

Table 4.5 – Zone 504 Additional Traffic (Not Included in Naas LAP)

Zoning Objectives	Naas Local Area Plan			Development Schedule (Units or Ha)	Trips								
	Area (Ha)	Plot Ratio/House Density (Units or m <sup>2</sup> GFA/Ha)	25		AM Peak			Inter Peak			PM Peak		
					In	Out	Total	In	Out	Total	In	Out	Total
New Residential	-	0.10	346	66	143	209	78	152	230	75	148	94	242
Community & Education	4	0.25	0.32	93	63	156	21	33	54	12	33	7	37
Industrial/Warehousing	3	0.25	2	22	10	32	16	32	48	16	32	6	19
<b>Total</b>	-		<b>Sub-Total</b>	<b>181</b>	<b>216</b>	<b>398</b>	<b>115</b>	<b>103</b>	<b>217</b>	<b>160</b>	<b>143</b>	<b>303</b>	<b>235</b>
			<b>Total*</b>	<b>141</b>	<b>168</b>	<b>308</b>	<b>89</b>	<b>168</b>	<b>257</b>	<b>80</b>	<b>124</b>	<b>204</b>	<b>235</b>

\*Takes into account the assumption of 22.5% shared or linked trips.

Table 4.6 – Zone 504 Total Additional Trips

Areas	Trips								
	AM Peak			Inter Peak			PM Peak		
	In	Out	Total	In	Out	Total	In	Out	Total
Naas LAP (excl. NWQ)	605	876	1,480	640	607	1,231	915	752	1,667
North Western Quadrant	1,648	676	2,324	724	716	1,440	530	1,383	1,913
Areas not included in LAP	141	168	308	89	80	168	124	111	235
<b>Total</b>	<b>2,393</b>	<b>1,719</b>	<b>4,122</b>	<b>1,453</b>	<b>1,403</b>	<b>2,840</b>	<b>1,569</b>	<b>2,245</b>	<b>3,815</b>

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5.0 Comparison of Future NTM Growth Scenarios & Land Use Zoning

Table 5.1 below shows the level of additional trips forecast for NTM Zone 504 for each NRA future growth scenario in the scheme Design Year (2030). The NRA growth scenarios are compared against the potential trips additional trips generated by the build out of the land zoned under the existing Naas LAP and Kildare CDP.

Table 5.1 - Zone 504 Additional Trips Comparison

Growth Scenario	Additional Trips								
	AM Peak			Inter Peak			PM Peak		
	In	Out	Total	In	Out	Total	In	Out	Total
NRA Low Growth (2030)	930	1,568	2,498	497	755	1,252	1,706	980	2,686
NRA Medium Growth (2030)	1,106	1,720	2,826	630	883	1,513	1,873	1,160	3,033
NRA High Growth (2030)	1,865	2,324	4,189	1,186	1,383	2,568	2,530	1,957	4,487
Land Use Zoning	2,393	1,719	4,122	1,453	1,403	2,840	1,569	2,245	3,815

The table shows that overall the additional trips forecast by the build out of the zoned lands in the LAP and CDP are reflective of the NRA High Growth scenario.

It should be noted that although the NRA High growth scenario overall has more outbound (origin) demand than inbound (destination) demand in the AM, this is not reflective of all the sub-zones with Zone 504. The allocation of demand for the NWQ is reflective of its high employment and education demand, with higher inbound trips than outbound in the AM and vice versa in the PM. This is presented in further detail in Section 6.

6.0 Allocation of NTM Future Growth

In the traffic model used to assess both schemes, NTM Zone 504 is split into a total of 16 sub-zones (50401 to 50416) as illustrated in Figure 6.1. The overall growth for Zone 504 in each NRA growth scenario is allocated between these sub-zones based on the land use zoning identified in each sub-zone and is presented in Table 6.1.

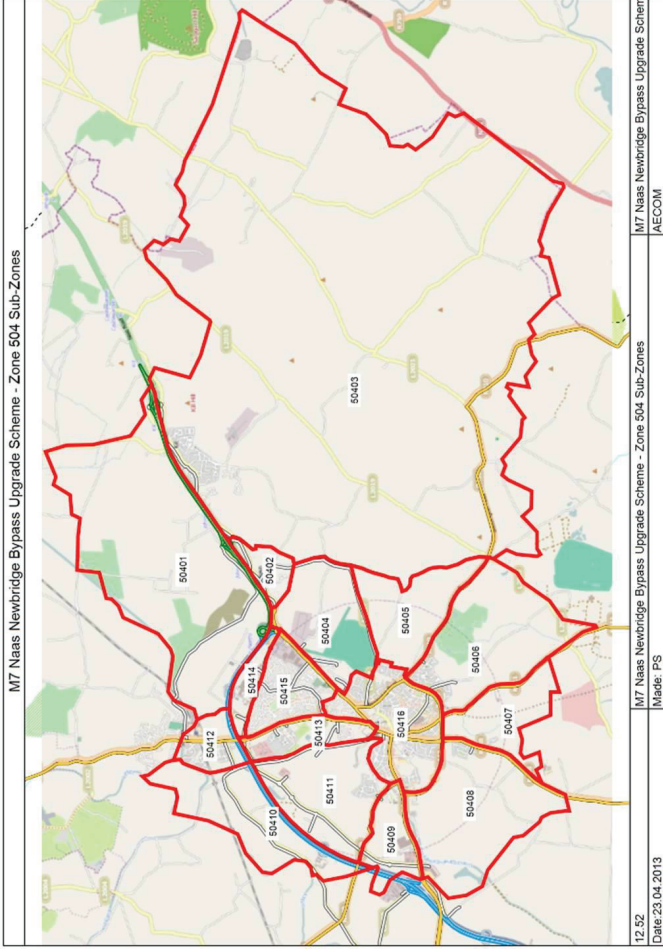


Figure 6.1 – Zone 504 (Sub-Zones)

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Table 6.1 – Allocation of Additional Traffic to Zone 504 Sub-Zones

Zone 504 Sub-Zones	Trips											
	AM Peak				Inter Peak				PM Peak			
	IN	Out	Total	IN	Out	Total	IN	Out	Total	IN	Out	Total
50401	1%	2%	1%	1%	1%	1%	2%	2%	1%	1%	1%	1%
50402	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50403	1%	3%	2%	2%	2%	2%	3%	3%	1%	1%	2%	2%
50404	3%	1%	2%	2%	2%	2%	1%	3%	2%	3%	2%	2%
50405	2%	7%	4%	5%	5%	5%	8%	4%	8%	4%	5%	5%
50406	5%	12%	8%	8%	7%	7%	13%	6%	13%	6%	9%	9%
50407	8%	11%	9%	6%	5%	5%	7%	5%	7%	5%	6%	6%
50408	2%	6%	4%	4%	4%	4%	7%	3%	7%	3%	5%	5%
50409	2%	1%	2%	2%	2%	2%	1%	2%	1%	2%	1%	1%
50410	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50411	69%	40%	57%	51%	51%	51%	34%	62%	51%	62%	51%	51%
50412	0%	1%	1%	1%	1%	1%	2%	1%	2%	1%	1%	1%
50413	1%	4%	3%	3%	3%	3%	5%	2%	5%	2%	3%	3%
50414	1%	0%	1%	1%	1%	1%	0%	1%	1%	0%	1%	1%
50415	3%	3%	3%	10%	11%	11%	8%	6%	7%	6%	7%	7%
50416	3%	9%	5%	6%	6%	6%	10%	4%	10%	4%	7%	7%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

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## 7.0 Conclusions

The key conclusions of the assessment are outlined below:

- The NRA high growth scenario is comparable to the forecasts based on the land use zonings in the Naas LAP and Kildare CDP; and
- The allocation of growth for the local area model zones that represent Naas, Johnstown, Kill and Sallins (part of) are based on the land use zoning objectives outlined in the Naas LAP and Kildare CDP.

# APPENDIX A

# APPENDIX B

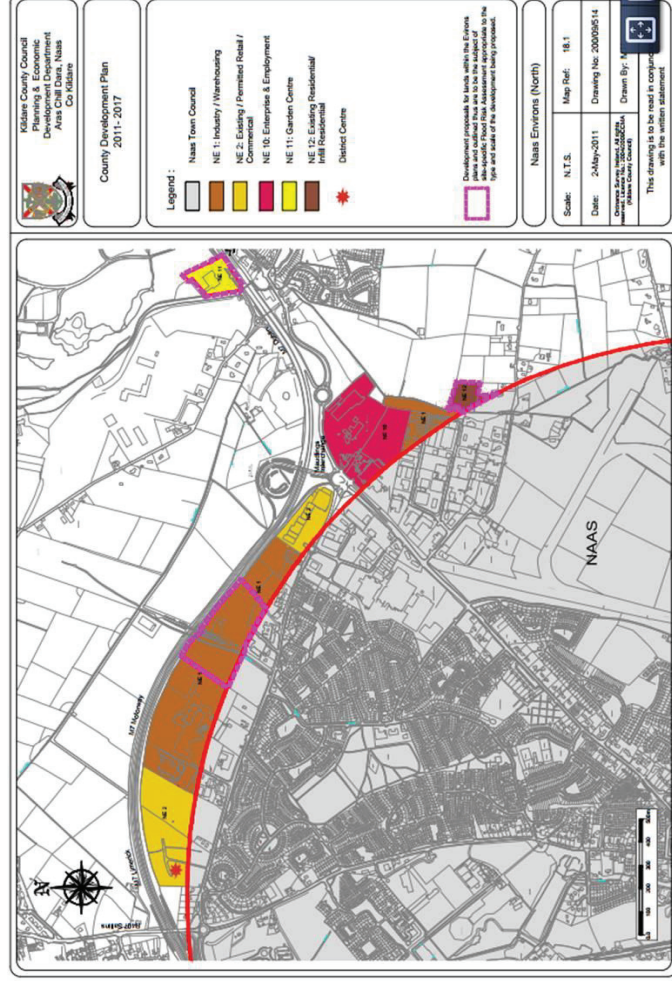


Figure A – Naas Environs (North)

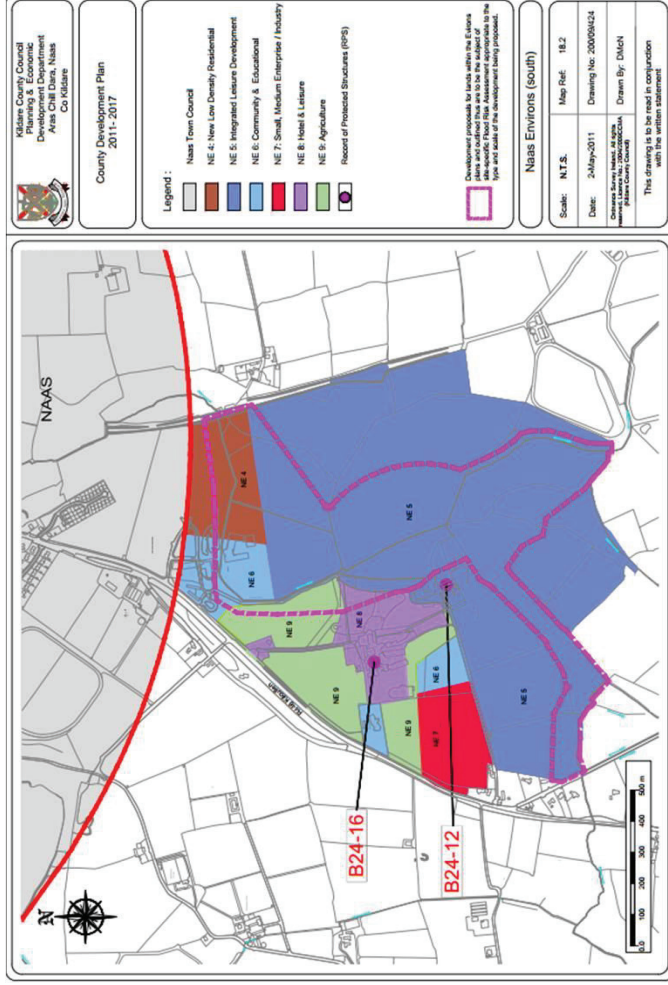


Figure B – Naas Environs (South)  
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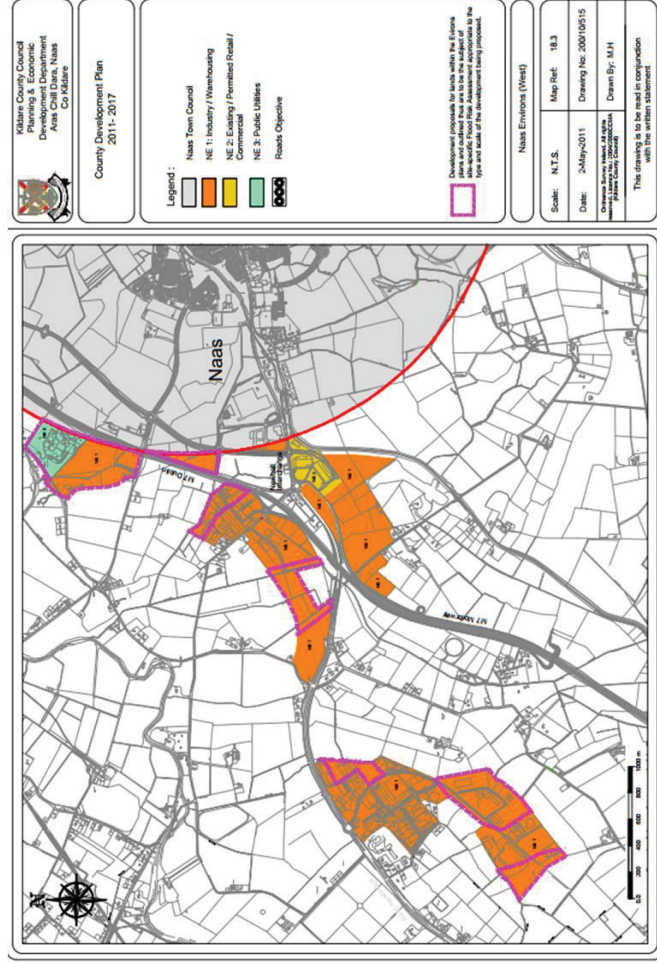


Figure C – Naas Environs (West)  
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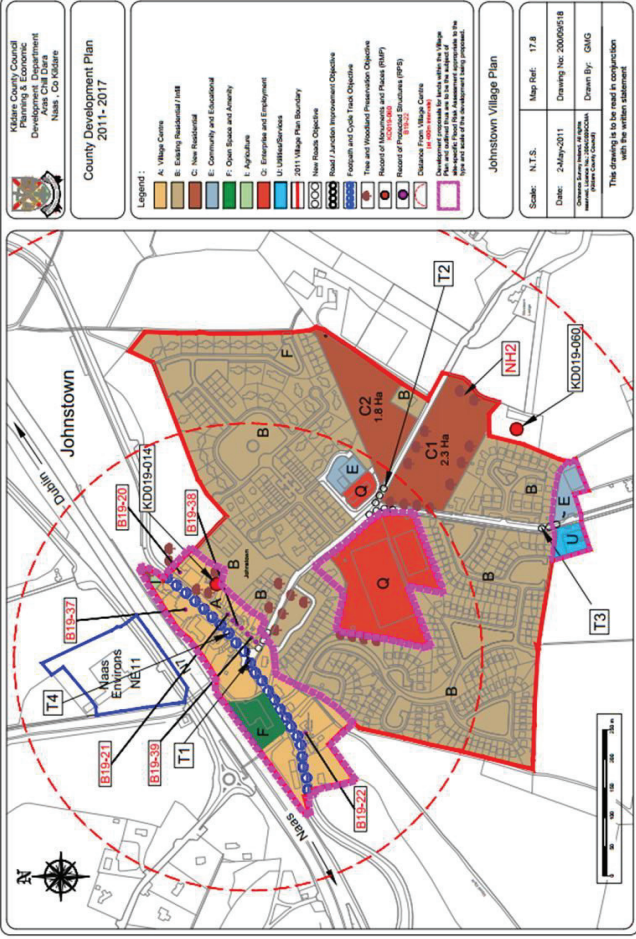


Figure D - Johnstown Land Use Zonings

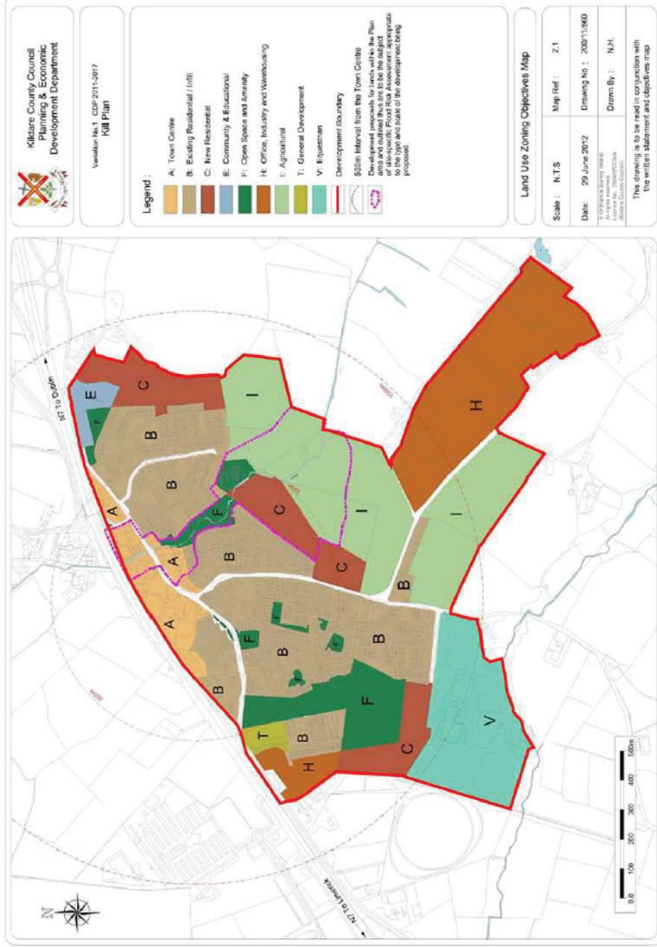


Figure E - Kill Land Use Zonings

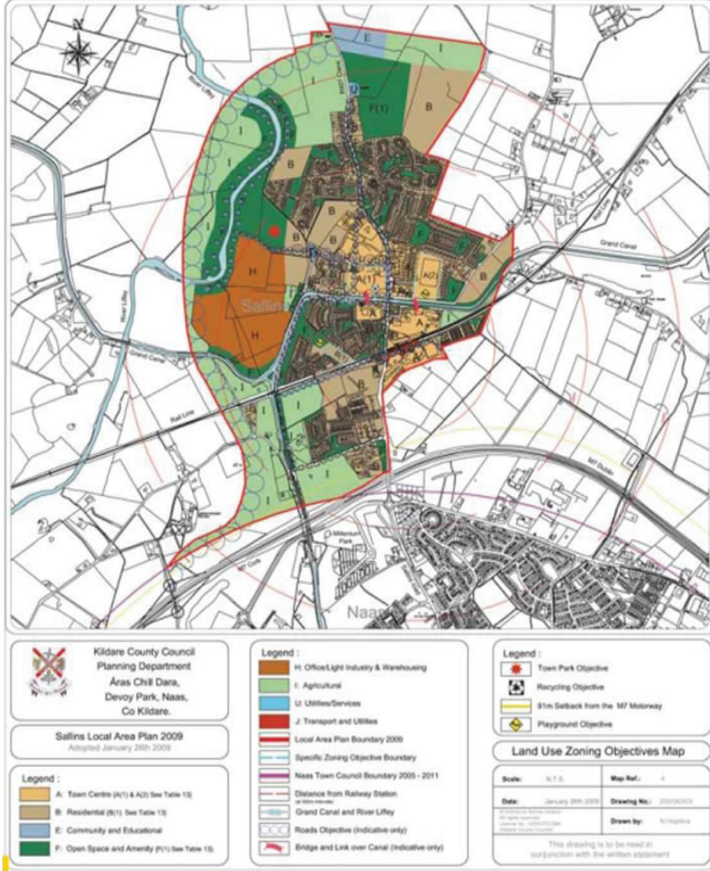


Figure F – Sallins LAP

TRICS 2013(a)(v6.11.1  
Trip Rate Parameter:

Gross floor area

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use Category: 02 - EMPLOYMENT  
VEHICLES: B - BUSINESS PARK

Selected regions and areas:

10 WALES  
CF  
CARDIFF 1 days  
CAERPHILL 1 days  
11 SCOTLAND  
EB  
CITY OF ED 1 days  
12 CONNAUGHT  
GA  
GALWAY 1 days  
14 LEINSTER  
WT  
WESTMEAT 1 days  
15 GREATER DUBLIN  
DL  
DUBLIN 2 days  
16 ULSTER (REPUBLIC OF IRELAND)  
DN  
DONEGAL 1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area

Actual Range: 5985 to 46175 (units: sqm)

Range Selected by User: 2587 to 116000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/04 to 12/09/12

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday 1 days  
Tuesday 3 days

Wednesday 4 days  
This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count 8 days  
Directional ATC Count 0 days  
This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Locations:

Town Centre 0  
Edge of Town Centre 0  
Suburban Area (PP56 Out of Ce 3  
Edge of Town 5  
Neighbourhood Centre (PP56 L 0  
Free Standing (PP56 Out of Tow 0  
Not known 0  
This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing Edge of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not known.

Selected Location Sub Categories:

Industrial Zone 3  
Commercial Zone 2  
Development Zone 0  
Residential Zone 0  
Retail Zone 0  
Built-Up Zone 0  
Village 0  
Out of Town 0  
High Street 0  
No Sub Category 3  
This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone Industrial Zone Development Zone Residential Zone Retail Zone Built-Up Village Zone Out of Town High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

B1 7 days  
This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000 2 days  
5,001 to 10,000 1 days  
10,001 to 15,000 2 days  
15,001 to 20,000 1 days  
20,001 to 25,000 1 days  
25,001 to 50,000 1 days  
This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000 2 days  
50,001 to 75,000 1 days  
100,001 to 125,000 1 days  
125,001 to 250,000 1 days  
250,001 to 500,000 1 days  
500,001 or More 2 days  
This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0 3 days  
1.1 to 1.5 5 days  
This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes 1 days  
No 7 days  
This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 CF-02-B-03 BUSINESS F CARDIFF  
FORTTRAN ROAD  
ST MELLONS  
CARDIFF  
Edge of Town  
Industrial Zone  
Total Gross floor area: 9520 sqm  
Survey date: MONDAY 18/10/2010 Survey Typ MANUAL  
2 CF-02-B-01 BUSINESS F CA ERPHILLY  
VAN ROAD



CAERPHILLY  
 Edge of Town  
 Commercial Zone  
 Total Gross floor area: 14450 sqm  
 Survey date: TUESDAY 17/07/2012 Survey Typ MANUAL  
 3 DL-02-B-02 BUSINESS F DUBLIN  
 BURTON HALL AVENUE  
 LEOPARDSTOWN  
 DUBLIN  
 Edge of Town  
 Commercial Zone  
 Total Gross floor area: 5985 sqm  
 Survey date: WEDNESD 12/05/2010 Survey Typ MANUAL  
 4 DL-02-B-04 BUSINESS F DUBLIN  
 TANEY DRIVE  
 DUNDRAUM  
 DUBLIN  
 Suburban Area (PP56 Out of Centre)  
 No Sub Category 20530 sqm  
 Total Gross floor area:  
 Survey date: WEDNESD 12/09/2012 Survey Typ MANUAL  
 5 DL-02-B-01 BUSINESS F DONEGAL  
 N56  
 KNOCKNAMONA  
 LETTERKENNY  
 Edge of Town  
 No Sub Category  
 Total Gross floor area: 7951 sqm  
 Survey date: WEDNESD 30/09/2009 Survey Typ MANUAL  
 6 EB-02-B-03 BUSINESS F CITY OF EDINBURGH  
 LOGIE GREEN ROAD  
 EDINBURGH  
 Suburban Area (PP56 Out of Centre)  
 Industrial Zone  
 Total Gross floor area: 6675 sqm  
 Survey date: TUESDAY 01/05/2007 Survey Typ MANUAL  
 7 GA-02-B-01 BUSINESS F GALWAY  
 WELLPARK ROAD

GALWAY  
 Suburban Area (PP56 Out of Centre)  
 Industrial Zone  
 Total Gross floor area: 46175 sqm  
 Survey date: WEDNESD 20/09/2006 Survey Typ MANUAL  
 8 WT-02-B-01 BUSINESS/ WESTMEATH  
 DUBLIN ROAD  
 GARRYCASTLE  
 ATHLONE  
 Edge of Town  
 No sub Category  
 Total Gross floor area: 22150 sqm  
 Survey date: TUESDAY 19/06/2007 Survey Typ MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site it displays a unique site reference code and site address the selected trip rate calculation parameter and its value the day of the week and date of each survey and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/B - BUSINESS PARK  
 Calculation Factor: 100 sqm  
 Count Type: VEHICLES

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00-00:30									
00:30-01:00									
01:00-01:30									
01:30-02:00									
02:00-02:30									
02:30-03:00									
03:00-03:30									
03:30-04:00									
04:00-04:30									
04:30-05:00									
05:00-05:30									
05:30-06:00									
06:00-06:30									
06:30-07:00									
07:00-07:30	8	16680	0.129	8	16680	0.026	8	16680	0.155
07:30-08:00	8	16680	0.312	8	16680	0.054	8	16680	0.366
08:00-08:30	8	16680	0.45	8	16680	0.077	8	16680	0.527

08:30-09:00	8	16680	0.542	8	16680	0.08	8	16680	0.622
09:00-09:30	8	16680	0.474	8	16680	0.112	8	16680	0.586
09:30-10:00	8	16680	0.281	8	16680	0.118	8	16680	0.399
10:00-10:30	8	16680	0.19	8	16680	0.101	8	16680	0.291
10:30-11:00	8	16680	0.121	8	16680	0.103	8	16680	0.224
11:00-11:30	8	16680	0.094	8	16680	0.085	8	16680	0.179
11:30-12:00	8	16680	0.127	8	16680	0.145	8	16680	0.272
12:00-12:30	8	16680	0.13	8	16680	0.232	8	16680	0.362
12:30-13:00	8	16680	0.226	8	16680	0.27	8	16680	0.496
13:00-13:30	8	16680	0.257	8	16680	0.247	8	16680	0.504
13:30-14:00	8	16680	0.235	8	16680	0.172	8	16680	0.407
14:00-14:30	8	16680	0.182	8	16680	0.211	8	16680	0.393
14:30-15:00	8	16680	0.139	8	16680	0.133	8	16680	0.272
15:00-15:30	8	16680	0.128	8	16680	0.166	8	16680	0.294
15:30-16:00	8	16680	0.112	8	16680	0.139	8	16680	0.251
16:00-16:30	8	16680	0.122	8	16680	0.269	8	16680	0.391
16:30-17:00	8	16680	0.094	8	16680	0.367	8	16680	0.461
17:00-17:30	8	16680	0.102	8	16680	0.524	8	16680	0.626
17:30-18:00	8	16680	0.102	8	16680	0.414	8	16680	0.516
18:00-18:30	8	16680	0.053	8	16680	0.222	8	16680	0.275
18:30-19:00	8	16680	0.044	8	16680	0.142	8	16680	0.186
19:00-19:30									
19:30-20:00									
20:00-20:30									
20:30-21:00									
21:00-21:30									
21:30-22:00									
22:00-22:30									
22:30-23:00									
23:00-23:30									
23:30-24:00									

Daily Trip Rates:

4,646

4,409

9,055

Parameter summary

Trip rate parameter range seller: 5985 - 46175 (units: \$/mi)

Survey date date range: 01/01/04 - 12/09/12

Number of weekdays (Monday

Number of Saturdays:

Number of Sundays:

Surveys manually removed for

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first followed by the range of minimum and maximum survey dates selected by the user. Then the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRICS 2013 (a)(v)6.11.1

Trip Rate Parameter: Number of dwellings

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use 03 - RESIDENTIAL  
Category A - HOUSES PRIVATELY OWNED  
VEHICLES

Selected regions and areas:

11 SCOTLAND  
AG ANGUS 1 days  
EA EAST AyrSHIRE 1 days  
HI HIGHLAND 1 days  
PK PERTH & KINROSS 1 days  
12 CONNAUGHT  
CS SLIGO 1 days  
GA GALWAY 3 days  
RO ROSCOMMON 2 days  
13 MUNSTER  
CR CORK 1 days  
WA WATERFORD 1 days  
14 LEINSTER  
KD KILDARE 1 days  
KK KILKENNY 1 days  
17 ULSTER (NORTHERN IRELAND)  
AN ANTRIM 2 days  
AR ARMAUGH 1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings

Actual Range: 7 to 185 (units: )

Range Selected by User: 4 to 437 (units: )

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/04 to 07/09/12

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday 6 days

Wednesday 4 days

Thursday 7 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count 17 days

Directional ATC Count 0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Locations:

Town Centre 0

Edge of Town Centre 0

Suburban Area (PP56 Out of Ce 11

Edge of Town 6

Neighbourhood Centre (PP56 L 0

Free Standing (PP56 Out of Tow 0

Not Known 0

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing Edge of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone 0

Commercial Zone 0

Development Zone 0

Residential Zone 12

Retail Zone 0

Built-Up Zone 1

Village 0

Out of Town 0

High Street 0

No Sub Category 4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone Industrial Zone Development Zone Residential Zone Retail Zone Built-Up Village Zone Out of Town High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3 17 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose which can be found within the library module of TRICS®.

Population within 1 mile:

1,001 to 5,000 6 days  
5,001 to 10,000 2 days  
10,001 to 15,000 4 days  
15,001 to 20,000 3 days  
25,001 to 50,000 2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,000 or Less 2 days  
5,001 to 25,000 2 days  
25,001 to 50,000 3 days  
50,001 to 75,000 5 days  
75,001 to 100,000 3 days  
100,001 to 125,000 1 days  
250,001 to 500,000 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0 3 days  
1.1 to 1.5 14 days

This data displays the number c within a radius of 5 miles of selected survey sites.

Travel Plan:

No 17 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1. AG-03-A-01 BUNGALOWS/DET., ANGLUS  
KEPTIE ROAD

ARBROATH

Suburban Area (PP56 Out of Centre)  
Residential Zone

Total Number of dwellings: 7

Survey date: TUESDAY 22/05/2012 Survey Typ MANUAL  
2. AN-03-A-06 SEMI-DET., NEWTON ANTRIM  
GLENMOUNT ROAD

NEWTOWNABBEY

Suburban Area (PP56 Out of Centre)

No Sub Category

Total Number of dwellings: 132

Survey date: THURSDAY 10/06/2010 Survey Typ MANUAL  
3. AN-03-A-07 THE CEDARS, ANTRIM ANTRIM  
CASTLE WAY

ANTRIM

Suburban Area (PP56 Out of Centre)

Residential Zone

Total Number of dwellings: 55

Survey date: TUESDAY 20/12/2011 Survey Typ MANUAL  
4. AR-03-A-01 MIXED HOUSES, LUF ARMAGH  
BIRCHDALE MANOR

LURGAN

Edge of Town

Residential Zone

Total Number of dwellings: 153

Survey date: TUESDAY 15/06/2010 Survey Typ MANUAL  
5. CR-03-A-01 BUNGALOWS, CORK-CORK  
CURRAGH ROAD  
TURNER'S CROSS

Suburban Area (PP56 Out of Centre)

Residential Zone

Total Number of dwellings: 48

Survey date: THURSDAY 08/12/2005 Survey Typ MANUAL  
6. CS-03-A-02 DETACHED, SLIGO SLIGO  
CHURCH HILL

SLIGO

Suburban Area (PP56 Out of Centre)

No Sub Category

Total Number of dwellings: 35

Survey date: THURSDAY 14/06/2007 Survey Typ MANUAL

7 EA-03-A-01 DETACHED, KILMA EAST AYRSHIRE  
TALSKER AVENUE  
KILMARNOCK  
Edge of Town  
Residential Zone  
Total Number of dwellings: 39  
Survey date: THURSDAY 05/06/2008 Survey Typ MANUAL  
8 GA-03-A-01 SEMI DETACHED, G/GALWAY  
HEADFORD ROAD  
KNOCKTARRAGH  
GALWAY  
Edge of Town  
No Sub Category  
Total Number of dwellings: 123  
Survey date: WEDNESDAY 20/09/2006 Survey Typ MANUAL  
9 GA-03-A-02 TERRACED, GALWAY GALWAY  
BOHEMORRE  
TOWNPARKS  
GALWAY  
Suburban Area (PP56 Out of Centre)  
Residential Zone  
Total Number of dwellings: 185  
Survey date: TUESDAY 19/09/2006 Survey Typ MANUAL  
10 GA-03-A-03 SEMI DET./TERRACE GALWAY  
MONEENEGEISHA ROAD  
WELLPARK  
GALWAY  
Suburban Area (PP56 Out of Centre)  
Built-Up Zone  
Total Number of dwellings: 24  
Survey date: WEDNESDAY 20/09/2006 Survey Typ MANUAL  
11 HI-03-A-13 HOUSING, INV ERNE HIGHLAND  
KINGSMILLS ROAD  
INV ERNESS  
Edge of Town  
Residential Zone  
Total Number of dwellings: 9  
Survey date: THURSDAY 21/05/2009 Survey Typ MANUAL  
12 KD-03-A-02 TERRACED/SEMI-D., KILDARE  
CEDARWOOD PARK  
MORRISTOWN ROAD  
NEWBRIDGE  
Suburban Area (PP56 Out of Centre)  
Residential Zone  
Total Number of dwellings: 71  
Survey date: TUESDAY 12/05/2009 Survey Typ MANUAL  
13 KK-03-A-03 MIXED HOUSING, KI KILKENNY  
FRESHFORD ROAD  
FRIMSINGH  
KILKENNY  
Edge of Town  
Residential Zone  
Total Number of dwellings: 70  
Survey date: WEDNESDAY 26/11/2008 Survey Typ MANUAL  
14 PK-03-A-01 DETAC. & BUNGALC PERTH & KINROSS  
TULLLUMB TERRACE  
GORNHILL  
PERTH  
Suburban Area (PP56 Out of Centre)  
Residential Zone  
Total Number of dwellings: 36  
Survey date: WEDNESDAY 11/05/2011 Survey Typ MANUAL  
15 RO-03-A-01 MIXED HOUSES, ROSCOMMON  
GALWAY ROAD  
ROSCOMMON  
Edge of Town  
No Sub Category  
Total Number of dwellings: 80  
Survey date: THURSDAY 07/05/2009 Survey Typ MANUAL  
16 RO-03-A-02 SEMI D. & BGLWS, ROSCOMMON  
SLIGO ROAD  
BALLAGHADERREEN  
Suburban Area (PP56 Out of Centre)  
Residential Zone  
Total Number of dwellings: 31  
Survey date: THURSDAY 14/07/2011 Survey Typ MANUAL  
17 WA-03-A-01 DET./SEMI-DET., WJ WATERFORD  
DUNMORE ROAD

WATERFORD  
 Suburban Area (PP56 Out of Centre)  
 Residential Zone  
 Total Number of dwellings: 70  
 Survey date: TUESDAY 18/11/2008 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

Calculation Factor: 1 DWELLS

Count Type: VEHICLES

Time Range	ARRIVALS		TRIP RATE		DEPARTURES		TOTALS			
	No. Days	Ave. DWELLS	Trips Rate	No. Days	Ave. DWELLS	Trips Rate	Ave. DWELLS	Trips Rate		
00:00-01:00	17		69	0.078	17	69	0.262	17	69	0.34
01:00-02:00	17		69	0.191	17	69	0.414	17	69	0.605
02:00-03:00	17		69	0.169	17	69	0.287	17	69	0.456
03:00-04:00	17		69	0.135	17	69	0.158	17	69	0.293
04:00-05:00	17		69	0.159	17	69	0.176	17	69	0.335
05:00-06:00	17		69	0.202	17	69	0.2	17	69	0.402
06:00-07:00	17		69	0.247	17	69	0.232	17	69	0.479
07:00-08:00	17		69	0.215	17	69	0.236	17	69	0.451
08:00-09:00	17		69	0.251	17	69	0.218	17	69	0.469
09:00-10:00	17		69	0.31	17	69	0.217	17	69	0.527
10:00-11:00	17		69	0.428	17	69	0.271	17	69	0.699
11:00-12:00	17		69	0.372	17	69	0.253	17	69	0.625
12:00-13:00										
13:00-14:00										
14:00-15:00										
15:00-16:00										
16:00-17:00										
17:00-18:00										
18:00-19:00										
19:00-20:00										
20:00-21:00										
21:00-22:00										
22:00-23:00										
23:00-24:00										

Daily Trip Rates:

2.757 2.924 5.681

Parameter summary

Trip rate parameter range select 7 - 185 (units: )

Survey date date range: 01/01/04 - 07/09/12

Number of weekdays (Monday 17

Number of Saturdays: 0

Number of Sundays: 0

Surveys manually removed from 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRICS 2013 (a)v6.11.1  
Trip Rate Parameter:

Gross floor area

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use Category  
04 - EDUCATION  
A - PRIMARY  
VEHICLES

Selected regions and areas:

10 WALES  
WR WREXHAM 1 days  
11 SCOTLAND  
DU DUNDEE CITY 1 days  
FA FALKIRK 1 days  
12 CONNAUGHT  
CS SLIGO 1 days  
13 MUNSTER  
LI LIMERICK 1 days  
KK KILKENNY 1 days  
14 LEINSTER  
DL DUBLIN 1 days  
15 GREATER DUBLIN  
AR ARMAGH 1 days  
DO DOWN 1 days  
17 ULSTER (NORTHERN IRELAND)

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area

Actual Range: 1350 to 3700 (units: sqm)  
Range Selected by User: 1350 to 3700 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/04 to 21/05/12

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday 2 days  
Wednesday 2 days  
Thursday 1 days  
Friday 4 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count 9 days  
Directional ATC Count 0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Locations:

Town Centre 0  
Edge of Town Centre 4  
Suburban Area (PP56 Out of Ce 3  
Edge of Town 0  
Neighbourhood Centre (PP56 L 2  
Free Standing (PP56 Out of Tow 0  
Not known 0

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edges of Town, Suburban Area, Neighbourhood Centre, Edge of Town, Centre, Town Centre and Not known.

Selected Location Sub Categories:

Industrial Zone 0  
Commercial Zone 0  
Development Zone 0  
Residential Zone 4  
Retail Zone 0  
Built-Up Zone 0  
Village 2  
Out of Town 0  
High Street 0  
No Sub Category 3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up, Village, Zone Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C2 1 days  
D1 8 days

This data displays the number of sites which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000 2 days  
5,001 to 10,000 1 days  
10,001 to 15,000 3 days  
15,001 to 20,000 1 days  
25,001 to 50,000 2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,000 or Less 1 days  
5,001 to 25,000 2 days  
75,001 to 100,000 3 days  
100,001 to 125,000 1 days  
125,001 to 250,000 1 days  
500,001 or More 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0 3 days  
1.1 to 1.5 5 days  
1.6 to 2.0 1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling within a radius of 5-miles of selected survey sites.

Travel Plan:

No 9 days  
This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1 AR-04-A-01 PRIMARY SCH ARMAGH  
COLLEGE HILL

ARMAGH

Edge of Town Centre

No Sub Category

Total Gross floor area: 2260 sqm

Survey date: FRIDAY 15/09/2006 Survey Typ MANUAL  
2 CS-04-A-01 PRIMARY SCH SLIGO  
PEARSE ROAD

SLIGO

Edge of Town Centre

No Sub Category

Total Gross floor area: 3700 sqm

Survey date: FRIDAY 15/06/2007 Survey Typ MANUAL  
3 DU-04-A-01 PRIMARY SCH DUBLIN  
LONG MILE ROAD

WALKINSTOWN

DUBLIN

Suburban Area (PP56 Out of Centre)

Residential Zone

Total Gross floor area: 2748 sqm

Survey date: WEDNESDAY 28/09/2011 Survey Typ MANUAL  
4 DO-04-A-01 PRIMARY SCH DOWN  
CHURCH GROVE

KIRRCUBBIN

Neighbourhood Centre (PP56 Local Centre)

Village

Total Gross floor area: 1350 sqm

Survey date: MONDAY 19/12/2011 Survey Typ MANUAL  
5 DU-04-A-01 PRIMARY SCH DUNDEECITY  
FALKLAND CRESCENT

BROUGHTY FERRY

DUNDEE

Suburban Area (PP56 Out of Centre)

Residential Zone

Total Gross floor area: 3288 sqm

Survey date: MONDAY 21/05/2012 Survey Typ MANUAL  
6 FA-04-A-02 PRIMARY SCH FALKIRK  
NEW HALLGLEN ROAD

HALLGLEN

NEAR FALKIRK

Neighbourhood Centre (PP56 Local Centre)

Village

Total Gross floor area: 2080 sqm

Survey date: WEDNESDAY 25/04/2007 Survey Typ MANUAL



7 KK-04-A-01 PRIMARY SCH KILKENNY  
STEPHEN STREET

KILKENNY  
Edge of Town Centre  
Residential Zone  
Total Gross floor area: 1600 sqm  
Survey date: 28/11/2008 Survey Typ MANUAL  
8 LL-04-A-01 PRIMARY SCH LIMERICK  
CORBALLY ROAD

LIMERICK  
Suburban Area (PP56 Out of Centre)  
Residential Zone  
Total Gross floor area: 2760 sqm  
Survey date: 24/06/2011 Survey Typ MANUAL  
9 WR-04-A-01 PRIMARY SCH WREXHAM  
BODHFRYD

WREXHAM  
Edge of Town Centre  
No Sub Category  
Total Gross floor area: 2000 sqm  
Survey date: THURSDAY 13/10/2011 Survey Typ MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value the day of the week and date of each survey and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

Calculation factor: 100 sqm

Count Type: VEHICLES

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
06:00-07:00	9	2421	0.395	9	2421	0.161	9	2421	0.556
07:00-08:00	9	2421	2.91	9	2421	1.974	9	2421	4.884
08:00-09:00	9	2421	1.57	9	2421	1.492	9	2421	3.062
09:00-10:00	9	2421	0.262	9	2421	0.234	9	2421	0.496
10:00-11:00	9	2421	0.257	9	2421	0.34	9	2421	0.597
11:00-12:00	9	2421	0.45	9	2421	0.376	9	2421	0.826
12:00-13:00	9	2421	0.849	9	2421	0.386	9	2421	1.235
13:00-14:00	9	2421	1.193	9	2421	1.193	9	2421	2.386
14:00-15:00	9	2421	1.12	9	2421	2.153	9	2421	3.273
15:00-16:00	9	2421	0.266	9	2421	0.812	9	2421	1.078
16:00-17:00	8	2441	0.056	8	2441	0.2	8	2441	0.256
17:00-18:00	5	2429	0.041	5	2429	0.066	5	2429	0.107
18:00-19:00									
19:00-20:00									
20:00-21:00									
21:00-22:00									
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			9.369			9.387			18.756

Parameter summary

Trip rate parameter range seller 1.350 - 3700 (units: sqm)

Survey date date range: 01/01/04 - 21/05/12

Number of weekdays (Monday

9

Number of Saturdays:

0

Number of Sundays:

0

Surveys manually removed float

0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first followed by the range of minimum and maximum survey dates selected by the user. Then the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRICS 2013 (a)v6.11.1

Trip Rate Parameter:

Gross floor area

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use Category  
D - INDUSTRIAL ESTATE  
VEHICLES

02 - EMPLOYMENT  
15 GREATER DUBLIN  
17 ULSTER (NORTHERN IRELAND)

Selected regions and areas:

11 SCOTLAND  
EA  
EAST AFRSI 1 days  
HI  
HIGHLAND 1 days  
DL  
DUBLIN 1 days  
AR  
ARMAGH 1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:

Gross floor area

Actual Range: 552 to 120000 (units: sqm)

Range Selected by User:

552 to 234115 (units: sqm)

Public Transport Provision:

Include all surveys

Date Range: 01/01/04 to 25/05/12

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday 1 days  
Tuesday 2 days  
Wednesday 1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count 4 days  
Directional ATC Count 0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Locations:

Town Centre 0  
Edge of Town Centre 1  
Suburban Area (PP56 Out of Ce 1  
Edge of Town 2  
Neighbourhood Centre (PP56 L 0  
Free Standing (PP56 Out of Tow 0  
Not known 0

This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Location Sub Categories:

Industrial Zone 2  
Commercial Zone 0  
Development Zone 0  
Residential Zone 0  
Retail Zone 0  
Built-Up Zone 0  
Village 0  
Out of Town 0  
High Street 0  
No Sub Category 2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing Edge of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not known.

Filtering Stage 3 selection:

Use Class: Not known 1 days  
B1 2 days  
B2 1 days

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone Industrial Zone Development Zone Residential Zone Retail Zone Built-Up Village Zone Out of Town High Street and No Sub Category.

Population within 1 mile:

1,001 to 5,000 1 days  
5,001 to 10,000 1 days  
15,001 to 20,000 1 days  
20,001 to 25,000 1 days



09:30-10:00	4	41775	0.138	4	41775	0.096	4	41775	0.234
10:00-10:30	4	41775	0.084	4	41775	0.093	4	41775	0.177
10:30-11:00	4	41775	0.095	4	41775	0.085	4	41775	0.18
11:00-11:30	4	41775	0.07	4	41775	0.086	4	41775	0.156
11:30-12:00	4	41775	0.082	4	41775	0.087	4	41775	0.169
12:00-12:30	4	41775	0.121	4	41775	0.124	4	41775	0.245
12:30-13:00	4	41775	0.14	4	41775	0.153	4	41775	0.293
13:00-13:30	4	41775	0.121	4	41775	0.155	4	41775	0.276
13:30-14:00	4	41775	0.154	4	41775	0.098	4	41775	0.252
14:00-14:30	4	41775	0.08	4	41775	0.077	4	41775	0.157
14:30-15:00	4	41775	0.099	4	41775	0.098	4	41775	0.197
15:00-15:30	4	41775	0.103	4	41775	0.112	4	41775	0.215
15:30-16:00	4	41775	0.105	4	41775	0.129	4	41775	0.234
16:00-16:30	4	41775	0.117	4	41775	0.149	4	41775	0.266
16:30-17:00	4	41775	0.087	4	41775	0.178	4	41775	0.265
17:00-17:30	4	41775	0.057	4	41775	0.172	4	41775	0.229
17:30-18:00	4	41775	0.035	4	41775	0.144	4	41775	0.179
18:00-18:30	4	41775	0.028	4	41775	0.06	4	41775	0.088
18:30-19:00	4	41775	0.022	4	41775	0.044	4	41775	0.066
19:00-19:30									
19:30-20:00									
20:00-20:30									
20:30-21:00									
21:00-21:30									
21:30-22:00									
22:00-22:30									
22:30-23:00									
23:00-23:30									
23:30-24:00									
Daily Trip Rates:			2.455			2.455			4.91

Parameter summary

Trip rate parameter range select: 552 - 120000 (units: sqm)

Survey date date range: 01/01/04 - 25/05/12

Number of weekdays (Monday

Number of Saturdays: 0

Number of Sundays: 0

Surveys manually removed for: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first

followed by the range of minimum and maximum survey dates selected by the user. Then the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRICS 2013 (a)v6.11.2

Trip Rate Parameter: Gross floor area

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use Category  
01 - RETAIL  
1 - SHOPPING CENTRE - LOCAL SHOPS  
VEHICLES

Selected regions and areas:

9 NORTH  
TW TYNE & WEAR 2 days  
11 SCOTLAND  
EB CITY OF EDINBURGH 1 days  
15 GREATER DUBLIN  
DL DUBLIN 1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area

Actual Range: 540 to 2442 (units: sqm)

Range Selected by User: 500 to 650 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/05 to 21/11/12

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday 1 days

Wednesday 2 days

Thursday 1 days

This data displays the number of selected surveys by day of the week

Selected survey types:

Manual count 4 days

Directional ATC Count 0 days

This data displays the number of total ATC surveys undertaken using machines.

Selected Locations:

Town Centre 0

Edge of Town Centre 0

Suburban Area (PP56 Out of Ce 2

Edge of Town 0

Neighbourhood Centre (PP56 L 2

Free Standing (PP56 Out of Tow 0

Not Known 0

This data displays the number of manual classified surveys and the number of unclassified ATC surveys the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff whilst ATC surveys are undertaken using machines.

Selected Location Sub Categories:

Industrial Zone 0

Commercial Zone 0

Development Zone 4

Residential Zone 4

Retail Zone 0

Built-Up Zone 0

Village 0

Out of Town 0

High Street 0

No Sub Category 0

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Town Suburban Area Neighbourhood Centre Edge of Town Centre Town Centre and Not Known.

Filtering Stage 3 selection:

Use Class:

A1 4 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000 1 days

20,001 to 25,000 1 days

25,001 to 50,000 1 days

50,001 to 100,000 1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

125,001 to 250,000 1 days  
 250,001 to 500,000 2 days  
 500,001 or More 1 days  
 This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:  
 0.6 to 1.0 4 days  
 This data displays the number of surveys within a radius of 5-miles of selected survey sites.

Petrol filling station:  
 Included in the survey count 0 days  
 Excluded from count or no fillir 4 days  
 This data displays the number of surveys that do not.

Travel Plan:  
 No 4 days  
 This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	DL-01-H-03	LOCAL SHOPS	DUBLIN
	RAVENSDALE PARK		
	TERENURE		
	DUBLIN		
	Suburban Area (PP56 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	07/09/1906 sqm	
	Survey date:	28/09/2011	Survey Typ MANUAL
2	EB-01-H-01	LOCAL SHOPS	CITY OF EDINBURGH
	COUNLTON ROAD		
	CRAIGLOCKHART		
	EDINBURGH		
	Suburban Area (PP56 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	04/04/1902 sqm	
	Survey date:	28/10/2010	Survey Typ MANUAL
3	TW-01-H-01	LOCAL SHOPS	TYNE & WEAR
	FARRINGDON ROAD		
	MARDEN		
	NORTH SHIELDS		
	Neighbourhood Centre (PP56 Local Centre)		

	Residential Zone								
	Total Gross floor area:	29/04/1902 sqm							
	Survey date:	17/10/2006	Survey Typ MANUAL						
4	TW-01-H-02	LOCAL SHOPS	TYNE & WEAR						
	DURHAM ROAD								
	BARNES PARK								
	SUNDERLAND								
	Neighbourhood Centre (PP56 Local Centre)								
	Residential Zone								
	Total Gross floor area:	540 sqm							
	Survey date:	21/11/2012	Survey Typ MANUAL						

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value the day of the week and date of each survey and whether the survey was a manual classified count or an ATC count.

Manually Deselected Sites	Reason for Deselection
DE-01-H-01	None
DE-01-H-02	None

TRIP RATE for Land Use 01 - RETAIL/ - SHOPPING CENTRE - LOCAL SHOPS  
 Calculation Factor: 100 sqm  
 Count Type: VEHICLES

Time Range	No. Days	ARRIVALS Ave. GFA	Trip Rate	No. Days	DEPARTURES Ave. GFA	Trip Rate	TOTALS Ave. GFA	Trip Rate
00:00-01:00	1	540	1.296	1	540	1.296	1	540
01:00-02:00	4	1164	1.417	4	1164	1.417	4	1164
02:00-03:00	4	1164	1.095	4	1164	1.095	4	1164
03:00-04:00	4	1868	1.46	4	1164	1.696	4	1164
04:00-05:00	4	2018	1.396	4	1164	2.04	4	1164
05:00-06:00	4	1396	1.396	4	1164	1.396	4	1164
06:00-07:00	4	1164	1.61	4	1164	1.696	4	1164
07:00-08:00	4	1164	1.568	4	1164	1.46	4	1164
08:00-09:00	4	1164	1.868	4	1164	1.696	4	1164
09:00-10:00	4	1164	2.018	4	1164	2.04	4	1164
10:00-11:00	4	1164	1.396	4	1164	1.396	4	1164
11:00-12:00	4	1164	1.396	4	1164	1.396	4	1164
12:00-13:00	4	1164	1.396	4	1164	1.396	4	1164

13:00-14:00	4	1164	1.16	4	1164	1.052	4	1164	2.212
14:00-15:00	4	1164	1.009	4	1164	0.945	4	1164	1.954
15:00-16:00	4	1164	1.009	4	1164	0.88	4	1164	1.889
16:00-17:00	4	1164	1.31	4	1164	1.396	4	1164	2.706
17:00-18:00	4	1164	1.503	4	1164	1.825	4	1164	3.328
18:00-19:00	4	1164	1.31	4	1164	1.417	4	1164	2.727
19:00-20:00	4	1164	0.644	4	1164	0.966	4	1164	1.61
20:00-21:00	3	1269	0.762	3	1269	0.841	3	1269	1.603
21:00-22:00	1	540	4.444	1	540	4.444	1	540	8.888
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			24,303			24,166			48,469

Parameter summary

Trip rate parameter range selector: 540 - 2442 (units: spm)  
 Survey date date range: 01/01/05 - 21/11/12  
 Number of weekdays (Monday): 4  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed for: 2

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first followed by the range of minimum and maximum survey dates selected by the user. Then the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

## Appendix H

### Micro-Simulation Traffic Modelling

## Technical Note 5

Version 1

Project:	<b>M7 Naas to Newbridge Bypass Upgrade Scheme</b>	Job No:	60241946
Subject:	<b>M7 VISSIM LAM Development</b>		
Prepared by:	<b>Declan Keenan</b>	Date:	<b>12<sup>th</sup> February 2013</b>
Checked by:	<b>Philip Shiels</b>	Date:	<b>12<sup>th</sup> February 2013</b>
Approved by:	<b>Alan O'Brien</b>	Date:	<b>12<sup>th</sup> February 2013</b>

### 1.0 Introduction

This Technical Note discusses the development, calibration and validation of the VISSIM micro-simulation models used to assess the operation of the M7 Naas Bypass and its interchanges, which include:

- M7/M9 interchange (J11);
- Newhall interchange (J10); and
- Maudlins interchange (J9).

The need for this study has arisen as a result of proposals to widen the M7 mainline carriageway from 2 to 3 lanes in both directions between the M7/M9 and Maudlins interchanges. Concerns have been raised as to the impact of the widening scheme upon the capacity and operation of these interchanges. In addition to above, the micro-simulation models are also used to assess the impact of the proposed development of the Osberstown Interchange and Sallins Bypass scheme upon the M7 mainline carriageway and interchanges mentioned above.

Due to the nature of the M7 carriageway, a strategic route between Dublin, Limerick, Cork, Waterford, Kilkenny and Carlow, the corridor experiences significant traffic demand during both the AM and PM periods which can result in considerable congestion and delay on the M7 mainline and interchanges (particularly Newhall) and also within the surrounding road network.

Due to the complexity of the road network, it was deemed necessary to develop a micro-simulation model covering the study area shown in Figure 1-1 below. This Technical Note has been prepared to describe the development of the micro-simulation base year (2012) models using the software VISSIM and is split into the following sections:

- Data collection;
- Network development;
- Matrix development; and
- Model calibration and validation.

## Technical Note 5

Version 1

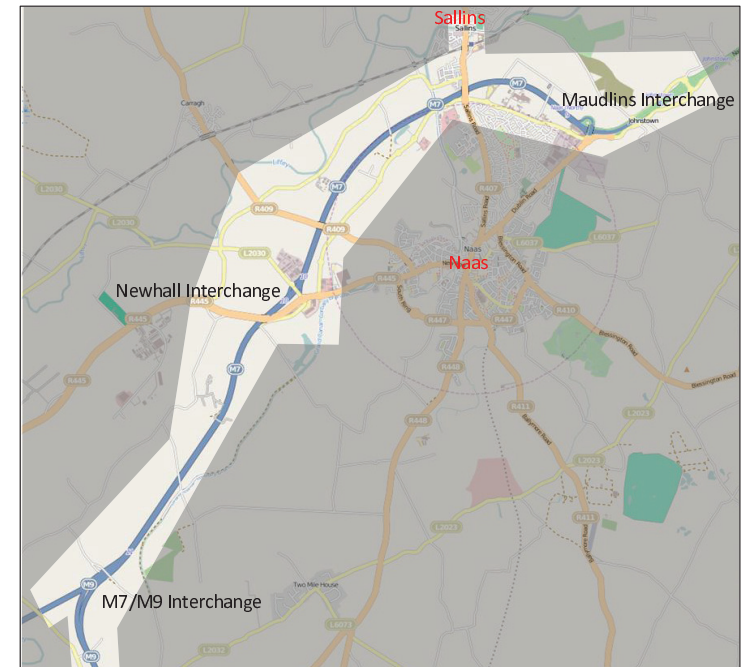


Figure 1-1: Study Area

### 2.0 Baseline Model Development

#### 2.1 Data Collection

A significant amount of traffic count data was collected in order to develop an understanding of the existing traffic patterns in the study area and for use in the development of the traffic models. The following data was applicable to the development of the M7 VISSIM models:

- Manual Classified Counts (MCC) – A total of 10 MCC at key junctions undertaken on 7th of February 2012;
- 8 Automatic Traffic Counts (ATC) undertaken between 6th to 12th February 2012; and
- 3 NRA Automatic Traffic Counters along the M7 carriageway were all utilised in the development of the base models.

The location of the traffic surveys is presented in Figures 2-1 and 2-2 below.



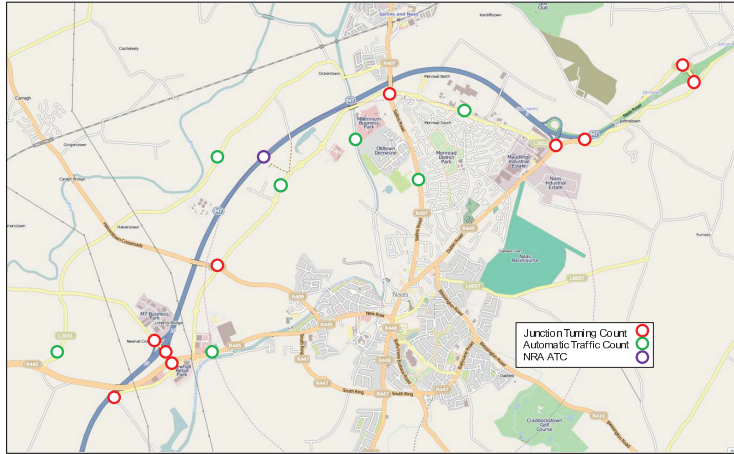


Figure 2-1: Data Collection

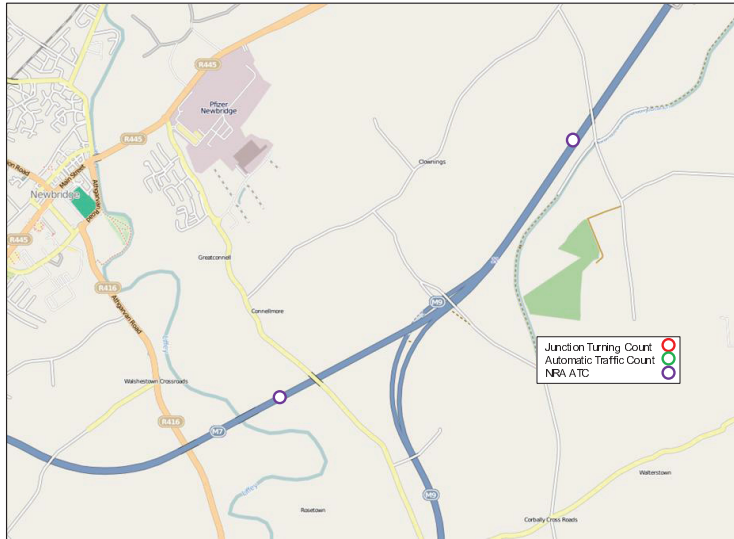


Figure 2-2: Data Collection

2.2 Stage 1 – Development of Refined M7 VISUM models

Initially, a VISUM strategic traffic model was developed as part of the M7 Naas to Newbridge Bypass Upgrade Scheme encompassing the study area shown in the Figure 2-3. This model, known as the M7 LAM, was cordoned out of the NRA National Traffic Model (NTM) from which two models were developed:

- AM peak hour (08:00 – 09:00) model: and
- PM peak hour (17:00 – 18:00) model.

A screenshot of the M7 Local Area Model (LAM) is presented in Figure 2-3 below. More detailed information in relation to the M7 LAM is available in the Traffic Modelling Report.

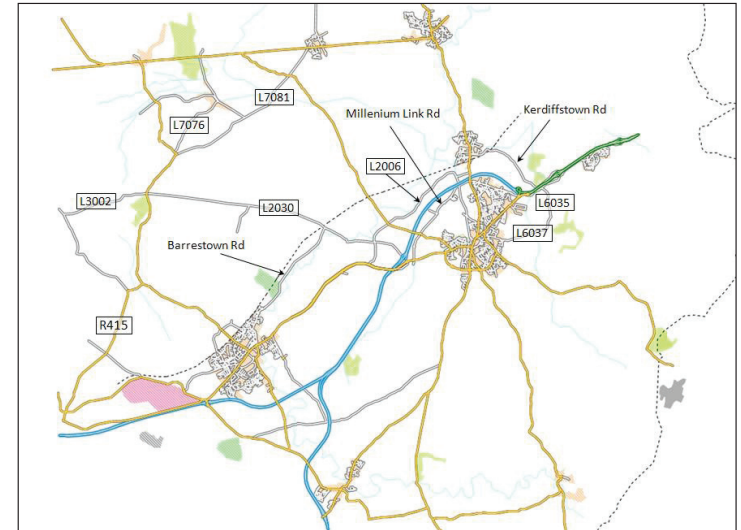


Figure 2-3: 2012 M7 LAM Network

A cordon was then generated in order to develop a VISSIM network that would satisfy the study area shown in Figure 1-1 above. The zoning structure from the M7 LAM models was retained. A screenshot of the resultant VISUM network is shown in Figure 2-4.

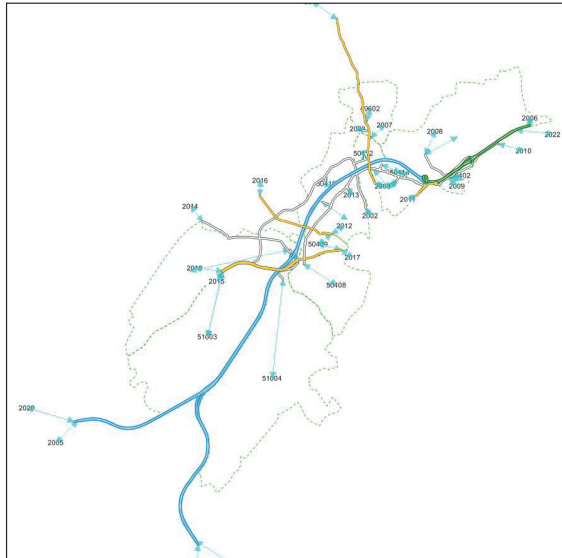


Figure 2-4: Re-cordoned 2012 M7 Network

Both of the cordoned AM and PM peak VISUM models were further refined by adjusting signal timings, road geometry and speeds. Significant processing was undertaken to ensure the correct link and junction geometries were applied through the network.

The VISUM models were then each re-calibrated against the traffic count data for each Peak hour mentioned above in order to ensure that the matrices were fit for purpose. The matrix estimation tool provided within VISUM was also utilised for this purpose. Following this process, the 2012 M7 VISUM network and matrices were exported into the VISSIM microsimulation modelling tool.

2.3 Stage 2 – Development of Refined M7 VISSIM Models

Subsequent to Stage 1 outlined above, the VISUM network and matrices were imported into VISSIM. The resultant M7 VISSIM models were further refined with regards network elements using OS mapping and digital photography. The resultant VISSIM network is shown in Figure 2-5 below.

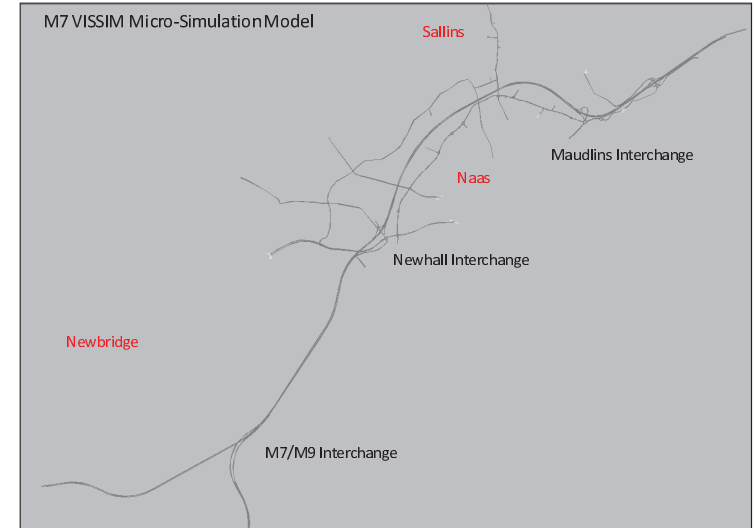


Figure 2-5: 2012 M7 VISSIM Network

Traffic counts at a number of key junctions in the network were examined to identify the proportion of traffic entering the study area over the periods 07:45 – 09:15 and 16:45 – 18:15. Figures 2-6 and 2-7 below highlight the volumetric proportions of traffic entering and exiting the network per 15 minute segment over the AM and PM peaks respectively.

Following this the AM and PM matrices were then split up into 15 minute time segments and loaded into the models separately to ensure that traffic loaded onto the network at the appropriate time. This resulted in the loading of 8 matrices into the VISSIM model comprising of both light and heavy vehicles.

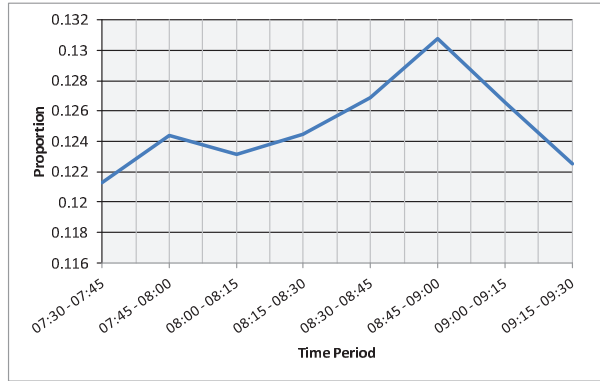


Figure 2-6: Proportions of Traffic Entering Network During AM Period

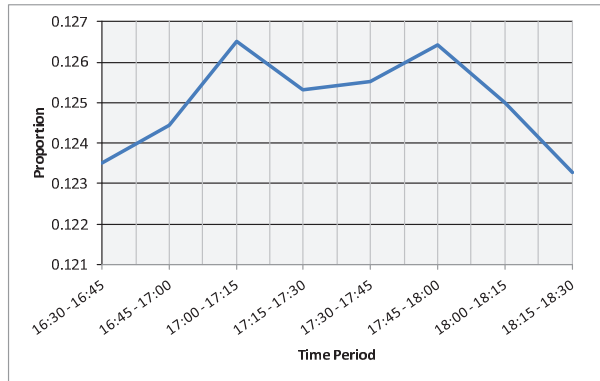


Figure 2-7: Proportions of Traffic Entering Network During PM Period

2.3.1 M7 VISSIM Model Calibration

The calibration process involves the adjustment of parameters within the model to generate a fit between modelled outputs and known observations. These parameters include the capacity and speeds on links, adjustment of trip matrices, gap times and signal timings. The traffic count data outlined above was utilised as part of the calibration process. Model parameters were adjusted based on these counts to create an accurate model replicating observed traffic conditions.

The NRA Project Appraisal Guidelines (PAG) specifies the acceptable values for modelled and observed flow comparisons and suggests how calibration should relate to the magnitude of the values being compared. A summary of these targets is shown in Table 2-1:

Table 2-1: Model Calibration/Validation Criteria: Individual Flows

Criteria and Measures	Guideline
Individual flows within 15% for flows 700 – 2700 vph	> 85% of cases
Individual flows within 100 vph for flows <700 vph	
Individual flows within 400 vph for flows > 2700	

The standard method used to compare modelled values against observations on a link involves the calculation of the Geoff Havers (GEH) statistic (Chi-squared statistic), incorporating both relative and absolute errors. The GEH statistic is a measure of comparability that takes account of not only the difference between the observed and modelled flows, but also the significance of this difference with respect to the size of the observed flow. The GEH statistic is calculated as follows:

$$GEH = \sqrt{\frac{(M - O)^2}{0.5(M + O)}}$$

Where M = Modelled Flow and O = Observed Flow.

Guidance in the Project Appraisal Guidelines sets out the following criteria:

Table 2-2: Model Calibration/Validation Criteria: GEH Values

Criteria and Measures	Guideline
GEH statistic	Individual flows: GEH < 5 > 85% of cases

The observed and modelled flows were compared at each of the calibration sites in accordance with the criteria above. The permissible difference was calculated for each value (based on the observed figure) and compared with that which had been modelled. Calibration results are included in Appendix A of this Note and are briefly summarised in Table 2-3 below.

Table 2-3: Calibration Results – Link Flows

Time Periods	% of Calibration Sites that meet the following criteria	
08:00 – 09:00	Individual Flows within 15% for flows 700 – 2700 vph	83%
	Individual flows within 100 vph for flows < 700 vph	
	Individual flows within 400 vph for flows > 2700 vph	
	Individual flows: GEH < 5	84%
17:00 – 18:00	Individual Flows within 15% for flows 700 – 2700 vph	86%
	Individual flows within 100 vph for flows < 700 vph	
	Individual flows within 400 vph for flows > 2700 vph	
	Individual flows: GEH < 5	83%

As shown above, the M7 VISSIM models are slightly under the criteria for calibration as set out in PAG. However, as 96% and 94% of the links assessed during the AM and PM peaks respectively demonstrate a GEH value less than 7, the model is regarded as fit for purpose in terms of calibration.

2.3.2 M7 VISSIM Model Validation

Model validation comprises the comparison of calibrated flows against an independent data set which was not used as part of the calibration process. A number of junctions were selected in order to validate junction turning counts. The junction turning count calibration sheets can be seen in Appendix B of this Technical Note. The validation results are briefly summarised in Table 2-4 below.

Table 2-4: Validation Results – Turning Counts

Time Periods	% of Calibration Sites that meet the following criteria	
08:00 – 09:00	Individual Flows within 15% for flows 700 – 2700 vph Individual flows within 100 vph for flows < 700 vph Individual flows within 400 vph for flows > 2700 vph	90%
	Individual flows: GEH < 5	72%
17:00 – 18:00	Individual Flows within 15% for flows 700 – 2700 vph Individual flows within 100 vph for flows < 700 vph Individual flows within 400 vph for flows > 2700 vph	92%
	Individual flows: GEH < 5	76%

The M7 VISSIM models developed are slightly under the criteria for validation in terms of the GEH statistic. However, as 87% and 92% of the turning movements assessed during the AM and PM peaks respectively demonstrate a GEH value less than 7, the model is regarded as fit for purpose in terms of validation.

3.0 Conclusion

The AM and PM Period models both produce levels of traffic that compare well with observed values. Similarly, turning flows at key junctions compare very well with values collected in surveys. Both models therefore reproduce observed traffic well and it is considered that any junction modification tests will be credible.

As well as replicating the levels of vehicle flow in the study area to a very good degree, the models also demonstrate levels of queuing that compare well with levels observed on site visits.

The AM and PM peak micro-simulation models of the M7 Naas Bypass can therefore be considered fit to model the effects of interventions on the traffic conditions within the study area.

APPENDIX A – MODEL CALIBRATION



APPENDIX B – MODEL VALIDATION

