four, not five as stated.
As the A680 has only one approach arm, why qualify it by south?
It is surprising that no reference is made to peak time delays on the B6527 approach.

2.2.7 Rising Bridge Roundabout, A56
The map at Figure 8 is wrong in showing Croft Top Farm on the roundabout. It is not acceptable to blame Google Maps.

2.2.8 Todd Hall Road access
The study places it north-east of Haslingden. In reality it is west north-west of the town.

2.2.9 Grane Road/Holcombe Road junction
Again, the writers lose their compass. The junction is west, not east, of Haslingden.

2..2.11 Grane Road/A56 junctions (Waterside Rd Access Rd A56 on-slip Road)
The statement that the junction serves Flax Moss to the south is curious.

2.2.12 A56/M66 Junction'0' at Edenfield
There are only four approach arms. It is wrong to say five arms.
It is not a motorway roundabout. Traffic does not join a motorway from the roundabout or reach the roundabout from a motorway. The roundabout does not connect with any motorway.
The junction does not connect the M66 and Bolton Road North. This is a blatant error.
The suspicion arises that the map at Figure 13 was deliberately cropped to avoid showing the end of the M66.
It should be noted that it is normal for morning peak period traffic southbound on the A56/M66 here to be reduced to a crawl and northbound traffic is often slow-moving, particularly in the early evening.

2.2.13 Rochdale Road/Market St Roundabout, Edenfield
The junction is in the centre of Edenfield. In no way can it be accurately described as north Edenfield.
The three arms are Rochdale Road, Bury Road and Market Place leading to Market Street. Market Street itself is not part of the junction.
The pedestrian crossing less than 25 yards to the north should have been mentioned.
So should the public car park entrance/exit on Bury Road immediately to the south of the roundabout.
The map at Figure 14 is wrong to show the name of the northern arm of the roundabout as Bury Road. It is not acceptable to blame Google Maps. When the study fails in the basic matter of identifying the roads correctly, what credence can be given to its findings?
Also within 25 yards to the north of the roundabout is Exchange Street. This should have been flagged up as a probable access to the development proposed in the Plan.
The study fails to take account of the implications for this junction of severe delays on, or the closure for whatever reason of, the A56 and/or M66.

2.2.14 Bacup St James Square
The descriptive text is over-simplified and wrong. The junction is not just a roundabout with four arms. It consists (or consisted) of a roundabout, with highly unusual priority to traffic from the left at two points, and a priority crossroads immediately adjacent.
The four arms of the roundabout are A681 Yorkshire Street, A671 St James Square, A681 Market Street and (ignored by the descriptive text) Lane Head Lane. The crossroads is formed of the A681 Market Street as the main road and A671 St James Square and A671 Burnley Road as the side roads.

To clarify the point about giving way to traffic from the left, traffic on the roundabout had to give way to traffic on A671 St James Square, and traffic on the roundabout coming from St James Square must give way to traffic on the A681.
I have described the situation as it was immediately before the current works and diversions began. That is what the study purports to do, but the authors conspicuously failed in their endeavour.
To cap off the woefulness of their description the authors wrongly name St James Square as Rochdale Road and Yorkshire Street as Todmorden Road.

2.2.15 Waterfoot roundabout

The text omits the adjacent signal-controlled pedestrian crossing to the east on Bacup Road.

2.2.16 Toll Bar Roundabout, Stacksteads

The text says this is a four-arm mini roundabout. Three of the arms are obviously A681 Newchurch Road (two arms) and Booth Road. The fourth might be Bankfield Street, but the text says this is one of three additional priority-controlled approaches. There might be some justification for that statement in the light of road markings and absence of mini-roundabout signage on Bankfield Street, but as a geographical fact Bankfield Street ends at the roundabout. If Bankfield Street is not counted as an arm, the statement that there are four arms is incorrect.
It is not clear why the text presents the A681 and Newchurch Road as separate items.
The text omits reference to the zebra crossing immediately to the east of Huttock End Lane, which has a significant effect on traffic at the junction, particularly when the crossing patrol is battling to ensure the safe passage of children and carers to and from the nearby St Joseph's RC Primary School.

2.4 Public Transport Provision

It is just too vague to refer to buses stopping close to a junction. How close is close? It needs to be defined, in feet or yards.
In any case, it is not clear why details of bus services not stopping close to a junction have been omitted, as the paragraph concludes by saying that service provision as well as accommodating buses themselves will need to be considered within any proposals to update junctions as part of this study.
The term 'peak period' should be defined.
It is not clear whether the list of bus services stopping close to a junction is meant to be comprehensive with peak period frequency as an example, or whether it is only a list of peak period services.
The study says that reference was made to public transport timetables. Given that bus services in Rossendale are substantially unchanged since 8 April 2018, *i.e.*, before the first draft of this report was presented to the Council, it is deplorable that it contains so many errors and omissions, which are indicated below.

J1 Omits **481**. Omits **13** - the first and last journeys are arguably during the peak period. **273** - one journey from and two into Rawtenstall. **892** - one journey in one direction only. **998** runs with two vehicles. **Rothwell's** service to Bacup and Rawtenstall GS (BRGS) will run via Bury Road instead of Haslingden Road from the end of October 2018, as publicised in the *Rossendale Free Pres*s in September and elsewhere. **464**, **843** and **844** - omitted, possibly because they do not stop close enough to the junction.
J2 **13** - omitted, presumably because it does not stop close enough to the junction.
J3 **10** - omitted. **482 -** included in error.
J4 **10** (outward) and **11** - omitted, maybe for lack of close enough stop. **843 -** omitted.
J5 The two junctions are not distinguished. **464** uses one, **X41** the other. **481, 843** and **844** use both, but are omitted.
J8 **11** runs in one direction only here. **912** - peak period frequency not stated; maybe included in error.
J9 **11** runs in one direction only here. **912** - peak period frequency not stated; maybe included in error.
J10 **273** runs once in the morning and twice in the late afternoon. **484** has not run here since 7 April 2018 and was not more than two journeys per hour. **X41** - omitted. **Rothwell's** service to BRGS - omitted.
J11 **273** runs once in the morning and twice in the late afternoon. **481** - omitted. **484** has not run here since 7 April 2018 and was not more than two journeys per hour. **842** - omitted. **972** - omitted. **998** - omitted. **Rothwell's** service to BRGS - omitted.
J12 **463** - omitted. **465** - one peak period journey (am) in only one direction. **466** - omitted; has one peak period journey (am) in one direction and one peak period journey (pm) in both directions.
J14 **465** - one peak period journey (am) in only one direction. **466** - omitted; has one peak period journey (am) in one direction and one peak hour journey (pm) in both directions. **964 -** included in error.
J15 **463** and **964** - included in error. **844** (one am peak period journey) - omitted.

All the above details are readily available on rossobus, TfGM and BRGS websites. There is no excuse for the multiple errors.

2.5 Accident Occurrences

What the study does not make clear is that the statistics in this paragraph are limited to accidents involving one or more casualties.
The slipshod approach of this study is exemplified by, first, its correctly observing that the data relate to the most recent five years available and, then, saying that the statistics relate to the last five years.
Table 3 ignores the fact that in paragraph 2.2 J5 was sub-divided into J5a and J5b. It omits statistics for the latter (at least 6 Slight and 1 Serious, more if the junction area is drawn more widely).
A Serious accident seems to have been omitted from the J1 figures.

4.2.8 Junction 10 - A56/M66 'Junction 0' at Edenfield

Clarity demands that to the end of the second sentence be added: "but there is no connection between the motorway and the roundabout".
It should be noted that it is normal for morning peak period traffic southbound on the A56/M66 here to be reduced to a crawl and northbound traffic is often slow-moving, particularly in the early evening.

4.2.9 Junction 11 - Rochdale Road/Market Street Edenfield

The reference to Market Street is wrong. The arms of the roundabout are Rochdale Road, Bury Road and Market Place.
The references in Tables 31 and 32 and ensuing text to Bury Road North and Bury Road South are confusing and incorrect. Bury Road forms only one arm of the junction and should not be described as North or South.
The text suggests that traffic between the north and many of the new housing allocations at Edenfield would not pass through this junction. Depending on where the accesses might be, that statement might be correct, but the question remains as to the numbers that would travel south. In this context regard must be had to the number of employment opportunities in Greater Manchester and the facts that several Edenfield children and students attend schools and colleges in Ramsbottom, Bury and Bolton, and that several residents register with GPs in Ramsbottom and Greenmount.
RBC's forward planners said that modelling for this junction would be based on a "worst case scenario" of the majority of new development-generated traffic going south. It is alarming that this study takes a different approach.
The sixth sub-paragraph on page 68 is ungrammatical and consequently unintelligible.
The suggested scheme for a southern bypass of Edenfield to be provided by Bury MBC seems to be no more than a vague possibility.

4.2.10 Junction 12 - St James Square, Bacup

The junction is described just as inadequately here as in paragraph 2.2.14 of the study, on which I have commented above.
It is not clear whether the modelling refers to the junction as it was or as it will be.

4.2.12 Junction 14 - Toll Bar Roundabout, Stacksteads

It is noted that the junction has lost an arm since it was described at paragraph 2.2.16.

6.5 Junction 11 - Rochdale Rd/Bury Rd Edenfield

The references in Tables 60 and 61 and the text to Bury Road North and Bury Road South are confusing and incorrect. Bury Road forms only one arm of the junction and should not be described as North or South.
Comment is made under 4.2.9 above on the assertion that the forecast operation of the junction in 2034 is "over exaggerated ' (not merely exaggerated). As noted under 4.2.9 above, RBC's forward planners said that modelling for this junction would be based on a "worst case scenario" of the majority of new development-generated traffic going south. It is alarming that this study takes a different approach.
The pedestrian crossing is on Market Place, not Bury Road.
It seems counter-intuitive to suggest that making the crossing signal-controlled could (the study does not go so far as to say would) benefit the Bury Road arm. The usual effect of a signalised crossing is to delay approaching traffic. If that were to happen here, traffic on Bury Road would tend to be delayed more before reaching the mini-roundabout, and upon reaching the mini-roundabout the traffic from Bury Road could find it occupied by vehicles from Rochdale Road waiting to proceed along Market Place to Market Street.
Whether or not the 2034 forecast was "over exaggerated", the second sub-paragraph below Table 60 suggests that further mitigation measures are required to deliver the Plan up to 2034. Whether or not that means further to the existing situation or further to installing a signalised crossing is not clear. But then the next two

sub-paragraphs and Table 61 suggest that, after the crossing is signalised, all will be well. But then the final sub-paragraph contemplates further mitigation solutions (not just mitigation), which "should only be determined in consultation with LCC, given the extremely land locked nature of the junction and" its proximity to housing. It is another statement of the obvious that LCC would need to be consulted; that would be essential however spacious the junction as they are the highway authority. That conclusion is surely saying that, if the Plan as drafted is built out by 2034, the junction will be beyond capacity and that improvement would require land take and demolition of residential units.

6.8 A682/A56 SB Merge

It is noted that Mott MacDonald have put forward three options, all of which propose an additional lane between the junctions of the A56 with the A682 and the M66. The study recommends RBC to undertake further consideration and discussion with Highways England. Until this matter is resolved, it seems premature for the Plan to allocate for housing land that might be required for improvements to the A56.

7.1 Summary

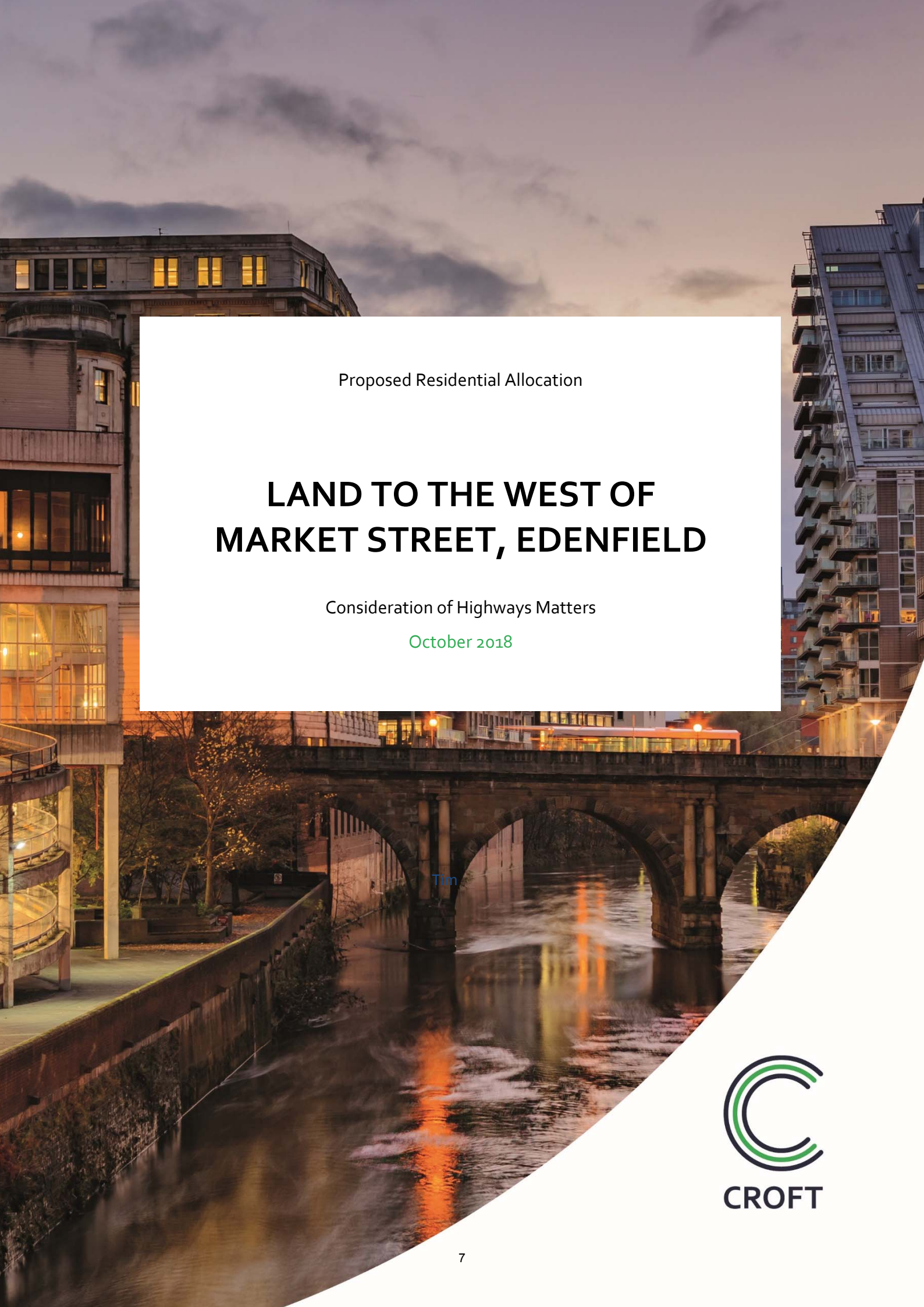
The study notes that it is part of a wider evidence base to support the Plan through consultation and subsequent examination. RBC have wrecked those aspirations by starting the consultation before the study was published and allowing less than five whole days for comments on the study as part of the consultation.

7.2 Conclusion

The study notes that nine locations have been identified as possibly requiring intervention before 2034 to accommodate the full build-out of the Plan but then states that the ability to accommodate Plan traffic growth has been demonstrated and that therefore there should be no grounds for objection.
As noted above under 6.5, the ability to accommodate traffic growth at the mini-roundabout at Edenfield without extensive demolition has not been demonstrated.
Whether the solutions to the problem at Edenfield have been fully identified or are desirable or achievable is open to question. It cannot be said that there are no grounds for objection on highway grounds to the proposals in the Plan for Edenfield.

Richard W. Lester

12 October 2018



Proposed Residential Allocation

LAND TO THE WEST OF MARKET STREET, EDENFIELD

Consideration of Highways Matters

October 2018

Tim

CROFT

REPORT CONTROL

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1 INTRODUCTION

1.1 Introduction

1.1.1 This document has been prepared by Croft Transport Planning & Design on behalf of Taylor Wimpey UK Limited and Methodist Church to support the release of the land in Edenfield for the delivery of new family and affordable homes during the next plan period.

1.1.2 The site is located to the north west of the village of Edenfield, bounded by Market Street to the east and the A56 to the west.

1.1.3 The Rossendale Draft Local Plan identifies draft allocation H72 as follows:

Housing Allocation Ref	Site Name	Net Developable Area (Ha)	No. of Units	Delivery Timescales
H72	Land west of Market Street	15.25	400	Years 6-15

Table 1.1 – Summary of Draft Housing Allocation within Edenfield

1.1.4 This submission considers the highways implications of the draft allocation H72.

1.1.5 The location of the site is shown on **Plan 1**.

1.2 Potential Development

1.2.1 For the purpose of the following analysis, the number of units identified within the Rossendale Draft Local Plan and set out in Table 1.1. above would be provided, i.e. a total of 400 units.

1.2.2 It is anticipated that these units would be delivered over three separate land parcels, namely land west of Market Street, land off Exchange Street and land to the west of Blackburn Road, and it is assumed that each of the land parcels would be served by separate vehicular access points.

1.2.3 The land off Exchange Street would be served via an extension to Exchange Street. The land west of Market Street would be served via a new priority controlled junction located along Market Street. The land to the west of Blackburn Road would be served via a new priority controlled junction located along Blackburn Road.

1.2.4 Whilst it is not anticipated that a vehicular connection will be provided between the land off Exchange Street and the land west of Market Street, a pedestrian, cycle and emergency vehicle link will be provided to ensure permeability by sustainable modes of transport.

1.2.5 An Illustrative Masterplan has been prepared and is shown at **Plan 2**.

1.2.6 The following provides a consideration of traffic impact of the three land parcels on the local highway network.

2 TRAFFIC IMPACT

2.1 Introduction

2.1.1 The following section of this report will discuss the potential traffic generation of the potential allocation sites as well as providing an assessment of the general impact on the local highway network.

2.1.2 A highway capacity study has been undertaken by Mott MacDonald (MM) on behalf of Rossendale Council, which considers the impact of the draft allocations on key junctions within the borough, as agreed with Lancashire County Council (LCC), the local highway authority, and Highways England.

2.1.3 With regard to junctions in the vicinity of Edenfield, the Market Street/Bury Road/Rochdale Road mini-roundabout has been identified, along with the M66/A56 roundabout.

2.1.4 The results of the MM study conclude that substantial spare capacity exists at the M66/A56 roundabout even at the end of the draft plan period, i.e.2034. The Market Street/Bury Road/Rochdale Road mini-roundabout is more constrained and it was concluded within the report that intervention may be required by the end of the plan period.

2.1.5 However, given the complexities of assessing the impact of all of the draft allocations, broad assumptions have been made with regard to, for example, the location of potential access points.

2.1.6 Given the allocation site that is considered within this report will be served by several access points, which will influenced the distribution of traffic locally, the following provides a review of the likely impact of the proposals on the local highway network, in particular the Market Street/Bury Road/Rochdale Road mini-roundabout.

2.2 Surveyed Flows

2.2.1 In order to establish the existing levels of traffic that occur on the local highway network, 2017 traffic survey data for the Market Street/Bury Road/Rochdale Road junction has been obtained from MM. This data has been agreed as being appropriate with LCC. The data is included at **Appendix 1**.

2.2.2 Analysis of this data reveals the peak flows at the junction occurred between 0730-0830 during the weekday AM peak and 1645-1745 during the weekday PM peak.

2.2.3 **Figures 1** and **2** show the 2017 surveyed flows, converted into passenger car units (PCUs)

2.3 Growthed Flows

2.3.1 The draft local plan covers the period up to 2034, and the impact of the allocation sites has therefore been considered at that assessment year. Consideration has also been given to an interim 2024 assessment year.

2.3.2 In order to growth the 2017 surveyed flows to the assessment years, reference has been given to TEMPro/National Transport Model growth factors.

2.3.3 It should, however, be recognised that a large proportion if not all of the increase in households and jobs contained within TEMPro will be associated with the existing local plan allocations. These will, however, be superceded by the emerging local plan allocations.

2.3.4 Therefore, for the purposes of this traffic impact analysis it has been assumed that there will no increase in households and jobs during this period and that solely the background growth assumed for the MSOA be applied to the highway network. The background growth represents the change in trips of existing land uses due to factors including changes in car use, fuel prices and income. Windfall developments are also included within background growth as their specific locations are unknown.

2.3.5 The resultant growth factors based on this methodology are shown below:

- 2017 to 2024 AM peak - 1.0407;
- 2017 to 2024 PM peak - 1.0351;
- 2017 to 2034 AM peak - 1.0740;
- 2017 to 2034 PM peak - 1.0642.

2.3.6 The resulting **Figures 3** and **4** show the 2024 growthed flows for the weekday AM and PM peaks respectively, whilst **Figures 5** and **6** shows the 2034 growthed flows for the weekday AM and PM peaks respectively.

2.4 Committed Development

2.4.1 No committed developments exist in the vicinity of the draft allocation sites under consideration.

2.4.2 As such, the growthed flows represent the base flows for the assessment years.

2.5 Allocation Site Trip Rates

2.5.1 Within their Highway Capacity Study, MM derived residential vehicular trips rates based on trip rates derived by reference to a number of Transport Assessments prepared in support of previous planning applications. The resulting trip rates were then applied to each of the draft residential allocations within the borough.

2.5.2 Given the myriad residential sites identified within the emerging local plan, this is considered a reasonable approach when preparing a borough wide study, but this may result in an overestimate of development trips in a specific location.

2.5.3 As such, consideration has been given the potential trips that would occur as a result of potential residfential development within Edenfield.

2.5.4 First, the TRICS database was interrogated for 'Houses Privately' owned, with sites from Greater London and Ireland being excluded along with Town Centre and Edge of Town Centre sites. The TRICS output is included at **Appendix 2**.

2.5.5 Based on the TRICS database, the weekday AM and PM peak period all person trip rates (i.e. two-way) per household are as follows:

- AM Peak Period = 0.975 Two-way Person Trip Rate Per Household; and
- PM Peak Period = 0.902 Two-way Person Trip Rate Per Household.

2.5.6 It is important to note that the development peak periods identified within TRICS and set out above are based on 0800-0900 hours and 1700-1800 hours. These are slightly different to the highway peak established from the traffic survey, but adding the development peak traffic onto the highway peak will add robustness to the assessment.

2.5.7 On the premise that up to 400 dwellings are proposed within the allocation sites under consideration, the sites have the potential person trip generation during both peak periods as follows:

- AM Peak Period = 390 two-way person trips; and
- PM Peak Period = 361 two-way person trips.

2.5.8 In addition, Table NTS0502 of the 2017 National Travel Survey identifies the percentage trips by trip purpose during the weekday AM and PM peak periods. Based on this information, the purpose split for each peak period is presented in Table 2.1 below.

2.5.9 For the purpose of the analysis, the following groupings were made when collating this data:

- Work = Commuting and Business;
- Education = Education and Escort Education;
- Shopping = Shopping; and
- Other = Other Work/ Other Escort and Personal Business, Visiting Friends/ Entertainment/ Sport, Holiday/ Day Trip/ Other.

Trip Purpose Percentage				
Peak Period	**Work**	**Education**	**Shopping**	**Other**
AM Peak	24%	51%	4%	21%
PM Peak	37%	5%	12%	46%

Table 2.1 2017 National Travel Survey – Peak Hour Trips by Journey Purpose

2.5.10 Therefore, based on the aforementioned, the weekday AM and PM peak hour person trips for 400 dwellings by purpose is shown in Table 2.2 below.

Person Trips by Purpose (400 dwellings)				
Peak Period	**Work**	**Education**	**Shopping**	**Other**
AM (08:00 – 09:00)	94	200	15	80
PM (17:00 – 18:00)	133	17	44	167

Table 2.2 Peak Hour Person Trips by Journey Purpose

Mode Split

2.5.11 By reference to the 2011 census Travel To Work data for the Middle Super Output Area Rossendale 008, the mode split for the commuting and business trips has been calculated.

2.5.12 As no mode split data is available for the remaining trip purposes, Table NTS0409 of the 2017 National Travel Survey was referenced for the mode split of non-work trips. A breakdown of the mode split for all purposes is presented in Tabe 2.3 below.

Person Trip Mode Split by Purpose				
Mode	**Work**	**Education**	**Shopping**	**Other**
Walk	10.0%	44.3%	27.1%	27.6%
Cycle	1.7%	1.3%	0.9%	1.5%
Car Driver	73.5%	21.5%	45.8%	37.7%
Passenger	7.4%	22.8%	18.7%	26.9%
Rail	0.3%	1.6%	1.0%	1.5%
Local Bus	5.5%	6.1%	5.2%	2.8%
Others	1.7%	2.6%	1.2%	1.9%
Total	100%	100%	100%	100%

Table 2.3 Summary of Person Trip Mode by Journey Purpose

2.5.13 Using the previously mentioned trip generations, trip purpose percentages and modal split percentages, the two-way multi-modal trips are presented in Table 2.4 below.

Two-way Trip Generation (400 Dwellings)										
Mode	Work		Education		Shopping		Other		Total by Mode	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Walk	9	13	88	7	4	12	22	46	124	79
Cycle	2	2	3	0	0	0	1	2	6	5
Car Driver	69	98	43	4	7	20	30	63	150	185
Passenger	7	10	46	4	3	8	22	45	77	67
Rail	0	0	4	0	0	0	1	2	5	4
Local Bus	5	7	12	1	1	2	2	5	20	15
Others	1	1	5	0	0	0	1	3	9	7
Total	94	133	200	17	15	44	80	167	390	361

Table 2.4 Summary of Two-way Multi Modal Peak Hour Trips by Journey Purpose

2.5.14 The TRICS output contained within Appendix B also provides the arrival / departure profile for the two-way person trip rates per household during each peak period and this has been summarised in Table 2.5 below.

AM and PM Arrival/Departure Profile			
Peak Period	**Arrivals**	**Departures**	**Two-way**
AM Peak	0.186	0.789	0.975
	19%	81%	100%
PM Peak	0.604	0.298	0.902
	67%	33%	100%

Table 2.5 Peak Hour Arrival/Departure Profile

2.5.15 Based upon these trip generations and arrival / departure profile, the predicted multi-modal trip generations for the AM and PM peak periods are set out in Table 2.6.

AM Multi-modal Trips (400 Dwellings)										
Mode	Work		Education		Shopping		Other		Total by Mode	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Walk	2	8	17	72	1	3	4	18	24	101
Cycle	0	1	1	2	0	0	0	1	1	4
Car Driver	13	56	8	35	1	6	6	25	29	121
Passenger	1	6	9	37	1	2	4	18	15	62
Rail	0	0	0	2	0	0	0	1	1	4
Local Bus	1	4	2	10	0	1	0	2	4	16
Others	0	1	1	3	0	0	0	1	1	7
Total	18	76	38	162	3	13	15	65	74	316
PM Multi-modal Trips (400 Dwellings)										
Mode	Work		Education		Shopping		Other		Total by Mode	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Walk	9	4	5	2	8	4	31	15	53	26
Cycle	1	1	0	0	0	0	2	1	4	2
Car Driver	66	32	2	1	13	7	42	21	124	61
Passenger	7	3	3	1	5	3	30	15	45	22
Rail	0	0	0	0	0	0	1	1	2	1
Local Bus	5	2	1	0	2	1	3	2	10	5
Others	1	0	0	0	0	0	2	1	4	3
Total	89	44	11	6	29	14	112	55	242	119

Table 2.6 Weekday AM and PM Peak Multi-Modal Trip Generations by Journey Purpose

2.5.16 Based on the above, it can be seen that the allocation sites under consideration would result in 29 vehicular arrivals and 121 vehicular departures during the weekday AM peak period, and 124 vehicular arrivals and 61 vehicular departures during the weekday PM peak.

2.5.17 Table 2,7, below, provides a breakdown of these trips based on each of the sites under consideration.

Site	Weekday AM Peak		Weekday PM Peak	
	Arrivals	Departures	Arrivals	Departures
Land to the west of Blackburn Road	4	19	19	9
Land west of Market Street	19	81	83	41
Land off Exchange Street	5	21	21	11
Total	29	121	124	61

Table 2.7 – Summary of Peak Hour Vehicular Trips by Land Parcel

2.6 Trip Distribution

2.6.1 In order to assign the light vehicles to the network, reference has been made to the 2011 census data, and consideration given to the origin of those employed in the middle upper output area (MSOA) workplace zones of Rossendale 008. This reveals the percentage of staff trips that are likely to originate within the MSOA workplace zones within the borough of Rossendale and within the wider boroughs.

2.6.2 The routes vehicles are likely to take from each of these locations to the application development site has then been predicted by reference to route planning software. The census data and routing assumptions are included at **Appendix 3**.

2.6.3 As the allocation sites will be served by different access points, there will be a slight variation in the distribution of traffic to/from each land parcel.

2.6.4 **Figure 7** shows the anticipated trip distribution for the Church land, **Figure 8** shows the distribution for the TW land and **Figure 9** shows the distribution for the Peel land.

2.6.5 The proposed vehicle trips for each site, as shown in Table 2.7, have been assigned to the network based on the site specific trip distribution.

2.6.6 The resulting trips are shown in **Figure 10** and **11** for the Church land, **Figures 12** and **13** for the TW land, and **Figures 14** and **15** for the Peel land. The predicted trips for each site have been combined to produced total allocation trip and these are shown in **Figure 16** and **17** for the weekday AM and PM peaks respectively.

2.6.7 The total allocation trips have been added to the growthed flows to produce 'with draft allocation' flows. **Figures 18** and **19** show the 2024 'with draft allocation' flows for the weekday AM and PM peaks respectively, whilst **Figures 20** and **21** show the 2034 'with draft allocation' flows for the weekday AM and PM peaks respectively.

2.7 Capacity Assessments

2.7.1 Having derived base and 'with draft allocation' flows, capacity assessments of the Market Street/Bury Road/Rochdale Road mini-roundabout have been undertaken.

2.7.2 The analysis has been undertaken using the industry-standard ARCADY computer program. A summary the results in provided in Table 2.8 and 2,9, below, for the 2024 and 2034 assessment years respectively. The full output is provided at **Appendix 4**.

Arm	2024 Base Flows						2024 'With Allocation' Flows					
	Weekday AM			Weekday PM			Weekday AM			Weekday PM		
	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)
Market Street	0.64	2	11	0.34	1	6	0.71	2	13	0.37	1	6
Rochdale Road	0.88	7	43	0.71	2	16	0.93	11	70	0.74	3	18
Bury Road	0.47	1	8	0.84	5	27	0.49	1	8	0.93	11	59

Table 2.8 – Summary of Capacity Analysis of the Market Street/Rochdale Road/Bury Road Mini-Roundabout – 2024 Analysis

Arm	2034 Base Flows						2034 'With Allocation' Flows					
	Weekday AM			Weekday PM			Weekday AM			Weekday PM		
	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)
Market Street	0.66	2	11	0.35	1	6	0.73	3	14	0.39	1	6
Rochdale Road	0.92	10	60	0.73	3	17	0.97	17	106	0.76	3	19
Bury Road	0.49	1	8	0.87	6	34	0.51	1	9	0.97	17	84

Table 2.9 – Summary of Capacity Analysis of the Market Street/Rochdale Road/Bury Road Mini-Roundabout – 2034 Analysis

2.7.3 As can be seen from the above tables, the Market Street/Rochdale Road/Bury Road mini-roundabout is predicted to operate within capacity at 2024 and 2034 base years and would continue to operate within capacity following the addition of traffic associated with the draft allocation sites.

2.7.4 The junction is predicted to experience modest increases in queuing compared with the base scenarios, however, it is not considered that the resulting increase in delay would substantially impact upon overall journey times.

2.7.5 Based on the above, it can be concluded that the Market Street/Rochdale Road/Bury Road mini-roundabout can accommodate the likely levels of traffic associated with the draft allocation sites.

2.8 Sensitivity Analysis

2.8.1 The trip rates adopted for the above analysis havce been derived by reference to travel to work data obtained for the Super Middle Output Area specific to Edenfield. This reveals vehicular trip rates slightly lower than those adopted by MM within their borough wide highway capacity study but are considered appropriate for the purpose of considering the potential impact of the draft allocations within Edenfield.

2.8.2 Indeed, no account has been taken for the potential internalisation of education trips that may occur should additional primary school provision be provided within the immediate vicinity of the draft allocation sites.

2.8.3 Notwithstanding the above, a sensitivity assessment has been undertaken using the residential trips rates adopted within the MM highway capacity study. These are shown in Table 2.10, below, together with the sensitivity trips based on 400 units.

	Weekday AM Peak		Weekday PM Peak	
	Arr	Dep	Arr	Dep
Trip Rate	0.142	0.416	0.404	0.221
Trips	57	166	162	88

Table 2.10 – Sensitivity Trip Rates and Trips

2.8.4 The sensitivity trips have been assigned to the network based on the trip distributions shown in Figures 7 to 9. The resulting sensitivity allocation trips for each site are shown in **Figures 22** to **27,** with the total sensitivity allocation trips being shown in **Figures 28** and **29** for the weekday AM and PM peaks respectively.

2.8.5 The total sensitivity allocation trips have been added to the growthed flows to produce 'with draft allocation' sensitivity flows. **Figures 30** and **31** show the 2024 'with draft allocation' sensitivity flows for the weekday AM and PM peaks respectively, whilst **Figures 32** and **33** show the 2034 'with draft allocation' sensitivity flows for the weekday AM and PM peaks respectively

2.8.6 Sensitivity capacity assessments have been undertaken using the sensitivity traffic flows and the results are summarised in Tables 2.11 and 2.12, below. The full output is provided at **Appendix 5**.

Arm	2024 Base Flows						2024 'With Allocation' Flows					
	Weekday AM			Weekday PM			Weekday AM			Weekday PM		
	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)
Market Street	0.64	2	11	0.34	1	6	0.73	3	14	0.39	1	6
Rochdale Road	0.88	7	43	0.71	2	16	0.95	14	88	0.75	3	19
Bury Road	0.47	1	8	0.84	5	27	0.51	1	9	0.97	17	85

Table 2.11 – Summary of Capacity Analysis of the Market Street/Rochdale Road/Bury Road Mini-Roundabout – 2024 Sensitivity Analysis

Arm	2034 Base Flows						2034 'With Allocation' Flows					
	Weekday AM			Weekday PM			Weekday AM			Weekday PM		
	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)	Max RFC	Max Queue	Delay (secs)
Market Street	0.66	2	11	0.35	1	6	0.76	3	16	0.40	1	7
Rochdale Road	0.92	10	60	0.73	3	17	1.00	23	140	0.77	3	21
Bury Road	0.49	1	8	0.87	6	34	0.53	1	9	0.99	25	121

Table 2.12 – Summary of Capacity Analysis of the Market Street/Rochdale Road/Bury Road Mini-Roundabout – 2034 Sensitivity Analysis

2.8.7 As can be seen from the above tables, the analysis based on the sensitivity trip rates predicted that the junction would operate within capacity during the 2024 assessment year following the additional of traffic associated with the draft alloction sites.

2.8.8 The assessment indicates that the junction would only just reach capacity at 2034 following the additional of traffic associated with the draft allocation site, however, even then, increases in delay are unlikely to impact on overall journey times.

2.8.9 Notwithstanding the above, as set out in the MM highway capacity study, the junction performance could benefit from the formalisation of the existing uncontrolled crossing on the Bury Road North arm of the junction into a demand controlled signalised crossing, if this is considered necessary by the local highway authority at the time of a planning future planning application(s).

3 CONCLUSIONS

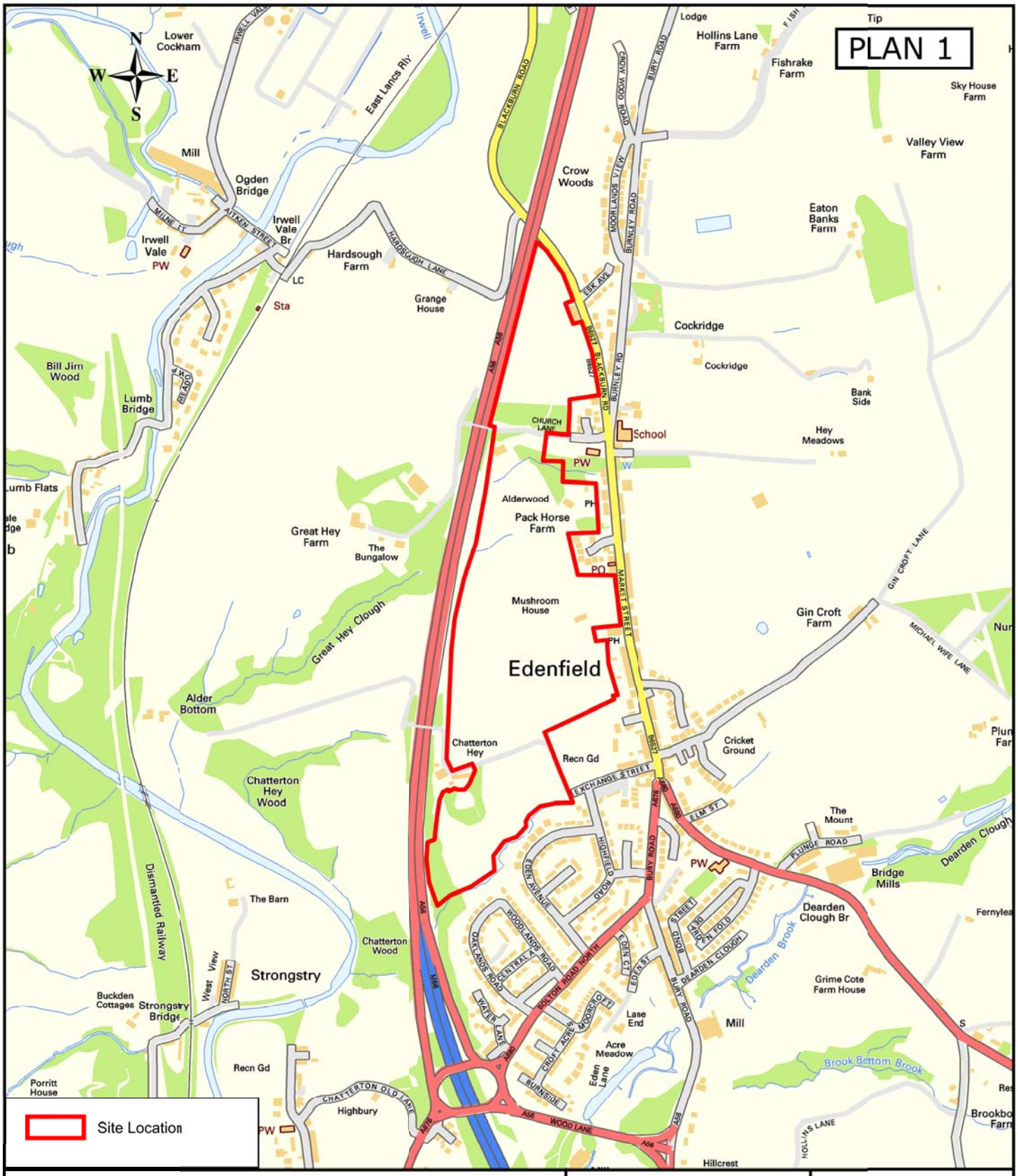
3.1.1 This document has considered the potential traffic impact of the release of the land in Edenfield for the delivery of new family and affordable homes during the next plan period on the local highway network.

3.1.2 The analysis has examined that likely levels of traffic associated with the proposals and the likely routing of traffic on the network based on the anticipated access strategy.

3.1.3 The study has considered the impact of the proposals on the key junction within Edenfield, namely the Market Street/Rochdale Road/Bury Road mini-roundabout, at both 2024 and 2034 assessment years.

3.1.4 Based on the above, it can be concluded that the Market Street/Rochdale Road/Bury Road mini-roundabout can accommodate the likely levels of traffic associated with the draft allocation sites without any significant impacts on the surrounding highway network.

PLANS



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CROFT

DRAWN:	DATE:	CHECKED:	DATE:	SCALE:	DRAWING NUMBER:	REVISION:
GM	19.10.18	TR	19.10.18	N.T.S	1537-01	.

RANDALL THORP

LANDSCAPE ARCHITECTURE
ENVIRONMENTAL PLANNING
MASTERPLANNING
URBAN DESIGN

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KEY:

- Draft housing allocation boundary
- Existing Public Right of Way
- Existing vegetation
- Proposed development cell
- Proposed indicative frontage
- Proposed green space
- Proposed woodland
- Proposed highway access
- Proposed primary road
- Proposed secondary road
- Proposed pedestrian /cycle routes
- Potential footpath links
- Potential pedestrian/ cycle/emergency connection

Date: 01.10.2018
Drawn by: SR
Checker: JF
Rev by:
Rev checker:
QM Status: checked
Product Status: Client Review

North West Edenfield Local Plan Representations

Combined Illustrative Masterplan

Drwg No: 610C-02B Scale: 1: 5,000 @ A3

FIGURES

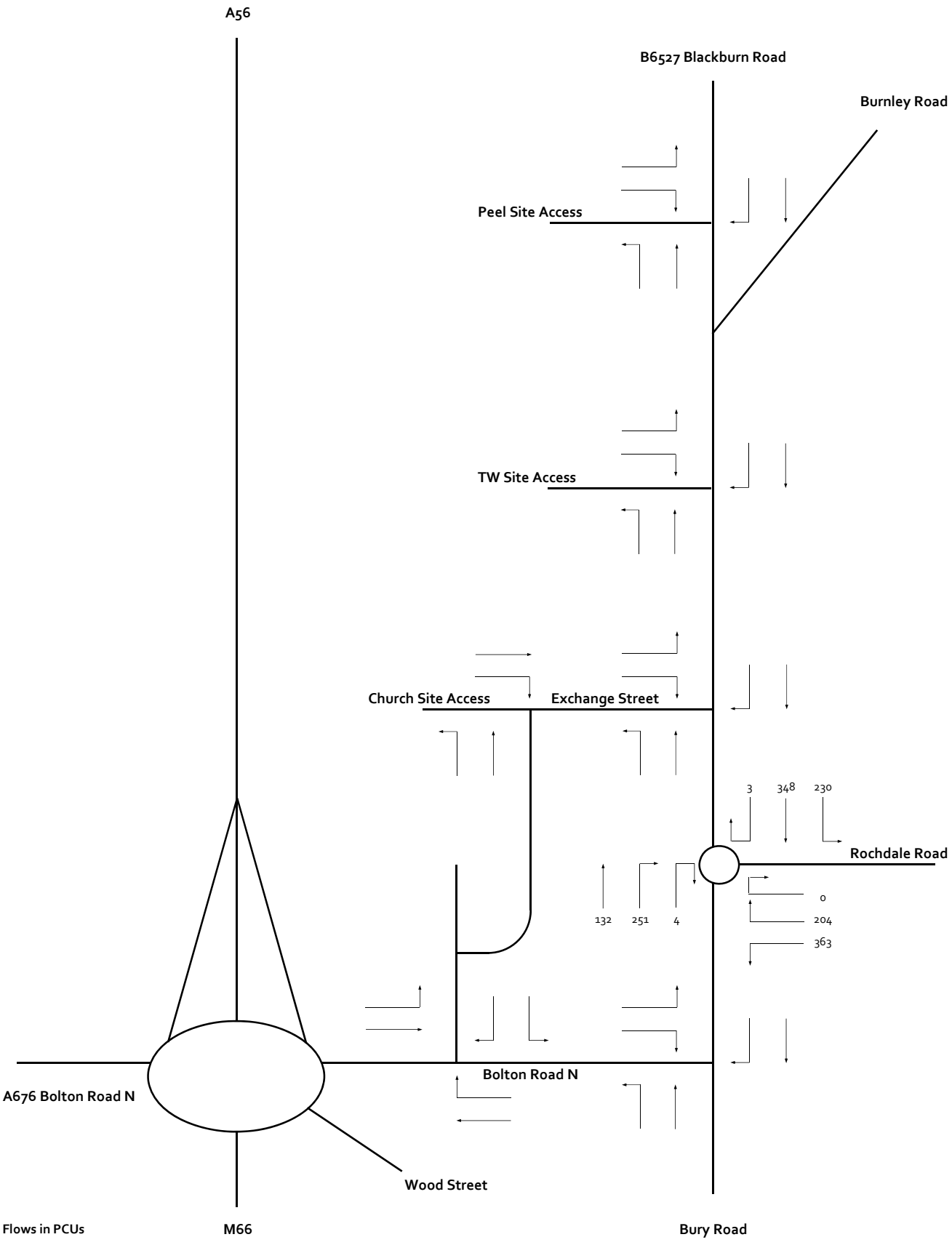

Figure 1 2017 Surveyed Flows - Weekday AM Peak (0730-0830)

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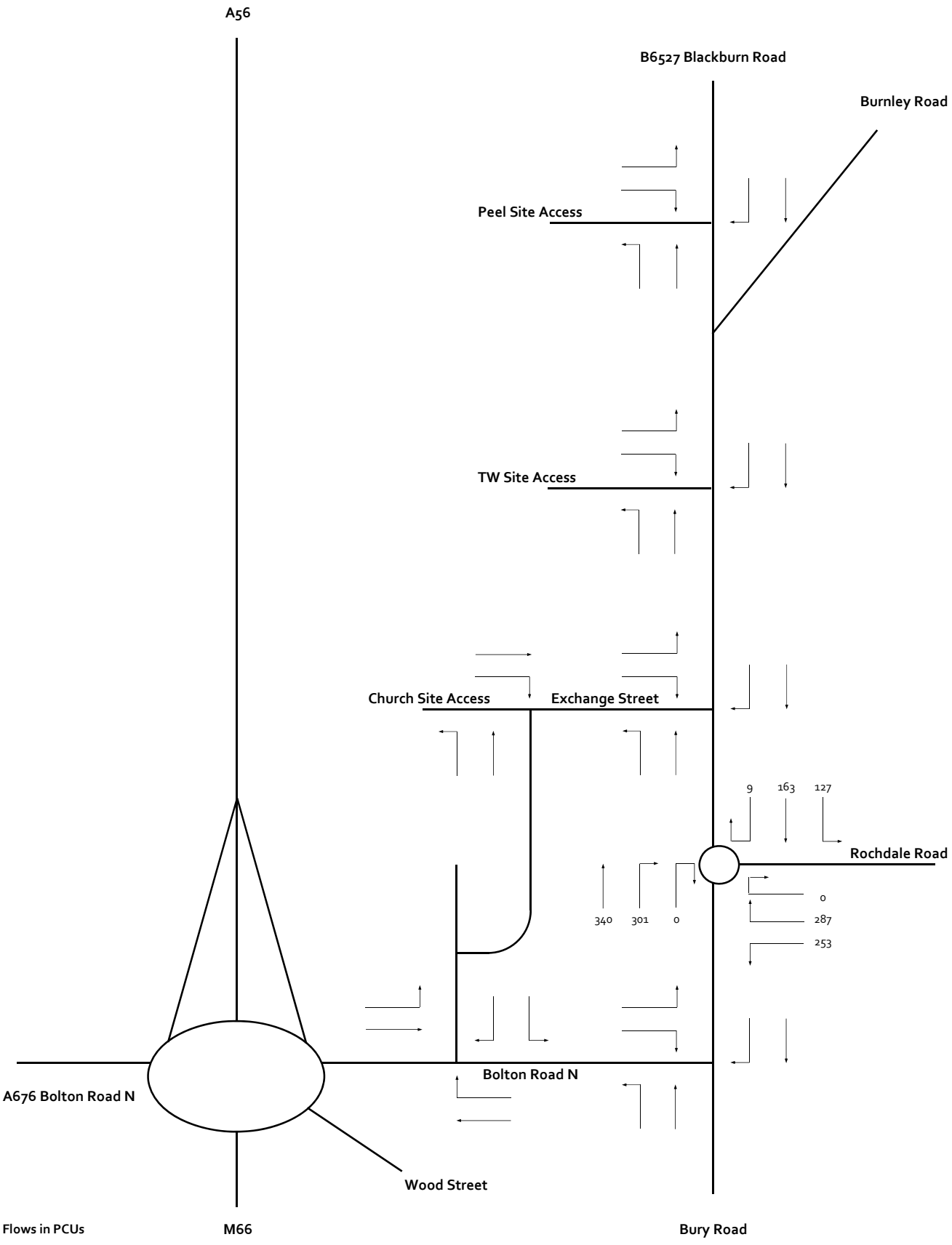

Figure 2 2017 Surveyed Flows - Weekday PM Peak (1645-1745)

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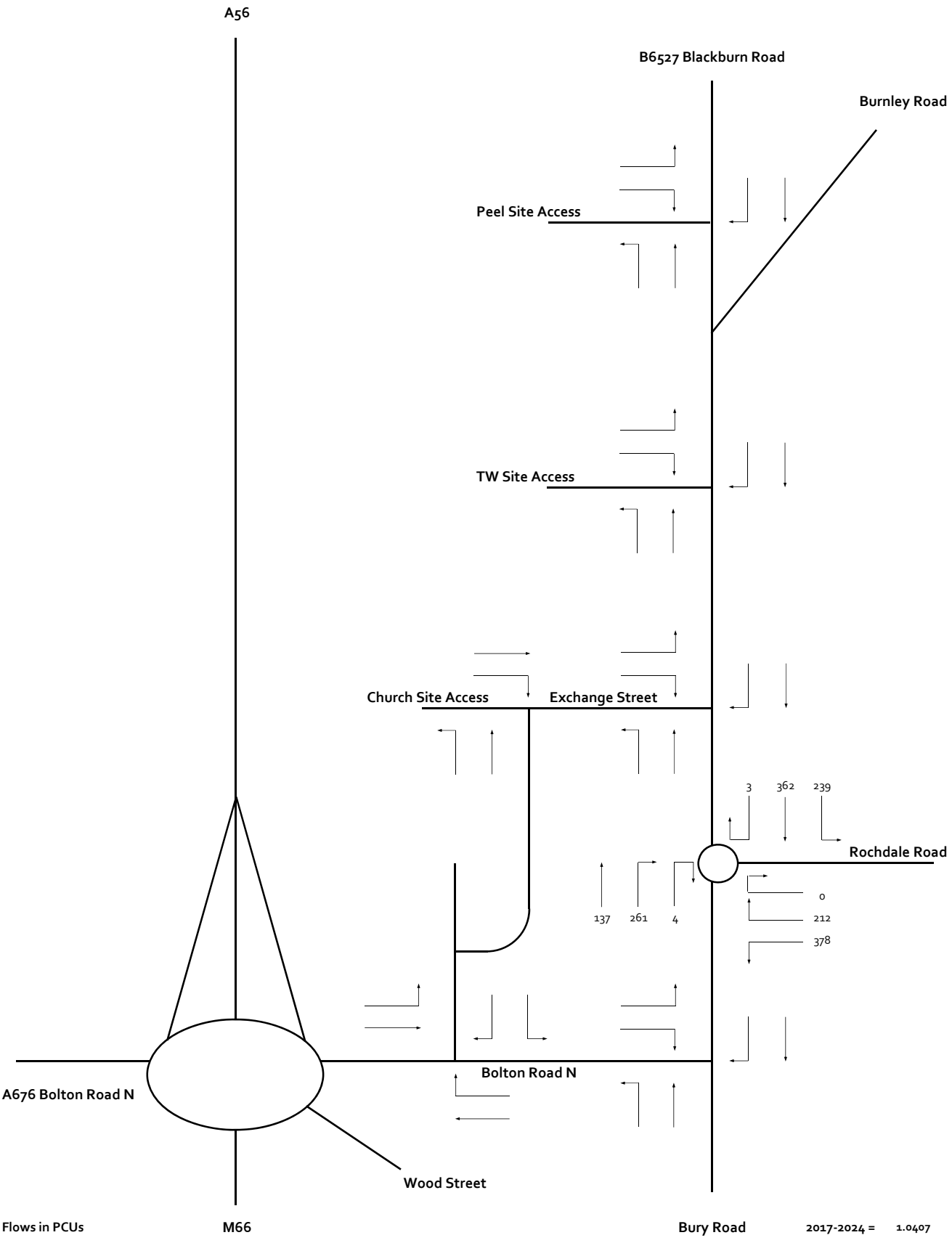

Figure 3 2024 Growthed Flows - Weekday AM Peak

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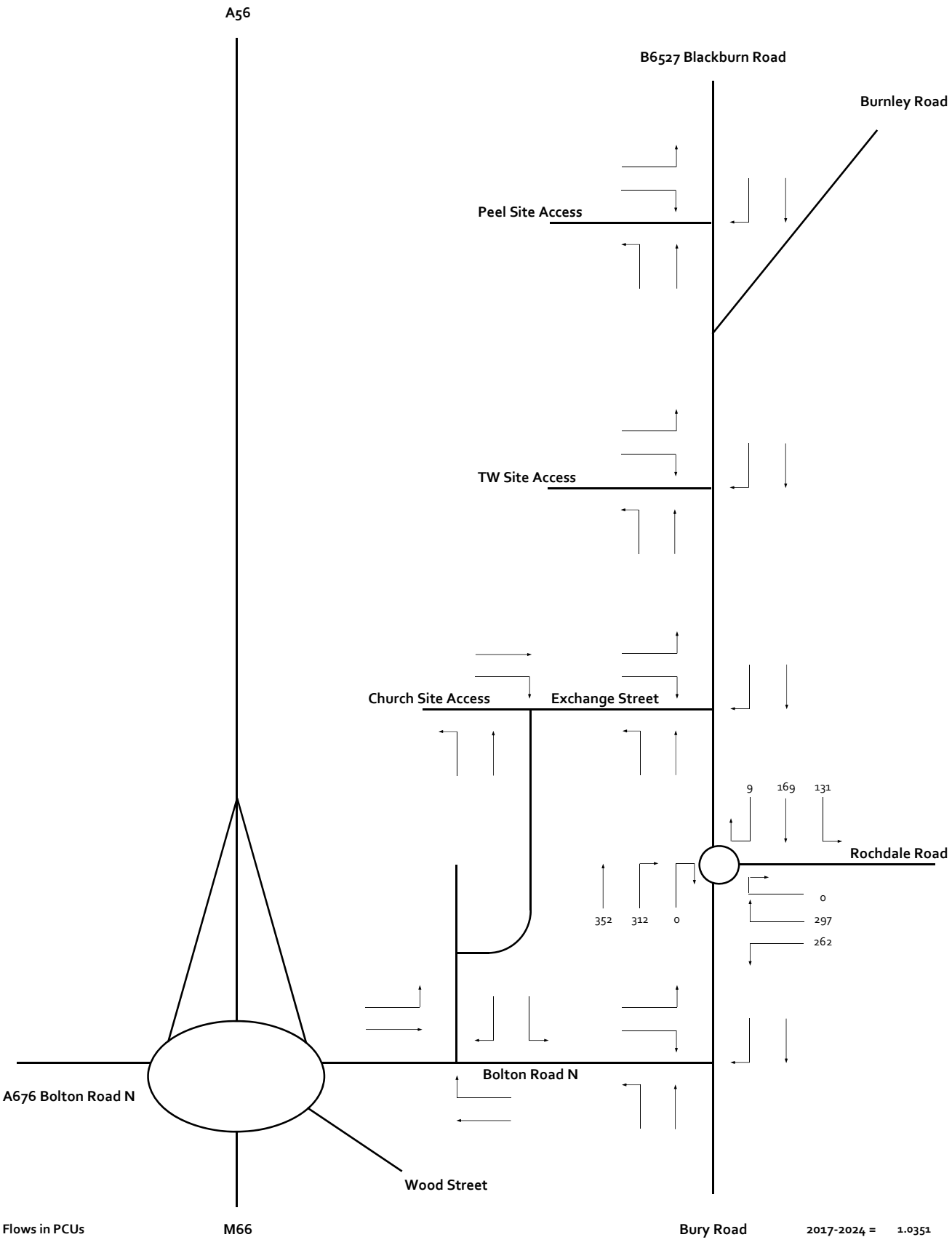

Figure 4 2024 Growthed Flows - Weekday PM Peak

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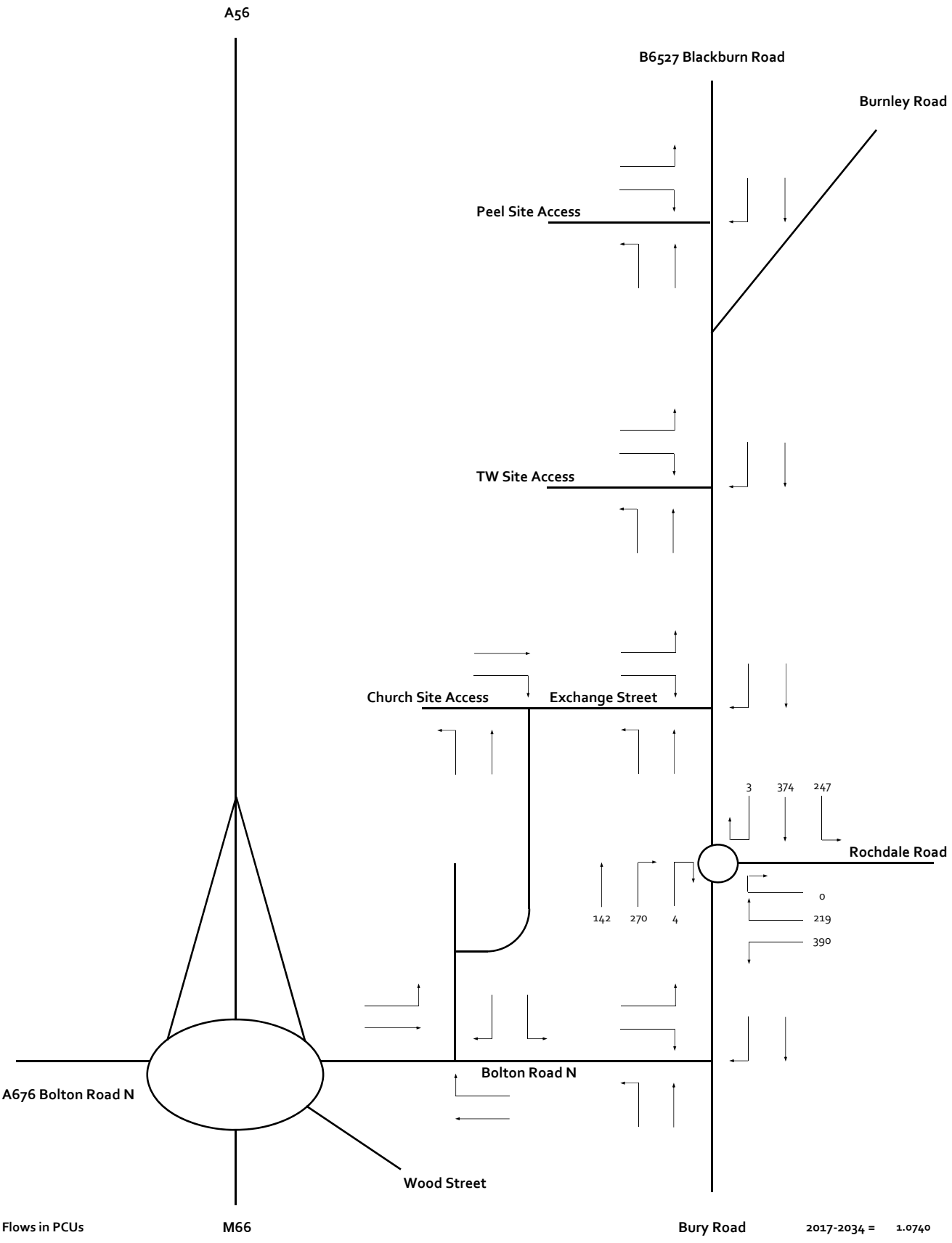

Figure 5 2034 Growthed Flows - Weekday AM Peak

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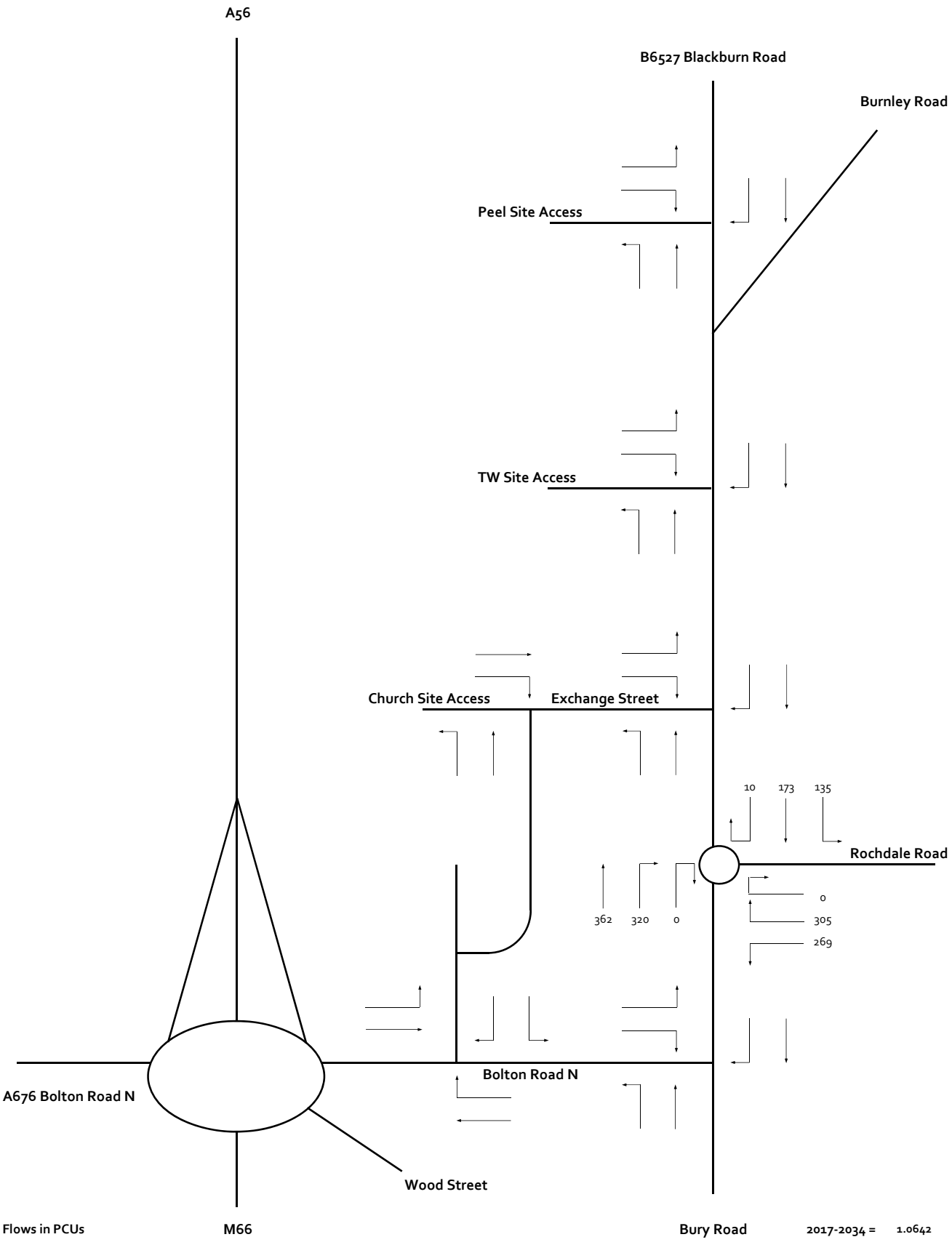

Figure 6 2034 Growthed Flows - Weekday PM Peak

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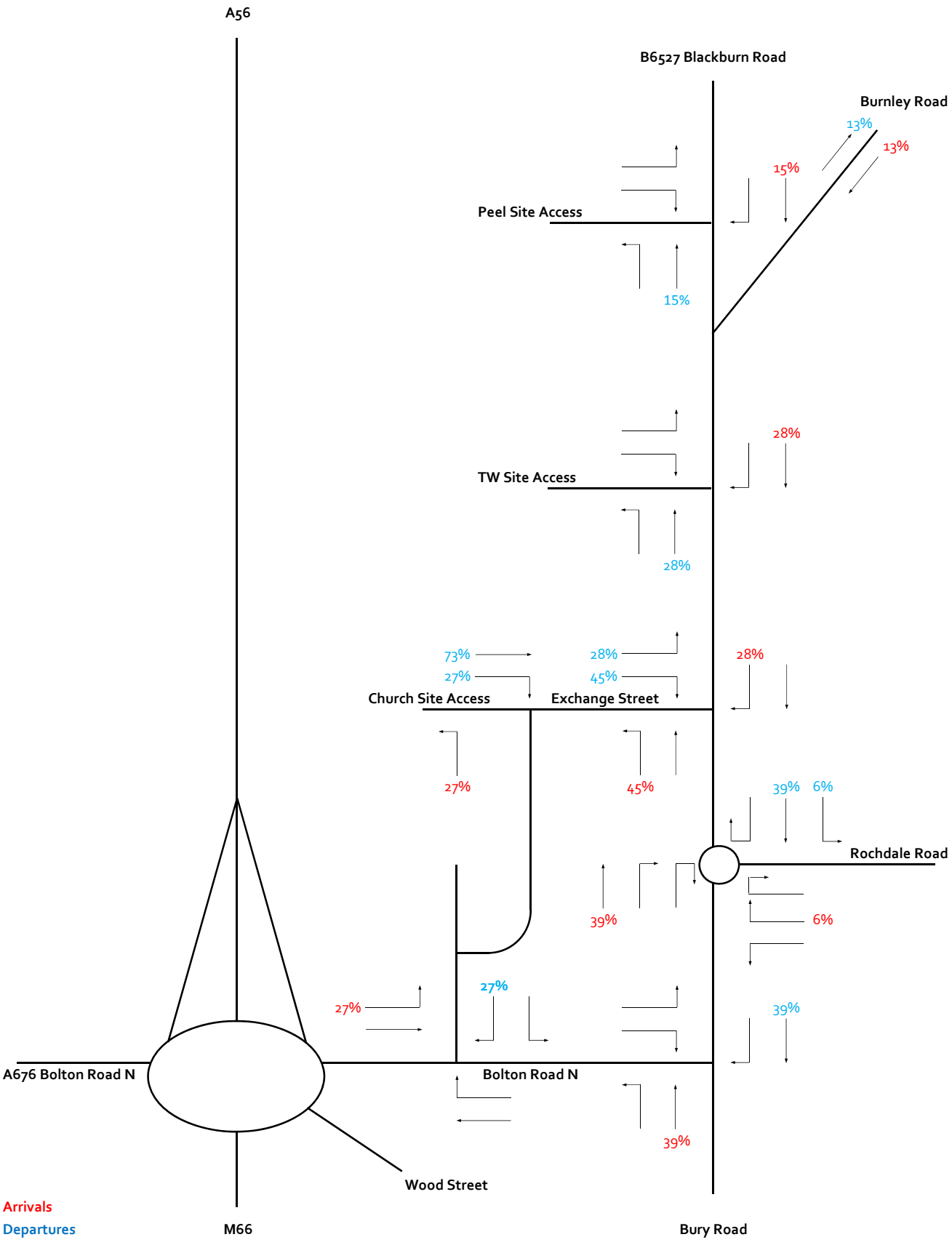

Figure 7 Proposed Church Land Vehicular Distribution

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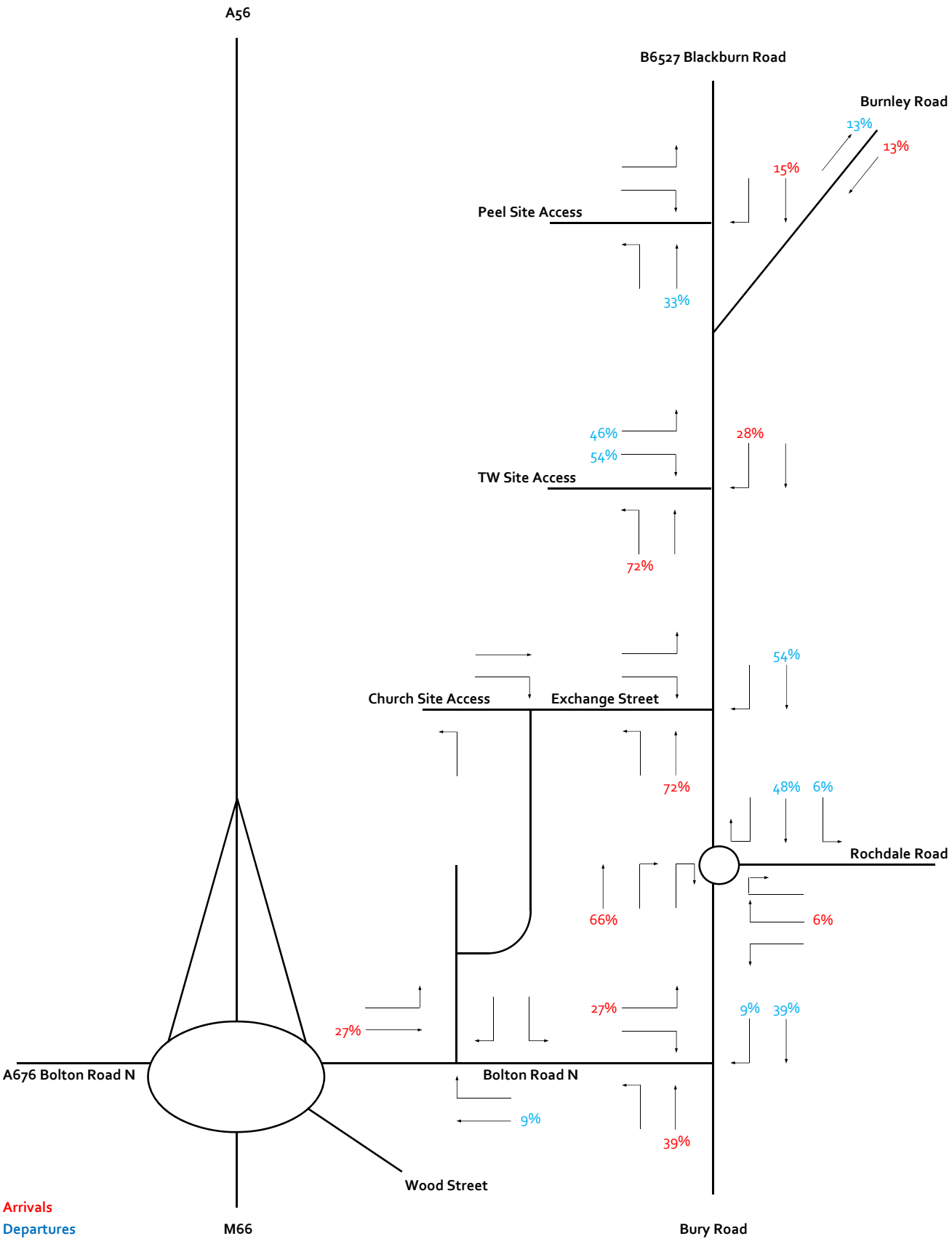

Figure 8 Proposed TW Land Vehicular Distribution

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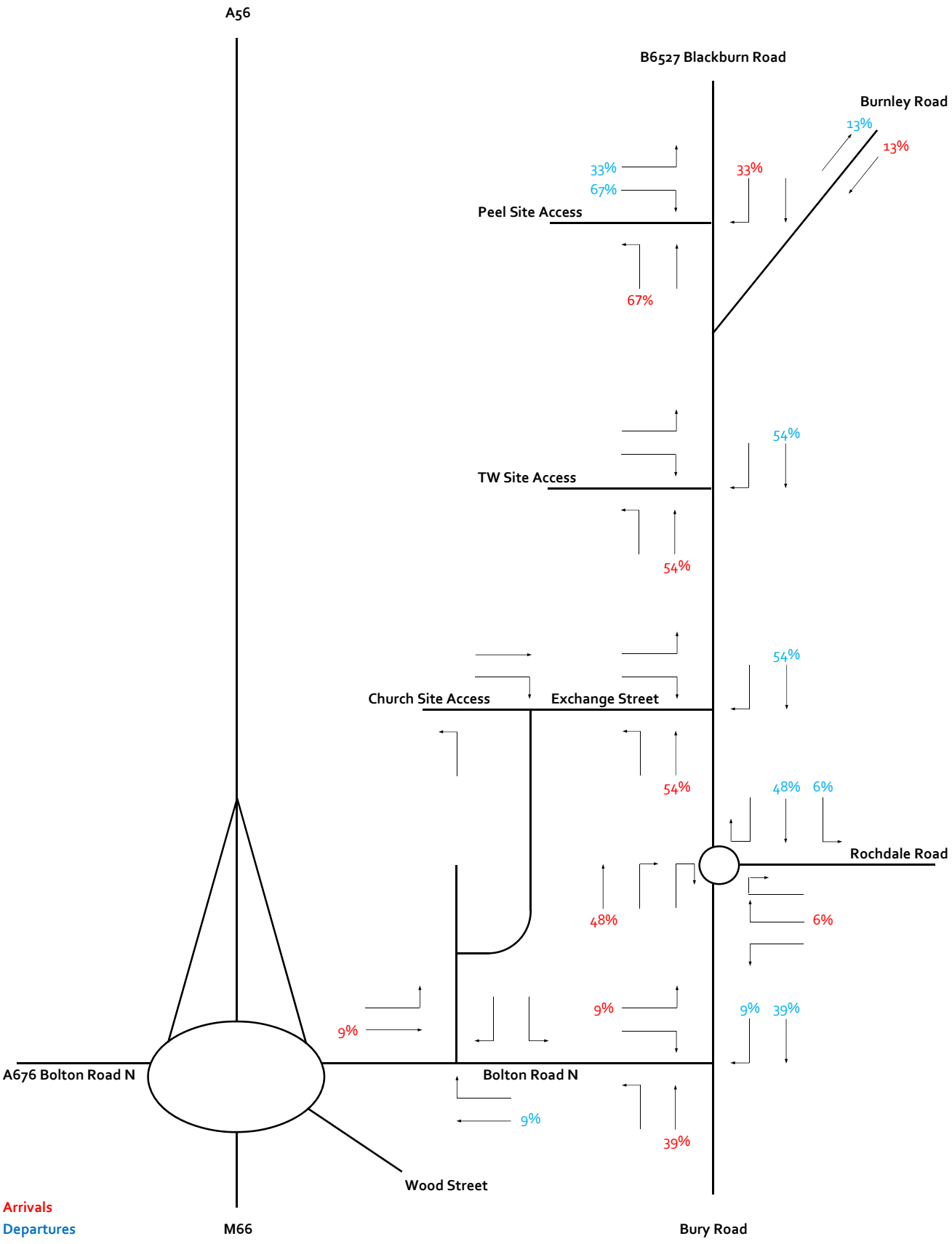

Figure 9 Proposed Peel Land Vehicular Distribution

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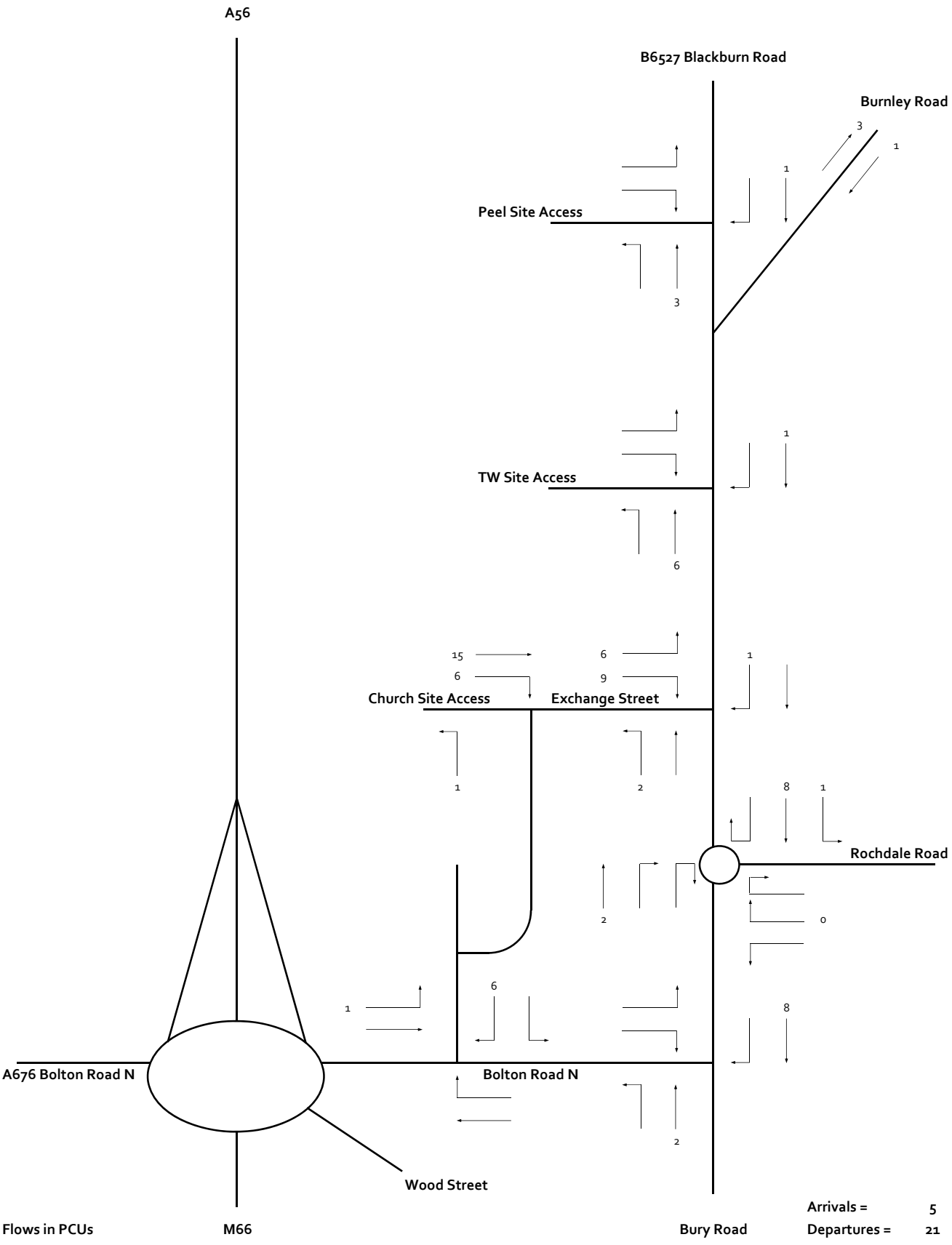

Figure 10 Proposed Church Land Trips - AM Peak

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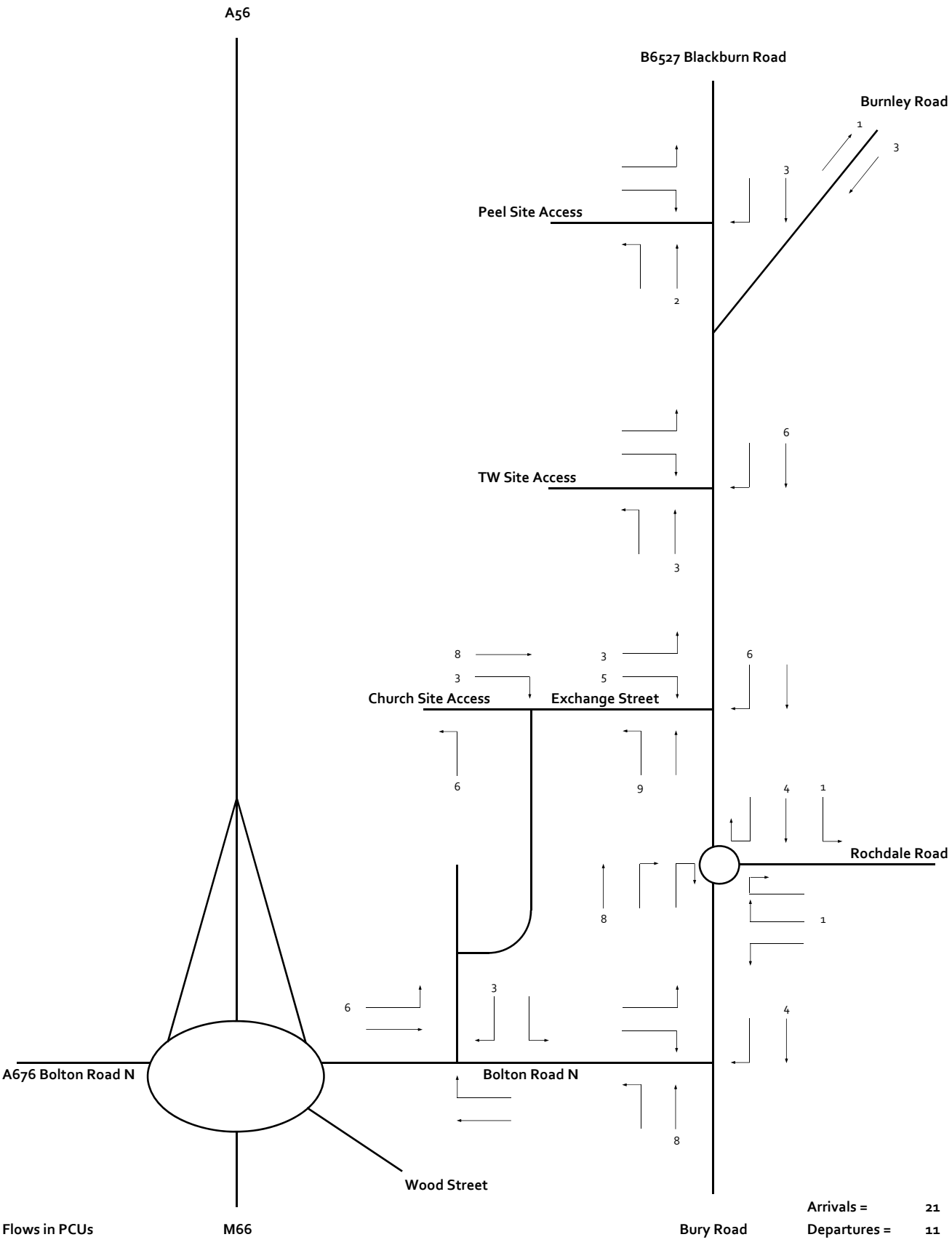

Figure 11 Proposed Church Land Trips - PM Peak

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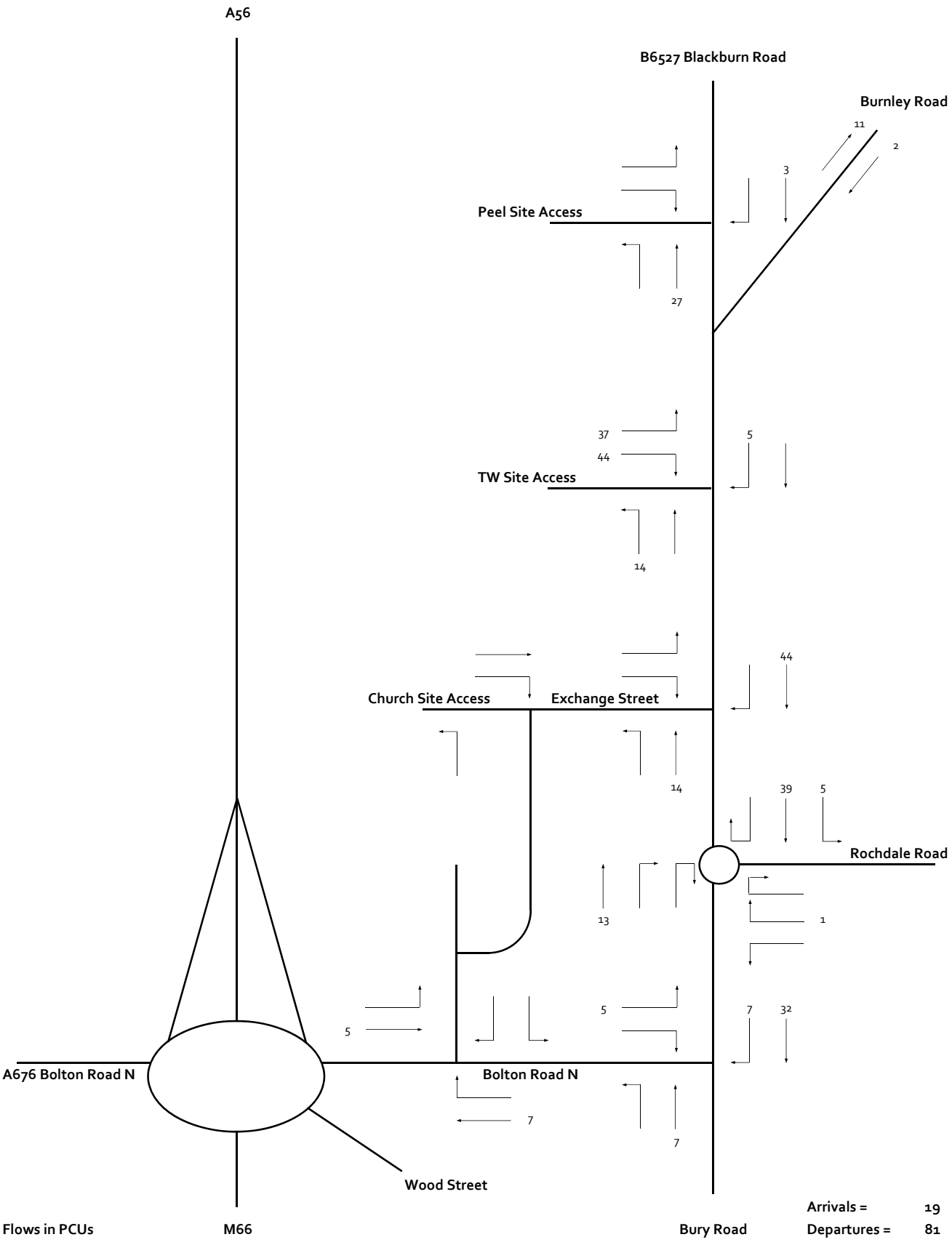

Figure 12 Proposed TW Site Trips - AM Peak

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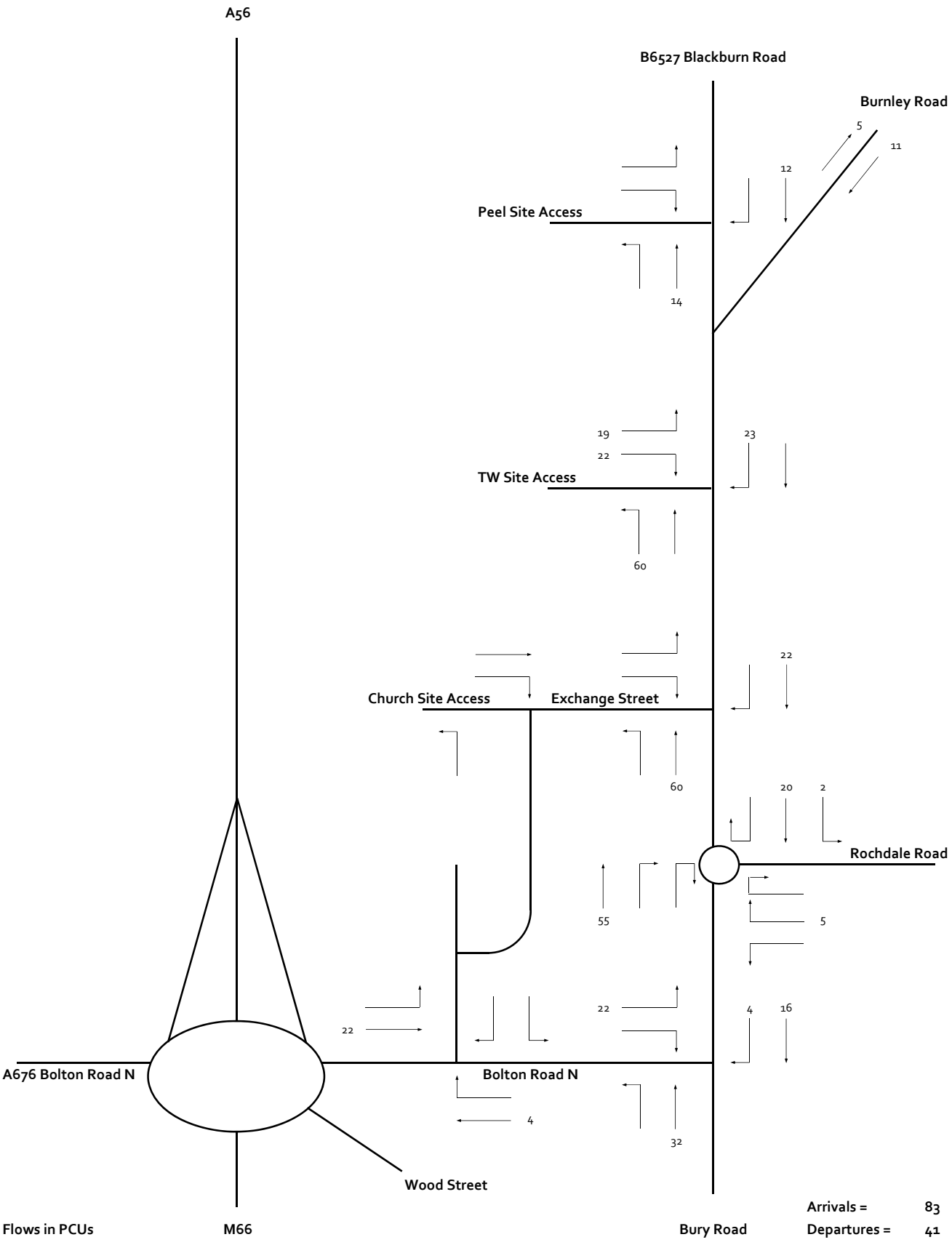

Figure 13 Proposed TW Land Trips - PM Peak

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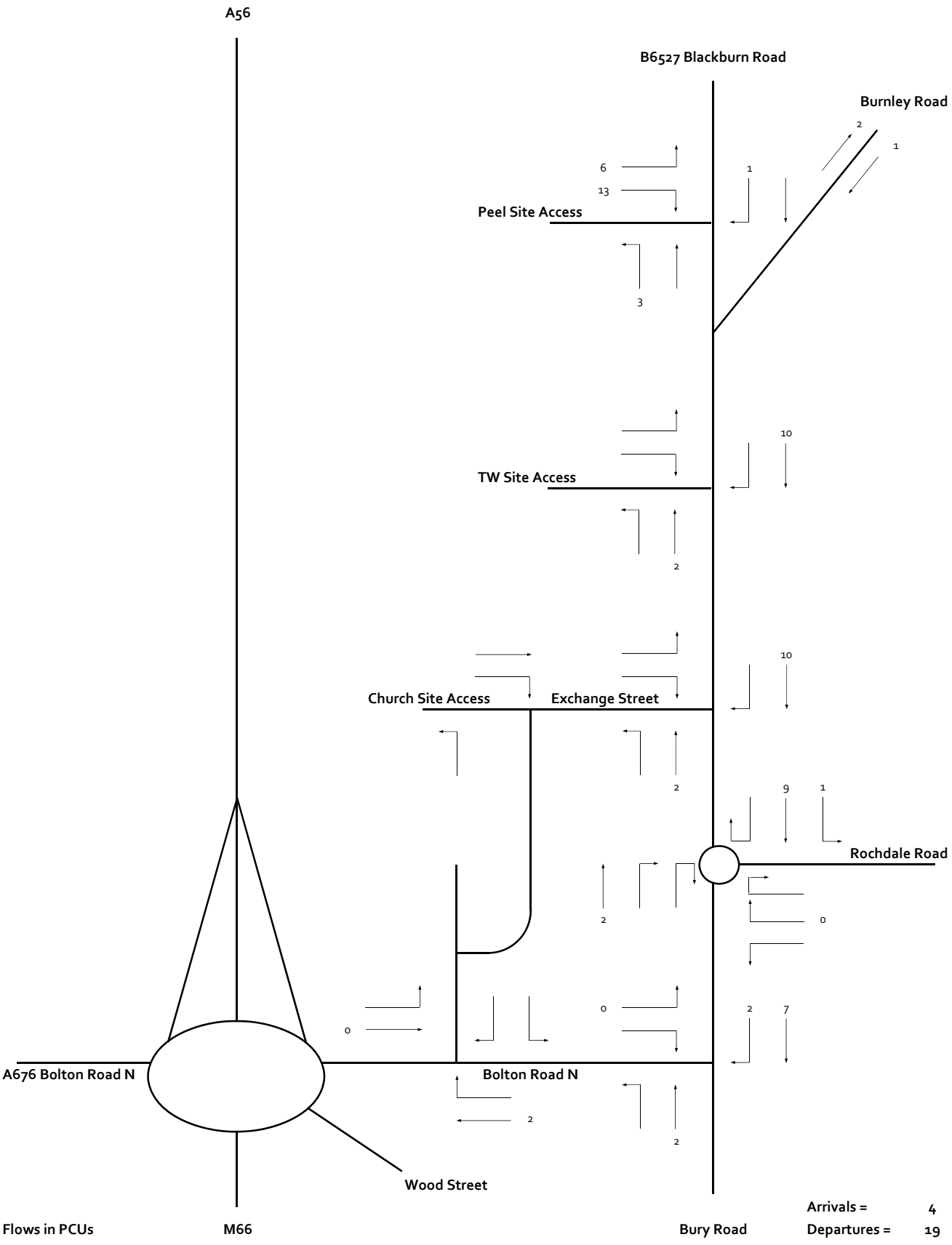

Figure 14 Proposed Peel Land Trips - AM Peak

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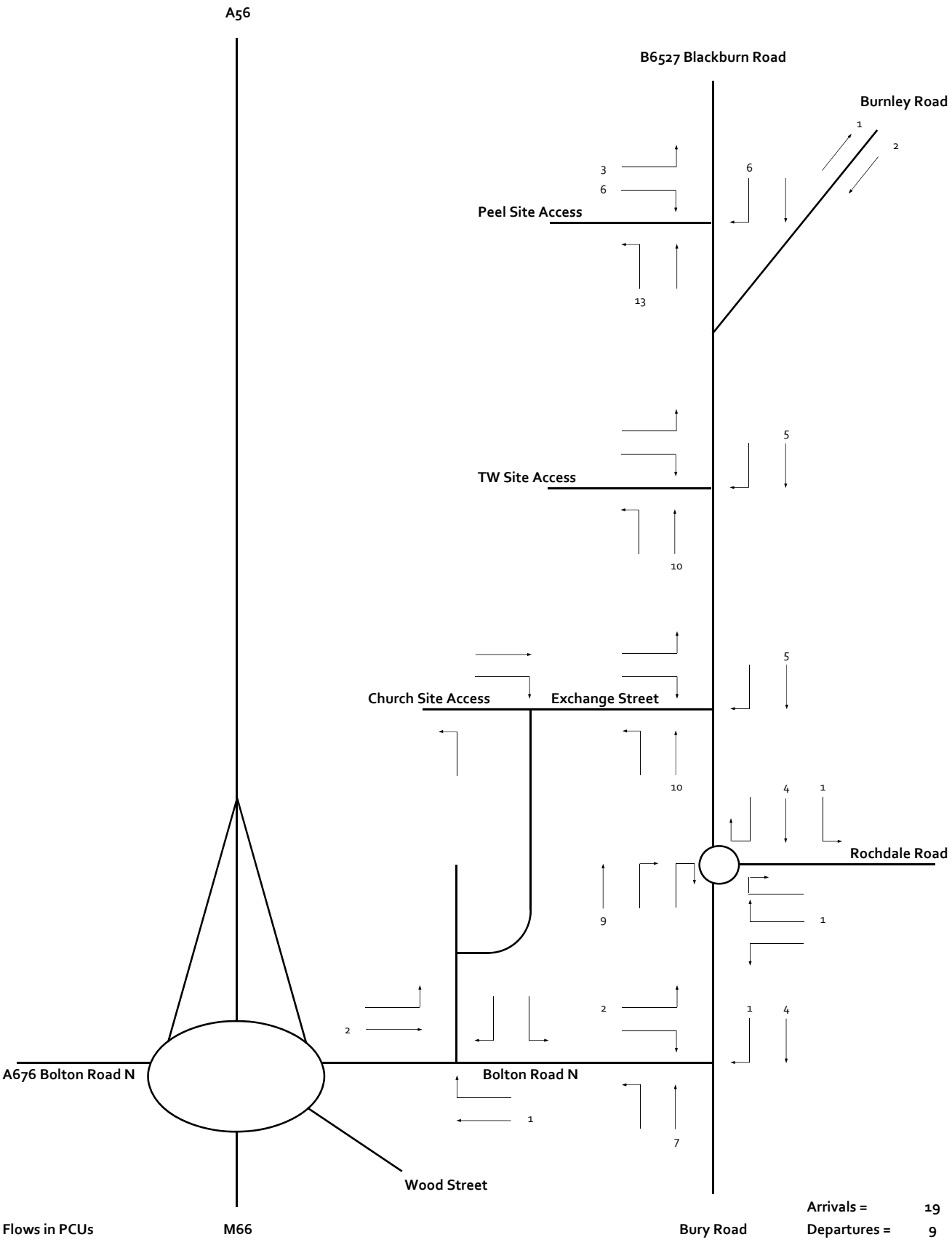

Figure 15 Proposed Peel Land Trips - PM Peak

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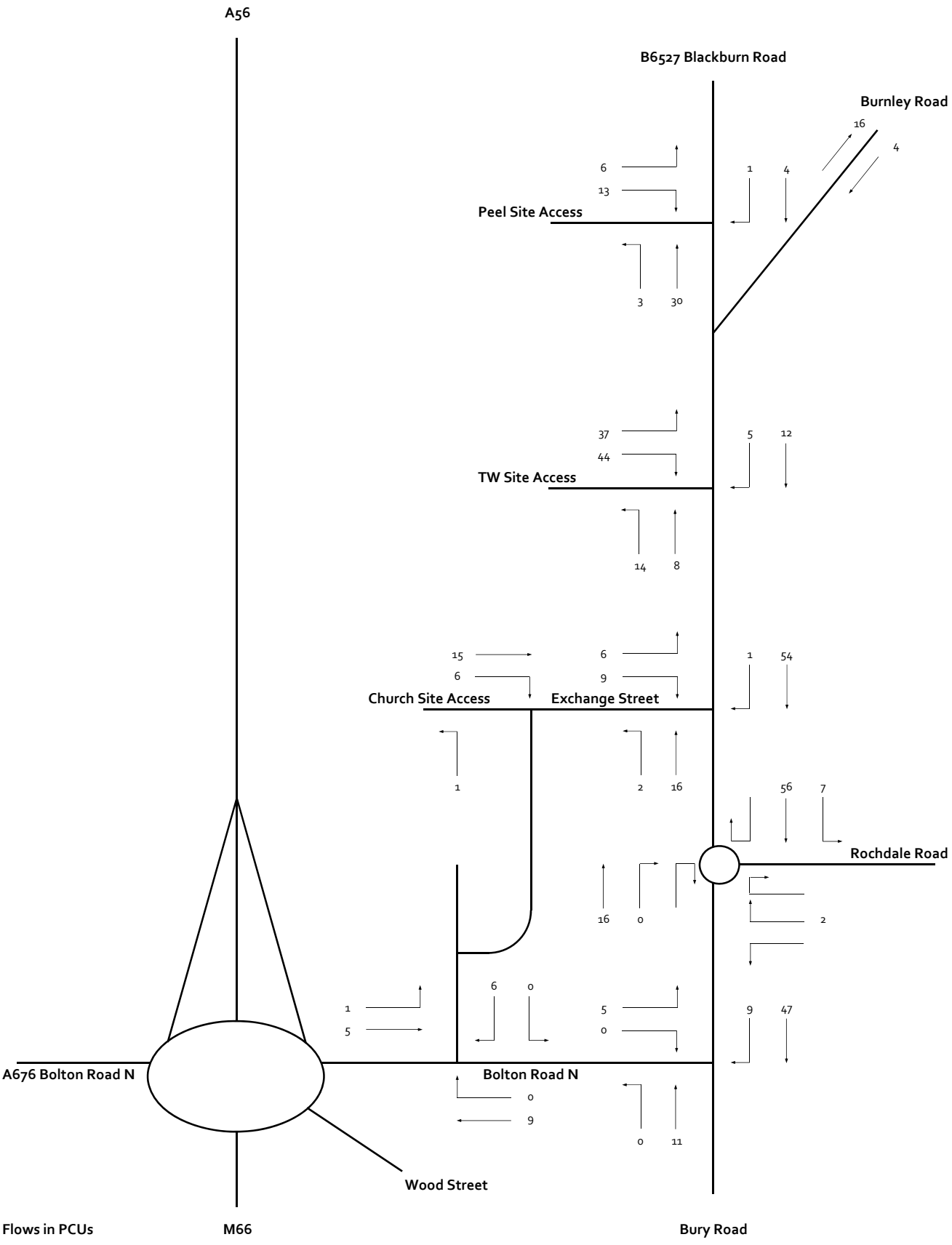

Figure 16 Total Proposed Residential Allocation Trips - AM Peak

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M15 4PY

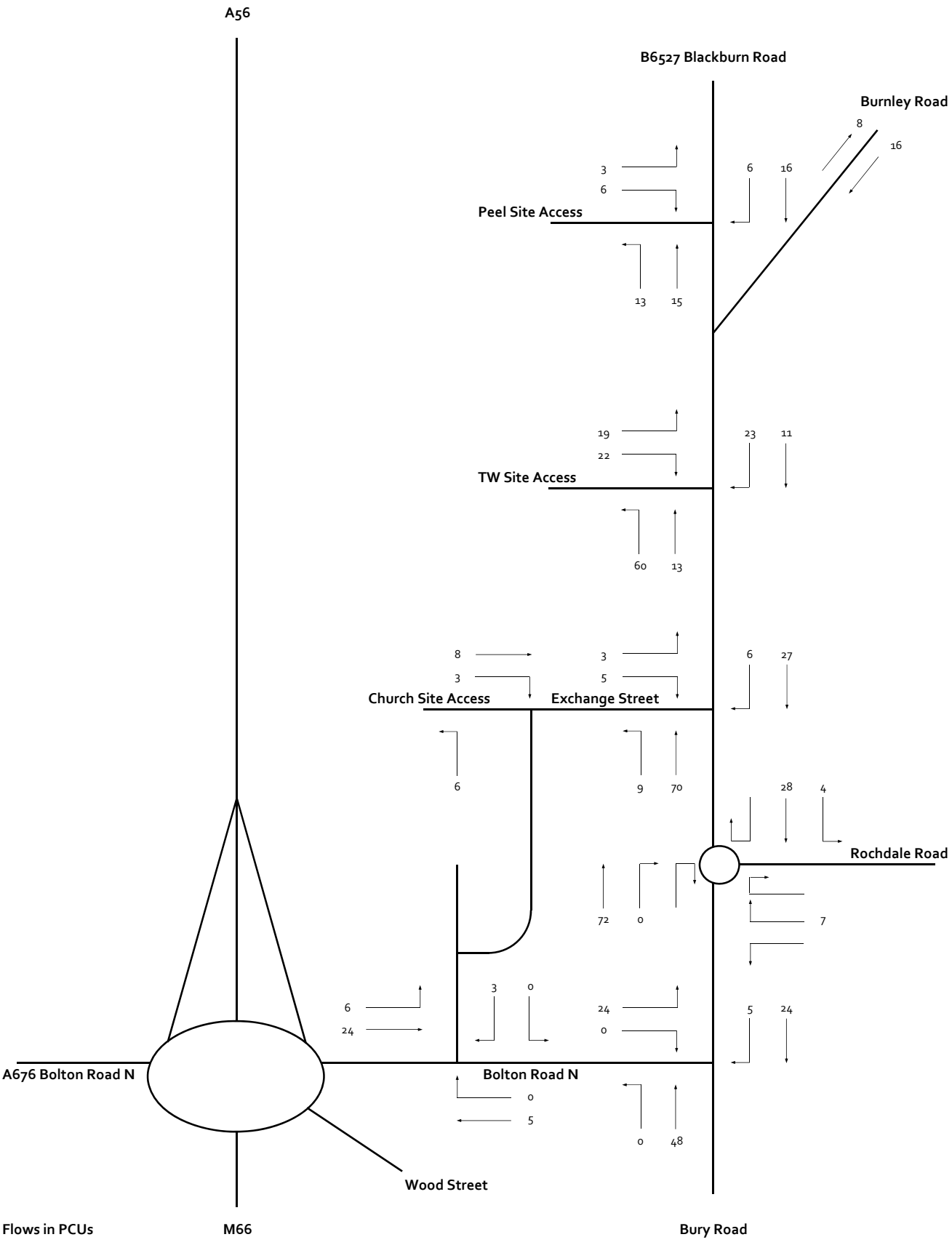

Figure 17 Total Proposed Residential Allocation Trips - PM Peak

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M15 4PY

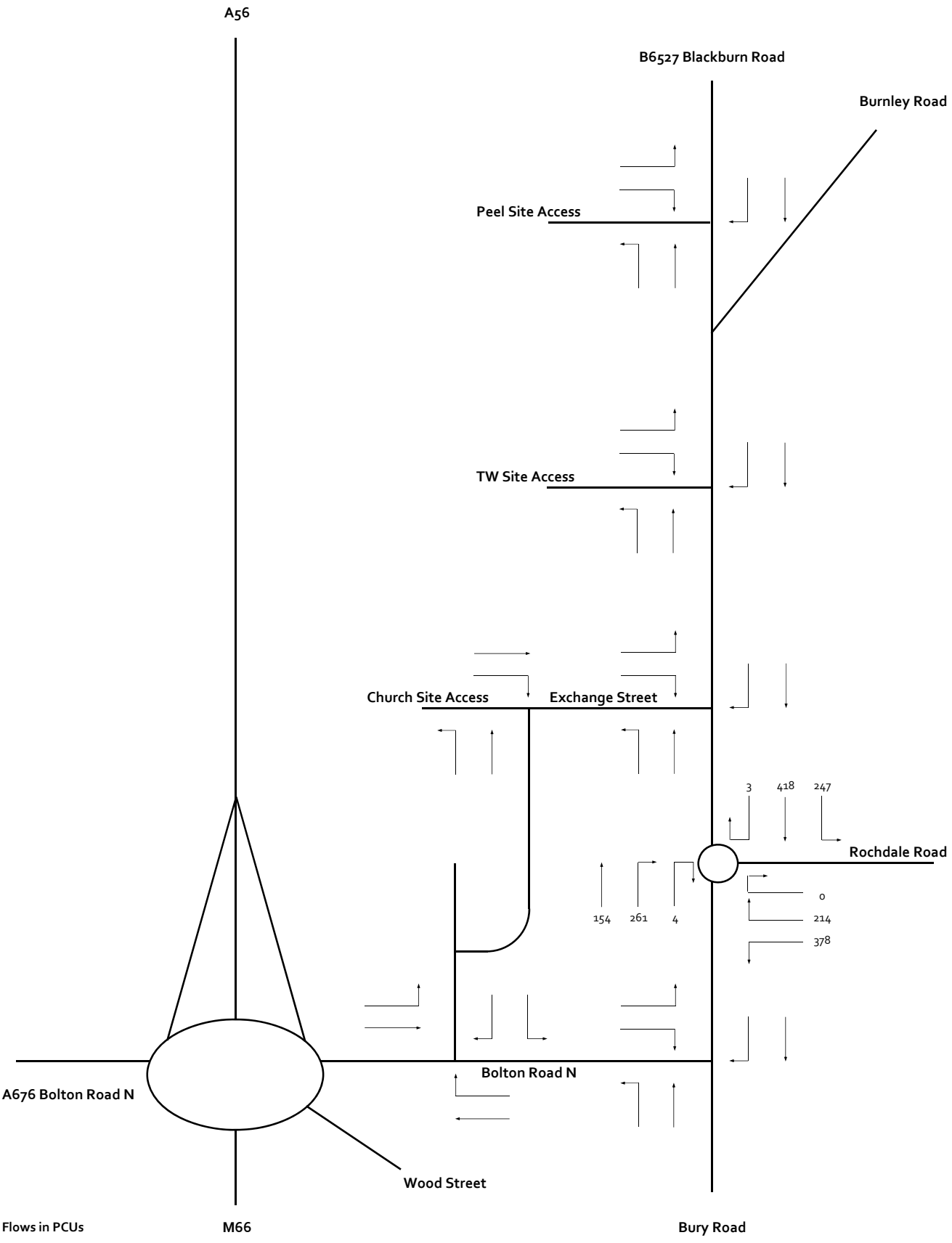

Figure 18 2024 'With Allocation' Flows - Weekday AM Peak

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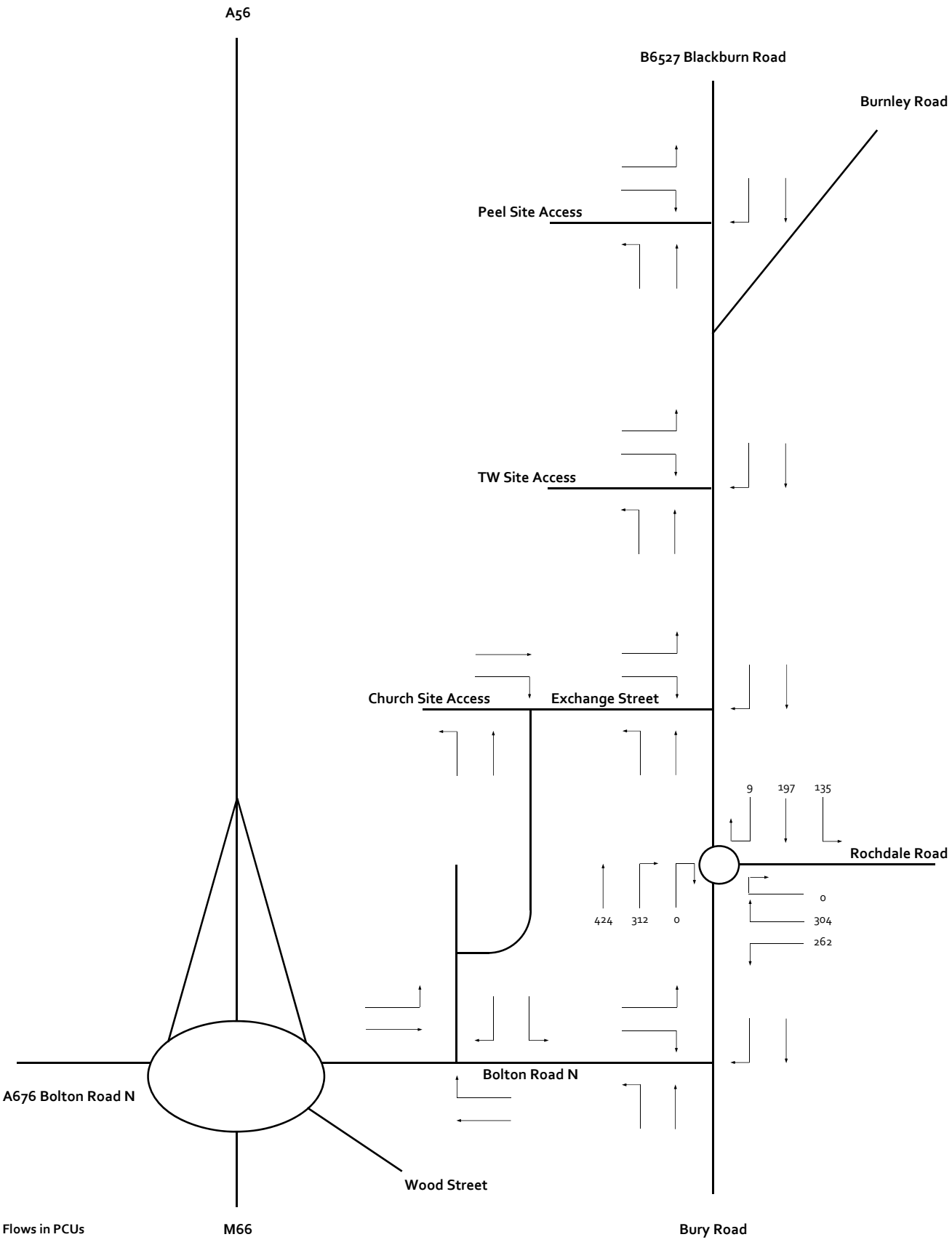

Figure 19 2024 'With Allocation' Flows - Weekday PM Peak

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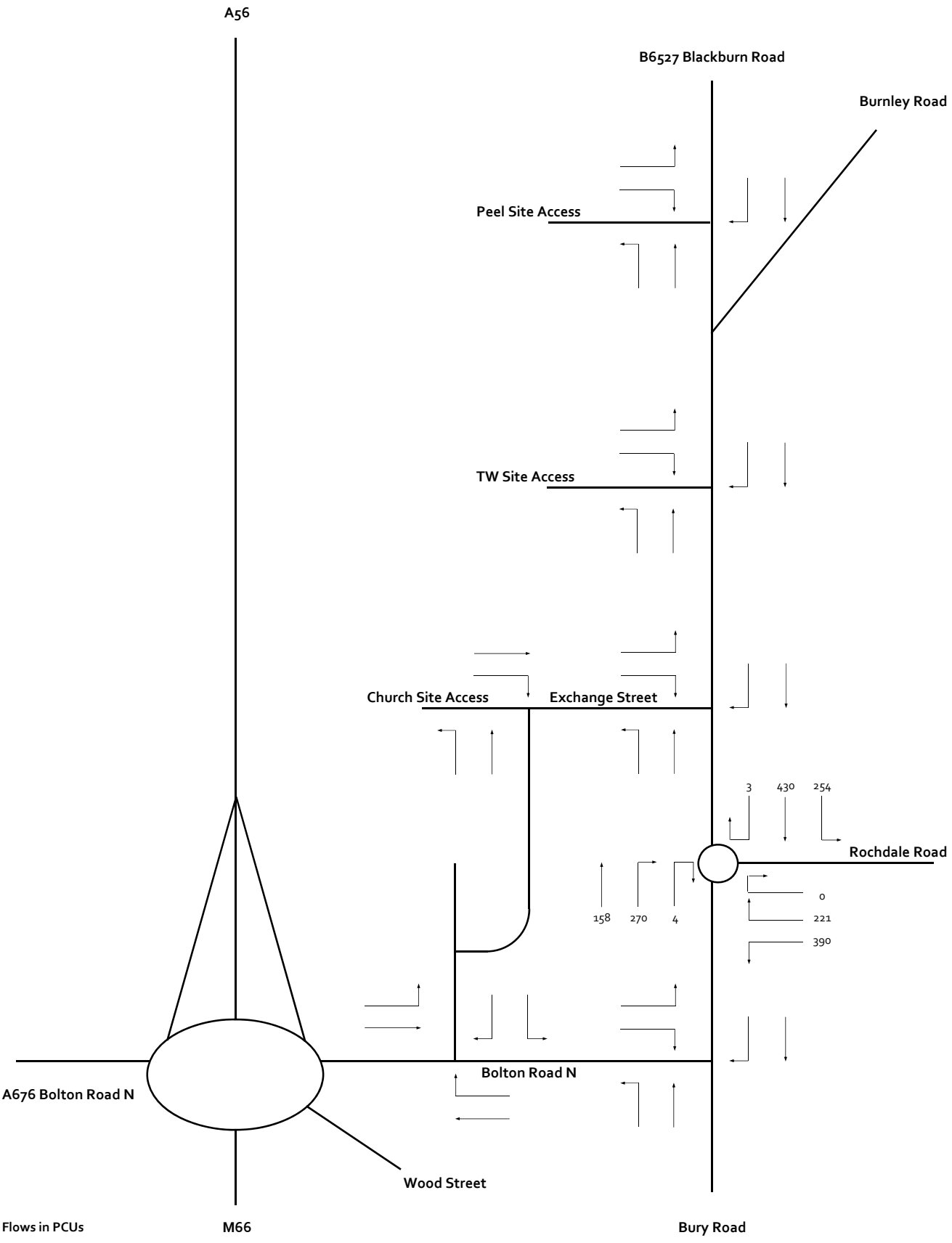

Figure 20 2034 'With Allocation' Flows - Weekday AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

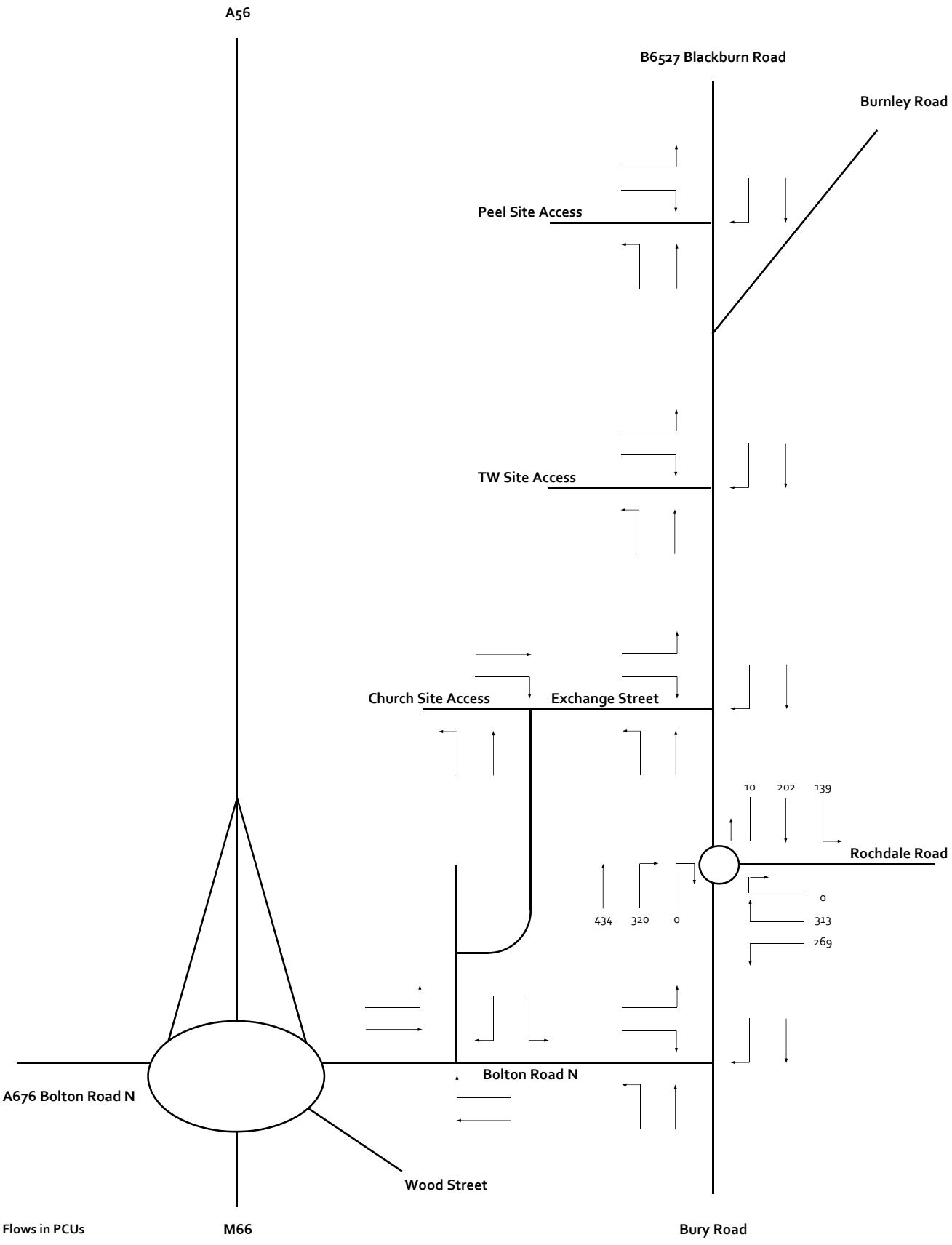

Figure 21 2034 'With Allocation' Flows - Weekday PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

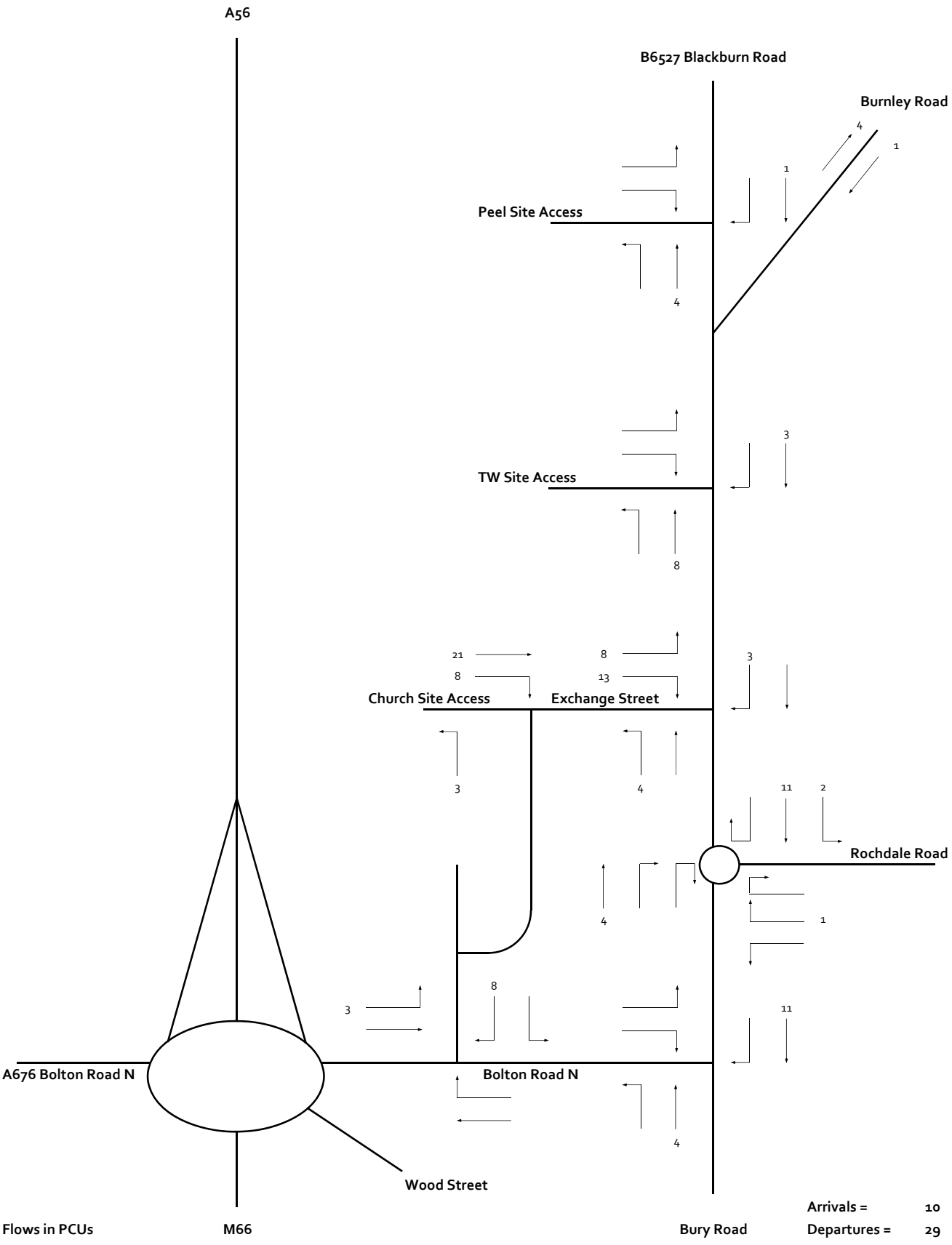

Figure 22 Proposed Church Land Sensitivity Trips - AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

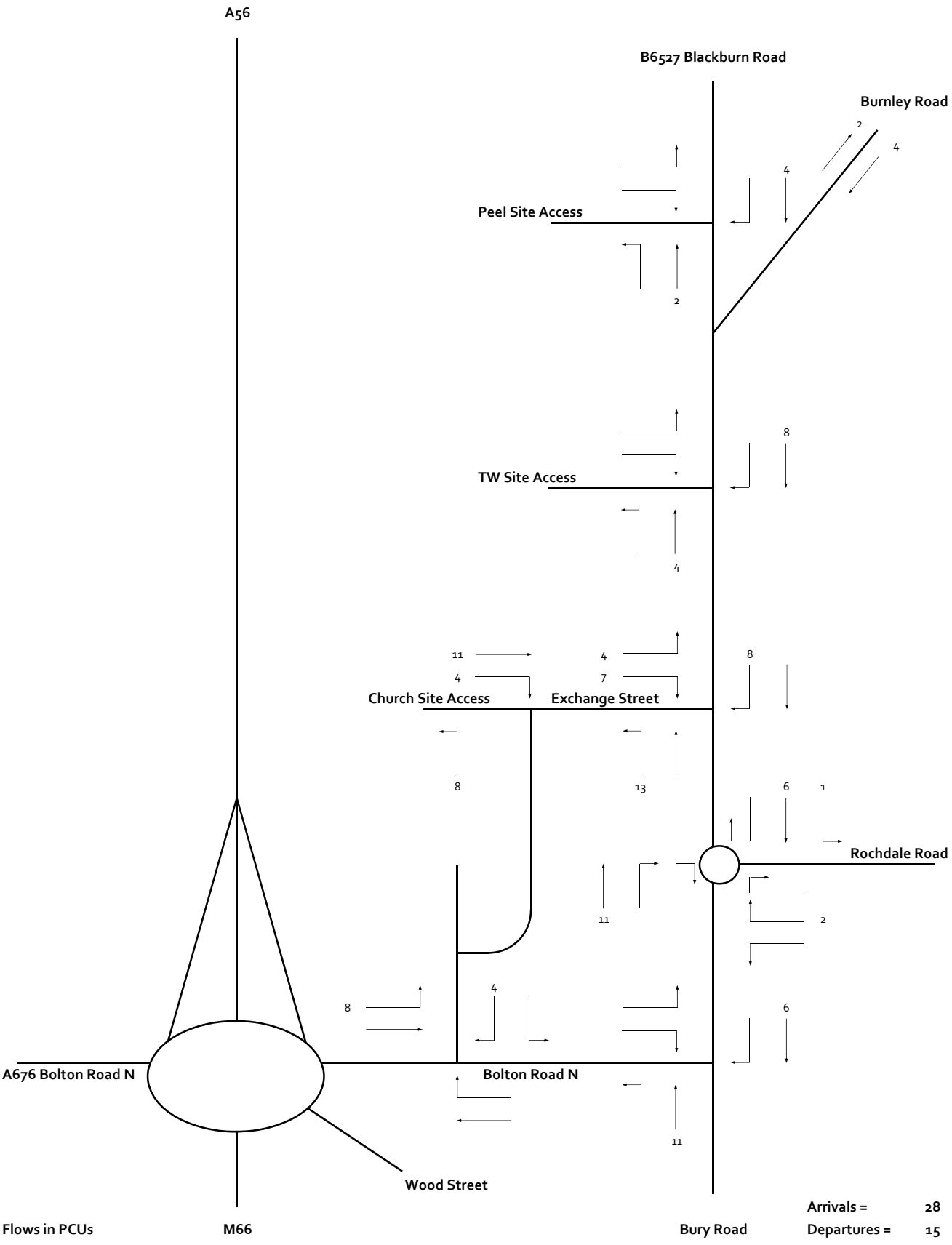

Figure 23 Proposed Church Land Sensitivity Trips - PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

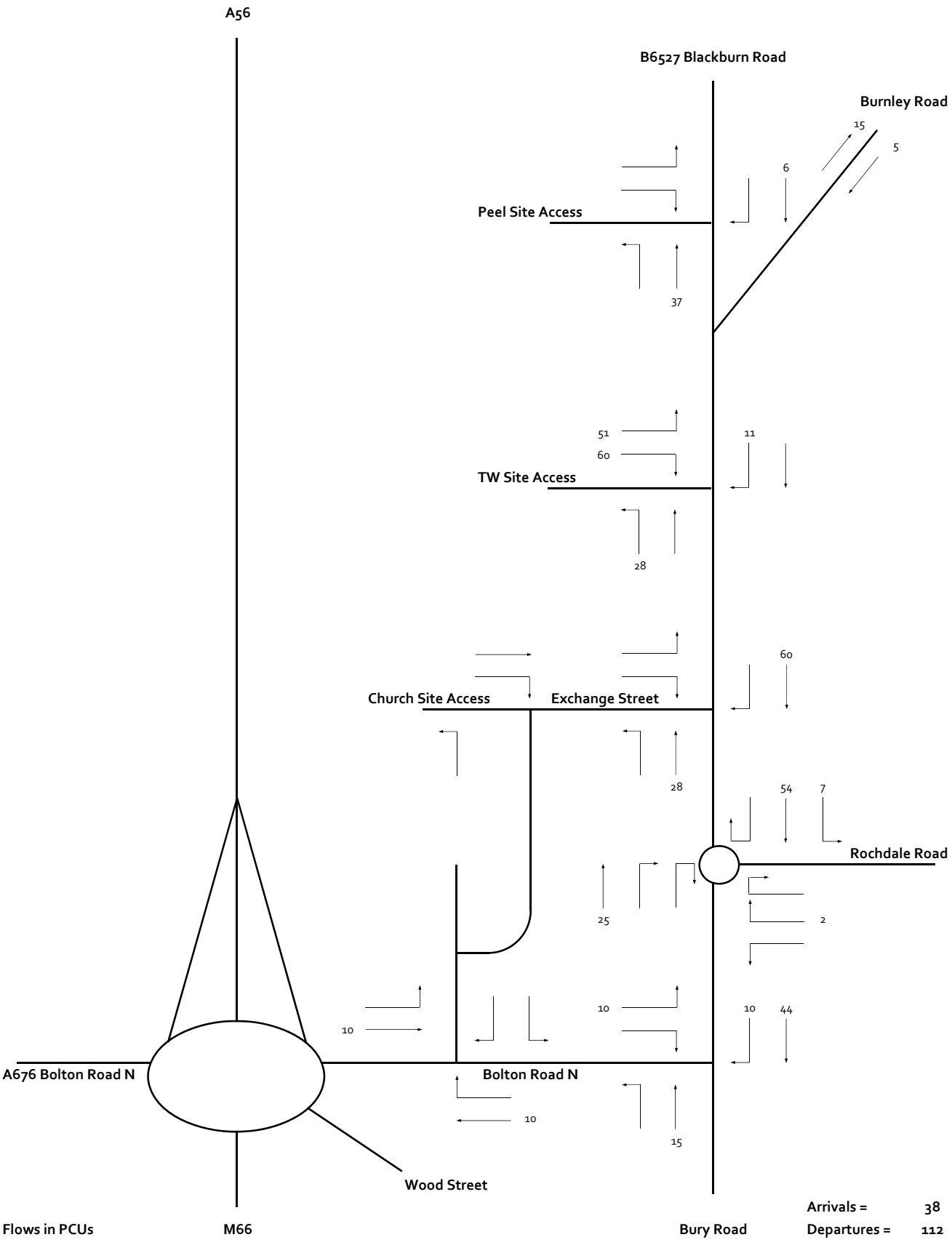

Figure 24 Proposed TW Land Sensitivity Trips - AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

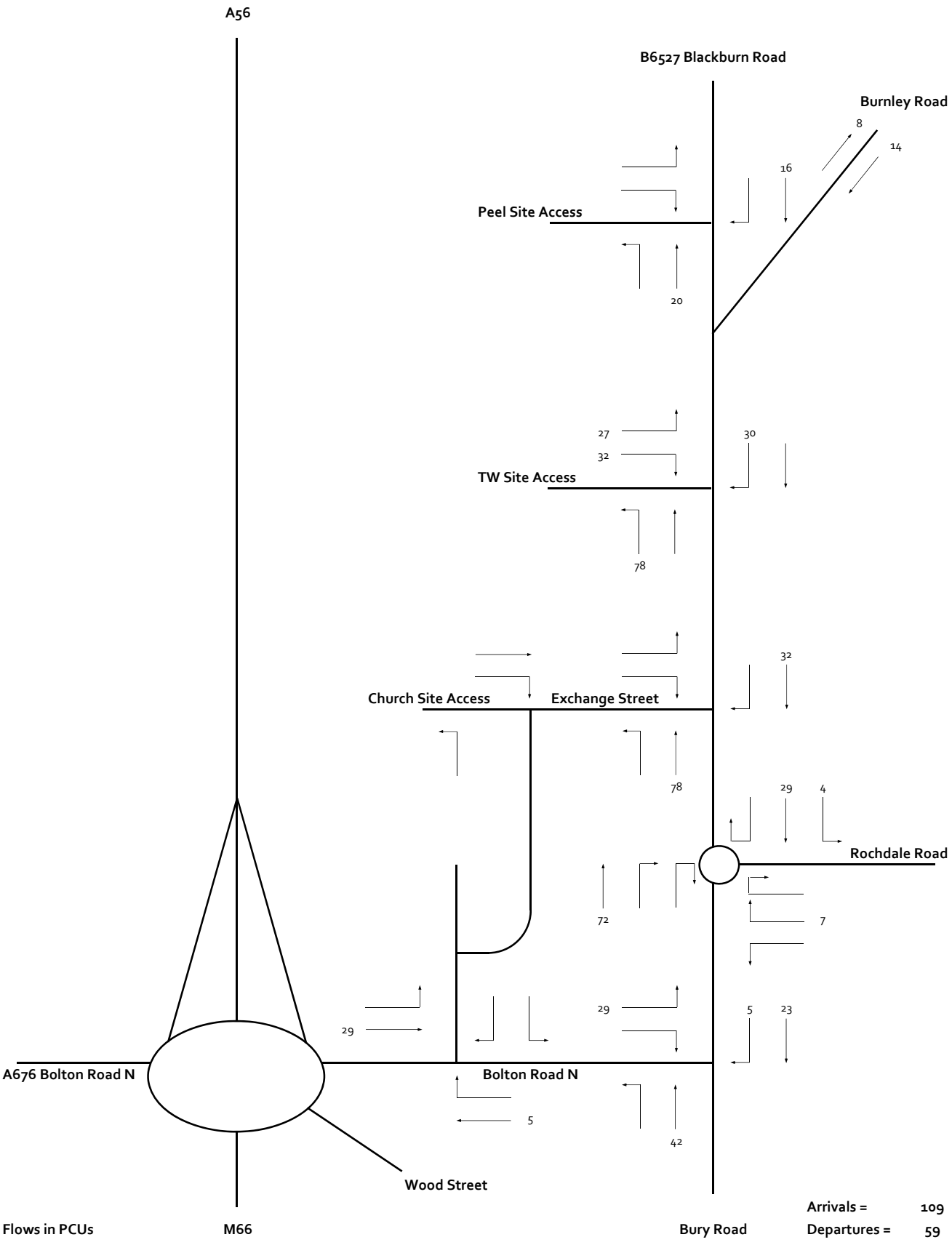

Figure 25 Proposed TW Land Sensitivity Trips - PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

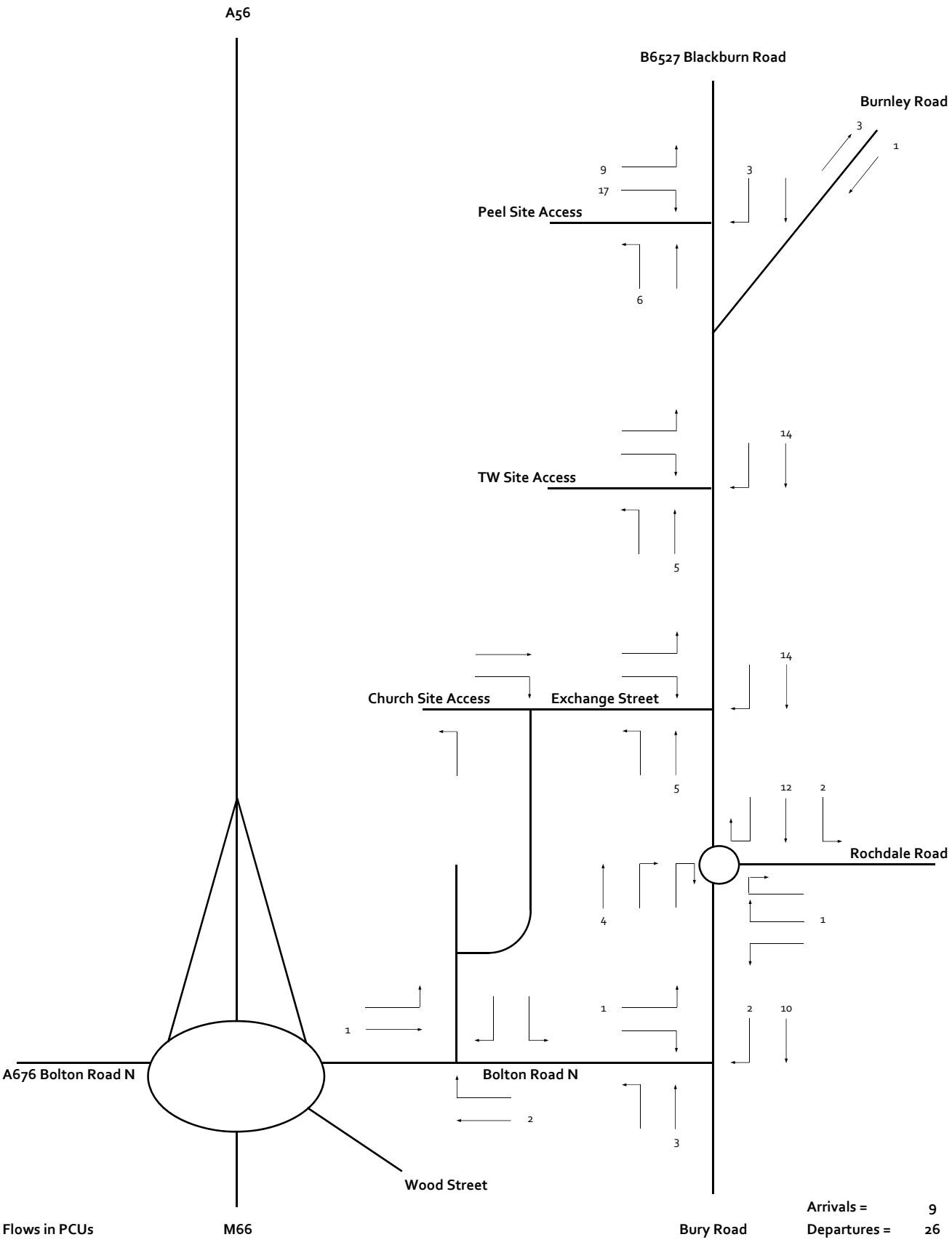

Figure 26 Proposed Peel Land Sensitivity Trips - AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

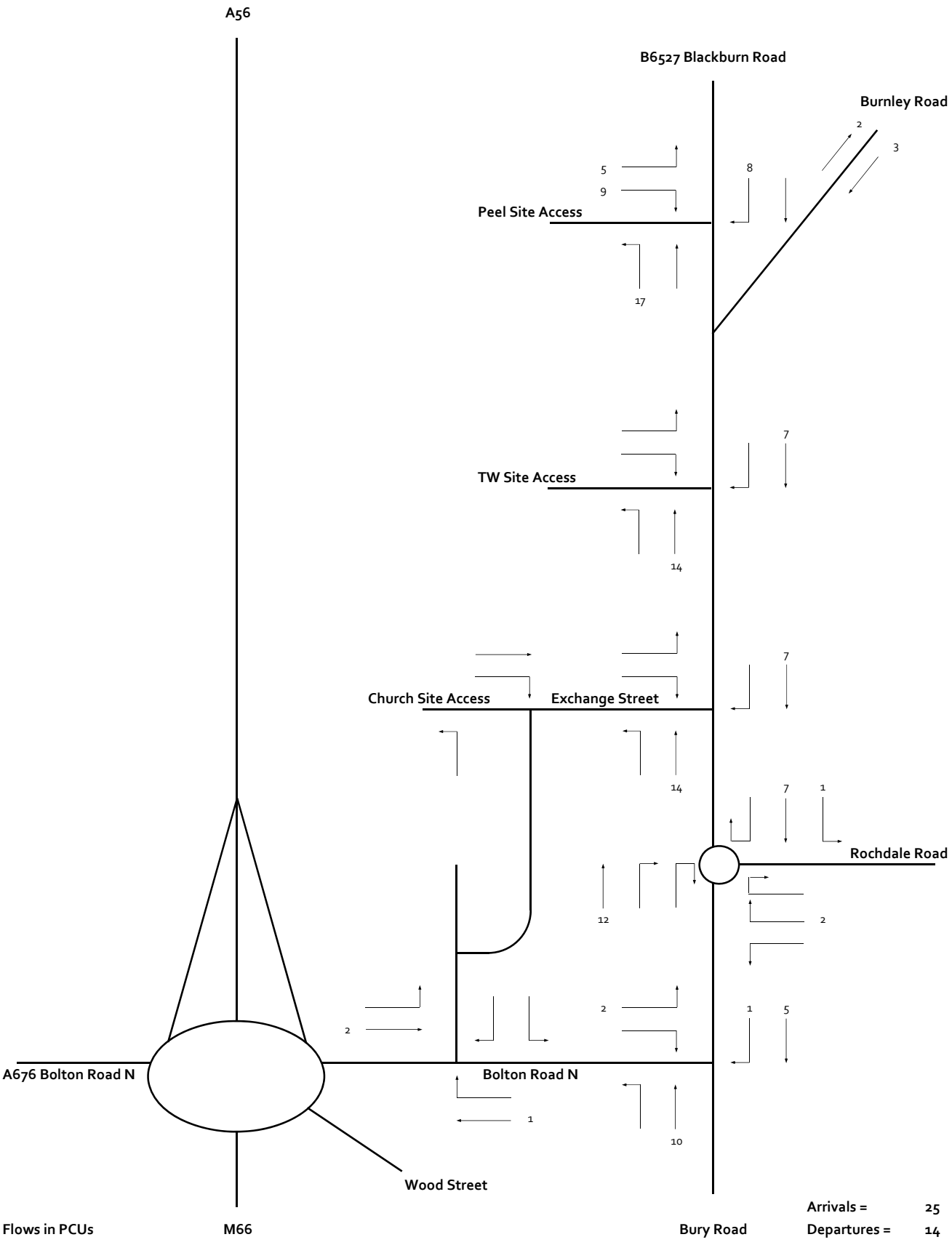

Figure 27 Proposed Peel Land Sensitivity Trips - PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

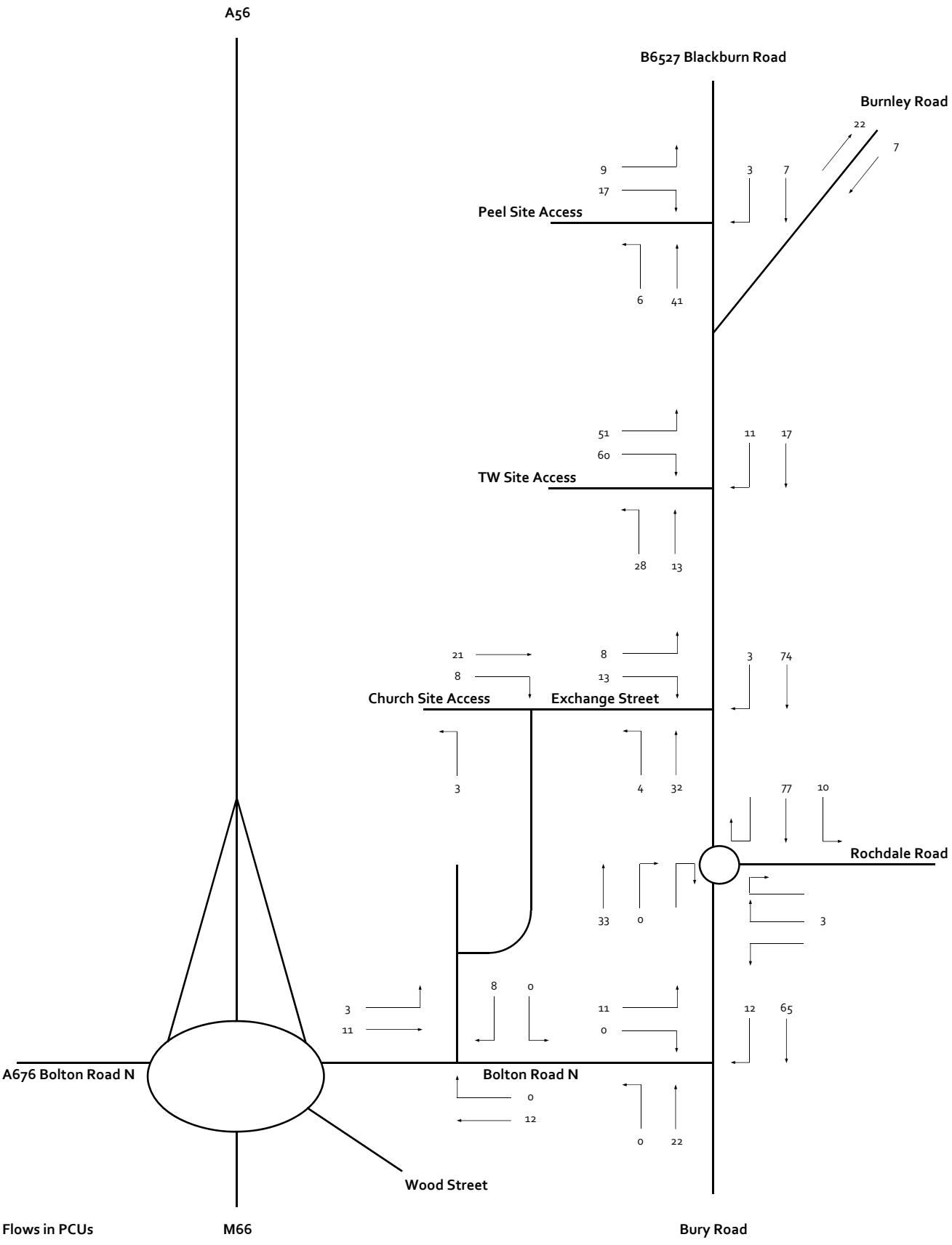

Figure 28 Total Proposed Residential Allocation Sensitivity Trips - AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

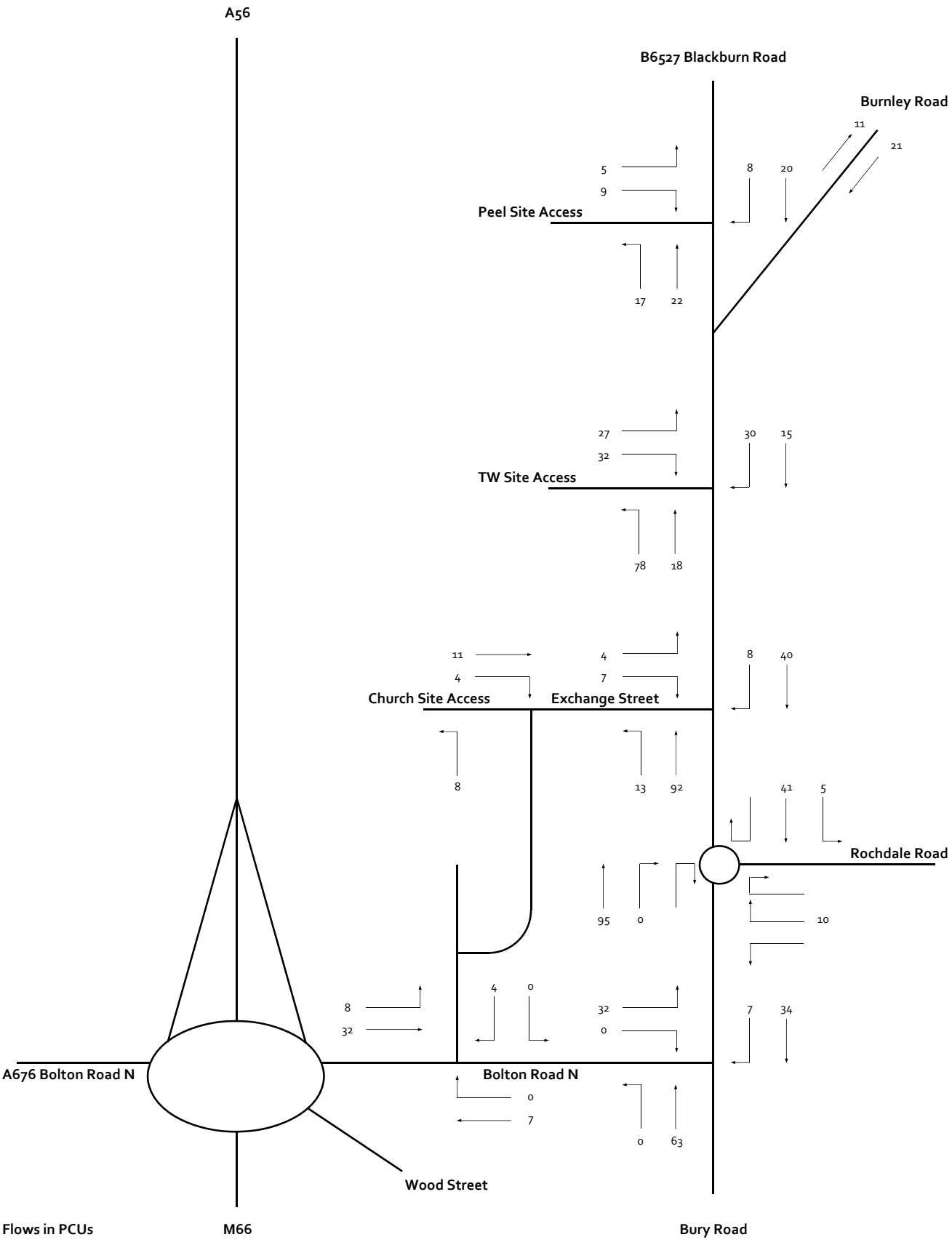

Figure 29 Total Proposed Residential Allocation Sensitivity Trips - PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

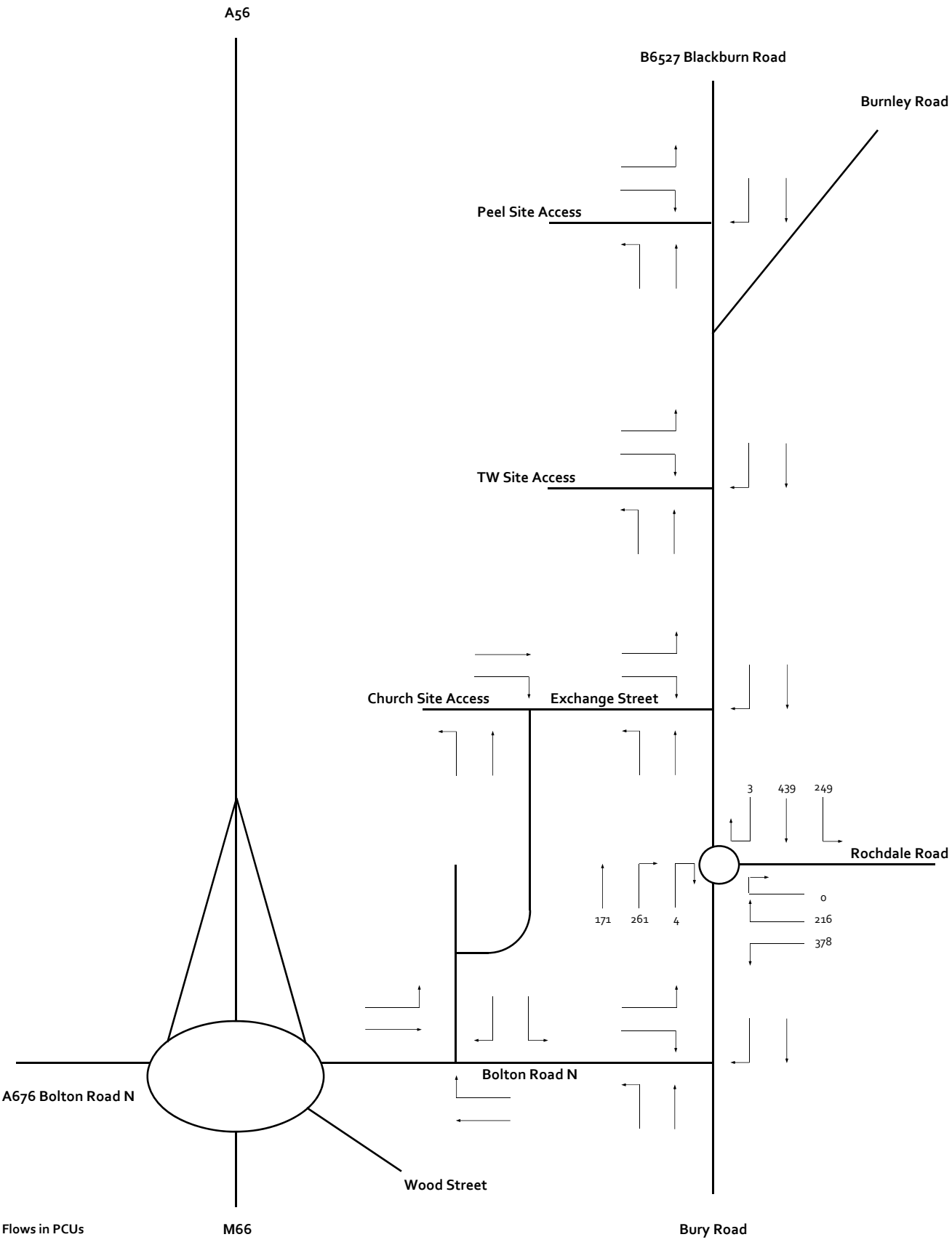

Figure 30 2024 'With Allocation' Sensitivity Flows - Weekday AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

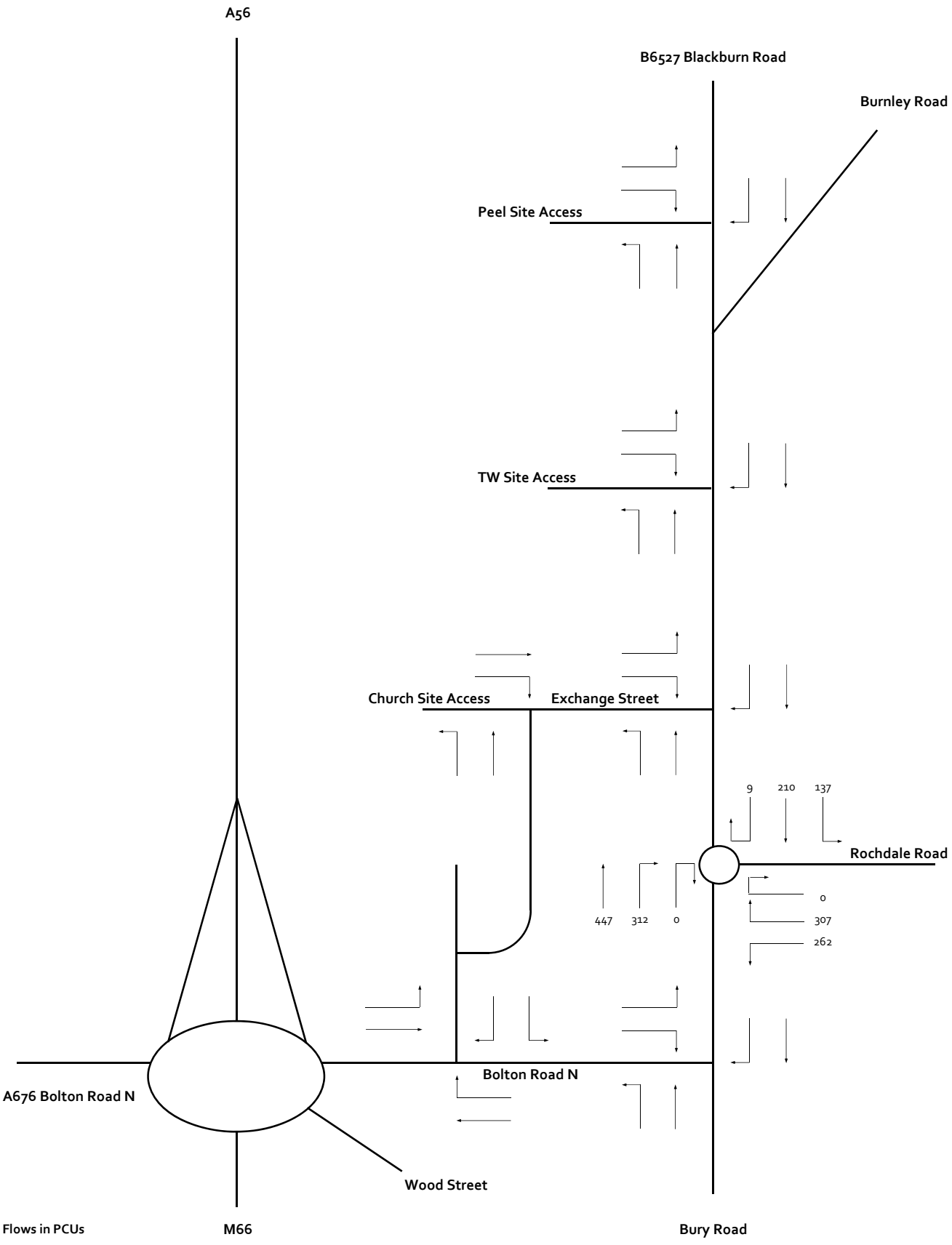

Figure 31 2024 'With Allocation' Sensitivity Flows - Weekday PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

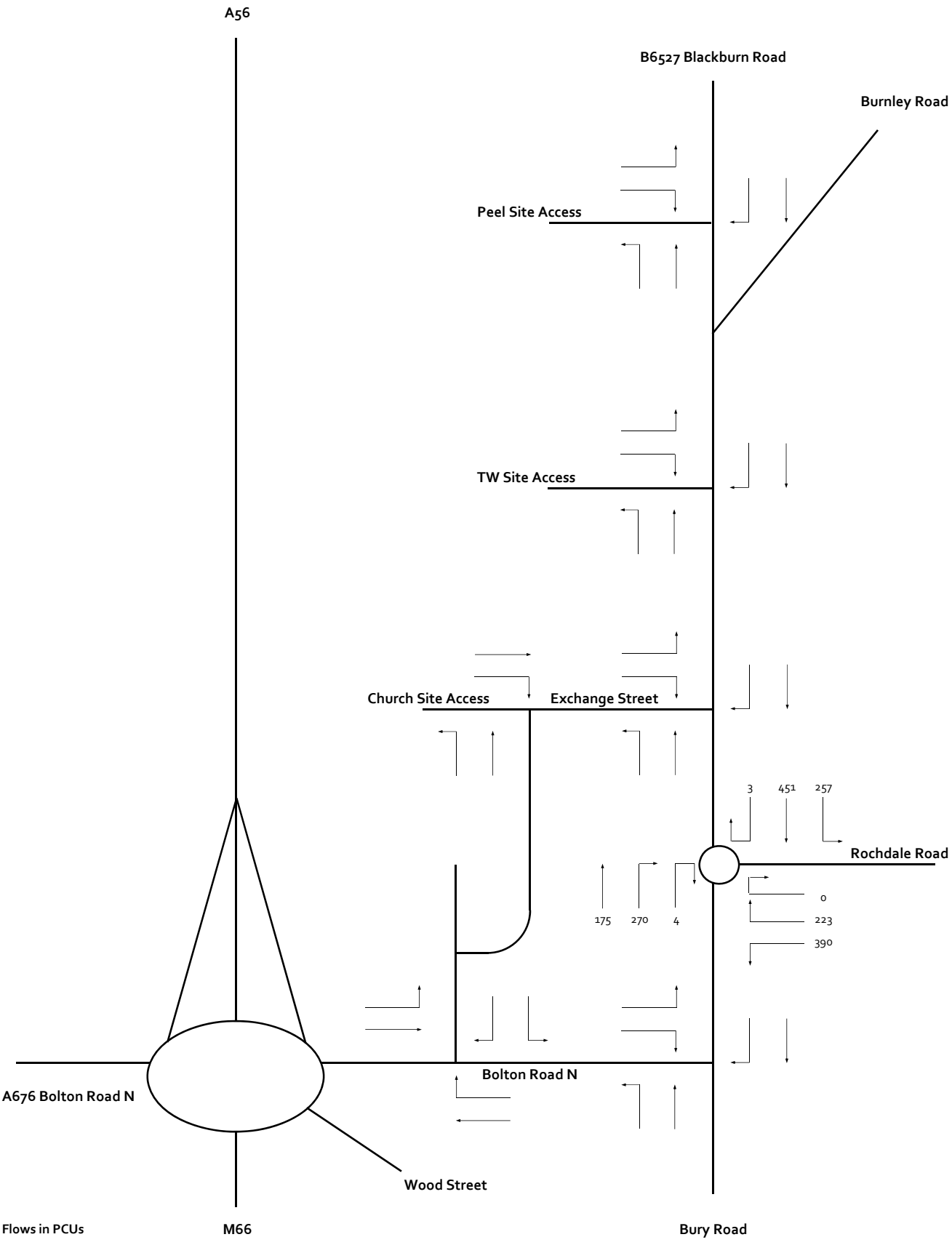

Figure 32 2034 'With Allocation' Sensitivity Flows - Weekday AM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

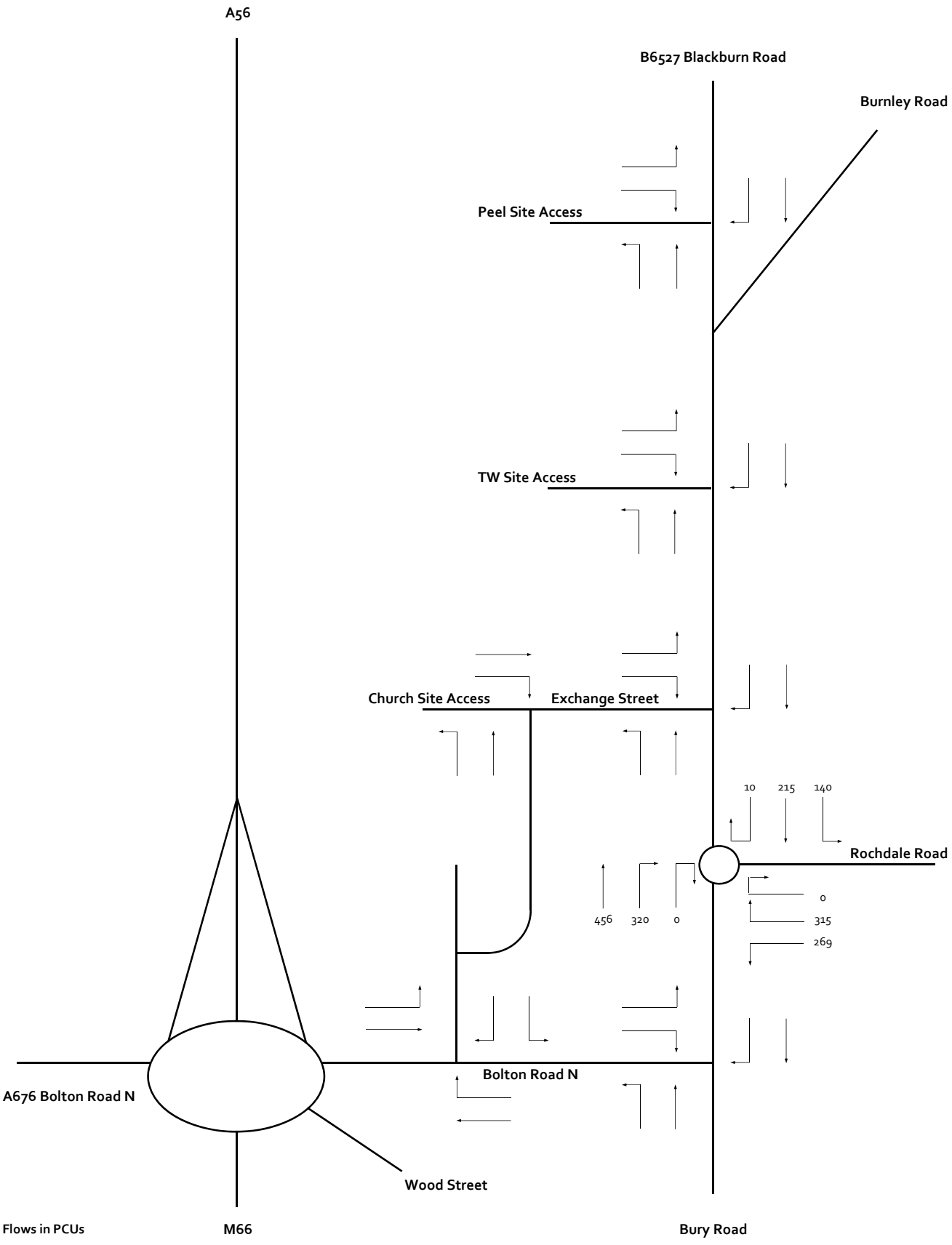

Figure 33 2034 'With Allocation' Sensitivity Flows - Weekday PM Peak

Croft Transport Planning & Design
Hill Quays
9 Jordan Street
Manchester
M15 4PY

APPENDICES

APPENDIX 1

Survey Data

	B652 Market Street (North Arm)							
	Bear Left Turn							Bear Left T
Interval	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
07:00	0	0	29	3	0	0	0	32
07:15	0	2	40	7	0	0	1	50
07:30	0	0	61	6	0	0	0	67
07:45	0	0	38	10	1	0	0	49
08:00	0	0	51	7	3	0	0	61
08:15	0	0	44	3	1	0	1	49
08:30	0	0	40	4	0	0	0	44
08:45	0	0	41	8	0	0	0	49
16:00	0	0	22	4	0	0	1	27
16:15	0	0	36	3	1	0	0	40
16:30	0	0	23	1	0	0	0	24
16:45	0	0	22	4	0	0	0	26
17:00	0	1	33	2	0	0	0	36
17:15	0	0	25	3	2	0	0	30
17:30	0	0	32	3	0	0	0	35
17:45	0	0	26	3	2	0	0	31
Grand Tota	0	3	563	71	10	0	3	650

urn Total	Bear Right Turn							Bear Right
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	1	49	2	1	1	1	55
	0	0	68	6	1	1	4	80
	0	0	75	11	1	0	2	89
	0	1	90	7	4	1	2	105
	1	1	63	6	3	0	2	76
	1	1	54	10	0	0	2	68
	0	2	60	10	1	0	1	74
	0	0	46	4	0	0	0	50
	0	0	38	5	0	0	0	43
	0	0	41	5	0	0	0	46
	2	0	31	4	0	1	1	39
	0	0	28	7	0	0	1	36
	0	2	35	2	0	0	0	39
	0	0	45	1	1	0	2	49
	0	0	33	4	0	0	0	37
	2	1	36	2	0	0	1	42
	6	9	792	86	12	4	19	928

Turn Total	U-Turn							U-Turn Tota
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	1	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	1
	0	0	1	0	0	0	0	1
	0	0	1	0	0	0	0	1
	0	0	1	1	0	0	0	2
	0	0	1	0	0	0	0	1
	0	0	1	0	0	0	0	1
	0	0	2	0	0	0	0	2
	0	0	1	0	0	0	0	1
	0	0	2	0	0	0	0	2
	0	0	1	0	0	0	0	1
	0	0	3	0	0	0	0	3
	0	0	3	0	0	0	0	3
	0	0	0	0	0	0	0	0
	0	0	19	1	0	0	0	20

	A680 Bury Rd (Northeastbound)							
al	Bear Left Turn							Bear Left Tı
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	7	0	1	0	1	9
	1	0	12	0	1	0	0	14
	0	2	12	4	0	0	2	20
	0	0	26	3	2	0	1	32
	0	0	20	6	1	1	1	29
	1	0	38	4	1	0	1	45
	0	0	32	5	0	0	1	38
	0	0	33	11	0	0	1	45
	0	0	45	9	1	0	1	56
	0	2	41	5	0	0	3	51
	1	2	52	3	0	1	3	62
	0	0	63	12	0	1	2	78
	0	1	78	10	0	0	2	91
	0	1	75	3	0	0	0	79
	0	2	74	7	0	0	3	86
	0	0	63	7	0	0	1	71
	3	10	671	89	7	3	23	806

urn Total	Right Turn							Right Turn
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	31	5	1	2	1	40
	0	0	35	9	1	0	1	46
	1	1	50	9	4	0	0	65
	0	0	32	12	6	0	0	50
	0	0	68	4	6	0	0	78
	0	0	40	2	5	1	0	48
	0	0	47	7	3	1	0	58
	0	0	40	11	3	1	1	56
	0	0	50	7	0	0	0	57
	0	0	48	17	2	1	0	68
	0	0	43	15	2	0	0	60
	0	1	67	8	1	0	0	77
	0	2	53	14	1	1	0	71
	0	0	74	9	0	0	0	83
	0	0	59	8	0	0	1	68
	0	0	71	4	0	0	0	75
	1	4	808	141	35	7	4	1000

Total	U-Turn							U-Turn Tot
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	1	0	1	0	0	2
	0	0	1	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	1	0	0	0	0	1
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	3	0	1	0	0	4

A680 Rochdale Rd (Northwestbound)

al	Left Turn							Left Turn T
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	1	75	2	0	0	0	78
	0	0	55	16	0	1	0	72
	0	0	67	13	5	0	0	85
	0	3	78	9	0	1	0	91
	1	0	83	12	3	2	0	101
	0	1	65	4	6	1	0	77
	0	0	61	11	2	4	0	78
	0	0	55	12	2	1	0	70
	0	0	44	10	0	2	0	56
	0	0	54	8	4	0	0	66
	0	1	59	13	1	0	0	74
	0	0	57	9	1	0	0	67
	0	0	59	13	0	0	0	72
	0	0	44	5	0	0	0	49
	0	0	59	5	0	0	0	64
	0	0	49	6	3	0	0	58
	1	6	964	148	27	12	0	1158

otal	Bear Right Turn							Bear Right
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	22	4	0	0	0	26
	0	0	33	5	0	0	0	38
	0	0	35	6	2	0	0	43
	0	0	34	6	1	0	1	42
	0	0	43	6	1	0	2	52
	0	0	54	8	0	0	0	62
	0	0	36	5	1	0	0	42
	0	0	33	5	0	0	0	38
	0	0	35	3	1	0	0	39
	0	0	40	6	0	0	0	46
	1	0	30	7	1	0	0	39
	0	0	53	11	0	0	0	64
	0	1	76	6	1	0	1	85
	0	0	59	4	1	0	0	64
	0	0	66	4	2	0	0	72
	1	0	40	7	1	0	0	49
	2	1	689	93	12	0	4	801

Turn Total	U-Turn							U-Turn Tota
	Bicycles on	Motorcycle	Cars	Light Good	Single-Unit	Articulated	Buses	
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0

Grand Total
al
241
300
371
371
398
350
336
309
279
320
299
350
395
357
365
326
5367

APPENDIX 2

TRICS Output

Calculation Reference: AUDIT-851401-180927-0943

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
	KC	KENT	2 days
	WS	WEST SUSSEX	3 days
06	WEST MIDLANDS		
	ST	STAFFORDSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	1 days
11	SCOTLAND		
	FA	FALKIRK	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 151 to 805 (units:)
Range Selected by User: 150 to 805 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 19/04/18

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Wednesday	4 days
Thursday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	9 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	7

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	8
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	9 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

5,001 to 10,000	2 days
10,001 to 15,000	5 days
20,001 to 25,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	3 days
75,001 to 100,000	3 days
100,001 to 125,000	1 days
125,001 to 250,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	7 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	3 days
No	6 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	9 days

This data displays the number of selected surveys with PTAL Ratings.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	316	0.129	9	316	0.492	9	316	0.621
08:00 - 09:00	9	316	0.186	9	316	0.789	9	316	0.975
09:00 - 10:00	9	316	0.221	9	316	0.276	9	316	0.497
10:00 - 11:00	9	316	0.190	9	316	0.242	9	316	0.432
11:00 - 12:00	9	316	0.198	9	316	0.247	9	316	0.445
12:00 - 13:00	9	316	0.247	9	316	0.238	9	316	0.485
13:00 - 14:00	9	316	0.260	9	316	0.255	9	316	0.515
14:00 - 15:00	9	316	0.275	9	316	0.310	9	316	0.585
15:00 - 16:00	9	316	0.566	9	316	0.295	9	316	0.861
16:00 - 17:00	9	316	0.546	9	316	0.295	9	316	0.841
17:00 - 18:00	9	316	0.604	9	316	0.298	9	316	0.902
18:00 - 19:00	9	316	0.523	9	316	0.357	9	316	0.880
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.945			4.094			8.039

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

APPENDIX 3

Census Data and Routing Assumptions

Rossendale 008

	Driving a car or van	Percentage	Route
E02005278 : Rossendale 001	27	1%	Market St N - Bury Road
E02005279 : Rossendale 002	107	5%	Market St N - B6527 Blackburn Road
E02005280 : Rossendale 003	22	1%	Market St N - Bury Road
E02005281 : Rossendale 004	144	6%	Market St N - Bury Road
E02005284 : Rossendale 007	33	1%	Market St N - B6527 Blackburn Road
E02005285 : Rossendale 008	156	7%	Market St N - B6527 Blackburn Road
E02005286 : Rossendale 009	10	0%	Market St S - A680 Rochdale Road
E02006884 : Rossendale 010	75	3%	Market St N - Bury Road
Bolton	89	4%	Market St S - Bolton Road - Ramsbottom
E02001019 : Bury 001	74	3%	Market St S - Bolton Road - Ramsbottom
E02001020 : Bury 002	13		Market St S - Bury Road - Whalley Road
E02001021 : Bury 003	23		Market St S - Bury Road - Whalley Road
E02001022 : Bury 004	14		Market St S - Bury Road - Whalley Road
E02001023 : Bury 005	5		Market St S - Bury Road - Whalley Road
E02001024 : Bury 006	5		Market St S - Bury Road - Whalley Road
E02001025 : Bury 007	48		Market St S - Bury Road - Whalley Road
E02001026 : Bury 008	74		Market St S - Bury Road - Whalley Road
E02001027 : Bury 009	14		Market St S - Bury Road - Whalley Road
E02001028 : Bury 010	1		Market St S - Bury Road - Whalley Road
E02001029 : Bury 011	63		Market St S - Bury Road - Whalley Road
E02001030 : Bury 012	4		Market St S - Bury Road - Whalley Road
E02001031 : Bury 013	36	16%	Market St S - Bury Road - Whalley Road
E02001033 : Bury 015	3		Market St S - Bury Road - Whalley Road
E02001034 : Bury 016	21		Market St S - Bury Road - Whalley Road
E02001035 : Bury 017	4		Market St S - Bury Road - Whalley Road
E02001036 : Bury 018	4		Market St S - Bury Road - Whalley Road
E02001037 : Bury 019	1		Market St S - Bury Road - Whalley Road
E02001038 : Bury 020	6		Market St S - Bury Road - Whalley Road
E02001039 : Bury 021	2		Market St S - Bury Road - Whalley Road
E02001040 : Bury 022	7		Market St S - Bury Road - Whalley Road
E02001041 : Bury 023	4		Market St S - Bury Road - Whalley Road
E02001042 : Bury 024	2		Market St S - Bury Road - Whalley Road
E02001044 : Bury 026	3		Market St S - Bury Road - Whalley Road
Manchester	174	8%	Market St S - Bury Road - Whalley Road
Oldham	45	2%	Market St S - Bury Road - Whalley Road
E02001132 : Rochdale 001	2		Market St S - A680 Rochdale Road
E02001133 : Rochdale 002	2		Market St S - A680 Rochdale Road
E02001134 : Rochdale 003	1		Market St S - A680 Rochdale Road
E02001135 : Rochdale 004	4		Market St S - A680 Rochdale Road
E02001136 : Rochdale 005	6		Market St S - A680 Rochdale Road
E02001137 : Rochdale 006	3		Market St S - A680 Rochdale Road
E02001138 : Rochdale 007	2		Market St S - A680 Rochdale Road
E02001139 : Rochdale 008	7	4%	Market St S - A680 Rochdale Road
E02001140 : Rochdale 009	6		Market St S - A680 Rochdale Road
E02001141 : Rochdale 010	24		Market St S - A680 Rochdale Road
E02001142 : Rochdale 011	3		Market St S - A680 Rochdale Road
E02001143 : Rochdale 012	4		Market St S - A680 Rochdale Road
E02001145 : Rochdale 014	4		Market St S - A680 Rochdale Road
E02001146 : Rochdale 015	6		Market St S - A680 Rochdale Road
E02001147 : Rochdale 016	3		Market St S - A680 Rochdale Road
E02001148 : Rochdale 017	9		Market St S - A680 Rochdale Road
E02001149 : Rochdale 018	8		Market St S - Bury Road - Whalley Road
E02001150 : Rochdale 019	15	2%	Market St S - Bury Road - Whalley Road
E02001151 : Rochdale 020	16		Market St S - Bury Road - Whalley Road
E02001152 : Rochdale 021	2		Market St S - A680 Rochdale Road
E02001153 : Rochdale 022	1	1%	Market St S - A680 Rochdale Road
E02001154 : Rochdale 023	2		Market St S - A680 Rochdale Road
E02001155 : Rochdale 024	15		Market St S - A680 Rochdale Road
Salford	66	3%	Market St S - Bury Road - Whalley Road
Stockport	24	1%	Market St S - Bury Road - Whalley Road
Tameside	36	2%	Market St S - Bury Road - Whalley Road
Trafford	64	3%	Market St S - Bury Road - Whalley Road
Wigan	12	1%	Market St S - Bolton Road - Ramsbottom
Blackburn with Darwen	105	5%	Market St S - Bolton Road - A56 (N)
Burnley	103	5%	Market St S - Bolton Road - A56 (N)
Hyndburn	99	4%	Market St S - Bolton Road - A56 (N)
Pendle	64	3%	Market St S - Bolton Road - A56 (N)
Other	214		
Total	**2245**		

APPENDIX 4

Capacity Analysis

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Bury Road - Rochdale Road Mini.j9
Path: Z:\projects\1537 Market Street, Edenfield\Arcady
Report generation date: 25/10/2018 15:12:55

»2024 Base Flows, AM
»2024 Base Flows, PM
»2034 Base Flows, AM
»2034 Base Flows, PM
»2024 With Allocation Flows, AM
»2024 With Allocation Flows, PM
»2034 With Allocation Flows, AM
»2034 With Allocation Flows, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2024 Base Flows							
Arm 1	1.8	10.54	0.64	B	0.5	5.95	0.34	A
Arm 2	6.7	43.14	0.88	E	2.4	15.77	0.71	C
Arm 3	0.9	8.00	0.47	A	4.9	27.65	0.84	D
	2034 Base Flows							
Arm 1	2.0	11.41	0.66	B	0.5	6.10	0.35	A
Arm 2	9.5	59.58	0.92	F	2.7	17.13	0.73	C
Arm 3	1.0	8.33	0.49	A	6.1	33.54	0.87	D
	2024 With Allocation Flows							
Arm 1	2.4	12.96	0.71	B	0.6	6.28	0.37	A
Arm 2	10.7	69.12	0.93	F	2.7	17.63	0.74	C
Arm 3	1.0	8.32	0.49	A	11.4	59.13	0.93	F
	2034 With Allocation Flows							
Arm 1	2.7	14.25	0.73	B	0.6	6.44	0.39	A
Arm 2	17.2	106.42	0.97	F	3.1	19.49	0.76	C
Arm 3	1.0	8.65	0.51	A	16.6	83.82	0.97	F

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	17/10/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	Cadworkstation4\Kyle
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2024 Base Flows	AM	FLAT	08:00	09:00	60	15
D2	2024 Base Flows	PM	FLAT	17:00	18:00	60	15
D3	2034 Base Flows	AM	FLAT	08:00	09:00	60	15
D4	2034 Base Flows	PM	FLAT	17:00	18:00	60	15
D5	2024 With Allocation Flows	AM	FLAT	08:00	09:00	60	15
D6	2024 With Allocation Flows	PM	FLAT	17:00	18:00	60	15
D7	2034 With Allocation Flows	AM	FLAT	08:00	09:00	60	15
D8	2034 With Allocation Flows	PM	FLAT	17:00	18:00	60	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2024 Base Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	21.95	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Bury Road (N)	
2	Rochdale Road	
3	Bury Road (S)	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	4.20	4.20	6.30	7.2	15.00	8.00	0.0	
2	2.70	2.70	4.30	7.0	15.00	5.00	0.0	
3	4.80	4.80	4.80	0.0	15.00	3.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.678	1125
2	0.614	896
3	0.658	994

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2024 Base Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	604	100.000
2		✓	590	100.000
3		✓	402	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	239	362
	2	212	0	378
	3	137	261	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.64	10.54	1.8	B
2	0.88	43.14	6.7	E
3	0.47	8.00	0.9	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	263	947	0.638	597	1.7	10.107	B
2	590	365	672	0.878	568	5.5	30.177	D
3	402	207	858	0.469	399	0.9	7.792	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.7	10.531	B
2	590	369	670	0.881	587	6.2	40.660	E
3	402	214	853	0.471	402	0.9	7.982	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.7	10.538	B
2	590	369	670	0.881	589	6.6	42.373	E
3	402	215	853	0.471	402	0.9	7.993	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.8	10.540	B
2	590	369	670	0.881	589	6.7	43.136	E
3	402	215	852	0.472	402	0.9	7.996	A

2024 Base Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	18.94	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2024 Base Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	309	100.000
2		✓	559	100.000
3		✓	664	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	9	131	169
	2	297	0	262
	3	352	312	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.34	5.95	0.5	A
2	0.71	15.77	2.4	C
3	0.84	27.65	4.9	D

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	304	919	0.336	307	0.5	5.863	A
2	559	177	788	0.710	550	2.3	14.622	B
3	664	301	796	0.835	647	4.3	22.117	C

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	311	914	0.338	309	0.5	5.949	A
2	559	178	787	0.710	559	2.4	15.725	C
3	664	306	792	0.838	662	4.7	27.000	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	312	914	0.338	309	0.5	5.952	A
2	559	178	787	0.710	559	2.4	15.759	C
3	664	306	792	0.838	663	4.9	27.468	D

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	312	914	0.338	309	0.5	5.953	A
2	559	178	787	0.710	559	2.4	15.772	C
3	664	306	792	0.838	664	4.9	27.647	D

2034 Base Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	28.42	D

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D3	2034 Base Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	624	100.000
2		✓	609	100.000
3		✓	416	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	247	374
	2	219	0	390
	3	142	270	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.66	11.41	2.0	B
2	0.92	59.58	9.5	F
3	0.49	8.33	1.0	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	272	941	0.663	616	1.9	10.856	B
2	609	376	665	0.916	581	6.9	35.692	E
3	416	212	854	0.487	412	0.9	8.078	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	1.9	11.396	B
2	609	381	662	0.919	603	8.4	53.003	F
3	416	220	849	0.490	416	0.9	8.309	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	2.0	11.408	B
2	609	381	662	0.920	606	9.1	57.318	F
3	416	221	848	0.490	416	1.0	8.324	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	2.0	11.410	B
2	609	381	662	0.920	607	9.5	59.581	F
3	416	221	848	0.491	416	1.0	8.330	A

2034 Base Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	22.01	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2034 Base Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	318	100.000
2		✓	574	100.000
3		✓	682	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	10	135	173
	2	305	0	269
	3	362	320	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.35	6.10	0.5	A
2	0.73	17.13	2.7	C
3	0.87	33.54	6.1	D

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	310	915	0.348	316	0.5	5.992	A
2	574	182	785	0.732	564	2.6	15.667	C
3	682	310	790	0.863	661	5.1	25.003	D

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	319	909	0.350	318	0.5	6.092	A
2	574	183	784	0.732	574	2.6	17.061	C
3	682	315	787	0.867	680	5.7	32.209	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	320	908	0.350	318	0.5	6.096	A
2	574	183	784	0.732	574	2.7	17.110	C
3	682	315	787	0.867	681	6.0	33.153	D

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	320	908	0.350	318	0.5	6.098	A
2	574	183	784	0.732	574	2.7	17.129	C
3	682	315	786	0.867	681	6.1	33.536	D

2024 With Allocation Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	31.60	D

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D5	2024 With Allocation Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	668	100.000
2		✓	592	100.000
3		✓	419	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	247	418
	2	214	0	378
	3	154	261	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.71	12.96	2.4	B
2	0.93	69.12	10.7	F
3	0.49	8.32	1.0	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	668	263	947	0.705	659	2.3	12.141	B
2	592	419	639	0.927	563	7.4	38.501	E
3	419	206	858	0.488	415	0.9	8.064	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	668	265	945	0.707	668	2.3	12.935	B
2	592	425	635	0.932	585	9.2	59.530	F
3	419	214	853	0.491	419	1.0	8.297	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	668	265	945	0.707	668	2.4	12.956	B
2	592	425	635	0.932	588	10.1	65.675	F
3	419	216	852	0.492	419	1.0	8.314	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	668	265	945	0.707	668	2.4	12.964	B
2	592	425	635	0.932	590	10.7	69.116	F
3	419	216	852	0.492	419	1.0	8.321	A

2024 With Allocation Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	33.87	D

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D6	2024 With Allocation Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	341	100.000
2		✓	566	100.000
3		✓	736	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	9	135	197
	2	304	0	262
	3	424	312	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.37	6.28	0.6	A
2	0.74	17.63	2.7	C
3	0.93	59.13	11.4	F

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	341	298	923	0.370	339	0.6	6.138	A
2	566	205	771	0.735	556	2.6	16.065	C
3	736	307	791	0.930	704	8.0	33.714	D

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	341	309	916	0.372	341	0.6	6.264	A
2	566	206	770	0.735	566	2.7	17.553	C
3	736	313	788	0.934	729	9.9	51.524	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	341	310	915	0.373	341	0.6	6.275	A
2	566	206	770	0.735	566	2.7	17.611	C
3	736	313	788	0.934	732	10.8	56.442	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	341	311	914	0.373	341	0.6	6.279	A
2	566	206	770	0.735	566	2.7	17.630	C
3	736	313	788	0.934	734	11.4	59.134	F

2034 With Allocation Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	45.40	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2034 With Allocation Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	687	100.000
2		✓	611	100.000
3		✓	432	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	254	430
	2	221	0	390
	3	158	270	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.73	14.25	2.7	B
2	0.97	106.42	17.2	F
3	0.51	8.65	1.0	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	687	271	941	0.730	677	2.6	13.161	B
2	611	431	632	0.967	572	9.6	46.256	E
3	432	210	856	0.505	428	1.0	8.343	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	687	274	939	0.731	687	2.6	14.202	B
2	611	437	628	0.973	597	13.1	80.717	F
3	432	219	850	0.508	432	1.0	8.612	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	687	274	939	0.731	687	2.7	14.237	B
2	611	437	628	0.973	602	15.4	95.810	F
3	432	221	849	0.509	432	1.0	8.639	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	687	274	939	0.731	687	2.7	14.248	B
2	611	437	628	0.973	604	17.2	106.421	F
3	432	221	848	0.509	432	1.0	8.652	A

2034 With Allocation Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	45.53	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D8	2034 With Allocation Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	351	100.000
2		✓	582	100.000
3		✓	754	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	10	139	202
	2	313	0	269
	3	434	320	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.39	6.44	0.6	A
2	0.76	19.49	3.1	C
3	0.97	83.82	16.6	F

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	351	303	920	0.382	349	0.6	6.278	A
2	582	211	767	0.759	570	2.9	17.423	C
3	754	317	785	0.960	714	10.0	39.231	E

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	351	315	912	0.385	351	0.6	6.418	A
2	582	212	766	0.760	582	3.0	19.373	C
3	754	323	781	0.965	741	13.2	66.255	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	351	317	910	0.386	351	0.6	6.434	A
2	582	212	766	0.760	582	3.1	19.462	C
3	754	323	781	0.965	746	15.2	76.838	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	351	318	910	0.386	351	0.6	6.442	A
2	582	212	766	0.760	582	3.1	19.495	C
3	754	323	781	0.965	748	16.6	83.818	F

APPENDIX 5

Sensitivity Capacity Analysis

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Bury Road - Rochdale Road Mini - ST.j9
Path: Z:\projects\1537 Market Street, Edenfield\Arcady
Report generation date: 25/10/2018 15:03:07

»2024 Base Flows, AM
»2024 Base Flows, PM
»2034 Base Flows, AM
»2034 Base Flows, PM
»2024 With Allocation Flows ST, AM
»2024 With Allocation Flows ST, PM
»2034 With Allocation Flows ST, AM
»2034 With Allocation Flows ST, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2024 Base Flows							
Arm 1	1.8	10.54	0.64	B	0.5	5.95	0.34	A
Arm 2	6.7	43.14	0.88	E	2.4	15.77	0.71	C
Arm 3	0.9	8.00	0.47	A	4.9	27.65	0.84	D
	2034 Base Flows							
Arm 1	2.0	11.41	0.66	B	0.5	6.10	0.35	A
Arm 2	9.5	59.58	0.92	F	2.7	17.13	0.73	C
Arm 3	1.0	8.33	0.49	A	6.1	33.54	0.87	D
	2024 With Allocation Flows ST							
Arm 1	2.7	14.13	0.73	B	0.6	6.44	0.39	A
Arm 2	13.7	87.73	0.95	F	2.9	18.63	0.75	C
Arm 3	1.0	8.68	0.51	A	17.1	85.46	0.97	F
	2034 With Allocation Flows ST							
Arm 1	3.1	15.73	0.76	C	0.7	6.58	0.40	A
Arm 2	23.0	139.71	1.00	F	3.3	20.60	0.77	C
Arm 3	1.1	9.02	0.53	A	25.3	120.86	0.99	F

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	17/10/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	Cadworkstation4\Kyle
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2024 Base Flows	AM	FLAT	08:00	09:00	60	15
D2	2024 Base Flows	PM	FLAT	17:00	18:00	60	15
D3	2034 Base Flows	AM	FLAT	08:00	09:00	60	15
D4	2034 Base Flows	PM	FLAT	17:00	18:00	60	15
D5	2024 With Allocation Flows ST	AM	FLAT	08:00	09:00	60	15
D6	2024 With Allocation Flows ST	PM	FLAT	17:00	18:00	60	15
D7	2034 With Allocation Flows ST	AM	FLAT	08:00	09:00	60	15
D8	2034 With Allocation Flows ST	PM	FLAT	17:00	18:00	60	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2024 Base Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	21.95	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Bury Road (N)	
2	Rochdale Road	
3	Bury Road (S)	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	4.20	4.20	6.30	7.2	15.00	8.00	0.0	
2	2.70	2.70	4.30	7.0	15.00	5.00	0.0	
3	4.80	4.80	4.80	0.0	15.00	3.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.678	1125
2	0.614	896
3	0.658	994

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2024 Base Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	604	100.000
2		✓	590	100.000
3		✓	402	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	239	362
	2	212	0	378
	3	137	261	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.64	10.54	1.8	B
2	0.88	43.14	6.7	E
3	0.47	8.00	0.9	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	263	947	0.638	597	1.7	10.107	B
2	590	365	672	0.878	568	5.5	30.177	D
3	402	207	858	0.469	399	0.9	7.792	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.7	10.531	B
2	590	369	670	0.881	587	6.2	40.660	E
3	402	214	853	0.471	402	0.9	7.982	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.7	10.538	B
2	590	369	670	0.881	589	6.6	42.373	E
3	402	215	853	0.471	402	0.9	7.993	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	604	265	945	0.639	604	1.8	10.540	B
2	590	369	670	0.881	589	6.7	43.136	E
3	402	215	852	0.472	402	0.9	7.996	A

2024 Base Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	18.94	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2024 Base Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	309	100.000
2		✓	559	100.000
3		✓	664	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	9	131	169
	2	297	0	262
	3	352	312	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.34	5.95	0.5	A
2	0.71	15.77	2.4	C
3	0.84	27.65	4.9	D

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	304	919	0.336	307	0.5	5.863	A
2	559	177	788	0.710	550	2.3	14.622	B
3	664	301	796	0.835	647	4.3	22.117	C

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	311	914	0.338	309	0.5	5.949	A
2	559	178	787	0.710	559	2.4	15.725	C
3	664	306	792	0.838	662	4.7	27.000	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	312	914	0.338	309	0.5	5.952	A
2	559	178	787	0.710	559	2.4	15.759	C
3	664	306	792	0.838	663	4.9	27.468	D

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	309	312	914	0.338	309	0.5	5.953	A
2	559	178	787	0.710	559	2.4	15.772	C
3	664	306	792	0.838	664	4.9	27.647	D

2034 Base Flows, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	28.42	D

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D3	2034 Base Flows	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	624	100.000
2		✓	609	100.000
3		✓	416	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	247	374
	2	219	0	390
	3	142	270	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.66	11.41	2.0	B
2	0.92	59.58	9.5	F
3	0.49	8.33	1.0	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	272	941	0.663	616	1.9	10.856	B
2	609	376	665	0.916	581	6.9	35.692	E
3	416	212	854	0.487	412	0.9	8.078	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	1.9	11.396	B
2	609	381	662	0.919	603	8.4	53.003	F
3	416	220	849	0.490	416	0.9	8.309	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	2.0	11.408	B
2	609	381	662	0.920	606	9.1	57.318	F
3	416	221	848	0.490	416	1.0	8.324	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	624	274	939	0.664	624	2.0	11.410	B
2	609	381	662	0.920	607	9.5	59.581	F
3	416	221	848	0.491	416	1.0	8.330	A

2034 Base Flows, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	22.01	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2034 Base Flows	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	318	100.000
2		✓	574	100.000
3		✓	682	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	10	135	173
	2	305	0	269
	3	362	320	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.35	6.10	0.5	A
2	0.73	17.13	2.7	C
3	0.87	33.54	6.1	D

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	310	915	0.348	316	0.5	5.992	A
2	574	182	785	0.732	564	2.6	15.667	C
3	682	310	790	0.863	661	5.1	25.003	D

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	319	909	0.350	318	0.5	6.092	A
2	574	183	784	0.732	574	2.6	17.061	C
3	682	315	787	0.867	680	5.7	32.209	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	320	908	0.350	318	0.5	6.096	A
2	574	183	784	0.732	574	2.7	17.110	C
3	682	315	787	0.867	681	6.0	33.153	D

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	318	320	908	0.350	318	0.5	6.098	A
2	574	183	784	0.732	574	2.7	17.129	C
3	682	315	786	0.867	681	6.1	33.536	D

2024 With Allocation Flows ST, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	38.15	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D5	2024 With Allocation Flows ST	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	691	100.000
2		✓	594	100.000
3		✓	436	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	249	439
	2	216	0	378
	3	171	261	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.73	14.13	2.7	B
2	0.95	87.73	13.7	F
3	0.51	8.68	1.0	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	691	263	947	0.730	681	2.6	13.064	B
2	594	439	626	0.948	560	8.5	42.831	E
3	436	207	858	0.508	432	1.0	8.377	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	691	265	945	0.731	691	2.6	14.088	B
2	594	446	623	0.954	584	11.0	70.812	F
3	436	215	852	0.512	436	1.0	8.645	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	691	265	945	0.731	691	2.7	14.119	B
2	594	446	622	0.954	588	12.6	81.163	F
3	436	217	851	0.512	436	1.0	8.669	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	691	265	945	0.731	691	2.7	14.131	B
2	594	446	622	0.954	590	13.7	87.730	F
3	436	217	851	0.513	436	1.0	8.680	A

2024 With Allocation Flows ST, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	46.19	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D6	2024 With Allocation Flows ST	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	356	100.000
2		✓	569	100.000
3		✓	760	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	9	137	210
	2	307	0	262
	3	448	312	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.39	6.44	0.6	A
2	0.75	18.63	2.9	C
3	0.97	85.46	17.1	F

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	356	295	925	0.385	354	0.6	6.275	A
2	569	217	763	0.746	558	2.7	16.810	C
3	760	310	790	0.962	719	10.2	39.521	E

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	356	307	917	0.388	356	0.6	6.413	A
2	569	219	762	0.747	569	2.8	18.527	C
3	760	316	786	0.967	747	13.5	67.129	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	356	309	916	0.389	356	0.6	6.429	A
2	569	219	762	0.747	569	2.9	18.600	C
3	760	316	786	0.967	752	15.6	78.118	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	356	310	915	0.389	356	0.6	6.436	A
2	569	219	762	0.747	569	2.9	18.625	C
3	760	316	786	0.967	754	17.1	85.457	F

2034 With Allocation Flows ST, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	56.90	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2034 With Allocation Flows ST	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	711	100.000
2		✓	613	100.000
3		✓	449	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	3	257	451
	2	223	0	390
	3	175	270	4

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.76	15.73	3.1	C
2	1.00	139.71	23.0	F
3	0.53	9.02	1.1	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	711	271	941	0.756	699	2.9	14.288	B
2	613	451	620	0.989	568	11.1	51.660	F
3	449	210	856	0.525	445	1.1	8.670	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	711	274	939	0.757	711	3.0	15.661	C
2	613	458	615	0.996	593	16.1	96.632	F
3	449	219	850	0.528	449	1.1	8.974	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	711	274	939	0.757	711	3.0	15.715	C
2	613	458	615	0.997	598	19.9	120.672	F
3	449	221	849	0.529	449	1.1	9.005	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	711	274	939	0.757	711	3.1	15.733	C
2	613	458	615	0.997	601	23.0	139.712	F
3	449	221	848	0.529	449	1.1	9.019	A

2034 With Allocation Flows ST, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	62.73	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D8	2034 With Allocation Flows ST	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	365	100.000
2		✓	584	100.000
3		✓	776	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	10	140	215
	2	315	0	269
	3	456	320	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.40	6.58	0.7	A
2	0.77	20.60	3.3	C
3	0.99	120.86	25.3	F

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	365	299	922	0.396	362	0.6	6.403	A
2	584	223	759	0.769	572	3.1	18.206	C
3	776	318	784	0.989	726	12.5	45.387	E

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	365	311	914	0.399	365	0.7	6.554	A
2	584	225	758	0.770	583	3.2	20.443	C
3	776	325	780	0.995	754	17.9	84.466	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	365	313	913	0.400	365	0.7	6.573	A
2	584	225	758	0.770	584	3.2	20.558	C
3	776	325	780	0.995	760	21.9	104.853	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	365	315	912	0.400	365	0.7	6.582	A
2	584	225	758	0.770	584	3.3	20.596	C
3	776	325	780	0.995	763	25.3	120.858	F

CROFT

Croft Transport Solutions

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Edenfield Proposed Allocation, Rossendale – 18TAY043

Proposed development located on the eastern slope of the Irwell Valley, with low topography sloping ~3-6 ˚east to west. The A56 borders the site to the west.

Land off Exchange Street (Church Land)

A56 constructed within a cutting (~4-5m in height), with semi mature trees. Engineered slope designed as part of the A56 construction. No obvious signs of instability.

Land West of Market Street (Taylor Wimpey)

A56 constructed within a cutting ~5-6m in height in the south reducing northwards to the centre of the site where site levels comparable with the A56. In the north A56 located above the site and constructed partially on natural slope and engineered embankment. Engineered slope designed as part of the A56 construction. No obvious signs of instability.

Land between Blackburn Road and A56 (Peel)

Site levels comparable with the A56.

Geotechnical Summary

- Max slopes ~5-6m along A56, (majority appear to be engineered), where slopes present significant development stand-off with landscaping (>25m) and therefore no change to loading regime on A56 slopes.
- No proposed changes to topography, crossings, new junctions etc. Therefore, current slope conditions will continue.
- No existing slope instabilities noted which may affect the A56, some minor instabilities on internal slopes within the Taylor Wimpey Site (detailed inspection of Peel Land and Church Land not undertaken).
- Development of site will see a betterment in surface water run off and infiltration. Through construction of appropriate drainage system. The design of any SUDS system will have to consider proximity of A56 – it is anticipated this be dealt with at detail design stage as part of the drainage conditions.
- Site located over 1km south of the existing Woodcliffe Slope failure. The slope failure is a result of construction a Highway within a cutting (6-20m in height) on a large over steepened (20-24˚) natural slope with possible reactivation of relic slip planes. Movement first noted shortly after construction in 1969 and extend up to 75m up slope. HWE comments not relevant.
- Site not located near Commerce Street (Haslingden) so HWE access comments not relevant.

Conclusions

No significant Geotechnical Risks have been identified to the A56 from the proposed development which should prevent the site from being formally 'allocated' within the Rossendale Development Plan.

Desk based studies indicate that the site generally poses a low risk to the proposed development from both environmental and geotechnical issues. This risk classification will be assessed further at planning stage (subject to allocation) through appropriately designed intrusive ground investigations.

RANDALL THORP

LANDSCAPE ARCHITECTURE
ENVIRONMENTAL PLANNING
MASTERPLANNING
URBAN DESIGN

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KEY:

- Draft housing allocation boundary
- Existing Public Right of Way
- Existing vegetation
- Proposed development cell
- Proposed indicative frontage
- Proposed green space
- Proposed woodland
- Proposed highway access
- Proposed primary road
- Proposed secondary road
- Proposed pedestrian /cycle routes
- Potential footpath links
- Potential pedestrian/ cycle/emergency connection
- Potential area for SuDS (subject to drainage strategy)

Date: 01.10.2018
Drawn by: SR
Checker: JF
Rev by:
Rev checker:
QM Status: checked
Product Status: Issue

North West Edenfield Local Plan Representations

Combined Illustrative Masterplan

Drwg No: 610C-02C Scale: 1: 5,000 @ A3

From: Ian Lord
Sent: 18 January 2019 11:02
To: Anne Storah
Cc:

Subject: ECNF Representation

Hi Anne

You may recall that the representation on the Draft Local Plan submitted by Troy Planning + Design on the Forum's behalf incorporated a list of names and addresses of supporters of the representation. The list analysed the names into three categories - residents of Edenfield, other Rossendale residents and those residing outside Rossendale. Since then we discovered that some of the names had been wrongly analysed and these have now been corrected. In addition we thought it appropriate that all support received prior to the consultation deadline should be included - for practical purposes the list submitted with the representation had been cut off a couple of day beforehand. We also determined that Edenfield should be more clearly defined as the Forum Neighbourhood Area.

Taking into consideration these adjustments we have produced a revised list of supporters, a copy of which is attached. The total numbers of supporters is not significantly different to that that referred to in the representation but we felt that you should be aware of the changes and have a copy of the revised list. The relevant totals are:
Residents of ECNF Neighbourhood Area - 892 (previously 898 for Edenfield)
Other Rossendale residents - 176 (previously 156)
Residing outside Rossendale - 167 (previously 159)
Total 1,235 (previously 1,213)

Please let me know if you have any comments or questions.

Thank you for your e-mail of 11th December regarding the timing of the submission of the Draft Local Plan to the Planning Inspectorate. Do you now have a more precise date as to when the Plan is likely to be submitted? Also do you have any indication of the likely time after that when the public examination would take place?

Finally, at a meeting with Adrian and Mike Atherton on 7th September last year we were advised that Taylor Wimpey were commissioning a Transport Study which would be part of the Masterplan. This study would use the data and methodology from the Mott McDonald report commissioned by RBC. It was anticipated that an initial study would be issued during the Local Plan consultation period with a more detailed study to follow. Can you please let me know if that study has now been completed and, if so, when will be able to see it.

Thanks and best regards

Ian

Ian Lord

Chair, Edenfield Community Neighbourhood Forum

Warren Hilton
Assistant Asset Manager
8th Floor
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Manchester M1 2WD

Direct Line:

25 January 2019

Rossendale Borough Council
Room 119
Business Centre
Futures Park
Bacup
Lancashire
OL13 0BB

Dear Anne,

CONSULTATION ON THE PRE-SUBMISSION PUBLICATION VERSION OF THE LOCAL PLAN

HIGHWAYS ENGLAND COMMENTS ON PROPOSED HOUSING SITE ALLOCATION H72 (LAND WEST OF MARKET STREET, EDENFIELD)

Highways England is charged with operating, managing capacity, maintaining and improving England's motorways and major A roads, which form the Strategic Road Network (SRN). The SRN in Rossendale comprises the northernmost stretch of the M66 motorway and the A56 corridor; from a point south of M66 Junction '0' to a point north of the A56 roundabout junction with the A680 at Rising Bridge. This north-south corridor is a route of regional significance that links Greater Manchester with Lancashire.

In our letter dated 4th October 2018, we provided consultation comments on the Rossendale Borough Council (RBC) Pre-Submission stage Local Plan. This consultation response commented on several areas covering RBC's Highway Capacity Study, as well as viability matters linked to geotechnics and ground conditions concerning three proposed allocations. It is on this latter aspect on which we now write; specifically in respect of comments made about the housing site allocation reference 'H72' known as 'Land West of Market Street, Edenfield'.

Our previous letter expressed serious concern regarding the physical impact that developing allocation H72 may have on the stability of the earth cuttings of the adjacent A56 trunk road, particularly given the absence of a detailed ground investigation survey and assessment within the Council's supporting evidence base. Those comments were made from our standpoint as an infrastructure provider with knowledge and experience of the uniquely difficult ground conditions found in the Rossendale valley. This is emphasised by the land slip problem that we are managing at the Woodcliffe cutting. Our borehole records for the remainder of the A56 path adjacent to the allocation indicates the presence of similar ground material.

Since our letter of 4th October 2018, RBC has engaged with Highways England on these matters. The purpose of this letter is therefore to update the Council on Highways England's position on the H72 site allocation proposal following those discussions.

Firstly, Highways England now notes that the portion of the proposed allocation to the north of Blackburn Road, situated above the A56 cutting at Woodcliffe referred to above, has been removed from the Preferred Options Local Plan. Highways England strongly welcomes this change, and would not have supported the Plan otherwise.

Highways England has therefore now considered the revised site allocation based on the masterplan drawing entitled 'North West Edenfield Local Plan Representations Combined Illustrative Masterplan' Drawing No. 610C-02C prepared by Randall Thorp on behalf of the three landowning interests in the amended site. We have also considered desktop ground investigation reports and preliminary site surveys that have been submitted to us, and prepared on behalf of, those interests in the central and southern parcels of the allocation. These are:

- Preliminary Sources Study Report prepared by Betts Geo on behalf of Taylor Wimpey (Report No.18TAY043/PSSR – dated November 2018 for central and partial northern site portion owed by Peel Holdings)
- Edenfield Geotechnical Summary Sheet (covering full allocation), prepared by Betts Geo on behalf of Taylor Wimpey (Reference 18TAY043 for central and partial northern site portion)
- Desktop Geotechnical Appraisal prepared by Hydrock on behalf of Nexus Planning (Document Reference ESE-HYD-XX-XX-RP-GE-0001 dated 19th December 2018 for southern site portion)

We are aware of stability issues within our cutting slope immediately to the west of Chatterton Heys (within the Hydrock survey area), although this is some distance from the proposed housing development itself judging by the masterplan. The report by Betts also describes some relic landslips in a slope towards the northern end of the proposed site allocation (see photo 23 within the section 11 photo location plan PDF drawing on page 60). Although not significant for the A56, it demonstrates our overall point about ground stability risks within the site.

From our own route geotechnical records of the adjoining A56, we have made RBC aware of the presence of laminated clays below the general area of the site. An abundance of laminated clay may change the building foundation conditions locally and engender differential ground settlement. For housing development, special attention therefore also needs to be taken to building foundations; perhaps deeper and pile-driven for example. The level of moisture content within the ground is also important; higher moisture content generally indicating lower strength material giving lower bearing capacities, increased settlement under load and a higher risk of instability (e.g. landslip). Laminated clay is also typically an unsuitable fill material and is therefore inappropriate for structural re-use elsewhere without appropriate stabilisation treatment.

Whilst development of the areas away from the A56 fringe may not in itself affect the trunk road, the presence of these deposits (and the evidence of some instability in the HE slopes adjacent to the site) demonstrates ground stability risks are present in the general area. It therefore underlines the need for a high level of caution and technical awareness in any approach to preparing a development application for this site to avoid causing instability or damage to Highways England's asset (as well as ground problems within the wider development away from the trunk road for that matter).

We therefore counsel RBC that it would be prudent to ensure that a comprehensive (and intrusive) site survey and geotechnical assessment is carried out before planning decisions affecting the development layout (and therefore quantum of development) are taken.

Consequently, we remain content with the statement in our previous letter that there is a *"realistic possibility the disturbance caused by earthworks and loading of the surrounding land by building upon (if not considered and managed correctly) would trigger further land slippage problems along the A56 boundary. This is of course a safety concern, both in relation to the users of the trunk road and the residents of any housing – the results of a sudden land failure would be catastrophic. That is beside any gradual movement to the dwellings themselves'*.

We now comment on proposed allocation of site H72 purely from the perspective of impacts on the safety and integrity of the A56 trunk road, and not in relation to any consequences of developing the land elsewhere within the site.

Overall, we are content that, in principle, the indicative layout outlined within the masterplan drawing referred to above would be unlikely to cause instability to our asset provided that the development layout, earthworks (e.g. land regrading), site drainage and construction operations are suitably designed, planned for and executed. That way, it is possible that the risk of geotechnical problems within the site can be engineered-out. We would therefore require any development to:

- Be based upon a comprehensive site ground investigation survey and geotechnical assessment incorporating new ground investigation and borehole surveys.

- Submit plans for all earthworks and drainage in the vicinity of the A56 boundary upon a full assessment under the Design Manual for Roads and Bridges standard HD22/08 'Managing Geotechnical Risk'.

- Avoid loading land adjoining the A56, for example with excavated material.

- Demonstrate that the natural form of the slopes within the site along the A56 boundary around the head of Great Hey Clough and along the boundary with the adjoining A56 embankments either remain undisturbed or their stability is improved.

- Demonstrate how both the culverts of the Great Hey Clough watercourse and unnamed brook to the south west of the site (which pass under the under the A56), together with our A56 embankment toe-drainage apparatus, will be protected from damage and blocking-up during construction (Highways England would be happy to provide RBC and any subsequent planning applicant involving this land with copies of our drainage and 'as-built' records for this section of the A56).

- Avoid the use of sustainable urban drainage systems (SUDS) within the site along the boundary with the A56, as indicated in the masterplan. Given the properties of the existing ground material (referred to above as likely to be found in this area) are such that ground stability is significantly reduced by increasing pore pressure. Highways England does not support the use of SUDS within a zone where it could adversely influence the stability of the A56 cutting slopes. Indeed, we would advise that any intention employ SUDS within the wider site should be approached carefully.

Finally, it is worth pointing out that RBC's Local Plan Highway Capacity Study refers to there being a future need (towards the end of the Local Plan period) to widen the adjoining section of the A56 to three lanes in each direction. This future network requirement is also something which Highways England is aware could be needed towards the early 2030s. Highways England has no proposals to take forward such a scheme at this time, but of course has the right to do so in the future. In theory, as a scheme could be completed within only 10 years of any future

dwellings being occupied, RBC and any future developer(s) of the H72 site may wish to consider this when planning the permanent internal layout and landscaping of a ‘new’ development.

In conclusion then, Highways England is now satisfied in principle that the emerging Rossendale Local Plan site allocation H72 could be developed for housing without adverse impact upon the A56 trunk road, provided that a careful approach is taken to its planning and construction.

We hope that this letter clarifies our position and enables the Council to make progress with this element of its emerging Local Plan. If you would like to discuss anything about this letter, please feel free to contact me.

Yours sincerely,

Warren Hilton
North West Asset Development Team
Email:

From: [redacted]
Sent: 23 January 2019 11:49
To: Forward Planning
Cc:
Subject: RE: Rossendale Local Plan - Regulation 19 consultation: Environment Agency response
Attachments: H10 Bury Road Rawtenstall.docx; UKCP18 and FRA CC Allowances briefing Final.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dear

Thank you for your e-mail, I've reviewed the additional information as submitted and I'd offer the following advice:-

Sites not in SFRA:

H53 - Waterfoot Primary School & H38 - Land off Burnley Road and Meadows Avenue: Both of these sites have not been included in the SFRA but they have been subject to site specific Flood Risk Assessments (FRAs) as part of previous planning applications. The EA reviewed these FRAs at the time they were submitted and we were satisfied that they could be developed safely. On this basis, we agree that sufficient evidence is available to demonstrate to the Inspector that the sites could be developed safely but you will need to present this to them is some form (along with information to show that you have demonstrated that the sites satisfy the Sequential Test).

H10 - Land at Bury Road, Rawtenstall: This site has not been included in the SFRA, but the comments from the SHLAA are noted. However, I've had a quick look at the site via Google Streetview and that part of the site that slopes down to the river may not be developable given the steepness of the bank and the fact that this may be within the river channel and EA consent would be required. From the images online, it seems that there is a relatively level area of public open space along Bury Road that could be developed. To avoid any flood risk issues and ensure that the allocated site is deliverable, I'd suggested revising the boundary as per the red-edged polygon on the attached map. This avoids works within the channel, removes the site from Flood Zone 3 and avoids the need for the Sequential Test.

Sites in SFRA:

H65 - Albert Mill, Whitworth: This site is in the SFRA and has also been subject to several planning applications. While the EA are objecting to 2018/0498 at this time, this objection relates to the detail rather than the principle of development. We have accepted previous schemes so we are satisfied that the site can be developed safely. However, the SFRA advises the LPA to withdraw the allocation, so an Inspector may query why it has been brought forward despite this recommendation. While we have no in-principle flood risk concerns with the site, sufficient evidence should be presented to the Inspector to demonstrate that site can be developed safely and explain why the allocation differs from the SFRA recommendation (along with information to show that you have demonstrated that the site satisfies the Sequential Test).

H73 - Edenwood Mill, Edenfield: We can see that the site is in the SFRA and providing any development proceed in accordance with the SFRA recommendations, we are satisfied that it could be delivered safely. On this basis, we agree that sufficient evidence is available to demonstrate to the Inspector that the site could be developed safely (if the site satisfies the Sequential Test – that will be for you to demonstrate). It is also noted that this site presents an opportunity to de-culvert the watercourse, and ideally this should be a mitigation measure associated with the demolition of the existing mill and redevelopment for residential use.

We'd be happy to review any information / position statements relating to flood risk that you draft in relation to these sites prior to submission for Examination. We'd also be happy to offer comments on any material you prepare to demonstrate to the Inpsector that sites in Flood Zone 2/3 satisfy the Sequential Test.

Also, for information, the UKCP18 climate change data was published at the end of 2018. This will affect the flood data provided in the national planning practice guidance (NPPG) and the climate change information used to inform SFRAs and site specific FRAs. However, the new data needs to be processed further until it is fit for purpose and can replace what is currently available in the NPPG. To this end, you should now refer to UKCP18 climate change figures rather than UKCP09, but continue to use existing data / guidance in the NPPG as it still represents the best available information until advised otherwise. Further advice / information is available in the attached briefing note.

If you have any further questions, please let me know.

Kind regards

Philip

Philip Carter
Planning Specialist
Cumbria and Lancashire Area

☎
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