

# Exeter Transport Strategy

## Transport Empirical Data Report

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# **1. Introduction**

## **1.1. Purpose of Report**

- 1.1.1. This report has been prepared by Devon County Council as part of the transport evidence base for the Exeter Transport Strategy and Greater Exeter joint Strategic Plan.
- 1.1.2. This report provides an overview of the empirical travel data for the Greater Exeter Area, going back at least 10 years. This includes a review of the key characteristics and usage of the local and strategic highway network, local rail network, walking, cycling and the usage of Park and Ride and bus services.
- 1.1.3. This evidence that will inform the development of a future transport strategy.

## **1.2. Structure of the Report**

- 1.2.1. This structure of this report is as follows:
  - Section 2: Baseline Transport Context
  - Section 3: Travel to Work Census Data
  - Section 4: Walking
  - Section 5: Cycling
  - Section 6: Public Transport - Bus
  - Section 7: Public Transport - Rail
  - Section 8: Highways Analysis
  - Section 9: Collision Data
  - Section 10: Aviation
  - Section 11: School Travel Data
  - Section 12: Air Quality
  - Section 13: Summary & Conclusions

## 2. Baseline Transport Context

- 2.1.1. The Greater Exeter area covers the Local Planning Authority areas of Exeter, East Devon, Mid Devon and Teignbridge, an area covering approximately 2,075 km<sup>2</sup> with a combined population in 2015 of 473,700.
- 2.1.2. At the centre of Greater Exeter area is the city of Exeter, with a population of 127,300. Exeter is the main administrative, retail and employment centre for the county and a key gateway for transport infrastructure into the region. Exeter is served by the M5 motorway and the A30 and A38 trunk roads and benefits from the convergence of five railway lines, including connections to the rest of the country and two direct routes to London. Exeter International Airport is only 7km from the city centre.
- 2.1.3. Exeter is a compact city with comprehensive coverage by bus. Local branch line train services connect the city to a number of market and coastal towns including Exmouth, Barnstaple and Crediton. Most services are within walking and cycling distance of residential areas, which is manifested by high levels of walking and cycling in the city.
- 2.1.4. However, congestion is experienced on the major routes into the city at peak times and in some locations throughout the day. This is particularly the case on the main radial routes of Heavitree Road and Alphington Road which connect the Strategic Road Network to the city centre.
- 2.1.5. Surrounding Exeter are the three districts of East Devon, Teignbridge and Mid Devon. Although broadly rural in nature, they include a number market and coastal towns each with their own strong identity providing employment, retail and community services. These include the following towns with a population of over 6,000 people;
- **Exmouth** (population in 2011 census of 34,400). Coastal town in East Devon including one of the largest schools in the Country. Main highway link provided by A376 to Exeter and terminus for Avocet Branch Line.
  - **Newton Abbot** (25,500). Administrative centre and Market Town in Teignbridge, situated between A380 and A38 and served by main line and Riviera branch line trains.
  - **Tiverton** (21,300). Administrative centre and market town in Mid Devon. Located at confluence of River Low and Exe, 5 miles to the west of M5 J27 and Tiverton Parkway mainline rail station. Main highway link from A361 with a secondary link to Exeter via the A396.
  - **Teignmouth** (15,100). Coastal town in Teignbridge with regionally significant port handling 400,000 tonnes of Ball Clay and dry bulks each year. Primary vehicle access from A381 and A379 and rail station served by mainline and Riviera branch trains.
  - **Sidmouth** (12,600). Administrative centre and coastal town in East Devon. Situated south of A3052
  - **Honiton** (11,800). Market town in East Devon, situated adjacent A30 and A35 and with London Waterloo mainline station in town centre (11,800)
  - **Dawlish** (11,300), Coastal town in Teignbridge. Primary vehicle access from A379 and rail station served by mainline and Riviera branch trains.
  - **Kingsteignton** (11,100) Market town in Teignbridge. Situated west of the A380 due north of Newton Abbot. No rail station.

- 2.1.6. Nevertheless, reflecting that population across the districts is generally dispersed, they are primarily out commuting districts with only 55-75% of those in employment working within the district they live in. This level varies considerably between the market and coastal town area and more rural areas. Similar patterns are likely to be prevalent for retail trips and accessing key services, such as the Hospital.
- 2.1.7. Accommodating the impact of this in commuting for jobs, retail and services to the main centre of Exeter and the corresponding additional movements in the market towns and districts represents a significant challenge for the local Transport network.
- 2.1.8. The evidence within this report, including current levels of usage and trends of the existing transport infrastructure, will provide a basis for planning for future transport challenges.

### 3. Travel to Work Data

#### 3.1. Travel to Work Census Areas

3.1.1. Reflecting Exeter's status as the County and regional centre, it has strong economic draw with people from a much wider area travelling to it for jobs and services.

3.1.2. The strength and size of this draw is represented by the Travel to Work area. These areas set out the extent to which the draw of one centre is dominant, with the ONS defining a TTW area as "at least 75% of the area's resident workforce work in the area and at least 75% of the people who work in the area also live in the area. The area must also have an economically active population of at least 3,500".

3.1.3. Since the 2001 census the Exeter TTW has grown considerably and is now the second largest geographical TTW area in the country (behind Cambridge). This change is highlighted by the 2001 and 2011 TTW maps shown in Figure 3-1 below.

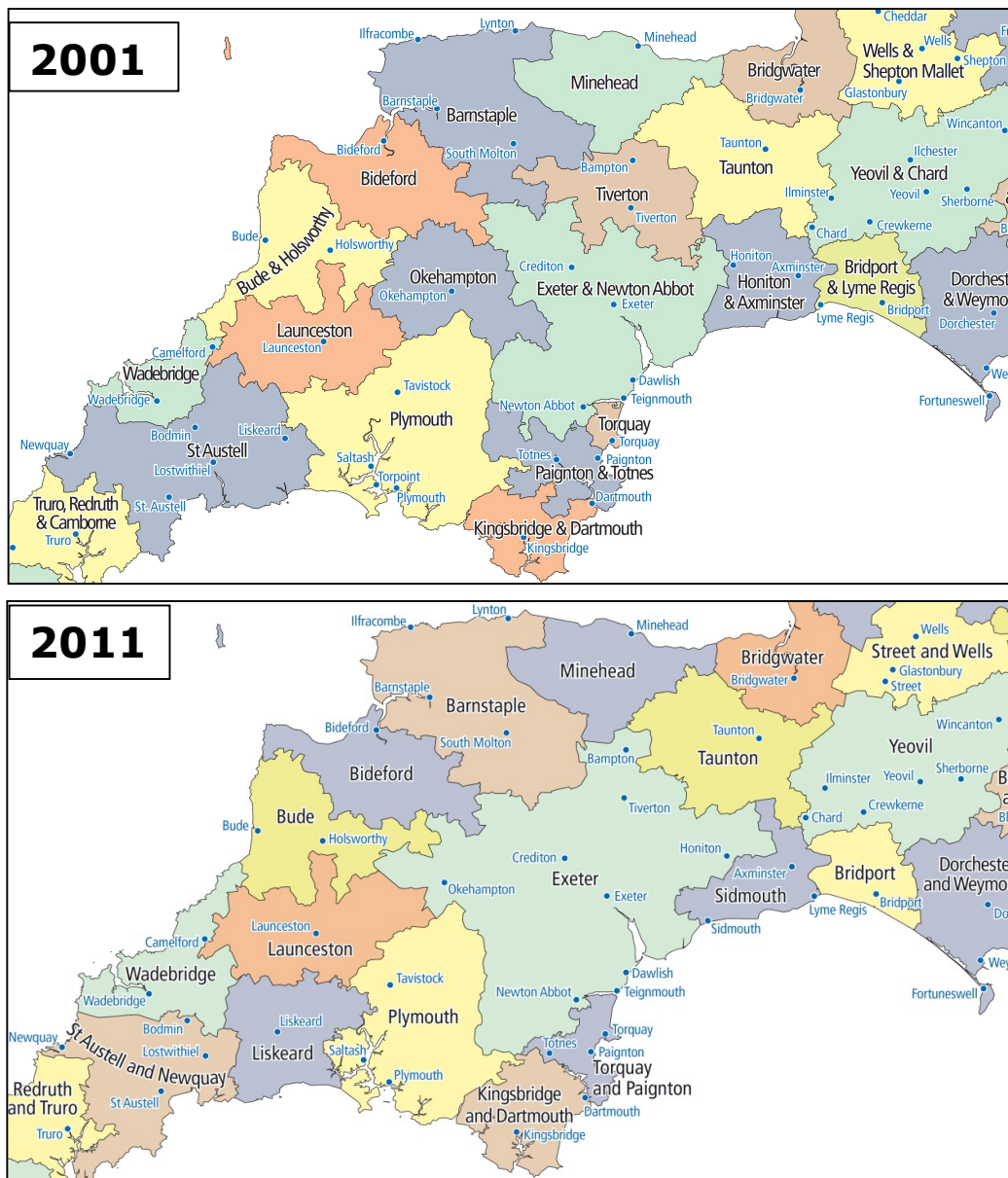


Figure 3-1: 2001 & 2011 TTW census areas for the South West

- 3.1.4. Exeter also has, at 48.0%, the second highest percentage level of net in commuting (the proportion which workplace population exceeds resident working population) of any town and city in England and Wales, again behind only Cambridge (*ONS Towns and Cities analysis 2016*). The Exeter net in commuting figure was 26,476.
- 3.1.5. By comparison, out commuting numbers of approximately 10-12,000 are in found for the 3 districts. This represents an out-commute percentage of 20-25% for East Devon and Teignbridge, although reflecting the lower population of Mid Devon the out-commuting percentage is approximately 50%.
- 3.1.6. A combination of variables is likely to have contributed towards the increased Travel to Work area in Exeter, including a stronger economy, better transport links and increasing jobs/businesses in the city. The relocation of the Met Office to Exeter in 2003 and continuing expansion of the University would seem to be key contributors to that. House prices may have also influenced travel patterns.
- 3.1.7. The numbers travelling to work in Exeter have been further disaggregated by origin, segregated into groups of
- Living and working in Exeter
  - Living in Greater Exeter and working in Exeter
  - Living outside Greater Exeter and working in Exeter

and the modal splits attributed to these are also identified below in Table 1. Those who responded live in Exeter and work at home are not included in this table.

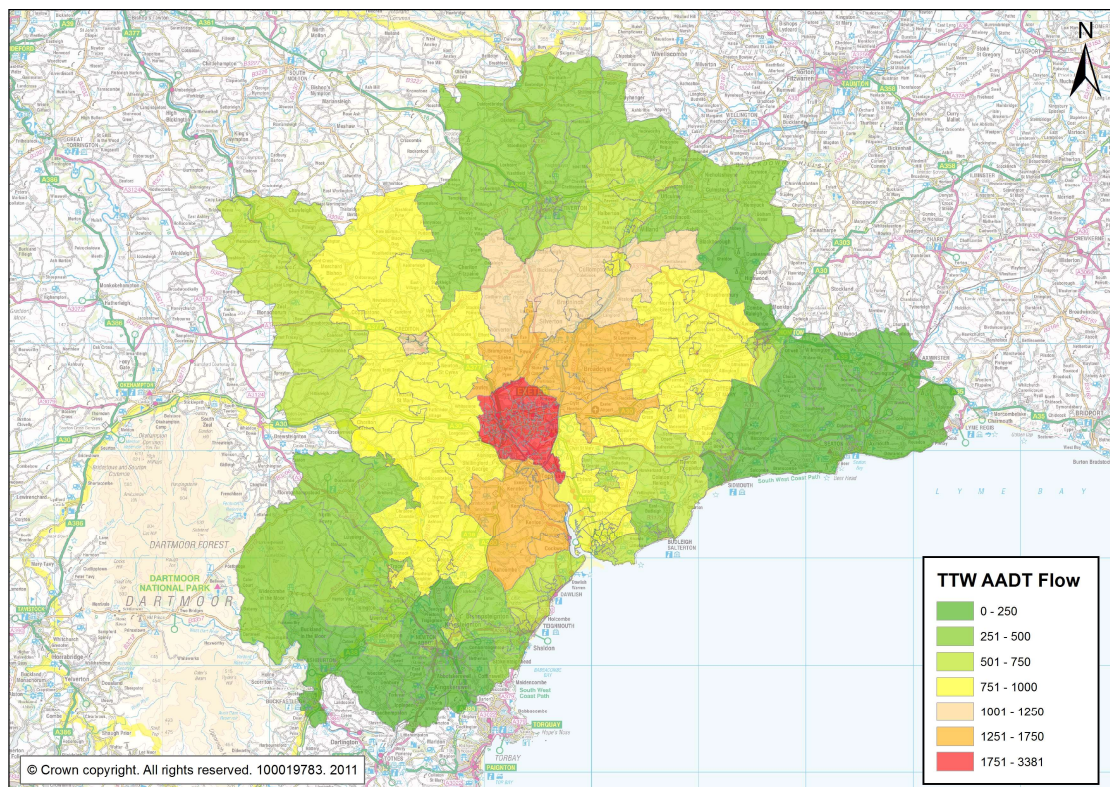
	Modal Splits (%)							
	ALL MODES	CAR Drive	CAR PASS	BUS	TRAIN	WALK	CYCLE	Other
LIVE IN Exeter and work in Exeter	<b>37,700</b>	<b>40.5</b>	5.6	11.5	1.3	30.9	8.4	1.9
Commute In – Greater Exeter	<b>25,500</b>	<b>78.5</b>	5.9	6.5	4.7	1.2	2.1	1.8
COMMUTE IN Outside	<b>11,100</b>	<b>80.0</b>	4.9	4.3	4.7	1.4	0.5	0.9

**Table 1: 2011 Mode of Travel for those travelling to work in Exeter by area**

- 3.1.8. There are just under 10,000 people who live in Exeter commute out for work, hence the net commuting figure of 26,476 above. Three quarters of those commuting out are to locations within Greater Exeter (4,170 to East Devon, 1,870 Teignbridge and 1,500 Mid Devon). In terms of modal splits, 74% of these trips are made by car drive, 10% by public transport and 9% by foot or cycle.
- 3.1.9. It should also be noted that there were 3,900 people recorded as living in Exeter, but with no fixed place of work. 70% of these recorded car drive for the mode split, 7.5% by public transport and 12% by foot or cycle.

## 3.2. Exeter TTW draw across Greater Exeter

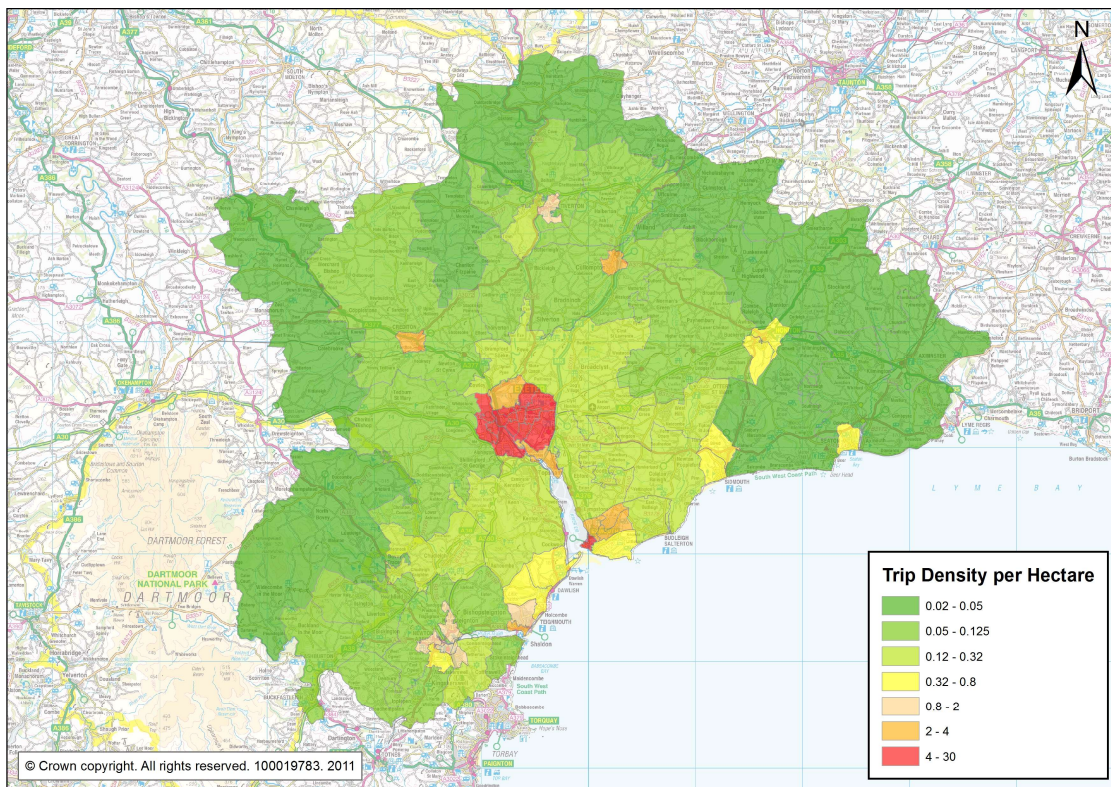
- 3.2.1. Within the Travel to Work area, the strength of draw towards Exeter varies. Intuitively, this draw is at its strongest close to the city, with the attraction decreasing with distance. However, the draw to Exeter for some towns, for example Crediton, is particularly strong.
- 3.2.2. Reviewing the TTW data for each sub electoral ward in Greater Exeter allows the gross number of trips from each ward to be identified. These numbers, effectively representing the magnitude of the draw to Exeter are shown in Figure 3-2 below.



**Figure 3-2: 2011 TTW trips to Exeter by ward in Greater Exeter Area**

- 3.2.3. Heading out from Exeter, the greatest ward-based flows are from the adjacent districts along the A38, A379 and M5 corridors. It is also notable that of the surrounding districts, the greatest level of attraction comes from the parts of Mid Devon immediately to the north of Exeter.
- 3.2.4. The draw from Tiverton however, the largest settlement in Mid Devon, is comparatively low. The draw also drops significantly to the east of Honiton.
- 3.2.5. It should however be highlighted that the wards within this analysis are based on areas of broadly equal populations. Consequently, more densely populated areas in the market and coastal towns have smaller wards. The wards are also areas where a higher proportion of residents have access to jobs and services in the town they live in. Whilst this results in lower numbers of out commuting by ward, it does not necessarily reflect the pull by population density.
- 3.2.6. Further analysis of travel demand per population density, represented as the number of people travelling to Exeter for work per hectare, are shown below in Figure 3-3. Note that the scale for densities is logarithmic (increasing by 2.5 for each band).

- 3.2.7. This image gives a guide to the areas with the highest concentration of travel demand to Exeter, and in particular how the strength of draw for different towns compares.
- 3.2.8. Generally, the draw from the towns closest to Exeter is strongest with the highest trip densities prevalent in the towns of Crediton, Cullompton, Teignmouth and Exmouth.
- 3.2.9. The level of draw seems to fall for the larger towns of Newton Abbot and Tiverton. However, the draw for Exmouth is noticeably strong, including a ward with a higher travel density to Exeter than two of the wards in Exeter. This highlights the very strong influence of Exeter over Exmouth.
- 3.2.10. There is also a higher density of movements in the wards closest to Exeter, particularly along the A376, A379 and A3052 corridors.



**Figure 3-3: 2011 TTW Trips to Exeter per Hectare**

- 3.2.11. To gauge an understanding of the relative number and proportions from the largest towns in the Greater Exeter, the Census TTW data for settlements with a population over 6,000, is shown below in Table 2.
- 3.2.12. These numbers are taken from the *Location of usual residence and place of work by method of travel to work (MSOA)* tables (WU03EW) albeit with the numbers recorded as working from home added to the working age. The numbers who answered no fixed place are not included in this table.
- 3.2.13. It should be noted that these are based on census wards, and therefore the population from these wards are not always equal to the population of the towns. This is the case for Dawlish, which also includes Holcombe and Dawlish Warren, and for Kingsteignton and Newton Abbot, where the Newton Abbot wards include part of Kingsteignton.

Town	Population		TTW Trips to Exeter	Working in Exeter (%)
	Total	Working Age		
Exeter	11,7773	52,447	42,492	<b>89%</b>
Crediton	7,600	3,420	1,068	<b>31%</b>
Exmouth	34,432	14,282	3,818	<b>27%</b>
Cullompton	7,643	3,580	896	<b>25%</b>
<i>Dawlish</i>	<i>13,161</i>	5,116	1,215	<b>24%</b>
Teignmouth	14,749	5,140	987	<b>19%</b>
Honiton	11,483	4,927	933	<b>19%</b>
Sidmouth	11,550	3,480	537	<b>15%</b>
<i>Kingsteignton*</i>	<i>8,306</i>	3,826	530	<b>14%</b>
Tiverton	21,335	8,999	1,050	<b>12%</b>
<i>Newton Abbot*</i>	<i>28,738</i>	12,644	1,288	<b>10%</b>
Seaton	8,413	2,342	175	<b>7%</b>
Axminster	5,761	3,242	172	<b>7%</b>

**Table 2: Comparative draw to Exeter of different towns in Greater Exeter Area**

- 3.2.14. The towns of Crediton and Exmouth have the highest proportion of residents working in Exeter, with roughly 3 in 10 of the population of each of those towns working in Exeter.
- 3.2.15. There is also a high proportion of travel to Exeter from Cullompton and Dawlish, where approximately 1 in 4 of the working population travel to Exeter and around 1 in 5 of the workforce from the towns of Honiton and Teignmouth work in Exeter.
- 3.2.16. By magnitude, Exmouth has by far the largest the largest number of its population working in Exeter. Although having the largest numbers in the largest settlement is unsurprising, the gross number of over 3,800 is almost 3 times more than for any other settlement in the Greater Exeter area.
- 3.2.17. By comparison, from the next two largest settlements in Greater Exeter of Newton Abbot and Tiverton, there are 1,300 and 1,050 people that work in Exeter. There are also over 1,000 people from each of Dawlish and Crediton that travel to work in Exeter.
- 3.2.18. Perhaps reflecting that both Seaton and Axminster are outside of the Exeter TTW area the numbers commuting to Exeter from these settlements are noticeably lower. Sidmouth is also outside the TTW area, although the numbers travelling to Exeter are significantly higher, at around 500 people.
- 3.2.19. The total commuting to Exeter from the above towns of 12,670 represents only half (49.7%) of the total of those living in Greater Exeter and commuting into Exeter. This points to some significant challenges in terms of both access from rural areas and in providing sustainable transport choices for areas that will be difficult to pick up at their point of origin by public transport.

### 3.3. Travel to Work by mode - Districts

- 3.3.1. The changing mode splits for commuters from 1991 to 2011 for all districts in the Exeter TTW area are shown in Table 3. In addition, these proportions have been applied to the census populations of all those in employment between 16 and 74. A summary of this is in Table 4.
- 3.3.2. Notably, the majority of **commute trips by residents of Exeter are not made by driving a car**. This is underpinned by high numbers of pedestrian and cycle commuting, including a walk mode split which, at 22% is the 4<sup>th</sup> highest in the UK, behind Norwich, City of Westminster and the Isles of Scilly.
- 3.3.3. Across the other districts in the Greater Exeter Study area the proportions driving a car to work have stayed broadly consistent between 1991 and 2011. Conversely, the proportions travelling to work by foot or as a passenger of a car have fallen.
- 3.3.1. Consistent with national data, the numbers working from home and by rail have increased significantly. When the mode splits are applied to the working population of Greater Exeter, the total numbers working from home and travelling by rail have increased from 1991 by 280% and 225% respectively.

	Mode	Work from Home	Train	Bus	Car	Car Pass	Cycle	Walk	Other	Average distance (KM)
<b>Exeter</b>	1991	4%	1%	13%	51%	8%	4%	18%	3%	
	2001	8%	1%	10%	49%	7%	4%	19%	2%	11.99
	2011	8%	2%	9%	45%	5%	6%	22%	1%	11.46
<b>Teignbridge</b>	1991	9%	1%	4%	61%	8%	2%	12%	3%	
	2001	13%	1%	3%	62%	6%	1%	11%	2%	15.70
	2011	15%	2%	3%	62%	5%	2%	10%	1%	17.23
<b>Mid Devon</b>	1991	13%	0%	2%	58%	7%	3%	15%	2%	
	2001	17%	0%	2%	58%	6%	2%	12%	2%	17.22
	2011	18%	1%	3%	60%	5%	2%	10%	1%	19.59
<b>East Devon</b>	1991	11%	1%	3%	59%	7%	3%	14%	3%	
	2001	15%	2%	3%	57%	6%	2%	12%	2%	16.96
	2011	17%	2%	3%	58%	5%	2%	11%	1%	18.33
<b>Weighted Average</b>	1991	9%	1%	6%	57%	8%	3%	15%	3%	
	2001	13%	1%	5%	57%	6%	3%	13%	3%	16.79
	2011	15%	2%	4%	56%	5%	3%	14%	2%	16.15

**Table 3: Comparison of Census TTW Mode Splits in Greater Exeter Area**

- 3.3.2. In terms of gross numbers, between 1991 and 2011 the population of working age in the Greater Exeter area has increased by a third from 161,000 to 215,000.
- 3.3.3. Over this period only cycling, rail and working from home have increased at a greater rate than the population increase. Car driving and walking have largely followed the change in overall population (albeit increasing at a slightly slower rate).

- 3.3.4. Although bus usage has dropped proportionately, the overall numbers are largely unchanged across the greater Exeter Area.
- 3.3.5. Again, it should be stressed that this data does not confirm at what time in the day these are taking place.

Gross Numbers by Mode for Travel to Work Trips										
	Year	Driving a car or van	Walk	Bus, minibus or coach	Work from home	Bicycle	Pass in a car or van	Train	Other	Total
Total (Gross Numbers)	1991	92187	23812	9070	13942	4327	12184	1425	4172	161120
	2001	107853	25666	8759	24222	4874	11849	2180	4781	190184
	2011	119458	29554	9138	31519	6193	10430	4011	4213	214517
% change		130%	124%	101%	226%	143%	86%	281%	101%	133%

**Table 4: Comparison of Total mode numbers from Census TTW Mode Splits and population of working age for Greater Exeter Area**

- 3.3.6. Although the census data in Table 3 shows that the length of TTW trips has been increasing in greater Exeter, there is limited information provided in the census to explain why this is occurring.
- 3.3.7. Further analysis of distances by ward also showed varying conclusions, with average trip distances tending to increase from 2001 to 2011 in both existing urban and rural wards. Average travel distances are however longer in rural wards.
- 3.3.8. Although nothing definitive is provided, a few possible factors influencing these changes are identified in the census and 2015 National Travel Survey, including that;
- With enhanced digital connectivity, people can be more productive on their commute and therefore open to longer journeys.
  - Number of trips by rail is increasing – and the average commute by rail is typically longer (*DfT Commuting and Business Travel Factsheet (2011) found that on average, commuting trips by foot take 18 minutes, by cycling 22 minutes, by car 24 minutes, by bus 41 minutes, and by rail 69 minutes.*)
  - Between 2001 and 2011 the total number of TTW trips from Greater Exeter to destinations outside Greater Exeter increased by a greater rate than the overall increase in TTW trips.
  - The growth in trips from Greater Exeter to Exeter, was also greater than the overall increase in TTW trips.
  - On average people are making less commuting trips and could therefore be prepared to accept a greater distance on less frequent commute trips. However, the average time for commuting has remained constant
  - With a falling number of commute trips, the increasing average distance per commute trips may not manifest as an increase in total commute miles.
- 3.3.9. Understanding the reasons for these trends for the census data is not easy, and the above is just presented as an informative (rather than definitive) guide to some factors that contribute to these changes.

### 3.4. Travel to Work by mode – Exeter Comparison

- 3.4.1. To gauge how the transport travel to work patterns for Exeter compare to other areas across the UK, the 2011 Census TTW data from a other cities and or towns in the region (Plymouth, Bath, Taunton and Bristol) and nationally have been undertaken.
- 3.4.2. The national data is provided for cities of comparative sizes to Exeter’s population of 118,000 at the 2011 census. These range from Carlisle, with a population of 108,000, up to York with a population of 198,000. These comparisons are shown in Table 5.

	Pop	Work from home	Train	Bus, minibus coach	Car	Car Pas	Walk	Cycle	Other
<b>Exeter</b>	<b>118,000</b>	<b>8%</b>	<b>2%</b>	<b>9%</b>	<b>45%</b>	<b>5%</b>	<b>22%</b>	<b>6%</b>	<b>2%</b>
<b>Bristol</b>	<b>428,000</b>	8%	2%	9%	47%	5%	18%	8%	3%
<b>Plymouth</b>	<b>256,000</b>	7%	1%	11%	55%	6%	14%	3%	3%
<b>Taunton</b>	<b>65,000</b>	12%	1%	2%	56%	5%	15%	6%	2%
<b>York</b>	<b>198,000</b>	9%	2%	7%	46%	5%	18%	11%	2%
<b>Peterboro’</b>	<b>183,000</b>	8%	2%	7%	58%	9%	9%	6%	2%
<b>Canterbury</b>	<b>151,000</b>	12%	5%	5%	55%	5%	15%	3%	2%
<b>Oxford</b>	<b>150,000</b>	10%	2%	16%	32%	3%	17%	17%	2%
<b>Lancaster</b>	<b>138,300</b>	11%	2%	6%	56%	6%	14%	4%	2%
<b>Norwich</b>	<b>133,000</b>	8%	1%	8%	44%	5%	23%	9%	2%
<b>Cambridge</b>	<b>124,000</b>	11%	5%	6%	30%	3%	15%	29%	2%
<b>Winchester</b>	<b>117,000</b>	15%	5%	3%	58%	4%	12%	2%	2%
<b>Carlisle</b>	<b>108,000</b>	10%	1%	7%	57%	6%	15%	3%	1%

**Table 5: Comparison of Census TTW mode splits against other settlements**

- 3.4.3. When considered against the other urban areas in the South West, the mode splits for Exeter are generally positive. Exeter has the lowest car and highest walking mode split of the South West urban areas. The combined public transport (bus + rail) mode share for the cities of Exeter, Plymouth and Bristol are also all very similar at 11-12%.
- 3.4.4. Reviewing the splits for cities of similar size nationally suggests that, with the exception of Oxford, the figure of 11-12% for public transport use is a consistent maximum.
- 3.4.5. Cycling mode splits are however much more variable with a number of the other cities having much higher cycling mode shares. This suggests that it is a mode where the usage in Exeter could be significantly increased.
- 3.4.6. Overall, Exeter’s mode splits compare favourably with other cities. Sustainable modes account for a significant proportion of trips and the car use is one of the lowest across all of the cities considered.
- 3.4.7. The mode splits for Cambridge and Oxford are noticeably different from any of the other settlements considered. These cities have a strong cycling culture, with Cambridge in particular having one of the highest levels of cycling use in the UK. The influence of the university on these cities and gentle topography are probably key contributors to this culture.

### 3.5. Travel to Work by mode – Towns in Greater Exeter

3.5.1. The Travel to work mode splits for the largest towns in the Greater Exeter, those with a population over 6,000, is shown below in Table 6.

	Work from Home	Train	Bus, minibus coach	Car	Car Pas	Cycle	Walk	Other
<b>Exeter</b>	8%	2%	9%	45%	5%	6%	22%	2%
<b>Sidmouth</b>	18%	1%	3%	50%	4%	4%	18%	1%
<b>Tiverton</b>	10%	0%	3%	52%	6%	3%	22%	2%
<b>Dawlish</b>	15%	6%	3%	53%	5%	1%	15%	2%
<b>Axminster</b>	20%	1%	1%	54%	4%	2%	17%	1%
<b>Crediton</b>	10%	1%	6%	55%	5%	1%	21%	1%
<b>Seaton</b>	15%	1%	4%	56%	4%	2%	17%	1%
<b>Exmouth</b>	11%	3%	4%	58%	6%	3%	13%	2%
<b>Teignmouth</b>	13%	5%	2%	58%	5%	1%	14%	2%
<b>Honiton</b>	10%	3%	1%	60%	6%	1%	17%	2%
<b>N.Abbot</b>	11%	2%	2%	61%	6%	2%	14%	2%
<b>Cullompton</b>	8%	0%	5%	64%	7%	2%	12%	2%
<b>Kingsteignton</b>	8%	1%	4%	70%	6%	2%	8%	2%

**Table 6: Comparative TTW mode splits of different towns in Greater Exeter Area**

3.5.2. Across all of the towns driving a car is by far the dominant mode choice, broadly accounting for 60% of all trips. Walking is the next most popular, representing around 15-20%, albeit the levels from town to town are much more variable

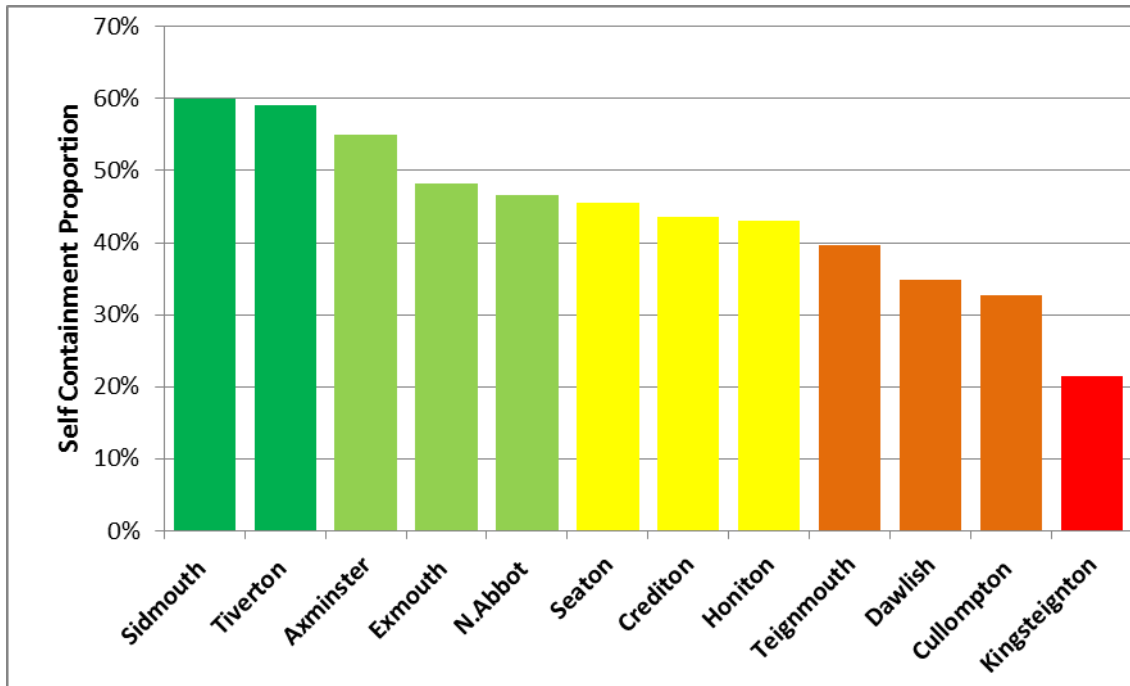
3.5.3. After Exeter, the highest sustainable mode splits are observed in Sidmouth, Crediton, Tiverton and Dawlish. In the first 3 of these towns, walking and cycling account for approximately a quarter of all trips. For Sidmouth and Tiverton this is reflective of the high self containment (over 50%) highlighted in Figure 3-4.

3.5.4. Total public transport splits in excess of 5% are only prevalent in Exmouth, Crediton, Dawlish and Teignmouth.

3.5.5. The coastal towns of Dawlish and Teignmouth in Teignbridge have the highest rail mode splits, most likely reflecting that the majority of dwellings in these settlements are within 1km of the rail station. This is replicated in the central Exmouth town ward, with a rail mode split of 7%, although this split is diluted when figures for the rest of Exmouth are included.

3.5.6. Kingsteignton is the town with the least sustainable travel patterns. Three quarters of residents drive to their place of work. Furthermore, just 10% (1 in 10) walk or cycle to work, the lowest proportion of any town by some distance (Cullompton at 14% is the next lowest).

3.5.7. The levels of self containment in each town identify the proportion of residents in each town who work within that town. This is reproduced in Figure 3-4 to highlight some significant disparities between the towns. This graphic includes the working from home numbers.



**Figure 3-4: Proportion of working population of key towns that work within the town they live in (2011 Census TTW)**

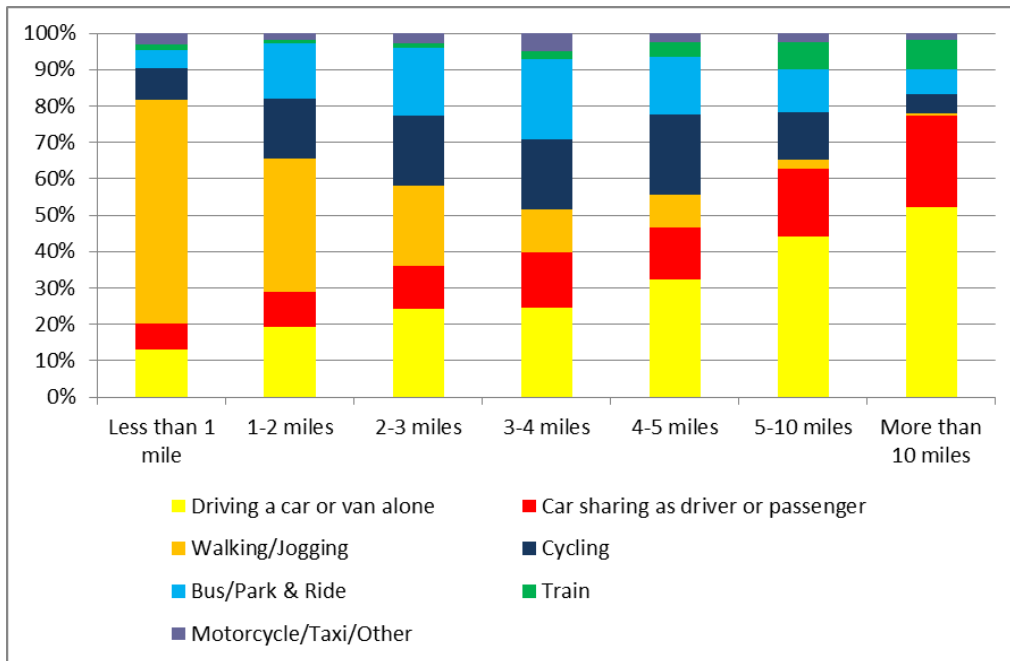
- 3.5.8. Tiverton and Sidmouth show the highest levels of self-containment, with close to 60% of the working population working within the town.
- 3.5.9. Axminster, Exmouth and Newton Abbot are the next highest with a self-containment figure of around 50%. Intuitively, you would expect the largest towns, with a greater number of jobs, services and amenities to have the highest levels of self-containment. Although therefore unsurprising that Newton Abbot and Exmouth have some of the highest levels of self-containment, it does serve to emphasise how self-contained Sidmouth and Axminster are.
- 3.5.10. Similarly, considering that Seaton and Crediton are two of the smallest towns considered, they exhibit an unusually high level of self-containment.
- 3.5.11. At the opposite end, Kingsteignton has by far the lowest levels of self-containment, suggesting it has one of the most unsustainable travel patterns. This is further confirmed by the TTW modal splits for Kingsteignton, shown earlier in Table 6, which show the highest car TTW modal split (70%) of any of the towns in Greater Exeter.
- 3.5.12. Cullompton and Dawlish also have lower levels of self-containment of 26% and 22% respectively. This again manifests in less sustainable travel patterns in Cullompton, although this is not necessarily the case in Dawlish where the TTW data shows it to have one of the lower car mode splits and highest public transport mode shares.

### 3.6. Travel to Work mode choice for major employers in Exeter

3.6.1. As identified Exeter is home to a number of major regional centre of employment, including the RD& E hospital, Met Office, County Hall and University of Exeter.

3.6.2. Many of these large employment sites operate a staff travel plan and staff survey and work with the County to promote sustainable travel to these sites. As part of the survey, mode choice and travel distance is provided. The breakdown of mode based on distance to work is shown below in Figure 3-5.

3.6.3. Alongside this, the total number of respondents within each distance band is set out in Table 7.



**Figure 3-5: Journey to work purpose by distance**

Distance (miles)	<1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10 >	Total
Number Surveyed	499	1036	947	560	391	792	2249	6474

**Table 7: Distance travelled to work by respondents**

3.6.4. As expected, a larger proportion of walking and cycling trips are made for short distance trips. Although the proportion of walking trips decreases linearly as the trip lengths increase, the proportions cycling stays relatively consistent (around 20%) for trips between 1 and 5 miles. Cycling also accounts for 1 in 7 trips for people travelling between 5 and 10 miles to work. This could be as a result of high-quality routes such as the Exe Estuary trail on which people are prepared to cycle longer distances.

3.6.5. Conversely, the dependence on the car is clear to see when trip lengths increase, albeit with higher journey costs car sharing becomes more prevalent. There are however still a reasonably high proportion of people living within 1, 2 and 3 miles of their place of work who travel by car (13%, 19% and 24% respectively).

3.6.6. Rail travel also places a much greater role for longer distance trips.

## 4. Walking

### 4.1. TTW Numbers

- 4.1.1. As identified in the Travel to work data in section 2, walking is the second most popular mode of travel to work across each district in the Greater Exeter Area. This is reaffirmed in the Travel to Work data repeated below, which also highlights that just under 30,000 people in the Greater Exeter area walk to work.

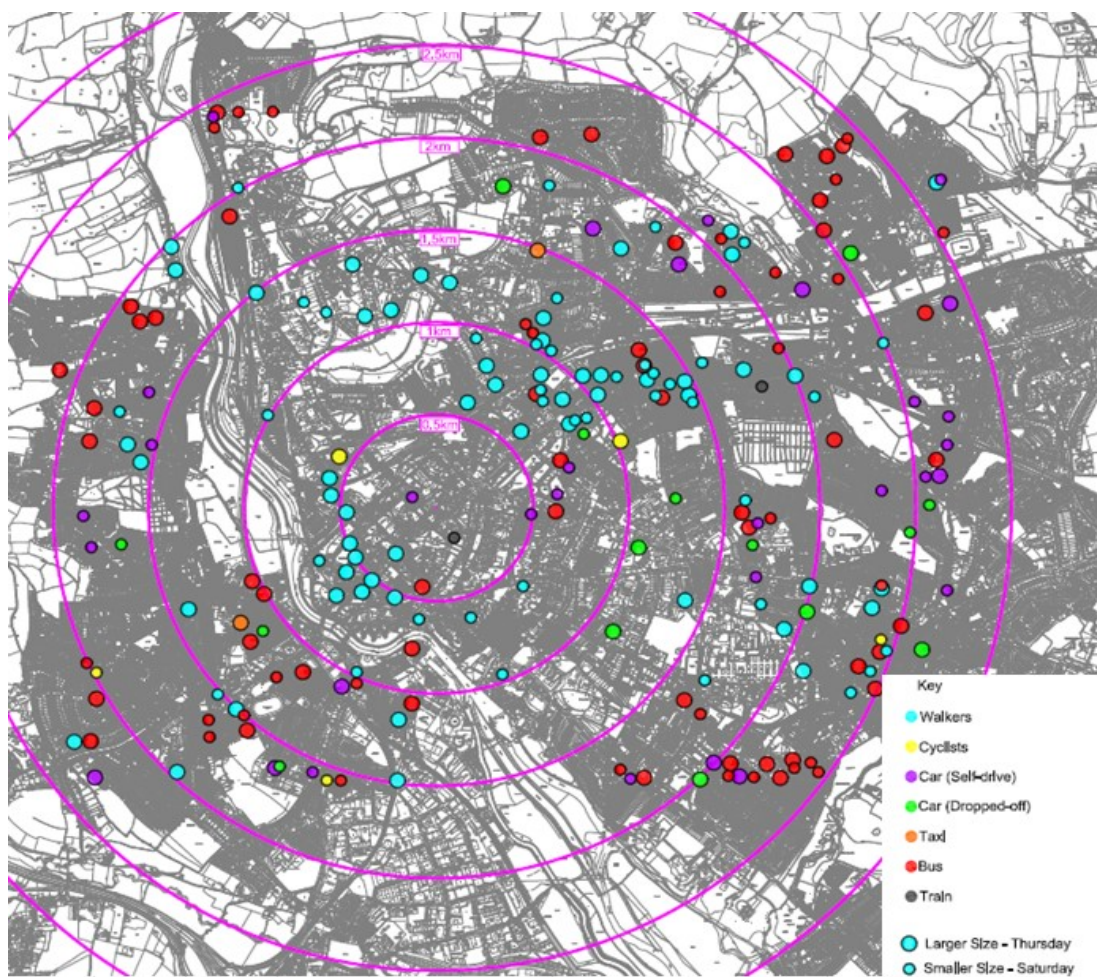
Location	Walk TTW Mode Split			Walk TTW numbers
	1991	2001	2011	2011
Exeter	18%	19%	22%	12,621
East Devon	14%	12%	11%	6,647
Mid Devon	15%	12%	10%	4,357
Teignbridge	12%	11%	10%	5,929
Greater Exeter	15%	13%	14%	29,554

Table 8: Walk Travel to Work Census Data

### 4.2. Propensity to Walk

- 4.2.1. The choice of walking to work is heavily driven by the distance being travelled. Trip length data from the National Travel Survey (NTS) identified that walking accounted for 76% of trips under a mile, falling to 32% between 1-2 miles and 4% for trips between 2-5 miles.
- 4.2.2. This is supported by the Exeter mode choice by distance data in Figure 3-5 which highlights that walking is the dominant mode for trips under a mile, accounting for over 60% of such trips. Although splits reduce drastically for longer trips, the Exeter data also highlighted that walking was still a popular mode choice for trips up to 3 miles, accounting for 20% of the trips to work of between 2 and 3 miles in length.
- 4.2.3. This suggests that walking can still be a significant mode choice for trips above the threshold of 2km traditionally considered in the Transport industry (CIHT).
- 4.2.4. This view seems further supported by the average walk distance of 18 minutes identified in the DfT's 2011 Commuting and Business Travel factsheet. Applying an average walking speed of 4 mph this corresponds to 1.8km. Given the average is so close to this indicative limit, it is reasonable to expect that many trips would be longer than this average.
- 4.2.5. However, it should be noted that the NTS data shows that car journeys make up 21% of trips under a mile, rising to 58% of trips between 1 and 2 miles and 77% of trips between 2 and 5 miles. When considered alongside the walking splits by distance, this seems to indicate that a distance of 2.5km, is a more likely distance above which walking levels drop significantly.
- 4.2.6. Alongside this, it is worth considering how topography and barriers, such as waterways, major road links and railways can significantly increase route lengths and ultimately influence mode choice.

- 4.2.7. Local evidence of this appears to exist for wards in Exeter where although crow flies distances to major employment sites such as Hospital and County Hall are in the region of 2km, the limited crossings of the river lead to lengthier walking routes and the mode splits by car are relatively high for such short journeys.
- 4.2.8. Unfortunately, little continuous data is collected on pedestrian movements. Instead it tends to be recorded on a site by site, or specifically on a scheme by scheme basis.
- 4.2.9. One area where information has been collected is for the Exeter City Centre study in 2010. Pedestrian surveys data enabled the mapping of the journey origins and identification of mode used for those journeys.
- 4.2.10. The postcode mapping for trips from within Exeter to Exeter city centre on a weekday (large dots) and Saturday (smaller dots) are shown below in Figure 4-1.



**Figure 4-1: Postcode mapping by mode of trips to Exeter City Centre**

- 4.2.11. The postcode mapping primarily related to shopping trips to the city centre and therefore is not necessarily reflective of trends across the Greater Exeter area.
- 4.2.12. Nevertheless, the postcode mapping further confirmed the TTW information. In particular, the dominance of walking for short distance trips and that as distances increase, walking is still prevalent albeit at a lower density.

4.2.13. It is notable that on the west side of the city centre there are fewer walking trips despite the close proximity and high density of population. This appears to highlight how particular barriers, such as River Exe and topography, can potentially have a greater impact on mode choice.

### 4.3. Walking as part of a Multi Stage Trip

4.3.1. In addition to forming a single mode choice, walking also forms part of public transport journeys. The 2014 NTS note on Multi Stage trips setting out that 27% of all walking trips are as part of a trip by another mode.

4.3.2. The NTS also sets out that walking stages as part of a multi modal trip, as shown in Figure 4-2, tend to be shorter. This seems sensible that if it forms part of a trip, it is likely to be shorter than for an individual trip.

4.3.3. It is therefore important to ensure that the layout of future developments ensure that the shortest routes to key attractions and public transport nodes are provided.

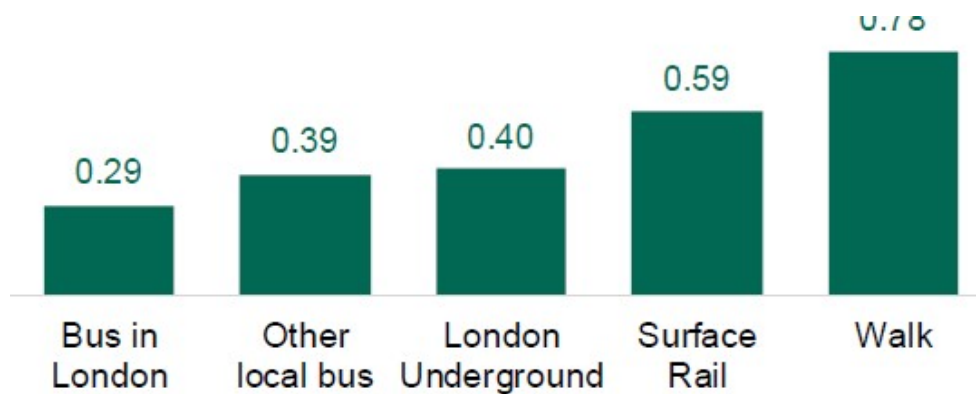


Figure 4-2: Average length in miles of a walking stage by main mode

4.3.4. It is noted that the average walk of 0.78 miles, is shorter in length than the average commute distance. This would seem to be reflective that people are likely to live closer to other amenities (shops/schools) than their place of work.

## 5. Cycling

### 5.1. Introduction

- 5.1.1. Cycling provides a sustainable means of travel, and alternative to private car, for trips of up to 10Km in length. Cycle infrastructure also forms a key part of the County's leisure trail network, with many routes providing an attraction to tourism as well as a transport utility function.
- 5.1.2. The local cycle network has been significantly enhanced in the last 15 years including;
- **Exe Estuary Trail** 16 mile trail running either side of the Exe Estuary connecting Exmouth including bridges over River Clyst and mainline railway
  - **Drakes Trail** a 17 mile route linking Tavistock and Plymouth, including new 305 metre Gem Bridge and refurbishment of 349 metre Grenofen tunnel
  - **Granite & Gears** Improvements, new bridges and extension of 5 existing routes as part of 36 km of new routes across Dartmoor National Park
  - **Exeter Cycle Demonstration town** including construction &/or improvements of 44km of cycle routes within Exeter
- 5.1.3. The County Council is continuing to develop the Exeter Strategic Cycle Routes and rural/leisure routes identified in the Cycling and Multi use Trail Strategy, although the speed of delivery of these will heavily rely on the availability of external funding opportunities.
- 5.1.4. In addition to a number of traffic free routes, cyclists are often able to avoid the congestion on key arterial routes leading to journey times that can be comparable, and sometimes faster, than those by private car.

### 5.2. Modal Splits

- 5.2.1. Since 2001 the travel to work modal share for cycling has been increasing. However, the modal splits for cycling across the Greater Exeter are modest at just 3%, a figure that is boosted by the 6% mode split recorded in Exeter.
- 5.2.2. The TTW work mode splits for each ward across the Greater Exeter area are shown below in Figure 5-1. The modal splits vary considerably across the Greater Exeter area with the highest mode splits being observed in urban areas where people live within a distance where cycling is a realistic option and/or close to higher quality routes such as the Exe Estuary Trail.
- 5.2.3. Reflecting this, the highest cycle modal splits across the Greater Exeter area are observed in Exeter, where mode splits of 10% are observed in the wards of St Leonards and Heavitree North and 9% in Topsham.
- 5.2.4. Conversely, mode splits of less than 1.5% are prevalent across most of the Greater Exeter area as cycling levels outside of the main towns and in rural areas are low. Cycle splits are also very low in vicinity of Teign Estuary and Newton Abbot.

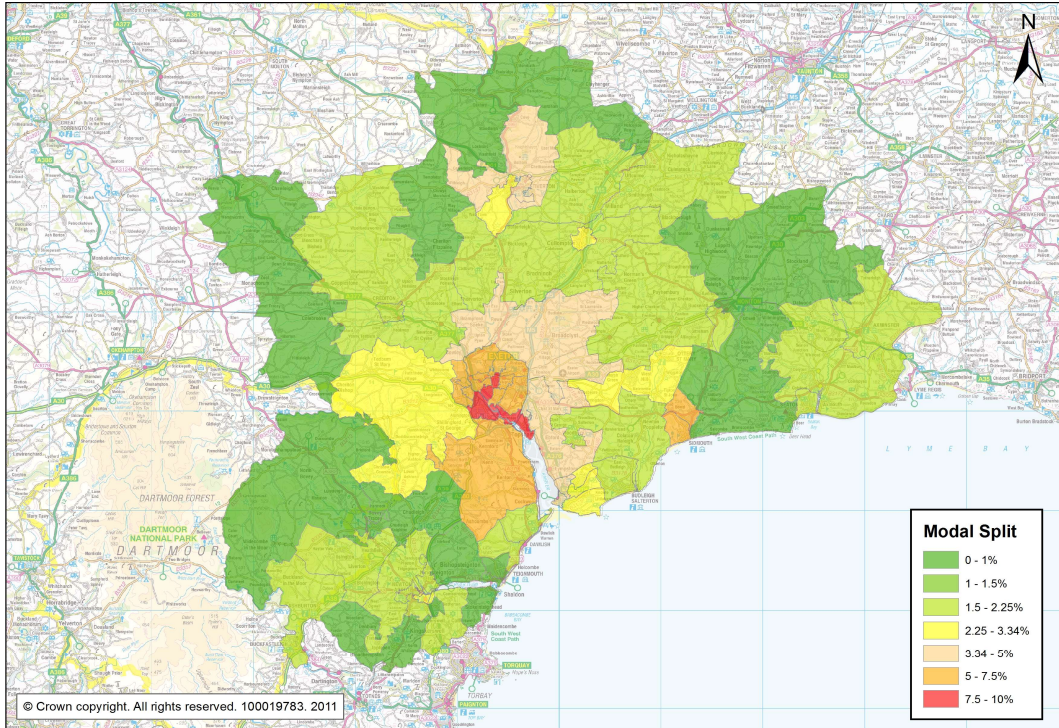


Figure 5-1: Travel to Work by Bicycle Mode Share

### 5.3. Usage

- 5.3.1. The usage of cycle routes has been obtained from a review of 15 automatic cycle counters across the Greater Exeter area. These sites, the location of which is shown in Figure 5-2 below, have at least 5 years data therefore allowing the changing usage to be reviewed. The associated AAWT (annual average weekday traffic) data for these sites is collated in Table 9.
- 5.3.2. It should be noted that there are a number of other counts sites in the Greater Exeter area that are not included as they have only a few years of data.

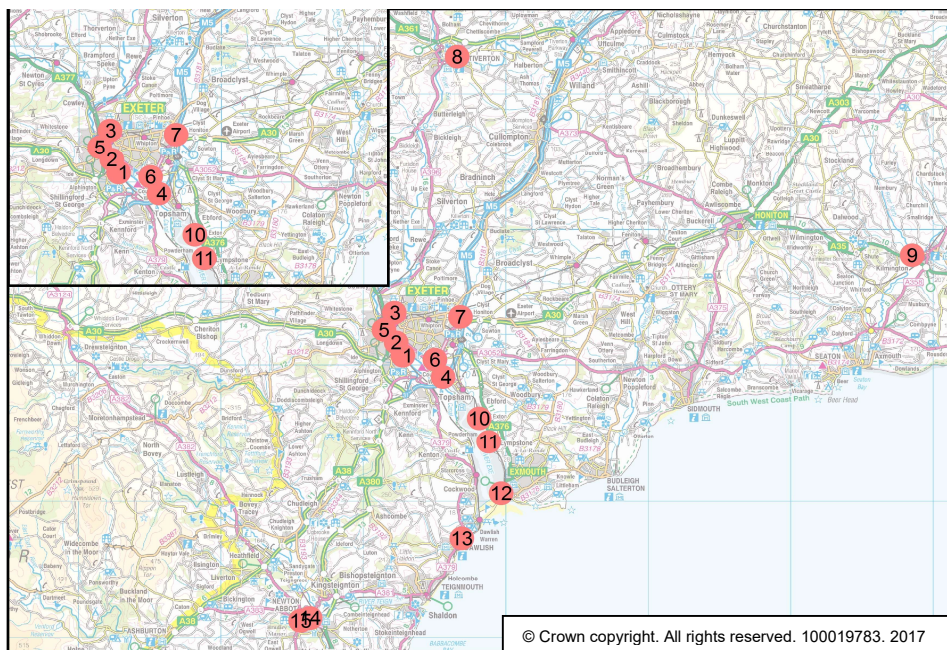


Figure 5-2: Location of Cycle counter sites

Site No.	Location	2005	2010	2015	Annual Change	No of Years	Total Change
1	Riverside	496	634	962	9%	10	+ 94%
2	Haven Banks	466	780	968	11%	10	+ 108%
3	Prince of Wales	N/A	126	204	12%	5	+ 61%
4	Topsham Exeter	127	278	404	22%	10	+ 218%
5	Millers Crossing	198	222	270	4%	10	+ 37%
6	Rydon Lane	125	226	256	10%	10	+ 105%
7	Redhayes Bridge	N/A	33 <sup>*1</sup>	113	60%	4	+ 242%
8	Tiv. Horsden Terrace	47	45	62 <sup>*2</sup>	9%	4	+ 37%
9	Axminster	N/A	18	45 <sup>*2</sup>	38%	4	+ 150%
10	Exton	N/A	269 <sup>*1</sup>	374	10%	4	+ 39%
11	Exe Trail Lypstone	N/A	228	524	26%	5	+ 130%
12	Esplanade	N/A	108	148	7%	5	+ 37%
13	Dawlish	31	41	29	-1%	10	- 7%
14	N.Abbot Marsh Road	N/A	67	73 <sup>*2</sup>	2%	4	+ 9%
15	N.Abbot Lemon Cycle	N/A	24	69 <sup>*2</sup>	47%	4	+ 188%

**Table 9: AAWT Cycle flows at main cycle counters**

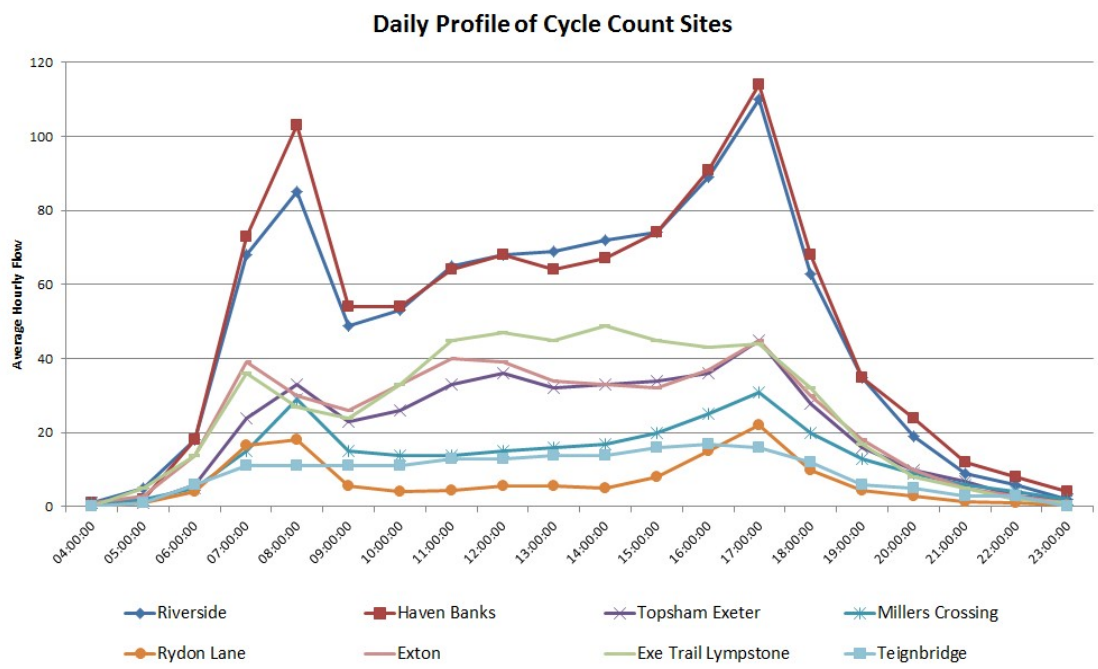
<sup>\*1</sup> No 2010 data. 2011 data used for 2010 value

<sup>\*2</sup> No 2015 data available. 2014 used as 2015 value.

- 5.3.3. Consistent with the TTW mode data, the highest flows are recorded on the sites in Exeter and the eastern side of the Exe Estuary trail where a few hundred cyclists each day are recorded. This peaks on the sections of Exe Estuary trail within Exeter, at Haven Banks and Riverside, where daily flows approach 1,000 cyclists per day.
- 5.3.4. Also consistent with the TTW data, the volumes outside of Exeter are much lower. Nevertheless, these routes have still broadly shown a consistent increase in use. The only exception is at Dawlish, although with the recent extension of the Exe Estuary Trial into Dawlish itself the evidence from other sites suggests this will increase considerably in the next few years.
- 5.3.5. Table 9 emphasises the strong growth on cycling in the Greater Exeter area. This is particularly evident on sites on the Exe Estuary Trail (1/4/10/11), where growth in excess of 10% per annum has been recorded over the last 5-10 years. This highlights that the high-quality cycle infrastructure results in significant cycle growth and usage.

## 5.4. Daily profile

- 5.4.1. The automatic count data has also been reviewed to identify the daily profile on the cycling routes.
- 5.4.2. To provide a clear representation, only the busiest 8 sites from Table 9 above are shown. Sites 13-15 (Dawlish and Newton abbot) are included as a single Teignbridge site.
- 5.4.3. These profiles are shown in Figure 5-3 below. With limited use in the early hours of the morning, only the profile between 04:00 and 24:00 is shown.

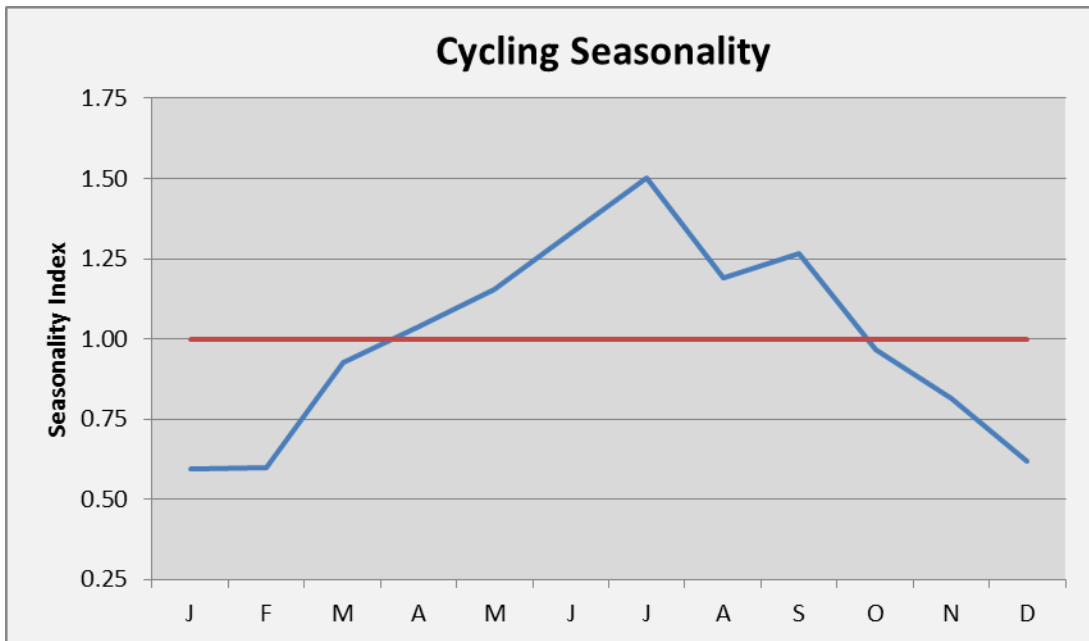


**Figure 5-3: Daily Flow Profile at Cycle Count Sites**

- 5.4.4. The Exeter Riverside routes with the highest use show a clear and significant commuter peak with flows in the AM and PM peak hours approximately two thirds higher than through the day.
- 5.4.5. This profile, albeit at a lesser magnitude, is also observed at Rydon Lane and Millers Crossing.
- 5.4.6. However, the sections of route of Exe Estuary trail at Exton, Lymptstone and Topsham Road show a vastly different profile with flows broadly consistent between 11:00 and 18:00. This also applies on the Teignbridge routes. These profiles indicate wider use of these routes through the day.

## 5.5. Seasonality

- 5.5.1. The seasonality values for each month, with the yearly average as 1.00, for the 15 sites in Table 9 combined is shown in Figure 5-4.
- 5.5.2. The cycle counters across Greater Exeter exhibit clear patterns of seasonality, with the recorded numbers varying considerably depending on the time of year.
- 5.5.3. The seasonality is particularly prevalent when considering that the number cycling in June are over twice those recorded in December.
- 5.5.4. To try and understand the magnitude of this, and noted that numbers are not strictly comparable, applying the seasonality values to the 6% TTW modal splits from the census (undertaken on 27<sup>th</sup> March 2011, which is considered neutral) then the seasonality would manifest itself in cycling TTW mode shares reaches a high in June of 9% and a minimum of around 4% in December and January.
- 5.5.5. Reflecting that cycling also follows the typical commuter and school peaks periods, the numbers in August are the lowest of the summer months.



**Figure 5-4: Cycle Seasonality**

- 5.5.6. When considering the ratio of flows in the Summer months (May-September) against Winter months (November - March) on each of the routes, the highest ratios are observed at the sites forming part of Exe Estuary trail or Riverside routes. The relevant ratio for these is approximately 1.85-2.15.
- 5.5.7. By comparison the sites away from the river such as Redhayes Bridge and Rydon Lane show lower ratios of approximately 1.5. This is indicative of more consistent levels of use through the year.
- 5.5.8. However, it is unclear if these greater ratios arise from the riverside routes because of a fall in regular users (i.e. commuters) during winter, or an uplift in less regular users (such as leisure trips) through the day in Summer.

## 6. Public Transport – Bus and Park & Ride

### 6.1. Introduction

6.1.1. This section explores the trends in travel for Bus and Park and Ride services across the Greater Exeter area.

### 6.2. Bus Patronage

6.2.1. There have been a number of improvements to public transport services across the Greater Exeter area over the last 20 years. This has included improvements to routes (upgrading of stops, bus priority measures) as well as vehicle and customer facility improvements including new low-floor buses allowing better access for all passengers, better seating and free Wi-Fi.

6.2.2. In addition, the national concessionary travel scheme allowing free travel for people over the age of 60, subsequently restricted to pensioners, has further boosted patronage.

6.2.3. Data on the usage of services has been requested from Stagecoach, the operator of the majority of services in the Greater Exeter Area. The data provided in Figure 6-1 below indicates the average daily bus passengers in Exeter. This is based on the total patronage for all services that do not leave the City boundaries divided by 365.

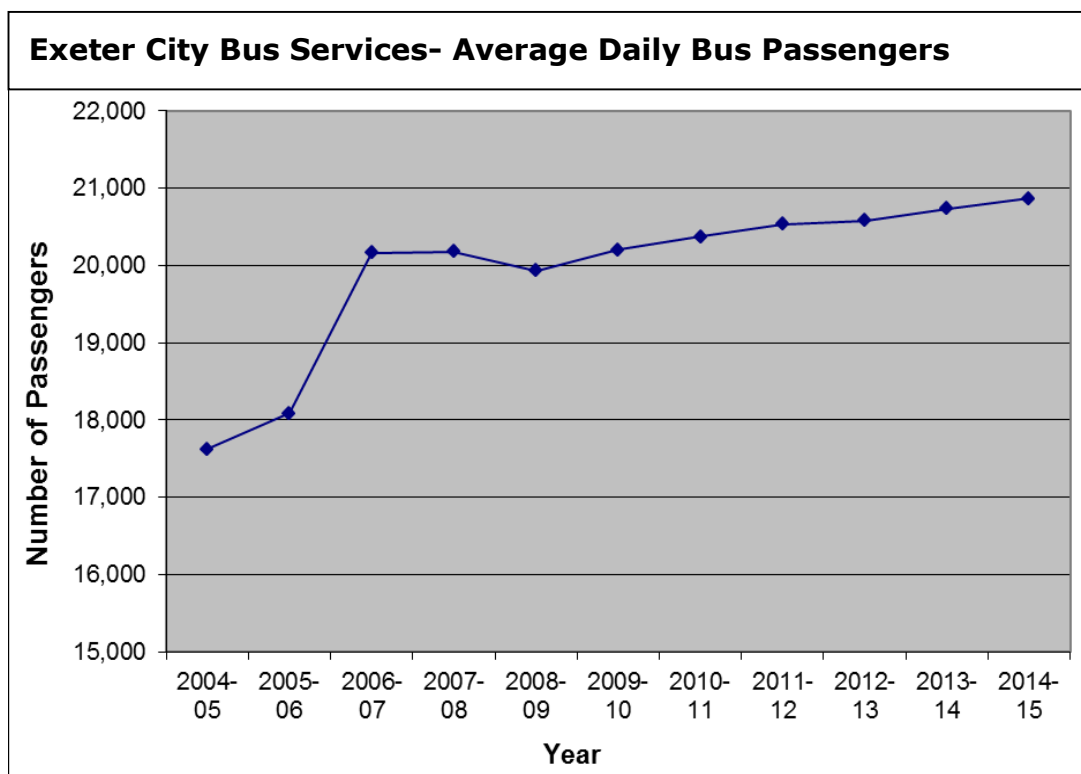


Figure 6-1 Exeter Average Daily Bus Passengers (City Services only)

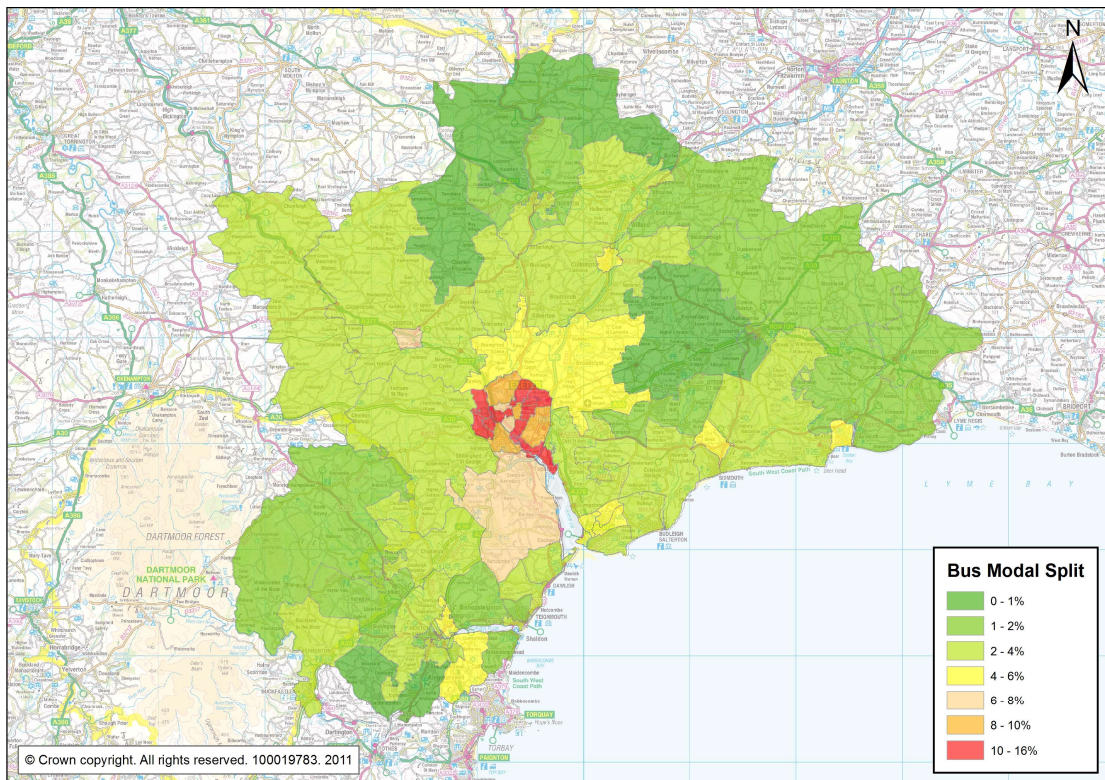
- 6.2.4. The Exeter data shows that the number of people using Exeter bus services each day has risen by 18% in the last 10 years, corresponding to over 3,000 people per day. A significant portion of this increase, approximately two thirds, occurs in 2005/06 and therefore appears to be linked to the introduction of concessionary travel.
- 6.2.5. The increase in Exeter is broadly consistent with the increase over the same period across England, where the number of trips has increased by 15% from 1,012 million in 2004/05 to 1,161 million in 2014/15. A rise has been recorded across Devon, albeit only available from 2009/10 shows an increase of 12% in total bus trips. This manifests as an 9% increase in journeys per head of population.
- 6.2.6. However, it should be noted that the most recent DfT publications show bus patronage across England and Devon fell last year. This drop (2% nationally) is driven by a 12.3 % reduction in mileage on Local Authority supported services outside London. This is also observed in the DfT Devon data which showed an 8% fall from 14/15 to 15/16. It is unclear if the fall from 2014/15 to 2015/16 is a blip in the previous growth, or likely to be the start of a downwards trend.
- 6.2.7. Given that bus trips per person have been rising, the influence of concessionary travel possibly explains why the increase is not necessarily reflected in TTW bus mode splits.

### 6.3. TTW Data

- 6.3.1. The Census TTW data in Section 2 showed that over the last over the last 20 years the use of bus services for commute trips has remained consistent, with the combined change across Exeter, Mid Devon, Teignbridge and East Devon of just 0.7%. When considering this slight uplift against the rising population, it represents a fall in the proportion of people traveling by bus to work.
- 6.3.2. TTW data highlights that of all the districts the highest bus mode share occurs in Exeter. Given that bus coverage is focused on Exeter and frequency is highest in urban areas, particularly in Exeter, this is not surprising.
- 6.3.3. The data for the districts does however partially hide the data for the towns, but sub analysis shows the relative travel to work mode splits for the following towns in the Greater Exeter area. These figures are the splits of those making a work trip (so excludes work from home shown in Table 6).

District	Town	Bus TTW Mode Split
<b>Exeter</b>	<b>Exeter</b>	<b>10%</b>
<b>East Devon</b>	Honiton	2%
	Exmouth	5%
	Seaton	5%
	Sidmouth	4%
<b>Mid Devon</b>	Crediton	7%
	Cullompton	6%
	Tiverton	4%
<b>Teignbridge</b>	Kingsteignton	5%
	Dawlish	4%
	Teignmouth	3%
	Newton Abbot	3%

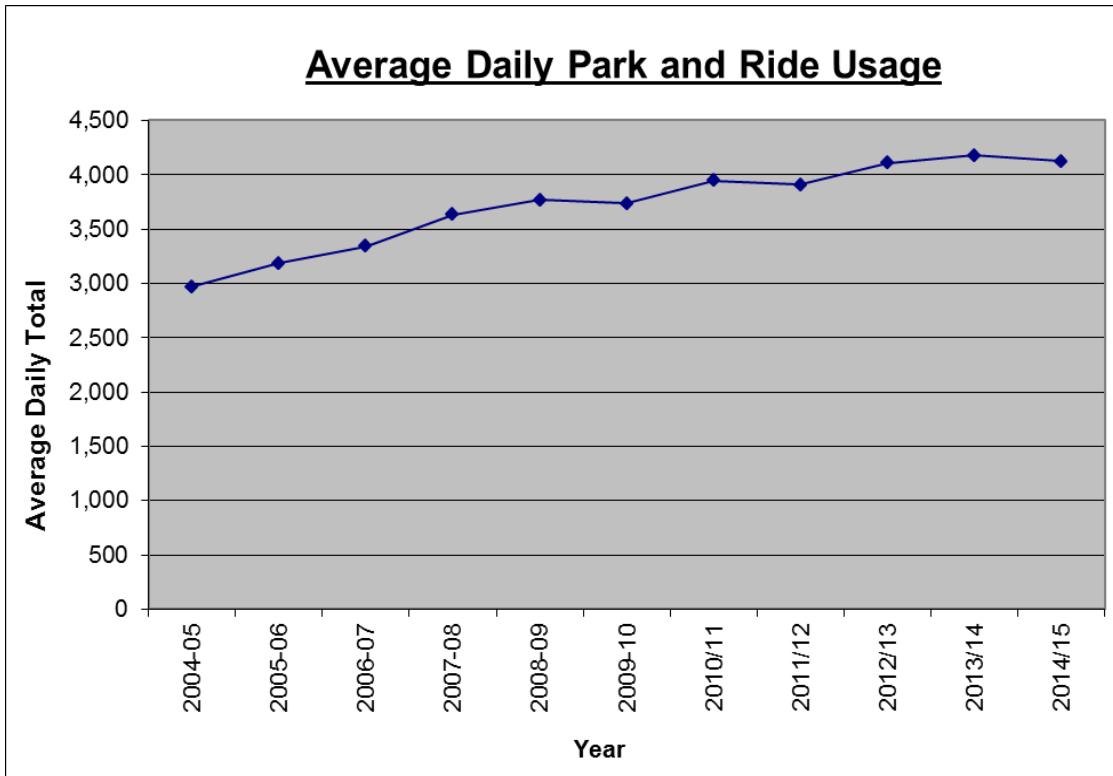
**Table 10: Bus Mode Splits for towns in Greater Exeter Area**



**Figure 6-2: Bus TTW Mode Split across Greater Exeter Area**

## 6.4. Park and Ride

- 6.4.1. There are currently 3 commercial services for Exeter in operation at Matford, Sowton and Honiton Road as well as two separate dedicated services serving the hospital (from Digby) and County Hall (from Sowton).
- 6.4.2. The 3 commercial Park and Ride services operate 4-5 services an hour at each site and carry over 1.5 million passengers a year. The services are used by commuters, shoppers and visitors and usage has increased steadily over the last 10 years.
- 6.4.3. Annual daily patronage, again based on 365 days, is shown in Figure 5-2 below. This shows the increase in average patronage from just under 3,000 passengers a day in 2004/5 to 4,100 in 2014/15. This represents a rise of 39%, equivalent to 420,000 additional Park and Ride trips per year.



**Figure 6-3 Annual Park and Ride Change**

6.4.4. There are however routes into Exeter which are not currently served. The west of the city is an area which has long been in need of a Park & Ride service with Alphington Road suffering from congestion and air quality concerns and there is no provision for routes from the north of the city.

## 7. Public Transport – Rail

### 7.1. Greater Exeter Rail Network

- 7.1.1. Situated at the confluence of two rail lines from London and for train services into the South West Peninsula, Exeter is at the heart of Greater Exeter rail network.
- 7.1.2. The mainline services to London also provide high speed rail connections to settlements across the Peninsula, including Taunton, Tiverton and Plymouth. Cross country services also provide services heading north to Bristol, Birmingham and beyond.
- 7.1.3. In addition, there are a number of branch lines which connect Exeter to the largest settlements in the Greater Exeter area, including Exmouth, Newton Abbot and Crediton, and across the County, namely Barnstaple. These branch lines remove trips from busy road corridors and provide links to main line services.
- 7.1.4. The rail network for the region is shown below in Figure 7-1. A nominal 1Km catchment around each rail station, reflecting a 10-minute walk, across the Greater Exeter area, and within Exeter are further highlighted in Figure 7-2 and Figure 7-3 below. These include the proposed Marsh Barton station.
- 7.1.5. To build upon this extensive coverage and further improve rail connections between market towns and Exeter the County Council has a Devon Metro project, setting out a program of new stations, rolling stock, improved integration and service quality.



Figure 7-1: South West Railway Network



## 7.2. Rail Patronage

7.2.1. Below sets out the usage of the mainline rail stations within the Greater Exeter Area, and those at the end of local branch lines, and how usage has changed over the last 15 years.

	2000/01	2004/05	2009/10	2014/15	% change
Exeter St David's	1,449,186	1,632,000	2,153,000	2,509,220	73%
Exeter Central	1,031,718	1,046,000	1,512,000	2,343,636	127%
Newton Abbot	569,090	721,000	941,000	1,141,040	101%
Tiverton Parkway	178,153	203,000	355,000	447,284	151%
Honiton	241,650	256,000	293,000	391,860	62%
Axminster	208,879	182,000	211,000	386,226	85%
Paignton	303,107	346,000	472,000	631,506	108%
Barnstaple	155,934	194,000	303,000	427,394	174%
Exmouth	578,218	624,000	723,000	927,182	60%
<b>Total</b>	<b>4,715,935</b>	<b>5,201,000</b>	<b>6,963,000</b>	<b>9,205,348</b>	<b>95%</b>

**Table 11: Annual Change Rail Customers outside of Exeter**

7.2.2. Table 11 identifies a considerable increase in usage across all of the main rail stations in the Greater Exeter area, ranging from of 60% at Exmouth to 175% at Barnstaple station. Noticeably there are five stations with over a 100% increase in patronage in the last 15 years.

7.2.3. The overall change is close to a doubling in usage over the last 15 years from 4.7 million passengers to 9.2 million in 2014/15.

7.2.4. This data is believed to provide a minimum estimate of actual rail travel numbers as people who have travelled on the trains without a ticket do not get recorded. This is likely to be highest on the smaller branch line and Exeter stations which do not have ticket barriers or ticket machines, and where short distance journeys can be made without passing through a station with a barrier.

### Branch Lines

7.2.5. A summary of the branch line services in the peninsula is provided in Table 12. Primarily there are considered to be 3 branch line services Avocet, Tarka and Riviera although for purposes of this analysis the East Devon section of the West of England mainline out to Axminster is included as it serves a strong local function.

Branch Line	End of Branch Line	Mainline Station	Length of journey (mins)
Avocet	Exmouth	Exeter St David's	30 Minutes
Tarka	Barnstaple	Exeter St David's/ Exeter Central	60 Minutes
Riviera	Paignton	Newton Abbot	Approx. 30 Minutes
East Devon section of West of England mainline	Axminster	Exeter Central	30 Minutes

**Table 12: Summary of the Branch Lines in proximity of Exeter**

- 7.2.6. Patronage growth on the branch lines has been even stronger than on the major stations. Table 13 shows the continued growth of patronage that has occurred during the past 14 years with all lines showing at least an 80% rise in patronage, with the Avocet and Tarka lines more than doubling. These trends reflect the changes in mode share in Devon observed by the TTW census and emphasises the growing role that rail plays in the Greater Exeter area.
- 7.2.7. The Riviera line in particular includes a number of well used stations, with over 550,000 passengers recorded at Dawlish and 600,000 at Teignmouth stations. This aligns with the high rail TTW mode splits for these towns.
- 7.2.8. It should be noted that the patronage at Exeter St David's and Exeter Central are excluded from these figures. Reflecting the mix of mainline and local services the Riviera line has also been sub divided.

Branch Line		2000/01	2004/05	2009/10	2014/15	Growth
Avocet		978,890	1,087,587	1,451,178	2,088,054	113%
Tarka		217,009	275,353	472,368	599,364	176%
Waterloo (Pinhoe-Axminster)		552,139	543,279	661,728	1,006,388	82%
Riviera	All	1,934,449	2,321,476	3,080,844	4,136,724	114%
	Torre-Paignton	669,318	797,446	986,976	1,363,938	104%
	St Thomas- N.Abbot	1,265,131	1,524,939	2,093,868	2,772,786	119%

**Table 13: Patronage on Branch Lines**

Exeter Stations

- 7.2.9. For a relatively small city, Exeter is well served by rail with five rail lines and nine stations. Since 2000/01 the patronage at Exeter stations has increased from just under 2.8 million passenger trips in 2000/01 to approximately 6.1 million trips in 2014/15, an increase of 121%. This is shown in Table 14.
- 7.2.10. Growth at Exeter St David's and Exeter Central station's makes up the bulk of the increase in passenger numbers, but it is the stations within Exeter which have experienced the largest increases. For example, there has been a 550% increase in patronage at Digby & Sowton station and over 1300% percent at Pinhoe station over the previous 15 years.

	2000/01	2004/05	2009/10	2014/15	% change
Exeter St David's	1,449,186	1,632,000	2,152,786	2,509,220	73%
Exeter Central	1,031,718	1,046,000	1,512,286	2,343,636	127%
St James Park	27,126	27,477	46,754	64,586	138%
Pinhoe	6,132	12,959	38,326	88,872	1349%
Polsloe Bridge	39,728	43,788	70,038	116,552	193%
Digby & Sowton	87,639	134,804	271,316	571,510	552%
Topsham	98,174	127,903	186,056	231,122	135%
Exeter St Thomas	35,673	64,295	103,488	213,848	499%
<b>Total</b>	<b>2,775,376</b>	<b>3,089,226</b>	<b>4,381,050</b>	<b>6,139,346</b>	<b>121%</b>

**Table 14: Annual Change Rail Customers in Exeter**

- 7.2.11. The newest of these, Newcourt, was opened in June 2015, but not included in the above table.
- 7.2.12. Although the overall mode share for travelling by train is low, mode splits within catchment areas are much higher and the strong patronage growth emphasises the strong role local rail stations can play as part of an urban transport system.

### 7.3. Seasonality

- 7.3.1. Seasonality for rail has been calculated from the monthly patronage on the Tarka, Avocet and Riviera Branch lines. An average of these, indicated by the thick black line, is also shown alongside the seasonality for the individual lines below in Figure 7-4.
- 7.3.2. Although there are some variations, overall the rail patronage appears to be relatively flat across the year.
- 7.3.3. The main exception across all 3 lines is a drop-in patronage of 15-20% in April. This seems to be as a result of reduced travel during the Easter Holidays. Similarly, albeit to a much lesser magnitude, numbers are also below average in January (except on Avocet Line). This is consistent with the highway seasonality explored in section 8.7.
- 7.3.4. The other notable variation occurs during August and September where volumes on the Riviera line increase but fall on the Avocet line.

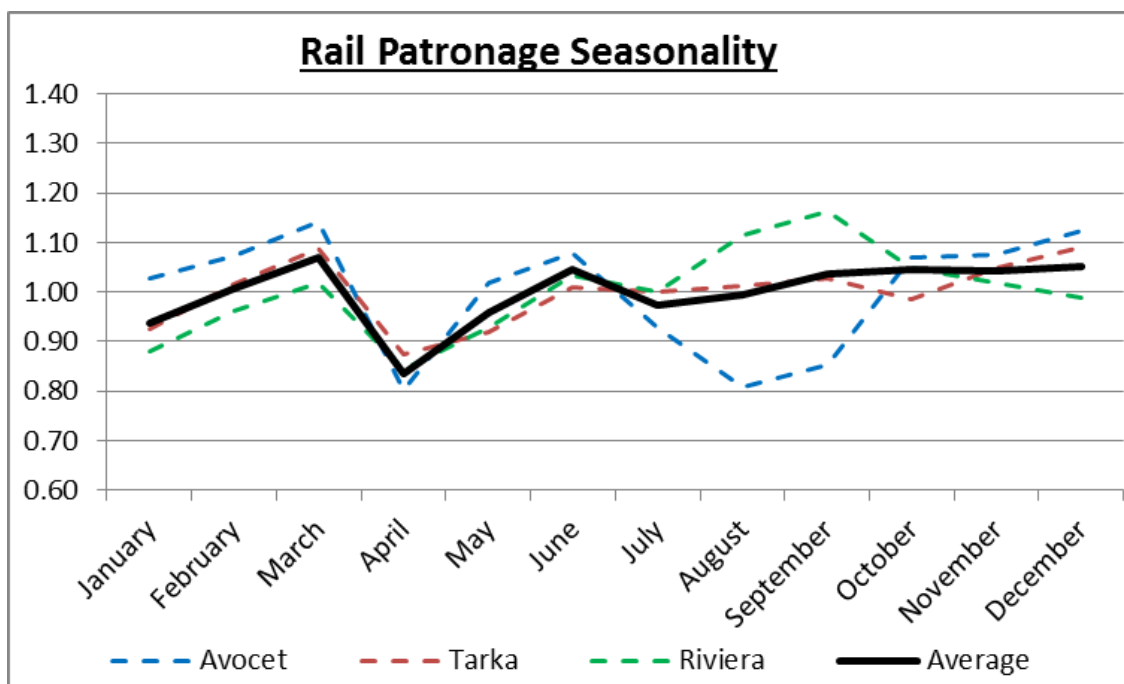
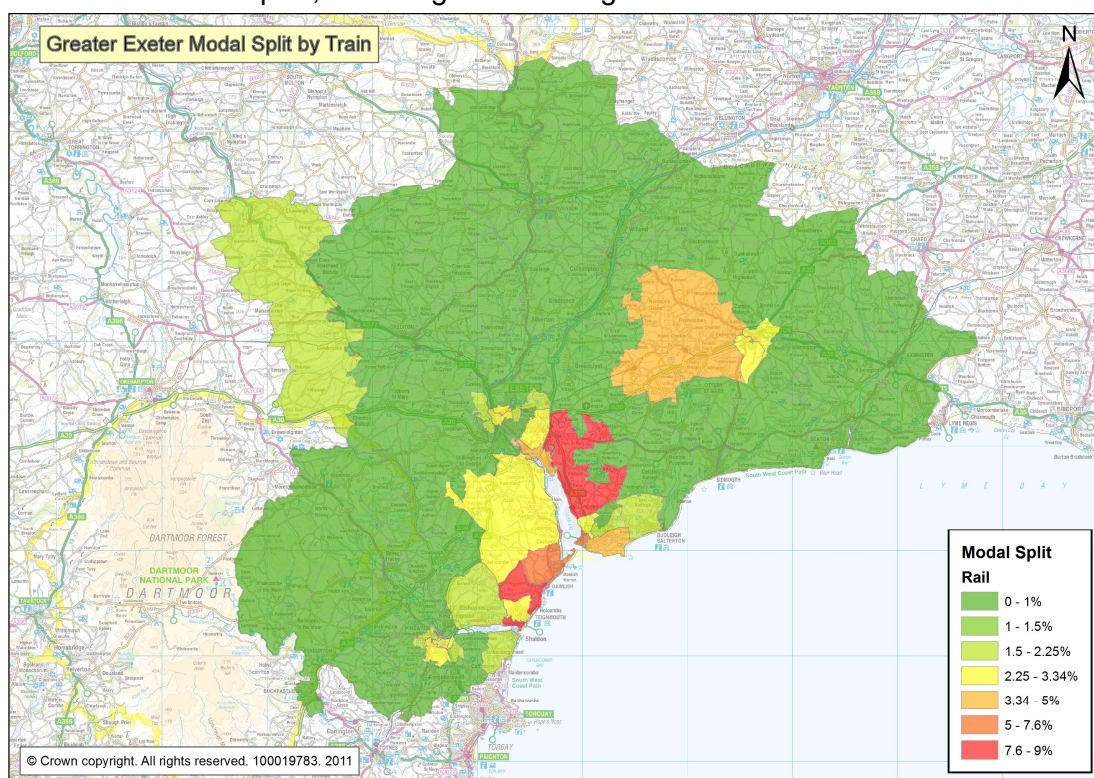


Figure 7-4: Rail Seasonality on Branch Lines in Greater Exeter Area.

### 7.4. TTW Data

- 7.4.1. The rail TTW mode splits shown in Figure 7-5 below largely reflect the Patronage data in section 7.2 above.

- 7.4.2. The mapping does help to emphasise the hot spots of rail usage. This includes the towns of Teignmouth and Dawlish, as referred to in section 3.6 above, but also the Exmouth Town ward and the wards along the east of Estuary.
- 7.4.3. The draw on the East Devon section of the Waterloo Line is varied. However, with patronage growth of 35% from 2010/11 to 2014/15 and the opening of Cranbrook Station in 2015 any future TTW data would be expected to show a band of areas of modest rail usage along this corridor.
- 7.4.4. The mapping also serves to highlight how rail splits tend to be more variable across the area than bus splits, reflecting that coverage of rail stations is more limited.



**Figure 7-5: Rail TTW mode split across Greater Exeter Area.**

## 7.5. Rail Capacity

- 7.5.1. The capacity on the rail line is identified through load factor analysis, which is typically published through the relevant route studies.
- 7.5.2. Load Factor information for the Greater Exeter area is presented in the 2015 Western Route Study. In particular, Figure 7-6 shows the 2023 predicted load factor for services arriving at Exeter St David's in the AM peak hour (08:00-08:59). It should be noted that this includes an account for additional seats expected to be provided on branch line services to Exmouth, Paignton and Barnstaple through the franchise renewal process.
- 7.5.3. This highlights that the stations into Exeter, particularly on the Avocet branch and services towards Cranbrook are expected to be operating at close to 100% load factor by 2023. The County Council has identified a need to enhance frequency on the West of England mainline in the Local Transport Plan 3 2011-2026.

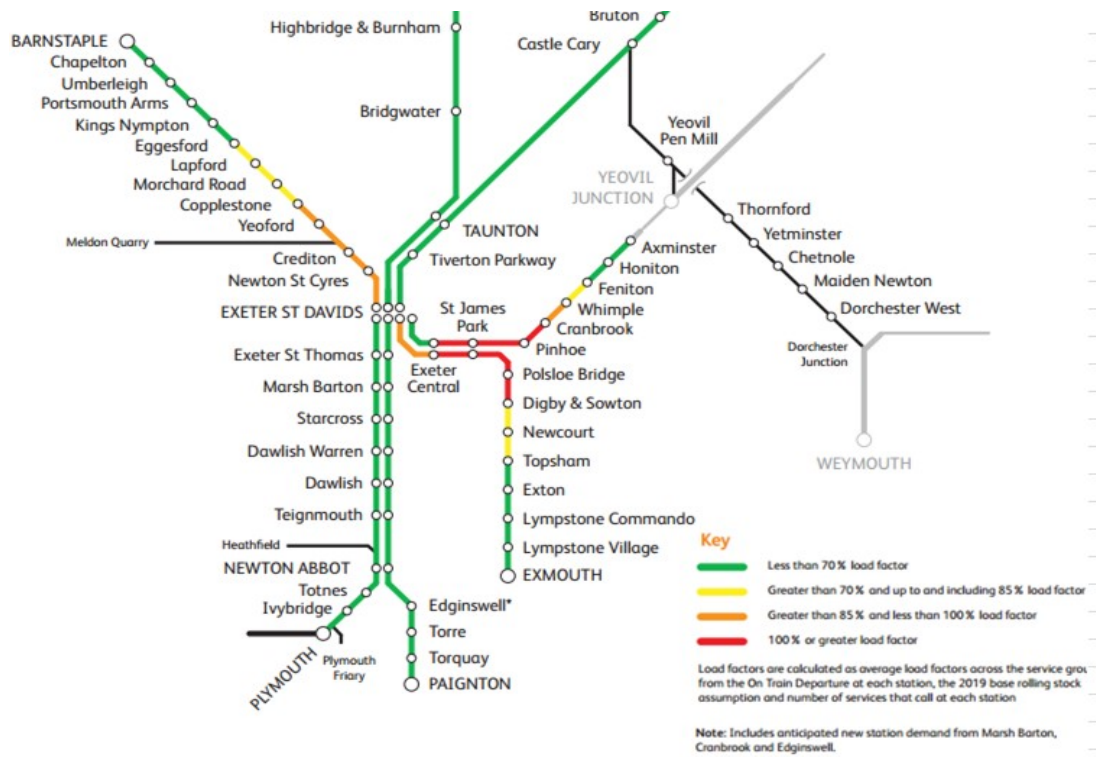


Figure 7-6: Estimated 2023 Load Factor on services arriving into Exeter St David's in AM peak

## 8. Vehicular Traffic

### 8.1. Introduction

8.1.1. This section explores the traffic levels and patterns on the local and strategic highway network in the Greater Exeter area. This includes data on car ownership, traffic levels, flow profiles, purpose splits and comparisons with national forecasts.

### 8.2. Car Ownership

8.2.1. Since 1991, the number of households with access to a car or van, as recorded in the Census, has increased. This is highlighted in Table 15. Notably, across the whole Greater Exeter area the number of households with access to a car has increased from 3 in 4 (75%) in 1991 to over 4 in 5 (81%) in 2011. The rate of increase has however slowed down since 2001, rising just 1% compared to 5% from 1991-2001.

8.2.2. For East Devon, Teignbridge and Mid Devon around 2 out of every 9 households did not have access to a car in 1991. By 2011, this figure had fallen to 2 out of every 13 households.

8.2.3. Car ownership levels in Exeter are markedly different from the other districts, although the trend in car ownership is consistent with the districts as the proportion with access to a car has increased from 2 in 3 in 1991 to almost 3 in 4 by 2011.

Percentage of households with access to a car			
	1991	2001	2011
East Devon	77%	82%	84%
Exeter	67%	72%	73%
Mid Devon	79%	83%	86%
Teignbridge	77%	82%	84%
Greater Exeter Area	75%	80%	81%

Table 15: Percentage of Households with access to a car

8.2.4. Similarly, as shown in Table 16, the average number of cars per household has also increased over this period by 20-25% from 1991 to 2011.

8.2.5. Considering the whole Greater Exeter area, 45% of households have access to one car, 28% two cars, 7% 3 cars and 3% of households have 4 cars or more. It should be noted that to calculate the average number of cars per household in Table 16, 4 or more is assumed to be 4.

Average number of cars per household			
	1991	2001	2011
East Devon	1.1	1.2	1.4
Exeter	0.9	1.0	1.1
Mid Devon	1.2	1.3	1.5
Teignbridge	1.1	1.3	1.4
Greater Exeter Area	1.1	1.2	1.3

Table 16: Average Number of cars per household

8.2.6. Although car ownership is rising, the number of journeys being made by each car is falling. This is further supported by the National data in the annual DfT Road use Statistics in Figure 8-1 that show that average mileage per person has been falling since 2002 (when their records begin).

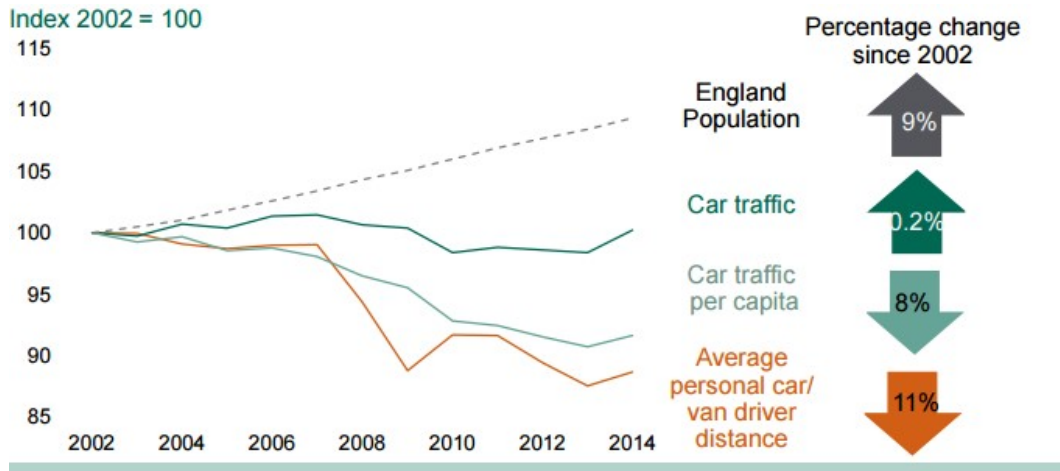


Figure 8-1: Average distance travelled per person (DfT: Road use statistics 2016)

### 8.3. Traffic Flow Data

8.3.1. Data has been collected from 30 local ATC sites and 15 TRADS sites within the study area to assess the annual and hourly variation of traffic flows. A map showing the locations of all local ATC and TRADS sites is shown in Figure 8-3.

8.3.2. Table 18 details the local ATC and TRADS sites, their location, the site number allocated and the years for which data was collected.

8.3.3. These data sources provide a useful evidence base to explain how recent development growth in the city has impacted on the transportation network, and how investment in sustainable transport modes has helped manage congestion.

8.3.4. To identify the function of various certain routes in and around the study area the traffic analysis has been split into 5 groupings:

- An Inner Cordon of Exeter Radial Routes;
- Exeter Outer Ring Road;
- An Outer Cordon of roads into Exeter;
- Districts, with a set of links in Mid Devon, East Devon and Teignbridge; and
- Strategic Road Network

8.3.5. At each site, where data is available, analysis has been completed and the following information calculated:

- Annual trends and average growth in Annual Average Daily Traffic (AAWT) from 2005 to 2015;
- Identification of peak hours of traffic flow on a typical weekday through looking at traffic profiles for the year 2014.

## 8.4. Strategic Road Network Data

8.4.1. Table 17 shows AAWT flows, trends, observed growth and seasonality indices at each site. The seasonality index is defined as the ratio of the average August weekday flow (Monday to Friday) in the neutral months, (April, May, June, September and October), excluding periods affected by bank holidays.

Site No.	Site Name	AAWT			Annual change	No. of years	Total Change	Seasonality Index
		2005	2010	2014				
26	Junction 27 - 28	29992	29325	31686	0.6%	9	5.6%	*1
	Junction 28 - 27		30614	31977	1.1%	4	4.5%	1.17
27	Junction 28 - 29	27309	30533	32010	1.9%	9	17.2%	1.14
	Junction 29 - 28	30740	30114	33278	0.9%	9	8.3%	1.17
28	Junction 29 - 30	34274	37822	42064	2.5%	9	22.7%	1.15
	Junction 30 - 29	36912	38472	41326	1.3%	9	12.0%	1.14
29	Junction 30 - 31	34519	41589	42963	2.7%	9	24.5%	1.18
	Junction 31 - 30	35147	38548	38549	1.1%	9	9.7%	*1
<b>Average M5 traffic</b>		<b>32699</b>	<b>34627</b>	<b>36732</b>	<b>1.4%</b>	<b>9</b>	<b>12.3%</b>	
30	A30 EB (East of J29)	15336*	15006	15463	0.1%	7	0.8%	1.13
	A30 WB (East of J29)	19319*	18862	20938	1.2%	7	8.4%	1.12
31	A38 to A377 NB	39993*	37901	40023	0.0%	7	0.1%	1.07
	A377 to A38 SB	40817*	38593	41837	0.4%	7	2.5%	1.06
32	A38 NB	20734*	19958	20972	0.2%	7	1.1%	1.08
	A38 SB	21150*	20741	21290	0.1%	7	0.7%	1.08
33	A30 EB (west of Ide)	14893	15003	15193	0.2%	9	2.0%	1.31
	A30 WB (west of Ide)	13989	15277	15877	1.5%	9	13.5%	1.28

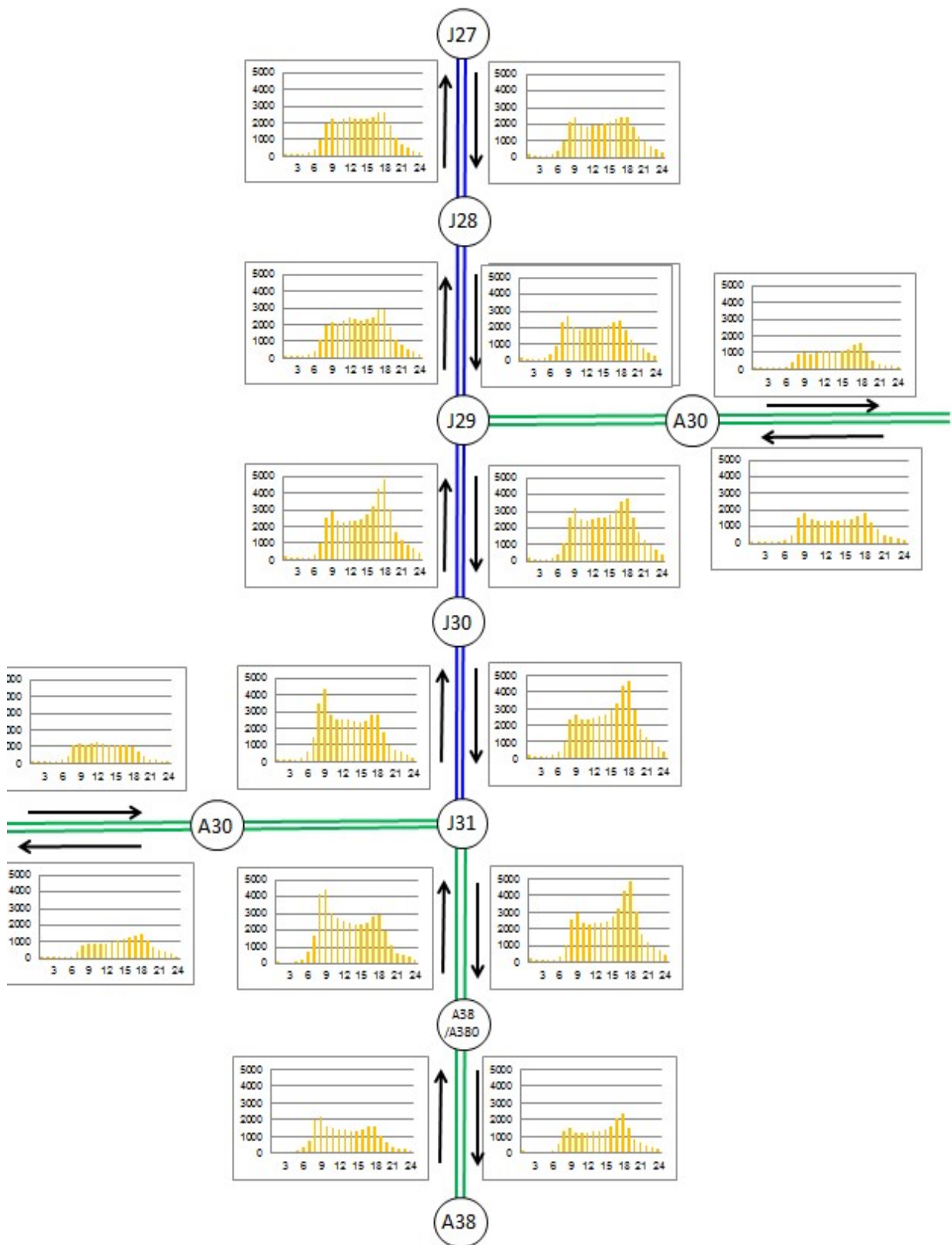
**Table 17: AAWT for TRADS Sites (2005, 2010 and 2014)**

**Notes** \*1 August data not available.  
\*No 2005 data, 2007 as base value

8.4.2. ATC data collected on the A30 and A38 showed a steep increase of traffic levels with count data obtained or 2005 being particularly low. In light of this, the base year for these sites is 2007, giving a better representation of changes in the past 7 years.

8.4.3. The general trend from the data collected over the past 9 years have shown gentle increase in flows, with Junction 30 to 31 showing the biggest increase of 2.7%. All sites have quite seasonality indices with 1.28 being calculated for the A30 WB between A377 and A382, demonstrating the levels of holiday traffic on the trunk road network.

8.4.4. Figure 8-2 below displays the daily flow profiles for each TRAD site identified in Figure 8-3. It is clear to see that between J29 to J30 and between J30 and J31 there is a clear tidal flow profile. This represents the commuting patterns as found in the journey purpose section. Traffic flows are noticeably lower on the A30 (east of J29 and west of J31).



**Figure 8-2: Summary of SRN flows 2014**

## 8.5. Local Highway Network Data

8.5.1. Figure 8- 3 provides an overview of how traffic flows have changed across sites in Greater Exeter is provided below.

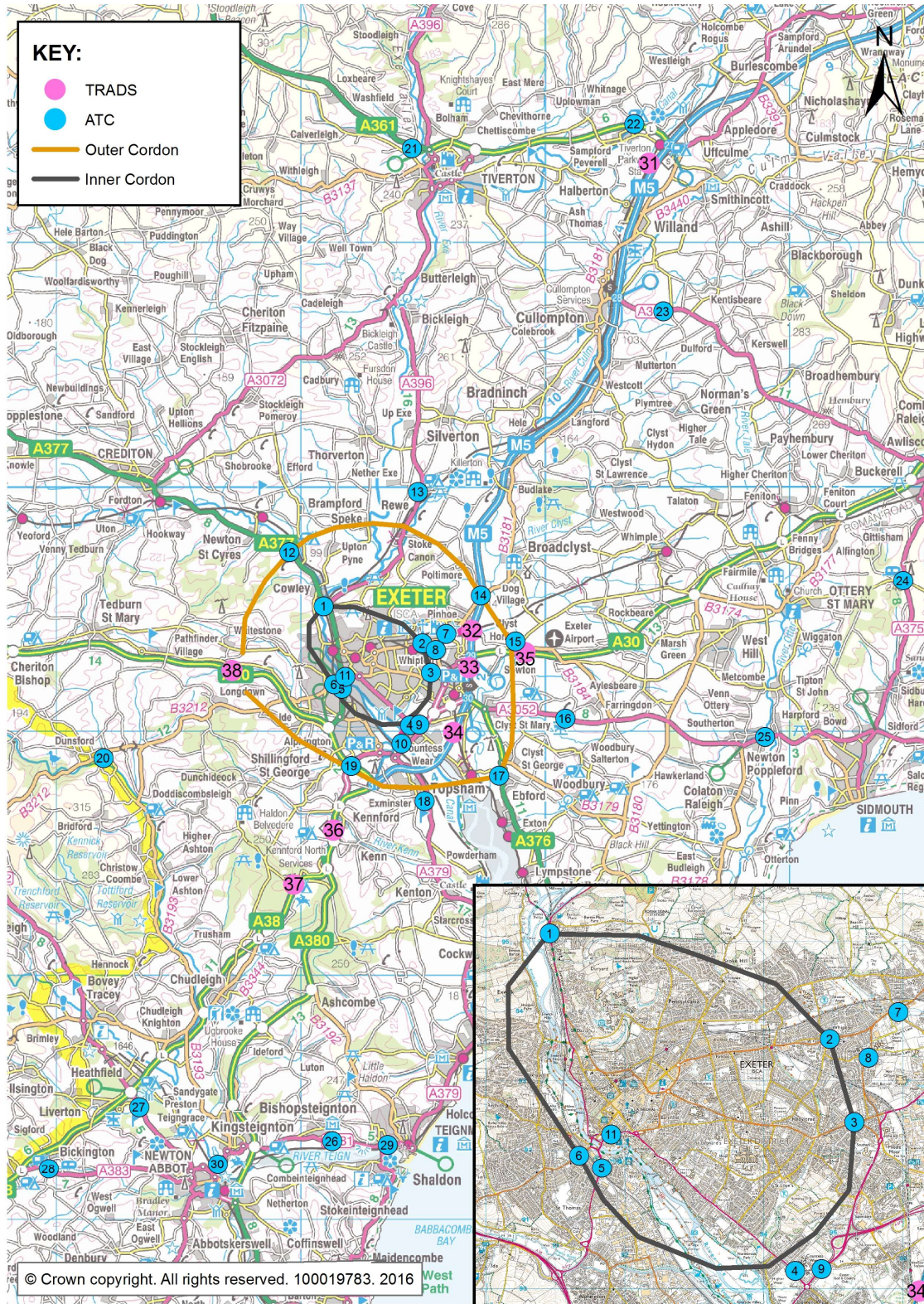


Figure 8-3: Location of ATC and TRADS sites

	Site No.	Site Name	AAWT			Annual change	No. yrs	Total Change
			2005	2010	2015			
Inner Cordon	1	Cowley Bridge Road	16426	15297	14758	-1.0%	10	-10.2%
	2	Pinhoe Road (Whipton)	18477	22291	21084	1.6%	10	14.1%
	3	Honiton Road	28804	27573	27168	-0.6%	10	-6.1%
	4	Topsham Road (King George)	28074	27617	26892	-0.4%	10	-4.0%
	5	Alphington St	30297	29273	29148	-0.4%	10	-4.0%
	6	Cowick St	15203	14760	13958	-0.9%	10	-9.2%
	<b>Total</b>			<b>137281</b>	<b>136811</b>	<b>133008</b>	<b>-0.3%</b>	<b>10</b>
Exeter Routes	7	Monkerton link road	11582 <sup>1</sup>	14076	16300	5.1%	8	40.7%
	8	Hill Barton Road	24797	18263	18720	-2.5%	10	-24.5%
	9	Rydon Lane	36473	35363	33255	-0.9%	10	-8.8%
	10	Bridge Road	36728	33961	33912	-0.8%	10	-7.7%
	11	Western Way	32983	32124	31982	-0.3%	10	-3.0%
	<b>Total</b>			<b>142563</b>	<b>133787</b>	<b>134169</b>	<b>-0.7%</b>	<b>10</b>
Outer Cordon	12	A377 Half Moon	12842	13268	13386	0.4%	10	4.2%
	13	A396 Rewe	7077	6493	6734* <sup>2</sup>	-0.5%	10	-4.8%
	14	B3181 Broadclyst	10428	8807	9515	-0.9%	10	-8.8%
	15	Clyst Honiton	6066	6180	6216	0.2%	10	2.5%
	16	A3052	17217* <sup>6</sup>	15392	16345* <sup>3</sup>	-0.6%	8	-5.1%
	17	A376	21780	21030	20899	-0.4%	10	-4.0%
	18	A379 Exminster	9927	10098	9917* <sup>3</sup>	0.0%	9	-0.1%
	19	A379 Peamore	* <sup>4</sup>	18387	18452	0.0%	5	0.4%
	20	Dunsford	1713	1598	1633	-0.5%	10	-4.7%
	<b>Total (excluding Peamore)</b>			<b>85337</b>	<b>81268</b>	<b>83012</b>	<b>-0.3%</b>	<b>10</b>
Mid	21	Cullompton	* <sup>5</sup>	6893	6657	-0.7%	5	-3.6%
	22	Sampford Peverell	* <sup>4</sup>	27628	26828* <sup>3</sup>	-0.7%	4	-2.9%
	23	Bolham	* <sup>4</sup>	14975	14788	-0.2%	5	-1.2%
	<b>Mid Devon Total</b>				<b>49496</b>	<b>48273</b>	<b>-0.5%</b>	<b>5</b>
East	24	A375 Sidbury	4404	4234	4183* <sup>3</sup>	-0.1%	9	-1.2%
	25	A3052 Newton Popp	12881	12947	13057* <sup>3</sup>	0.1%	9	0.8%
	<b>East Devon Total</b>			<b>17285</b>	<b>17181</b>	<b>17240</b>	<b>0.0%</b>	<b>9</b>
Teignbridge	26	Bishopsteignton	14470	14895	14658* <sup>3</sup>	0.1%	9	1.3%
	27	A382	* <sup>4</sup>	20298	20637* <sup>3</sup>	0.4%	4	1.6%
	28	A383	8470* <sup>6</sup>	8807	9065* <sup>3</sup>	0.8%	9	7.0%
	29	A381 Teignmouth	* <sup>4</sup>	21327	21355	0.0%	5	0.1%
	30	A383 Kingsteignton	24617	23164	23137	-0.6%	10	-6.0%
	<b>Teignbridge Total (26,28,30)</b>			<b>47557</b>	<b>46866</b>	<b>46860</b>	<b>0.2%</b>	<b>9</b>

Table 18: AAWT for ATC Sites (2005, 2010 and 2015)

- Notes
- \*<sup>1</sup> Monkerton Link Road was opened in December 2006, Used 2007 as base value
  - \*<sup>2</sup> Two way flow only available to 2012. NB flows used to synthesise 2014 two way flow
  - \*<sup>3</sup> No 2015 data available. 2014 used as 2015 value.
  - \*<sup>4</sup> No data available until 2010
  - \*<sup>5</sup> Data available in only one direction
  - \*<sup>6</sup> Data available only available for 2006

### Exeter Inner Cordon

- 8.5.2. Daily traffic flows on most roads within the Exeter Inner Cordon have been consistently decreasing over the last 10 years. Further review of historical data suggests that this trend of falling traffic levels appears to have started in 2003.
- 8.5.3. This fall is in the region of 0.5% per year (Honiton Road, Topsham Road, Alphington Street) although a larger decrease is observed on Cowick Street and Cowley Bridge Road. On Cowley Bridge Road in particular, two-way traffic flows have decreased by over 10% since 2005.
- 8.5.4. Traffic flows on Pinhoe Road have actually increased and this appears to be as a result of the opening of Monkerton Link Road in 2006. However, since the initial spike in traffic following opening of the road, flows have been steadily falling as evidenced by the fall from 22,300 in 2010 to 21,100 in 2015.

### Exeter Routes

- 8.5.5. Similar to the inner cordon, traffic levels on the Exeter routes have also been steadily decreasing at a rate of around 0.5 to 1.0% per annum.
- 8.5.6. Cumberland Way was opened in 2007, and two-way daily flows have increased steadily since its opening to 16,000 vehicles. Its provision has however significantly reduced flows on Hill Barton Road by approximately 6000 vehicles a day. The net increase in traffic across the two routes therefore dampens the underlying falling numbers on the Exeter Routes.

### Outer Cordon

- 8.5.7. Traffic flows on the outer cordon routes show a less clear pattern. Although the majority (5 of 8) show a decrease in traffic, on four of these flows have increased since 2010. Only the A376, which is arguably the route operating closest to capacity, has shown a consistent fall in traffic levels.
- 8.5.8. Increased in flow of less than 0.5% per year have been recorded on Half Moon, Peamore and Clyst Honiton. Nevertheless, the gross increase in traffic across those 3 routes since 2010 is just 219 vehicles - a rise of less than 0.6% over 5 years.

### Districts

- 8.5.9. The Mid Devon sites exhibit a steady reduction in flow since 2010 of between 0.2-0.8% per annum on each of the 3 routes. This trend is broadly consistent with the flow changes recorded on the Exeter routes.
- 8.5.10. Traffic flows on the two sites in East Devon, A375 and A3052, have stayed relatively constant since 2005. The majority of East Devon ATC counters are included in the Outer Cordon above, albeit the flows on these are broadly decreasing.
- 8.5.11. However, the trends at the 5 Teignbridge sites are much more varied. The overall increase is driven by a significant rise on the A382. Flows have also risen on the A383, Bishopsteignton and A381 Teignmouth, although the change on the last two has been minimal, whilst at the A383 Kingsteignton flows have fallen.

## 8.6. Daily ATC Traffic profiles

8.6.1. Daily profiles have been produced and analysed for each of the 5 regions. Most sites display one of two typical flow profiles: Flat or M, as shown in Figure 8-4.

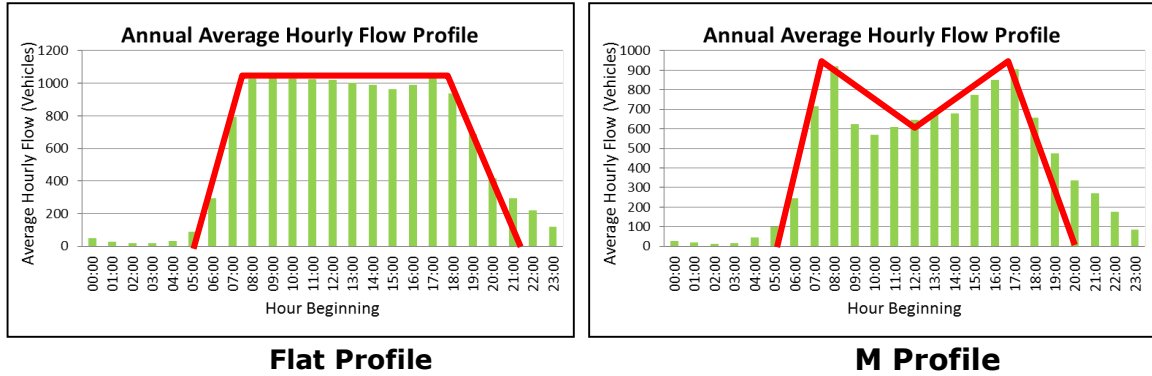


Figure 8-4: Daily Flow Profiles

8.6.2. A flat profile rises during the morning peak and stays at similar levels throughout the day until where flows decrease after the evening peak. An M profile has distinctive peaks in the morning typically at around 08:00 or 09:00 and again in the evening at around 16:00 or 17:00 with lower flows during the day between the peaks.

8.6.3. Figure 8-5 and Figure 8-6 shown below, show that the majority of radial routes within Exeter have a flat profile. This indicates that they are operating at capacity throughout the day. The Pinhoe Road corridor is an exception in that it shows a more traditional “M-profile” suggesting that peaks occur at 09:00 and 17:00. It remains to be seen if Pinhoe Road will maintain this profile as the East of Exeter developments in current Local Plans are built out.

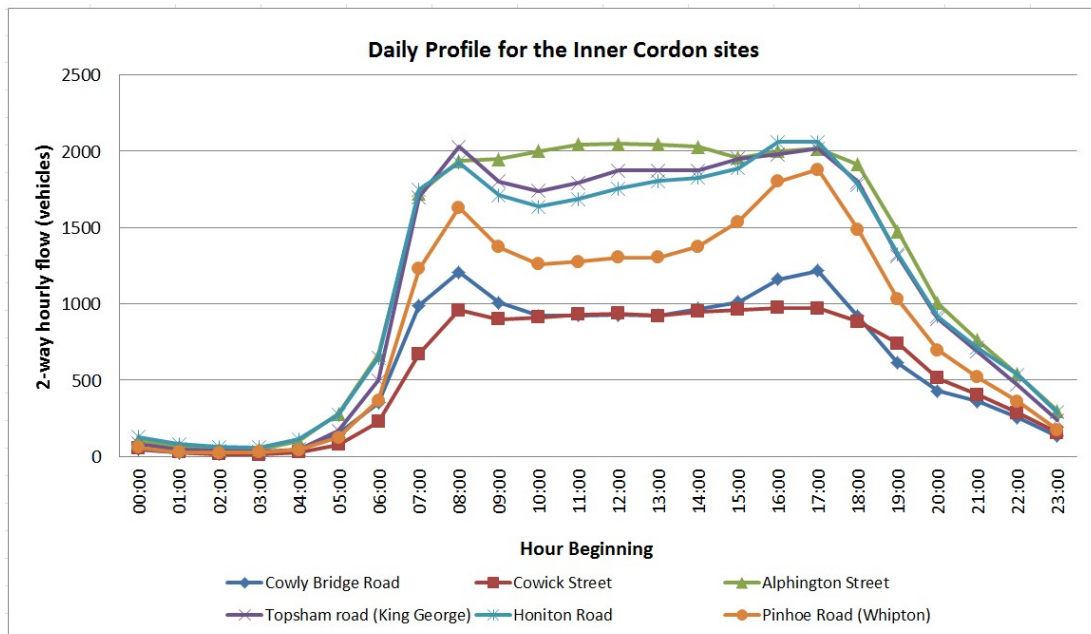


Figure 8-5: Average Daily Traffic Profile for the Inner Cordon ATC sites 2014

8.6.4. In terms of the 5 Exeter routes, Bridge Road, Rydon Lane and Western Way all have a flat profile and two way flows in excess of 2,000 vehicles between 07:00 and 18:00. Conversely, Hill Barton Road and Monkerton Link Road have an M profile and are

both considerably quieter than the 3 main arteries, with maximum flows of just over 1,500 vehicles occurring in the peaks, falling to around 1,100 in between.

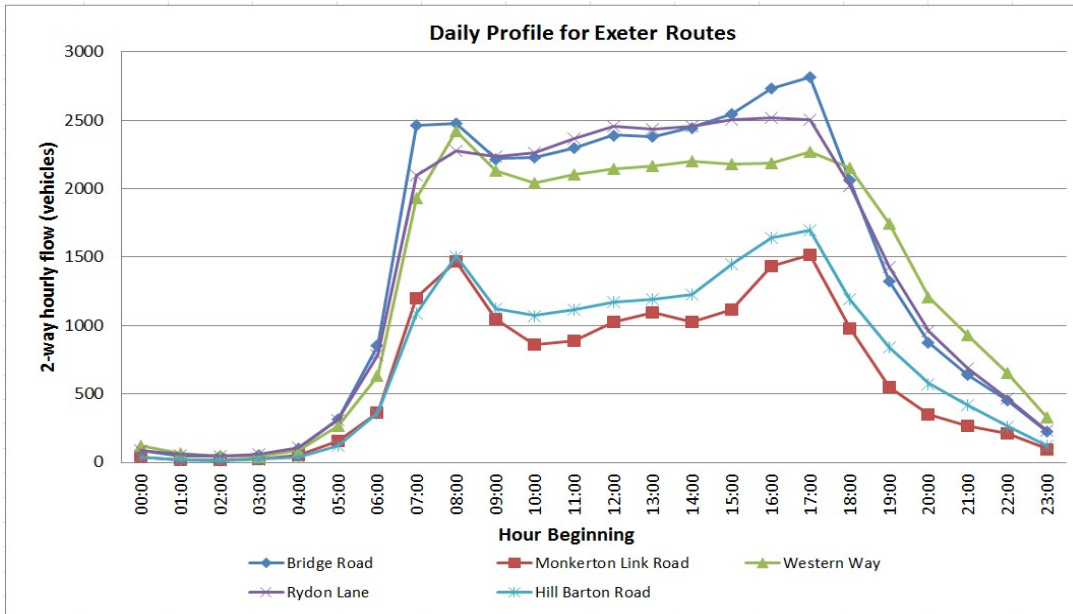


Figure 8-6: Average Daily Traffic Profile for the Exeter Routes sites 2014

8.6.5. The changing function of routes as you head out of Exeter is emphasised by the prominence of “M-profiles” for the Outer Cordon sites. This clearly shows the typical tidal pattern of people commuting to and from Exeter in the peak hours, as well as the significant variation in traffic upon each of these routes (2 way flows on the A376 of 1800 vehicles compared to just 400 two-way vehicles from Rewe).

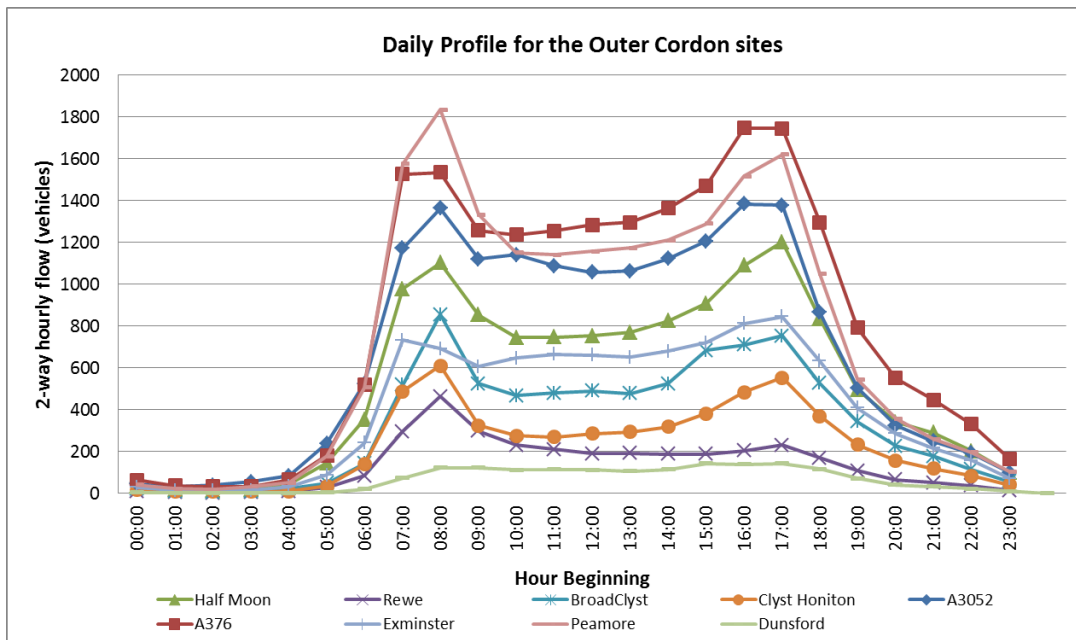


Figure 8-7: Average Daily Traffic Profile for the Outer Cordon ATC sites 2014

8.6.6. The counts sites within East Devon and Mid Devon shown in Figure 8-8 also typically exhibit M profiles, particularly the counters at Sampford Peverell and Cullompton.

8.6.7. The profiles on the counts at the other sites are relatively flat with small peaks in the peak period. However, the relatively modest flows on these routes of up to 1,000 two-way vehicles suggest they are some way from being at capacity.

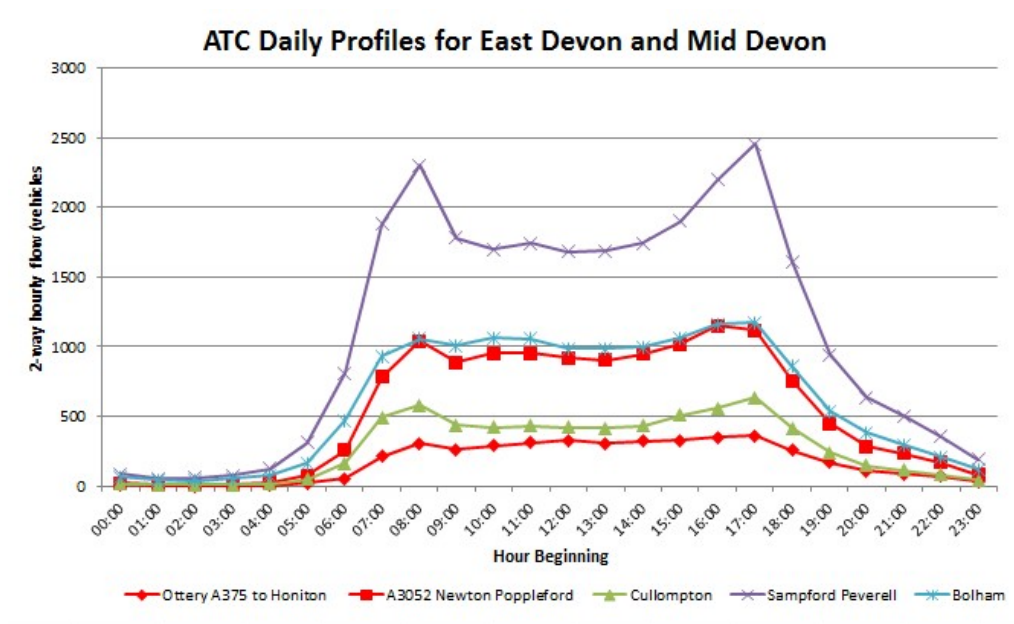


Figure 8-8: Average Daily Traffic Profile for Mid Devon and East Devon ATC sites

8.6.8. The flow profiles across Teignbridge, much like the trends in traffic volumes, are also very varied. The trends in flow profile and volume appear to be linked. The routes with flat profiles (A381 & Bishopsteignton) are those which showed no change in traffic over 10 years whereas the routes with more typical M profiles (A382 & A383) have seen a rise in flows.

8.6.9. The flow profile at the A383 Kingsteignton is highly atypical, with the peak through the middle of the day. This is also the route on which flows have fallen. This profile and trend could be as a result of the significant amount of retail units served off the road.

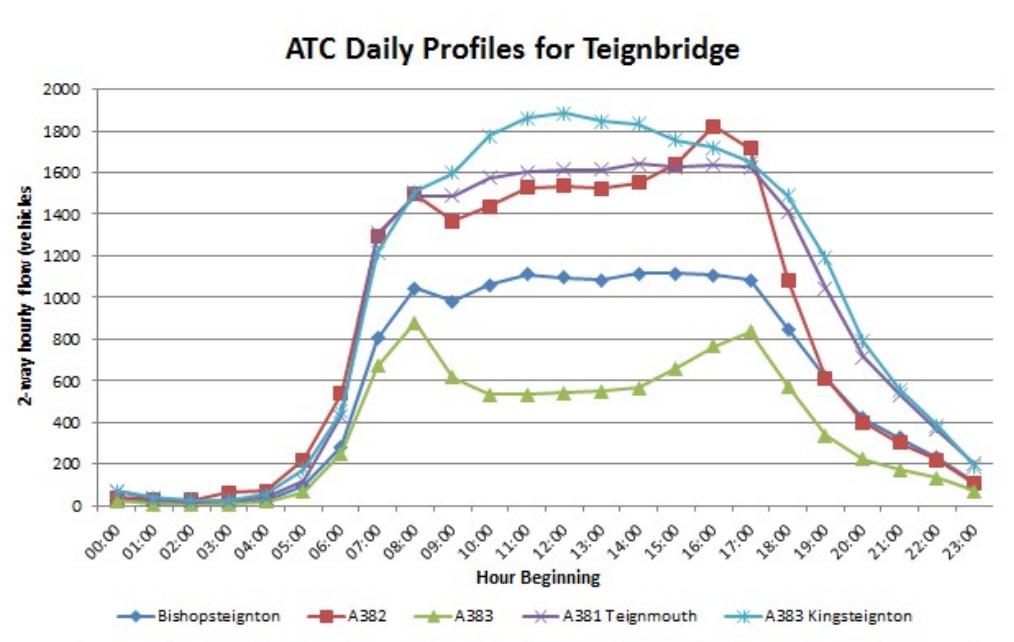
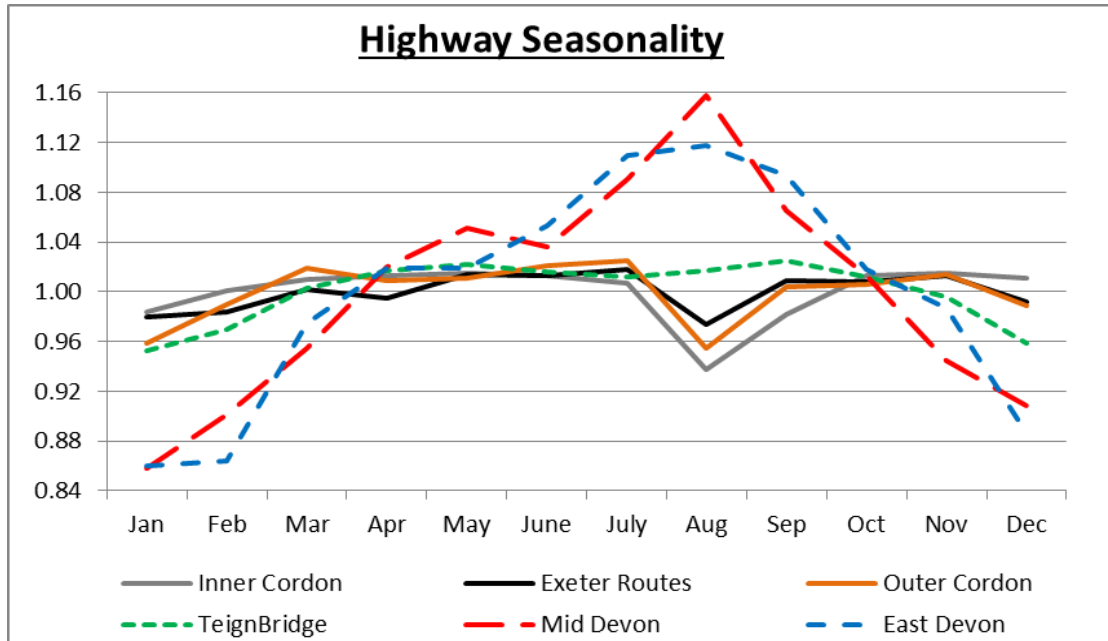


Figure 8-9: Average Daily Traffic Profile for Teignbridge sites

## 8.7. Seasonality

- 8.7.1. The seasonality of the highway routes has been based upon the average weekday flows, by month. The flows on all the routes within each group have then been summed to get the average monthly flow for the group (i.e. Inner Cordon). These are shown in Figure 8-10 below.



**Figure 8-10: Seasonality of Highway Routes**

- 8.7.2. For the routes into and out of Exeter the flow profiles are broadly consistent across the year. The lowest flow levels are recorded in August, to a minimum of 0.94 on the Inner Cordon and 0.95 on the Outer Cordon, and noticeably lower in January. The seasonality for the remaining 10 months of the year are between 0.98-1.02.
- 8.7.3. Traffic volumes on the Exeter routes are particularly consistent with seasonality values of between 0.97- 1.02 across the year.
- 8.7.4. The lowest flow volumes recorded in August on the Inner Cordon translate to flows on these days being 8% lower than the weekdays in the busiest months. It is unclear as to what extent days of adverse weather in August, when significant travel demand into Exeter is typical, may dampen the difference. In terms of volume, this is a difference of 8,400 vehicle movements across the 6 inner cordon routes across the day, or 5,000 vehicles on the Exeter Routes.
- 8.7.5. Conversely across the district routes, the highest levels of flow are recorded in August. This is particularly the case on Mid Devon and East Devon where recorded August flows are 35% higher than those in January (and February for East Devon)
- 8.7.6. This ties in with the seasonal nature of flows recorded on the mainline of the M5, and interesting to see that this is passed onto routes across the district only and not the routes of Exeter cordon.
- 8.7.7. Should be noted that of the Outer Cordon routes, higher levels of traffic in August are also observed on the A3052. This is not the case on any of the other Outer Cordon routes. As well as being a main route to holiday sites in East Devon, one of the most visited tourist attractions in Devon, Crealy Park, is also located on the A3052.

## 8.8. Highways Journey Purpose

8.8.1. Devon County Council has undertaken numerous road side interviews (RSIs) in the Exeter area over recent years. Sites 1 – 5 as shown in Figure 8-11 represents the most suitable RSI locations to compare journey purposes for each region identified. This section of the report therefore reports on what the purpose of each journey is in each region.

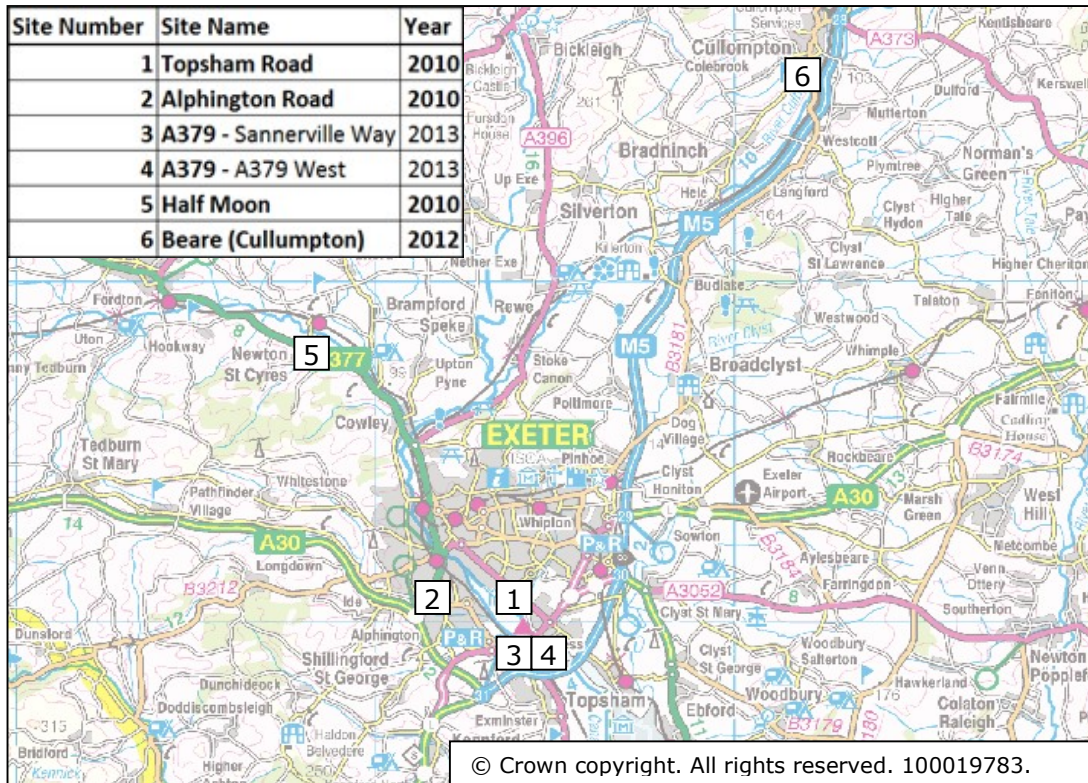
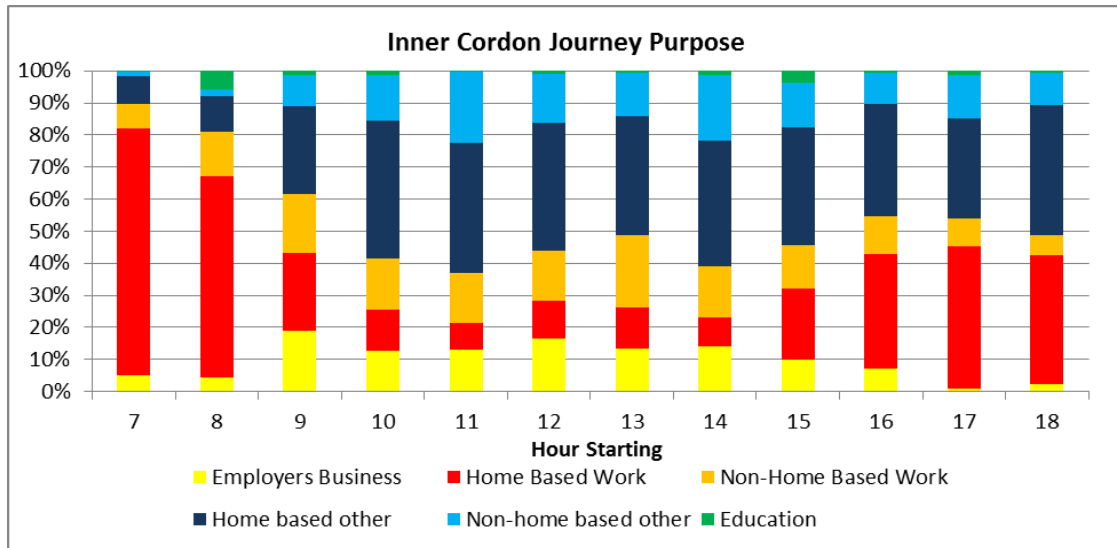


Figure 8-11: RSI Locations in Study Area

### Inner Cordon

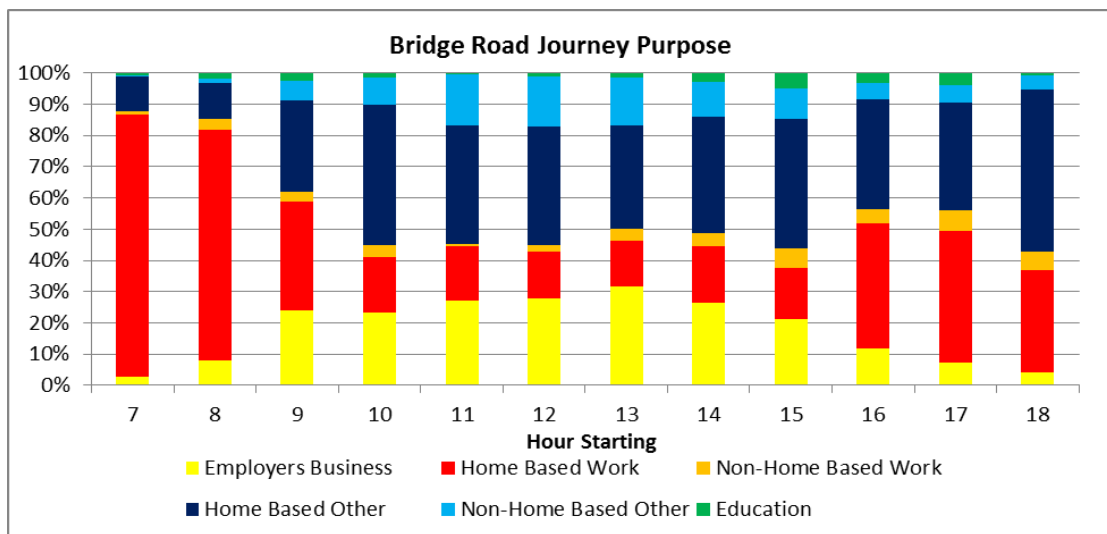
- 8.8.2. Figure 8-12: shows the journey purposes undertaken in 2010 for both the Topsham Road and Alphington Road RSI's. There are a large proportion of commuter ('Home Based Work') trips between 07:00 and 09:00. From 10:00 onwards the most common purpose is 'Home Based Other' which includes social, recreation, leisure and shopping trips. A high proportion of commuter trips are again observed between 16:00 and 19:00 suggesting a significant number of people living inside the city and working outside the city.
- 8.8.3. The number of trips on employer's business is broadly constant at around 10% for most of the day, although combined with non-home based work, this accounts for approximately a quarter of the traffic composition between 10:00 and 15:00.
- 8.8.4. The overall profile shows that the journey purpose during peak hours are commuter dominated. During the day, the journey purpose changes to other based trips, reflecting that the Exeter City Centre attracts shoppers and leisure trips, as expected. A very small minority of vehicular trips are educational based.



**Figure 8-12: Inner Cordon Journey Purpose**

Exeter Routes- Bridge Road

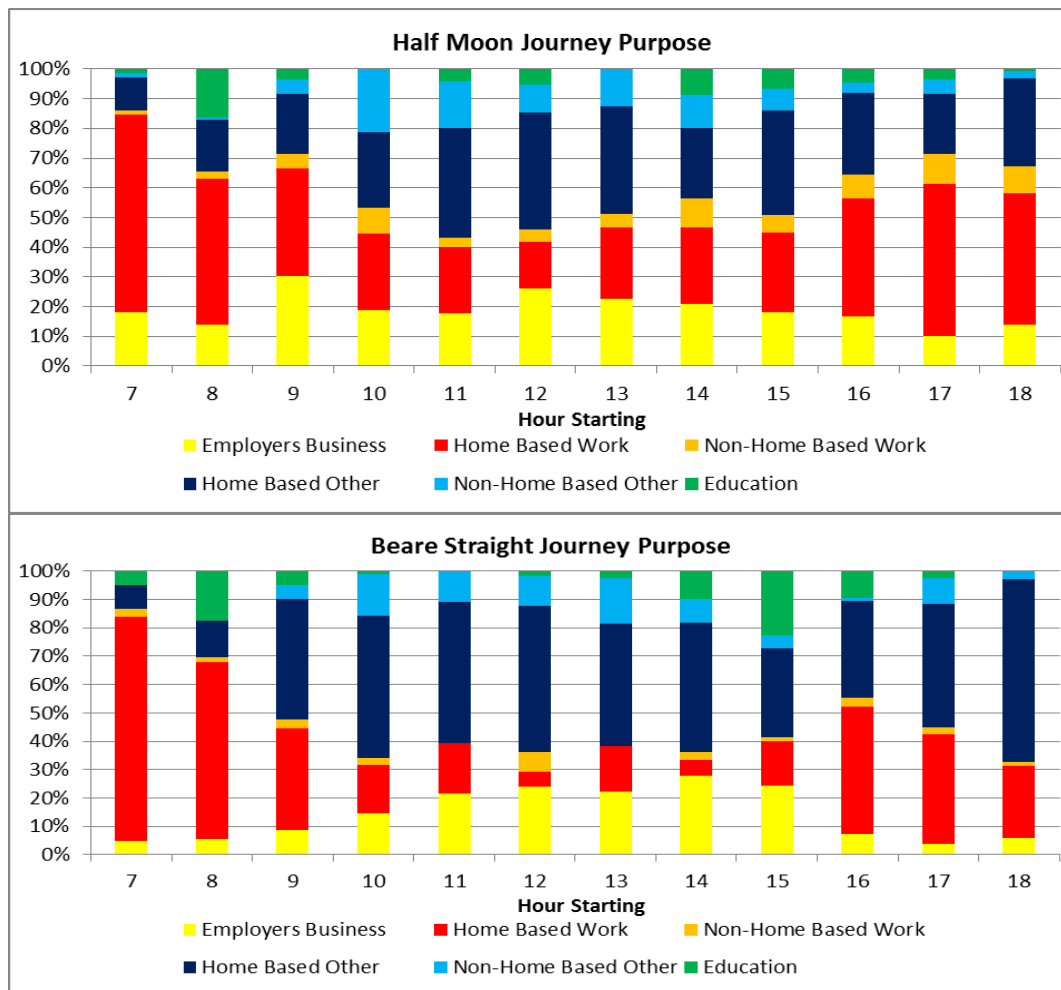
- 8.8.5. Outbound journey purpose data for the A379 Bridge Road, shown in Figure 8-13 , is based on the combination of RSIs on the A379 west of Matford roundabout and the A379 Sannerville Way heading south towards Exminster.
- 8.8.6. As per the Inner Cordon, there are a large proportion of commuter (Home Based Work) trips in the AM between 07:00 and 09:00 and once again in the PM between 16:00 and 19:00, albeit at a lower concentration due to the prevalence of leisure and shopping trips in the evening.
- 8.8.7. Throughout the interpeak periods there are also a significant amount of Employers Business trips, accounting for 30% of traffic between 10:00 and 16:00. This highlights the importance of this route to business users and is likely to be due to the proximity of the RSI site to Marsh Barton Industrial Estate and as the main route between it and the movements to and from Sowton Industrial Estate.



**Figure 8-13: Bridge Road Journey Purpose**

Outer Cordon

- 8.8.8. Journey Purpose data for roads on the outer cordon were recorded from RSIs undertaken on the northbound A377 Half Moon in 2010 and southbound on the B3181 Beare Straight in 2012. These are both shown in Figure 8-14.
- 8.8.9. As expected for roads into and out of Exeter there are a large proportion of commuter ('Home Based Work') trips between 07:00 and 09:00. Although there are also high levels of commuting in the PM peak, a wider range of purposes are observed than in the AM peak.
- 8.8.10. Most trips during the day are predominantly made up of "Home Based Other" trips, representing shopping, leisure and personal business trips. These continue into the evening peak.
- 8.8.11. The presence of education trips is markedly more prominent on these routes than the roads within Exeter. This could be as a result of number of reasons, including post 16 provision, wider range of private schools in Exeter, dropping off on way to Exeter and potentially families moving out of the city after children have reached school age.



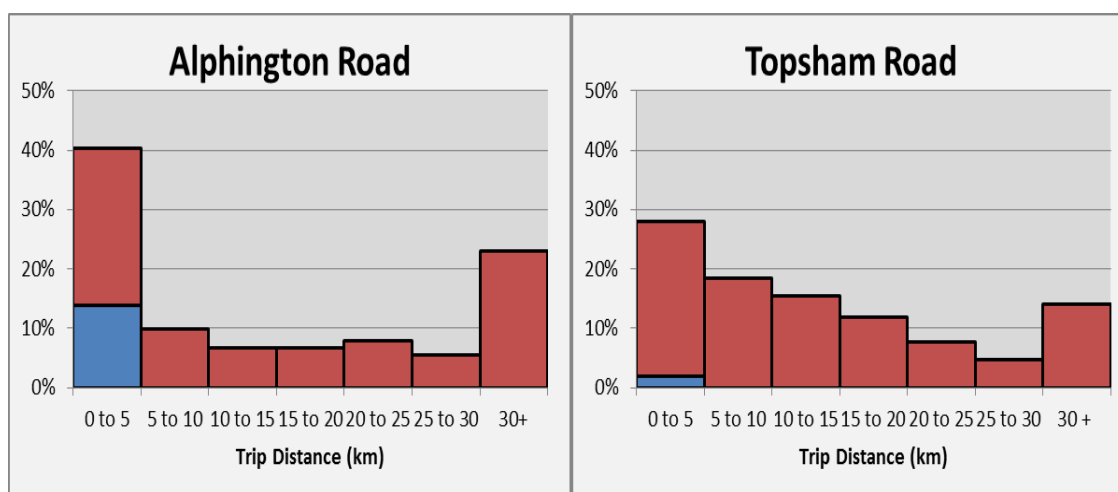
**Figure 8-14: Outer Cordon Journey Purpose Data**

## 8.9. Journey Distance

8.9.1. The RSI data identified above has been further reviewed to identify the breakdown of, and average journey distances of drivers on the different route types.

### Inner Cordon

8.9.2. For the inner cordon, the breakdowns of trip distances on Alphington and Topsham Road are displayed side by side in Figure 8-16. It should be noted that the area shown in blue represents the trips of less than 2 km.



**Figure 8-15: Inner Cordon Trip Length Distribution**

8.9.3. A high proportion of trips over 30 km in length are recorded on both arterial routes. This could be reflective of these routes strategic nature, particularly for Alphington Road which serves as the main route for traffic coming from west of Exeter.

8.9.4. A significant feature on both routes, is the high proportion of trips under 5 km. This is particularly stark on Alphington Road, where 1 in 7 trips is over a distance of less than 2 km. A further 26% of trips on Alphington Road are over a distance of between 2 km and 5 km.

8.9.5. On Topsham Road again 26% of trips are between 2 and 5 km, although just 2% are of trips along Topsham road are less than 2 km in length.

8.9.6. Whilst this is perhaps reflective of high population density within the 5 km radius, these are potentially trips that could be made sustainably.

### Exeter Routes – Bridge Road

8.9.7. A breakdown of trip distances on the two routes leading out of Bridge Road, A379 Matford and A379 Sannerville Way are shown in Figure 8-17.

8.9.8. The most observed trip bands on the A379 to Matford were under 5 km, accounting for nearly 1 in 3 trips. Only 4% of these were trips under 2 km.

8.9.9. Although trip frequencies fall with distance, there are still around 10% of total trips in each bandwidth. This and the high number of trips over 30 m are likely to be reflective of it being the main route to Marsh Barton and onwards to the A38 and A380

8.9.10. On Sannerville Way, there is almost no traffic making trips between 20-30 km in length. Noted that this is primarily a route into Teignbridge, and that longer distance journeys likely to be made by a higher standard route offered by the A380.

8.9.11. There are however a number of trips over 30 kilometres on the Sannerville Way. Review of the RSI data highlights these to be over 60 km, and review of the RSI data shows these are Review of purposes confirms these are leisure trips, most likely people to and from the high number of holiday parks along the coast of Teignbridge and Torbay.

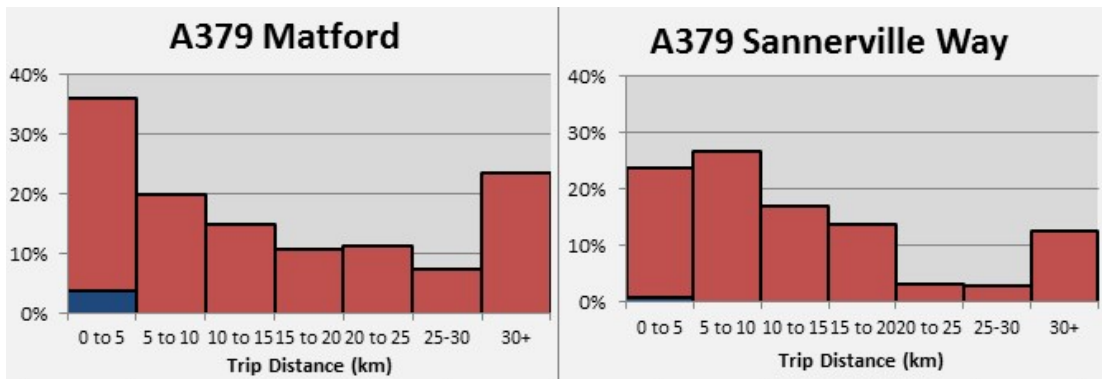


Figure 8-16: Bridge Road Routes Trip Length Distribution

Outer Cordon

8.9.12. On the Outer cordon routes, the breakdown of trip distances on Beare Straight (B3181) and Half Moon (A377) shown in Figure 8-17 are similar.

8.9.13. The key differences are the B3181 catering for a much higher percentage of trips of 15 to 20 km length, reflecting the greater distance of Cullompton to Exeter than Crediton to Exeter on the A377.

8.9.14. There is also a higher number of trips over 30Km on the A377, which most likely arises as the A377 provides an alternative route to Exeter from Barnstaple, which is some 70 kilometres away.

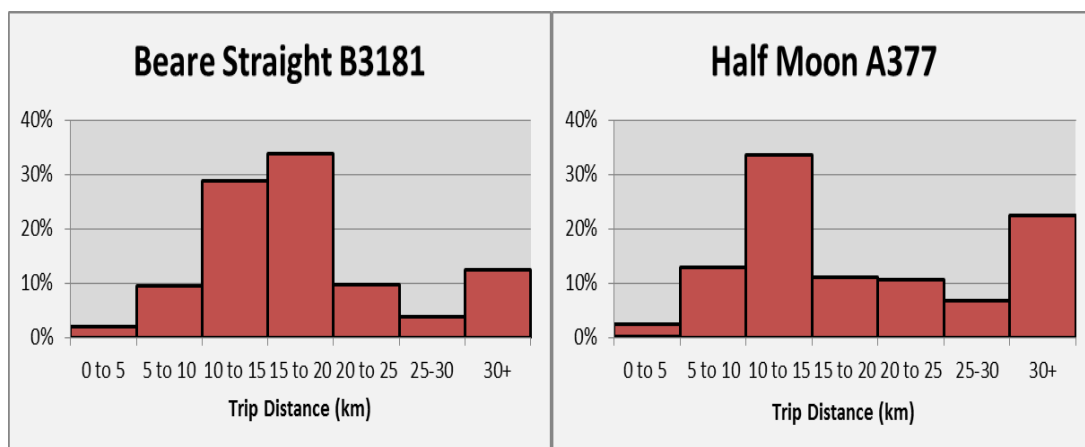


Figure 8-17: Outer Cordon Trip Length Distribution

## 8.10. Comparison with TEMPro Growth Factors

- 8.10.1. Traffic growth forecasts are typically obtained from TEMPro, a program developed by Department of Transport (DfT) to provide a nationally standardised growth in trip ends. These forecasts are based on census data, demographic analysis, car ownership data and population/workforce planning data.
- 8.10.2. The TEMPro growth factors align with the *DfT Road Traffic Forecasts 2015* that project an increase in flows ranging from 19% to 55% between 2010 and 2040.
- 8.10.3. The TEMPro growth factors from 2005-2015 for districts in the Greater Exeter area are shown in Table 19 below. These factors are taken from dataset 6.2. Overall, these predict an average increase in traffic flow of approximately 1% per year.

TEMPro Growth Factors		ORIGIN	DEST'N	Average	ORIGIN	DEST'N	Average
		<b>Exeter</b>			<b>Teignbridge</b>		
2005-2015	<b>AM</b>	1.12	1.07	<b>1.10</b>	1.07	1.06	<b>1.06</b>
	<b>IP</b>	1.09	1.09	<b>1.09</b>	1.09	1.09	<b>1.09</b>
	<b>PM</b>	1.08	1.11	<b>1.09</b>	1.07	1.07	<b>1.07</b>
		<b>East Devon</b>			<b>Mid Devon</b>		
2005-2015	<b>AM</b>	1.10	1.13	<b>1.11</b>	1.11	1.16	<b>1.14</b>
	<b>IP</b>	1.14	1.14	<b>1.14</b>	1.17	1.17	<b>1.17</b>
	<b>PM</b>	1.13	1.11	<b>1.12</b>	1.18	1.13	<b>1.14</b>

**Table 19: TEMPRO Growth Factors for Greater Exeter Districts**

- 8.10.4. The TEMPro growth projections appears to predict a much higher level of growth than that recorded in the empirical traffic data shown in Table 18. In particular,
- Exeter (sites 1-11) recorded flows are 13% lower than TEMPro forecast
    - 3% fall on Exeter Radial routes and 6% fall on Exeter routes, compared to a 9% increase forecast by TEMPRO.
  - Mid Devon to Exeter (12-13) routes 11% lower than TEMPro forecast
    - 1% rise in flows at combined A377 and Rewe, compared to a 12% increase forecast by TEMPro.
  - East Devon to Exeter (14-17) routes 15% lower than TEMPro forecast
    - 4.5% fall in flows across Broadclyst , A376, A3052 and Clyst Honiton, compared to a 10% increase forecast by TEMPro.
  - East Devon (24-25) routes 12% lower than TEMPro forecast
    - No change at A375 and A3052, compared to a 12% increase forecast by TEMPro.
  - Teignbridge (26, 28, 30) consistent with TEMPRO growth
    - 1.5% increase in recorded flows, compared to a 7.5% increase forecast by TEMPRO.

8.10.5. A summary of these findings is shown in Table 20 below. It should be noted that the Teignbridge to Exeter routes (19&20) and the Mid Devon sites (24&25) are not included due to limited years of data. It is however noted that the decrease on these routes is again in contrast to a projected increase from TEMPro.

Site No.	Site Name	AAWT		Overall change	TEMPro Forecast	TEMPro difference
		2005	2015			
1-11	Exeter	279844	267177	-4.7%	+9.1%	+ 13.8%
12-13	Mid Devon to Exeter	19919	20120	+1.0%	+12.2%	+ 11.2%
14-17	East Devon to Exeter	55491	52975	-4.5%	+10.7%	+ 15.2%
21-23	East Devon	17285	17240	-0.3%	+12.4%	+ 12.7%
26-30	Teignbridge	41046	44360	+1.5%	+7.6%	+ 6.1%

**Table 20: TEMPro Growth Factors for Greater Exeter Districts**

Predicted Growth by road type.

8.10.6. The National Trip End Model (NTEM) module has been used to obtain growth factors estimated for the Greater Exeter area by road type. These are summarised in Table 21 below. It should be noted that these figures are calculated in a different way to TEMPro and although similar are not directly comparable.

TEMPro		Motorway	Principle	Minor	All Roads
2005 - 2015	AM	1.04	1.07	1.08	1.07
	IP	1.06	1.09	1.10	1.09
	PM	1.05	1.07	1.09	1.07

**Table 21: NTEM growth factors by road type**

8.10.7. The NTEM factors again suggest rising traffic levels on each of the different road types, with the increases in the region of 7-10% over the last 10 years.

8.10.8. However, the NTEM factors suggest a lower amount of traffic growth on the Strategic Road Network than on more localised principal (indicated as A roads) and minor roads. This is contrary to the recorded data in Table 17 and Table 18 which showed flows on local roads to be slightly decreasing but SRN flows to have increased.

8.10.9. The comparisons of the observed data against the TEMPro and NTEM highlights that these factors have not been reflective of traffic level changes over the last 10 years.

8.10.10. This raises an important question about the appropriateness of using these for future forecasts without careful consideration of if the projections are likely to be realistic. This seems especially true in urban areas where the recorded traffic flows are decreasing.

## 9. Collision Data

### 9.1. Introduction

- 9.1.1. The following section summarises the key trends in road traffic collisions and casualties across the Greater Exeter area over the last 10 years.
- 9.1.2. This includes the trends in accidents numbers across each district, a comparison of the accident rates against other areas in the South West, seasonality and mapping of routes in the area by accident performance.
- 9.1.3. Further information can be found in the latest Road Safety Statistics Annual Report, available from <https://new.devon.gov.uk/roadsandtransport/safe-travel/road-safety/collision-data/collision-reports/>

### 9.2. 10 Year Accident History

#### Total Casualties

- 9.2.1. The annual number of road traffic casualties going back to 2006 is shown in Figure 9-1 below.
- 9.2.2. The total number of road traffic casualties across both the County and Greater Exeter area have fallen by around a third over the last 10 years. Although the annual number of casualties has continued falling, the magnitude of change has levelled off since 2010. This is emphasised by the 29% fall in collisions (579 less casualties) from 2006 to 2010 compared to a more modest 7% fall (97 casualties) from 2010 to 2015.



Figure 9-1: Annual Number of Road Traffic Casualties, Greater Exeter and Devon

#### Serious Casualties and Fatalities

- 9.2.3. The total number of serious injury accidents and fatalities across the Greater Exeter area, compared against Devon, are shown in Figures 9-2 and 9-3 below.

9.2.4. Although there has been a significant reduction in overall road traffic casualties in the last 10 years, the total number of collisions resulting in serious injury is largely unchanged from the 2006 figure.

9.2.5. The number of fatalities does however appear to have fallen from number on the low 20s in 2006-2008 to a figure in the low to mid-teens. Over the past 10 years 36% of the total fatalities occurred in East Devon, 31% in Teignbridge and 23% in Mid Devon. Despite accounting for 22% of all collisions, just 12% of fatalities occurred in Exeter.

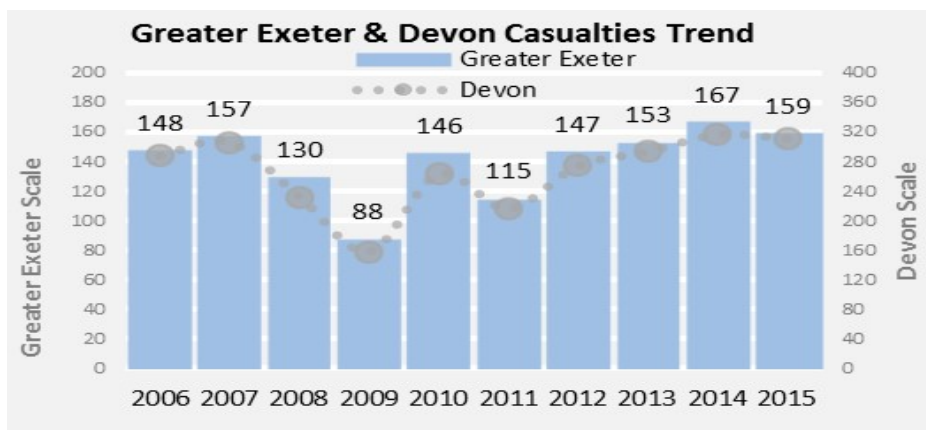


Figure 9-2: Annual Number of Road Traffic Collisions resulting in Serious Injury

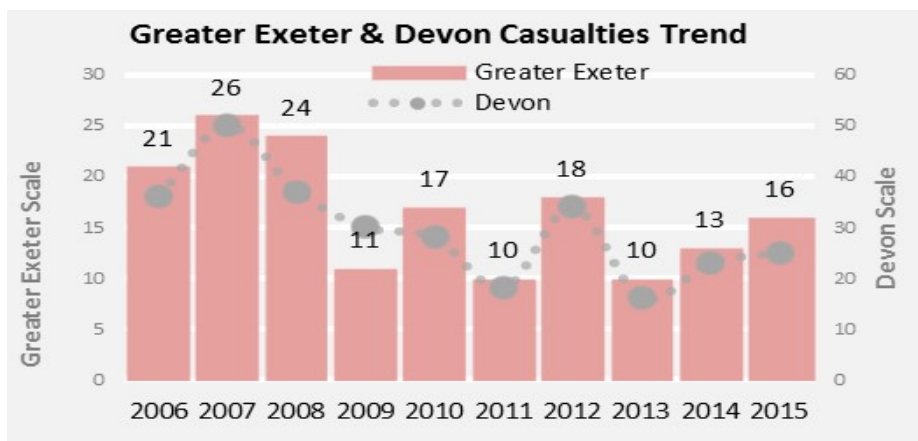


Figure 9-3: Annual Number of Road Traffic Fatalities, Greater Exeter and Devon

### 9.3. Breakdown of Fatalities by Mode

9.3.1. The graphs below show the 10-year history of fatalities by mode for both Devon as a whole and the Greater Exeter area. Reflecting that the overall number of fatalities is low, the number of fatalities by mode tends to be highly variable from one year to the next. For that reason, further breakdowns by district are not provided due to the low number of occurrences each year in each district.

9.3.2. The graphs for Devon fatalities and Greater Exeter area further show the reduction in road traffic fatalities in the area since 2008.

9.3.3. The majority of fatalities involve people in cars or on motorcycles. The number of car fatalities being highest is perhaps expected given it is the most used mode, however, the fact that motorcycle fatalities is so high (particularly in 2008 when number of Motorcycle fatalities was equal to car fatalities) is a stark statistic.

9.3.4. The majority of pedestrian and cycle fatalities across Devon also occur in the Greater Exeter area. This is most likely reflecting the higher levels of urbanisation and population density and consequently higher levels of pedestrian and cycle traffic compared to the rest of the county.

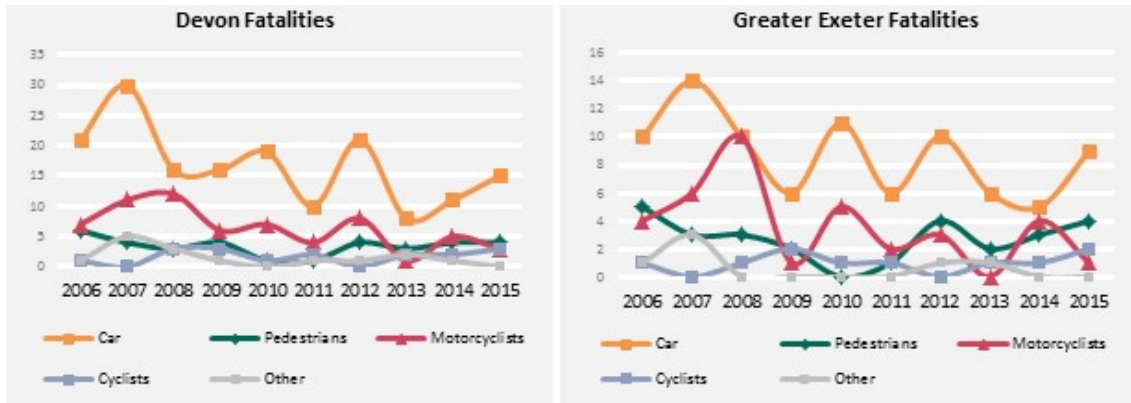


Figure 9-4: Annual Number of Road Traffic Fatalities, Greater Exeter and Devon

## 9.4. Accident Seasonality (Devon)

- 9.4.1. Weather patterns and hours of darkness can have a significant influence on traffic levels, sustainable mode share and vehicle performance. This in turn has a significant impact on the collision frequency.
- 9.4.2. To highlight the impact of this seasonality, data for Devon is provided below in Figure 9-5 setting out the number of collisions or killed or seriously injured incidents each month. The numbers involving vulnerable road users are also provided alongside this.

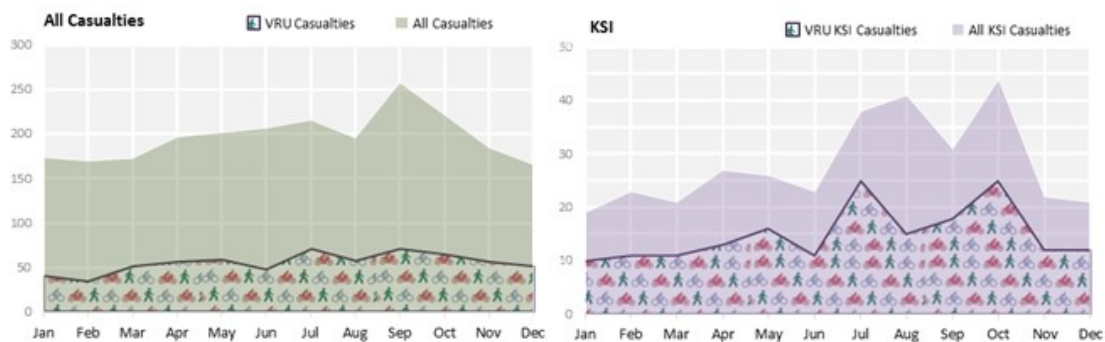


Figure 9-5: Accident Seasonality Data – Total Casualties (left) and KSI (right)

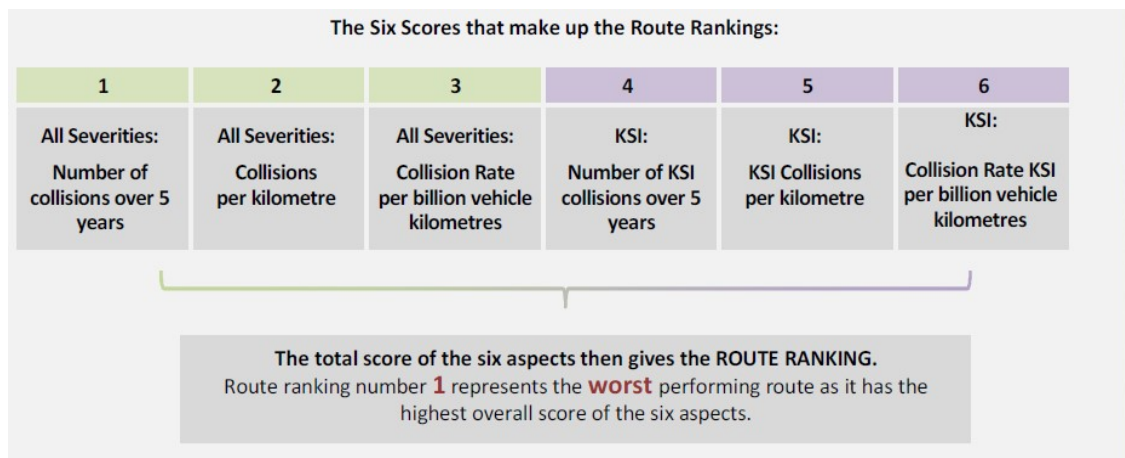
- 9.4.3. In an average month 197 people were injured in a road traffic collision across Devon, of which 28 people were killed or seriously injured. On average vulnerable Road users (RU) accounted for just over 50% of the KSI casualties (15 of 28).
- 9.4.4. During the Winter months from November through to March, on average there were 174 injured people each month, and 11 KSIs. However, during the Summer (April to October) casualty rates are over 20% higher, with an average of 214 people being injured each month, and KSI rates increase by over 50% to 18 a month.
- 9.4.5. Although these figures suggest roads are much more dangerous for vulnerable road users in the Summer months, it should be noted that this period coincides with the

higher number of trips being made by such users during these months. Further details on the reasons for this and the impact of weather conditions are explained in the Devon County Road Safety end of year reports available online.

- 9.4.6. The average number of annual casualties for different vulnerable road users classes are provided below. Considered against the total numbers using each mode, for which the TTW data in Section 3 provides a guide, again highlights the higher risks for motorcyclists.
- **Motorcyclists** On average 22 motorcycle casualties each month and on Devon Roads, 8 of which are KSIs,
  - **Cyclists** 15 cycle casualties per month (3 of which are KSI),
  - **Pedestrians** 18 pedestrian injuries per month, (4 were KSI)

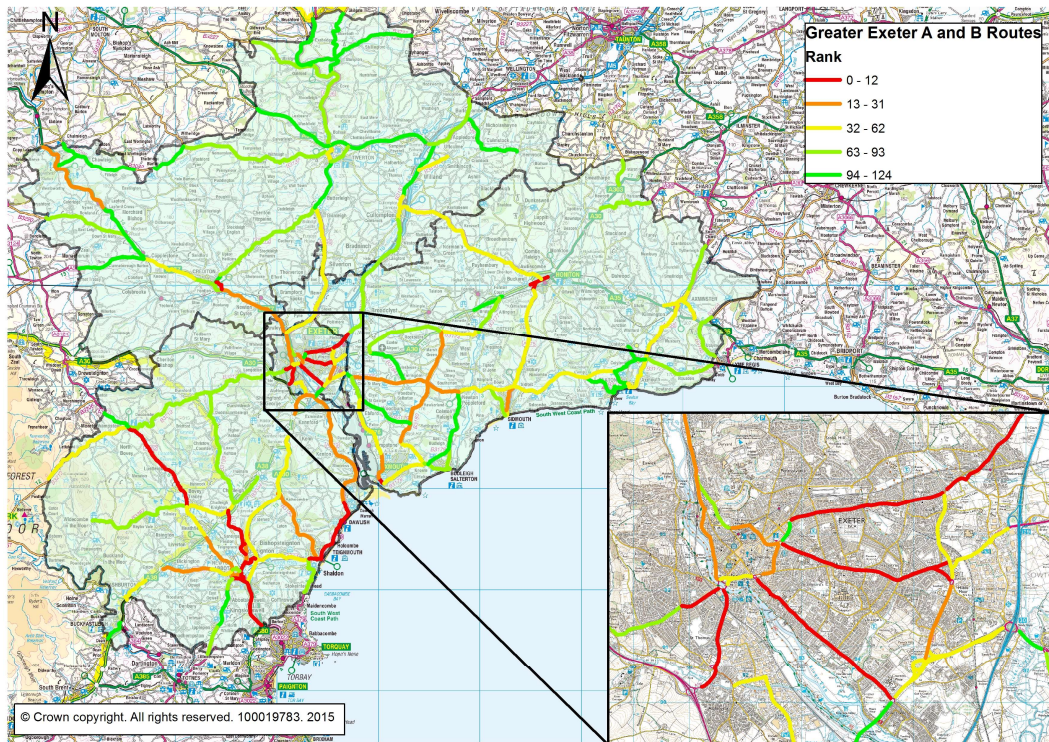
## 9.5. Route Analysis

- 9.5.1. Route based multi factor accident analysis is undertaken by the County Council to compare the accident performance of all A roads and some B roads across the County.
- 9.5.2. The route analysis is based on six aspects that feed into give an overall score. The County includes this analysis in its annual collision reporting to help provide a more consistent assessment than can be given by a single metric. An overview of the inputs is provided below



**Figure 9-6: Overview of Route Analysis Methodology**

- 9.5.3. This analysis has been refined to the Greater Exeter area to provide a localised route map of the comparative accidents performance of 124 different routes across the Greater Exeter Area.
- 9.5.4. The route analysis rankings by route are shown below in Figure 9-7. Alongside the 10 worst performing routes in the Greater Exeter region are listed in 9.6.6.
- 9.5.5. It should be noted that the analysis is primarily based on frequency against vehicle kilometres, and factors as such as pedestrian volume (which are rarely accurately counted) are not included. As a result, urban areas, where pedestrians and cyclists are mode prevalent tend to be higher on the list. Equally, this is reflective of the higher number of incidents on these routes.



**Figure 9-7: Greater Exeter Accident Route Analysis Map**

*Disclaimer- Note that methodology for obtaining B road AADT traffic data is different from the [Department for Transport](#) methodology used to obtain A road AADT data.*

9.5.6. The 5 worst performing routes in the Greater Exeter region are;

- **B3183** Exeter: Paris St Rbt to Heavitree to Middlemoor
- **B3212** Exeter: Sidwell St Rbt to Pinhoe Sainsbury's
- **A377** Exeter A30 junction along Alphington Rd to Exe Bridges
- **A381** Penn Inn to Newton Abbot A382 junction (Asda)
- **A375** Honiton High St and link to Tesco Sidmouth Rd

9.5.7. The three worst performing roads in Greater Exeter are all located in Exeter. The B3183 from Paris St Roundabout Heavitree to Middlemoor route has 37% more collisions of all severities compared with the 2<sup>nd</sup> worst ranking route.

## 10. Aviation

### 10.1. Introduction

- 10.1.1. The sole airport within the Greater Exeter area is Exeter International Airport. The airport is situated in East Devon, 5 miles to the east of Exeter City Centre and 1 mile south of the new town of Cranbrook.
- 10.1.2. The airport is adjacent to the A30 with vehicular access from the recently upgraded B3184 which connects to the A30 junction north roundabout. The airport is served by a half hourly bus service.
- 10.1.3. The nearest railway station to the airport is at Cranbrook, a distance by road of 2.5 miles. However, there are no direct public transport services between the two.

### 10.2. Patronage

- 10.2.1. In 2015 821,000 passengers flew from Exeter airport, a 7% increase from the previous year. By Passenger Volume it is the 22<sup>nd</sup> Busiest Airport in the UK.
- 10.2.2. Passenger numbers have increased considerably from 328,000 in 2000, peaking at just over a million in 2007. The 2008 recession appeared to have a significant impact on passenger numbers, and they continued to fall until 2012. Since 2012, passenger numbers have increased by 18%.
- 10.2.3. Passenger numbers for Exeter Airport from the Civil Aviation Authority (CAA) going back to 1995 are provided in Figure 10-1 and Table 22 below.

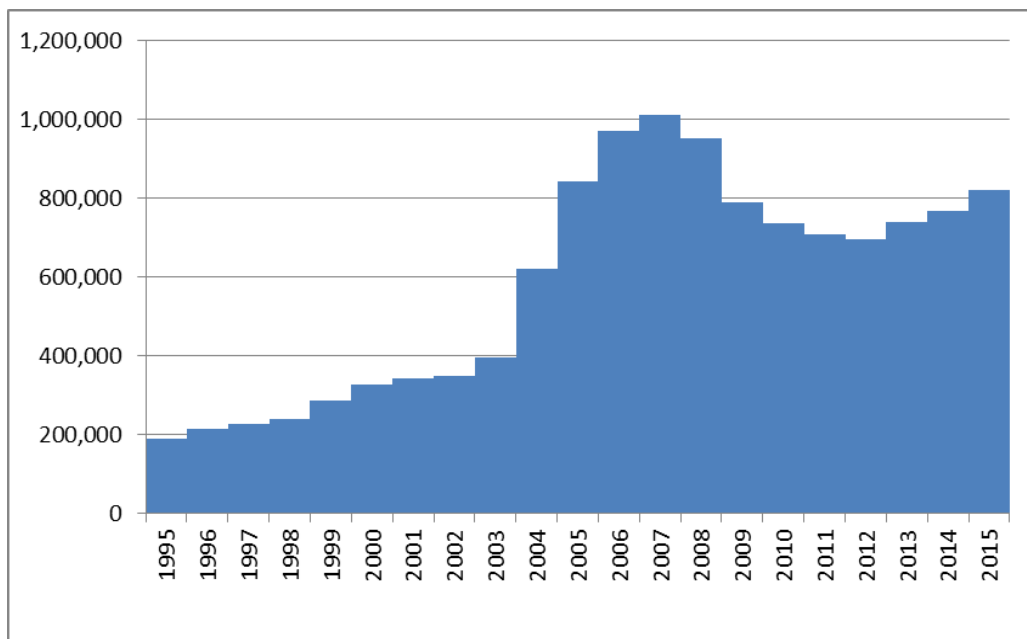


Figure 10-1: Annual Passenger Numbers at Exeter Airport (1995-2015)

<b>Year</b>	<b>Passenger Numbers</b>
1995	190,000
2000	328,000
2005	842,000
2010	737,000
2015	821,000

**Table 22: Passenger Numbers at Exeter Airport (1995-2015)**

10.2.4. With the introduction of new services in 2016, including new services to Glasgow and Norwich which helped push monthly passenger figures to more than 100,000 for the time, passenger numbers are expected to continue to rise.

### **10.3. Busiest Routes**

10.3.1. The airport flies to a number of domestic and international locations. The domestic service to Manchester is by far the most popular flight, handling over 127,000 passengers in 2015.

10.3.2. The next most popular were services to London City, Majorca, Paris, Amsterdam and Edinburgh which all carried between 40-50,000 passengers per annum.

10.3.3. The ten busiest routes to and from Exeter Airports are shown below. These 10 busiest routes account for half a million passengers, 60% of the total passenger numbers.

1. Manchester – 127,700
2. London City- 49,900
3. Palme De Mallorca – 49,200
4. Edinburgh (45,100)
5. Amsterdam (43,600)
6. Paris Charles de Gaulle (43,100)
7. Jersey (37,600)
8. Newcastle (35,900)
9. Tenerife South (35,200)
10. Belfast City (30,900)

## 11. School Travel Data

### 11.1. Introduction

- 11.1.1. The data provided below provides an overview of School Travel Patterns across the Greater Exeter Area.
- 11.1.2. School Travel Data for all Local Authority schools in Devon is recorded by the County Council. Where relevant this has also been compared to National data from the National Travel Survey.

### 11.2. Modal Splits

- 11.2.1. Table 23 shows the travel to school mode split for 2013. Overall, a higher proportion of children walked to school in Exeter and Greater Exeter than the national average and a much lower proportion were driven, particularly for primary schools.

Location	Primary				Secondary			
	Walk	Cycle	Car	PT	Walk	Cycle	Car	PT
National	46%	1%	46%	6%	37%	2%	23%	36%
Greater Exeter	59%	1%	36%	3%	55%	6%	15%	24%
Exeter	68%	2%	26%	3%	60%	9%	17%	14%
Greater Exeter (excl Exeter)	56%	1%	40%	3%	49%	2%	13%	34%

**Table 23: 2013 School Mode Split Comparison**

- 11.2.2. The numbers using public transport were well below the national average for both primary and secondary, although for secondary the Greater Exeter average is heavily influenced by the low public transport splits in Exeter. If the Exeter schools are excluded the public transport mode split for the rest of Greater Exeter area is consistent with the National figure.
- 11.2.3. Further review of the secondary school mode splits by Exeter, urban and rural areas highlights that the secondary schools serving rural catchments have public transport mode splits in the order of 70%. This most likely arises as majority of students living more than 3 miles from the secondary school are eligible for free school.
- 11.2.4. The more favourable modal splits for Exeter schools are likely to be driven by the shorter distances of pupils to the schools. This is emphasised in Figure 11-2 below which shows the mode choice, by distance for both primary and secondary school. Similarly, this feature would be expected to be prevalent for those schools, particularly primary, situated within the Market and Coastal towns in the greater Exeter Area.

### 11.3. Trends in Mode choice for School Travel

- 11.3.1. Nationally, between 2007 and 2013, there has been a decrease in the proportion of children walking to school, and an increase in the proportion of children being driven and taking the bus. The comparative data for primary and secondary schools in the Exeter and Greater Exeter area is however more positive, showing that walking splits have increased over this period. This is shown in Figure 11-1.
- 11.3.2. For primary school children the proportion walking and cycling to school across Greater Exeter increased steadily between 2007 and 2016 to over 60%, while the proportion of children being driven and taking public transport decreased.
- 11.3.3. Trends in travel choice for secondary schools are less clear, and this is most likely as a result of the smaller sample size (for example only 6 secondary schools in Exeter) and addition of new school, e.g. Steiner Academy Exeter. The Steiner School in particular, with a large catchment and located on the edge of the city, has a much higher car mode split (46%) than other secondary schools and leads to an overall increase in car mode split across Exeter Schools.
- 11.3.4. Across the Greater Exeter area walk (45%) and car drive (20%) splits have remained relatively constant from 2007 to 2015. Although there is a notable spike in 2011 data, the reason for this is unclear and possibly an anomaly with the data rather than a fundamental shift in travel patterns that year.

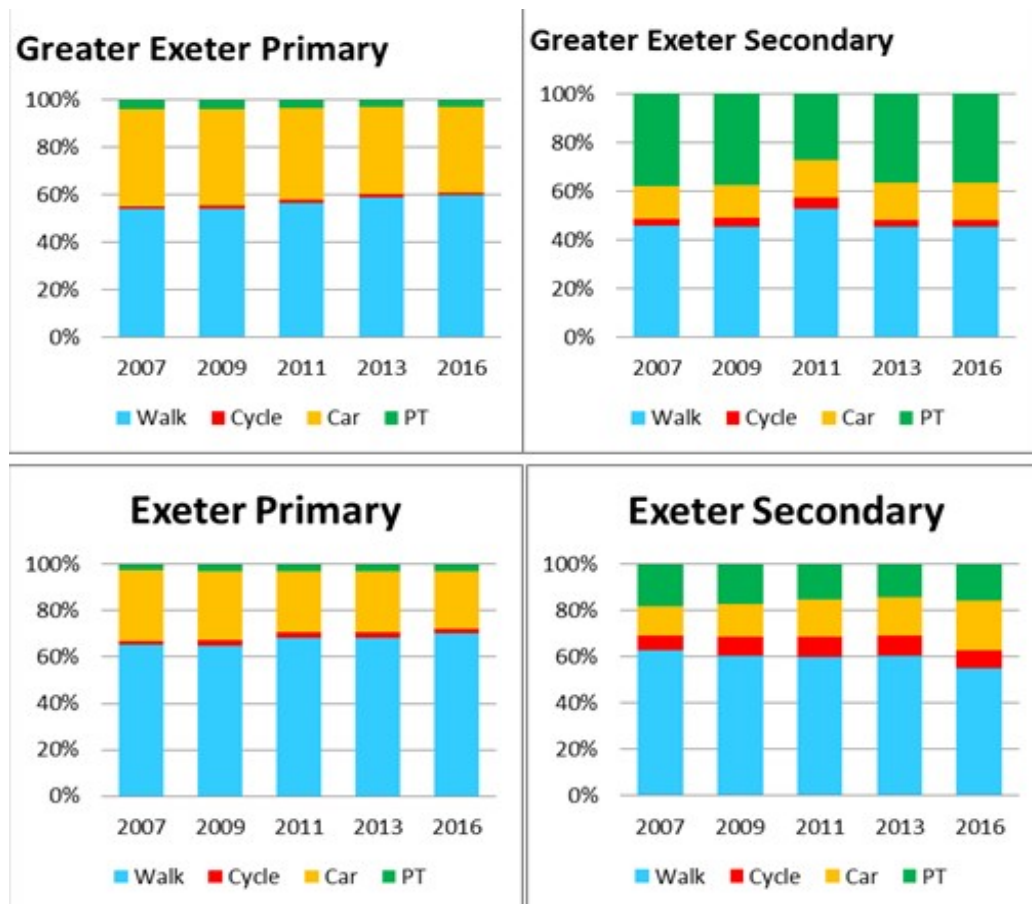


Figure 11-1: Primary and Secondary School Mode Split by Distance

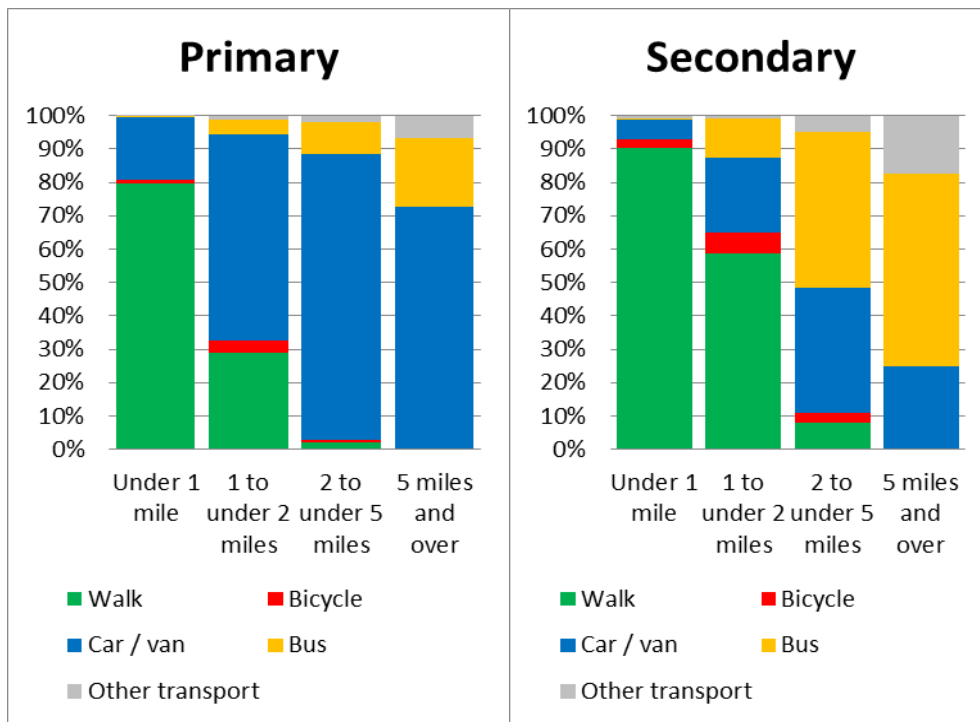
11.3.5. Overall, the numbers travelling sustainably to primary schools seems to be increasing across the Greater Exeter area. For secondary schools, the mode splits seem to be remaining broadly constant. Although there is scope to improve on this, both these trends are more positive than the underlying national trends.

#### 11.4. Impact of distance on School Travel Modal Choice

11.4.1. For shorter distances, walking is the main mode for both primary and secondary school children, albeit with much higher levels for secondary students.

11.4.2. For longer distances, primary school children tend to travel by car, and secondary school children tend to travel by bus or train.

11.4.3. There are a surprisingly high proportion of primary students who are driven less than a mile (20%) or 2 miles (60%) to their primary school.



**Figure 11-2: Primary and Secondary School Mode Split by Distance**

11.4.4. The comparative mode splits as a result of distance to the school highlight the importance that school location, particularly primary schools, can have on vehicular travel demand.

## 12. Air Quality

### 12.1. Background

- 12.1.1. Under the Environment Act 1995 all Local Authorities are required to assess the air quality against a set of national targets for seven key pollutants. These include, carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide and fine particles (PM<sub>10</sub>).
- 12.1.2. Air quality assessments have to be carried out every three years and the areas where objectives are not met, must be declared as Air Quality Management Areas (AQMAs). Typically, the recorded exceedances are for Nitrogen Dioxide based on the following criteria;
- Annual mean NO<sub>2</sub> Concentration of 40 µg/m<sup>3</sup>.
  - Hourly mean NO<sub>2</sub> Concentration of 200 µg/m<sup>3</sup> not exceeded more than 18 times a year.
- 12.1.3. Air pollution has a negative impact on the health of those living and working in vicinity. Road transport is a major source of pollutants and the worst affected areas are often at roadside locations where there are often residential dwellings.
- 12.1.4. The contribution to air pollution varies considerably by vehicle type. For example, data in the Exeter Air Quality Management Plan sets out that whilst cars typically account for 80% of the traffic volumes, they contribute only 35-40% of the NO<sub>2</sub>.

### 12.2. AQMAs

- 12.2.1. Across the Greater Exeter area there are a number of Air Quality Management Areas (AQMAs). These are summarised in Figure 12-1 and the areas of exceedance listed in the text below.

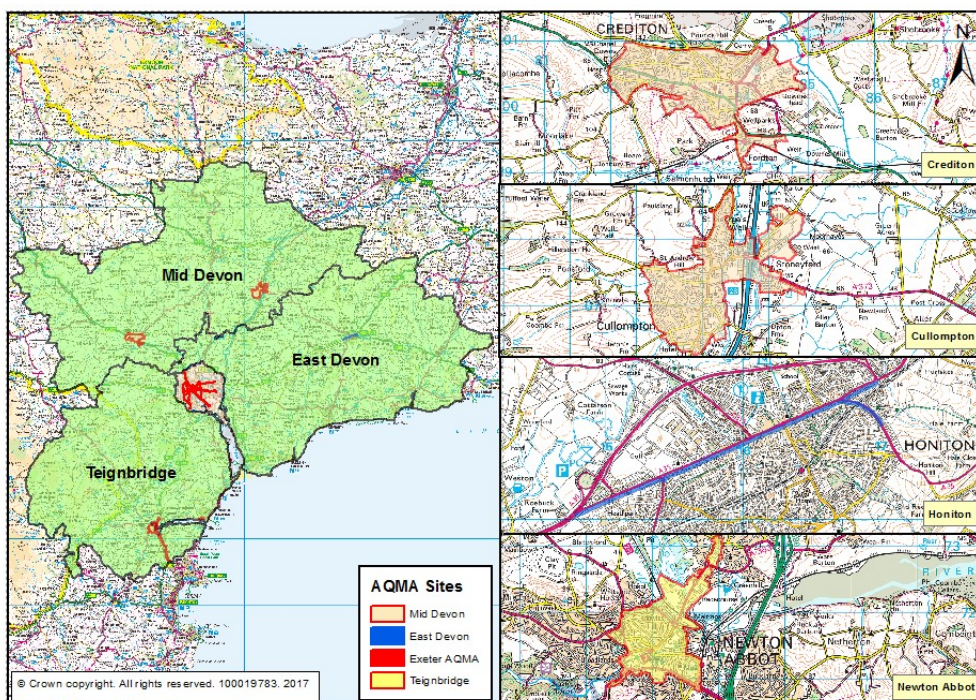


Figure 12-1: AQMAs in Greater Exeter Area

12.2.2. **Teignbridge** has four designated AQMAs.

- **Newton Abbot Town Centre**
- **Teignmouth A379** Bitton Park Road.
- **Dawlish A379** Iddesleigh Terrace
- **Kingskerswell Village\*** (following construction of South Devon Link Road, traffic flows through Kingskerswell have reduced by over 85% and expected that the AQMA will be revoked in due course)

12.2.3. **East Devon** has 2 designated AQMAs, these include

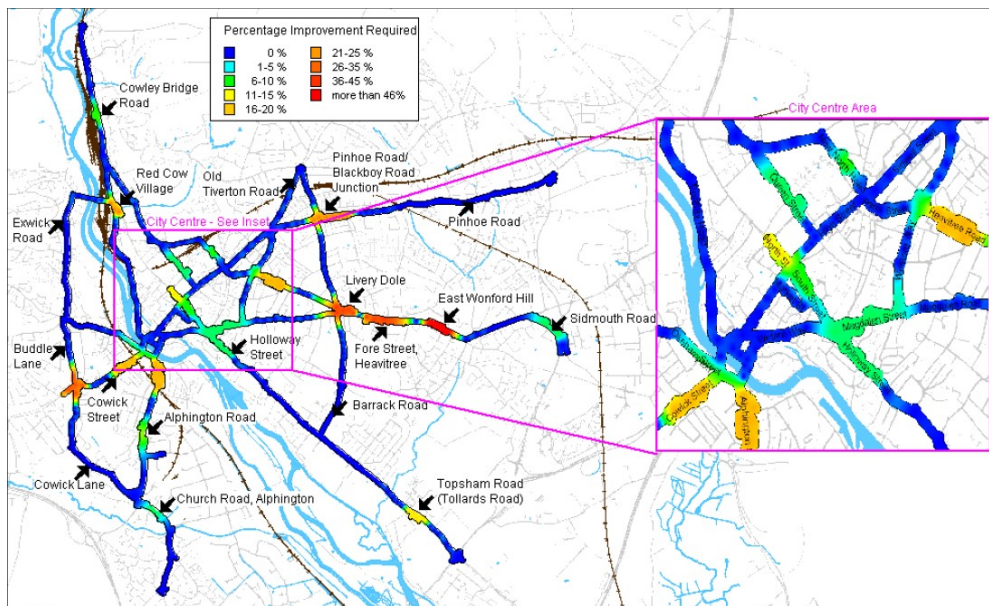
- **Honiton High Street**, Turks Head through to Monkton Road
  - Improvement scheme at Turks Head junction, to reduce queuing from A30 off slip expected to improve Air Quality in the local vicinity.
- **Clyst St George**, vicinity of George and Dragon outside Clyst Dene

12.2.4. In **Mid Devon** there are two designated AQMA's.

- **Crediton Town Centre**
  - Construction of Crediton Link Road in 2015 has helped to reduce congestion, particularly from HGVs, on Exeter Road.
- **Cullompton Station Road**, Higher Street and Fore Street

12.2.5. The **Exeter AQMA** covers most of the main traffic routes in the city (see coloured area of Figure 12-2 below). This image indicates the areas of poorest air quality and improvement needed from 2010 levels to remove the exceedance. However, with recent improvements there are currently just 3 main areas of NO<sub>2</sub> concentration exceedances in Exeter.

- **East Wonford Hill B3183**
- **Livery Dole Junction B3183/Polsloe Road/Barrack Road**
- **Pinhoe Road/Blackboy Road B3212**



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**Figure 12-2: Exeter AQMA and N02 Exceedance Points (2010)**

## 12.3. NO<sub>2</sub> Concentration

12.3.1. Table 24 below sets out the annual mean concentrations of NO<sub>2</sub> across the Air Quality Management Areas.

District	Location	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )				
		2011	2012	2013	2014	2015
Teign Bridge	N.Abbot – Wolborough St	55.2	55.1	-	-	50.1
	N.Abbot – Highweek St	48.1	43.0	-	-	41.3
	Teignmouth – Bitton Park Rd	48.3	58.2	-	-	47.3
	Dawlish - Iddesleigh Terrace	37.6	37.4	-	-	36.0
	<i>Kingerswell- Torquay Road</i>	-	-	-	-	41.4
Mid Devon	Crediton High St	42.0	41.2	43.3	40.9	36.1
	Crediton Exeter Rd	44.9	81.8	64.2	67.2	54.7
	Cullompton Fore St	41.1	41.5	33.5	37.6	38.1
East Devon	Honiton – East	48.2	42.3	48.5	40.4	-
	Honiton – Central	51.7	46.1	45.3	41.7	-
	Clyst St George	-	45.2	45.0	40.1	-
Exeter	East Wonford Hill	62.6	70.6	60.8	64.2	59.2
	Livery Dole	52.8	51.8	49.3	52.0	48.8
	Pinhoe Road	49.6	55.4	48.4	48.3	42.1
	Fore St Heavitree	48.7	50.9	46.2	48.5	38.6
	Alphington Street	41.1	42.4	45.8	44.4	35.2
	Cowick Street	57.7	50.4	47.7	45.4	36.4
	Topsham Rd/Tollards Rd	40.2	42.6	38.1	40.2	36.6

**Table 24: Location of NO<sub>2</sub> exceedances in Greater Exeter Area**

12.3.2. Table 24 sets out some encouraging trends with annual means typically falling at the AQMAs over the last 5 years.

12.3.3. There is however a number of sites where exceedances still occur that will need to be considered as part of future proposals. Data for sites in Teignbridge are not complete but a net reduction can still be seen across all sites.

## 13. Summary

13.1.1. The key points from the above sections are set out below. Consistent with the document, these are set out by section

### **Travel to Work Data**

- 13.1.2. The Travel to work influence of Exeter has grown significantly since 2001, and both the geographic size of the TTW area and proportion of in commuting for jobs (48%) are the second highest nationally- both behind Cambridge.
- 13.1.3. The strength of draw towards Exeter is at its strongest close to the city, with the strength of draw decreasing with distance. The draw to Exeter for some towns, for example Crediton, Dawlish, Exmouth (the largest town in Greater Exeter) and Cullompton, is particularly strong with over a quarter of the working residents in these towns working in Exeter
- 13.1.4. Conversely, just 10-12% of working population the 2<sup>nd</sup> and 3<sup>rd</sup> largest towns of Newton Abbot and Tiverton commute to Exeter. These towns show high levels of self-containment, with approximately 50% of residents working within the town. Sidmouth shows the highest self-containment, with 60% of residents working within the town. This may change with the upcoming relocation of the East Devon Council Offices.
- 13.1.5. Of the 26,500 in commuters to Exeter, half come from the towns of over 6,000 population in the Greater Exeter Area.
- 13.1.6. Proportion of sustainable travel to work in Exeter has been increasing and the majority of commute trips by residents of Exeter are not made by driving a car. The walk mode split of 22% is the 4<sup>th</sup> highest in the UK, behind Norwich, City of Westminster and the Isles of Scilly.
- 13.1.7. These trends are not replicated across the districts, where the proportions driving have stayed broadly consistent for 20 years. Proportions working from home have however increased from 10% in 1991 to 15% in 2011.
- 13.1.8. The Exeter TTW work mode splits compare favourably against cities of other size. With the exception of Oxford, the Public transport figure of 11% is consistent with the highest levels at other cities. Although higher than a number of other cities, the cycle mode split of 6% is still much lower than a number of the other cities considered, where a figure of 10% is frequently observed. (Norwich, York, Bristol).
- 13.1.9. For the towns in Greater Exeter, the highest sustainable mode splits are observed in Sidmouth, Crediton, Tiverton and Dawlish. In the first 3 of these towns, walking and cycling account for approximately 25% of all trips. For Sidmouth and Tiverton this is reflective of the high containment, although slightly surprising for Crediton where the containment is lower.
- 13.1.10. Although rail modal splits are typically low, towns and wards within short distance of a rail station typically have rail mode splits in the region of 5-10%.

### **Walk**

13.1.11. Walking is the 2<sup>nd</sup> most popular mode of travel across the Greater Exeter area and a dominant mode choice for trips under 1 mile.

- 13.1.12. The splits of walking reduce significantly as distance increase, consequently barriers and/or provision of indirect routes can have a significant impact on the propensity to walk for journeys between 1 and 2 miles.
- 13.1.13. A walking leg is also integral to public transport journeys. Data from the NTS suggests average distances of 0.4 miles (650 metres) for bus and 0.6 miles (1,000 metres) for rail.

### **Cycle**

- 13.1.14. Overall TTW cycle modes splits across Greater Exeter are modest at just 3%, although this rises in towns up to 10% at some wards in Exeter.
- 13.1.15. Cycle levels have increased significantly since 2005. On High quality routes in particular, such as the Exe estuary Trail, patronage growth in excess of 10% per annum has been recorded over the last 5-10 years. This suggests that high quality cycle infrastructure results in significant cycle usage.
- 13.1.16. Whilst the majority of cycle sites show a traditional M profile, the Exe Estuary trail sites experience highest levels of usage through the middle of the day.
- 13.1.17. Cycling levels are however very seasonal, with June flows over double those recorded in January. On intercity commuter routes where this seasonal variation is weakest, Summer flows are still 50% higher than those recorded in Winter.

### **Bus & P&R**

- 13.1.18. Bus is the most used form of public transport, accounting for approximately 1 in 20 TTW trips (5%) across the Greater Exeter area. Although the 10% bus mode split in Exeter inflates the average across the whole Greater Exeter area, the 5% mode split is broadly consistent (3-7%) across the main market and coastal towns.
- 13.1.19. City services within Exeter carry just under 21,000 people a day, up from 17,500 in 2004/05. A large part of this coincides with the introduction in concessionary travel, and although the residual passenger numbers have been increasing, this has been at a slower rate than the population leading to a slight fall in the bus TTW mode split.
- 13.1.20. Exeter is served by 3 commercial Park & Ride services. Patronage has increased by 40% on these services since 2004/05 to over 4,000 trips per day. Growth has however slowed in recent years, just 4.5% since 2010, as some sites operate at close to capacity.

### **Rail**

- 13.1.21. With two mainline routes to London, Exeter is excellently served by rail. The three Branch Line services (Avocet to Exmouth, Tarka to Barnstaple and Riviera to Paignton) converging on Exeter provide rail connections to a number of towns and villages in the Greater Exeter area.
- 13.1.22. Since 2000/01 patronage has doubled at the main stations in the Greater Exeter area. Passenger growth on the Branch lines has been even stronger with 115% increase on the Avocet and Riviera lines and a 175% rise on the Tarka line. Growth at stations within Exeter has been a comparable 130% over this period.

- 13.1.23. Some services already operate at close to capacity and even with planned capacity enhancements on the Avocet line that are being delivered in 2018 through the franchise, the sections of line between Exeter and Digby & Sowton and Exeter and Cranbrook are expected to have a load factor greater than 1 by 2023.

### **Vehicular**

- 13.1.24. Between 1991- 2011 the number of households with access to a car in the Greater Exeter area has increased by 8% and the average number of cars per household up by 20%. Despite this, national data available from 2002 shows that the average miles driven per person has fallen to the extent that such that between 2002 and 2014 there has been virtually no change in car traffic.
- 13.1.25. On the Strategic Road Network in Greater Exeter, traffic data from Highways England TRADS data show that flows on the M5 have been increasing by around 1% per annum. Traffic on the A30 and A38 have also increased, albeit at a much smaller magnitude of around ¼% each year.
- 13.1.26. The review of flow changes, profiles and journey purpose of the Local Authority roads has been undertaken by groupings of routes including Exeter radial roads, Exeter routes, outer cordon of inter urban routes to Exeter and district cordons. The key characteristics of these sets of routes are set out below
- 13.1.27. For the Exeter radial routes of Cowley Bridge Road, Pinhoe Road Heavitree Road, Topsham Road, Alphington Road and Cowick Street;
- Traffic flows have fallen since 2005 (except Pinhoe Road) with the level of reduction in the region of 0.5-1.0% per year.
- Predominantly exhibit a flat flow profile suggesting they are full throughout the day, although Cowley Bridge Road and Pinhoe Road still have traditional M profile
- Main users are commuters AM peak but shift to leisure/shopping trips from 10AM. Leisure & shopping also account for 50% of traffic in the PM peak.
- 13.1.28. For the Exeter routes of Cumberland Way, Hill Barton Road, Rydon Lane, Bridge Road and Western Way;
- Cumberland Way opened in 2007. Flows have increased steadily since opening, although flows on adjacent Hill Barton Road have fallen significantly. Both routes exhibit a traditional M profile.
- Other routes exhibit a flat profile and have on average seen a consistent fall in traffic levels of 1% per year since 2005.
- Based on Bridge Road RSI appear to carry a higher level of employer's business traffic than the radial routes. Leisure trips also around 50% of PM peak traffic.
- 13.1.29. For the outer cordon inter urban routes of A377, A396, B3181, C832, A3052, A376 and A379;
- Although the majority have seen a reduction in traffic levels since 2005, the patterns in traffic flow are both mixed and less clear.
- All exhibit a traditional M profile, and majority of peak period trips are commuters.
- Journey purposes show a greater level of PM peak commute trips. Education trips are also markedly more prominent than on the roads in Exeter.

#### 13.1.30. For routes in the East Devon and Mid Devon

On East Devon roads (A375 and A3052) traffic flows have stayed relatively constant since 2005. These typically have a flat profile through the day and exhibit some seasonality with summer flows 10% higher than through the rest of the year.

The roads in Mid Devon exhibit a steady reduction in flow since 2010 of between 0.2-0.8% per annum on each of the 3 routes, a trend that is broadly consistent with the changes recorded on the Exeter routes. The Mid Devon routes are however much more seasonal, with summer flows 15% higher than the weekday average.

Traffic flows profiles and volume trends on the 5 Teignbridge sites are very varied. The flows changes do however suggest that on routes with a typical M profile, and some spare capacity, volumes have been increasing. Unlike the other districts, the considered routes show little seasonality.

#### 13.1.31. Comparison of the observed traffic flow changes across the Greater Exeter area against the DfT TEMPro forecasts highlights that these factors have not been reflective of the changes from 2005-2015. In particular, the TEMPro estimates are 15% higher than the observed changes in Exeter and inter urban routes between East Devon and Exeter.

#### **Road Safety**

#### 13.1.32. The number of road traffic collisions in Greater Exeter has fallen by a third since 2005, although the bulk of this reduction was prior to 2010. The number of fatalities has fallen by a similar level, although the number of collisions resulting in serious injury has stayed relatively stable.

#### 13.1.33. Vulnerable Road Users account for 50% of the KSIs across Devon. The number of incidents and KSI collisions are in Summer, which appears to be reflective of higher pedestrian/cycle numbers.

#### 13.1.34. Multi factor route analysis has been undertaken to compare the accident performance of the main roads in the Greater Exeter area. Reflecting that the highest number of collisions occur in urban areas, worst performing routes tend to be in urban centres of Exeter, Honiton and Newton Abbot. Of these, the section of the B3183 through Heavitree is the worst performing route.

#### **Aviation**

#### 13.1.35. 820,000 passengers passed through Exeter airport in 2015, making it the 22<sup>nd</sup> busiest airport in the UK. This is the 4<sup>th</sup> successive year of patronage growth, since a period of decline from 2007, when over a million passengers flew, to 2012. These numbers are expected to continue to increase following the introduction of new services to Glasgow and Norwich in 2016.

#### 13.1.36. The route to Manchester, carrying over 127,000 passengers per annum, is the most popular flight. Flights to London City, Paris, Edinburgh, Palma de Mallorca and Amsterdam are the next most popular, all with between 40-50,000 passengers per annum.

#### **School Travel**

#### 13.1.37. A higher proportion of children walked to school in Exeter and Greater Exeter than the national average and a much lower proportion were driven, particularly for primary schools. The proportion of secondary school children cycling to school in Exeter was

over 4 times the national average, although this is not replicated across all of Greater Exeter.

- 13.1.38. The level of sustainable travel in Exeter has been increasing over the last 8 years. Splits across the rest of across the Greater Exeter area walk (45%) and car drive (20%) splits have remained relatively constant from 2007 to 2015. However, nationally, the trend has been for less sustainable trips to school.
- 13.1.39. For shorter distances, walking is the main mode for both primary and secondary school children, albeit with much higher levels for secondary students. There are a surprisingly high proportion of primary students who are driven less than a mile (20%) or 2 miles (60%) to their primary school. The comparative mode splits as a result of distance to the school highlight that where children are more than a mile from the nearest primary school, there is likely to be significant vehicular demand.

### **Air Quality**

- 13.1.40. The Air Quality Management Areas (AQMAs) in the Greater Exeter region are within the radial routes of Exeter and in the towns of Crediton, Cullompton, Newton Abbot and Honiton.
- 13.1.41. The contribution to air pollution varies considerably by vehicle type. For example, data in the Exeter Air Quality Management Plan sets out that whilst cars typically account for 80% of the traffic volumes, they contribute only 35-40% of the NO<sub>2</sub>.
- 13.1.42. NO<sub>2</sub> concentrations at the AQMAs have been gradually reducing year on year. This has further been bolstered by major infrastructure schemes at Kingskerswell and Crediton which have helped to improve air quality in these settlements considerably.
- 13.1.43. Within Exeter the number of areas where air pollution exceedances are recorded has dropped since 2011. The B3183 Heavitree Road is the worst route in Exeter and still includes a number of locations which exceed the objective.