

7 Traffic and transport

Introduction

- 7.1 This chapter examines the environmental impact of the traffic and transport issues associated with the proposed development. In particular it considers the potential effects of changes in traffic flows, congestion and delays, and changes in car parking supply and demand.
- 7.2 This chapter is based on the transport assessment (TA) prepared by WSP, which forms technical appendix D to this ES.
- 7.3 This chapter (and its associated figures and appendices) is not intended to be read as a stand-alone assessment and reference should be made to chapters 8 and 9 of this ES to consider associated impacts in relation to air quality, noise and vibration, as well as chapter 14 ‘cumulative effects with future phases of Northstowe’.
- 7.4 The Institute of Environmental Management and Assessment (IEMA’s) *Guidelines for Environmental Assessment of Road Traffic* (2003) provides a range of human and natural impacts from traffic, defines those that should be regarded as a material consideration and then considers the weight to which those impacts should be defined.
- 7.5 It is acknowledged that transport infrastructure around Cambridge is constrained both purposefully, to promote sustainable transport, and from traffic delays.
- 7.6 A number of other factors, including natural and historical features, contribute towards the quality of the built environment and impact on the transport network. An element of topographical segregation exists through the presence of the disused railway line, which has now been converted to the Cambridgeshire Guided Busway (CGB) and the River Great Ouse running to the north of the study area.
- 7.7 This chapter is structured as follows:
- Relevant legislation and policy
 - The methodology adopted within this chapter of the ES
 - The baseline conditions in the vicinity of the site without the proposed development, including the future baseline
 - Impact assessment of the effects of constructing the proposed development, within the vicinity of the site, before mitigation
 - Impact assessment of the effects of the proposed development post-construction
 - Possible mitigation measures are identified to reduce the traffic impacts
 - A summary of the residual effects with the mitigation measures in place

Legislation and policy

Preamble

- 7.8 Other chapters consider the over-arching environmental planning policies, while this chapter reviews relevant transport policies in more detail.
- 7.9 This section summarises the relevant transport planning policies. The TA contains a more detailed review of the policies.

National legislation and policy

Planning Policy Guidance Note 13: Transport (PPG13, 2011)

- 7.10 PPG13 outlines the key themes of sustainable development that have emerged in recent years. The document seeks to reinforce the message that there needs to be greater integration of planning and transport in order to promote more sustainable transport choices and reduce the need to travel, especially by private car.
- 7.11 The guidance emphasises the importance of incorporating realistic means of access by public transport, walking and cycling into the design of a development; rather than assuming that the car will represent the only means of access for the vast majority of people.
- 7.12 PPG13 identifies the following major objectives for the integration of transport and planning at the national, regional and local level:
- Promote more sustainable transport choices for both people and for moving freight
 - Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling
 - Reduce the need to travel, especially by car
- 7.13 To deliver these objectives, PPG13 advises that local planning authorities should, amongst others:
- Ensure that development comprising jobs, shopping, leisure and services offers a realistic choice of access by public transport, walking and cycling
 - Use parking policies, alongside other planning and transport measures, to promote sustainable transport choices and reduce reliance on the car for work and other journeys
 - Give priority to people over ease of traffic movement and plan to provide more road space to pedestrians, cyclists and public transport in town centres, local neighbourhoods and other areas with a mixture of land uses
- 7.14 Where developments are significant in scale, PPG13 recommends that a TA is undertaken to assess the level of accessibility to local facilities. This chapter

should be read alongside the TA, which is produced in line with the parameters set out in PPG13 and the *Guidance on Transport Assessments*, published by the Department for Transport (DfT) and the Department for Communities and Local Government in 2007.

- 7.15 In terms of PPG13, the proposed development has been configured to create a sustainable land use mix to minimise the need to travel. Trips to and from adjacent settlements will, however, be inevitable, but the CGB will immediately contribute to increasing trip mode choices and thereby exploit public transport use.
- 7.16 Paragraphs 82-94 of the draft National Planning Policy Framework (July 2011) set out emerging policy on transport.

Regional and local policy

Localism and the Regional Spatial Strategy for the East of England (2008)

- 7.17 The Localism Bill was enacted in November 2011, thereafter becoming the Localism Act. Different parts of the Act will, however, come into effect at different times over the coming months. The Act enables Regional Spatial Strategies, including the East of England Plan, to be abolished, but this will be undertaken by statutory order by the government in due course (it is currently understood that this will be around March / April 2012), subject to consultation. Whilst the East of England Plan remains part of the development plan until it is formally abolished, the government has advised that the proposed abolition of Regional Spatial Strategies should be regarded as a material consideration by local planning authorities when deciding planning applications. It should therefore be afforded limited weight in the determination of this planning application.

Local Development Framework (LDF)

- 7.18 South Cambridgeshire District Council (SCDC) has promoted its LDF with a Core Strategy, Development Control Policies and, notably, the Northstowe Area Action Plan (NAAP), which was adopted in July 2007. Further details of these and their transport significance are outlined in section 3 of the TA.

Cambridgeshire Local Transport Plan 3 (LTP3, 2011)

- 7.19 LTP3 replaces the previous Local Transport Plan (LTP2) and was formally adopted in March 2011. It covers the period 2011 to 2026 and sets out objectives and strategies to overcome the challenges in the county and a short term three year implementation plan detailing programmes for delivery of improvements to the transport network.

Guidance

- 7.20 The methodology for assessing the proposed development's traffic and transport effects has been based on the following documents:

- DfT's *Guidance on Transport Assessments* (March 2007)
- IEMA's *Guidelines for Environmental Assessment of Road Traffic* (2003)
- Design Manual for Roads and Bridges (DMRB), Volume 11 (varies)

Methodology

Scope of the assessment

- 7.21 The scope of this ES chapter considers baseline conditions within the study area (figure 7.1) and examines representative road links. These will be used to assess the impact of the proposed development during the construction and final post-construction phases. The results of this assessment have been used to formulate a transport strategy to be brought forward to mitigate the direct impact of the development on transport and any associated environmental impacts.
- 7.22 The TA outlines the programme for the proposed development and the key stages. This ES chapter therefore considers the following baseline:
- 2011 – Existing situation
 - 2021 – Future baseline (without the proposed development, but including other committed developments within the LDF)
- 7.23 The future years of the proposed 1 development will be considered in:
- 2021 - Forecast development year (with the proposed development – including up to 1,500 homes)
- 7.24 The future year of 2021 is an identified design year of the Cambridge Sub-Regional Model (CSRM) and is broadly similar to the provisions of the DfT *Circular 02/2007 Planning and the Strategic Road Network* (SRN), which recommends an assessment year ten years after registration of the application. As part of the scoping exercise, Cambridgeshire County Council (CCC) and the Highways Agency (HA) agreed that a forecast design year of 2021 was suitable for phase 1 of the development. 2021 is therefore considered representative of forecast years for this ES chapter.

Extent of the study area

- 7.25 A scoping exercise was conducted with SCDC in July 2011, taking account of consultation responses from other key stakeholders. The identified study area and assessment criterion for each ES chapter varies slight to take account of the various impacts.
- 7.26 Based on feedback from SCDC and other consultees, it has been agreed that the scope of this ES chapter shall include the assessment areas identified at

figure 7.1, broadly between Swavesey and Over (to the north west) and Oakington / Cottenham (to the south east).

- 7.27 For the purposes of this chapter, roads through and connecting villages have been identified to provide an indication of the environmental impacts of the development.
- 7.28 For the purposes of this assessment, allowance for the site's current or previous land use has been included within the CSRMM model. However, the traffic associated with the existing use has typically occurred outside of peak periods and does not represent any appreciable demand during the assessment years.

Method of baseline data collation

Cambridgeshire County Council's CSRMM

- 7.29 The CSRMM is the preferred media for examining the effects of strategic development in the Cambridge sub-region, taking account of committed and planned development, transport infrastructure and services.
- 7.30 The CSRMM considered a range of forecast years, typically at five year intervals. Traffic flows for 2011 represent a CSRMM forecast baseline model, which is being 'bench-marked' against recent traffic survey data in conjunction with CCC and its consultants. The bench-marking exercise reveals that the modelled two-way traffic flows for 2011 are within acceptable confidence levels, but are typically higher than those observed in neutral months. As suppressed economic conditions have been shown to have a material impact on traffic flows, it can be assumed that these will recover within the assessment period and therefore remain robust.
- 7.31 The model incorporates recent changes in the area, notably Home Farm, the Longstanton western bypass and the recently opened CGB.
- 7.32 As the model considers future development forecasts, it considers the likely phased completions identified in the Structure Plan, Core Strategies and Area Action Plans. Whilst these growth forecasts could vary they have previously been agreed with SCDC, CCC and the HA to be representative of future committed developments for other developments in the sub-region.

Existing conditions

- 7.33 The existing conditions for road users have been assessed from a combination of site visits and aerial photography. These are detailed in the TA and reviewed as part of this chapter to inform qualitative assessments

Impact assessment methodology

- 7.34 The specific impact assessment methodology used for each of the traffic and transport effects is detailed below.

Visual impact

- 7.35 Within an ES, the visual effects of traffic are usually limited to the impact of a new road or a change to the adjacent landscape or topography, which increase the visual perception of traffic. Any visual impact of traffic and road improvements identified as part of the scope is considered in more detail in chapter 4: landscape and visual effects.
- 7.36 In certain circumstances, visual impact can relate to a perceptible change in traffic composition, but will normally be restricted to a numerical increase in high sided vehicles. As the proposed development includes increases in overall traffic, but modest increases in heavy goods vehicles (HGV), the visual impact of traffic will not be perceptible. Indeed, the perception of traffic change is more likely to have an impact in terms of environmental factors, such as severance or pedestrian / cycle amenity.

Severance

- 7.37 Severance can be physical or a perceived separation within a geographic area. It is described in the Design Manual for Roads and Bridges (DMRB Volume 11) as “the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows”. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether crossing facilities are provided or not.
- 7.38 The DMRB (Volume 11, Section 3) provides some guidance, set out in Table 7.1, as to the measure of community severance, offering some indication of pedestrian delay or diversion. When considering the level of severance, allowance needs to be made for the presence of existing crossing facilities relative to desire lines. As far as reasonably practicable these have been identified.

Table 7.1: DMRB community severance

Level of severance	Average annual daily total traffic	
	AADT	Delay / diversion
Slight	>8,000	<250 m
Moderate	8-16,000	250-500 m
Severe (significant)	>16,000	>500 m

- 7.39 New pedestrian crossings can reduce the effects of severance by improving the ability of the community to cross the road. Whilst the DMRB suggests that some judgement should be applied to the scale of relief that might be achieved, the extent to which severance is reduced by a crossing is set out in Table 7.2. Where these are placed to accommodate relative desire lines, the DMRB suggests that the severance effects can be reduced by up to 90%.

Table 7.2: Relief from severance with crossings

Level of severance	Slight	Moderate	Substantial
Built-up area	<30%	30-60%	>60%
Rural area	60-75%	75-90%	>90%

Pedestrian delay

- 7.40 There are few quantitative measures of pedestrian delay. The IEMA guidelines recommend that, rather than relying on thresholds of pedestrian delay, the assessor should use his / her judgement to determine whether there is a significant impact to pedestrian delay.
- 7.41 The DMRB references research on pedestrian crossing behaviour and delays at a number of controlled and uncontrolled crossing points. Survey locations considered a range of location and traffic flow conditions; it was noted that sites with traffic flows above 1,500 vehicles per hour (vph), the equivalent of over 16,000 annual average daily traffic (AADT), generally had controlled crossings or limited crossing demand. Even with controlled crossings the scale of delay was on average 15 seconds or more.
- 7.42 The proposed development will bring about increases in the number of vehicle movements. Consequently, material increases in traffic levels are likely to lead to increases in delay of pedestrians seeking to cross roads. Based on the same research, even without controlled crossings, an increase in 500 vph resulted in an average increase in delay of around five seconds.
- 7.43 Generally roads that have traffic flows that create moderate or significant severance will generate appreciable pedestrian delays, although where crossings exist severance can be reduced, especially during off-peak periods. For the purpose of this assessment pedestrian delay is considered as part of severance.

Pedestrian / cycle amenity

- 7.44 The IEMA guidelines broadly define pedestrian amenity as the “relative pleasantness of a journey”. It is affected by traffic flow, traffic composition, footway width and separation from traffic. A common threshold for changes in pedestrian / cycle use is where traffic flow is either halved or doubled.
- 7.45 Traffic conditions may cause pedestrians and cyclists to be hesitant to walk or cycle adjacent to, or crossing, the carriageway. This impact is dependent on the speed and volume of traffic, its HGV composition and its proximity to people or the lack of protection caused by factors such as narrow footway widths.
- 7.46 Section 4 of the TA examines non-motorised users (NMU) in detail by considering a range of routes and available infrastructure. A strategy associated with future improvements is then considered in section 6 of the TA, and this identifies a range of proposed and possible improvements. Within

this chapter, existing and any proposed infrastructure improvements, relative to staged completion, will form the basis of the environmental assessment in terms of pedestrian / cycle amenity.

- 7.47 The study area is predominantly rural, with discontinuous footways outside the built up areas. Given the rural environment, many pedestrians walk in the road or use the public rights of way (PROW) network for travel within the community for social and recreational purposes.
- 7.48 The DMRB includes guidance on the design of NMU routes. Within Technical Advice (TA90), reference is made to ‘kerb shyness’, which reflects on the use of a NMU route. A trafficked carriageway is also assumed to have a boundary effect on a NMU route, where guidance suggests that increased segregation or route width can reduce fear and intimidation. As pedestrian / cycle amenity is largely a qualitative assessment, this chapter considers the existing footway network relative to traffic flows and speeds in order to provide a measure of pedestrian / cycle amenity, as set out below:
- Very poor – typically unsuitable for pedestrian / cycle use
 - Poor – pedestrian / cycle travel may be acceptable at certain times of the day / week
 - Adequate – the pedestrian / cycle infrastructure / environment is adequate for most users; some vulnerable users may be less inclined to use the route during periods of higher traffic flow
 - Good – the pedestrian infrastructure is adequate for all users, offering a relatively attractive route for most users and either dedicated cycle infrastructure is available or the route is suitable for on-road cycling
 - Very good – the quality of the route is very good, where the infrastructure / environment is suitable for both pedestrians and cyclists and / or a degree of separation is available
- 7.49 The level of service of NMU routes is examined within section 4 of the TA. Generally these define routes within villages as good, as footways are available. In some villages localised pinch points exist, which results in narrow or discontinuous provisions that can contribute to reduced levels of amenity.

Road safety

- 7.50 The IEMA guidelines state that an assessment of road accident rates should be undertaken using recent data. This can be supplemented using national statistics that relate to accident rates per vehicle kilometres. The assessment of effect significance should be based on professional judgement, accounting for local circumstances and factors that may elevate or lessen the accident risks.
- 7.51 The Personal Injury Accident (PIA) records for the local highway network have been obtained from the highway authority, CCC, for at least a three year period to July 2011.

- 7.52 The existing accident and safety record is examined in detail in section 4 of the TA. For the future years an analysis based on the DfT's Cost Over Benefit Analysis (COBA) principles will be used to validate the methodology against observed data and then to project future PIA levels based on increases in traffic flows and accident rates.

Hazardous loads

- 7.53 The IEMA guidelines acknowledge that most developments will not result in an increase in the number of movements of hazardous / dangerous loads. The publication *The Carriage of Dangerous Goods in the UK* lists materials that can represent a hazard when in transit, and provides guidance in relation to the safe carriage of these goods.
- 7.54 Due to the nature of the construction activities that will be employed during the phased build out of Northstowe, coupled with the proposed end users, it is not anticipated that either the construction or operational stages of the proposed development will require carriage of materials listed on *The Carriage of Dangerous Goods in the UK*. This issue has therefore not been included further in the scope of this chapter.

Dust and dirt

- 7.55 The assessment of traffic and transport impacts as part of an EIA should consider dust and dirt created by traffic arising from the operations of certain types of development, such as quarrying where the transportation of quarried materials can have an environmental effect. Whilst the proposed development involves the movement of earth within the site, the transportation of materials on surrounding roads will be limited mainly to the importation of building materials and the disposal of inert waste. Such impacts are covered by Highways Act legislations but will require the adoption of management practices to ensure the effects are minimised. The air quality and noise and vibration assessments consider these issues in chapters 8 and 9 respectively, based on traffic data produced in conjunction with this assessment.

Driver stress and delay

- 7.56 Driver stress incorporates an element of amenity in terms of view and relative need for attention to possible risks. Effectively this is a qualitative assessment of the driving environment. In an urban environment the risks are normally greater; therefore driving can be more stressful and require greater cognition. Rural environments generally require less attention to driving conditions and therefore provide opportunities to enjoy the driving environment.
- 7.57 The existing highway network is generally open countryside with roads through intermittent villages. The streetscape can be described as good; however, in some cases the ancient road alignment, bounded by ditches or hedgerows that can limit visibility, can create a more moderate driving environment.

- 7.58 Driver stress can also be assessed more quantitatively by taking account of traffic conditions and the ability for drivers to choose their speed and overtake slower vehicles. The DMRB (Volume 11, Section 3) provides some indication of the effects of driver stress resulting from flows and typical speeds, reproduced as table 7.3.

Table 7.3: Assessing driver stress			
Average peak hourly flow per lane	Average journey speed (kph)		
Dual carriageway	60	60-80	>80
<1200	High*	Moderate	Low
1200-1600	High	Moderate	Moderate
>1600	High	High	High
Single carriageway	<50	50-70	>70
Under 600	High*	Moderate	Low
600 – 800	High	Moderate	Moderate
>800	High	High	High

*Moderate in urban areas

- 7.59 As the existing highway environment will change as a result of some road improvements associated with subsequent phases of Northstowe, this is likely to result in a number of beneficial and adverse impacts in terms of driver stress, considered as part of this application. For the proposed development the scale of infrastructure improvements will be modest.
- 7.60 The CSRSM provides average output speeds for local area link roads and these have been used for estimating vehicles speeds, and thus driver stress, within this chapter.

Public transport

- 7.61 The IEMA guidelines do not identify a specific need to assess the impact of public transport changes, although in some circumstances their impact could be material. Where improvements involve changes in service route and frequency it may be necessary to consider if these are material individually or collectively with other commercial vehicles.
- 7.62 The proposed development does not consider improvements in rail services but will include some changes to bus services. The environmental effects of these vehicles are included within the assessment of HGV forecasts, as commercial vehicles. These changes also form part of a mitigation measure to reduce traffic generation, which is integral to the proposals.

Assessment of significance

- 7.63 The IEMA *Guidelines for the Environmental Assessment of Road Traffic* sets out that “highway links should be assessed when traffic flows have increased by more than 30% or other sensitive areas are affected by traffic increases of at least 10%”.

- 7.64 The IEMA guidelines highlight that sensitive receptors can include congested junctions, hospitals, community centres, conservation areas, schools, colleges, churches and accident black-spots. Within the agreed study area, many of the villages can be regarded as sensitive. There can also be a range of affected groups and special interests, such as areas of concentrated levels of vulnerable road users (e.g. child pedestrians).
- 7.65 In accordance with the IEMA guidelines, material impacts will be considered, as far as reasonably practicable, for those impacts that are quantitatively measurable. Where the impacts cannot be measured in this way a qualitative measure will be taken and a judgement will be applied to the scale of change.
- 7.66 The guidance offered by the DMRB explores some variations of impacts on severance. Where these differ, they are reported as published and clarified relative to the degree of effect and associated significance adopted in this chapter.
- 7.67 Whilst the IEMA guidance offers some direction on the determination of sensitive receptors, an element of judgement applies to land uses and areas that should be identified as sensitive. Figure 7.2 identifies conservation areas and a number of land uses that are more sensitive to inform which road links should be considered receptors with the impacts predicted in more detail. For these links the magnitude of change will be lower and will be reported accordingly.
- 7.68 The degree of both beneficial and adverse effects identified as a result of the proposed development, including temporary and permanent, are set out in the assessment and considered cumulatively with future phases of Northstowe in chapter 14 and in summary in chapter 15, adopting a consistent approach as follows:
- Substantial – significant change in local conditions or circumstances
 - Moderate – readily apparent change in conditions or circumstances
 - Slight – perceptible change in conditions or circumstances
 - Negligible – no discernable change in conditions or circumstances
- 7.69 Effects that are moderate or above are considered to be significant. The above scales for changes in flow are measured in accordance with the IEMA guidelines as follows:
- **Substantial** – A change in total traffic, HGV or hazardous load flows of greater than 90% of the baseline on receptors that are sensitive to traffic flow (e.g. hospitals, shopping centres and areas with narrow pavements); or a change in total traffic, HGV or hazardous load flows of 60 to 90% of the baseline on receptors of medium to high sensitivity to traffic; or a change in total traffic, HGV or hazardous load flows of 60% of the baseline on a receptor of high sensitivity to traffic such as schools, playgrounds and accident black-spots.

- **Moderate** – A change in total traffic, HGV or hazardous load flows in excess of 60% of the baseline on receptors of some sensitivity to traffic, such as churches, public open space, tourist attractions and residential areas with adequate pavements; or a change in total traffic, HGV or hazardous load flows of 30 to 60% of the baseline on receptors of medium sensitivity (e.g. hospitals, shopping centres and areas with narrow pavements) and high sensitivity (schools, playgrounds and accident black-spots).
- **Slight** – A change in total traffic, HGV or hazardous load flows of between 30 and 60% of the baseline on receptors of some sensitivity to traffic, such as churches, public open space, tourist attractions and residential areas with adequate pavements.
- **Negligible** – A change in total traffic, HGV or hazardous load flows of less than 30% of the baseline on receptors of very low sensitivity or sensitive receptors significantly distant from affected roads and junctions.

Baseline

Overview of scenario

- 7.70 This section sets out a summary of the existing situation of the site and considers the baseline scenario comparison between 2011 and 2021 (without the proposed development) to identify the level of background impact of each environmental category on each of the selected roads. The baseline traffic flows are examined in more detail within the TA.

Highway network

- 7.71 The site is located approximately 10 km north west of the centre of Cambridge. The northern border of the site is formed by the CGB, which has unoccupied land to its north. To the east of the site is rural land, with Rampton Road approximately 200 m beyond that. The south western border of the site is the existing settlement of Longstanton, with residential buildings and a school immediately fronting the site.
- 7.72 To the northwest, the site is bordered by the B1050 Station Road, offering a north / south corridor for a number of villages and surrounding rural hinterland. On the western side of Station Road are scattered residential and commercial properties and open countryside.
- 7.73 Other settlements in the vicinity of the site include Oakington, 3 km south east of the site, Rampton, 2.6 km north east of the site, and Willingham, 2.8 km to the north.
- 7.74 Junction 29 of the A14 is situated just under 4 km south of the site. The local highway network within the study area is illustrated on figure 7.1. The main

characteristics of the surrounding road networks are described within section 4 of the TA.

- 7.75 The road network immediately around the site is characteristic of the rural area, with typical carriageway widths of 4.5 to 6.5 m, including a range of B and C class and unclassified road links.
- 7.76 The speed limits through villages are typically 30 mph, although other speed limits apply in some locations. Elsewhere the road network is subject to the national speed limit (60 mph), although the road environment is such that typical vehicle speeds are frequently within 30 to 50 mph.
- 7.77 The road network includes a number of roads through villages and rural areas. As a result of previous consultation exercises, it is apparent that many parishes feel their community is sensitive to traffic flow increases. This is acknowledged in the IEMA guidelines and the threshold for 'slight' environmental impacts will therefore reduce to a +/-10% change where roads pass sensitive receptors.
- 7.78 The B1050 Longstanton western bypass opened in December 2008 to divert over 7,300 vehicles a day away from the village. It runs from Hatton's Road to the south of Longstanton to a roundabout adjacent to the site, where it re-joins the original route of the B1050.
- 7.79 The A14 is the main strategic route around the north of Cambridge. Peak hour two-way flows reported in the previous 2007 ES for the stretch closest to the site were 4,629 for the AM peak and 5,577 for the PM peak, with relatively high percentages of HGVs (23% in the AM peak and 17% in the PM peak). Whilst many factors influence the change in traffic flows, it is assumed that economic activity has changed, resulting in reductions in growth and reduction in real terms on the adjacent sections of the A14. Based on available traffic data for the corridor recent (2011), traffic flows are considered in more detail below.
- 7.80 The A14 in the vicinity of the site experiences varying levels of congestion. It is a trunk road, administered by the Secretary of State, and forms part of the SRN. A programme of improvement works was planned by the Highways Agency, including upgrading the carriageway to three lanes in each direction between Ellington and Fen Ditton, limiting junctions and creating a parallel distributor road for local traffic between Fenstanton and the Girton interchange. However, government funding reviews have meant that the implementation of these works has been suspended.
- 7.81 The HA has prepared a study brief for a new study for interim improvements for the A14 to address levels of severe congestion and delay. The government announced immediate investment (£20 million) to improve junctions and increase resilience on the A14 before 2015. It is understood that these funds will be shared between Cambridgeshire County Council and the HA and used to exploit the potential of the CGB and community based travel plans, whilst delivering junction improvements at a few grade separated junctions on the

A14 corridor. As these improvements cannot be quantified at this juncture, any adverse or beneficial effects have been discounted from this assessment.

- 7.82 The government also launched a large scale engagement programme in December 2011, the 'A14 Challenge' consultation, looking at ways to relieve congestion on the A14, including improving other modes on local roads. The government intends for this work to support development of new homes in Northstowe, Waterbeach and Alconbury. Additionally, more longer term, the government will provide investment for widening of the A14 Kettering Bypass. As these improvements cannot be quantified they have been discounted from this assessment. Whatever improvements are taken forward are likely to form EIA works and will therefore be assessed in detail with any Highways Orders.

Traffic flows

- 7.83 The baseline traffic flows have been established using the CSRМ. Details of the model are set out in the TA. In accordance with paragraph 7.22, the baseline conditions are considered for years 2011 and 2021.
- 7.84 The baseline CSRМ was subject to a Local Model Validation Report (LMVR) based on observed traffic flows. As identified above, forecast years were considered against a range of planning and infrastructure assumptions. Amongst other things, economic conditions have changed and these are reflected as far as reasonably practical in the revised baseline 2011 CSRМ flows. To ensure these remain robust, a 'bench-mark' test has been undertaken based on a number of traffic surveys in the assessment study area.
- 7.85 The TA focuses on sustainable travel demands and examines peak period traffic flows in detail. The relevant measure of environmental impact is quoted in national guidance as Average Annual Daily Totals (AADT); therefore, this chapter typically adopts these as (24-hour) daily flows.
- 7.86 The CSRМ provides peak hour flows during the AM and PM peak hours. Conversion factors have been adopted based on the aggregate of 2011 surveys on the SRN or local roads, also considered in more detail in the TA.
- 7.87 The potential environmental impact of traffic has been considered for separate areas. First, the rural roads between villages; these are likely to be less sensitive to changes in flows. Second, the selected roads within the two villages adjacent to Northstowe (Longstanton and Oakington) have been considered, and then roads in the adjoining villages. The main road in each village has been selected, as this will represent the road that will be subject to the greatest change.
- 7.88 All the selected roads can be used to assess the impact around Northstowe, including sensitive areas. Flows are provided on some roads, but these flows extend along the whole modelled link. For example, the rural flow on Rampton Road between Willingham and Cottenham (link 2) also applies in the village of Rampton itself.

- 7.89 It should be noted that the Home Farm development and Longstanton western bypass will be complete by 2013, resulting in some positive and negative environmental effects considered as part of the Home Farm planning application. It is assumed that any residual effects will have been considered as part of the planning consent, although forecast traffic flows form an integral part of the CSRM forecast traffic flows and therefore are included within the future baseline in this assessment.

Severance

- 7.90 Table 7.4 reveals the existing level of severance on the rural links, and A14 based on the baseline thresholds identified in table 7.1.

Table 7.4: Summary of baseline severance

Link no.	Link road	2011 (Existing)		2021 (Forecast)	
		AADT	Severance	AADT	Severance
1	Station Road	8345	Moderate	8926	Moderate
2	Rampton Road	3699	Slight	4685	Slight
3	Ramper Road	1327	Slight	1725	Slight
4	High Street, Longstanton	1027	Slight	1689	Slight
5	B1050, Longstanton Bypass	9111	Moderate	9990	Moderate
6	Bucking Way Road	4856	Slight	5182	Slight
7	School Lane	2629	Slight	3443	Slight
9	Oakington Road	7662	Slight	7588	Slight
10	Hatton's Road	12779	Moderate	14858	Moderate
11	Water Lane, Oakington	7662	Slight	7588	Slight
12	Dry Drayton Road	12725	Moderate	12952	Moderate
13	A14 North of J28	70448	Severe	76849	Severe
14	A14 South of J28	77396	Severe	84399	Severe
15	A14 South of J29	97364	Severe	107534	Severe
16	A14 South of J30	95035	Severe	106486	Severe

- 7.91 By 2021 the scale of change is negligible overall, with the level of severance remaining constant to 2011 levels. Whilst the A14 is a trunk road, and it is theoretically possible for NMUs to cross the road, the existing environment precludes crossing the A14 other than via existing bridges.
- 7.92 In relation to the rural roads, the largest future baseline change is on Hatton's Road; however, this is largely due to the Home Farm development to the west of Longstanton and does not result in a change of severance above current moderate levels
- 7.93 The southeast quarter of Longstanton is designated as a conservation area and hence is a sensitive location. There are two additional sensitive receptors to the north-west; a doctor's surgery and a school road. It is possible to suggest that much of Longstanton is sensitive to traffic flow changes where a smaller change could be considered material.

- 7.94 Within Longstanton (links 4, 7 and 8), severance remains slight within the built-up area, although traffic flows on the bypass (B1050) remain at moderate levels of severance by 2021.
- 7.95 The Longstanton western bypass was formally opened in December 2008. The High Street and School Lane have demonstrated moderate and minor improvements respectively as a result, with the severance levels remaining slight.
- 7.96 Overall, severance conditions in the future baseline remain similar to existing conditions. Even though some roads will experience traffic flows approaching higher thresholds, these are in locations where very few properties would experience any discernible impact.

Pedestrian / cycle amenity

- 7.97 Overall the local cycle and pedestrian conditions around Longstanton are good, with roadside footways provided on both sides of almost all streets and traffic calming on the High Street. Similar provision is present on Rampton Road, providing one of the main routes into the Northstowe site.
- 7.98 The CGB borders the north of the site and includes a parallel footpath / cycleway along its length, functioning as a traffic-free cycle route. The route runs along the northern perimeter of the site, heading east to Oakington, Histon and Cambridge, and west to Longstanton Park and Ride, Swavesey, Fen Drayton Nature Reserve, St Ives (also has a Park and Ride) and finally Huntingdon. Most stops along the guided section of the busway provide covered, well lit and CCTV monitored cycle parking, providing an ideal opportunity for cyclists to both commute to work, or to use this route for leisure purposes.
- 7.99 National cycle route 24 provides a link for cyclists from Longstanton to Cambridge, via Oakington and Girton. Conditions for cyclists within Oakington itself are generally good and traffic volumes are considered to be acceptable. This route utilises a newly completed shared use footpath between Oakington and Girton. At Girton, although the route moves onto the carriageway, traffic must abide by a 30 mph limit that is complemented by traffic calming. The route is heavily trafficked by local cyclists and continues through to Cambridge, generally functioning well and providing a safe environment for cyclists with the context of a busy radial corridor.
- 7.100 Pedestrian conditions in Rampton are generally good, although cycling facilities are limited. Access to Willingham for all non-motorised modes is via the B1050 corridor. This corridor does not have a footway along the section from the end of the High Street to Station Road where it crosses the CGB line. Traffic flows are relatively high along this route, making it a less attractive for cycling and walking.

- 7.101 In assessing the above facilities, the pedestrian / cycle assessment criteria is outlined in paragraphs 7.44-7.49 and considers the exposure of people to road traffic when using pedestrian and cyclist facilities.
- 7.102 The 'kerb shyness' described in paragraph 7.48 will affect the usable width of footway infrastructure, as people may feel more intimidated by vehicle speed and proximity. Some of the footways in the study area are segregated from the carriageway by nominal verges or bollards, creating an improved sense of safety for pedestrian movements within some villages.
- 7.103 Within the study area there are a number of areas where appreciable pedestrian demand exists. There are also a number of areas where occasional on road pedestrian activity occurs.
- 7.104 The width of existing pedestrian infrastructure has been assessed to produce a qualitative measure of existing pedestrian / cycle amenity. The footway network is discontinuous in some locations and generally has little or no physical separation from the adjacent carriageways, thus road widths can amplify traffic effects and contribute to reduced levels of pedestrian amenity.
- 7.105 Although pedestrian flows are generally very low, there is some activity in the village centres. It is reasonable to state that pedestrian / cycle amenity is currently adequate, which is comparable with the level of service considered in section 4 of the TA.
- 7.106 Table 7.5 provides a qualitative assessment of pedestrian / cycle amenity in the study area for the baseline 2011 and 2021 periods.
- 7.107 On most rural roads pedestrian infrastructure is very limited, with a few bus stands or short sections of footway. As traffic flows close to the A14 are moderate, pedestrian amenity is therefore considered to be adequate or poor. However, the completion of the Home Farm relief road and the Longstanton western bypass will contribute towards material enhancements in terms of pedestrian amenity within the study area. The LTP3 does not identify any specific works in the assessment area; therefore, other than the completion of the relief road, it has been assumed that no material improvements are undertaken to pedestrian / cycle infrastructure.

Table 7.5: Summary of baseline pedestrian / cycle amenity

Link no.	Link road	2011 (Existing)	2021 (Forecast)
1	Station Road	Poor	Poor
2	Rampton Road	Poor	Poor
3	Ramper Road	Poor	Poor
4	High Street, Longstanton	Good	Good
5	B1050, Longstanton Bypass	Very poor	Very poor
6	Bucking Way Road	Poor	Poor
7	School Lane	Adequate	Adequate
9	Oakington Road	Poor	Poor
10	Hatton's Road	Adequate	Adequate
11	Water Lane, Oakington	Adequate	Adequate
12	Dry Drayton Road	Very poor	Very poor
13	A14 North of J28	Very poor	Very poor
14	A14 South of J28	Very poor	Very poor
15	A14 South of J29	Very poor	Very poor
16	A14 South of J30	Very poor	Very poor

Driver stress and delay

- 7.108 The CSRM has been used to calculate average link speeds on the surrounding road network and reproduced in table 7.6.
- 7.109 Estimated vehicle speeds have been used to provide a measure of driver stress in the surrounding highway network. Vehicle speeds are intended to provide illustrative speeds based on traffic flows and the road environment. In some cases the illustrative vehicle speed will exceed the relevant speed limit. This is, however, used to provide an indication of the potential speed based on environmental factors and thereby inform the levels of driver stress.
- 7.110 Table 7.6 sets out driver stress conditions on surrounding roads and considered modelled off-peak speeds and the traffic flows presented in table 7.4. The patterns of change reflect the distribution of traffic flows on the surrounding network.
- 7.111 The existing traffic flow levels close to the A14 are relatively high for some roads to the south of the settlements. Therefore they attract moderate or substantial levels of driver stress as drivers are unable to choose their speed. Notwithstanding this, a number of these roads are relatively straight, with reasonably good visibility, affording some opportunity to overtake.
- 7.112 Whilst the ability to overtake can reduce the levels of driver stress, the volume of on-coming traffic on Hatton's Road, for example, reduces these opportunities. The accident pattern examined in the following section informs this trend and highlights an existing need to tackle this issue.

Link no.	Link road	2011 (Existing)		2021 (Forecast)	
		kph	Driver stress	kph	Driver stress
1	Station Road	64	Moderate	63	Moderate
2	Rampton Road	66	Moderate	66	Moderate
3	Ramper Road	67	Moderate	67	Moderate
4	High Street, Longstanton	47	High	47	High
5	B1050, Longstanton Bypass	84	Low	83	Low
6	Bucking Way Road	66	Moderate	66	Moderate
7	School Lane	66	Moderate	66	Moderate
9	Oakington Road	75	Low	75	Low
10	Hatton's Road	66	Moderate	66	High
11	Water Lane, Oakington	44	High	44	High
12	Dry Drayton Road	70	Moderate	69	Moderate
13	A14 North of J28	66	High	60	High
14	A14 South of J28	61	High	56	High
15	A14 South of J29	87	High	81	High
16	A14 South of J30	88	High	82	High

Note: Average speed estimated for whole link

- 7.113 Dry Drayton Road accommodates around 13,000 vehicles per day. During peak periods the road environment through the village contributes to creating relatively high levels of driver stress. The quality of the streetscape softens this impact, although the traffic volumes within the village result in a reduced level of service. Table 7.6 indicates that speeds will marginally reduce by 2% due to increases in traffic flow by 2021. This would achieve a slight road safety improvement at the expense of driver stress.
- 7.114 Driver stress levels are already high therefore any changes are unlikely to be material. The existing A14 traffic flows can be expected to increase in line with growth in the region, resulting in reductions in average speed. The resultant effect is a negligible improvement in road safety at the expense of a corresponding reduction in driver stress.
- 7.115 The surrounding highway environment provides a number of long-distance and glimpse views of open countryside. These preserve and enhance driver stress conditions; however, these also influence drivers' perception of safe speed, considered below. The LTP3 does not identify specific improvements or corridor studies; therefore, it has been assumed that no material changes would occur with the study period.

Road safety

7.116 A detailed appraisal of recent accident data is presented in the TA. The main findings of the appraisal are shown in table 7.7.

7.117 Personal Injury Accident Data (PIAs) have been supplied by CCC for the most recent three year period available. This period extends from January 2008 to August 2011. The extent of highway covered in the study area includes the following links:

- A14 from junction 28 to 30
- Bucking Way Road / Boxworth End, from junction 28 of the A14 to its junction with Ramper Road Lane in Swavsey
- Ramper Road and B1050 from Swavsey to the B1050 Station Road roundabout
- Rampton Road between Willingham and Cottenham
- Oakington Road and Dry Drayton Road between Cottenham and junction 30 of the A14
- Hatton's Road between Ramper Road and junction 29 of the A14
- Longstanton Road between Station Road and Dry Drayton Road

7.118 Figure 7.3 illustrates the location of the links summarised below in table 7.7, which records the number and severity of all PIAs in the area surrounding the site. Full accident descriptions are provided in section 4 and appendix A of the TA.

Table 7.7: Accident analysis									
Link no.	Link road	Severity				Vulnerable users			
		Slight	Serious	Fatal	Total	Ped	Cycle	M/C	Total
1	Station Road	15	4	0	19	1	1	2	4
2	Rampton Road	9	2	0	11	2	3	0	5
3	Ramper Road	2	1	0	3	0	1	0	1
4	High Street, Longstanton	0	0	0	0	0	0	0	0
5	B1050, Longstanton Bypass	0	0	0	0	0	0	0	0
6	Bucking Way Road	6	0	0	6	0	0	0	0
8	Longstanton Road	5	0	0	5	0	1	3	4
9	Oakington Road	17	1	0	18	1	2	4	7
10	Hatton's Road	12	1	0	13	1	1	0	2
11	Water Lane, Oakington	3	0	0	3	1	1	0	2
12	Dry Drayton Road	4	0	0	4	0	0	0	0
15	A14	50	8	0	58	0	0	1	1
Total		123	17	0	133	6	9	10	25

7.119 The PIA record shows that more collisions occur on the A14; however, the HA acknowledges these are broadly representative of collision rates for a similar road with similar traffic flows. Nevertheless, a series of possible intervention measures have been considered for the A14, including enhanced traffic signs and road markings. The preferred option is to deliver improvements commensurate with the strategic nature of the road. The most recent government announcement includes an interim £20 million investment

to relieve congestion and delays on the A14, whilst issuing a study brief to explore other medium term improvements. These investment commitments are consistent with national policy and should help towards reducing associated accidents as a result.

- 7.120 Analysis of the data provided by CCC has revealed some crash trends that infer vehicle speeds were excessive to the prevailing conditions; however, as most of these are isolated in terms of vehicle movements no pattern exists that could reasonably be mitigated through engineering measures. The vast majority resulted when vehicles attempted to turn off the main carriageway, or negotiate bends. The rural natures of the roads within the study area lend themselves to higher speeds, which would explain the high number of accidents occurring on bends.
- 7.121 There are also relatively few accidents involving vulnerable road users, presumably because of the rural location. The proposed development will alter the highway environment in some locations such that it will be necessary to alter the speed limits of some roads, as part of a package of traffic management measures. In some cases these will change naturally as a consequence of development, whilst others will include measures appropriate to the environment, such as enhanced village gateways, potentially reducing driver stress levels and potentially the occurrence and / or severity of accidents.
- 7.122 The relationship between traffic flows and accident rates is not linear and it is not appropriate to draw direct relationships between traffic flow increases and accident rates. As a broad proxy, the doubling of traffic on any road would attract around 50% more personal injury accidents. However, as traffic flows increase, junction improvements would normally become necessary to accommodate traffic capacity and therefore the road environment will have changed, making it difficult to draw direct comparisons.

Public transport provision

- 7.123 The northern edge of the site generally abuts the CGB. The busway has been built along the disused railway from St Ives Park and Ride to Trumpington Park and Ride, offering an attractive alternative to the private car. The CGB was officially opened in August 2011 and is a traffic-free route, but is extended in parts to follow an on-road route through central Cambridge, St Ives and Huntingdon, utilising bus priority measures such as new bus lanes and bus priority traffic signals.
- 7.124 The CGB provides commuters and those looking to reach local facilities with a high quality, comfortable journey. Bus services provided along the Busway route are frequent and reliable since there is no general traffic to contend with. All services stop at Longstanton Park and Ride, which is adjacent to the northern perimeter of the Northstowe site, making these services easily accessible to new residents.

- 7.125 The service operates at a 10 minute frequency and all Guided Busway stops feature real time travel information boards. Bus stops are well-lit and feature raised platforms reached by ramps, making accessibility for wheelchair users and people with pushchairs much easier.
- 7.126 The CGB opened in August 2011, when passenger forecasts were expected to grow gradually to around 3.5 million passengers per year five years after opening, based on the Transport & Works Order evidence. These forecasts included some patronage from the proposed development, but assumed the A14 improvements would be underway. These changes have affected previous forecasts, which CCC has recently reviewed.
- 7.127 CCC has reviewed patronage data on the CGB and notes that it is nearly 50% ahead of forecasts, with demand already around 2 million passengers per year within six months. Bus operators have therefore increased services, in-turn improving service frequency and fostering increased demand. With additional funding it may be possible that patronage levels could exceed targets by 2021, even without the proposed development.
- 7.128 In addition to the CGB, the 'Citi 5 Fen service' provides a 60 minute frequency of service between Cambridge, Bar Hill, Longstanton, Over, Fen Drayton, Fenstanton and St Ives. This service provides a key public transport link to facilities such as the large Tesco at Bar Hill and an alternative route to reach Cambridge. Further details of the baseline public transport provision are set out within the TA. Whilst the CGB partially competes for some patronage, it would be reasonable to assume that these services would remain static.

Baseline condition summary

- 7.129 The detailed assessment of existing baseline traffic conditions reveals a moderate traffic environment within the study area. The change to government spending plans has removed the prospect of A14 improvements, along with a series of positive environmental impacts these would bring. Without these improvements the environment will remain similar to existing, with some continued negative environmental impacts arising from network traffic growth. The extent to which these impacts will change as a result of interim measures are for the Secretary of State to consider. This chapter focuses on forecast changes without the proposed development to derive likely residual effects.
- 7.130 Severance is generally slight or moderate within the settlements in the study area. In most village locations existing crossings are available to reduce these effects.
- 7.131 Within the study area the limited footway network is supplemented by the PROW network. Footways are typically provided within the limits of each village, although these are discontinuous in places. Pedestrian / cycle amenity is generally adequate or poor. The current Local Transport Plan does not identify specific improvements in the area; thus one can conclude that conditions without the proposed development would not materially alter.

- 7.132 Driver stress is measured across the study area. Those areas that highlight 'high' levels of driver stress occur on the A14. Roads close to the A14, where traffic flows are highest, typically result in 'moderate' levels of driver stress, consistent both in 2011 and in 2021.
- 7.133 The accident rates in the area are generally below national trends. There are some elevated casualty levels on and near congested roads such as the A14. Within some villages clusters of accidents arise; this is largely due to the high frequency of vehicle accesses on the minor roads. In some cases modest junction improvements have been made in recent years, and conditions have already improved.

Effects during construction

Overview of scenario

- 7.134 The staging of Northstowe is described in section 7.7 of the TA and the Construction Management Strategy (CMS). These documents outline the development quantum through the construction period and estimate the vehicles that would be generated by the construction. The proposed development is expected to deliver up to 360 dwellings a year in 2017.
- 7.135 This section examines the traffic impact, mitigation and residual effects of the proposed development during construction. Based on forecast housing delivery, the design years of 2017 and 2018 are considered to represent the peak construction years for the proposed development.

Impact

- 7.136 The proposed development will include the construction of new site access roads and junctions on the B1050. Some of the works can be constructed alongside the existing road with minimal disruption to existing traffic; however, it will be necessary to adopt a system of traffic management for many months to enable these works to be completed.
- 7.137 Road works are likely to include temporary lane restrictions in the early months of the proposed development, contributing to existing levels of driver stress and delay. The resultant delays are likely to vary across the day, typically representing around 30-90 seconds depending on the length of lane closures. These will have an effect on journey times for all vehicles, with some traffic diverting to avoid these, but it is assumed that existing bus services would not be affected. These could be considered to have a temporary negligible adverse effect that will not be significant.
- 7.138 The key element of the construction traffic will be larger vehicles providing equipment and materials to the site. These movements can be split into local deliveries, such as raw materials and aggregate from local quarries, and longer distance traffic with specific building materials, such as tiles and house fittings. Until a main contractor has been selected it is not possible to ascertain

the detailed construction methodology and supply of materials; therefore, a series of assumptions have been applied to inform this section of the chapter.

- 7.139 It is assumed that some construction activities and construction vehicles would be subject to some planning obligations and conditions. It is also assumed that these obligations may restrict working hours and the routes / times of heavy goods vehicles (HGV) traffic, which will be examined through application consultation.
- 7.140 For the purpose of this assessment it is assumed that the construction HGV traffic will be restricted to principal roads, including the B1050. Until the main contractor is appointed, it is not practical to determine where the supply of materials will originate and where any waste arising would be exported to. It can be assumed that the vast majority of construction activities will occur during daylight hours (typically 07:30-18:00 Monday to Friday), thus the timing deliveries can be programmed, as far as reasonably practical, to avoid peak hours and the A14 corridor during critical time periods.
- 7.141 For the 2007 outline application, an emerging CMS was substantially advanced and incorporated a range of obligations where the main contractor would programme and monitor construction traffic. A CMS has been submitted in support of this application that embraces these obligations and defines the anticipated construction HGV traffic routes, relative to the supply of materials, and therefore seeks to minimise the adverse impacts of construction traffic.
- 7.142 The CMS forecasts an average of 19 HGV movements per day (38 two-way HGV trips per day, or around four to five per hour) arising from the construction activities, in addition to construction staff. It is anticipated that the peak construction activities for the proposed development will occur in 2017 / 2018, when there could be up to 39 HGV movements per day.
- 7.143 The CMS outlines a series of obligations to minimise the environmental impacts of construction traffic to preserve the amenity of residents and other road users.
- 7.144 If no effort were made to avoid sensitive time periods, the quantum of construction HGV traffic would certainly have a temporary negligible adverse effect, relative to existing traffic flows. By concentrating construction traffic during other times, to mitigate the impact on sensitive receptors, the proportion of HGV would become more perceptible. Nevertheless, the temporary adverse effect will remain negligible and not significant.
- 7.145 With clearly defined routings that use principal routes, and movements programmed to avoid peak periods, there should be no residual effects on the rural roads around the site. There will, however, be very small percentage increases on the A14 and the primary roads (primarily the B1050) into the site. These will result in a temporary negligible adverse effect on these roads that will not be significant.

Effects post-construction

Overview of scenario

- 7.146 This section considers the impact of the proposed development in the completion year of 2021 (with development) in comparison with the future baseline scenario in 2021. The resulting impact for each environmental category on the selected roads is analysed below. Changes in traffic flows are examined in greater detail within the TA.
- 7.147 Generally, the CSRM reports that the impact of traffic arising from the proposed development results in very small changes in traffic flows over the wider area, as some trips redistribution to alternative routes. These traffic flow changes are very small, resulting in negligible changes to traffic flows on the assessment area network. In addition some trips are transferred to the CGB and associated park and ride sites. As these changes are very small the holistic impact is negligible.

Summary of the findings of the TA

- 7.148 The TA reveals that the proposed development will result in around 650-700 vehicles per hour (two-way) during the peak hours. As a result, many existing travel patterns will change, with modest changes to traffic flows across the sub-region. There will be modest increases on some roads and small reductions on others.
- 7.149 Transport modelling reveals that traffic flow increases are typically within the capacity limits of existing roads or junctions. A few junctions would operate at or above capacity, typically with marginal changes compared to those without development.
- 7.150 The A14 it is operating close to capacity, and without improvements will continue to operate in this way, contributing to subtle changes as travel demand increase. The land use and transport model reveals that there will be few material changes to traffic flows on the A14 and in the local area with the proposed development. Generally, where changes do occur they will be relatively small, revealing that some existing inter-urban trips on local roads redistribute onto other roads.
- 7.151 The effect of the proposed development on the A14 will be negligible; however, both government and local concerns with regards to the performance of the A14 are acknowledged. National policy suggests that any potential improvements to the SRN should be identified as part of the Regional Strategy on behalf of the Secretary of State. Any possible junction improvements must respect the general capacity of the corridor and, where possible, support more sustainable travel patterns.

Severance

- 7.152 The proposed development will involve development on both sides of parts of the B1050 Station Road and could therefore be expected to substantially alter the streetscape of the B1050 Station Road, enhancing the pedestrian and cycle environment. Whilst new crossings are proposed, these form part of a package of mitigation measures that are examined later in this chapter.
- 7.153 Table 7.8 reveals the levels of severance on the rural links, based on the thresholds in table 7.1. In most cases severance of rural roads can be classified as slight.

Table 7.8: Summary of post -construction severance

Link no.	Link road	2021 (Forecast) future baseline		2021 (Forecast) with development	
		AADT	Severance	AADT	Severance
1	Station Road	8926	Moderate	9041	Moderate
2	Rampton Road	4685	Slight	5149	Slight
3	Ramper Road	1725	Slight	2656	Slight
4	High Street, Longstanton	1689	Slight	2179	Slight
5	B1050, Longstanton Bypass	9990	Moderate	11605	Moderate
6	Bucking Way Road	5182	Slight	6417	Slight
7	School Lane	3443	Slight	3816	Slight
9	Oakington Road	7588	Slight	7385	Slight
10	Hatton's Road	14858	Moderate	17149	Severe
11	Water Lane, Oakington	7588	Slight	7385	Slight
12	Dry Drayton Road	12952	Moderate	12746	Moderate
13	A14 North of J28	76849	Severe	77115	Severe
14	A14 South of J28	84399	Severe	84305	Severe
15	A14 South of J29	107534	Severe	109441	Severe
16	A14 South of J30	106486	Severe	107829	Severe

- 7.154 The scale of change between 2021 future baseline and 2021 with development is negligible, based on the level of severance. With development severance remains, in general, consistent with future baseline levels.
- 7.155 In relation to the rural roads, the highest increase, in terms of vehicles is, as could be anticipated, on Hatton's Road; where the level of severance is adversely altered from moderate to severe. This is due to Hatton's Road, and the B1050, offering the most direct route from the site to and from the A14. Within Longstanton (links 4 and 7), severance remains slight and flows on the bypass (B1050) remain at moderate levels of severance.
- 7.156 Although the A14 severance remains severe with and without development in 2021, conditions do not materially change as a result of the proposed development; indeed, the ability for NMUs to cross the A14 is already restricted to existing bridges that will not materially change as a result of the proposed development.

7.157 Overall, severance levels on the local highway network remain comparatively stable between the with development and future baseline scenarios, with notable increases in traffic only seen on links that provide the most direct route to the A14 and that are suitable to accommodate such increases. Where these occur, there will be a permanent negligible adverse effect that will not be significant and will not be perceptible to most communities.

Pedestrian and cycle amenity

7.158 The proposed development can be expected to substantially alter the streetscape of the B1050 Station Road, enhancing the pedestrian and cycle environment. Again, some infrastructure improvements are proposed and are considered in the mitigation section of this chapter.

7.159 Table 7.9 provides a qualitative overview of the levels of pedestrian / cycle amenity with the proposed development, assuming infrastructure improvements have been undertaken.

7.160 As identified in the section above, severance typically worsens through increased levels of traffic flows. This will contribute to some reduction in pedestrian amenity, but not to a level to alter assessment levels.

Table 7.9: Summary of post-construction pedestrian / cycle amenity

Link no.	Link road	2021 (Forecast) future baseline	2021 (Forecast) with development
1	Station Road	Poor	Poor
2	Rampton Road	Poor	Poor
3	Ramper Road	Poor	Poor
4	High Street, Longstanton	Good	Good
5	B1050, Longstanton Bypass	Very poor	Very poor
6	Bucking Way Road	Poor	Poor
7	School Lane	Adequate	Adequate
9	Oakington Road	Poor	Poor
10	Hatton's Road	Adequate	Adequate
11	Water Lane, Oakington	Adequate	Adequate
12	Dry Drayton Road	Very poor	Very poor
13	A14 North of J28	Very poor	Very poor
14	A14 South of J28	Very poor	Very poor
15	A14 South of J29	Very poor	Very poor
16	A14 South of J30	Very poor	Very poor

7.161 Rampton Road is a public highway to Rampton Drift. As the trafficked road extends toward the CGB route, traffic volumes are modest and are unlikely to materially change. The route therefore functions as a quiet route, which is unlikely to change in terms of motorised traffic flow.

7.162 Within other villages, conditions are likely to remain static in most cases. As the redistribution of traffic result in small changes in traffic flows, without proposed mitigation measures, the proposed development will have a

permanent negligible adverse effect that will not be significant and will not be perceptible to most communities.

Driver stress and delay

- 7.163 The CSRM has been used to calculate average link speeds on the surrounding road network, following completion of the development, which are set out in table 7.10.
- 7.164 Table 7.8 provides a comparison of traffic flow changes between 2021 with development and 2021 future baseline scenarios. The patterns of change reflect the changing distribution of traffic flows on the surrounding network.

Table 7.10: Post-construction driver stress

Link no.	Link road	2011 (Forecast) future baseline		2021 (Forecast) with development	
		kph	Driver stress	Kph	Driver stress
1	Station Road	63	Moderate	62	Moderate
2	Rampton Road	66	Moderate	66	Moderate
3	Ramper Road	67	Moderate	66	Moderate
4	High Street, Longstanton	47	High	47	High
5	B1050, Longstanton Bypass	83	Low	80	Low
6	Bucking Way Road	66	Moderate	66	Moderate
7	School Lane	66	Moderate	66	Moderate
9	Oakington Road	75	Low	75	Low
10	Hatton's Road	66	High	66	High
11	Water Lane, Oakington	44	High	44	High
12	Dry Drayton Road	69	Moderate	68	Moderate
13	A14 North of J28	60	High	60	High
14	A14 South of J28	56	High	56	High
15	A14 South of J29	81	High	79	High
16	A14 South of J30	82	High	81	High

Note: Average speed estimated for whole link

- 7.165 Overall driver stress levels on the local highway network remain comparatively stable between the 'with development' and future baseline scenarios, with only minor decreases in traffic speed seen on links that provide the most direct routes to the A14.
- 7.166 The traffic flows close to the A14 are relatively high for the minor roads in the southern region of the study area. These roads therefore attract moderate or high levels of driver stress, as drivers are unable to choose their speed. Notwithstanding this, a number of these roads are relatively straight with reasonably good visibility affording some opportunity to overtake, particularly at off-peak times.
- 7.167 Hatton's Road is expected to reach high levels of driver stress in 2021, but this will occur with or without the development. Here the driving environment, with views or glimpses of open countryside, helps mitigate these conditions and the effects on drivers.

- 7.168 Other rural roads will see changes commensurate with the scale of redistributed traffic flows. Like most environmental impacts this provides a range of permanent minor adverse and beneficial impacts.
- 7.169 Comparing 2021 predictions with and without development, the effect on local roads includes some increases and subtle reductions. Without proposed mitigation measures, the development will have a permanent negligible adverse effect that will not be significant and will not be a material change for most drivers, as the CSRSM suggests very few trips will divert to alternative roads due to congestion and delay.

Road safety

- 7.170 There will be an increase in traffic flows with development in 2021 (table 7.8 refers). Generally an increase in traffic can result in a proportional increase in collisions and therefore personal injuries. However, higher flows also mean that traffic speeds are slower and this has a corresponding positive impact in terms of accident severity.
- 7.171 In most cases, a 1 mph reduction in average speed will correspond with a 5% reduction in personal injury accidents (Transport Research Laboratory, 2000, *TRL Report 421: The effects of driver speeds on the frequency of accidents*). From table 7.10 it is possible to conclude that some links will see negligible reductions in vehicle speeds and therefore should see some improvement in road safety. Taken together, the proposed development will have a negligible effect that will not be significant.

Effects post-construction summary

- 7.172 The detailed assessment of post-construction traffic conditions reveals that a moderate traffic environment is maintained within the study area. Severance remains generally slight or moderate within the settlements in the study area. The only road where the level of severance category is altered is on Hatton's Road. This is due to Hatton's Road offering one of the most direct routes from the site to and from the A14.
- 7.173 Driver stress is measured across the study area. Those areas that highlight 'high' levels of driver stress are present with and without development in 2021 and only affect the A14 link roads and direct roads leading to the A14, which have the capacity to accommodate additional vehicle flow.
- 7.174 The redistribution of traffic will result in some changes in traffic flows, but overall the proposed development will have a negligible effect post-construction, which will not be significant.

Mitigation

- 7.175 It is clear from a comparison of the CSRSM model results and this assessment that there will be largely permanent and temporary negligible adverse effects

over the local area as a result of the proposed development and its associated construction. However, the proposed development includes a package of measures that will further reduce any identified impacts. These include:

- A construction management strategy that will restrict HGV traffic to primary roads and programme these to avoid sensitive time periods
- A permeable network of footways and cycleways that link to external routes and avoid existing roads
- Enhanced access to high quality public transport services, with enhanced bus services on the B1050
- Site access junctions that preserve journey time reliability on local roads
- Rigorous resident, workplace and school travel plans to change travel characteristics

7.176 The site is adjacent to the route of the CGB, which opened in August 2011. The CGB provides a public transit system along the disused Cambridge to St Ives railway line between Huntingdon and Cambridge. A park and ride stop is located at Longstanton, immediately to the north of the proposed development site, with up to 16 services per hour in each direction between the park and ride and Cambridge and a further six services per hour extending north to Huntingdon.

7.177 Within the package of improvements associated with the proposed development will be enhancements to the 'Citi 5' bus service that currently provides a 20 minute frequency of service between Bar Hill and Cambridge. This will be extended to Longstanton and into the Northstowe site. Through this provision, in combination with the CGB, all houses at Northstowe will be within 400 m of a bus service offering at least a 20 minute frequency of service to Cambridge city centre, enhancing frequencies and access to a range of facilities for existing communities.

7.178 The proposals will alter the streetscape of the B1050 through the provision of development, where a series of pedestrian crossings will be provided to link development east and west of Station Road. This will provide a beneficial impact in terms of severance and pedestrian / cycle amenity. Based on the DMRB the provision of a crossing can reduce severance by up to 90%. As traffic flows are marginally above the moderate threshold, it would be reasonable to conclude the residual effect will be to reduce severance on Station Road to slight, delivering a net permanent negligible beneficial effect that will not be significant.

Residual effects

7.179 No significant residual effects are predicted.