TRANSPORT ASSESSMENT

ISLEY WOODHOUSE

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1.0 INTRODUCTION

1.1 Caesarea and Harworth Group commissioned ADC Infrastructure to provide transport advice in support of their proposed new settlement known as Isley Woodhouse. The location of the proposed development is shown at **Figure 1.1**. It surrounds the hamlet of Isley Walton, south of Donington Park Circuit and to the southwest of East Midlands Airport (EMA) in Leicestershire. The land is predominantly agricultural land with areas of woodland.

Figure 1.1: general site location

1.2 The proposed development comprises the delivery of a new settlement of 4,250 dwellings. In delivering a new settlement, a range of complimentary employment uses, services, and facilities are also proposed to ensure the new settlement is as self-contained and sustainable as possible. A full description of the development proposals is in Section 3.

1.3 The local planning authority responsible for determining the planning application is North West Leicestershire District Council (NWLDC), and Leicestershire County Council (LCC) are the local highway authority. National Highways (NH) has responsibility for the Strategic Road Network (SRN), which near the proposed development comprises the M1 motorway, including junctions 23A, 24, and 24A, the A42, A50 and A453.

Transport Working Group

1.4 To steer the transport assessment of the development, a Transport Working Group was established in May 2021, and it has met on an approximately monthly basis ever since. The Transport Working Group comprises representatives from LCC and NH, NWLDC, and also representatives from Derbyshire County Council (DCC), Nottinghamshire County Council (NCC), National Highways' term consultant (initially AECOM and since September 2024 Jacobs), the applicants and their planning consultants.

1.5 The Transport Working Group has considered all matters associated with the development proposal, although there has been a primary focus on the strategic traffic modelling necessary to understand the traffic impacts. The Transport Working Group have guided and agreed the inputs

to that modelling, grappling with matters such as the cumulative assessment and the status of surrounding planned and emerging development proposals such as the redevelopment of the Ratcliffe on Soar power station, the East Midlands Freeport, and draft Local Plan allocations.

East Midlands Growth Point

1.6 Through the discussions with the Transport Working Group, the Isley Woodhouse applicants have understood the emerging cumulative impacts on the strategic road network around M1 J24, including junctions 23A and 24A. They have formed a consortium with other interested parties to seek solutions under the banner of the "East Midlands Growth Point". The common ground within the consortium, and other stakeholders such as East Midlands Combined Authority, Midlands Connect, East Midlands Development Company, East Midlands Freeport, and the highway authorities (NH, LCC, NCC, DCC), is the need to upgrade infrastructure around the motorway network to allow for further economic growth.

1.7 Initial plans for significant new infrastructure have been developed and are currently undergoing testing. The work includes strategic traffic modelling and VISSIM microsimulation modelling. Hence, this Transport Assessment report does not include detailed modelling of the impact of the development at M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory or M1 Junction 24. These areas will instead be covered in an addendum report as the work on the East Midlands Growth Point advances, as detailed later in this report.

Scope of this Transport Assessment

1.8 This Transport Assessment has been produced to support the outline planning application for Isley Woodhouse. It is structured as follows.

- Section 2 provides a review of the relevant national and local planning policies.
- Section 3 details the location of the site, its existing use, and the development proposals including the proposed internal sustainable travel opportunities.
- Section 4 presents the travel demands and modal splits for the proposed development.
- Section 5 describes pedestrian travel – the baseline opportunities and proposed infrastructure.
- Section 6 describes cycle travel – the baseline opportunities and proposed infrastructure that will be introduced.
- Section 7 details the baseline opportunities for travel by bus and a strategy for ensuring the development is adequately served.
- Section 8 describes the baseline conditions and future opportunities for rail and tram travel.
- Section 9 details the agreed methodology for the strategic traffic modelling.
- Section 10 describes the baseline highway conditions including the existing highway network, the collision record, and the results of the base year modelling.
- Section 11 summarises the methodology used to calculate the proposed development traffic and details how this traffic was routed through the strategic traffic model to key areas.
- Section 12 analyses the stage 1 modelling and defines an initial study area for further assessment.
- Section 13 details the proposed access junctions, and the capacity modelling and road safety audits of those junctions.
- Section 14 details the assessment of the off-site study area junctions.
- Section 15 describes the proposed highway mitigation.
- Section 16 presents the summary and conclusions.

1.9 This Transport Assessment has been prepared with reference to the government's national Planning Practice Guidance[1]. It seeks to demonstrate that the objectives of the National Planning Policy Framework[2] are met. A separate Framework Travel Plan has been prepared to support the application and forms part of the mitigation strategy.

[1] https://www.gov.uk/government/collections/planning-practice-guidance
[2] National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2024

2.0 POLICY AND SUPPORTING DOCUMENT REVIEW

National Planning Policy Framework

2.1 The National Planning Policy Framework (NPPF) sets out the government's planning policies for England and how these should be applied. The NPPF was first published in March 2012 and was last updated in December 2024. Chapter 9 of the NPPF is titled Promoting sustainable transport.

2.2 Paragraph 109 states that,

"Transport issues should be considered from the earliest stages of plan-making and development proposals, using a vision-led approach to identify transport solutions that deliver well-designed, sustainable and popular places. This should involve:

a) making transport considerations an important part of early engagement with local communities;

b) ensuring patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places;

c) understanding and addressing the potential impacts of development on transport networks;

d) realising opportunities from existing or proposed transport infrastructure, and changing transport technology and usage – for example in relation to the scale, location or density of development that can be accommodated;

e) identifying and pursuing opportunities to promote walking, cycling and public transport use; and

f) identifying, assessing and taking into account the environmental impacts of traffic and transport infrastructure – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains."

2.3 Paragraph 115 states that,

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) sustainable transport modes are prioritised taking account of the vision for the site, the type of development and its location

b) safe and suitable access to the site can be achieved for all users;

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code48; and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree through a vision-led approach."

2.4 Paragraph 116 states that,

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios."

Department for Transport Circular 01/22

2.5 Department for Transport (DfT) Circular 01/22[3] provides an overview of the principles of sustainable development in the context of the Strategic Road Network (SRN). The guidance notes that new development should be located in sustainable locations or locations that can be made sustainable, and that sustainable infrastructure must be delivered alongside or ahead of occupancy. Sustainable travel must be the natural first choice for those able to use it.

2.6 The Circular recognises that transport planning needs to move away from predicting future demand to provide capacity, to instead set an ideal outcome and provide solutions to deliver this vision (moving from 'Predict and Provide' to 'Decide and Provide'). Capacity enhancements to the SRN will be considered on a case-by-case basis. Enhancements should improve community connectivity and public transport accessibility. Any scheme proposing modifications to the SRN is required to undertake a Walking, Cycling, and Horse-riding Assessment (WCHAR) to identify improvement opportunities and follow the Road Safety Audit Assessment process. Planned improvements to the SRN must include the consideration or development of safe and integrated networks for pedestrians, wheelers, cyclists, and horse-riders.

2.7 The Circular provides information on the role of NH in decision-taking. In decision making, it is expected that developers promote sustainable transport ahead of new capacity enhancements to the SRN. In residential developments, consideration should be given to street layout, broadband, cycle parking and access to amenities and open space. Large schemes should provide mobility or micro-mobility hubs. High-powered, open-access EV charge points should be provided where developments include on-street or communal parking.

Leicestershire Strategic Growth Plan

2.8 The Leicestershire Strategic Growth Plan was published in 2018 and outlines a comprehensive strategy for sustainable development and growth in the region until 2050. Focused on the Leicester and Leicestershire area, the plan aims to address housing needs, economic growth, infrastructure, and environmental sustainability. Whilst it is a non-statutory plan, it sets out an agreed strategy that is to be delivered through Local Plans.

2.9 The Strategic Growth Plan identifies that around 187,000 new dwellings will be needed between 2011 and 2050 to house the area's growing population, with 96,580 required by 2031 and a further 90,516 by 2050. In addition, it was also estimated that between 367 and 423 hectares of employment land will be required by 2031 to meet future demand.

2.10 The Strategic Growth Plan discusses the Leicestershire International Gateway. Highlighted in purple on **Figure 2.1**, the Leicestershire International Gateway is centred around the northern part of the A42 and M1 corridor. Viewed as an area of significant long-term strategic growth, the Leicestershire International Gateway provides major high-quality employment centres, most notably East Midlands Gateway (EMG), East Midlands Airport (EMA), Castle Donington Distribution Centre, and planned development around the airport as part of the East Midlands Freeport and Ratcliffe on Soar power station.

2.11 The Strategic Growth Plan is clear in its desire to provide the required levels of housing to support the planned employment growth in the area, as a matter of priority. Overall, it is estimated that the area has the potential to accommodate up to 11,200 new homes.

[3] Circular 01/22 Strategic road network and the delivery of sustainable development, Department for Transport and National Highways, December 2022

2.12 **Figure 2.1** shows that Isley Woodhouse will be at the heart of the Leicestershire International Gateway and is therefore well placed to support the growth ambitions of the Strategic Growth Plan.

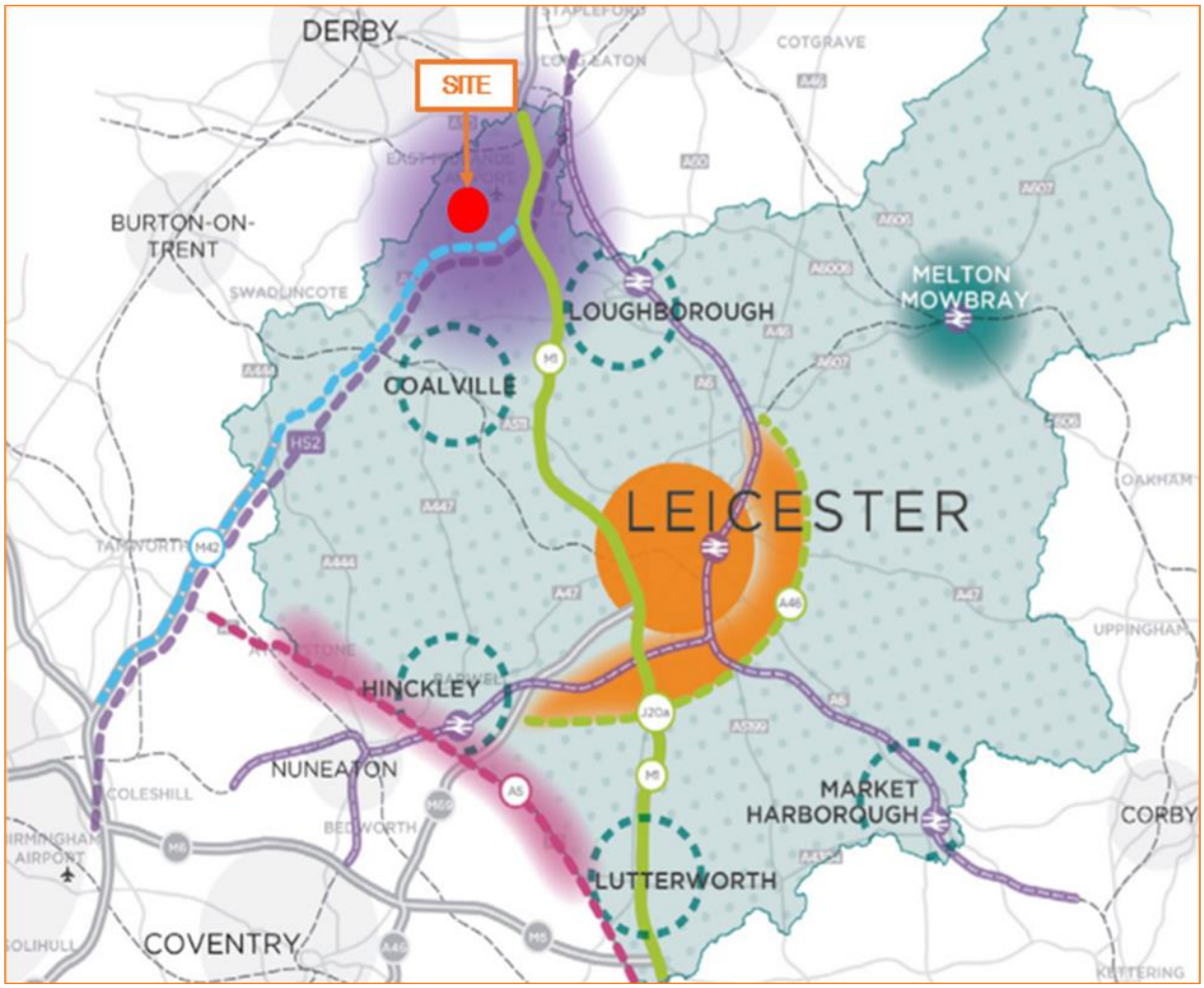

Figure 2.1: extract from the Leicestershire Strategic Growth Plan (Leicestershire International Gateway highlighted in purple)

Leicestershire Local Transport Plan 4 (LTP4)

2.13 The LTP4 sets out a vision for transport in Leicestershire to 2050 and will be developed in three phases. The first phase comprises the Core Document[4] and was adopted on 22 November 2024. The remaining phases will be under development between summer 2024 and spring 2026.

2.14 The LTP4 vision for transport across Leicestershire is, "*Delivering a safe and connected transport network which is resilient and well-maintained to support the ambitions and health of our communities, deliver economic prosperity whilst safeguarding our environment*."

2.15 LTP4 has six core policies as set out below:

> *"Core Policy 1: Delivering the vision - Delivering a safe and connected transport network which is resilient and well-maintained to support the ambitions and health of our communities, deliver economic prosperity whilst safeguarding our environment.*

[4] Leicestershire County Council (November 2024) A Local Transport Plan for Leicestershire Core Document 2026-2040

Core Policy 2: Managing demand - Delivering a safe, accessible, connected and resilient transport network that is well managed and enables communities to access jobs, education and services. The network will also enable efficient movement and delivery of goods to support the local, regional and international markets.

Core Policy 3: Enabling travel choice - Enabling travel choice in all of our communities that reflects their unique needs which ensures their safety whilst promoting health & wellbeing and protecting the environment.

Core Policy 4: Delivering solutions - Work collaboratively to identify and develop innovative transport related solutions which provide good value for money and enable travel choice, improve our transport network users' experiences, and benefit the environment and the health and wellbeing of our communities.

Core Policy 5: Embracing innovation - Embrace innovation and collaboration, which enables us to decarbonise transport and adapt to climate change to ensure a resilient transport network, while benefiting the environment and promoting the health and wellbeing of our communities.

Core Policy 6: Evaluating progress - Utilise data, monitoring and evaluation of our transport solutions to enable evidence based programmes, provide a flexible approach to policy development, technology, and innovation to address changes and challenges which impact our communities."

North West Leicestershire Economic Growth Plan

2.16 The North West Leicestershire Economic Growth Plan 2022-2025 (NWLEGP) was produced by North West Leicestershire District Council and identifies priority sectors that the district is targeting for major economic growth, and sets out a framework for delivery of priorities, objectives and steering resources. The Growth Plan adopts and aligns with the principles and properties outlined in the Leicestershire Strategic Growth Plan, including priorities to create the conditions for new investment and growth.

2.17 The NWLEGP sets out an objective to work with a range of partners to maximise the provision of affordable housing within North West Leicestershire to ensure that residents have access to good quality affordable housing. The plan also aims to ensure that there are sufficient employment sites and premises in the district. The plan highlights the emerging East Midlands Freeport as a strong strategic infrastructure project that connects businesses in North West Leicestershire with the wider world.

2.18 The NWLEGP sets out how, with consideration of the Local Plan, the planning process can support the increased use of sustainable technologies and renewable energy, both in residential and commercial developments. It also sets out how LCC will work with public transport operators to encourage the transition from traditional vehicles to more sustainable options.

North West Leicestershire Local Plan (2011 – 2031)

2.19 The adopted Local Plan (2011-2031) was formally adopted on 21 November 2017. Subsequently the plan was subject to a partial review, and the amended Local Plan was adopted in March 2021[5].

[5] North West Leicestershire Local Plan, North West Leicestershire District Council, March 2021

2.20 The adopted Local Plan details the need for a range of infrastructure to be provided. Policy IF1 – *Development and Infrastructure*, outlines how new development should support and make contributions to physical, social, and green infrastructure in order to mitigate its impact upon the environment and communities. The policy details the type of infrastructure required to support new developments which includes, but is not limited to:

a) Affordable housing; and
b) Community Infrastructure including education, health, cultural facilities and other public services; and
c) Transport including highways, footpaths and cycleways, public transport and associated facilities; and
d) Green infrastructure including open space, sport and recreation, National Forest planting (either new provision or enhancement of existing sites) and provision of or improvements to sites of nature conservation value; and
e) The provision of superfast broadband communications; and
f) Utilities and waste; and
g) Flood prevention and sustainable drainage.

2.21 Policy 1F4 – *Transport Infrastructure and new development*, details the requirements of new development in terms of transport infrastructure provision. The policy highlights how land use and transport must be planned together to give people genuine choice of travel and increase the use of sustainable transport modes. Policy IF4 outlines how new and improved transport infrastructure, and making the best of existing infrastructure, is vital to achieving the objective of sustainable development.

2.22 The Council, working with the highway authorities, will ensure that development takes account of the impact upon the highway network and the environment, including climate change, and incorporates safe and accessible connections to the transport network to enable travel choice, including by non-car modes, for residents, businesses and employees. In assessing proposals regard will be had to any Transport Assessment/Statement and Travel Plan prepared to support the application.

2.23 New development will be expected to maximise accessibility by sustainable modes of transport, having regard to the nature and location of the development site, and contribute towards improvement of the following where there is a demonstrable impact as a result of the proposed development:

a) The provision of cycle links within and beyond sites so as to create a network of cycleways across the district, including linkages to key Green Infrastructure;
b) The provision of public footpath links within and beyond sites so as to enhance the network of footpaths across the district, including linkages to key Green Infrastructure;
c) The provision of new public transport services, or the enhancement of existing services, to serve new developments so that accessibility by non-car modes to essential services and facilities, such as shops, schools and employment, is maximised.
d) Where new development has a demonstrable impact upon the highway network contributions towards improvements will be sought commensurate with the impact'.

North West Leicestershire Strategic Housing and Economic Land Availability Assessment

2.24 The NPPF requires local planning authorities to have a clear understanding of the land available for potential developments in their areas. NWLDC produce a Strategic Housing and Economic Land Availability Assessment (SHELAA) for this purpose. The SHELAA is used as evidence when producing the next Local Plan.

2.25 The latest SHELAA was produced in 2021 and contains two appendices, one assessing potential housing sites and one assessing potential employment sites. Isley Woodhouse appears in both appendices and is considered potentially achievable for both residential and employment development.

North West Leicestershire New Local Plan

2.26 NWLDC are currently preparing a new Local Plan (2020 – 2040), which is scheduled to be adopted in October 2026. The Plan has progressed through various stages. In January 2024 the Council published the proposed housing and employment allocations. Isley Woodhouse was identified as a new settlement and a draft allocation under policy IW1. NWLDC undertook a period of consultation in February/March 2024 and are analysing the responses to the consultation. In November 2024 the Council confirmed their commitment to the new settlement following the consultation.

2.27 Draft policy IW1 states the following.

New Settlement: Isley Woodhouse (IW1)

(1) Land to the south of East Midlands Airport and Donington Park Circuit and to the west of Diseworth (316Ha) is allocated for a new, standalone village. When complete, Isley Woodhouse village will comprise:

(a) Some 4,500 new homes, around 1,900 of which will be built by 2040.
(b) A mix of market and affordable homes, including plots of land for those who want to build their own home in accordance with draft Local Plan Policies H4, H5, H7 and H10.
(c) Homes suited to the elderly, and those who need care, such as bungalows, sheltered and extra care facilities, nursing or care homes in accordance with draft Local Plan Policies H4 and H11. 63 64
(d) Some 23,000sqm of employment floorspace (industry and warehousing) located along the A453 frontage to include start-up premises suitable for small businesses. By 2040 some 4,600 sqm of employment floorspace will have been delivered.
(e) Primary and secondary schools.
(f) A main village centre plus smaller neighbourhood centres with facilities such as convenience stores, pub/restaurant/cafes, health services, community venue etc.
(g) Formal and informal open space to include children's play areas, sports pitches, recreation routes and cycling and walking links.

(2) The planning and delivery of Isley Woodhouse will be underpinned by the following key principles:

(a) Putting the health and wellbeing of residents and workers at the forefront by creating an accessible, safe, sociable and inclusive environment where healthy choices are easy to make.
(b) Striving for carbon neutrality, including by incorporating measures to minimise energy consumption whilst maximising the benefits from on-site renewable energy generation and energy efficient buildings.
(c) Achieving exceptional design quality based on a bespoke design code.
(d) Delivering the infrastructure needed to serve the development.
(e) Making sustainable travel - walking cycling, public transport and the use of electric vehicles - a realistic option for residents and workers.

(f) Creating a village which caters for all stages of life.
(g) Ensuring residents' day to day needs can be met as far as possible within the village.
(h) Enabling people to live close to where they work by creating a village with a range of house types and tenures, including plentiful affordable housing, with sustainable transport links to nearby employment areas.

(3) A comprehensive masterplan and phasing plans are needed to bring the development forward. These must be approved by the District Council and should provide for:

(a) A mix of house sizes, tenures and types, including provision suited to older people and for self- and custom-built homes and which reflects the requirements of those in greatest need, in particular for affordable housing.
(b) The identification of essential infrastructure, including all necessary on-site and off-site highway improvements, and its delivery in a coordinated and timely way.
(c) A comprehensive landscaping strategy that retains, enhances and capitalises on existing landscape features and is informed by the Council's Landscape Sensitivity Study (2020).
(d) The achievement of national biodiversity net gain requirements as a minimum.
(e) The conservation and enhancement of heritage assets both on-site and within the vicinity of the site.
(f) A strategy to address the noise from East Midlands Airport and Donington Park Racing Circuit, including mitigation measures to protect the amenity of residents.
(g) Linked phasing plans for housing, employment and infrastructure.

(4) To ensure that a cohesive development is delivered which meets the principles and requirements outlined, the Council will only approve planning applications that adhere to the comprehensive masterplan (or any updated masterplan agreed with the Council) and the bespoke design code.

East Midlands Freeport

2.28 The East Midlands Freeport (EMF) was announced as a successful freeport bid by the UK Government in March 2021. The EMF will be the only inland Freeport in the UK and is intended to drive economic regeneration across the East Midlands. Freeports are special areas within the UK's borders where different economic regulations apply, providing tax relief to companies importing and exporting goods via a freeport. The EMF is comprised of three tax sites: East Midlands Airport and Gateway Cluster (EMAGIC), East Midlands Intermodal Park, and the Ratcliffe on Soar power station.

2.29 The EMF will benefit from the existing rail freight interchange at East Midlands Gateway, operated by Maritime, and existing and proposed railheads at Ratcliffe on Soar power station and East Midlands Intermodal Park. The freeport is expected to generate 61,700 jobs.

2.30 The North West Leicestershire Local Plan discusses the potential of the East Midlands Gateway and Airport area, *"Businesses will choose to locate and grow in this area, taking advantage of its excellent location in the centre of the country, close to major road networks and a major international airport."*

2.31 **Figure 2.2** below shows the outline of the portion of the proposed freeport situated in Leicestershire. Isley Woodhouse is in the southwest corner of the map. The freeport area south of the A453 and east of Diseworth is being developed by SEGRO, owners of East Midlands Gateway, and thus they call the development East Midlands Gateway Phase 2 (EMG2).

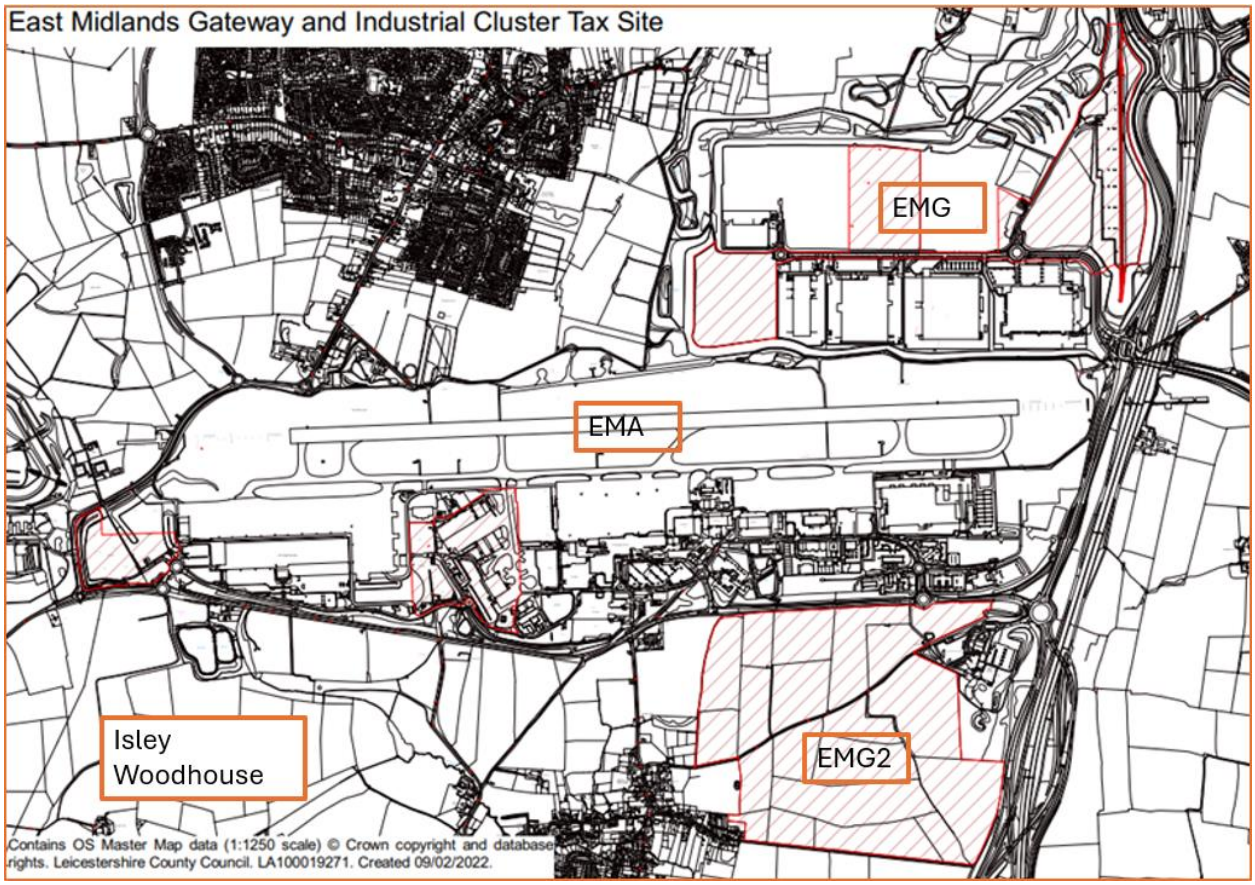

Figure 2.2: location of EMAGIC

2.32 The freeport will generate significant numbers of jobs close to Isley Woodhouse. Isley Woodhouse will assist in delivering the housing need to fill those jobs. That is a key aspect of the vision for Isley Woodhouse.

3.0 PROPOSED DEVELOPMENT

Site location and existing use

3.1 The site comprises approximately 313ha of land that is primarily in agricultural use. The significant scale of the site means that various other features are within the red line including farm dwellings, agricultural buildings, access tracks and the A453. A detailed description of all the features within the red line is contained in the Environmental Impact Assessment.

3.2 The site is approximately 800m west of Diseworth, 3.5km south of Castle Donington, 14km southeast of Derby, and 20km southwest of Nottingham. The site is bound by the A453, East Midlands Airport and Isley Walton to the north, and agricultural land to the east, northwest, west, and south. The site location is shown in **Figure 3.1**.

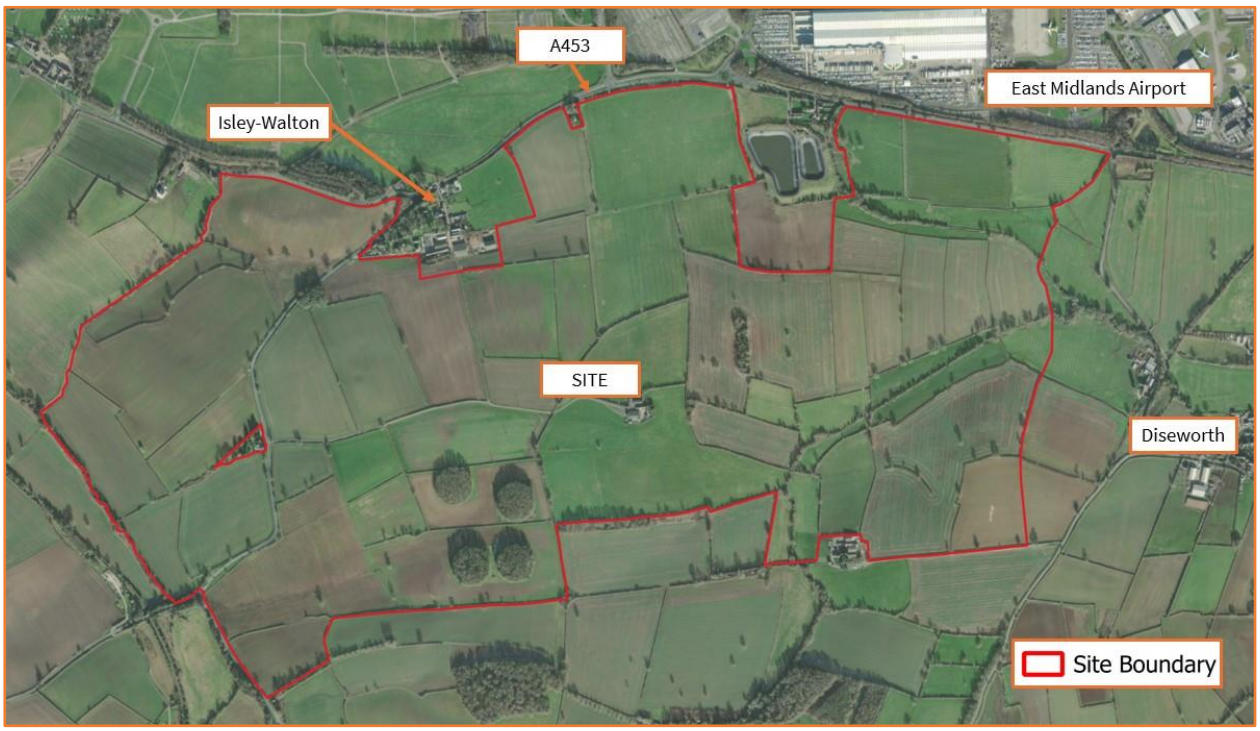

Figure 3.1: site location

Development concept and vision

3.3 As discussed in Section 2, the Leicestershire Strategic Growth Plan identifies a requirement to provide the required levels of housing to support the recent and planned employment growth around the Leicestershire International Gateway. In 2011 the estimated number of jobs in the area was around 15,000, but by 2022 this had grown to around 29,000. However, during the same period, the number of homes had only grown from around 6,200 to around 7,000. The number of jobs in the area is forecast to grow. The East Midlands Freeport, expansion of the airport, and other employment development coming forward will add to the jobs in the area.

3.4 The existing and proposed employment centres include East Midlands Airport, the DHL distribution hub, East Midlands Gateway, the proposed Freeport site south of the A453 (EMG2), significant employment sites at Castle Donington including the East Midlands Distribution Centre, the large ALDI Regional Distribution Centre, the proposed development of Ratcliffe on Soar power station, the employment centres on the western edge of Kegworth, and the University

of Nottingham Campus at Sutton Bonington. The majority of employees at these sites have no opportunity to live locally and have to travel considerable distances between home and work.

3.5 Hence, the vision for Isley Woodhouse is for an inherently sustainable new settlement, residential led, with a commitment to net-zero carbon at its core. Additional land-uses within the development will support the sustainability of the new settlement, delivering education, employment, retail, and leisure opportunities.

3.6 Within Isley Woodhouse, the distances to facilities will be short. There will be walkable neighbourhoods with the majority of journeys being undertaken on foot and by cycle. Car use will be minimised. Journeys to the existing and proposed employment sites outside Isley Woodhouse will be enabled, allowing employees to live close to work. The employment sites will be within ideal cycling distance and connected by excellent bus services. Again, car use will be minimised.

3.7 The walking, cycling, and public transport strategies for the new settlement are therefore a fundamental part of the net-zero carbon development objectives. During the lengthy build out time of the development, future technologies will become commonplace. Robot and drone deliveries, electric cars, driverless cars and buses, electric bikes, and car clubs are all part of the transport future that will manage travel demand and deliver the net-zero ambitions.

Development proposals

3.8 The proposed development comprises the delivery of a new settlement of 4,250 dwellings. In delivering a new settlement, a range of complimentary employment uses, services and facilities are included as part of the proposals to ensure the new settlement is as self-contained and sustainable as possible. The development proposals are detailed as follows:

- 4,250 dwellings
- vehicular access to the site via four new junctions on the A453
- a realignment of the A453 around the western end of the development – “the A453 diversion”
- a new secondary school
- two new primary schools (up to 3 form entry each)
- one large new local centre, to include:
  - convenience store Class E(a)
  - smaller mixed use retail units comprising Classes E(a), E(b) and take-away uses
  - assisted living and retirement accommodation
  - day nursery: Class E(c)(f)
  - public house E(b)
  - doctors’ surgery E(c)(e)
  - community uses Class F.2
- two smaller neighbourhood centres, to include:
  - small convenience store Class E(a)
  - smaller mixed use retail units comprising Classes E(a), E(b) and take-away uses
  - day nursery Class E(c)(f)
- supporting employment uses (Classes E, B2 & B8) over approximately 16ha
- green Infrastructure including open space, landscape and green corridors with informal and formal recreation, proposed and retained landscaping, sustainable urban drainage system (SuDs), extensive cycling and footpath connections and play space
- new sports facilities/pitches with changing and parking facilities
- associated infrastructure, including internal access, pedestrian and cycle crossings, utilities and drainage works, including SuDs.

3.9 The Parameters Plan and an illustrative masterplan are in **Appendix 1**. Technical Note E, which sets of the Development Schedule with floor areas, pupil numbers, etc is in **Appendix 2**. Following consultation with the local education authority (LCC), during the course of the transport assessment work the primary school provision has altered from three two-form entry schools to two three-form entry schools. The total number of primary school pupils is unchanged.

Reserved matters applications, the internal layout, and travel opportunities

3.10 The planning application is in outline, with all matters reserved apart from access, controlled by a Parameters Plan. The illustrative masterplan reflects the many aspects of the development that have been assessed, including noise and air quality, landscape impact and ecology, flood risk and drainage. The illustrative masterplan gives a framework for the development. It includes a movement framework, with an indicative road pattern, footpaths and pedestrian connections.

3.11 In due course reserved matters applications will come forward to show the layout details and matters such as parking provision. The delivery and acceptability of those matters will be dictated by the design guidance in force at the time, and any conditions that assert control over design coding. The highways aspects will be delivered in accordance with the Leicestershire Highway Design Guide. Its provisions are in line with Manual for Streets and will guide the details of the internal movement networks.

3.12 Isley Woodhouse is large, measuring approximately 3km east to west at its widest point. The proposed employment zones are on the northern boundary of the site, adjacent to the A453. The majority of the remainder of the site is proposed to be residential dwellings with three local centres, two primary schools, a secondary school and assorted leisure uses. At this stage it is not necessary to set out the detail of the internal roads, footpaths, cycle tracks, etc.

3.13 Nevertheless, the details would be delivered in line with the concept behind the masterplan, which is for the creation of walkable neighbourhoods to encourage pedestrian and cycle movement and internalise as many trips as possible. The 15-minute settlement concept is a key theme within the masterplan, with Isley Woodhouse intended to be a place where all your daily needs can be accessed within a 15-minute walk or short cycle journey from your home. The masterplan proposes three 'village' hubs to achieve this aim, with a range of retail, education and leisure opportunities provided at each.

3.14 The internal movement network would comprise of primary and secondary active travel routes designed with pedestrians and cyclists in mind, with integration into the primary streets network and the extensive green corridors. Residents and visitors would therefore have multiple routing options on high quality infrastructure when travelling within the settlement. By its very nature, subject to appropriate design, which can be controlled, the proposed development would be inherently sustainable.

3.15 The Design and Access Statement that accompanies the planning application includes further information about how the internal provisions will emerge. It includes precedent examples, and proposed road cross-sections. The expectation is that there will be conditions added to the consent to control design coding and development wide strategic infrastructure.

Phasing

3.16 The scale of the development means it will come forward in phases. Those phases will align with access proposals, the need to provide bus services, the delivery of the supporting facilities such

as the schools, and other commercial considerations. At this stage, Figure 3.2 shows the initial phasing proposals for indicative purposes only.

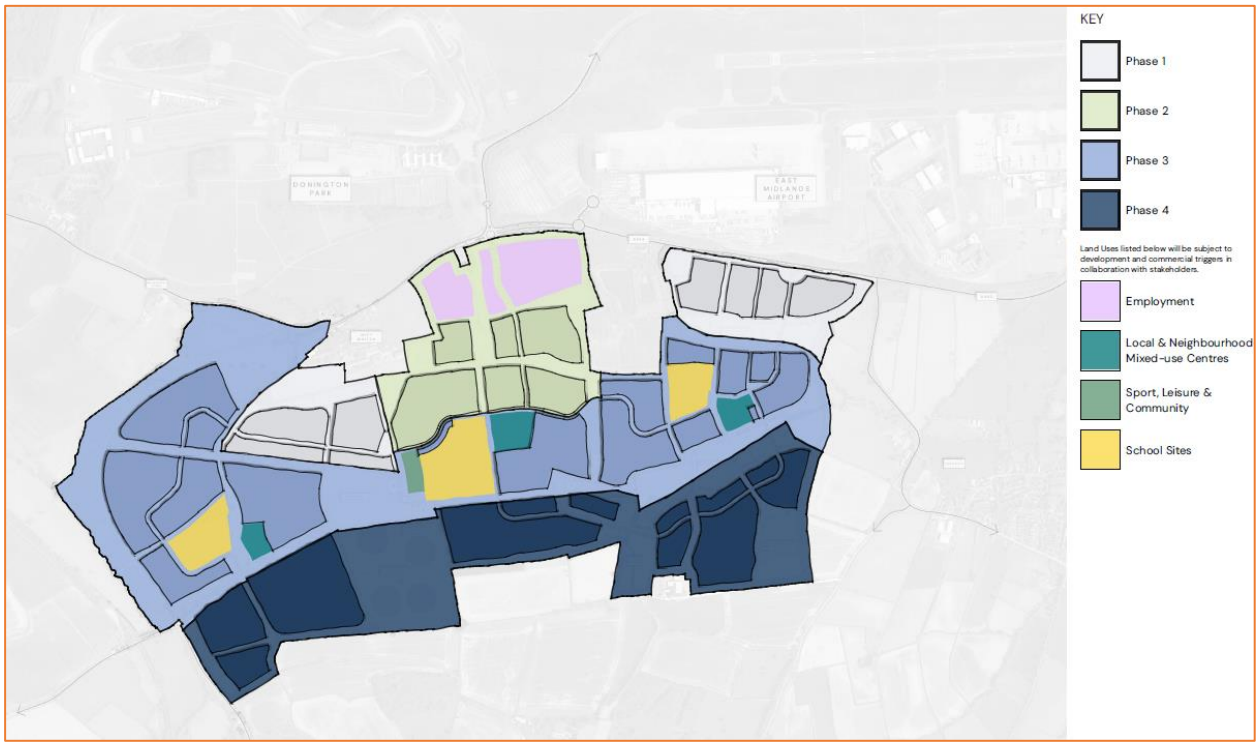

Figure 3.2: initial phasing proposals

3.17 The first phases are likely to be adjacent to the A453, on the northeastern part of the development, to take advantage of new access junctions on the A453 and the proximity to existing bus services. Development around the downgraded A453 at the western side of the development can only come forward once the A453 realignment is complete, and will therefore be part of later phases. **Figure 3.2** shows four phases, and as each would be substantial on its own, the phases will be broken down into sub-phases.

4.0 MODAL SHARE

4.1 Technical Note N in **Appendix 4** presents the forecast peak hour person trip generation for Isley Woodhouse. It assesses the baseline forecast, and targets for modal shift. The following is a summary.

Baseline forecast

4.2 Technical Note N presents calculations for each land use within the proposed Isley Woodhouse development and determines the number of peak hour trips that would be made by walking, cycling, car, car share, and public transport. Those forecasts are further divided into internal and external trips. The results for the morning and evening peak hours are shown in Section 8 of Technical Note N.

4.3 The figures can be thought of as the baseline forecast. They are derived from agreed estimates of the amount of traffic that would be generated, albeit those estimates were robust to ensure that traffic modelling does not underestimate the traffic impacts. The modal split for the external trips gives the following totals.

External person trips - morning peak hour						
Land-use	**Walk**	**Cycle**	**Car Driver**	**Car Passenger**	**Bus**	**Total trips**
Total	181	103	2,921	530	250	3,985
Modal share	4.5%	2.6%	73.3%	13.3%	6.3%	100.0%

External person trips - evening peak hour						
Land-use	**Walk**	**Cycle**	**Car Driver**	**Car Passenger**	**Public transport**	**Total trips**
Total	184	85	2,753	706	199	3,927
Modal share	4.7%	2.2%	70.1%	18.0%	5.1%	100.0%

Internal person trip targets

4.4 In keeping with the vision for Isley Woodhouse, target modal shares have been identified, which encourage a shift from single occupancy car trips. The target for internal trips is based on the National Travel Survey mode choice for trips up to one mile, and is shown in the table below.

Internal person trips - morning peak hour					
Land-use	**Active travel**	**Car Driver**	**Car Passenger**	**Public transport**	**Total trips**
target modal share	90.0%	6.0%	3.0%	1.0%	100.0%
Total	4,955	332	165	55	5,505

Internal person trips - evening peak hour					
Land-use	**Active travel**	**Car Driver**	**Car Passenger**	**Public transport**	**Total trips**
target modal share	90.0%	6.0%	3.0%	1.0%	100.0%
Total	3,407	227	113	37	3,784

4.5 As discussed in Sections 3 and 5, so that the internal mode share targets can be achieved, walkable neighbourhood principles will be implemented to ensure that the distances to facilities will be short. The internal movement network will comprise of primary and secondary active travel routes, with integration into the primary streets network and the extensive green corridors. Residents and visitors would therefore have multiple routing options on high-quality infrastructure when travelling within the settlement.

External person trip targets

4.6 Separate targets are identified for external trips to the local employment sites, and the remaining external trips.

4.7 The strategic traffic modelling using the East Midlands Freeport Model (described later in this report) relies on a gravity model to forecast the number of development vehicle trips to the local employment centres, which include the DHL distribution hub, EMA, the Pegasus Business Park, EMG, the Freeport development sites, the Ratcliffe on Soar power station development site, and employment sites in and around Castle Donington. The table below summarises the vehicle trips to these employment centres, showing that in the morning peak hour there would be 588 two-way trips between Isley Woodhouse and the local employment zones. That equates to 29% of the residential vehicle trips generated by Isley Woodhouse. In the evening peak hour there would be 562 two-way vehicle trips between Isley Woodhouse and the employment zones, which equates to 28% of the residential vehicle trips.

Isley Woodhouse residents' car trips to local employment - PRTM			
peak hour	residential traffic generation	total trips to local employment	% of residential traffic generation
morning	2,045	588	28.8%
evening	2,011	562	27.9%

4.8 The vehicle trips to the local employment zones represent a significant proportion of the overall traffic likely to be generated by the proposed development and can be targeted for modal change, in keeping with the vision for Isley Woodhouse. With the introduction of exemplar active travel infrastructure as part of the mitigation strategy, as set out in Sections 5 and 6, and the implementation of a public transport strategy discussed in Sections 7 and 8, there is no reason why most of these vehicle trips could not be transferred to active travel or public transport modes.

4.9 A target of 50% mode shift from single occupancy car trips on journeys between Isley Woodhouse and the local employment zones is proposed, which would equate to 294 two-way vehicle trips in the morning peak hour and 254 two-way vehicle trips in the evening peak hour. Of these trips, an initial assumption is that 80% would switch to cycling, 5% to walking, 10% to public transport, and 5% to car share. This reflects the fact that only EMA and the DHL hub within it would be within reasonable walking distance for Isley Woodhouse residents, whilst all other employment zones would be within comfortable cycling distance.

4.10 The remaining external trips are those made by residents of Isley Woodhouse who travel out to locations other than the identified local employment zones, and trip made from outside to facilities within Isley Woodhouse, such as to the schools, retail and leisure opportunities. Separate targets have been identified for these journeys, adopting more modest modal shift targets, as set out in Technical Note N.

4.11 Combining the separate targets for external trips to the local employment sites, and the remaining external trips, gives the total target figures shown in the table below. These figures can be compared with the baseline forecast above, and result in a reduction of 644 and 610 two-way traffic movements in the morning an evening peak hours, respectively.

External trips - AM peak with resultant modal split						
Land-use	**Walk**	**Cycle**	**Car Driver**	**Car Passenger**	**Public transport**	**Total trips**
local employment trips	38	250	294	78	66	725
other external trips	193	263	1,983	502	319	3,260
total	231	513	2,277	580	384	3,985
external mode split	5.8%	12.9%	57.1%	14.5%	9.6%	100%

External trips - PM peak with resultant modal change						
Land-use	**Walk**	**Cycle**	**Car Driver**	**Car Passenger**	**Public transport**	**Total trips**
local employment trips	43	240	281	85	61	710
other external trips	188	235	1,862	668	265	3,217
total	231	474	2,143	753	326	3,927
external mode split	5.9%	12.1%	54.6%	19.2%	8.3%	100%

5.0 WALKING

Baseline opportunities for pedestrian travel

5.1 *Guidelines for Providing for Journeys on Foot*[6] describes acceptable walking distances for pedestrians without mobility impairment. It suggests that for commuters and school pupils, up to 500m is the desirable walking distance, up to 1km is an acceptable walking distance, and up to 2km is the preferred maximum walking distance. The development site is large, being 3km across, and much of it is undeveloped greenfield land, with a consequent lack of existing pedestrian facilities.

5.2 Pedestrian facilities will therefore be introduced as Isley Woodhouse advances. Nevertheless, early phases of development will be on the northern side of the development, where existing locations such as Diseworth, Donington Park Circuit, and the DHL freight terminal at EMA would be within walking distance. The northern boundary of the development is where there is some existing infrastructure that could cater for the early occupants.

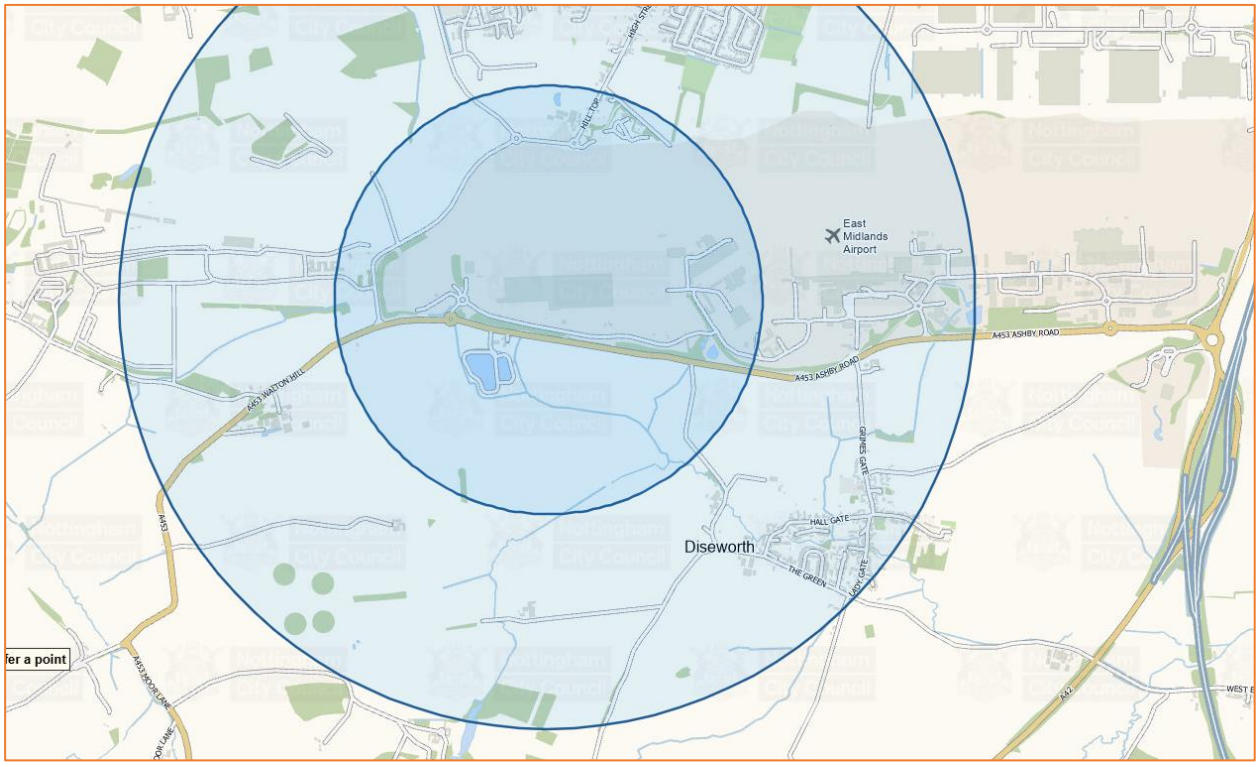

Figure 5.1: 1km and 2km crow fly catchments from the DHL freight terminal at EMA

5.3 There are no footways along the A453 as it passes through the western part of the site, except for limited pedestrian facilities within the hamlet of Isley Walton. There are no footways on the northern boundary of the site, except at and east of the A453/Airport Perimeter Road traffic signal controlled junction, located centrally on the site's northern border. There are uncontrolled pedestrian crossings on the junction's northern and eastern arms, linking to the existing footway network along the Airport Perimeter Road, and the short section of footway on the northern edge of the A453 between the A453/Airport Perimeter Road junction and the DHL access roundabout (**Figure 5.2**).

[6] Guidelines for Providing for Journeys on Foot, Institution of Highways and Transportation, 2000

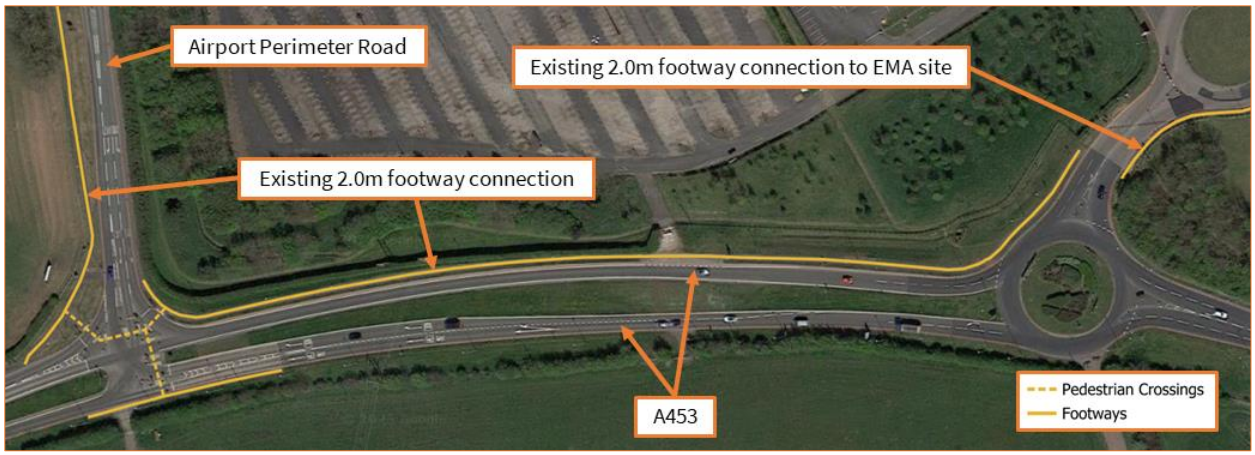

Figure 5.2: existing footways and pedestrian crossings along the A453

5.4 The footway on the western side of the Airport Perimeter Road continues northwards from the A453 to the Donington Park access, whereafter it becomes a shared footway/cycleway. The shared footway/cycleway continues to the roundabout at Top Hill on the southern outskirts of Castle Donington. Thereafter it continues as a footway, as part of the continuous network throughout Castle Donington.

5.5 On the way to Top Hill, the shared footway/cycleway ties into the Castle Donington bypass, where there is a continuous route on its eastern side, providing a continuous pedestrian link to the employment areas to the north of Castle Donington.

5.6 There is, therefore, a continuous pedestrian link from the site to Castle Donington and its surroundings, albeit the majority of the town and its associated employment opportunities are 4km to 5km from the centre of the site and therefore outside of the recommended maximum walking distance.

5.7 As shown on **Figure 5.2**, the existing footway network extends eastwards from A453/Airport Perimeter Road junction for approximately 500m along the A453, before diverting into the airport. The roads within the airport are privately maintained, though the public may use them when accessing the airport and the businesses operating there.

5.8 The footway network continues along the airport's internal road network, with Zebra crossings at regular intervals, providing connectivity to the DHL freight terminal, the main airport terminal buildings, various hotels, businesses, and the Pegasus Business Park located at the eastern end of the EMA site. As shown by Figure 5.1, a number of these locations would be within 2km walking distance of the new residents.

5.9 In addition to the footways provided alongside the EMA internal road network, there is a publicly accessible permissive footpath, known as the Airport Trail, which runs around the perimeter of the airport (**Figure 5.3**). The majority of the Airport Trail is on land owned by EMA and the owner of Field Farm, with the exception of the western airport perimeter road, where it joins the shared use path described above. Currently, the majority of the Airport Trail is on unsurfaced paths. However, its alignment with the A453, and segregation from the carriageway, means that it provides an excellent pedestrian/cycling facility that could be further enhanced to accommodate intensification of use.

5.10 Discussions between the Isley Woodhouse applicants and the owners of the Airport Trail are ongoing about what changes would be permitted. Nevertheless, as described in the cycling section below, the Airport Trail is included in NWLDC's LCWIP. Therefore, it is anticipated that a

contribution could be made by the applicants to secure enhancements to the route, despite the third party ownership, which would deliver improved pedestrian connections around the airport.

Figure 5.3: the Airport Trail Path

5.11 Public footpaths that pass within the red line are the L89 and L98. Each footpath is split into sub-routes as shown on **Figure 5.4**.

Figure 5.4: Public Rights of Way within the vicinity of the site.

5.12 Of note, is footpath L89a/1 that links the eastern part of the site to Diseworth. It intersects with the L89/1 and L89/2 footpaths just south of the two reservoirs. From this intersection, footpath L89/1 runs north out of the site, passes immediately west of the two reservoirs, crosses the A453 at the DHL roundabout, and passes through the car park at the western end of the airport. From the same intersection, footpath L89/2 runs south through the site, intersects with footpath L98a/1, becomes footpath L89/3, and exits the site west of Woodhouse Farm.

5.13 There are various other footpaths, as seen on Figure 5.4, including the footpath M10/1 at the western end of the development that links to the Cloud Trail. Overall, there are excellent

connections from the development site to the local network of public rights of way that residents of the proposed development could use for leisure and for access to neighbouring local villages including Diseworth, Wilson, and Tonge.

Future pedestrian infrastructure

5.14 As explained above, the pedestrian catchment of off-site attractions for the new settlement would be relatively limited. However, the new settlement would include extensive provisions throughout, to link residents with education, healthcare, retail, and leisure facilities. The proposed development would be focussed around three local centres, and have two primary schools, as a well as a centrally located secondary school.

5.15 Manual for Streets describes a walkable neighbourhood (para 4.4.1) as, "*typically characterised by having a range of facilities within 10 minutes (up to about 800m) walking distance of residential areas which residents may access comfortably on foot. However, this is not an upper limit and PPS13 states that walking offers the greatest potential to replace short car trips, particularly those under 2km.*" Taking that 800m walking distance, **Figure 5.5** shows 800m buffers around the local centre and two neighbourhood centres. It is therefore clear that all residents will be within 800m of a local centre, and 95% will be within 1km of a primary school. The secondary school will be in the centre of the development, meaning that approximately 70% of residents will be within 1km walking distance, and all will be within 2km.

Figure 5.5: walking catchments of 800m from each of the neighbourhood centres, and 800m and 2km from the central local centre

5.16 As noted above, the internal movement network will be designed in accordance with the Leicestershire Highway Design Guide and will comprise of primary and secondary active travel routes designed with pedestrians and cyclists in mind, with integration into the primary streets network and the extensive green corridors. Residents and visitors would therefore have multiple routing options on high-quality infrastructure when travelling within the settlement.

5.17 Section 13 details the proposed access strategy for Isley Woodhouse. Section 6 describes the proposed cycling strategy. Those sections describe in more detail the pedestrian provisions delivered with the accesses and cycle proposals. In summary, they include the following pedestrian infrastructure:

- segregated footways and cycleways on the site access roads on the approaches to the A453/access junctions
- along the A453 diversion, an 8m wide grass verge to allow for future provisions associated with the Growth Point scheme, described below, of a 2m wide footway and a 4m wide bi-directional cycleway separated from the carriageway by a 2m wide verge
- dropped kerb crossing points along the A453 realignment to enable access to the public open space to the west
- crossing points at the northwestern and southwestern A453/access roundabouts comprising of dropped kerbs and tactile paving
- signal controlled pedestrian and cycle crossings of the A453 at the A453/central access roundabout
- to the north of the central access roundabout, a bi-directional cycle track and segregated footway on the eastern side of the Airport Perimeter Road
- signal controlled pedestrian and cycle crossings of the A453 at the A453/eastern access junction
- a Toucan crossing to the west of the A453/DHL roundabout
- a Toucan crossing to the west of the proposed eastern site access junction to provide a connection to the airport's road network and bus stops
- footway/cycleway provisions along the A453 between the central and eastern site access junctions
- to the east of the eastern site access junction, a bi-directional cycle track with segregated footway on the northern side of the A453 to provide a connection to EMA, EMG, and EMG2.

6.0 CYCLING

Introduction

6.1 As discussed in Sections 2 and 3 of this report, the Leicestershire Strategic Growth Plan aims to provide the required levels of housing to support the recent and planned employment growth within the Leicestershire International Gateway. Between 2011 and 2022 the estimated number of jobs in the area had grown by around 14,000, but the number of homes had grown by just 800. Hence, most employees have no opportunity to live locally. The location of the proposed new settlement has been strategically positioned to co-locate homes, and therefore people, within cycling distance of a significant number of the current and proposed employment sites.

6.2 This Section of the Transport Assessment report defines the catchment of the proposed development in terms of the opportunities for cycling and details the existing facilities within the catchment. The anticipated demand for cycling trips within the catchment area is identified and the proposed enhancements to the cycling network to facilitate these trips are detailed.

Cycle catchments

6.3 Statistics from the National Travel Survey 2023 indicate that the average length of a cycle journey is approximately 4.8km. A 5km catchment from the centre of the site is shown in **Figure 6.1**. Castle Donington, Diseworth, Wilson, Breedon on the Hill, the eastern edge of Melbourne, and EMA would be within a 5km cycle of the centre of the site.

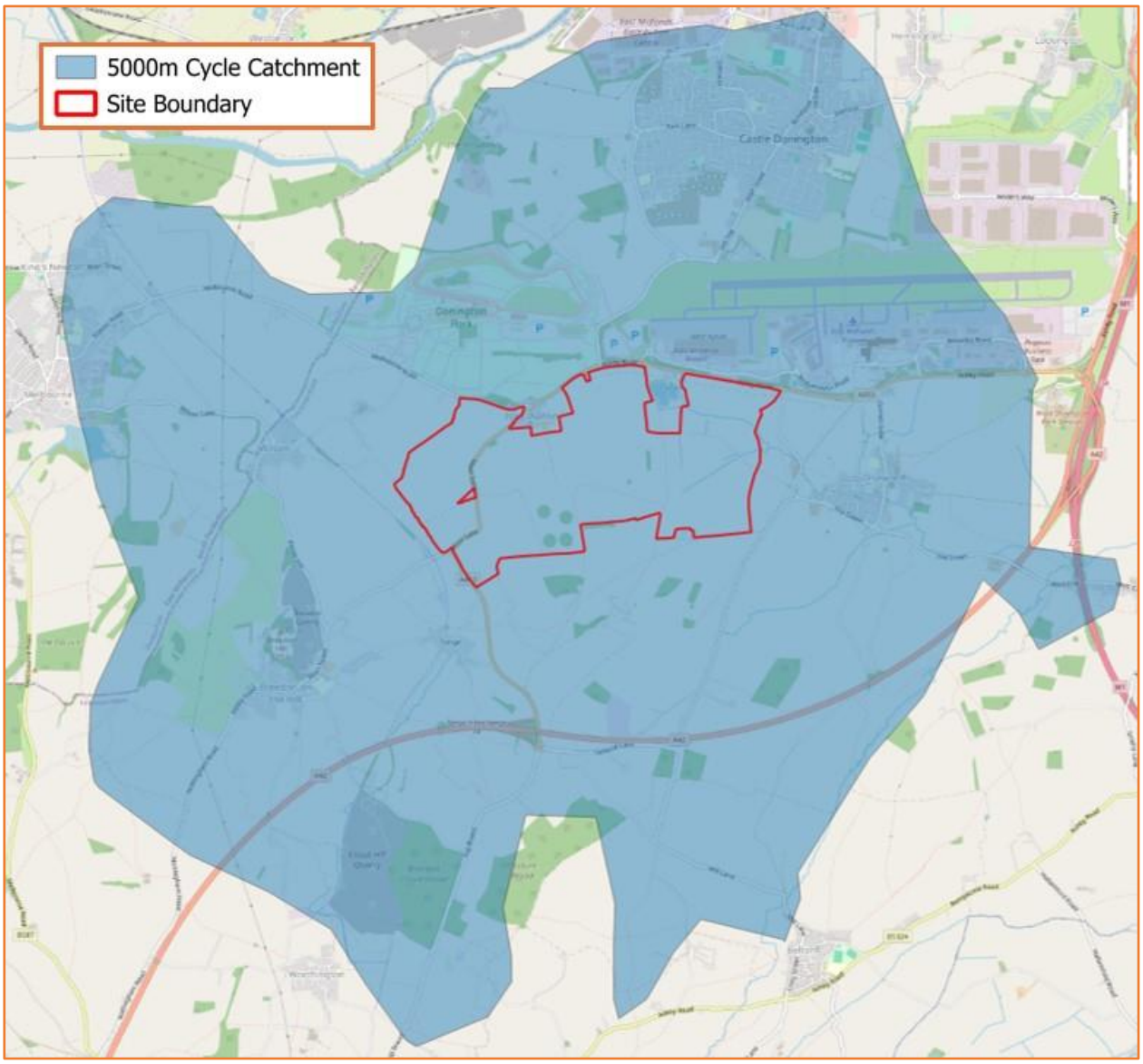

Figure 6.1: 5km cycle catchment

6.4 However, cyclists will commute significantly longer distances than 5km if the topography and highway conditions are favourable. DfT guidance notes that *"Cycling has the potential to replace trips made by other modes, typically up to 10km"*. In addition, E-bikes are becoming increasingly prominent in the UK. Modern e-bikes are light, reliable, cost-effective, and make commuting by bicycle a realistic alternative to car travel, especially within areas with a hilly topography, or for people with reduced mobility, expanding the effective cycle catchment.

6.5 The average cycling speed is between 15kph and 20kph and, therefore, in accordance with DfT guidance for cycle trips of up to 10km, a 40 minutes cycle range has been considered. The major employment attractors within approximately 40 minutes cycle time of the site are highlighted on **Figure 6.2**. These include EMA, the DHL hub at EMA, EMG, the proposed Freeport site south of the A453 (EMG2), the Castle Donington employment sites including the East Midlands Distribution Centre, the large ALDI Regional Distribution Centre and its neighbouring site at Junction 1 of the A50, and Ratcliffe on Soar power station. Also within reach would be the employment centres in Kegworth and the University of Nottingham Campus at Sutton Bonington.

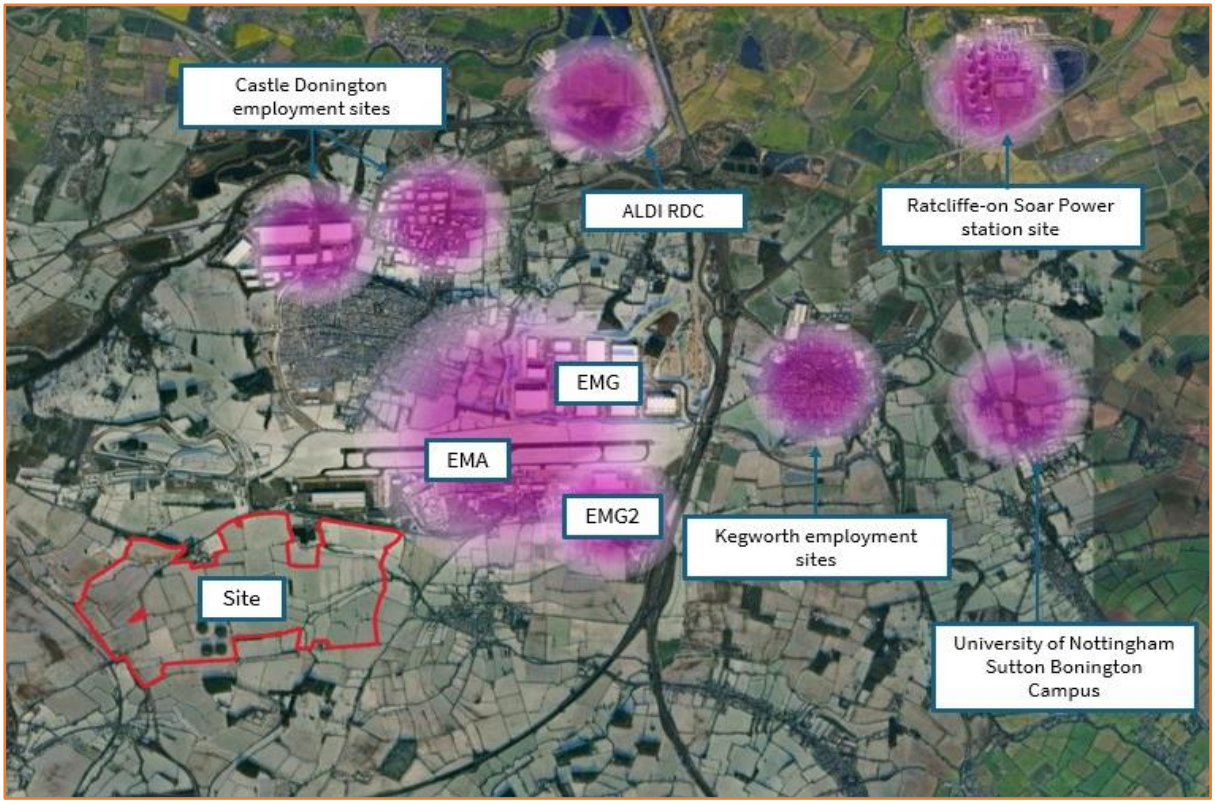

Figure 6.2: key employment attractors

6.6 **Figure 6.3** below shows the approximate time it would take for an average commuter to cycle from Isley Woodhouse to these employment centres, based upon an average speed of 15kph. The DHL hub, EMA and EMG are within 5 to 20 minutes cycling time. The EMG2 Freeport site is within 10 minutes. This places a significant number of jobs within easy cycling distance of Isley Woodhouse. The employment, retail, leisure and education opportunities within Castle Donington, and the major employment sites to the north including the East Midlands Distribution Centre are within 20 to 25 minutes cycling time.

6.7 Cyclists commuting as far as the Aldi Regional Distribution Centre at A50 Junction 1, Kegworth, the University of Nottingham's Sutton Bonington Campus, Ratcliffe on Soar power station site, Long Eaton, Shepshed, and the northern parts of Loughborough are also within the 40-minute cycle catchment, and the distance barrier is likely to reduce as infrastructure improves and e-bike technology takes off.

Figure 6.3: approximate cycling times (variance due to origin within the site)

6.8 Isley Woodhouse will also be an attractor for cycle journeys from the surrounding area. The residents of Castle Donington will be within comfortable cycling distance of the education, employment, retail, and leisure facilities provided by Isley Woodhouse.

6.9 The proposed development is therefore located within acceptable cycling distance of a large amount of existing and committed employment development, situating it in an ideal location for potential employees to commute by bicycle and e-bike.

Existing cycle infrastructure

6.10 The existing cycle infrastructure relevant to the proposed development is shown on **Figure 6.4**. There are no dedicated cycle facilities along the A453 between A42 Junction 14 and M1 Junction 23A, including along the site frontage, and the 50mph speed limit for most of the distance means it is not conducive for on-carriageway cycling. At the existing A453/Airport Perimeter Road traffic signal controlled T-junction there are uncontrolled crossing facilities on the A453 east and Airport Perimeter Road arms.

6.11 There is a shared footway/cycleway along the western side of the Airport Perimeter Road from the Donington Park access to the roundabout with Hill Top on the southern edge of Castle Donington. The width of the facility varies between 2m and 3m. This route connects with the shared footway/cycleway along the Castle Donington bypass via an uncontrolled crossing at the roundabout. The shared footway/cycleway along the Castle Donington bypass is 3.0m wide and provides an excellent cycle link to the employment areas to the north of Castle Donington.

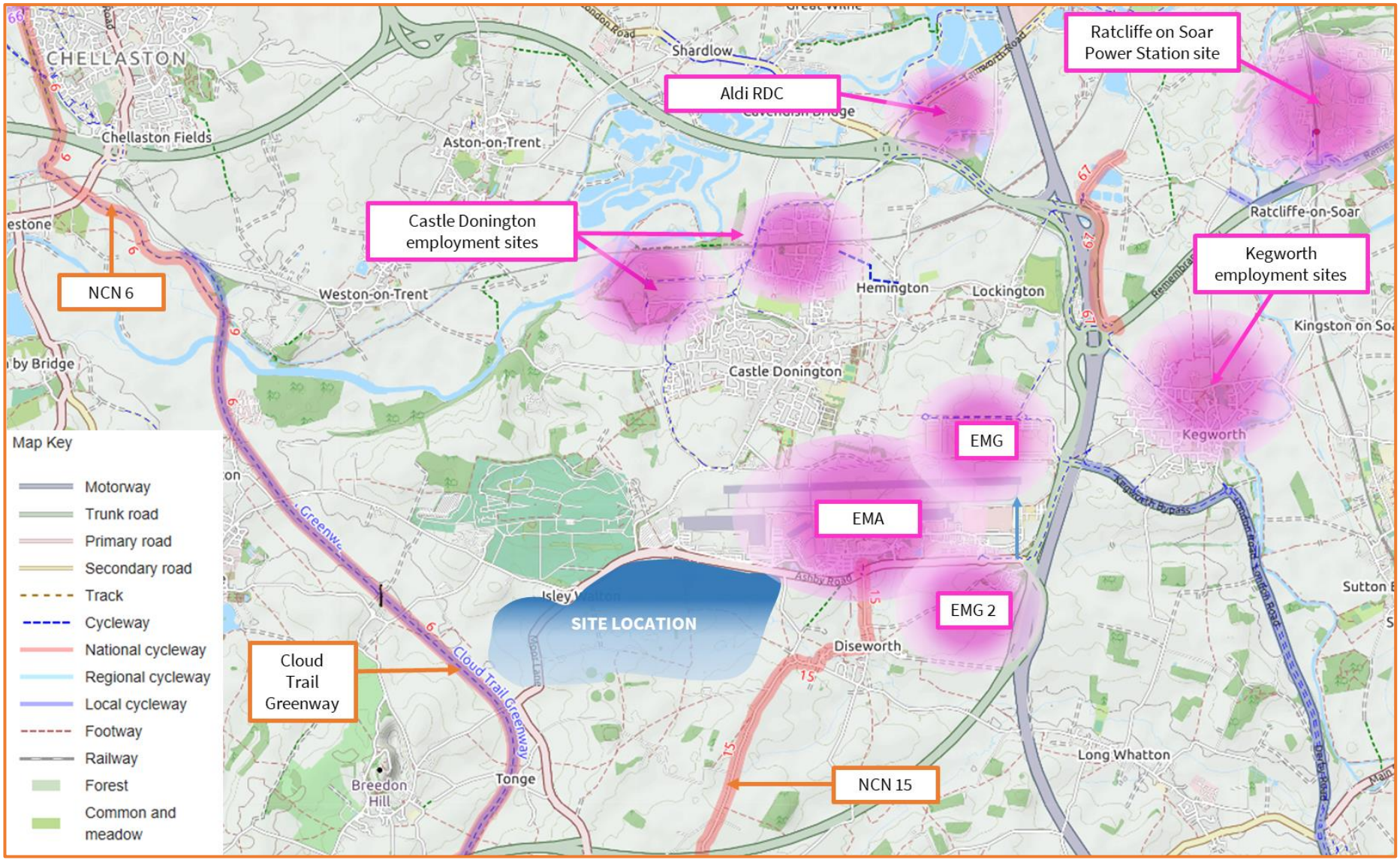

Figure 6.4: existing cycle network local to the site

6.12 The shared footway/cycleway along the eastern edge of the Castle Donington bypass ties into the existing infrastructure on both the Airport Perimeter Road and Short Lane/Back Lane, providing a pedestrian/cycle connection between the site and Castle Donington and the employment sites on its northern fringe.

6.13 **Figure 6.4** also shows that there are dedicated, off-road cycle access to EMG from the west of EMG, providing convenient and safe access to this major employment centre via Diseworth Lane, which was closed to through traffic as part of the EMG highway mitigation strategy such that it could form a safe cycle route between Hemington Hill and the Airport Trail to the south. Further, as part of the planning conditions for EMG, the existing PRoW between Moira Dale and Diseworth Lane is to be upgraded to cater for cyclists, providing a direct, fast connection between Castle Donington and EMG.

6.14 The interior roads through EMA are governed by a 30mph speed limit. They feed into the main car parks, freight operations and drop off points for EMA and the surrounding employment sites. Traffic volumes on these interior roads are relatively low, making them appropriate for on-carriageway cycling. It is possible to cycle the length of EMA via the internal road network.

6.15 From the Pegasus Business Park access roundabout on the A453 to M1 Junction 23A there is a shared footway/cycleway along the northern edge of the A453 that connects via uncontrolled crossings to an existing segregated footway/cycleway running along the eastern side of the A453 carriageway between junctions M1 Junction 23A and the A453/EMG/Kegworth Bypass gyratory. At the A453/EMG/Kegworth Bypass gyratory, the shared footway/cycleway ties into the pedestrian and cycle infrastructure on the EMG site and also links with the shared footway/cycleway that runs alongside the Kegworth Bypass, providing access to Kegworth. There are Toucan crossings on the southern arm of the A453/EMG/Kegworth Bypass gyratory.

6.16 From the Kegworth Bypass, there is a shared footway/cycleway alongside the A6 linking Kegworth and Loughborough. To the north of Kegworth, cycle connections to the former Ratcliffe on Soar power station site and East Midlands Parkway station are possible via existing quiet lanes and shared footway/cycleways.

6.17 As shown on **Figure 6.4**, route 6 of the National Cycle Network (NCN) is west of the site running along the Cloud Trail Greenway. NCN 15 is east of the site, running along Mill Lane, The Green and Grimes Gate, where it connects to EMA via an uncontrolled crossing on the A453 and a short section of the Airport Trail. These NCN routes provide connections to Derby, Nottingham, Loughborough and Leicester via a mixture of cycleways, shared footway/cycleways, and on-road sections.

6.18 Adjacent to the site, the Cloud Trail Greenway utilises a disused railway and is a high-quality, paved, car free route. The nearest access points to the Cloud Trail to the site are at Wilson, which can be accessed via Melbourne Road and Slade Lane, and Tonge via the A453 and Moor Lane.

Cycle demand, distribution and assignment

6.19 As detailed in Section 4 and Technical Note N (**Appendix 4**), to capitalise on the vision for Isley Woodhouse to co-locate homes and employees, ambitious modal share targets have been set for cycling. Achieving the modal share targets could reduce the number of single occupancy car trips by 644 and 610 two-way trips in the morning and evening peak hours, respectively. The resulting number of external cycle trips would be 513 in the morning peak hour and 474 in the evening peak hour, with 250 cycle trips to and from the major local employment centres in the morning peak hour, and 240 in the evening peak hour.

Major local employment centres

6.20 For the cycle trips to the major local employment centres, the morning and evening peak hour vehicle trips to each have been extracted from the EMFM (as summarised in the table at paragraph 11.24). The figures have been used to derive a localised employment distribution, as shown in the table below. The forecast cycle trips have been applied to that distribution, to estimate the number that could be attracted to each of the major local employment centres.

Cycle trips between Isley Woodhouse and local employment centres				
Employment zone	Peak Hour	Two-way vehicle trips	Assignment	Two- way cycle trips
East Midlands Airport	AM	254	43.2%	108
	PM	279	49.6%	119
Pegasus Business Park	AM	54	9.2%	23
	PM	43	7.7%	18
DHL @EMA	AM	64	10.9%	27
	PM	41	7.3%	17
East Midlands Gateway	AM	37	6.3%	16
	PM	43	7.7%	18
EMG2 (Freeport (A453))	AM	36	6.1%	15
	PM	32	5.7%	14
Castle Donington employment zones	AM	126	21.4%	53
	PM	114	20.3%	49
Ratcliffe on Soar power station	AM	17	2.9%	7
	PM	10	1.8%	4
Total	AM	588	100%	250
	PM	562	100%	240

6.21 Given the locations of the major local employment centres, shown on **Figure 6.3 and 6.4**, the two key routes are east along the A453 corridor (Route 1), and north along the Airport Perimeter Road and the Castle Donington bypass (Route 2). The table below shows how the forecast cycle trips to the major local employment zones would assign.

External cycle trip assignment to major local employment centres				
Route	Morning peak hour		Evening peak hour	
	Assignment	Two-way trips	Assignment	Two-way trips
Route 1 - A453 corridor	72.3%	181	72.1%	173
Route 2 - Airport Perimeter Road	27.7%	69	28.0%	67

Other external cycle trips

6.22 The remaining external cycle trips would be made by:

- Isley Woodhouse residents travelling for work (but not to the major sites identified above) or to access local services and facilities, most likely in Castle Donington, but also Kegworth, Long Eaton, Shepshed, and Loughborough
- residents within the North West Leicestershire 001 MSOA and neighbouring MSOAs accessing the employment, education, retail and leisure opportunities at Isley Woodhouse
- employees at major local employment sites accessing the retail opportunities at Isley Woodhouse.

6.23 Given its size and proximity, the majority of these cycle trips would be between the site and Castle Donington, using the above identified Route 1. Route 1 would also include cycle trips to/from the

Aldi Regional Distribution Centre at A50 Junction 1 and Long Eaton. For Route 2, east along the A453 corridor, cyclists could access the ancillary employment sites around EMA, Kegworth, the Sutton Bonington Campus of the University of Nottingham and the surrounding smaller settlements.

6.24 As identified earlier in this Section, Shepshed and the northern parts of Loughborough are within commuting distance of the site by bike, especially when considering the anticipated future development in e-bike technology and accessibility. Cyclists travelling between the site and Loughborough could also use The Green past Diseworth and through Long Whatton to Hathern, where there is a cycle facility alongside the A6 (Route 3). Between the site and Shepshed and the northwest of Loughborough, cyclists could use NCN 15, which runs along Mill Lane south of Diseworth (Route 4).

6.25 To the west, there might be a small number of cycle trips between the site and Melbourne, which is accessed along Melbourne Road (Route 5), and which also provides a connection to the Cloud Trail via Slade Lane. To the southwest of the site, there might be a small number of cycle trips between the site, Breedon on the Hill and Tonge, where cyclists can also access the Cloud Trail.

6.26 The select link analysis of development peak hour vehicle trips within the EMFM is presented at paragraphs 11.21 and 11.23. The percentage assignments of vehicle trips to routes 1, 3, 4, 5 and 6 have been used to assign the external cycle trips (excluding the cycle trips to the major employment centres), as shown in the table below. The remaining cycle trips have been assigned to Castle Donington, as the most significant origin/destination for these cycle trips.

Cycle trips between Isley Woodhouse and non-local employment centres				
Route	Morning peak hour		Evening peak hour	
	Assignment	Two-way trips	Assignment	Two-way trips
Route 1 - A453 corridor	13.5%	36	13.9%	33
Route 2 - Airport Perimeter Road	55.1%	145	58.0%	139
Route 3 - The Green	12.1%	32	11.7%	28
Route 4 - Mill Lane (NCN 15)	13.9%	37	12.5%	30
Route 5 - Melbourne Road	3.9%	10	2.2%	5
Route 6 - Tonge/Breedon on the Hill	1.5%	4	1.7%	4
Total	100.0%	264	100.0%	239

6.27 Combining the cycle trip assignments at paragraphs 6.21 and 6.26 gives the total two-way cycle trip assignment shown below.

Total external cycle trip assignment		
Route	Morning peak hour	Evening peak hour
Route 1 - A453 corridor	217	206
Route 2 - Airport Perimeter Road	214	206
Route 3 - The Green	32	28
Route 4 - Mill Lane (NCN 15)	37	30
Route 5 - Melbourne Road	10	5
Route 6 - Tonge/Breedon on the Hill	4	4
Total	514	479

NWLDC Local Cycling and Walking Strategy and Infrastructure Plan (LCWIP)

6.28 NWLDC, with assistance from LCC and Sustrans, have developed the North West Leicestershire Local Cycling and Walking Infrastructure Plan (LCWIP). LCWIPs are designed to allow local authorities to take a long-term approach to the development of networks of walking and cycling infrastructure that encourage people to choose to travel on foot or by bicycle, whether for work, education, retail, or leisure purposes. LCWIPs are based on evidence of existing and future travel patterns and include plans for walking and cycling infrastructure improvements on identified preferred routes, with a prioritised programme for delivery.

6.29 Table 2 in Section 4.6 of the LCWIP sets out identified infrastructure improvements across North West Leicestershire that could significantly increase levels of cycling in the district. Referenced as CD-C01 and CD-C02 in Table 2 is the proposal for a Green Way around EMA. The table in section 4.7 of the LCWIP describes CD-C01 as a new off-road facility alongside the A453, the upgrading of existing shared-use routes, provision of signalised crossings. CD-C02 is described as the creation of a new off-road Green Way link and the upgrading of existing shared-use routes. Both proposals include quiet-way treatment on Hill Top and High Street within Castle Donington.

6.30 Further to the above, policy CD-C08 of the LCWIP proposes quiet way treatments through Diseworth and Long Whatton with a new traffic free route created between the two villages.

6.31 To assist in developing a prioritised programme for delivery, Section 6.3 of the LCWIP scores the walking and cycling proposals against a range of criteria including effectiveness, policy, economic, and deliverability. CD-C01 is the joint-third highest ranked proposal across the network and CD-C02 is the joint second highest ranked proposal.

6.32 As detailed in Section 5 of this report, the Airport Trail runs around the perimeter of the airport and the majority of this trail is currently on unsurfaced paths. As identified in the LCWIP, its alignment with the A453 and segregation from the carriageway means that it could provide an excellent pedestrian/cycling facility to encourage modal change and provide sustainable access to jobs and services locally.

6.33 Proposals for how sections of the Airport Trail could be improved to provide high quality walking and cycling infrastructure, in accordance with the aspirations set out in NWLDC's LCWIP, are detailed below. It is anticipated that a contribution could be made by the applicants to secure enhancements to the identified routes, despite the third-party ownership, which would deliver improved pedestrian connections around the airport.

Future cycle infrastructure

6.34 The Department for Transport's "*Gear Change, A bold vision for cycling and walking*", and its accompanying design guidance "*Cycle infrastructure design (LTN1:20)*" identify the requirements for high quality cycling infrastructure. The guidance seeks a step change in the provision of high-quality cycle infrastructure to assist in achieving modal transfer to cycles away from private motorised vehicle use to provide improved transport, health and environmental outcomes.

6.35 The paragraphs above about cycle demand identify six external cycling routes. The east-west route along the A453 (Route 1), and the route north between the site and Castle Donington (Route 2), are forecast to cater for 85% of the total number of external cycle trips. Routes 1 and 2 are therefore the main focus for improving the connectivity for cyclists.

6.36 The future provision of cycle infrastructure has been a key topic of discussion within the applicant team and also during consultation events. The clear objective to emerge was for cycling to become the first choice mode of transport for a significant proportion of residents at Isley Woodhouse. Hence, the best possible infrastructure would be required, with cycle routes being direct, consistent, and safe for the people using them. Importantly, it was felt that providing a traditional cycleway immediately adjacent to the high speed A453 carriageway would not be attractive or give cyclists a feeling of safety, and hence residents may not be encouraged to adopt cycling as a preferred mode of transport.

6.37 Adopting these principles, within the development boundary and where space permits externally, segregated cycle facilities are proposed. The preferred cross section is for a 3.0m wide bi-directional cycle facility and a 2.0m wide footway. However, where space is constrained, these segregated facility geometries are reduced to minimum acceptable levels over short distances. Where the available highway is constrained below the segregated minimums, the proposals seek to provide short sections of shared footway/cycleway. Given the forecast peak hour cycle volumes, these facilities would exceed the requirements of LTN 1/20.

6.38 To accommodate the peak hour forecast cycle flows and assist in the delivery of elements of the NWLDC LCWIP, extensive cycle infrastructure is proposed on Routes 1 and 2. The cycle connectivity **Drawing ADC2570-DR-006-P7** provides a strategic overview of the cycling proposals. **Drawings ADC2570-DR-015-P3** and **ADC2570-DR-016-P2** show the proposals in more detail, demonstrating how high-quality cycle (and pedestrian) routes could be established linking the site with the major employment centres.

Route 1 – A453 corridor

6.39 The east-west route along the A453 would provide an upgrade of this section of the Airport Trail between the eastern site access junction and the Pegasus Business Park roundabout, where it would tie into the existing shared footway/cycleway. This would be a bi-directional route, segregated from the carriageway by 6 to 7m and would include a footway. The route avoids the most densely wooded areas, which would improve deliverability and limit vegetation loss.

6.40 As shown on **Drawing ADC2570-DR-015-P3**, the proposed east-west cycle route would include the following.

- A Toucan crossing on the eastern arm of the central roundabout access junction.
- A segregated bi-directional cycleway and footway along the site frontage between the central access roundabout and the eastern site access junction.
- A Toucan crossing on the western arm of the A453/DHL roundabout, providing access into EMA.
- A Toucan crossing between the A453/DHL roundabout and the proposed eastern site access junction to provide a connection to EMA and the existing bus stops.
- To the east of the eastern site access junction, a bi-directional cycle track with segregated footway on the northern side of the A453, sufficiently offset from the carriageway to provide a connection to EMA, Pegasus Business Park, EMG, and EMG2 employment sites.
- A Toucan crossing at the A453/Grimes Gate junction to improve the connection between NCN 15, the Airport Trail, and EMA.
- A Toucan crossing at the altered A453/EMA access junction, as discussed in Section 15.

6.41 To the west of the site, **Drawings ADC2570-DR-01-P7 and ADC2570-DR-02-P5** show that there would be an 8m wide grass verge provided on the eastern side of the realigned A453 as a reserved corridor for future provisions. It could accommodate a 2m wide footway and a 3m wide bi-directional cycleway set back from the carriageway edge behind a 2m wide verge. Three crossing

points are provided along the realigned A453 to enable access to the public open space to the west of the road.

6.42 The northwestern A453/site access roundabout would be provided with dropped kerb crossing points to provide connectivity with Melbourne Road. Short lengths of 3m wide shared footway/cycleways would provide for cyclists.

6.43 The southwestern A453/access roundabouts would also be provided with dropped kerb crossing points to enable access to the public open space to the west. A 3.0m wide shared footway/cycleway would be introduced along the eastern side of the A453 Moor Lane up to a new crossing point, where pedestrians and cyclists could cross to a proposed short length of shared footway/cycleway on the western side of the A453. That new link would provide access to Moor Lane that runs into Tonge and provides access to the Cloud Trail Greenway, and Breedon on the Hill using quiet lanes.

6.44 The proposed cycle infrastructure was the subject of a Stage 1 Road Safety Audit (RSA) in accordance with DMRB GG 119. All recommendations identified within the RSA report were considered within the Response Report, which is in **Appendix 9.** Where necessary, changes to the designs were incorporated.

Route 2 – Castle Donington

6.45 The northern route has a mixture of bi-directional cycleways and upgraded shared footway/cycleways and requires an upgrade to a section of the Airport Trail along the northern border of the airport between Diseworth Road and Diseworth Lane. It would connect to the existing cycle facilities on the Castle Donington bypass, providing connectivity between the extensive employment sites to the north of Castel Donington and EMG via the western cycle access from Diseworth Lane.

6.46 As shown on **Drawing ADC2570-DR-016-P2**, the proposed northern cycle route would include the following.

- A Toucan crossing on the eastern arm of the central roundabout access junction.
- A segregated bi-directional cycleway and footway along the Airport Perimeter Road for a distance of 450m, before switching to a 4.0m wide shared footway/cycleway.
- A Toucan crossing on the Airport Perimeter Road to facilitate pedestrians and cycle crossing to the northern side of the carriageway, where the existing shared/footway would be widened to around 4.0m and would connect to the Castle Donington bypass roundabout.
- The existing shared footway/cycleway between the Castle Donington Roundabout and the Hill Top roundabout would be widened to 3.0m. The crossing facilities at these roundabouts will be upgraded.
- The existing public right of way between Hill Top and Diseworth Road would be widened and upgraded to provide a 3.0m shared footway/cycleway.
- Between Diseworth Road and Diseworth Lane, the Airport Trail would be upgraded to a segregated bi-directional cycleway and footway that would enable fast, direct, and safe access to EMG.

6.47 The proposed cycle infrastructure was the subject of a Stage 1 RSA in accordance with DMRB GG 119. All recommendations identified within the RSA report were considered within the Response Report, which is in **Appendix 9.** Where necessary, changes to the designs were incorporated.

East Midlands Growth Point

6.48 As discussed in Section 15, on behalf of the East Midlands Growth Point and in collaboration with consultants representing the consortium partners, ADC Infrastructure prepared **Drawing ADC2570-DR-902-P3**, which shows the proposed cycle infrastructure associated with the Isley Woodhouse, EMG Phase 2, and Ratcliffe on Soar power station proposed developments, alongside the existing cycle facilities in the area. The drawing demonstrates how the Growth Point could enhance cycle connections to Castle Donington, EMA, both East Midlands Gateway sites, Kegworth, and the Ratcliffe on Soar power station site, offering residents and workers an attractive and safe alternative to using the car to gain access to work and leisure opportunities.

7.0 BUS STRATEGY

Baseline opportunities for bus travel

7.1 The closest bus stops to the development site are shown in **Figure 7.1**. The precise location of the two closest bus-stops to the centre of the site are shown in **Figure 7.2**. There are few stops, because currently there is no demand to stop, other than at Isley Walton, or within the airport.

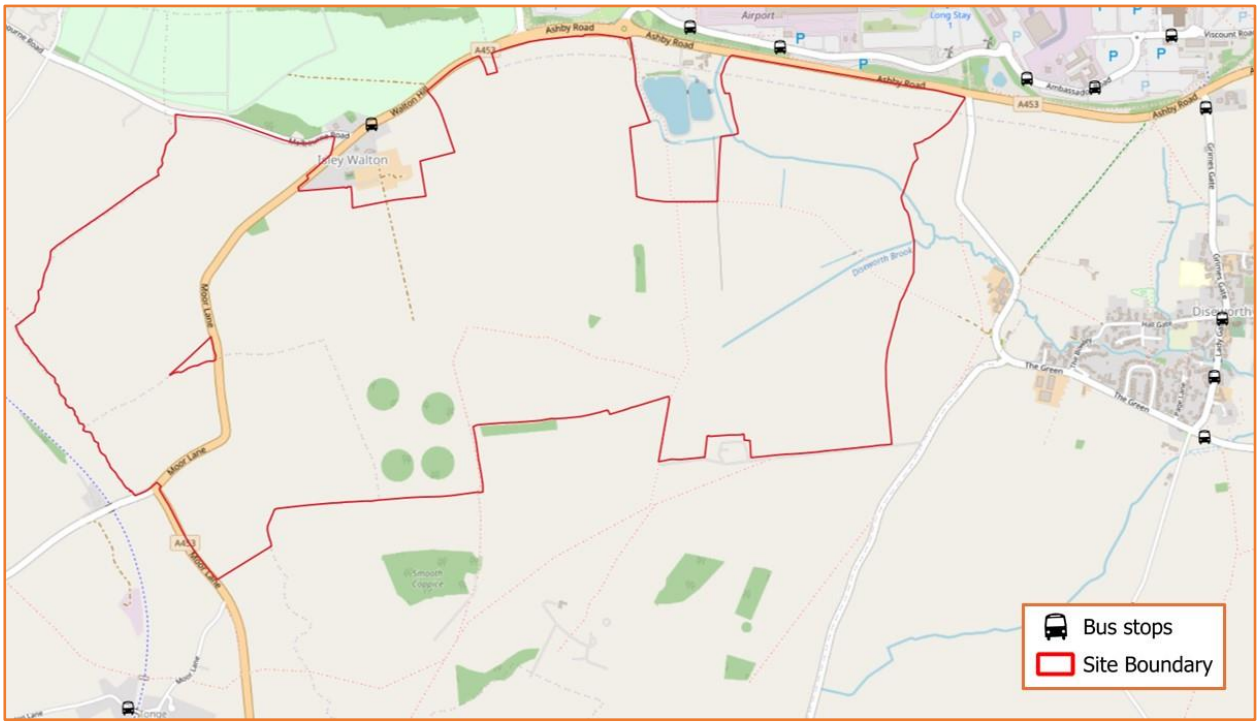

Figure 7.1: location of bus stops

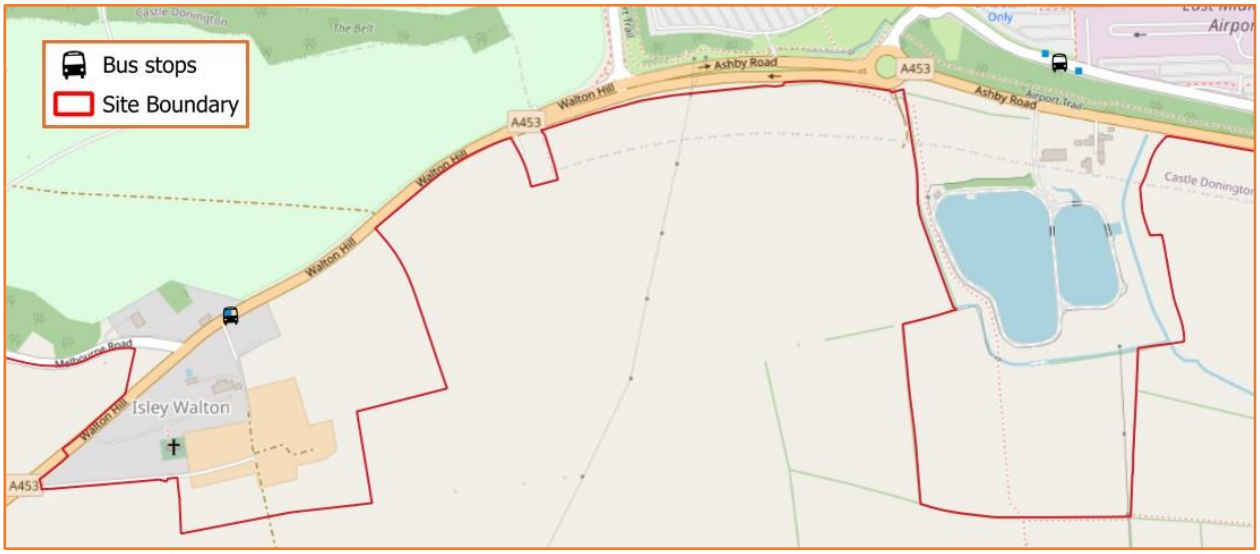

Figure 7.2: closest existing bus-stops to the site

7.2 The routes of the existing bus services within the vicinity of the site are detailed in **Drawing ADC2570-DR-007-P2**, and an excerpt is at **Figure 7.3**.

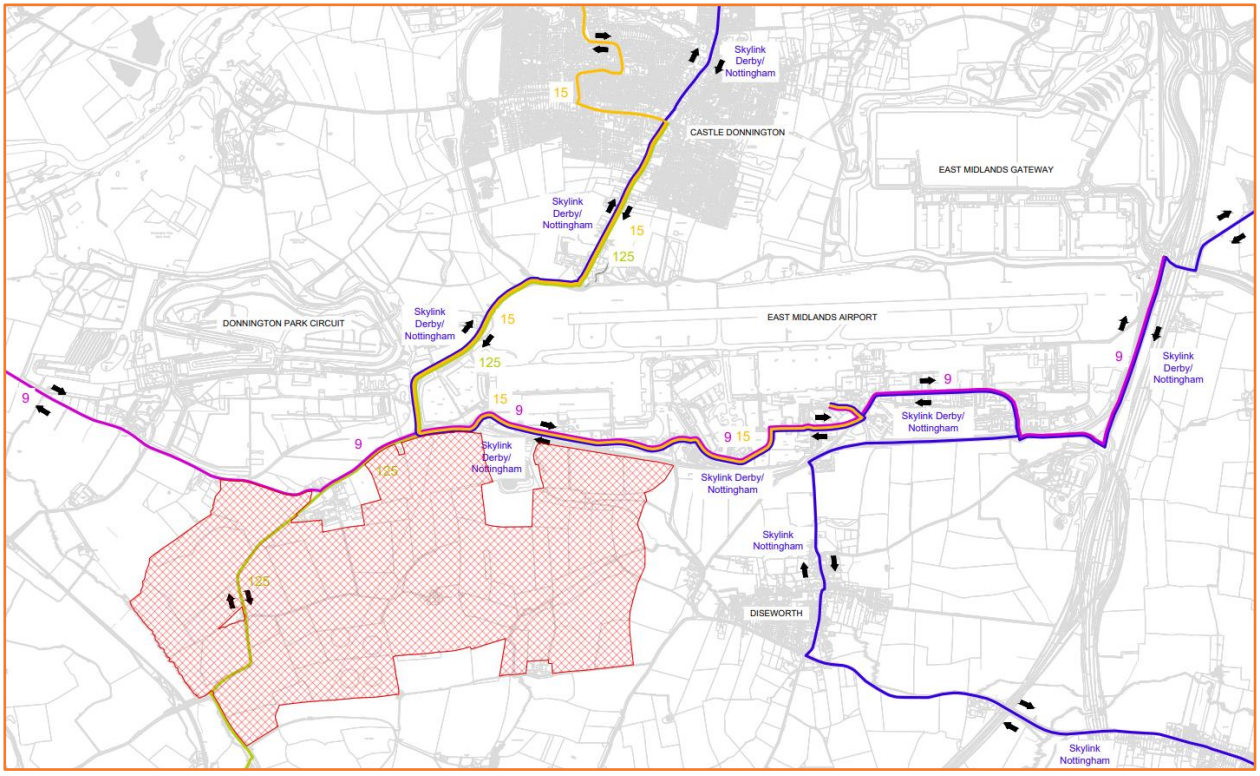

Figure 7.3: existing bus services

7.3 The table below summarises the bus services available from the bus stops show on **Figure 7.2**. The Skylink services serve a wide area with frequent services at all hours.

service	route	days	times	daytime frequency
stop locations: East Midlands Airport, DHL Cargo West				
9	East Midlands Airport to Burton	Mon to Sun	0426 to 2241	60 mins
15	East Midlands Airport to Ilkeston	Mon to Sat	0511 to 0003	30-60 mins
Skylink Derby	Leicester - Loughborough – East Midlands Airport -Derby	Mon to Sat Sun	0449 to 0419 0449 to 0419	20 to 60 mins 30 to 60 mins
	Derby – East Midlands Airport – Loughborough - Leicester	Mon to Sat Sun	0530 to 0600 0530 to 0604	20 to 60 mins 30 to 60 mins
Skylink Nottingham	Nottingham - East Midlands Airport - Coalville	Mon to Sat Sun	0420 to 0350 0420 to 0350	20 to 60 mins 30 to 60 mins
	Coalville – East Midlands Airport - Nottingham	Mon to Sat Sun	0444 to 0414 0444 to 0414	20 to 60 mins 30 to 60 mins
stop locations: Isley Walton, Melbourne Road				
125	Castle Donington – Isley Walton - Leicester	Mon to Sat	1019 to 1404	2 services a day
	Leicester – Isley Walton - Castle Donington	Mon to Sat	0958 to 1341	2 services a day
9	Burton - East Midlands Airport – Isley Walton	Mon to Fri	0359 to 2219	60 mins
	East Midlands Airport – Isley Walton - Burton	Mon to Sun	0427 to 2242	60 mins

Bus demand from the proposed development

7.4 The mode share forecasts in Section 4 show a baseline forecast for 199 (6.3%) and 250 (5.1%) journeys by bus in the morning and evening peak hours, respectively. The target is to increase those figures to 384 (9.6%) and 326 (8.3%), respectively, and a significant proportion of just under 20% of those journeys would be to the local employment sites.

7.5 To determine where future residents are likely to want to travel to by bus, reference was made to Datashine Commute (commute.datashine.org.uk), which visualises 2011 Census journey to work data. Examining the journeys by bus made by residents in the North West Leicestershire 001 MSOA that is centred on Castle Donington gives almost no data. Thus, **Figure 7.4** shows travel to work by all modes of transport. Despite that limitation, and the historic data, it provides a useful starting point from which to analyse the demand to travel to and from the proposed development by bus. There are journeys in all directions, notably to the significant employment locations such as Derby, Nottingham, Loughborough, and Leicester. There is a large draw towards Kegworth, which is in the neighbouring MSOA that covers EMG and also part of the airport, as well as having its own employment destinations.

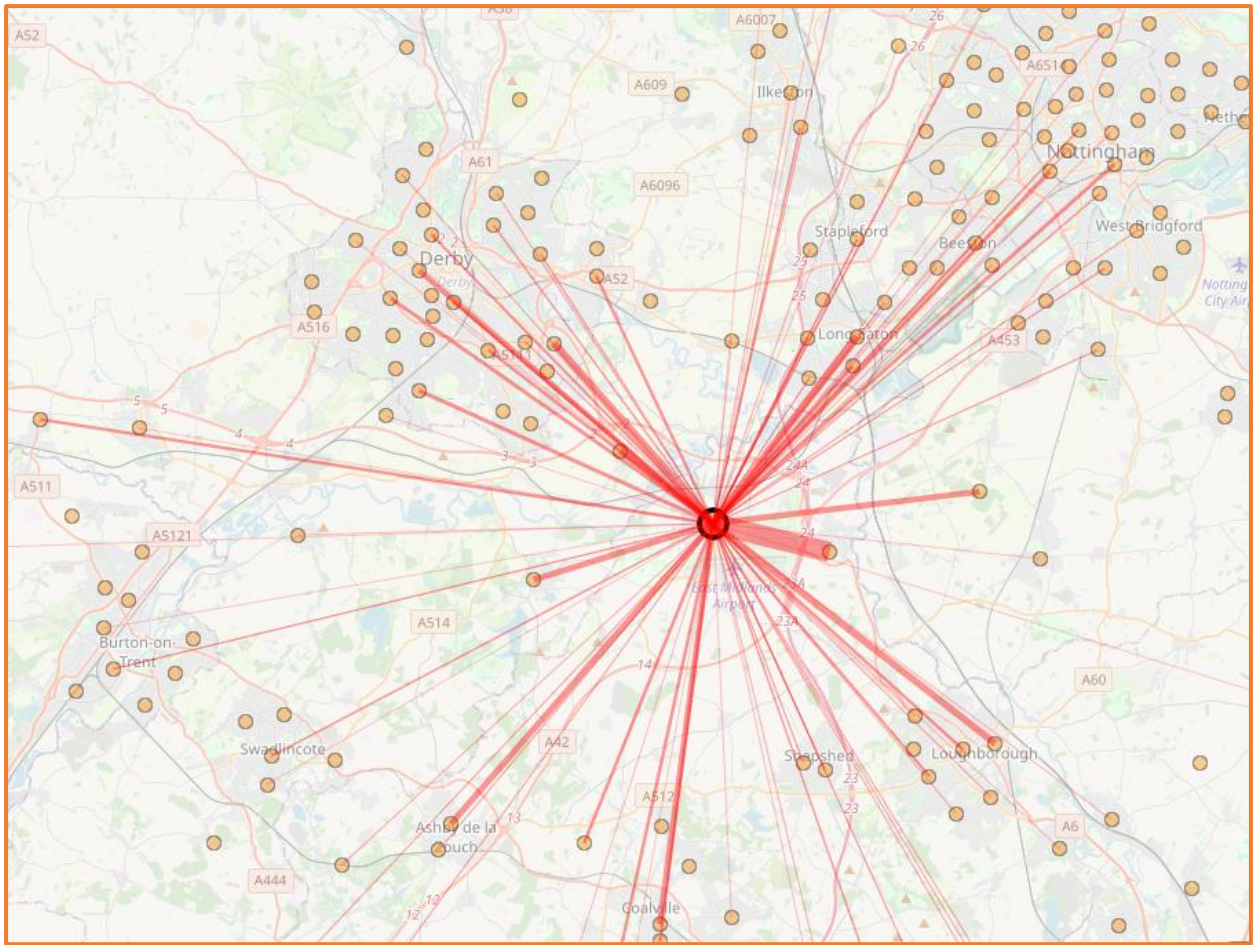

Figure 7.4: visualisation of North West Leicestershire 001 MSOA journey to work data

Future bus provision - initial phases of development

7.6 **Figure 7.5** shows 400m walking catchment areas around the existing bus stops. It is an excerpt from **Drawing ADC2570-DR-010-P2.** It shows that initial phases of development located within the northern parts of Isley Woodhouse could be served by the existing bus services. The crossing facilities included as part of the access junction proposals would enable pedestrians to safely cross the A453 to access the bus stops.

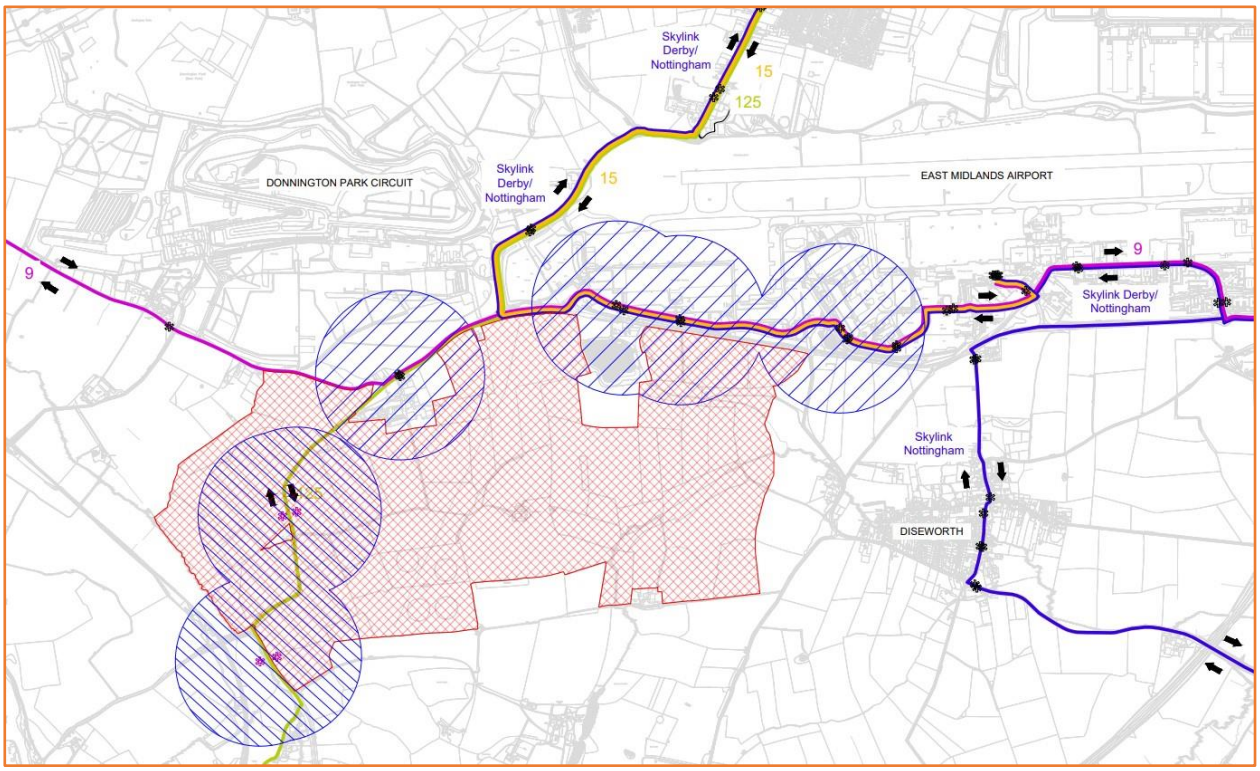

Figure 7.5: 400m catchments (in blue) from existing and proposed bus stops along the A453

Future bus provision - later phases of development

7.7 To serve the development as a whole will therefore require new, diverted, and improved services. A fundamental consideration has been to design the masterplan to accommodate bus routes through the development, with a primary road network of loops that connect with the accesses, can be delivered and expanded in phases, and ensures all parts of the development will be within 400m walking distance of a bus service. The primary road network is secured on the Parameters Plan, an extract of which is shown in **Figure 7.6** with the primary road network highlighted.

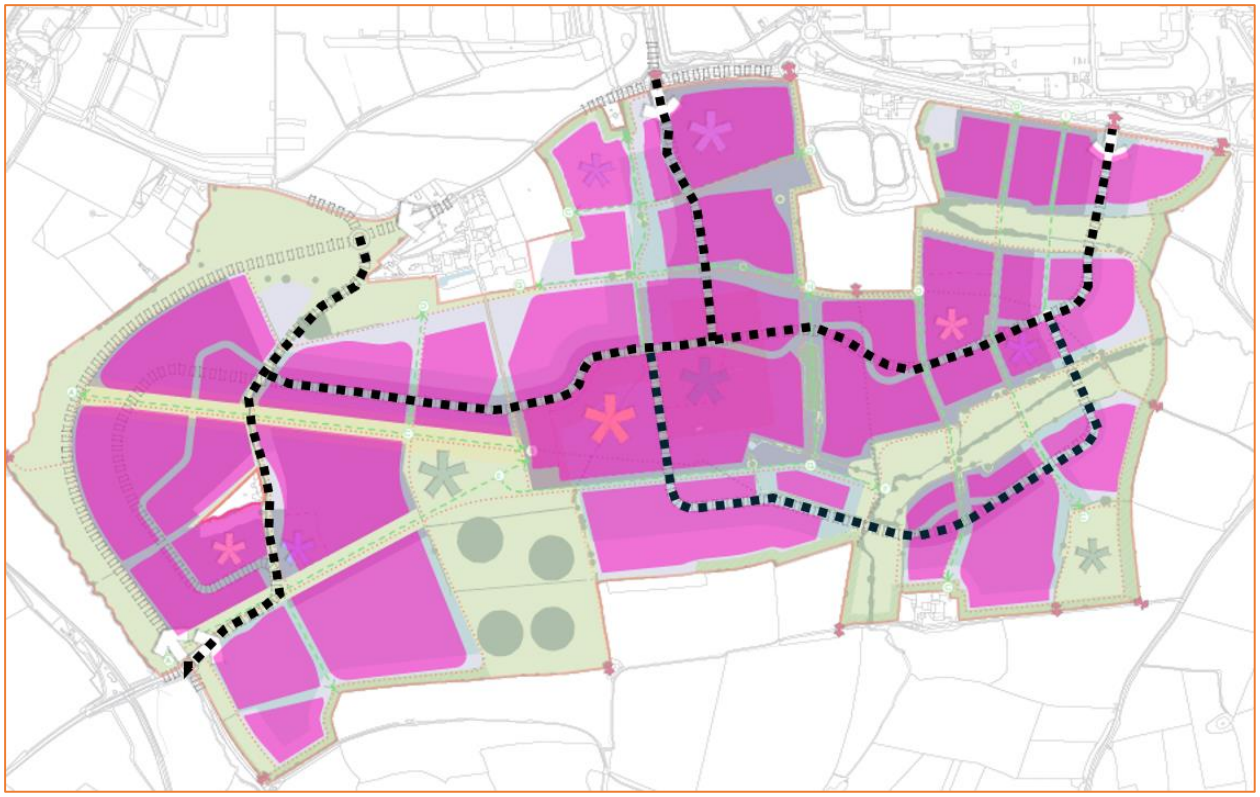

Figure 7.6: extract from the Parameters Plan with the primary road network highlighted

7.8 The primary road network has been designed to accommodate buses, and the roads would be of appropriate width in accordance with the Highway Design Guide. On-street parking would be controlled where necessary, and bus stops with shelters and boarding kerbs would be introduced at appropriate locations, such as adjacent to the local centres. The Design and Access Statement includes a plan showing the potential bus stop locations with their catchments. It demonstrates that every resident would be within walking distance of a bus stop.

7.9 With that primary road network, the options to serve the site are explained below. They are presented as options, although a combination of interventions will be required, with more than one option being delivered. Nevertheless, the delivery of services will evolve as phases of development come forward, and demand increases. The options below show that there are various different ways of bringing forward acceptable bus services.

7.10 The peak hour demand figures quoted above are sufficient to make services viable, although they will be realised on completion of the development and hence phasing will be important. Thus, it is expected that a condition will be included on the consent requiring a Bus Strategy, which is adjusted through the occupation of the development.

Service diversions

7.11 Although the Skylink services are regular and frequent, they rely on direct express connections over a long distance, such as Leicester to EMA. Significant diversion through Isley Woodhouse is thought to be unlikely. However, there are less frequent services that could be diverted through the development, without needing to divert significantly from their existing routes, as shown in **Figure 7.7**, which is an excerpt from **Drawing ADC2570-DR-011-P3**. The frequency of the services can be increased as development and hence demand (and income) expands.

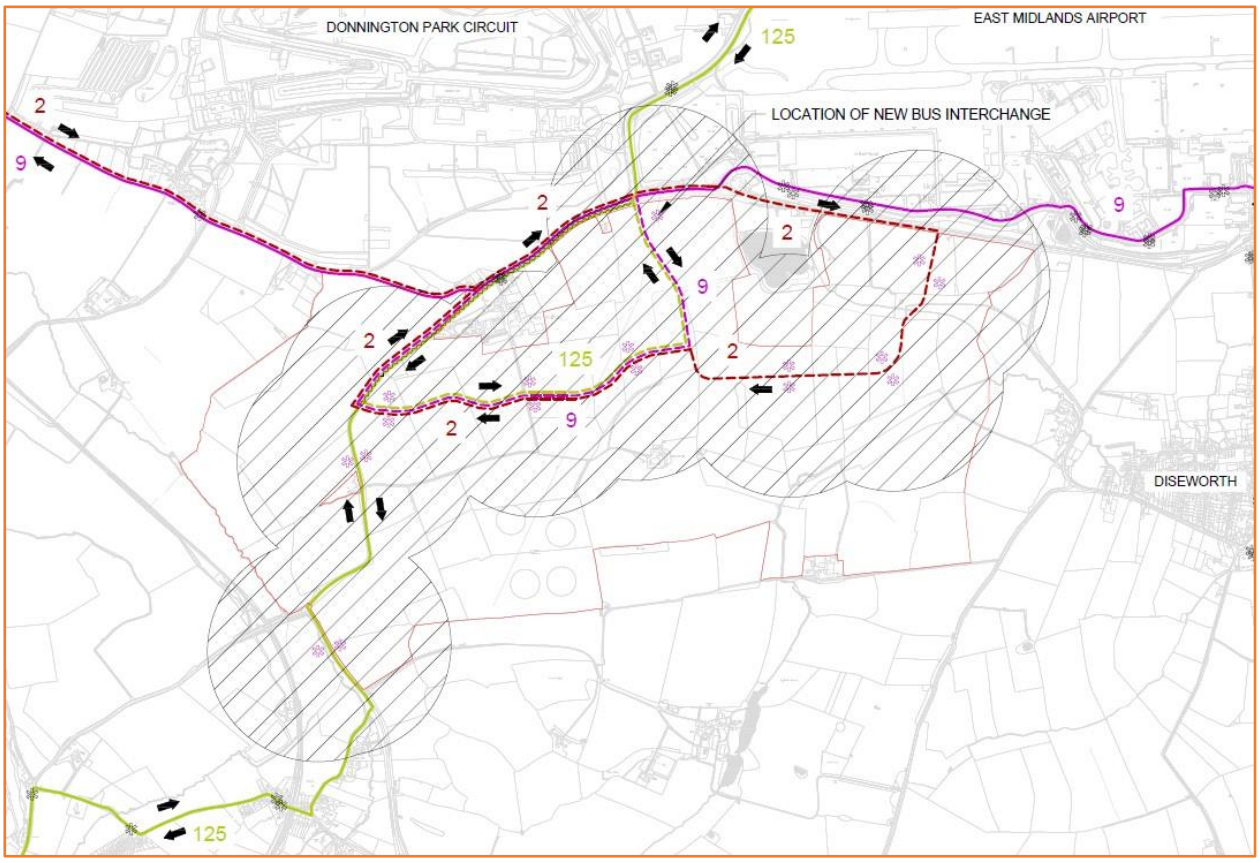

Figure 7.7: proposed bus diversions

7.12 The hourly 9 service currently routes between Burton and East Midlands Gateway via Swadlincote, Ashby, and the airport via the A453. There is the opportunity to divert this service to route along Isley Woodhouse's western and northern primary roads. This will enable the bus to serve a portion of the site as well as continue on the A453 to serve the DHL warehouse and airports stops.

7.13 The 2 service currently operates between Derby City Centre and Chellaston with a 30-minute frequency in both directions, and every other service continues from Chellaston to Swadlincote via Melbourne. The 2 service could be extended so that the buses that currently stop in Chellaston instead continue to Melbourne and onto Isley Woodhouse where they could loop through the development before returning. Additional vehicles would be required to support this extension to the service.

7.14 The infrequent 125 service that runs along the A453 would naturally run through the development in the future. Its route can be extended to run through the rest of Isley Woodhouse.

Provide a travel interchange near the central access roundabout

7.15 A bus interchange (as at EMG) would be provided within the development just south of the A453/central access roundabout. This would enable the Skylink Derby, Skylink Nottingham, and the 15 service to stop within the development with minimal diversion before returning to their route serving the DHL and airports stops that are key destinations for these services.

New bus service

7.16 Allied to the above, a strand of the wider Growth Point proposals that are examining highway capacity enhancements around M1 Junction 24 is the proposal to introduce a bespoke bus service. An indicative route is shown in **Figure 7.8.**

Figure 7.8: indicative route for a new bus service

7.17 At EMG there is a bus that runs around that site to and from the interchange at its entrance. That shuttle bus can be extended to serve the proposed EMG2 and other local employment sites as well as Isley Woodhouse. Such a bespoke service would need to operate a loop through Isley Woodhouse to ensure all residents were within 400m of a stop.

7.18 The estimated journey time for the primary loop, shown in green on **Figure 7.8**, would be approximately 30 minutes and the timetable could be designed to cater for shift change times at the major employment sites. The service could be extended to serve East Midlands Parkway railway station, and the redeveloped Ratcliffe on Soar power station. The additional loop could be incorporated into the timetable or run as an on-demand service at peak periods.

7.19 The new service could be operated from the travel interchange near the central access roundabout, described above, to create a sustainable transport hub/interchange. Alternatively, that hub, or a second one, could be centrally positioned adjacent to the central local centre, with commercial-scale electric vehicle charging points and cycle parking with incorporated charging for privately owned electric cycles, alongside public bicycle or electric scooter hire.

7.20 This solution would cater for the needs of the proposed development and provide a fast, tailored sustainable transport option for residents employed locally. The service would also be available to existing residents of Castle Donington, improving the connectivity between the settlements and the local employment sites.

8.0 RAIL AND LIGHT RAIL

Baseline opportunities for rail travel

8.1 The nearest railway station to the site is East Midlands Parkway, approximately 8km northeast of the centre of the site adjacent to the former Ratcliffe on Soar power station. The location of the station relative to the proposed development is in **Figure 8.1**.

Figure 8.1: East Midlands Parkway station, relative to the site

8.2 The station is not within realistic walking distance of the site, and while it is possible to reach it by cycle in approximately 30 minutes, this is not a realistic option for many commuters. The station is easily accessible by road from the proposed development site and as such represents a viable multi-modal alternative for mid or long-distance commuting given the range of destinations served and current journey times.

8.3 East Midlands Parkway station is located on the Midland Mainline, which connects the East Midlands and South Yorkshire with London St Pancras Station. A network map showing all the stations on the Midland Mainline is at **Figure 8.2**. Hence, the station is well located for both regional and national rail connections. A summary of the key routes, along with frequencies and approximate journey times, is in the table below.

destination	journey time	frequency (weekdays)	frequency (weekends)
Nottingham	15 mins	2 services per hour	2 services per hour
Leicester	32 mins	2 services per hour	2 services per hour
Loughborough	8 mins	2 services per hour	2 services per hour
Derby	14 mins	1 service per hour	1 service per hour
Lincoln	1 hr 21 mins	1 service per hour	1 service per hour
London St Pancras	1 hr 28 mins	2 services per hour	2 services per hour

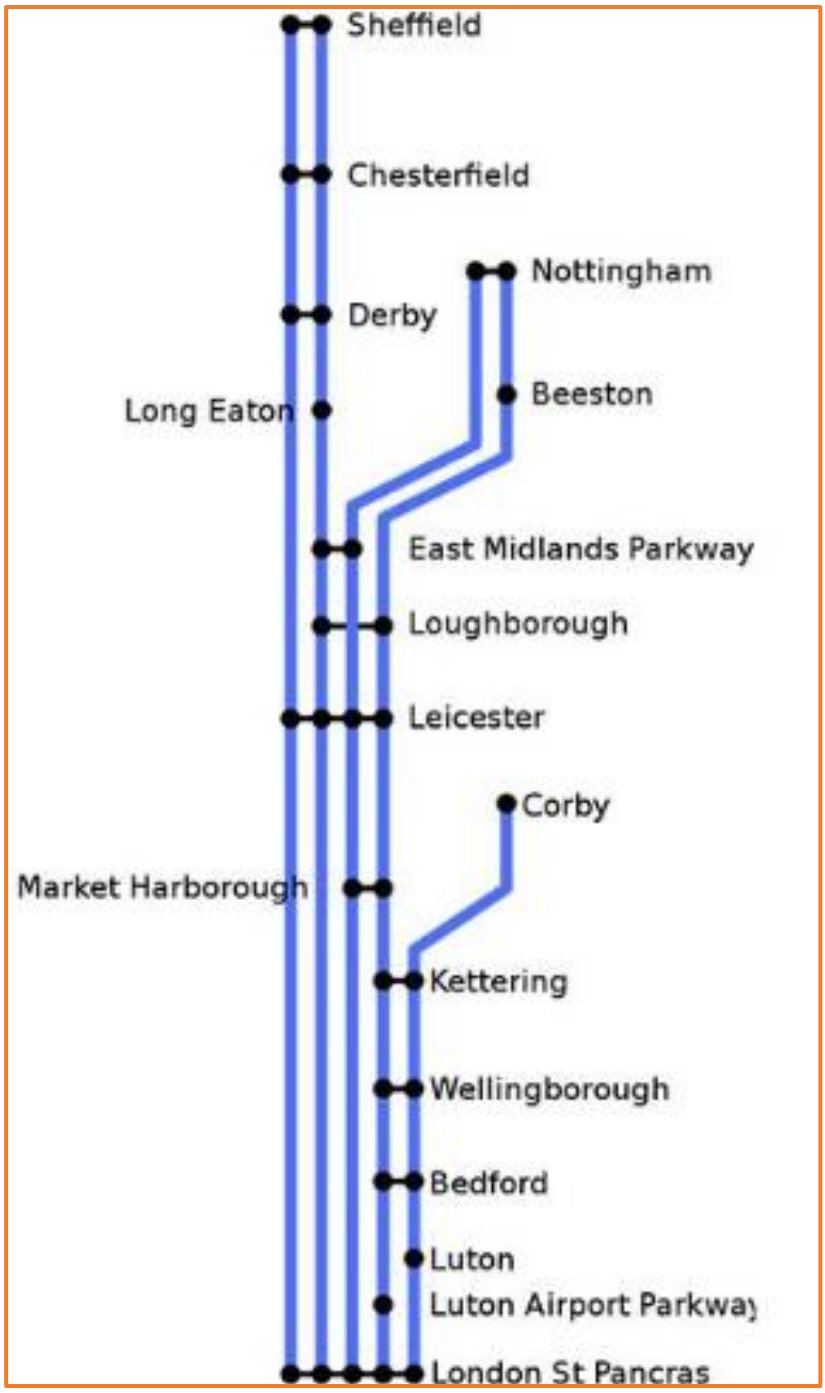

Figure 8.2: Midland Mainline map

8.4 East Midlands Parkway has a large car park, with 885 spaces. It is accessible 24 hours a day, and tariffs range from £8 for a day ticket, up to £800 for an annual pass.

8.5 The station is also served by an on-demand bus service, the Nottsbus Connect, which is operated by Nottinghamshire County Council. The Nottsbus Connect is an on-demand service, which means that it doesn't follow a fixed route like a conventional bus. Users must pre-book their journeys via the app, or phone. The station falls within the West Rushcliffe zone that includes East Midlands Airport and EMG, and extends as far east as Clifton Park and Ride, as shown in **Figure 8.3**.

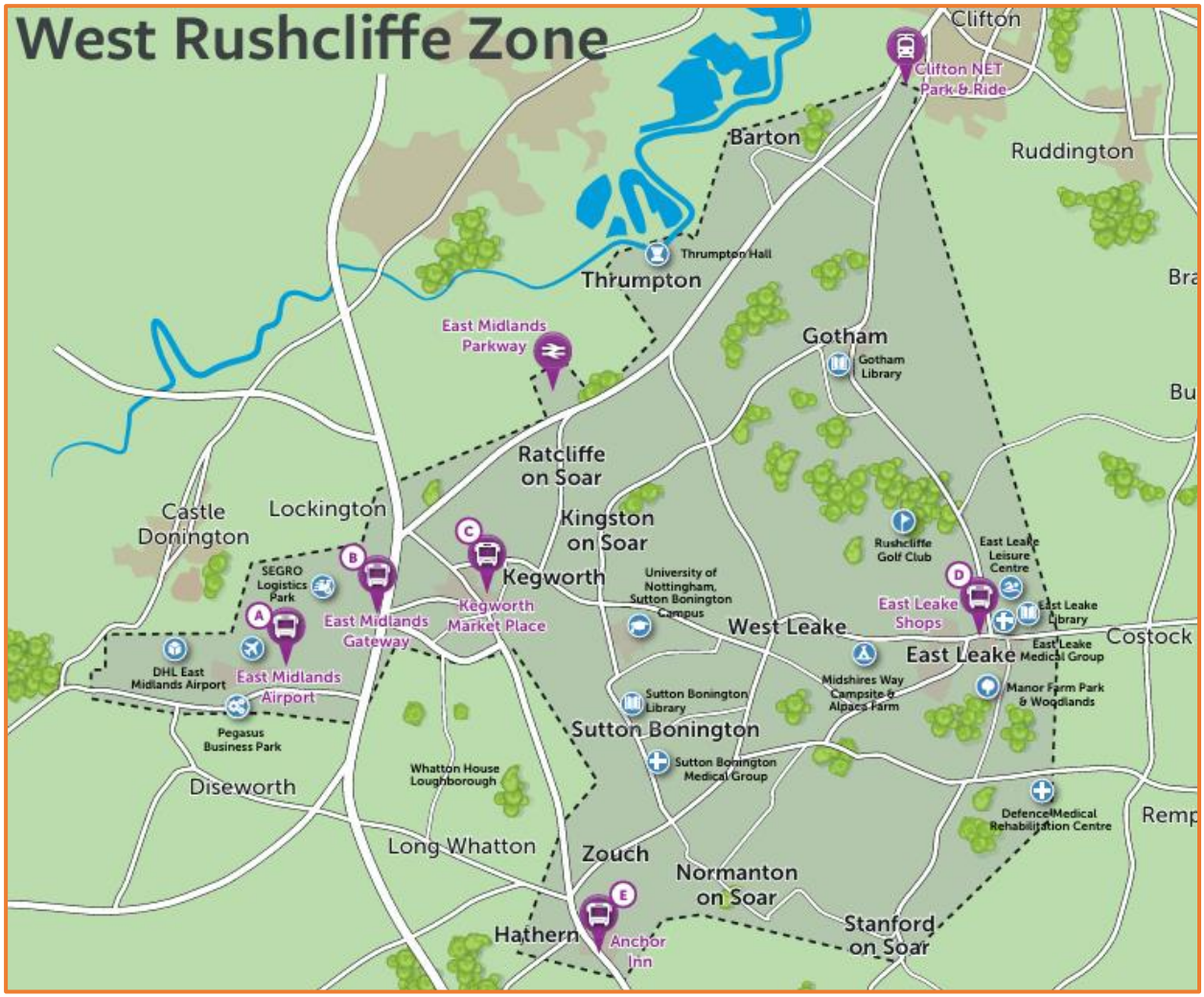

Figure 8.3: Nottsbus Connect west Rushcliffe zone map

Baseline opportunities for tram travel

8.6 The nearest Nottingham Express Transit (NET) stop to the proposed development is the Line 3 terminus at Clifton South Park and Ride. At approximately 15km from the development, it is well beyond the maximum commuting distance for pedestrians or cyclists. However, it is easily accessible by road, and could form part of a multi modal journey for commuters into Nottingham, in combination with either the car or the bus.

8.7 Clifton South Park and Ride site has approximately 1,000 car parking spaces, including spaces with EV charging infrastructure. It is called at by the Skylink Nottingham service, which also serves EMA, and runs every half an hour. The tram journey into Nottingham city centre (railway station) takes approximately 25 minutes, which is generally faster than the equivalent road journey at peak times.

Future opportunities for tram travel

8.8 Several options for a potential extension of the existing Nottingham Express Transit (NET) tram network have been considered in recent years, including lines to Gedling and Kimberley, and the ultimate aim is to extend the network. However, the current position is that any extension would be unlikely to come forward in the next decade. There is no committed funding.

8.9 When HS2 was to have a station at Toton, extension options from the tram terminus at Toton Lane were considered, through Long Eaton and south to EMA. As shown on **Figure 8.4**, one option ran alongside the M1 to EMG, then on to EMA, the other ran through Castle Donington before terminating at EMA.

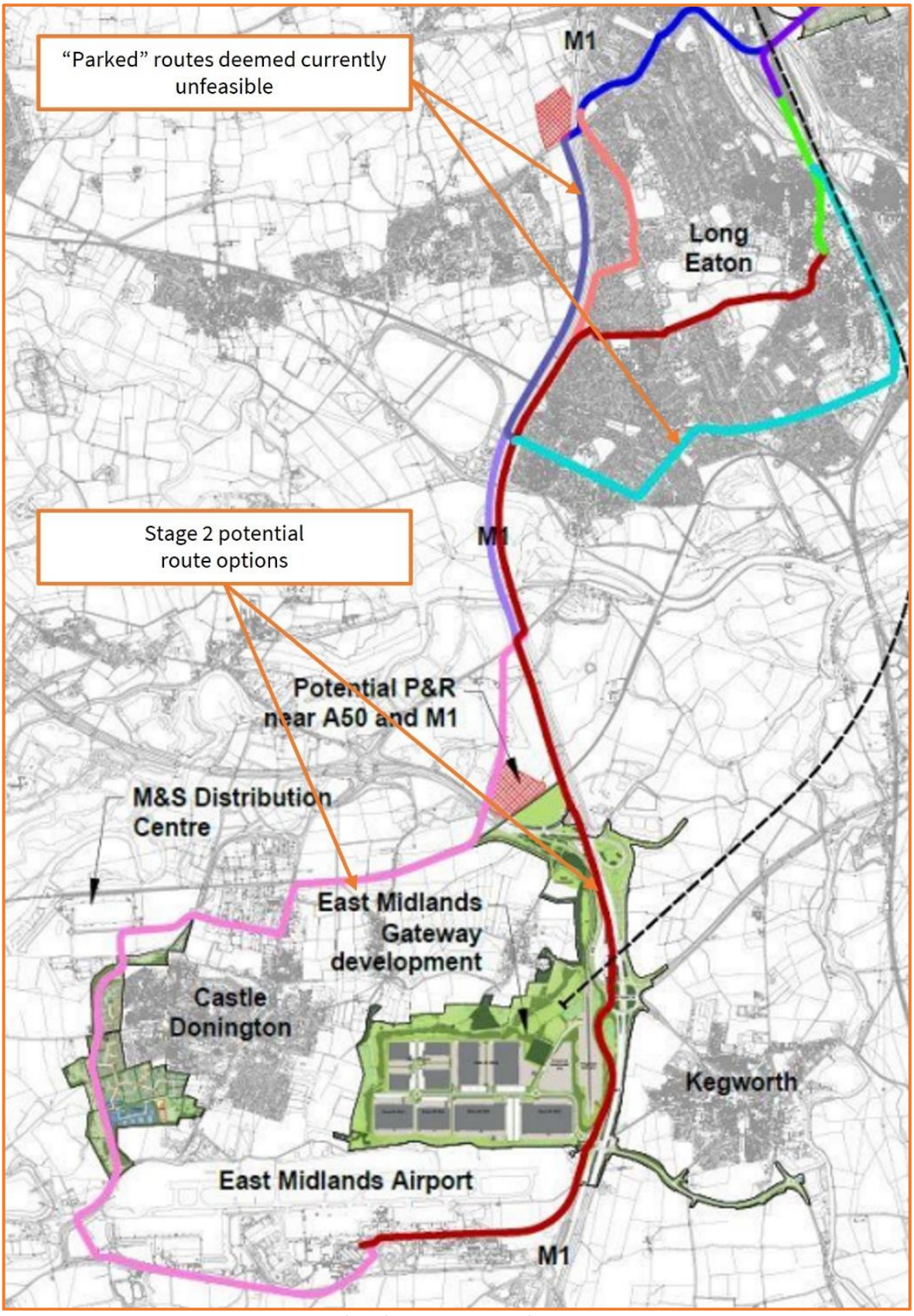

Figure 8.4: NET extension options considered to accompany the HS2 station at Toton

8.10 The proposed route via EMG would range in length between 14 and 16km, with between 10 and 13 new stops. Journey time from Toton to EMA would be 24-28 minutes, or approximately 55 minutes from Nottingham city centre. The proposed route to EMA via Castle Donington would be 18km long, with 13 additional stops and a journey time of 33 minutes from Toton to EMA, or approximately 65 minutes to Nottingham city centre.

8.11 Both options were deemed technically feasible. A business case was not prepared. With HS2 no longer stopping at Toton, the options have been shelved.

8.12 In 2019, Nottingham City Council also explored the feasibility of a tram extension along the A453 from the Clifton Park & Ride terminus to EMA. Two route options were explored. One was immediately adjacent to the A453, and around the north side of the power station. The other was through Fairham, including an on-street section, and then through the villages to the south of the A453, including Gotham and Kegworth. The high level review only looked at the engineering work, and deemed the routes were deliverable. Approval was granted to start the business case, but it was stopped by the pandemic and was not started again. The NET team believe there is a case for connections to employment sites around the airport. However, there is a debate about whether it should be a tram extension or more traditional heavy rail.

8.13 In the future, any new extensions would be explored by the new Combined Transport Authority. However, such studies are yet to happen, whereafter a business case will be required. There is no prospect of a tram extension in the near future.

8.14 Despite that, part of the highway mitigation strategy described later in this report involves the construction of a new bridge over the M1 at junction 24. The intention is that this bridge will be designed with sufficient width to accommodate a tram line adjacent to the road carriageway. This would facilitate future connections across the M1 should an extension of the tram network to EMA be brought forward.

8.15 If that were to occur, a tram extension to the EMA terminal buildings is most likely, through the Pegasus Business Park. It is unlikely the tram would extend further to Isley Woodhouse. Nevertheless, Isley Woodhouse residents could reach the tram by walking, cycling, or taking the bus to EMA. Hence, accessibility to the tram will be safeguarded by delivering good connections to EMA.

9.0 STRATEGIC TRAFFIC MODELLING METHODOLOGY

9.1 The Transport Working Group agreed that the traffic impacts of the proposed new settlement would be assessed using Leicestershire County Council's East Midlands Freeport Model (EMFM), which is a cordoned part of the larger PRTM 2019 (Pan-Regional Transport Model).

Summary of the agreed strategic modelling methodology

9.2 The transport modelling methodology was discussed with the Transport Working Group and Technical Note J (**ADC2570-RP-J-v3** in **Appendix 5)** sets out the agreed methodology. Given the scale and complexity of the project, the modelling scope is broken down into three stages, as summarised below.

- Stage 1 – initial modelling focused on achieving the following objectives:
  - forecasting the morning and evening peak hour reference case traffic scenarios (i.e. no Isley Woodhouse development) for the opening year and assessment year
  - establishing the distribution of development traffic
  - forecasting the morning and evening peak hour 'with development but no mitigation' traffic scenarios (ie. with Isley Woodhouse but no mitigation) for the opening year and the assessment year
  - demonstrating the suitability of the access strategy
  - identifying off-site impacts due to the development traffic in the assessment year and agreeing the area of influence.
- Stage 2 – using outputs from the Stage 1 modelling to identify a mitigation strategy incorporating highway interventions and strategies for walking, cycling, and public transport for agreement with the Transport Working Group.
- Stage 3 – testing the proposed phasing strategy for the proposed development.

Assessment years and stage 1 modelling scenarios

9.3 The Transport Working Group agreed that an opening year of 2029 should be considered, when first occupations would occur. The development is forecast to be complete by 2050. However, an assessment year of 2051 was agreed as the PRTM is developed in 5-year increments.

9.4 The traffic impacts due to Isley Woodhouse would impact on the Strategic Road Network. Therefore, modelling scenarios that comply with the requirements of DfT Circular 01/2022[7] are required. The Circular requires only an opening year assessment, to include the forecast growth and committed development up to that opening year.

9.5 Hence, to comply with the Circular, and assess the impact of the development on the road network in 2051, it was agreed with the Transport Working Group that the following scenarios will be tested:

[7] Strategic road network and the delivery of sustainable development - GOV.UK (www.gov.uk)

stage		ID	year	scenario	reference case parameters	development parameters	to be used for
Stage 1	Base	B2019	2019	base year	committed and allocated development and infrastructure in place by 2019	n/a	base year traffic flows for air quality model verification
		B2022	2022	base year	committed and allocated development and infrastructure in place by 2022	n/a	base year traffic flows
	Reference Case	RC1	2029	opening year	committed and allocated development and infrastructure in place by 2029	n/a	background traffic flows in opening year for assessment of: • environmental effects • assessment of local road network • assessment of strategic road network
		RC2	2051	assessment year	committed and allocated development and infrastructure in place by 2051	n/a	background traffic flows in assessment year for assessment of: • environmental effects • assessment of local road network
	With Development	WD1	2029	opening year with development no mitigation	RC1	100% of development no mitigation (other than site access)	Circular 01/2022 compliant assessment of the development impact on the strategic road network
		WD2	2051	assessment year with development no mitigation	RC2	100% of development no mitigation (other than site access)	assessment of the development impact on the local road network

Uncertainty log

9.6 The forecast planning and infrastructure schemes to be included in the forecast modelling are provided in the form of an Uncertainty Log, which is shown at Appendices A and B in the Isley Woodhouse: Forecasting Report (Stage 1) provided at **Appendix 8**. The forecast planning and infrastructure schemes were reviewed in detail and agreed by the Transport Working Group.

9.7 Included within the Uncertainty Log is the proposed EMG Phase 2 Freeport site located south of the A453, to the east of Diseworth. An application for a Development Consent Order (DCO) is being prepared for EMG Phase 2, with the application expected to be made in 2025 for up to 3 million sqft of warehouse and distribution floorspace. The provisions incorporated into the articles of a DCO include the necessary powers in relation to highways works, and therefore the EMG Phase 2 DCO application would be expected to include the access proposals, and the highway works proposals of sufficient scale to ensure that adverse impacts on the surrounding highway network are mitigated.

9.8 At the time that the Uncertainty Log for the Isley Woodhouse stage 1 modelling was agreed, only the forecast traffic generation of EMG Phase 2 was known. No details of its access strategy or highway mitigation proposals were available and they were therefore not included within the stage 1 strategic modelling for Isley Woodhouse.

9.9 The Uncertainty Log also included significant draft allocations from the North West Leicestershire Local Plan. In particular, the draft allocation known as Land North and South of Park Lane, Castle Donington (CD10) was included. Although the traffic that the development might generate was estimated, there was no highway mitigation identified.

10.0 BASELINE HIGHWAY CONDITIONS

Current local highway network

10.1 To the northeast of Isley Walton, the A453 runs along the northern boundary of the site providing access to EMA, including the main airport site, the DHL distribution centre, Pegasus Business Park, and the various ancillary businesses and facilities connected with EMA. Further east, the A453 provides access to the M1 southbound and Donington service station at M1 Junction 23A (approximately 3km northeast of the site). The A453 continues to the north of M1 Junction 23A, providing access to EMG and the Kegworth Bypass at a signalised roundabout. Further north still it meets M1 Junction 24. From M1 Junction 24 access is provided to the M1 northbound, the A50, and the A453 towards Nottingham.

10.2 To the south of Isley Walton, the A453 connects with the A42 at Junction 14, approximately 3km south of the site, providing connectivity to Birmingham and the West-Midlands. Where the A453 ends, the only connections to the A42 are a westbound on-slip and an eastbound off-slip. There are no slip roads on the eastern side of the junction. However, east of the junction the A42 only provides connectivity to M1 Junction 23A, which can instead be reached via the A453.

10.3 The town of Castle Donington and the employment sites located on its northern edge are approximately 3.5km north of the site and are accessible from the site via the A453 and the Airport Perimeter Road.

10.4 Northwest of the site, Melbourne Road runs from east to west, meeting the A453 at Isley Walton via a simple priority-controlled T-junction. Melbourne Road is a single carriageway road subject to a 40mph speed limit in the vicinity of the junction, although the speed limit increases to the national speed limit approximately 230m west of its junction with the A453. Melbourne Road provides access to the town of Melbourne and the village of Wilson. Melbourne Road does not benefit from any pedestrian or cycle infrastructure.

10.5 To the east of the site, Diseworth Lane runs south from its junction with the A453, becoming The Green as it enters the village of Diseworth approximately 500m beyond the eastern border of the site. East of Diseworth, the Green continues under both the A42 and M1 through Long Whatton before meeting the A6 near Hathern, approximately 5km north of Loughborough. Although it has no dedicated cycle infrastructure, the National Cycle Network (NCN) Route 15 routes through Diseworth and uses The Green. NCN Route 15 links Loughborough and Shepshed with EMA. The A453/Diseworth Lane junction is a priority controlled simple T-junction and sits immediately adjacent to the northeastern corner of the site.

10.6 The Castle Donington Western Relief Road provides a bypass around the western edge of the town. Construction of the bypass began in late 2018 and was opened in February 2020, comprising of a 2.5km single carriageway road with a 3 metres wide shared footway/cycleway on the eastern side of its carriageway. The bypass runs from Back Lane to the north of Castle Donington in a westerly direction to the Short Lane roundabout, with a link to the East Midlands Distribution Centre, before turning south with further junctions at Park Lane and the Airport Perimeter Road at its southern end.

10.7 The bypass provides connectivity between Isley Woodhouse and employment sites north of Castle Donington, as well as providing access to the A50 via the Sawley Interchange (A50 Junction 1), removing the need for vehicles to travel through the centre of Castle Donington. The shared footway/cycleway along the eastern edge of the bypass ties into the existing infrastructure provision on both the Airport Perimeter Road and Short Lane/Back Lane, providing a

pedestrian/cycle connection between the site and Castle Donington and the employment sites on its northern fringe.

Collision data analysis

10.8 The Planning Practice Guidance says that a Transport Assessment should include, "*an analysis of the injury accident records on the public highway in the vicinity of the site access for the most recent 3-year period, or 5-year period if the proposed site has been identified as within a high accident area*;". The assessment should consider whether there are any trends in accident type or location that maybe exacerbated by the proposed development.

10.9 An accident study area has been adopted to include the A453 between A42 Junction 14 and M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, M1 Junction 24, routes through and around Diseworth, and the Airport Perimeter Road towards Castle Donington (see **Figure 10.1**). Personal injury accident records within that study area were obtained from LCC for the five-year period between 1 January 2018 and 30 September 2023.

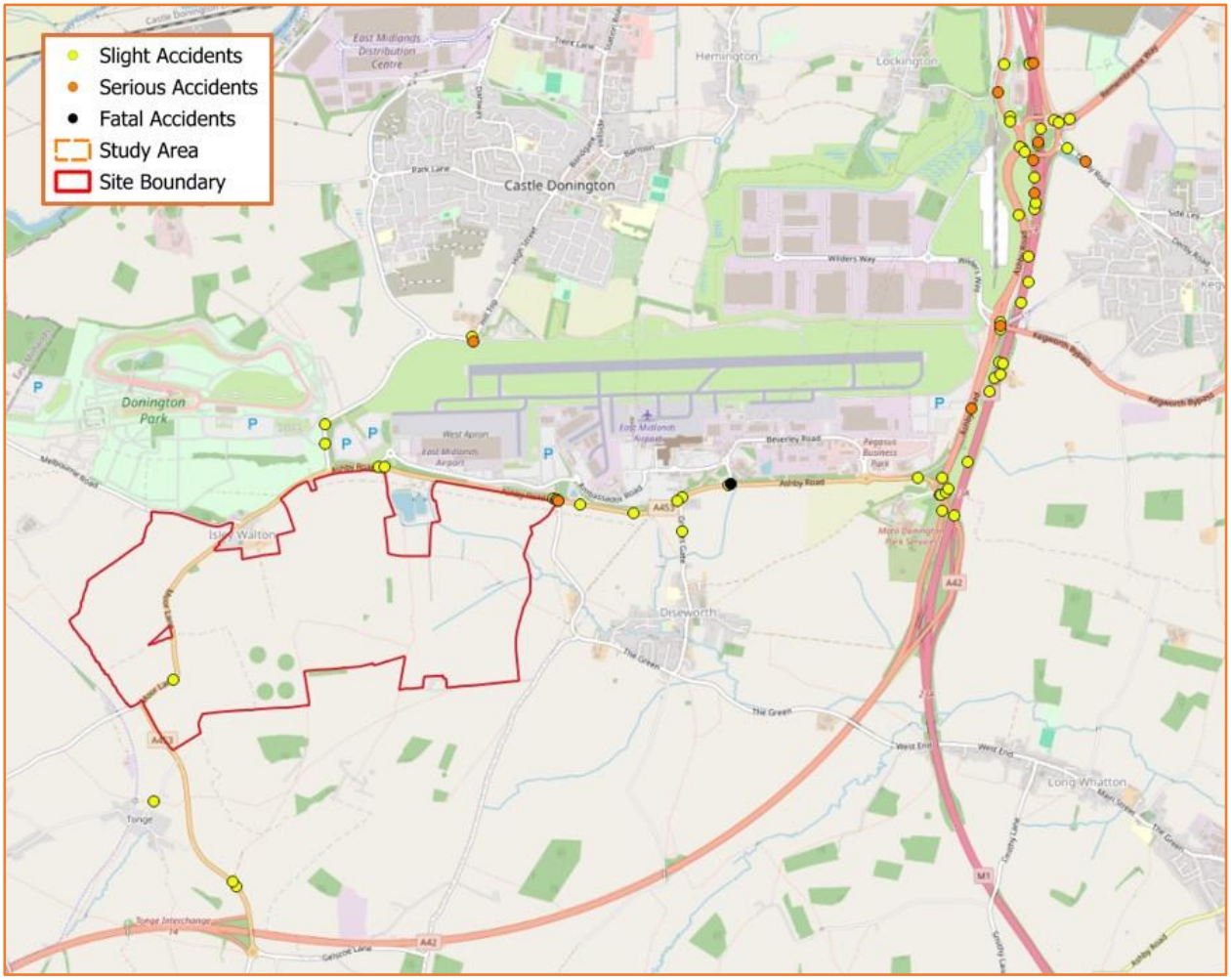

Figure 10.1: personal injury collision data

10.10 In total there were 70 accidents recorded in the study area, of which one was fatal, 10 were classified as serious in severity, and 59 were slight in severity. The locations are shown on **Figure 10.1**, and their distribution is summarised in the table below. The following paragraphs contains a detailed breakdown of the accidents by location.

location	fatal	serious	slight	total

A453 (M42 J14 to M1 J23A)	1	1	12	14
Grimes Gate Road	0	0	1	1
Airport Perimeter Road	0	1	3	4
M1 mainline (including on and off slips)	0	4	17	21
M1 Junction 24	0	2	11	13
A453 (north of M1 J23A)	0	2	3	5
M1 Junction 23A	0	0	8	8
Tonge	0	0	4	4
Complete Study Area	1	10	59	70

A453 and Airport Perimeter Road north of the site

10.11 The location of the accidents recorded in the area to the north of the site are shown on **Figure 10.2** are described in the following paragraphs.

Figure 10.2: PIC data to the north of the site

10.12 A fatal accident occurred on the A453 at the EMA access when a westbound car attempted to turn right in to EMA and collided with an agricultural vehicle that was traveling from west to east on the A453. The car driver suffered serious injuries, and the car passenger suffered fatal injuries. There were two further accidents recorded at this junction, both resulting in slight injuries. One of these occurred between a goods vehicle travelling from west to east along the A453 and a car as it turned north towards the terminal. The other accident occurred on the A453 between two westbound cars as one attempted to switch lanes to the left, colliding with a car in the inside lane.

10.13 Two accidents of slight severity occurred at the A453/Grimes Gate Road junction. One was a collision between a motorcycle and a car on the A453 and occurred as the two vehicles travelled northeast. The other incident involved a car and goods lorry in similar circumstances.

10.14 There was one accident that was deemed slight in severity on Grimes Gate Road, south of the A453, near Diseworth. The collision occurred in the immediate vicinity of Byland's Cottage and involved a car reversing on to the carriageway and colliding with a northbound motorcycle.

10.15 There were two collisions west of the A453/Grimes Gate junction, both involving a goods van and a car. One collision involved the vehicles colliding as they travelled east and the other involved the vehicles traveling in opposing directions. Both collisions resulted in slight injuries.

10.16 At the northeast corner of the site there was a group of five collisions at the junction between the A453 and the road connecting to Diseworth (which becomes The Green). Four were deemed slight and one serious. The serious collision occurred between a westbound car and a taxi and car heading east. Two of the accidents that were deemed slight in nature were rear-end shunt collisions and occurred in queuing traffic. One involved a car, lorry, and goods van and the other a car and goods van. In addition, there was collision between a car headed west and an eastbound car turning right. An additional car on the minor road was involved while waiting to turn right. One driver suffered slight injuries.

10.17 There were two collisions on the A453 at the DHL roundabout. The A453 consists of a single carriageway east of the roundabout and a dual carriageway to the west. One of the accidents involved a car and pedal cycle colliding on the roundabout as at they travelled from west to east. The other accident was a loss of control incident involving a single car exiting the roundabout to the east.

10.18 There were four accidents to the east of EMA and north of the A453 along the Airport Perimeter Road. Two accidents deemed slight in nature were recorded on the Airport Perimeter Road within the vicinity of Donington Park. One involved both a southbound car and motorcycle colliding with a northbound car. The other occurred at the entrance to Donington Park when a motorcycle entering Donington Park from the north collided with a car exiting to the south.

10.19 Two additional collisions occurred at the Airport Perimeter Road/Hill Top roundabout to the north of EMA. Both were loss of control type accidents. One involved a motorbike travelling west and resulted in serious injuries for the rider. The other involved a car travelling northwards and resulted in slight injuries for the driver.

M1 Junction 23A

10.20 As shown on **Figure 10.3**, there were eight incidents at, or on the approach to, M1 Junction 23A. All of these accidents were classified as slight in nature.

10.21 Four of these accidents occurred on the A42 northbound approach to the roundabout. Two were collisions between a goods lorry and a car - one involved both vehicles entering the roundabout and in the other the car was parked. There was also a rear end shunt collision between two queuing cars at the northbound entry to the roundabout. Approximately 100m south of the roundabout there was a loss of control collision involving a car.

10.22 There were two accidents that were slight in severity on the circulating carriageway. One accident involved a car leaving the roundabout and colliding with a van that was held up. The other accident occurred when a motorcycle changed lanes to the right and collided with a car.

10.23 In addition, a collision occurred on the A453 approximately 150 east of the roundabout. The collision involved five eastbound vehicles in a rear end shunt collision. An additional car travelling in the opposite direction was also involved. There was also one collision at the A453 northbound exit between a car and a goods vehicle.

10.24 Approximately 500m north of M1 Junction 23A, there was a serious collision. The incident was a loss of control type collision involving an HGV travelling south in wet conditions.

Figure 10.3: PIC data to the northeast of the site

A453/EMG/Kegworth Bypass junction

10.25 **Figure 10.3** shows that there were three collisions at the junction between the A453 and the A6. One accident was serious and involved two cars on the A6 entering the junction from the east and colliding with a southbound car. Similarly, a collision that was deemed slight in nature occurred between a southbound goods lorry on the A453 and two eastbound cars turning right as they left

the A6. The final incident at this junction involved two cars colliding as one turned south on to the A453 from Wilders Way into a car travelling north to south along the A453.

M1 mainline and Junction 24 slip roads

10.26 **Figure 10.3** show that in total there were 21 collisions on the M1 mainline and the on and off slips of M1 Junction 24. Four of these collisions were deemed serious in severity and the rest were deemed slight.

10.27 Of the four serious collisions, two occurred on the main carriageway. One incident, involving two cars, took place north of M1 Junction 24 on the southbound carriageway, and the other occurred in the vicinity of the northbound off slip and was a loss of control type collision involving a single car travelling north. The other two serious collisions occurred on the off slips of the junction. One involved two motorcycles and a car at the southbound off slip, and the other involved a collision between three goods vehicles and a car during queuing traffic exiting the M1 northbound.

10.28 17 slight accidents occurred on the M1 and the off and on slips of M1 Junction 24. Three of these accidents occurred on the northbound off-slip, of which two were shunt collisions that occurred during queuing traffic. The other accident in this location was a loss of control collision. There were two accidents that occurred at the northbound on slip. One of these occurred as a car joined the main carriageway and involved four vehicles. The other accident took place when a car changed lanes and collided with an HGV.

10.29 Three accidents occurred northbound on the M1, two of which involved a collision between two vehicles during normal traffic conditions, the other involved five vehicles. Nine accidents occurred southbound, two of which were rear end shunts and two occurred during queuing traffic. One accident was a loss of control type collision. There were two accidents that occurred as a result of a lane change manoeuvre by one of the vehicles and two collisions that occurred under normal traffic conditions.

M1 Junction 24

10.30 **Figure 10.3** shows that there was a slight collision on the A453 Ashby Road northbound approach M1 Junction 24. The collision was a loss of control collision involving a motorcycle travelling north.

10.31 There were three accidents at the A453 Ashby Road entry to M1 Junction 24. There was a rear end shunt that was slight in nature between two cars as they queued to enter the roundabout. Also at the A453 Ashby Road entry, there was a collision that was slight in severity between two cars on the circulating carriageway. There was a third collision of slight severity adjacent to the A453 arm of the roundabout involving a lorry colliding with a car as it changed lanes to the left as both vehicles exited the roundabout on to the A453 Ashby Road.

10.32 Four collisions occurred north of M1 Junction 24 on the A50, of which one was serious and three were slight, as shown on **Figures 10.2** and **10.3**. The serious incident involved a northbound car colliding with a goods van as it turned left (north) onto the main road. One of the slight accidents occurred further north and involved a collision between a goods lorry and a car, both travelling north, colliding as the lorry changed lane to the left. The two collisions that were slight in a nature occurred closer to M1 Junction 24, one of which involved a goods lorry approaching with the junction colliding with a car it overtook. The other incident involved a goods lorry and car colliding as the lorry changed lanes to the left as the vehicles left the roundabout northbound.

10.33 A group of four accidents, all slight in nature, were recorded adjacent to the A453 Remembrance Way node of M1 Junction 24, two of which were loss of control type collisions, each involving a car as it exited the roundabout. One accident involved a goods van turning into the left lane and colliding with a car as they both exited the roundabout onto Remembrance Way. Similarly, there was a collision on Remembrance Way between a car and goods vehicle as they travelled northeast.

10.34 One serious and one slight accident occurred on Derby Road close to M1 Junction 24. The serious collision involved an overtaking motorcycle colliding with two cars as they left the junction. The slight collision involved two cars and a motorcycle colliding while held up approaching the junction. The accident also involved a stationary car on the other side of the road.

A453 southwest of the site

10.35 **Figure 10.4** below shows that there were two accidents of slight severity on the A453, approximately 250m north of A42 Junction 14. The accidents occurred between vehicles traveling in opposing directions. One involved a car and van (under 3.5 tonnes), and the other involved two cars.

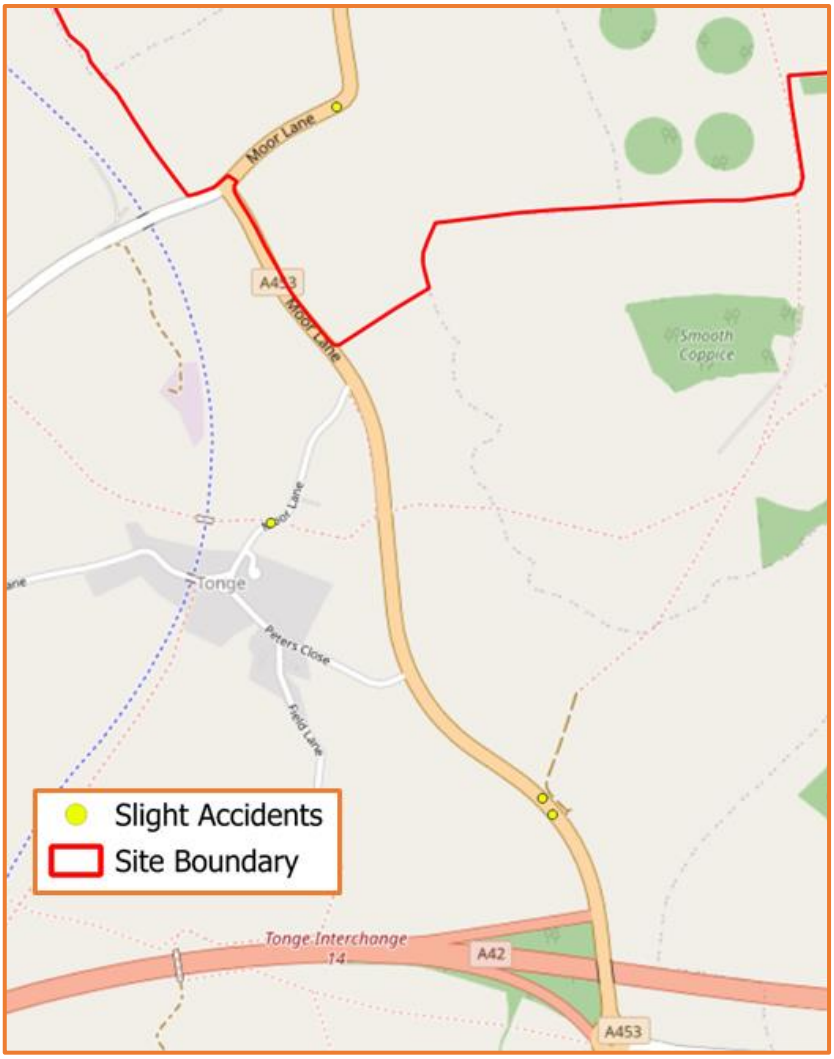

Figure 10.4: PIC data to the southwest of the site

10.36 Within the village of Tonge there was a single collision of slight severity on Moor Lane, approximately 300m southwest of the A453. The accident was a rear end shunt collision between two northbound motorcycles as one failed to stop.

10.37 Additionally, there was a collision on the A453 within the site boundary. The accident occurred approximately 250m northeast of the Moor Lane T-junction. The accident was described as a loss of control collision on a right-hand bend, involving a motorcycle travelling south.

Summary

10.38 The paragraphs above describe the accident record on the road network in the vicinity of the site. There are high numbers of accidents on the busiest strategic roads such as the M1. There are relatively few accidents on the A453. None of the accidents involved pedestrians and only one involved a cyclist. The rest were vehicle collisions, with a number of loss of control accidents where speeds are high, and rear end shunts where there is queuing traffic.

10.39 The need for measures to address any road safety concerns at the study area junctions will be included within the mitigation strategy for the development.

EMFM base year model

10.40 AECOM were commissioned to undertake strategic traffic modelling (Stage 1) to assess the potential traffic impacts of the proposed development using the East Midlands Freeport Model (EMFM). That model is a cordoned part of the Pan-Regional Transport Model (PRTM), with additional highway network density in the Freeport area to allow its use in assessing the emerging developments around the Freeport. The travel demands used in the highway assignment element of the EMFM are derived from the PRTM. The base year of the EMFM is 2019.

10.41 Before the forecast modelling could be undertaken, the suitability of the base year model was demonstrated to the satisfaction of the Transport Working Group. AECOM reviewed the base year model and provided additional evidence about journey times to satisfy the requests of the Transport Working Group. Their Base Year Model Review report was issued in January 2024 (EMFM 2019: Isley Woodhouse – Base Year Model Review v1.0 - **Appendix 6**). It concludes that, "*the EMFM is considered suitable for the strategic assessment of the proposed Isley Woodhouse development*."

EMFM 2022 base scenario

10.42 In accordance with the forecast modelling methodology set out in Section 9, a 2022 base year was run to establish the base year traffic flows across the modelled network. The table below summarises the 2022 base year flows on the key links within the vicinity of Isley Woodhouse.

2022 EMFM base year traffic flows (PCUs)						
Route	2022 morning base year			2022 evening peak hour		
	Outbound	Inbound	2-way	Outbound	Inbound	2-way
A453 west of J23A	798	1,219	2,017	1,048	749	1,797
A453 north of J23A	2,027	734	2,761	1,861	907	2,768
M1 South of J23A	4,625	4,568	9,193	4,513	4,883	9,396
A42 south of J23A	2,033	2,159	4,192	1,857	2,017	3,874
Airport Perimeter Road	572	919	1,491	734	488	1,222
Castle Donington bypass	*208*	*202*	*410*	*268*	*134*	*402*
High Street	*365*	*719*	*1,084*	*473*	*362*	*835*
Station Road (south of A50 J1)	701	1,104	1,805	1,043	724	1,767
M1 (north of J24A)	3,817	5,083	8,900	5,457	3,954	9,411
A453 Remembrance Way	1,928	1,853	3,781	1,730	2,051	3,781
A453 (east of The Green)	720	350	1,070	293	502	795
A453 (west of The Green)	733	456	1,189	364	511	875
The Green (northwest of Diseworth)	223	317	540	253	192	445
The Green (east of Diseworth)	226	138	364	172	119	291
Mill Lane (north of Gelscoe Ln)	35	202	237	118	106	224
Mill Lane (south of Gelscoe Ln)	38	78	116	52	59	111
Top Brand (south of A42 J13)	162	263	425	304	251	555
A453 (south of Isley Walton)	332	562	894	548	316	864
Melbourne Road (west of Slade Ln)	261	168	429	126	194	320
Breedon on the Hill	95	175	270	150	82	232
Nottingham Road (west of Breedon)	58	62	120	60	66	126
A42 (west of A42 J13)	2,135	2,414	4,549	2,010	2,142	4,152

Traffic surveys

10.43 For the initial study area set out in Section 14 of this report, morning and evening peak hour traffic surveys were undertaken at the junctions listed in the table below. The survey data can be provided on request.

junction number	location
1	A453/northeastern site access traffic signal junction
2	A453/Airport Perimeter Road/central site access roundabout
3	A453/Melbourne Road/northwestern access roundabout
4	A453/southwestern site access roundabout
5	Station Road/Donington Lane/Trent Lane roundabout
6	Station Road/Broad Rushes roundabout
7	Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre
8	Park Lane/Castle Donington bypass roundabout
9	A453/The Green priority T-junction
10	A453/EMA access traffic signal controlled T-junction
11	A50 Junction 1
12	A42 Junction 14 Tonge Interchange

11.0 DEVELOPMENT TRAFFIC

Development traffic generation - methodology

11.1 Technical Note B in **Appendix 3** sets out the methodology for forecasting the traffic generation of Isley Woodhouse for use in the strategic traffic modelling. The Technical Note was agreed with the Transport Working Group. The approach is summarised below.

11.2 The traditional methodology for calculating the volume of traffic that could be generated by a new development has been to survey existing developments with similar characteristics and apply the resulting trip rates to the proposed development. This approach, known as 'predict and provide', assumes that past travel patterns will continue unchanged into the future, and hence this methodology does not account for changing travel behaviour, such as the reduction in trip making by car over time. It also fails to acknowledge that the resulting trip rates could be influenced by the design of the development.

11.3 The scale of the Isley Woodhouse settlement is such that the effects of changing travel behaviour, in terms of the demand for travel and also the travel mode of choice, should not be ignored. Otherwise, it will result in capital expenditure on highway improvements instead of internal facilities and sustainable transport provision.

11.4 An alternative approach known as 'decide and provide' is emerging, which is based upon an understanding of how trip rates are changing over time, and how the design of a settlement would influence the demand to travel. The methodology proposes deciding on a preferred future and providing a development path best suited to achieving it.

11.5 The decide and provide methodology is in its infancy, and following discussions with the Transport Working Group it was decided that the traditional methodology should be used for the proposed development to assess a robust worst-case scenario in the first instance as part of the stage 1 EMFM modelling.

11.6 Once the worst-case impacts of the development have been identified in stage 1, the stage 2 modelling could consider a comprehensive strategy for mitigating the identified impacts of the development. This mitigation strategy will include the following:

- targeted highway improvements to accommodate the traffic generated by the development
- a reduction in the external traffic generation due to the positive effects of the movement strategy that seeks to reduce the number of single occupancy car trips and maximise the opportunity for residents to commute to the extensive local employment zones using active modes.

Development traffic generation

11.7 Adopting the methodology described above, Technical Note B sets out the forecast traffic generation of Isley Woodhouse for the stage 1 EMFM modelling. The Technical Note was agreed with the Transport Working Group.

11.8 The unmitigated development would generate a significant amount of traffic movements. Some of those movements will be internalised, for example new residents who attend the primary and secondary schools or use the local shops. For EMFM purposes, it is the external traffic that is of interest. The agreed internal and external traffic generation for Isley Woodhouse stage 1 modelling is summarised in the tables below.

TRIP RATES			AM peak hour			PM peak hour		
			arrive	depart	two-way	arrive	depart	two-way
C3 residential	per	dwelling	0.126	0.355	0.481	0.326	0.147	0.473
employment area	per 100	sqm	0.536	0.284	0.820	0.173	0.453	0.626
secondary school	per	pupil	0.144	0.108	0.252	0.022	0.029	0.051
primary schools	per	pupil	0.322	0.262	0.584	0.022	0.041	0.063
day nurseries	per 100	sqm	3.632	2.544	6.176	1.803	2.676	4.479
large local centre - local centre uses	per 100	sqm	4.074	3.519	7.593	4.103	4.786	8.889
large local centre - foodstore	per 100	sqm	3.053	2.528	5.581	4.461	4.653	9.114
neighbourhood centres - local centre uses	per 100	sqm	4.074	3.519	7.593	4.103	4.786	8.889

TRAFFIC GENERATION			AM peak hour			PM peak hour		
			arrive	depart	two-way	arrive	depart	two-way
C3 residential	4250	dwellings	536	1509	2045	1386	625	2011
employment area	23924	sqm	128	68	196	41	108	149
secondary school	900	pupils	130	97	227	20	26	46
primary schools (x3)	1260	pupils	406	330	736	28	52	80
day nurseries (x3)	1800	sqm	65	46	111	32	48	80
large local centre - local centre uses	8000	sqm	326	282	608	328	383	711
large local centre - food store	3000	sqm	92	76	168	134	140	274
neighbourhood centres - local centre uses	4000	sqm	163	141	304	164	191	355
total			1846	2549	4395	2133	1573	3706

INTERNAL TRIPS	Internalisation rate		AM peak hour			PM peak hour		
	AM	PM	arrive	depart	two-way	arrive	depart	two-way
C3 residential	0%	0%	0	0	0	0	0	0
employment area	20%	20%	26	14	40	8	22	30
secondary school	50%	50%	65	49	114	10	13	23
primary schools (x3)	75%	75%	305	248	553	21	39	60
day nurseries (x3)	75%	75%	49	35	84	24	36	60
large local centre - local centre uses	50%	50%	163	141	304	164	192	356
large local centre - food store	65%	38%	60	49	109	51	53	104
neighbourhood centres - local centre uses	90%	90%	147	127	274	148	172	320
total			815	663	1478	426	527	953

EXTERNAL TRIPS			AM peak hour			PM peak hour		
			arrive	depart	two-way	arrive	depart	two-way
C3 residential			536	1509	2045	1386	625	2011
employment area			102	54	156	33	86	119
secondary school			65	48	113	10	13	23
primary schools (x3)			101	82	183	7	13	20
day nurseries (x3)			16	11	27	8	12	20
large local centre - local centre uses			163	141	304	164	191	355
large local centre - food store			32	27	59	83	87	170
neighbourhood centres - local centre uses			16	14	30	16	19	35
total			1031	1886	2917	1707	1046	2753

EXTERNAL TRIPS (BY VEHICLE TYPE)	vehicle type		AM peak hour			PM peak hour		
			arrive	depart	two-way	arrive	depart	two-way
C3 residential	1	cars	536	1509	2045	1386	625	2011
employment area	0.9	cars	92	49	141	30	77	107
employment area	0.1	HGVs	10	5	15	3	9	12
secondary school	1	cars	65	48	113	10	13	23
primary schools (x3)	1	cars	101	82	183	7	13	20
day nurseries (x3)	1	cars	16	11	27	8	12	20
large local centre - local centre uses	1	cars	163	141	304	164	191	355
large local centre - food store	1	cars	32	27	59	83	87	170
food store	1	cars	16	14	30	16	19	35
total			1031	1886	2917	1707	1046	2753

Development traffic distribution

11.9 It was agreed with the Transport Working Group that the external development traffic shown in the table above would be distributed onto the highway network using the PRTM gravity model approach. The gravity model distributes traffic between zones based on the travel costs between zones, with a different trip-cost profile for each trip purpose. The slides showing the traffic distribution are in **Appendix 7**.

Traffic modelling

11.10 The stage 1 EMFM forecast modelling has been completed. The Forecasting Report (Stage 1) is in **Appendix 8**. Together with the Forecasting Report, GIS shape files presenting various datasets and comparisons between the modelled scenarios have been provided by AECOM for the 2029 opening year and 2051 assessment year scenarios. The shape files include the traffic volume plots, traffic flow difference plots, background traffic reassignment plots, and a select link analysis detailing the forecast routing of the development traffic. The shape files show traffic flows in terms of passenger car units (PCUs).

11.11 The select link analysis has been interrogated to confirm that the total amount of development traffic in the model matches the forecast external development traffic shown above. The comparison is shown in the table below.

2029 development traffic (PCUs)	morning peak hour			evening peak hour		
	Arrive	Depart	2-way	Arrive	Depart	2-way
Agreed external traffic generation	1,041	1,891	2,932	1,710	1,054	2,764
PRTM development traffic	1,018	1,891	2,909	1,683	1,054	2,737
Difference	-23	0	-23	-27	0	-27

2051 development traffic (PCUs)	morning peak hour			evening peak hour		
	Arrive	Depart	2-way	Arrive	Depart	2-way
Agreed external traffic generation	1,041	1,891	2,932	1,710	1,054	2,764
PRTM development traffic	995	1,891	2,886	1,649	1,054	2,703
Difference	-46	0	-46	-61	0	-61

11.12 The table shows that in both the morning and evening peak hours for the 2029 and 2051 scenarios, all forecast development vehicle trips have departed the site and entered the network. The table also shows that in all scenarios the number of arrivals at the site is slightly lower than the forecast number of arrivals.

11.13 Hence, whilst the correct number of vehicles trips to the proposed development site have been released into the model, a relatively small number have not arrived at the site by the end of the modelled peak hour, which suggests that there is congestion within the network. The number of vehicles that fail to arrive at the site is higher in 2051 than in 2029, which would be expected as congestion increases over time due to traffic growth, especially given the 22-year difference between the 2029 opening year and the 2051 completion year. Nevertheless, the differences are small, and the model results are suitable for use.

Development traffic assignment

11.14 The Forecasting Report (Figures 2.7 to 2.14 in **Appendix 8**) shows the routes taken by development traffic in the 2029 opening year and 2051 assessment year scenarios, for both the morning and evening peak hours.

11.15 In the morning peak hour, the majority of vehicle trips would be departures from the site, and there would be a higher volume of arrivals in the evening peak hour. As stated in the Forecasting Report, the routes used for arrivals and departures are broadly consistent. Hence, for simplicity, **Figure 11.1** shows the routes taken by departing development vehicles during the 2051 morning peak hour and **Figure 11.2** shows the routes taken by arriving development vehicles during the 2051 evening peak hour.

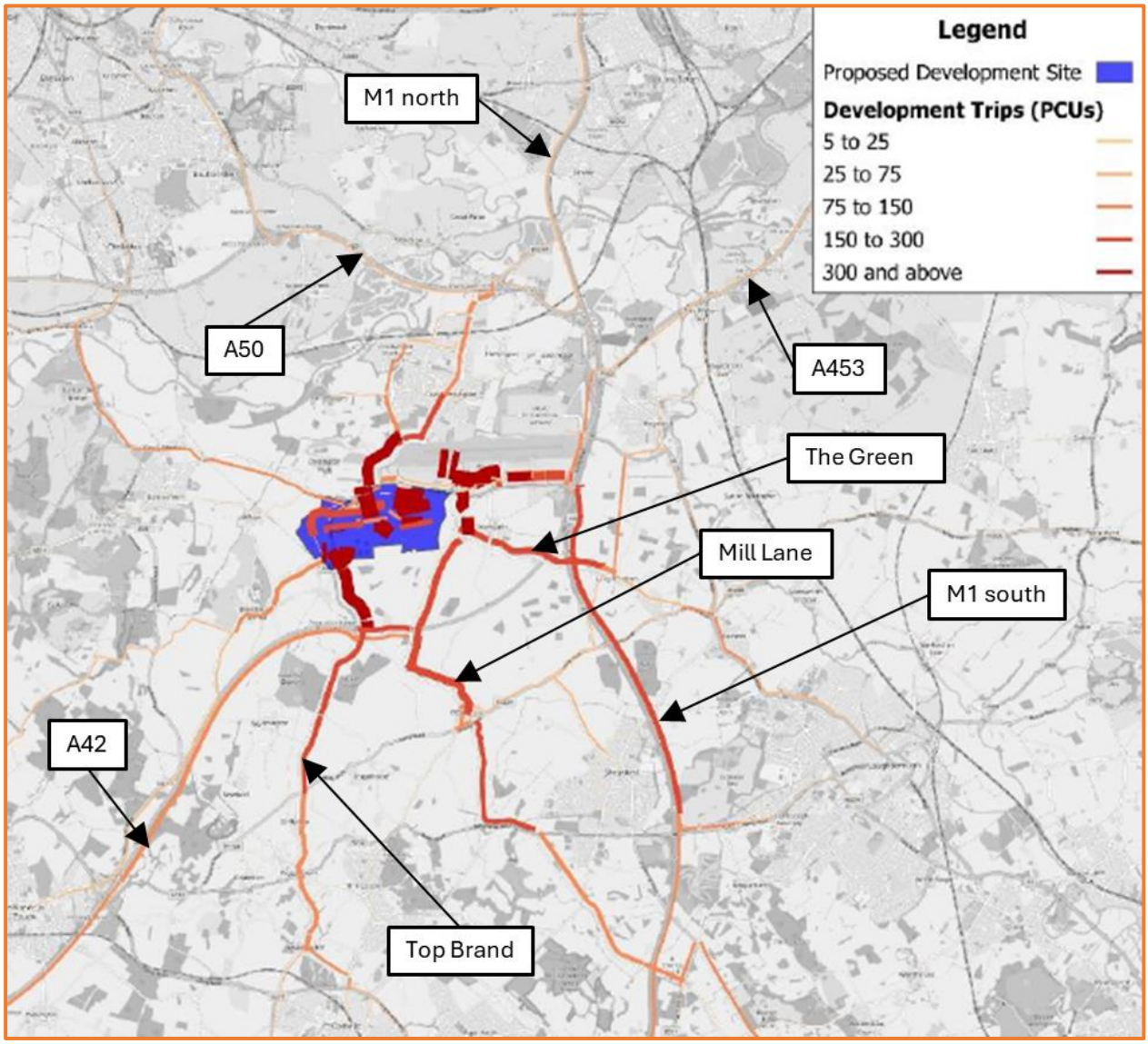

Figure 11.1: Figure 2.12 of the Forecasting Report showing the 2051 AM peak hour development departures

11.16 As illustrated, the development vehicle trips are forecast to route as follows:

- to the east, vehicles route along the A453 to access the local employment sites, the M1 (south) and A453 Remembrance Way
- to the north, vehicles use the local network of Castle Donington to access employment sites within the town, the A50 (east and west), and the M1 (north)
- to the southwest, vehicles access the A42 at Junction 14 to route towards Ashby-de-la-Zouch and the West Midlands
- through Breedon on the Hill to Nottingham Road to route to/from Ashby-de-la-Zouch
- the M1 south to/from destinations to the south, including Loughborough via Junction 23
- the local network southeast, south, and southwest of the proposed development comprising The Green/West End passing Diseworth and Long Whatton, Mill Lane and Top

Brand in order to access the urban areas of Kegworth, Loughborough, Shepshed and Coalville.

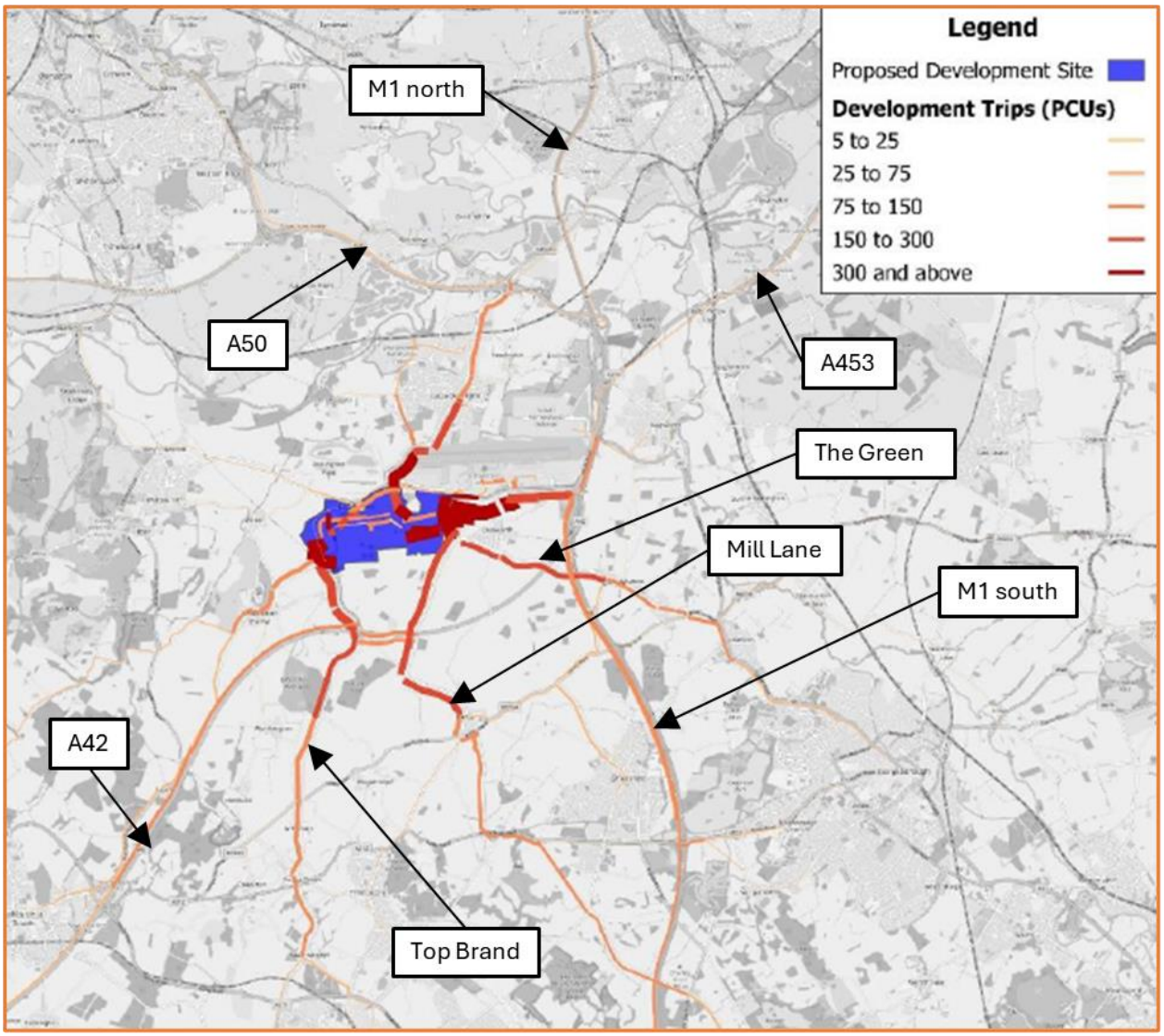

Figure 11.2: Figure 2.13 of the Forecasting Report showing the 2051 PM peak hour development arrivals

11.17 Figures 2.7 to 2.14 of the Forecasting Report show that the development traffic routing patterns in the 2029 and 2051 scenarios are very similar, particularly to the north and west, though there is a degree of variance in the traffic flows to/from the south. **Figure 11.3** below compares the 2029 and 2051 development traffic flows departing the proposed development in the morning peak hour, with the routes highlighted yellow showing that more traffic uses the A453 and M1 south route in the 2029 scenario, and more southbound traffic uses the routes via Mill Lane and Top Brand in the 2051 scenario (the thicker and darker the line, the higher the traffic flow).

11.18 Similarly, **Figure 11.4** compares the 2029 and 2051 development traffic flows arriving at the proposed development in the evening peak hour, again showing that more traffic uses the A453 and M1 south route in the 2029 scenario, and more northbound traffic uses the routes via Mill Lane and Top Brand in 2051.

11.19 The comparisons indicate that increasing congestion on the SRN around M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory and M1 Junction 24, causes more development traffic to avoid the SRN in 2051 compared to 2029 and instead route on lower category roads.

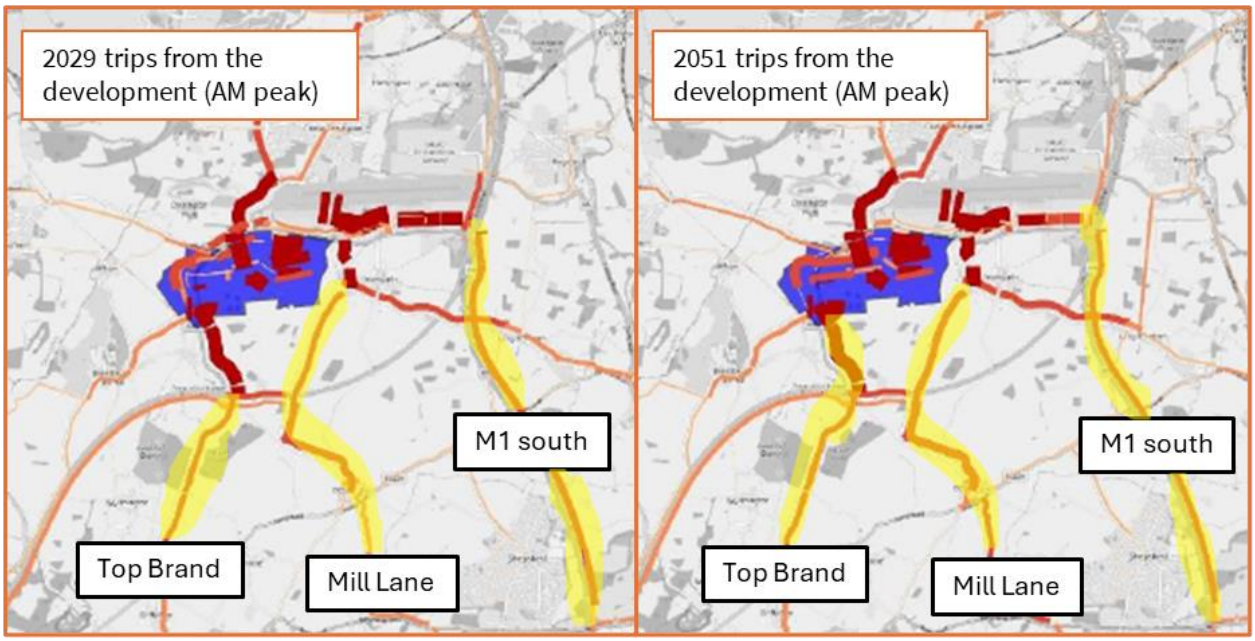

Figure 11.3: Figures 2.9 and 2.13 of the Forecasting Report comparing the 2029 and 2051 morning peak hour development departures

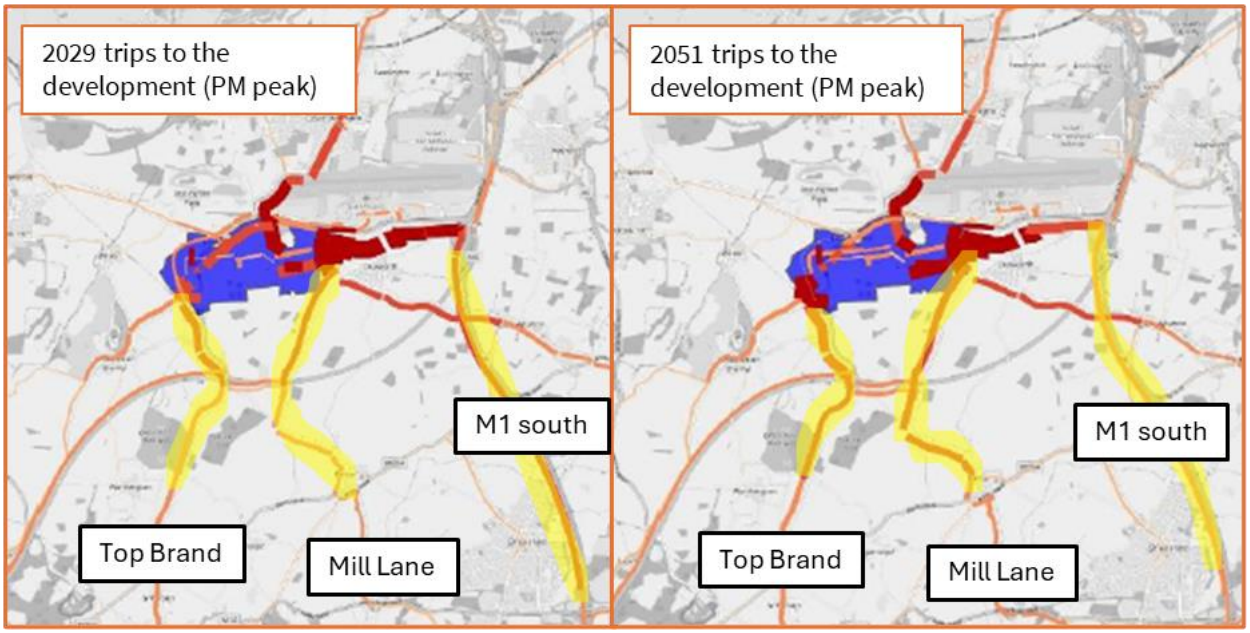

Figure 11.4: Figures 2.9 and 2.13 of the Forecasting Report comparing the 2029 and 2051 evening peak hour development arrivals

11.20 To give more context to the development traffic routing figures in the Forecasting Report and summarised above, the tables below quantify the number of development vehicle trips using the above described routes in the morning and evening peak hours for the 2029 and 2051 scenarios (all traffic volumes shown in PCUs).

11.21 The first table shows that in the 2029 opening year scenario, 14.8% and 14.7% of trips in the respective morning and evening peak hours are to/from the employment areas that are accessed from the A453 east of the development site. These include the DHL distribution hub, EMA, the Pegasus Business Park and the Freeport site. These proportions are broadly matched in the 2051 assessment year scenarios.

2029 development traffic routing								
Route	morning peak hour				evening peak hour			
	Outbound	Inbound	2-way	% of 2-way traffic generation	Outbound	Inbound	2-way	% of 2-way traffic generation
A453 employment sites	317	113	*430*	14.8%	112	289	*401*	14.7%
EMA	*180*	*78*	*258*	*8.9%*	*88*	*185*	*273*	*10.0%*
DHL	*57*	*15*	*72*	*2.5%*	*7*	*38*	*45*	*1.6%*
Pegasus	*46*	*17*	*63*	*2.2%*	*13*	*37*	*50*	*1.8%*
Freeport	*34*	*3*	*37*	*1.3%*	*4*	*29*	*33*	*1.2%*
A453 west of J23A	350	136	486	16.7%	219	320	539	19.7%
A453 north of J23A	151	67	218	*7.5%*	94	142	236	*8.6%*
M1 South of J23A	199	70	269	*9.2%*	124	178	302	*11.0%*
A42 south of J23A	0	0	0	0.0%	0	0	0	0.0%
Airport Perimeter Road	325	196	521	17.9%	198	306	504	18.4%
Castle Donington bypass	*211*	*49*	*260*	*8.9%*	*139*	*59*	*198*	*7.2%*
High Street	*114*	*147*	*261*	*9.0%*	*58*	*247*	*305*	*11.1%*
Station Road (south of A50 J1)	143	58	201	6.9%	54	101	155	5.7%
A50 (west of A50 J1)	72	20	92	3.2%	31	45	76	2.8%
A50 (east of A50 J1)	33	22	55	1.9%	3	23	26	0.9%
A6 north of A50 J2)	72	22	94	3.2%	30	44	74	2.7%
M1 (north of J24A)	87	21	108	3.7%	18	34	52	1.9%
A453 (east of M1 J24)	1	22	23	0.8%	29	45	74	2.7%
Melbourne Road (west of Slade Ln)	72	30	102	3.5%	26	48	74	2.7%
The Green (east of Diseworth)	173	159	332	11.4%	120	174	294	10.7%
Mill Lane (south of Gelscoe Ln)	202	133	335	11.5%	95	134	229	8.4%
Top Brand (south of A42 J13)	158	96	254	8.7%	100	141	241	8.8%
Breedon on the Hill	131	99	230	7.9%	106	136	242	8.8%
Nottingham Road (west of Breedon)	98	61	159	5.5%	69	94	163	6.0%
A42 (west of A42 J13)	133	58	191	6.6%	64	107	171	6.2%
A6 (south of Hathern)	81	64	145	5.0%	50	75	125	4.6%
Hallamford Road	54	70	124	4.3%	63	64	127	4.6%
A512 (west of M1 J23)	20	8	28	1.0%	14	0	14	0.5%
A512 (east of M1 J23)	91	32	123	4.2%	48	83	131	4.8%
Charley Road	104	66	170	5.8%	28	59	87	3.2%

11.22 The remaining development traffic routes as follows in the 2029 scenario, with figures quoted for the morning and evening peak hours, respectively.

- Excluding the employment sites along the A453, 16.7% and 19.7% of development traffic routes to/from the east along the A453, with 8.5% (AM) and 11.0% (PM) routing south on the M1.
- 17.9% and 18.3% of development traffic routes north to/from Castle Donington and A50 Junction 1.
- 4.8% and 4.5% of development traffic routes to/from the west through Melbourne, mostly to/from A50 Junction 3.
- 6.6% and 6.2% of development traffic routes to/from the west on the A42 towards the West Midlands, though about one third of this traffic exits the A42 at Junction 13 for Ashby-de-la-Zouch.
- Development traffic for Ashby-de-la-Zouch mostly uses Nottingham Road and Derby Road, via Breedon on the Hill. 7.9% and 8.8% of development traffic routes west through Breedon on the Hill, though some of this traffic routes to Swadlincote and the surrounding area instead of Ashby-de-la-Zouch.
- 31.7% and 27.9% of development traffic routes on The Green/West End, Mill Lane and Top Brand to access Kegworth, Loughborough, Shepshed, Coalville and the surrounding areas.
    - Development traffic using The Green/West End routes south of Diseworth to Long Whatton where it splits for routes to/from Kegworth, Shepshed and Loughborough.
    - Development traffic using the Mill Lane route splits for routes to/from Shepshed, Loughborough and further south towards north Leicester.
    - Development traffic using the Top Brand route is almost exclusively travelling to/from Coalville and the surrounding areas.

11.23 Comparing the development traffic routing in the 2029 scenario with the routing in the 2051 assessment year (table below) shows some key changes.

- The proportion of development vehicles routing east on the A453 at M1 Junction 23A materially reduces in 2051 by 3.1% in the morning peak hour and by 5.6% in the evening peak hour, as discussed above. This is due to increased congestion at M1 Junction 23A, on the M1 itself and also at the A453/EMG/Kegworth Bypass gyratory.
- In the 2051 scenario there are corresponding increases in development traffic using Mill Lane to access Coalville, Shepshed and Loughborough, with increases of 2.5% in the morning peak hour and by 4.3% in the evening peak hour (also as discussed above).
- In 2051, compared to 2029, there are also smaller increases in development traffic routing on The Green/West End, which is being used as a route to Kegworth avoiding M1 Junction 23A and the A453/EMG/Kegworth Bypass gyratory, and on Top Brand towards Coalville.
- There is no material change in the number of development vehicles routing north through Castle Donington or west through Melbourne in 2051 compared to 2029, though there is an increase in the number of vehicles routing to/from Ashby-de-la-Zouch through Breedon on the Hill rather than using the A42.

2051 development traffic routing								
Route	morning peak hour				evening peak hour			
	Outbound	Inbound	2-way	% of 2-way traffic generation	Outbound	Inbound	2-way	% of 2-way traffic generation
A453 employment sites	302	106	408	14.1%	109	286	395	14.6%
EMA	*177*	*77*	*254*	*8.8%*	*89*	*190*	*279*	*10.3%*
DHL	*52*	*12*	*64*	*2.2%*	*6*	*35*	*41*	*1.5%*
Pegasus	*40*	*14*	*54*	*1.9%*	*11*	*32*	*43*	*1.6%*
Freeport	*33*	*3*	*36*	*1.2%*	*3*	*29*	*32*	*1.2%*
A453 west of J23A	291	102	393	13.5%	127	254	381	13.9%
A453 north of J23A	111	55	166	*5.7%*	54	110	164	*6.0%*
M1 South of J23A	167	47	214	*7.4%*	72	144	216	*7.9%*
A42 south of J23A	0	0	0	0.0%	0	0	0	0.0%
Airport Perimeter Road	325	175	500	17.2%	186	323	509	18.6%
Castle Donington bypass	159	57	216	*7.4%*	156	113	269	*9.8%*
High Street	166	118	284	*9.8%*	30	210	240	*8.8%*
Station Road (south of A50 J1)	139	50	189	6.5%	48	122	170	6.2%
A50 (west of A50 J1)	57	20	77	2.6%	21	53	74	2.7%
A50 (east of A50 J1)	40	16	56	1.9%	8	30	38	1.4%
A6 north of A50 J2)	57	19	76	2.6%	20	36	56	2.0%
M1 (north of J24A)	59	15	74	2.5%	19	33	52	1.9%
A453 (east of M1 J24)	56	22	78	2.7%	28	41	69	2.5%
Melbourne Road (west of Slade Ln)	84	28	112	3.9%	34	52	61	2.2%
The Green (east of Diseworth)	190	162	352	12.1%	158	162	320	11.7%
Mill Lane (south of Gelscoe Ln)	234	170	404	13.9%	148	194	342	12.5%
Top Brand (south of A42 J13)	167	107	274	9.4%	204	257	461	16.8%
Breedon on the Hill	140	111	251	8.6%	116	141	257	9.4%
Nottingham Road (west of Breedon)	62	48	110	3.8%	84	104	188	6.9%
A42 (west of A42 J13)	135	41	176	6.1%	52	98	150	5.5%
A6 (south of Hathern)	70	70	140	4.8%	48	70	118	4.3%
Hallamford Road	66	81	147	5.1%	71	73	144	5.3%
A512 (west of M1 J23)	5	7	12	0.4%	7	11	18	0.7%
A512 (east of M1 J23)	89	30	119	4.1%	46	80	126	4.6%
Charley Road	144	86	230	7.9%	73	93	166	6.1%

Local employment zones

11.24 The paragraphs above explain the number of development trips to and from the employment sites accessed from the A453 to the east of Isley Woodhouse including the DHL distribution hub, EMA, the Pegasus Business Park, and the Freeport site. Analysis has also been undertaken to identify the development vehicle trips to and from the other local employment zones referenced earlier in this report including EMG, the employment zones within Castle Donington including the East Midlands Distribution Centre, and the Ratcliffe on Soar power station site. These

employment zones have been specifically highlighted due to the high volumes of existing and proposed jobs that would be within walking and cycling distance of Isley Woodhouse. The table below shows the total number of development trips to and from these employment zones.

vehicle trips between Isley Woodhouse and local employment zones (PCUs)				
Employment zone	peak hour	depart	arrive	2-way
East Midlands Airport	AM	77	177	254
	PM	190	89	279
Pegasus Business Park	AM	14	40	54
	PM	32	11	43
DHL @EMA	AM	12	52	64
	PM	35	6	41
East Midlands Gateway (EMG)	AM	4	33	37
	PM	37	6	43
EMG2 (Freeport (A453))	AM	3	33	36
	PM	29	3	32
Castle Donington (employment zones including East Midlands Distribution Centre)	AM	38	88	126
	PM	91	23	114
Ratcliffe on Soar power station	AM	2	15	17
	PM	6	4	10
Total	AM	150	438	588
	PM	420	142	562

11.25 In total, there are 588 two-way trips between the site and the local employment zones in the morning peak hour and 562 two-trips in the evening peak hour. This equates to 29% of the residential vehicle trips generated by the proposed development in the morning peak hour, and 28% in the evening peak hour.

11.26 There is further discussion of this point in Section 4 and Technical Note N in **Appendix 4**, because the vehicle trips to the local employment zones represent a significant proportion of the overall traffic likely to be generated by the proposed development and can be targeted for modal change, in keeping with the vision of Isley Woodhouse.

Development vehicle trips north of Castle Donington, the A50 and Derby

11.27 As described above, around 18% of the total development traffic would route north towards Castle Donington in both the morning and evening peak hours. Of this development traffic, around 62% would have its origin or destination within Castle Donington in the morning peak hour, increasing to 69% in the evening peak hour, which equates to around 11 to 12% of the total peak hour development traffic. Most of the remaining development traffic routing north from the site would travel through A50 Junction 1.

11.28 **Figures 11.5** and **11.6** show that there would be 201 two-way development vehicle trips at A50 Junction 1 in the 2029 morning peak hour and 155 in the evening peak hour. Development traffic flows between Castle Donington and A50 Junction 1 are very similar in the 2051 scenario, in which there would be 189 two-way development vehicle trips at A50 Junction 1 in the morning peak hour and 170 in the evening peak hour.

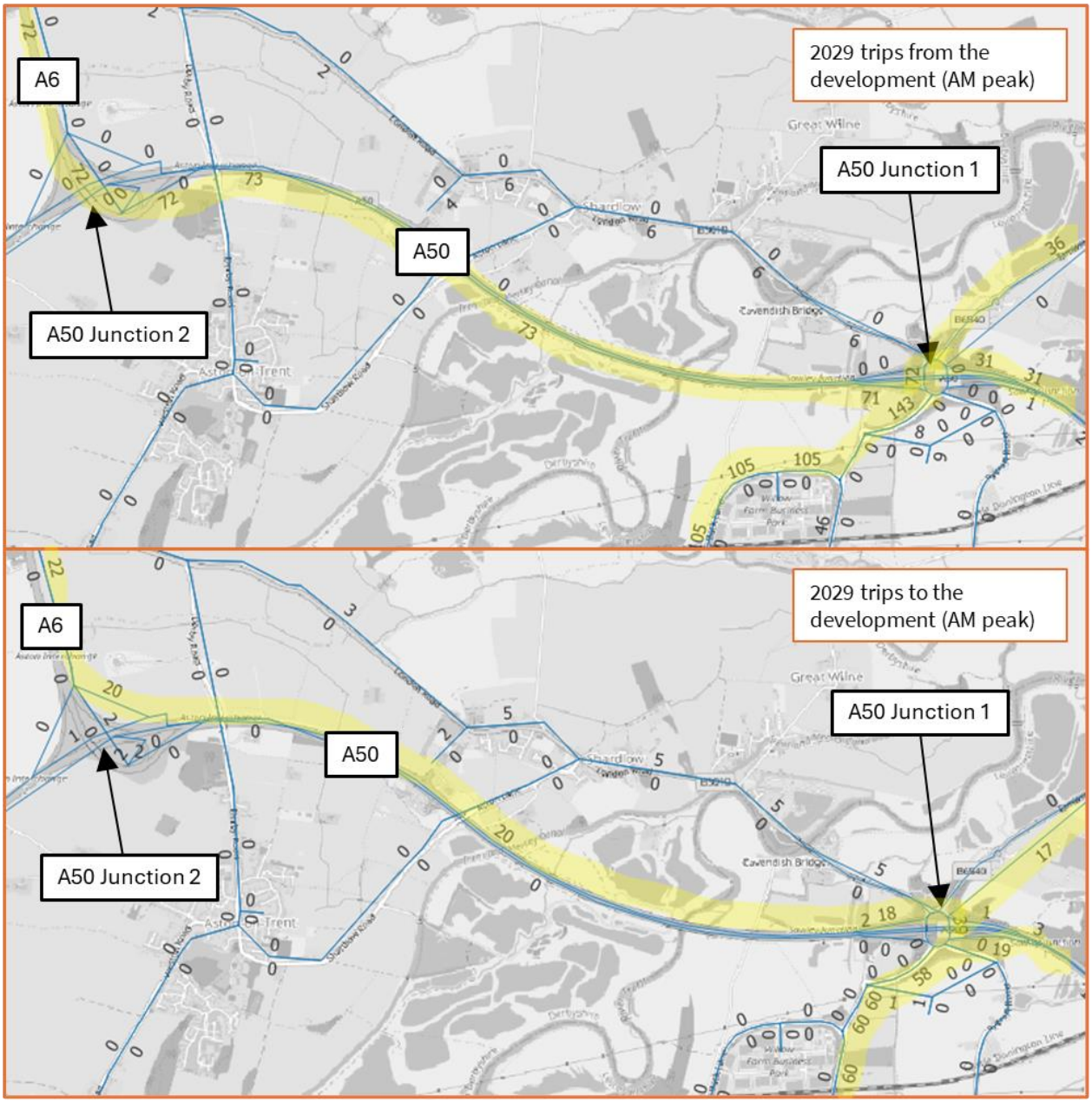

Figure 11.5: 2029 morning peak hour development trips immediately north of Castle Donington

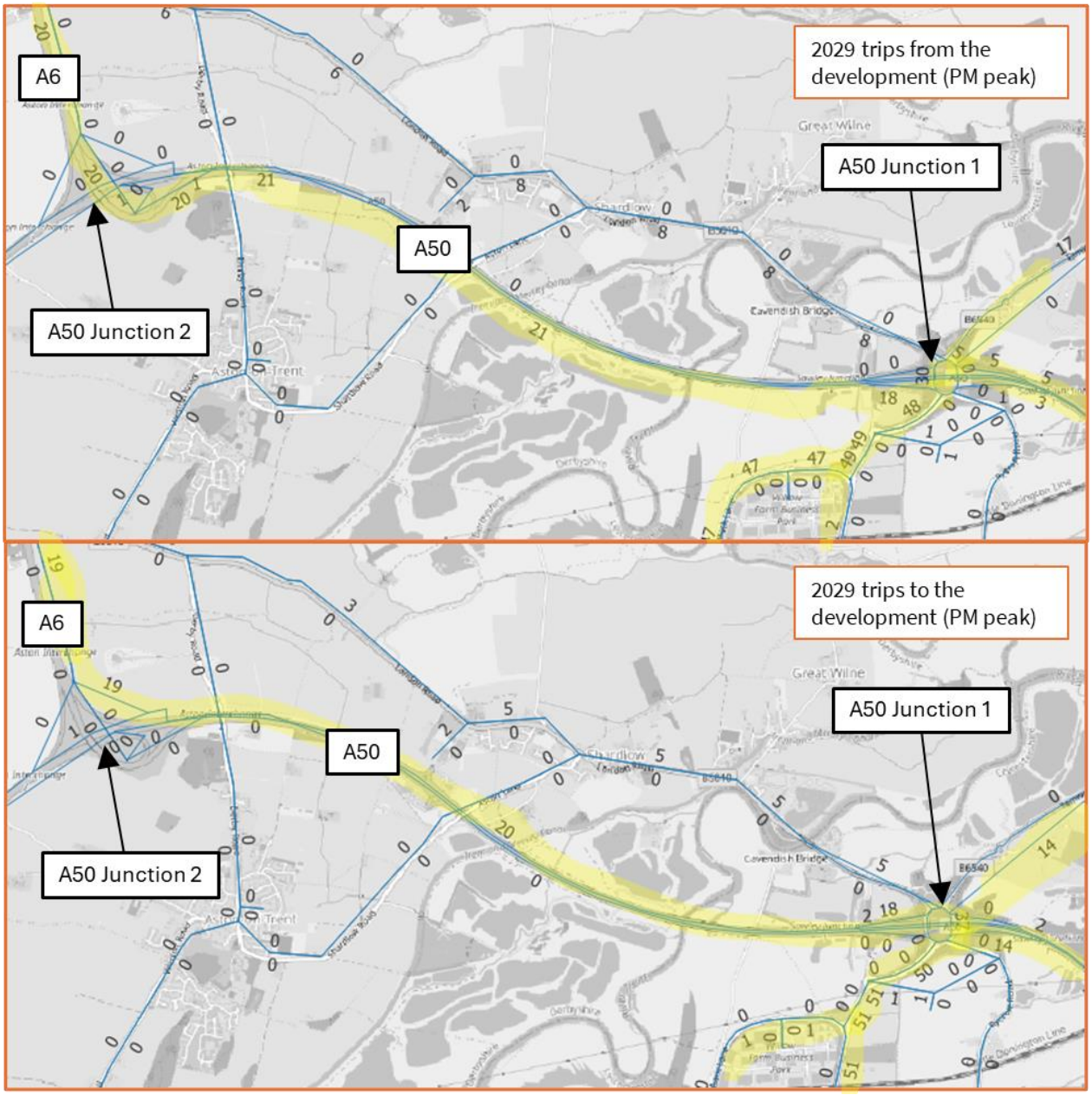

Figure 11.6: 2029 evening peak hour development trips immediately north of Castle Donington

11.29 Of the development traffic routing through A50 Junction 1, there are 92 and 39 two-way development vehicle trips in the respective 2029 morning and evening peak hours routing to/from the west along the A50. All of these trips then route north towards Derby on the A6 via the slip roads at A50 Junction 2 (76 and 56 two-way development trips in the 2051 morning and evening peak hours, respectively). The development traffic on the A6 to/from Derby disperses at Thulston Island and the Raynesway Interchange.

11.30 Development traffic routing further to/from the west on the A50 does so via A50 Junction 3, as previously described, with the exception of the 2051 morning peak hour, in which there are 17 eastbound trips between A50 Junctions 3 and 1.

11.31 From A50 Junction 1, there would be 53 and 31 two-way development vehicle trips routing to/from Tamworth Road towards Long Eaton in the respective 2029 morning and evening peak hours. In the 2051 scenario there would be 46 and 44 two-way development vehicle trips routing to/from Long Eaton in the respective morning and evening peak hours. Approximately 25% of the

development traffic on Tamworth Road would access the existing and consented employment sites west of the M1.

11.32 **Figures 11.5** and **11.6** also show that there would be 54 and 24 two-way development vehicle trips in the respective 2029 morning and evening peak hours routing to/from M1 Junction 24A, with the vast majority of this traffic travelling to/from the M1 north. In the 2051 scenario there would be 56 and 39 two-way development vehicle trips routing to/from M1 Junction 24A in the respective morning and evening peak hours.

11.33 **Figures 11.7 and 11.8** show the development vehicle trips at A50 Junction 3 in the 2029 opening year morning and evening peak hours, respectively. They show that there would be around 85 and 55 two-way trips in the respective peak hours routing from the development through Melbourne and arriving at A50 Junction 3 via Swarkestone Bridge and the A514. This development traffic would split between the A50 west and the A514 north towards Chellaston at A50 Junction 3.

11.34 In the 2051 scenario there is no material change in the development traffic at A50 Junction 3, though as discussed above, in the 2051 evening peak hour 17 development vehicles travelling towards the proposed development route via A50 Junction 1 and Castle Donington rather than A50 Junction 3 and the route through Melbourne.

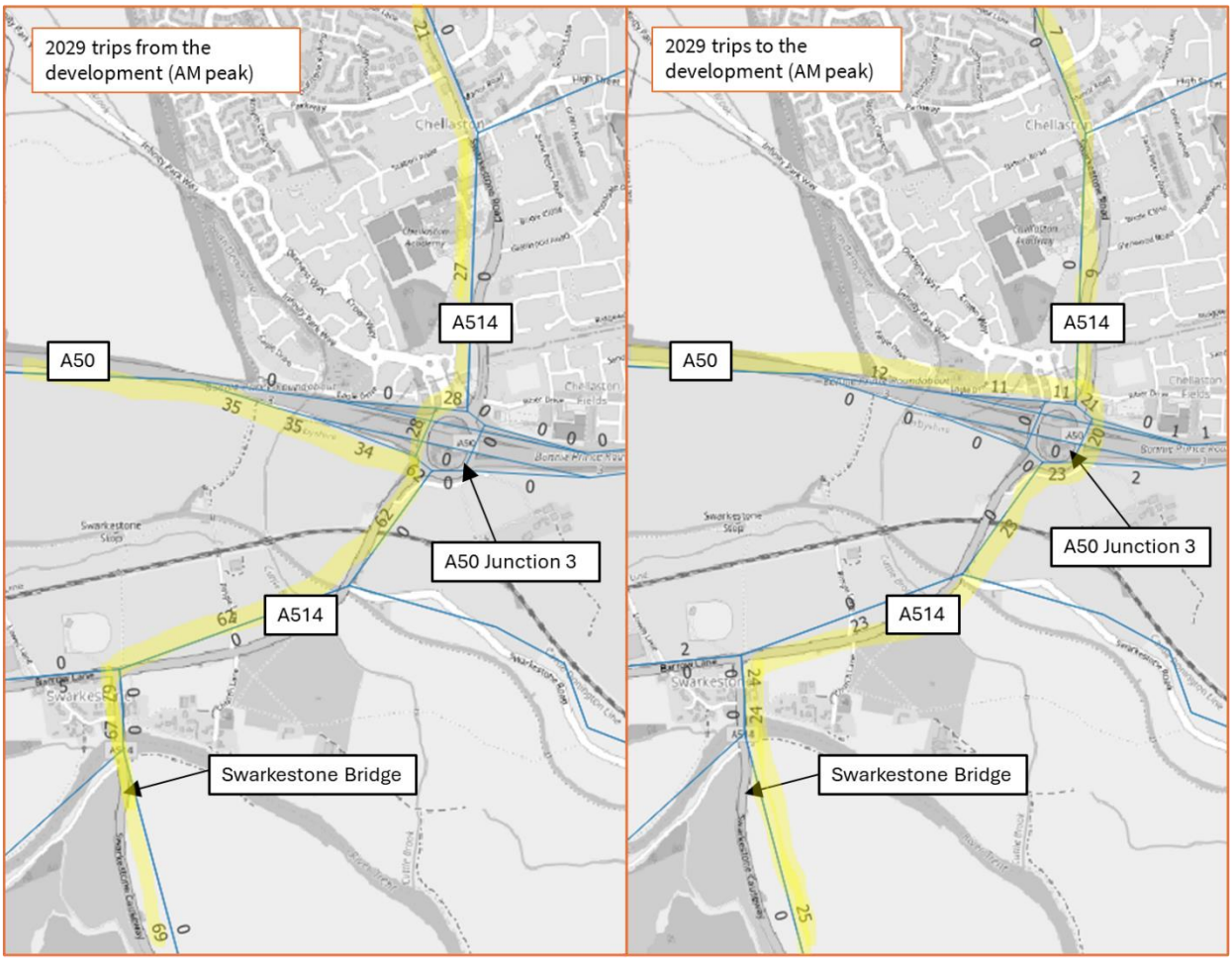

Figure 11.7: 2029 morning peak hour development trips immediately north of Castle Donington

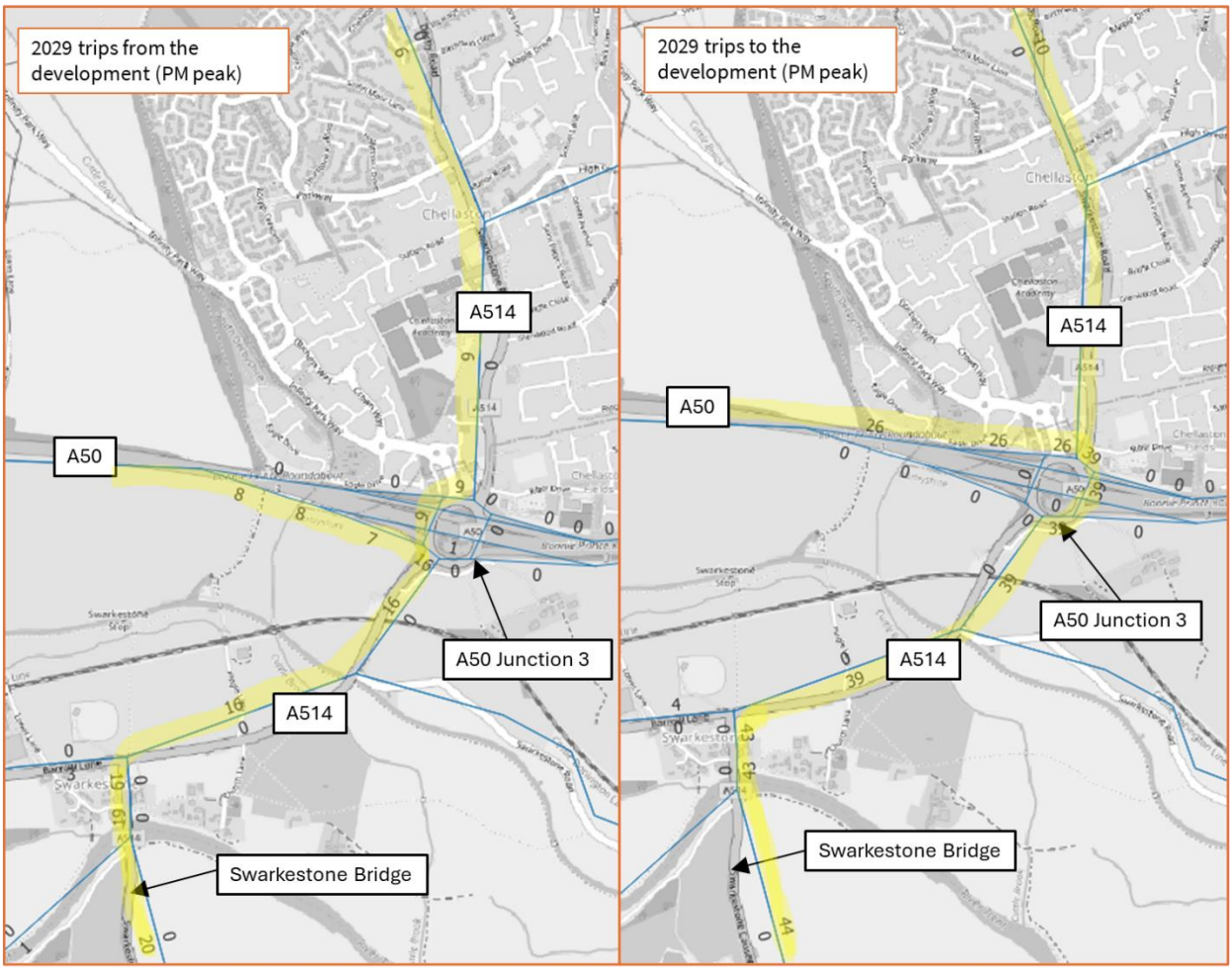

Figure 11.8: 2029 evening peak hour development trips immediately north of Castle Donington

Development vehicle trips around Kegworth

11.35 **Figure 11.9** shows the routing of development trips through Kegworth in the 2029 scenario, with the trips from the proposed development in the morning peak hour on the left-hand side and the trips to the proposed development in the evening peak hour on the right-hand side. **Figure 11.9** shows that in the 2029 morning peak hour scenario, the majority of development traffic arrives via the Kegworth Bypass from the junction with the A453 and EMG, with a small amount of traffic also joining Kegworth Bypass from Whatton Road. This is a longer route which suggests that congestion at M1 Junction 23A and the A453/EMG/Kegworth Bypass junction is influencing routing decisions. Approximately 45% of the development traffic arriving in Kegworth remains in the town, with most of the remaining development vehicle trips routing towards the A453 at Ratcliffe on Soar power station via Station Road and Kingston Lane, suggesting that this traffic is avoiding routing through M1 Junction 24.

11.36 In the 2029 evening peak hour, development vehicle trips towards the proposed development from Kegworth have their origin in the town, with very few development trips routing through the town from Ratcliffe on Soar power station or the A453 Remembrance Way.

11.37 It is also evident from **Figure 11.9** that there are no development trips routing to/from Loughborough via the A6 at Kegworth in the 2029 scenarios, with all development traffic towards Loughborough routing south of Diseworth, Long Whatton and Hathern, as discussed earlier in this Section.

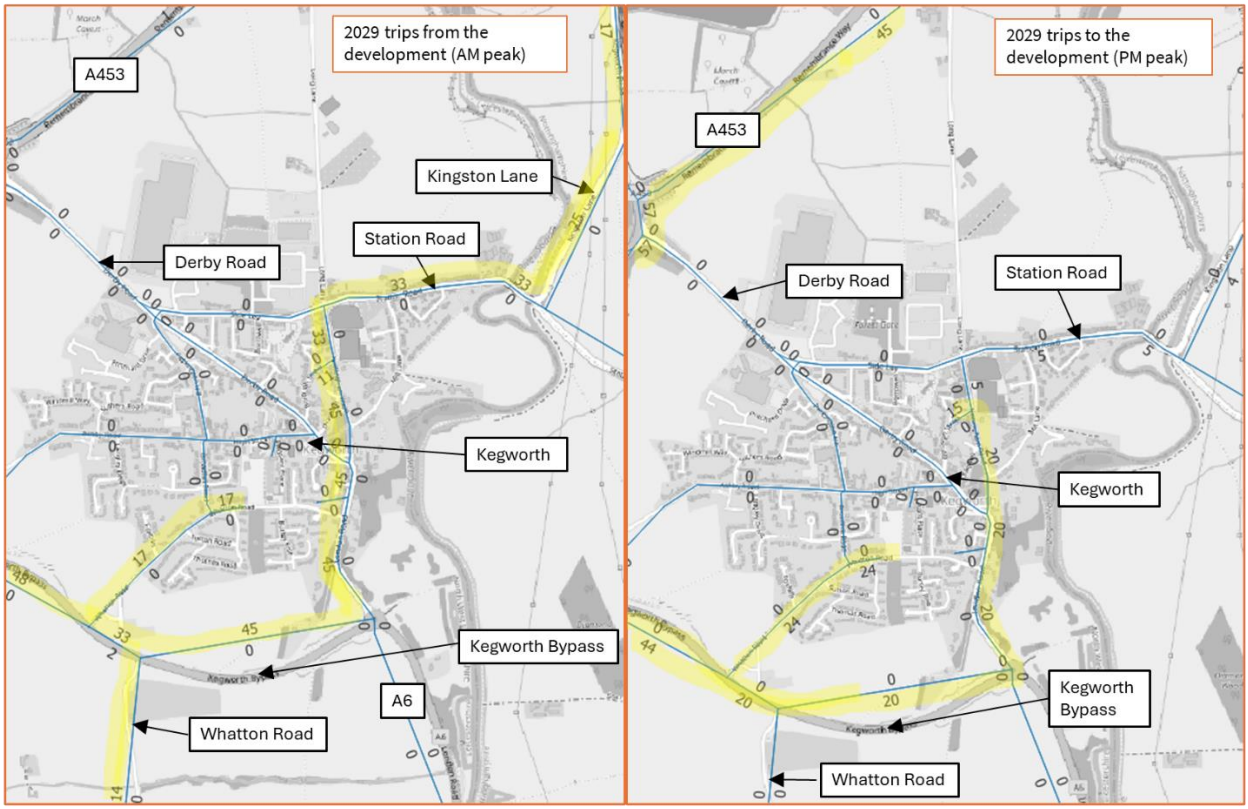

Figure 11.9: 2029 development trips around Kegworth

11.38 **Figure 11.10** shows the routing of development trips through Kegworth in the 2051 scenario. In the 2051 morning peak hour, all development traffic arrives at Kegworth via the Kegworth Bypass from Whatton Road and is therefore avoiding M1 Junction 23A and the A453/EMG/Kegworth Bypass junction. As in the 2029 morning peak hour, there are a similar volume of development vehicle trips routing towards the A453 at Ratcliffe on Soar power station via Station Road and Kingston Lane, suggesting that this traffic is avoiding routing through M1 Junction 24. However, in 2051 there are also 56 development PCU trips routing towards Ratcliffe on Soar power station and Nottingham on the A453. As discussed below, this is traffic that uses the A52 corridor from M1 Junction 25 in the 2029 scenario.

11.39 In a change from the routing around Kegworth in the 2029 morning peak hour, 29 development vehicle trips route southbound towards Loughborough from the Kegworth Bypass.

11.40 In the 2051 evening peak hour, most development vehicle trips towards the proposed development from Kegworth have their origin in the town, with only a slight increase in the development trips routing through the town from Ratcliffe on Soar power station or the A453 when compared to the 2029 scenario.

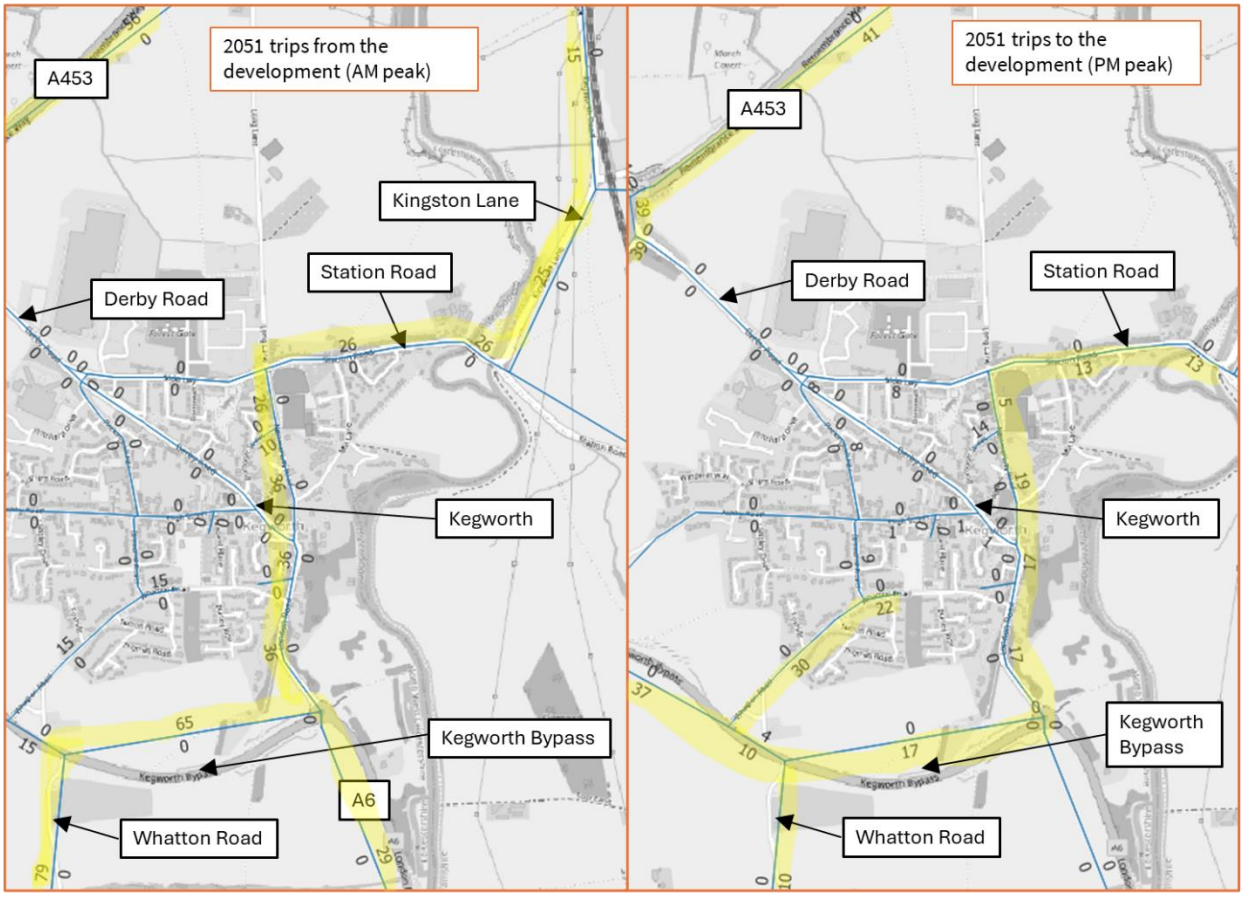

Figure 11.10: 2051 development trips around Kegworth

Development trips towards Nottingham

11.41 The table below shows the development trips to/from the two major routes towards Nottingham, which are the A52 via M1 Junction 25 and the A453 via M1 Junction 24, for both the 2029 opening year and 2051 completion year scenarios

11.42 . The table shows that development traffic flows on both routes would be relatively low, accounting for up to 2.8% of the forecast traffic generation.

To/From Nottingham	2029 morning peak hour			2029 evening peak hour		
	Departures	Arrivals	2-way	Departures	Arrivals	2-way
A52 (via M1 Junction 25)	38	5	43	5	9	14
A453 (via M1 Junction 24)	7	16	23	21	37	58
proportion of trip gen	2.4%	2.0%	2.3%	2.5%	2.7%	2.6%

To/From Nottingham	2051 morning peak hour			2051 evening peak hour		
	Departures	Arrivals	2-way	Departures	Arrivals	2-way
A52 (via M1 Junction 25)	13	3	16	5	8	13
A453 (via M1 Junction 24)	49	17	66	20	31	51
proportion of trip gen	3.3%	1.9%	2.8%	2.4%	2.3%	2.3%

11.43 In the evening peak hour, there is no material change in the development traffic flows on the two routes when comparing the 2029 and 2051 scenarios. However, as highlighted above in the discussion on Kegworth, in the morning peak hour there is traffic routing towards Nottingham that switches between the A52 in the 2029 scenario and the A453 in the 2051 scenario.

Summary

11.44 The forecast traffic generation for the stage 1 EMFM modelling has been agreed with the Transport Working Group. The proposed development is forecast to generate 2,917 and 2,753 two-way external vehicle trips in the respective morning and evening peak hours. It has been demonstrated that the correct number of development vehicles trips have been released into the model, though a small number are shown not to arrive at the site by the end of the modelled morning and evening peak hours, which suggests that there is congestion in the network.

11.45 It was agreed with the Transport Working Group that the external development traffic would be distributed onto the road network using PRTM's gravity model. The development vehicle trips have been forecast to use the following routes:

- to the east, vehicles route along the A453 to access the local employment sites, the M1 (south), and A453 Remembrance Way
- to the north, vehicles use the local network of Castle Donington to access employment sites within the town, the A50 (east and west), and the M1 (north)
- to the southwest, vehicles access the A42 at Junction 14 to route towards Ashby-de-la-Zouch and the West Midlands
- development vehicles also route through Breedon on the Hill to route to/from Ashby-de-la-Zouch via Nottingham Road
- the M1 south to/from destinations to the south, including Loughborough via Junction 23
- the local network southeast, south, and southwest of the development comprising The Green/West End past Diseworth and Long Whatton, Mill Lane and Top Brand in order to access the urban areas of Kegworth, Loughborough, Shepshed and Coalville.

11.46 Comparing the development traffic routing in the 2029 scenario with the routing in the 2051 assessment year shows some key changes.

- The proportion of development vehicles routing east on the A453 at M1 Junction 23A materially reduces in 2051 by 3.1% in the morning peak hour and by 5.6% in the evening peak hour. This is due to increased congestion at M1 Junction 23A, on the M1 itself, and also at the A453/EMG/Kegworth Bypass gyratory.
- In the 2051 scenario there are corresponding increases in development traffic using Mill Lane to access Coalville, Shepshed and Loughborough, with increases of 2.5% in the morning peak hour and by 4.3% in the evening peak hour.
- In 2051, compared to 2029, there are also smaller increases in development traffic routing on The Green/West End, which is being used as a route to Kegworth avoiding M1 Junction 23A and the A453/EMG/Kegworth Bypass gyratory, and on Top Brand towards Coalville.
- There is no material change in the number of development vehicles routing north through Castle Donington or west through Melbourne in 2051 compared to 2029, though there is an increase in the number of vehicles routing to/from Ashby-de-la-Zouch through Breedon on the Hill rather than using the A42.

11.47 There are 588 two-way trips between the site and the local employment zones in the morning peak hour and 509 in the evening peak hour. This equates to 29% of the residential vehicle trips generated by the proposed development in the morning peak hour, and 25% in the evening peak hour. The vehicle trips to the local employment zones represent a significant proportion of the overall traffic likely to be generated by the proposed development and can be targeted for modal change, in keeping with the vision for Isley Woodhouse.

11.48 Relatively small volumes of traffic are shown to route to/from Derby via A50 junctions 2 and 3. Similarly, only small amounts of development traffic route towards Nottingham via the A453 Remembrance Way and the A52 via M1 Junction 25.

12.0 STAGE 1 TRAFFIC FORECAST ANALYSIS

12.1 The development traffic routing is detailed in Section 11. However, the future year traffic volumes on the road network are comprised of two elements. Firstly, the development traffic, but also background traffic that may reassign because the changing conditions means that alternative routes become quicker. The impact of the development is a combination of these two effects, where traffic volumes before and after the development must be compared.

12.2 This Section therefore details the changes across the highway network due to the proposed development in the 2029 Circular compliant opening year scenario and the 2051 assessment year scenario through analysis of the following:

- changes in traffic flow across the network, including
  - total flow difference due to the proposed development
  - consideration of background traffic reassignment
- changes to the volume to capacity (V/C) ratios at junctions and nodes.

12.3 This analysis will provide a deeper understanding of the impact of the proposed development such that mitigation strategies are targeted appropriately.

Area of Influence

12.4 **Figure 12.1** shows the Area of Influence (AoI) identified by AECOM. It is based on a comparison of the 2051 With Development and 2051 Without Development scenarios and shows where there is a forecast traffic flow change of more than +/-5% and/or +/-30 vehicles in either of the morning or evening peak hours.

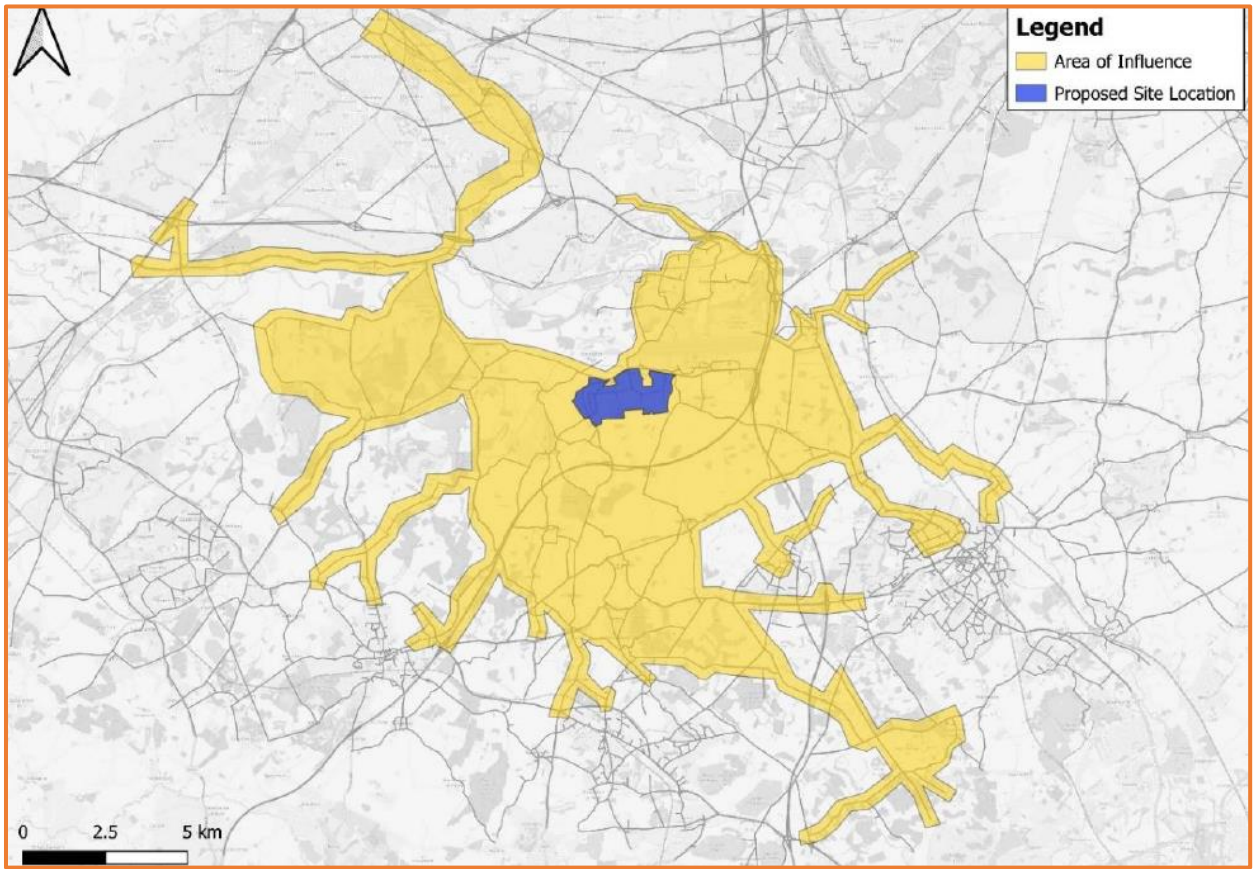

Figure 12.1: Forecasting Report Figure 3.5 showing the forecast area of influence

12.5 As reported at paragraph 3.4.2 of the Forecasting Report (**Appendix 8**), the primary links affected are summarised as follows:

- the A453 between the A42 Junction 14 and M1 Junction 23A
- local roads in and around Castle Donington and Kegworth
- routes to the south of the site including those to Diseworth, Long Whatton, Loughborough, Shepshed, Coalville and Ashby-de-la-Zouch
- the M1 between Junction 23 and Junction 24A
- the A42 between Junction 13 and the M1
- the A50.

12.6 The following sections consider the highway impact on these corridors so that a study area for detailed junction assessment can be identified.

Change in traffic flows

12.7 As discussed in the Forecasting Report, the largest increases in traffic flow between the 'without development' and 'with development' scenarios for the 2029 opening year and the 2051 assessment year are forecast along the A453 between the A42 and the M1, routes to the north through Castle Donington, local links to the south of the proposed development site towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the M1 south of Junction 23A, the A42 between Junctions 13 and 14 and the A50 around Junction 1.

12.8 However, it is clear that the increases in traffic flow on some of these routes are not entirely due to the addition of development traffic. This is especially true on routes through Castle Donington, where traffic increases are materially greater than the development traffic using those routes. On other routes, traffic increases are shown to be less than the development traffic forecast to use them. Hence, it is clear that the addition of the proposed development traffic and the access strategy changes how background traffic routes through the model.

12.9 As detailed in the section below on junction and node V/C ratios, the complex of junctions including M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24, suffer from significant congestion in the 2029 and 2051 assessment years without the development in place and this congestion impacts traffic routing through the network.

12.10 To more thoroughly understand the likely traffic impacts due to the proposed development and identify where the priorities are with respect to devising the mitigation strategy, AECOM have provided graphical plots and shape files showing the change in total traffic flow and also the change in background traffic flow between the 'without development' and 'with development' scenarios for the 2029 opening year and the 2051 assessment year. The shape files can be provided upon request. The plots showing the total change in traffic flow for each scenario are provided at Figures 3.1 to 3.4 in the Forecasting Report (**Appendix 8**), with extracts provided within the analysis below[8]. The plots showing the change in background traffic flow for each scenario are provided at **Appendix 8** with extracts also provided below.

2029 opening year morning peak hour

12.11 The AoI, as discussed above, identifies the key routes on which there is likely to be a material change in traffic flow due to Isley Woodhouse. To quantify these changes across the road network, the table below summarises the number of development vehicle trips, the change in

[8] Red lines indicate background traffic increases, and green lines represent background traffic reductions, the thicker the line, the greater the increase or decrease.

background traffic flow, and the total change in traffic flow on the above-described key routes in the morning peak hour for the 2029 opening year.

2029 flow difference analysis - morning peak hour									
Route	development flow			background reassignment			flow difference		
	Outbound	Inbound	2-way	Outbound	Inbound	2-way	Outbound	Inbound	2-way
A453 west of J23A	350	136	486	-197	-77	-274	153	59	212
A453 north of J23A	151	67	218	-95	-17	-112	56	49	105
M1 South of J23A	199	70	269	-8	-23	-31	190	47	237
A42 south of J23A	0	0	0	-26	21	-5	-26	21	-5
Airport Perimeter Road	325	196	521	72	-278	-206	397	-82	315
Castle Donington bypass	*211*	*49*	*260*	*107*	*-46*	*61*	*318*	*3*	*321*
High Street	*114*	*147*	*261*	*-35*	*-233*	*-268*	*79*	*-86*	*-7*
Station Road (south of A50 J1)	143	58	201	211	-51	160	354	8	362
A50 (west of A50 J1)	72	20	92	17	-66	-49	89	-45	44
A50 (east of A50 J1)	33	22	55	202	-10	192	236	11	247
A6 north of A50 J2)	72	22	94	8	-36	-28	81	-14	67
M1 (north of J24A)	87	21	108	-12	-16	-28	75	5	80
A453 (east of M1 J24)	1	22	23	9	-3	6	11	19	30
Melbourne Road (west of Slade Ln)	72	30	102	-80	28	-52	-8	58	50
The Green (east of Diseworth)	173	159	332	-88	-43	-131	85	116	201
Mill Lane (south of Gelscoe Ln)	202	133	335	19	-23	-4	221	110	331
Top Brand (south of A42 J13)	158	96	254	-20	16	-4	137	112	249
Breedon on the Hill	131	99	230	-23	41	18	109	140	249
Nottingham Road (west of Breedon)	98	61	159	-19	11	-8	78	71	149
A42 (west of A42 J13)	133	58	191	15	9	24	148	67	215
A6 (south of Hathern)	81	64	145	-59	-20	-79	22	44	66
Hallamford Road	54	70	124	-7	-21	-28	47	48	95
A512 (west of M1 J23)	20	8	28	18	24	42	37	33	70
A512 (east of M1 J23)	91	32	123	-3	18	15	88	50	138
Charley Road	104	66	170	18	-3	15	122	63	185

NB: the columns for 'outbound' and 'inbound' in relation to the 'background reassignment' and the total 'flow difference' refer to trips away from the development site and trips towards the development site, respectively.

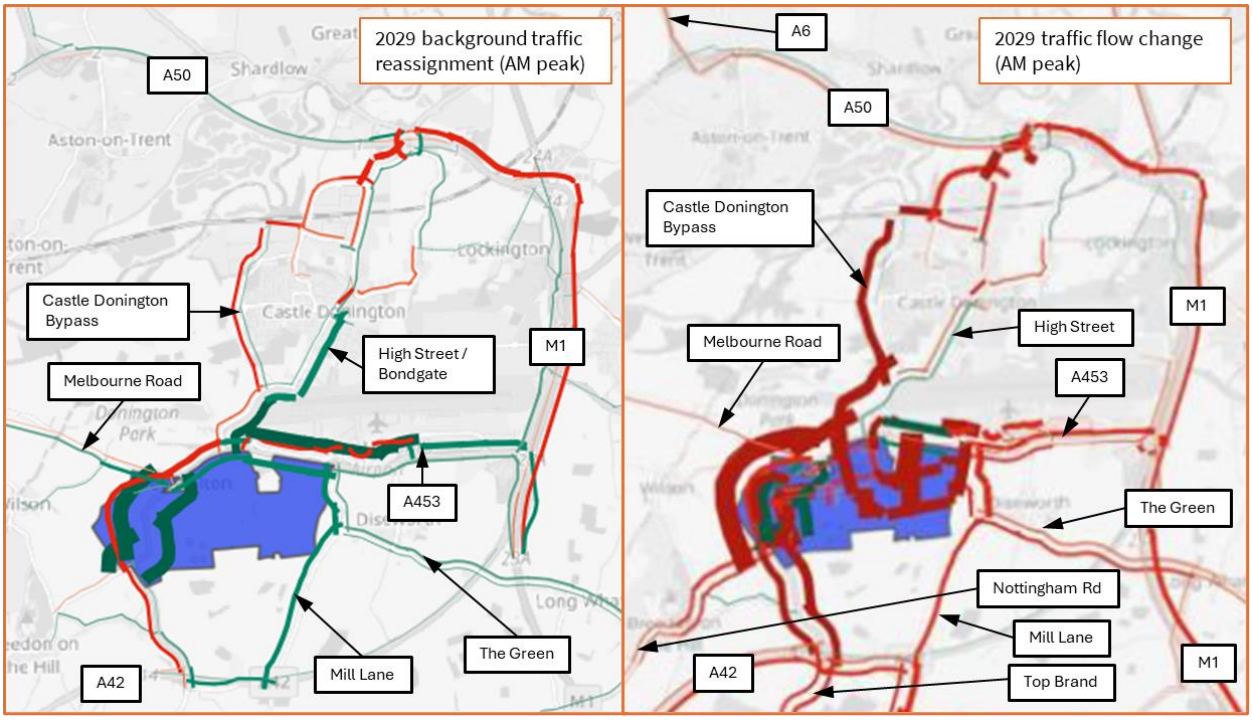

Figure 12.2: 2029 morning peak hour background traffic reassignment and total flow change (PCUs)

12.12 On the right-hand side of **Figure 12.2**, there are shown to be traffic increases in the 2029 opening year morning peak hour on the A453 to the east of the development site, the route north from A42 Junction 14 around the realigned A453, and the Castle Donington bypass, routes to the south,

southeast, and southwest of the proposed development site towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the A50 eastbound from Junction 1, the M1 southbound from Junction 24A and the A42 west of Junction 14. There is also a reduction in traffic flow eastbound between A50 Junctions 1 and 2, and southbound towards the development along Main Street in Castle Donington.

12.13 The majority of the traffic flow increases summarised above are due to the development traffic routing shown in the above table, especially on the routes to the south, southeast, and southwest of the proposed development site towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough where there is little background traffic reassignment occurring.

12.14 However, there are also background traffic reassignments to consider. The left-hand side of **Figure 12.2** shows that with the proposed development in place, background traffic reduces on the A453 in both directions east of the development site, northbound on Mill Lane, eastbound and westbound on The Green and southbound on High Street through the centre of Castle Donington. There are increases in background traffic on the new section of the realigned A453 through the development site and the Castle Donington Bypass, the A50 eastbound and the M1 southbound.

12.15 Hence, with the proposed development in place, there is a material background traffic reassignment away from the route between A42 Junction 14, Mill Lane and the A453, and instead background traffic routes north around the realigned A453 and the Castle Donington bypass to Castle Donington and the A50 Junction 1. The effect is likely to be due to congestion issues on the A453 corridor and the SRN but could also be influenced by the improved quality of the route towards Castle Donington including the realigned A453.

12.16 Further, background traffic also reassigns away from the route from Castle Donington and along the A453 eastbound to the M1 and instead routes eastbound on the A50 from Junction 1 to the M1 southbound via M1 Junction 24A.

12.17 There is a small reassignment from Melbourne Road westbound, which is traffic that was travelling towards A50 Junction 3 which is now routing around Castle Donington to A50 Junction 1 and using the A50 westbound.

2029 opening year evening peak hour

12.18 The table below summarises the number of development vehicle trips, the change in background traffic flow and the total change in traffic flow on the key routes highlighted in the Forecasting Report in the evening peak hour for the 2029 opening year.

12.19 In the 2029 evening peak hour the right-hand side of **Figure 12.3** below shows traffic increases on the A453 to the east of the development site, on the route north from A42 Junction 14 around the realigned A453 and the Castle Donington bypass, routes to/from the south, southeast and southwest of the proposed development site towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the A50 westbound from Junction 1 to Junction 2, the M1 southbound from Junction 23A and the A42 west of Junction 14. There is also an increase in traffic flow eastbound on Melbourne Road and southbound towards the development along Main Street in Castle Donington.

2029 flow difference analysis - evening peak hour									
Route	development flow			background reassignment			flow difference		
	Outbound	Inbound	2-way	Outbound	Inbound	2-way	Outbound	Inbound	2-way
A453 west of J23A	219	320	539	48	-97	-49	267	222	489
A453 north of J23A	94	142	236	-48	-124	-172	46	18	64
M1 South of J23A	124	178	302	10	-23	-13	133	155	288
A42 south of J23A	0	0	0	23	-97	-74	23	-97	-74
Airport Perimeter Road	198	306	504	189	-12	177	387	294	681
Castle Donington bypass	*139*	*59*	*198*	*431*	*-7*	*424*	*570*	*53*	*623*
High Street	*58*	*247*	*305*	*-254*	*-18*	*-272*	*-195*	*229*	*34*
Station Road (south of A50 J1)	54	101	155	126	-22	104	180	79	259
A50 (west of A50 J1)	31	45	76	38	-97	-59	70	-52	18
A50 (east of A50 J1)	3	23	26	-2	17	15	0	42	42
A6 north of A50 J2)	30	44	74	19	-4	15	50	41	91
M1 (north of J24A)	18	34	52	-23	6	-17	-5	40	35
A453 (east of M1 J24)	29	45	74	-21	-20	-41	9	26	35
Melbourne Road (west of Slade Ln)	26	48	74	-59	211	152	-33	259	226
The Green (east of Diseworth)	120	174	294	42	-34	8	162	139	301
Mill Lane (south of Gelscoe Ln)	95	134	229	-39	-6	-45	56	128	184
Top Brand (south of A42 J13)	100	141	241	9	7	16	109	148	257
Breedon on the Hill	106	136	242	-23	36	13	83	173	256
Nottingham Road (west of Breedon)	69	94	163	-29	22	-7	40	115	155
A42 (west of A42 J13)	64	107	171	47	-13	34	110	94	204
A6 (south of Hathern)	50	75	125	-10	-13	-23	40	63	103
Hallamford Road	63	64	127	15	8	23	77	72	149
A512 (west of M1 J23)	14	0	14	4	-9	-5	4	5	9
A512 (east of M1 J23)	48	83	131	-15	-17	-32	33	66	99
Charley Road	28	59	87	2	10	12	30	69	99

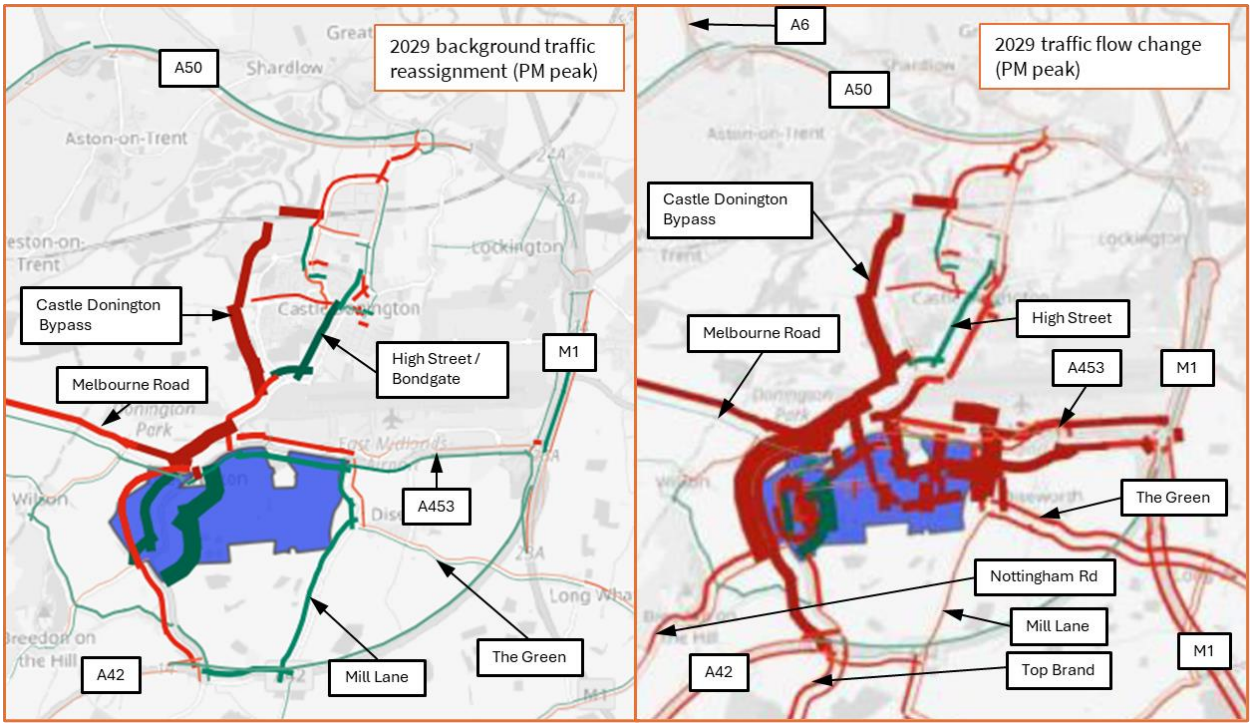

Figure 12.3: 2029 evening peak hour background traffic reassignment and total traffic flow change (PCUs)

12.20 As with the morning peak hour, the majority of the traffic flow increases summarised above are due to the development traffic routing shown in the above table, especially on the routes to the south, southeast, and southwest of the proposed development site towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough.

12.21 **Figure 12.3** also shows reductions in the traffic flow eastbound between A50 Junction 3 and Junction 1, southbound along Main Street in Castle Donington, southbound between Wilson and the A453 east of Breedon on the Hill and northbound between A42 Junction 14 and the M1.

12.22 The left-hand side of **Figure 12.3** shows that with the development there are background traffic reductions on the A42 northbound between A42 Junction 14 and M1 Junction 23A/24, on the A453 westbound from M1 Junction 23A, and also on the route including the A42 Junction 14, Mill Lane and the A453 towards Castle Donington. There are corresponding increases in background traffic on the new section of the realigned A453, the Airport Perimeter Road, and the Castle Donington Bypass. This effect is likely to be due to increased congestion through the M1 J23A/24 complex and the improvements to the A453 route northwards towards Castle Donington making it more attractive.

12.23 A significant volume of northbound background traffic south of Castle Donington switches routes from the High Street through the town centre to the Castle Donington bypass. There are also relatively small background traffic reductions on the route westbound on The Green and from the A50 eastbound between Junction 3 and Junction 1, and relatively small increases in background traffic on the A453 eastbound towards M1 Junction 23A, eastbound on The Green and the A50 westbound from Junction 1.

12.24 **Figure 12.3** shows a small reassignment from Melbourne Road westbound, as per the morning peak hour. There is also a more significant reassignment on Melbourne Road eastbound which is effectively background traffic wishing to route towards A42 Junction 14 that switches to route on the realigned A453, via Melbourne Road, as predominantly shown by the reduction in eastbound traffic on the A50 and also the southbound background traffic routing from Wilson to the A453.

12.25 In general terms, the reassignment effects of the proposed development traffic are less significant in the 2029 evening peak hour, especially on the A453 east of the proposed development which is under less stress in the evening peak. Reassignment effects in the 2029 evening peak hour are largely due to issues on the SRN.

2051 assessment year morning peak hour

12.26 The table below summarises the number of development vehicle trips, the change in background traffic flow, and the total change in traffic flow on the key routes highlighted in the Forecasting Report in the morning peak hour for the 2051 assessment year scenario.

12.27 Comparing **Figure 12.4** for the 2051 morning peak hour and **Figure 12.2** for the 2029 morning peak hour shows that there is a high degree of commonality in terms of the routes experiencing traffic flow increases in the two assessment years. The key differences include the following.

- Similar to 2029, in the 2051 assessment year there is an increase in traffic on the A50 eastbound from Junction 1 towards the M1 Junction 24A, but instead of an increase southbound on the M1, the increase is northbound in 2051.
- There is a reduction in traffic northbound from A42 Junction 14 towards the M1 corridor in the 2051 assessment year.
- In the 2051 assessment year there is also an increase in traffic flow on Whatton Lane between Long Whatton and the Kegworth Bypass.
- There is also a notable traffic flow reduction in the 2051 assessment year southbound from M1 Junction 24 through Lockington towards Castle Donington.

2051 flow difference analysis - morning peak hour									
Route	development flow			background reassignment			flow difference		
	Outbound	Inbound	2-way	Outbound	Inbound	2-way	Outbound	Inbound	2-way
A453 west of J2A	291	102	393	-228	-122	-350	63	-20	43
A453 north of J23A	111	55	166	-114	53	-61	-2	108	106
M1 South of J23A	167	47	214	-45	-92	-137	121	-45	76
A42 south of J23A	0	0	0	20	-58	-38	20	-58	-38
Airport Perimeter Road	325	175	500	252	-205	47	577	-30	547
Castle Donington bypass	*159*	*57*	*216*	*270*	*-95*	*175*	*429*	*-38*	*391*
High Street	*166*	*118*	*284*	*-22*	*-113*	*-135*	*145*	*5*	*150*
Station Road (south of A50 J1)	139	50	189	226	-67	159	366	-17	349
A50 (west of A50 J1)	57	20	77	-130	32	-98	89	-109	-20
A50 (east of A50 J1)	40	16	56	102	-28	74	142	-13	129
A6 north of A50 J2)	57	19	76	21	-8	13	77	11	88
M1 (north of J24A)	59	15	74	29	39	68	88	54	142
A453 (east of M1 J24)	56	22	78	-48	-21	-69	8	0	8
Melbourne Road (west of Slade Ln)	84	28	112	-100	116	16	-16	143	127
The Green (east of Diseworth)	190	162	352	5	-10	-5	194	152	346
Mill Lane (south of Gelscoe Ln)	234	170	404	-45	29	-16	188	199	387
Top Brand (south of A42 J13)	167	107	274	3	-84	-81	170	24	194
Breedon on the Hill	140	111	251	-28	97	69	112	208	320
Nottingham Road (west of Breedon)	62	48	110	-14	39	25	47	87	134
A42 (west of A42 J13)	135	41	176	26	-23	3	161	18	179
A6 (south of Hathern)	70	70	140	-77	-1	-78	-7	69	62
Hallamford Road	66	81	147	7	-31	-24	73	50	123
A512 (west of M1 J23)	5	7	12	8	67	75	13	75	88
A512 (east of M1 J23)	89	30	119	-11	-12	-23	78	17	95
Charley Road	144	86	230	-20	-88	-108	124	-2	122

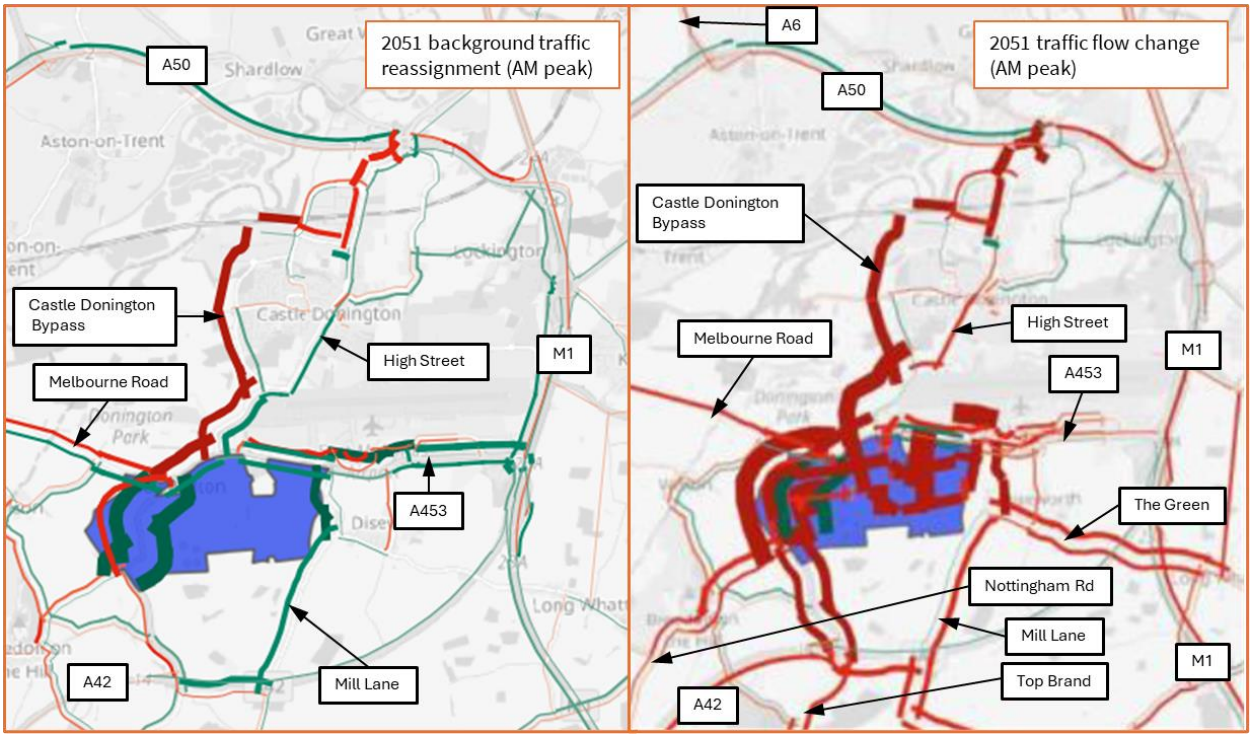

Figure 12.4: 2051 morning peak hour background traffic reassignment and total flow change (PCUs)

12.28 In terms of background traffic reassignments, comparing **Figure 12.4** for the 2051 morning peak hour and **Figure 12.2** for the 2029 morning peak hour also shows a high degree of commonality in the changes to background traffic routing. The key observations are as follows.

- In the 2051 assessment year more traffic reassigns from the A453 east of the development site to the Airport Perimeter Road and the Castle Donington bypass. This is likely to be due to increased congestion along the A453 corridor and also at the SRN complex of M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory and M1 Junction 24.

- The amount of background traffic reassigning from the A42 northbound between A42 Junction 14 and the M1 increases in 2051. Again, this is likely due to increased congestion at the M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory and M1 Junction 24 complex.
- Traffic no longer reassigns away from The Green in the 2051 assessment year.
- In the 2051 assessment year there is less traffic reassignment southbound on High Street through the centre of Castle Donington.
- There is a greater increase in background traffic using Melbourne Road eastbound in the 2051 assessment year, with a higher degree of route switching around Melbourne and Wilson and a reduction in traffic eastbound on the A50 to Junction 1.
- The reduction in traffic from M1 Junction 24 through Lockington towards Castle Donington in 2051 is due to background traffic reassignment.

12.29 Hence, with the proposed development in place in the 2051 assessment year, the traffic flow increases, and background traffic reassignments, follow a similar pattern to the 2029 opening year, with development traffic displacement and increased congestion on the A453 and the SRN causing background traffic to reassign west of Castle Donington.

2051 assessment year evening peak hour

12.30 The table below summarises the number of development vehicle trips, the change in background traffic flow, and the total change in traffic flow on the key routes highlighted in the Forecasting Report routes in the evening hour for the 2051 assessment year.

2051 flow difference analysis - evening peak hour									
Route	development flow			background reassignment			flow difference		
	Outbound	Inbound	2-way	Outbound	Inbound	2-way	Outbound	Inbound	2-way
A453 west of J23a	127	254	381	75	-94	-19	202	159	361
A453 north of J23A	*54*	*110*	*164*	*-250*	*-114*	*-364*	*-197*	*-4*	*-201*
M1 South of J23A	*72*	*144*	*216*	*69*	*-116*	*-47*	*140*	*27*	*167*
A42 south of J23A	*0*	*0*	*0*	*81*	*-199*	*-118*	*81*	*-199*	*-118*
Airport Perimeter Road	186	323	509	475	235	710	661	558	1,219
Castle Donington bypass	*156*	*113*	*269*	*589*	*66*	*655*	*745*	*178*	*923*
High Street	*30*	*210*	*240*	*-153*	*130*	*-23*	*-123*	*340*	*217*
Station Road (south of A50 J1)	48	122	170	182	119	301	230	241	471
A50 (west of A50 J1)	21	53	74	70	-38	32	91	15	106
A50 (east of A50 J1)	8	30	38	-16	69	53	-10	102	92
A6 north of A50 J2)	20	36	56	56	33	89	75	69	144
M1 (north of J24A)	19	33	52	13	3	16	32	36	68
A453 (east of M1 J24)	28	41	69	35	-42	-7	63	-2	61
Melbourne Road (west of Slade Ln)	34	27	61	-127	168	41	-93	194	101
The Green (east of Diseworth)	158	162	320	5	-70	-65	163	92	255
Mill Lane (south of Gelscoe Ln)	148	194	342	-1	-7	-8	147	186	333
Top Brand (south of A42 J13)	110	153	263	75	47	122	185	200	385
Breedon on the Hill	116	141	257	-78	33	-45	37	174	211
Nottingham Road (west of Breedon)	84	104	188	-48	4	-44	36	108	144
A42 (west of A42 J13)	52	98	150	59	-21	38	111	77	188
A6 (south of Hathern)	48	70	118	-85	-51	-136	-37	18	-19
Hallamford Road	71	73	144	17	12	29	88	86	174
A512 (west of M1 J23)	7	11	18	-30	19	-11	-23	29	6
A512 (east of M1 J23)	46	80	126	11	-70	-59	57	10	67
Charley Road	73	93	166	8	-78	-70	81	15	96

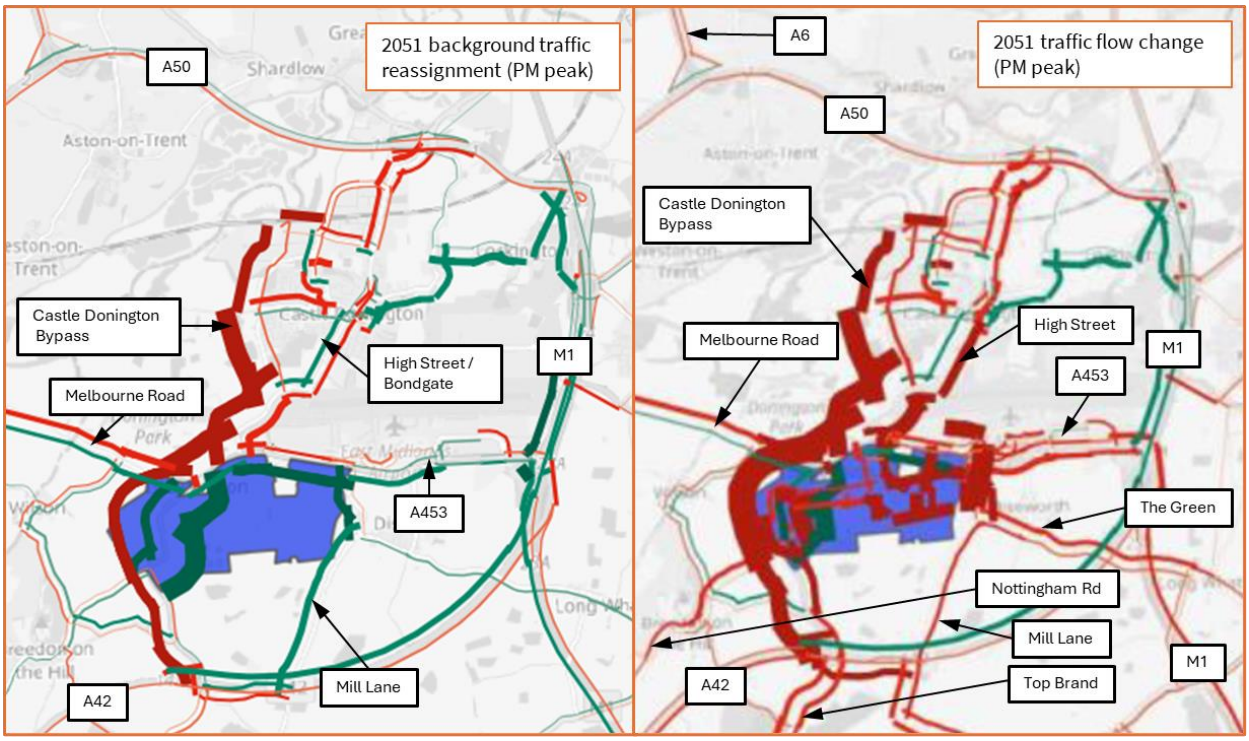

Figure 12.5: 2051 evening peak hour background traffic reassignment and total flow change (PCUs)

12.31 Comparing **Figure 12.5** for the 2051 evening peak hour and **Figure 12.3** for the 2029 evening peak hour shows that there is a high degree of commonality in terms of the routes experiencing traffic flow increases in the two assessment years. The key differences include the following.

- In the 2051 assessment year there is an increase in traffic on the A50 westbound from M1 Junction 24A.
- In the 2051 assessment year there is a reduction in traffic on the A453 north of M1 Junction 23A.
- As indicated in Section 11, in the 2051 evening peak hour there is a reduction in development traffic using the A453 to route south on the M1 when compared to 2029, with development traffic increase on the routes via Mill Lane and Top Brand. This is likely due to increase congestion at M1 Junction 23A.
- There is no increase in the northbound traffic flow on the M1 mainline towards Junctions 23A/24 in the 2051 assessment year, and a reduction in traffic flow on the A453 north of M1 Junction 23A, again due to increased congestion along the M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory and M1 Junction 24 complex.
- The reduction in traffic northbound from A42 Junction 14 towards the M1 corridor is greater in the 2051 assessment year. There is also an increase in traffic flow westbound on the A42 in 2051.
- There is also a notable traffic flow reduction in the 2051 assessment year southbound from M1 Junction 24 through Lockington towards Castle Donington.
- The increase in traffic eastbound on Melbourne Road reduces in the 2051 assessment year, with no reduction in eastbound traffic on the A50.

12.32 In terms of background traffic reassignments, comparing **Figure 12.5** for the 2051 evening peak hour and **Figure 12.3** for the 2029 evening peak hour also shows a high degree of commonality in the changes to background traffic routing. The key observations are as follows.

- In the 2051 assessment year, very little background traffic reassigns from the A453 east of the development site, though there is a significant increase in the amount of background traffic reassigning from the A453 north of M1 Junction 23A due to the congestion on the SRN.

- The amount of background traffic reassigning from the A42 northbound between A42 Junction 14 and the M1 increases in 2051, again due to increased SRN congestion.
- For the same reason, background traffic reassigns from the M1 northbound in the 2051 assessment year.
- In the 2051 assessment year there is less traffic reassignment northbound on High Street through the centre of Castle Donington.
- There is a reduction in the background traffic reassigning away from the A50 eastbound to Junction 1.
- The reduction in traffic from M1 Junction 24 through Lockington towards Castle Donington in 2051 is due to background traffic reassignment.

12.33 Hence, with the proposed development in place in the 2051 assessment year, the traffic flow increases and background reassignments in the evening peak hour follow a similar pattern to the 2029 opening year, though they are more pronounced, with increased congestion on the SRN causing ever more background traffic to reassign west of Castle Donington from the SRN.

Volume-capacity analysis

12.34 The Forecasting Report (**Appendix 8**) considers the congestion of junctions and nodes within the AoI by calculating the ratio of traffic volumes against the theoretical capacity. Junction or node volume to capacity (V/C) ratios exceeding 85% indicate that the junction/node is under stress which may result in increases in delay and, therefore, journey time.

12.35 Figures 3.10 to 3.13 in the Forecasting Report show the maximum node V/C ratios for the 2029 opening year and 2051 assessment year scenarios for the 'without development' and 'with development' scenarios. Junctions/nodes with maximum V/C ratios below 85% in all forecast scenarios are not shown, except at the proposed development site accesses on the realigned A453. Junctions/nodes that have a V/C ratio above 85% in at least one of the modelled scenarios are represented with a circle. As defined in the legends, the left-hand side of each circle represents the 'without development' scenario and the right-hand side represents the 'with development' scenario, with the colour[9] of the semi-circles coded to distinguish the level of congestion.

2029 opening year summary

12.36 For ease of reference, on the left-hand side of **Figure 12.6** are extracts of Figures 3.10 and 3.11 for the 2029 morning and evening peak hour scenarios. **Figure 12.6** shows the following:

a) In the morning peak hour, A50 Junction 3 is operating below 85%, though there are congestion hotspots indicated on the slip roads both east and west of the junction. However, no nodes at A50 Junction 3 show a congestion category change due to the proposed development. In the evening peak hour, there are nodes at the junction where the V/C ratio changes from green to yellow due to the proposed development, with congestion on the slip roads.

b) **Figure 12.6** shows that there is one node at A50 Junction 2 which has a V/C ratio above 100% in both the morning and evening peak hour, with all other nodes operating below 85%. There are no material changes in performance due to the proposed development.

[9] Green indicates a V/C ratio below 85%, yellow indicates a V/C ratio between 85% and 95%, red indicates a V/C between 95% and 100%, and black indicates a V/C ratio above 100%

c) At A50 Junction 1 there are multiple nodes shown to be operating with a V/C ratio between 85% and 95% in both the morning and evening peak hours, with one node operating between 95% and 100% in both peak hours. However, there are no material changes in performance due to the proposed development.

d) At M1 Junction 24A there are multiple nodes with a V/C ratio between 85% and 95% in both the morning and evening peak hours, with one node operating over 100% in both peak hours. Congestion is more evident in the evening peak hour, particularly on the southbound slip roads. However, only one node switches congestion category due to the proposed development, changing from green to yellow with the development in place. There are no congestion category changes in the evening peak hour.

e) At M1 Junction 24, there are congestion issues in both peak hours at much of the junction, with the exception of the A6 approach in the southeast corner of the gyratory. There are multiple nodes on the western side of the gyratory with a V/C ratio between 95% and 100% in both peak hours with nodes around the M1 southbound approach and the A453 southbound approach having a V/C ratio above 100% in both peak hours. In the morning peak hour two nodes switch congestion category due to the proposed development. However, there are no material changes between the 'without development' and 'with development' scenarios in the evening peak hour.

f) Nodes at the A453/EMG/Kegworth Bypass gyratory are shown to have V/C ratios between 95% and 100%, or above 100%, in both peak hours, with congestion worse in the evening peak hour. Hence, the junction is shown to be experiencing considerable congestion for both the 'without development' and 'with development' scenarios.

g) **Figure 12.6** shows that all nodes at M1 Junction 23A would have a V/C ratio below 85% in the morning peak hour. In the evening peak hour, congestion is shown to be greater with multiple nodes shown to have a V/C ratio between 85% and 95%, and with the V/C ratio on the A453 eastbound node going above 100% with the development in place.

h) At A42 Junction 14, **Figure 12.6** shows that in the 2029 opening year there are nodes at the junction that would have a V/C ratio between 85% and 95% in both the morning and evening peak hours. However, there are no congestion category changes due to the proposed development in the morning or evening peak hours.

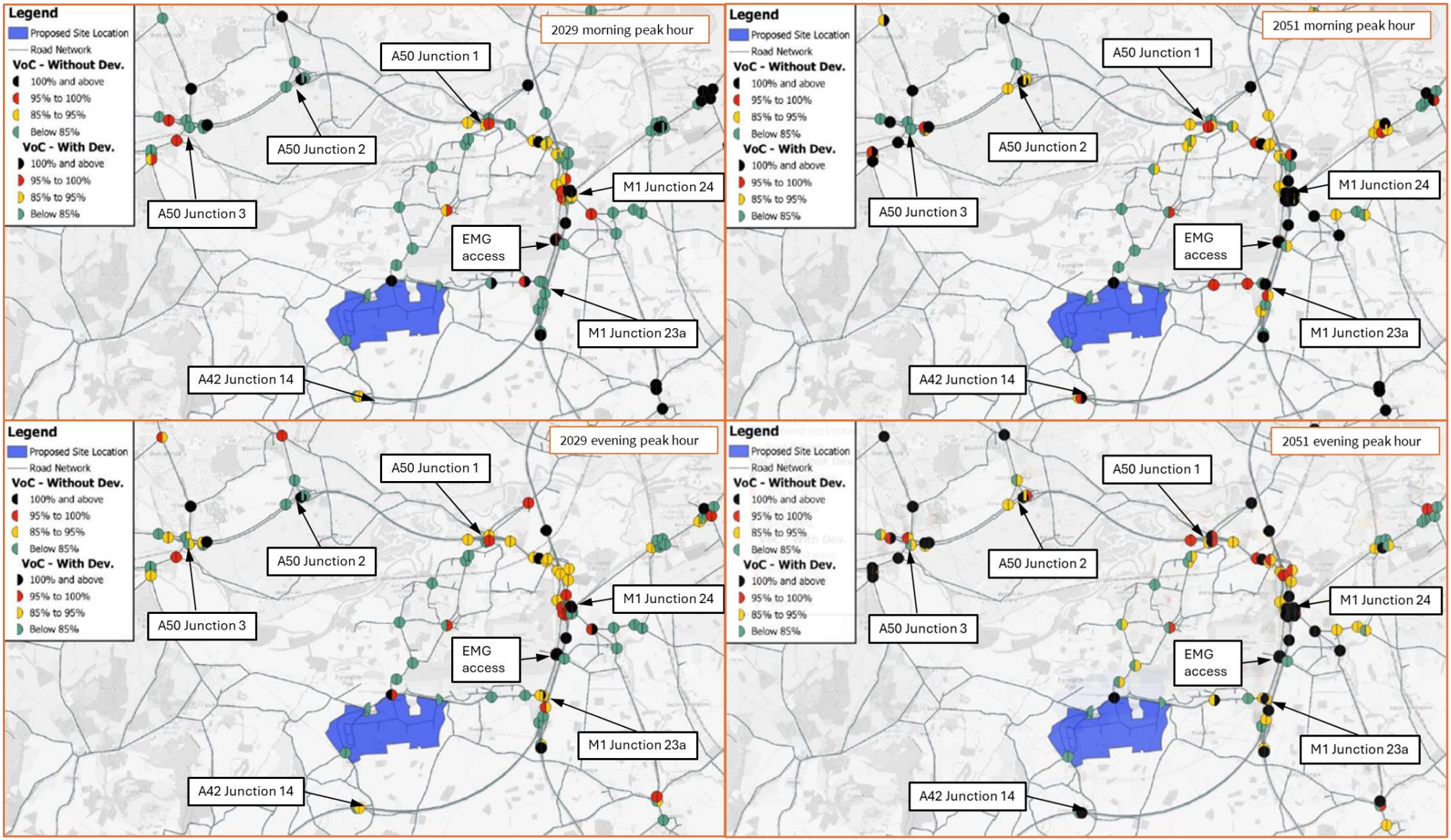

Figure 12.6: extract of Figures 3.10 and 3.13 from the Forecasting Report showing 2029 and 2051 V/C comparison

12.37 **Figure 12.6** shows that there are two further nodes on the M1 mainline where V/C issues are indicated in the 2029 opening year. The first of these nodes is located between M1 Junctions 24 and 23A, where the V/C is above 100% in both the morning and evening peak hours, and for both the 'without development' and 'with development' scenarios. The second of these nodes is located north of M1 Junction 24A and has a V/C above 100% in the evening peak hour, and for both the 'without development' and 'with development' scenarios.

12.38 Not shown on **Figure 12.6** is M1 Junction 23. Figures 3.10 and 3.11 in the Forecasting Report shows that there is one node at the junction which has a V/C ratio between 85% and 95% in the evening peak hour, with all nodes below 85% in the morning peak hour. In both the morning and evening peak hours there are two nodes to the north of the junction that also suffer with congestion, particularly the northern most node on the mainline which has a V/C over 100% for both the 'without development' and 'with development' scenarios. In the morning peak hour, the second of these nodes switches congestion category from below 85% without the development in place to between 85% and 95% with the development in place.

12.39 Whilst the 2029 opening year is aimed at assessing the impact on the SRN, it is notable that **Figure 12.6** shows that there are no junctions along the Castle Donington bypass that have a V/C ratio of 85% or above in the 2029 morning and evening peak hours, for the scenarios without and with the development. Whilst there are no identified congestion issues in the 2029 morning peak hour without the development in place, the A453/EMA access junction and the A453/Pegasus Business Park junction show congestion issues in the morning peak hour with the development in place. There are no congestion issues on the A453 in the 2029 evening peak hour for the scenarios both without and with the development.

12.40 Hence, the above identified congestion issues on the SRN and on the A453 in the morning peak hour with the development in place, help to explain the background traffic reassignments and flow increases on the route west of Castle Donington, as discussed earlier in the section on traffic flow changes.

2051 assessment year summary

12.41 For the 2051 assessment year, the right-hand side of **Figure 12.6** above shows extracts of Figures 3.12 and 3.13 from the Forecasting Report. **Figure 12.6** enables direct comparison with the 2029 opening year scenario for the SRN. As would be expected, congestion generally worsens in the 2051 assessment year across the A50 and M1 corridors within the AoI, particularly at M1 Junctions 24 and 23A. The key findings from the 2051 V/C analysis are summarised below.

a) Whilst congestion on the A50 Junction 3 slip roads is shown to increase in the 2051 assessment year, the performance of the junction itself remains relatively consistent. In the 2051 morning peak hour, all nodes at the junction have V/C ratios below 85%, and there is just one node on a slip road to the east that experiences a material change in the congestion category, changing from green to yellow with the development in place. In the 2051 evening peak hour there is a node at the junction which shows a material improvement in performance, switching from red to yellow in the 'with development' scenario. However, in the 2051 evening peak hour, congestion is shown to be worse on the A50 Junction 3 slip roads with the development in place.

b) At A50 Junction 2, congestion is worse in the 2051 morning and evening peak hours when compared to 2029, with two nodes showing a material deterioration in performance due to the development in the 2051 evening peak hour.

c) At A50 Junction 1 in the morning peak hour, there is no material change in performance between 2029 and 2051, though in the 2051 assessment year scenario there is a node to the east that switches from green to yellow due to the proposed development. In the evening peak hour, it is evident that congestion is more pronounced in 2051, though there are two nodes where the V/C performance improves with the development in place, both switching from black to red.

d) At M1 Junction 24A, **Figure 12.6** shows that congestion levels are relatively consistent between the two assessment years. In the 2051 morning peak hour there is one node on a slip road to the east that switches congestion category from red to black with the development in place. In the 2051 evening peak hour congestion is generally higher than for the 2029 assessment, though there are two nodes showing a material improvement in performance, switching from red to yellow with the development in place.

e) At M1 Junction 24 in the 2051 assessment year for the morning and evening peak hours, most nodes are showing a V/C ratio above 100% for the 'without development' and 'with development' scenarios. Hence, compared to the 2029 opening year, there is a marked increase in congestion levels at the junction.

f) Similarly, at the A453/EMG/Kegworth Bypass gyratory in the 2051 assessment year, most nodes are showing a V/C ratio above 100% for the 'without development' and 'with development' scenarios in the morning and evening peak hours.

g) **Figure 12.6** shows that there are nodes at M1 Junction 23A that would have a V/C ratio above 100% in both the 2051 morning and evening peak hours. In the evening peak hour congestion is shown to be higher. In the 2051 morning peak hour there is one node which shows a material reduction in congestion with the development in place, switching from red to yellow in the 'with development' scenario. There are no congestion category changes due to the proposed development in the evening peak hour.

h) At A42 Junction 14, **Figure 12.6** shows that in the 2051 assessment year congestion increases when compared to 2029. In the 2051 morning peak hour one node switches congestion category due to the proposed development, going from red to black with the development in place. There are no congestion category changes in the evening peak hour, though the V/C is over 100%.

12.42 Figures 3.12 and 3.13 in the Forecasting Report shows that at M1 Junction 23 there is increased congestion in 2051 when comparted to 2029. In the 2051 morning peak hour there are no material increases in congestion with the proposed development in place. However, in the 2051 evening peak hour two nodes experience a switch in their congestion category, with one changing from yellow to green in the 'with development' scenario, and one changing from green to yellow with the development in place.

12.43 Consideration has also been given to junctions away from the SRN in the 2051 assessment year. The right-hand side of **Figure 12.6**, and **Figure 12.7**, show extracts of Figures 3.12 and 3.13 from the Forecasting Report, showing the locations were a junction or node experiences a V/C ratio above 85% in the 2051 assessment year. The key findings from the non-SRN 2051 V/C analysis are summarised as follows.

a) In the morning peak hour, **Figure 12.6** shows that junctions around the southern section of the Castle Donington bypass are shown to have a V/C of below 85% for the 'without development' and 'with development' scenarios. However, further north the V/C ratio at

the Broad Rushes/Trent Lane roundabout and the Station Road/Trent Lane roundabout changes from green to yellow with the development in place. Further, the Broad Rushes/Station Road has a V/C ratio of between 85% and 95% in both the 'without development' and 'with development' scenarios.

b) In the evening peak hour, the V/C ratios at the Airport Perimeter Road/Castle Donington Bypass and Castle Donington Bypass/Park Lane roundabouts change from green to yellow with the development in place, as do the Station Road/Trent Lane and Broad Rushes/Station Road roundabouts to the north.

c) The V/C ratio at the High Street/Park Lane/Delven Lane traffic signal controlled junction in the centre of Castle Donington increases from below 85% in both the morning and evening peak hours, to between 95% and 100% with the development in place.

d) The figure shows that the V/C for the existing A453/Airport Perimeter Road T-junction and the proposed A453/Airport Perimeter Road/site access roundabout would be over 100% in the 2051 morning and evening peak hours. However, as detailed in Section 13, the capacity of the proposed A453/Airport Perimeter Road/site access roundabout is not accurately represented in the strategic modelling, with the detailed junction modelling showing that the roundabout would operate acceptably.

e) In the morning peak hour, **Figure 12.6** shows that on the A453 corridor to the east of the site, the A453/EMA traffic signal controlled access junction and the A453/Pegasus Business Park access roundabout both have V/C ratios between 95% and 100% in both the 'without development' and 'with development' scenarios. Further, in the evening peak hour, the V/C ratio for the A453/EMA traffic signal controlled access changes from yellow to black with the development. It is noted that the A453/Pegasus Business Park roundabout also forms the access to the proposed EMG2 development south of the A453. However, as discussed above, neither the proposed access junction design nor details of the accompanying offsite highway mitigation for the EMG2 development was available to be included within the stage 1 Isley Woodhouse modelling, which therefore represents a worst case.

f) As discussed in Section 11 of this report, a significant volume of development traffic routes towards Coalville, Shepshed, and Loughborough using routes on Top Brand and Mill Lane. **Figure 12.7** shows that there are no junctions or nodes on these routes with a V/C ratio above 85% in the 2051 morning and evening peak hours.

g) Development traffic also uses the route along The Green south of Diseworth and through Long Whatton. Much of this development traffic is routing through Hathern and along the A6 to/from Loughborough. **Figure 12.7** shows that in the morning peak hour there are multiple junctions along this section of the A6 that have V/C ratios greater than 85% in the 'without development' and 'with development' scenarios, including three within Hathern above 100%. However, the V/C category does not materially deteriorate at any of these junctions due to the proposed development. **Figure 12.7** shows that the A6 corridor is less congested in the evening peak hour, with a reduced number of junctions with a V/C ratio above 85% and only one junction above 100%. However, one junction in Hathern has a V/C that deteriorates from green to red with the development in place.

h) **Figure 12.7** also shows that there are multiple junctions within the northern part of Loughborough with V/C ratios indicating that they suffer from congestion in the 2051 morning and evening peak hours. However, none of these junctions show a deterioration in the V/C ratios due to the proposed development.

i) At Kegworth, **Figure 12.7** shows that there are six junctions identified as suffering from congestion in 2051. Of these junctions, the only two junctions that switch congestion category from green to yellow due to the proposed development are the Kegworth Bypass/Ashby Road junction in the morning peak hour, and the Station Road/Kingston Lane junction in the morning and evening peak hours.

j) At Shepshed, **Figure 12.7** shows that there are seven junctions along the A512 corridor, either side of M1 Junction 23, that suffer from congestion in the 2051 'without development' and 'with development' scenarios. None of these junctions switch congestion category due to the proposed development, except for the A512/Charley Road junction in the morning peak hour, which switches from green to yellow.

k) **Figures 12.6 and 12.7** show that to the west of the development there are no junctions or nodes on the routes through Melbourne and Breedon on the Hill with a V/C ratio above 85% in the 2051 morning and evening peak hours. This includes the Nottingham Road route towards Ashby-de-la-Zouch which attracts a relatively high volume of development traffic. Figures 3.12 and 3.13 in the Forecasting Report show three junctions on the A511 at Ashby-de-la-Zouch which suffer from varying levels of congestion in the 2051 morning and evening peak hours, though there are no changes in congestion categories due to the proposed development.

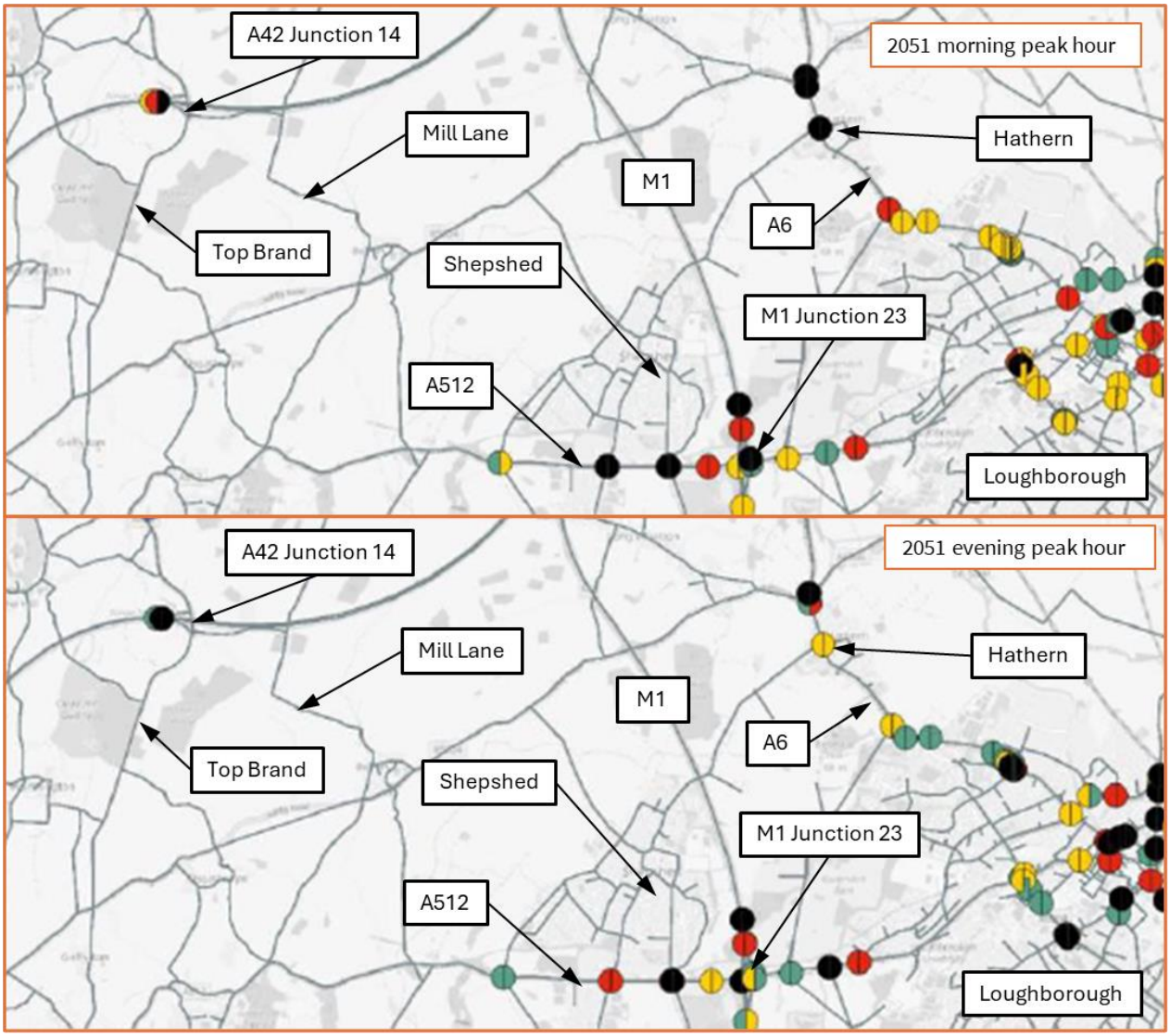

Figure 12.7: extract of Figures 3.12 and 3.13 from the Forecasting Report

12.44 **Figure 12.7** shows two further areas within the AoI where the V/C ratios are highlighting junctions/nodes that are indicating congestion.

- Two junctions north of A50 Junction 3 and two junctions north of A50 Junction 2, with two of these junctions showing increased congestion due to the proposed development.
- The two junctions on the A453 Remembrance Way, either side of the Ratcliffe on Soar power station site, though there is no material change in congestion levels due to the proposed development.

Summary and study area

12.45 The stage 1 strategic traffic modelling has been completed, assessing the impacts of the proposed development and the access strategy, but with no mitigation in place.

12.46 The proposed development would add a significant volume of vehicle trips to the road network. The largest increases in traffic flow between the 'without development' and 'with development' scenarios for the 2029 opening year and 2051 assessment year are forecast along the A453 between the A42 and the M1, routes to the north through Castle Donington, routes to the southeast, south, and southwest towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the M1 south of Junction 23A, the A42 between Junctions 13 and 14, and the A50 around Junction 1.

12.47 Inspection of the traffic flow increases on these routes shows that the increases are not solely due to the addition of development traffic. This is especially true on the route west of Castle Donington, where traffic increases are materially greater than the development traffic assigned to the route, particularly in the evening peak hour for the 2051 assessment year. On other routes, notably the A453 east of the development site in the morning peak hour, traffic increases are shown to be less than the development traffic that is forecast to use them.

12.48 Hence, it is clear that the impact of traffic due to the proposed development and the improved A453 route between the A42 and Castle Donington delivered as part of the access strategy, would change how background traffic routes through the network.

12.49 Consideration of the junction and node V/C ratios shows that the complex of junctions including M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24, suffer from significant congestion in the 2029 and 2051 assessment years without the development in place and this congestion would impact traffic routing through the network. Further notable conclusions from the V/C analysis are as follows.

- Junctions around the Castle Donington bypass route between the A453 and A50 Junction 1 have a V/C ratio below 85% without the development in place, though congestion increases due to the development traffic and the background traffic reassignment. Congestion is also increased at the High Street/Park Lane/Delven Lane traffic signal controlled junction in the centre of Castle Donington.
- The proposed development increases congestion at the A453/EMA traffic signal controlled junction and the A453/Pegasus Business Park roundabout.
- A significant volume of development traffic routes towards Coalville, Shepshed, and Loughborough using routes on Top Brand and Mill Lane. However, there are no junctions or nodes on these routes with a V/C ratio above 85%.
- Whilst there are multiple junctions on the A512 in Shepshed and across the northern part of Loughborough that are shown to experience various degrees of congestion, there are no material changes due to the proposed development.

- To the west of the development there are no junctions or nodes on the routes through Melbourne and Breedon on the Hill with a V/C ratio above 85% in the 2051 morning and evening peak hours. This includes the Nottingham Road route towards Ashby-de-la-Zouch which attracts a relatively significant amount of development traffic.

12.50 Therefore, severe congestion at the complex of junctions including M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24 is a significant constraint on the road network in the vicinity of Isley Woodhouse. This congestion is impacting on the routing of background traffic and development traffic.

12.51 Across all modelled scenarios, the most significant and consistent effect with the proposed development in place is a material background traffic reassignment away from the routes including the A42 east of Junction 14, Mill Lane, the A453 east of the site and the SRN to the east. The displaced background traffic routes north around the realigned A453 and the Castle Donington bypass to Castle Donington and A50 Junction 1.

12.52 This reassignment effect is due to a combination of the addition of the development traffic to the network and the existing congestion issues on the A453 corridor and the complex of junctions including M1 Junction 23A, the A453/EMG/Kegworth Bypass, and M1 Junction 24, as described above. The reassignment of background traffic is influenced by the improved quality of the route towards Castle Donington around the realigned A453.

12.53 Some of these reassignment effects should be viewed positively, especially with regards to Mill Lane, The Green and the A453. Nevertheless, it must be demonstrated that the Castle Donington bypass route has sufficient capacity to accommodate the forecast traffic increases due to the development and reassigned traffic flows. Hence, the junctions along this route where a V/C change in the 2051 'with development' scenario is identified have been modelled in detail and the results are discussed in Section 14. Junctions along the A453 to the east of the site have also been modelled in detail.

12.54 Further, given the severity of the congestion at M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24, it is recognised that significant upgrades are required in that area to deliver the forecast growth.

12.55 As discussed in Section 1, the developers behind Isley Woodhouse are working together with the developers behind other nearby strategic sites, including the Freeport site and the Ratcliffe on Soar power station site, under the umbrella of the East Midlands Growth Point. The identified common ground behind these strategic developments is the need to upgrade infrastructure around the motorway network to allow for further economic growth, and initial plans for this new infrastructure have been developed that would deliver a step-change in the capacity of the SRN suitable to accommodate the scale of development the Growth Point could deliver. The initial plans are discussed in further detail in Section 14 of this report.

12.56 The assessment of the Growth Point mitigation scheme for the SRN is on-going, including strategic modelling and VISSIM microsimulation modelling work. Hence, this report does not include detailed modelling of the impact of the development at M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, or M1 Junction 24.

12.57 The A453/Pegasus Business Park access junction has also not been modelled at this stage as it is proposed to be altered to also provide access to the EMG Phase 2 development.

12.58 Routes to the southwest, south, and southeast experience relatively large traffic flow increases in the peak hours, but no junctions on these routes have a V/C ratio above 85%. Hence, they are not included within the study area. A42 Junction 14 is part of the study area.

12.59 It is acknowledged that traffic increases at junctions along the A6 towards Derby, the A512 Ashby Road West in Shepshed, and the A6 towards Loughborough may also require detailed assessment as the highway mitigation strategy evolves. However, it is important to note that the Growth Point scheme is likely to alter traffic patterns in these locations. Hence, there will be an opportunity to extend the study area dependent upon the results of the mitigation modelling and the identification of residual impacts.

12.60 The study area for this Transport Assessment is therefore comprised of the following locations.

junction number	location
local road network	
1	A453/northeastern site access traffic signal junction
2	A453/Airport Perimeter Road/central site access roundabout
3	A453/Melbourne Road/northwestern access roundabout
4	A453/southwestern site access roundabout
5	Station Road/Donington Lane/Trent Lane roundabout
6	Station Road/Broad Rushes roundabout
7	Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre
8	Park Lane/Castle Donington bypass roundabout
9	A453/The Green priority T-junction
10	A453/EMA access traffic signal controlled T-junction
strategic road network	
11	A50 Junction 1
12	A42 Junction 14 Tonge Interchange

Assessment flows by furnessing

12.61 The EMFM provides accurate link flow outputs. However, the turning flows are not suitable for junction capacity assessments. Hence, a matrix balancing (furnessing) methodology has been applied to the EMFM outputs.

12.62 For each study area junction, the turning count matrices for the 2022 EMFM base flows and 2029/2051 EMFM forecast flows have been compared to gain the difference between the total flows on each row and column. Using the traffic survey data for the junction, the sum of the traffic flows on each row and column is also calculated. By comparing the two sets of data, the target 2029/2051 total flows into and out of each link at the junction are identified. The traffic survey turning count data is then adjusted to match the target row and column values using the following methodology.

- For each row of the matrix, the difference between the actual and target value is calculated.
- The turning count proportions on each row are then multiplied by the target value on that row.
- At this stage the total flow on each row will match the target figure, however the column totals will not match the target columns values.
- The above process is then repeated for each column, so that the column figures add up to the target values.

- The above process is repeated until the sum of the rows and columns are within 2% of the required target values.

12.63 Further details on the furnessing method and the matrix spreadsheets can be provided on request.

12.64 The furnessed traffic flows for the 2029 and 2051 without and with development scenarios have been used in the assessment of the study area junctions and these assessments are detailed in the following chapters.

13.0 SITE ACCESS STRATEGY

Introduction

13.1 The proposed access strategy for the Isley Woodhouse settlement includes the realignment of the A453 towards the western site boundary, effectively forming a bypass around the development site, with vehicular access gained by four junctions from sections of the existing A453 and the new section of the A453. The access junctions would consist of three four-arm roundabouts and one new traffic signal controlled T-junction. There would be no direct vehicular access onto The Green towards Diseworth.

13.2 The proposed access strategy is shown on **Drawing ADC2570-DR-001-P7**, and an extract is provided below at **Figure 13.1**.

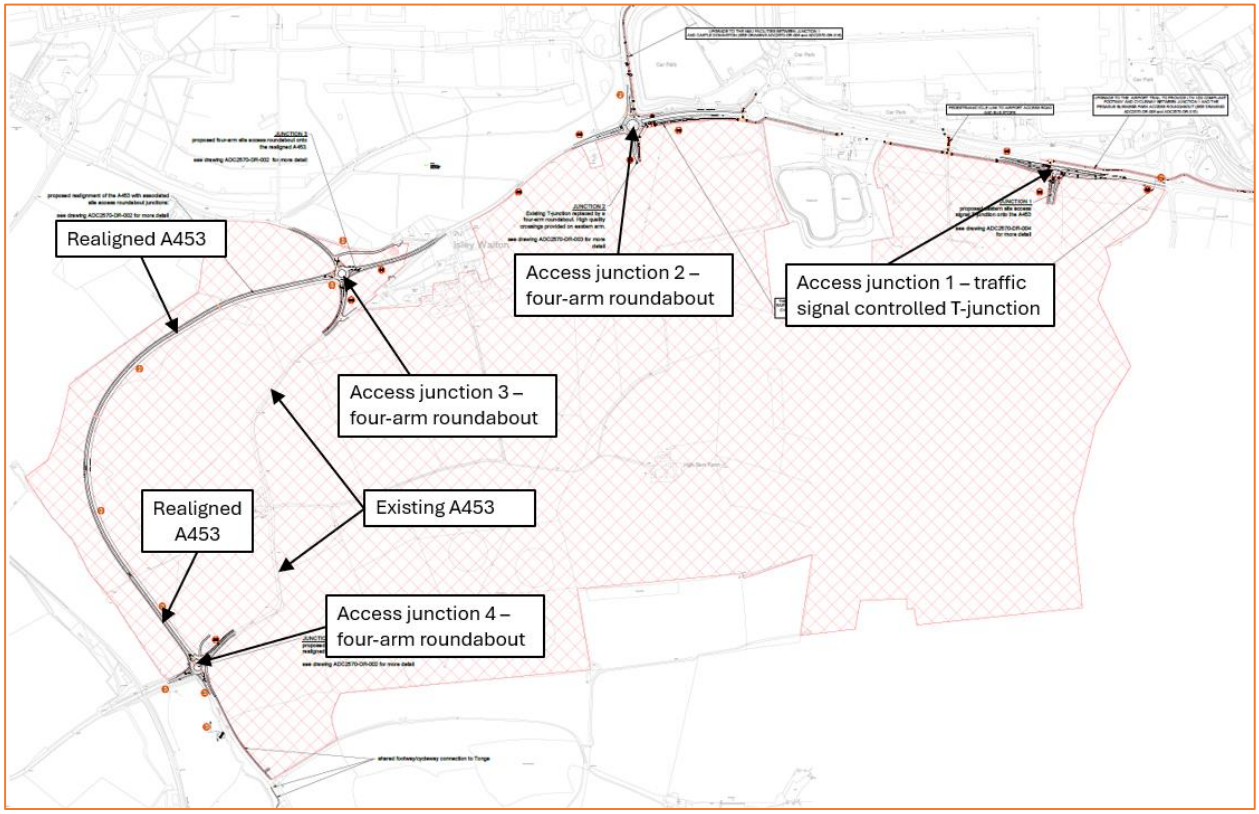

Figure 13.1: extract of drawing number ADC2570-DR-001-P7

Realigned A453

13.3 The Parameters Plan (**Appendix 1**) shows that the development proposals include the diversion of the A453 towards the western site boundary, forming a bypass around the development. The realignment is proposed to remove this high category road from within the developable area, helping to create a coherent community with suitable connectivity throughout.

13.4 As it passes through the site, the existing A453 has a poor alignment, with two particularly sharp bends, and a narrow carriageway width. The southernmost bend is effectively 90 degrees resulting in significantly limited forward visibility. Therefore, the carriageway alignment and narrow width, combined with the configuration of the A453/A453 Moor Lane junction that also has poor visibility, makes it an unattractive route. The proposed realignment of this section of the A453 would provide a material improvement so that the road can better achieve its strategic function.

13.5 In February 2022, Midlands Connect published a document[10] that put forward a strategic transport road map to improve the A50/A500 corridor, with the ambition to transform the A50/A500 east-west corridor into one of the primary locations for sustainable growth and investment in the UK. The strategic recommendations of the paper are set out on page 11, including the building of, "*a new link road between the A50 (near junction 1) and A42 (near junction 14, Breedon-on-the-Hill). This is recommended as a long-term option to be considered for RIS5 or beyond.*" The recommended link road route is shown on **Figure 13.2**.

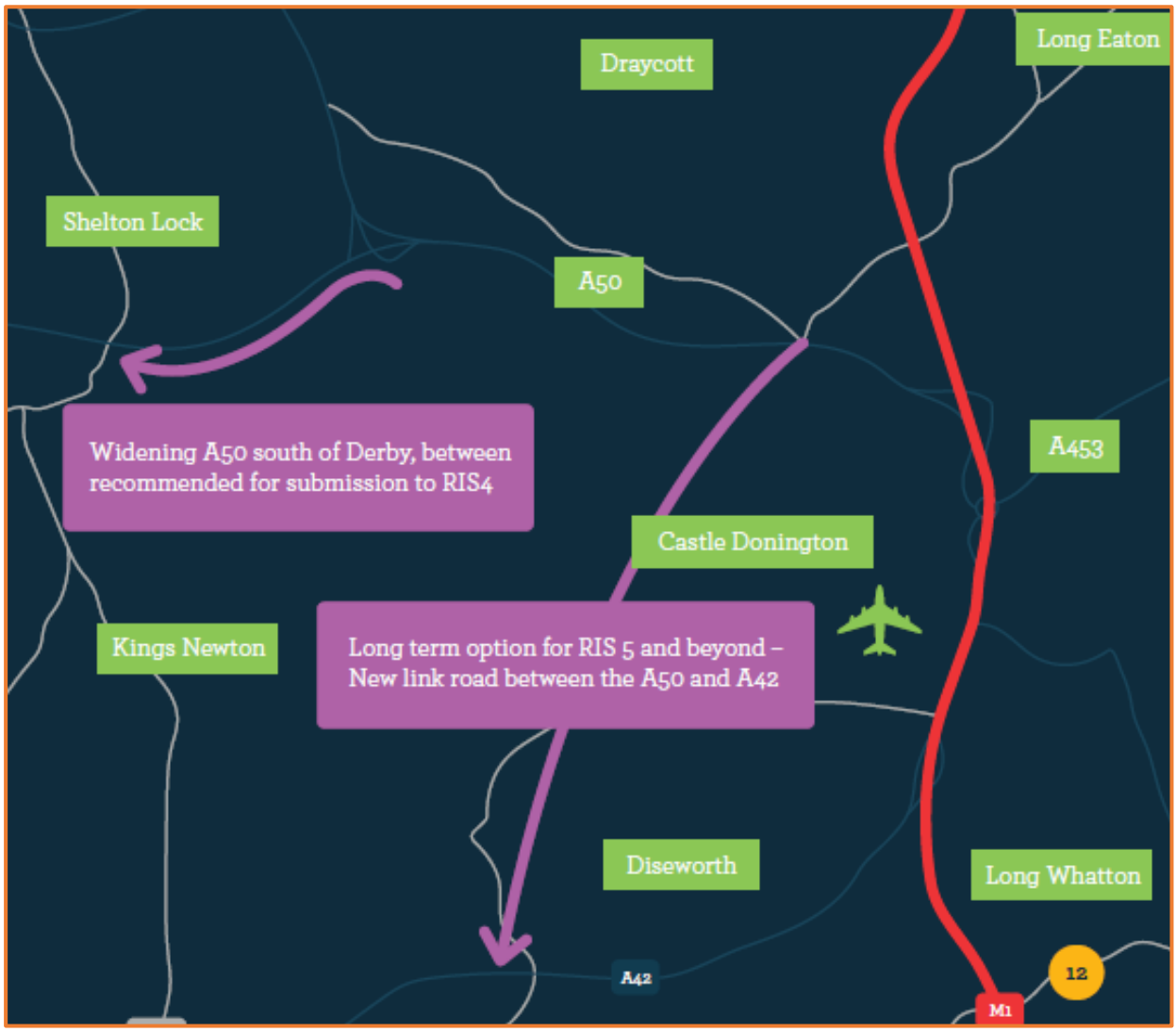

Figure 13.2: extract of Midlands Connect document recommending a new link road between the A42 and A50

13.6 The proposed realignment of the A453 around the western perimeter of the site, combined with the recently opened Castle Donington Western Relief Road, can assist in the delivery of this strategic vision by Midlands Connect.

13.7 Three options for improving the A453 route were considered, as shown on **Figure 13.3**.

[10] Levelling up Stoke-on-Trent, Staffordshire, Derby & Derbyshire: The road to success - A strategic transport road map to improve the A50/A500 North Midlands Manufacturing Corridor – Midlands Connect, February 2022

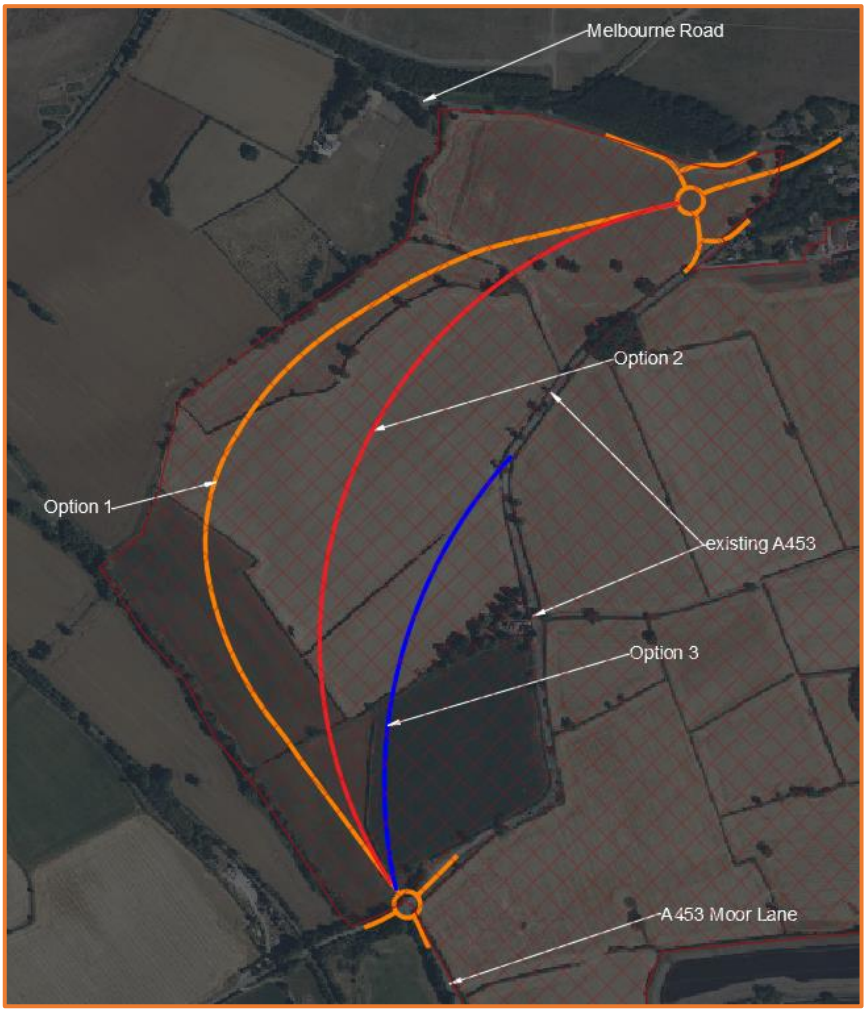

Figure 13.3: A453 realignment options

Option 1

13.8 Option 1 would realign the A543 towards the western boundary of the development site, such that there would be no developable land to the west. Pushing the A453 away from the residential areas has the advantage of limiting its environmental impact on residents, particularly in respect to noise and severance. It would mean that there would be no requirement for additional junctions along the new section of the A453, which would reduce the accident risk, as accidents cluster around junctions where there are conflicting movements and speed differentials. Fewer junctions also reduces the cost and removes delays that impact on the strategic function.

13.9 The realigned A453 could be designed to a high standard, as a single carriageway with an 85kph design speed, in accordance with the Design Manual for Roads and Bridges (DMRB). The alignment would eliminate the sharp bends on the current A453, improving the quality of the route for all road users. The existing A453 would become a development road, with a 30mph speed limit where the bends would be less problematic.

Option 2

13.10 Option 2 would be a 1.6km route of new carriageway construction (0.2km shorter than option 1). The route could be designed to DMRB standards, as for Option 1, and would offer the same improvements over the existing alignment. The vertical alignment and cut-and-fill requirement at the northern end of the route would be very similar to that of Option 1 and hence there is no material change. There would be a reduction in cost because of the shorter route. However, there

would be around 118,000sqm of developable land on the western side of the realigned A453, which could not be developed, or would require at least one additional junction on the A453 to provide access to the west. A route through the development would create environmental impacts such as noise and severance. Additional junctions on this section of the A453 would change the character of the route and could limit its strategic function.

Option 3

13.11 Option 3 would provide around 900m of new carriageway construction to the south to create a new section of the A453. To the north, this option would utilise the existing alignment of the A453. The northern section would require localised widening to provide a 7.3m wide carriageway and re-surfacing. However, further investigation may show that this section does not meet current DMRB standards, and significant re-building could be necessary.

13.12 Whilst this option would bring some benefits to the A453 route compared with the existing alignment, and could reduce construction costs compared to Option 1, the perception of its function would be that of a realignment to facilitate development, rather than an upgrade to provide a high-quality strategic route. Further, there would be around 274,500sqm of developable land to the west of the A453 that would either be lost or require multiple accesses to deliver sustainable development.

Preferred route – Option 1

13.13 Option 1 was selected as the preferred route as it provides the best opportunity to improve the strategic function of this section of the A453, in keeping with the aspirations of Midlands Connect, whilst maximising developable land, and limiting the environmental impacts. Initial discussions about the provision of the realigned A453 with LCC and the Transport Working Group were positive, in terms of both the improvement in horizontal and vertical alignment of the road and also in terms of strategic connectivity between the A42, EMA, the key employment sites discussed within this report, the A50 to the north, and the M1 to the east.

13.14 A 3D design has been prepared to ensure deliverability, and to understand earthworks particularly around the northern end of the realignment where there are challenging levels. The general arrangement of the proposed route is shown on **Drawings ADC2570-DR-001-P7** and **ADC2570-DR-002-P5**.

13.15 The design work has demonstrated that the route can be designed to the standards in the DMRB without need for relaxations. The carriageway width would be 7.3 metres, and the alignment would have a minimum radius of 510m with 5% superelevation and appropriate transitions. The vertical curves reach the minimum requirements but during detailed design these could be adjusted to provide larger K values without affecting the alignment significantly. The long-section demonstrates the road can be designed to meet the vertical alignment requirements.

13.16 As described in Section 4, an 8m wide corridor would be safeguarded along the eastern edge of the realigned A453 to allow future provision of a bi-directional cycle route with a segregated footway. Green open-space would be provided within the limited remaining site land to the west of the realigned A453 and hence three crossing points are provided to allow pedestrian access.

Existing and proposed speed limits

13.17 With respect to the proposed access strategy, **Drawing ADC2570-DR-001-P7** shows the existing and proposed speed limits.

- The speed limit on the realigned A453 would be 50mph.
- The current speed limit on the A453 between Junction 2 and the priority-controlled junction east of Junction 1 is 50mph. Given the increased number of junctions and Toucan crossings along this stretch of the A453, a more appropriate speed limit would be 40mph. This has been discussed with the Transport Working Group.
- All site access roads would have a 30mph speed limit.

Access Junction 1 – northeastern access junction

General arrangement

13.18 Access Junction 1 would be a new traffic signal controlled T-junction, as shown on **Drawing ADC2570-DR-004-P7**. An extract is shown in **Figure 13.4**.

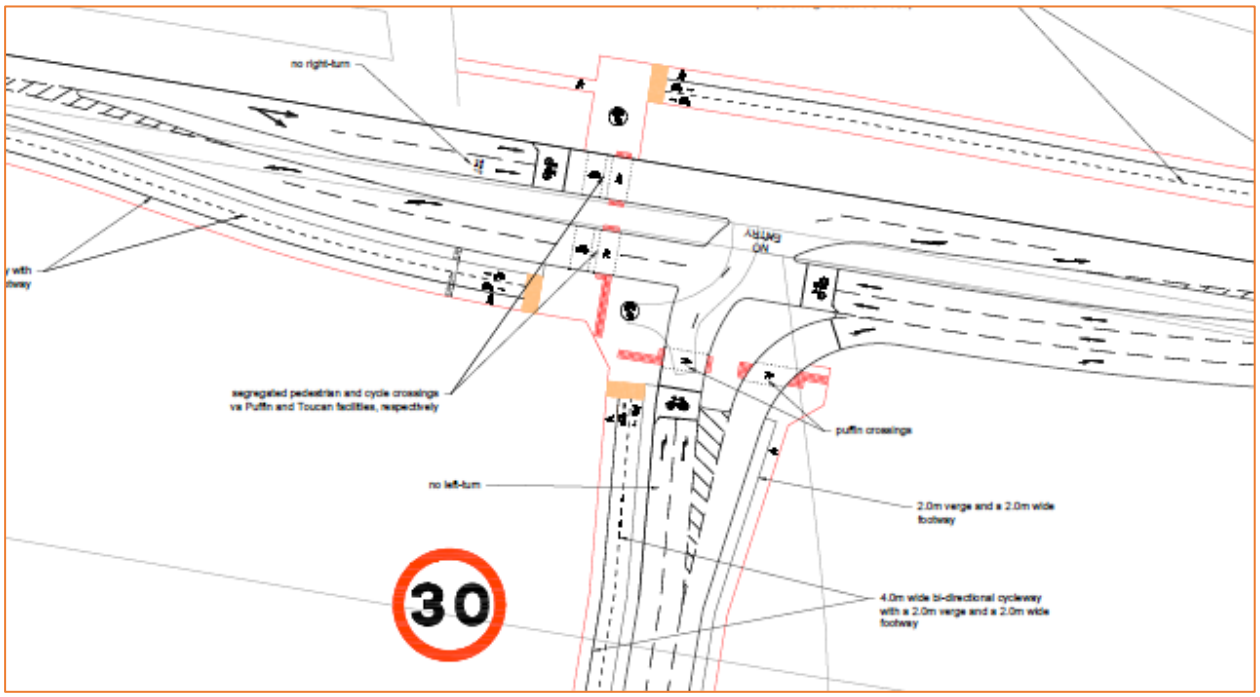

Figure 13.4: extract of drawing ADC2570-DR-004-P7

13.19 There would be two ahead lanes in each direction on the A453, with a left-turn lane into the proposed development provided on the eastern arm. There would be two right-turn lanes out of the site. Toucan crossings, with the pedestrian and cycle movements segregated, would be provided on the site access arm and the A453 western arm.

13.20 The junction has been designed to operate in two stages so that it can be as efficient as possible, minimising delays on the A453, whilst still providing high quality Toucan crossing facilities. Vehicles arriving at Isley Woodhouse from the north, west, and southwest would have multiple alternative opportunities to enter the development and hence the right turn at Access Junction 1 is unlikely to be a popular movement. Providing for the right turn into Isley Woodhouse would require a third stage, leading to increased delay for the A453 westbound movement. Hence, this movement would not be permitted at the proposed junction.

13.21 The left turn out of the site would also be prohibited to enable the Toucan crossings on the A453 to be prioritised. Vehicles departing the site and wishing to travel north, west, and southwest could do so from the three new site access roundabouts further west.

Capacity assessment

13.22 The performance of Access Junction 1 was modelled using LinSig software. It has been tested with the furnessed 2051 With Development traffic flows for both the morning and evening peak hours. The results are summarised in the table below and the LinSig model can be provided on request.

scenario	peak	cycle time	PRC (%)	total delay (PCU/hr)	highest degree of saturation (%)	longest MMQ (PCU)
2051 With Development	AM	90	4.0	21.61	86.6	19.9
2051 With Development	PM	90	28.0	11.73	70.3	10.1

13.23 With the development in place, the junction is forecast to operate with a positive practical reserve capacity (PRC) in both the morning and evening peak hours, indicating that all arms are operating less than 90% saturated. Therefore, Access Junction 1 would operate acceptably with the development fully constructed in the 2051 assessment year.

Road Safety Audit

13.24 Access Junction 1 was the subject of a Stage 1 Road Safety Audit (RSA) in accordance with DMRB GG 119. All recommendations identified within the RSA report were considered within the Response Report, which is at **Appendix 9**. Where necessary, changes to the design were included.

Interim Access Junction 1

13.25 Consideration has been given to the provision of access to the early phases of Isley Woodhouse, which are likely to be on the northern edge of the development, and notably around Access Junction 1. An interim design for Access Junction 1 has been identified, that unlike the final proposal where some movements would be prohibited to improve efficiency and priority for pedestrians and cyclists, all-moves would be allowed. The design is shown on **Drawing ADC2570-DR-017-P3**. An extract is below at **Figure 13.5**.

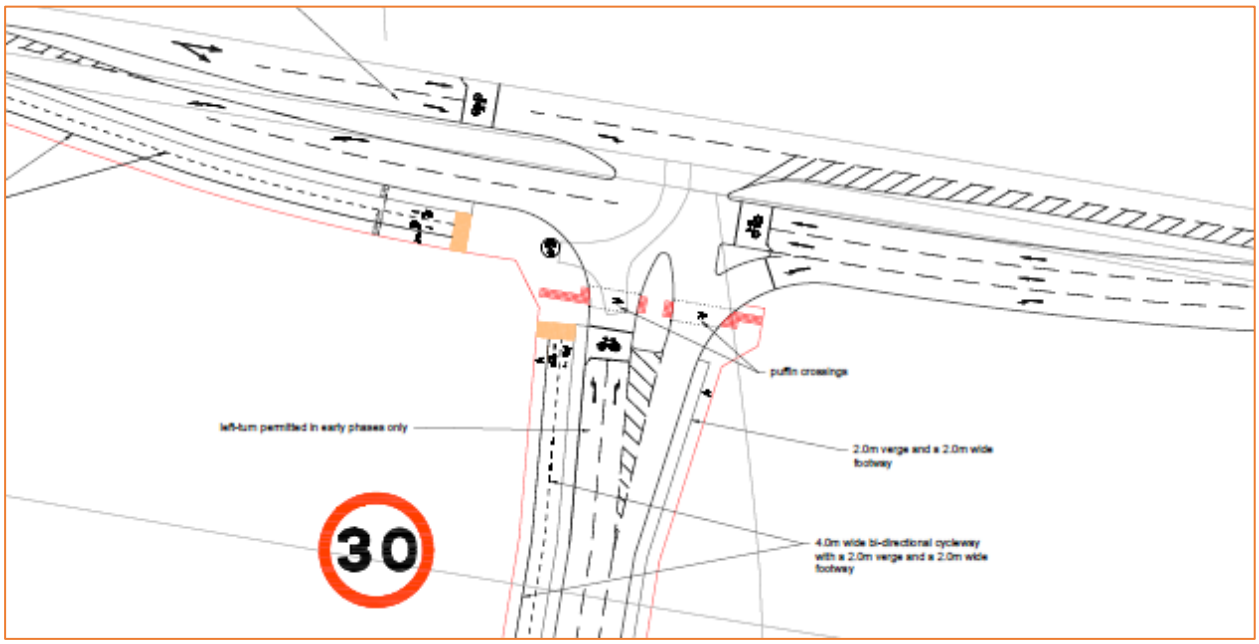

Figure 13.5: extract of ADC2570-DR-017-P3 showing the early phase site access

13.26 The design of the interim junction aims to limit the amount of abortive work in converting it to its final form. The key points to note are as follows.

- During the early phases, full pedestrian and cycle facilities would be provided alongside the A453 to the west of the junction with the proposed Toucan crossing providing a link to the internal EMA infrastructure, including the bus stops at the DHL Hub.
- The A453 and the site access kerb lines would be as per the final scheme to minimise the amount of construction work required to modify the junction to the final scheme.
- The right turn into the site is facilitated by re-purposing the offside ahead lane from the full development scheme and shaping the splitter island on the site access arm.
- The A453 Toucan crossing facilities at Access Junction 1 would be omitted at this stage and a corner radius provided to allow the left turn out of the site to be provided.

13.27 The interim site access junction will be tested as part of the stage 3 strategic modelling, which will consider the phasing of the development.

Access Junction 2 – central roundabout access

General arrangement

13.28 An initial design for Access Junction 2 proposed adding a fourth arm on the existing A453/Airport Perimeter Road traffic signal controlled T-junction, as shown at **Figure 13.6**.

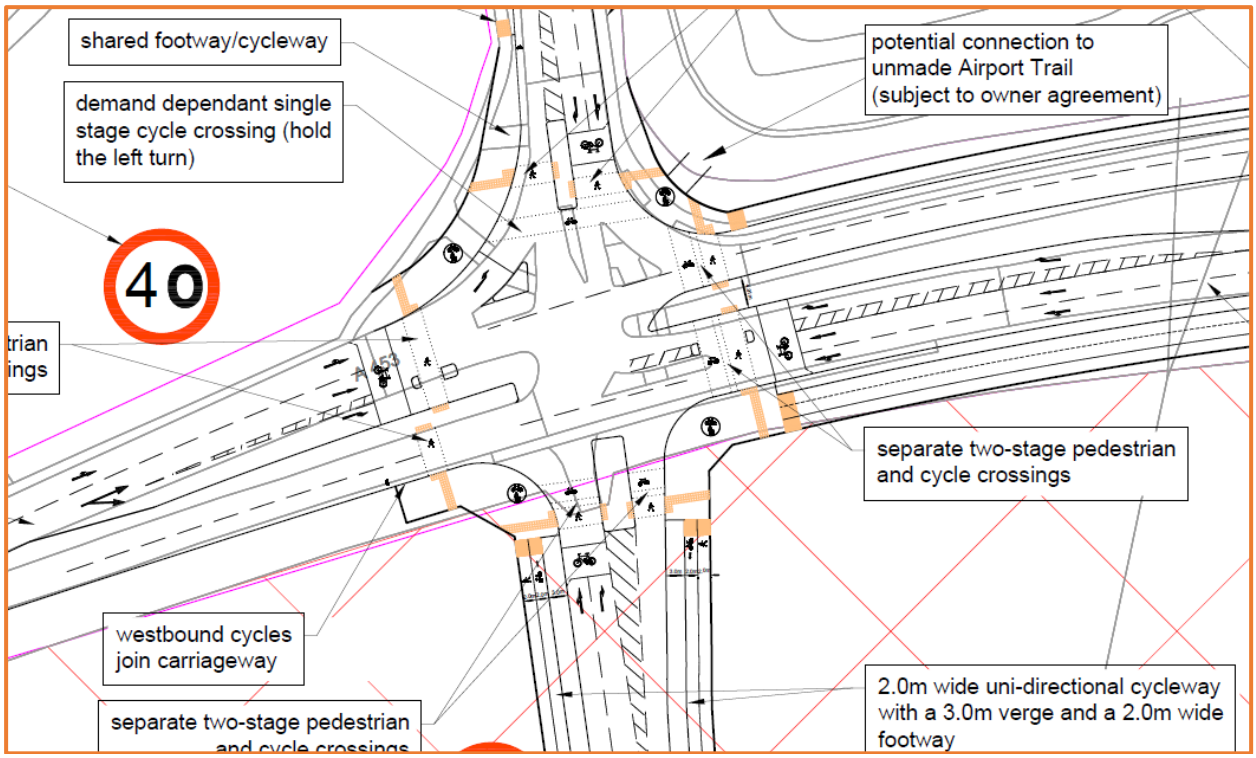

Figure 13.6: A453/Airport Perimeter Road traffic signal controlled crossroads option

13.29 Provision of the fourth arm would necessitate the provision of a right-turn lane and splitter island on the A453 west arm. Further, as demonstrated by the V/C analysis from the strategic modelling (Section 12) and the detailed junction modelling in Section 14, the existing T-junction would operate over capacity without the development in place and, therefore, two ahead lanes in each direction would be required on the A453. The result is a very large junction which would have a very urban aesthetic. The feedback from the Transport Working Group was that the junction would feel intimidating and complicated, particularly for pedestrians and cyclists.

13.30 Hence, further work was undertaken to consider the form of the central junction, including the conversion of the existing T-junction to a four-arm roundabout with Toucan crossing facilities on the A453 east arm. The roundabout emerged as the preferred option and the proposed layout is shown on **Drawing ADC2570-DR-003-P5**, with an extract at **Figure 13.7**.

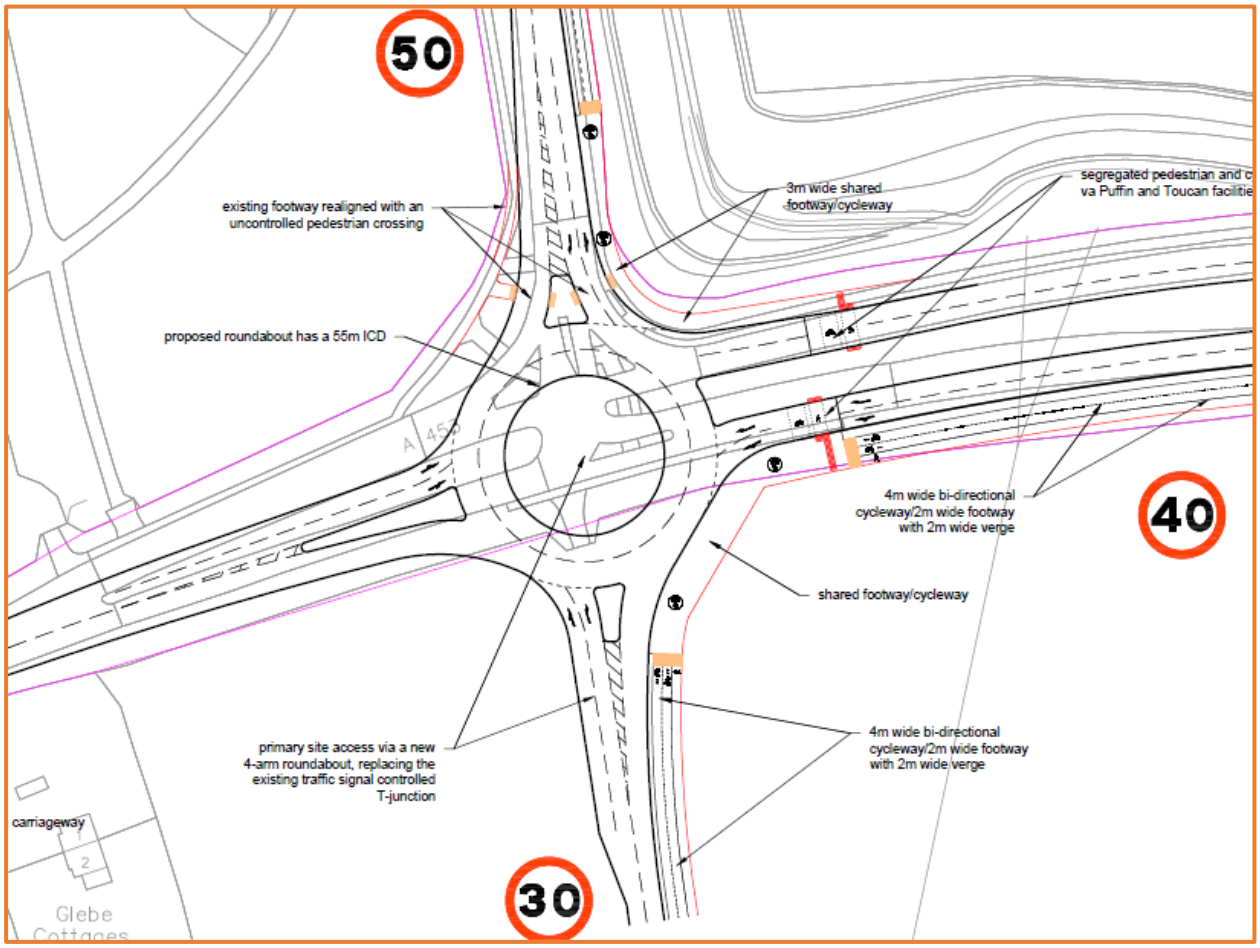

Figure 13.7: A453/Airport Perimeter Road four-arm roundabout

13.31 The proposed roundabout would have a 55m ICD. There would be two full lanes in both directions between the proposed roundabout and the A453/DHL Hub roundabout to the east. All other arms would flare to two lanes on approach to the roundabout. As discussed in Section 4, there are no proposals to provide pedestrian or cycle facilities along the A453 to the west of the proposed roundabout, as access to the western parts of the site are best provided for internally. Hence, to tie into the proposed pedestrian and cycle facilities on the A453 east and the eastern side of the Airport Perimeter Road, a Toucan crossing would be provided on the A453 east arm, with separation between the pedestrian and cycle elements. There would also be an uncontrolled crossing on the Airport Perimeter Road arm.

13.32 In Section 12 above, it was noted that the V/C ratios of the existing A453/Airport Perimeter Road T-junction and the proposed four-arm roundabout were over 100% in the 2051 morning and evening peak hour scenarios. The following paragraphs explain the detailed modelling of the junctions.

Capacity assessment – existing junction

13.33 The existing A453/Airport Perimeter Road T-junction was modelled using LinSig software and the furnessed 2051 Without Development traffic flows. The results are summarised in the table below and the LinSig model can be provided on request.

scenario	peak	cycle time	PRC (%)	total delay (PCU/hr)	highest degree of saturation (%)	longest MMQ (PCU)
2051 Without Development	AM	90	11.0	16.56	81.1	13.4
2051 Without Development	PM	90	-5.7	26.35	95.1	27.4

13.34 In 2051 Without Development, the PRC would be positive in the morning peak hour, indicating that all links are operating less than 90% saturated. In the evening peak hour, whilst the PRC would be -5.7%, no approach to the junction would be operating above 100% of its capacity. These results suggest that the strategic modelling underestimates the capacity of the junction.

Capacity assessment – proposed roundabout

13.35 The performance of Access Junction 2 has been modelled using Junctions 9 ARCADY software. It was tested with the furnessed 2051 With Development traffic flows. The results are summarised in the table below and the Junctions 9 ARCADY model can be provided on request.

2051 With Development	AM peak hour			PM peak hour		
	queue (veh)	delay (secs)	ratio of flow to capacity	queue (veh)	delay (secs)	ratio of flow to capacity
A453 eastbound	1.3	6.64	57%	4.7	19.57	83%
Airport Perimeter Road	1.5	4.98	61%	2.8	6.87	74%
A453 westbound	0.8	3.68	44%	2.0	7.50	67%
Site Access	0.6	3.89	37%	0.3	4.62	23%

13.36 Access Junction 2 is forecast to operate with a maximum RFC of 61% in the morning peak hour and 83% in the evening peak hour. The junction would therefore operate acceptably with the development fully constructed in the 2051 assessment year.

Road Safety Audit

13.37 Access Junction 2 was the subject of a Stage 1 Road Safety Audit (RSA) in accordance with DMRB GG 119. All recommendations identified within the audit report were considered within the Response Report, which is at **Appendix 9**. Where necessary, changes to the design were included.

Access Junction 3 – northwestern roundabout access

General arrangement

13.38 To the northwest, a new four-arm roundabout will replace the existing A453/Melbourne Road T-junction, connecting the northern extent of the realigned A453 with the existing A453, Melbourne Road, and also providing access to the development, as shown on **Drawing ADC2570-DR-002-P5**. An extract is at **Figure 13.8**.

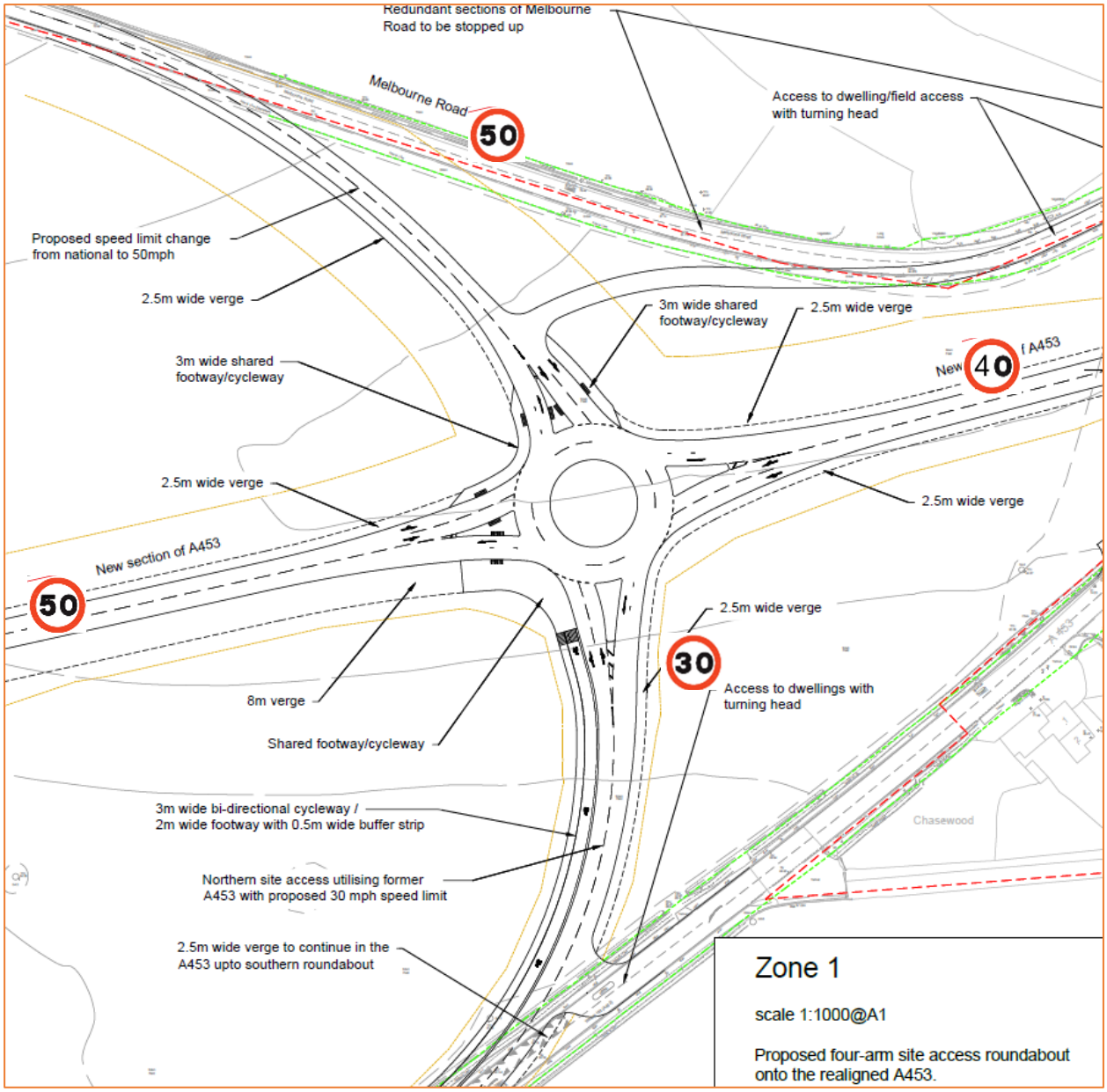

Figure 13.8: extract of drawing ADC2570-DR-002-P5

13.39 The proposed roundabout would have a 40m ICD and all arms would flare to two lanes on approach to the roundabout. There would be uncontrolled crossings on two of the four arms of the roundabout. The existing Melbourne Road would be stopped-up west of its junction with the A453, with access to the private properties maintained via a connection to the realigned Melbourne Road. The existing section of Melbourne Road would be retained for pedestrian and cycle access between Melbourne and Isley Walton. To the south of the new roundabout, access to the existing properties on the redundant section of the A453 would be maintained via a new simple priority controlled T-junction.

Capacity assessment

13.40 The performance of Access Junction 3 was modelled using Junctions 9 ARCADY software. It was tested with the furnessed 2051 With Development traffic flows. The results are summarised in the table below and the Junctions 9 ARCADY model can be provided on request.

2051 With Development	AM peak hour			PM peak hour		
	queue (veh)	delay (secs)	ratio of flow to capacity	queue (veh)	delay (secs)	ratio of flow to capacity
A453 eastbound	0.6	4.37	38%	0.9	5.59	48%
Melbourne Road	0.8	5.58	43%	0.5	5.17	32%
A453 westbound	1.0	5.02	50%	3.9	12.05	80%
Site access	0.0	2.84	3%	0.1	3.80	10%

13.41 The roundabout would operate with a maximum RFC of 50% in the morning peak hour and 80% in the evening peak hour and therefore has spare capacity. There would be no significant queuing or delay, and the roundabout can accommodate the forecast traffic demand.

Road Safety Audit

13.42 Access Junction 3 was the subject of a Stage 1 Road Safety Audit (RSA) in accordance with DMRB GG 119. All recommendations identified within the RSA report were considered within the Response Report, which is in **Appendix 9.** Where necessary, changes to the design were incorporated.

Access Junction 4 – southwestern roundabout access

General arrangement

13.43 To the southwest, a new four-arm roundabout will replace the existing A453/Moor Lane T-junction, connecting the southern extent of the realigned A453 with Moor Lane and providing access to the development, as shown on **Drawing ADC2570-DR-002-P5**. An extract is at **Figure 13.9**.

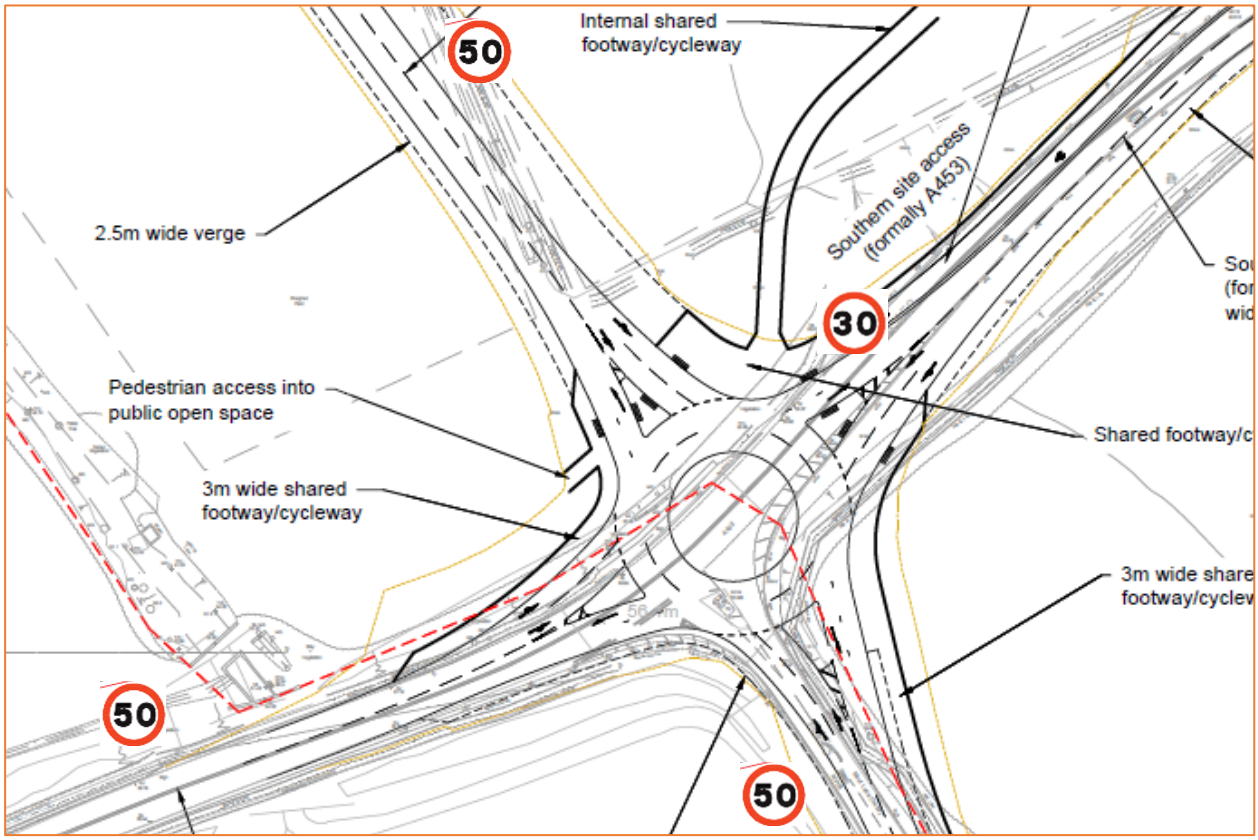

Figure 13.9: extract of drawing ADC2570-DR-002-P5

13.44 The proposed roundabout would have a 40m ICD and all arms would flare to two lanes on approach to the roundabout. There would be uncontrolled crossings on the northern and eastern arms of the junction. The provision of a roundabout in place of the existing A453/A453 Moor Lane junction would improve accessibility for traffic travelling to/from the A42. Under the existing arrangement, visibility for vehicles attempting to turn right from the A453 Moor Lane to the A453 northbound is poor, and hence the new junction improves the attractiveness of the A453 route.

Capacity assessment

13.45 The performance of Access Junction 4 was modelled using Junctions 9 ARCADY software. It was tested with the furnessed 2051 With Development traffic flows. The results are summarised in the table below and the Junctions 9 ARCADY model can be provided on request.

2051 With Development	AM peak hour			PM peak hour		
	queue (veh)	delay (secs)	ratio of flow to capacity	queue (veh)	delay (secs)	ratio of flow to capacity
A453 northbound	0.4	3.73	30%	0.7	3.94	41%
Moor Lane	0.4	4.17	28%	0.3	3.75	23%
A453 southbound	0.7	4.51	40%	1.0	5.16	51%
Site access	0.6	4.87	39%	0.3	3.92	23%

13.46 As shown in the table above, Access Junction 4 is forecast to operate with a maximum RFC of 40% in the morning peak hour and 51% in the evening peak hour and would therefore have plenty of spare capacity. There would be no material queuing or delay associated with the proposed junction, which can therefore comfortably accommodate all the proposed development traffic with no detriment to the wider road network.

Road Safety Audit

13.47 Access Junction 3 was the subject of a Stage 1 Road Safety Audit (RSA) in accordance with DMRB GG 119. All recommendations identified within the audit were considered within the Response Report, which is at **Appendix 9**. Where necessary, changes were made to the design.

14.0 OFF-SITE JUNCTION CAPACITY ASSESSMENTS

Introduction

14.1 **Figure 14.1** shows the location of the off-site study area junctions. The following sections provide the details of the junction capacity assessments. **Appendix 10** provides a list of the model files for each junction, and these files can be provided on request.

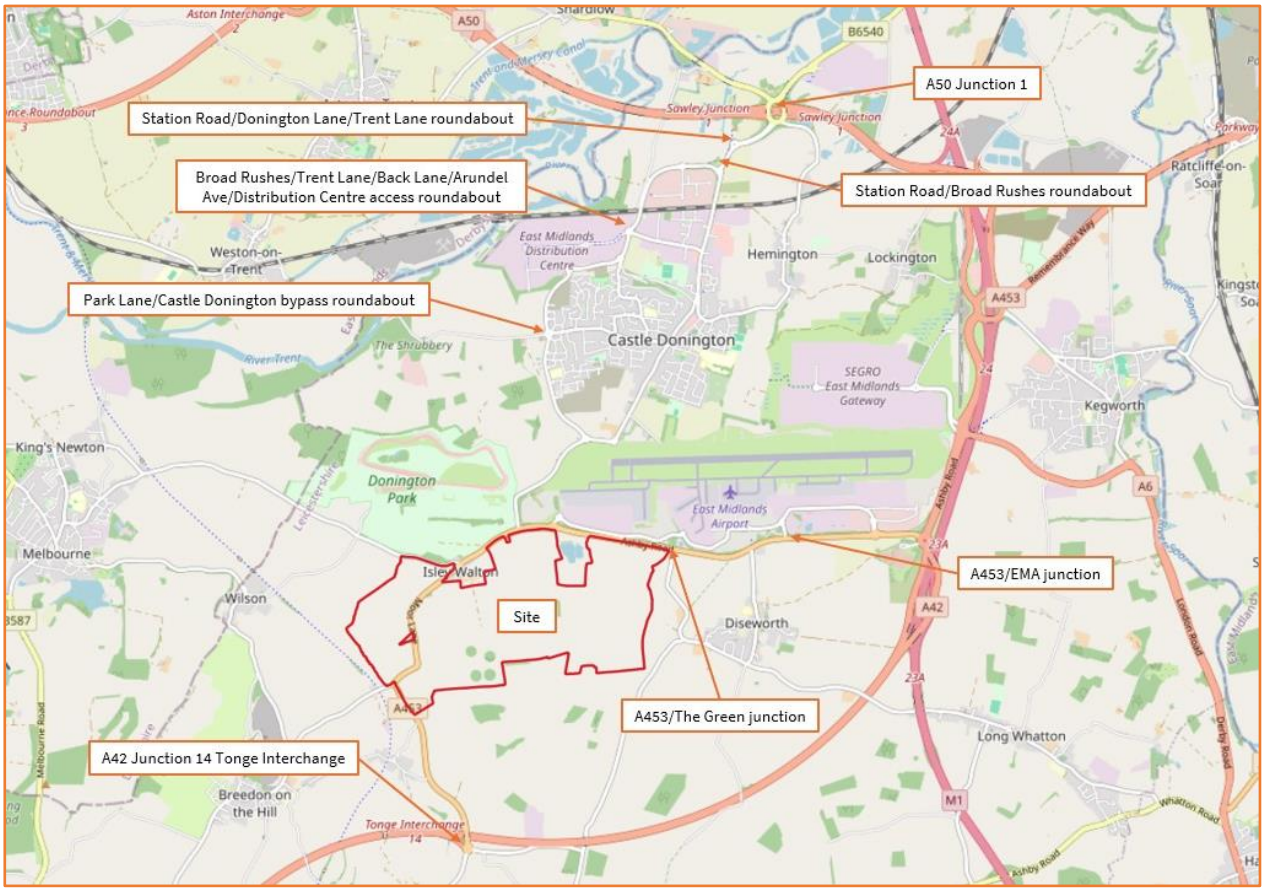

Figure 14.1: location of the study area junctions

Station Road/Donington Lane/Trent Lane roundabout

14.2 The Station Road/Donington Lane/Trent Lane roundabout as shown in **Figure 14.2**.

14.3 As part of planning permission 19/01496/OUTM the roundabout is to be upgraded to a partially signalised four-arm roundabout to include an additional fourth arm to access the proposed employment site. An extract from the masterplan from the reserved matters application (24/00074/REMM) is shown in **Figure 14.3**. The scheme includes widening on Station Road, the introduction of a new signal controlled crossing point, and reinstating the second lane on Trent Lane.

Figure 14.2: Station Road/Donington Lane/Trent Lane roundabout (source: Bing Maps)

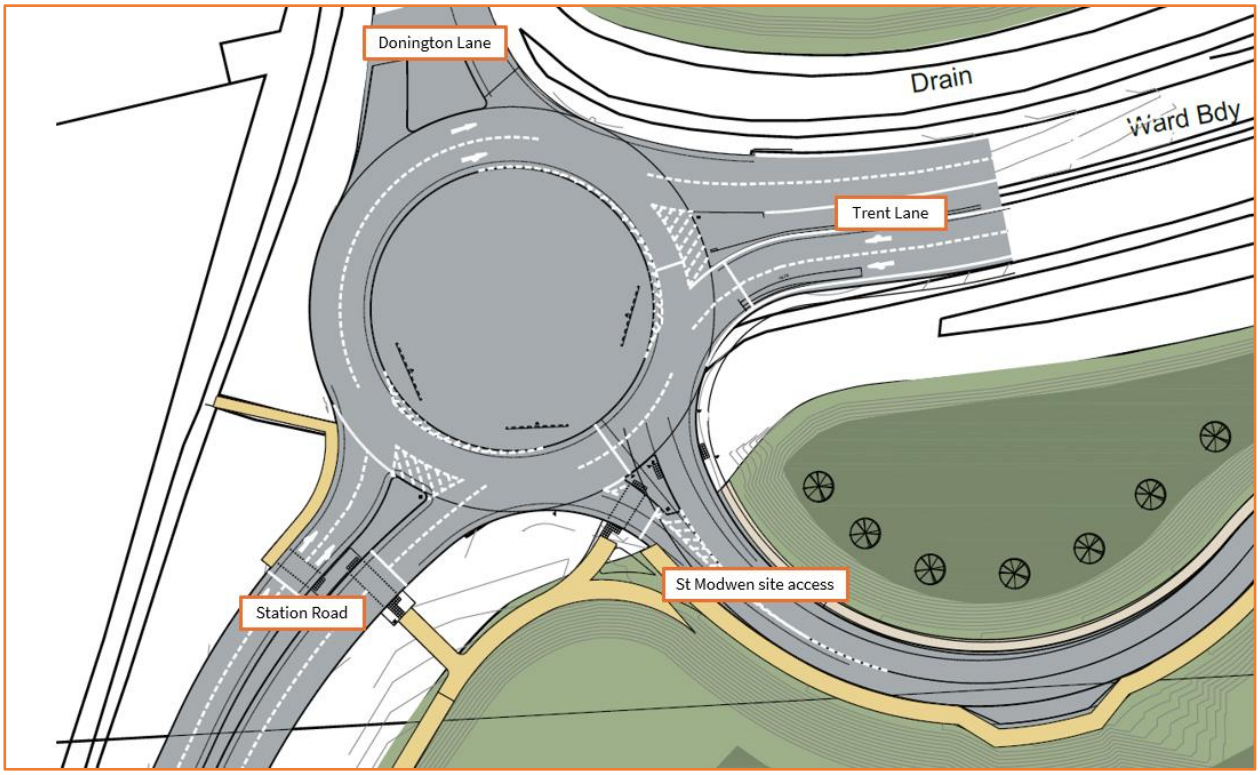

Figure 14.3: Station Road/Donington Lane/Trent Lane/St Modwen site access

14.4 The consented layout has been modelled in LinSig using the 2051 traffic forecasts. Signal plan information was extracted from the reports submitted with the planning application for the consented development. The results are summarised in the table below.

scenario	peak	cycle time	PRC	total delay (PCU/hr)	highest degree of saturation	longest MMQ (PCU)
2051 Without Development	AM	90s	55.7%	12.95	57.8%	10.3
	PM	90s	44.0%	11.78	62.5%	7.5
2051 With Development	AM	90s	27.1%	16.05	70.8%	11.2
	PM	90s	23.1%	15.96	73.1%	12.7

14.5 In 2051 Without Development, the junction is forecast to operate with a PRC of 55.7 % in the morning peak hour and 44.0% in the evening peak hour. In the 2051 With Development, the junction would operate with a PRC of 27.1% in the morning peak and 23.1% in the evening peak hour. As the junction would operate within capacity, no mitigation measures are required.

Station Road/Broad Rushes roundabout

14.6 The three-arm Station Road/Broad Rushes roundabout is shown in **Figure 14.4**.

Figure 14.4: Station Road/Broad Rushes roundabout (source: Bing Maps)

14.7 A model of the roundabout was created using Junctions 9 ARCADY software and was tested with the 2024 Observed and 2051 forecast traffic flows. The results are in the table below.

	AM peak hour			PM peak hour		
	queue (veh)	delay (s)	RFC	queue (veh)	delay (s)	RFC
2024 Observed						
Station Road (south)	0.3	3.53	26%	0.9	4.26	47%
Broad Rushes	0.4	3.25	30%	1.0	5.07	50%
Station Road (north)	2.3	5.93	70%	1.0	3.50	50%
2051 Without Development						
Station Road (south)	0.5	4.23	33%	1.1	5.00	51%
Broad Rushes	1.3	5.30	58%	1.7	6.91	63%
Station Road (north)	5.9	12.61	86%	1.5	4.43	61%
2051 With Development						
Station Road (south)	1.2	6.05	55%	1.8	6.84	64%
Broad Rushes	2.7	9.46	73%	3.1	11.48	76%
Station Road (north)	5.1	11.06	84%	2.7	6.45	73%

14.8 The roundabout is currently operating at a maximum RFC of 70% in the morning peak hour and 50% in the evening peak hour. In 2051 Without Development, the RFC increases to 86% in the morning peak hour and 63% in the evening peak hour.

14.9 In 2051 With Development, the roundabout would operate with a maximum RFC of 84% in the morning peak hour and 76% in the evening peak hour. As the junction would operate within capacity, no mitigation measures are required.

Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre access roundabout

14.10 Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre Access junction is a five-arm roundabout, as shown in **Figure 14.5**.

Figure 14.5: Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre roundabout (Bing Maps)

14.11 A model of the roundabout was created using Junctions 9 ARCADY software with geometries measured from OS mapping. The model was tested with the 2024 Observed, and 2051 traffic forecasts. The results are summarised in the table below.

	AM peak hour			PM peak hour		
	queue (veh)	delay (s)	RFC	queue (veh)	delay (s)	RFC
2024 Observed						
Broad Rushes	0.8	5.22	43%	0.9	5.69	48%
Trent Lane	0.2	5.36	15%	0.3	5.63	25%
Back Lane	0.8	4.94	44%	0.5	4.35	33%
Arundel Ave	0.1	4.98	5%	0.3	3.71	21%
Distribution Centre Access	0.0	3.88	1%	0.0	3.42	1%
2051 Without Development						
Broad Rushes	1.7	8.15	63%	2.1	9.17	68%
Trent Lane	0.3	6.81	25%	0.7	8.19	40%
Back Lane	2.6	10.34	73%	0.9	5.62	47%
Arundel Ave	0.1	6.37	7%	0.3	4.17	23%
Distribution Centre Access	0.0	4.88	1%	0.0	3.78	1%
2051 With Development						
Broad Rushes	1.9	9.85	66%	3.4	14.03	78%
Trent Lane	0.3	6.46	22%	1.2	11.49	55%
Back Lane	16.1	48.87	97%	2.0	8.76	67%
Arundel Ave	0.1	8.12	8%	0.4	5.05	26%
Distribution Centre Access	0.0	6.09	1%	0.0	4.45	2%

14.12 The roundabout currently operates at a maximum RFC of 44% in the morning peak and 48% in the evening peak hour. In 2051 Without Development, the roundabout is forecast to operate at 73% RFC in the morning peak hour and 68% in the evening peak hour.

14.13 In 2051 With Development, the roundabout is forecast to operate with a maximum RFC of 97% in the morning peak hour and 78% RFC in the evening peak hour. In the morning peak hour, the Back Lane arm of the roundabout will operate with a queue of 16 vehicles and a delay of 48.87 seconds, all other approaches would have spare capacity. The need for mitigation measures at this junction will be investigated in the next stage of the modelling process.

Park Lane/Castle Donington bypass roundabout

14.14 The four-arm Park Lane/Castle Donington bypass roundabout is shown in **Figure 14.6**.

14.15 A model of the junction was created using Junctions 9 ARCADY software with geometries measured from OS mapping. The model was tested with the 2051 traffic forecasts. The outputs are summarised in the table below.

Figure 14.6: Park Lane/Unnamed Road roundabout (source: Bing Maps)

	AM peak hour			PM peak hour		
	queue (veh)	delay (s)	RFC	queue (veh)	delay (s)	RFC
2051 Without Development						
Unnamed Road (north)	0.2	2.83	16%	0.2	2.38	18%
Park Lane East	0.1	4.8	6%	0.2	5.18	2%
Unnamed Road (south)	0.3	3.06	24%	0.4	3.53	30%
Park Lane West	1.6	9.16	62%	0.4	4.75	29%
2051 With Development						
Unnamed Road (north)	0.2	2.75	16%	0.4	2.92	28%
Park Lane East	0.1	4.56	5%	0.1	5.15	11%
Unnamed Road (south)	1.0	4.43	49%	4.7	13.39	83%
Park Lane West	3.6	19.84	79%	0.8	9.14	46%

14.16 In 2051 Without Development, the roundabout is forecast to operate at a maximum RFC of 62% in the morning peak hour and 30% in the evening peak hour. In 2051 With Development, the roundabout would operate at a maximum RFC of 79% in the morning peak hour and 83% in the evening peak hour with up to 4 vehicles queuing. As the junction would continue to operate within capacity, no mitigation measures are required.

A453/The Green junction

14.17 The Forecasting Report identified that the A453/The Green junction will operate with a V/C of less than 85% in all of the modelling scenarios. However, a review of the predicted traffic flows in 2051 suggests that there will be congestion at the junction with queues and delays for vehicles turning into and out of The Green.

14.18 The next stage of the strategic traffic modelling will consider mitigation measures along the A453 corridor and on the SRN, which is likely to affect the number and routing of vehicles through the junction. Detailed capacity assessments of will therefore be undertaken at the next modelling stage and appropriate mitigation measures will be identified.

A453/EMA junction

14.19 The A453/EMA junction is a traffic signal controlled T-junction as shown in **Figure 14.7.**

Figure 14.7: A453/EMA junction (source: Bing Maps)

14.20 A model of the junction was created using LinSig with geometries measured from OS mapping. The model was tested with the 2051 traffic forecasts. The results are summarised in the table below.

scenario	peak	cycle time	PRC	total delay (PCU/hr)	highest degree of saturation	longest MMQ (PCU)
2051 Without Development	AM	90s	18.5%	14.50	76.0%	11.3
	PM	121s	3.4%	22.60	87.1%	16.7
2051 With Development	AM	90s	5.0%	18.60	85.7%	14.5
	PM	121s	-7.5%	32.94	96.7%	29.1

14.21 The junction would perform acceptably in the 2051 morning peak hour with the development in place. However, there would be a significant impact in the 2051 evening peak hour, with congestion on the EMA exit arm.

14.22 Given the congestion indicated by the stage 1 strategic modelling, the impact due to the development, and also the desire to improve the pedestrian and cycling crossing facilities to accommodate the proposals detailed in Section 6, an improvement scheme will be considered at this junction. An initial mitigation scheme is detailed in Section 16 and will be tested and refined in the stage 2 EMFM assessment work.

A50 Junction 1

14.23 A50 Junction 1 is a partially traffic signal controlled grade-separated gyratory, as shown in **Figure 14.8.**

Figure 14.8: existing A50 J1 layout

14.24 The A50 westbound and eastbound off-slips are subject to traffic signal control with the remaining four approaches of London Road, the B6540 Tamworth Road, Ryecroft Road, and Trent Lane, being priority controlled. The two traffic signal controlled approaches to the gyratory are controlled by individual controllers and are not linked. Both controllers run a simple two stage strategy with the circulating carriageway in one stage and the off-slip approach in the other.

14.25 An improvement scheme at the junction has been identified through the transport work undertaken for planning applications 19/01496/OUTM and 09/01226/OUTM, as shown on the drawing extract presented in **Figure 14.9**.

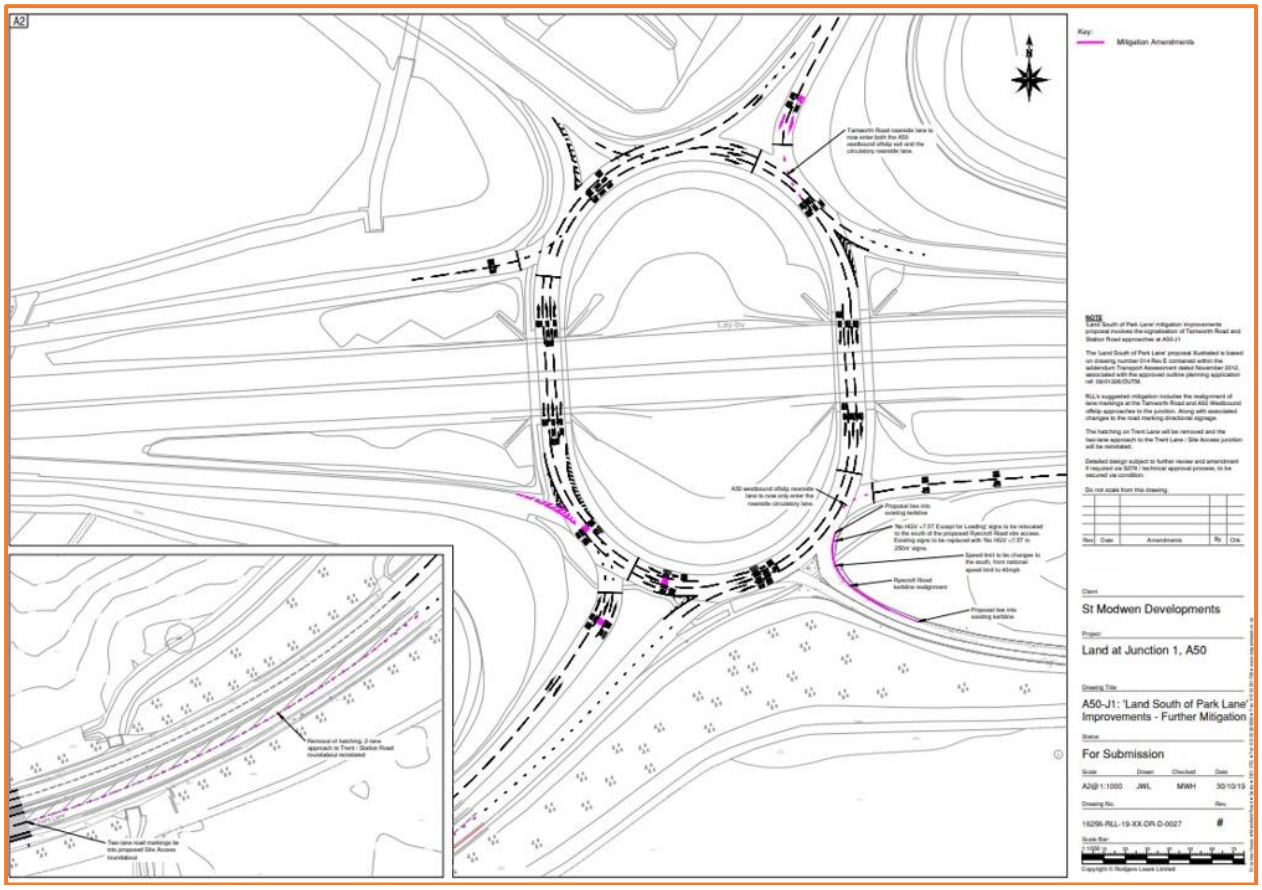

Figure 14.9: proposed A50 Junction 1 improvement scheme

14.26 A LinSig model was produced to assess the proposed improvement scheme as part of the assessment work undertaken for planning application 20/00316/OUTM and the model was agreed with National Highways and LCC. The agreed model has been used for the current assessments of Isley Woodhouse, and the results are summarised in the table below.

scenario	peak	cycle time	PRC	total delay (PCU/hr)	highest degree of saturation	longest MMQ (PCU)
2024 Observed	AM	90	26.1%	41.06	71.4%	11.8
	PM	90	40.2%	41.45	64.2%	10.8
2029 Without Development	AM	90	-4.3%	74.36	93.9%	30.0
	PM	90	7.1%	65.77	84.0%	15.7
2029 With Development	AM	90	-5.8%	88.43	93.8%	31.7
	PM	90	-0.2%	70.97	90.2%	24.7
2051 Without Development	AM	90	-15.0%	126.48	103.5%	38.4
	PM	90	-11.8%	117.67	100.6%	26.9
2051 With Development	AM	90	-16.5%	142.25	104.9%	41.4
	PM	90	-19.4%	184.49	107.5%	82.4

14.27 The results show that Isley Woodhouse will not have a severe impact on the operation of the junction in the 2029 opening year for the morning and evening peak hours.

14.28 However, in 2051 there will be an impact on the Trent Lane approach from Castle Donington, particularly in the evening peak hour. This approach will be over capacity in the Without Development scenario, and deteriorates further in the With Development scenario, with large

increases in queuing caused by the significant traffic increases due to the development traffic and the reassigning background traffic.

14.29 Hence, whilst a mitigation scheme has not been considered at this stage, the performance of the junction will be reviewed throughout the stage 2 EMFM assessment work and a scheme considered at that stage if necessary.

A42 Junction 14 Tonge Interchange

14.30 A42 Junction 14 Tonge Interchange includes two junctions as shown in **Figure 14.10** below.

Figure 14.10: A42 Junction 14 Tonge Interchange (source: Bing Maps)

A453 Moor Lane/A42 off-slip T-junction

14.31 The northern part of the junction is the A453 Moor Lane/A42 off-slip priority controlled T-junction shown in **Figure 14.11**. A model of the junction was created using Junctions 9 PICADY software and was tested with the 2024 Observed, 2029, and 2051 traffic forecasts. The results are summarised in the table below.

14.32 The results show the junction will operate within capacity in all of the 2029 and 2051 scenarios. Mitigation measures are therefore not proposed at this junction.

Figure 14.11: A42/A453 junction (source: Bing Maps)

	AM peak hour			PM peak hour		
	queue (veh)	delay (s)	RFC	queue (veh)	delay (s)	RFC
2024 Observed						
A42 off slip – left turn	0.3	8.30	24%	0.2	7.22	14%
A42 off slip – right turn	0.2	11.65	15%	0.1	9.65	9%
A453 – right turn	0.0	0.00	0%	0.0	0.00	0%
2029 Without Development						
A42 off slip – left turn	0.3	9.31	23%	0.2	7.45	18%
A42 off slip – right turn	0.5	14.15	35%	0.1	10.28	12%
A453 – right turn	0.0	0.00	0%	0.0	0.00	0%
2029 With Development						
A42 off slip – left turn	0.9	14.31	47%	1.0	13.96	50%
A42 off slip – right turn	0.7	19.22	40%	0.4	14.75	29%
A453 – right turn	0.0	0.00	0%	0.0	0.00	0%
2051 Without Development						
A42 off slip – left turn	0.1	8.32	12%	0.0	7.76	5%
A42 off slip – right turn	0.7	16.95	42%	0.2	10.92	17%
A453 – right turn	0.0	0.00	0%	0.0	0.00	0%
2051 Without Development						
A42 off slip – left turn	0.4	13.14	31%	1.4	19.22	59%
A42 off slip – right turn	1.3	30.89	58%	0.6	20.44	39%
A453 – right turn	0.0	0.00	0%	0.0	0.00	0%

A42 on-slip A453/Gelscoe Lane/Top Brand roundabout

14.33 The A42 on-slip/A453/Gelscoe Lane/Top Brand junction is a four-arm roundabout as shown in **Figure 14.12**.

Figure 14.12: A42 on-slip/A453/Gelscoe Lane/Top Brand roundabout (source: Bing Maps)

14.34 A model of the junction was built using Junctions 9 ARCADY software using geometries measured from OS mapping. The model was tested with the 2024 observed, 2029, and 2051 traffic forecasts. The results are summarised in the table below.

	AM peak hour			PM peak hour		
	queue (veh)	delay (s)	RFC	queue (veh)	delay (s)	RFC
2024 Observed						
Top Brand	0.1	2.58	12%	0.0	2.12	5%
A453	0.2	2.66	18%	0.3	2.47	21%
Gelscoe Lane	0.0	2.08	3%	0.0	2.09	4%
2029 Without Development						
Top Brand	0.2	2.58	15%	0.1	2.23	7%
A453	0.3	2.83	24%	0.4	2.85	31%
Gelscoe Lane	0.1	2.14	8%	0.1	2.29	12%
2029 With Development						
Top Brand	0.3	2.94	23%	0.2	2.62	18%
A453	0.7	3.42	40%	0.5	3.04	35%
Gelscoe Lane	0.2	2.53	17%	0.2	2.68	20%
2051 Without Development						
Top Brand	0.4	2.94	28%	0.1	2.41	12%
A453	0.5	3.45	35%	0.5	3.00	33%
Gelscoe Lane	0.2	2.24	13%	0.3	2.68	25%
2051 With Development						
Top Brand	0.5	3.43	33%	0.4	3.12	26%
A453	1.0	4.12	49%	0.8	3.50	43%
Gelscoe Lane	0.4	2.90	28%	0.7	3.71	43%

14.35 The results show the junction would operate within capacity in all of the 2029 and 2051 scenarios. Mitigation measures are therefore not proposed.

Merge/diverge assessment

14.36 A merge and diverge assessment was undertaken for the A42 off-slip and on-slip at the Tonge Interchange. The link flow data was extracted from the EMFM results for the 2029 Without and With Development scenarios to determine the merge and diverge requirements to and from the mainline A42 in accordance with Figure 3.12a and Figure 3.26a of CD 122. The required layout of each merge and diverge is shown in the table below.

scenario	A42 eastbound diverge		A42 westbound merge	
	AM	PM	AM	PM
2029 Without Development	Type A	Type A	Type A	Type A
2029 With Development	Type A	Type A	Type A	Type A

14.37 A type A diverge, and a type A merge, are currently provided at the junction. The table above shows that a type A merge and type A diverge will be required in the future. Therefore, the addition of development traffic would not alter the level of compliance with CD 122 and the merge/diverge requirements for the slip roads. No mitigation measures are proposed.

15.0 HIGHWAY MITIGATION

15.1 The stage 1 strategic traffic modelling has been completed and is discussed in detail in Section 12. The stage 1 modelling assesses the impacts of the proposed development, but with no mitigation in place. The conclusions from the stage 1 modelling are summarised as follows.

- The largest increases in traffic flow are forecast along the A453 between the A42 and the M1, the Castle Donington bypass, routes towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the M1, the A42 between Junction 14 and the A50.
- There is severe congestion at the complex of junctions including M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24.
- This strategic road network congestion is a significant constraint on the road network in the vicinity of Isley Woodhouse and impacts on the routing of background traffic and development traffic, with significant reassignment to the route between A42 Junction 14 and A50 Junction 1 around the realigned A453 and the Castle Donington bypass.
- Congestion increases at junctions around the Castle Donington bypass route due to the development traffic and the background traffic reassignment.
- Congestion increases at junctions along the A453 between Isley Woodhouse and M1 Junction 23A.

15.2 A key element of the mitigation strategy is the improvements to the strategic road network around M1 Junction 24. Testing of those improvements as part of the East Midlands Growth Point scheme is ongoing, and initial results shows the proposals will provide the additional capacity necessary to mitigate the impact of the various developments. However, due to the timescales for the submission of the Isley Woodhouse planning application it was not possible to report fully on that work. A summary is provided below.

15.3 This section therefore describes the elements of the mitigation strategy that have been developed to date. The detail of the full mitigation strategy will be discussed with the Transport Working Group and presented in a future addendum report, which would also include road safety audits and WCHAR assessments where necessary.

Realigned A453

15.4 As discussed in detail in Section 13, the access strategy for Isley Woodhouse includes the diversion of the A453 towards the western site boundary, forming a bypass around the development. The realignment is proposed to remove this high category road from within the developable area, helping to create a coherent community with suitable connectivity throughout, whilst also providing a material improvement to the existing A453 so that the road can better achieve its strategic function. The realigned A453 is included within the stage 1 EMFM.

15.5 The analysis of the stage 1 EMFM results showed that there would be significant reassignment of background traffic to the route between A42 Junction 14 and A50 Junction 1 around the realigned A453 and the Castle Donington bypass. Whilst the severe congestion on the strategic road network around M1 Junction 24 is a causal factor in this reassignment. The reassignment of background traffic is also being influenced by the improved quality of the route towards Castle Donington due to the realigned A453.

15.6 Therefore, the reassignment effects due to the realigned A453 should be viewed positively, especially with regards to background traffic reductions on Mill Lane, The Green, and the A453.

Strategic Road Network

East midlands Growth Point Scheme

15.7 As stated in Section 1, the Isley Woodhouse applicants have understood the emerging cumulative impacts on the strategic road network around M1 Junction 24, including junctions 23A and 24A. They have formed a consortium with other interested parties to seek solutions under the banner of the "East Midlands Growth Point".

15.8 Initial plans for significant new infrastructure have been developed and are currently undergoing testing using the EMFM. The plans are shown schematically at **Figure 15.1**, and are summarised as follows.

- A new slip road from M1 south to A50 west. This would remove a significant amount of traffic from M1 Junction 23A, the A453/EMG/Kegworth Bypass, and M1 Junction 24, significantly relieving congestion at these junctions.
- Significant upgrade of M1 Junction 23A, as detailed below. This would also include the installation of a 'Weaving Monitoring System' on the M1 northbound.
- At M1 Junction 24, provision of a segregated left turn from the M1/A50 north to the A453 Remembrance Way, with a new A453 underbridge, re-location of the Quarry access and a new roundabout with the A6 Derby Road. This would relieve existing congestion of the M1/A50 north.
- Also at M1 Junction 24, the scheme would provide a segregated left-turn from the A453 Remembrance Way to the M1 south. This would be facilitated by the closure of the A6 Derby Road approach and provision of a new bridge over the M1 and its slip roads to the south of Junction 24. The overbridge would be constructed so that it could be used by a tram, should the NET be extended to EMA and/or Isley Woodhouse in the future.

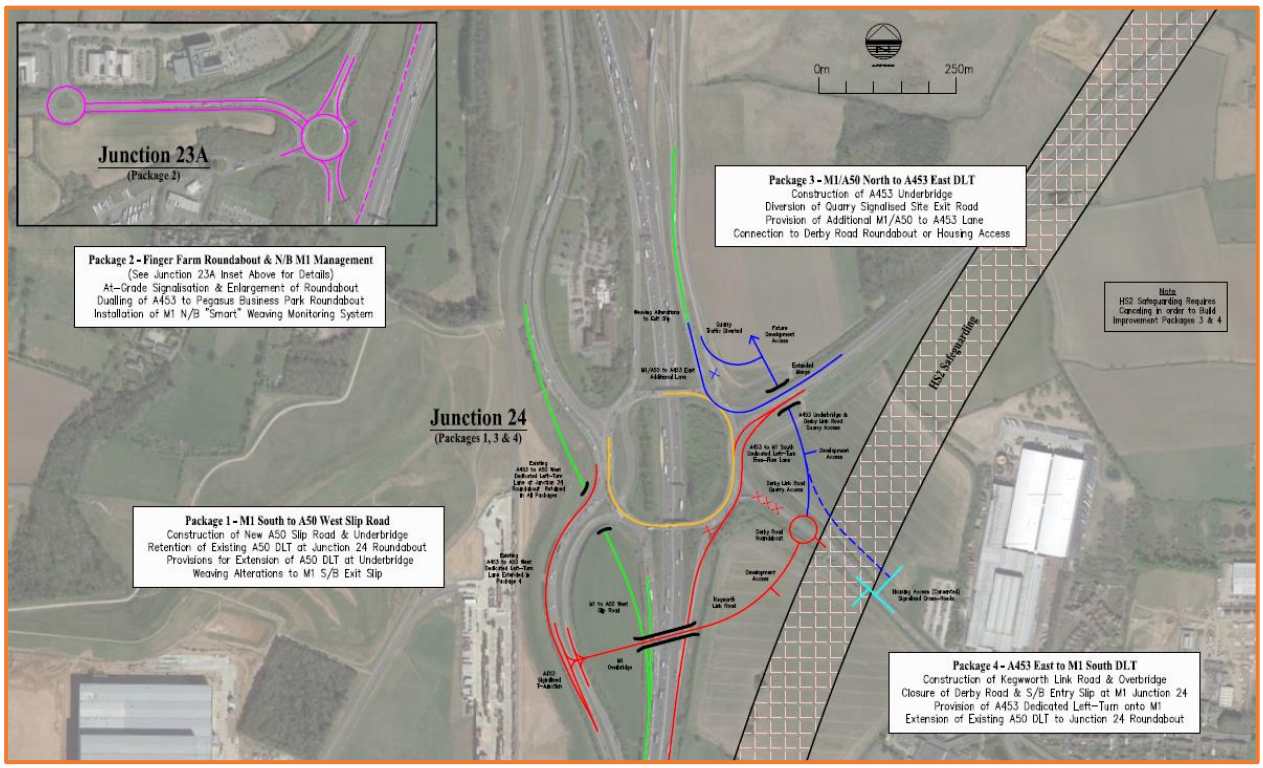

Figure 15.1: proposed East Midlands Growth Point scheme

15.9 The assessment work to demonstrate the effectiveness of the East Midlands Growth Point scheme is ongoing and will include strategic traffic modelling using the EMFM and VISSIM

microsimulation modelling. The Isley Woodhouse development traffic flows and access strategy is being included within the Growth Point assessment work and therefore this Transport Assessment for Isley Woodhouse does not include detailed modelling of the impact of the development at M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, or M1 Junction 24. These areas will instead be covered in an addendum report as the work on the East Midlands Growth Point advances.

15.10 Alongside the work on a strategic highway solution, on behalf of the East Midlands Growth Point and in collaboration with consultants representing the consortium partners, ADC Infrastructure prepared plans showing an integrated cycle network and an integrated public transport solution. These strategies for cycling and public transport, shown on **Drawings ADC2570-DR-901-P5 and ADC2570-DR-902-P3** respectively, build on the work undertaken by the respective consultant teams.

15.11 **Drawing ADC2570-DR-901-P5** combines the existing cycle facilities with the proposed cycle infrastructure associated with Isley Woodhouse, EMG Phase 2, and Ratcliffe on Soar power station. As described throughout this report, and detailed in Section 6, the Isley Woodhouse development has prioritised the provision of high-quality cycle infrastructure to connect future residents to jobs. The Growth Point provides an opportunity for this work to be extended across its entire geography, enhancing cycle connections to Castle Donington, EMA, both East Midlands Gateway sites, Kegworth, and to the Ratcliffe on Soar power station site, offering residents and workers an attractive and safe alternative to using the car to gain access to work and leisure opportunities.

15.12 There are high quality existing bus services serving the Growth Point area from the region's major population centres and it is proposed that these will be expanded to link the major development sites including Isley Woodhouse. The entrance to EMG has a transport hub for employees arriving and departing by bus. This concept has been highly successful and **Drawing ADC2570-DR-902-P3** proposes that it could be replicated at Isley Woodhouse, EMG Phase 2, and further east to Ratcliffe on Soar power station and the East Midlands Parkway, so there is a fully integrated network that efficiently and sustainably moves workers and residents between the sites.

M1 Junction 23A

15.13 It has long been anticipated that a significant improvement scheme would be required at M1J23A to mitigate the impact of Isley Woodhouse, with the A453 route experiencing a large increase in traffic flow due to the proposed development. The V/C analysis summarised in Section 12 shows that in the 2051 assessment year M1 Junction 23A would be above 100% of its capacity and cannot therefore accommodate the additional development traffic, with background traffic forced to reassign.

15.14 As stated above, the East Midlands Growth Point scheme includes a significant improvement of M1Junction 23A. ADC Infrastructure have developed this aspect of the scheme, and the current delivery strategy is for Isley Woodhouse to deliver this aspect. The current proposals are shown on **Drawing ADC2570-DR-019-P2** and **Figure 15.2** shows an extract. The works would deliver a significant capacity uplift, and are summarised as follows:

- significant widening on the A42 northbound and A453 eastbound approaches to provide four lanes
- provision of traffic signal control on the A42 northbound, A453 eastbound, and A453 southbound approaches
- widening of the circulating carriageway to the south to facilitate the entry widening.

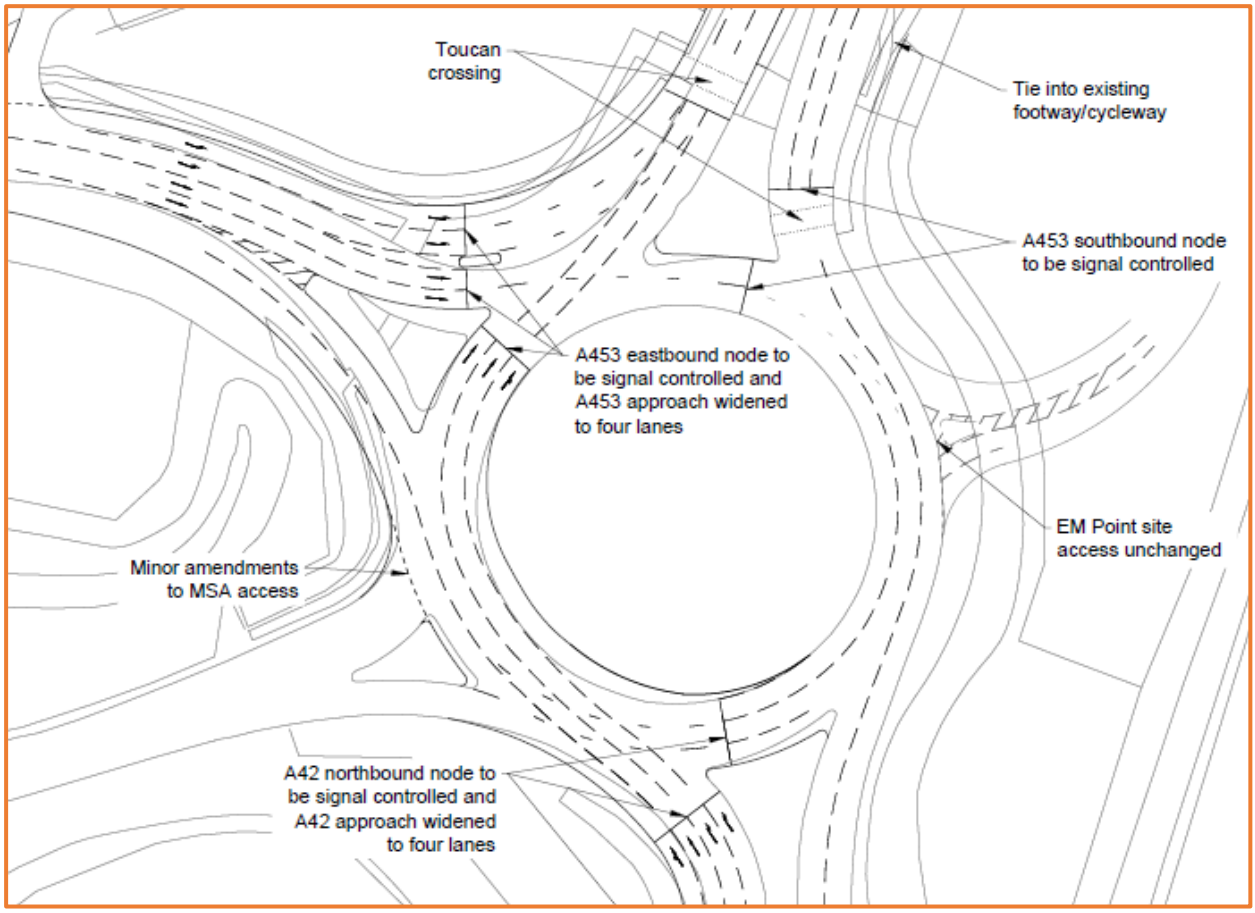

Figure 15.2: proposed mitigation at Finger Farm Roundabout

15.15 The ongoing testing of the East Midlands Growth Point scheme will include consideration of the requirement to upgrade the A453 to dual carriageway along the frontage of the EMG Phase 2 site.

A50 Junction 1

15.16 The detailed junction modelling results presented in Section 14 show that there is no severe impact at A50 Junction 1 in the 2029 opening year for the morning and evening peak hours. However, in 2051 there is an impact on the Trent Lane approach from Castle Donington, particularly in the evening peak hour. This approach is over capacity in the without development scenarios, and deteriorates further in the with development scenarios, with large increases in queuing caused by the significant traffic increases due to the development traffic and the reassigning background traffic.

15.17 Hence, whilst a mitigation scheme has not been considered at this stage, the performance of the junction will be reviewed throughout the stage 2 EMFM assessment work and a scheme considered at that stage if necessary.

Proposals for walking, cycling and public transport

15.18 Section 5 and 6 of this report sets out the proposed walking and cycling infrastructure that would be delivered to connect the site to the extensive existing and proposed employment centres local to the site, along with the settlements of Castle Donington and Kegworth. The walking and cycling infrastructure, shown on **Drawings ADC2570-DR-015-P3** and **ADC2570-DR-016-P2**, has been designed to reduce the number of external single occupancy car trips and increase the mode share for active and sustainable modes of transport.

15.19 The proposed inventions are ambitious and seek to tie into the work undertaken by Sustrans in preparing the Local Cycling and Walking Infrastructure Plan (LCWIP) for North West Leicestershire District Council. As set out in Section 4 and Technical N (**Appendix 4**), achieving the mode change targets could reduce the number of single occupancy car trips by 644 two-way trips in the morning peak hour and by 610 two-way trips in the evening peak hour.

15.20 These reductions in single occupancy car trips would represent a material reduction in the traffic generated by the proposed development. Therefore, the proposals for walking, cycling, and public transport form an integral part of the mitigation strategy.

Castle Donington

15.21 As detailed in Section 12, traffic flows are forecast to increase significantly along the Castle Donington bypass due to development traffic and background reassignment. The V/C analysis shows that whilst all junctions on this corridor would experience an increase in congestion, no junction is shown to operate above 95%, suggesting that the junctions between Isley Woodhouse and A50 Junction 1, via the Castle Donington bypass, would cope with the increase in traffic.

15.22 Detailed junction assessments have been undertaken at the following key junctions on the route between Isley Woodhouse and A50 Junction 1:

- Station Road/Donington Lane/Trent Lane roundabout
- Station Road/Broad Rushes roundabout
- Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre
- Park Lane/Castle Donington bypass roundabout.

15.23 The only junction shown to operate above 90% of its capacity due to the impact of the proposed development was the Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre Access roundabout. The modelling shows that there would be an impact on the Back Lane arm of the junction in the 2051 morning peak hour. If the stage 2 EMFM analysis shows that the impact at this location is not resolved by the interventions proposed across the wider network, mitigation measures at this junction will be investigated.

15.24 As noted in Section 12, the proposed improvements to the strategic road network are likely to alter traffic patterns local to the development site. Therefore, the junction assessments will be revisited during the stage 2 EMFM assessment process to ensure there are no further residual impacts.

A453 corridor

15.25 The stage 1 EMFM analysis shows that the A453/DHL hub roundabout and the A453/The Green priority controlled T-junction would operate below 85% V/C in all scenarios. Whilst there is confidence that this is correct for the DHL hub roundabout, it is unlikely that the existing A453/The Green junction could cope with the forecast flows, as stated in Section 14. Hence, it may be necessary to consider an improvement at this junction. This will be reviewed during the stage 2 modelling once the effects of the strategic road network interventions are understood.

15.26 The V/C analysis from the stage 1 EMFM assessment discussed in Section 12 shows that the A453/EMA traffic signal controlled T-junction would suffer from congestion in the 2051 morning peak hour both without and with development. Further, the V/C analysis shows that there would be a significant impact in the 2051 evening peak hour due to the development, taking the V/C above 100%.

15.27 The detailed junction modelling presented in Section 14 shows that the junction would perform acceptably in the 2051 morning peak hour with the development in place, however there would be a significant impact in the 2051 evening peak hour, with congestion on the EMA exit arm.

15.28 In addition to this increased congestion, there is a desire to improve the pedestrian and cycling crossing facilities to accommodate the walking and cycling proposals detailed in section 6. Hence, an improvement scheme has been identified, as shown on **Drawing ADC257-DR-018-P1**, with an extract shown at **Figure 15.3**.

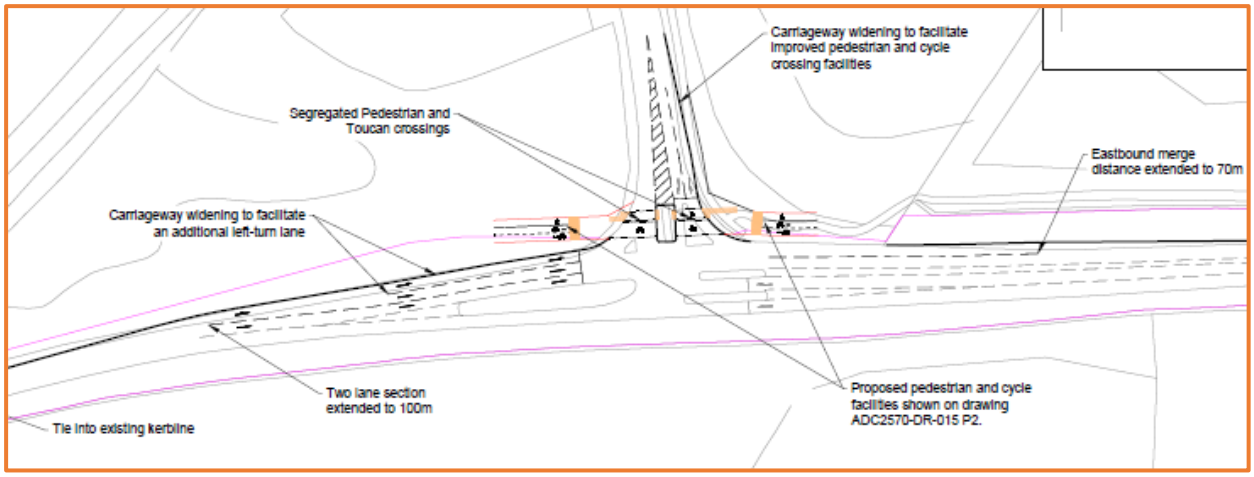

Figure 15.3: extract of drawing ADC2570-DR-018-P1

15.29 The A453 would be widened to the north to provide a third lane on the eastbound approach to facilitate the left-turn into EMA. The two-lane section for ahead movements would be extended to add further capacity, with the two-lane exit extended accordingly. A Toucan crossing would be provided to facilitate the east-west pedestrian and cyclists movements. LinSig modelling using the 2051 With Development traffic flows indicates that, with the proposed improvements in place, the junction would operate acceptably in both the morning and evening peak hours. Therefore, the proposals will be included in the stage 2 modelling.

15.30 The V/C analysis from the stage 1 EMFM assessment discussed in Section 12 shows that the A453/Pegasus Business Park roundabout would suffer from congestion in the 2051 morning peak hour without development and with development.

15.31 The access strategy for the proposed EMG Phase 2 development located south of the A453 would take access from a fourth arm on the A453/Pegasus Business Park roundabout, which will be amended to accommodate the additional traffic volumes. The exact proposals are unknown and therefore a detailed junction assessment has not been possible. A detailed junction assessment will be included in the stage 2 modelling works and further improvements identified if necessary.

16.0 SUMMARY AND CONCLUSIONS

16.1 The vision for Isley Woodhouse is for a new settlement at the heart of the Leicestershire International Gateway. The Leicestershire Strategic Growth Plan identifies the International Gateway as an area of significant long-term strategic growth, where there are major high-quality employment centres such as East Midlands Airport, East Midlands Gateway, Castle Donington Distribution Centre, planned development around the airport as part of the Freeport, and redevelopment of Ratcliffe on Soar power station. There are already many jobs in the area, and the number will expand greatly. At the same time, there are insufficient numbers of houses to accommodate employees, who travel long distances to work. That disconnect is set to widen.

16.2 Thus, Isley Woodhouse would be a new settlement with 4,250 houses, a secondary school, two primary schools, and associated retail and leisure facilities to deliver a self-contained development where the need to travel is minimised. The settlement has been masterplanned to provide three walkable neighbourhoods, interconnected with pleasant walking and cycling connections. The internal road network has been planned to allow bus services to route through the development, such that all residents will be within walking distance of a bus service. The A453 routes through the western part of the site, and would be diverted further west to form part of a longer distance strategic route identified by Midlands Connect from A42 Junction 14 to A50 Junction 1, around the western side of Castle Donington and along its new bypass. New roundabouts at the northern and southern ends of that A453 diversion would provide two of the vehicle accesses to Isley Woodhouse. Conversion of the existing A453/Airport Perimeter Road junction to a roundabout would give a third access junction. A fourth access junction on the A453 would be a new signal controlled T-junction at the eastern end of the site frontage. Numerous pedestrian and cycle access points would penetrate the site's boundaries at other locations.

16.3 The masterplan has also been developed with recognition to how the development will be built out in phases, over many years. The traffic modelling work adopts a future assessment year of 2051. In that time, there will be considerable change, with increased technological advances and focus on environmental protection. E-bikes and electric cars will be commonplace. There will be robot deliveries, drone deliveries, driverless buses, and autonomous cars, controlled by ever more sophisticated smart devices and real time information. Working habits and co-working spaces will evolve, and increased leisure time will demand more open spaces for walking, running, and playing. In case that is doubted, the first iPhone was sold in June 2007, 18 years prior to the date of this report. Yet 2051 is 26 years in the future. The proposals must therefore be flexible, with the ability to adapt.

16.4 Despite the potential for change, forecasts have been prepared of the amount of traffic that will be generated by the development. Estimates have been made of how much traffic each element will generate, and then internalisation factors have been applied to account for linked trips, for example Isley Woodhouse residents that attend the Isley Woodhouse schools. The external trips are those that will impact on the surrounding environment. They consist of, for example, Isley Woodhouse residents travelling to East Midlands Gateway, or a Castle Donington resident travelling to the Isley Woodhouse secondary school. The forecast is that there will be just under 4,000 external person trips in each of the morning and evening peak hours. Of those, 2,921 (73.3%) and 2,753 (70.1%) car trips would be made in the morning and evening peak hours, respectively.

16.5 Modal share targets have been established that seek to reduce the number of external vehicle movements. Around 28% of the traffic generated by Isley Woodhouse's residents will be to and from the local employment sites. Those sites are ideally located to allow residents to instead bicycle or bus to work. Thus, in keeping with the vision for the development, infrastructure and

incentives will be provided to enable such journeys and target a shift from car to more sustainable modes of transport. The remaining external trips are subject to more modest modal shift targets. Combined, the aim is to reduce the car driver modal share to 57.1% and 54.6% in the morning and evening peak hours, respectively. There will be corresponding increases in use of other modes. In the morning peak hour, cycling will increase from 2.6% to 12.9%, and bus use will increase from 6.3% to 9.6%. The targets will result in a reduction of 644 and 610 traffic movements in the morning and evening peak hours, respectively.

16.6 Walking journeys will be mostly contained within the development, and a framework strategic movement network is set out on the masterplan. Beyond Isley Woodhouse there are only a modest number of attractions within walking distance, such as parts of East Midlands Airport and Diseworth. To enable those journeys, infrastructure is proposed at the edges of the development, including pedestrian crossings over the A453 in numerous locations.

16.7 Cycling is a major focus of the infrastructure proposals, given the ideal cycling distances to local employment sites and other destinations. A series of interventions are proposed, in particular focused on two key routes. The first, the A453 corridor, would cater for around 72% of the cycle journeys to local employment sites. The Airport Trail is a permissive path on the airport owner's land. It is identified for upgrading in North West Leicestershire's LCWIP. The Isley Woodhouse applicants would work with the airport owners and NWLDC to deliver those upgrades. Linked with that, would be new segregated cycle tracks and Toucan crossings along and over the A453 to tie Isley Woodhouse into the Airport Trail.

16.8 The second key route, around the western end of the airport along the Airport Perimeter Road, would attract around 28% of the cycle journeys to local employment sites. There is a cycleway beside the Castle Donington bypass, and new segregated and shared cycle tracks would be introduced to link Isley Woodhouse to the bypass. Toucan crossings would be introduced, and the existing public right of way between Hill Top and Diseworth Road would be widened and upgraded to provide a route into the rear of East Midlands Gateway.

16.9 A bus strategy is set out that would deliver bus services to the heart of Isley Woodhouse. The masterplan is designed with a primary road network of loops that connect with the accesses, and can be delivered and expanded in phases, to ensure every resident is within 400m walking distance of a bus stop. Various existing services can be readily diverted to run through the development, and the increased demand and revenue generated would allow for frequency increases. Three high quality, frequent and direct Skylink services pass close to Isley Woodhouse, destined for the airport. An interchange would be introduced near the development's central access roundabout so that only a small diversion of those services would be necessary to serve Isley Woodhouse. As part of the wider Growth Point proposals for the area, a new bespoke bus service would be introduced, in a 30 minutes loop around the airport and Castle Donington, which could be extended to the redevelopment site at the Ratcliffe on Soar power station and East Midlands Parkway railway station.

16.10 East Midlands Parkway railway station offers journeys to more distant locations. It has a large car park, for park and ride, and kiss and ride journeys. Extensions to Nottingham's tram network may be delivered in the timeframe of the development. As this report is being written, the East Midlands Combined Authority have announced funding of a business case for an extension of the tram from Clifton to the emerging urban extension south of Clifton called Fairham. In case a further tram extension to the airport is deemed deliverable, a route over the M1 is being safeguarded as part of the Growth Point proposals at M1 Junction 24, and Isley Woodhouse residents would be connected to a potential stop at the airport.

16.11 The forecast traffic demand for the development has been studied with use of the East Midlands Freeport Model, a cordoned part of PRTM2019 (the Pan-Regional Transport Model). The development as a whole, and particularly the strategic traffic modelling process, has been the subject of a Transport Working Group established to guide the assessment of the development. The Group has met most months for almost four years to discuss and agree the inputs to the modelling, which assesses a cumulative scenario taking into account the other committed and emerging developments in the area. The modelling has examined a 2029 first occupation scenario to align with National Highways' requirements set out in DfT Circular 01/2022. It has also examined a 2051 completion year, required by the local highway authorities of Leicestershire, Nottinghamshire, and Derbyshire County Councils.

16.12 The strategic modelling work has included some of the interventions proposed as part of the development, such as the A453 diversion, the four new vehicle access junctions, and an upgrade to the Finger Farm roundabout at M1 Junction 23A. However, a full mitigation package has not been assessed, and therefore the traffic forecasts generated by the modelling are a worst case. The modelled traffic demands do not account for the modal share targets, so the results reflect the additional 2,921 and 2,753 car trips that would be made in the morning and evening peak hours, respectively.

16.13 The resulting future year traffic forecasts show the primary links affected by the development would be the A453 between the A42 and the M1, routes to the north through Castle Donington, routes to the southeast, south, and southwest towards Ashby-de-la-Zouch, Coalville, Shepshed and Loughborough, the M1 south of Junction 23A, the A42 between Junctions 13 and 14, and the A50 around Junction 1.

16.14 However, the traffic increases on these routes are not solely due to the addition of development traffic. This is especially true on the route west of Castle Donington, where traffic increases are materially greater than the development traffic assigned to the route. That is because the improved route between the A42 and A50 delivered as part of the access strategy changes how background traffic routes through the network.

16.15 The considerable congestion at the complex of junctions including M1 Junction 23A, A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24, causes background traffic to find alternative routes. An example is Isley Woodhouse traffic wishing to access Loughborough. Rather than routing through M1 Junction 23A, or along the Kegworth Bypass, it instead finds routes south through places such as Long Whatton.

16.16 To mitigate the traffic impacts therefore requires a significant upgrade to M1 Junction 23A, the A453/EMG/Kegworth Bypass gyratory, and M1 Junction 24. As those junctions are cumulatively impacted by various developments coming forward, including the Ratcliffe on Soar power station redevelopment, East Midlands Gateway Phase 2, and other Freeport sites, the developers of those sites have formed a consortium under the umbrella of the East Midlands Growth Point. The consortium has identified a set of interventions that are the subject of ongoing testing through strategic traffic modelling and VISSIM microsimulation modelling. The interventions include, for example, a new free flow lane from the M1 northbound to the A50, which removes significant amounts of traffic from M1 Junction 24. Initial findings are that the interventions will provide significant additional capacity, that will in turn pull traffic back into the area and away from less appropriate routes. Thus, the proposed highway works will be a significant part of the mitigation for Isley Woodhouse.

16.17 Elsewhere, the traffic impacts of the development within the study area listed in the table below have been studied using traffic flows generated by the traffic modelling process, furnessed to be

suitable for development management purposes, and run through models created of individual junctions. Where necessary, improvement schemes have been identified.

junction number	location
local road network	
1	A453/northeastern site access traffic signal junction
2	A453/Airport Perimeter Road/central site access roundabout
3	A453/Melbourne Road/northwestern access roundabout
4	A453/southwestern site access roundabout
5	Station Road/Donington Lane/Trent Lane roundabout
6	Station Road/Broad Rushes roundabout
7	Broad Rushes/Trent Lane/Back Lane/Arundel Ave/Distribution Centre
8	Park Lane/Castle Donington bypass roundabout
9	A453/The Green priority T-junction
10	A453/EMA access traffic signal controlled T-junction
strategic road network	
11	A50 Junction 1
12	A42 Junction 14 Tonge Interchange

16.18 The vehicle access junctions have been tested to ensure they have sufficient capacity to accommodate the forecast traffic volumes. Road safety audits have been undertaken of all the proposed infrastructure works. To accompany the physical mitigation proposals, a Framework Travel Plan has been prepared with measures to manage travel demand on an ongoing basis. Those measures include the appointment of a Travel Plan Coordinator, travel packs for each household, and bus taster tickets, and they are part of the mitigation package.

16.19 To be acceptable in planning terms, Isley Woodhouse must satisfy the aims of the National Planning Policy Framework, and ensure that:

- "*sustainable transport modes are prioritised taking account of the vision for the site, the type of development and its location*
- *safe and suitable access to the site can be achieved for all users*
- *the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code*
- *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree through a vision-led approach."*

16.20 The planning application will undergo scrutiny from all affected parties over the coming months. There will be clarification of details and amendments to proposals. Nevertheless, as explained in this Transport Assessment report, the NPPF's aims can be satisfied and Isley Woodhouse should not be prevented or refused on highways grounds.

DRAWINGS

APPENDIX 1

PARAMETERS PLAN AND ILLUSTRATIVE MASTERPLAN

APPENDIX 2

TECHNICAL NOTE E
DEVELOPMENT SCHEDULE
(ADC2570-RP-E-V4)

APPENDIX 3

TECHNICAL NOTE B
TRAFFIC GENERATION
(ADC2570-RP-B-V7)

APPENDIX 4

TECHNICAL NOTE N
MODAL SHARE AND PERSON TRIP GENERATION
(ADC2570-RP-N-V2)

APPENDIX 5

TECHNICAL NOTE J
PRTM BRIEFING NOTE – STAGE 1
(ADC2570-RP-J-V3)

APPENDIX 6

EMFM 2019: ISLEY WOODHOUSE BASE YEAR MODEL REVIEW (AECOM REPORT V1.0)

APPENDIX 7

EMFM 2019: ISLEY WOODHOUSE DEVELOPMENT TRIP DISTRIBUTION (AECOM SLIDES V1.0)

APPENDIX 8

EMFM 2019: ISLEY WOODHOUSE FORECASTING REPORT (STAGE 1) (AECOM REPORT V1.0)

APPENDIX 9

ROAD SAFETY AUDIT RESPONSE REPORT (ADC2570-RP-P-v2)

APPENDIX 10

LIST OF JUNCTION MODEL FILES