

Exeter Civic Society

Rush Hour



A Report into how traffic congestion in Exeter at peak times will worsen in the period 2020–2030 as a result of the City's expansion and its focus as the economic heart of central Devon.

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Foreword

I am pleased to endorse this extensively researched report which forecasts a significant increase in car users by 2026 and beyond unless major proposals are developed and implemented to alleviate further congestion in the City. Exeter is about to experience a significant and rapid growth; its population and that of the adjacent parishes will increase to 180,000 by 2026 if all of the planned housing is built. The number of workers within this conurbation will rise from 64,000 to 87,000 if each new home has at least one worker. This growth will result in pressures on the road network throughout the day but especially in the rush-hour periods.

People's employment is not always in the area where they live (which is clearly idealistic), and Exeter is also recognised as a major employment area for commuters from as far as Torbay, North Devon and East Devon. There is an increasing number of commuters travelling out of the city's central areas by car, which must lead to more congestion where the incoming traffic meets the outgoing traffic, such as at Countess Wear roundabout.

My concern is that the County Council's Local Transport Plan (LTP3) for the period 2011 to 2026 fails to effectively address the issue of coping with traffic congestion within Exeter. The strategy is to encourage residents and commuters going to work to walk, cycle or use the train or bus in the hope that this will stem the growth, all of which are desirable. But even if all that is hoped for is achieved, there will still be a 20% increase in car usage in the rush-hour volume. There are plans to introduce more bus lanes, but if this is done by converting parts of the existing highway it will only lead to more congestion because there will be less space for cars.

Exeter's public transport system is still based on the historical basis that most employment and retail activity is based in the city centre. Most bus routes are via the city centre, along the routes that are the most congested. An orbital transport system which bypasses the city centre could go some way to allowing people to get from their homes to the major employment areas more directly and probably quicker. And if this linked up to train stations and park & ride sites there could be an integrated transport system, which is alluded to in LTP3, but there are no concrete proposals to achieve this.

The authorities must establish long term plans to reduce congestion below current levels, and completely mitigate the impact of the growth in population and the possibility of more car users. This requires planning decades ahead rather than the current short-term planning based on the availability of funds. It's time to be innovative!

Keith Lewis



Chairman, Exeter Civic Society.

Preface

This analysis of the current and likely future traffic volume in Exeter during the Rush-hour period has been prepared by drawing upon data and statistical information available on national and regional public web-sites. I am indebted to Susan Kay, Transition Exeter, for carrying out the sensitivity analysis and for some very valuable discussions about the accuracy and robustness of the data and assumptions underpinning the analysis.

Trevor Preist

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Rush-hour Transport in Exeter 2011 – 2026

Summary

The population growth planned for Exeter during the next fifteen years will have an impact on the quality of life in various ways. A detailed analysis of the effect on rush-hour mobility of those travelling to work has been carried out and the conclusions of the extended report are presented below.

Background

The Local Transport Plan (LTP3) considers the impact in transport terms of the approved construction of 10,000 homes within Exeter and 13,000 in the 17 parishes adjacent to the city boundary. The two areas together match the area used by Stagecoach for its Megarider Plus ticket; this reflects the fact that those living in the outer ring are effectively residents of the Exeter conurbation and distinct from ‘commuters’ who come from further afield. The additional ‘residents’ live within 5km of the city boundary.

[The conclusions in the following analysis are based upon the assumption that each new dwelling will have one worker and an average of two residents.]

Demographics 2011 – 2026

| | | 2011 | 2026 |
|--------------------|-----------------|----------------|----------------|
| Population: | Exeter | 118,000 | 138,000 |
| | Nearby Parishes | 15,500 | 42,000 |
| | Total | 133,500 | 180,000 |
| | | | |
| Jobs: | Residents | 64,000 | 87,000 |
| | Commuters | 28,000 | 28,000 |
| | Total | 92,000 | 115,000 |

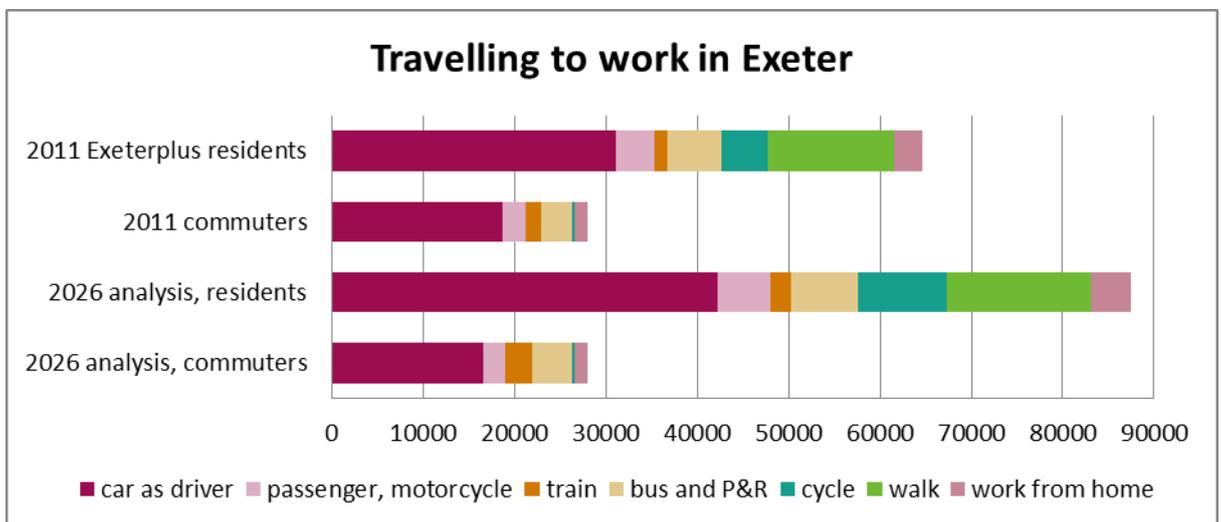
Rush-hour Mobility

- Currently within Exeter the mode of transport to work is:

| | | | |
|------------------|-----|---------------|-----|
| Work at home | 5% | Motor vehicle | 54% |
| Public Transport | 11% | Walk or cycle | 29% |

- For commuters, 25% work at home, use public transport or the P&R facilities at the edge of the city. 75% drive to their place of work.
- Currently during the rush hour period, 31,000 residents and 18,600 commuters use their cars.

- The current capacity of public transport in trains, city and country buses and the park and ride system can cope with no more than 12,000/hr and the improvements envisaged in the next 15 years will only increase the capacity to 17,000/hr
 - Currently 3 times as many people walk as cycle since the historical job area in the city is close to residential areas. This is changing with many more new jobs on the periphery increasing the average distance to work.
 - Walking will be less feasible and sustaining the 30% walking or cycling figure will be difficult to achieve unless there is investment in SAFE, SEGREGATED routes for walkers and cyclists.
- **Current car usage is 31,000 (residents) and 18,600 (commuters) totalling 49,600 which will rise to 59,000 by 2026.**
 - **This increase of 19% assumes that all the transport improvements proposed will be achieved and 30% of those from the Exeter conurbation going to work will walk or cycle.**
 - **The current road system within Exeter is used at a level close to capacity in the rush hour period and significant improvements are very difficult. The growth of the extended city to 180,000 will see a 19% rise in the rush hour traffic volume with the prospect of greater rises as the city grows to over 200,000 by 2050.**



The only way to manage this, in the long term, is to develop a game changing transport strategy over 25 – 35 years. Rennes has been doing this since 1985. Exeter needs to start NOW since failure to do so will severely affect the attractiveness of the City as a place to live, work, visit or locate a business.

Rush-hour Transport in Exeter 2011 – 2026

1. Introduction

Exeter and its immediate surrounds is a rapidly changing area with new jobs being created and new homes built. In the next 15 years the plans that have been approved will become a reality resulting in opportunities and pressures for the City.

One particular pressure is how people are able to move around the city for work and leisure, particularly as the numbers moving around increase significantly. This pressure will arise not only from the growth within the city but also from a greater growth in the population of the 17 civil parishes adjacent to the city in the District Authorities of East Devon and Teignbridge.

The way the inhabitants of these lead their work and leisure lives will have a major impact on Exeter. Currently these parishes have a population of 15,500 (13% of Exeter) but by 2026 it will rise to 42,000 (30%) of Exeter at that time. For this reason it seems sensible to include these as part of a greater Exeter conurbation.

Whilst it can be hoped that some people will live and work in the same community, the majority will not, and will criss-cross each other getting from one part of Exeter to another.

The analysis presented here sets out to quantify how those who work within the Exeter conurbation travel to work currently and how they are likely to do so in the future identifying in particular the extent to which car use will change.

2. Growth

i. Population

In 2011, Exeter had a population of 117,800 (2011 Census) and the new Local Transport Plan (LTP3) describes how the city is embedded within a travel to work in Exeter region with 280,000 inhabitants and a shopping region containing 500,000.

Exeter has a boundary determined by its district authority status but adjacent to this boundary there are 17 village / towns within 5 km of the boundary whose inhabitants look to Exeter for work and leisure purposes since the alternatives are much more distant. Those centres are in the 17 civil parishes of East Devon, Teignbridge and Mid Devon that adjoin the city boundary; the population of these in 2012 was 15,500 (Patient and Practitioner Services, PPSA, data: 2012, Appendix A).

In any discussion about the growth of Exeter and the pressures and demands that this growth will create it is logical to include these adjacent areas together with Exeter as a single entity which will be called EXETERPLUS. This is particularly important since the

population in the adjacent area will grow significantly. The residents of this part of the travel to work area impact on Exeter in a significantly different way from the ‘commuters’ who come from towns more distant. This concept is already incorporated into Stagecoach’s ticketing policy. The Megarider ticket covering day travel in Exeter has a counterpart Megarider Plus which extends its validity to an outer zone effectively embracing the area of the 17 parishes mentioned above.

The Exeterplus area today has a population of almost 140,000 (PPSA data: 2012) and the current Local Transport Plan (LTP3) envisages the following growth in the period to 2026

- a) at least 10,000 additional dwellings within the city boundary in 2012 – 2026 including Newcourt and Monkerton. (Planning documents of 2011 refer to 12,000 houses but the detailed list includes 2,000 already completed.)
- b) 13,000 dwellings in the adjacent area including those at Cranbrook and near Alphington and Pinhoe.

The Devon CC population projections which incorporate the growth in (a) anticipate a population for Exeter in 2026 of 138,000 growing by 2031 to 143,000. The growth envisaged in (b) above suggests that the population of the adjacent region will grow from 15,500 to about 42,000 in 2026 giving an Exeterplus population of 183,000, i.e. a growth of 28%.

Finally the student population, currently 14,000, is planned to increase by about 6,000 and this increase may not be included in the population projections used above.

ii. Employment in Exeterplus

The 2007 business survey (Appendix B) within Exeter indicated that there were 85,000 jobs within the city boundary and more than 7,500 in the nearby boundary region,

LTP3 envisages that 10,000 jobs will be created at the Science Park and Skypark regions but the growth in population projected suggests that a further 13,000 jobs will be required if the new residents are to be employed implying a total 115,000 jobs by 2026. (In estimating this figure it is assumed that on average each new home has at least one employee.)

The jobs are largely concentrated in a number of areas:

| | |
|--|--------|
| City Centre | 16,300 |
| St James & University | 9,700 |
| Barrack Road area | 17,200 |
| West of river (inc Matford and Marsh Barton) | 30,600 |
| A30, northeast sector (including Sowton) | 15,100 |
| Airport | 3,500 |

The growth in jobs envisaged will occur mainly in the NE sector, near the airport and Science Park, and at Matford.

3. Transport Implications during the rush hour

i. Getting to work (for residents of Exeterplus)

The 2011 Census indicates that, of the 118,000 Exeter residents, 57,000 are employed and, on a pro-rata basis, the figure of employees for Exeterplus would be 64,000.

The 2011 Census also gives details of the modes of travel to work for the residents in the current Exeter area (Appendix C).

| | |
|---------------|-------|
| Train | 2.1% |
| Bus | 9.2% |
| Driver / Taxi | 47.9% |
| Passenger | 5.3% |
| Motorcycle | 1.2% |
| Cycle | 6.3% |
| Walk | 22.9% |
| At home/other | 5.0% |

This implies that 27,300 cars driven by Exeter residents are used to drive to work and on a pro-rata basis the figure for **Exeterplus is 31,000**. This latter figure is probably an underestimate since the use of public transport in the adjoining parishes is limited by capacity and availability and car ownership in rural areas is greater than urban areas.

ii. Getting to work (commuters)

The residents of Exeterplus fill 64,500 jobs of the 92,500 currently available in Exeter implying that 28,000 people commute into Exeter to work from outside Exeterplus using cars, train, buses, cycles (possibly) and on foot (unlikely).

Appendix D to this report considers the information available about the capacity, use and potential use of public transport indicating that

- a) Trains bring about 1700 workers into Exeter during the rush hour period
- b) The current country bus capacity could bring no more than 2400 / hour into the city during the rush hour
- c) 1000 park and ride places are available for commuters.
- d) In addition the data on Exeter indicates that 5% of employees work at home and it will be assumed that 5% of the 28,000 commuters, i.e. 1400 do not travel to work.

The total of the above figures is 6,500 leaving 21,500 who travel into central Exeter by motor vehicle.

Again using the figures for Exeter that the passenger / motorcycle number is 14% of car drivers implies that **18,600 cars are used to commute into Exeter from outside the Exeterplus area**.

Hence the total rush-hour period involves about 49,500 cars.

4. Rush Hour Car traffic in Exeter

i. Current position

The previous section indicates that in total almost 50,000 cars move around Exeter in the rush hour creating enormous pressure and congestion. The main arterial roads into Central Exeter are accepted to be near capacity (letter from Devon CC to Ben Bradshaw, July 2012) with extremely slow movement at times and each has at least one point of restriction hindering smooth flow.

This is compounded by the few points at which the Exe can be crossed; the railway crossing near St David's has limited capacity whilst Exe Bridges and the Swing Bridges at Countess Wear experience extremely restricted flow. The bridge approaches to the latter are currently being upgraded as is the rest of the original bypass connecting the NE business sector to Matford and Marsh Barton but this is mainly to improve out-flowing traffic.

On the basis of the previous discussion the road system barely copes during the rush hour with 50,000 cars (residents and commuters).

ii. Projections of car users for 2026

The population of Exeterplus will grow by 46,000 with 23,000 new employees in the area. For the purpose of this analysis it has been assumed that job growth will be sufficient to meet this demand with no surplus for growth in jobs held by commuters.

a) Additional public transport use due to new infrastructure (Appendix D)

The planned improvements could increase bus and rail use as below:

| | |
|--|-------------|
| 4 new stations and doubling frequency (DM Appraisal) | |
| Commuters | 1300 |
| Residents | 800 |
| Extra P&R places | |
| Commuters | 1000 |
| Bus services from Cranbrook | |
| Residents | 500 |
| Enhanced City buses | |
| Residents | 1000 |
| | <hr/> |
| | 4600 |

b) Work at home (5%)

1150

c) Ecofriendly (Appendix E)

Cycling (20%)

4600

Walking (9%)

2050

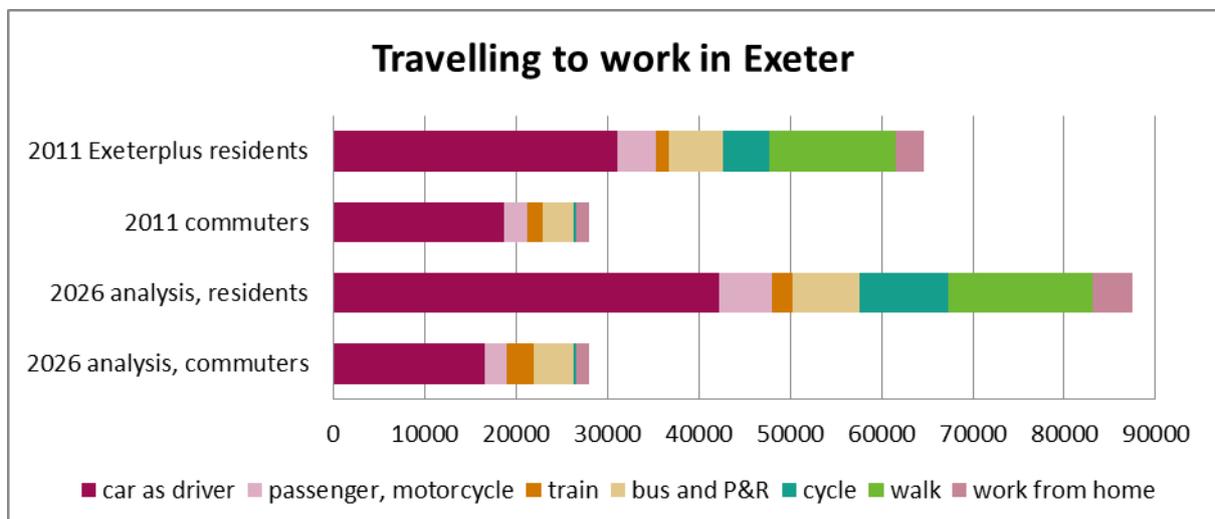
Overall Total

12400

This implies that 10,600 of the 23,000 new workers will use the road in some manner and, allowing for passengers and motorcycles, is equivalent to 9200 extra cars, a growth of 19%.

A complete breakdown of the results of the analysis is given below together with a bar chart representation of the current and future travel modes.

| | 2011 Exeterplus residents | 2011 commuters | 2026 analysis, residents | 2026 analysis, commuters |
|-----------------------|---------------------------|----------------|--------------------------|--------------------------|
| car as driver | 31000 | 18600 | 42200 | 16600 |
| passenger, motorcycle | 4300 | 2600 | 5800 | 2300 |
| train | 1400 | 1700 | 2200 | 3000 |
| bus and P&R | 5900 | 3400 | 7400 | 4400 |
| cycle | 5100 | 300 | 9700 | 300 |
| walk | 13800 | 0 | 15800 | 0 |
| work from home | 3200 | 1400 | 4400 | 1400 |



5. Discussion

The analysis given above indicates that rush hour traffic will increase by 19% as a result of the impact of the new developments.

There are a variety of reasons why this figure should be seen as a lower limit.

The assumed overall level of 30% for cycling and walking for the new residents of Exeterplus within the analysis is extremely optimistic by international standards and the assumed growth in cycling is unlikely to be achieved without serious investment in designing and realising segregated routes for cyclists, free of motor traffic.

Many of the proposed improvements in the infrastructure of train and bus services are not certain to happen and some involve significant investment.

The move to a cycling culture is one of the aspirational targets of the LTP3 and this document quantifies the impact of 30% of the Exeterplus residents cycling or walking in 2026. ***The increase in car usage estimated has been limited by the assumption that 30% of the residents of Exeterplus will cycle or walk to work – a very challenging target.***

Appendix F looks at the effect of changing some of the assumptions made, both optimistically and pessimistically.

The striking feature is that because the two largest components by a long way are car users and cycling or walking numbers, the effect of the success or otherwise of achieving the proposed transport improvements produces only marginal change.

The biggest ameliorating factor is the extent to which residents are encouraged to cycle and walk to work and existing residents are assisted to increase their current 29% level. Getting the latter to double the cycle to work level to 12.5% (from the current 6.3%) while maintaining their walking level at 23% will get 3000 cars off the road, reducing the growth to 13%. Conversely if the overall cycling and walking level drops to 20% (rather than the estimated 29%) there will be 7000 extra cars on the road, increasing car growth to 30%.

The other aspiration is to persuade people to use public transport rather than cars. This is often seen as simply the need to energise people to make the effort not to use their car or alternatively to make it more difficult by limiting parking, charging to park at work places or by increasing public parking charges. A parallel strand is to make public transport more attractive by providing better real-time information, efficient ticketing and priority bus lanes. Many use their cars because the distance to work is too far to walk or cycle. Public transport is, for them, a realistic option only if the routes, access and timetable are convenient.

The current bus system is focussed on transporting people into the city centre for work, leisure and shopping. About a third of the jobs are in the centre and adjacent areas but the other areas with large numbers of jobs are only marginally served by the transport system. ***Arguably the period from 7.00 - 9.00 would be better served by using different routes focussing on linking residential areas to all work areas.***

Doing this would provide a modest improvement in usefulness and take-up but the overall capacity of the system is limited.

The analysis presented of the existing public transport infrastructure indicates that, even with the upgrades proposed, its capacity is starkly inadequate to cope with a major transfer from car use.

The total hourly capacity of rail and buses (both city and country) with all the enhancements proposed will be no more than 17,000 people/hr compared with the rush hour period volume of individuals travelling to work which will be 115,000 by 2026.

One factor not included in this analysis is the use of cars to take children to school since there is no source of data available. There are about 16,000 children of school age in Exeter who go to school on foot, cycle or bus or by car. The number driven to school is probably in the range 2 – 5000 and the new developments will result in an increase in this figure.

Without some game changing strategy for public transport, a significant reduction in car use is possible only if

- a) at least 50% of the residents of Exeter cycle or walk
- and
- b) at the periphery there are P&R sites capable of capturing 10,000 cars. (This would require about 150 bus journeys!)

The latter illustrates the problem of coping with commuter traffic without the infrastructure of a high capacity, multiple-destination, transport system.

Without a realistic strategy to cope with the projected growth to 2026 followed by the likely growth to well over 200,000 by 2050, movement within the city will be throttled.

What is needed is a strategy for the next 25-30 years and beyond in which an infrastructure suited to the needs and growth of the city is progressively designed and put in place.

Rennes, our twin city in France, started this process in 1985 and is continuing to improve its infrastructure extremely successfully. We could learn much from them about what they have done and how they did it.

Data Sources and Assumptions

Sources

- 1) Exeter Core Strategy, Feb 2012.
www.exeter.gov.uk/CHHpHandler.ash
- 2) Devon Local Transport Plan, 2011 – 2026 (LTP3), April 2011
www.devon.gov.uk/dtltp2011-2026strategydoc.pdf
- 3) Devon Metro Appraisal, Jan 2011
www.devon.gov.uk/eldf_devonmetroappraisal.pdf
- 4) Population of civil parishes adjoining Exeter, 2012
PPSA, data 2012 www.devon.gov.uk/PPSA
- 5) Distribution of jobs in Exeter (2007) by sub-postcode areas
ONS Crown copyright Business Survey 2007
(from Nomis, www.nomisweb.co.uk courtesy of Tom Oswald Exeter C.C.)
- 6) Methods of travel to work for Exeter Residents, 2011
ONS Crown Copyright Census 2011
(from Nomis, www.nomisweb.co.uk courtesy of Tom Oswald Exeter C.C.)
- 7) Exeter City Bus Map 2013, 2014 Devon C.C.
These contain details of the frequency of trains and city & country bus services into and within Exeter.
- 8) Exeter Park and Ride Leaflet www.devon.gov.uk/park_and_ride
- 9) The following support documents for the Exeter Transport Strategy are available as links from
www.devon.gov.uk/index/transportroads/devon_local_transport_plan/transplan-exeter-ldf.htm

Exeter Growth Bus Strategy
Exeter Walking Strategy
Summary of LDF Evidence Base

Baseline Traffic Evidence Report
Future of Transport in Exeter Consultation Report
Local Transport Plan 2011 - 2026 'Exeter Place Strategy'
Exeter Cycle Strategy
Enhancing the Public Transport System in Exeter Option Appraisal Report

- 10) Walking and Cycling Statistics 2011/12, Department for Transport
www.gov.uk/government/collections/walking-and-cycling-statistics#publications-released-during-2012

Assumptions

1. Every new home has on average 2 residents and 1 employed person
2. 5% of employees work at home
3. The total number of car passengers and motorcycle users during the rush-hour period is 14% of the number of car drivers
4. The distribution of the modes of transport of the 7,500 employees in the 17 parishes adjacent to Exeter is the same as for Exeter, other than the assumption that, of the 29% who cycle or walk to work, 20% cycle and 9% walk.
5. The number of jobs will grow by 23,000 to meet the needs of the new residents but there will be no surplus growth for new commuters
6. It is assumed the number of P&R spaces for **all day parking** is 1000 and that 1000 additional spaces will be provided by 2026
7. It is assumed that the suggested improvements in the bus system serving Exeter will result in an increased travel to work patronage of 1500
8. It is assumed that the travel-to-work rail patronage will be increased as forecast in the Devon Metro Appraisal report following the creation of four new stations (Cranbrook, Marsh Barton, Newcourt and Monkerton) and the doubling of local train frequencies.
9. The analysis does not include the traffic movements associated with taking children to school since no reliable data source is known.

Note: The figures quoted in 2) and 3) are the values for Exeter residents in the 2011 Census data.

Appendix A Current population of civil parishes adjoining Exeter

Source: PPSA data 2012, devon.gov.uk

| | Population | Road distance to Exeter boundary (km) |
|------------------------|------------|---------------------------------------|
| East Devon | | |
| Upton Pyne | 481 | 3 |
| Bramford Speke | 347 | 5 |
| Stoke Canon | 652 | 4 |
| Huxham | 104 | 1 |
| Poltimore | 299 | 1 |
| Broadclyst | 3172 | 2 |
| Sowton | 637 | 2 |
| Clyst St Mary | 621 | 1 |
| Clyst St George | 779 | 3 |
| Clyst Honiton | 318 | 1 |
| Teignbridge | | |
| Exminster | 3789 | 1 |
| Kenn | 1135 | 3 |
| Shillingford St George | 371 | 2 |
| Ide | 542 | 1 |
| Holcombe Burnell | 581 | 4 |
| Whitestone | 767 | 4 |
| Mid Devon | | |
| Newton St Cyres | 902 | 4 |
| | 15497 | |

For many employees living in communities less than 5km by road from the city boundary, the travel to work time (in Exeter) is less than for many Exeter residents.

Pro-rata by the population of Exeter(117,800) and the figure above for the population of the adjoining region (15497), the number of employees would be 7517

Appendix B Annual business inquiry employee analysis SIC 2007

ONS Crown Copyright Reserved [from Nomis on 16 March 2012]

Postcode sub-area

| | | |
|-----------------|---------|--|
| EX 1 1 - Exeter | 7,614* | City centre |
| EX 1 2 - Exeter | 3,292* | St Luke's area |
| EX 1 3 - Exeter | 7,200* | Met Office, Exeter Business Park |
| EX 2 4 - Exeter | 5,781* | Near the Barracks and Devon County Council |
| EX 2 5 - Exeter | 9,611* | Pynes Hill and RD&E |
| EX 2 6 - Exeter | 2,702* | Topsham Road |
| EX 2 7 - Exeter | 12,500* | Matford |
| EX 2 8 - Exeter | 11,675* | Marsh Barton |
| EX 2 9 - Exeter | 1,335* | St Thomas |
| EX 3 0 - Exeter | 1,569* | Topsham |
| EX 4 1 - Exeter | 2,155* | Haven Banks |
| EX 4 2 - Exeter | 753* | Exwick |
| EX 4 3 - Exeter | 8,680* | Central Exeter |
| EX 4 4 - Exeter | 6,089* | University, St James |
| EX 4 5 - Exeter | 266* | Duryard |
| EX 4 6 - Exeter | 2,153* | Sidwell St |
| EX 4 7 - Exeter | 450* | Mt Pleasant |
| EX 4 8 - Exeter | 2,611* | Arena/Pinhoe |
| EX 4 9 - Exeter | 178* | Pinhoe |
| EX 5 2 - Exeter | 3,469* | Near the airport |
| EX 5 3 - Exeter | 1,030* | Broadclyst |
| EX 6 7 - Exeter | 954* | Kenn |

* These figures are aggregates from which farm agriculture (SIC class 0100) have been excluded.

Appendix C Method of travel to work

ONS Crown Copyright Reserved [from Nomis on 4 October 2013]

| | |
|-------------|---------------------------------------|
| Population | All usual residents aged 16 to 74 |
| Units | Persons |
| area type | local authorities: district / unitary |
| area name | Exeter |
| rural urban | Total |

| Method of Travel to Work | 2011 |
|---------------------------------------|--------|
| Work mainly at or from home | 2,622 |
| Underground, metro, light rail, train | 55 |
| Train | 1,135 |
| Bus, minibus or coach | 5,264 |
| Taxi | 211 |
| Motorcycle, scooter or moped | 706 |
| Driving a car or van | 27,152 |
| Passenger in a car or van | 3,049 |
| Bicycle | 3,622 |
| On foot | 13,065 |
| Other method of travel to work | 258 |
| Not in employment | 32,405 |
| All categories: Method of travel | 89,544 |

These figures will be scaled up in the analysis by 1.13 (the ratio of the workers in Exeterplus and Exeter) to give the numbers in the relative categories for Exeterplus.

Two assumptions drawn from the table above will be used in the analysis of the impact of the additional employees travelling to work.

- i. 5% of the total will work from home.***
- ii. The number of passengers and motorcyclists is 14% of the number of car drivers***

Appendix D Capacity and usage of public transport

1. Rail

- a) The current time tables have a total of 4 trains /hr arriving from Exmouth (2) Barnstaple (1) and Paignton (1). These trains are normally 2-car diesels with a capacity of about 200 each so that they bring a maximum of 800/hr into Exeter.
- b) The main line services to or through Exeter are
- | | |
|--------------------------------------|------|
| GW (from Plymouth 8 coaches) | 1/hr |
| GW (from Taunton 8 coaches) | 1/hr |
| CC (from Plymouth 4/5 coaches) | 1/hr |
| CC (from Taunton 4/5 coaches) | 1/hr |
| Stagecoach (from Waterloo 3 coaches) | 1/hr |
- a) A coach capacity is about 100 giving a capacity/hr of 2,800. These are long distance travel through trains (except from Waterloo); assuming they are full and 25% get off at Exeter implies that they bring about 700/hr into the city.
- c) Summing the figures in a) and b) implies **that the maximum input of commuters from rail services to Exeter is 1500/hr.**
This is comparable with the destinations of rail journeys to work in Exeter (Figure 1 of the Devon Metro Appraisal, Devon CC report) which estimates 1100. This figure uses 2001 Census data; rail usage has grown by about 50% which would imply a **current figure of 1700 for those arriving by rail to work in Exeter.**
- d) In the context of rail use within Exeter the relevant lines are those to Waterloo and Exmouth which have a capacity of 900/hr in each direction. The total capacity of 1800/hr is consistent with the census figure that approximately 1200 Exeter residents go to work by rail.

2. Bus

- a) Country buses
Those operated by Stagecoach, First, Dartline and others provide services from about 15 start points outside the Exeterplus area and these services have about 36 arrivals during the rush hour period.
This implies the maximum number of commuters arriving per hour is

| | | |
|-----------------------------|--|------|
| Single decker (capacity 50) | | 1800 |
| | | |
| Double decker (capacity 75) | | 2700 |

Since the buses in use vary with the route the actual maximum is between these two limits say 2,400.

b) City buses

The timetables of the city bus service indicate that the service delivers a total of 48 buses/hour into the city centre from each of the two directions of the routes.

This implies that a maximum of $48 \times 2 \times 50 = 4800$ people/hr could be brought into the city centre by the service.

c) Park & Ride

The 3 park and ride services provide a total of 16 buses/hr arriving in the centre with a similar number returning to the periphery. During the rush hour period the routes of the return journeys are modified to pass through areas with significant numbers of jobs.

The maximum capacity, assuming they are all double decker, is

$$16 \times 75 = 1200/\text{hr into the city centre}$$

and

1200/hr capacity to take city residents from the centre to job locations at the periphery.

The services are either 5 or 6 per hour and although the capacity could be increased with a more frequent service the parking available at the sites is another limitation.

Currently the parking capacity of the 3 sites is 1650 and the successful filling of these with all day commuters would render the P&R system useless for shoppers. ***It will be assumed that 1000 are used by commuters for parking all day.***

d) Summary

This analysis suggests that, ***for commuters, the Country bus services and P&R system can cope with***

$$2400 + 1000 = 3400 \text{ commuters}$$

assuming those coming by bus arrive during a one-hour period.

For Exeter residents there is a capacity for those travelling to work of
$$4800 + 1200 = 6000/\text{hr}$$

This is comparable with the 2011 census which indicated that 5,300 Exeter residents travel to work by bus.

These capacity figures for rail and bus total 12,500 and represent only 14% of over 92,000 travelling to work. They would be larger if the travel to work period by bus is assumed to be larger say 1.5 hours. In either case they are a small fraction of the total number.

3. Planned improvements

i. Rail

- a) Increased frequency of trains from Paignton, Axminster and Exmouth (this would require line improvements).

The doubling of these frequencies would have an additional capacity of 800/hr. However the Devon Metro Appraisal projects the resulting increase in patronage on these lines to be respectively 50%, 50% and 37%.

This increase in patronage would raise the 1,700 rail commuters to 2,420.

- b) Station at Cranbrook.

This will happen and the Devon Metro Appraisal estimates that it would generate **200**/day travelling to work in Exeter and 500 rail trips per day in total from the station. Doubling the train frequency would increase the numbers travelling to work by rail to **300**.

- c) New stations at Newcourt, Marsh Barton and possibly Monkerton depending upon finding funding.

The Devon Metro Appraisal projections for the **travel to work usage** for these stations are respectively

| | | | | |
|------|------|-----|--------------|------------|
| 214, | 337, | 226 | Total | 777 |
|------|------|-----|--------------|------------|

and the daily usage

| | | | | |
|------|------|-----|--------------|-------------|
| 555, | 877, | 588 | Total | 2020 |
|------|------|-----|--------------|-------------|

Doubling the train frequency would increase those using the trains during the rush-hour period from **777 to 1110**.

Although the Monkerton figures are slightly larger than Newcourt the revenue from the latter is greater making it the prioritised station. The cost of either of these two stations is £4 million and for Marsh Barton £6 million.

- d) If all these rail improvements were put in place, the number travelling to work by rail would increase by 1300 for commuters (to 3000) and by 800 for residents of Exeterplus (to 2200).**

ii. Bus services

The Bus Growth Strategy identifies a number of possible developments:

- e) Within the city it is envisaged that some routes will be extended into the new development areas providing access to the city centre. This will involve increased frequency over much of the route (which may be split at the ends) and an increased capacity.

- f) Two changes on the country services are proposed:
The 1 service will be re-routed during the peak period to link into the employment areas in the east. The service is currently 3/hr and an extra bus is required. This and the increased attractiveness of the route for Exeter residents in the Pinhoe area could produce an extra 150/hr bus passengers.

The 4 service (twice an hour) will now serve Cranbrook en route from Honiton. This might generate an extra 50/hr. Although the sought-after enhanced service did not materialise it seems likely that the needs of the significant number in Cranbrook who will work in Exeter will result in a dedicated service modelled on the P&R buses (450/hr).

In this analysis it is assumed that the enhancement to the city and country buses outlined, including a dedicated service to Cranbrook will increase travel-to-work bus usage by 1500 per day.

- g) Park and Ride
The plans for the enhancement of the system are currently in a state of flux. Modification to Matford and new sites at Ide and Cowley are under discussion.
In this analysis it is assumed that 1500 new spaces will be created with the assumption that 1000 will be used by commuters for all day parking.

On the basis of these assumptions the numbers using rail and bus will rise by 4,600 to 17,000 which will be 15% of the 115,000 travelling to work in 2026.

Appendix E Cycling and walking

i. The current position

It is perhaps surprising and certainly encouraging that 30% of the journeys to work in Exeter are by cycle or on foot. This is probably because the job area embracing the University, City Centre, County Hall and the RD&E is close to large areas of population. Probably too this is the reason why the walking to cycling ratio is 3:1. Within Exeter of the 54,000 who travel to work, 13,000 walk and 3,600 cycle.

For the region adjacent to the Exeter boundary no data is available. The region contains about 7,500 workers and if the same percentage as Exeter cycled or walked this would be 2,250. This is likely to be an overestimate since distances to work make walking less likely and cycle routes to work involve using the main roads into Exeter.

Much of the projected job growth is in the NE sector near the M5 and in the Matford area with residential growths at Cranbrook, Monkerton, Newcourt and SW Exeter with distances in the main too great to walk. The exceptions to these are for those in the Monkerton area who find work in the NE sector and those in SW Exeter with jobs in Matford/Marsh Barton.

By 2026 Exeter will have a population of 133,000 (Exeter plus 180,000) and the LTP3 has an aim of increasing **the cycling to work rate to 20% of those employed.**

By international standards this is an ambitious target; within Europe, the Netherlands is top with 30% as the 'main form of transport' and about half a dozen countries between 10% and 20% and the rest lower than 10%. Of course within these figures individual cities can do better – Copenhagen is currently 36%. However this has been achieved by seriously addressing the safety issue which is the most serious barrier to increasing use. Unless there is a serious investment in safe routes **separated** from motor traffic, the target is probably unattainable.

The current leading cities in the UK for 'cycle to work' are Cambridge 18%, Oxford 10% and York 8% with Exeter at 4% (Census 2011). These are expressed as a percentage of the working age population and not as a percentage of those actually travelling to work each day; as a percentage of the latter the figure would be increased by a factor of 1.4 – 1.5 with Exeter rising to 6.3%.

The two leaders have city centres dominated by the University Colleges and their transport infrastructure reflects the very large use of cycles by students who control the road scene in many areas especially in Cambridge. This of course impacts upon the ease with which other residents feel confident and safe to cycle to work.

Exeter was one of the six chosen towns in the Department of Transport project 'Cycling Demonstration Town'; at the end of this project its cycling-to-work level was assessed as 10%. On this basis Exeter hoped to move to a level of 20% for 2026. The 2011 Census data, available in 2012, indicated the current level (based upon the response of all

residents in the working age group) was actually 6.3% and in the light of this fact a more realistic goal for 2026 might have been 12.5% (a doubling of the current level).

The disappointment in the Census data is however tempered by the fact that 23% of employees in Exeter walk to work. This is probably a consequence of the fact that the City Centre and its adjacent areas (the historical source of jobs) is surrounded by residential areas making walking easier and realistic.

This pattern is changing and currently there are almost 30,000 jobs in Matford and Marsh Barton and about 20,000 (and growing) on the eastern perimeter making walking, but not cycling, less feasible. Of course if there are residential areas (old and new) close to the job areas then walking will be more feasible.

In the analysis presented below for the future it is assumed that

- A 20% cycling to work rate will be achieved among all the new residents
- The walking rate will be 20% (jobs close), 10% (jobs within walking distance) 0% (jobs distant).

ii. A Future Scenario

The projected growth will produce a new 10,000 homes within Exeter and 13,000 in the adjoining parishes and it is assumed that on average each home will have one employed person, giving a total of 23,000 for new employees.

The following estimates for cycling and walking assume 20% cycling in all new developments, 20% walking if close to employment, 0% if remote from employment, 10% otherwise.

Within Exeter (10,000)

| | | |
|-------------------|---------------|-------------|
| Monkerton (2,500) | Cycling (20%) | 500 |
| | Walking (20%) | 500 |
| Other (7,500) | Cycling (20%) | 1,500 |
| | Walking (10%) | 750 |
| | | <hr/> 3,250 |

Peripheral Region (13,000)

| | | |
|-------------------|---------------|-------------|
| Cranbrook (7,500) | Cycling (20%) | 1,500 |
| | Walking (0%) | - |
| SW Exeter (2,500) | Cycling (20%) | 500 |
| | Walking (20%) | 500 |
| Other (3000) | Cycling (20%) | 600 |
| | Walking (10%) | 300 |
| | | <hr/> 3,400 |

| | | |
|--------------------------------|--------|-------|
| | Total | 6,650 |
| Total work force | 23,000 | |
| Percentage cycling and walking | 29% | |

For the existing population of Exeter the Census yielded 6% cycling and 23% walking and for the current employees of the surrounding parishes the assumption was 20% cycling and 9% walking.

Overall in 2026 for the enlarged Exeterplus region the assumptions result in a figure of 11% cycling and 18% walking to work – ***that is almost 30% use methods involving no fuel consumption.***

This target for the new population is a challenging target by national and international comparison. It will be achieved only if significant efforts are made to create a cycling and walking culture as new residential areas are created supporting them with facilities that make these modes of movement easy and safe.

Appendix F Getting to work in Exeter, 2011 and 2026 – Sensitivity Analysis

The table and chart presented here show how the detailed analysis described in the main body of this document can be modified to explore other possible scenarios for transport choices in 2026. Scenario A is a version where some Exeter residents who currently drive have changed to cycling. In scenario B the opposite is assumed: people who cycled or walked in 2011 are driving in 2026, perhaps because their journey is longer, more dangerous or more polluted. Scenario C is a future where only the minimum public transport improvements in planning have been implemented, other proposals have not been realised. Many other scenarios could be envisaged, but these three serve to show the range of possibilities that might follow from different decisions made by planners and the public. The details of the scenarios are:

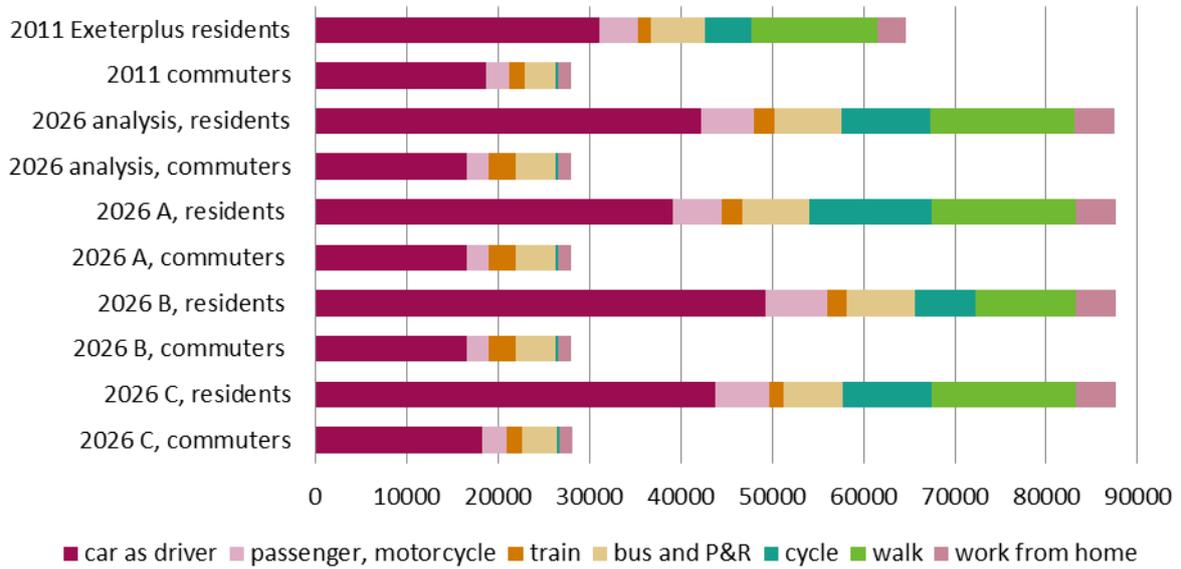
- **Scenario A:** cycling among current Exeter residents becomes 12.5% in 2026, no change in walking, public transport or working from home.
- **Scenario B:** the total cycling and walking rate for Exeterplus falls from 29% to 20%: the values for new residents are 50% of the baseline analysis values; the cycling rate for current residents falls from 6 to 5% and walking to from 23 to 17%. There is no change in public transport.
- **Scenario C:** reduced improvements to public transport. Rail – Cranbrook is the only new station; no increased frequency. Buses – city services increase by 500 instead of 1000; Park and Ride only 350 increase (Matford). Cycling and walking stays at 29%

The table below summarises the baseline figures for 2011 and 2026 and three other possible scenarios for 2026.

| | 2011 Exeterplus residents | 2011 commuters | 2026 standard, residents | 2026 standard, commuters | 2026 A, residents | 2026 A, commuters | 2026 B, residents | 2026 B, commuters | 2026 C, residents | 2026 C, commuters |
|-----------------------|---------------------------|----------------|--------------------------|--------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| car as driver | 31000 | 18600 | 42200 | 16600 | 39100 | 16600 | 49200 | 16600 | 43700 | 18300 |
| passenger, motorcycle | 4300 | 2600 | 5800 | 2300 | 5400 | 2300 | 6800 | 2300 | 6000 | 2600 |
| train | 1400 | 1700 | 2200 | 3000 | 2200 | 3000 | 2200 | 3000 | 1600 | 1700 |
| bus and P&R | 5900 | 3400 | 7400 | 4400 | 7400 | 4400 | 7400 | 4400 | 6400 | 3800 |
| cycle | 5100 | 300 | 9700 | 300 | 13300 | 300 | 6600 | 300 | 9700 | 300 |
| walk | 13800 | 0 | 15800 | 0 | 15800 | 0 | 11000 | 0 | 15800 | 0 |
| work from home | 3200 | 1400 | 4400 | 1400 | 4400 | 1400 | 4400 | 1400 | 4400 | 1400 |

The following bar charts give a pictorial representation of these outcomes; the mode of travel becomes more eco-friendly moving from left to right i.e. car ... walk, work at home.

Travelling to work in Exeter: current situation and four future projections



Susan Kay, June 2014