TRANSPORT ASSESSMENT ADDENDUM

Land East of Holt Road, Horsford

David Wilson Homes (Eastern)

December 2016

Project no: 47172
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Contents:-

1. INTRODUCTION .................................................................................................................. 2

2. TECHNICAL UPDATE .......................................................................................................... 3

3. SUMMARY AND CONCLUSION .......................................................................................... 5

Figures

Figure 1 Site Location Plan

Drawings

47172-PP-004B B1149 Holt Road/Green Lane Compact Roundabout Option
47172-PP-012 Vehicle Tracking 1 of 5
47172-PP-013 Vehicle Tracking 2 of 5
47172-PP-014 Vehicle Tracking 3 of 5
47172-PP-015 Vehicle Tracking 4 of 5
47172-PP-016 Vehicle Tracking 5 of 5

Appendices

Appendix A Correspondence
Appendix B Development Layout
Appendix C Traffic Model Outputs
1. **INTRODUCTION**

1.1. Richard Jackson Ltd have been commissioned by David Wilson Homes (Eastern) to prepare a Transport Assessment Addendum (TAA) in support of an application for full planning permission for a development of 259 dwellings on land east of Holt Road, Horsford, Norfolk. The site has a grid reference of 618900, 317350 and an approximate postcode of NR10 3ED. The site location is shown on Figure 1.

1.2. The site is bound by residential properties to the southwest, Green Lane to the north, agricultural fields to the east and the development of ‘Butterfly Mill’ to the south.

1.3. The site lies within the Broadland District Council area and Broadland District Council are the local planning authority for the development which is being considered under application number 20161770. The local highway authority is Norfolk County Council (NCC).

1.4. This TAA reviews changes to the developments access since the submission of the planning application following discussions with. As part of these discussions the proposed junction improvement at Holt Road/Green Lane has been changed from a priority arrangement to a compact roundabout for which NCC’s agreement in principle is included in Appendix A. The development layout has also been updated following comments received from NCC, however the proposals still include 259 new dwellings. Updated tracking drawings are provided for these revised proposals in this addendum.

1.5. This TAA will cover the following areas:

- A Technical Update is presented in Chapter 2.

- The conclusions derived are set out in Chapter 3.

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2. **TECHNICAL UPDATE**

   **Introduction**

   2.1. The proposed development will comprise of 259 dwellings on the site as illustrated on the Site Layout included in Appendix B which has been updated by the architect following comments received from NCC. The associated improvements to the Holt Road/Green Lane have also been revised in consultation with NCC as detailed below.

   **Holt Road/Green Lane Junction Format**

   2.2. Following discussions with NCC (summarised in Appendix A) further consideration has been given to the junction format at Holt Road/Green Lane where a compact roundabout is understood to be preferred to a priority junction. The format of the compact roundabout junction is shown on Drawing 47172-PP-004 which be a three arm junction with Haveringland Road immediately to the north remaining on priority control. The design would result in the loss of the existing property at 360 Holt Road which is within the developers control. The roundabout will reduce speeds on the B1149 approach to Horsford. The junction has been tested to ensure that an HGV may negotiate northbound and southbound manoeuvres. Drawings showing tracking are provided in this addendum.

   2.3. As requested by NCC the drawing includes the highway boundary. As a result the alignment of Haveringland Road has been amended from that included in an earlier consultation version considered by NCC. The junction would be subject to detailed design and safety audit in due course and be subject to a S278 agreement.

   2.4. It is possible that the roundabout would be constructed by NCC via a S106 contribution.

   **Road Signage**

   2.5. To support the introduction of the compact roundabout the existing 40mph speed limit change is proposed will be relocated some 150-200m to the north at a point agreeable with NCC. This will be the subject of a Traffic Regulation Order which will be promoted as part of the planning application.

   2.6. If the TRO is accepted in due course and the opportunity to include entry gateway ‘mantle’ style speed restriction signing to improve driver awareness of the new junction and the change to a more urban environment.

   **Traffic Modelling**

   2.7. The compact roundabout has been checked for vehicular capacity in isolation with standard modelling software Junctions 9 based on traffic flows for 2021 with development included with the Transport Assessment (Appendix E, Traffic Flow Diagrams 11 and 12). The model output is included at Appendix C and summarised in Table 2.1.
Table 2.1 – B1149/Green Lane Road Compact Roundabout Junction Assessment – 2021 with Development

<table>
<thead>
<tr>
<th>Arm/Movement</th>
<th>AM Peak</th>
<th></th>
<th>PM Peak</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queue</td>
<td>RFC</td>
<td>Queue</td>
<td>RFC</td>
</tr>
<tr>
<td>Holt Road (N)</td>
<td>0.7</td>
<td>0.42</td>
<td>0.8</td>
<td>0.44</td>
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<tr>
<td>Green Lane</td>
<td>0.2</td>
<td>0.14</td>
<td>0.1</td>
<td>0.08</td>
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<tr>
<td>Holt Road (S)</td>
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<td>0.39</td>
<td>0.9</td>
<td>0.47</td>
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</table>

2.8. The results indicate that the junction will operate within capacity at 2021 with development traffic included. The forecast queue lengths are up to 1PCU on each approach.

2.9. When considered as part of a staggered arrangement with Green Lane, queue lengths for Haveringland Road at 2021 were forecast to be around 1PCU in length in the worst case as illustrated in Table 7.1 of the Transport Assessment. The proximity of Haveringland Road is therefore not been modelled in further detail.
3. SUMMARY AND CONCLUSION

3.1. Richard Jackson Ltd have previously reviewed the transport implications of 259 dwellings on land east of Holt Road, Horsford, Norfolk. This TAA has considered revised access proposals following discussions with NCC.

3.2. The proposed layout for the 259 dwellings has been revised by the architect following comments received from NCC and the updated layout is included in this TAA for reference.

3.3. The proposals for improving Holt Road/Green Lane have been updated from a priority arrangement to a compact roundabout, which is the preferred format of NCC. Consideration has been given to the position of the highway boundary along with road signage as requested by NCC.

3.4. The junction has been checked for vehicular capacity with development at 2021 and no operational issues are forecast. Queue lengths on the approach from the north are not expected to reach the give-way line at the junction of Holt Road/Haveringland Road.

3.5. In conclusion, the proposed development would be in accordance with the aims and objectives of Local and National Transport Planning policy and would not have a severe impact on the local transport network.
FIGURES
Holt Road, Horsford, Location
Grid Reference 618900, 317350 and Postcode: NR10 3ED

Site Location Plan

Client: David Wilson Homes (Eastern)
Job Title: Land East of Holt Road, Horsford
Drawing Title: Site Location Plan
Date: 14/10/16
Job No: 47172
Dwg No: Figure 1

Richard Jackson Engineering Consultants
6 The Old Church, St Matthews Road, Norwich, NR1 1SP
Tel. 01603 230240
www.richardjackson.uk.com
Dear All,

Further to our meeting on Tuesday, we have had some informal discussions in-house with our design team and safety audit team.

So as we agreed at the meeting, the principle of the roundabout is acceptable although will be subject to detailed design if/when the development comes forward.

However, looking at the highway boundary information along the northern approach we feel that you should be able to achieve a forward visibility to the give way line of 120m. This may require some realigning of the carriageway/cutting back of vegetation/introducing kerbing – whatever you feel is appropriate.

The 40mph limit needs to be moved to 150m to 200m north of the roundabout and we will condition that this extension to the limit is promoted and undertaken as part of the S278 works.

You will also need to look at entry signs/features as discussed at the extent of the 40mph and possible map type signing showing the roundabout layout.

Your drawings also need to show the highway boundary.

I hope this all makes sense, any queries, please let me know.

Apologies but I don’t have Jonathan’s email address.

Liz

Liz Poole BSc (Hons), MSc, MIHE
Acting Principal Engineer (Major & Estate Development)
Developer Services
Environment & Transport
Community & Environmental Services
Tel: 01603 638009
Fax: 01603 223128
Email: liz.poole@norfolk.gov.uk
Norfolk County Council
General Enquiries: 0344 800 8020 or information@norfolk.gov.uk
Website: www.norfolk.gov.uk
Summary of junction performance

<table>
<thead>
<tr>
<th></th>
<th>AM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm 1</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Arm 2</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Arm 3</td>
<td>0.6</td>
<td>0.9</td>
</tr>
</tbody>
</table>

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

File summary

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**Units**

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<th>Traffic units results</th>
<th>Flow units</th>
<th>Av. delay units</th>
<th>Total delay units</th>
<th>Rate of delay units</th>
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<tr>
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<td>kph</td>
<td>PCU</td>
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<td>perHour</td>
<td>s</td>
<td>-Min</td>
<td>perMin</td>
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**Analysis Options**

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<th>Calculate detailed queueing delay</th>
<th>Calculate residual capacity</th>
<th>RFC Threshold</th>
<th>Av. Delay threshold (s)</th>
<th>Q threshold (PCU)</th>
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## Demand Set Summary

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<th>Time Period name</th>
<th>Traffic profile type</th>
<th>Model start time (HH:mm)</th>
<th>Model finish time (HH:mm)</th>
<th>Time segment length (min)</th>
<th>Run automatically</th>
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<tr>
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<td>AM</td>
<td>ONE HOUR</td>
<td>08:00</td>
<td>09:30</td>
<td>15</td>
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<tr>
<td>2021 with Development</td>
<td>PM</td>
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<td>17:00</td>
<td>18:30</td>
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TA Addendum - 2021 with Development, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

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<th>Network flow scaling factor (%)</th>
<th>Network capacity scaling factor (%)</th>
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<td>TA Addendum</td>
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Junction Network

Junctions

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<th>Junction LOS</th>
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Junction Network Options

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<th>Lighting</th>
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Arms

Arms

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<th>Name</th>
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<td>3</td>
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Capacity Options

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<th>Initial queue (PCU)</th>
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<td>3</td>
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<td>99999.00</td>
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Roundabout Geometry

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<tr>
<th>Arm</th>
<th>V (m)</th>
<th>E (m)</th>
<th>f (m)</th>
<th>R (m)</th>
<th>D (m)</th>
<th>PHI (deg)</th>
<th>Exit only</th>
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<td>3.00</td>
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<td>20.0</td>
<td>30.0</td>
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<td>3.00</td>
<td>4.50</td>
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<td>30.0</td>
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<td>3</td>
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Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

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<th>Arm</th>
<th>Final slope</th>
<th>Final intercept (PCU/hr)</th>
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<td>1352.669</td>
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<td>3</td>
<td>0.554</td>
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*The slope and intercept shown above include any corrections and adjustments.*

Traffic Demand

Demand Set Details

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<th>Scenario name</th>
<th>Time Period name</th>
<th>Traffic profile type</th>
<th>Model start time (HH:mm)</th>
<th>Model finish time (HH:mm)</th>
<th>Time segment length (min)</th>
<th>Run automatically</th>
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<tbody>
<tr>
<td>D1</td>
<td>2021 with Development</td>
<td>AM</td>
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<td>09:30</td>
<td>15</td>
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Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
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<th></th>
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<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>HV Percentages</td>
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Demand overview (Traffic)

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<tr>
<th>Arm</th>
<th>Linked arm</th>
<th>Profile type</th>
<th>Use O-D data</th>
<th>Av. Demand (PCU/hr)</th>
<th>Scaling Factor (%)</th>
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<tr>
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Origin-Destination Data

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<th>Demand (PCU/hr)</th>
<th>To</th>
<th>From</th>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
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</tr>
<tr>
<td>To</td>
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<tr>
<td>From</td>
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<th>3</th>
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Vehicle Mix

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<th>Heavy Vehicle proportion</th>
<th>To</th>
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<th>2</th>
<th>3</th>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From</td>
<td>1</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
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<tr>
<td></td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Av. PCU Per Veh</th>
<th>To</th>
<th>From</th>
<th>1</th>
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<tr>
<td></td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>From</td>
<td>1</td>
<td>1.000</td>
<td>1.000</td>
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<td></td>
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## Results

### Results Summary for whole modelled period

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<thead>
<tr>
<th>Arm</th>
<th>Max RFC</th>
<th>Max delay (s)</th>
<th>Max Q (PCU)</th>
<th>Max LOS</th>
<th>Av. Demand (PCU/hr)</th>
<th>Total Junction Arrivals (PCU)</th>
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<tbody>
<tr>
<td>1</td>
<td>0.42</td>
<td>4.69</td>
<td>0.7</td>
<td>A</td>
<td>470.74</td>
<td>706.11</td>
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### Main Results for each time segment

#### Main results: (08:00-08:15)

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<tr>
<th>Arm</th>
<th>Total Demand (PCU/hr)</th>
<th>Junction Arrivals (PCU)</th>
<th>Circulating flow (PCU/hr)</th>
<th>Capacity (PCU/hr)</th>
<th>RFC</th>
<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
<th>Delay (s)</th>
<th>LOS</th>
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<tbody>
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#### Main results: (08:15-08:30)

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<th>Capacity (PCU/hr)</th>
<th>RFC</th>
<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
<th>Delay (s)</th>
<th>LOS</th>
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#### Main results: (08:30-08:45)

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<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
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<th>Capacity (PCU/hr)</th>
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<th>Throughput (exit) (PCU/hr)</th>
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<th>End queue (PCU)</th>
<th>Delay (s)</th>
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### Main results: (09:15-09:30)

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<th>Capacity (PCU/hr)</th>
<th>RFC</th>
<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
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<th>LOS</th>
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TA Addendum - 2021 with Development, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

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<td>TA Addendum</td>
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Junction Network

Junctions

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<th>Junction LOS</th>
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Junction Network Options
[same as above]

Arms

Arms
[same as above]

Capacity Options
[same as above]

Roundabout Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

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<th>Time Period name</th>
<th>Traffic profile type</th>
<th>Model start time (HH:mm)</th>
<th>Model finish time (HH:mm)</th>
<th>Time segment length (min)</th>
<th>Run automatically</th>
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<tr>
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<td>RM</td>
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<td>17:00</td>
<td>18:30</td>
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Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU)
✓                             | ✓                           | HV Percentages     | 2.00
Demand overview (Traffic)

<table>
<thead>
<tr>
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<th>Linked arm</th>
<th>Profile type</th>
<th>Use O-D data</th>
<th>Av. Demand (PCU/hr)</th>
<th>Scaling Factor (%)</th>
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Origin-Destination Data

Demand (PCU/hr)

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<th>To 3</th>
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Proportions

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<th>To 3</th>
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Vehicle Mix

Heavy Vehicle proportion

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Av. PCU Per Veh

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<th>To 3</th>
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Results

Results Summary for whole modelled period

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<tr>
<th>Arm</th>
<th>Max RFC</th>
<th>Max delay (s)</th>
<th>Max Q (PCU)</th>
<th>Max LOS</th>
<th>Av. Demand (PCU/hr)</th>
<th>Total Junction Arrivals (PCU)</th>
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# Main Results for each time segment

**Main results: (17:00-17:15)**

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<th>Circulating flow (PCU/hr)</th>
<th>Capacity (PCU/hr)</th>
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<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
<th>Delay (s)</th>
<th>LOS</th>
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**Main results: (17:15-17:30)**

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<th>End queue (PCU)</th>
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**Main results: (17:30-17:45)**

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**Main results: (17:45-18:00)**

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**Main results: (18:00-18:15)**

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<th>Total Demand (PCU/hr)</th>
<th>Junction Arrivals (PCU)</th>
<th>Circulating flow (PCU/hr)</th>
<th>Capacity (PCU/hr)</th>
<th>RFC</th>
<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
<th>Delay (s)</th>
<th>LOS</th>
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**Main results: (18:15-18:30)**

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<th>Capacity (PCU/hr)</th>
<th>RFC</th>
<th>Throughput (PCU/hr)</th>
<th>Throughput (exit) (PCU/hr)</th>
<th>Start queue (PCU)</th>
<th>End queue (PCU)</th>
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