



Greater Cambridge Local Plan

Transport Existing Transport Conditions Report

Cambridgeshire County Council
Transport Strategy and Funding

November 2020

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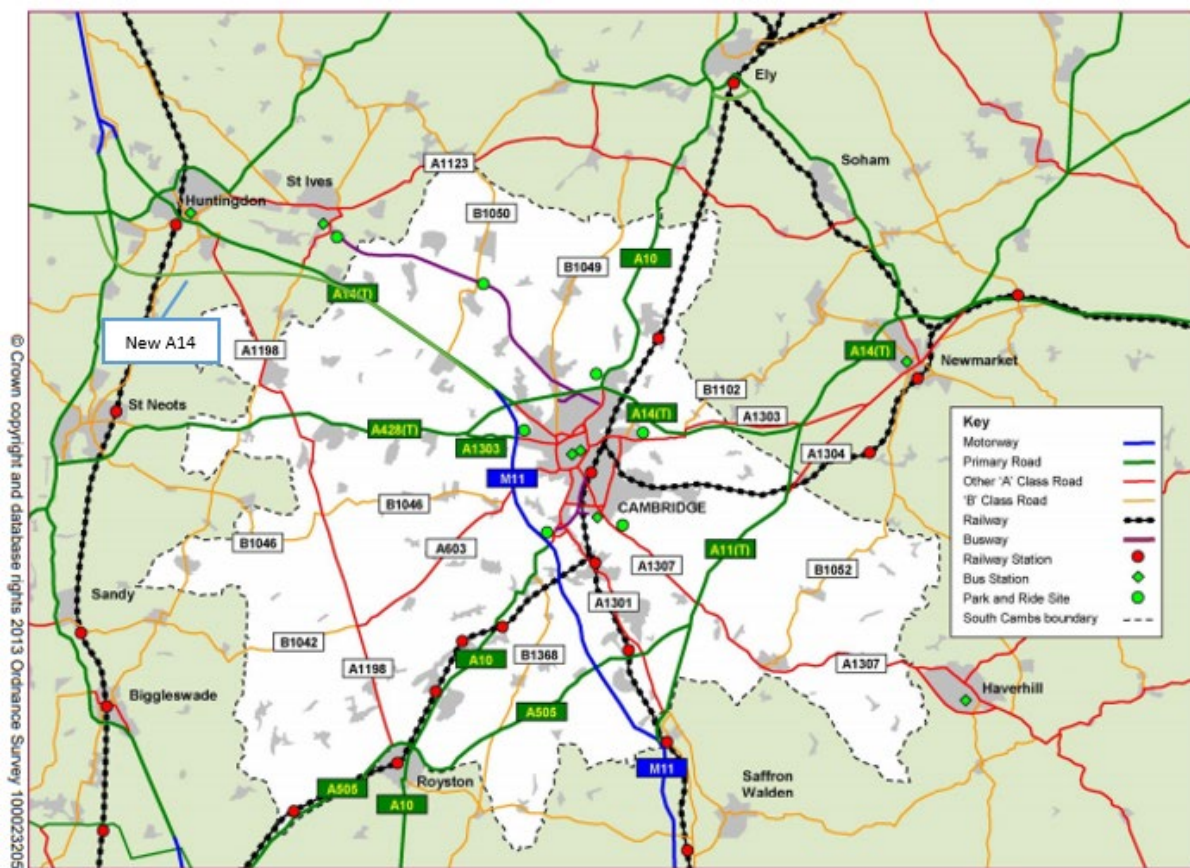
1. Introduction

1.1. Study Background

This document sets out the existing transport situation in the Study area for the emerging Greater Cambridge Local Plan which covers the administrative areas of Cambridge City Council and South Cambridgeshire District Council the greater Cambridge area is shown in Figure 1.

The Greater Cambridge area has the University of Cambridge at its heart and is a world-leading centre for the research, life science, innovation and technology industries. The recent growth in this area has led to increased economic growth, inward investment, new jobs and a growth in housing.

Figure 1: Map of Greater Cambridge



Source: Transport Strategy for Cambridge and South Cambridgeshire (Figure 1.1)

1.2. Report Purpose and Approach

The purpose of this report is to set out the baseline transport conditions in Greater Cambridge to support the development of the Greater Cambridge Local Plan to 2041. The local plan will set out the planning policy basis for Cambridge City and South Cambridgeshire District Councils.

The main aim of the transport evidence base is to identify the opportunities for encouraging a shift to more sustainable transport modes and as well as to identify the main strengths and weaknesses of the transport networks in the plan area.

In order to develop this understanding across all aspects of the transport networks which affect the end user, the following approach was adopted:

1. Demand: Where do people want to travel from and to?
2. Connectivity: What connectivity options are available to facilitate these movements?
3. Future transport provision: Known transport schemes in development.

The remainder of the report is structured accordingly and concludes with a summary section which identifies the main themes emerging from this assessment.

2. Demand

2.1. Introduction

The level of transport demand takes into account the existing distribution of land uses and trip generators in and around the Greater Cambridge area and the need for goods and people to travel between them.

2.2. Area demographics

2.2.1. Population Growth

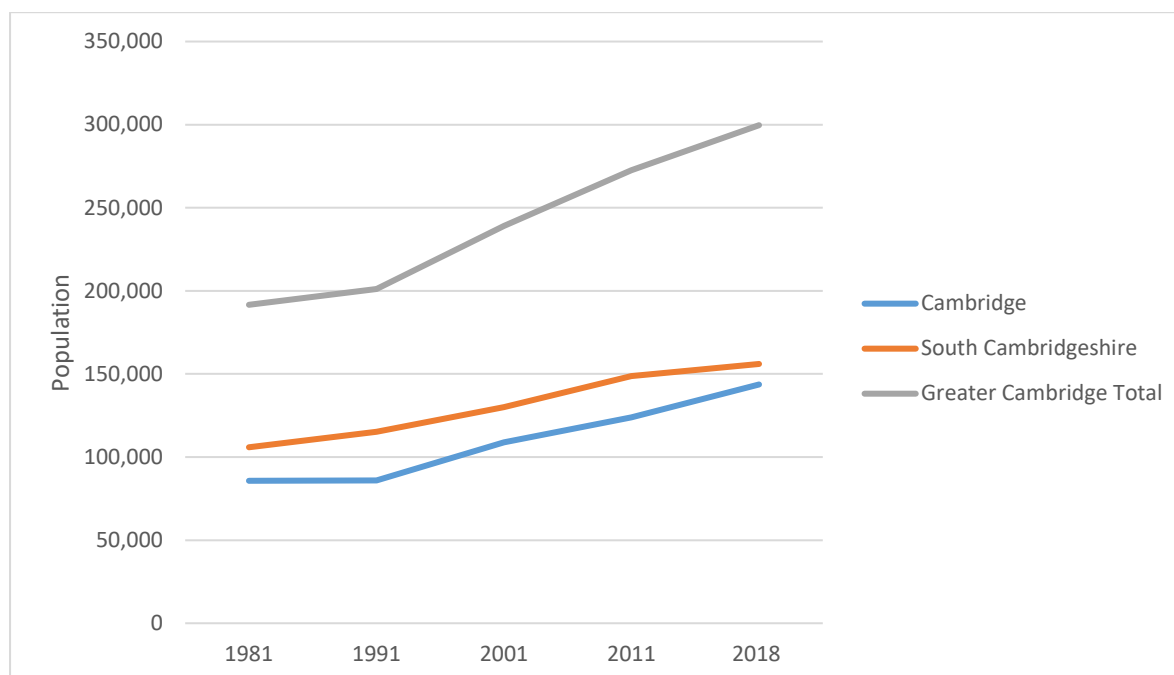
The Greater Cambridge population has been increasing. Table 1 and Figure 2 show that the Greater Cambridge population has increased by around 108,000 people since 1981, driven in large part by the “Cambridge phenomenon” and the emergence and continued growth of clusters of high tech / biotech industries in and around the city.

Table 1: Greater Cambridge Population Growth

Year	Cambridge	South Cambridgeshire	Greater Cambridge Total
1981	85,708	105,879	191,605
1991	85,943	115,147	201,090
2001	108,863	130,108	238,971
2011	123,867	148,755	272,622
2018	143,653	156,000	299,653

Source: Census data and Cambridge Insight Data

Figure 2: Greater Cambridge Population

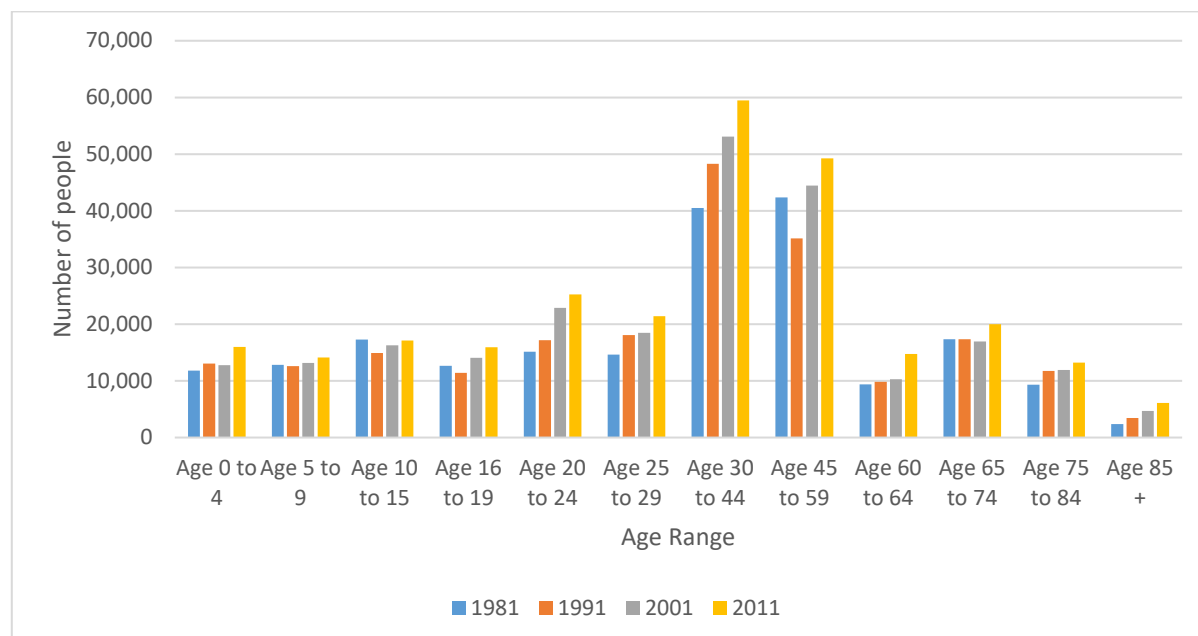


Source: Census data and Cambridge Insight Data

2.2.2. Age Distribution

Key to the economic prosperity is the age structure of the population Figure 3 shows the age structure of the Greater Cambridge population between 1981 and 2011.

Figure 3: Greater Cambridge Age Distribution



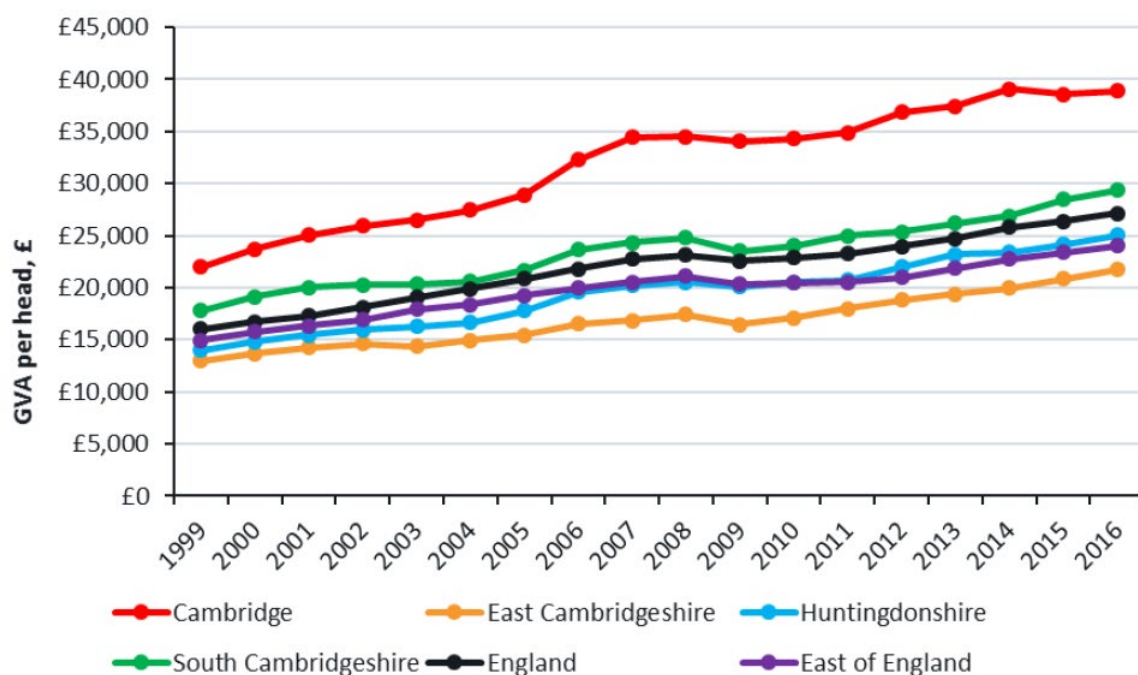
Source: Census Data

From the information in Figure 3 it is possible to see that the age distribution has remained relatively consistent over the last 40 years, with the majority of the population in the economically active age range (16 to 64 years) although the 2011 census indicates that there has been a slight rise in the proportion of residents in the 60 and 65 age categories.

2.2.3. Economic Performance

The large economically active population and the large growth in the knowledge intensive industries within Greater Cambridge has directly influenced the region's Gross Value Added (GVA) per head of population, which can be seen in Figure 4 below.

Figure 4: Regional, Balanced, Gross Value Added (GVA) per head, By Local Authority area



Source: Office for National Statistics, Regional gross value added (balanced) reference tables

Figure 4 shows that the GVA per head of population for both Cambridge City and South Cambridgeshire is higher than the national average for the whole period between 1999 and 2016. However, whilst South Cambridgeshire's is shown to be only slightly higher than the national average and has followed the same profile, Cambridge's GVA per head has been significantly higher than the national average and has followed a different profile. This is an indicator that Greater Cambridge's prosperity is driven by the knowledge based industries in and around Cambridge.

2.2.4. Car Ownership

Table 2 shows how car ownership in Greater Cambridge compares to Cambridgeshire as a whole and the wider East of England region. This information comes from the 2011 census, which remains the only comprehensive and robust dataset for commuting patterns available.

Table 2: Car Ownership Levels (per household)

Area	No cars or vans	One car or van	Two cars or vans	Four cars or vans	Four+ cars or vans	Total cars or vans	Ave cars or vans
Cambridge	15,702	21,764	7,568	1,311	369	42,445	0.91
South Cambridgeshire	6,571	24,225	21,950	5,220	1,994	92,794	1.55
Greater Cambridge	22,273	45,989	29,518	6,531	2,363	135,239	1.27
Cambridgeshire	43,588	106,212	76,970	17,830	6,641	343,690	1.37
East England	449,358	1,039,677	703,968	166,426	63,606	3,231,763	1.33

Source: Census 2011

From the information in Table 2 we can see that South Cambridgeshire has the highest level of car ownership in the Greater Cambridge area with an average of 1.55 cars per household, whilst Cambridge has the lowest with an average of 0.91 cars per household. This reflects the more rural nature of South Cambridgeshire and the less frequent Public Transport available in South Cambridgeshire meaning that there is a greater reliance on cars in rural locations.

The level of car ownership in Greater Cambridge of 1.27 cars per household is slightly lower than the Cambridgeshire average (1.37) and the wider East of England region (1.33) which is due mostly to the low levels of car ownership in the City of Cambridge.

2.3. Trip Generation

2.3.1. Total Commuter Trips

Tables 3 and 4 show the top five origins and destinations from the 2011 census data for commuter trips into and out of Cambridge, South Cambridgeshire and Greater Cambridge.

Table 3: Commuter Trips, top inflows

Destination	Inflow from Inflow from South Cambs.	Inflow from East Cambs.	Inflow from Huntingdonshire	Inflow from St Edmundsbury	Inflow from Forest Heath	Total Inflow from all areas
Cambridge	23,367	7,206	4,716	2,858	1,852	51,240

Destination	Inflow from Cambridge	Inflow from Huntingdonshire	Inflow from East Cambs.	Inflow from St Edmundsbury	Inflow from North Herts.	Total Inflow from all areas
South Cambs.	8,272	5,830	4,554	2,302	2,100	34,916

Destination	Inflow from East Cambs.	Inflow from Huntingdonshire	Inflow from St Edmundsbury	Inflow from North Herts.	Inflow from Forest Heath	Total Inflow from all areas
Greater Cambridge	11,760	10,546	5,160	3,445	3,277	54,517

Source: Census 2011 and Cambridgeshire County Council calculations

From Table 3 above we can see that approximately 46% of employment trips into Cambridge come from South Cambridgeshire. Of the remaining in-commuters to Cambridge 23% come from either Huntingdonshire or East Cambridgeshire with the remaining 33% coming from outside of Cambridgeshire.

For South Cambridgeshire 24% of in-commuters come from Cambridge and 30% come from either Huntingdonshire or East Cambridgeshire with the remaining 46% coming from outside of Cambridgeshire. This indicates that more in-commuters in South Cambridgeshire come from outside Cambridgeshire rather than Cambridge.

From the figures for Greater Cambridge as a whole it is possible to see that 41% of commuters come from either Huntingdonshire or East Cambridgeshire, a further 1% come from Fenland district with the majority of the remaining 58% coming from outside of Cambridgeshire.

Table 4: Commuter Trips, Top Outflows

Origin	Outflow to South Cambs.	Outflow to City of London	Outflow to Huntingdonshire	Outflow to East Cambs.	Outflow to Camden	Total Outflow to all areas
Cambridge	8,272	1,018	855	667	431	16,388

Origin	Outflow to Cambridge	Outflow to Huntingdonshire	Outflow to North Herts.	Outflow to Uttlesford	Outflow to City of London	Total Outflow to all areas
South Cambs	23,367	2,690	1,812	1,178	1,112	39,701

Origin	Outflow to Huntingdonshire	Outflow to City of London	Outflow to North Herts.	Outflow to East Cambs.	Outflow to Uttlesford	Total Outflow to all areas
Greater Cambridge	3,545	2,130	2,087	1,709	1,570	24,450

Source: Census 2011 and Cambridgeshire County Council calculations

From Table 4 above we can see that approximately 50% of out-commuting trips from Cambridge go to South Cambridgeshire. Of the remaining out-commuters from Cambridge 9% go to either Huntingdonshire or East Cambridgeshire with the remaining 41% traveling to locations outside of Cambridgeshire including approximately 6% of residents commuting to London.

For South Cambridgeshire 59% of out-commuters go to Cambridge and 7% go to either Huntingdonshire with the remaining 36% traveling to locations outside of Cambridgeshire of which approximately 3% commute to London.

From the figures for Greater Cambridge as a whole it is possible to see that 21% of commuters travel to locations within wider Cambridgeshire with the remaining 79% traveling to locations outside of Cambridgeshire. 9% London.

2.3.2. Commuting Mode Shares

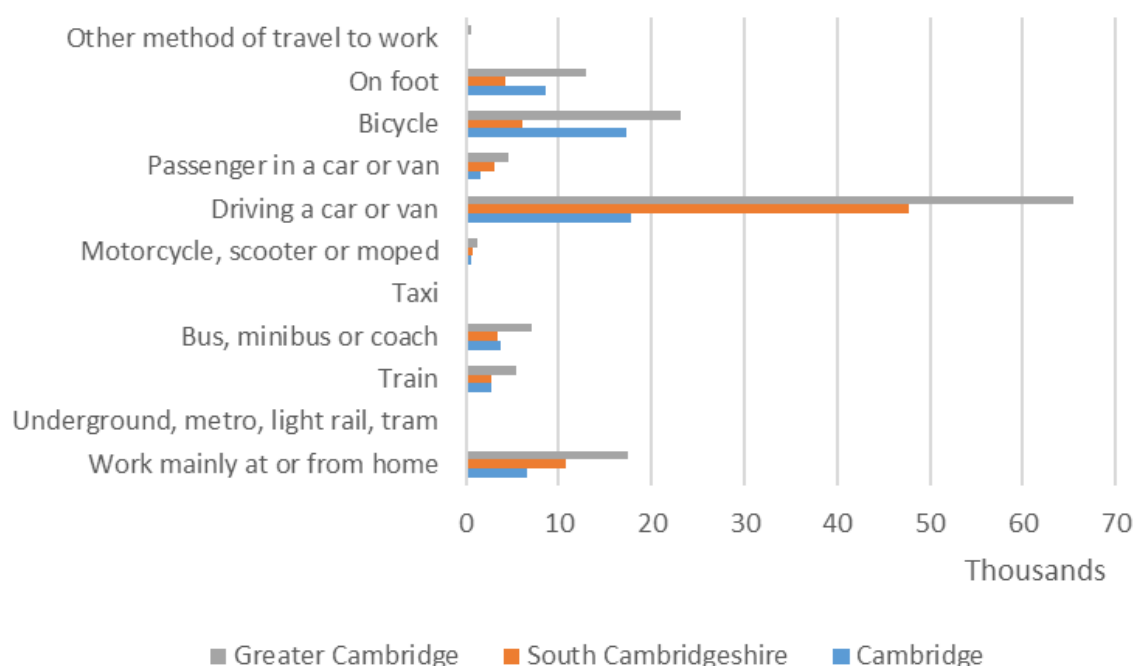
The following section sets out the mode share of travel to work journeys within, to, and from Greater Cambridge. It uses 'method of travel to work' data sets from the 2011 Census. This data includes all residents aged 16 and over in employment the week before the Census in April 2011 that travel to work (so excludes those that were recorded as working mostly from home).

Table 5: Greater Cambridge Mode Share

Mode	Cambridge Number	Cambridge %	South Cambridgeshire: Number	South Cambridgeshire: %	Greater Cambridge Number	Greater Cambridge %
Underground, metro, light rail, tram	129	0.24%	118	0.17%	247	0.20%
Train	2,755	5.21%	2,729	3.99%	5,484	4.52%
Bus, minibus or coach	3,781	7.15%	3,380	4.94%	7,161	5.91%
Taxi	188	0.36%	113	0.17%	301	0.25%
Motorcycle, scooter or moped	487	0.92%	771	1.13%	1,258	1.04%
Driving a car or van	17,817	33.71%	47,667	69.73%	65,484	54.03%
Passenger in a car or van	1,623	3.07%	3,021	4.42%	4,644	3.83%
Bicycle	17,205	32.56%	6,011	8.79%	23,216	19.15%
On foot	8,629	16.33%	4,279	6.26%	12,908	10.65%
Other method of travel to work	233	0.44%	269	0.39%	502	0.41%

Source: Census 2011

From the information in Table 5 it is possible to see that at the time of the 2011 census within Greater Cambridge approximately 58% of trips were made by car or taxi either as a driver or passenger whilst approximately 30% of trips were made by non-motorised vehicles. Analysis of the two authority areas indicates that 49% of journeys to work were by active mode in Cambridge compared to 13% in South Cambridgeshire with Public Transport accounting for 13% in Cambridge and 9% in South Cambridgeshire. This information is presented in Figure 5 below which clearly shows that car usage is the largest mode share for Greater Cambridge and South Cambridgeshire but in Cambridge the car mode share is similar to that of cycling.

Figure 5: Method of Travel

Source: Census 2011/ Cambridgeshire County Council

2.3.3. Distance Travelled to work

The information set out in Table 6 below sets out the distances travelled to work by residents of Greater Cambridge.

Table 6: Distance Travelled to Work

	Cambridge	South Cambridgeshire	Greater Cambridge
Less than 2km	32%	12%	21%
2km to less than 5km	39%	15%	26%
5km to less than 10km	8%	26%	18%
10km to less than 20km	7%	27%	18%
20km to less than 30km	3%	7%	5%
30km to less than 40km	1%	3%	2%
40km to less than 60km	2%	3%	3%
60km and over	7%	7%	7%
Average distance (km)	12.6	17.4	15.3

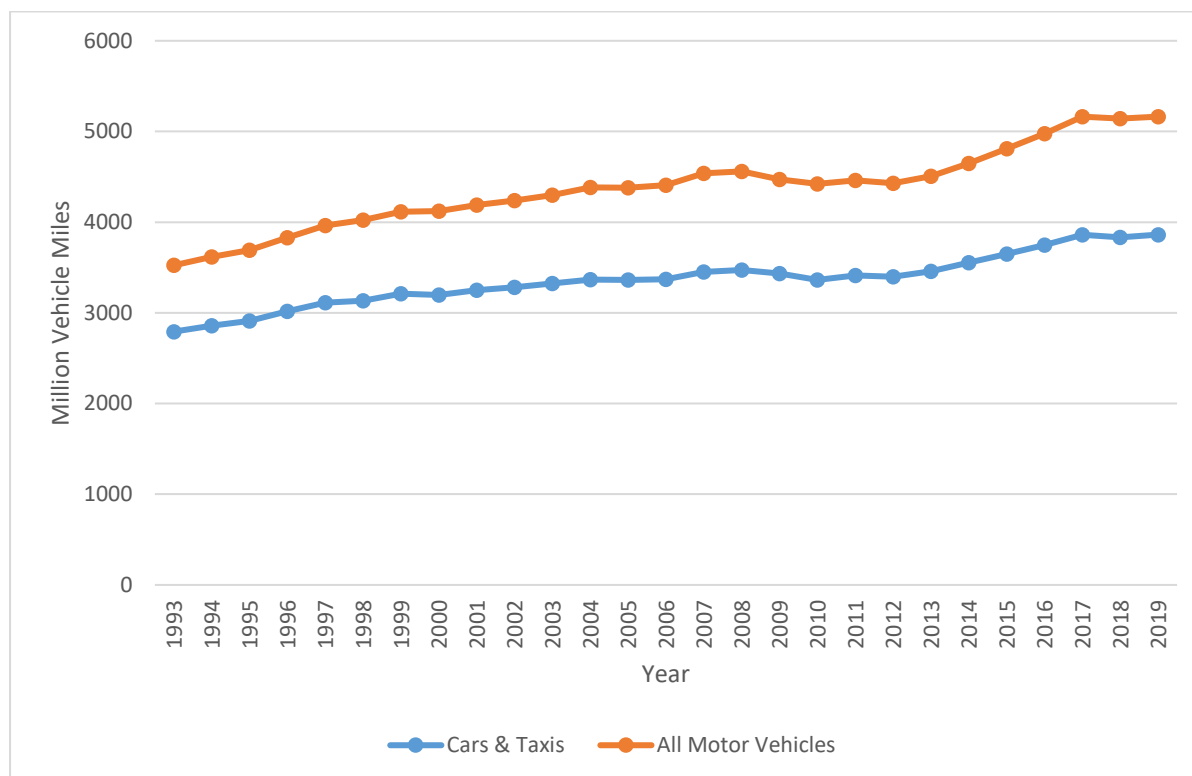
Source: Census 2011/ Cambridgeshire County Council

From the information in Table 6 we can see that 71% of the population of Cambridge travel less than 5km to work compared to 27% in South Cambridgeshire which highlights that the major employment locations are located closer to Cambridge. The details of the employment locations are set out in section 3.5.

2.3.4. Traffic Volumes on the Strategic and Main Road networks

Figure 6 shows the annual traffic by vehicle type in Cambridgeshire. In 2019, a total of 5.16 billion vehicle miles were travelled, of which 3.86 billion miles were made by cars and taxis, which equates to 75% of the total.

Figure 6: Annual Traffic by Vehicle Type in Cambridgeshire by Vehicle Miles



Source: <https://roadtraffic.dft.gov.uk/local-authorities/97>

From the information in Figure 6 above it is possible to see that the volume of traffic has gradually increased between 1993 and 2019 with the level of cars and taxis increasing in line with the increase shown for all traffic.

The composition of motor vehicle traffic on roads that are part of the Strategic Road Network and Main Road Network is set out in Table 7 below.

Table 7: Two-way Annual Average Daily Flow on the major routes 2019

	Pedal Cycles	Powered two Wheelers	Cars & Taxis	Bus & Coach	LGV	HGV	Total
M11 between A11 and A14	0	8,045	42,178	155	232	8,309	58,919
A10 between Royston and Cambridge	84	1,413	10,149	63	103	335	12,147
A10 between Cambridge and Ely	7	2,421	14,658	73	209	1,666	19,034
A11 between M11 and A14	5	6,675	33,486	110	299	2,888	43,462
A14 between Suffolk border and M11	0	7,539	38,530	77	200	7,454	53,800
A14 between M11 and Swavesey	1	7,722	38,197	156	245	9,282	55,602
A428 between A14 and St Neots	76	3,078	16,798	65	146	1,863	22,026
A505 between Royston and the A11	23	2,679	14,983	72	123	1,023	18,902
A1303 between the M11 and the A428	26	2,472	15,839	155	192	801	19,485
A1307 between the A11 and Haverhill	10	2,349	14,740	91	143	1,005	18,336

Source: <https://roadtraffic.dft.gov.uk/local-authorities/97>

From the information in Table 7 we can see that the vast majority of trips are made by car or taxi whilst very few trips are made by public transport even on routes where public transport services exist.

However it is important to note that due to the location of the study area on the strategic route from the eastern ports to the midlands and beyond, a significant proportion of the traffic on these routes is through traffic that is outside the scope of the local plan to control.

2.4. Demand Summary

- The Greater Cambridge population is currently approximately 300,000 people with a large percentage of the population within the economically active age range (16-64).
- The GVA in Cambridge City and South Cambridgeshire is higher than the national average, indicating the prosperity of the Greater Cambridge area.
- Car ownership is higher in South Cambridgeshire than in Cambridge City due to the more rural nature of the district. South Cambridgeshire's car ownership levels are higher than the average for both Cambridgeshire and the East of England.

- In total 54,517 people commute into Greater Cambridge from outside with 41% of these coming from Huntingdonshire and East Cambridgeshire
- A total of 24,450 people commute out of Greater Cambridge with Huntingdonshire, the city of London and North Hertfordshire amongst the top destinations.
- The Greater Cambridge travel to work mode share shows that 51% of the population drives a car or a van, 13% use public transport and 43% walk or cycle.
- Cars and taxis account for around 75% of trips on the Greater Cambridge Road network.

Connectivity

3. Connectivity

3.1. Introduction

This section reviews the existing transport networks currently available in and around Greater Cambridge.

3.2. Public Transport Services

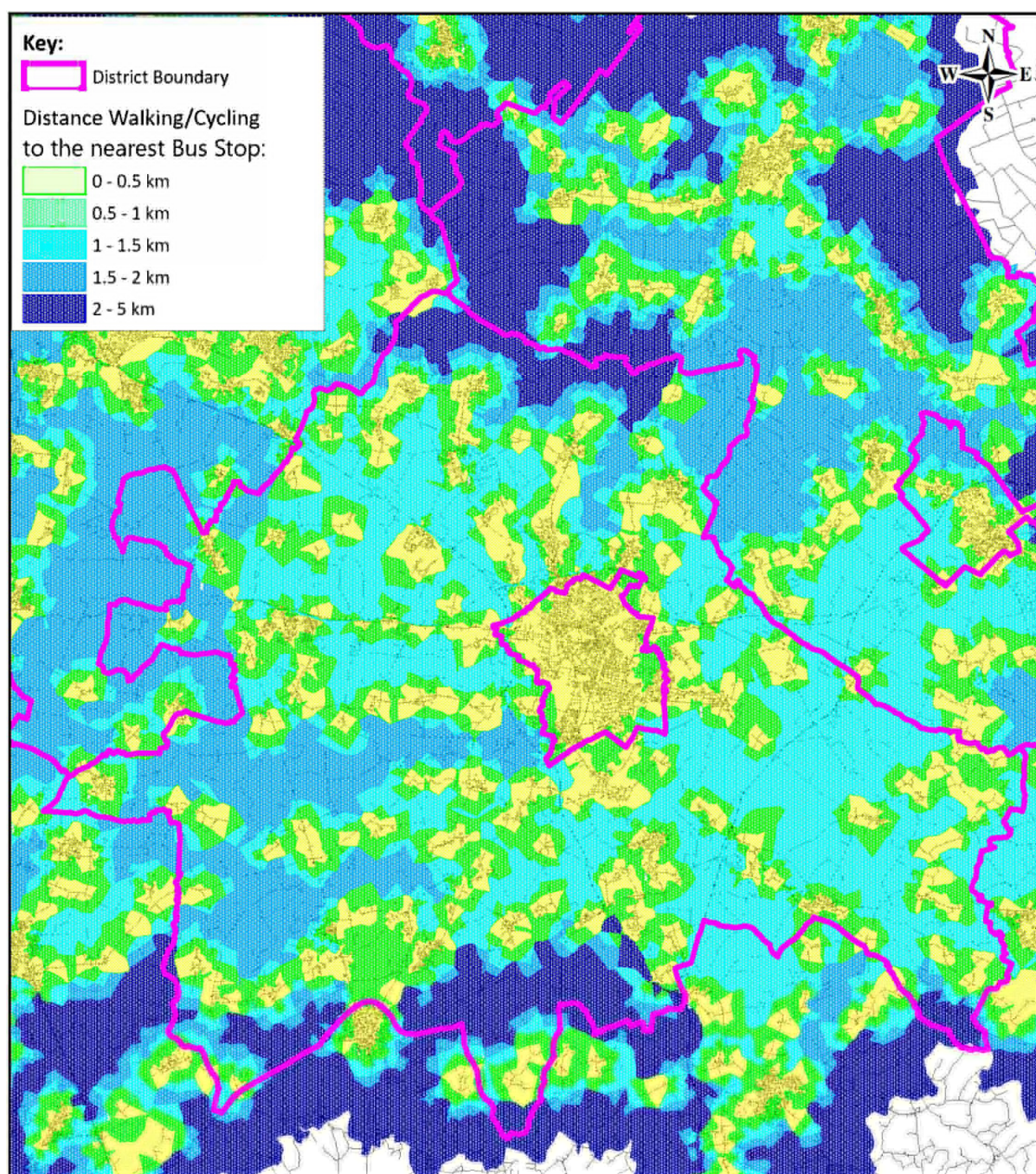
Greater Cambridge benefits from a network of buses, guided busways, park and ride sites and Rail services. This section highlights the current public transport network providing connectivity in Greater Cambridge.

3.2.1. Bus Services

There are five bus operators who run registered commercial bus services within Greater Cambridge, with Stagecoach and Whippet providing the most services across the county. The bus network can be considered the most accessible public transport available with direct connections to towns and rural villages.

3.2.1.1. Bus Connectivity

Key to encouraging use of public transport for journeys is the accessibility of residents to reliable bus services. It is generally agreed that people would be willing to walk approximately 500m to access a bus stop. The resulting bus connectivity in Greater Cambridge is shown in Figure 7 below. While Figure 8 shows the Cambridge Area in more detail.

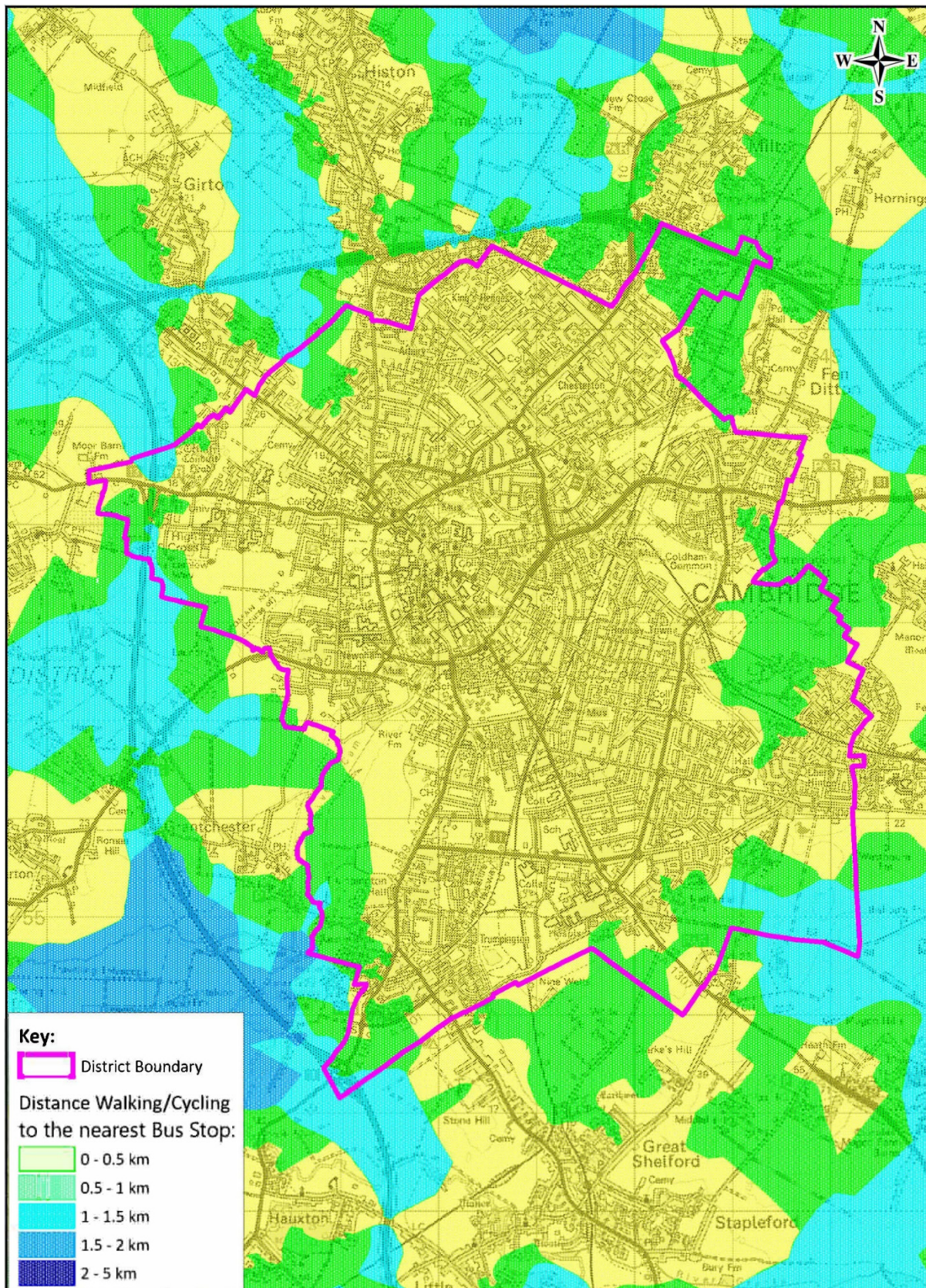
Figure 7: Bus Accessibility in Greater Cambridge

Source: Cambridgeshire County Council

From the information in Figure 7 it is possible to see that the vast majority of the settlements in South Cambridgeshire are within 500m from a bus stop. However, the frequency of many of these services means that they are not an attractive mode of transport for regular journeys such as to work. It is also clear that the majority of the routes that currently exist focus on the centre of Cambridge and therefore for people looking to access the major employment areas on the edge of Cambridge by public transport they would have to change routes at least once which can deter use of public transport. Figure 8 below shows that all of the existing developed area in the city of Cambridge is within 400m however as previously noted the routes focus on the centre

of Cambridge meaning that residents would have to access more than one service to cross the city to access the major employment areas.

Figure 8: Bus Accessibility in Cambridge



Source: Cambridgeshire County Council

From these figures it is clear to see that there is a good coverage of the main areas that commute in to Greater Cambridge and very good coverage in Cambridge itself but the journey to work indicated only 13% of journeys are made by bus. As mentioned above the current model where the majority of the routes focus on the centre of Cambridge must be an important factor in this but this is not enough to fully explain the low level of bus use for journeys which needs to be considered in the choice of development locations.

3.2.1.2. Bus Frequencies

The details of the services offered in Greater Cambridge are set out in Table 8 below.

Table 8: Bus Frequencies in Greater Cambridge

Service	Operator	Weekday Frequency	Saturday Frequency	Sunday frequency
Citi 1 - Fulbourn- Cherry Hinton- Addenbrooke's	Stagecoach in Cambridge	Every 10 minutes	Every 20 minutes	Every 30 minutes
Citi 2 - Addenbrooke's- City Centre - Science Park	Stagecoach in Cambridge	Every 10 minutes	Every 20 minutes	Every 30 minutes
Citi 3 - Fison Road - City Centre - Rail Station - Cherry Hinton	Stagecoach in Cambridge	Every 10 minutes	Every 20 minutes	Every 30 minutes
Citi 4 - Cambridge - Hardwick – Cambourne	Stagecoach in Cambridge	Every 20 minutes	Every 20 minutes	Every hour
Citi 5 - Cambridge - Bar Hill - Longstanton - Swavesey (- Fenstanton)	Stagecoach in Cambridge	Every 20 minutes	Every 20 minutes	Every Hour
Citi 6 - Cambridge - Girton – Oakington	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes	Every Hour
Citi 7 - Cambridge - Sawston - Duxford - Saffron Walden	Stagecoach in Cambridge	Every 20 minutes	Every 20 minutes	Every 30 minutes
Citi 8 - Cambridge - Impington - Histon – Cottenham	Stagecoach in Cambridge	Every 20 minutes	Every 20 minutes	Every 30 minutes
1A – St Ives – Fenstanton – Bar Hill	Dews Coaches	1 service an hour	No service	No service
7A- Trumpington P&R – Hinxton – Whittlesford – Trumpington P&R	A2B Bus & Coach Ltd	Every 30 minutes	Every 30 minutes (between selected hours)	Every 30 minutes
8 - Cambridge - Dry Drayton - Papworth Everard	Whippet Coaches Ltd	3 services a day	3 services a day	No service
9 - Cambridge - Waterbeach - Ely - Littleport	Stagecoach in Cambridge	1 service per hour	1 service per hour	No service
11 - Cambridge - Newmarket - Bury St Edmunds	Stagecoach in Cambridge	Every hour	Every hour	No service
12 - Cambridge - Newmarket - Ely	Stagecoach in Cambridge	Every hour	Every hour	No service

Service	Operator	Weekday Frequency	Saturday Frequency	Sunday frequency
13 - Cambridge - Linton - Haverhill	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes (during selected times)	Every hour
13a - Cambridge - Haverhill	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes (during selected times)	Every hour
13B - Haverhill - Linton - Cambridge	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes (during selected times)	Every hour
13C - Haverhill - Linton - Cambridge	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes (during selected times)	Every hour
15- Haslingfield - Bassingbourn - Royston	C G Myall & Son	1 service a week (Wednesday)	No service	No service
16A - Cambridge - Long Rd - Teversham - Fulbourn - Balsham - Great Thurlow	Stagecoach in Cambridge	2 Services a day	1 Service a day	No service
18 - Cambridge - Cambourne	Stagecoach in Cambridge	Every hour	Every hour	No service
18 - Newmarket- Fulbourn	A2B Bus and Coach	2 services a day (Tuesday and Friday only)	No service	No service
19 - Cambridge – Horningsea – Landbeach	Stagecoach in Cambridge	1 service a day	No service	No service
25 - Addenbrooke's Hospital - Trumpington	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes	No service
31- Cambridge - Stapleford - Fowlmere	A2B Bus and Coach	Every 1 hour and 30 minutes	Every 1 hour and 30 minutes	No service
32 - Trumpington P&R – Hauxton	A2B Bus and Coach	Every 30 minutes (during selected times)	Every 30 minutes (during selected times)	Every 30 minutes (during selected times)

Service	Operator	Weekday Frequency	Saturday Frequency	Sunday frequency
46 - Newmarket - Dullingham - Linton	Big Green Bus Company	1 service a week (Tuesday)	No service	No service
47- Brinkley - Dullingham - Newmarket	Big Green Bus Company	1 service a day	No service	No service
75 - Cambridge - Orwell - Wrestlingworth	A2B Coaches	Every 1 hour and 30 minutes (during selected times)	Every 1 hour and 30 minutes (during selected times)	No service
94 - Milton - Impington Village College	Stagecoach in Cambridge	1 service a day	No service	No service
96 - Swavesey - Longstanton	Stagecoach in the Fens Ltd	1 service a day	No service	No service
101 - Whittlesford - Duxford - Saffron Walden	C G Myall & Son	1 service a week (Tuesday)	No service	No service
110 - Ely - Cottenham – Impington	Big Green Bus Company	1 service a day	1 service a day	No service
114 - City Centre - Grafton - Beehive - Addenbrooke's	A2B Travel Group	Every 1 hour and 15 minutes (during selected times)	Every 1 hour and 15 minutes (during selected times)	No service
117 - Cambridge City Centre - Fen Estate	A2B Travel Group	1 service per hour (during selected times)	No service	No service
127 - The Mordens – Bassingbourn – Meldreth – Royston	A2B Travel	Every 2 hours (during selected times)	Every 2 hours (during selected times)	No service
132- Cambridge - Duxford - Saffron Walden	C G Myall & Son	No service	No service	Every hour (during selected times)
199 - Cambridge - Newnham	C G Myall & Son	2 services a week	No service	No service

Service	Operator	Weekday Frequency	Saturday Frequency	Sunday frequency
206 - Cambridge - Impington Village College	Stagecoach in Cambridge	1 service a day	No service	No service
C2 - St Neots - Longstowe - Orwell - Arrington - Croydon - The Hatleys	C G Myall & Son	1 service a week (Thursday)	No service	No service
H - Addenbrooke's – Madingley Road Park & Ride – Cambourne – Papworth	Stagecoach in Cambridge	3 services a day	No service	No service
U - Eddington - Addenbrooke's Hospital	Whippet Coaches Ltd	Every 20 minutes	Every 20 minutes	Every 30 minutes (in peak times)
X3 - Cambridge - Papworth Everard - Huntingdon	Whippet Coaches Ltd	Every hour and half (during selected times)	Every 2 hours	No service
X5- Cambridge - St Neots - Oxford	Stagecoach Bedford	Every 30 minutes	Every 30 minutes	Every hour
X8 - Cottenham – Cambridge	Stagecoach in Cambridge	2 services a day	2 services a day	No service
X9 - Cambridge – Waterbeach – Ely – Littleport	Stagecoach in Cambridge	Every hour	Every hour	No service
X11 - Cambridge – Newmarket – Bury St Edmunds	Stagecoach in Cambridge	4 services a day	4 services a day	No service
X13 - Cambridge - Linton - Haverhill	Stagecoach in Cambridge	Every 30 minutes	Every 30 minutes	Every hour

Source: Cambridgeshire County Council

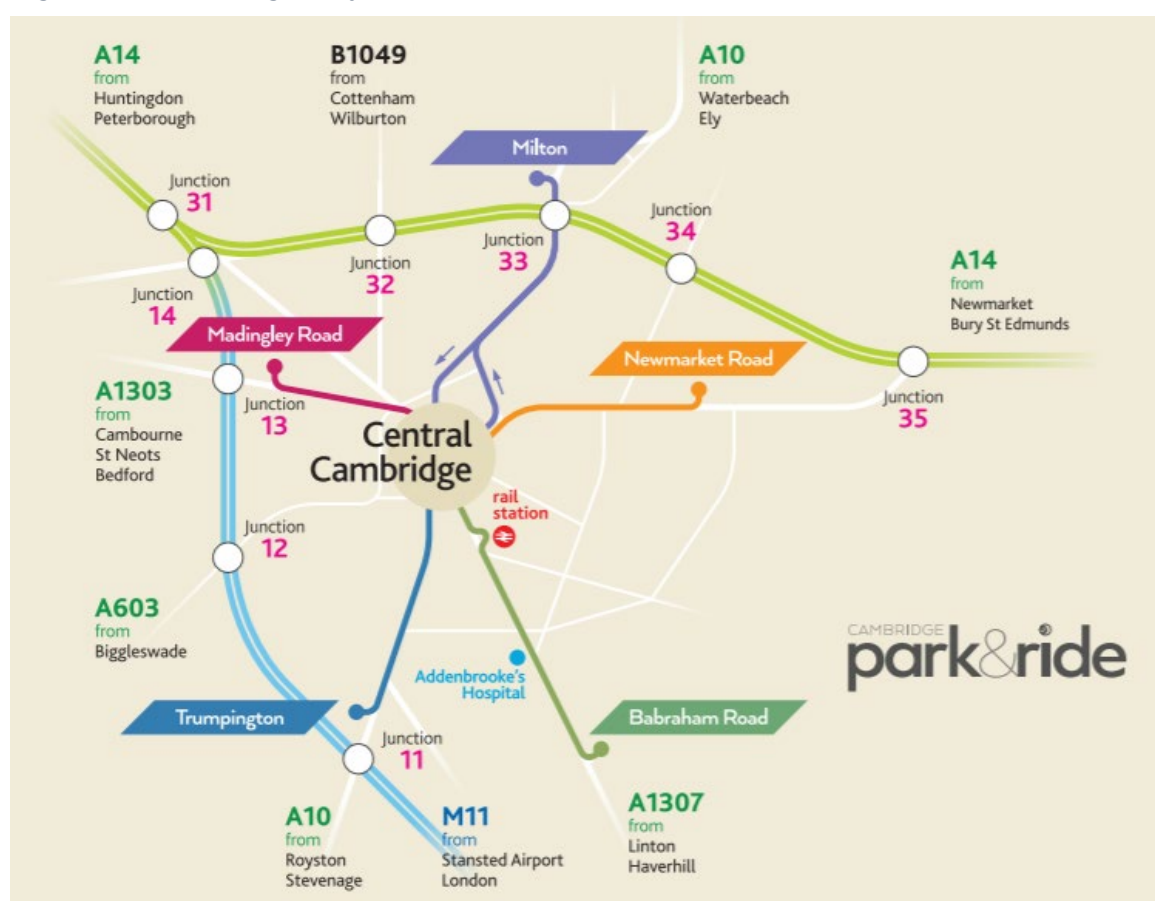
From the information in Table 8 it is possible to see that within Cambridge City the Citi services offer the most frequent services with a bus every ten or twenty minutes during weekdays. Many of the services which provide links to South Cambridgeshire and other Cambridgeshire districts operate a reduced service compared to the Citi routes with some routes having a service per hour. All of the bus services across Greater Cambridge have a reduced service on weekends with most routes not operating on Sundays.

The frequency of these bus journeys is one of the major reasons that the bus mode share for journeys to work is so low in Greater Cambridge as the low frequency of services means that people's arrival and departure times are limited. In addition the service times do not necessarily coincide with the start and end of the working day and certainly don't allow shift workers to make use of the existing bus services.

3.2.2. Park and Rides

Cambridge has five park and ride sites located around the outskirts of the city. These sites work to reduce the number of cars entering the city centre. The five main park and ride sites and the bus routes can be seen in Figure 9.

Figure 9: Cambridge City Park and Ride Network



Source: <http://cambridgeparkandride.info/index.shtml>

In addition to the five sites shown above there is also a Park & Ride site located at Longstanton which is on the Cambridge Guided Busway

Table 9: Park and Ride Buses Frequency

Service	Operator	Weekday Frequency	Saturday Frequency	Sunday Frequency
Madingley Road Park & Ride	Stagecoach in Cambridge	Every 10 minutes	Every 10 minutes	Every 15 minutes
Newmarket Road Park & Ride	Stagecoach in Cambridge	Every 10 minutes	Every 10 minutes	Every 15 minutes
Trumpington Park & Ride	Stagecoach in Cambridge	Every 10 minutes	Every 10 minutes	Every 15 minutes
Babraham Road Park & Ride	Stagecoach in Cambridge	Every 10 minutes	Every 10 minutes	Every 15 minutes
Milton Park & Ride	Stagecoach in Cambridge	Every 10 minutes	Every 10 minutes	Every 15 minutes
Longstanton Park & Ride	Stagecoach in the Fens Ltd	Every 15 minutes	Every 15 minutes	Every 30 minutes

Source: Cambridge Park and Ride

Table 10: Cambridge Park and Ride Capacity

Site	Capacity
Babraham Road	1,458
Madingley Road	930
Milton	792
Newmarket Road	873
Trumpington	1,600
Longstanton	350

Source: Cambridgeshire County Council

The current capacity of all of the park and rides is 6,025 parking spaces as shown in Table 10. In 2018 there were over 3.24 million park and ride passenger journeys which indicates that the park and rides offer a viable option for trips into Cambridge and the Biomedical Campus.

3.2.3. Busway

The Cambridgeshire Guided Busway is a segregated busway connecting Cambridge to St Ives with journeys continuing to Huntingdon on road as shown in Figure 10. The guided busway network is unique to Cambridge in the UK and provides excellent connections to Cambridge and Trumpington with wider public transport connectivity to bus routes linking to Peterborough and Royston amongst other destinations.

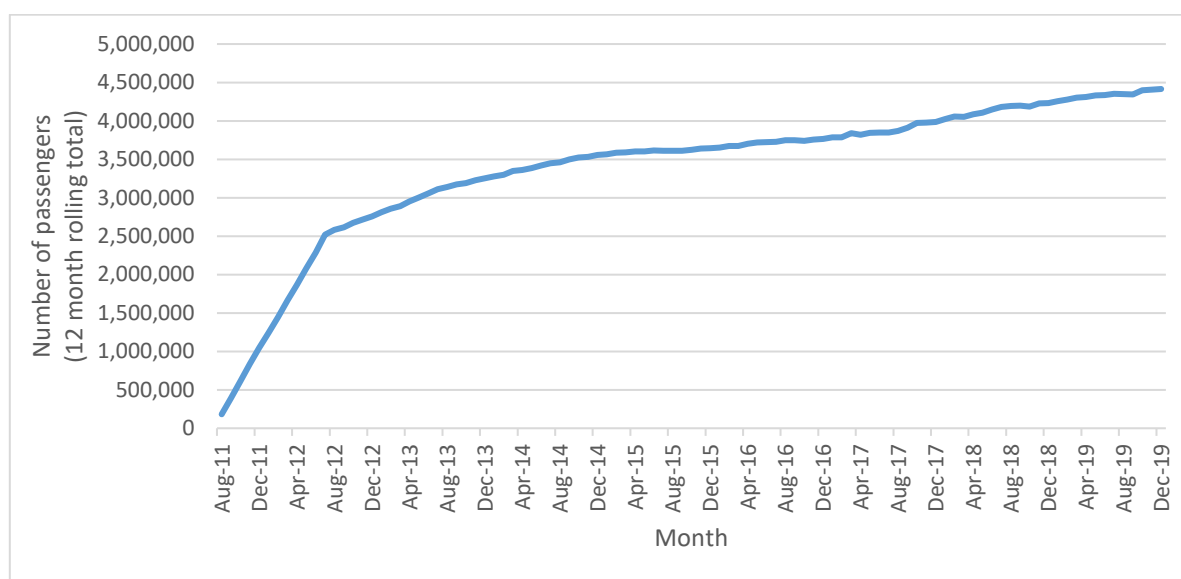
Figure 10: Cambridgeshire Guided Busway Network Map



Source: The Busway

Figure 11 below shows the growth in patronage on the guided busway since it opened in August 2011.

Figure 11: Cambridgeshire Guided Busway Passenger Numbers



Source: Cambridgeshire County Council

From the information in Figure 11 it is possible to see that patronage levels rose rapidly to June 2012 and has continued to increase gradually since. The latest figures available indicate that the busway carried 4.4 million passengers in 2019, which represented a 4% increase compared to 2018.

3.2.3.1. Busway Frequencies

The Cambridgeshire Busway services operate between 6am and midnight on Monday to Saturday. Reduced hours on Sunday operate between 9am and 7pm. Table 11 provides an overview of the frequency of the guided busway services.

Table 11: Cambridgeshire Guided Busway Frequency

Routes	Operator	Weekend Frequency	Saturday Frequency	Sunday Frequency
The Busway A	Stagecoach in the Fens Ltd	Every 15 minutes	Every 15 minutes	Every 30 minutes
The Busway B	Stagecoach in the Fens Ltd	Every 15 minutes	Every 15 minutes	Every 30 minutes
R - Trumpington P&R - Cambridge Rail Station	Stagecoach in the Fens Ltd	Every 10 minutes	Every 15 minutes	Every 15 minutes
D - Cambridge - Longstanton - St Ives	Stagecoach in Cambridge	Every hour	Every Hour	Every 30 minutes

Source: The Busway

The Busway offers a reliable direct route into Cambridge linking up with the major employment areas at the Science Park and the Biomedical Campus, and provides a viable alternative to the private car for employees looking to access the site.

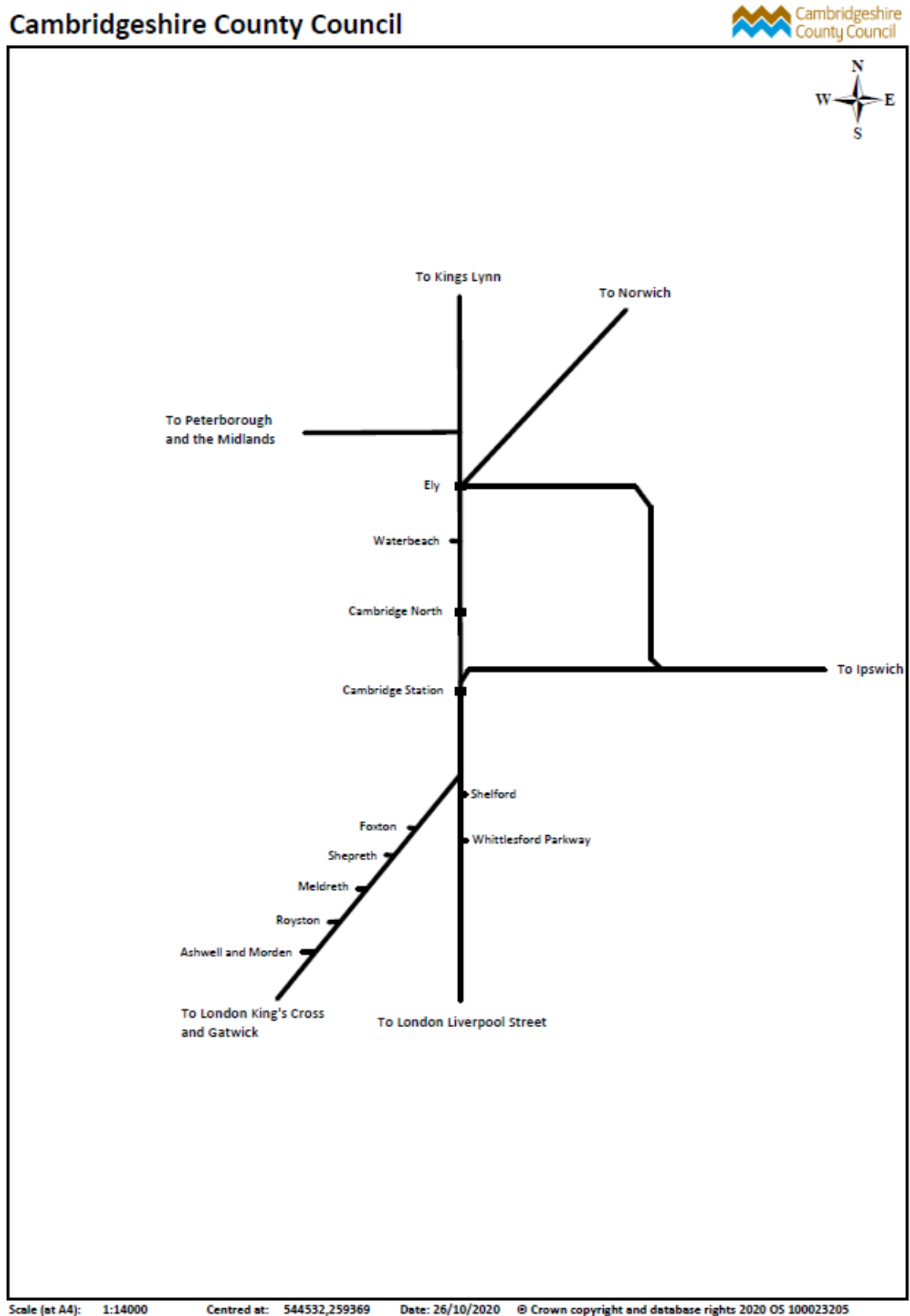
3.2.4. Rail Network

Greater Cambridge has 9 train stations. These are as follows:

- Cambridge
- Cambridge North
- Waterbeach
- Foxton
- Shepreth
- Meldreth
- Ashwell & Morden
- Shelford
- Whittlesford Parkway

Figure 12 shows the current rail network that serves Cambridge and the stations in Greater Cambridge and the links to locations served. The current network offers direct services from Cambridge to London Kings Cross, London Liverpool Street, Gatwick Airport, Stansted Airport, Norwich, Ipswich, Ely, Kings Lynn, Brighton and Peterborough.

Figure 12: Regional Rail Network Serving Greater Cambridge



Source: Cambridgeshire County Council

3.2.4.1. Rail Frequencies

Table 12 shows the direct services accessible from Greater Cambridge Stations. Greater Cambridgeshire is well connected by rail with peak hour services offering a frequency of up to six services an hour to Ely, eight services an hour to London and half hourly services to Stansted, Peterborough and Brighton.

Table 12: Greater Cambridgeshire Rail Frequencies - Service Level (Trains per hour)

Station	Destination	Weekday	Weekday peak off	Saturday	Sunday
Cambridge	London Kings Cross / St Pancras	Up to 6	Up to 6	4	3
Cambridge	London Liverpool Street	2 to 3	2	2	2
Cambridge	Cambridge North	6 to 7	6 to 7	3	3
Cambridge	Ipswich	1	1	1	1 service every 2 hours
Cambridge	Norwich	1	1	1	1
Cambridge	Stansted Airport	2	2	2	2
Cambridge	Brighton	2	1 to 2	1	1
Cambridge	Birmingham New Street	1	1	1	1
Cambridge	Peterborough	1 to 2	1 to 2	1	1
Cambridge	Kings Lyn	2	1	1	1
Cambridge	Ely	6	4	6	3
Cambridge North	London Kings Cross	1 to 2	1 to 2	1 to 2	1
Cambridge North	Cambridge	6 to 7	6 to 7	6	3
Cambridge North	London Liverpool Street	3	3	1	1
Cambridge North	Ely	5	5	5	3
Cambridge North	Norwich	1	1	1	1

Station	Destination	Weekday	Weekday peak off	Saturday	Sunday
Cambridge North	Kings Lynn	1	1	1	1
Cambridge North	Peterborough	1 to 2	1 to 2	1	1
Waterbeach	London Kings Cross	3	1	1	1
Waterbeach	Kings Lynn	2	1	1	1
Foxton	London Kings Cross	2	2	1 to 2 in peak period, 1 in off peak	1
Foxton	Cambridge	2	2	1	1
Foxton	Cambridge North	1	1	No service	No service
Shepreth	London Kings Cross	2	2	1 to 2 in peak period, 1 in off peak	1
Shepreth	Cambridge	2	2	1	1
Shepreth	Cambridge North	1	1	No service	No service
Meldreth	London Kings Cross	2	2	1 to 2 in peak period, 1 in off peak	1
Meldreth	Cambridge	2	2	1	1
Meldreth	Cambridge North	1	1	No service	No service
Ashwell & Morden	London Kings Cross	3 to 4	3 to 4	2 to 3 in peak period, 1 in off peak	1
Ashwell & Morden	Cambridge	3	3	2 to 3 in peak period, 1 in off peak	1

Station	Destination	Weekday	Weekday peak	off	Saturday	Sunday
Ashwell & Morden	Cambridge North	1	3		2 to 3 in peak period, 1 in off peak	1
Ashwell & Morden	Brighton	2	2		1	1
Shelford	London Liverpool Street	2	1		1	1
Shelford	Cambridge	2	2		1	1
Shelford	Cambridge North	1	1		1	1
Whittlesford Parkway	London Liverpool Street	3 to 4	3		3	3 in peak period, 1 in off peak
Whittlesford Parkway	Cambridge	2	2		1	1
Whittlesford Parkway	Cambridge North	1	1		1	1

Source: Greater Anglia / Great Northern / National Rail

3.2.4.2. Rail Station Usage

Rail usage has seen large growth in Cambridgeshire and the Greater Cambridge area over the last 20 years, as shown in Table 13. Rail growth and connectivity is key to ensure Cambridgeshire's economy continues to grow.

Table 13: Annual Passenger Usage (2018-19)

Station (within Cambridge or South Cambridgeshire unless noted)	Entries and exits	Interchange	Growth from (2017-18)
CAMBRIDGE	11,983,320	555,666	3.9%
Cambridge North	812,972	1,892	66.3%
Foxton	101,900	-	-0.2%
Shepreth	115,600	-	1.1%
Meldreth	295,470	-	-4.0%
Royston (Hertfordshire)	1,467,154	21,255	-0.7%
Ashwell and Morden	156,490	-	2.7%
Shelford	207,478	-	1.4%
Whittlesford Parkway	558,134		3.6%
Great Chesterford (Essex)	110,120	-	0.9%
Audley End (Essex)	979,414	8458	-3.2%
Waterbeach	407,650	-	-5.2%
Ely (East Cambridgeshire)	2,386,744	466,015	4.6%
Dullingham (East Cambridgeshire)	41,832	-	7.2%
Newmarket (Suffolk)	355,068	-	-1.0%

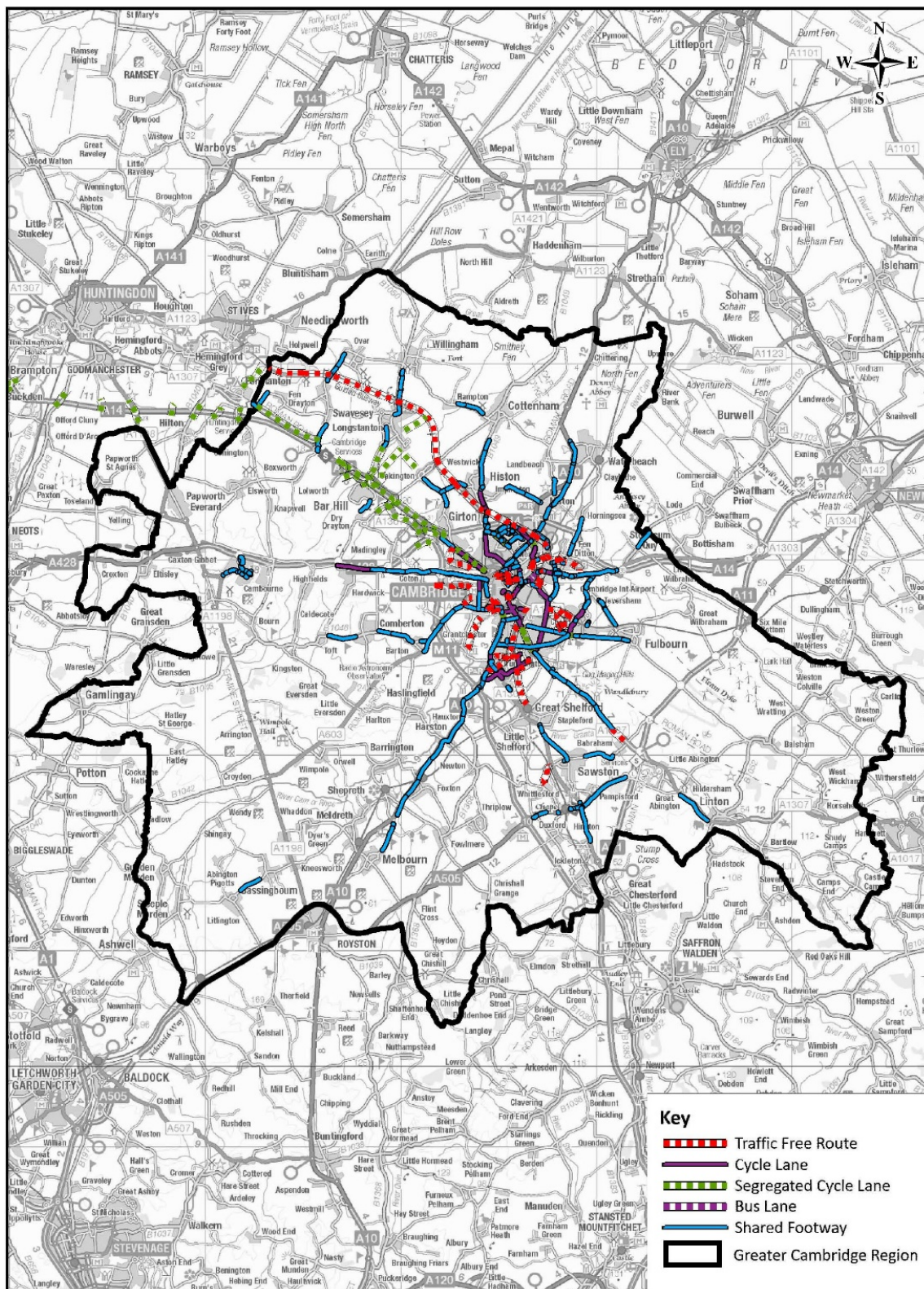
Source: Transport Strategy for Cambridge and South Cambridgeshire

The most recent addition to the rail network in Greater Cambridge is Cambridge North Station which opened in May 2017. This station is a 20 minute walk from the Cambridge Science Park in the north of the city and also offers a direct connection to the Cambridgeshire Guided Busway for interchange.

3.3. Cycle Network

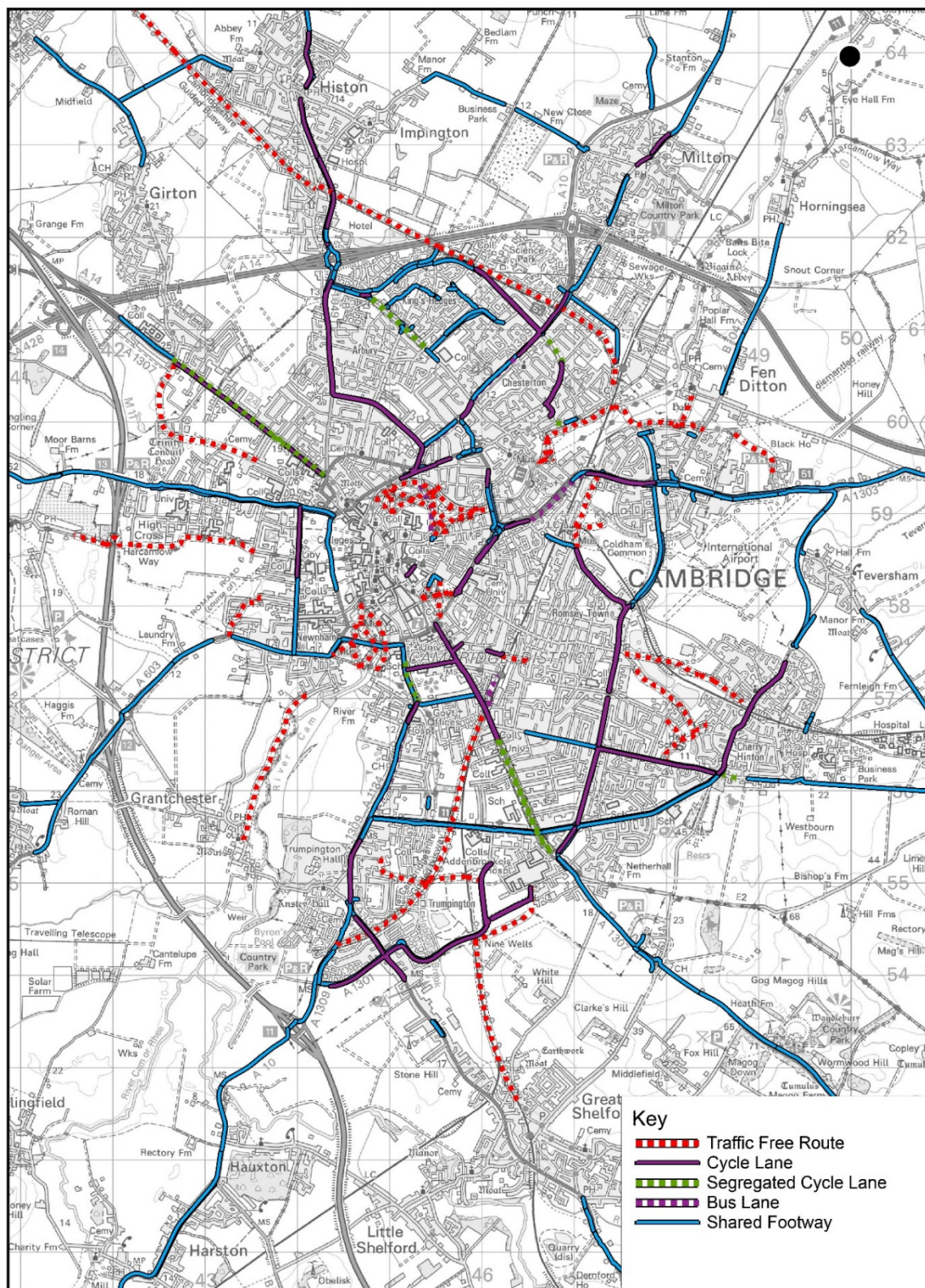
The existing cycle network within Greater Cambridge is shown in figure 13 while the network in Cambridge is shown in Figure 13.

Figure 13: Greater Cambridge Cycle Network



Source: Cambridgeshire County Council

Figure 14: Cambridge City Cycle Network



Source: Cambridgeshire County Council

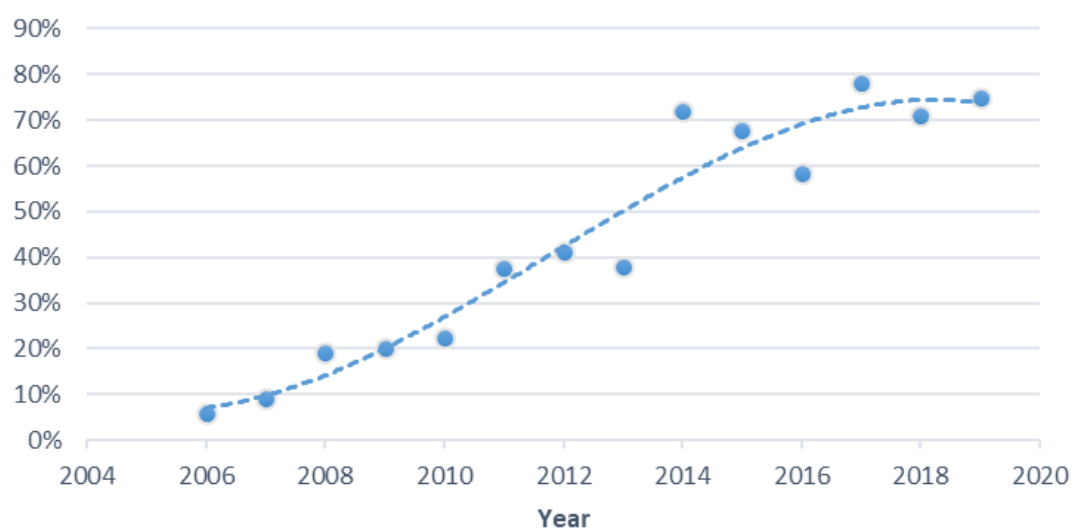
Table 14: Greater Cambridge Cycle Network length

Classification Type	Total Length (Miles)
Traffic Free	31.8
Cycle Lane	31.3
Segregated Cycle Lane	27.4
Bus Lane	3.6
Shared Use Footway	83.1

Source: Cambridgeshire County Council - Cycle Team

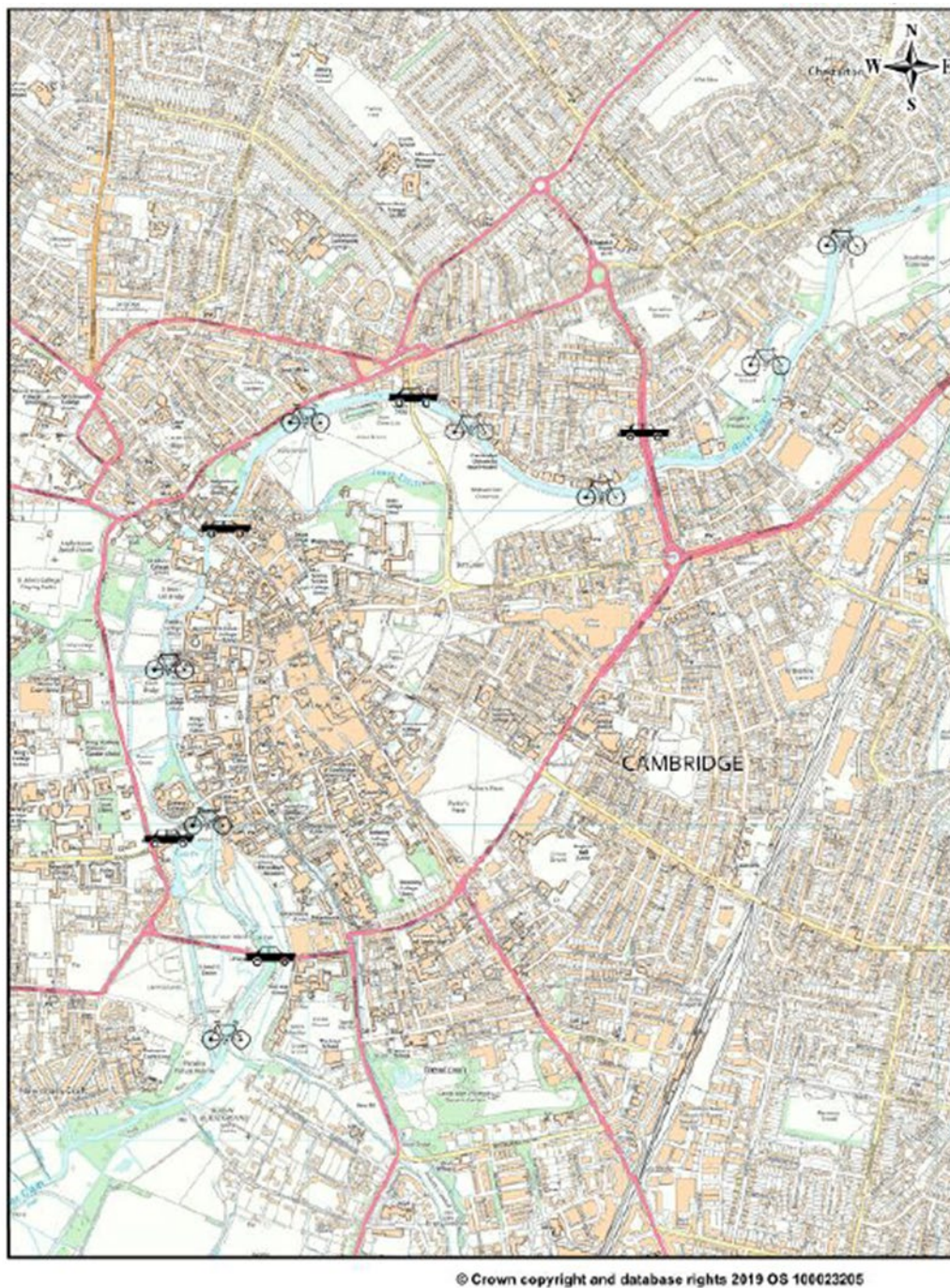
Data from the 2011 National census shows that 30% of journeys to work by Cambridge residents are by cycle. For Cambridgeshire as a whole the figure is 9.7%, which is much higher than the average of 3% for England.

Cambridgeshire County Council has cycle counters set up around the county. The River Cam Screenline monitoring which takes place every April shows there has been an increase in the level of cycling in the city up to 2017 but there are signs that this was starting to level off in 2018 as shown in Figure 15.

Figure 15: Cambridgeshire Cycle Flows across the River Cam screenline

Source: Cambridgeshire County Council - Business Intelligence team

Figure 16 below show the locations of the cycle monitors along the River Cam that are reported above.

Figure 16: River Cam Screenline

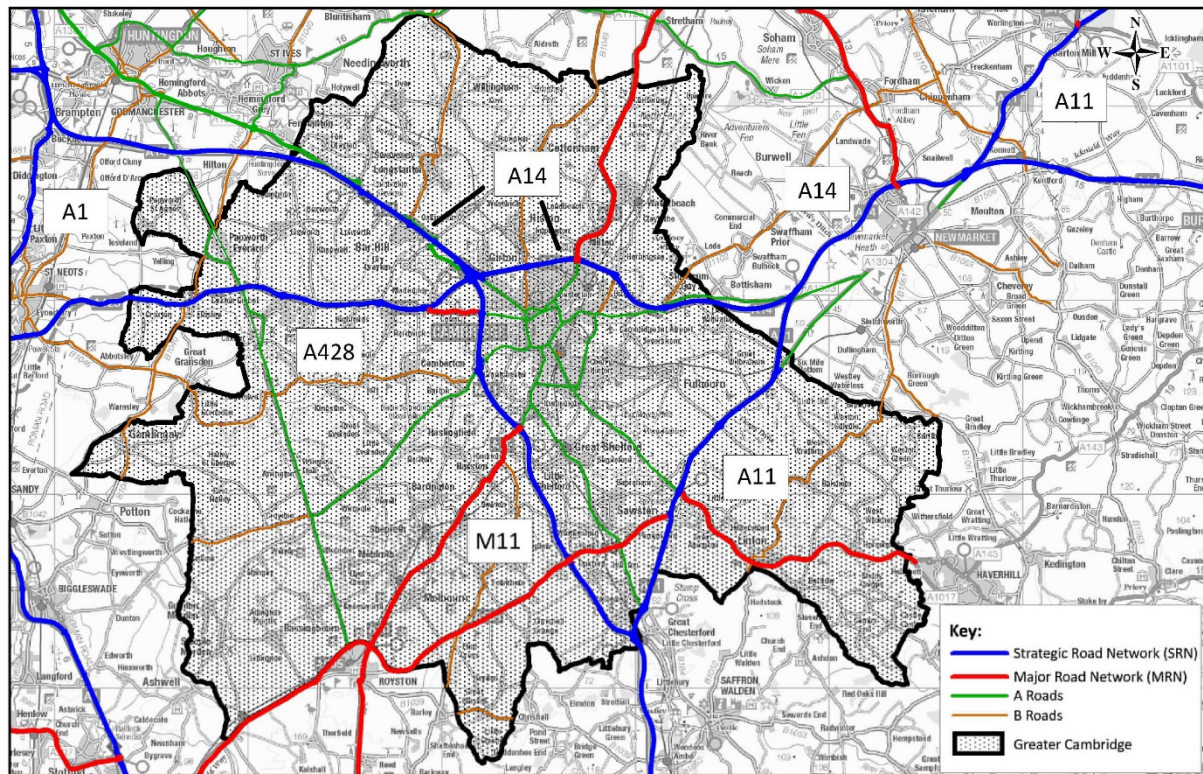
Source: Cambridgeshire County Council Traffic Monitoring Report 2018 (Figure 2.3)

3.4. Highway Network

3.4.1. Highway Connectivity

Greater Cambridge has good connections to the national and regional strategic road network. The main strategic routes are shown in the location map in Figure 17.

Figure 17: Highway network



Source: Cambridgeshire County Council

The routes that form part of either the Strategic Road Network (SRN) or Main Road Network (MRN) in Greater Cambridge are:

- The M11 (SRN) is a north south link between Cambridge, Stansted Airport and London. It passes to the west of Cambridge and ends at Girton where it meets the A14 and A428.
- The A10 (MRN) is a north south link linking London to Kings Lynn via Cambridge. In Greater Cambridge, it links Ely and Royston to Cambridge.
- The A11 (SRN) links Norwich to London, and passes through the east of Greater Cambridge between the A14 at Newmarket and the M11 at Great Chesterford.
- The A14 (SRN) is an east west link and links Greater Cambridge with the Midlands, the East Coast ports, and the north of England via the A1, M1 and M6 and is part of the Trans European Network - Transport (TEN-T).
- The A428 (SRN) links Cambridge to the A1 at St Neots, and provides onwards connection via the A421 to Bedford, Milton Keynes, Oxford.
- The A505 (MRN) is an east west link running from the A11 at Granta Park to the A1, Luton and the M1. It links a number of towns in Hertfordshire to Cambridge.

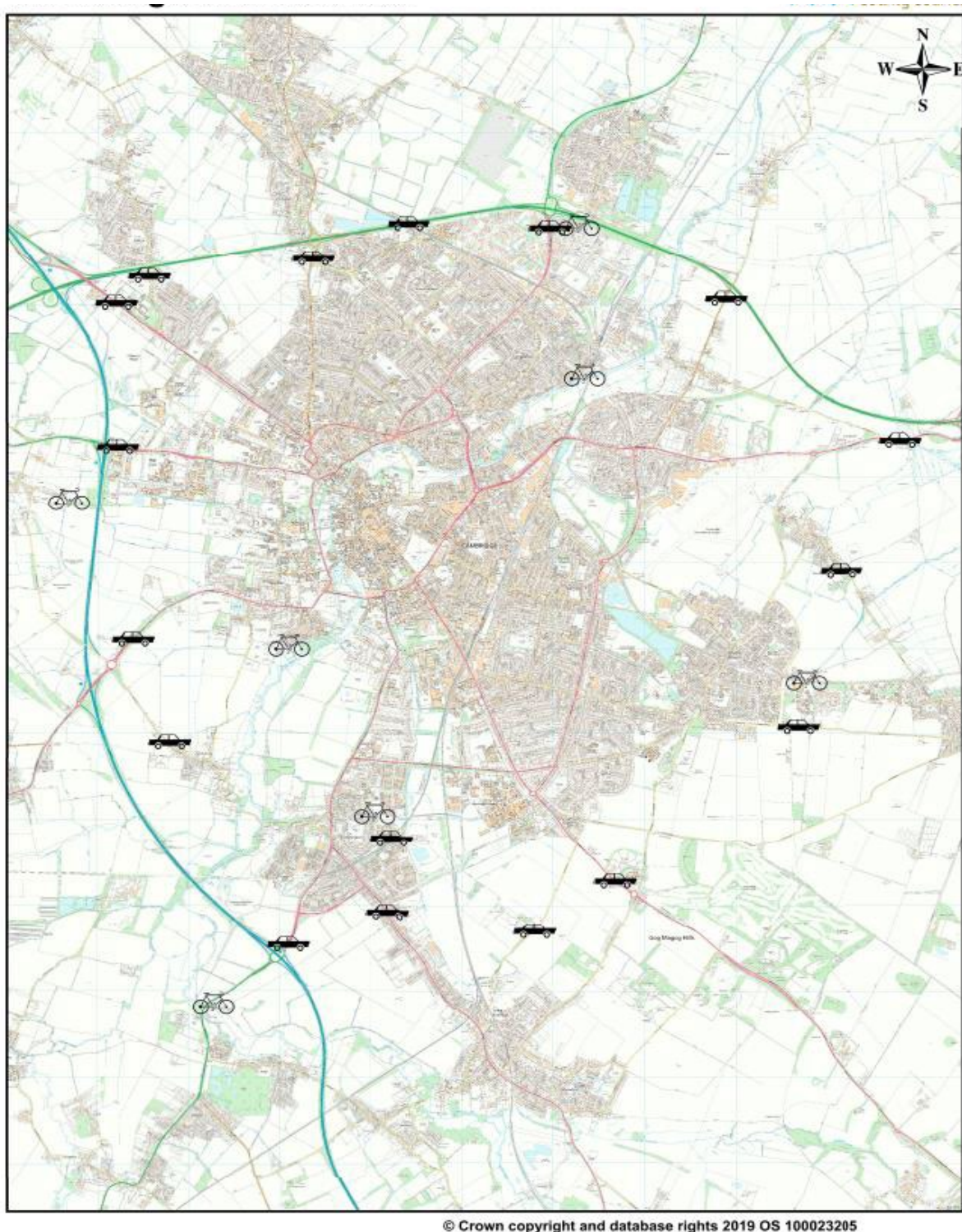
- The A1303 (MRN) between the A428 and the M11 to the west of Cambridge, providing for movements that cannot be made on the strategic road network.
- The A1307 (MRN) south west of Cambridge links Haverhill and the A11.
- The A1307 (MRN) de-trunked A14 and local access road to Huntingdon.

In addition to the strategic routes running through Greater Cambridge listed above, there are several other A and B class roads in the Greater Cambridge area (excluding those within Cambridge itself) these are as follows;

- The A603 running from Cambridge to the A1198 north of Bassingbourn.
- The A1198 running from Huntingdon to the south of Cambridgeshire via the A428 Caxton Gibbet junction, providing links to Camborne, Royston and beyond.
- The A1301 running from Cambridge to the A11 at Great Chesterford.
- The A1303 running from Cambridge to Newmarket parallel to the A14.
- The B1046 running from Barton to St Neots and provides links to Bourn and Comberton.
- The B1049 provides links from Wilburton to the A14 via Cottenham and Histon.
- The B1050 running from Earith to the A14 near Longstanton provides links through Willingham and Northstowe.
- The B1052 running from Newmarket to Linton.
- The B1102 between the A142 at Fordham and the A1303 / A14 at Quy.
- The B1368 from Hauxton to the south via Newton and Fowlmere.
- The B1040 linking the A1141 to A1307 via St Ives.

3.4.2. Traffic Flows

Cambridgeshire County Council undertakes annual monitoring counts within Cambridge and the major market towns. Within the Greater Cambridge area the only monitoring done is on two screen lines in Cambridge. These are the River Cam Cordon shown in Figure 16 above and the Cambridge Radial Cordon shown in Figure 18 below.

Figure 18: Cambridge Radial Cordon Traffic Count Locations

Source: Cambridge City Traffic Monitoring Report 2018 (Page 8)

Data has been collected on both the Cambridge cordons over many years providing an indication of the trends in the level of trips across both cordons.

3.4.2.1. River Cam Cordon

The 2019 River Cam Cordon indicates that of the 123,573 trips that crossed the river Cam Cordon 66,613 were pedestrians or Cyclists which represents 64% of trips crossing the cordon.

Table 15: Vehicles Crossing the River Cam Cordon April 2019

Vehicle Type	Vehicles: 12 Hr Flows	Vehicles: Modal Split
Motor Cycles	1,337	1%
Cars & Taxis	46,321	37%
Light Goods	6,564	5%
Heavy Goods	1,179	1%
Bus & Coach	1,559	1%
All Motor Vehicles	56,960	46%
Pedal Cycles	35,511	29%
Pedestrians	31,102	25%
Total (All modes)	123,573	100%

Source: Cambridge City Traffic Monitoring Report 2019

The information in Table 16 shows how the number of trips across the River Cam cordon has changed since 2009, for the purposes of this exercise 2009 is assumed to be 100% so the subsequent years show how the number of trips by each mode has changed.

Table 16: Traffic Growth on the Urban River Cam Cordon (Index (2009 = 100))

Vehicle Type	2009	2015	2016	2017	2018	2019	Change 2018 to 2019
Motor Cycles	100	86	93	65	96	124	30%
Cars & Taxis	100	94	93	96	92	93	1%
Light Goods	100	106	106	106	103	95	-8%
Heavy Goods	100	87	94	101	71	112	57%
Bus & Coach	100	99	87	89	81	83	2%
All Motor Vehicles	100	95	95	97	93	94	1%
Pedal Cycles	100	137	142	147	136	152	12%

Source: Cambridge City Traffic Monitoring Report 2019

From the information in Table 16 it is possible to see that the volume of cycle trips crossing the River Cam Cordon has gone up by 52% since 2009 whilst car and taxi trips have dropped by 7%. When considering the changes between 2018 and 2019 it can be seen that the largest percentage change was in the number of Heavy Goods Vehicles and Motor Cycles. Car traffic saw a 1% increase over 2018 levels whilst cycling saw a 12% increase since 2018. This indicates that of the new trips made in 2019 the largest modes shift was to motorcycle and then pedal cycle.

3.4.2.2. Cambridge Radial Cordon

Table 17 shows the number and type of vehicles crossing the Cambridge radial cordon. In April 2019.

Table 17: Vehicles Crossing the Cambridge Radial Cordon - April 2019

Vehicle Type	Vehicles: 12 Hr Flows	Vehicles: Modal Split
Motor Cycles	1,461	1%
Cars & Taxis	173,289	79%
Light Goods	21,084	10%
Heavy Goods	4,615	2%
Bus & Coach	1,784	1%
All Motor Vehicles	202,233	92%
Pedal Cycles	12,200	6%
Pedestrians	4,790	2%
Total (All modes)	219,223	100%

Source: Cambridge City Traffic Monitoring Report 2019

The information in Table 17 shows there were a total of 219,223 trips across the radial cordon in April 2019 of which 202,233 were by motor vehicle which accounts for 92% of trips.

Table 18: Traffic Growth on the Cambridge Radial Cordon Index (2009 = 100)

Vehicle Type	2009	2015	2016	2017	2018	2019	Change 2018 to 2019
Motor Cycles	100	92	99	79	77	66	0.1%
Cars & Taxis	100	110	110	109	107	110	2%
Light Goods	100	103	102	112	113	99	12%
Heavy Goods	100	153	157	129	129	122	5%
Bus & Coach	100	104	103	79	79	76	3%
All Motor Vehicles	100	110	110	108	108	108	-0.04%
Pedal Cycles	100	165	185	170	170	173	-2%

Source: Cambridge City Traffic Monitoring Report 2019

From the information in Table 18 it is possible to see that the volume of cycle trips crossing the Radial Cordon has gone up by 73% since 2009 and car and taxi trips have also gone up but by just 10%. When considering the changes between 2018 and 2019 it can be seen that the largest percentage change was in the number of Light Goods Vehicles which saw a 12% increase over 2018 levels whilst cycling saw a 2% drop compared to 2018.

It is interesting to note the very different mode split for trips crossing the two Cambridge cordons with more cycle and walking trips in the central area and higher numbers of LGV's in the outer area. This highlights the differences between the central and outer

areas of Cambridge and indicates that people are more inclined to walk or cycle for trips in the centre compared to the outer areas of the city. The details of the existing cycle networks are set out in section 3.3 of this report.

3.4.2.3. Strategic Road Network

Highways England collects traffic counts along the full extent of the Strategic Road Network, this information has been analysed for the links within the Greater Cambridge area. The location of the counters within Greater Cambridge are shown in Figure 19 below;

Figure 19: Greater Cambridge Two-Way Annual Average Daily Flow Count Locations

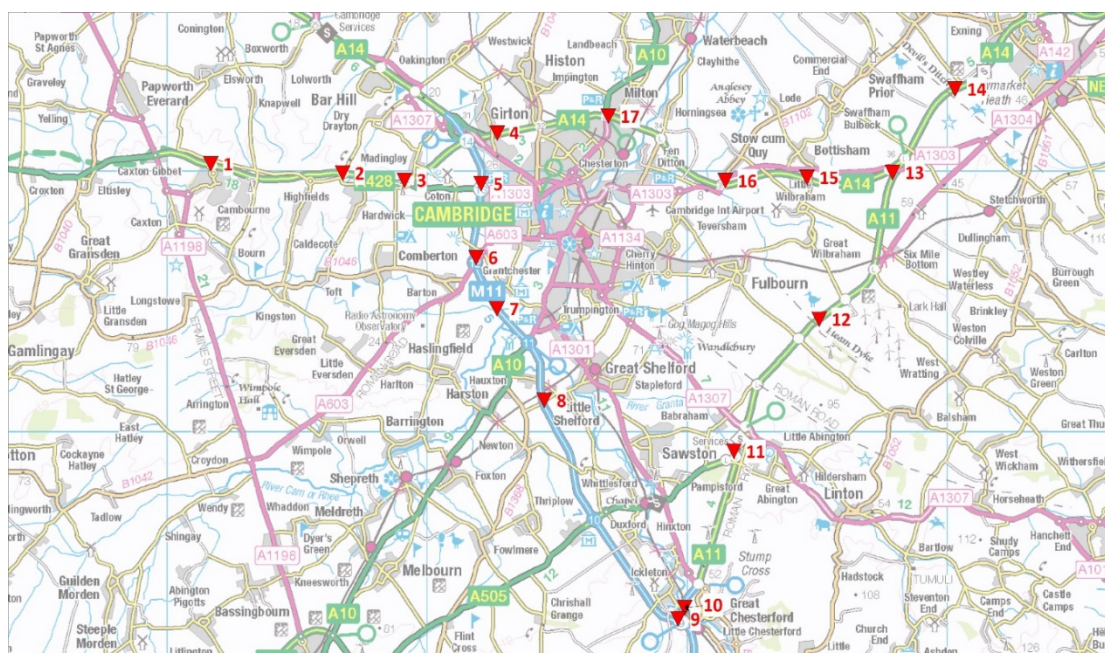


Table 19: Greater Cambridge Two-Way Annual Average Daily Flows (AADF) in 2019

Reference	Location	AADF
1	A428 - Camborne	35,860
2	A428 - Hardwick	21,206
3	A428 - Madingley	18,508
4	A14 - Girton	72,760
5	M11 (between J13 and J14)	59,080
6	M11 (between J12 and J13)	79,151
7	M11 (between J11 and J12)	68,216
8	M11 (between J10 and J11)	56,253
9	M11 (between J9 and J10)	44,627
10	M11 (between J9 and J9a)	25,874
11	A11 (between A1307 and A505)	57,248
12	A11 (between A1307 and A1304)	47,315
13	A11 (between A14 and A1304)	40,154
14	A14 (between J37 and J36)	72,425
15	A14 (between J36 and J35)	41,412
16	A14 (between J35 and J34)	50,966
17	A14 (between J34 and J33)	62,420

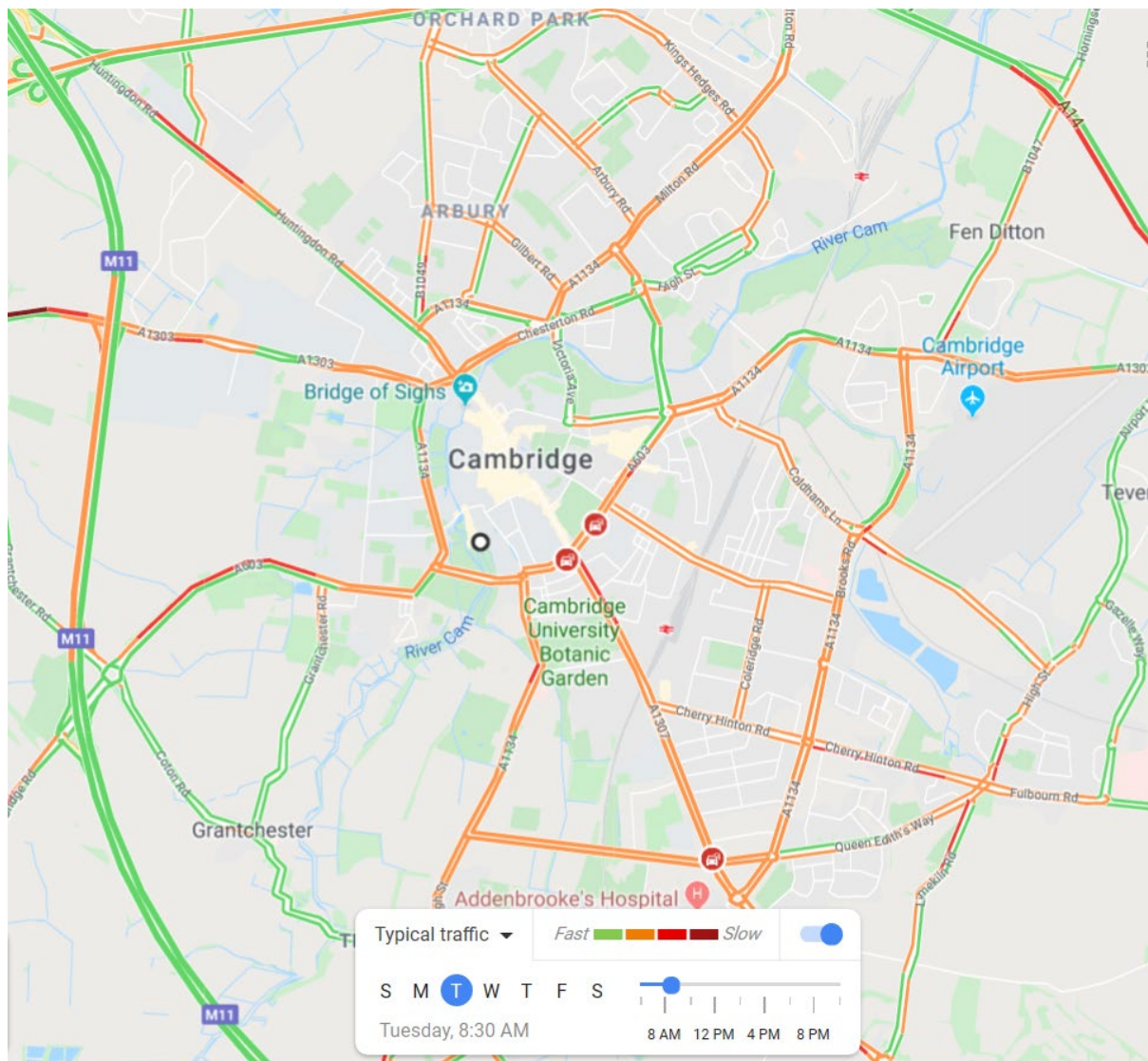
Source: <http://webtris.highwaysengland.co.uk> and <https://roadtraffic.dft.gov.uk>

The highest flows on the strategic network were observed on the M11 between Junction 13 and 11 to the west of Cambridge, this implies that approximately a third of traffic on this section of the M11 is accessing Cambridge as the flows either side of these junctions drops considerably.

3.4.3. Traffic Congestion

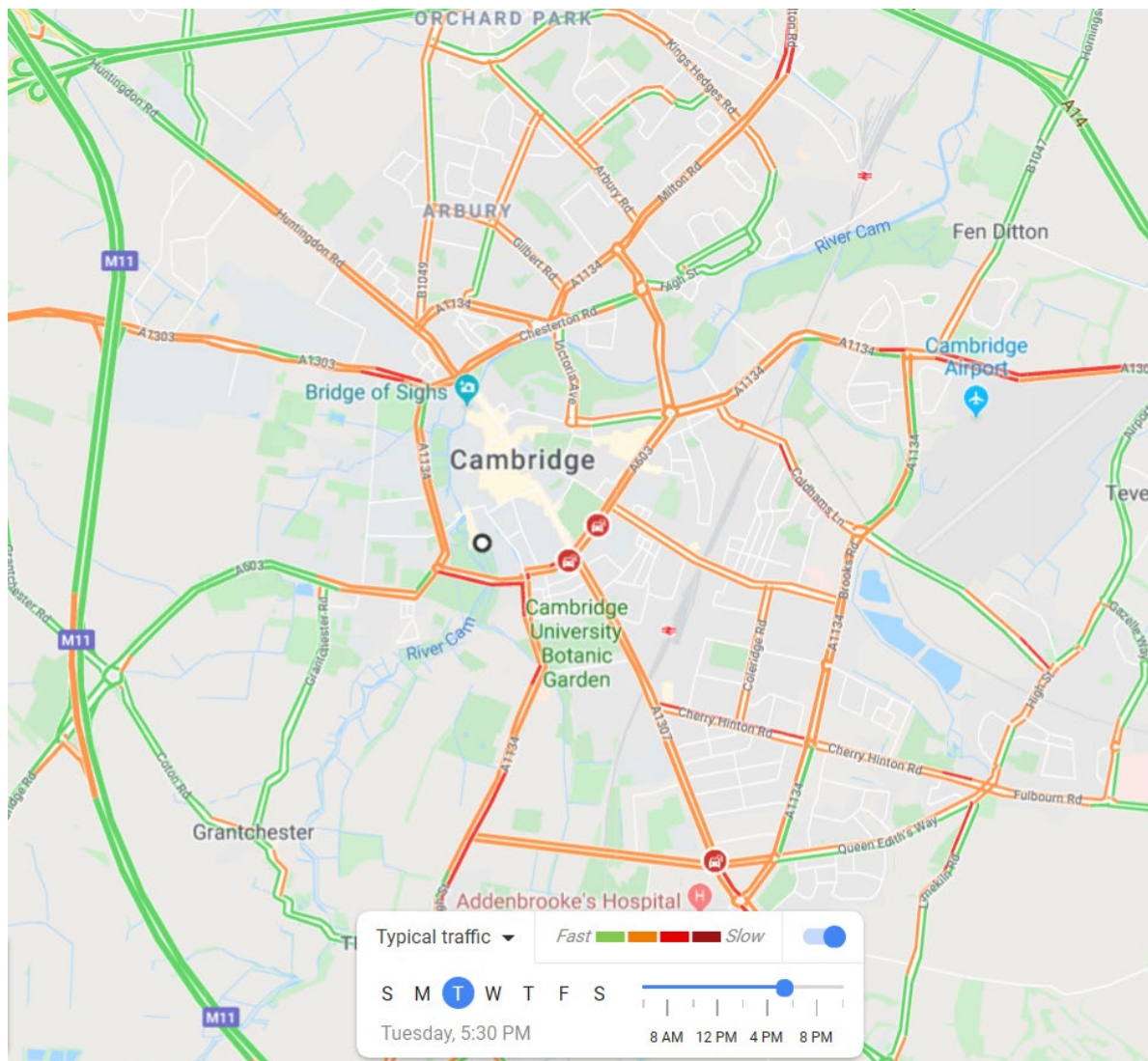
Congestion acts to limit the effectiveness of the transport network. For example, the average speed on all radial routes entering Cambridge during the peak hour is less than 60% of the 'free flow' speed (i.e. the speed that a motorist would travel at on a road if there were no congestion or other adverse conditions). The road network lacks resilience, particularly on the radial routes in to Cambridge and in the city centre, where the highway network is constrained by the urban environment. Congestion is detrimental for all road users. On average more than 20% of bus services within Greater Cambridge run late, in large part due to congestion which has knock on detrimental environmental and social impacts such as air quality, noise and safety for non-motorised users. Disruption caused by the A14 road works mean that there is no representative congestion data for 2019 in South Cambridgeshire.

Figure 20 shows the observed AM peak traffic congestion in Cambridge in 2019.

Figure 20: Observed AM Traffic Congestion in Cambridge City 2019

Source: Google Maps 2019

From the information in Figure 20 above it is possible to see that the vast majority of roads in Cambridge were show to be running slower than the free flow speed and in addition all the major arterial routes into the city were showing very slow to stationary traffic at 8:30 in the morning.

Figure 21: Observed PM Traffic Congestion in Cambridge City 2019

Source: Google Maps 2019

From the information in Figure 21 above it is possible to see that the vast majority of roads in Cambridge were shown to be running slower than the free flow speed, in addition there are several stretches of roads shown to be running very slow but the impacts at 5.30 pm are not as severe or as wide spread as in the AM peak.

3.5. Trip Attractors

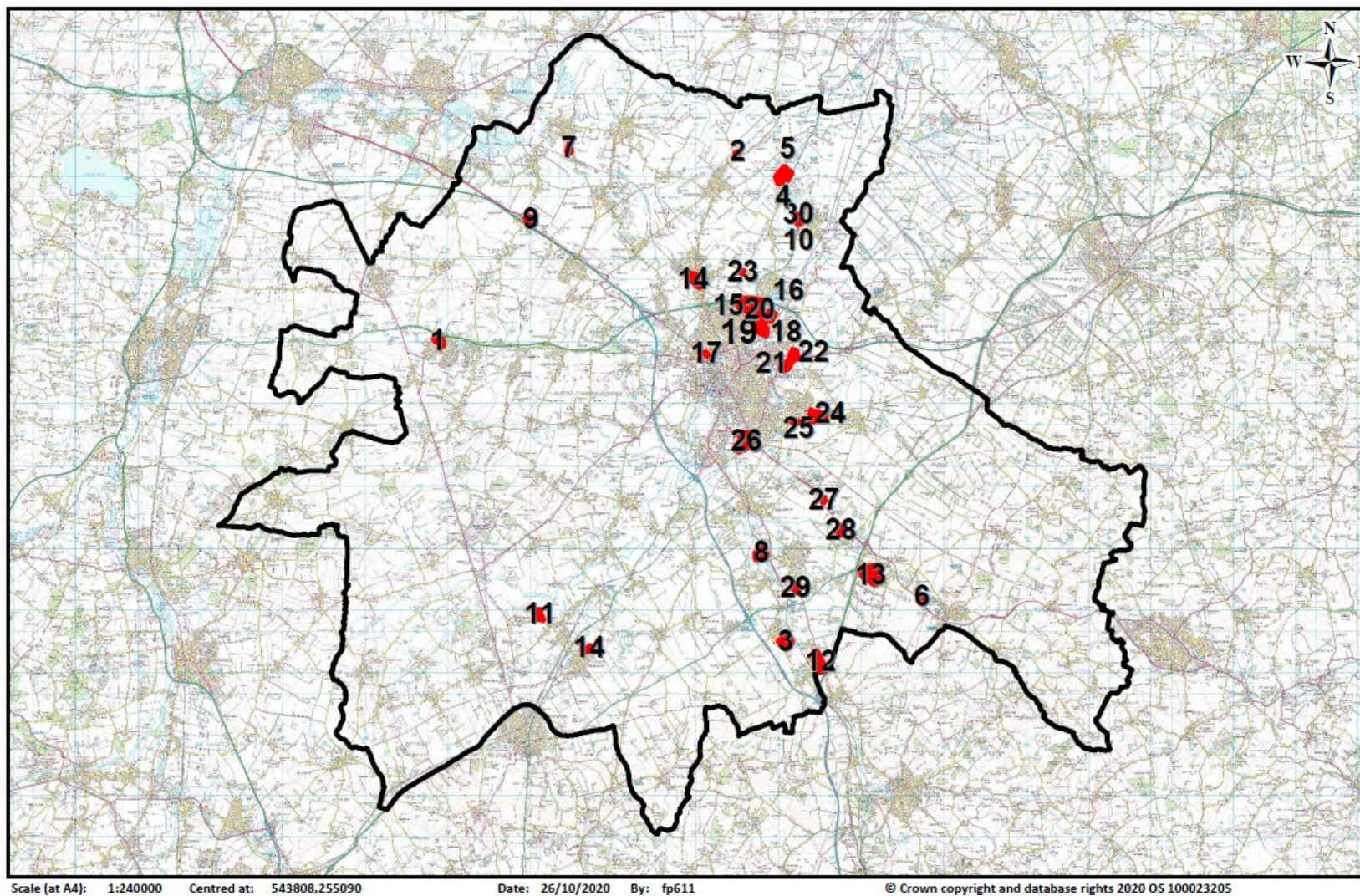
The research and technology industry is one of the key the drivers of the local economy and is one of the main trip attractors bringing people to Greater Cambridge. Table 20 shows the major employment and research facilities within Greater Cambridge. The locations of these sites are shown on Figure 22.

Table 20: Major Employment Areas

Ref	Employment Area
1	Cambourne Business Park
2	Brookfield's Business Estate, Cottenham
3	Land at Hixton Road, South of Duxford
4	Cambridge Research Park
5	North of Cambridge Research Park
6	Daleshead Food Ltd, Linton
7	Norman way Industrial Estate, Over
8	Former Spicers Site, Sawston
9	Buckingway Business Park, Swavesey
10	Covent Drive/ Pembroke Avenue, Waterbeach
11	Eternit Site, Meldreth
12	Wellcome Trust Genome Campus, Hinxton
13	Granta Park, Great Abington
14	Regus Cambridge Vision Park
15	Cambridge Science Park
16	St Johns Innovation Park
17	Citi Base Cambridge
18	Cowley Road Industrial Park
19	Nuffield Road Industrial park
20	Cambridge Business Park
21	Marshalls of Cambridge
22	Marshalls Industrial Park
23	Evolution Business park
24	Capital Park, Cambridge
25	Peterhouse Technology park
26	Addenbrooke's Hospital / Cambridge Biomedical Campus
27	Copley Hill Business Park
28	Babraham Research Campus
29	Sawston Trade Park
30	Cambridge Innovation Park

Source: Cambridgeshire County Council

Figure 22: Major Employment Areas in Greater Cambridge



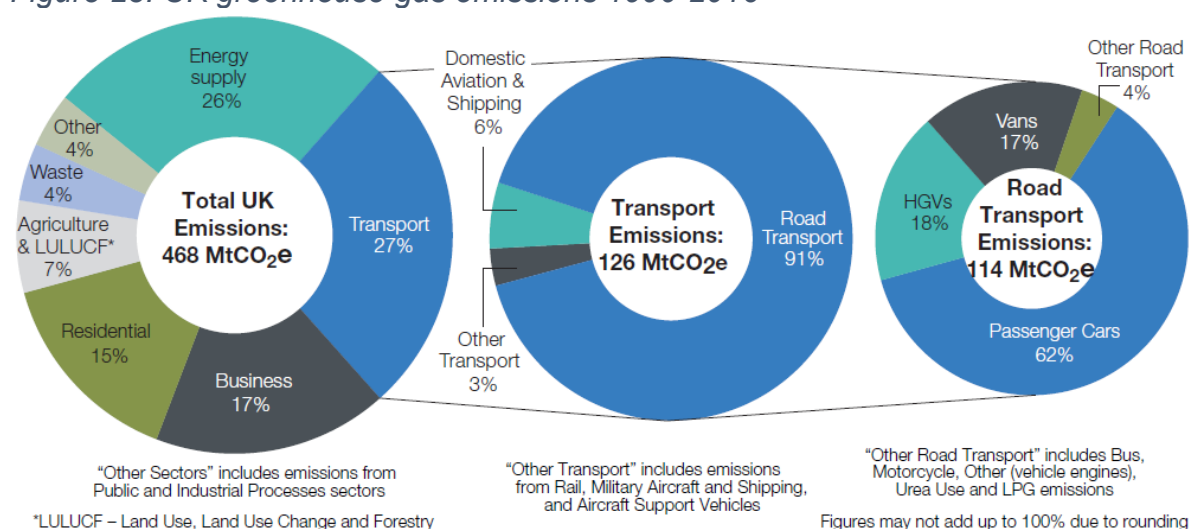
Source: Cambridgeshire County Council

As can be seen from Figure 22 many of the major trip attractors are in more remote locations which are less readily accessible via alternatives to the private car, especially commercial bus services for longer journeys. This is evidenced by the private services run by some of the major employment sites to facilitate access for their employees without the need to drive as part of their Travel Plans.

3.6. Environment Indicators

Road transport accounts for around 27% of air pollution in cities and towns, causing serious pollution. Due to the increase in the vehicle miles travelled, road traffic pollution is considered a major threat to clean air in the UK. Real world emissions of nitrogen oxides (NOx) from diesel vehicles are typically much higher than from petrol equivalents.

Figure 23: UK greenhouse gas emissions 1990-2016



Source: The Road to Zero. Next steps towards cleaner road transport (Fig1.3)

Among the air pollutants gasoline and diesel engines emit are NOx and Particulate Matter (PM). Nitrogen oxides have harmful direct effects on human health, and indirect effects through the damage they do to agricultural crops and ecosystems. PM is a generic term used to describe a complex mixture of solid and liquid particles of varying size, shape, and composition. The size of particles and the duration of exposure are key determinants of potential adverse health effects and the strongest evidence for effects on health is associated with fine particles (PM_{2.5} and PM₁₀).

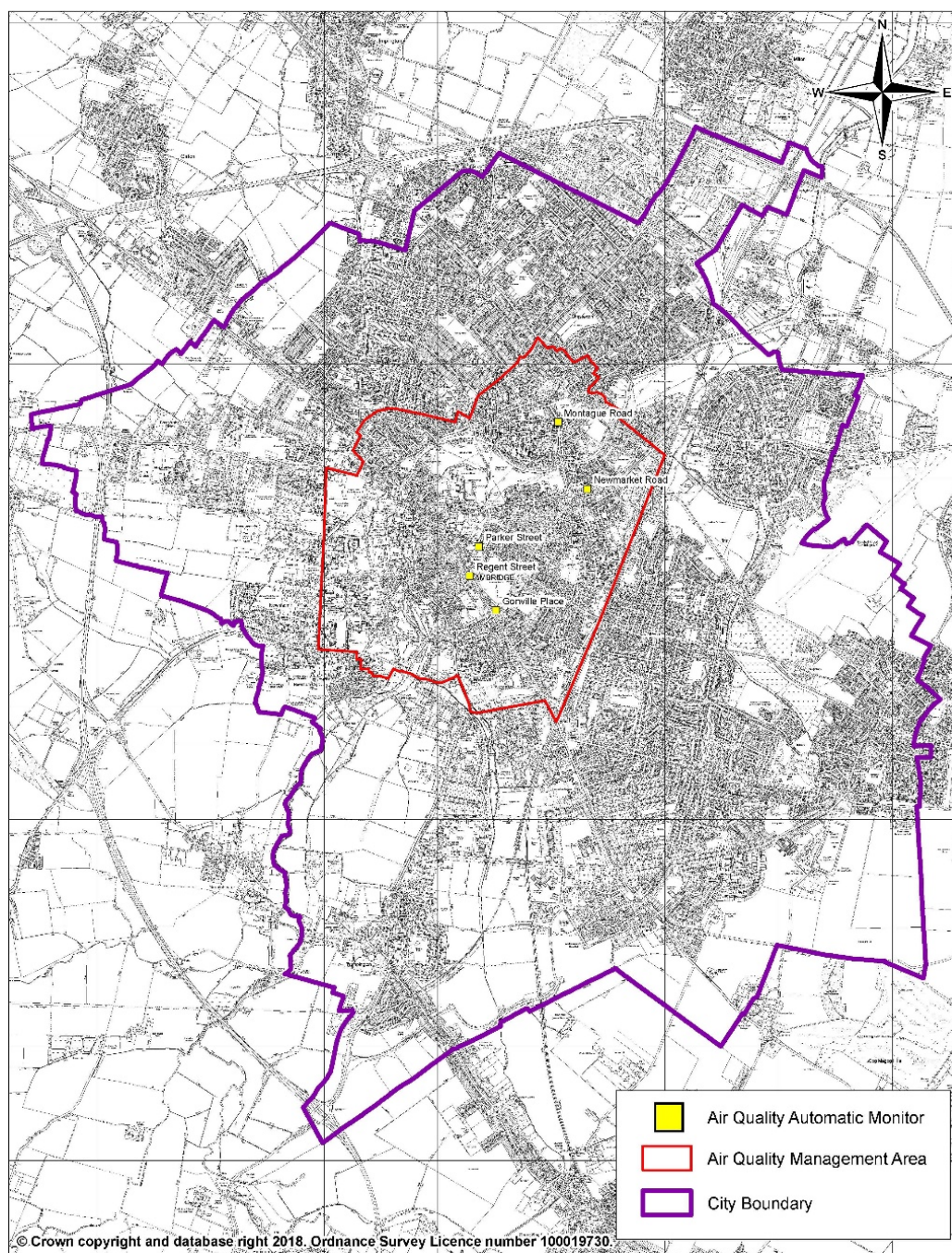
UK road transport NOx emissions are primarily from diesel vehicles. However, most road transport PM_{2.5} emissions are not from the tailpipe but from materials such as soot and other wind-blown dust formed from road abrasion or tyre and break wear.

Cambridge City Council has an Air Quality Management Area (AQMA) in the City Centre as shown in Figure 25 whilst South Cambridgeshire District Council declared an AQMA along the A14 in 2008 (Figure 26).

The continuing increase in the level of traffic and congestion are the main challenge to air quality in the south of Cambridgeshire. In 2010, South Cambridgeshire, Cambridge City Council and Huntingdonshire District Council produced a joint Action

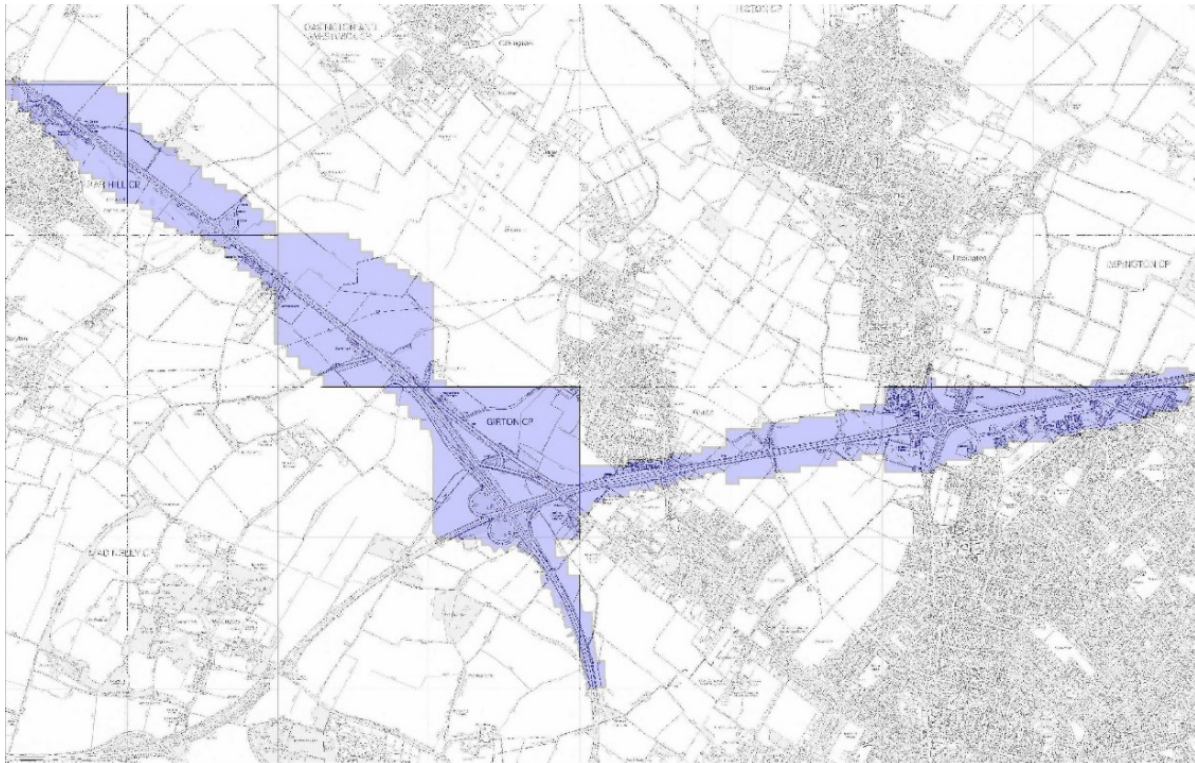
Plan because of the nature of the road network and spatial distribution of housing, recreation and employment in the region.

The Department for Environment, Food and Rural Affairs (Defra) concluded in 2018 that there was no evidence the A14 AQMA status should continue to be retained since no exceedances of objective levels had occurred within the AQMA since 2013. Defra therefore recommended that the AQMA should be considered for revocation. However, the Council will continue to monitor air quality in this area until the impacts of the A14 improvements are clear.

Figure 24: Cambridge City Air Quality Management Area

Source: <https://www.cambridge.gov.uk/air-pollution-levels-and-monitoring-them>

Figure 25: A14 Air Quality Management Area



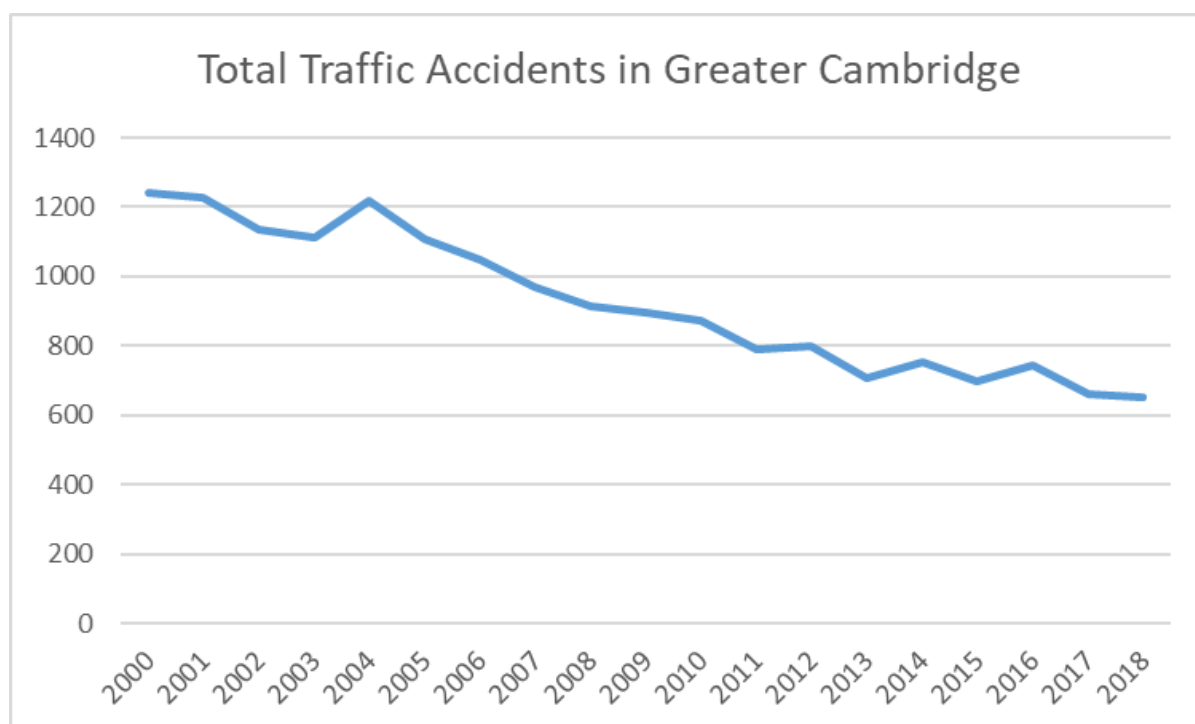
Source: <https://www.scams.gov.uk/environment/pollution/air-pollution/local-air-quality-management/>

3.7. Road Safety

The information in this section sets out details of the personal injury accident data recorded within Greater Cambridge for the period between 2000 and 2019. This data includes all accidents that involve personal injuries and covers all types of vehicles and pedestrians.

Figure 26 shows that there has been a decrease in the number of personal injury accidents recorded each year in Greater Cambridge since 2000.

Figure 26: Greater Cambridge Personal Injury Accidents



Source: Cambridgeshire County Council - Business Intelligence team

As Figure 26 indicates, the number of recorded accidents has decreased over the last 18 years, but it is also important to consider the severity of the accidents that have occurred. Table 21 below shows, the number of accidents in each of the categories, from this it is possible to see that the majority of accidents were recorded as slight.

Table 21: Severity of Personal Injury Accidents in Greater Cambridge

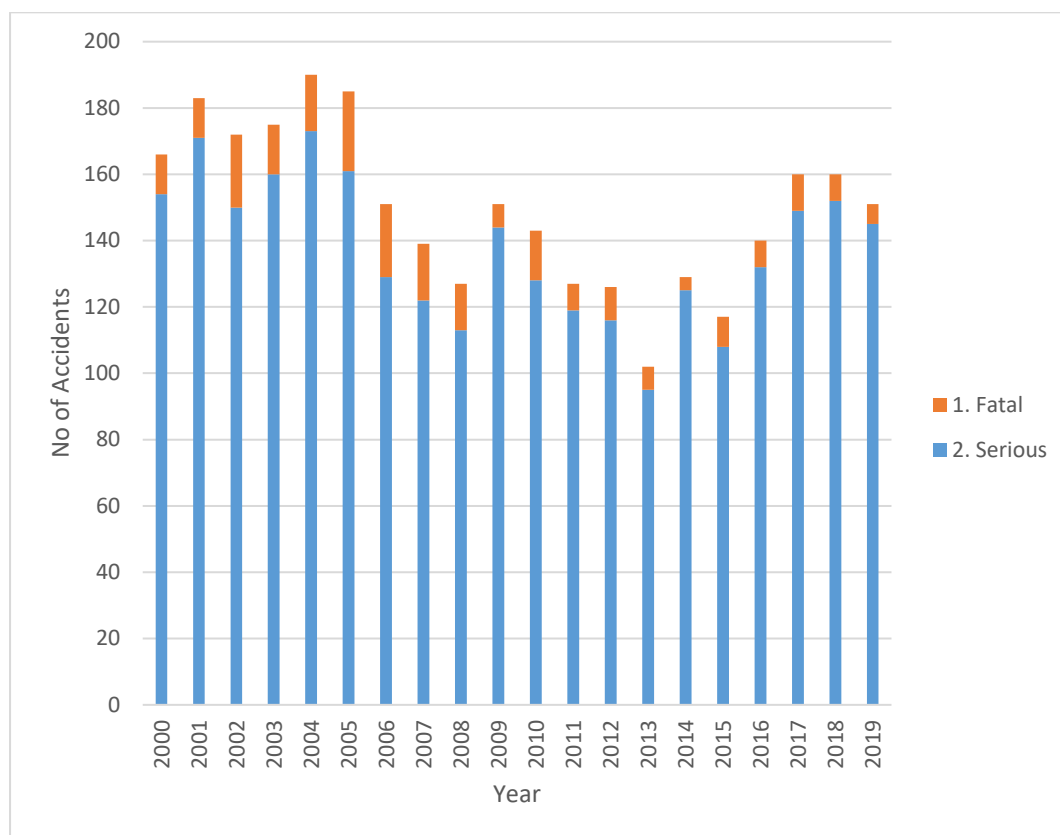
Severity / Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fatal	12	12	22	15	17	24	22	17	14	7
Serious	154	171	150	160	173	161	129	122	113	144
Slight	1,077	1,045	962	936	1,028	924	896	832	786	747
Total	1,243	1,228	1,134	1,111	1,218	1,109	1,047	971	913	898

Severity / Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fatal	15	8	10	7	4	9	8	11	8	6
Serious	128	119	116	95	125	108	132	149	152	145
Slight	728	661	672	603	622	581	604	517	490	490
Total	871	788	798	705	751	698	744	677	650	641

Source: Cambridgeshire County Council - Business Intelligence team

However, the key metric is the number of killed and seriously injured (KSI) accidents and therefore it is necessary to investigate these categories further. Figure 27 shows the changes in the number of KSI accidents recorded in Greater Cambridge per year.

Figure 27: Severity of Traffic Accidents in Greater Cambridge

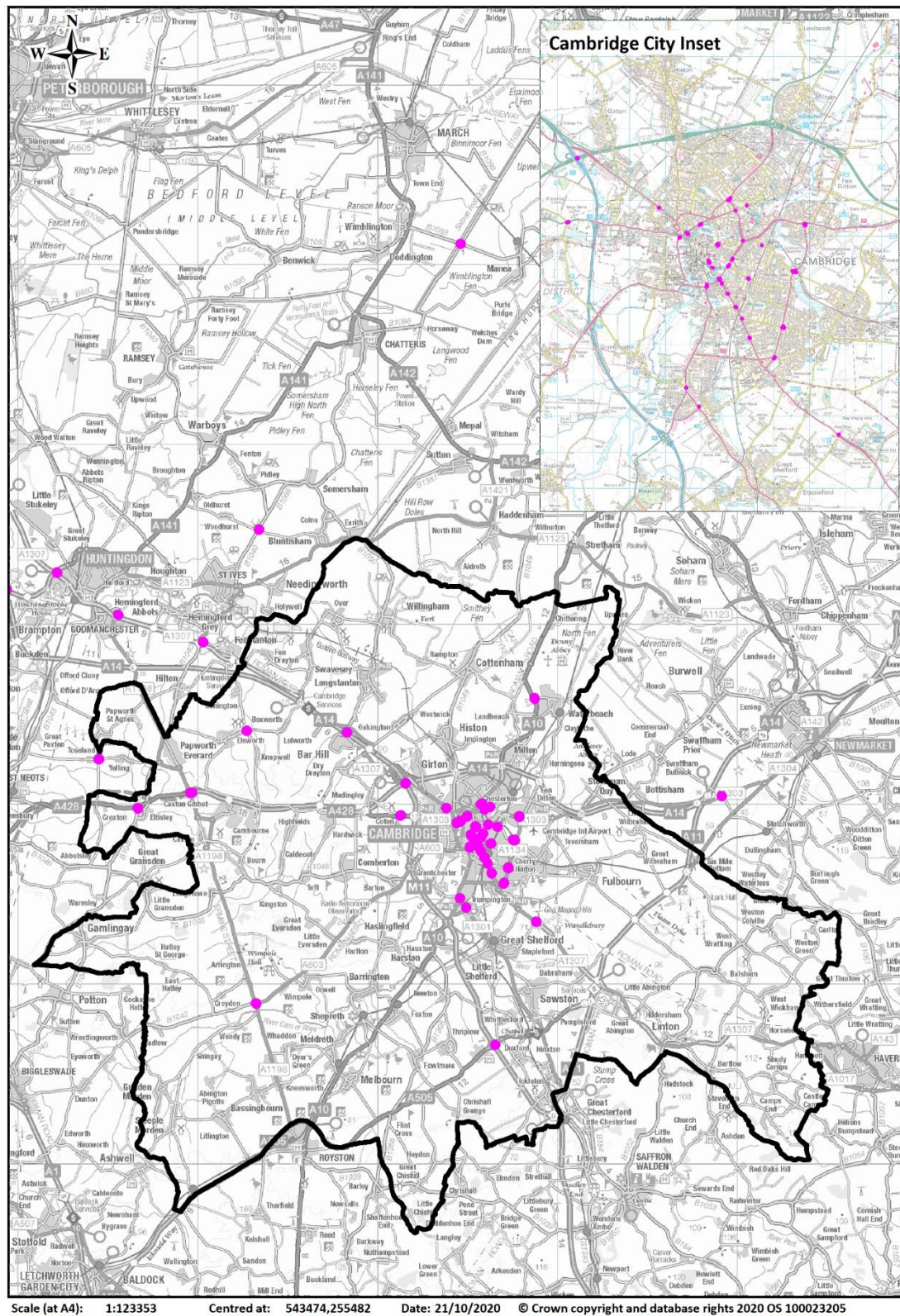


Source: Cambridgeshire County Council - Business Intelligence team

From the information in Figure 27 it is possible to see that over the period 2000 – 2005 the number of fatal accidents rose, since when the number of fatalities has remained fairly constant. The number of serious accidents fell between 2000 and 2008, but by 2013 the number of serious accidents has been rising, so that in 2019 the number of serious accidents was similar to that in 2000. The number of slight accidents between 2000 and 2019 has reduced significantly, and as a result the number of accidents KSI has increased as a percentage of total accidents.

The analysis of accidents tends to look for clusters, i.e. areas where there are groups of accidents, as this indicates there may be a consistent contributing factor that could be addressed. Figure 28 shows the identified accident cluster locations in Greater Cambridge in the period studied.

Figure 28: Accident cluster sites in Greater Cambridge 2017-2019



Source: Cambridgeshire County Council

3.8. Cycle Parking

Table 22 shows the capacity of the large formal cycle parks located around the city. Cambridge of course known for cycling has various small cycle stands located around the city. The formal cycle parks at the stations and large car parks have a capacity of over 4,250 spaces.

Table 22: Large Cycle Parks

Large Cycle Parks	Number of Spaces
Cambridge Station	2,850 spaces
Cambridge North Station	1,000 spaces
Grand Arcade	200+ spaces
Park Street	200+ spaces

Source: Greater Anglia / Cambridge City Council

In addition to the cycle parking spaces located around the city, the park and ride sites also have capacity for 381 cycle stands and 380 cycle lockers across all of the park and ride sites.

3.9. Car Parking

Table 23 shows the capacity of the pay and display car parks which are currently in operation in Cambridge City. In total there are 5715 spaces available. This does not include the five park and ride sites located around the edges of the city which have a capacity of 6,025 spaces.

Table 23: Pay and Display Car parks in Cambridge

Pay and Display Car Parks	Number of Spaces
Castle Hill	115 spaces
Lammas Land	76 spaces
Gwydir Street	50 spaces
Riverside	8 Spaces
Adam and Eve Street	50 spaces
Park Street	287 spaces
Grand Arcade	953 spaces
Grafton West	280 spaces
Grafton East	874 spaces
Queen Anne Terrace	570 spaces
Cambridge Station	352 spaces
Cambridge North Station	450 spaces
Addenbrooke's Hospital	1,050 spaces
Cambridge Leisure Park	600 spaces

Source: Cambridge City Council / NCP

Figure 29: Cambridge Car Parks



Scale (at A4): 1:35342 Centred at: 548599,256954 Date: 19/11/2019 © Crown copyright and database rights 2019 OS 100023205

Source: Cambridgeshire County Council

3.10. Connectivity Summary

- The Greater Cambridge bus network provides 49 services.
- Bus use in Greater Cambridge accounts for just 13% of Journeys to work.
- Bus frequencies outside Cambridge drop with some services only having one or two per day meaning they are not viable for regular journeys. Also poor service frequency in the evenings and on weekends are common.
- Park and ride services provide a viable choice for trips into the Centre of Cambridge but still encourage car trips through South Cambridgeshire.
- The Guided busway has seen a significant growth in patronage since opening in 2011 and provides a viable option for those along the routes looking to access Cambridge
- Greater Cambridge has nine railway stations providing good north south connectivity to and from Cambridge.
- From Cambridge, direct services are available to London, Ipswich, Norwich, Kings Lynn, Peterborough, Stansted Airport, Birmingham, Gatwick Airport and Brighton. The other stations in Greater Cambridge all have direct services to London.
- The opening of Cambridge North station has opened up the Science Park and wider North East Cambridge area to access by rail
- The majority of the cycle facilities within Greater Cambridge are within Cambridge City but the region as a whole has 154.6 miles of cycle infrastructure.
- There has been a significant growth in cycle trips across both Cambridge screen lines over the last 15 years
- Recent years has seen an increase in HGV traffic crossing the River Cam Cordon whilst the largest increase in trips crossing the Cambridge radial cordon has been in cars and taxis
- 2018-2019 saw a 12% increase in LGV trips across the Cambridge radial cordon.
- The Greater Cambridge highway network has a large strategic road network with the M11, A14, A11 and A428 being major national routes.
- Congestion is an issue in Greater Cambridge. The average speed on all major roads entering Cambridge during the peak hour is less than 60% of the 'free flow' speed.
- There are 13 pay and display off road public car parks within Cambridge which provide 5,715 spaces, in addition to this the Cambridge Park and Ride sites offer 6,025 spaces.
- Trip attractors in the Greater Cambridge area for employment are located away from Cambridge city Centre meaning that public transport access is limited.
- Transport is one of the main contributors to poor air quality in the Greater Cambridge area.
- The number of personal injury accidents in Greater Cambridge has reduced over the period 2000-2018 but the proportion of those that result in serious or fatal injuries has increased.

4. Future Transport Provision

4.1. Introduction

The Greater Cambridge area is covered not just by the local authorities and Cambridgeshire County Council but also by the Cambridgeshire and Peterborough Combined Authority (CPCA) and the Greater Cambridge Partnership (GCP), both of whom have a programme of transport schemes that aim to bridge the gap in the existing provision. In addition, there are also transport schemes being developed which pass through Greater Cambridge, being led by organisations external to the area.

4.2. Cambridgeshire and Peterborough Combined Authority

The CPCA is the Local Transport Authority with responsibility for the Local Transport Plan. The CPCA has a number of schemes under development;

- Cambridge Autonomous Metro (CAM) - The CAM is proposed to provide a high-quality, fast and reliable mass transit link throughout the Greater Cambridge region and Cambridgeshire. The CAM will link up with existing stations in Cambridge, the proposed Cambridge South Station and major city fringe employment areas. The scheme would include 12km of 'twin bore' tunnelling under Cambridge city and two underground stations, one at the city centre, and one at Cambridge Station. The CAM would serve inner transport corridors in the Greater Cambridge area from the city to Cambourne, Granta Park, Waterbeach and Newmarket Road and Trumpington Park & Ride sites. It would also serve the regional area, with corridors extending to St Neots, Alconbury, Mildenhall and Haverhill. The CAM would extend in total to 142km.
- Cambridge South Station – This is proposed to serve the Cambridge Biomedical Campus (CBC) located at Addenbrooke's Hospital. The campus is a large trip generator with 17,250 staff and 14,500 patients and visitors each day. More growth is planned at the Biomedical Campus as shown in Figure 39.
- A10 Ely to Cambridge Junctions and Dualling - The A10 provides a strategic road link between Cambridge, Ely and the rest of the north eastern sub region of Cambridgeshire. The A10 Ely to Cambridge Junctions and Dualling project builds on the Greater Cambridge Partnership's A10 Ely to Cambridge Study and looks to take forward the strategic highway element of those proposals.

Further information about the above schemes is available at the CPCA's website: <https://cambridgeshirepeterborough-ca.gov.uk/>.

4.3. Greater Cambridge Partnership Schemes

The Greater Cambridge Partnership (GCP) is the local delivery body for a City Deal with central government, which is worth up to £1 billion over 15 years. The aim of the City Deal is to provide infrastructure improvements, supporting and accelerating the creation of the 44,000 new jobs and 33,500 new homes identified in the 2018

Cambridge and South Cambridgeshire Local Plans. The GCP has a list of committed schemes throughout Greater Cambridge for sustainable transport measures to improve transport accessibility and connectivity within the area.

- A428 Cambourne to Cambridge - This corridor is one of the key radial routes into Cambridge. It suffers from congestion during the network peak periods, particularly at the Cambridge end, on the A1303 Maddingley Road at M11 Junction 13. Modelling for the Greater Cambridge Partnership (GCP) has demonstrated that the A1303 Maddingley Road has seen significant increases in traffic over the last decade. The key current conditions on the corridor include; long delays on the eastbound A1303 up to M11 junction 13, and; significant journey time variability along the corridor, particularly eastbound in the morning peak and westbound in the evening peak. This Cambourne to Cambridge Better Public Transport scheme will provide a new reliable, public transport route to ease congestion, create sustainable travel choices, connect communities and support growth, and form a first phase of the CAM network.
- A1307 (Cambridge South East Transport Scheme - CSETS) The CSETS aims to provide better public transport, walking and cycling options for those who travel in the A1307 and A1301 area, improving journey times and linking communities and employment sites in the area south east of Cambridge. This scheme will form a first phase of the CAM network.
- M11 Junction 11 Park & Ride is a key entry point into Cambridge. With significant growth in housing and employment in the area, upgrading the existing transport infrastructure in this area is vital to reduce congestion and improve access into the city.
- Cambridge Eastern Access corridor provides the main access into the city from the east and consists of the A1134/A1303 Newmarket Road between Quy Interchange and Elizabeth Way and connects with the main Strategic Road Network at A14 Junction 35. Newmarket Road Park & Ride is located approximately 500m west of the junction with Airport Way and is accessed off the A1303. This scheme will form a first phase of the CAM network.
- Histon Road is a key route into Cambridge from the A14 and surrounding villages. However, due to the economic and population growth in Cambridge, Histon Road now suffers from peak-time traffic congestion and delays, impacting on the ability of businesses to operate effectively, and on the lives of those who live, work, and travel along Histon Road. As a result, the Greater Cambridge (GCP) Partnership is looking to redesign Histon Road to encourage the use of public transport, reduce congestion and air pollution, whilst encouraging the continued economic growth of the Greater Cambridge area.
- Milton Road is busy residential area in Cambridge which also acts as a key route between the city centre, the A14 and A10, as well as the nearby villages of Milton and Waterbeach. As a key arterial route, Milton Road has been identified as vital to the local economy. However, current levels of peak-time traffic congestion threaten the continued economic growth of the local area. With the population of Cambridge and South Cambridgeshire expected to grow by around 28% over the

next 15 years, improvements to Milton Road will need to be made to now, to accommodate the increasing number of journeys in the future.

- Madingley Road is a scheme to improve cycling provision along Madingley Road, the Greater Cambridge Partnership is looking to improve sustainable travel along this key route into the city.
- Waterbeach to Cambridge Public Transport Scheme: the Waterbeach to Cambridge project is considering options for improvements to infrastructure to ensure that planned employment and housing growth, such as at Waterbeach New Town, can be accommodated without increasing levels of traffic in Cambridge. This scheme will form a first phase of the CAM network.
- Chisholm Trail is a new walking and cycling route, creating a mostly off-road and traffic-free route between Cambridge Station and Cambridge North Station. It will link to Addenbrooke's Hospital and the Biomedical Campus in the south and to the business and science parks in the north. In all the full trail provides a 26 kilometre route from Trumpington and Addenbrookes to St Ives (via the Cambridge Guided Busway cycle track).
- Cross City Cycling is made up of five different projects across Cambridge. Each scheme aims to improve walking and cycling links to schools and employment centres. They will help to reduce congestion and improve air quality, health and road safety.
- Foxton Travel Hub - trains from Foxton reach Cambridge in 10 minutes. Trains could also serve a future Cambridge South station, which would provide easy access to the Cambridge Biomedical Campus and Addenbrookes hospital.
- Greater Cambridge Greenways identifies a number of missing links that could be provided on private land, generally on field edges. There are 12 Greenways planned in total:
- Rural Travel Hubs are small flexible transport interchanges at key locations in South Cambridgeshire, allowing more people to access sustainable transport networks.

Further information about the above schemes is available at the Greater Cambridge Partnership's website: <https://www.greatercambridge.org.uk/>

5.3 National Infrastructure Schemes

Two transport schemes being developed which will pass through Greater Cambridge, led by organisations external to the area, include:

- The A428 Black Cat to Caxton Gibbet Road Improvement Scheme will upgrade the A428 between the A1 Black Cat roundabout and A1198 Caxton Gibbet roundabout with a new 10-mile dual carriageway and a number of junction improvements. Highways England is responsible for the scheme, which is now heading towards the development consent process. Further information about this scheme can be found on Highways England's website: <https://highwaysengland.co.uk/our-work/a428-black-cat-to-caxton-gibbet/>
- The East West Rail Bedford to Cambridge Section will link the existing stations in Bedford and Cambridge with communities in Cambourne and the area south of St.

Neots. It will provide new links to Thameslink and Midland Mainline at Bedford the East Coast Mainline at Sandy/St Neots and the West Anglia Mainline in Cambridge. This will provide convenient additional inter-regional connectivity for people, making it easier to get to towns like Kettering, Leeds, Norwich and Nottingham. Further information about this scheme can be found on East West Rail Company's website: <https://eastwestrail.co.uk>

5. Conclusion

As seen in the evidence above, whilst there is good coverage for pedestrians, cyclists and Public Transport in Cambridge, the level of coverage in South Cambridgeshire is less comprehensive. Whilst there are numerous public transport services that serve the major areas of population within South Cambridgeshire, the routing or frequencies means that they are not attractive for regular journeys such as commuting.

Therefore there is a need to address the gaps in the existing transport networks. To this end the Cambridgeshire and Peterborough Combined Authority and the Greater Cambridge Partnership have developed a range of transport interventions designed to cater for the future growth aspirations in the Greater Cambridge area.