# Appendix 43

AECOM Technical Note Extract on Omega VISSIM Trip Rates

**Trip Generation and Distribution Extract.**

**(From note produced on 26th October 2015 on behalf of Highways England)**

The Technical Note (TN) was prepared to summarise the work undertaken by AECOM to update an existing VISSIM model of the M62 to include the proposed Omega Zones 3-6 development proposals and a parallel Section 73 application for variation of prior planning permission at Omega Zones 1 and 2.

## Trip Generation and Distribution

This section presents the trip rates which were used to derive the trip generation of the OMEGA Zones 3-6 and Section 73 development proposals; describes how the development traffic was distributed on the highway network along with all the necessary assumptions; and defines which VISSIM zones were utilised to assign the traffic in the VISSIM model.

AECOM has undertaken a review of the trip generation and distribution assumptions proposed in WSP's documentation for the development proposals, which is described in detail in a parallel TN produced by AECOM. For consistency, those assumptions which were accepted by AECOM have also been utilised in the VISSIM model. The trip generation and distribution assumptions utilised within the VISSIM model are summarised below.

### *OMEGA Zones 3-6 Development Trip Generation and Distribution*

#### *Residential Development*

The trip rates and resulting trip generation for the proposed residential units used in the model, are presented in **Table 1**.

**Table 1: Residential Trip Rates and Generation, utilised by AECOM in the VISSIM model**

| Development Traffic | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | Arrivals | Departures | Arrivals | Departures |
| 85th Percentile Trip Rates | 0.225 | 0.523 | 0.495 | 0.307 |
| Residential Trips (1100 units) | 248 | 575 | 545 | 338 |

The trip distribution of the residential units has been based upon WSP's gravity model, described within WSP'S TA Scope. The external links of WSP's gravity model were represented by a series of VISSIM zones, as summarised in **Table 2**.

**Table 2: Zones in VISSIM utilised for the residential trip distribution**

| Ref | Road | Zones in VISSIM |
|---|---|---|
| 1 | Lingley Green Ave | 21 |
| 2 | Barrow Hall Lane | 20 |
| 3 | Kingsdale Road | 19 |
| 4 | Whittle Ave | 18 |
| 5 | Malvern Cl | 17 |

| | | |
|---|---|---|
| 6 | Burtonwood Rd | 16 |
| 7 | Westbrook Way | 15 |
| 8 | Kingswood Rd | 14 |
| 9 | Charon Way | 13 |
| 10 | A57 (S) | 1 |
| 11 | A557 | 1 |
| 12 | M62 (W) | 1 |
| 13 | A57 (N) | 1 |
| 14 | St. Helens Linkway | 1 |
| 15 | Lockheed Rd | 2 |
| 16 | Burtonwood Rd | 3 |
| 17 | Service Area Access | 5 |
| 18 | Delph Ln | 6 |
| 19 | Winwick Park Ave | 6 |
| 20 | A48 (N) | 7 |
| 21 | Winwick Link Rd | 7 |
| 22 | M6 (N) | 8 |
| 23 | M62 ( E) | 9 |
| 24 | M6 (S) | 10 |
| 25 | Winwick Rd (S) | 11 |

***Food Store***

The trip rates used to derive the discount food store development traffic, are summarised alongside the resulting trip generation in **Table 3**.

**Table 3: Discount Food Store Trip Rates and Generation, utilised by AECOM in the VISSIM model**

| Trip Rates | AM Peak | | PM Peak | |
|---|---|---|---|---|
| Mode Vehicles | Arrivals | Departures | Arrivals | Departures |
| Discount Food Store (per 100 sq.m) | 0.660 | 0.321 | 2.799 | 3.280 |
| Trip Generation (2,000 sq.m) | 14 | 7 | 56 | 66 |

The WSP TA Scope Addendum proposed that 70% of vehicle trips would be "internal" and generated from within the Omega site, and the other 30% would be "external" and generated elsewhere in the wider area. Considering the proportion of trips for this land use type likely to use the SRN from this land would be low, AECOM applied the same assumptions to derive the food store trip distribution.

The 70% "internal" foodstore trips were distributed equally on all available internal zones, resulting in 14.2% of such trips being assumed to arrive/depart at each 7 no. zones within the modelled Omega development area.

The 30% "external" trips for the foodstore were assumed to arrive depart via the Burtonwood Road roundabout, and therefore zones representing each of the four existing arms of the roundabout were selected and the 25% of the external trips assigned to each of these zones.

The discount food store distribution percentages and the corresponding VISSIM zones are shown in **Table 4** and **Table 5**.

**Table 4: Zones in VISSIM utilised to distribute 70% of the Discount Food Store Traffic**

| 70% of Development Traffic | Attraction % | Zones in VISSIM |
|---|---|---|
| Zone 604 in VISSIM (Development Zone) | 14% | 601 |
| | 14% | 602 |
| | 14% | 603 |
| | 14% | 605 |
| | 14% | 606 |
| | 14% | 607 |
| | 14% | 610 |

**Table 5: Zones in VISSIM utilised to distribute 30% of the Discount Food Store Development Traffic**

| 30% of Development Traffic | Attraction % | Zones in VISSIM |
|---|---|---|
| Zone 604 in VISSIM (Development Zone) | 25% | 13 |
| | 25% | 14 |
| | 25% | 15 |
| | 25% | 16 |

***Hotel and Pub/Restaurant***

**Table 6** shows the trip rates/trip generation for the proposed Hotel and Pub/Restaurant development.

**Table 6: Hotel and Pub/Restaurant Trip Rates and Generation, proposed in WSP TA Scope**

| Trip Rates | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Mode Vehicles** | **Arrivals** | **Departures** | **Arrivals** | **Departures** |
| **Hotel Pub/Res (per 100 sq.m)** | 0.302 | 0.631 | 1.033 | 0.474 |
| **Trip Generation (2,850 sq.m)** | 9 | 18 | 30 | 14 |

The hotel and pub/restaurant trip distribution percentages and the relevant VISSIM zones are shown in **Table 7**.

**Table 7: Zones in VISSIM utilised to distribute the Hotel and Pub/Restaurant Development Traffic**

| Location | Attraction % | Zones in VISSIM |
|---|---|---|
| **M62 East** | 40% | 9 |
| **M62 West** | 20% | 1 |
| **Westbrook Way (Warrington N)** | 20% | 15 |
| **Whittle Avenue (Warrington W)** | 20% | 18 |

***Care Home***

**Table 8** shows the trip rates/trip generation for the proposed Care Home development.

**Table 8: Care Home Trip Rates Trip Rates and Generation, proposed in WSP TA Scope**

| Trip Rates | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Mode Vehicles** | **Arrivals** | **Departures** | **Arrivals** | **Departures** |
| **Care Home (per bed)** | 0.068 | 0.068 | 0.083 | 0.113 |
| **Trip Generation (80 beds)** | 6 | 6 | 7 | 10 |

**Table 9** indicates the VISSIM zones and the trip distribution percentages which were used to distribute the Care Home development trips.

**Table 9: Zones in VISSIM utilised to distribute the Hotel and Pub/Restaurant Development Traffic**

| Location | Attraction % | Zones in VISSIM |
|---|---|---|
| **Westbrook Way (Warrington N)** | 50% | 15 |
| **Whittle Avenue (Warrington W)** | 50% | 18 |

***Omega B1 Trip Off-Setting Trip Generation and Distribution***

In addition to reviewing the trip rates and trip distribution proposed by WSP, AECOM has also undertaken a review of a proposed off-setting analysis proposed by WSP. This review is detailed in a parallel TN produced by AECOM, while the net trip generation "offset" resulting from the replacement

of 55,740sq.m of consented B1 development with 30% B2 and 70% B8 uses is summarised in **Table 10** for reference.

**Table 10: Net Trip Reduction from B1 to B2/B8 Land Use Offsetting**

| B1 – B2/B8 Offset | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Arrivals | Departures | Two-Way | Arrivals | Departures | Two - Way |
| **Net Trips** | 924 | 41 | 965 | 43 | 684 | 727 |

**Table 11** indicates the trip reduction percentages from B1 to B2/B8 land use offsetting.

**Table 11: Trip Reduction percentages from B1 to B2/B8 Land Use Offsetting**

| Trips | AM Peak | | PM Peak | | AM Peak | PM Peak |
|---|---|---|---|---|---|---|
| | Arrivals | Departures | Arrivals | Departures | Two-Way | Two Way |
| **Vehicles** | 12% | 56% | 48% | 14% | 15% | 17% |

In order to apply the above net trip reduction on the existing VISSIM model, AECOM requested from Atkins detailed information regarding the distribution of traffic of the OMEGA Phase 2 Office development. Atkins provided a TN (dated 27th August 2015) and an additional spreadsheet which together describe how the trip distribution for the B1 Office development was derived and which zones were utilised in their VISSIM models. These zones are shown in **Table 12**.

**Table 12: Zones in VISSIM on which Atkins has applied OMEGA B1 Development Traffic**

| Origin Zone in VISSIM | Destination Zones in VISSIM |
|---|---|
| 500 | 1,3,7,8,9,10,11,13,15,17,18,19,20,21 |

AECOM derived a formula which (was applied) to the original traffic matrices provided by Atkins, to represent the development trip reduction due to the B1 to B2/B8 land use offsetting.

This formula is as follows:

***((57.1%* Original Traffic O/D Value) +***

***(42.9%*Original Traffic O/D Value*Net Trip Reduction Percentage))***

In addition to updating the traffic matrices to include the above assumptions, AECOM has also applied a traffic profile adjustment to the hourly traffic matrices, based on information provided by Atkins. Atkins' traffic profile is shown in **Table 13**.

**Table 13: Peak Hour Traffic Profile**

| Start time | AM profile | Start time | PM profile |
|---|---|---|---|
| 07:00:00 | 17.50% | 16:00:00 | 20.99% |
| 07:15:00 | 20.97% | 16:15:00 | 21.47% |
| 07:30:00 | 23.99% | 16:30:00 | 23.57% |
| 07:45:00 | 28.78% | 16:45:00 | 24.19% |
| 08:00:00 | 26.98% | 17:00:00 | 25.63% |
| 08:15:00 | 26.71% | 17:15:00 | 25.56% |
| 08:30:00 | 24.73% | 17:30:00 | 26.13% |
| 08:45:00 | 21.58% | 17:45:00 | 22.67% |
| 09:00:00 | 19.41% | 18:00:00 | 22.46% |
| 09:15:00 | 15.17% | 18:15:00 | 19.12% |
| 09:30:00 | 13.93% | 18:30:00 | 17.70% |
| 09:45:00 | 12.95% | 18:45:00 | 14.60% |