

Birmingham Development



Revision	Date	Originator	Checker	Approver	Description	Standard
A	21 May 2014	Mike Oliver	Paul Parkhouse	Paresh Shingadia	First issue	
B	3 June 2014	Mike Oliver	Paul Parkhouse	Paresh Shingadia	First revision - two image titles amended	

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2.1 Introduction

The purpose of this section is to provide an introduction to and overview of the Hybrid Model.

2.2 PRISM Forecast

PRISM (Policy Responsive Integrated Strategy Model) is a transport model of the West Midlands and is described in some detail in the Initial Output Report where the results of three scenarios were presented and compared:

1. Base year scenario (2011) which represents a present-day transport and land-use scenario.
2. Reference Case scenario (2021 and 2031) which represents the future transport and land-use scenario in the hypothetical case where there is no Development Plan implemented
3. Development Case scenario (2021 and 2031) Development Case scenario

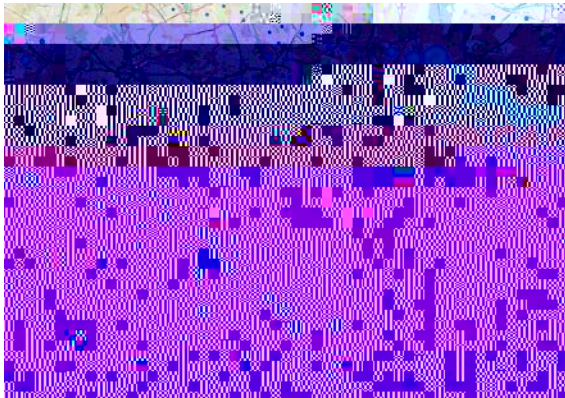
2.6 Trip Rates

The PJA TDM uses survey data collected from the TRICS database to calculate average trip rates for the land uses intended at the GBD². These trip rates are then applied to each land use to estimate the following total person trips in the peak hours:

Table 2.3: Total peak hour person-trips to/from the GBD from the PJA TDM

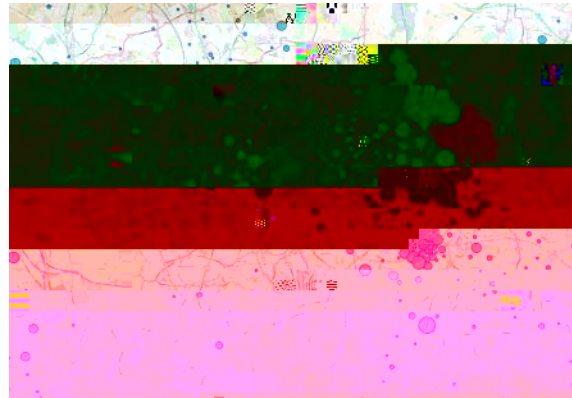
Person Trips	08:00-09:00	17:00-18:00
Peddimore Arrivals	2018	297
Peddimore Departures	458	1739
Langley Arrivals	1280	3397
Langley Departures	4373	2244
Total Arrivals	3298	3694
Total Departures		

Figure 2.4: AM Departures



Source: Mott MacDonald

Figure 2.5: PM Departures



Source: Mott MacDonald

The figures above provide some insight into the external travel patterns forecast for the GBD:

- f* The majority of external arrivals from the GBD in the AM are at zones in the Sutton Coldfield / Four Oaks area with some concentration also in Birmingham City Centre. The pattern of PM departures is fairly similar to AM arrivals.
- f* The majority of external departures to the GBD in the AM also come from the Sutton Coldfield / Four Oaks area but also from East Birmingham. The similarity of the PM arrivals to the AM departures reflects the tour-based nature of the PRISM demand model.

3 Forecasting Results

3.1 Introduction

The purpose of this section is to use the Hybrid Model to present an update of the outputs given in the Initial Output Report.

3.2 2031 Do Minimum Reference Case Results

Figure 3.1 and Figure 3.2 below show the predicted distribution of link flows in the 2031 Reference Case AM and PM average hour scenarios. The thicker the blue line, the higher the flow. These figures show the greatest flows on:

- f* The motorway network
- f* The A38 corridor between the M6 Toll and Selly Oak, especially on the Aston Expressway and through the city centre
- f* The A456 Hagley Road corridor
- f* The A45 Coventry Road corridor
- f* The A4540 city centre Ring Road

Figure 3.3 and Figure 3.4 below show the predicted impact of these AM and PM flow levels on link flow speed. Impact is shown in terms of the ratio of modelled scenario speeds compared to the equivalent impact on:

- f* Sutton Coldfield town centre
- f* The city centre, particularly the A4540, A38 and A34 corridors
- f* Sections on key radial routes, particularly the A38 north and south, the A5127 (Sutton Road), the A34 (north) and the A441 (Pershore Road)

Figure 3.5 and Figure 3.6 below show the predicted impact of the AM and PM flow levels on junction capacity. Impact is shown in terms of the ratio of flow to capacity (RFC). Only those junctions are shown where one or more movements within the junction are predicted to operate at a RFC of 85% or more, as this is the threshold above which junctions are considered to be operating at or over capacity. It is at levels above this value that increased delays and cumulative queuing can occur. These figures show greatest junction impacts on:

- f* A4040 Outer Ring Road, between the A5127 Sutton Road and Bordesley Green East
- f* A4540 Ring Road
- f* A34 Walsall Road corridor
- f* A38 Tyburn Road corridor, especially at the Norton Crossroads and Salford Circus
- f* A4097 Kingsbury Road, at M42 J9 and Water Orton Lane
- f* A38 city centre corridor
- f* A38 Bristol Road corridor
- f* A456 Hagley Road corridor
- f* A457 Dudley Road corridor
- f* A45 Coventry Road corridor

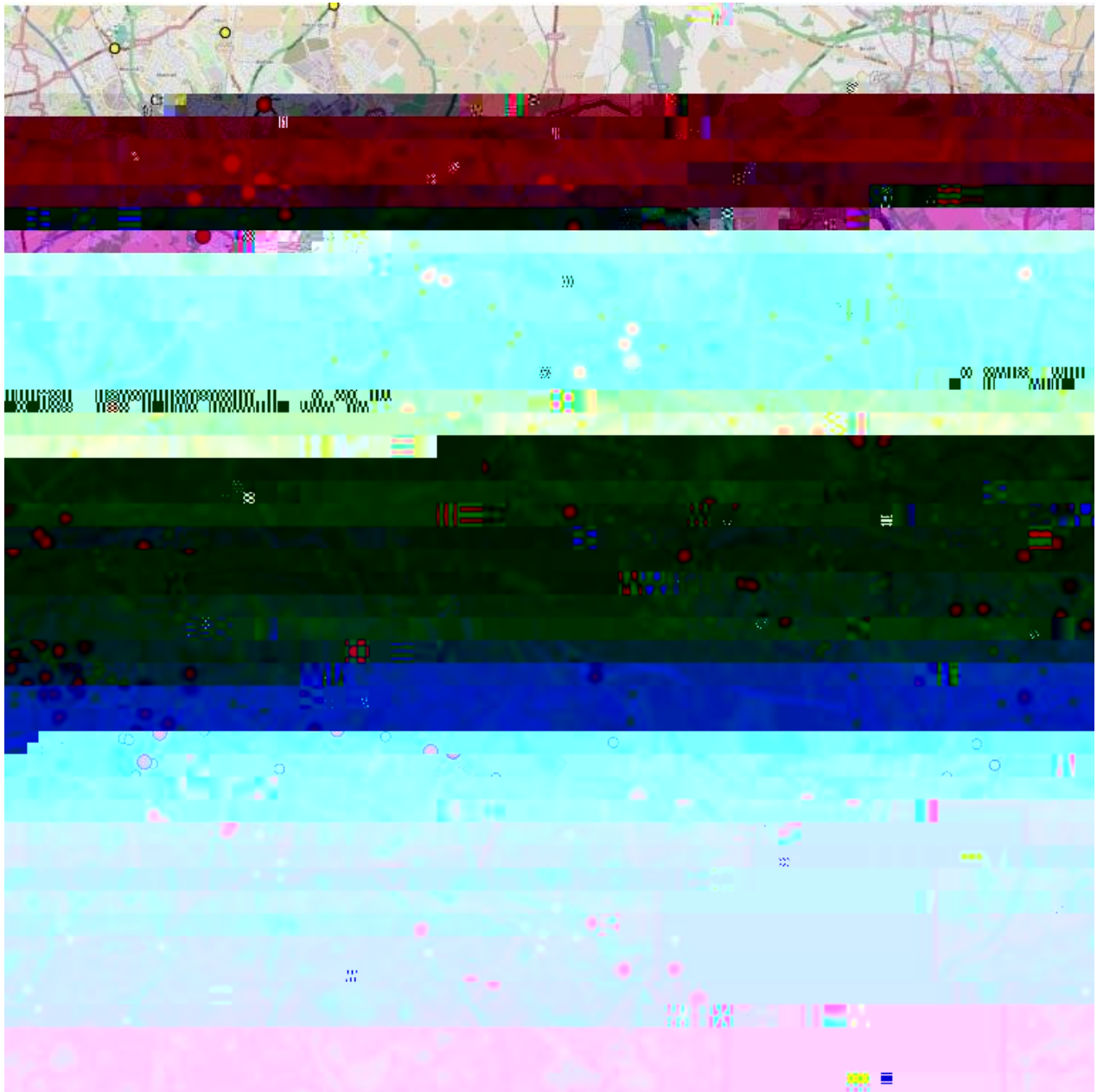
Figure 3.2: 2031 PM Reference Case Actual PCU Flow



Source: Mott MacDonald

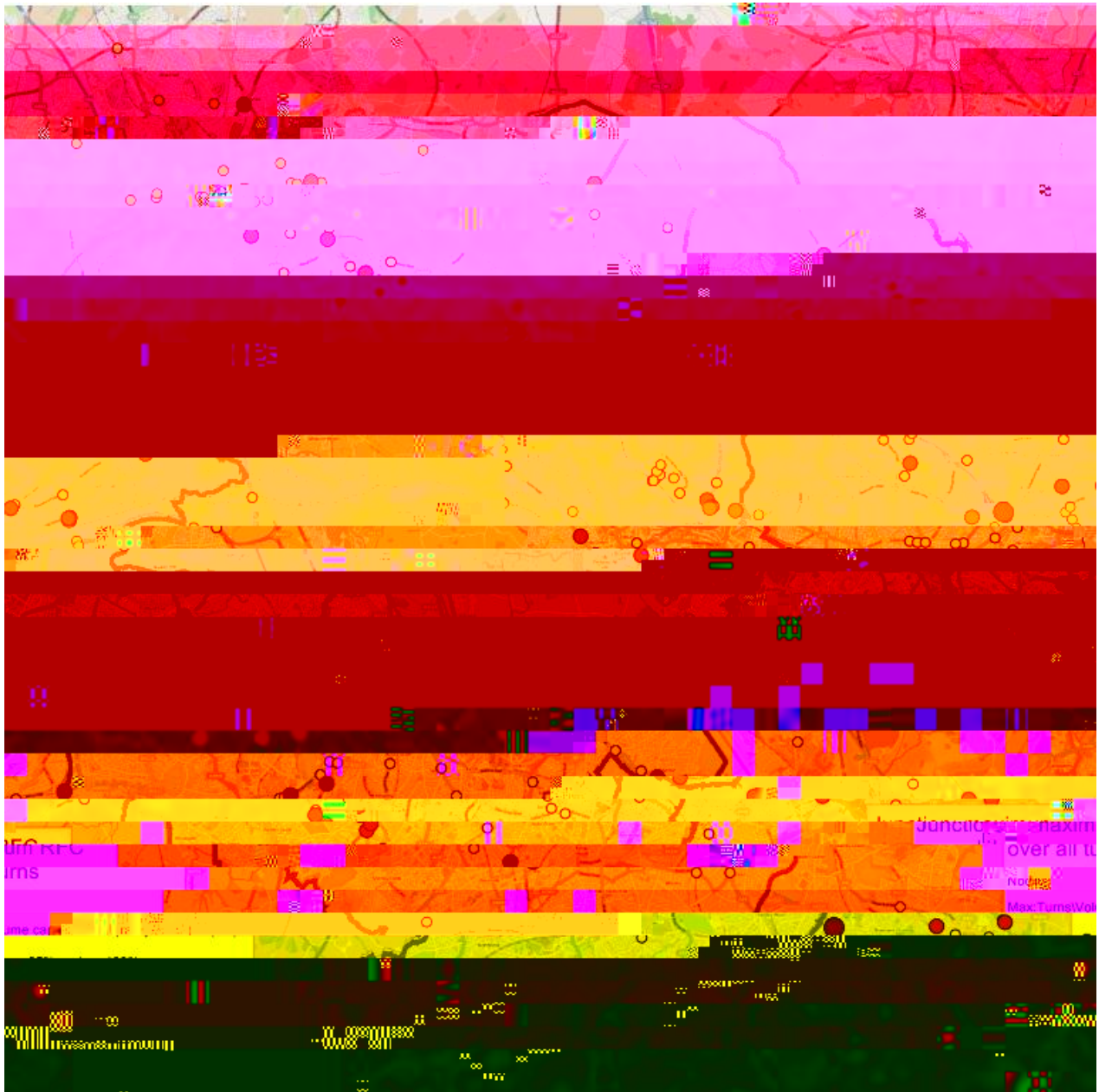
Birmingham Development Pla502 g 0.5 a9Hf4T230.694 792.6 389.95 13.

Figure 3.5: 2031 AM Reference Case RFC (of most saturated turn)



Source: Mott MacDonald

Figure 3.6: 2031 PM Reference Case RFC (of most saturated turn)



Source: Mott MacDonald

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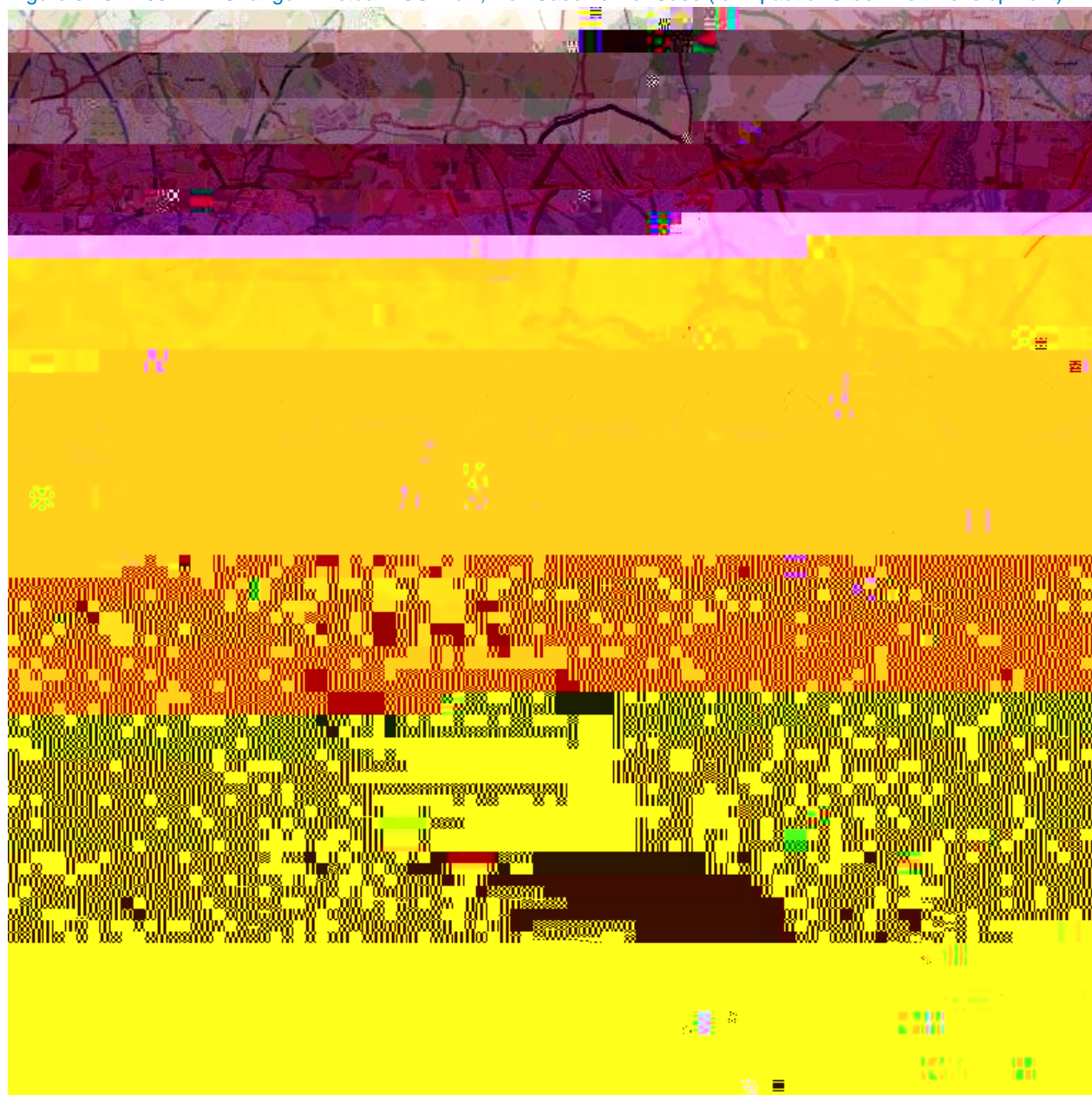
Transport Modelling Assessment: Hybrid Model Output

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Figure 3.8: 2031 PM Development Case Actual PCU Flow

Source: Mott MacDonald

Figure 3.10: 2031 PM Change in Actual PCU Flow, Dev Case vs Ref Case (ie Impact of Green Belt Development)



Source: Mott MacDonald

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Transport Modelling Assessment: Hybrid Model Output

Figure 3.12: 2031 PM Development Case Ratio of Congested Speed to Free-Flow Speed



Source: Mott MacDonald

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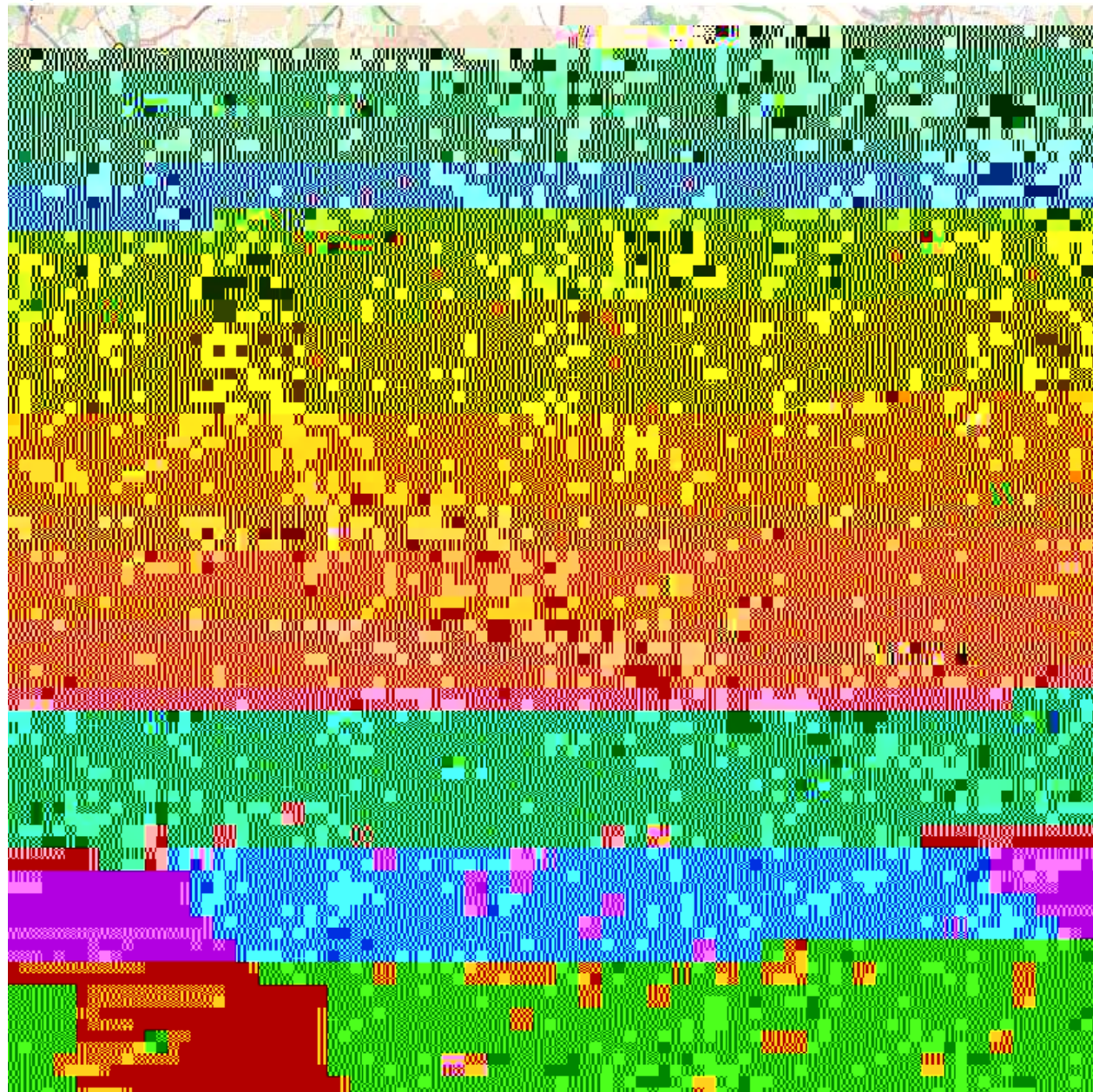
Transport Modelling Assessment: Hybrid Model Output

Figure 3.15: 2031 AM Development Case RFC (of most saturated turn)



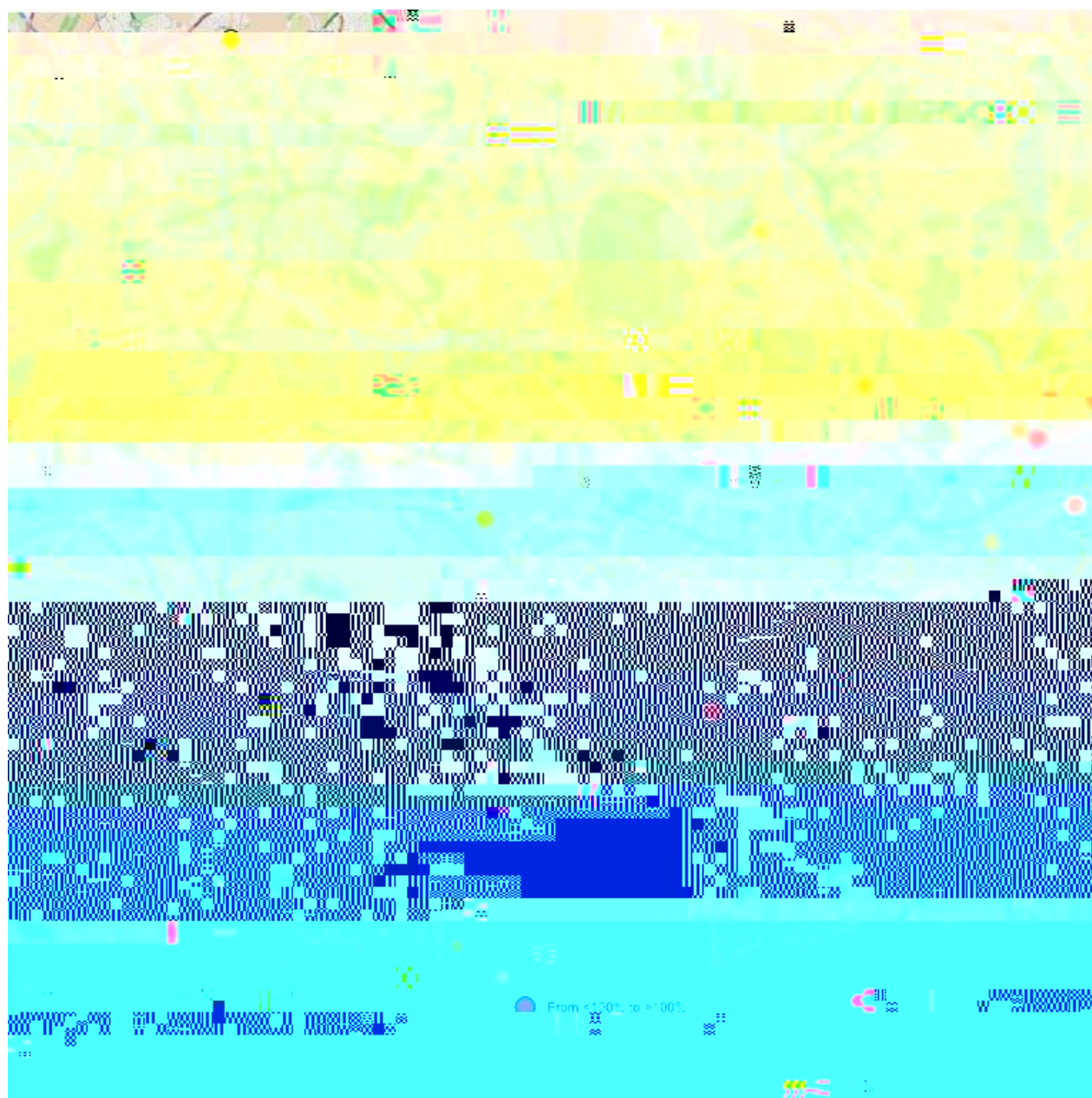
Source: Mott MacDonald

Figure 3.16: 2031 PM Development Case RFC (of most saturated turn)



Source: Mott MacDonald

Figure 3.17: 2031 AM Change in RFC Classification, Dev Case vs Ref Case (ie Impact of Green Belt Development)



Source: Mott MacDonald

Figure 3.18:

Appendices

Appendix A. Junction Data Tables _____ 33

A.1 2031 AM Comparison

Table A.1: Junction Data from the AM Reference Case and Hybrid Model

Junction	Reference Case			Hybrid Model	
	In Flow	RFC	Delay	In Flow	%chge

Note: Flow is in PCU of average hour for both AM and PM. The In Flow for junctions is the flow of all arms going toward the junction. Delay is in minutes. Some minor roads are not included in the PRISM model such as Church Lane, Blindpit Lane, Dunton Lane etc, so no results could be presented for these links.