TRICS Guidance Note on Changes in Travel Behaviour August 2019

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PROJECT			
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1 Introduction

General

Recognising Change in Travel Behaviour

1.1 TRICS Consortium Limited (TRICS) is responding to the fact that the world is experiencing significant change in relation to social, technological, economic and environmental drivers which in turn is creating new dynamics in travel behaviour and challenges for transport planning. In the face of deep uncertainty, the "predict and provide" paradigm that has framed transport planning processes is to give way to "decide and provide" paradigm – decide on the preferred future and provide the means to work towards that which can accommodate uncertainty.

1.2 It is fundamental that TRICS, as a spatial planning tool, provides direction to support the "decide and provide" approach and managing uncertainty in forecasting and trip generation analysis.

1.3 TRICS is therefore seeking to gather together the evidence of change and consider in what ways the use of TRICS may be developed to consider the impact of changes in travel behaviour.

1.4 BasfordPowers (BP) in conjunction with ITS Leeds (Professor Greg Marsden) and UWE (Professor Glenn Lyons) has been commissioned to produce a TRICS Guidance Note concerning Change in Travel Behaviour. It is proposed that this Guidance Note informs TRICS users of the changes in travel behaviour and discusses the implications of travel trends for TRICS users. Further research maybe required to understand the implications of the evidence concerning trip rate reductions which have been cited in the All Change Commission on Travel Demand report on the use of TRICS data and analysis. Future traffic forecasts included in the Department for Transport Road Traffic Forecasts 18 may also have implications for the use of TRICS which also needs to be understood.

Report Scope

1.5 The scope of this note is to inform TRICS users of the changes in travel behaviour, to set out the potential implications for the use of TRICS and ask key questions regarding these implications. This note will include the following information:

- Trend analysis distilled from the All Change Report Commission on Travel Demand May 2018 covering travel demand, demographical changes that impact on travel choices (including aging population).
- Scenario analysis drawing on the Department for Transport Road (DfT) Traffic Forecast 18 and CIHT FUTURES.
- TRICS trend analysis of historic trip rates for the three main land-uses of Food Retail, Offices and Houses Privately Owned.

1.6 In addition to the above, the note sets out ten discussion points that have been used to shape a debate on the matter of Change in Behaviours and TRICS at the TRICS User Group Meeting on 25 June 2019

Report Structure

1.7 Following this brief introductory section, the Guidance note is structured as shown below. All supporting appendices (A to INSERT) are included at the end of the Guidance Note.

- Section 2 includes how the demand for travel has changed and why it is important to recognise this issue in planning for new developments, including the evidence base. This section includes TRICS trends analysis.
- Section 3 sets out the ”decide and provide “ that moves from demand led supply to supply led demand by adopting vision led process that accommodates uncertainty.
- Section 4: sets out decide and provide approaches and illustrates this through a case study for new development and poses the question of how we can support decision makers in this new process.
- Section 5: poses Key Questions for TRICS Users
- Section 6: conclusions of the Guidance Note and provides a summary.

1.8 Section 2, which follows, analyses how the demand for travel has changed and why it is important to act on this information in planning new developments.

2 How the demand for travel has changed.

The evidence.

2.1 Understanding future demand for road travel is essential in assessing transport impacts of new developments and the potential investments that will need to be made. However, forecasting future demand is complex and there is significant uncertainty about the extent to which existing trends and relationships will carry on into the future. We need to ensure that we understand and communicate this uncertainty in line with the latest transport and societal trends.

2.2 It is important that transport practitioners are cognisant of these trends and changes in travel behaviour so that their assumptions concerning travel demand, which are then carried through in transport assessments, are appropriate and relevant to the site that they are assessing.

2.3 This section of the report provides a synopsis of a number of key documents that demonstrate a change in travel behaviour over time.

All Change? The future of travel demand and the implications for policy and planning **The Commission on Travel Demand in May 2018**

2.4 The First Report of the Commission on Travel Demand entitled *All Change? The future of travel demand and the implications for policy and planning* ("*All Change*") was published in May 2018. This report, developed through a twelve-month long evidence gathering process from across the UK and internationally, offers a positive perspective on the future of travel demand.

2.5 It demonstrates that the evidence of previous transport planning based on growing car ownership and use is now limited, and sometimes wrong. This is also recognised in the Department for Transport Road Traffic Forecast Report - RTF18 (July 2018).

2.6 Evidence in *All Change* shows that we make 16% fewer trips than in 1996, travel 10% fewer miles than in 2002 and spend 22 hours less time travelling per annum than we did in 2008. This was not expected and is down to societal shifts in activities of how we work and shop; changing demographics; shifts in income across the population; as well as increased urbanisation. All of these changes are underpinned by and connected to the rise in internet and communication technologies (the digital age has collided, and is merging with and disrupting the motor age)[1]

2.7 *All Change* states that European cities are rethinking the roles of vehicles in the context of the changes outlined above, and it is notable that the recent London Mayoral Transport Strategy does the same along with the Greater Manchester 2040 Strategy. It remarks that future demand policies should be led by asking "what sort of places do we want to live in, what kind of activities do we need to travel for and what actions need to be taken"? By planning differently new, lower and more sustainable levels of travel demand than have previously been observed are being created. These questions need to be asked in the planning of any new development.

2.8 *All Change* identifies a number of[2] trends that should be taken into account in development planning. These are as follows:

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[1] [1] Lyons, G. (2015). Transport's Digital Age Transition. Journal of Transport and Land Use, 8(2), 1-19. DOI: http://dx.doi.org/10.5198/jtlu.v0i0.751

[2]

1. **Retail**: Online shopping is growing at around 10-12% per annum and now represents 17% of total UK retail sales. There has been a 25% decrease in physical shopping trips over the past two decades and 16% decline in distance travelled.

2. **Travelling less**: As highlighted in paragraph 2.6 above, there is now evidence going back 25 years that we are travelling less today than has been done previously. 16% fewer trips are made now than in 1996. Motorised trips have declined by 14% per year than in 2002. Person miles are 10% less than in 2002 and people are spending 22 hours less time travelling per annum than in 2005, and less than at the start of the 1990s.

3. **Travel to work**: The DfT's substantive review of travel to work trends in 2017 revealed that there has been a substantial decrease in commuting trips between 1988/92 and 2013/2014, from 7.1 journeys per worker per week down to 5.7 journeys. The distance travelled to work has increased by 10% and the number of people in work has never been higher. The net effect of this, despite economic growth and population growth, is a decline in annual commuting trips from 8.5 billion to 7.9 billion. Work patterns are changing and need to be reflected in the planning process, for example, working from home is growing on both an occasional and usual basis, and there is a growth in the number of workers who do not have a fixed usual place of work.

4. **Age and gender differences**: . *All Change* accessed data from ONS and NIC that revealed net international migration accounts for more than half of the change in total population. This migration compensates for dips in birth rates as people are living longer and so the majority of forecast population growth is from ageing. Over 65s are using their cars more than previous older cohorts but have different trip patterns from those who work which will affect peak hour trip rates. The gender gap in how much people are travelling has closed and, most significantly, younger people are far less likely to have a driving license and subsequently drive less than previous generations[3]. Over a 20 year period the proportion of 17 -20 year olds holding a driving license has dropped from nearly one half to less than a third. It is important not to assume that future generations will follow the same patterns of previous generations as they age. Younger generations are travelling 20% less (17-34 years) and 35-64 year olds are travelling 10% less. Recent policy research published in January 2019 further amplifies this point.[4] In contrast miles driven per capita for over 65 year olds has increased in all areas of the country by around 12% over the decade to 2014. In rural areas this is higher whilst the numbers are lower for London and core cities.

5. **Socio-economic conditions affecting travel choices**: A decline in home ownership, a rise in lower paid, less secure jobs and a decline in disposable income all affect travel and housing choices. Social interactions, substituting face to face interactions with digital communications, all affect trip making. The long-term implications of these changes are not fully known, but it is difficult to imagine a return to previous levels of car use for younger people. Their economic and social circumstances have changed and so their expectations of transport and patterns of living have evolved.

6. **Geographical differences**: Shire towns, resorts and rural areas still show the highest mileage and more limited reductions than urban areas, where densities are higher and travel choices are more prevalent. Should higher densities and travel choices be provided then further reductions in travel may occur. Longer-distance travel has increased, with Highways England (HE) believing that the majority of trips on its network are longer distance. However, analytical tools do not currently serve

[3] Chatterjee, K. et al. (2018). Young People's Travel – What's Changed and Why? Review and Analysis. Report to Department for Transport. UWE Bristol, UK. http://eprints.uwe.ac.uk/34640/

[4] Why are younger people travelling less by car? What follows? Radical Transport Policy Two-Pager #4, Lynn Sloman et al, January 2019, Transport for Quality of Life. https://www.transportforqualityoflife.com/

to understand this phenomenon in depth and it is acknowledged by HE that further work is required in this area. HE is therefore developing its analytical capabilities in this area.

7. **Changing transport technologies:** The electrification of the fleet, increasingly connected and autonomous vehicles and shared mobility will all influence travel patterns. The extent of this is currently unknown and the DfT recognise this in its RTF18 report. Reductions in travel costs per mile will influence travel behaviour and have the propensity to increase vehicle miles. Therefore, the take-up of these technologies could impact on capacity on the road network both positively and negatively. This has to be considered very carefully in the planning of future developments. There are no 'right' answers and historic evidence will provide only limited insight.

8. **Cycling and walking**: The number of miles cycled in 2016, 3.5 billion, is around 23% above the figure ten years before, and 6.3% more than the miles cycled in 2015. The figure for 2016 is about the same as in 2014, which was the highest since 1987. According to the NTS data, walking trips under 1 mile have gone up 23% between 2005 and 2017.[5] The Government continues to invest in active travel modes and wishes to see an ongoing increase in cycling and walking activity.

9. **Rail travel**: There has been an increase in rail trips by 56% and a 23% increase in the distance travelled by rail which continued through the recession period. London Underground saw the first decline in passenger numbers in 2017 of 2%. Rail patronage is also showing signs of slowing in other parts of the country. Area or corridor specific understanding of the changing role of rail is required.[6]

National Travel Survey Report 2016

2.9 Other evidence of changes in travel behaviour can be found in report of The National Travel Survey (NTS) 2016.

2.10 The total distance travelled per person per year has fallen by 9% between 2007 and 2016. Distance by all motorised private transport has fallen by about 13% since 2003, and as a car driver by about 10% since 2007. Miles travelled by surface rail have almost doubled since 1985. Charts two and three over leaf illustrate this activity. (Source: National Travel Survey 2016).

2.11 The NTS 2016 results shows that almost all the change in the total number of trips since 1985 has occurred because of changes in the number of trips shorter than 1 mile. These trips reduced from 335 per person per year in 1985 to 173 in 2015. The numbers of trips of 1 to under 2 miles and 2 to under 5 miles fluctuated but have not changed substantially over the whole period. The number of longer trips increased slightly for about 15 years after 1985, since when they have changed little. It is interesting to note what types of trips are affected by this change. This is shown in Chart 8 in the NTS 16 Report.

2.12 As discussed in paragraph 8 above there has been an increase in walking trips under one mile. It is not yet clear why there has been this significant change in walk trips. It could be that for certain trips that people are making to more local destinations, they are choosing to walk.

[5] Lyons, G. (2019). Walking as a Service – does it have legs? Proc. 51st Universities Transport Study Group Annual Conference, Leeds, 8-10 July

[6] Williams, I. and Jahanshahi, J. (2018) Wider Factors affecting the long-term growth in Rail Travel, Independent Transport Commission, http://www.theitc.org.uk/wp-content/uploads/2017/05/ITC-Report-Rail-Passenger-Demand-November-2018.pdf

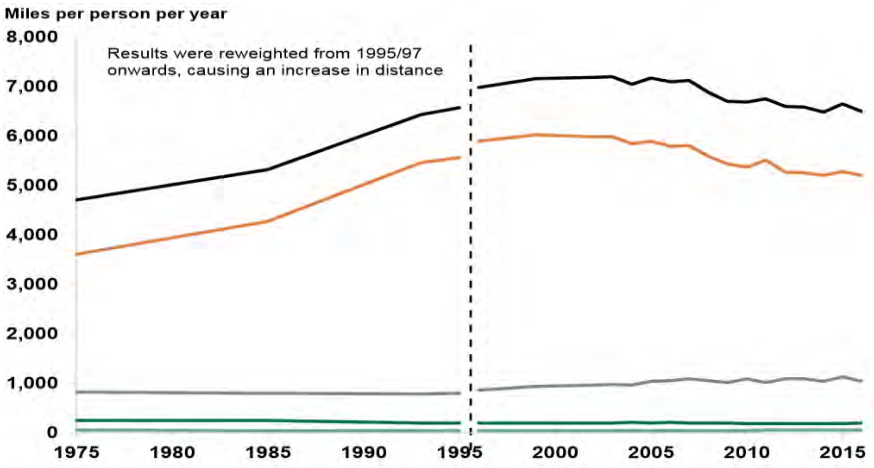


Chart 2: Miles per person per year by modes: 1975-2016

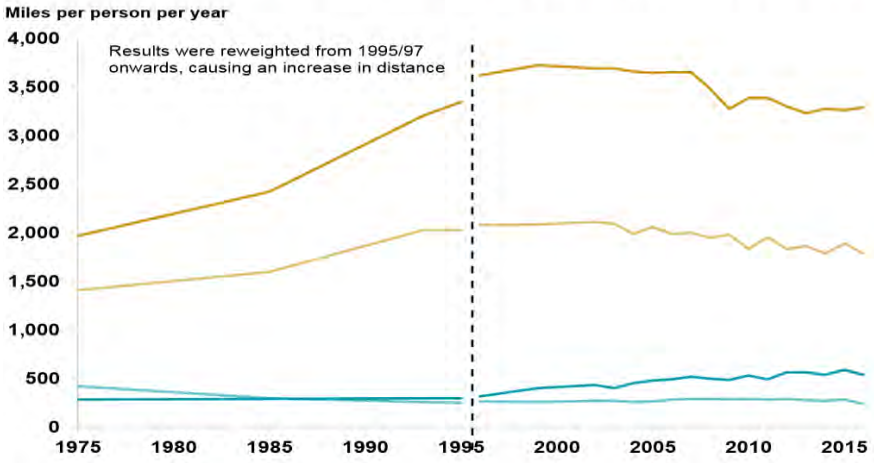


Chart 3: Miles per person per year for selected modes: 1975-2016

Road Traffic Forecasts 2018 Department for Transport

2.13 Road Traffic Forecasts 2018 (RTF18) produced by the Department for Transport (DfT) in July 2018 present the latest forecasts for traffic demand, congestion and emissions in England and Wales up to the year 2050. These are produced using the Department for Transport's National Transport Model (NTM).

2.14 This report sets out a significant change in direction by the DfT in forecasting as the DfT has used scenario planning to:

"to construct a number of different plausible future outcomes. This provides a strategic view of key uncertainties that might impact on future road traffic and supports the design of strategies and policies that are resilient to these uncertainties."

2.15 The DfT has recognised that there is significant uncertainty about the extent to which existing trends and relationships will carry on into the future. They comment that there is a need to ensure that this uncertainty is communicated in the appraisal process.

2.16 Most significantly DfT state:

2.17 "These forecasts are not definitive predictions about the future, or desired futures, but show how demand for road travel may evolve assuming no change in government policy beyond that already announced. These forecasts have been produced using a broad range of research, evidence and data focusing on:

- *Our understanding of how people make travel choices*
- *The possible paths of key drivers of travel demand."*

2.18 The range of scenarios that DfT has developed are set out below.

Scenario	Assumptions
1 (Reference)	NTEM7.2 (incl. constant trip rates) Updated central forecasts for GDP (OBR) BEIS Central Forecasts for Fuel Central projection for Population (ONS) WebTAG Value of Time 25% of car and LGV mileage powered by zero emission technologies by 2050
2 (High GDP, Low Fuel)	High GDP Growth (+0.5pp Growth on OBR) Low Fuel Cost Projection (Fossil Fuel Price Assumptions 2017, BEIS)
3 (Low GDP, High Fuel)	Low GDP Growth (-0.5pp Growth on OBR) High Fuel Cost Projection (Fossil Fuel Price Assumptions 2017, BEIS)
4 (High Migration)	High Migration population variant (ONS) No Relationship between Income and Car Ownership in London High LGV Growth High HGV Growth
5 (Low Migration)	Low Migration population variant (ONS) Low LGV Growth Low HGV Growth
6 (Extrapolated Trip Rates)	Extrapolation of recent trip rate trends until 2050 Extrapolation of recent decreases in young person licence holding
7 (Shift to ZEVs)	97% of car and LGV mileage powered by zero emission technologies by 2050 (Assumes all car and LGVs sold are zero emission by 2040)

2.19 The 2018 road traffic forecasts exercise builds upon that in 2015 which also – and significantly – for the first time moved away from referring to a central (most likely) projection, bounded by sensitivity tested uncertainty. At present, in scheme appraisal, official guidance[7]still points to a core scenario as "the best basis for decision making given current evidence". However, in its new Appraisal and Modelling Strategy, DfT has prioritised a need to further address uncertainty, with plans for an uncertainty toolkit. Transport planning guidance and practice is not standing still – there are new dynamics here just as there are in travel itself.

Extrapolated Trip Rates (scenario 6) recognises the uncertainty in future trip rates and extrapolates this recent trend (2011 to 2016) in trip rates to 2050 to understand how this might impact on traffic growth. This scenario cites the evidence from the National Travel Survey (NTS) that demonstrates trip rates have been declining over the last 20 years, with a reduction in trip rates of 13% since 2002 as shown in Figure 15 Trips per Person – Index taken from RTF18.

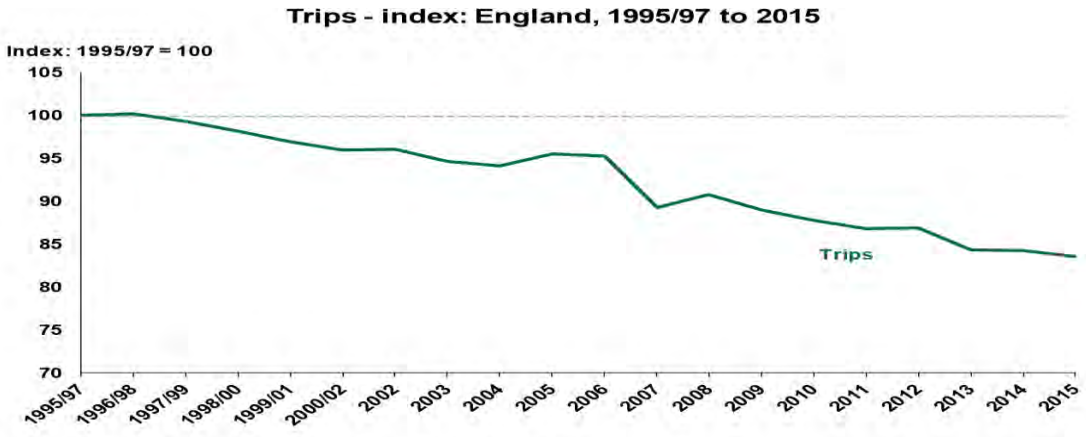
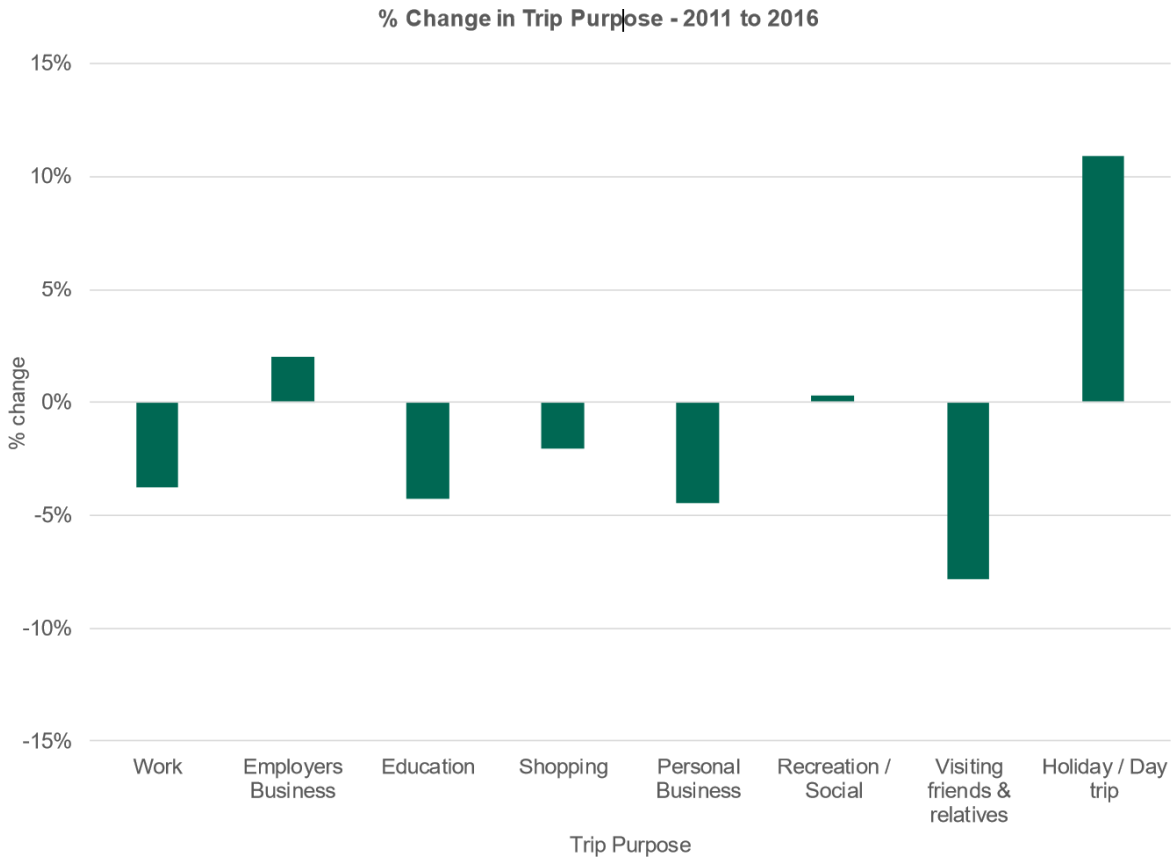


Figure 15: Trips per Person – index[33]

[7] TAG UNIT M4 Forecasting and Uncertainty May 2018 Department for Transport Transport Analysis Guidance (TAG) https://www.gov.uk/transport-analysis-guidance-webtag

2.20 Scenario 6 captures uncertainty around socio economic trends, for example in both trip rates and licence holding in young people. This scenario assumes that young people reduce their licence holding acquisition compared to current levels and have extrapolated this trend in young people's licence holding up until 2050.

2.21 Changes in trip purpose are also cited. This is shown in the figure below taken from RTF Figure 16: Trips by purpose percentage change between 2011 and 2016 (NTEM)



2.22 DfT does recognise that there is uncertainty in this scenario and has advocated that they will:

"continue to monitor the evidence on trip rates in the coming years and monitor the developments of the National Travel Survey aimed at improving the method of collection of data on walking trips, which are believed to be underrepresented."

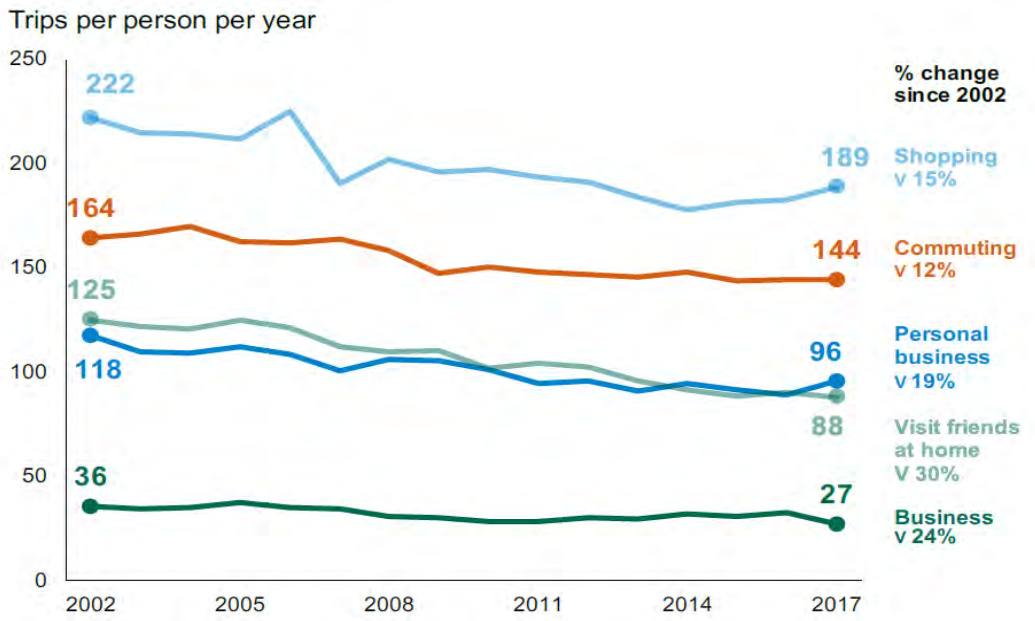
2.23 Having considered the evidence in *All Change*, NTS16 and RTF18 TRICS has carried out its own trend analysis to see if these changes in travel behaviour are reflected in the substantial data sets that are held by TRICS for land use classes – residential, retail and office.

TRICS Trend Analysis May 2019

Introduction

What does the NTS tell us?

2.24 Before exploring what the TRICS data tells us, it is important to look at what the NTS says about trip rate change over time. The results of the 2017 NTS time series analysis are shown below. These show a reduction in commuting (12%), shopping (15%) and all trips (9%) since 2002.



What does the TRICS analysis show?

Vehicle Trips

2.25 In May 2019 TRICs undertook a historical analysis of the TRICS Database to see how vehicular (car) Trip Rates have changed over time. Due to the fact that there was a need to have a large number of survey days across the whole 30 year period it was decided to initially concentrate on 01/A – Food Superstores, 02/A – Offices & 03/A – Residential Private Dwellings. It was decided to split the 30 years' worth of data into six year groups, those being 1989-1993, 1994-1998, 1999-2003, 2004-2008, 2009-2013 and 2014-2018.

2.26 In order to achieve a good sample size, location types of Edge of Town Centre, Suburban Area and Edge of Town were combined.

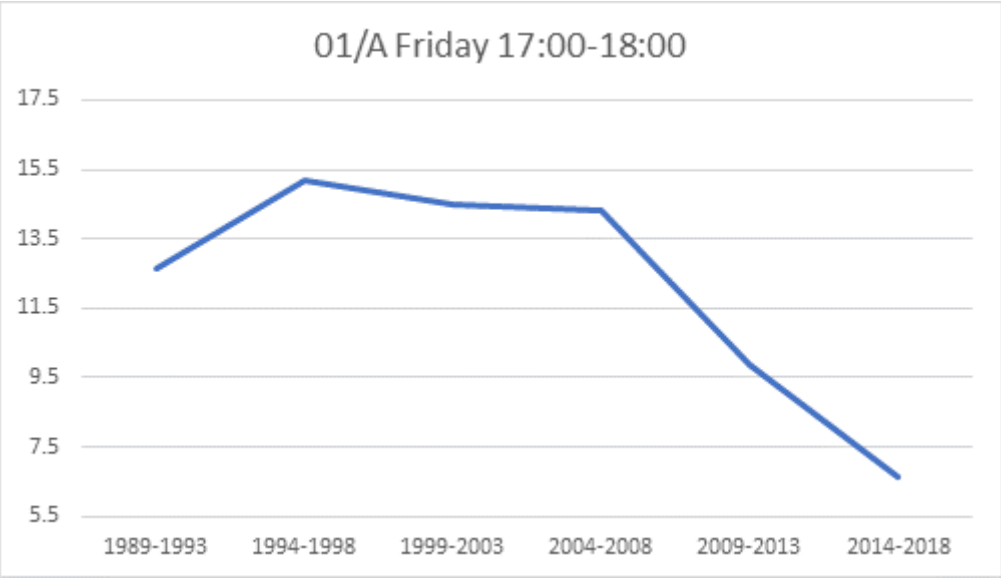
2.27 The days considered for the analysis were Food Superstores Friday and Saturday, Offices Weekday and Residential Weekday. These selected days were then analysed to cover the AM and PM Peaks as well as the complete 12 hour period, the only exception from this 2 period analysis was that of the Food Superstore on the Saturday, where only a mid-morning peak was considered as well as the whole day.

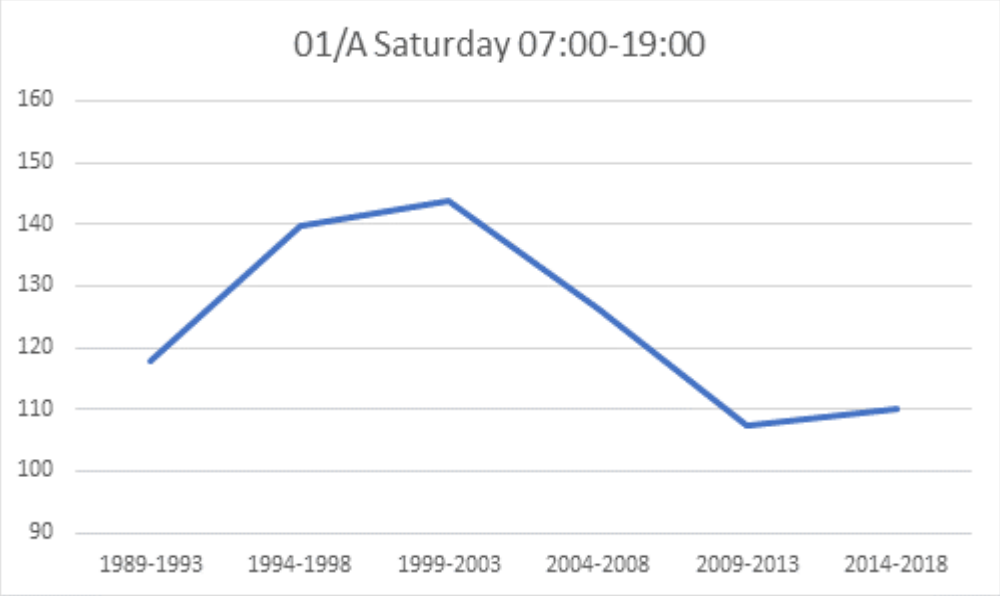
2.28 The detailed analysis and graphs are included in Appendix A.

2.29 A summary of the results from the TRICS historic trend analysis is set out below.

Shopping

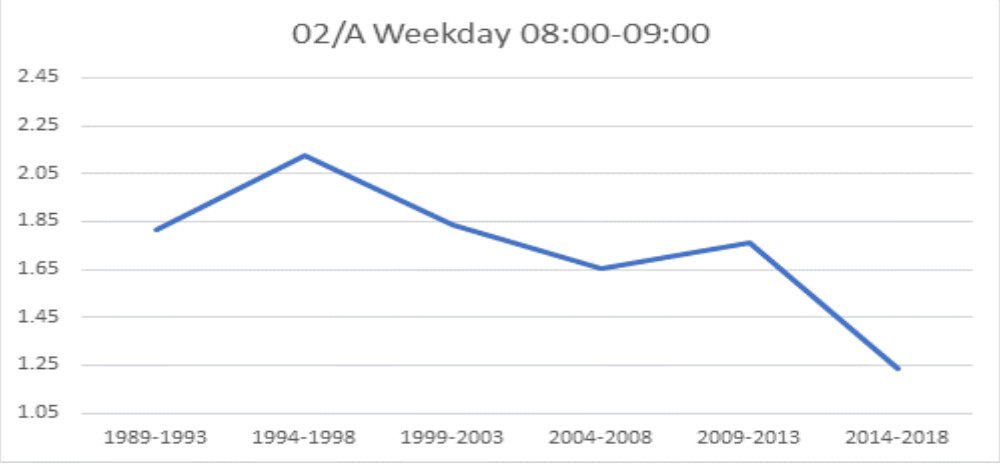
2.30 The supermarket shopping results (just showing Friday PM and Saturday AM for reasons of space) seem to mimic the NTS. There is first, a plateauing of trip rates from 1994-1998 and then a decline in trip rates from 1999-2003 (most similar to the NTS comparator of 2002) to 2014-2018 is a 51% reduction for Friday evening and 24% across Saturday.

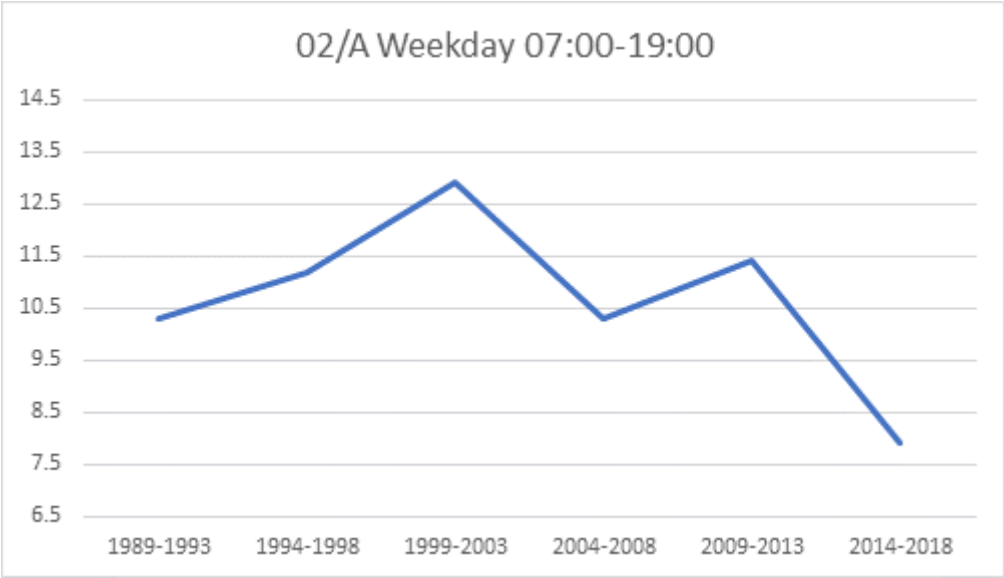




Office

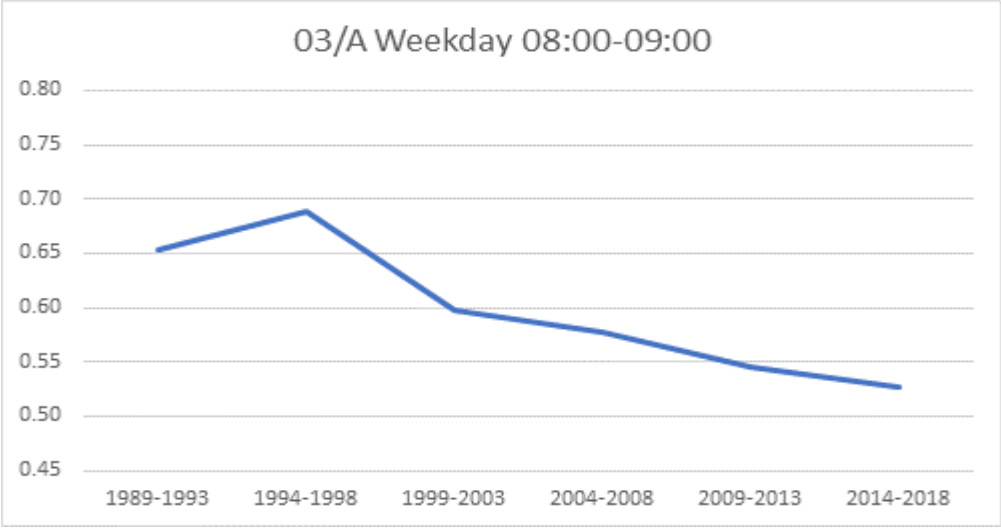
2.31 For offices, the weekday peak decline in trip rates is 32% and across the whole day the decline is 39%.

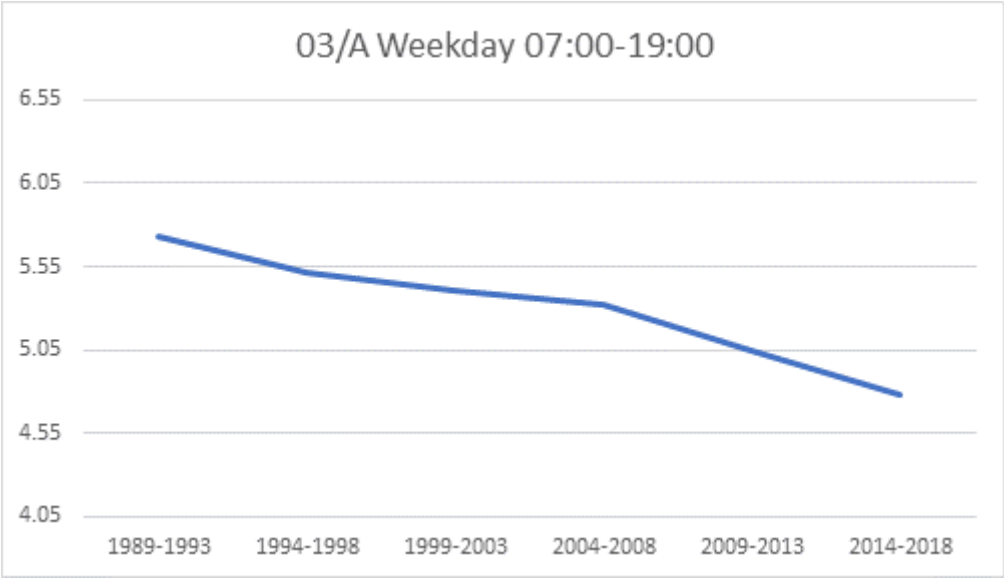




Private Residential

2.32 For the morning peak there is a 12% decline in trip rates and this is the same for the all day residential trip rate. There is some variability between time periods in some of the cases but the weekday residential decline in trip rates is the most consistent trend.





Multi modal Survey analysis – what is happening to person trips, walking, cycling and public transport trips?

2.33 At the same time as undertaking the review of vehicle trip rates TRICs undertook a historical analysis of the TRICS Database to see how multi modal have changed over time. The same categories were compared 01/A – Food Superstores, 02/A – Offices & 03/A – Residential Private Dwellings. The time period for the multi modal surveys was from the year 2000 with twenty sites.

2.34 Replicating the vehicular trip rate analysis and to achieve a good sample size, location types of Edge of Town Centre, Suburban Area and Edge of Town were combined.

2.35 The days considered for the analysis were Food Superstores Friday and Saturday, Offices Weekday and Residential Weekday. These selected days were then analysed to cover the AM and PM Peaks as well as the complete 12 hour period.

2.36 A summary of the results from the TRICS historic multi modal trend analysis is set out below.

Shopping

2.37 There has been a marked decline in total person trip rates and total vehicle trip rates on a Friday AM and PM peak. The daily trip rate is set out below in table 1. This is reflective of the trends shown in the *All Change* Report regarding the reduction in retail trips.

Table 1: Retail: Food Superstore (01/A) Friday Multi-modal Daily Trip Rate Trends

01/A FRIDAY DAILY (07:00-19:00) TRIP RATE BY MODE & YEAR				
MODE	1999-2003	2004-2008	2009-2013	2014-2018
Total Vehicles (TV)	139.242	158.072	102.688	68.962
Total People (TP)	231.851	275.760	156.303	113.595
Pedestrians (P)	21.097	45.916	15.775	15.607
Public Transport Users (PTU)	4.013	7.098	0.947	3.466
Cyclists (C)	1.291	1.923	0.714	0.886

Source: TRICS® 2019

2.38 The Saturday AM and PM peak again show a decline in total person trips and total vehicle trips from the year 2000 then an increase in the afore mentioned trips from around 2010 but total person trips and total vehicle trips are less than the period 2004 -2008. Public transport trips are slightly increased and walking shows a

slight increase in the period 2014 -2018. This appears to reflect the increase in walking as discussed earlier in the report. Table 2 below sets out daily trip rates for retail Food Superstore.

Table 2: Retail: Food Superstore (01/A) Saturday Multi-modal Daily Trip Rate Trends

01/A SATURDAY DAILY (07:00-19:00) TRIP RATE BY MODE & YEAR				
MODE	1999-2003	2004-2008	2009-2013	2014-2018
Total Vehicles (TV)	137.964	127.272	114.320	111.650
Total People (TP)	253.059	234.507	199.527	206.859
Pedestrians (P)	25.908	26.812	16.608	16.787
Public Transport Users (PTU)	4.967	4.532	2.490	6.688
Cyclists (C)	1.757	1.400	1.057	0.889

Source: TRICS® 2019

Office

2.39 Total person trips for employment Office trips show an increase in the AM peak from 1999 until 2008. A reduction in total person trips and a plateauing of total vehicle trips is shown up until 2013. This is most likely a result of the recession experienced at this time. However, there is an increase in total person trips from 2014- 2018, accompanied by increases in all modes. Whilst total vehicle trips have increased the increase is less than total person trips which again is reflective of national data reported in the *All Change* report.

2.40 In the PM peak total vehicle trip rates are less than the AM peak, this reduction could be due to peak spreading but this consideration would need to be validated. Cycling and public transport trips are greater in the PM peak. Daily trip rates for all modes are set out in table 3 below.

Table 3: Employment: Office (02/A) Weekday Multi-modal Daily Trip Rate Trends

02/A WEEKDAY DAILY (07:00-19:00) TRIP RATE BY MODE & YEAR				
MODE	1999-2003	2004-2008	2009-2013	2014-2018
Total Vehicles (TV)	12.822	14.788	16.518	12.674
Total People (TP)	24.203	28.224	28.385	25.213
Pedestrians (P)	6.872	8.126	7.578	7.122
Public Transport Users (PTU)	2.077	2.415	1.824	3.328
Cyclists (C)	0.880	0.299	0.348	0.395

Source: TRICS® 2019

Private Residential

2.41 Total vehicle trips are seen to reduce for both the AM and PM peak from 1999 along with total person trips. There is some increase in pedestrian trips in the AM and PM peak although public transport and cycling trip rates fluctuate especially during the period 2009 - 2013. Total daily trip rates are shown in table 4 below.

Table 4: Residential: Houses Privately Owned (03/A) Weekday Multi-modal Daily Trip Rate Trends

03/A WEEKDAY DAILY (07:00-19:00) TRIP RATE BY MODE & YEAR				
MODE	1999-2003	2004-2008	2009-2013	2014-2018
Total Vehicles (TV)	5.623	5.671	5.209	5.156
Total People (TP)	9.815	9.921	9.420	8.994
Pedestrians (P)	1.252	1.881	1.937	1.591
Public Transport Users (PTU)	0.317	0.273	0.304	0.221
Cyclists (C)	0.280	0.178	0.279	0.119

Source: TRICS® 2019

Overall Reflection

2.42 There has been a decline in car trip rates recorded in TRICS across the time period from 1994-1998. Taking a like for like time period comparison with the NTS 2002-2017 the TRICS data shows residential trip rates to have declined at 12% compared with 9% overall trip rate decline. The reductions for offices and supermarkets, for the time periods studied, are more significant than those found in the NTS. Such differences will reflect the changing nature of work and shopping but are clearly hugely significant to individual site assessments.

2.43 The findings quite clearly suggest that care should be taken in aggregating trip rates from different sites over time as these will inflate the trip rate compared with contemporary measurements. In addition, it seems at least as plausible that future trip rates could be lower than currently indicated by TRICS as the same or indeed higher. This would however require a site specific analysis to justify the future projections.

2.44 The multi modal surveys reveal a decline in total vehicle trips to food superstores on a Friday which could be paralleled with the growth in online shopping which is growing at around 10-12% per annum and now represents 17% of total UK retail sales.

2.45 It appears that the historic TRICS data is reflecting the national travel behaviour trends at a local level.

2.46 What is not clear is whether the total vehicle trip reduction is as a result of site specific measures, for example, reduction in car parking provision over time, site specific design.

2.47 The increase in pedestrian trips and public transport trips has positive implications for planning sustainable transport sites.

Implications of the Evidence for TRICS

2.48 In this section we consider what are the implications of the evidence that has been reviewed and the steps that we should be thinking of taking to ensure the evidence of change in travel behaviour is reflected in trip generation assessments and transport planning.

2.49 The evidence reviewed from *All Change,* the DfT RTF 18, NTS 2016 and the TRICS historic review demonstrates that there has been a sustained change in travel behaviour. This change is reflected in the trip rates for residential, retail (super food) and employment sites. Care need to be taken to ensure that the design of the residential and retail development, in particular, take account of these changes in travel behaviour.

2.50 It seems plausible that trip rates, in particular vehicle trip rates in urban areas could become lower or plateau at current rates, therefore care needs to be taken in projecting trip rates in future years. Site specific analysis is recommended to justify future projections.

2.51 Exposing and accommodating uncertainty in socio technological, economic, environmental and political drivers becomes a key activity in the transport assessment process. Early discussions between the scheme promoter and the determining authority is recommended where the vision for the development is set out along with the measures that are required to achieve the vision. This in turn will influence the trip generation assessment.

2.52 It appears that the national data trends are reflected at a local level in the TRICS historic data review. Further trip reduction may be experienced on the local road network, dependent on the location of proposed site, that should be taken into account in the trip generation and distribution process.

2.53 It is important to remember that TRICS holds a valuable bank of data which when applied with the consideration of trends in changes of travel behaviour, can provide practitioners with a new view on trip

generation that will enable a move away from “predict and provide” appraisal techniques to “decide and provide”. Use of the TRICS data in this way supports flexible travel planning for future trends in travel needs and indeed lends further legitimacy to shaping rather than only providing for future trends.

2.54 If no recognition is given to the trends shown in the evidence from *All Change* and the DfT RTF18 report then it is inevitable that transport planning will continue to provide infrastructure that meets previous predicted needs rather than the transport needs of the future. This could lead to the over provision of highway capacity which in turn induces travel demand or the analysis could lead to the under provision of walking and cycling infrastructure or public transport services. The consequences are serious and we run the risk of planning and developing stranded or underutilised assets.

2.55 The Business as Usual or “rear view mirror” approach, i.e. projecting past traffic growth trends and socio economic trends to determine the need for infrastructure, in particular new roads and junction capacity has diminished relevance. The question becomes how to plan in light of the evidence of trends and the uncertainty that lies ahead.

2.56 As change in travel behaviour continues, it is anticipated there would a need for a more flexible approach in adapting or providing new transport measures for the development. Phasing and effective monitoring plays a key role in determining the need for this adaptation.

3 Planning for Change in Travel Behaviour

Transport Futures

Introduction and context

3.1 Traditional transport planning has commonly used the "predict and provide" process using past trends to forecast the transport needs for the future. Given that society is experiencing significant change in mobility and the digital age is offering choices to the way in which we work, shop and carry out leisure activity there is deep uncertainty over what the future transport needs may look like. Deciding on what future society wants means a move from "predict and provide" to "decide and provide".

3.2 In 2013 the New Zealand Ministry of Transport (NZ MoT) as part of its Strategic Policy Programme investigated the uncertainty in the future demand for car travel (in the context of a $10bn 10-year forward programme of infrastructure investment and a previous 10-year period of (near) zero road traffic growth) and the implications for forward planning[8]. As well as undertaking a scenario planning exercise as part of the work, it highlighted the importance of distinguishing between transport and access when addressing supply and demand. Access to people, goods, service and opportunities is not only provided by the transport system but by the land use system and (increasingly) by the telecommunications system. The work also concluded that uncertainty can be turned into an opportunity by moving from predict and provide to decide and provide. With its agreement, the findings of their research were used to design and develop a series of workshops run by CIHT to examine the implications of the NZ MoT findings for the UK. A series of 11 workshops involving just over 200 CIHT members were held over 2015 and 2016. The findings are documented in "Uncertainty Ahead – Which Way Forward for Transport?"[9] (hereafter *Uncertainty Ahead)*.

3.3 Key messages from *Uncertainty Ahead*, in relation to this Guidance Note are as follows:

- deep uncertainty exists about the future and official forecasts of total car traffic appear at odds with overall professional opinion on future uncertainty.
- The transport sector is ill equipped in grasping the extent of socio technological transformation that the digital age may bring and how that has a bearing on transport.
- Where the population locates, and which type of people locate where constitutes both uncertainty and an important influence on the shape of future transport supply and demand.
- Policy makers need to be engaged with the issues of uncertainty.
- A lack of evaluation of transport policy and strategy is likely to allow that status quo to be maintained.
- Clear guidance should be developed to assist a culture change towards a more decide and provide approach.
- The transport profession is working in times of unprecedented change and there is a window of opportunity to address the challenges that this change brings about. There is a need, in turn, for

[8]Lyons, G. et al. (2014). *Future Demand: How could or should our transport system evolve in order to support mobility in the future?* Final Report. New Zealand Ministry of Transport, Wellington, New Zealand. https://www.transport.govt.nz/multi-modal/keystrategiesandplans/strategic-policy-programme/future-demand/

[9] Lyons, G. (2016). *Uncertainty Ahead: Which Way Forward For Transport?* Final Report from the CIHT FUTURES Initiative, Chartered Institution of Highways & Transportation, August, London. https://www.ciht.org.uk/knowledge-resource-centre/resources/futures/

guidance to help empower practitioners to change the norm in transport planning towards decide and decide.

3.4 The CIHT FUTURES report concludes with ten recommendations that look to support the transport industry take forward the key messages in *Uncertainty Ahead*. These recommendations largely take the form of developing advocacy for the contents of CIHT FUTURES and supporting the transport industry take forward the new approaches through providing professional practice guidance, making resources available through www.ciht.org.uk/futures and training.

3.5 One of the key activities for planning for change in travel behaviour is scenario planning.

3.6 *Uncertainty Ahead* sets out the principles of scenario planning. Scenario planning is contrasted with forecasting, which, while we commonly use in understanding the impacts of proposed developments, conceals uncertainty and gives misplaced confidence in the future. Scenario planning enables us to ask the following three key questions:

- *What sort of place are we creating?*
- *What kinds of activity do we need to travel for?*
- *How will we provide for mobility?*

3.7 In asking and answering these questions we are moving to a "decide and provide" approach rather than the traditional "predict and provide" approach which takes as its base assumption that people will maintain past and current travel behaviour.

Scenario Planning and TRICS

3.8 As a technique, scenario planning allows us to open up about uncertainty and consider a range of plausible scenarios within which a proposed development would exist and for which future demand for access would play out. Importantly, by giving emphasis to vision-led thinking prompted by the three questions above, the nature of the development it understood to play its part in aligning with the different plausible futures that may present themselves and shape demand.

3.9 In the transport assessment process, vision led thinking and scenario planning can be represented by setting out a range of the potential trip generation outcomes that could take place within a proposed development in the context of "what sort of place are we creating?"

3.10 This range of trip generation can include consideration of background growth scenarios (as seen in the RTF18 report) as well as the implications of high and low provision of sustainable transport measures. The later can be determined through scrutinising the TRICS outputs from comparative locations which have differing levels of sustainable transport provision. The sustainable transport provision evidence can be sourced through TRICS evidence of comparative sites.

3.11 The travel behaviour trends and trip reductions that have been presented in this document mean that we need to provide infrastructure that meets the needs of changing demands, including future technology. Developers should not see the change in travel behaviour and the trip reductions as an opportunity to avoid providing for mobility. It is critical that the right type of infrastructure is designed into the proposed development and assessed thoroughly so that any transport schemes support access and mobility needs.

3.12 A range of potential trip generation arising from plausible scenarios could be represented as a trip rate fan - "Fan of Influence" that illustrates the outcomes of the different scenarios that have been examined in terms of trip rates and the assumptions of transport measures that will form the transport strategy for the development.

3.13 This "Fan of Influence" could then be reported in the transport assessment and a recommendation about the most likely scenario that is to meet the vision led development be made by the developer.

3.14 The scale of the development is an important consideration as to whether scenario planning is applicable. For smaller scale development scenario planning may not be as relevant as for larger scale developments. This approach should be discussed and agreed with the highway authority.

4 Using "Decide and Provide" and supporting Decision Makers

The use of Decide and Provide

4.1 As discussed earlier in this Guidance Note, there is a significant set of evidence that shows there is a change in travel behaviour that needs to be taken into account in the planning and assessing of development proposals.

4.2 The RTF18 report illustrates the use of scenario planning, in particular Scenario 6 Extrapolated trip rates recognises the impacts of current trends on travel behaviour. Whilst there are questions that remain about whether the change in travel behaviour will continue at the same rate up to 2050, there is a need to plan in light of the plausibility of this change in travel behaviour continuing (as well as accounting for other plausible developments in society and access).

4.3 Support for and use of the decide and provide approach is spreading with examples including national policy development in New Zealand, Scotland, and England; and city (regions) including Manchester, Oxford, Cambridge and Copenhagen. Guidance on how to apply the decide and provide approach is already available[10] and will continue to be developed across the industry as lessons from application are shared.

4.4 On a site specific level there are some strategic sites coming forward are choosing to use this approach of decide and provide. These sites are larger sites of 800+ dwellings which have supporting community facilities.

4.5 Reference is drawn to one strategic site which is going through the Local Plan process for 3,500 dwellings, 3500 jobs, two schools, leisure facilities and a high street. The vision for the site is a strong vision of a sustainable, beautiful new town. The aim of the transport strategy is similar to other new developments:

"To support the community of Kingswood's access to work, education and community facilities by sustainable, low carbon travel infrastructure so that the majority of journeys that take place will be on foot or by bicycle, within the village itself, and by public and shared transport for shorter and longer journeys."

4.6 The differentiation between this site and other sites is the supply led approach that is supported by the developer. The community and jobs provision will come on stream in the initial phases of the development, supporting the goal of internalised trips.

4.7 The decide and provide approach has been integrated into the design and planning for the site. TRICS rates have been applied to the residential, retail, commercial and education. These rates have then been reduced to take into account the changes in travel behaviour as set out in *All Change.* National growth rates set out in RTF18 report have also been applied in the scenario planning for the site and the phasing of the site.

4.8 In this context a range of plausible scenarios have been developed and tested for their impacts on the surrounding transport network. The outcome is a predominantly bus based transport strategy to support trips migrating off site for the commute whilst a street hierarchy and high levels of accessibility supports movements by bicycle and walking.

[10] See for example the six-stage vision-led approach to strategic planning for an uncertain world called FUTURES for which a full-interactive guide is publicly available: www.mottmac.com/futures

Supporting decision makers in this process

4.9 The Business as Usual or "rear view mirror" approach, i.e. using historical traffic and socio economic trends to determine the need for infrastructure, in particular new roads and junction capacity is unlikely to be a relevant approach now. The question becomes how to plan in light of the evidence of trends and the uncertainty that lies ahead.

4.10 *Uncertainty Ahead* and *All Change* reports both discuss the need to review and adapt the current policy making process. The later discusses the key differences between the current approach where demand is an input and how by using "decide and provide" approach demand is determined through the policy. *Uncertainty Ahead* (reflecting developments based upon the work in New Zealand[11]) sets out a new paradigm of Regime Testing rather than the current Regime Compliant approach.

4.11 Whilst these approaches are discussed in a policy making context, these approaches also apply to bringing forward and assessing site specific proposals in development planning.

4.12 At the earliest stage decision makers; local authority officers and politicians need to be brought into the discussions surrounding the use of the "decide and provide" approach, the use of trends and scenario planning and the trip generation analysis.

4.13 The Transport Assessment Scoping meeting that is held between the local highway authority and the applicant as part of the Pre Planning Application Process can be used to discuss and understand how the assessment will use "decide and provide" in place of "predict and provide".

4.14 Briefings for local politicians demonstrating the evidence based approach to the site assessment process should be arranged early in the planning process.

4.15 Presenting the case for the site is not just about numbers and impacts, it is about telling the story surrounding the assumptions, the scenarios, the validity of the approach from the DfT perspective. The TRICS Best Practice 2016 states the need to be clear about the site selection and assumptions, this advice is of particular relevance in demonstrating how changes in travel behaviour tells a different story to business as usual in transport planning.

4.16 TRICS is an objective set of recorded data. It is clearly showing different trajectories over time and both variation across urban to rural but also across geographies.

4.17 Rather than seeing divergence between data points as problematic these should be useful in understanding variability and direction of travel by developers and decision makers.

4.18 Planning and highway authorities can see that trip rates have been declining over time if the developer is putting forward a lower car intensity development or to see that peak hour trip rates are reducing for offices. However, it might be that there are parts of the country where this does not hold and TRICS provides some insight for that. TRICS cannot project forward, but it does provide a platform from which credible scenarios for future site trip rates are derived.

[11] Lyons, G. and Davidson, C. (2016). Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

5 Ten Key Questions for TRICS Users

General

5.1 To support the development of this process, ten key questions have been drawn up by the project team. These questions were discussed with the attendees of the TRICS User Group meeting on 25 June 2019.

1. Accommodating change in travel behaviour

Question

5.2 How can we accommodate the travel behaviour change evidenced in the trends analysis to inform vision and supply led demand development decisions?

2. Presenting the evidence

Question

5.3 How do we best present the evidence of the change in travel behaviour over time in transport assessments, using local and national trends information?

3. Formulating local transport policy

Question

5.4 The trend information shown in the TRICS research and the All Change report can be used to formulate local policy, how can this information be used in the planning process?

4. Supporting Decision Makers

Question

5.5 What information will support decision makers taking forward the “decide and provide” approach?

5. Dealing with Uncertainty

Question

5.6 What level of uncertainty in trip rates might mean a more flexible transport strategy for the site is required and what monitoring strategy would be required?

6. Addressing different sites in different area types and regions?

Question

5.7 What aggregation advice should be issued to users about different sites in different area types and regions?

7. Variability of Trip Rates

Question

5.8 What guidance should TRICS issue over variability of trip rates? Is variability more important under a decide and provide future than has previously been allowed for?

8. Understanding temporal shifts in trip rates

Question

5.9 What research needs are there to understand the quite significant temporal shifts in trip rates for some use classes?

9. Scale of development

Question

5.10 What scale and type of development would be best suited to scenario planning?

10. Relationship between TEMPRO and TRICS

Question

5.11 What further work needs to be carried out to understand the relationship between TEMPRO and TRICS

Responses

5.12 The questions helped to shape the debate on what needed to be addressed going forward in terms of responding to changes in travel behaviour.

5.13 It was proposed and agreed that a survey covering the questions set out above would be undertaken following the publication of this report. This survey would be sent out to all users. The results of the survey would be used to inform future TRICS research and importantly progress the development of a "Decide and Provide" process document.

5.14 Local trend data is available from TRICS and could be used to formulate policy and that more data/evidence was required on the travel behaviour arising from large urban extensions.

5.15 It was recognised that the "gearing up" stage plays an important part in supporting the decision makers. Gearing up includes the dissemination of the latest information on trends and forecasts being published by the Department for Transport and examples of working practices from elsewhere along with monitoring data. A change in mindset with regards to the movement from predict and provide approach to decide and provide will be required.

5.16 The application of scenario planning was considered to be relevant for larger sites and less relevant for smaller sites and infill. The location of the development is key when applying trends.

5.17 TRICS scatter graphs, site surveys and area selection can provide evidence regarding the variability of trip rates. Variances of trip rates can be seen through the review of the 12 hour trip profile.

5.18 The importance of monitoring developments through the phases of implementation was stressed as the true level of sustainability of the site will not be seen until the end of the build out and full implementation of the site's transport strategy.

5.19 Discussions between TEMPRO and TRICS should take place as soon as possible to consider the relationship between TRICS data and TEMPRO data.

5.20 There was a recognition of the need to engage with TRICS users and key stakeholders involved in the development process to shape the guidance for the application of TRICS in light of the changes in travel behaviour.

6 Conclusions and Recommendations

6.1 TRICS Consortium Limited (TRICS) is responding to the fact that the world is experiencing significant change in social, technological, economic and environmental drivers which in turn is creating new challenges for transport planning. The "predict and provide" paradigm shows increasingly strong signs of transitioning to "decide and provide".

6.2 The evidence reviewed from *All Change,* the DfT RTF 18, NTS 2016 and the TRICS historic review suggests that there has been a substantial change in travel behaviour.

6.3 TRICS bank of data and historic trends analysis provides the context for TRICS users to recognise that change in travel behaviour is happening at a local level. This change in travel behaviour needs to be reflected in the analysis of trip generation for local development proposals.

6.4 TRICS historic trend analysis and its comparability with national trends analysis offers TRICS users the potential for not only using TRICS for site assessment but also for policy development at a regional and local level.

6.5 In the transport assessment process, scenario planning could be represented by setting out a range of the potential trip generation outcomes that could take place within a proposed development in the context of "what sort of place are we creating?" This range of trip generation can include consideration of background growth scenarios (as seen in the RTF18 report) as well as the implications of high and low provision of sustainable transport measures. The later can be determined through scrutinising the TRICS outputs from comparative locations which have differing levels of sustainable transport provision. The sustainable transport provision evidence can be sourced through TRICS evidence of comparative sites.

6.6 It is important to remember that TRICS holds a valuable bank of data which when applied with the consideration of trends in changes of travel behaviour, can provide practitioners with a new view on trip generation that will enable a move away from "predict and provide" appraisal techniques to "decide and provide".

6.7 At the earliest stage decision makers; local authority officers and politicians need to be brought into the discussions surrounding the use of the "decide and provide" approach, the use of trends and scenario planning and the trip generation analysis conducted by the scheme proposer.

6.8 Presenting the case for the site is not just about numbers and impacts, it is about telling the story surrounding the assumptions, the scenarios, the validity of the approach from the DfT perspective. The TRICS Best Practice 2016 states the need to be clear about the site selection and assumptions, this advice is of particular relevance in demonstrating how travel behaviour changes business as usual in transport planning.

6.9 Developers should not see the change in travel behaviour and the trip reductions as an opportunity to avoid providing for mobility. It is critical that the right type of infrastructure is designed into the proposed development and assessed thoroughly so that any transport schemes support access and mobility needs.

6.10 Further research on how the changes in travel behaviour can be reflected in the development planning process and transport assessment process is required.

6.11 A Working Group should be established to take forward the updating of TRICS guidance for trip analysis and forecasting for change in travel behaviour. This group will comprise public and private sector and representatives from academia.