TRICS Consortium Limited

A Comparison of Vehicular Trip Rate Variation by TRICS Regions and Location Types – Technical Note

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1. Executive Summary

1.1. As the TRICS database has expanded over the years, and as a result became increasingly flexible with a growing number of survey filtering options made available, it became necessary for the TRICS Consortium to provide a Good Practice Guide. This guidance, aimed at both suppliers and auditors of TRICS trip rate calculation results, included a section on the selection of surveys by region. Up until the study covered by this technical note was undertaken, we advised that users should avoid automatically filtering by regional category, and instead look in more detail at the local characteristics of their development scenario.

1.2. This study of vehicular trip rate variation by region compared to variation by TRICS location type has been undertaken in advance of a revised 2020 TRICS Good Practice Guide, which will contain more detailed and updated guidance on all elements of the use of TRICS, including revised advice on regional and location type survey selection. This study has sought to provide greater clarity in this particular element of our guidance.

1.3. The study was undertaken in two stages. The first stage compared peak and full survey duration vehicular trip rates for three of the most populous land use categories within TRICS. These are 01/A (Food Superstores), 02/A (Offices), and 03/A (Houses Privately Owned). The Food Superstores analysis was split between Fridays and Saturdays, whilst the analyses for Offices and Houses Privately Owned covered weekdays. For both stages of the analysis, the survey cut-off date was set to 01/01/1999. When undertaking the regional analysis, all location types were grouped together, and for the location type analysis, all regional categories were grouped together. This was designed to ensure statistically sound survey samples.

1.4. The first stage of the study grouped the regions into Greater London, South East, South West, East Anglia, All Midlands, All North, Wales, Scotland, and All Ireland. The second stage grouped the location types into Town Centre/Edge of Town Centre, Suburban Area and Edge of Town.

1.5. For both stages, trip rates were calculated per 100m2 of Gross Floor Area (GFA) for Food Superstores and Offices, and per 1 dwelling for Houses Privately Owned, covering arrival, departure and total peak periods and full survey duration periods. Also, for both stages, the percentages of variance for each regional or location type grouping compared to trip rates for all sites (by land use category) were calculated, and a system of rankings showed how the groupings compared to each other across the land uses, to see if any significant patterns emerged. It was from the presentation of sets of tables displaying these results that our conclusions were drawn.

1.6. The regional analysis reveals no clear, consistent pattern of vehicular trip rate variation by region evident, with variation appearing to fluctuate randomly throughout. If there had been a clear basis for overall trip rate variation by region alone, then we would have seen certain regions ranking consistently lower or higher than others, but this is not evident from this study. Our conclusion is that a considerable number of other factors are influencing vehicular trip generation to a significantly greater degree than region alone.

1.7. On the other hand, the location type analysis does overall appear to show a structured and consistent variation in vehicle trips. The ranked comparison of TRICS location types shows the Edge of Town category ranking mostly at the top in terms of trip rates, with the Town Centre/Edge of Town Centre category ranking mostly at the bottom. This suggests that, although there are of course a number of factors that can influence trip generation, TRICS location type is certainly an important one of these.

1.8. So, it is clear from this study that there is a significantly higher correlation between location type and vehicular trip rates than there is between region and vehicular trip rates, with location type clearly showing a greater level of consistency and a clear, emerging pattern, compared to the apparent randomness of fluctuations when trip rates are split by region.

1.9. These results provide us with a much greater level of clarity than we had before the study was undertaken. We can conclude from this study that regional selection should not be the major consideration when applying trip rate calculation filtering criteria, whilst TRICS location type appears to be one of the most influential factors in terms of trip generation, and therefore should be one of the main filtering considerations. The 2020 TRICS Good Practice Guide shall reference this report accordingly.

2. Introduction

2.1. Ever since the TRICS system was first introduced, its site information has included a range of location types, and surveys have been undertaken across a wide variety of regions across the UK and Ireland. As the database grew, and an increasing number of surveys took place every year, the regions and sub-areas within the system were more finely categorised, with the location types being better defined and sub-location types also added.

2.2. In 2005, with the database by that time containing thousands of surveys, with the supporting information contained within individual TRICS sites having become much more comprehensive, it was decided that a TRICS Good Practice Guide would be written, with this guidance aimed at practitioners in both the public and private sectors of the transport planning and development management industry. The aim of the guidance was not to set strict and enforced "rules" for TRICS users; Instead, it was written to provide structured assistance, which urged our member organisations to use the system in the most professional way. It provided notes on clarity when using TRICS data in Transport Assessments, and it was also designed to assist those tasked with auditing such data. Our Good Practice Guide remains in use today, and it is often used right up to Public Inquiry level.

2.3. The current version of the guidance (the 2016 version remained valid at the time of this note being written), includes a section on "site selection by region and data fields" *(TRICS Good Practice Guide 2016: Section 4).* The current advice we provide is that users should avoid automatically filtering by regional category, and instead look in more detail at the local characteristics of their development scenario, taking into account location type, population density, car ownership, public transport accessibility, and a number of other possibly influencing factors.

2.4. With this guidance having been in place for several years, the issue of regional trip rate selection and variation has remained one of the most often raised topics by TRICS users. It has become clear that the practice of regional selection in undertaking trip rate calculations is still used by a number of TRICS member organisations, with this practice sometimes leading to disputes with local authorities and other organisations who refer to our guidance, which advocates a somewhat more detailed approached to assessing potential sites for inclusion in calculations.

2.5. Prior to our guidance being written, some internal and unpublished statistical research into regional vehicular trip rate variation was undertaken, with its results being largely inconclusive. As TRICS will be re-writing our Good Practice Guide in 2020, and with the size of the database now being significantly larger than before the original guidance was written, it was decided in 2018 to undertake a set of technical analyses, which would seek to address the issue of regional vehicular trip rate variation compared to a similar exercise looking at variation between different TRICS location categories.

2.6. A presentation on the results of the first stage of the analysis, this being a look into regional vehicular trip rate variation, was given at the November 2018 TRICS Training & Development Forum. Following this, the second stage of the analysis was undertaken, looking at variation in vehicular trip rates by TRICS location type, and the results of this stage were presented at the June 2019 TRICS User Meeting. This technical note puts both stages of the analysis together, addressing with clear data the long-standing question of regional selection and vehicular trip rate variation, by providing a direct comparison with vehicular trip rate variation by TRICS location type. The results of this work will subsequently feed into the revised 2020 Good Practice Guide.

3. Site Selection

3.1. At the time this set of analyses was undertaken, the TRICS database contained thousands of surveys across the 17 regions of the UK and Ireland. The level of surveys through these regions does vary considerably, so, for the first stage of this analysis, regional vehicular trip rate variation, it was decided that the following regions would be grouped as below to maximise the sample sizes for data analysis. The numbers shown represent the regional type codes as contained within the TRICS database.

- (1) Greater London
- (2) South East
- (3) South West
- (4) East Anglia
- (5) East Midlands, (6) West Midlands – "All Midlands"
- (7) Yorkshire & North Lincolnshire, (8) North West, (9) North – "All North"
- (10) Wales
- (11) Scotland
- (12) Connaught, (13) Munster, (14) Leinster, (15) Greater Dublin, (16) Ulster Republic of Ireland, (17) Ulster Northern Ireland – "All Ireland".

3.2. For the second stage of the analysis, focusing on vehicular trip rate variation by TRICS location type, the groupings were split as follows, again to ensure that the largest possible survey samples were obtained. The full definitions of each TRICS location type can be found within the Help section of the TRICS system, but Figure 1 below provides a very brief visual idea of these. Note that the Suburban Area category has quite a broad definition, stretching from just outside the edge of a town/city centre to near the town or city edges. Note that there were insufficient surveys to include the Free Standing and Neighbourhood Centre location categories in the analyses, so the chosen groupings taken forward were as follows.

- Town Centre/Edge of Town Centre
- Suburban Area
- Edge of Town

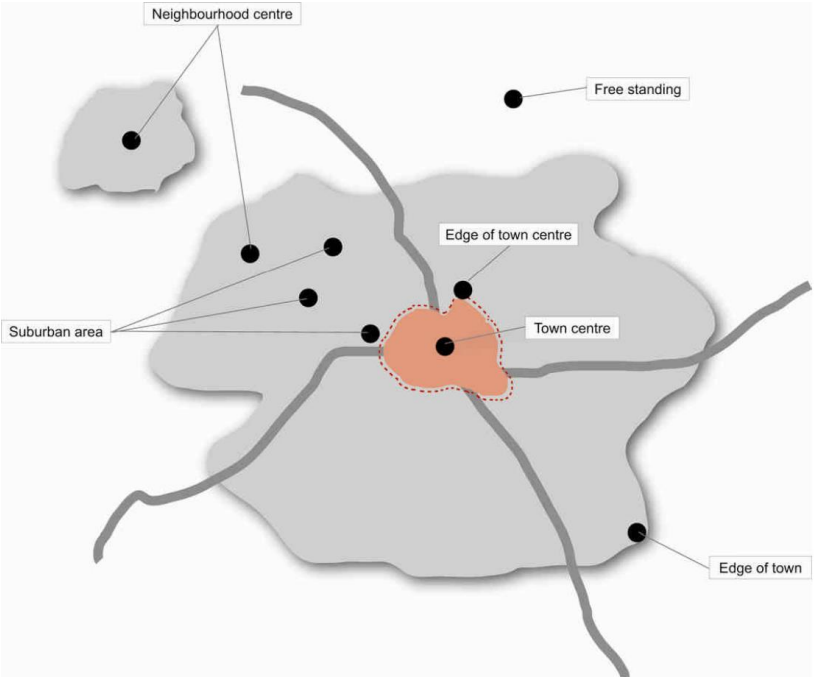

Figure 1 – TRICS Main Location Types

3.3. It was also important to ensure that the land use types selected for inclusion in this analysis contained enough surveys for the results to be statistically reliable, and so the following TRICS land use sub-categories that higher numbers of surveys present were chosen.

- 01/A: Food Superstore
- 02/A: Office
- 03/A: Houses Privately Owned

3.4. Again, for the purposes of obtaining an acceptable data sample, only total vehicle trip rates were undertaken. The analyses for superstores were split into Friday only and Saturday only sub-groupings, with the analyses for offices and houses privately owned only using weekday (Monday to Friday) surveys. For all analyses, the survey cut-off date was set to 01/01/1999. When undertaking the regional analysis, all location types were grouped together, and for the location type analysis, all regional categories were grouped together. It should be noted that all of this was necessary to ensure that decent survey samples were obtained. If more filtering had been applied, we would have been potentially faced with ending up with very small data samples, and so we considered it sensible and practical to keep filtering as reasonable as possible, whilst at the same time not compromising the aims of the analysis at any stage by retaining statistically sound survey samples throughout.

3.5. Appendix A of this note provides full details of all survey samples used in these analyses. A brief summary of the total sample sizes is presented in the two tables below. Table 1 shows the survey samples for the regional analysis, and Table 2 shows the survey samples for the location type analysis. All numbers represent survey days.

Regional Grouping	Food Superstores (Friday)	Food Superstores (Saturday)	Offices (Weekday)	Houses Privately Owned (Weekday)
Greater London	3	7	20	10
South East	8	15	30	27
South West	9	9	6	11
East Anglia	4	3	10	13
All Midlands	11	10	10	28
All North	7	16	26	37
Wales	4	7	6	8
Scotland	4	7	9	14
All Ireland	9	5	17	54
Total (all regions)	59	79	134	202

Table 1 – Survey Sample sizes for the regional analysis

Location Type	Food Superstores (Friday)	Food Superstores (Saturday)	Offices (Weekday)	Houses Privately Owned (Weekday)
Town Centre/ Edge of Town Centre	26	34	28	90
Suburban Area	20	28	29	81
Edge of Town	13	17	73	21
Total (all regions)	59	79	130	192

Table 2 – Survey Sample sizes for the location type analysis

4. Regional Vehicular Trip Rate Results

4.1. The first set of results tables cover the vehicular trip rate variation analyses by region. There are two tables shown for each land use type, with the 01/A (Food Superstore) land use split between Fridays and Saturdays. For each land use type, the first table displays total two-way vehicular trip rates per 100m2 GFA (or per 1 dwelling for the 03/A (Houses Privately Owned) land use category), for the peak hour of activity (or peak half hour for the 02/A (Office) land use category). The second table displays total two-way vehicular survey duration trip rates. In both tables, the percentage of vehicular trip rate variation from the "All Regions" category (which is set at 0%) is also displayed.

Regional Grouping	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
South West	9	14.629	+16.1%
All Ireland	9	14.056	+12.7%
Wales	4	13.875	+11.5%
East Anglia	4	13.044	+5.9%
South East	8	12.325	+0.4%
All Regions	59	12.273	0.0%
All North	7	12.266	-0.1%
All Midlands	11	11.736	-4.6%
Scotland	4	9.806	-25.2%
Greater London	3	7.299	-68.1%

Table 3 – Peak hour vehicular trip rate variation by region (01/A – Food Superstores, Friday)

Regional Grouping	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
South West	9	187.741	+21.7%
All Ireland	9	157.722	+6.8%
South East	8	154.470	+4.9%
All Regions	59	146.938	0.0%
East Anglia	4	141.472	-3.9%
All North	7	139.858	-5.1%
Wales	4	139.479	-5.3%
All Midlands	11	134.661	-9.1%
Scotland	4	90.652	-62.1%
Greater London	3	77.657	-89.2%

Table 4 – Survey duration vehicular trip rate variation by region (01/A – Food Superstores, Friday)

Regional Grouping	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
East Anglia	3	18.391	+31.4%
Wales	7	14.804	+14.8%
South West	9	14.486	+12.9%
All North	16	13.647	+7.5%
South East	15	12.886	+2.1%
All Midlands	10	12.878	+2.0%
All Regions	79	12.617	0.0%
All Ireland	5	10.730	-17.6%
Scotland	7	9.755	-29.3%
Greater London	7	8.788	-43.6%

Table 5 – Peak hour vehicular trip rate variation by region (01/A – Food Superstores, Saturday)

Regional Grouping	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
East Anglia	3	190.215	+25.2%
South West	9	182.402	+22.0%
Wales	7	148.896	+4.4%
All North	16	145.470	+2.2%
All Regions	79	142.324	0.0%
All Midlands	10	135.579	-5.0%
South East	15	134.599	-5.7%
All Ireland	5	105.874	-34.4%
Scotland	7	98.821	-44.0%
Greater London	7	95.211	-49.5%

Table 6 – Survey duration vehicular trip rate variation by region (01/A – Food Superstores, Saturday)

Regional Grouping	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Wales	6	1.537	+53.0%
East Anglia	10	1.118	+35.3%
All North	26	1.073	+32.6%
South West	6	1.045	+30.8%
Scotland	9	0.852	+15.1%
South East	30	0.826	+12.5%
All Regions	134	0.723	0.0%
All Ireland	17	0.550	-31.5%
All Midlands	10	0.522	-38.5%
Greater London	20	0.326	-121.8%

Table 7 – Peak half hour vehicular trip rate variation by region (02/A – Offices, Weekday)

Regional Grouping	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Wales	6	15.949	+33.0%
All North	26	15.699	+31.9%
South West	6	15.016	+28.8%
East Anglia	10	11.204	+4.6%
All Regions	134	10.685	0.0%
Scotland	9	10.389	-2.8%
South East	30	10.342	-3.3%
All Ireland	17	8.244	-29.6%
All Midlands	10	7.095	-50.6%
Greater London	20	5.136	-108.0%

Table 8 – Survey duration vehicular trip rate variation by region (02/A – Offices, Weekday)

Regional Grouping	Survey Days	Peak (two-way) Vehicular Trip Rates per 1 dwelling	Variation Percentage
All Ireland	54	0.700	+15.3%
Scotland	14	0.669	+11.4%
All Midlands	28	0.618	+4.0%
Wales	8	0.594	+0.2%
All Regions	202	0.593	0.0%
South West	11	0.573	-3.5%
East Anglia	13	0.570	-4.0%
Greater London	10	0.565	-5.0%
South East	27	0.534	-11.0%
All North	37	0.516	-14.9%

Table 9 – Peak hour vehicular trip rate variation by region (03/A – Houses Privately Owned, Weekday)

Regional Grouping	Survey Days	Total (two-way) Vehicular Trip Rates per 1 dwelling	Variation Percentage
All Ireland	54	8.315	+16.2%
Scotland	14	7.225	+3.6%
All Regions	202	6.968	0.0%
Greater London	10	6.449	-8.0%
South East	27	6.120	-13.9%
East Anglia	13	5.094	-36.8%
All Midlands	28	5.075	-37.3%
South West	11	4.921	-41.6%
Wales	8	4.892	-42.4%
All North	37	4.589	-51.8%

Table 10 – Survey duration vehicular trip rate variation by region (03/A – Houses Privately Owned, Weekday)

4.2. The following two tables show how the various regional groupings rank in terms of total (two-way) vehicular trip rates for peak period and survey duration, when compared with each other by land use category (with 01/A Food Superstores split between Fridays and Saturdays). Note that the "All Regions" category has been included for comparative purposes.

Regional Grouping	01/A Food Superstores (Friday)	01/A Food Superstores (Saturday)	02/A Offices (Weekday)	03/A Houses Privately Owned (Weekday)
All Regions	6th	7th	7th	5th
Greater London	10th	10th	10th	8th
South East	5th	5th	6th	9th
South West	1st	3rd	4th	6th
East Anglia	4th	1st	2nd	7th
All Midlands	8th	6th	9th	3rd
All North	7th	4th	3rd	10th
Wales	3rd	2nd	1st	4th
Scotland	9th	9th	5th	2nd
All Ireland	2nd	8th	8th	1st

Table 11 – Regional groupings ranked by peak period vehicular trip rates (all land use categories)

Regional Grouping	01/A Food Superstores (Friday)	01/A Food Superstores (Saturday)	02/A Offices (Weekday)	03/A Houses Privately Owned (Weekday)
All Regions	4th	5th	5th	3rd
Greater London	10th	10th	10th	4th
South East	3rd	7th	7th	5th
South West	1st	2nd	3rd	8th
East Anglia	5th	1st	4th	6th
All Midlands	8th	6th	9th	7th
All North	6th	4th	2nd	10th
Wales	7th	3rd	1st	9th
Scotland	9th	9th	6th	2nd
All Ireland	2nd	8th	8th	1st

Table 12 – Regional groupings ranked by total survey duration vehicular trip rates (all land use categories)

4.3. The following two tables display the highest, lowest and average percentage variance from the "All Regions" category for each regional grouping, with the percentage figures covering all land use categories analysed. The first table shows the variance for peak period, whilst the second table shows the variance for total survey duration. So, in each case, the highest variation percentage from the various land uses analysed is displayed for each regional grouping, along with the lowest variation percentage.

Regional Grouping	Survey Days	Highest Peak Period Percentage Variation	Lowest Peak Period Percentage Variation	Average Peak Period Percentage Variation
All Regions	474	0.0%	0.0%	0.0%
Greater London	40	-4.7%	-54.9%	-32.6%
South East	80	+14.2%	-9.9%	+1.7%
South West	35	+44.5%	-3.4%	+18.8%
East Anglia	30	+54.6%	-3.9%	+25.7%
All Midlands	59	+4.2%	-27.8%	-6.5%
All North	86	+48.4%	-13.0%	+10.9%
Wales	25	+112.6%	+0.2%	+35.8%
Scotland	34	+17.8%	-22.7%	-3.0%
All Ireland	85	+18.0%	-23.9%	-1.6%

Table 13 – Highest, lowest and average peak period vehicular trip rate variation from the "All Regions" category by regional grouping (all land use categories)

Regional Grouping	Survey Days	Highest Survey Duration Percentage Variation	Lowest Survey Duration Percentage Variation	Average Survey Duration Percentage Variation
All Regions	474	0.0%	0.0%	0.0%
Greater London	40	-7.4%	-51.9%	-34.9%
South East	80	+5.1%	-12.2%	-3.9%
South West	35	+40.5%	-29.4%	+16.8%
East Anglia	30	+33.6%	-26.9%	+2.0%
All Midlands	59	-4.7%	-33.6%	-18.5%
All North	86	+46.9%	-34.1%	+2.5%
Wales	25	+49.3%	-29.8%	+4.8%
Scotland	34	+3.7%	-38.3%	-17.0%
All Ireland	85	+19.3%	-25.6%	-5.4%

Table 14 – Highest, lowest and average survey duration vehicular trip rate variation from the "All Regions" category by regional grouping (all land use categories)

5. Location Vehicular Trip Rate Results

5.1. The second set of results tables cover the vehicular trip rate variation analyses by location type. There are two tables shown for each land use type, with the 01/A (Food Superstore) land use split between Fridays and Saturdays. For each land use type, the first table displays total two-way vehicular trip rates per 100m2 GFA (or per 1 dwelling for the 03/A (Houses Privately Owned) land use category), for the peak hour of activity (or peak half hour for the 02/A (Office) land use category. The second table displays total two-way survey duration vehicular trip rates. In both tables, the percentage of vehicular trip rate variation from the "All Location Types" category (which is set at 0%) is also displayed.

Location Type	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Edge of Town	13	12.542	+7.0%
All Location Types	59	11.661	0.0%
Suburban Area	20	11.510	-1.3%
Town Centre/Edge of Town Centre	26	9.757	-19.5%

Table 15 – Peak hour vehicular trip rate variation by location type (01/A – Food Superstores, Friday)

Location Type	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Edge of Town	13	149.839	+6.6%
Suburban Area	20	141.898	+1.4%
All Location Types	59	139.976	0.0%
Town Centre/Edge of Town Centre	26	102.822	-36.1%

Table 16 – Survey duration vehicular trip rate variation by location type (01/A – Food Superstores, Friday)

Location Type	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Edge of Town	17	13.396	+5.4%
All Location Types	79	12.675	0.0%
Suburban Area	28	12.007	-5.6%
Town Centre/Edge of Town Centre	34	11.802	-7.4%

Table 17 – Peak hour vehicular trip rate variation by location type (01/A – Food Superstores, Saturday)

Location Type	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Edge of Town	17	145.308	+1.8%
All Location Types	79	142.637	0.0%
Suburban Area	28	142.528	-0.1%
Town Centre/Edge of Town Centre	34	120.902	-18.0%

Table 18 – Survey duration vehicular trip rate variation by location type (01/A – Food Superstores, Saturday)

Location Type	Survey Days	Peak (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Edge of Town	73	0.997	+26.4%
All Location Types	130	0.734	0.0%
Suburban Area	29	0.714	-2.8%
Town Centre/Edge of Town Centre	28	0.601	-22.1%

Table 19 – Peak half hour vehicular trip rate variation by location type (02/A – Offices, Weekday)

Location Type	Survey Days	Total (two-way) Vehicular Trip Rates per 100m2 GFA	Variation Percentage
Suburban Area	29	11.813	+8.8%
Edge of Town	73	11.222	+4.0%
All Location Types	130	10.771	0.0%
Town Centre/Edge of Town Centre	28	7.690	-40.1%

Table 20 – Survey duration vehicular trip rate variation by location type (02/A – Offices, Weekday)

Location Type	Survey Days	Peak (two-way) Vehicular Trip Rates per 1 dwelling	Variation Percentage
Edge of Town	21	0.616	+3.4%
All Location Types	192	0.595	0.0%
Suburban Area	81	0.574	-3.7%
Town Centre/Edge of Town Centre	90	0.560	-6.2%

Table 21 – Peak hour vehicular trip rate variation by location type (03/A – Houses Privately Owned, Weekday)

Location Type	Survey Days	Total (two-way) Vehicular Trip Rates per 1 dwelling	Variation Percentage
Edge of Town	21	7.102	+1.8%
All Location Types	192	6.975	0.0%
Town Centre/Edge Of Town Centre	90	5.766	-21.0%
Suburban Area	81	5.010	-39.2%

Table 22 – Survey duration vehicular trip rate variation by location type (03/A – Houses Privately Owned, Weekday)

5.2. The following two tables show how the various location types rank in terms of total (two-way) vehicular trip rates for peak period and survey duration, when compared with each other by land use category (with 01/A Food Superstores split between Fridays and Saturdays). Note that the "All Location Types" category has been included for comparative purposes.

Location Type Grouping	01/A Food Superstores (Friday)	01/A Food Superstores (Saturday)	02/A Offices (Weekday)	03/A Houses Privately Owned (Weekday)
All Location Types	2nd	2nd	2nd	2nd
Town Centre/Edge of Town Centre	4th	4th	4th	4th
Suburban Area	3rd	3rd	3rd	3rd
Edge of Town	1st	1st	1st	1st

Table 23 – Location Type groupings ranked by peak period vehicular trip rates (all land use categories)

Location Type Grouping	01/A Food Superstores (Friday)	01/A Food Superstores (Saturday)	02/A Offices (Weekday)	03/A Houses Privately Owned (Weekday)
All Location Types	3rd	2nd	3rd	2nd
Town Centre/Edge of Town Centre	4th	4th	4th	3rd
Suburban Area	2nd	3rd	1st	4th
Edge of Town	1st	1st	2nd	1st

Table 24 – Location Type groupings ranked by total survey duration vehicular trip rates (all land use categories)

5.3. The following two tables display the highest, lowest and average percentage variance from the "All Location Types" category for each location type grouping, with the percentage figures covering all land use categories analysed. The first table shows the variance for peak period, whilst the second table shows the variance for total survey duration. So, in each case, the highest variation percentage from the various land uses analysed is displayed for each location type grouping, along with the lowest variation percentage.

Location Type Grouping	Survey Days	Highest Peak Period Percentage Variation	Lowest Peak Period Percentage Variation	Average Peak Period Percentage Variation
All Location Types	460	0.0%	0.0%	0.0%
Town Centre/Edge of Town Centre	178	-5.9%	-18.1%	-11.8%
Suburban Area	158	-1.3%	-5.3%	-3.2%
Edge of Town	124	+35.8%	+3.5%	+13.2%

Table 25 – Highest, lowest and average peak period vehicular trip rate variation from the "All Location Types" category by location type grouping (all land use categories)

Location Type Grouping	Survey Days	Highest Survey Duration Percentage Variation	Lowest Survey Duration Percentage Variation	Average Survey Duration Percentage Variation
All Location Types	460	0.0%	0.0%	0.0%
Town Centre/Edge of Town Centre	178	-15.2%	-28.6%	-21.9%
Suburban Area	158	+9.7%	-28.2%	-4.3%
Edge of Town	124	+7.0%	+1.8%	+3.7%

Table 26 – Highest, lowest and average survey duration vehicular trip rate variation from the "All Location Types" category by location type grouping (all land use categories)

6. Conclusions

6.1. The findings of the regional analysis are presented first, followed by the findings of the location type analysis. This is then followed by a comparison between the two sets of analyses, and the advice of TRICS Consortium Limited with regards to the vehicular trip rate calculation selection process and the TRICS Good Practice Guide.

6.2. For the land use categories analysed, there is no clear, consistent pattern of vehicular trip rate variation by region evident, with variation appearing to fluctuate randomly throughout the analysis. Table 12 illustrates this quite clearly. If there had been a clear basis for overall vehicular trip rate variation by region alone, then we would have seen certain regions ranking consistently lower or higher than others, but this is not evident from the land uses analysed in this study. The rankings by regional category vary greatly by land use type without any distinct, consistent patterns emerging. This leads us to conclude that a considerable number of other factors are influencing vehicular trip generation to a significantly greater degree than region alone.

6.3. For example, we can look at the Greater London region to illustrate this. Greater London is shown in Table 12 as ranking 10th out of 10 for the Food Superstore and Office land use categories, but ranking 4th out of 10 for the Houses Privately Owned category. This is a clear example of the inconsistency in vehicular trip rate generation when compared directly by region. The fact that the Greater London region ranks relatively highly for one land use category when compared to the other two categories illustrates the need for users to take care when using the vehicular trip rate calculation filtering process in TRICS, to ensure that more localised factors are taken in to account when considering filtering criteria. If the Greater London region had ranked lowest for all three of the land use categories analysed, then there may have been the justification for us to state that Greater London displays consistently lower vehicular trip rates than other regions, but this cannot be stated because of the results of the Houses Privately Owned category. We can only conclude that the particular results of this study, covering three of the main TRICS land use categories, show inconsistent regional fluctuations, with no emerging pattern of clear and obvious regional variation emerging.

6.4. We can of course look at individual results within the greater analysis to see countless examples of varying fluctuation by region, but without any clear consistency throughout the analysis, no conclusions can be drawn from these, other than recognising that there must be many factors outside of this analysis that are influencing vehicular trip generation in each individual set of calculations.

6.5. When we look at vehicular trip rate variation by TRICS location type, it does appear overall that there is a structured and consistent variation in vehicle trips. Table 24 illustrates this quite clearly. It is logical to think that the level of vehicle trips to and from developments would decrease as we move from the edge of a town/city towards its built-up centre, with greater provision for vehicular accessibility tending to be further out from a town/city centre core, and likewise a greater opportunity for non-vehicular forms of transport in town/city centres. The results shown in Table 24 reaffirm this logic. The ranked comparison of TRICS location types shows the Edge of Town category ranking mostly at the top in terms of vehicular trip rates, with the Town Centre/Edge of Town Centre category ranking mostly at the bottom. This suggests that, although there are of course a number of factors that can influence vehicular trip generation, TRICS location type is certainly an important one of these.

6.6. When we look at the results of the Suburban Area location type in Table 24, the variability of this location type as described earlier in this report is clearly displayed. Whilst the other location types show more relative consistency in their comparative rankings, we see significant fluctuations for the Suburban Area category. It ranks 2nd out of 4 for Food Superstores on a Friday, 3rd out of 4 for Food Superstores on a Saturday, 1st out of 4 for Offices, and 4th out of 4 for Houses Privately Owned. As described earlier, the definition of Suburban Area in TRICS is quite broad. A development within this location category could be situated just outside the edge of a town/city centre, or almost at the edge of one. It is the broadest location type in terms of its definition, and regularly covers the majority of a town/city's total area. It is therefore no surprise that this is the category showing the most fluctuation in vehicular trip rates. It should be noted that the Suburban Area data used in this analysis was not filtered in any way, so the whole broad range of Suburban Area developments were included together, with survey samples of course varying throughout the analysis.

6.7. Again, we can look at individual sets of calculations within the location type section of this study and see fluctuations in the results, but there appears to be a clear overall correlation between TRICS location type and vehicular trip rate generation when we look at the comparative rankings. The other factors outside of this study that influence trip rates are still there of course, but the evidence from this study is that location type is firmly one of the main influencing factors given the relative consistency in the results in this set of analyses.

6.8. So, we can directly compare the results of the two sets of analyses, vehicular trip rate variation by region and by location type. It is clear from this study that there is a significantly higher correlation between location type and vehicular trip rates than there is between region and vehicular trip rates, with location type clearly showing a greater level of consistency and a clear, emerging pattern, compared to the apparent randomness of fluctuations when vehicular trip rates are split by region. We can conclude from this that region alone is not a significant influencing factor in vehicular trip generation, whilst location type clearly appears to be a greater influence (along with a number of other factors outside of this study that should always be taken into consideration).

6.9. These results provide us with a much greater level of clarity than we had before the study was undertaken. The question asked was 'Does regional selection in the TRICS trip rate calculation filtering process influence vehicular trip generation, when compared to location type selection?'. We can conclude from this study that regional selection should not be the major consideration when applying trip rate calculation filtering criteria, whilst TRICS location type appears to be one of the most influential factors in terms of vehicular trip generation, and therefore should be one of the main filtering considerations.

6.10. This study reaffirms our existing TRICS Good Practice Guidance in the area of regional vehicular trip rate variation. Before we undertook this analysis, TRICS Consortium Limited was of the opinion that factors other than region had the most influence on vehicular trip rate variation, and this has in the past been indicated by the range of vehicular trip rates that can be obtained within individual trip rate calculations, the study of rank order scatterplots and other features within the TRICS system, and of course the experience of the TRICS team. We have now undertaken and published for the first time a detailed vehicular analysis of key land use categories within the TRICS database, which has concluded that TRICS location type, when compared to regional selection, provides a much greater and consistent influence on vehicular trip rate variation. The 2020 TRICS Good Practice Guide shall reference this report accordingly.

APPENDIX A

The vehicular trip rate calculation results by region are shown in the following tables. For the 01/A (Food Superstore) and 02/A (Office) land use sub-categories, vehicular trip rates are displayed per 100m2 of Gross Floor Area (GFA), whilst for the 03/A (Houses Privately Owned) category, vehicular trip rates are displayed per 1 dwelling. The peak period vehicular trip rates represent the average peak period per calculation, whilst the total vehicular trip rates represent the total survey duration per calculation.

01/A: Food Superstores (Friday) – Vehicular Trip Rates							
Region	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Regions	59	5.954	6.319	12.273	73.622	73.316	146.938
1 Greater London	3	3.607	3.692	7.299	38.883	38.774	77.657
2 South East	8	6.142	6.271	12.325	77.393	77.077	154.470
3 South West	9	7.194	7.490	14.629	94.147	93.594	187.741
4 East Anglia	4	6.329	6.715	13.044	70.559	70.913	141.472
5 East Midlands	8	6.077	6.258	12.098	70.818	71.269	142.087
6 West Midlands	3	5.014	5.397	10.411	53.121	53.010	106.131
7 Yorkshire & North Lincs	1	6.629	6.843	12.985	74.486	73.886	148.372
8 North West	2	6.156	5.830	11.884	56.873	57.921	114.794
9 North	4	6.488	6.866	13.354	73.700	73.412	147.112
10 Wales	4	6.870	7.005	13.875	69.906	69.573	139.479
11 Scotland	4	4.762	5.044	9.806	45.334	45.318	90.652
12 Greater Dublin	1	8.332	7.268	15.600	55.658	55.473	111.131
13 Connaught	1	3.614	3.386	7.000	35.526	35.629	71.155
14 Munster	1	8.783	8.783	17.305	86.087	85.914	172.001
15 Leinster	0	-	-	-	-	-	-
16 Ulster (Ireland)	0	-	-	-	-	-	-
17 Ulster (Northern Ireland)	6	9.583	9.940	18.978	101.202	100.649	201.851
5-6 All Midlands	11	5.747	5.995	11.736	67.116	67.545	134.661
7-9 All North	7	6.041	6.330	12.266	70.019	69.839	139.858
12-17 All Ireland	9	7.353	7.379	14.056	79.105	78.617	157.722

Table 27 – TRICS vehicular trip rate calculations by region for 01/A Food Superstores (Fridays)

01/A: Food Superstores (Saturday) – Vehicular Trip Rates							
Region	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Regions	79	6.446	6.368	12.617	71.583	70.741	142.324
1 Greater London	7	4.414	4.522	8.788	47.726	47.485	95.211
2 South East	15	6.511	6.464	12.886	67.525	67.074	134.599
3 South West	9	7.389	7.397	14.486	92.520	89.882	182.402
4 East Anglia	3	9.215	9.620	18.391	94.804	95.411	190.215
5 East Midlands	8	7.052	7.002	13.864	70.670	70.772	141.442
6 West Midlands	2	5.272	5.309	10.574	54.419	54.435	108.854
7 Yorkshire & North Lincs	6	7.339	7.585	14.633	75.931	75.915	151.846
8 North West	4	6.593	7.768	14.304	66.504	68.547	135.051
9 North	6	6.522	6.852	13.254	69.166	70.267	139.433
10 Wales	7	7.453	7.435	14.804	74.409	74.487	148.896
11 Scotland	7	5.014	5.108	9.755	49.280	49.541	98.821
12 Greater Dublin	0	-	-	-	-	-	-
13 Connaught	0	-	-	-	-	-	-
14 Munster	0	-	-	-	-	-	-
15 Leinster	0	-	-	-	-	-	-
16 Ulster (Ireland)	1	4.240	4.560	8.520	43.200	43.120	86.320
17 Ulster (Northern Ireland)	4	5.824	5.750	11.525	54.845	55.217	110.062
5-6 All Midlands	10	6.630	6.558	12.878	67.757	67.822	135.579
7-9 All North	16	6.840	6.983	13.647	72.428	73.042	145.470
12-17 All Ireland	5	5.456	5.278	10.730	52.771	53.103	105.874

Table 28 – TRICS vehicular trip rate calculations by region for 01/A Food Superstores (Saturdays)

02/A: Offices (Weekday) – Vehicular Trip Rates							
Region	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Regions	134	0.637	0.618	0.723	5.410	5.275	10.685
1 Greater London	20	0.283	0.293	0.326	2.609	2.527	5.136
2 South East	30	0.762	0.732	0.826	4.962	5.380	10.342
3 South West	6	0.858	0.908	1.045	7.600	7.416	15.016
4 East Anglia	10	1.017	0.964	1.118	5.633	5.571	11.204
5 East Midlands	3	0.733	0.726	0.925	8.346	8.127	16.473
6 West Midlands	7	0.388	0.398	0.424	2.252	2.230	4.482
7 Yorkshire & North Lincs	4	1.640	1.197	1.876	10.701	9.318	20.019
8 North West	8	0.672	0.594	0.734	4.947	4.658	9.605
9 North	14	0.838	0.772	1.073	8.678	8.227	16.905
10 Wales	6	1.307	1.224	1.537	8.420	7.529	15.949
11 Scotland	9	0.721	0.658	0.852	5.198	5.191	10.389
12 Greater Dublin	3	0.544	0.420	0.907	5.077	5.021	10.098
13 Connaught	1	0.767	0.674	0.814	4.304	4.280	8.584
14 Munster	1	0.703	0.554	0.883	5.119	5.111	10.230
15 Leinster	5	0.243	0.262	0.312	1.896	1.713	3.609
16 Ulster Ireland	4	1.034	1.083	1.924	11.790	11.678	23.468
17 Ulster Northern Ireland	3	0.818	0.791	0.858	4.923	4.969	9.892
5-6 All Midlands	10	0.443	0.470	0.522	3.593	3.502	7.095
7-9 All North	26	0.838	0.728	1.073	8.143	7.556	15.699
12-17 All Ireland	17	0.490	0.480	0.550	4.159	4.085	8.244

Table 29 – TRICS vehicular trip rate calculations by region for 02/A Offices (Weekdays)

03/A: Houses Privately Owned (Weekday) – Vehicular Trip Rates							
Region	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Regions	202	0.381	0.418	0.593	3.491	3.477	6.968
1 Greater London	10	0.320	0.333	0.565	3.258	3.191	6.449
2 South East	27	0.358	0.403	0.534	3.068	3.052	6.120
3 South West	11	0.384	0.335	0.573	2.429	2.492	4.921
4 East Anglia	13	0.331	0.399	0.570	2.503	2.591	5.094
5 East Midlands	7	0.412	0.373	0.692	2.659	2.778	5.437
6 West Midlands	21	0.383	0.420	0.599	2.446	2.536	4.982
7 Yorkshire & North Lincs	13	0.263	0.349	0.456	1.895	2.009	3.904
8 North West	15	0.360	0.369	0.586	2.472	2.599	5.071
9 North	9	0.342	0.375	0.519	2.277	2.315	4.592
10 Wales	8	0.404	0.438	0.594	2.448	2.444	4.892
11 Scotland	14	0.435	0.446	0.669	3.571	3.654	7.225
12 Greater Dublin	15	0.432	0.450	0.705	2.708	2.885	5.593
13 Connaught	3	0.410	0.503	0.679	2.991	3.153	6.144
14 Munster	6	0.487	0.483	0.840	3.785	3.857	7.642
15 Leinster	7	0.312	0.442	0.564	2.241	2.458	4.699
16 Ulster (Ireland)	6	0.380	0.464	0.658	3.005	3.143	6.148
17 Ulster (Northern Ireland)	17	0.517	0.510	0.806	4.383	4.393	8.776
5-6 All Midlands	28	0.389	0.410	0.618	2.490	2.585	5.075
7-9 All North	37	0.324	0.364	0.516	2.242	2.347	4.589
12-17 All Ireland	54	0.440	0.482	0.700	4.152	4.163	8.315

Table 30 – TRICS vehicular trip rate calculations by region for 03/A Houses Privately Owned (Weekdays)

APPENDIX B

The vehicular trip rate calculation results by location type are shown in the following tables. For the 01/A (Food Superstore) and 02/A (Office) land use sub-categories, vehicular trip rates are displayed per 100m2 of Gross Floor Area (GFA), whilst for the 03/A (Houses Privately Owned) category, vehicular trip rates are displayed per 1 dwelling. The peak period vehicular trip rates represent the average peak period per calculation, whilst the total vehicular trip rates represent the total survey duration per calculation.

01/A: Food Superstores (Friday) – Vehicular Trip Rates							
Location Type	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Locations	59	5.654	6.007	11.661	70.150	69.826	139.976
1 Town Centre/Edge of Town Centre	26	4.737	5.173	9.757	51.497	51.325	102.822
2 Suburban Area	20	5.838	5.943	11.510	71.275	70.623	141.898
3 Edge of Town	13	6.151	6.391	12.542	74.761	75.078	149.839

Table 31 – TRICS vehicular trip rate calculations by location type for 01/A Food Superstores (Fridays)

01/A: Food Superstores (Saturday) – Vehicular Trip Rates							
Location Type	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Locations	79	6.469	6.396	12.675	71.734	70.903	142.637
1 Town Centre/Edge of Town Centre	34	6.067	6.009	11.802	60.280	60.622	120.902
2 Suburban Area	28	6.118	6.055	12.007	72.191	70.337	142.528
3 Edge of Town	17	6.844	6.745	13.396	72.596	72.712	145.308

Table 32 – TRICS vehicular trip rate calculations by location type for 01/A Food Superstores (Saturdays)

02/A: Offices (Weekday) – Vehicular Trip Rates							
Location Type	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Locations	130	0.647	0.626	0.734	5.449	5.322	10.771
1 Town Centre/Edge of Town Centre	28	0.523	0.517	0.601	3.928	3.762	7.690
2 Suburban Area	29	0.616	0.604	0.714	6.042	5.771	11.813
3 Edge of Town	73	0.910	0.851	0.997	5.376	5.846	11.222

Table 33 – TRICS vehicular trip rate calculations by location type for 02/A Offices (Weekdays)

03/A: Houses Privately Owned (Weekday) – Vehicular Trip Rates							
Location Type	Survey Days	Peak Arr	Peak Dep	Peak Total	Total Arr	Total Dep	Total Totals
0 All Locations	192	0.385	0.422	0.595	3.501	3.474	6.975
1 Town Centre/Edge of Town Centre	90	0.320	0.363	0.560	2.968	2.798	5.766
2 Suburban Area	81	0.367	0.405	0.574	2.444	2.566	5.010
3 Edge of Town	21	0.403	0.437	0.616	3.565	3.537	7.102

Table 34 – TRICS vehicular trip rate calculations by location type for 03/A Houses Privately Owned (Weekdays)