

APPENDIX M: TECHNICAL NOTE 14 (TRIP DISTRIBUTION)

WEST MIDLANDS INTERCHANGE

SUBJECT: Technical Note 14 –Trip Distribution

DATE: 23 May 2017

Client	Four Ashes Ltd
Project Number	70001979
Version	2
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Authorised	I Fielding

1 Introduction

- 1.1 WSP | Parsons Brinckerhoff has been commissioned by Four Ashes Ltd to provide advice in relation to the proposed development of a Strategic Rail Freight Interchange (SRFI) on land south west of M6 J12 in south Staffordshire.
- 1.2 The development, known as West Midlands Interchange (WMI) will include an intermodal terminal and rail related B8 warehousing amounting to a total floor area of up to 743,200sqm (8 million sqft). The final layout and development content has not yet been determined.
- 1.3 This Technical Note responds to comments from JMP, Highways England’s transport consultants, on the employee vehicular trip distribution presented in Technical Note 10 – Trip Distribution Methodology, attached in Annex A. This note also includes a summary of the HGV distribution which was included in Technical Note 10 and agreed by JMP on behalf of Highways England.

2 Light Vehicle Distribution

- 2.1 JMP provided a response to Technical Note 10 on 26th October 2016, attached in Annex B. In this they generally agreed the proposed approach to the employee trip distribution and accepted the use of a gravity model but requested Shropshire was disaggregated into smaller areas and that time was used as the deterrence factor rather than distance.
- 2.2 Shropshire has now been disaggregated into Medium Super Output Areas (MSOAs) for all further Gravity Model work. The results presented in this note are a summary but the full disaggregated results for Shropshire, as well as Cannock Chase and South Staffordshire, are included in Annex C.
- 2.3 Further investigation into using time as the deterrence factor rather than distance has also been carried out. JMP have suggested using actual peak period journey times. It is noted that using am / pm peak journey times does not reflect when journeys by the majority of employees will take place as they will travel outside the peak hours given shift change patterns associated with the scheme. Therefore any distribution calculated using this data would not necessarily reflect the general daily distribution of employees. However, a review using these peak period journey times has been carried out.
- 2.4 The fastest typical morning (8am – 9am) / evening (5pm – 6pm) journey times and the slowest typical morning / evening journey times have been used to develop 4 gravity models. These fastest / slowest journey times are taken from Google maps as the best available source of continuous route journey times. Other data sources, such as TRADs and Traffic Master, were considered but were not suitable due to either incomplete data for the whole length of the route or the data not being available.

2.5 A summary of the results of these models are presented below compared to the results using distance², which were presented in Technical Note 10, dated 10th October 2016 (updated to include the disaggregated data for Shropshire). A full set of the disaggregated results are included in Annex C.

Table 1 – Distance² and Journey Time Gravity Model Results

Area	Distance ²	AM Fastest	AM Slowest	PM Fastest	PM Slowest	Average Fastest Peak Hour Distribution	Average Slowest Peak Hour Distribution	Average Peak Hour Distribution
Birmingham selection	5.26%	10.61%	8.03%	10.71%	9.92%	10.66%	8.97%	9.82%
Cannock Chase	15.71%	5.67%	6.04%	5.32%	5.99%	5.50%	6.01%	5.76%
ualad09:Dudley	4.45%	5.95%	5.33%	6.01%	5.71%	5.98%	5.52%	5.75%
ualad09:Lichfield	2.72%	5.48%	6.21%	5.54%	6.14%	5.51%	6.17%	5.84%
ualad09:Sandwell	9.91%	10.81%	8.66%	12.02%	9.78%	11.41%	9.22%	10.32%
ualad09:Shropshire	1.93%	5.85%	6.82%	5.94%	6.79%	5.90%	6.81%	6.35%
South Staffordshire	17.55%	7.28%	8.34%	7.00%	8.00%	7.14%	8.17%	7.66%
ualad09:Stafford	2.46%	5.10%	5.71%	5.15%	5.25%	5.13%	5.48%	5.30%
ualad09:Telford and Wrekin	2.74%	6.00%	6.86%	6.06%	7.31%	6.03%	7.08%	6.56%
ualad09:Walsall	13.01%	11.32%	11.41%	11.44%	10.48%	11.38%	10.94%	11.16%
ualad09:Wolverhampton	19.39%	12.15%	11.79%	10.91%	9.99%	11.53%	10.89%	11.21%
Stoke-on-Trent	2.18%	7.62%	7.21%	7.70%	7.13%	7.66%	7.17%	7.41%
Staffordshire Moorlands	0.46%	1.35%	1.54%	1.36%	1.53%	1.36%	1.54%	1.45%
Newcastle-under-Lyme	0.92%	2.82%	3.19%	2.84%	3.15%	2.83%	3.17%	3.00%
East Staffordshire	1.31%	1.97%	2.87%	1.99%	2.84%	1.98%	2.85%	2.42%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

2.6 The results in Table 1 show that using time as the deterrence factor results in a larger proportion of employees travelling from Birmingham. Based on the 2011 census travel to work data presented in Technical Note 10, it has been accepted by JMP, on behalf of HE, that there is unlikely to be a significant proportion of employees travelling from Birmingham. Further analysis of the 2011 Census data indicates that currently only 0.19% of the working population of Birmingham travels to South Staffordshire for work and only 2.9% of the working population of South Staffordshire MSOA 006 comes from Birmingham.

2.7 Notable differences in the outputs of the models include the proportion of employees travelling from South Staffordshire and its neighbouring districts such as Wolverhampton and Cannock Chase.

2.8 As Table 1 sets out, the proportion of employees travelling from Wolverhampton is now predicted to be almost half that when using distance² as the deterrence. Cannock Chase and South Staffordshire also have significantly fewer employees travelling to Site, when using journey time as the deterrence factor compared to using distance².

2.9 Given the labour force profile of these districts and the accessibility of the Site from residents in neighbouring districts – we consider the time deterrence model to underestimate the number of employees who would travel from South Staffordshire and its immediate neighbours. This view has also been expressed by Wolverhampton City Council and is also supported by the Socio-Economic Preliminary Environmental Information which has been produced to support the proposal.

- 2.10 In addition, the relative weight of economic opportunities in Birmingham means that employees are less likely to travel longer distances for work. In simple terms, there are numerous jobs available within and around Birmingham and therefore it is less likely that Birmingham residents would need to travel to find employment. The job density in Birmingham is 0.63 jobs per head of working age population, compared to 0.36 in South Staffordshire and 0.48 in Cannock Chase.
- 2.11 Employees who work in the logistics sector in Wolverhampton, South Staffordshire and Cannock Chase are much more likely to travel further to work than residents in Birmingham. Only 7% of Birmingham logistics employees travel more than 20km to work. This compares to 11% in Wolverhampton and 17% and 18% in Cannock Chase and South Staffordshire respectively. Only 5% travel 30km or more – which is the distance from Birmingham’s northern suburbs to WMI. These are key factors which need to be taken into account when determining the developments realistic distribution.
- 2.12 Wolverhampton and South Staffordshire are currently net “exporters” of workers. That means that more workers leave these districts each day than travel to them: c. 16,000 more employees leave South Staffordshire for work than travel to the district. This demonstrates that there is an existing pool of local labour for whom WMI could provide a job closer to home and who are more likely to take up jobs at WMI than a Birmingham resident would be, for example.
- 2.13 Analysis of the distribution of employees in MSOA Daventry 003, which contains DIRFT, a similar facility upon which the WMI trip generation is based, indicates that over 49% of employees come from within 10 miles of the site. Applying this to the WMI site location encompasses South Staffordshire, Cannock Chase and Wolverhampton within this catchment (and would not include Birmingham).
- 2.14 Based on the above results, using journey time as a deterrence factor is not considered to give a realistic distribution. Therefore, taking the analysis a step further we have also considered journey time². Longer journey times are likely to act as a greater deterrence and this should be reflected in the analysis. A summary of the results of this are presented below with a full set of the disaggregated results included in Annex C.

Table 2 – Peak Hour Journey Time² Gravity Models Results

Area	AM Fastest	AM Slowest	PM Fastest	PM Slowest	Average Fastest Peak Hour Distribution	Average Slowest Peak Hour Distribution	Average Peak Hour Distribution
Birmingham selection	7.62%	4.18%	7.93%	6.72%	7.77%	5.45%	6.61%
Cannock Chase	8.64%	9.45%	7.66%	9.49%	8.15%	9.47%	8.81%
ualad09:Dudley	2.78%	2.14%	2.89%	2.58%	2.84%	2.36%	2.60%
ualad09:Lichfield	7.31%	8.98%	7.61%	9.24%	7.46%	9.11%	8.29%
ualad09:Sandwell	9.18%	5.63%	11.56%	7.57%	10.37%	6.60%	8.49%
ualad09:Shropshire	3.14%	4.04%	3.25%	4.20%	3.20%	4.12%	3.66%
South Staffordshire	17.29%	20.50%	16.35%	18.66%	16.82%	19.58%	18.20%
ualad09:Stafford	4.76%	5.72%	4.96%	5.08%	4.86%	5.40%	5.13%
ualad09:Telford and Wrekin	5.09%	6.38%	5.30%	7.62%	5.20%	7.00%	6.10%
ualad09:Walsall	11.75%	11.42%	12.23%	10.14%	11.99%	10.78%	11.38%
ualad09:Wolverhampton	14.18%	12.79%	11.67%	9.67%	12.93%	11.23%	12.08%
Stoke-on-Trent	5.47%	4.69%	5.70%	4.83%	5.58%	4.76%	5.17%
Staffordshire Moorlands	0.46%	0.57%	0.48%	0.59%	0.47%	0.58%	0.53%
Newcastle-under-Lyme	1.50%	1.84%	1.56%	1.90%	1.53%	1.87%	1.70%
East Staffordshire	0.82%	1.66%	0.85%	1.71%	0.83%	1.68%	1.26%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

2.15 Table 2 shows that again there is very little variance in the distribution using fastest / slowest peak hour journey times². However, using journey times² results in approximately 6.5% from Birmingham which is considered much more realistic given current socio-economic factors. In fact, analysis of the distribution of employees from the DIRFT MSOA shows approximately 10% travel from Coventry which is a comparable distance from DIRFT as Birmingham is from WMI, however, Coventry is more accessible from DIRFT than WMI will be from Birmingham and journey times from Birmingham are likely to be longer. Therefore, we would expect the proportion from Birmingham to be lower than 10% and similar to what is presented in Table 2. Other notable results include a higher proportion of trips from Wolverhampton, South Staffordshire and Cannock Chase, which would be expected based on the baseline labour force profile and the existing employment patterns.

3 Heavy Good Vehicle Distribution

3.1 The HGV Distribution for WMI has been informed by the DfT Road Freight Statistics 2015, to calculate inbound and outbound movements from regions across the UK and this is set out in Table 3 below.

Table 3 – National HGV Distribution

Origin	Million Tonnes	Distribution (%)
North East	2	0.6%
North West	26	7.3%
Yorkshire and Humber	15	4.2%
East Midlands	33	9.3%
West Midlands	218	61.6%
East of England	13	3.7%
London	5	1.4%
South East	14	4.0%
South West	14	4.0%

Wales	12	3.4%
Scotland	2	0.6%
Total	354	100%

Source: Road Freight Statistics 2015

- 3.2 As approximately 60% of goods to/from WMI will be from the West Midlands Region, a separate analysis has been completed for this region using a gravity model in order to model local HGV journeys. For the HGV distribution Gravity Model, a simple Resident Population / Distance equation has been used. Population is used as a proxy for the likely demand of goods. The results of the Gravity Model, and therefore the proposed distribution within the West Midlands, are set out in Table 4 below.

Table 4 – HGV Distribution within the West Midlands

Area	Distribution (%)
Birmingham	11.7%
Bromsgrove	0.7%
Cannock Chase	3.3%
Coventry	1.7%
Dudley	3.5%
East Staffordshire	1.1%
Herefordshire, County of	0.6%
Lichfield	1.5%
Malvern Hills	0.3%
Newcastle-under-Lyme	1.0%
North Warwickshire	0.5%
Nuneaton and Bedworth	0.7%
Redditch	0.5%
Rugby	0.5%
Sandwell	5.1%
Shropshire	2.1%
Solihull	1.4%
South Staffordshire	3.6%
Stafford	1.6%
Staffordshire Moorlands	0.6%
Stoke-on-Trent	2.1%
Stratford-on-Avon	0.5%
Tamworth	0.8%
Telford and Wrekin	1.9%
Walsall	5.5%
Warwick	0.7%
Wolverhampton	6.4%
Worcester	0.5%
Wychavon	0.5%
Wyre Forest	0.7%
Total	61.6%

4 Summary

- 4.1 In summary, as requested, WSP have considered the comments made by JMP on the proposed employee distribution methodology. As a result Shropshire has been disaggregated into MSOAs to better reflect the distribution from this area and the use of journey time as the preferred deterrence factor has been investigated. A review of the results has shown that the distribution using just journey times as the deterrence factor is not suitable. When the inconvenience of a longer journey time is accounted for by using journey time² as a suitable distribution, this appears more realistic when considering other factors such as the local labour force profile and the weight of existing economic opportunities available in Birmingham.

- 4.2 Two methodologies for the distribution of HGVs were used. The distribution for the whole of the UK was obtained using the DfT document 'Road Freight Statistics 2015'. This document includes information on the movement of freight by road inbound and outbound from each region in the UK. The second methodology of a Gravity Model has been used within the West Midlands region. Distance has been used as the deterrent factor.

5 Conclusions

- 5.1 In conclusion, following this further analysis it is proposed to use the distribution calculated using journey time 2 as the deterrence factor for employee vehicles. It is proposed to use the Average of the four gravity models, to reflect variance in journey time across the day, for the WMI employee vehicular distribution.
- 5.2 HGVs are forecast to come from a much wider area, with data suggesting around 60% of trips staying within the West Midlands. The North West and the East Midlands are the most likely destinations/origins outside of the West Midlands.

ANNEX A

WEST MIDLANDS INTERCHANGE

SUBJECT: Technical Note 10 – Trip Distribution Methodology

DATE: 10 October 2016

Client	Four Ashes Ltd
Project Number	70001979
Version	1
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1 Introduction

- 1.1 WSP | Parsons Brinckerhoff has been commissioned by Four Ashes Ltd to provide advice in relation to the proposed development of a Strategic Rail Freight Interchange (SRFI) on land south west of M6 J12 in south Staffordshire.
- 1.2 The development, known as West Midlands Interchange (WMI) will include an intermodal terminal and rail related B8 warehousing amounting to a total floor area in the order of 740,000sqm (8,000,000sqft). The final layout and development content has not yet been determined.
- 1.3 This Technical Note explains the methodology used to derive the distribution of light vehicle trips that will enter and exit the SRFI. It also presents the method used to establish distribution for HGV traffic using the DfT document 'Road Freight Statistics 2015'.

2 Light Vehicle Distribution

- 2.1 Initially, the 2011 Census journey to work data has been analysed to determine a possible light vehicle distribution for the trips generated by potential employees of the proposed development.
- 2.2 The data has been analysed by Middle Layer Super Output Area (MSOA) for South Staffordshire 006 within which part of the site is located and by district for South Staffordshire, Wolverhampton, Cannock Chase, Walsall, Lichfield, Dudley, Sandwell, Birmingham, Stafford and Telford and Wrekin.
- 2.3 Whilst the majority of the site is in MSOA South Staffordshire 001 it was not felt that this MSOA would suitably represent the development as it does not include any significant employment areas and is very large, extending north of the site to the south side of Stafford. MSOA South Staffordshire 006 includes a small part of the site and also includes the Four Ashes industrial area and SI Group site which provide employment land uses. Data for travel to this area for work has been analysed.
- 2.4 Table 1 shows the results of the journey to work data analysis for all modes to MSOA South Staffordshire 006.

Table 1 – Journey to Work Distribution

Area	Distribution (%)
South Staffordshire MSOA 006	8%
Rest of South Staffordshire	25%
Wolverhampton	23%
Cannock Chase	10%
Walsall	10%
Litchfield	2%
Dudley	4%
Sandwell	2%
Birmingham	3%
Stafford	5%
Telford and Wrekin	3%
Other	6%
Total	100%

Source: 2011 Journey to Work Census Data

- 2.5 Table 1 shows that a large amount of trips to South Staffordshire 006 are made from South Staffordshire and Wolverhampton. Most of the remaining trips are from within the local authorities surrounding South Staffordshire whilst a small proportion of trips are made from Birmingham.

Gravity Model

- 2.6 We have been advised that WMI will be such a large new employer in the area that employee distribution is unlikely to match existing patterns due to the availability of staff in the immediate area surrounding the site. Therefore, in addition to studying the 2011 Census data a gravity model has also been created. This provides a greater understanding of the potential trip distribution.
- 2.7 To generate the gravity model a cordon has been created which includes the areas which employees are expected to commute from, as identified by the 2011 Journey to Work Census data. This cordon included the whole of Birmingham but excluded Newcastle-under-Lyme, Stoke-on-Trent, Staffordshire Moorlands and East Staffordshire districts.
- 2.8 The resultant proportions showed a large percentage of employee trips coming from Birmingham. This was regarded as unrealistic considering the majority of those currently living in Birmingham work in Birmingham or in very close proximity to it as shown in Table 2.

Table 2 – Employment Containment of Birmingham

Area	All usual residents in Birmingham aged 16 and over in employment the week before the census travelling to work	% of Workers
Birmingham	256,811	71.85%
Solihull	26,479	7.41%
Sandwell	13,661	3.82%
Sub Total	296,951	83.08%
Other	60,482	16.9%
Total	357,433	100%

Source: 2011 Census

- 2.9 Table 2 shows that over 80% of people who live in Birmingham work locally. It is acknowledged though that due to WMI being such a large employer there is likely to be some attraction to the site from Birmingham therefore some of the more accessible areas in relation to the site within the north of the city have been included in the cordon.
- 2.10 It was also decided the rest of Staffordshire should be included in the cordon therefore Newcastle-under-Lyme, Stoke-on-trent, Staffordshire Moorlands and East Staffordshire have been added. They are also within a similar proximity to the site as other selected areas. The resulting cordon is shown in Annex A.
- 2.11 This cordon has formed the basis for the gravity model which is described in detail in the following paragraphs.
- 2.12 A gravity model consists mainly of two elements. First the “attractiveness” of a particular site, in this case for employment, is often expressed in terms of population centres. Therefore larger population centres are expected to generate a higher number of trips towards a particular site. The second element is the deterrence factor, which would usually be travel distance, time or cost. The formula typically used for a gravity model is $\text{attractiveness} / \text{deterrence factor}^x$ where x determines whether the data is “skewed” towards local conditions e.g. travel is more likely from a shorter distance to the site. The basic gravity model formula used in this Technical Note is $\text{Population of Working Age} / \text{Distance}^2$.
- 2.13 Consideration was given to the use of time as the deterrent factor but it was concluded that, because only typical travel times could be used, which would not reflect the effects of traffic congestion at certain times of the day, particularly within Birmingham, the results would not be representative of true travel time.
- 2.14 The distance to each centre (MSOA or district) within the cordon has been obtained using an internet route planner. In the case of the MSOA the centre has been calculated using population centroid data provided by NOMIS. The centres of the districts have been located by the internet route planner.
- 2.15 An X value of 2 has been applied to reflect that traffic conditions, not just distance, can also act as a barrier to the willingness to travel to the site for work. Traffic will play a bigger factor as distance increases therefore an X deterrence factor of 2 is appropriate.

2.16 Several gravity models based on different population groups have been developed to look at the variability in potential distribution. These population groups are as follows

- Total Population (All usual residents)
- Working age population (Age 18-64)
- Economically active: Unemployed
- Transport and storage workers
- Low skilled workers

2.17 The results of these gravity models are included in Annex B.

2.18 Following further discussion with the Socio Economic consultants it was felt that using Working Age Population would be best to calculate the site distribution. Total Population is not relevant as it includes children in full time education as well as those retired and no longer in work. The other population groups used will represent a proportion of the employees but not all. For example, some of the employees on site will be drawn from those currently unemployed but not all as it is likely some currently in employment will move jobs to work at WMI and a reasonable proportion of the job on site will be low or semi-skilled but there will be a proportion of managerial and office jobs too. The working age population group will include all employees and therefore is the most suitable for the gravity model calculation.

2.19 The final proposed employee distribution is presented in Table 3. This shows that the highest proportion of employees will travel from Wolverhampton.

Table 3 – Employee Distribution

Area	Distribution
Birmingham	5.3%
Cannock Chase	15.8%
Dudley	4.5%
Litchfield	2.7%
Sandwell	9.9%
Shropshire	1.6%
South Staffordshire	17.6%
Stafford	2.5%
Telford and Wrekin	2.8%
Walsall	13.1%
Wolverhampton	19.5%
Stoke-on-Trent	2.2%
Staffordshire Moorlands	0.5%
Newcastle-under-Lyme	0.9%
East Staffordshire	1.3%
Total	100%

2.20 The distribution presented in Table 3 has been discussed and agreed with the Socio Economic consultants to ensure it aligns with their research and anticipated employee catchments.

3 HGV Distribution

Introduction

3.1 WMI is expected to act as both a regional and national distribution centre generating a significant number of HGV trips. In order to be able to assess and manage the impact of these HGVs a suitable distribution across the UK needs to be established.

3.2 To understand the likely distribution of the HGV trips the DfT document 'Road Freight Statistics 2015' has been utilised. This document provides data on the volume of goods inbound and outbound to each region in the UK.

HGV Distribution

3.3 The DfT document 'Road Freight Statistics 2015' provided the best usable source of information on the movements of goods around the UK.

3.4 The Road Freight Statistics document provides information on the movement of freight by road inbound and outbound from each region in the UK. Within the document, this information is included in Table RFS0138 which is contained in Annex C of this note.

3.5 It is expected that WMI will result in a distribution pattern similar to that of the region it's located in. WMI is located in the West Midlands region of the UK. To calculate the road based distribution of freight to and from WMI a combination of information on inbound and outbound goods has been used.

3.6 The results of the analysis are shown in Table 4, 5 and 6. Table 6 is a combination of the inbound and outbound data.

Table 4 – National HGV Distribution - Outbound

Destination	Million Tonnes	Distribution (%)
North East	1	0.6%
North West	13	7.4%
Yorkshire and Humber	6	3.4%
East Midlands	15	8.6%
West Midlands	109	62.3%
East of England	6	3.4%
London	3	1.7%
South East	8	4.6%
South West	8	4.6%
Wales	5	2.9%
Scotland	1	0.6%
Total	175	100%

Source: Road Freight Statistics 2015

Table 5 – National HGV Distribution - Inbound

Origin	Million Tonnes	Distribution (%)
North East	1	0.6%
North West	13	7.3%
Yorkshire and Humber	9	5.0%
East Midlands	18	10.1%
West Midlands	109	60.9%
East of England	7	3.9%
London	2	1.1%
South East	6	3.4%
South West	6	3.4%
Wales	7	3.9%
Scotland	1	0.6%
Total	179	100%

Source: Road Freight Statistics 2015

Table 6 – National HGV Distribution - Combined

Origin	Million Tonnes	Distribution (%)
North East	2	0.6%
North West	26	7.3%
Yorkshire and Humber	15	4.2%
East Midlands	33	9.3%
West Midlands	218	61.6%
East of England	13	3.7%
London	5	1.4%
South East	14	4.0%
South West	14	4.0%
Wales	12	3.4%
Scotland	2	0.6%
Total	354	100%

Source: Road Freight Statistics 2015

Gravity Model

- 3.7 As approximately 60% of goods to / from WMI will be from the West Midlands region, separate analysis has been completed for this region using a gravity model in order to model local HGV journeys.

- 3.8 The gravity model uses the same principles as explained in Section 2. For the HGV gravity model a simple Resident Population / Distance equation has been used. Population is used as a proxy for the likely demand for goods. Distance is used without an X deterrence factor as travel distance is not seen as a significant barrier in the delivery of goods from a facility like WMI.
- 3.9 The cordon for the model in this instance is the whole of the West Midlands region. The cordon has been split into each district/ unitary authority.
- 3.10 Table 7 details the HGV distribution within the West Midlands based on the gravity model.

Table 7 – HGV Distribution within the West Midlands

Area	Distribution (%)
Birmingham	11.7%
Bromsgrove	0.7%
Cannock Chase	3.3%
Coventry	1.7%
Dudley	3.5%
East Staffordshire	1.1%
Herefordshire, County of	0.6%
Lichfield	1.5%
Malvern Hills	0.3%
Newcastle-under-Lyme	1.0%
North Warwickshire	0.5%
Nuneaton and Bedworth	0.7%
Redditch	0.5%
Rugby	0.5%
Sandwell	5.1%
Shropshire	2.1%
Solihull	1.4%
South Staffordshire	3.6%
Stafford	1.6%
Staffordshire Moorlands	0.6%
Stoke-on-Trent	2.1%
Stratford-on-Avon	0.5%
Tamworth	0.8%
Telford and Wrekin	1.9%
Walsall	5.5%
Warwick	0.7%
Wolverhampton	6.4%
Worcester	0.5%

Area	Distribution (%)
Wychavon	0.5%
Wyre Forest	0.7%
Total	61.6%

4 Summary

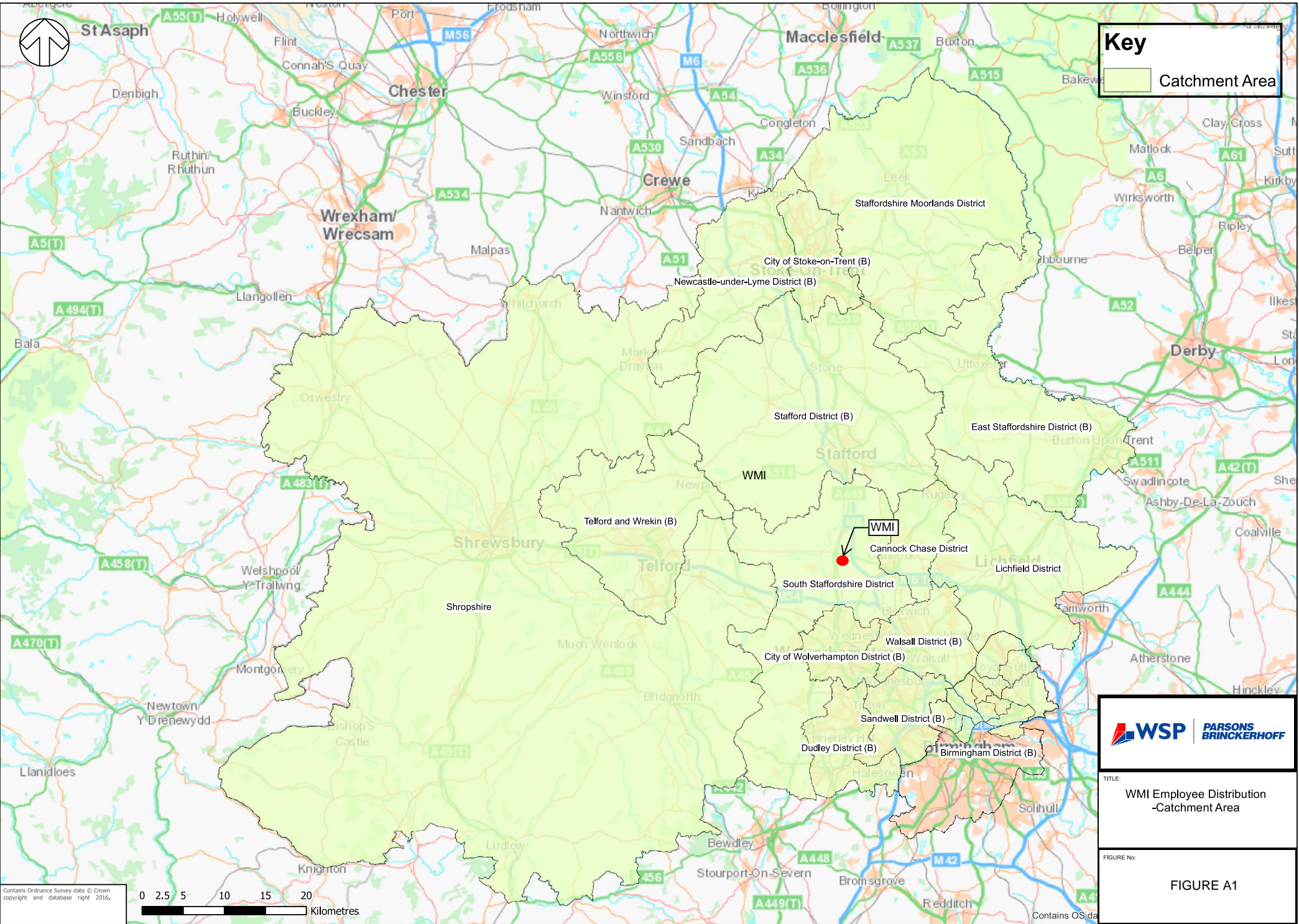
- 4.1 This Technical Note sets out the proposed methodology for the distribution of the light and heavy vehicle trip generation at WMI.
- 4.2 Two methodologies for the distribution of light vehicle development trips were examined, namely using Journey to Work Census Data and a Gravity Model. Journey to Work Census Data was analysed for the MSOA South Staffordshire 006. A Gravity Model was then undertaken with distance as the deterrent factor.
- 4.3 Two methodologies for the distribution of HGVs were used. The distribution for the whole of the UK was obtained using the DfT document 'Road Freight Statistics 2015'. This document includes information on the movement of freight by road inbound and outbound from each region in the UK. The second methodology of a Gravity Model has been used within the West Midlands region. Distance has been used as the deterrent factor.

5 Conclusions

- 5.1 Both the Census Data and the Gravity Model suggested that a large proportion of vehicle trip will come from the local districts of South Staffordshire, Wolverhampton, Walsall, Sandwell and Cannock Chase. The final distribution uses the Gravity Model.
- 5.2 HGVs are forecast to come from a much wider area, with data suggesting around 60% of trips staying within the West Midlands. The North West and the East Midlands are the most likely destinations/origins outside of the West Midlands.

ANNEX A

Date Modified: Drawn By: File:



Key

 Catchment Area

TITLE:
WMI Employee Distribution
-Catchment Area

FIGURE No:
FIGURE A1

Contains Ordnance Survey data © Crown copyright and database right 2015.

0 2.5 5 10 15 20
Kilometres

Contains OS data

ANNEX B

ANNEX C

Department for Transport statistics

[Road Freight Statistics](#)

Table RFS0138

Goods lifted by region and country of origin and destination, 2015

UK activity of GB registered heavy goods vehicles

		Destination														Million tonnes															
Area code	Origin	North East		North West		Yorkshire and The Humber		East Midlands		West Midlands		East		London		South East		South West		England		Wales		Scotland		Great Britain		Northern Ireland		United Kingdom	
		E12000001	E12000002	E12000003	E12000004	E12000005	E12000006	E12000007	E12000008	E12000009	E92000001	W92000004	S92000003	K03000001	N92000002	K02000001															
E12000001	North East	40	3	10	3	1	:	:	:	:	58	:	:	:	63	:	:	:	:	63	:	:	:	:	:	:	:	:	63		
E11000004	Tyne and Wear FMC	17	1	1	~	~	:	:	:	:	20	:	:	:	21	:	:	:	:	21	:	:	:	:	:	:	:	:	21		
	Rest of North East	23	2	9	2	1	:	:	:	:	38	:	:	:	42	:	:	:	:	42	:	:	:	:	:	:	:	:	42		
E12000002	North West	3	136	16	7	13	3	1	3	2	183	6	8	196	:	:	:	:	:	196	:	:	:	:	:	:	:	:	196		
E11000001	Greater Manchester FMC	~	41	4	2	2	1	:	1	:	53	1	1	55	:	:	:	:	:	55	:	:	:	:	:	:	:	:	55		
E11000002	Merseyside FMC	:	29	3	2	4	1	:	1	1	40	2	1	43	:	:	:	:	:	43	:	:	:	:	:	:	:	:	43		
	Rest of North West	2	66	8	3	7	1	1	1	1	90	3	5	99	:	:	:	:	:	99	:	:	:	:	:	:	:	:	99		
E12000003	Yorkshire and The Humber	9	18	134	19	9	5	1	3	1	199	2	3	205	:	:	:	:	:	205	:	:	:	:	:	:	:	:	205		
E11000003	South Yorkshire FMC	2	3	21	5	2	2	1	1	:	35	:	:	36	:	:	:	:	:	36	:	:	:	:	:	:	:	:	36		
E11000006	West Yorkshire FMC	2	6	41	4	2	1	:	1	:	57	:	1	58	:	:	:	:	:	58	:	:	:	:	:	:	:	:	58		
	Rest of Yorkshire and The Humber	6	10	71	10	4	2	:	1	1	107	1	2	110	:	:	:	:	:	110	:	:	:	:	:	:	:	:	110		
E12000004	East Midlands	3	13	17	85	18	15	6	10	5	173	2	1	176	:	:	:	:	:	176	:	:	:	:	:	:	:	:	176		
E12000005	West Midlands	1	13	6	15	109	6	3	8	8	168	5	1	175	:	:	:	:	:	175	:	:	:	:	:	:	:	:	175		
E11000005	West Midlands FMC	1	2	1	4	41	2	1	3	2	57	2	~	59	:	:	:	:	:	59	:	:	:	:	:	:	:	:	59		
	Rest of West Midlands	1	10	5	10	68	4	2	5	6	112	4	1	116	:	:	:	:	:	116	:	:	:	:	:	:	:	:	116		
E12000006	East	:	4	5	14	7	114	18	16	4	180	1	1	182	:	:	:	:	:	182	:	:	:	:	:	:	:	:	182		
E12000007	London	:	1	1	1	2	12	67	15	2	101	1	:	102	:	:	:	:	:	102	:	:	:	:	:	:	:	:	102		
E12000008	South East	:	2	2	7	6	11	17	121	8	175	1	:	177	:	:	:	:	:	177	:	:	:	:	:	:	:	:	177		
E12000009	South West	:	2	1	3	6	2	2	9	113	138	5	:	143	:	:	:	:	:	143	:	:	:	:	:	:	:	:	143		
E92000001	England	57	191	193	153	171	169	115	185	142	1,376	22	19	1,418	:	:	:	:	:	1,418	:	:	:	:	:	:	:	:	1,418		
W92000004	Wales	:	6	2	2	7	1	1	1	5	25	45	:	71	:	:	:	:	:	71	:	:	:	:	:	:	:	:	71		
S92000003	Scotland	3	6	2	1	1	:	:	:	:	16	:	:	152	:	:	:	:	:	152	:	:	:	:	:	:	:	:	152		
K03000001	Great Britain	61	203	197	156	179	171	116	187	147	1,417	68	155	1,640	:	:	:	:	:	1,640	:	:	:	:	:	:	:	:	1,641		
N92000002	Northern Ireland	:	:	:	:	:	:	:	:	:	:	:	:	~	:	:	:	:	:	~	:	:	:	:	:	:	:	:	6		
K02000001	United Kingdom	61	203	197	156	179	171	116	187	147	1,417	68	155	1,641	6	:	:	:	:	1,641	6	:	:	:	:	:	:	:	1,647		

NB: FMC are the Former Metropolitan Counties

'-' = none recorded in the sample or not available due to small sample size

'~' = rounds to zero but different from a real zero

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[Notes & definitions](#)

Source: Continuing Survey of Road Goods Transport (Great Britain)
 Last updated: August 2016
 Next update: Summer 2017

ANNEX B

Spatial Planning Framework Commission – Technical Note

Prepared by JMP as named Sub-Consultant to AECOM under the Highways England 2016 SPA

Job no.	X401006 - DT0015						
Job title	Staffordshire and Stoke – Area Based Support						
To	Neil Hansen – Highways England	CC					
Topic	West Midlands Interchange – Trip Distribution Methodology						
Prepared	Nick Oram	Date	20/10/2016	Checked	Derek Jones	Date	21/10/2016
Approved	Lee White	Date	21/10/2016	Verified	Matthew Jopp	Date	26/10/2016

RESPONSE TO TRIP DISTRIBUTION METHODOLOGY

Introduction

- 1 JMP have been commissioned by Highways England to review the proposed trip distribution for the West Midlands Interchange (WMI) and the methodology used by WSP Parsons Brinckerhoff.
- 2 WSP Parsons Brinckerhoff produced a technical note for HGV and Light Vehicle Trip Distribution on 10th October 2016.
- 3 This document is to review the technical note on trip distribution methodology. The sections in italics show the statements made by WSP Parsons Brinckerhoff within their technical note. Comment is provided on these statements to confirm acceptability or otherwise.
- 4 It is important to emphasise that this note comments solely on the trip distribution methodology. Only when further site parameters become available will a further note be produced to set out the actual forecast trip distribution for the proposals. This will require separate review.

Trip Distribution Methodology

Light Vehicles

For the light vehicle distribution, 2011 Census journey to work data was analysed as a potential methodology as well as a gravity model. The technical note explained that if this method was used to gain a trip distribution for the development then it would be preferable to use data from the Middle Super Output Area (MSOA) for South Staffordshire 006 instead of MSOA South Staffordshire 001.

Whilst the majority of the site is in MSOA South Staffordshire 001 it was not felt that this MSOA would suitably represent the development as it does not include any significant employment areas and is very large, extending north of the site to the south side of Stafford. MSOA South Staffordshire 006 includes a small part of the site and also includes the Four Ashes industrial area and SI group site which provide employment land uses. Data for travel to this area for work has been analysed.

- 5 This statement is accepted and if a trip distribution methodology including Census journey to work data were to be used then it would make sense to use data from MSOA South Staffordshire 006 instead of MSOA South Staffordshire 001.

Spatial Planning Framework Commission – Technical Note

- 6 However, it was decided by WSP Parsons Brinkerhoff that a gravity model approach would be preferable and the trip distribution method using Census journey to work data was not prioritised. This is explained by WSP Parsons Brinkerhoff as below.

We have been advised that WMI will be such a large new employer in the area that employee distribution is unlikely to match existing patterns due to the availability of staff in the immediate area surrounding the site. Therefore, in addition to studying the 2011 Census data a gravity model has also been created. This provides a greater understanding of the potential trip distribution.

- 7 This statement is acceptable, as is the majority of the methodology used to create the light vehicle distribution gravity model and its cordon. Based on the 2011 Census data on 'Employment Containment of Birmingham' provided it is understandable that a large percentage of trips coming from Birmingham was deemed to be unrealistic. Therefore, the following statement is justified.

...over 80% of people who live in Birmingham work locally. It is acknowledged though that due to WMI being such a large employer there is likely to be some attraction to the site from Birmingham therefore some of the more accessible areas in relation to the site within the north of the city have been included in the cordon

- 8 Based on the proximity of the development site it is agreed that the decision to include the areas in the cordon of Newcastle-under-Lyme, Stoke-on-Trent, Staffordshire Moorlands and East Staffordshire is correct.

- 9 The methodology used to create the gravity model is largely acceptable with the two elements "attractiveness" and "deterrence" explained and understood correctly. The following formula was used:

Population of Working Age/Distance²

An X value of 2 has been applied to reflect that traffic conditions, not just distance, can also act as a barrier to travel to the site for work. Traffic will play a bigger factor as distance increases therefore an X deterrence of 2 is appropriate.

- 10 This is a largely reasonable methodology to use for a gravity model. However, in the area immediately surrounding the proposed site there are a number of routes, such as the M6 and other routes that regularly become congested at peak times. Traffic delays can be an important factor over shorter as well as longer distances. This is a concern as places including Walsall and the north Black Country may look more attractive than they are in reality if the gravity model is just based on population size and distance.

Consideration was given to the use of time as the deterrent factor but it was concluded that, because only typical travel times could be used, which would not reflect the effects of traffic congestion at certain times of the day, particularly within Birmingham, the results would not be representative of true travel time.

Spatial Planning Framework Commission – Technical Note

11 As stated above, traffic can play a large factor as a deterrence. Therefore, journey travel time is an important factor and should be included in the gravity model equation for WMI. It is understood that travel times at specific times of the day are not widely available nor accurate using the Google Maps route finder tool. However, it is suggested that an alternative journey travel time tool should be used to obtain accurate journey travel time data at specific times of the day. Journey travel time tools that could be used include:

- TRADS
- Trafficmaster
- Spectrum
- Satellite Navigation Data

12 It is appreciated that only TRADS data is available without charge, although robust journey time data is crucial for constructing an accurate gravity model as well as for any future modelling work for the site.

13 It is accepted that using working age population would be best to calculate the site distribution as it is the best suited population range for representing the largest proportion of potential employees.

14 In reviewing the overall methodology for Light Vehicle Distribution it is noted that in the final employee distribution Staffordshire has been broken up into a number of boroughs/districts but this is not the case for Shropshire. Being near to the proposed development, this could raise some issues:

- Only one centre point has been used for Shropshire to measure distance which could skew the data input into the gravity model;
- One large population has been used instead of smaller, more localised populations which could skew the data input into the gravity model;
- Geographically, Shropshire is a large area and people in towns such as Oswestry are less likely to work at WMI than towns nearer to the WMI such as Shifnal and Newport, and even places not included in the gravity model cordon, such as central and southern Birmingham;
- Establishing routings between the WMI and the whole of Shropshire.

15 Accordingly, it is requested that the analysis for Shropshire is refined to take into account the points noted above.

HGV's

16 Journey travel time is likely to be less important in determining trip distribution for HGV movements. As such, the methodology used to establish the HGV gravity model and the HGV trip distribution for the site is deemed to be acceptable.

Trip Distribution Calculations

17 Whilst reviewing the trip distribution methodology technical note, the calculations made by WSP Parsons Brinkerhoff were checked by referring to raw data provided.

18 It was found that the non HGV journey to work distribution and employment containment of Birmingham data matched the raw data provided.

19 From the raw data, trip distributions were calculated correctly for employee distribution, national HGV distribution, and HGV distribution within the West Midlands.

Spatial Planning Framework Commission – Technical Note

20 In summary, the raw data has been used correctly in the technical note and trip distributions / other calculations have been completed in a satisfactory manner.

Summary and Conclusion

21 WSP Parsons Brinkerhoff have produced a technical note in relation to the trip distribution methodology for the proposed WMI site.

22 Traffic can play a large factor as a deterrence. Accordingly, journey travel time is an important factor and should be included in the gravity model equation for WMI.

23 It is suggested that a journey travel time tool such as TRADS, Trafficmaster, Spectrum or Satellite Navigation data should be used to obtain accurate journey travel time data at specific times of the day.

24 Distortions in the light vehicle gravity model data need to be addressed with regards to Shropshire as it has not been split into smaller boroughs/districts in the same way that Staffordshire has.

25 The raw data provided is used correctly in the technical note/trip distributions and other information has been calculated satisfactorily.

26 WSP Parsons Brinkerhoff are invited to provide further comment on the outstanding matters above.

DRAFT

ANNEX C

KS102EW - Age structure

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Area	Journey Time				Journey Time * 2				Population	Gravity Model Results							
	AM FASTEST	AM SLOWEST	PM FASTEST	PM SLOWEST	AM FASTEST*2	AM SLOWEST*2	PM FASTEST*2	PM SLOWEST*2		AM FASTEST	AM SLOWEST	PM FASTEST	PM SLOWEST				
msoa2011:E02006118 : Cannock Chase 001	20	24	20	24	400	576	400	576	4,474	11.2	0.27%	7.8	0.37%	11.2	0.28%	7.8	0.39%
msoa2011:E02006119 : Cannock Chase 002	20	24	18	22	400	576	324	484	5,131	12.8	0.31%	8.9	0.43%	15.8	0.39%	10.6	0.53%
msoa2011:E02006120 : Cannock Chase 003	22	26	22	26	484	676	484	676	5,398	11.2	0.27%	8.0	0.39%	11.2	0.28%	8.0	0.40%
msoa2011:E02006121 : Cannock Chase 004	14	18	18	18	196	324	324	324	3,606	18.4	0.44%	11.1	0.54%	11.1	0.28%	11.1	0.55%
msoa2011:E02006122 : Cannock Chase 005	16	22	18	18	256	484	324	324	4,168	16.3	0.39%	8.6	0.42%	12.9	0.32%	12.9	0.64%
msoa2011:E02006123 : Cannock Chase 006	16	24	18	22	256	576	324	484	4,312	16.8	0.40%	7.5	0.36%	13.3	0.33%	8.9	0.44%
msoa2011:E02006124 : Cannock Chase 007	14	20	14	18	196	400	196	324	4,360	22.2	0.53%	10.9	0.53%	22.2	0.55%	13.5	0.67%
msoa2011:E02006125 : Cannock Chase 008	12	18	14	18	144	324	196	324	4,601	32.0	0.76%	14.2	0.69%	23.5	0.58%	14.2	0.71%
msoa2011:E02006126 : Cannock Chase 009	14	22	16	22	196	484	256	484	5,265	26.9	0.64%	10.9	0.52%	20.6	0.51%	10.9	0.54%
msoa2011:E02006127 : Cannock Chase 010	14	20	14	20	196	400	196	400	5,208	26.6	0.63%	13.0	0.63%	26.6	0.66%	13.0	0.65%
msoa2011:E02006128 : Cannock Chase 011	10	14	10	14	100	196	100	196	4,971	49.7	1.18%	25.4	1.22%	49.7	1.23%	25.4	1.26%
msoa2011:E02006129 : Cannock Chase 012	7	9	8	10	49	81	64	100	4,703	96.0	2.28%	58.1	2.80%	73.5	1.82%	47.0	2.34%
msoa2011:E02006130 : Cannock Chase 013	14	20	16	24	196	400	256	576	4,600	23.5	0.56%	11.5	0.55%	18.0	0.44%	8.0	0.40%
msoa2011:E02006174 : South Staffordshire 001	6	8	7	9	36	64	49	81	6,221	172.8	4.11%	97.2	4.69%	127.0	3.14%	76.8	3.81%
msoa2011:E02006175 : South Staffordshire 002	12	12	14	14	144	144	196	196	4,206	29.2	0.69%	29.2	1.41%	21.5	0.53%	21.5	1.07%
msoa2011:E02006176 : South Staffordshire 003	4	6	4	7	16	36	16	49	4,228	264.3	6.28%	117.4	5.67%	264.3	6.54%	86.3	4.28%
msoa2011:E02006177 : South Staffordshire 004	12	16	12	16	144	256	144	256	6,064	42.1	1.00%	23.7	1.14%	42.1	1.04%	23.7	1.18%
msoa2011:E02006178 : South Staffordshire 005	12	16	12	16	144	256	144	256	4,808	33.4	0.79%	18.8	0.91%	33.4	0.83%	18.8	0.93%
msoa2011:E02006179 : South Staffordshire 006	8	8	8	8	64	64	64	64	4,784	74.8	1.78%	74.8	3.61%	74.8	1.85%	74.8	3.71%
msoa2011:E02006180 : South Staffordshire 007	10	16	12	16	100	256	144	256	4,005	40.1	0.95%	15.6	0.75%	27.8	0.69%	15.6	0.78%
msoa2011:E02006181 : South Staffordshire 008	14	16	14	14	196	256	196	196	3,288	16.8	0.40%	12.8	0.62%	16.8	0.42%	16.8	0.83%
msoa2011:E02006182 : South Staffordshire 009	14	18	14	16	196	324	196	256	3,810	19.4	0.46%	11.8	0.57%	19.4	0.48%	14.9	0.74%
msoa2011:E02006183 : South Staffordshire 010	20	24	20	22	400	576	400	484	4,827	12.1	0.29%	8.4	0.40%	12.1	0.30%	10.0	0.50%
msoa2011:E02006184 : South Staffordshire 011	20	26	20	24	400	676	400	576	3,608	9.0	0.21%	5.3	0.26%	9.0	0.22%	6.3	0.31%
msoa2011:E02006185 : South Staffordshire 012	28	45	30	40	784	2,025	900	1,600	4,099	5.2	0.12%	2.0	0.10%	4.6	0.11%	2.6	0.13%
msoa2011:E02006186 : South Staffordshire 013	35	35	35	35	1,225	1,225	1,225	1,225	7,098	5.8	0.14%	5.8	0.28%	5.8	0.14%	5.8	0.29%
msoa2011:E02006187 : South Staffordshire 014	45	45	45	45	2,025	2,025	2,025	2,025	4,124	2.0	0.05%	2.0	0.10%	2.0	0.05%	2.0	0.10%
msoa2011:E02006015 : Shropshire 001	50	60	50	60	2,500	3,600	2,500	3,600	5,910	2.4	0.06%	1.6	0.08%	2.4	0.06%	1.6	0.08%
msoa2011:E02006016 : Shropshire 002	45	55	45	55	2,025	3,025	2,025	3,025	4,427	2.2	0.05%	1.5	0.07%	2.2	0.05%	1.5	0.07%
msoa2011:E02006023 : Shropshire 003	50	70	50	70	2,500	4,900	2,500	4,900	5,857	2.3	0.06%	1.2	0.06%	2.3	0.06%	1.2	0.06%
msoa2011:E02006017 : Shropshire 004	55	70	55	65	3,025	4,900	3,025	4,225	4,299	1.4	0.03%	0.9	0.04%	1.4	0.04%	1.0	0.05%
msoa2011:E02006018 : Shropshire 005	45	45	40	45	2,025	2,025	1,600	2,025	6,987	3.5	0.08%	3.5	0.17%	4.4	0.11%	3.5	0.17%
msoa2011:E02006024 : Shropshire 006	55	70	55	70	3,025	4,900	3,025	4,900	5,919	2.0	0.05%	1.2	0.06%	2.0	0.05%	1.2	0.06%
msoa2011:E02006025 : Shropshire 007	55	75	55	70	3,025	5,625	3,025	4,900	5,492	1.8	0.04%	1.0	0.05%	1.8	0.04%	1.1	0.06%
msoa2011:E02006019 : Shropshire 008	40	55	40	55	1,600	3,025	1,600	3,025	3,290	2.1	0.05%	1.1	0.05%	2.1	0.05%	1.1	0.05%
msoa2011:E02006020 : Shropshire 009	35	35	35	40	1,225	1,225	1,225	1,600	4,552	3.7	0.09%	3.7	0.18%	3.7	0.09%	2.8	0.14%
msoa2011:E02006021 : Shropshire 010	35	50	35	45	1,225	2,500	1,225	2,025	4,777	3.9	0.09%	1.9	0.09%	3.9	0.10%	2.4	0.12%
msoa2011:E02006026 : Shropshire 011	50	65	50	60	2,500	4,225	2,500	3,600	4,078	1.6	0.04%	1.0	0.05%	1.6	0.04%	1.1	0.06%
msoa2011:E02006027 : Shropshire 012	55	75	50	65	3,025	5,625	2,500	4,225	3,072	1.0	0.02%	0.5	0.03%	1.2	0.03%	0.7	0.04%
msoa2011:E02006022 : Shropshire 013	35	50	35	50	1,225	2,500	1,225	2,500	3,652	3.0	0.07%	1.5	0.07%	3.0	0.07%	1.5	0.07%
msoa2011:E02006028 : Shropshire 014	40	55	40	50	1,600	3,025	1,600	2,500	5,363	3.4	0.08%	1.8	0.09%	3.4	0.08%	2.1	0.11%
msoa2011:E02006029 : Shropshire 015	35	45	35	45	1,225	2,500	1,225	2,025	4,845	4.0	0.09%	2.4	0.12%	4.0	0.10%	2.4	0.12%
msoa2011:E02006030 : Shropshire 016	30	45	30	40	900	2,025	900	1,600	4,504	5.0	0.12%	2.2	0.11%	5.0	0.12%	2.8	0.14%
msoa2011:E02006031 : Shropshire 017	35	50	35	45	1,225	2,500	1,225	2,025	4,884	4.0	0.09%	2.0	0.09%	4.0	0.10%	2.4	0.12%
msoa2011:E02006032 : Shropshire 018	35	50	35	45	1,225	2,500	1,225	2,025	5,354	4.4	0.10%	2.1	0.10%	4.4	0.11%	2.6	0.13%
msoa2011:E02006033 : Shropshire 019	35	50	40	55	1,225	2,500	1,600	3,025	5,196	4.2	0.10%	2.1	0.10%	3.2	0.08%	1.7	0.09%
msoa2011:E02006034 : Shropshire 020	35	50	35	50	1,225	2,500	1,225	2,500	5,202	4.2	0.10%	2.1	0.10%	4.2	0.11%	2.1	0.10%
msoa2011:E02006035 : Shropshire 021	30	45	30	40	900	2,025	900	1,600	3,188	3.5	0.08%	1.6	0.08%	3.5	0.09%	2.0	0.10%
msoa2011:E02006036 : Shropshire 022	35	45	35	45	1,225	2,025	1,225	2,025	3,816	3.1	0.07%	1.9	0.09%	3.1	0.08%	1.9	0.09%
msoa2011:E02006037 : Shropshire 023	35	50	35	45	1,225	2,500	1,225	2,025	5,766	4.7	0.11%	2.3	0.11%	4.7	0.12%	2.8	0.14%
msoa2011:E02006038 : Shropshire 024	35	45	30	45	1,225	2,025	900	2,025	4,505	3.7	0.09%	2.2	0.11%	5.0	0.12%	2.2	0.11%
msoa2011:E02006008 : Shropshire 025	18	24	20	24	324	576	400	576	4,540	14.0	0.33%	7.9	0.38%	11.4	0.28%	7.9	0.39%
msoa2011:E02006039 : Shropshire 026	40	55	40	55	1,600	3,025	1,600	3,025	4,478	2.8	0.07%	1.5	0.07%	2.8	0.07%	1.5	0.07%
msoa2011:E02006009 : Shropshire 027	16	20	16	20	256	400	256	400	4,287	16.7	0.40%	10.7	0.52%	16.7	0.41%	10.7	0.53%
msoa2011:E02006040 : Shropshire 028	35	50	35	45	1,225	2,500	1,225	2,025	4,290	3.5	0.08%	1.7	0.08%	3.5	0.09%	2.1	0.11%
msoa2011:E02006010 : Shropshire 029	40	40	40	40	1,600	1,600	1,600	1,600	6,840	4.3	0.10%	4.3	0.21%	4.3	0.11%	4.3	0.21%
msoa2011:E02006041 : Shropshire 030	60	75	65	80	3,600	5,625	4,225	6,400	3,509	1.0	0.02%	0.6	0.03%	0.8	0.02%	0.5	0.03%
msoa2011:E02006011 : Shropshire 031	45	45	40	50	2,025	2,025	1,600	2,500	3,430	1.7	0.04%	1.7	0.08%	2.1	0.05%	1.4	0.07%
msoa2011:E02006042 : Shropshire 032	50	60	50	60	2,500	3,600	2,500	3,600	3,028	1.2	0.03%	0.8	0.04%	1.2	0.03%	0.8	0.04%
msoa2011:E02006012 : Shropshire 033	40	40	35	45	1,600	1,600	1,225	2,025	3,735	2.3	0.06%	2.3	0.11%	3.0	0.08%	1.8	0.09%
msoa2011:E02006013 : Shropshire 034	35	35	40	40	1,225	1,225	1,600	1,600	4,503	3.7	0.09%	3.7	0.18%	2.8	0.07%	2.8	0.14%
msoa2011:E02006014 : Shropshire 035	55	55	50	60	3,025	3,025	2,500	3,600	5,329	1.8	0.04%	1.8	0.08%	2.1	0.05%	1.5	0.07%
msoa2011:E02006043 : Shropshire 036	60	65	60	65	3,600	4,225	3,600	4,225	4,052	1.1	0.03%	1.0	0.05%	1.1	0.03%	1.0	0.05%
msoa2011:E02006044 : Shropshire 037	70	85	70	85	4,900	7,225	4,900	7,225	3,459	0.7	0.02%	0.5	0.02%	0.7	0.02%	0.5	0.02%
msoa2011:E02006045 : Shropshire 038	70	70	70	75	4,900	4,900	4,900	5,625	6,102	1.2	0.03%	1.2	0.06%	1.2	0.03%	1.1	0.05%
msoa2011:E02006046 : Shropshire 039	75	75	70	80	5,625	5,625	4,900	6,400	5,050	0.9	0.02%	0.9	0.04%	1.0	0.03%	0.8	0.04%
u1ad09:Sandwell	22	40	20	35	484	1,600	400	1,225	186,846	386.0	9.18%	116.8	5.63%	467.1	11.56%	152.5	7.57%
u1ad09:Dudley	40	65	40	60	1,600	4,225	1,600	3,600	186,998	116.9	2.78%	44.3	2.14%	116.9	2.89%	51.9	2.58%
u1ad09:East Staffordshire	45	45	45	45	2,02												