# Eagle Quarter II, Newbury
## Response to West Berkshire Council's Highways Comments – VISSIM Modelling

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|---|---|
| **Date:** | 03.05.2024 |
| **Client Name:** | Lochailort Newbury Ltd |
| **Document Reference:** | WIE18916-115.R.6.1.3 |
| **Planning Reference:** | 23/02094/FULMAJ |
| **Planning Description** | Full planning permission for the redevelopment of the Kennet Centre comprising the partial demolition of the existing building on site and the development of new residential dwellings (Use Class C3) and residents' ancillary facilities; commercial, business and service floorspace including office (Class E (a, b, c, d, e, f, and g)); access, parking, and cycle parking; landscaping and open space; sustainable energy installations; associated works, and alterations to the retained Vue Cinema and multi storey car park |

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

| Issue | Prepared by | Checked & Approved by |
|---|---|---|
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## 1.  Introduction

As previously advised, the Councils VISSIM traffic model should be used to assess the impact of any increase in traffic from this development, particularly the area including and towards the A339 / Bear Lane / Kings Road roundabout and the A339 / Cheap Street junction.

This Technical Note summaries the results of the required VISSIM Modelling.

## 2.  Scope of Works & Methodology

The modelling work was undertaken by WSP who operate and maintain the VISSIM model on behalf of West Berkshire Council.

The scope of works and extent of the modelling was agreed with West Berkshire Council and included the following junctions:

- A339 / Bear Lane / Kings Road Roundabout;
- A339 / Cheap Street Junction;
- Cheap Street / Market Street Junction;
- Bear Lane / The Wharf Junction; and
- Market Street / Bartholomew Street.

The model has been run for the AM peak within the 2031 future assessment year. The model includes all known committed developments, all highway improvement schemes and mitigation from strategic housing developments. The model also includes predicted traffic flows following the proposed redevelopment of the Kennet Centre. The trip rates and resulting trip generation calculations are agreed and presented in the Transport Assessment report submitted in support of the planning application.

WSP updated the model to include a new southbound arm on Bartholomew Street. This was included within the Market Street junction and the signals adapted for this additional (Demand Dependent) stage.

This Note compares the results of the without and with development scenarios in the following paragraphs.

## 3. Results

The summary results are attached in **Appendix A** and detail the providing turning flows and queue lengths at the five key junctions, as well as overall network performance statistics (note that 'average queues' are the best guide, rather than 'maximum queues' which show the worst single point across the whole peak hour).

WSP noted (after running the model through for 20 random seeds) that they did not have queue data collection points on the A339 NB and SB arms at Cheap Street (only the Cheap St EB arm). However, when considering the impacts shown at the other junctions WSP do not envisage there would be any impact (with only 16 development vehicles passing SB through this junction in the AM peak hour).

Overall the average time for each vehicle passing through the network increases by 6 seconds to 06:07(mm:ss) and the average delay increases by 7 seconds. These results provide confidence that any impact of the shopping centre over the network is negligible in the AM peak.

In reviewing the model, the results for the individual junctions have been detailed below. The A339 / Bear Lane / Kings Road is of particular concern to West Berkshire Council and so has therefore been summarised in greater detail, focusing on turning counts and queue lengths.

### A339 / Bear Lane / Kings Road Junction

A summary of the turning flows at the A339 / Bear Lane / Kings Road roundabout is provided below.

Table 1:   Turning Counts without Development - A339 / Bear Lane / Kings Road Junction

| All Values are in Vehicles | Bear Lane Roundabout | | | | | |
|---|---|---|---|---|---|---|
| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
| Lights | A339 (N) | 0 | 210 | 207 | 1311 | 0 | 1728 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 343 | 25 | 0 | 543 | 0 | 912 |
| | A339 (S) | 1187 | 204 | 166 | 0 | 0 | 1557 |
| | Bear Ln | 159 | 76 | 77 | 175 | 0 | 487 |
| | Sum | 1689 | 515 | 449 | 2029 | 0 | 4683 |
| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
| Heavies | A339 (N) | 0 | 0 | 2 | 79 | 0 | 81 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 8 | 0 | 0 | 22 | 0 | 30 |
| | A339 (S) | 44 | 5 | 3 | 0 | 0 | 52 |
| | Bear Ln | 4 | 1 | 1 | 6 | 0 | 12 |
| | Sum | 56 | 6 | 6 | 107 | 0 | 175 |

**Table 2:    Turning Counts with Development - A339 / Bear Lane / Kings Road Junction**

| All Values are in Vehicles | Bear Lane Roundabout | | | | | |
|---|---|---|---|---|---|---|
| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |

| Lights | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| | A339 (N) | 0 | 208 | 207 | 1311 | 0 | 1726 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 343 | 25 | 0 | 542 | 0 | 910 |
| | A339 (S) | 1189 | 201 | 162 | 0 | 0 | 1552 |
| | Bear Ln | 161 | 77 | 69 | 189 | 0 | 495 |
| | Sum | 1693 | 510 | 438 | 2042 | 0 | 4684 |

| Heavies | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| | A339 (N) | 0 | 0 | 2 | 78 | 0 | 80 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 8 | 0 | 0 | 22 | 0 | 30 |
| | A339 (S) | 44 | 5 | 3 | 0 | 0 | 52 |
| | Bear Ln | 4 | 1 | 0 | 6 | 0 | 12 |
| | Sum | 56 | 6 | 5 | 107 | 0 | 174 |

**Table 3:    Turning Counts Difference - A339 / Bear Lane / Kings Road Junction**

| All Values are in Vehicles With Dev - Without Dev | Bear Lane Roundabout | | | | | |
|---|---|---|---|---|---|---|

| Lights | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| | A339 (N) | 0 | -2 | 0 | 0 | 0 | -1 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | -1 | 0 | 0 | -1 | 0 | -1 |
| | A339 (S) | 3 | -4 | -4 | 0 | 0 | -5 |
| | Bear Ln | 3 | 1 | -8 | 13 | 0 | 9 |
| | Sum | 5 | -5 | -12 | 13 | 0 | 1 |

| Heavies | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| | A339 (N) | 0 | 0 | 0 | -1 | 0 | -1 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 0 | 0 | 0 | 0 | 0 | 0 |
| | A339 (S) | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bear Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sum | 0 | -1 | -1 | -1 | 0 | -2 |

As can be seen in the above tables, the impact of the proposed development would be negligible when comparing the with and without development scenarios. The maximum vehicle increase on an approach arm is 9 vehicles during the morning peak hour. This occurs on Bear Lane and represents an increase of less than 1%.

In regard to queue lengths, the following results are reported by WSP:

**Table 4:    Queue Lengths Average (m) - A339 / Bear Lane / Kings Road Junction**

| MCCs | 2031 without dev | 2031 with dev | Difference |
|---|---|---|---|
| Bear Lane Roundabout SB | 148.6 | 144.3 | -4 / -3% |
| Bear Lane Roundabout WB Straight | 76.4 | 76.6 | 0 / 0% |
| Bear Lane Roundabout WB LT | 83.8 | 83.5 | 0 / 0% |
| Bear Lane Roundabout NB | 83.4 | 72.0 | -11 / -14% |
| Bear Lane Roundabout EB | 59.1 | 59.3 | 0 / 0% |

***Note: The average queue lengths are calculated by running the VISSIM model for several random seeds and then an average is calculated for each 5-minute interval, then the average of these values across the whole peak hour is reported.***

In conclusion the VISSIM modelling shows that the proposed development would have a negligible impact upon the A339 / Bear Lane / Kings Road roundabout in 2031.

## A339 / Cheap Street

A summary of the difference in turning flows at the A339 / Chep Street junction is provided below.

Table 5:    Turning Counts Difference - A339 / Cheap Street

| All Values are in Vehicles With Dev - Without Dev | A339 / Cheap Street | | | |
|---|---|---|---|---|
| **Lights** | | A339 (N) | A339 (S) | Cheap St | Sum |
| | A339 (N) | 0 | 17 | -4 | 13 |
| | A339 (S) | -7 | 0 | -4 | -11 |
| | Cheap St | 0 | 0 | 0 | 0 |
| | Sum | -7 | 17 | -8 | 2 |
| | | A339 (N) | A339 (S) | Cheap St | Sum |
| **Heavies** | A339 (N) | 0 | -1 | 0 | -1 |
| | A339 (S) | 0 | 0 | 0 | 0 |
| | Cheap St | 0 | 0 | 0 | 0 |
| | Sum | 0 | -1 | 0 | 0 |

As can be seen above the impact of proposed development would be negligible when comparing the with and without development scenarios. The maximum increase on any approach arm is 12 vehicles during the morning peak hour (this occurs on the A339 North).

In conclusion the VISSIM modelling shows that the proposed development would have a negligible impact upon the A339 / Cheap Street junction.

## Cheap Street / Market Street

A summary of the difference in turning flows at the Cheap Street / Market Street junction is provided below.

Table 6:    Turning Counts Difference - Cheap Street / Market Street

| All Values are in Vehicles With Dev - Without Dev | Cheap Street / Market Street | | | |
|---|---|---|---|---|
| | | Cheap St (N) | Cheap St (S) | Market St | Sum |
| **Lights** | Cheap St (N) | 0 | 0 | -1 | -1 |
| | Cheap St (S) | 1 | 0 | -1 | 0 |
| | Market St | 12 | 0 | 0 | 12 |
| | Sum | 13 | 0 | -2 | 11 |
| | | Cheap St (N) | Cheap St (S) | Market St | Sum |
| **Heavies** | Cheap St (N) | 0 | 0 | 0 | 0 |
| | Cheap St (S) | 0 | 0 | 0 | 0 |
| | Market St | 0 | 0 | 0 | 0 |
| | Sum | 0 | 0 | 0 | -1 |

As can be seen above the impact of proposed development would be negligible when comparing the with and without development scenarios. The maximum increase on any approach arm is 12 vehicles during the morning peak hour (this occurs on Market Street).

In conclusion the VISSIM modelling shows that the proposed development would have a negligible impact upon the Cheap Street / Market Street junction.

## Bear Lane / The Wharf

A summary of the difference in turning flows at the Bear Lane / The Wharf junction is provided below.

Table 7:    Turning Counts Difference - Bear Lane / The Wharf

| All Values are in Vehicles With Dev - Without Dev | | Bear Lane / The Wharf | | | |
|---|---|---|---|---|---|
| | | Wharf Rd | Bear Ln (E) | Bear Ln W | Sum |
| Lights | Wharf Rd | 0 | 0 | 0 | 0 |
| | Bear Ln (E) | 0 | 0 | 0 | 0 |
| | Bear Ln W | -1 | 10 | 0 | 8 |
| | Sum | -1 | 9 | 0 | 8 |
| | | Wharf Rd | Bear Ln (E) | Bear Ln W | Sum |
| Heavies | Wharf Rd | 0 | 0 | 0 | 0 |
| | Bear Ln (E) | 0 | 0 | 0 | 0 |
| | Bear Ln W | 0 | -1 | 0 | 0 |
| | Sum | 0 | -1 | 0 | 0 |

As can be seen above the impact of proposed development would be negligible when comparing the with and without development scenarios. The maximum increase on any approach arm is 8 vehicles during the morning peak hour (this occurs on Bear Lane West).

In conclusion the VISSIM modelling shows that the proposed development would have a negligible impact upon the Bear Lane / The Wharf junction.

## Market Street / Bartholomew Street

A summary of the difference in turning flows at the Market Street / Bartholomew Street junction is provided below.

Table 8:    Turning Counts Difference - Market Street / Bartholomew Street

| All Values are in Vehicles With Dev - Without Dev | | Market Street / Bartholomew Street | | | |
|---|---|---|---|---|---|
| | | Bartholomew (N) | Market Street | Bartholomew St (S) | Sum |
| Lights | Bartholomew St  (N) | 0 | 45 | 6 | 51 |
| | Market Street | -1 | 0 | -1 | -2 |
| | Bartholomew St (S) | -22 | -36 | 0 | -58 |
| | Sum | -23 | 9 | 6 | -8 |
| | | Bartholomew (N) | Market Street | Bartholomew St (S) | Sum |
| Heavies | Bartholomew St  (N) | 0 | 0 | 0 | 0 |
| | Market Street | 0 | 0 | 0 | 0 |
| | Bartholomew St (S) | 0 | -1 | 0 | -1 |
| | Sum | 0 | -1 | 0 | -1 |

As can be seen above the impact of proposed development would be negligible when comparing the with and without development scenarios. The maximum increase on any approach arm is 51 vehicles during the morning peak hour (this occurs on Bartholomew Street North). This arm currently only allows northbound movements. As part of the development proposals a new southbound lane would be provided, and the signals would be adapted for this additional stage. The junction is shown to operate efficiently as evidenced by the queue surveys results.

In conclusion the VISSIM modelling shows that the proposed development would have a negligible impact upon the Bear Lane / The Wharf junction.

## 4. Conclusion

The VISSIM modelling work was undertaken using the Council's approved model and the scope of works/methodology was greed in advance.

In results of the VISSIM modelling shows that the proposed development would have a negligible impact upon the local highway network.

We trust the VISSIM results provide the clarity the Council require to support the proposals and remove this part of the objection.

**A.  VISSIM Model Results provided by WSP**

**2.1 Network Performance Statistics - supplied by WSP**

| | 2031 without dev | 2031 with dev | Difference |
|---|---|---|---|
| Average Time [mm:ss] / Vehicle | 00:06:01 | 00:06:07 | 6 / 2% |
| Average Distance (km) / Vehicle | 2.38 | 2.38 | 0 / 0% |
| Average Speed (mph) | 14.75 | 14.50 | -0.26 / -2% |
| Average Speed (kph) | 23.74 | 23.33 | -0.41 / -2% |
| Average Delay [mm:ss] / Vehicle | 00:02:58 | 00:03:05 | 7 / 4% |

*Description:*

*Average travel time of each vehicle that has passed through the network (mm:ss)*
*Average distance travelled of each vehicle that has passed through the network (km)*
*Average speed of each vehicle that has passed through the network (mph)*
*Average speed of each vehicle that has passed through the network (kph)*
*Average delay time of each vehicle that has passed through the network (mm:ss)*

**2.2 Turning Flows without Dev supplied by WSP**

| All Values are in Vehicles | Bear Lane Roundabout | | | | | | |
|---|---|---|---|---|---|---|---|
| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
| **Lights** | A339 (N) | 0 | 210 | 207 | 1311 | 0 | 1728 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 343 | 25 | 0 | 543 | 0 | 912 |
| | A339 (S) | 1187 | 204 | 166 | 0 | 0 | 1557 |
| | Bear Ln | 159 | 76 | 77 | 175 | 0 | 487 |
| | Sum | 1689 | 515 | 449 | 2029 | 0 | 4683 |

| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| **Heavies** | A339 (N) | 0 | 0 | 2 | 79 | 0 | 81 |
| | Mill Ln | 0 | 0 | 0 | 0 | 0 | 0 |
| | Kings Rd | 8 | 0 | 0 | 22 | 0 | 30 |
| | A339 (S) | 44 | 5 | 3 | 0 | 0 | 52 |
| | Bear Ln | 4 | 1 | 1 | 6 | 0 | 12 |
| | Sum | 56 | 6 | 6 | 107 | 0 | 175 |

| All Values are in Vehicles | A339 / Cheap Street | | | |
|---|---|---|---|---|
| | | A339 (N) | A339 (S) | Cheap St | Sum |
| **Lights** | A339 (N) | 0 | 1589 | 436 | 2025 |
| | A339 (S) | 1541 | 0 | 109 | 1650 |
| | Cheap St | 29 | 0 | 0 | 29 |
| | Sum | 1570 | 1589 | 545 | 3704 |

| | | A339 (N) | A339 (S) | Cheap St | Sum |
|---|---|---|---|---|---|
| **Heavies** | A339 (N) | 0 | 102 | 5 | 107 |
| | A339 (S) | 52 | 0 | 5 | 57 |
| | Cheap St | 0 | 0 | 0 | 0 |
| | Sum | 52 | 102 | 10 | 164 |

| All Values are in Vehicles | Cheap Street / Market Street | | | |
|---|---|---|---|---|
| | | Cheap St (N) | Cheap St (S) | Market St | Sum |
| **Lights** | Cheap St (N) | 0 | 0 | 237 | 237 |
| | Cheap St (S) | 86 | 0 | 295 | 380 |
| | Market St | 319 | 0 | 0 | 319 |
| | Sum | 404 | 0 | 532 | 936 |

| | | Cheap St (N) | Cheap St (S) | Market St | Sum |
|---|---|---|---|---|---|
| **Heavies** | Cheap St (N) | 0 | 0 | 8 | 8 |
| | Cheap St (S) | 1 | 0 | 9 | 10 |
| | Market St | 17 | 0 | 0 | 17 |
| | Sum | 18 | 0 | 17 | 35 |

**2.2 Turning Flows without Dev supplied by WSP**

| All Values are in Vehicles | | Bear Lane / The Wharf | | | |
|---|---|---|---|---|---|
| | | **Wharf Rd** | **Bear Ln (W)** | **Bear Ln (E)** | **Sum** |
| **Lights** | **Wharf Rd** | 0 | 66 | 12 | 78 |
| | **Bear Ln (E)** | 0 | 0 | 0 | 0 |
| | **Bear Ln (W)** | 123 | 426 | 0 | 549 |
| | **Sum** | 123 | 492 | 12 | 627 |

| | | **Wharf Rd** | **Bear Ln (E)** | **Bear Ln (W)** | **Sum** |
|---|---|---|---|---|---|
| **Heavies** | **Wharf Rd** | 0 | 1 | 5 | 6 |
| | **Bear Ln (E)** | 0 | 0 | 0 | 0 |
| | **Bear Ln (W)** | 10 | 11 | 0 | 21 |
| | **Sum** | 10 | 12 | 5 | 27 |

| All Values are in Vehicles | | Market Street / Bartholomew Street | | | |
|---|---|---|---|---|---|
| | | **Bartholomew (N)** | **Market Street** | **Bartholomew St (S)** | **Sum** |
| **Lights** | **Bartholomew St  (N)** | 0 | 0 | 0 | 0 |
| | **Market Street** | 121 | 0 | 333 | 454 |
| | **Bartholomew St (S)** | 497 | 407 | 0 | 905 |
| | **Sum** | 619 | 407 | 333 | 1359 |

| | | **Bartholomew (N)** | **Market Street** | **Bartholomew St (S)** | **Sum** |
|---|---|---|---|---|---|
| **Heavies** | **Bartholomew St  (N)** | 0 | 0 | 0 | 0 |
| | **Market Street** | 0 | 0 | 12 | 12 |
| | **Bartholomew St (S)** | 11 | 8 | 0 | 18 |
| | **Sum** | 11 | 8 | 12 | 30 |

**2.3 Turning Flows with Dev supplied by WSP**

**Bear Lane Roundabout**

| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| **Lights** | **A339 (N)** | 0 | 208 | 207 | 1311 | 0 | 1726 |
| | **Mill Ln** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Kings Rd** | 343 | 25 | 0 | 542 | 0 | 910 |
| | **A339 (S)** | 1189 | 201 | 162 | 0 | 0 | 1552 |
| | **Bear Ln** | 161 | 77 | 69 | 189 | 0 | 495 |
| | **Sum** | 1693 | 510 | 438 | 2042 | 0 | 4684 |

| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| **Heavies** | **A339 (N)** | 0 | 0 | 2 | 78 | 0 | 80 |
| | **Mill Ln** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Kings Rd** | 8 | 0 | 0 | 22 | 0 | 30 |
| | **A339 (S)** | 44 | 5 | 3 | 0 | 0 | 52 |
| | **Bear Ln** | 4 | 1 | 0 | 6 | 0 | 12 |
| | **Sum** | 56 | 6 | 5 | 107 | 0 | 174 |

| | | A339 (N) | Mill Ln | Kings Rd | A339 (S) | Bear Ln | Sum |
|---|---|---|---|---|---|---|---|
| **Dev Traffic only (Included in Lights)** | **A339 (N)** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Mill Ln** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Kings Rd** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **A339 (S)** | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Bear Ln** | 15 | 9 | 0 | 16 | 0 | 41 |
| | **Sum** | 15 | 9 | 0 | 16 | 0 | 41 |

| **All Values are in Vehicles** | | **A339 / Cheap Street** | | | |
|---|---|---|---|---|---|

| | | A339 (N) | A339 (S) | Cheap St | Sum |
|---|---|---|---|---|---|
| **Lights** | **A339 (N)** | 0 | 1606 | 432 | 2038 |
| | **A339 (S)** | 1534 | 0 | 105 | 1639 |
| | **Cheap St** | 29 | 0 | 0 | 29 |
| | **Sum** | 1563 | 1606 | 537 | 3705 |

| | | A339 (N) | A339 (S) | Cheap St | Sum |
|---|---|---|---|---|---|
| **Heavies** | **A339 (N)** | 0 | 101 | 5 | 106 |
| | **A339 (S)** | 53 | 0 | 5 | 58 |
| | **Cheap St** | 0 | 0 | 0 | 0 |
| | **Sum** | 53 | 101 | 10 | 164 |

| | | A339 (N) | A339 (S) | Cheap St | Sum |
|---|---|---|---|---|---|
| **Dev Traffic only (Included in Lights)** | **A339 (N)** | 0 | 16 | 0 | 16 |
| | **A339 (S)** | 0 | 0 | 0 | 0 |
| | **Cheap St** | 0 | 0 | 0 | 0 |
| | **Sum** | 0 | 16 | 0 | 16 |

**2.3 Turning Flows with Dev supplied by WSP**

| All Values are in Vehicles | Cheap Street / Market Street | | | |
|---|---|---|---|---|

| Lights | | Cheap St (N) | Cheap St (S) | Market St | Sum |
|---|---|---|---|---|---|
| | Cheap St (N) | 0 | 0 | 237 | 237 |
| | Cheap St (S) | 87 | 0 | 294 | 380 |
| | Market St | 330 | 0 | 0 | 330 |
| | Sum | 417 | 0 | 530 | 947 |

| Heavies | | Cheap St (N) | Cheap St (S) | Market St | Sum |
|---|---|---|---|---|---|
| | Cheap St (N) | 0 | 0 | 8 | 8 |
| | Cheap St (S) | 1 | 0 | 9 | 10 |
| | Market St | 16 | 0 | 0 | 16 |
| | Sum | 17 | 0 | 17 | 34 |

| Dev Traffic only (Included in Lights) | | Cheap St (N) | Cheap St (S) | Market St | Sum |
|---|---|---|---|---|---|
| | Cheap St (N) | 0 | 0 | 0 | 0 |
| | Cheap St (S) | 0 | 0 | 0 | 0 |
| | Market St | 44 | 0 | 0 | 44 |
| | Sum | 44 | 0 | 0 | 44 |

| All Values are in Vehicles | Bear Lane / The Wharf | | | |
|---|---|---|---|---|

| Lights | | Wharf Rd | Bear Ln (E) | Bear Ln W | Sum |
|---|---|---|---|---|---|
| | Wharf Rd | 0 | 65 | 12 | 78 |
| | Bear Ln (E) | 0 | 0 | 0 | 0 |
| | Bear Ln W | 122 | 436 | 0 | 557 |
| | Sum | 122 | 501 | 12 | 635 |

| Heavies | | Wharf Rd | Bear Ln (E) | Bear Ln W | Sum |
|---|---|---|---|---|---|
| | Wharf Rd | 0 | 1 | 5 | 6 |
| | Bear Ln (E) | 0 | 0 | 0 | 0 |
| | Bear Ln W | 10 | 11 | 0 | 21 |
| | Sum | 10 | 12 | 5 | 27 |

| Dev Traffic only (Included in Lights) | | Wharf Rd | Bear Ln (E) | Bear Ln W | Sum |
|---|---|---|---|---|---|
| | Wharf Rd | 0 | 0 | 0 | 0 |
| | Bear Ln (E) | 0 | 0 | 0 | 0 |
| | Bear Ln W | 0 | 42 | 0 | 42 |
| | Sum | 0 | 42 | 0 | 42 |

**2.3 Turning Flows with Dev supplied by WSP**

| All Values are in Vehicles | Market Street / Bartholomew Street | | | | |
|---|---|---|---|---|---|
| | | Bartholomew (N) | Market Street | Bartholomew St (S) | Sum |
| **Lights** | **Bartholomew St (N)** | 0 | 45 | 6 | 51 |
| | **Market Street** | 120 | 0 | 332 | 452 |
| | **Bartholomew St (S)** | 475 | 371 | 0 | 846 |
| | **Sum** | 596 | 416 | 338 | 1350 |

| | | Bartholomew (N) | Market Street | Bartholomew St (S) | Sum |
|---|---|---|---|---|---|
| **Heavies** | **Bartholomew St (N)** | 0 | 0 | 0 | 0 |
| | **Market Street** | 0 | 0 | 11 | 11 |
| | **Bartholomew St (S)** | 10 | 7 | 0 | 18 |
| | **Sum** | 10 | 7 | 11 | 29 |

| | ` | Bartholomew (N) | Market Street | Bartholomew St (S) | Sum |
|---|---|---|---|---|---|
| **Dev Traffic only (Included in Lights)** | **Bartholomew St (N)** | 0 | 45 | 6 | 51 |
| | **Market Street** | 0 | 0 | 0 | 0 |
| | **Bartholomew St (S)** | 0 | 0 | 0 | 0 |
| | **Sum** | 0 | 45 | 6 | 51 |

| MCCs | 2031 without dev | 2031 with dev | Difference |
|---|---|---|---|
| 31 - MCC 3 - Bear Lane Roundabout SB | 148.6 | 144.3 | -4 / -3% |
| 32 - MCC 3 - Bear Lane Roundabout WB Straight | 76.4 | 76.6 | 0 / 0% |
| 33 - MCC 3 - Bear Lane Roundabout WB LT | 83.8 | 83.5 | 0 / 0% |
| 34 - MCC 3 - Bear Lane Roundabout NB | 83.4 | 72.0 | -11 / -14% |
| 35 - MCC 3 - Bear Lane Roundabout EB | 59.1 | 59.3 | 0 / 0% |
| 41 - MCC 4 - A339 / Cheap St EB | 18.0 | 16.9 | -1 / -6% |
| 71 - MCC 7 - Bear Lane / Wharf Car Park SB | 8.9 | 9.7 | 1 / 9% |
| 72 - MCC 7 - Bear Lane / Wharf Car Park WB | 16.1 | 16.0 | 0 / 0% |
| 73 - MCC 7 - Bear Lane / Wharf Car Park EB | 86.3 | 91.9 | 6 / 7% |
| 301 - MCC 30- Bartholomew St / Market St WB | 41.0 | 43.5 | 3 / 6% |
| 302 - MCC 30- Bartholomew St / Market St NB | 75.9 | 76.6 | 1 / 1% |
| 303 - MCC 30- Bartholomew St / Market St SB |  | 13.4 | 13/100% |
| 321 - MCC 32 - Market St / Cheap St NB | 83.5 | 82.5 | -1 / -1% |
| 322 - MCC 32 - Market St / Cheap St EB | 99.8 | 106.2 | 6 / 6% |
| 323 - MCC 32 - Market St / Cheap St SB | 58.4 | 58.5 | 0 / 0% |

*The model is run for several random seeds and for each run, the  MAXIMUM  queue in every 5-minute interval is reported.  The  AVERAGE  of the runs is then calculated for each 5-minute interval.  Finally the  **AVERAGE**  of these values, across the whole peak hour, is reported in the above table.*