**Norfolk Strategic Framework: Transport Constraints**

**Introduction**

This report summarises the state of the county’s transport network, providing an evidence base for the production of a Norfolk Strategic Framework. The aim of the work is to identify: the current state of the transport system; the constraints (current and future); and opportunities. This report is the first stage of this work, presenting a review of transport constraints to identify issues that – without resolution – will be a barrier to growth.

**Transport Constraints: Scope and Description**

The scope for this part of the work was to produce a report that:

* Summarises the existing state of the transport network
* Identifies the locations where there are existing known issues, or predicted future issues
* Identifies future opportunities: either where transport improvements are planned or where desirable transport improvements could be brought forward that arise from other things, eg housing development.

The scoping report for the work made clear that no new evidence would be collected. The report would rely on existing available evidence bases. In undertaking the work it has become clear that much of the available evidence dates from a number of years ago. Whilst this evidence is still relevant and can be used to inform development of the Norfolk Strategic Framework it needs to be considered with a degree of caution due in particular to the major changes to the state of the economy that occurred around 2008. This affected the transport system in a number of ways, the most obvious being a reduction in the numbers of trips being made particularly car trips. (As well as traffic volumes, this has resulted in a number of concomitant changes such as reductions in congestion and increases of general traffic speeds. It has also likely had an effect on a number of other factors including casualty numbers, types and severity, or air quality.) Since 2008 the transport system has gradually returned to the patterns of usage seen pre-2008. Where the age of the evidence base is a concern, this has been noted in the commentary.

The most comprehensive evidence base was that compiled for production of Norfolk’s Local Transport Plan, published in 2011. The most relevant parts of the evidence base are produced in Appendix 1. Appendix 2 contains a number of figures referred to in the main report. This report has also drawn on a number of other focussed pieces of evidence that been undertaken to examine impacts of growth on the transport systems in particular areas including Thetford and Attleborough.

As stated, no new evidence or monitoring work has been undertaken for this report; only existing available sources of data have been used. Further analysis of existing data could be undertaken if it is considered appropriate to meet the needs of the Strategic Framework. Further iterations will be required as and when local growth plans are reviewed or development proposals come forward, perhaps in order to assess any locationally specific constraints.

**Conclusion / Executive Summary**

Norfolk is a large rural county characterised by a large number of smaller, dispersed settlements. Across the county there are around 20 market towns and urban centres where the majority of services can be found (education, jobs, leisure, retail, medical, etc…). Outside of these settlements trips tend to be lengthy due to the county’s rural nature and the dispersed geography of the settlements. Without a car, travel can be difficult: there are relatively few bus or rail services and journeys are generally too lengthy to be undertaken on foot or bicycle. Within the settlements, especially the larger ones, the road networks can be congested at peak times. This is largely due to the historic basis of the street patterns with little opportunity or scope for improvements.

The county benefits from some relatively good strategic connections with an international airport, and comparatively good rail and road connections to the capital, Cambridge and London airports. However, east-west connections are poor, both by road and rail. Even where connections are relatively good, journey times are long due to the geographical position of the county, with Norfolk some distance from other major centres or international connections.

National infrastructure improvements will benefit strategic connections for Norfolk. Rail improvements including Crossrail, Thameslink and HS2 will open up rail connectivity to the major London airports and south coast, avoiding use of the London Underground network. East West Rail, linking the county through Cambridge to Oxford and the south west is planned for delivery around the end of the 2020s. Similarly, government has confirmed the start of work to develop and deliver a high quality road link between Oxford and Cambridge. A limited number of rail services between Norwich and London will have faster journey times, of 90 minutes, from 2018 [CHECK DATE]. Norwich services to Cambridge will be extended to Stansted also from this date. The Regional Air Connectivity Fund (2015) has pump primed air connections from Norwich to Exeter and Newcastle.

Strategic connections are provided by the national trunk road network comprising the A47/A12 (Lowestoft-Great Yarmouth-Norwich-King’s Lynn-Peterborough) and the A11 (Norwich-Cambridge-London). The A47 requires significant improvement being a mixture of dual and single carriageway. Sections around Norwich are programmed to be dualled in 2020 but this will still leave unreliable, slow single carriageway sections notably the Acle Straight connecting into Great Yarmouth and much of the length west of Dereham to King’s Lynn.

The A11 has recently been fully dualled but there are a number of junctions that require, or will soon require, significant improvement. Examples include junctions on Thetford bypass that would require major improvements to accommodate growth in the town as well as continuing to provide strategic connectivity.

Within the county opening of the Norwich Northern Distributor Road in late 2017/early 2018 will provide a strategic road connection from the south of the county to north east Norfolk, as well as relieving the city of traffic and accommodating development in north east Norwich. Funding has been secured from government for development of the Third River Crossing in Great Yarmouth. This would connect the town’s southern peninsula, containing the port and South Denes Enterprise Zone, to the trunk road network. Subject to successfully completing the business case and statutory processes, this could lead to its delivery in the early 2020s. The council is also working to secure delivery of major road infrastructure that would release housing development in Norwich (the north east link road), Long Stratton (A140 Long Stratton bypass), Attleborough (Attleborough link road) and West Winch (A10 West Winch bypass). The A12-A143 link road in Great Yarmouth has recently been completed. The Lynnsport Access Road, King’s Lynn, is under construction. Both open up large housing sites. The A12-A143 link connects directly into Beacon Park, one of the Enterprise Zone sites in Great Yarmouth.

**Summary of the evidence**

The evidence suggests that:

* Small-scale growth outside of the urban areas and market towns would have poor connectivity to services and facilities. Unless sited on a major road connections would likely involve minor routes, which would probably need upgrading. Public transport connectivity – unless a very major growth area – would probably be poor.
* Spreading growth across rural areas will mean that people will have to travel considerable distances to their nearest services including employment, shopping, medical, education, etc… Clearly, journey length would be dependent on the location, but generally journey distances to locations with services and facilities are likely to be lengthy. People without access to a car will have no viable travel choice. (Small amounts of growth will not lead to improvements in public transport to the rural areas.)
* Although there are few capacity issues, the rural road network is largely unimproved. Growth of any meaningful size sited in one area is likely to add unacceptable stress to the network in the immediate vicinity and on routes to the closest major centre(s).
* Given the strategic road and rail networks any growth – whatever its pattern – in the northern part of the county is likely to have comparatively worse connectivity than locations sited adjacent to the A11 corridor. Large-scale growth adjacent to, or spread along the A47 corridor, could exacerbate already poor traffic conditions especially on the single carriageway sections of the A47.
* Growth within urban centres could lead to further transport issues on already constrained networks and would need to be very carefully located and planned. Most urban centres – whether larger settlements including Norwich or market towns – have capacity constraints in their transport systems. These areas have grown over the years but the growth has not been matched by a similar increase in their transport systems, mainly because the historical street patterns constrain major measures (even if they are desirable). (The same might be said of the central retail centres, which have also not grown and are constrained.)

**Roads**

**Overview and Summary**

Norfolk is served by two trunk roads: the A11 from London and Cambridge, and the A47 from the west. The A47 continues as the A12 trunk road from Great Yarmouth to Lowestoft. The A11 is fully dual carriageway and the corridor will see some of the largest scale growth planned in the county (at Thetford, Attleborough, Wymondham, Hethersett and the Norwich fringe at Cringleford). The A47 is a mix of single and dual carriageway, both within and beyond Norfolk, and as such offers slow and unreliable journey times. The A47 connects the major centres of King’s Lynn, Norwich and Great Yarmouth within the county.

Away from the strategic road network, Norfolk’s road network is a largely rural, single carriageway network. Much of it has not seen significant improvement schemes and so journey times can be slow, particularly away from the higher standard A-class network. The urban areas and market towns tend to have historical street patterns where the scope for major improvements is limited, even if these were considered desirable. As such there can be congestion within towns and urban areas with limited scope for resolution.

Most of the larger settlements benefit from bypasses. Completion of the Norwich Northern Distributor Road in late 2017 or early 2018 will see through-traffic removed from Norwich and its fringes. However, there are a number of market towns where the primary road network (the more important class of A road) passes through the urban area; notably Cromer where the A140 and A148 meet in the town centre, Long Stratton, strung out along the A140, and Swaffham where the A1065 passes north-south through the town centre. Other market towns with longer-distance A-class routes passing through the centre include North Walsham, Wroxham / Hoveton, Hunstanton (where the A149 skirts the town), Sheringham, Wells-Next-The-Sea, Dereham, Diss and Watton.

**Figure 1 Summary SWOT Table: Road Network**

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * Fully-dualled A11 trunk road connection to Cambridge and London * Rural A and B-class network generally uncongested | * Unimproved A47 trunk road connection east-west to north of England, the Midlands and Scotland * Urban centres and market towns can have high levels of traffic * Main A-class road network passes through a number of market towns and other settlements |
| **Opportunities** | **Threats** |
| * Trunk road improvement programme * Shifts in travel patterns perhaps arising from new technology allowing eg home working * Infrastructure from large growth areas, eg relief road for A10 West Winch linking to A47 through major growth area | * Further traffic growth, perhaps arising from new development * Technological advances will require additional investment in road networks |

**Journey times and reliability on the main road network (including trunk roads)**

The evidence compiled for Norfolk’s Local Transport Plan (2011) found the following:

* There is poor transport connectivity to destinations outside Norfolk resulting in long journey times
* There is poor connectivity for Greater Norwich especially for westward journeys, exacerbated by congestion and unreliable journey times on parts of the A47, eg Wisbech, Dereham to Easton west of Norwich and Acle Straight into Great Yarmouth
* Congestion and unreliable journey times are significant between Norwich and Great Yarmouth
* Great Yarmouth is even more peripheral (than other main settlements in the county) with even longer journey times to key destinations. Although there is good connectivity to Norwich and Lowestoft, there is congestion between the town and in both destinations
* There is congestion south of King’s Lynn on the A10
* King’s Lynn has better westward journey times than Norwich or Great Yarmouth
* Thetford has reasonable journey times to Cambridge and London
* The dualling of the A11 between Fiveways (at Mildenhall) and Thetford has helped journey times and congestion.

Figure A3 (see appendix) – Traffic Speeds on Local A Roads – shows that average traffic speeds have remained largely static over recent years. Speeds on rural A roads are generally somewhere between 40 and 50mph, compared to – generally – a 60mph speed limit. As would be expected speeds are much lower on urban sections of road where there would generally be a 30mph speed limit. Monitoring shows recorded speeds of 10-20mph. The average speeds on both rural and urban stretches of road are likely to mask significant variations in journey times, for example on coastal routes in peak holiday seasons. (It is interesting to note that in the figure below, using AA Route Planner, speeds between the major centres within Norfolk are around 40mph; to Cambridge 50mph; and to the M25 60mph. This highlights the relatively poor standards of roads within the county compared to the major trunk roads to the south east.)

**Figure 2: Journey times between local major centres and the M25**

*See also Figure A7 in appendix showing road and rail times to UK major centres*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Origin | Destination | Distance (miles) | Journey Time  (minutes) | Average speed (mph) |
| Norwich | Great Yarmouth | 22 | 37 | 36 |
|  | King’s Lynn | 44 | 69 | 38 |
|  | Thetford | 31 | 42 | 44 |
|  | Cambridge | 64 | 81 | 47 |
|  | M25 (M11 junction) | 96 | 101 | 57 |
| King’s Lynn | Great Yarmouth | 66 | 84 | 47 |
|  | Thetford | 31 | 50 | 37 |
|  | Cambridge | 45 | 77 | 35 |
|  | M25 (M11 junction) | 85 | 100 | 51 |
| Great Yarmouth | Thetford | 50 | 58 | 52 |
|  | Cambridge | 83 | 99 | 50 |
|  | M25 (M11 junction) | 116 | 117 | 59 |

Source: AA Route Planner

**Congestion hotspots**

Monitoring, carried out regularly as part of the county council’s network management duty, of the local road network suggests the following congestion hotspots:

* King’s Lynn A148 / B1144 Tennyson Avenue, including the level crossing (half-hourly services/longer trains will make this more of an issue when they are introduced)
* King’s Lynn A149 Corridor, including Heacham traffic signalled junction
* Great Yarmouth town centre and A1243 / B1141 Haven Bridge / Hall Quay
* Norwich A1074/ A140 Sweetbriar Road / Guardian Road roundabout
* Diss A1066 including Vince’s Road
* Cromer A149 one-way system
* Thetford C587 London Road / Norwich Road from A1066 Hurth Road / Mundford Road roundabout to A134 Bury Road / Brandon Road.

**Air Quality**

Monitoring shows the following areas where – because of transport – air quality exceeds defined thresholds, and which have therefore been declared as air quality management areas:

* Norwich (The entire city area has been declared as an air quality management area in order that the action plan can consider area wide solutions needed to effect an improvement, rather than considering solutions for particular areas that might only have the effect of moving the air quality problem from one street to another. However, the particular streets where air quality was originally found to be in breach of the thresholds are Castle Meadow area, Riverside Road area, St Augustine’s Street, Grapes Hill.)
* King’s Lynn town centre (Railway Road, London Road, St James Road, Austin Street, Blackfriars Road gyratory system) and around Gaywood Clock.

**Predicted congestion or capacity issues on the strategic road network**

This section deals with strategic roads. These are trunk roads forming part of the government’s national network, which in Norfolk comprises the A47, A12 and A11. Highways England manage these roads on behalf of government. Their study work in preparation for announcements about the 2015-2020 programme (A47-A12 Corridor Feasibility Study Summary, March 2015) found the following major issues on the A47:

* Congestion. For example, between North Tuddenham and Easton and at hotspots at key junctions such as the A47 junction with the A11 south of Norwich and junctions along the A12 in Great Yarmouth
* Inconsistent carriageway standards
* Lack of overtaking opportunities
* Poor resilience. The study identified resilience as an issue, particularly where there are single carriageway sections or no alternative routes. Particular traffic congestion issues can arise in the case of vehicle breakdowns or accidents, which can have a disproportionate effect on the routes
* Collision hotspots: the overall collision and casualty rates appear to be decreasing. The exception are hotspots such as Blofield to North Burlingham where the collision rate is above the route and national averages
* Limited rail and public transport alternatives.

On the A11 the Highways England East of England Route Strategy (April 2015) found capacity issues at Thetford and Mildenhall Fiveways roundabout junctions. Anecdotal evidence has reported that since the A11 dualling scheme businesses are more likely to invest in the county (housing and jobs) because connectivity is better.

**Parking in the major centres**

Various studies have been carried out assessing parking needs in the urban centres, albeit these are some years old now:

* The *King’s Lynn Area Transportation and Land Use Study (KLATS) Stage 1 Final Report* (March 2009) identified a number of possible options in relation to parking in the town. These included consideration of Park and Ride, rationalisation of long-stay and short-stay parking, changes to parking time limits and removing the transferability of tickets between car parks.
* The *Great Yarmouth Parking Strategy* was published in December 2000 and revised in November 2004. It aims to manage parking through a range of policies including differential fees for shoppers, commuters and tourists.
* *Norwich Area Transportation Strategy City Centre Parking Study* September 2004 found that the forecast demand for parking is less than the forecast capacity within the timescale of the study (ie by 2021). At this point peak occupancy figures were calculated to be approximately 93%. It suggested that, beyond this time, if existing NATS policies relating to the reduction in long-stay parking were continued, a shift to other modes of access to the city centre (eg park and ride) would be required to accommodate forecast demand.

**Car ownership**

The proportion of households with no cars is higher in Norwich and Great Yarmouth compared to the rest of Norfolk (33% and 27% respectively compared to 19% across Norfolk). Only around 11% of households do not have a car in both Broadland and South Norfolk. In South Norfolk and Broadland especially the proportion of households with two or more cars is relatively high. (See Appendix, Figure A11.) All of these figures are from the Census 2011; the most up to date source of data at the local level.

**Road traffic casualties**

There had been strong reductions in road traffic casualties up to around 2011, but over the last five years this downward progress has stopped and a notable increase in numbers of killed and seriously injured (KSI) casualties has taken place. (See Appendix, Figure A10.) Norfolk is not alone in this stalling of reduction and similar trends are apparent in other parts of the country.

There were just over 400 KSI casualties in 2015. Just over 2/3 of road traffic casualties involve a car. However when considering casualty rates (that is, the numbers of casualties per distance travelled), the most vulnerable modes are motorcyclists, cyclists and pedestrians, in that order. Across Norfolk there is also a prevalence of casualties on higher-speed rural roads. As would be expected most pedestrian and cycle casualties occur in urban areas and town centres.

**Rail**

**Overview and Summary**

The rail network serving Norfolk is sparse: few settlements are connected to the rail network, and the network serves few destinations out of the county. There are two lines from London: the Great Eastern Main Line from London Liverpool Street via Ipswich to Norwich; and the Fenline / Great Northern Route from London King’s Cross via Cambridge to King’s Lynn. (King’s Lynn also has one train per day to London Liverpool Street.) Norwich is directly connected to Cambridge, Great Yarmouth, Lowestoft and Sheringham; and longer distance services via Peterborough to Liverpool.

**Figure 3: Rail network in Norfolk**

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Journey times by rail to major destinations outside the county are lengthy: for example it takes nearly two hours to get to London from Norwich, and four hours from Norwich to Birmingham (see Appendix, Figure A7).

Nine of the 21 Norfolk market towns are directly served by rail. Some of the larger market towns are some distance from their nearest rail connection, for example Dereham and Fakenham are both over half an hour travel time from the nearest station (see Figure 4).

Rail provides an important travel choice for commuters into the main centres, albeit only for those with a convenient service available.

**Figure 4: Rail connections from market towns**

|  |  |
| --- | --- |
| **Market Town** | **Rail Served?** |
| Attleborough | Yes: Norwich to Cambridge line |
| Cromer | Yes: Norwich to Sheringham line |
| Diss | Yes: Norwich to London line |
| Downham Market | Yes: King’s Lynn to London line |
| North Walsham | Yes: Norwich to Sheringham line |
| Sheringham | Yes: Norwich to Sheringham line |
| Thetford | Yes: Norwich to Cambridge line |
| Wroxham/Hoveton | Yes: Norwich to Sheringham line |
| Wymondham | Yes: Norwich to Cambridge line |
| Aylsham | No: Nearest station Aylsham 7miles 15mins |
| Dereham | No: Nearest station Wymondham 13m 39mins |
| Fakenham | No: Nearest station Sheringham 19m 31mins |
| Harleston | No: Nearest station Harleston 10m 20 mins |
| Holt | No: Nearest station Sheringham 7m 15mins |
| Hunstanton | No: Nearest station King’s Lynn 16m 30mins |
| Loddon | No: Nearest station Beccles 8m 13mins |
| Long Stratton | No: Nearest station Wymondham 10m 20mins |
| Stalham | No: Nearest station Worstead 7m 14mins |
| Swaffham | No: Nearest station King’s Lynn 16m 26mins |
| Watton | No: Nearest station Attleborough 10m 17mins |
| Wells-Next-The-Sea | No: Nearest station Sheringham 17m 34mins |

*Note: Journey times and distances are car journey times. Source: AA Route Planner*

**Figure 5: Summary SWOT Table (to be completed)**

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * Direct connections to London and Cambridge from Norwich and King’s Lynn | * Few places in Norfolk connected to rail network * Lack of destinations served by rail connections from the county * Long journey times * Poor quality rolling stock |
| **Opportunities** | **Threats** |
| * Refranchising of Greater Anglia services will provide upgraded rolling stock and faster journey times to London | * Cost and complexity of Ely infrastructure upgrade * Investment being unable to maintain pace of passenger increases |

**Existing Patterns of Usage**

Norfolk has a very limited rail network, meaning that few of its towns are served by rail. Also, the services offered provide a very limited range of destinations and many have only one train per hour. In particular, services to the Midlands and Home Counties are poor. Whilst rail generally provides faster journeys to other major centres compared to road, average rail speeds compare poorly with connections between major centres out of the county (eg York to London) (see Appendix, Figure A7).

Norwich station is by far the busiest of all Norfolk stations. Usage has almost doubled in the past ten years, to over 4 million passengers per annum. The second busiest station is King’s Lynn. The importance of the lines to London is demonstrated by Diss being the third busiest station in the county, and Downham Market the fourth. (See Appendix, Figure A8.) Patronage at Norfolk stations on the King’s Lynn to London line has increased in recent years. Conversely, at Great Yarmouth patronage fell by 5% over the last year, relegating the station to fifth busiest station with around 440,000 passengers.

Whilst station usage has increased dramatically over the last ten years there are signs of the increase levelling off in the last two years. Some lines are reaching, or are at, capacity at peak times: the Bittern Line; services to Cambridge; and London services (Norwich services tend to be full towards the southern, London, end of the route only whereas King’s Lynn services can be full north of Cambridge). In describing lines as ‘at capacity’ it should be noted that this means that the existing trains, at their existing frequencies, are full. However, operators cannot lengthen trains because they do not have rolling stock that can be used and / or the infrastructure cannot accommodate longer trains, for example the platforms are not long enough. Additional frequencies cannot be provided because of – again – rolling stock and / or infrastructure constraints.

A number of stations on rural lines have very low usage – fewer than 100 per annum in the case of Buckenham – which is a reflection of both low catchment areas as well as infrequent services.

The frequency of rail services from Norwich to Cambridge and Peterborough (for onward services to the north and the Midlands), and from King’s Lynn south to Cambridge and London, is limited by infrastructure at Ely. Here, the available track capacity, its layout, and the numbers and arrangement of level crossings restrict the numbers of services that can pass through. Across most of the network journey times are limited by infrastructure including the numbers of level crossings. Only the London lines (to Norwich and King’s Lynn) are electrified; all other services need to use diesel rolling stock. There is a national shortage of diesel stock, meaning that additional services – in the form of higher frequencies – or longer trains cannot be provided. Shortages of stock can also lead to disruption on existing timetabled services in the case of, for example, train breakdowns.

**Known rail capacity issues**

As set out above some lines are at capacity. This includes:

* Bittern Line from Sheringham to Norwich in peak times. These trains can be full from south of North Walsham in the morning peak coming in to Norwich
* Cambridge to Norwich in peak times. Again, these services can be full coming in to Norwich in peak times, and also between Cambridge and Ely due to Cambridge commuters
* London to Norwich. These services are full going in to London in the mornings towards the south of the line, and again coming out of London in the evenings. Passengers can have to stand all the way to Ipswich.

**Journey times and rail frequencies between main economic centres (within the county and to major destinations outside)**

Figure A7 in the appendix shows journey times and frequencies to a range of destinations. For business trips, business people need connections to markets and suppliers and – ideally – need to be able to get there and back in half a day (including time for the business part of the trip as well as travel time); although will accept a full day. It can be seen from the table that few destinations offer easy half-day connections with even trips to Cambridge involving 2 hours 40 travel time from Norwich (there and back and excluding any wait time or travel to and from the stations at either end). King’s Lynn to Cambridge, at 45m each way, is more convenient but hampered presently by a frequency of every hour outside of the peak times. Some trips, such as to Birmingham, are difficult even given a whole day (eight hours train travel time (from Norwich) alone).

Within the county out of peak times all services except Norwich to Diss have hourly frequency, which militates against use of the train for business people. Otherwise journey times are reasonable. However, the main issue is lack of connectivity. Only nine of the 21 market towns are directly served by rail. Some of the larger market towns are some distance from their nearest rail connection, for example Dereham and Fakenham are both over half an hour travel time from the nearest station (see Figure 4). Even where towns are connected to rail, there are often no direct connections. King’s Lynn to Norwich by rail for example takes 2 hours 20m because travel involves going via Ely where there is a need to change trains.

The National Travel Survey 2015 shows that the average duration of a commuter journey in the UK is 31 minutes. The following figure shows rail journey times into Norwich, King’s Lynn and Great Yarmouth. This illustrates that, for people living close to or having easy access to stations (and their workplace being conveniently sited for the station), rail provides an important travel choice into the main centres.

**Figure 6: Rail journey times into main centres**

|  |  |  |
| --- | --- | --- |
| **From** | **To** | **Rail Journey Time (minutes)** |
| Diss | Norwich | 20 |
| Wymondham | Norwich | 15 |
| Attleborough | Norwich | 22 |
| North Walsham | Norwich | 28 |
| Acle | Norwich | 22 |
| Downham Market | King’s Lynn | 14 |
| Acle | Great Yarmouth | 13 |

Access to airports is covered below in the Access to International Hubs section.

**Forecast rail passenger use**

The Anglia Route Study, Network Rail March 2016, looked ahead over the next 30 years. It forecast an increase in numbers of passengers on services into London on the Great Eastern Main Line of over 30% (or 2,200 extra passengers in the peak hour) by 2023 and 75% (or 5,100 passengers) by 2034. The study stated “*passengers on these services will be travelling in crowded conditions for a long time. Without intervention, services will be over seated capacity and between 40 per cent and 100 per cent of standing capacity taken up for well over 20 minutes. Services that start from Norwich, Stowmarket, Witham and Chelmsford tend to have the highest load factors and demand is at, or exceeds, seated capacity now*.”

For cross country services, including Norwich to Cambridge, Network Rail’s study states that – although there are some issues regarding crowding presently – the main driver for improvement is better connectivity rather than accommodating peak capacity. The study recognises the need for half hourly services on the route. The study also notes that “*Kings Lynn to Cambridge [is] also infrequently served; as such, the Route Study investigates the feasibility of improving the frequency of services*” to half hourly.

The main barrier to additional Norwich and King’s Lynn to Cambridge services is the capacity for trains through the network at Ely.

The study also recognises the aspirations for half hourly services from Norwich to Sheringham and Great Yarmouth but concludes that there is unlikely to be a business case for these.

**Bus-based public transport**

**Overview and Summary**

The bus network in the county is largely a commercial network. That is, it is run by private companies in order to make a profit. The market is not regulated and operators are able to put on new, or cease existing, services at short notice. This means that the larger urban areas, especially Norwich, are well-served but many rural areas have few services.

At present there are no plans for the county council to enter into arrangements with bus operators whereby the council specifies – and pays for – services to be run. The county council does subsidise some services where they are considered socially necessary but the authority’s ability to fund such services has reduced considerably in recent times and is likely to continue to reduce.

Around 70% of the county’s population has bus access to a market town or urban area for the journey to work and return. (Monitoring of access to a market town or urban area is undertaken as it represents people’s ability to get to services and facilities, these including employment, education, a doctor’s surgery, and retail. Figure A1 in the appendix illustrates people’s ability to get to market towns by public transport.)

Only 2% of workers use the bus to get to work in North Norfolk, Breckland and King’s Lynn districts. Conversely, bus use in Broadland Gt Yarmouth and Norwich districts is 5%, 6% and 8% respectively. (See Appendix, Figure A2.) Norwich is served by a network of Park and Ride sites which allows people to split their journeys conveniently in to car use and bus for the journey in to the city centre.

Facilities, in the form of bus priority and bus lanes, have been implemented in Norwich (and to a lesser extent in King’s Lynn and Great Yarmouth). However, the constricted nature of the urban networks often makes this difficult to achieve adequately. In Norwich in particular there are also issues relating to the ability of the road space to provide capacity for the numbers of buses and bus stops.

The county council has a statutory duty to provide transport to school for all pupils of compulsory school age (5-16) if their nearest suitable school is beyond 2 miles (for pupils below the age of 8) or beyond 3 miles (aged 8 to 16), and for all children who cannot reasonably be expected to walk to school. A suitable school is one that is the nearest qualifying school with places available that provides education appropriate to the age, ability and aptitude of the child, and any Special Educational Needs that the child may have. Therefore, existing residents in rural areas – and any residents of new residential development – will perhaps be outside of these recognised walking distance (probably almost certainly for high school pupils). There will thus be a duty on the county council to provide school transport. Journeys for pupils will be lengthy, especially for pupils to the limited number of higher education establishments in the county.

The predominant operators are: First who operate services based on the Norwich built up area and fast, long-distance A47 corridor services; KonectBus operating services into a wider Norwich hinterland area (eg Dereham and Yarmouth to Norwich); Sanders operating in the north of Norfolk; Stagecoach operating services out of King’s Lynn; and Anglian bus in the Great Yarmouth / Norwich / Diss area.

**Figure 7: Summary SWOT Table**

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * Vibrant commercial bus market in urban areas * Competition from a number of operators | * Paucity of services in rural areas * Long journey times |
| **Opportunities** | **Threats** |
| * Innovative or different ways of serving the market, eg community transport services * Younger people having a different perspective on the use of public transport | * Continuing public sector cuts resulting in fewer subsidies to very rural services * Capacity and ability of urban centres to accommodate buses |

**Current levels of bus use**

Across Norfolk, travel to work by bus is at a similar level to those seen across the East of England (4%), but lower than those seen nationally (7%). (See Appendix, Figure 2.) The figure for Norfolk masks variations across the county with 8% and 6% of residents using the bus to get to work in Norwich and Great Yarmouth respectively; and 2% in Breckland, North Norfolk and King’s Lynn and West Norfolk.

There is very little, if any, available data reflecting trends in bus usage although operators in Norwich report increases recently.

**Accessibility by public transport to market towns and urban centres**

Accessibility to services and facilities is problematic in some more rural and isolated parts of Norfolk. This is especially the case for people who live in households without a car. As a result of demographic changes and increases in the numbers of older residents, ‘no car ownership’ could increase in future years. Overall, accessibility tends to be poorest in the more rural districts of Breckland and West Norfolk, where there is a significant number of smaller villages, hamlets and isolated dwellings. Operators often find that providing bus services within these smaller settlements is unviable due to low population numbers.

Analysis shows that around 70% of the population is able to make a trip to market towns by public transport; used as a proxy for people able to get to work or other services such as medical facilities or retail (see Appendix, Figure A1). Regardless of this, public transport journeys can be lengthy in both times and distance. Anecdotal evidence suggests that public transport can be a barrier for people continuing to access learning opportunities (people take up the opportunity but drop out over time because of the travelling time each day).

**Main Routes**

Main bus routes tend to follow the main roads, because these link the larger settlements together. There are strong east-west services along the A47 corridor with fast frequent services connecting Lowestoft via Great Yarmouth to Norwich (every 15 minutes), and Norwich to King’s Lynn and beyond to Peterborough (every half an hour). Similarly the A11 corridor has good services connecting Thetford and Attleborough via Wymondham and Hethersett to Norwich (every half hour). [Note that these are First services. Other operators run additional services.]

Most main routes into the urban centres are served by half hourly services, for example Wroxham to Norwich (Sanders), Norwich-Aylsham-Cromer-Holt (Sanders), and Downham Market to King’s Lynn (Stagecoach). Journey times can be relatively long due to the distances involved.

**Bus Journey Reliability**

Bus journeys can be as affected as general traffic by congestion. Therefore they will be disrupted – like all traffic – by incidents such as accidents. Within Norwich measures such as bus lanes, bus-only streets, and priority at traffic signals have been introduced in order to maintain bus journey times and reliability. Some measures have also been implemented in Great Yarmouth and King’s Lynn.

Operators report that reliability of services in central Norwich has improved significantly since the implementation of the recent tranche of Transport for Norwich improvements: removal of general traffic from St Stephens and Rampant Horse Street; two-way working on Chapelfield North; and pedestrianisation of Westlegate. However, reliability can be affected by general traffic congestion at both inner and outer ring road crossing points, with major issues being experienced at Grapes Hill and Boundary junctions.

Buses continue to be affected by congestion in the other major centres of King’s Lynn and Great Yarmouth. Within these areas the town centres remain particular issues. Additionally, the gateways into the towns on the strategic networks can be problematic for reliability with issues in particular on the A47 Acle Straight/Vauxhall Junction, Great Yarmouth and Hardwick Junction, King’s Lynn.

**Walking and Cycling**

**Overview and Summary**

Walking and cycling trips generally take place on the regular road network. Pavements are provided for pedestrians (except on the rural road network) whilst cyclists are usually expected to cycle on the main carriageway, although dedicated facilities could be available. Within urban areas this might be seen to be adequate particularly for pedestrians. However, this masks several factors including: the high numbers of pedestrian and cyclist casualties in urban areas; networks not being convenient to use (pedestrians will tend to use the shortest route and any deviation from the desire line – even if only a few metres – will be seen as inconvenient and perhaps not taken); barriers to movement (particularly for cyclists using the roads; roundabouts being especially difficult); and the general character of the trip (perceptions of safety, noise, etc…) or condition of the facility (surface quality, etc…). Within town centres this last factor is of particular significance with the quality of the public realm being an intrinsic factor in why people might visit a town to shop or to do business in; or even investors choosing whether to invest in a place. Across Norfolk there is a marked variation in quality.

There are few facilities outside of settlements. Any trips here tend to be for leisure since the pattern of development in the county makes journey distances too great for people to walk (or cycle) for commuting or business purposes.

There are relatively high levels of walking and cycling in the urban areas, especially Norwich. Facilities for pedestrians are generally good in the urban areas and the market towns. For cyclists, the facilities tend to lack coherence. Some routes have very good stretches of facilities but do not join up to provide coherent easy to use routes. Norwich, King’s Lynn and Great Yarmouth all have extensive areas of pedestrianisation in the main retail and business areas.

**Figure 8: Summary SWOT Table**

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * Pedestrianised centres of urban areas * High levels of walking and cycling in urban areas | * Lack of comprehensive, joined-up-route facilities for cyclists * Poor quality public realm in some urban areas and market towns * Relatively high numbers of cycle and pedestrian casualties in urban areas |
| **Opportunities** | **Threats** |
| * Growth Deal funding in Great Yarmouth * Identified cycle network within Norwich | * Available levels of funding |

**Current levels of activity**

Levels of both walking and cycling to work are relatively high in Norwich (see Appendix, Figure 2). In South Norfolk and Broadland districts levels of walking are comparatively lower than elsewhere in the county, probably reflecting that many people from these districts work in Norwich; too far to walk.

There is very little, if any, data relating to levels of walking and cycling usage other than this, now six-year-old Census data.

**Network development and constraints within market towns and urban areas**

A comprehensive cycle network has been identified in some towns including Norwich which has also benefited from a large amount of funding that has been used to upgrade parts of the cycle network. There is still however a considerable amount of work required to upgrade the network in its entirety.

Both Great Yarmouth and King’s Lynn have identified cycle networks, albeit probably less well-defined than Norwich’s. Parts of both networks have facilities – in the form of cycle lanes, etc… – that might be considered appropriate, but many parts of the network will need to see improvements on the ground. Work is being put underway to audit these networks and identify where / what improvements might be required.

Networks have not been identified in most of the market towns and no audit of cycle provision has been undertaken. Some work has been done in the areas that will see large amounts of growth such as Attleborough and Thetford.

**Access to International Hubs**

**Overview and Summary**

Norfolk benefits from Norwich International Airport, an airport with international links via Schiphol, and ports at Great Yarmouth and King’s Lynn. The county is also relatively close to major south east airports, in particular Stansted, and the major Port of Felixstowe in Suffolk.

**Figure 9: Summary SWOT Table**

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * A number of international hubs sited close to the county * Good rail access from King’s Lynn to European high speed rail links | * Travel to major south east airports can be lengthy; rail connections not ideal * Poor rail access from Norwich to European high speed rail links |
| **Opportunities** | **Threats** |
| * Improvements to the rail network will improve access to major south east airports * Norwich International Airport | * Expansion at major airports could threaten role of Norwich |

**Airports**

Norwich International Airport is the only airport operating scheduled services in the county. It is situated some 5km north of Norwich city centre and operates a number of scheduled and charter flights. It also provides servicing for the offshore energy industries via helicopter flights. The airport terminal has capacity for 700,000 passengers per year.

The major London airports are Stansted, Gatwick and Heathrow. These are all some considerable travel time from Norfolk the closest being Stansted at around 1½ hours drive-time from both Norwich and King’s Lynn. Both Gatwick and Heathrow are around 2½ hours by road. By rail, the airports are not so well-served. From both King’s Lynn and Norwich services to Stansted are hourly, take around 1 hour 45m and involve a change of trains. The new Greater Anglia franchise will see direct through services from Norwich operating to Stansted. Over time this will mean that a change of trains will not be needed although journey times are unlikely to reduce significantly. Rail does not provide services convenient for all flight times (eg early morning departures or evening arrivals). Gatwick and Heathrow are both some 3 hours 10m from Norwich and involve use of the Underground. Journey times from King’s Lynn are around 20m shorter although again passengers need to use Underground services to Heathrow. Implementation of Crossrail will allow travellers from Norwich to avoid using the Underground when these services are introduced.

**Figure 10: Passenger Numbers at Norwich Airport**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **2011/12** | **2012/13** | **2013/14** | **2014/15** | **2015/16** |
| Scheduled Traffic | 266,372 | 264,544 | 255,753 | 258,918 | 252,129 |
| Charter Traffic | 84,770 | 73,724 | 108,305 | 100,859 | 107,273 |
| Gas Platforms & Domestic Charter | 77,037 | 85,128 | 101,606 | 106,354 | 114,082 |
| **Total Passengers** | **427,909** | **423,396** | **465,664** | **466,131** | **473,484** |

*Source: Norwich International Airport*

**Figure 11: Busiest Routes to and from Norwich Airport 2014**

|  |  |  |
| --- | --- | --- |
| **Passengers handled on route** | **Number of passengers** | **% change**  **compared to 2012/13** |
| Amsterdam | 137,380 | +4 |
| Aberdeen | 60,162 | -6 |
| Manchester | 29,668 | -2 |
| Palma de Mallorca | 28,584 | +21 |
| Edinburgh | 28,460 | +15 |
| Tenerife-South | 16,554 | -6 |
| Dalaman (Turkey) | 13,523 | +11 |
| Enfidha (Tunisia) | 11,817 | +14 |
| Corfu | 7,075 | -33 |
| Ibiza | 6,550 | -16 |

**Ports**

Great Yarmouth is the largest port in the county, seeing just under 1,100 thousand tonnes of traffic in 2015, an increase of over 1/3 compared to 2013. Although 62% of this by tonnage is inward traffic there has been a tenfold increase in outward traffic since 2009, meaning that increasingly outward traffic has become more important to the port. All landside port traffic is by road. The port is strategically located to serve the oil and gas fields of the southern North Sea and the existing and planned offshore wind development off the UK east coast, and offers the shortest North Sea crossing between Great Britain and continental Europe. It also handles a wide range of cargoes including aggregates, cement, dry and liquid bulks, fertilisers, forest products, grain and minerals.

The next main port in the county is King’s Lynn, with around 475 thousand tonnes of traffic in 2015, 60% of which was outward tonnage. Port traffic – again serviced by road – is made up of dry bulks (grain), forest products, and steel and other metals.

Just outside the county, on the A17, Port Sutton Bridge has just under 400,000 tonnes of traffic annually.

*All figures source: DfT*

**Appendix 1: Summary of Evidence Base for Norfolk’s Local Transport Plan**

The following sections summarise the evidence base compiled for Norfolk’s 3rd Local Transport Plan, updated where appropriate. The full evidence base can be accessed in the report *Connecting Norfolk Evidence Base for the 3rd Local Transport Plan*, Norfolk County Council December 2009.

*Connectivity*

* There is poor transport connectivity to destinations outside Norfolk resulting in long journey times, both for road and rail, making ‘there and back in a day’ journeys difficult for businesses and reducing business competitiveness
* Norfolk is perceived as peripheral
* ‘There and back in half a day’ for businesses between Norfolk’s urban areas by public transport is only feasible from Norwich to both Great Yarmouth and Thetford. This compares poorly with other parts of the region
* Accessibility to employment centres by non-car means is poor, especially in West Norfolk, Breckland and North Norfolk, which could restrict labour supply and skills matching. For those claiming job seekers allowance, Norwich and Great Yarmouth emerge as having a problem, which could exacerbate social exclusion
* Access to further education is poor in rural areas, especially West Norfolk, which could be barrier to improving skills levels

*Connectivity for Greater Norwich*

* There is poor connectivity, especially for westward journeys, exacerbated by congestion and unreliable journey times on parts of the A47
* Congestion and unreliable journey times are significant between Norwich and Great Yarmouth, adding to business costs
* Improvements to the Norwich to London rail service will deliver the greatest economic benefits of any rail scheme in the region
* Norwich International Airport confers good international accessibility
* Although there is a relatively small workforce within 30 minutes of Norwich, its free standing nature and sub-regional influence results in high levels of in-commuting, which could bode well for job creation

*Connectivity for Great Yarmouth*

* The town is even more peripheral with even longer journey times to key destinations
* Although there is good connectivity to Norwich and Lowestoft, there is congestion between the town and both destinations which will add to business costs
* The town’s rail station is poorly located in unattractive environs

*Connectivity for King’s Lynn*

* There is congestion south of the town on the A10
* Good rail connections to Cambridge and London are evident
* The town has better westward journey times than Norwich or Great Yarmouth

*Connectivity for* *Thetford*

* Thetford has reasonable journey times to Cambridge and London
* The dualling of the A11 between Fiveways and Thetford has helped journey times and congestion

*Travel demand and growth*

* Traffic growth in Norfolk has been high in recent years NB: Data suggests that traffic growth levelled-off post-2008, but in more recent years has started to increase once more
* There are high commuting flows into Norwich, which could place demands on the city’s transport network, although peak period traffic in Norwich city centre has consistently fallen
* Congestion is not as severe in Norfolk as elsewhere in the region, either on the roads or on rail, which is good in terms of economic productivity as well as delivering the required growth
* Norwich residents generally travel short distances to work, especially less than 5km. Other districts also tend to have quite a high proportion of commuters travelling short distances, except Broadland and South Norfolk for whom the attraction of Norwich results in a high proportion travelling 5-20km
* Norwich has a high proportion of residents who travel to work by walking, but also quite high for cycling and bus use
* North Norfolk in particular has a relatively high percentage of residents who work from home
* Housing and jobs growth is forecast to increase travel demand with congestion potentially worsening, especially around King’s Lynn, on the A11 approach to Norwich, and between Norwich and Great Yarmouth, which could act as a barrier to delivering the growth
* The capacity of transport networks in urban centres is limited although targeted infrastructure improvements may be appropriate in some instances
* Traffic speeds on A class roads have remained broadly similar over the last few years (see radar diagram)

*Network resilience*

* Some routes that are important for the economy are vulnerable to random disruption through flooding, but also Road Traffic Accidents, which will risk the ready availability of these routes. This includes parts of the A47, A10, A149 and A12, but also the rail services using the Wherry Lines and between King’s Lynn and Cambridge

*Equality of opportunity key points*

* Accessibility by non-car means to a range of services is below average in Norfolk, and is a particular problem in the more remote rural areas of Breckland and West Norfolk, which adversely impacts on equality of opportunity and can exacerbate social exclusion
* Accessibility to hospital is notably difficult, especially for residents of Broadland and North Norfolk, which could lead to adverse health outcomes
* Accessibility is exacerbated by services such as post offices and job centres closing down
* Demand Responsive Transport and community based schemes provide alternative means of accessibility for predominantly health related matters, especially for the more vulnerable members of rural communities, with passenger numbers continuing to rise
* Virtual access to some services can be made possible through the use of broadband, but some areas of the county do not have broadband, including large area in West Norfolk

*Accessibility to specific services*

* Accessibility to education is mixed but generally below average. Accessibility to children’s centres is cited as an issue in rural areas, whilst accessibility to primary and secondary schools is lower than comparable rural counties like Suffolk, and the roll out of ‘different lines of learning’ may exacerbate this. Accessibility to further education is universal in Norwich, but relatively low in West Norfolk and the level of accessibility in much of Norfolk is cited as a barrier to continuing in full time education
* Access to employment centres, which offer a range of jobs, is below average in Norfolk with West Norfolk, Breckland and North Norfolk being in the bottom 10% nationally. However, accessibility to local jobs is good, with a high proportion of people, especially in Norwich, travelling less than 5km to work, resulting in a high proportion of people who can walk or cycle to work in the urban areas and some market towns
* Accessibility to work or training in rural areas is improved by Kickstart, which helps hundreds of younger people each year. Although it has a strong presence in some districts such as Breckland, it has a low presence in the more deprived district of Great Yarmouth
* Accessibility to leisure is mixed. Adult educations centres are very well distributed around the county, even in some smaller rural settlements, and the 50 libraries are supported by a mobile service. However, museums are more sparsely distributed

*At-risk groups*

* Cost of travel can be a barrier for low income households, but the concessionary fares schemes has helped older people, resulting in an increase in bus use
* Disabled access onto buses is generally good, especially community transport, although only 1 in 4 bus stops is DDA compliant
* Although footway condition is above average it is rated a problem by those with mobility problems. Furthermore, a number of rail stations are not DDA compliant
* The increasing older population and the move towards personalised social care may put a strain on transport services
* Transport is a barrier in rural areas for migrant workers and for low income families
* Some areas of poor accessibility in rural Norfolk are also areas of deprivation, especially parts of West Norfolk, Breckland and North Norfolk

**Safety and security key points**

*Overall*

* Very good progress has been made in reducing Killed or Seriously Injured casualties, including children, with national targets for both exceeded
* Very good progress in reducing fatalities is evident
* Road traffic accident rate (as a function of resident and workplace population) is generally low in Norfolk, except for Norwich which has a higher rate than nationally
* The reduction in overall casualty rate (as a function of traffic volume) is fairly average, but the reduction in the rate for Killed or Seriously Injured casualties is better than average
* Good recent progress has been made in reducing the actual number of slight casualties

*At-risk groups*

* Children are relatively safe in Norfolk in terms of road safety, with very good reduction in child pedestrian casualties, though much slower progress in reducing child cyclist casualties
* There has been a very low reduction in motorcyclist casualties, with recent increase apparent
* Similarly, there has been quite a low reduction in cyclist casualties, with a recent increase
* Quite a good reduction in pedestrian casualties is evident
* Motorcyclists and cyclists seem to have a slightly elevated risk in Norfolk, whilst pedestrians have a much lower risk. Cyclist risk could be associated with relatively high cycle usage in the county
* The urban areas and market towns harbour the vast majority of pedestrian and cyclist casualties, especially Norwich
* Motorcyclist casualties have a fairly even rural/ urban split. In urban areas there is a high number of younger riders on small machines being slightly injured, and older riders on bigger machines being either slightly or more severely injured. In rural areas, there is a tendency for casualties to be older riders on larger machines being more severely injured

*Other risk factors*

* Three in four Killed or Seriously Injured casualties are on rural roads. One in four are on Rural A roads. One in six, however, are in Greater Norwich
* Older drivers are disproportionately involved in fatal accidents, especially in rural areas, and there has been little reduction in Killed or Seriously injured older casualties
* A good reduction in younger driver Killed or Seriously Injured casualties has been achieved with the ‘loser’ campaign
* More cyclists and motorcyclists feel unsafe than feel safe on country roads. For main roads, this is only true for cyclists
* Speed related issues are perceived as a bigger problem than other road safety issues
* One in five people feel insecure (in very safe North Norfolk) when using public transport or walking at night
* One in five buses are not on time, increasing exposure to crime and feelings on insecurity
* Only one rail station (Great Yarmouth) has secure station accreditation
* Climate change impacts such as storms and gales could have an adverse impact on road safety and general public safety
* There is a medium risk to public safety due to the transportation of hazardous goods on road and rail

**Quality of life and health key points**

*Active travel*

* The proportion of adults classified as obese in Norfolk is above the national average. Breckland has the highest rate of obesity
* A high proportion of people in Norfolk walk or cycle to work, though it has been declining. Only small proportions do so in South Norfolk and Broadland, perhaps because of commuting the longer distance to Norwich to work. However, one in three in Norwich do so, and rural North Norfolk has quite a high proportion, mainly because of the high rate of active travel to work evident in towns like Holt.
* There is a strong positive correlation between choosing to walk to work and living less than 2km from work. The relationship between cycling and distance is positive but less clear, indicating that other factors play a part
* The high proportion of people living less than 5km from work suggests an opportunity for increasing active travel modes
* Walking to school has increased, although part of this has been at the expense of a slight reduction in cycling to school
* Generally, active travel to work is higher in the more deprived urban areas, which might help to reduce health inequalities

*Environmental protection*

* Norfolk has a large number of nature conservation sites. This restricts opportunities for transport interventions in view of the risk of creating adverse impacts, especially where a higher proportion of the sites are not improving, such as King’s Lynn and West Norfolk, South Norfolk and Norwich
* The ecological network can be enhanced by transport measures, such as roadside hedges
* The high quality countryside and landscape provides an opportunity for people to access open space and improve their well being
* Air pollution exceeds safe levels in parts of Norwich and King’s Lynn, impacting adversely on a range of health matters. Furthermore, it might start to exceed safe levels at more sites in Norwich as well as at Long Stratton and Hoveton
* Noise pollution is low in Norfolk and generally mirrors traffic flow, being focused on the urban areas and main roads
* The high number of listed buildings in Norwich city centre restricts opportunities for new transport infrastructure, but the on-going reduction in city centre traffic bodes well for their protection

*Travel experience*

* One in five buses are not on time, resulting in frustration and anxiety
* People in Norfolk are generally less satisfied with bus services and travel information, especially in Breckland and North Norfolk, but satisfaction levels are high in West Norfolk
* Most rail stations have inadequate cycle parking and no taxi rank, although most have a connecting bus service
* Although Norwich International Airport is served by bus seven days a week, the drop off point is 400m from the airport terminal with no clear walking route
* The interchange between the train station and the bus station in Great Yarmouth is particularly problematic

*Mitigating climate change*

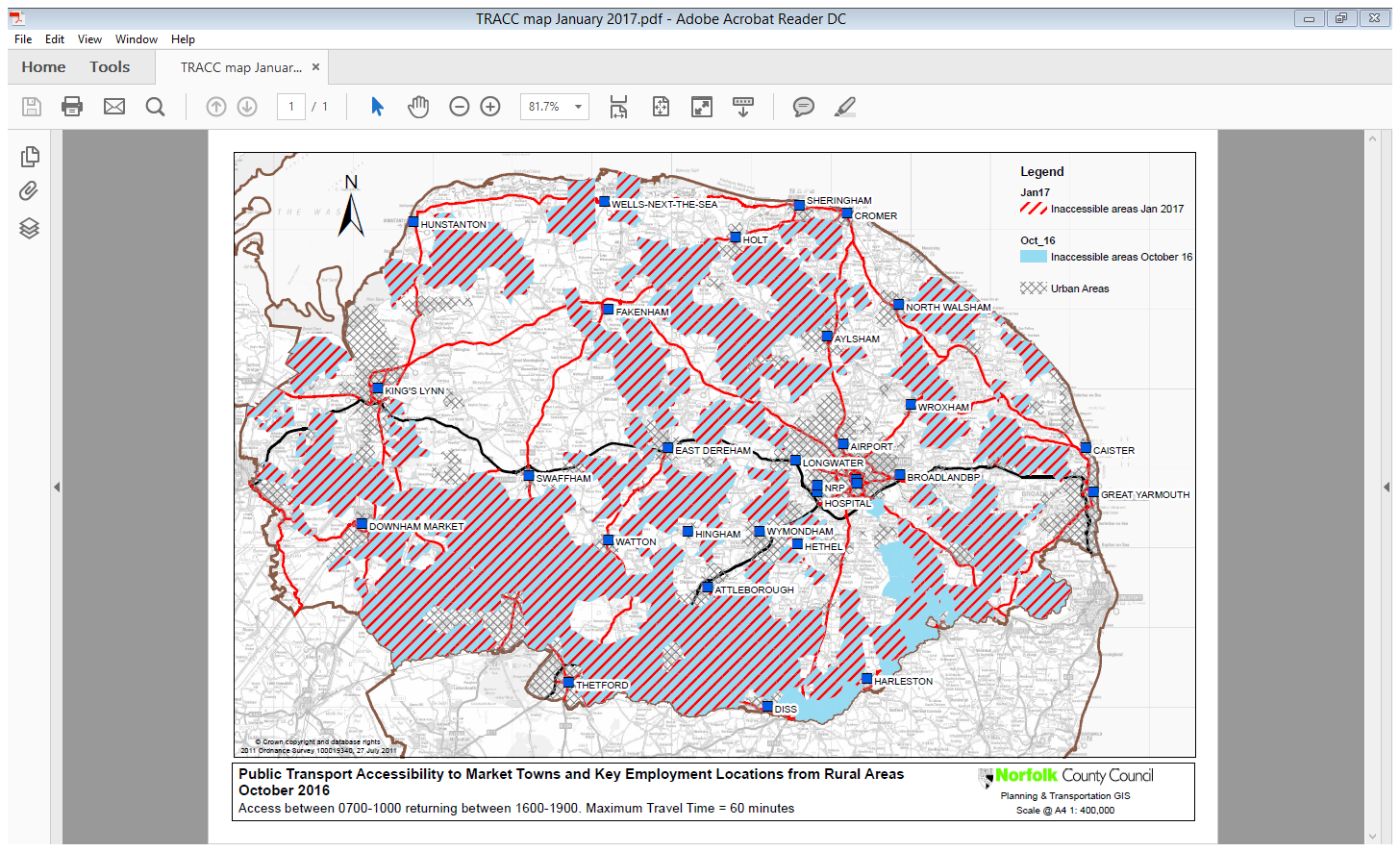
* Norfolk has high per capita road transport CO2 emissions
* Emissions, both absolute and per capita from road transport were growing, but have recently stabilised
* Breckland district has the highest absolute levels of emissions, whereas Norwich and Great Yarmouth are relatively low emitters
* South Norfolk and Breckland both have high per capita emissions, whereas Norwich and Great Yarmouth have low emissions
* The required reductions in per capita emissions are behind the LAA target rate
* A ‘business as usual’ transport strategy will increase emissions
* The vehicle fleet in Norfolk has a high average level of emissions, with only 2% being ‘low emission’
* To reduce emissions, eco-driving offers potential
* There is a strong opportunity to reduce emissions through reducing traffic and achieving modal shift. There is some evidence of a reduced modal share for cars for the school run though it has increased recently
* A focus on the public sector and journeys of 10 to 25 miles should prove effective in reducing emissions

*Adaptation*

* Large number of main roads (trunk, A and B) are vulnerable to flooding
* Disruption could have a greater impact on economically important routes, and some of these are vulnerable to flooding
* As a result of coastal erosion, some road links between settlements will be lost, as will coastal footpaths and accesses to the seafront

**Appendix 2: Figures**

**Figure A1: Public Transport Accessibility to Market Towns and Key Employment Locations from Rural Areas January 2016**

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**Figure A2: 2011 Census: Method of travel to work, local authorities**

*NB: Percentages shown are a percentage of the total population excluding those recorded as not in employment*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Work mainly at or from home | Underground, metro, light rail, tram | Train | Bus, minibus or coach | Taxi | Motor-cycle, scooter or moped | Driving a car or van | Passenger in a car or van | Bicycle | On foot | Other method of travel to work |
| England and Wales | 10% | 4% | 5% | 7% | 0% | 1% | 54% | 5% | 3% | 10% | 0% |
| England | 10% | 4% | 5% | 7% | 0% | 1% | 54% | 5% | 3% | 10% | 0% |
| East of England | 11% | 1% | 7% | 4% | 0% | 1% | 58% | 5% | 3% | 9% | 0% |
| Norfolk | 11% | 0% | 1% | 4% | 0% | 1% | 61% | 5% | 4% | 10% | 1% |
| Breckland | 12% | 0% | 1% | 2% | 0% | 1% | 65% | 6% | 3% | 10% | 0% |
| Broadland | 11% | 0% | 1% | 5% | 0% | 1% | 66% | 5% | 4% | 5% | 1% |
| Great Yarmouth | 9% | 0% | 1% | 6% | 1% | 1% | 58% | 7% | 4% | 12% | 2% |
| King’s Lynn and West Norfolk | 12% | 0% | 1% | 2% | 0% | 1% | 64% | 6% | 5% | 8% | 0% |
| North Norfolk | 16% | 0% | 1% | 2% | 0% | 1% | 61% | 5% | 3% | 10% | 1% |
| Norwich | 8% | 0% | 1% | 8% | 0% | 1% | 44% | 5% | 9% | 23% | 1% |
| South Norfolk | 13% | 0% | 1% | 4% | 0% | 1% | 66% | 5% | 3% | 5% | 1% |

**Figure A3: Traffic Speeds on Local A Roads**

Sept 2015

Sept 2009

**Figure A4: Vehicles entering & leaving Norwich city centre cordons by year**

*October 12hr 0700-1900 excluding pedal cycles*

2007 2008 2009 2010 2011 2012 2013 2014

**Figure A5: Vehicles entering & leaving King’s Lynn centre cordons by year**

*July 12hr 0700-1900 excluding pedal cycles*

**Figure A6: Vehicles entering & leaving Great Yarmouth centre cordons by year**

*June 12hr 0700-1900 excluding pedal cycles*

**Figure A7: Typical Journey Times**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Journey** | **Distance** **(miles)** | **Typical train journey time**  **(Frequency)** | **Road journey time** | **Speed** | |
| **Rail** | **Road** |
| Norwich to London | 119 | 2 hours  (Every 30 minutes) | 2 hours 50 | 60mph | 42mph |
| King’s Lynn to London | 111 | 1 hour 45 (30 mins peak times; hourly out of peak) | 2 hours 40 | 63mph | 42mph |
| King’s Lynn to Cambridge |  | 45m (30 mins peak times; hourly out of peak) |  |  |  |
| Great Yarmouth to London | 138 | 2 hours 40 (30 mins peak times; hourly out of peak) | 3 hours 15 | 52mph | 43mph |
| York to London | 210 | 2 hours (30 mins) | 4 hours | 105mph | 53mph |
| Peterborough to London | 86 | 1 hour (10 mins) | 2 hours | 86mph | 43mph |
| Oxford to London | 63 | 1 hour (15 mins) | 1 hour 30 | 63mph | 42mph |
| Southampton to London | 81 | 1 hour 25 (15 mins) | 1 hour 50 | 57mph | 44mph |
| Nottingham to London | 128 | 1 hour 50 (30 mins) | 2 hours 35 | 70mph | 50mph |
| Edinburgh to London | 379 | 5 hours (1tph) | 7 hours 40 | 76mph | 49mph |
| Norwich to Cambridge | 62 | 1 hour 20 (Hourly) | 1 hour 30 | 47mph | 41mph |
| Norwich to Peterborough | 78 | 1 hour 30 (Hourly) | 2 hours | 52mph | 39mph |
| Norwich to Birmingham | 159\* | 4 hours (Hourly) | 3 hours 10\* | 40mph | 50mph\* |
| Source: thetrainline.co.uk / AA route planner  \* via A14 | | | | | |

**Figure A8: Station Usage All Norfolk Stations**

**Top 20 Norfolk Stations by Usage**

|  |  |
| --- | --- |
| **Station** | **Footfall 2014/15** |
| Norwich | 4,071,502 |
| King’s Lynn | 970,890 |
| Diss | 682,142 |
| Downham Market | 491,744 |
| Great Yarmouth | 436,834 |
| Thetford | 295,044 |
| North Walsham | 239,934 |
| Sheringham | 196,068 |
| Cromer | 183,032 |
| Wymondham | 182,080 |
| Attleborough | 153,828 |
| Watlington | 143,904 |
| Hoveton & Wroxham | 131,024 |
| Brandon | 103,196 |
| Brundall | 98,472 |
| Acle | 48,076 |
| Lingwood | 46,966 |
| Reedham | 45,336 |
| West Runton | 26,464 |
| Worstead | 24,394 |

*Source: Office of Road and Rail*

**Figure A9: Port Traffic in East Anglia**

*All Traffic Thousand Tonnes*

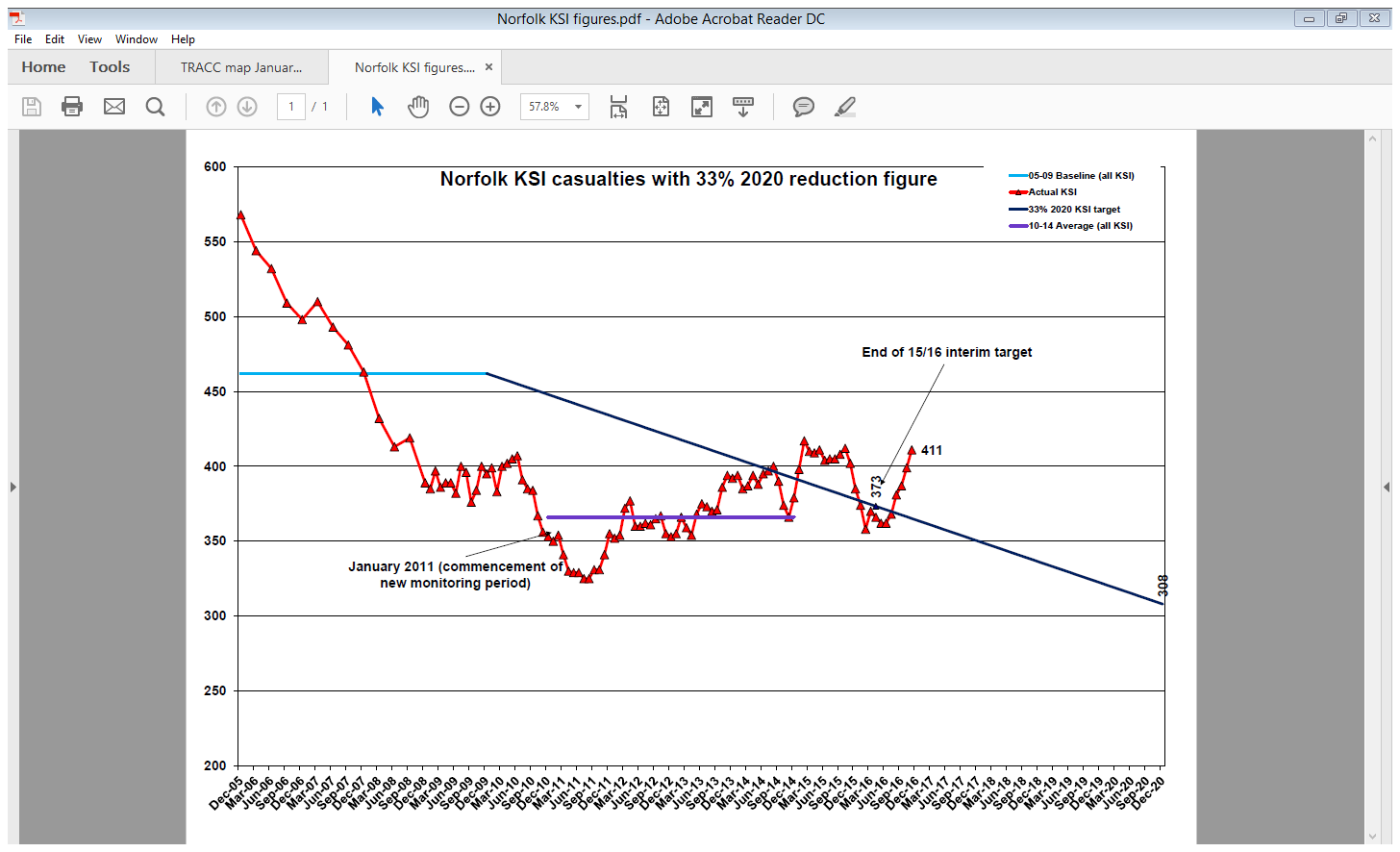
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ports** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** |
| Grimsby & Immingham | 60,686 | 64,033 | 66,279 | 65,267 | 54,708 | 54,029 | 57,227 | 60,091 | 62,614 | 59,370 | 59,103 |
| Felixstowe | 23,144 | 24,370 | 25,685 | 24,988 | 24,267 | 25,756 | 26,817 | 26,269 | 26,214 | 28,127 | 27,971 |
| Harwich | 4,221 | 4,176 | 3,784 | 3,739 | 2,942 | 3,141 | 3,090 | 3,189 | 3,638 | 3,888 | 4,550 |
| Ipswich | 3,578 | 3,505 | 2,797 | 2,572 | 2,814 | 2,875 | 2,544 | 2,206 | 1,689 | 1,929 | 2,293 |
| Great Yarmouth | 763 | 950 | 900 | 784 | 659 | 855 | 827 | 889 | 840 | 1,137 | 1,096 |
| Boston | 767 | 834 | 836 | 961 | 702 | 951 | 838 | 829 | 724 | 824 | 852 |
| King's Lynn | 1,008 | 613 | 578 | 771 | 662 | 723 | 582 | 531 | 459 | 475 | 475 |
| Sutton Bridge | 534 | 593 | 609 | 530 | 440 | 443 | 430 | 415 | 449 | 402 | 391 |
| River Ouse | 217 | 234 | 282 | 226 | 196 | 241 | 182 | 157 | 106 | 170 | 188 |
| Lowestoft | 242 | 323 | 237 | 169 | 141 | 178 | 103 | 84 | 89 | 104 | 126 |
| Wisbech | 75 | 56 | 63 | 58 | 31 | 36 | 54 | 57 | 49 | 56 | 70 |
| Fosdyke | . | . | . | . | . | . | . | . | . | . |  |
| Wells | . | . | . | . | . | . | . | . | . | . |  |
| **England Total** | **392,286** | **400,517** | **399,085** | **386,534** | **340,792** | **343,386** | **353,318** | **346,534** | **347,079** | **353,037** | NA |
| **United Kingdom Total** | **584,541** | **583,261** | **581,504** | **562,166** | **500,881** | **511,855** | **519,495** | **500,860** | **503,324** | **503,171** | **982,437** |

*Source: DfT*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Area name | All categories: Car or van availability | No cars or vans in household | 1 car or van in household | 2 cars or vans in household | 3 cars or vans in household | 4 or more cars or vans in household | All cars or vans in the area |
|  | Households | Households | Households | Households | Households | Households | Cars or vans |
|  | Number | Percentage | Percentage | Percentage | Percentage | Percentage | Number |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **ENGLAND AND WALES** | **23,366,044** | **25.6** | **42.2** | **24.7** | **5.5** | **1.9** | **27,294,656** |
| **ENGLAND** | **22,063,368** | **25.8** | **42.2** | **24.7** | **5.5** | **1.9** | **25,696,833** |
| **EAST** | **2,423,035** | **18.5** | **42.9** | **29.1** | **6.9** | **2.6** | **3,231,763** |
| **Norfolk** | **372,085** | **18.8** | **44.8** | **27.4** | **6.4** | **2.5** | **484,255** |
| Breckland | 54,519 | 15.5 | 43.8 | 30.3 | 7.5 | 2.9 | 76,224 |
| Broadland | 53,336 | 11.4 | 44.4 | 33.5 | 7.8 | 2.9 | 78,795 |
| Great Yarmouth | 42,079 | 27.2 | 44.8 | 21.2 | 5.0 | 1.8 | 46,431 |
| King’s Lynn and West Norfolk | 62,977 | 16.4 | 44.6 | 29.0 | 7.1 | 3.0 | 86,531 |
| North Norfolk | 46,046 | 16.2 | 46.1 | 28.1 | 6.9 | 2.7 | 62,334 |
| Norwich | 60,319 | 33.4 | 47.6 | 15.8 | 2.5 | 0.7 | 54,249 |
| South Norfolk | 52,809 | 11.7 | 42.4 | 34.3 | 8.4 | 3.3 | 79,691 |

*Source: Office for National Statistics*

**Figure A10: Killed and Seriously Injured Road Traffic Casualties**



**Figure A11: Car Ownership (Census 2011)**