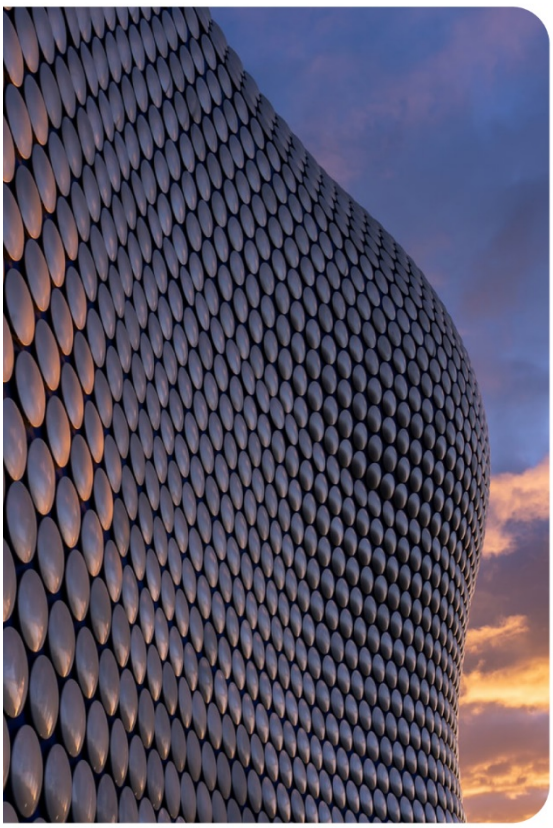

mode
transport planning

Barratt David Wilson Homes (Cambridgeshire)

Land at Southwest Bourne, South Kesteven

Sustainable Access & Highway Strategy

August 2023

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Sustainable Access & Highway Strategy

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mode transport planning

CONTENTS

APPENDICES

1. Introduction

1.1 Overview

1.1.1 mode transport planning (mode) has been commissioned by Barratt David Wilson (BDW) Homes (Cambridgeshire) to provide a sustainable access and highway strategy report in relation to the ongoing promotion of Land at Southwest Bourne, South Kesteven, for a new residential-led mixed use development through the emerging South Kesteven Local Plan review and emerging Bourne Neighbourhood Plan.

1.1.2 The site is located on the edge of Bourne, adjacent to the Elsea Park development, approximately 1.4km[1] southwest of Bourne Town Centre.

1.2 Purpose of Report

1.2.1 Promoting sustainable transport opportunities for new development sites is a key policy within the National Planning Policy Framework (NPPF) (2021). Under the 'Promoting sustainable transport' chapter of the NPPF, it is cited that transport issues should be considered from the earliest stages of plan-making and development proposals (Para. 104).

1.2.2 By doing this the potential impacts of development on transport networks can be addressed and the appropriate transport infrastructure can be implemented accordingly. By considering transport at the earliest stages, it allows the opportunity to promote walking, cycling and public transport, and help mitigate any problems.

1.2.3 This Highway Strategy has been produced as part of an overall review of site accessibility with a focus on opportunities for access by sustainable modes, and the proximity of local services and amenities.

1.2.4 The strategy also assesses traffic impacts, junction capacity and any required mitigation, if needed. The report also provides some initial high-level recommendations which will need to be considered as part of a future comprehensive sustainable transport / movement strategy for the development of the site as future planning applications progress.

1.3 Proposed Development

1.3.1 The vision for the promotion of Land at Southwest Bourne is that of a new settlement, bordered by West Road and Raymond Mays Way. The site comprises an area of c.63 hectares of (currently) arable land, which it is envisaged can deliver the following development quantum:

[1] Taken from the northernmost proposed access off West Road.

- Approximately 900 residential (C3) dwellings;
- A new two-form entry (2FE) primary school (D1); and,
- Local centre comprising a mixture of uses (E(a)&(b) & Sui Generis) <TBC>.

1.3.2 An overview of the site is outlined in **Figure 1.1**, for reference. A copy of the latest indicative concept masterplan for the site is included at **Appendix A**, for reference.

Figure 1.1 Site Location

2. Policy Context

2.1 Overview

2.1.1 This chapter provides an overview of the relevant national and local policy in relation to the development.

2.1.2 The following relevant document have been reviewed:

- National Planning Policy Framework (NPPF) (July 2021);
- Active Travel England (ATE) (2023);
- South Kesteven District Council Local Plan (January 2020);
- Lincolnshire Local Transport Plan 5 (LTP5) (2022); and,
- Bourne Parish Neighbourhood Plan (Emerging).

2.2 National Planning Policy Framework

2.2.1 The National Planning Policy Framework (NPPF) sets out the Government's key objectives for achieving sustainable development. The NPPF was last revised in July 2021 which streamlines the national planning policies set out in previous policy guidance and a number of related circulars. These have been combined into a single document to make the planning system more accessible, whilst still protecting the environment and promoting sustainable growth.

2.2.2 The NPPF sets out the government's planning policies for England, and how these are expected to be applied, stating that all developments generating significant amounts of movement should be supported by a Transport Assessment (TA) or Transport Statement (TS), alongside a Travel Plan (TP). Within the NPPF, it is suggested that economic, social and environmental objectives should be at the heart of the planning process.

2.2.3 Under the 'Promoting sustainable transport' chapter of the NPPF, it is stated that transport issues should be considered from the earliest stages of plan-making and development proposals (Para. 104). By doing this the potential impacts of development on transport networks can be addressed and the appropriate transport infrastructure can be implemented. By considering transport at the earliest stages, it allows the opportunity to promote walking, cycling and public transport, and to mitigate any problems.

2.2.4 Significant developments should be focused on being sustainable, this can be done through limiting the need to travel and offering a genuine choice of transport modes.

2.2.5 The NPPF states (Para. 106, pg.30) that planning policies should:

- *"Support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities;*
- *Be prepared with the active involvement of local highways authorities, other transport infrastructure providers and operators and neighbouring councils, so that strategies and investments for supporting sustainable transport and development patterns are aligned;*
- *Provide for attractive and well-designed walking and cycling networks with supporting facilities such as secure cycle parking, Local Cycling and Walking Infrastructure Plans."*

2.2.6 Within the context of assessing sites for that may be allocated for development in plans, or specific applications for development, it should be ensured that (Para. 110, pg.31):

- *"Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given 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; and*
- *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."*

2.2.7 Within this context, new developments should (Para. 112, pg.32):

- *"give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas… facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use.*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."*

2.2.8 Paragraph 111 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 would be severe."

2.2.9 Paragraph 113 concludes that all developments expected to generate significant amounts of movement should provide a travel plan, and applications should also be supported by a Transport Statement or Transport Assessment, to assess the likely impacts of the proposals.

2.2.10 The proposed development will be designed in accordance with the NPPF guidelines, principally the requirement to provide development which is sustainably accessible, and this report demonstrates that the above objectives can be satisfied by the development proposals, in terms of sustainability / accessibility – highways impact on the local road network is also assessed initially and will be fully considered as part of a future TA in support of a planning application <TBC once traffic data is received>.

2.3 Active Travel England (ATE) Guidance (2023)

2.3.1 Active Design sets out how the design of our environments can help people to lead more physically active and healthy lives. Active Design aims to create places and spaces, 'active environments', which encourage people to move more, with more opportunities for everyone to increase their activity levels and lead healthier lives.

2.3.2 There are a series of principles set out within the Active Design Guidance, of which the most pertinent are summarised below:

Principle 2 – Walkable Communities

2.3.3 Facilities for daily essentials and recreation should be within easy reach of each other by active travel means, making it more likely that people will make the journey by using active travel modes. Good active travel connections should be provided to extend the range of services that are accessible while remaining physically active.

Principle 3 – Providing Connected Active Travel Routes

2.3.4 The principle focuses on encouraging active travel for all ages and abilities, by creating a continuous network of routes, connecting places safely and directly. Highlighting that networks should be easy to use, supported by signage and landmarks to help people find their way.

Principle 6 – High-Quality Streets and Spaces

2.3.5 Streets and outdoor public spaces should be Active Environments in their own right. They should be safe, attractive, functional, prioritise people and able to host a mix of uses, with durable, high-quality materials, street furniture in the right places and easy-to-use signage. High quality streets and spaces encourage activity, whereas poor quality streets and spaces are much less likely to be used to the same degree.

2.4 South Kesteven District Council (SKDC) Local Plan

2.4.1 The SKDC Local Plan was adopted in January 2022 and is the statutory planning document for the region and provides the vision, objectives, spatial strategy and polices for future development up to 2036.

2.4.2 Relevant policies have been set out and summarised below:

SD1: The Principles of Sustainable Development in South Kesteven

2.4.3 Development proposals within South Kesteven will be expected to minimise the impact climate change and contribute towards creating a strong, stable and more diverse economy.

2.4.4 This should be done by reducing the need reducing the need for travel by having services and facilities accessible by sustainable modes of travel, avoiding pollution (air, land, water, noise and light), the use of previously developed land, support strong and healthy communities and enhance the districts character , services and infrastructure.

2.4.5 Development proposals shall consider how they can minimise effects of climate change and reduce the need for travel by having services and facilities accessible by sustainable modes of travel.

SP4: Development on the Edge of Settlements

2.4.6 Proposals for development on the edge of a settlement that are in accordance with all other relevant Local Plan policies, will be supported provided that the following criteria is met:

- Demonstrate substantial support from the local community or the Town or Parish Council or Neighbourhood Plan Group or Forum;
- Be well designed and appropriate in size / scale, layout and character to the setting and area;
- Be adjacent to the existing pattern of development for the area, or adjacent to developed site allocations as identified in the development plan;
- Not extend obtrusively into the open countryside and be appropriate to the landscape, environmental and heritage characteristics of the area;
- Meet a proven local need for housing; and,
- Enable the delivery of essential infrastructure to support growth proposals.

DE1: Promoting Good Quality Design

2.4.7 All development proposals will be expected to:

- Positively contribute to the character of the area and reinforce the local identity;
- Ensure there is no adverse impact in terms of noise, light, pollution, loss of privacy and loss of light; and,
- Incorporate features that minimise crime or fear of crime.

2.4.8 All major development must demonstrate compliance with Neighbourhood Plan policies, Manual for Streets guidance and relevant Lincolnshire County Council guidance (Lincolnshire County Council Streetscape Design Manual 2016).

SB1: Sustainable Building

2.4.9 All development proposals will be expected to mitigate against and adapt to climate change, to comply with national and contribute to local targets on reducing carbon emissions and energy use unless it can be demonstrated that compliance with the policy is not viable or feasible.

2.4.10 All development should demonstrate how they can support low carbon travel through provision of electric car charging points.

ID1: Infrastructure for Growth

2.4.11 Development proposals will be expected to demonstrate that there is sufficient infrastructure capacity (including green infrastructure) to support and meet the essential infrastructure requirements arising from the proposed development.

2.4.12 Where the development will create a need provide additional or improved infrastructure the developer will be expected to make up the necessary infrastructure provision for the local communities affected either by direct provision or through a proportionate contribution towards the overall cost of the provision of local and strategic infrastructure required by the development either alone or cumulatively with other developments.

2.4.13 Planning permission should only be granted if it can be demonstrated that there is or will be sufficient infrastructure capacity provided within an agreed timescale to support and meet all the requirements arising from the proposed development.

ID2: Transport and Strategic Transport Infrastructure

2.4.14 SKDC and it's its delivery partners will support and promote an efficient and safe transport network that offers a range of transport choices to users. New development will be required to contribute to transport improvements in line with appropriate evidence, including the Infrastructure Delivery Plan (/Schedule), the Local Transport Plan and local transport strategies.

2.4.15 Table 6b of the Infrastructure Delivery Plan notes that there is no modelling or transport strategy for Bourne and that it is likely new developments will need to make improvements to junction capacity, active travel infrastructure and bus services.

2.4.16 New developments will be required to demonstrate that they are located where sustainable travel can be maximised, reduce travel demand, generate or support demand required to improve public transport, do not severely impact the safety and movement of traffic on the highway network and ensure transport is accessible to all.

2.4.17 Compliance should be demonstrated through provision of a TA and TP as appropriate.

2.5 Lincolnshire Local Transport Plan (LPT) 5

2.5.1 The LTP5 was adopted in 2021 and primarily focuses on the 5-year period up to 2026 but also considers longer term issues up to 2034.

2.5.2 Relevant themes and policies have been set out below:

Theme 2 – Future ready, green transport

- Policy GREEN4 - We will use the local and strategic development management processes to ensure that development is planned, delivered and managed to reduce the need to travel and support the delivery of sustainable transport modes. We will support the provision of improved walking, cycling and public transport services and facilities as part of new developments and actively encourage innovative solutions such as car clubs, mobility hubs, active travel plans and other sustainable solutions as opposed to single occupancy car use.

Theme 3 – Promoting thriving environments.

- Policy ENV4 - We will make use of our existing transport infrastructure and services and prioritise the maintenance and management of it over the building of new infrastructure.

Theme 4 – Supporting safety, security and a healthy lifestyle.

- Policy SH5 - We will champion greater use of active travel modes and provide the infrastructure and services that encourages a shift towards them.
- Policy SH6 - In partnership with others, we will promote the benefits of active travel and support initiatives that encourage and promote a healthier lifestyle by people changing their travel behaviours.

Theme 5 – Promoting high aspirations.

- Policy HA2 - We will seek to increase accessibility for everyone by promoting measures to improve accessibility to the transport network.

Theme 6 – Improve quality of life.

- Policy QL2 We will endeavour to deliver transport improvements that transform mobility and accessibility across Lincolnshire and provide a significant uplift in the quality of life or all residents and visitors to Lincolnshire.

2.5.3 The site is well aligned with the themes and strategic objectives set out above. Inclusion of a primary school and local centre, supports minimising the need to travel by car and encouraging active travel within the site. The site also incorporates recreational routes that link with PRoW which will further supports walking and cycling throughout the development and connecting with surrounding areas.

2.5.4 Active travel infrastructure improvements will be required to ensure safe movements along primary desire lines and facilitate movements from the site to the wider area. Bus improvements will also be required to support further accessibility with a diversion into and/or along the boundary of the site with a potential increase in frequency of services to be explored.

2.6 Bourne Neighbourhood Plan

2.6.1 The Bourne Neighbourhood Plan is an emerging document currently in the consultation stage. The most recent stage is the Housing Sites Options Consultation for which a Draft Housing Sites Assessment was published in September 2022.

2.6.2 The document sets out that the South Kesteven Local Plan requires a minimum of 100 additional homes to be allocated in Bourne. This is in addition to sites that are already permitted including Elsea Park and Manning Road.

2.6.3 The Plan vision and objectives are set out in the Appendix 4 of the Draft Housing Sites Assessment September 2022. The vision highlights a thriving economy, housing that meets the needs of the community and greater opportunities for sustainable travel all of which are relevant to the proposed site.

2.6.4 The plan objectives relevant to the proposed site are set out below:

- To protect our most important green assets whilst improving and increasing the provision of open space and green infrastructure links.
- To support a diverse range of employment opportunities in Bourne.
- To plan for a minimum of 100 new homes in sustainable locations which are well connected to local services and facilities.
- To provide for a mix of house types, sizes and tenures which reflect the housing needs of Bourne.
- To encourage walking, cycling and the use of public transport as alternatives to the car.
- To minimise the impact of new development on the highway.

2.6.5 The proposed site has been included in the Draft Housing Sites Assessment identified as ‘Site 2’ (Land at south-west Bourne). The site scored 8/15 for accessibility to employment areas, schools, bus stops and the town centre; with only 3 of the other 9 sites assessed scoring above this. The scoring for the existing bus stops does not initially appear to the bus stop on A6121 that can be accessed from the northern extent of site within 400m via the Public Right of Way that intersects the site – nonetheless, once a bus route is brought through the site (which is acknowledged within the assessment), this score would increase.

2.6.6 Further to this, if the site was brought forward the primary school and local centre would both provide further employment opportunities within 400m, also alongside the proposed employment land uses within Elsea Park (which has currently been excluded). This could potentially improve the overall scoring/ratings to a hypothetical 10/15 which is the third highest score from the 9 sites that were assessed.

2.6.7 With regards to the objectives relating to sustainable transport, it will be of importance for the site to encourage active travel for residents by providing safe walking routes towards bus stops and connections with existing infrastructure.

2.7 Summary

2.7.1 In summary, the planning policy above seeks to ensure that the development is located where future residents have access to sustainable modes of transport and are within short distances of amenities to reduce the need to travel by car.

2.7.2 Furthermore, the planning policy considered also seeks to ensure that the impacts of the development are properly considered and mitigated via the preparation of appropriate transportation reports to accompany the planning application and where necessary the provision of mitigation in order to temper the impacts of a given development to ensure that any residual impacts are not 'severe'.

3. Existing Conditions

3.1 Introduction

3.1.1 This chapter considers the existing conditions of the site with respect to the provision of local services and amenities within an accessible distance, and opportunities for access by sustainable modes of transport.

3.2 Site Description and Location

3.2.1 The site is located at the south-western edge of Bourne adjacent to the Elsea Park development approximately 1.4km southwest of Bourne Town Centre. An overview of the site location, and the local highway network surrounding the site, is provided in in **Figure 1.1**.

3.3 Walking & Cycling

3.3.1 A desktop review of existing walking and cycling routes in the vicinity of the site has been undertaken. A further site visit has also been undertaken in order to examine the conditions of existing walking routes and infrastructure in the immediate vicinity of the site.

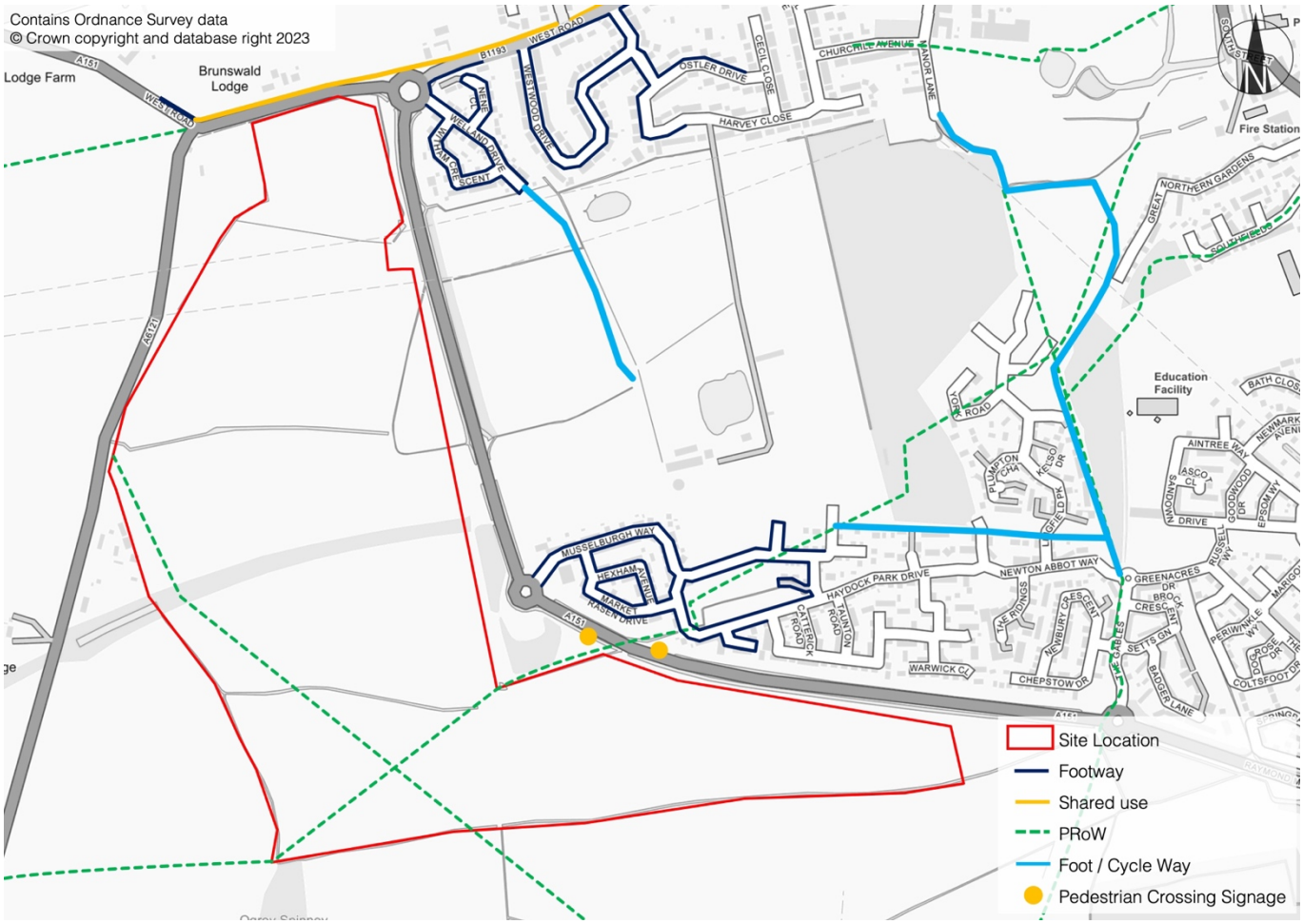
3.3.2 The principal desire lines are considered to be to the east and northeast of the site, providing access and routes towards local facilities and amenities, notably, towards Bourne Town Centre, existing bus stops along West Road, as well as convenience store and amenities within the neighbouring Elsea Park development.

3.3.3 A full review of the local amenities and services in the vicinity of the site is provided in **Section 3.7**.

Walking

3.3.4 The 'Planning for Walking' (2015) document produced by the Chartered Institution of Highways and Transportation (CIHT) document suggests that c.80% of journeys shorter than 1 mile (1.6km) are made wholly on foot. It goes on to say that traditional layouts are typically characterised as having a range of facilities within 10 minutes' walking distance (around 800 metres). However, the propensity to walk is not only influenced by distance but also the quality of the experience; people may be willing to walk further where their surroundings are more attractive, safe and stimulating.

Figure 3.1 Existing Active Travel Infrastructure



3.3.5 **Figure 3.1** shows the existing active travel infrastructure within the vicinity of the site including connections towards Bourne town centre and Elsea Park to the east.

3.3.6 The footway on the northern side of West Road is a (signed) shared path for walking and cycling and provides connections onwards to Bourne Town Centre. Street lighting is present from the West Road / Raymond Mays Way roundabout approach.

3.3.7 A6121 runs in a north-south alignment along the sites western boundary. There is no streetlighting and no footways present on either side of the carriageway.

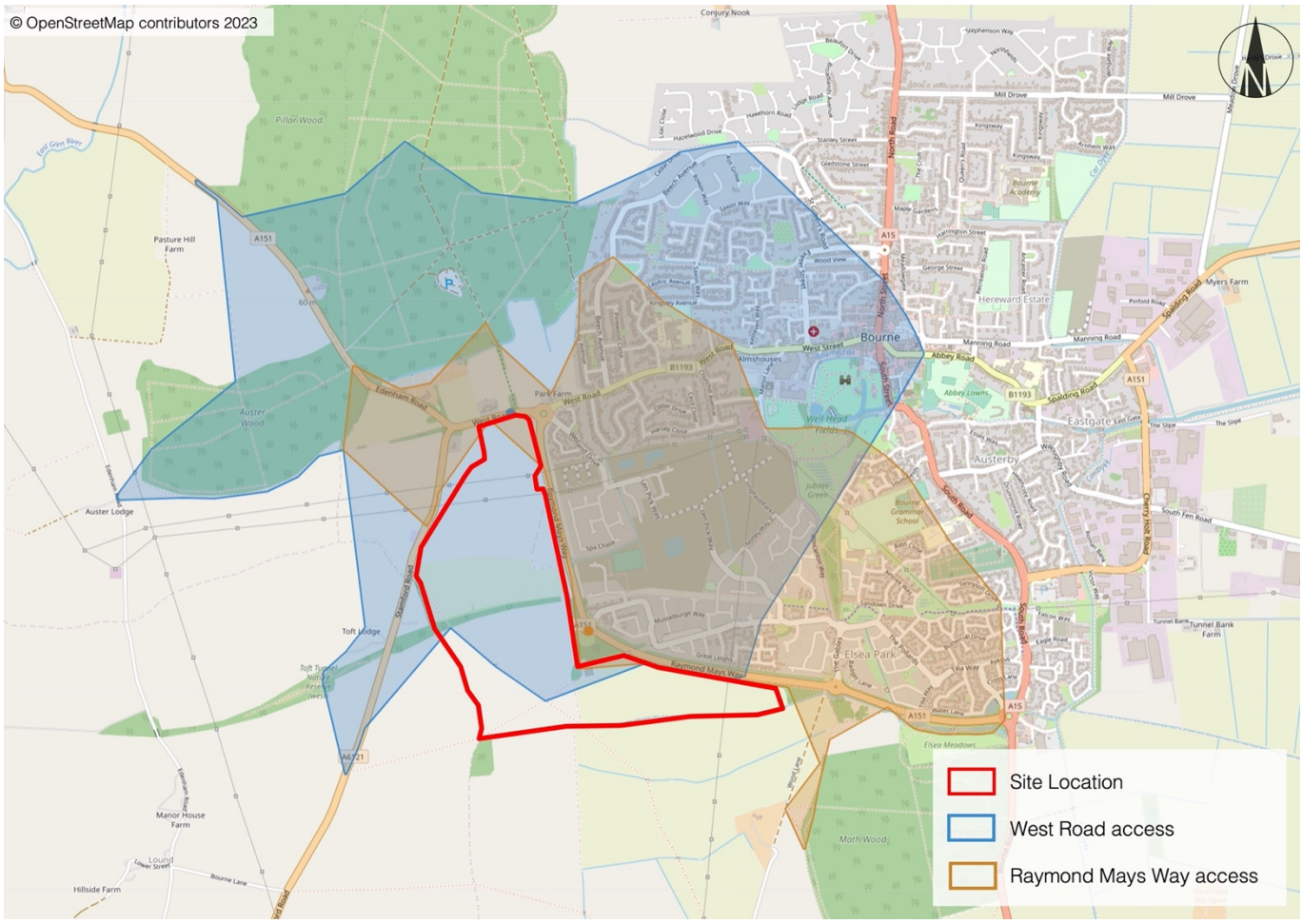
3.3.8 Raymond Mays Way runs in a north-south alignment along the sites eastern boundary. There is no streetlighting and no footways present on either side of the carriageway. There are wide grass verges on both sides of the carriageway and two PRoW routes that cut across Raymond Mays Way with signage to alert drivers that pedestrians may be crossing.

3.3.9 With regards to PRoW, there are footpath routes intersecting the site (at the southern and western extents) and it is envisaged that these are predominantly used as leisure walking (/ rambling) routes. It is therefore envisaged that the future development of the site will need to be accompanied by the delivery of a network of footways that connect with existing infrastructure to facilitate safe pedestrian movements from the site to Elsea Park and Bourne town centre; through a series of footways throughout the development and along the existing highway network.

3.3.10 There are also shared walking and cycling routes throughout Elsea Park as indicatively shown in **Figure 3.1**, which further improves accessibility. Elsea Park is still currently being built out and developed, and there will also be further permeable connections through the internal street networks.

3.3.11 **Figure 3.2** below shows what can be accessed within 1.6km walking distance from the site accesses on West Road and Raymond Mays Way based on existing infrastructure.

Figure 3.2 1.6km Walking Isodistance



3.3.12 As shown above, the west and south of Bourne are within walking distance from the site accesses on West Road and Raymond Mays Way.

3.3.13 A potential indicative sustainable movement strategy to facilitate the development of the site is set out in **Chapter 5**, which includes a series of recommended improvements for pedestrians along the surrounding highway network.

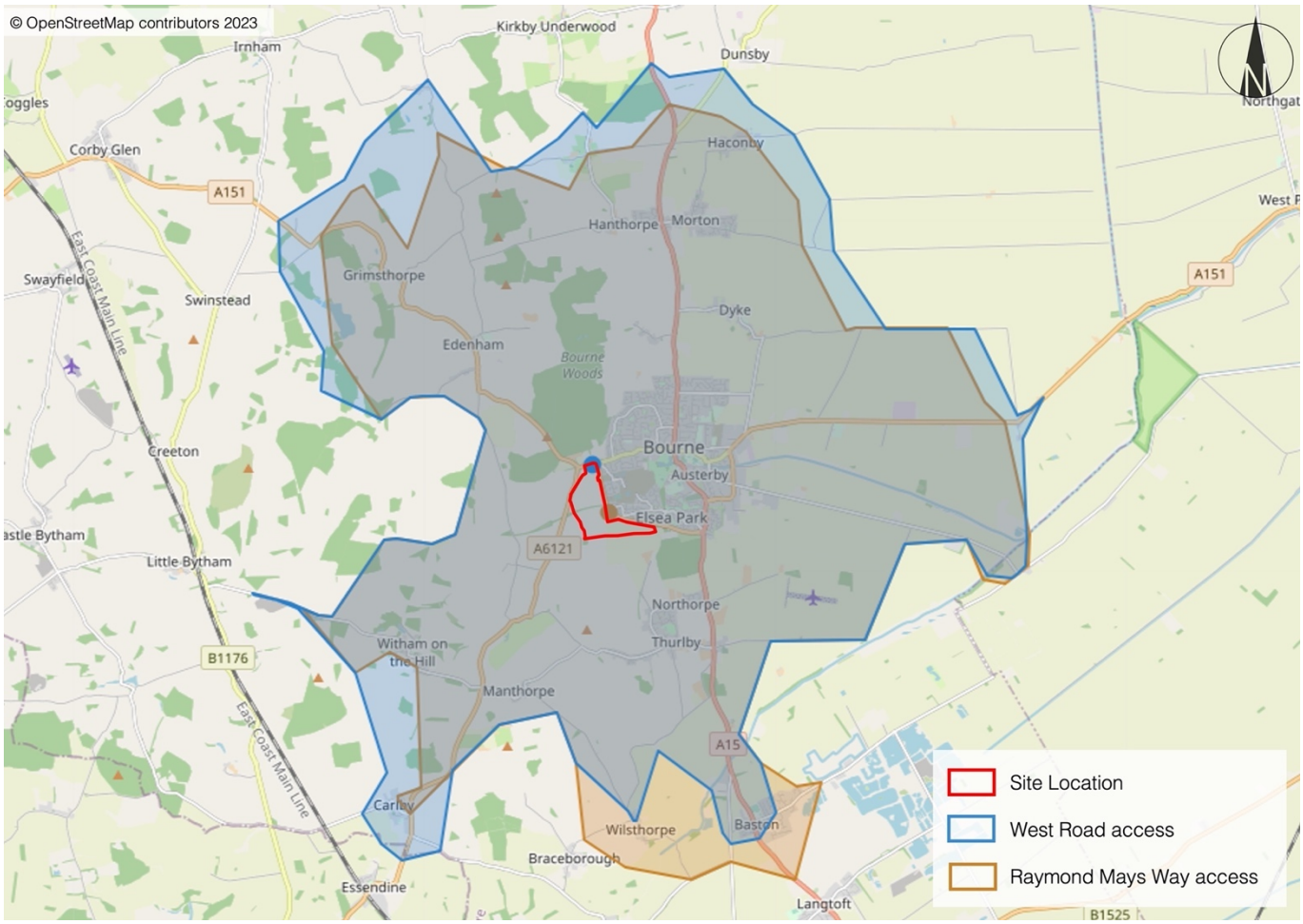
Cycling

3.3.14 The DfT – Local Transport Note 1/20 'Cycle Infrastructure Design' states that two out of every three personal trips are less than five miles in length (Transport Statistics Great Britain, DfT, 2016) - an achievable distance to cycle for most people. Cycling is therefore an important journey to work mode that has the potential to perform a more significant role.

3.3.15 The nearest cycle route to the site is a (signed) shared walk and cycle way located on the northern side of West Road, as shown in **Figure 3.1** above. The route provides connections towards Bourne Town Centre. There are also internal shared walking and cycling routes throughout Elsea Park as shown in **Figure 3.1**, which further improves accessibility.

3.3.16 **Figure 3.3** shows the 5km distance from the site accesses on West Road and Raymond Mays Way based on existing infrastructure. The entirety of Bourne and neighbouring villages Edenham, Dyke, Morton, Northorpe, Carlby and Thurlby are all within an accessible cycling distance.

Figure 3.3 8km Cycling Isodistance



3.4 Bus

3.4.1 The Guidelines for Buses in Urban Developments (Chartered Institution of Highways and Transportation, 2018), states that housing developments should "be located within 400m of a bus stop and preferably closer". Based on CIHT guidance which states "a 300m notional catchment will result in maximum walking distances up to around 400m", 300m isodistances have been drawn around the nearest bus stop location, on West Road and A6121.

3.4.2 An overview of the location of the bus stops in the vicinity of the site, along with the services which operate from each stop is provided in **Figure 3.4**.

3.4.3 The nearest bus stop to the development is located on West Road within an approximate 5-minute walk from the proposed site access on West Road and an approximate 14-minute walk from the proposed access on Raymond Mays Way. The bus stop is served by 3 services (201, 202 and 404).

3.4.4 Further bus stops are located on A6121 and can be accessed from the site within a 400m walking distance via the PRoW that intersects the site. The stops on A6121 are served by 2 services (201 and 202).

Figure 3.4 Existing Bus Stop Locations

Table 3.1 Local Bus Service Provision

No.	Route	Weekday	Saturday	Sunday
201	Bourne – Stamford – Peterborough	1 per hour	1 per hour	-
202	Bourne – Stamford – Peterborough	2 per day	1 per day	-
404	Little Bytham - Bourne	1 per day	-	-

3.4.5 The 201 route is the most frequent bus service operating within walking distance of the proposed site's northernmost access (on West Road). The service operates between 09:24 and 19:26 on weekdays and 10:19 and 18:32 on Saturdays. The 202 bus has 2 services per day at 08:18 and 16:59 and one service on Saturday at 15:50.

3.4.6 In order to promote opportunities for access via bus to and from the site, it is considered that an improvement to the existing service offer and diversion of routes into the site and/or along Raymond Mays Way will be required. The bus stops along West Road take the form of a flagpole design, with timetable information. All other stops in the vicinity of the site (A6121) are request stops (hail & ride) and do not incorporate any signage or timetable information.

3.4.7 In order to maximise opportunities for promoting bus access to and from the site, improvements to existing infrastructure will be made where feasible, for example signage, timetabling information and safe waiting areas with street lighting.

3.4.8 When examining the accessibility for prospective residents at the site, focus has been placed on the existing 201 bus route, which is currently the most frequent service. There is currently no continuous footway link/connection between the proposed site accesses and the bus stops on West Road and A6121, in order to provide safe access for pedestrians as part of a multi-modal journey.

3.4.9 Based on CIHT guidance, a 300m catchment has been drawn around the bus stops closest to the site in **Figure 3.4**. Based on the locations of the existing bus stop infrastructure, the majority of the site is not within suitable walking distance/catchments of a bus stop.

3.4.10 A potential indicative movement strategy to facilitate the development of the site is set out in **Chapter 5**, which includes a series of provisional recommended improvements/enhancements for bus services in the vicinity of the site.

3.5 Rail

3.5.1 Stamford (Lincs) Railway Station is the closest station, located c.14km southwest of the site, a c.35-minute bus journey from West Road (route no. 201 Inc. 10-minute walk). The station is operated by East Midlands Railway offering services to Birmingham New Street, Cambridge and Stansted Airport.

3.5.2 The station benefits from 14 sheltered cycle parking stands with CCTV and 79 car parking spaces including 4 disabled parking bays. Although the station is located outside of typical walking and cycling distances, there is opportunity to access by bus, as above, and potentially by driving and utilising the station car parking facilities.

3.5.3 A summary of the typical frequency operating from Stamford (Lincs) Station is provided in **Table 3.2**.

Table 3.2 Rail Service Provision

Destination	Direct Frequencies	Approx. Journey Time
Birmingham New Street	1 per hour	90-mins

Destination	Direct Frequencies	Approx. Journey Time
Stansted Airport	1 per 2-hours	105-mins
Cambridge	1 per hour	75-mins

3.6 Local Amenities

3.6.1 On account of the predominantly residential nature of the development, it is imperative to consider the potential opportunities for access to local amenities.

3.6.2 In transport planning terms, the most sustainable sites are those generating the lowest number of single occupancy private vehicle trips, which can be promoted and achieved by facilitating a greater proportion of walking, cycling and public transport journeys.

3.6.3 The 'Planning for Walking' (2015) document produced by the Chartered Institution of Highways and Transportation (CIHT) suggests that c.80% of journeys shorter than 1 mile (1.6km) are made wholly on foot.

3.6.4 Appropriate walking distances are dependent upon the location of the specific development; more remote locations will see people being prepared to walk further to their end destination. Similarly, appropriate walking distances are also dependent upon the standard of existing pedestrian infrastructure provision, with further walking distances achievable in locations with extensive and high-quality pedestrian footways, crossings and pedestrianised areas.

3.6.5 As with pedestrian accessibility, the level of a site's cycle accessibility depends upon a combination of the distance from the local amenities and the standard of existing cycle infrastructure. It should, however, be noted that the cycle infrastructure can include facilities shared with vehicles and pedestrians, as well as dedicated cycle infrastructure.

3.6.6 **Table 3.3** provides an indication of the approximate distances and walking / cycling times to local amenities and facilities from the development site. The measurements have been taken from the site access nearest to the facility (either from West Road or Raymond Mays Way); the estimated times are based on the outputs from Google Maps Directions / Journey Planner.

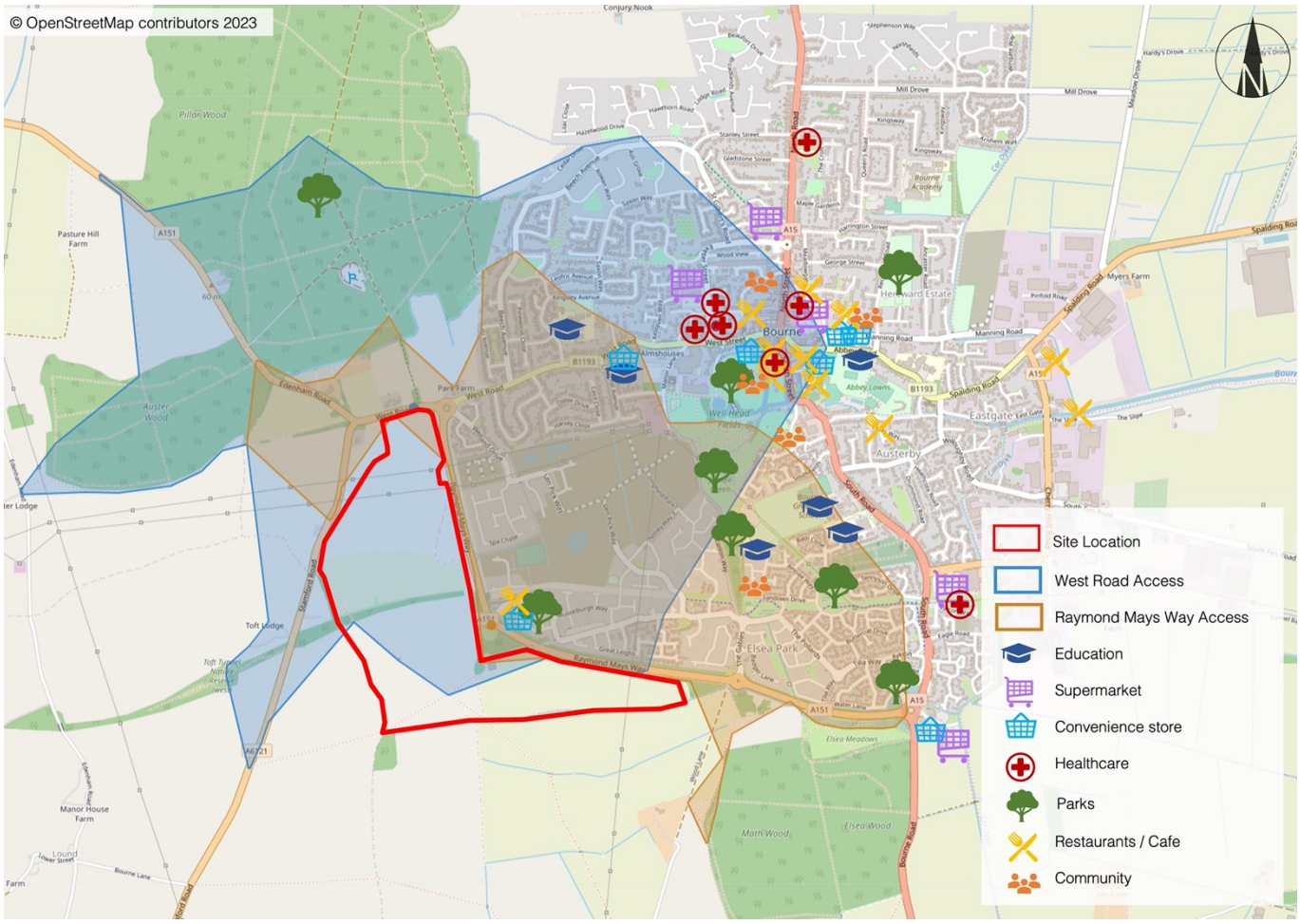
Table 3.3 Local Facilities & Amenities

Facility	Distance from site (m)	Walking Time (mins)	Cycling Time (mins)
Co-op Food	85m	1 minute	1 minute
Full of Beans Bourne	100m	1 minute	1 minute
Market Rasen Play Area	320m	3 minutes	1 minute
Family Shopper	805m	10 minutes	3 minutes
Hereward Medical Centre	1285m	15 minutes	3 minutes
The Leaf Restaurant	1285m	16 minutes	4 minutes

Facility	Distance from site (m)	Walking Time (mins)	Cycling Time (mins)
Post office	1285m	16 minutes	4 minutes
Elsea Park Community Trust	1285m	15 minutes	3 minutes
Boots Pharmacy	1450m	17 minutes	4 minutes
Starbucks	1450m	17 minutes	4 minutes
Caffe Cream	1450m	17 minutes	4 minutes
China Palace	1610m	19 minutes	5 minutes
Heron Foods	1610m	19 minutes	4 minutes
Wake House Community and Business Facility	1610m	20 minutes	5 minutes
M&S Foodhall	1610m	20 minutes	5 minutes

3.6.7 An overview of the locations of facilities and amenities is provided in **Figure 3.5**.

Figure 3.5 Local Facilities & Amenities



3.6.8 The site is served by a range of food, health and community facilities within the recommended walking (c.1.6km) and cycling (c. distances. A wider range of facilities can be found within Bourne Town Centre.

3.6.9 Further to the above, accessibility to facilities will be further enhanced by the mixture of uses proposed on site, including education and local centre uses, alongside the residential dwellings, which will help to reduce the provision of off-site car trips and internalisation of trips within the development.

3.7 Summary

3.7.1 The site is within walking distance of a range of local amenities and services. Local bus services provide connections to surrounding towns and villages. There is a network of roadside footways and cycle facilities in close proximity to the site that provide good connections to Bourne Town Centre. These connections can also be promoted further by improved and enhanced provision/infrastructure delivered by the development.

4. Sustainable Access Improvements

4.1 Overview

4.1.1 This section of the report sets out an indicative high-level sustainable transport strategy and measures for the proposed site. Promoting sustainable transport for new sites is a key policy within the NPPF.

4.1.2 The strategy has been developed with a view to identifying the opportunities to promote sustainable travel at the site, which can be developed further as the proposed concept masterplan scheme progresses, and furthermore when a planning application and full transport assessment is being undertaken and submitted.

4.2 Walking & Cycling

4.2.1 The site is predominantly rural in nature however, the eastern boundary of the site lies adjacent the Elsea Park development. Within the confines of the site, pedestrian infrastructure is limited to the Public Rights of Ways (PRoW) that intersect the site, the northern frontage of the site contains single-sided provision of a shared use foot/cycleway on the northern side of West Road opposite the proposed site access.

4.2.2 The site will be developed with a focus on promoting and prioritising active travel within and throughout the site to encourage non-car travel modes, whilst also providing connections and links to off-site existing infrastructure, along with improvements/upgrades where necessary, in order to promote walking and cycling access to local services and amenities.

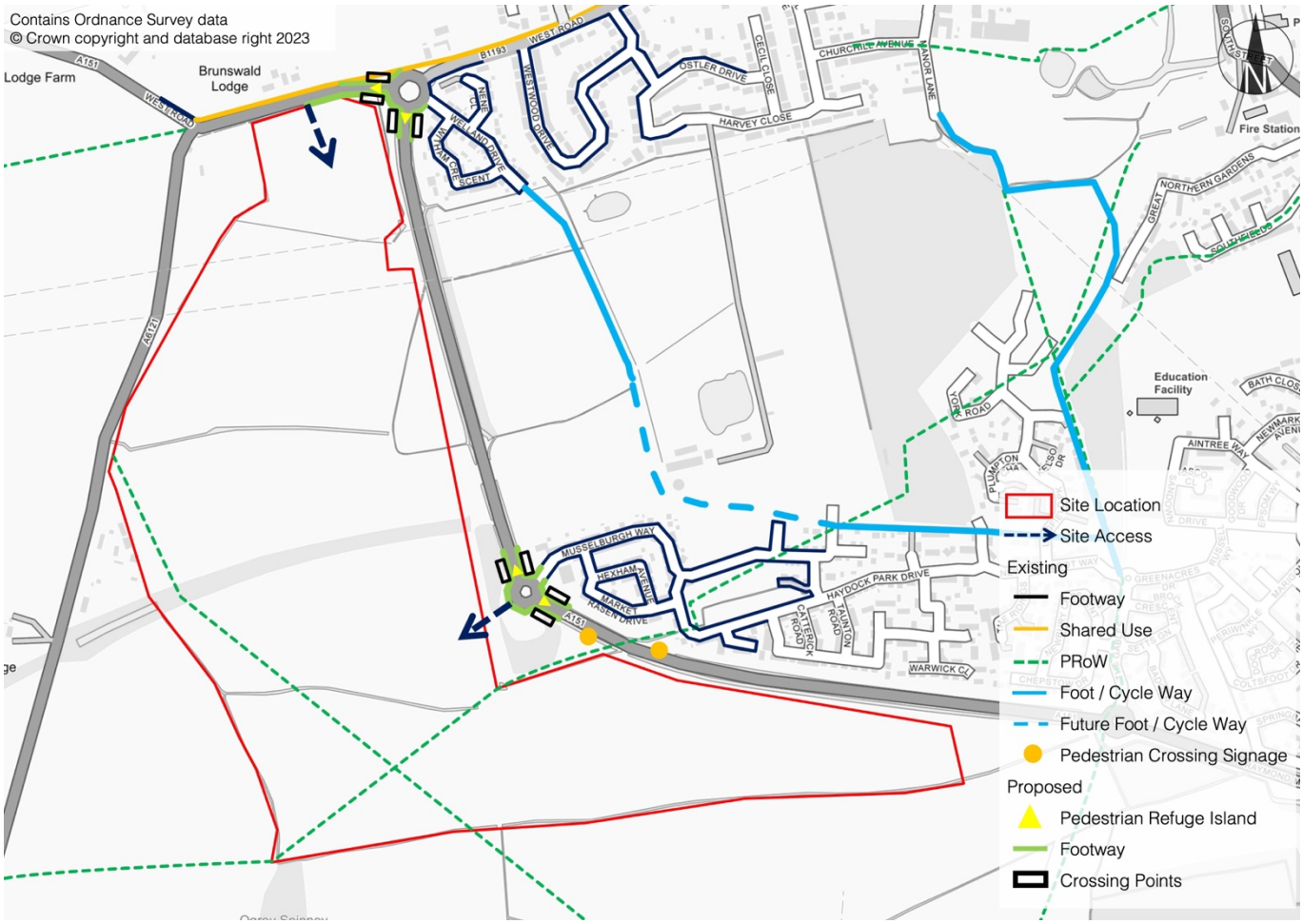
4.2.3 It is proposed that pedestrian infrastructure is provided to connect with the existing infrastructure, in particular the Elsea Park development east of the site.

4.2.4 Footway connections and crossings can be created at the site access on Raymond Mays Way, that link with Musselburgh Way, along the northeast arm of the site access roundabout. Pedestrian infrastructure, in the form of footways and crossings will also be required at the proposed site access on West Road to facilitate movements towards Bourne Town Centre.

4.2.5 Raymond Mays Way is subject to national speed limit of 60mph. This speed limit could potentially be reduced to 40mph between Raymond Mays Way / Musselburgh Way roundabout and Raymond Mays Way / West Road roundabout with signalised toucan crossings provided on Raymond Mays Way to forge and create a routes into Elsea Park. Further assessment will be necessary to determine the approach to providing most appropriate forms of crossings as part of the development.

4.2.6 Proposed pedestrian improvements are shown in **Figure 4.1**.

Figure 4.1 Indicative Proposed Walking Improvements



4.2.7 The form of the crossings on West Road and Raymond Mays Way will be considered as part of a crossing review analysis. If signalised crossings are proposed, reduction in speed on Raymond Mays Way would be required as the current speed is 60mph.

4.3 Bus Improvements

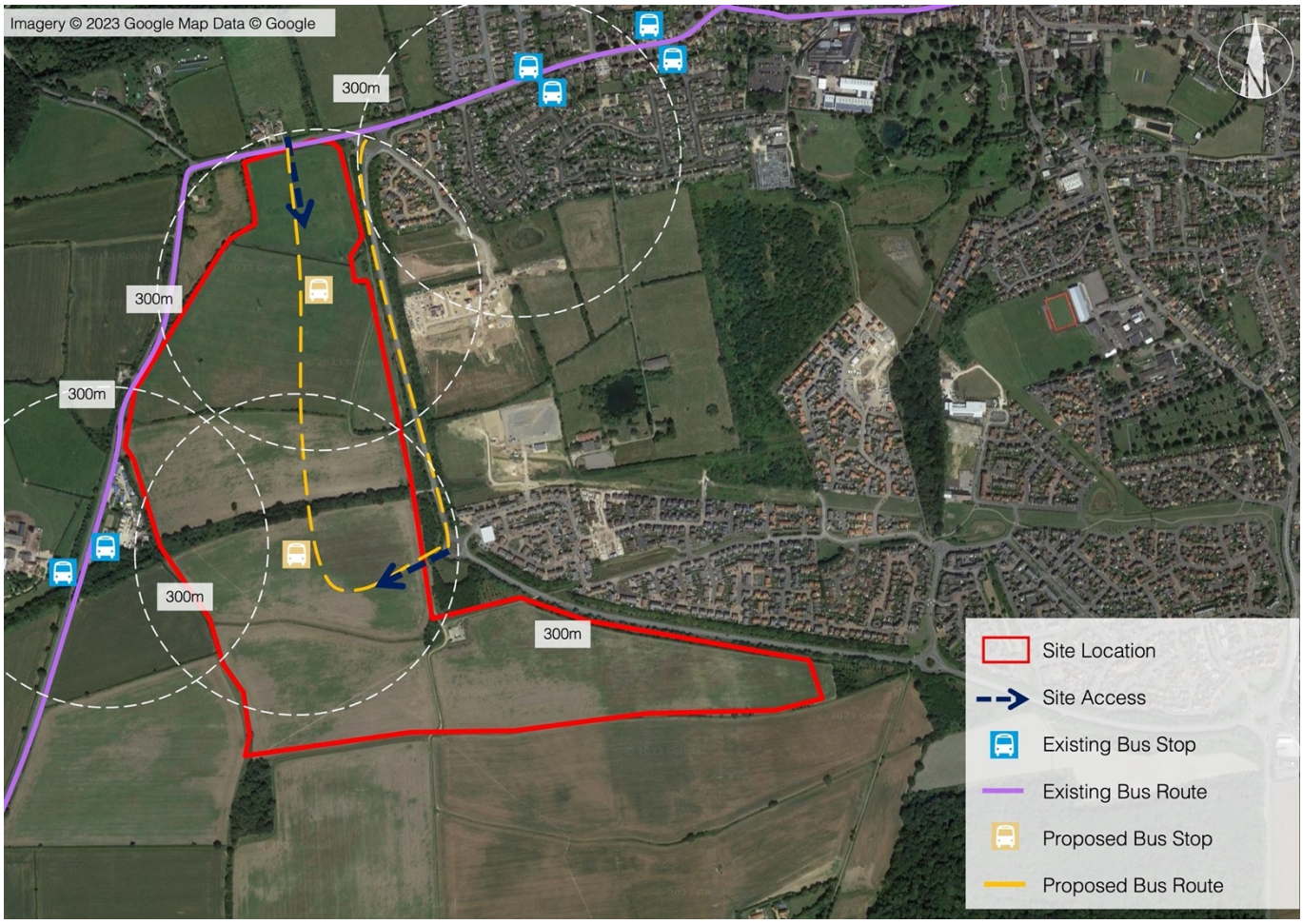
4.3.1 As the majority of the development does not fall within a 400m walking distance of existing bus stops. in order to maximise opportunities for access to and from the site by public transport, it is considered that the development will either require a new service or the diversion of an existing service.

4.3.2 The existing bus services along A6121 and West Road could potentially be diverted into the site or along Raymond Mays Way which would also be of benefit to residents of Elsea Park. Given the current frequency that services operate, there would likely also be a requirement to increase frequencies, which may subsequently result in additional buses being required, commissioned and pump-primed.

4.3.3 A high-level concept has been developed to illustrate where the existing 201 bus service could potentially be diverted to ensure residents at that the site have better access to bus stops and services[2].

4.3.4 An indicative re-routing of bus services including new bus stop provision is outlined in **Figure 4.2**.

Figure 4.2 Potential Bus Diversion



4.3.5 As shown in **Figure 4.2**, the bus route could be diverted into the site from West Road egress onto Raymond Mays Way, continuing north and then reconnecting with the existing bus route on West Road. This ensures the majority of residents are within a 400m walking distance of a bus stop.

4.3.6 A stop could also be provided on Raymond Mays Way which would be of benefit to residents of Elsea Park. Further work will be required to determine the most suitable diversion route and the number and location of additional bus stops.

[2] The potential and viability of bus service re-routing would be subject to a separate bus strategy feasibility study, including opening dialogue and consultation with Lincolnshire Highways and local bus operators.

5. Travel Plan Measures / Incentives

5.1 Overview

5.1.1 This section of the report sets out measures that could be incorporated into a Travel Plan for the site to encourage sustainable travel and reduce car use.

5.2 Active Travel Measures

Developer Contributions

5.2.1 Fair and proportionate financial S106 contributions towards walking/cycling infrastructure and public transport/bus service improvements, inc. any new PT infrastructure that may be necessary, including stops/shelters/real-time timetable information etc., or potentially increasing the frequencies of existing (and future) services in the local area.

Travel Plan Co-ordinator Role

5.2.2 A Travel Plan Co-ordinator (TPC) is responsible for the planning and ongoing implementation of a development's Travel Plan. The role of TPC will generally be filled three months prior to initial occupation of the development. Whilst it is not a full-time post, it is important that the role falls to an individual or individuals who have the time, ability and responsibility to drive the Travel Plan forward. It is envisaged that the role will be filled by a staff member of the sales/marketing suite or sub-contracted out to an independent consultant.

5.2.3 The TPC will need to complete a final Travel Plan document specific to the development site. The TPC will be responsible for all elements of their final Travel Plan. This essentially includes the following tasks (this list is not exhaustive):

- Marketing the overall Travel Planning;
- Undertaking travel surveys and obtaining feedback from residents;
- Monitoring against modal shift targets (against existing travel habitats determined from travel questionnaire);
- Developing further measures to contribute towards meeting targets;
- Implementing measures, and ongoing promotion of the Travel Plan (including introduction of new residents to the Travel Plan);
- Monitoring the effect of the Travel Plan, and summarising / reporting findings to LCC's Travel Planning Officer/Team; and,

- Reviewing progress of the Travel Plan and looking for areas where further improvements can be made.

5.2.4 TPC's will also offer a personalised travel planning service (as aforementioned), this would be promoted through promotional specific leaflets or flyers, delivered to residents. This could be delivered alongside a travel information pack. The pack would contain the following:

- An overview of the TP and the benefits that having a travel plan brings to individuals, the community and to the environment;
- Contact details of the respective TPCs;
- Details of opportunities for sustainable travel to and from the site, with walking and cycling maps illustrating local routes and site-specific public transport information, including location of bus stops and railway stations;
- Details of any incentives that may be offered to encourage sustainable travel; and,
- Useful websites / contacts for public transport, walking, cycling information / maps etc.

Personalised Travel Planning (PTP)

5.2.5 Personalised Travel Planning (PTP) will allow residents to contact the TPC and arrange a meeting (either face-to-face or via email/telephone) to discuss individual circumstances. The TPC will assist in tailoring travel planning advice specific to residents' individual needs, whilst aiming to incorporate and promote sustainable travel modes as much as possible.

5.2.6 If requested by the resident, a personalised and tailored information pack can be produced by the TPC showing local walking and cycling routes; details of bus/train services providing access to their specific place of work/education; and information on the public transport providers (links to websites etc.). Any potential discounts/vouchers/offers (organised by the TPC, and funded by the developer), will be provided within the pack, tailored to the household's requirements.

5.2.7 A Department for Transport (DfT) published report 'Making Personal Travel Planning Work' states that "Within the UK, PTP has been reported to help reduce car driver trips by 11% (amongst the targeted population) and reduce the distance travelled by car by up to 12%. Follow-on benefits from these impacts can be expected in terms of wider community benefits, including the improved health of participants, a greater propensity to use local services, and improved local air quality. The limited evidence that exists concerning the long-term impacts of PTP campaigns suggests that changed travel behaviour is best sustained in the immediate years following the occupation of the development and commencement of the PTP (for up to five years afterwards).

Promotion of events

5.2.8 'National Walking Month', 'Cycle to Work Day' and 'Ride to Work Week': residents/visitors at the application site will be encouraged to participate in events such as 'National Walking Month' and 'Cycle to Work Day'. For these activities, promotional resources (digital/hard copies) could be obtained from charities, such as Living Streets, Sustrans and CycletoWorkDay.org.

Bicycle Hub

5.2.9 A bicycle hub could be introduced as a part of complementary infrastructure / measures that promote confidence in cycling for residents / users of all ages. This could be located in a building in the proposed local centre.

5.2.10 This scheme could be supplemented with a range of complementary measures such as cycle training, promotional events, personalised travel planning, guided route training and bike safety checks to give people the confidence to try (and keep using) a bike. Many of these measures will also be of use to already committed cyclists to encourage them to cycle more and keep cycling.

Mobility Credits

5.2.11 A scheme could be introduced whereby each household is entitled to a certain number of sustainable travel 'credits', supporting households with their individual travel patterns / needs. Each household may be entitled to discounts / subsidies towards the specific measures detailed throughout this chapter, such as:

- New cycle equipment;
- Public transport tickets / passes;
- Electric Vehicle (EV) Charging Equipment; and,
- Cycle training.

5.2.12 By offering credits through the TPC, residents will be given an individual choice for a subsidy / discount towards a sustainable travel mode which would benefit them personally, giving them a sense of ownership, which is likely to increase uptake. Uptake is likely to be much greater than offering the same individual measures which may not suit a resident's travel requirements / patterns at that time.

Cycle Training

5.2.13 Cycle Proficiency training or Bike-ability programs offer bespoke cycling instruction to people of all ages. There is no charge or heavily subsidised fees for the majority of courses within schools for bike-ability levels 1-3. The cost per adult rider varies from £45 per adult for level 1 courses and £55 for levels 2 and 3 with a maximum of 12 riders per group.

5.2.14 Alongside training courses, national travel events will also be promoted by the TPC, for example, the following events could be relevant to the school:

- The Big Pedal – Run by Sustrans (www.bigpedal.org.uk), the UK's largest inter-school cycling and scooting challenge that inspires pupils, staff and parents to choose two wheels for their journey to school;
- Active Travel Week – a week in which active school journeys earn house / class points and prizes.

Car Share

5.2.15 Regional and national car share websites will be promoted to the residents. Such websites include:

- www.share-a-lift.co.uk;
- www.shareacar.com;
- www.blablacar.co.uk;
- www.liftshare.com; and,
- www.gocarshare.com.

5.2.16 These sites match users with potential partners as a driver or passenger. Once matched, users can choose to car share as little or often as they like. This could be promoted to residents as an option for longer journeys to Stamford, Grantham or Peterborough.

Travel Planning Questionnaires

5.2.17 The TPC will be responsible for monitoring the progress of the TP; to ensure that it continues to remain effective, it is important that it is actively promoted. In order to measure its success and provide insights as to what improvements can be made the document will be reviewed annually by the TPC (for a period of up to 5-years inclusive of the 1st travel survey questionnaire). This will include a repeat travel survey questionnaire to identify any changes in travel patterns and monitor uptake of the measures to promote sustainable travel.

5.2.18 The information collected will enable a review of year-on-year change in modal choices against targets, as well as providing an opportunity to identify areas where the TP can be improved or refined. An assessment will then be made of where further progress can be most effectively achieved. Specific targets may need to be modified as part of this process.

5.3 Summary

5.3.1 In summary, it is proposed that a combination of measures could be incorporated within the site's Travel Plan to encourage sustainable travel to and from the site.

6. Travel Demand & Capacity Analysis

6.1 Overview

6.1.1 This section provides an overview of the methodology used to calculate the travel demand associated with the development proposals, including forecast vehicle trip generation and multi-modal assessments.

6.2 Vehicle Trip Generation

Residential Element

6.2.1 To establish the forecast traffic generation for the proposed development, the 'Residential 03 – A Houses Privately Owned' category of the TRICS Database (v.7.8.4) was examined.

6.2.2 A size filter of '650-1,050' dwellings was chosen, along with the site location category 'edge of town'. Sites situated in Greater London, Wales, Scotland and Ireland were de-selected. Residential zone area was selected as location sub-category. Sites were further filtered by their public transport accessibility rating (i.e., sites with a comparable level of bus service provision), to provide a more robust and comparable assessment.

6.2.3 A summary of the trip rates and associated traffic generation, based on 900 dwellings, is provided in **Table 6.1** below and the full TRICS output is included at **Appendix X**, for reference.

Table 6.1 Trip Rates and Vehicular Trip Generation (900 dwellings)

Land Use	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	In	Out	2-Way	In	Out	2-Way
Trip Rate (per dwelling)	0.147	0.451	0.598	0.415	0.168	0.583
Veh Trips (900 dwellings)	132	406	538	374	151	525

School Trips

6.2.4 School trips for the proposed primary school[3] have been calculated based on a first principles approach.

6.2.5 The total number of pupils in the 2FE primary school will be 420, and Lincolnshire has a pupil yield rate for new developments of c.0.2[4]. This means that from the proposed 900 dwellings there is forecast to be 180 primary school age pupils.

[3] AM Peak hour only has been assessed using first principles – the PM peak hour has been extracted from TRICS.
[4] Lincolnshire County Council School Organisation Plan 2018/2019

6.2.6 For the purposes of this assessment, it is considered that all 180 will attend the new school. Based on this assumption, there are 240 pupils remaining who will originate from outside of the development.

6.2.7 Table NTS0613 of the National Travel Survey (NTS) undertaken by Department for Transport, provides percentages of trips to and from school by main mode for England.[5]

6.2.8 For children aged 5 -10, the data shows that c.45% travel to school by car, this equates to 108 external pupils arriving to school by car, and 216 two-way vehicular trips in the AM peak hour; this is shown in **Table 6.2** below, for reference.

Table 6.2 First Principles AM Peak Hour Vehicular Trips

Land Use	AM Peak (08:00 – 09:00)		
	In	Out	2-Way
Primary School	108	108	216

6.2.9 Trips for the typical network PM peak hour have been calculated using TRICS (v7.10.2) for 'Education 04 – A Primary.

6.2.10 A size filter of 220-621 pupils was chosen along with the following site location categories 'Edge of Town'. Sites situated in Greater London, Wales, Scotland and Ireland were de-selected. Residential zone area was selected as location sub-category. Sites were further filtered by their public transport accessibility rating (i.e., sites with a comparable level of bus service provision), to provide a more robust and comparable assessment.

6.2.11 A summary of the trip rates and associated traffic generation for the school PM Peak hour, based on a total of 420 pupils[6], is provided in **Table 6.3** below and the full TRICS output in **Appendix X** for reference.

Table 6.3 PM Peak Hour Vehicular Trips

Land Use	PM Peak (17:00 – 18:00)		
	In	Out	2-Way
Trip Rate (per pupil)	0.018	0.026	0.044
Veh Trips (420 pupils)	8	11	19

[5] NTS0613: Trips to and from school by main mode, England, 1995 to 1997 onwards.
[6] Total 420 pupils taken, as TRICS specific site data will potentially account for varied travel modes (internalisation) from neighbouring and surrounding residential areas.

6.2.12 **Table 6.4** sets out the total AM and PM peak hour trips forecast to be generated by the proposed school.

Table 6.4 AM and PM Peak Hour School Trip Generation

Land Use	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	In	Out	2-Way	In	Out	2-Way
School Trips	108	108	216	8	11	19

Local Centre Trips

6.2.13 The site includes a local centre, situated east of the site next to the Primary School. It is assumed that all trips will be internal with a small percentage of pedestrian trips from Elsea Park.

Full Site

6.2.14 **Table 6.5** below provides the total trip generation for the full site.

Table 6.5 Total Vehicular Trips

Land Use	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	In	Out	2-Way	In	Out	2-Way
Residential	132	406	538	374	151	525
School	108	108	216	8	11	19
Total	**240**	**514**	**754**	**382**	**162**	**544**

6.2.15 **Table 6.5** shows that the proposed development is forecast to generate 754 and 554 two-way vehicular trips during the AM and PM peak hours, respectively.

6.3 Multi-modal Assessment

6.3.1 Multi-modal percentages have been sourced from 2011 Census Method of Travel to Work data for E02005485: South Kesteven 010 and E02005486: South Kesteven 011 Mid-Level Super Output Areas (MSOA) which are considered to be representative of the proposed development location. These have been applied to the two-way total residential vehicle trips in **Table 6.5** in order to generate a multi-modal assessment for the residential element of the development proposals.

6.3.2 The forecast multi-modal trip generation from the development is summarised in **Table 6.6**.

Table 6.6 Multi-modal Development Trips

Mode of Travel	% Mode Split	AM Peak	PM Peak
Rail / Metro	1%	9	9
Bus	2%	18	17
Taxi	0%	1	1
Motorcycle	0%	3	3
Driving a car or van	70%	538	525
Passenger in a car or van	5%	37	36
Cycle	5%	38	37
Walk	16%	122	119
Other	0%	3	3
Total	**100%**	**769**	**750**

6.3.3 **Table 6.6** indicates that the residential element of development is forecast to generate 769 and 750 total person trips in the AM and PM peak hour respectively. In terms of sustainable travel, 21% of trips are forecast to be made by active travel (walk or cycle), 3% by public transport (bus or train) and 5% as car passengers.

7. Vehicle Trip Distributions

7.1 Residential

7.1.1 The distribution of residential vehicular trips has been derived from the 'Journey to Work' (JtW) Origin & Destination (OD) dataset obtained from the 2011 Census. Data from the 2021 Census for Origin & Destination is not available at the time of this assessment and the full OD results are not expected to be published until late 2023/early 2024.

7.1.2 For the purpose of the assessment, the existing JtW patterns of residents living within the combined Middle Super Output Areas (MSOAs) E02005485: South Kesteven 010 and E02005486: South Kesteven 011 have been examined and are considered to be representative of the proposed development location.

7.1.3 The JtW OD data assessed contains vehicle work trips to destinations across the UK split down to MSOAs (within South Kesteven & South Holland Districts), and all UK local authority districts and regions.

7.1.4 Journeys to each workplace destination have been routed using Google Maps 'Directions' function to assign the forecast trips onto the local highway network. The likely routes taken to and from the proposed development have been assigned a 'Zone'. A total percentage distribution has then been given to each of the Zones identified. This methodology has been undertaken for both the BDW site and the competing site located to the north-east of the town centre.

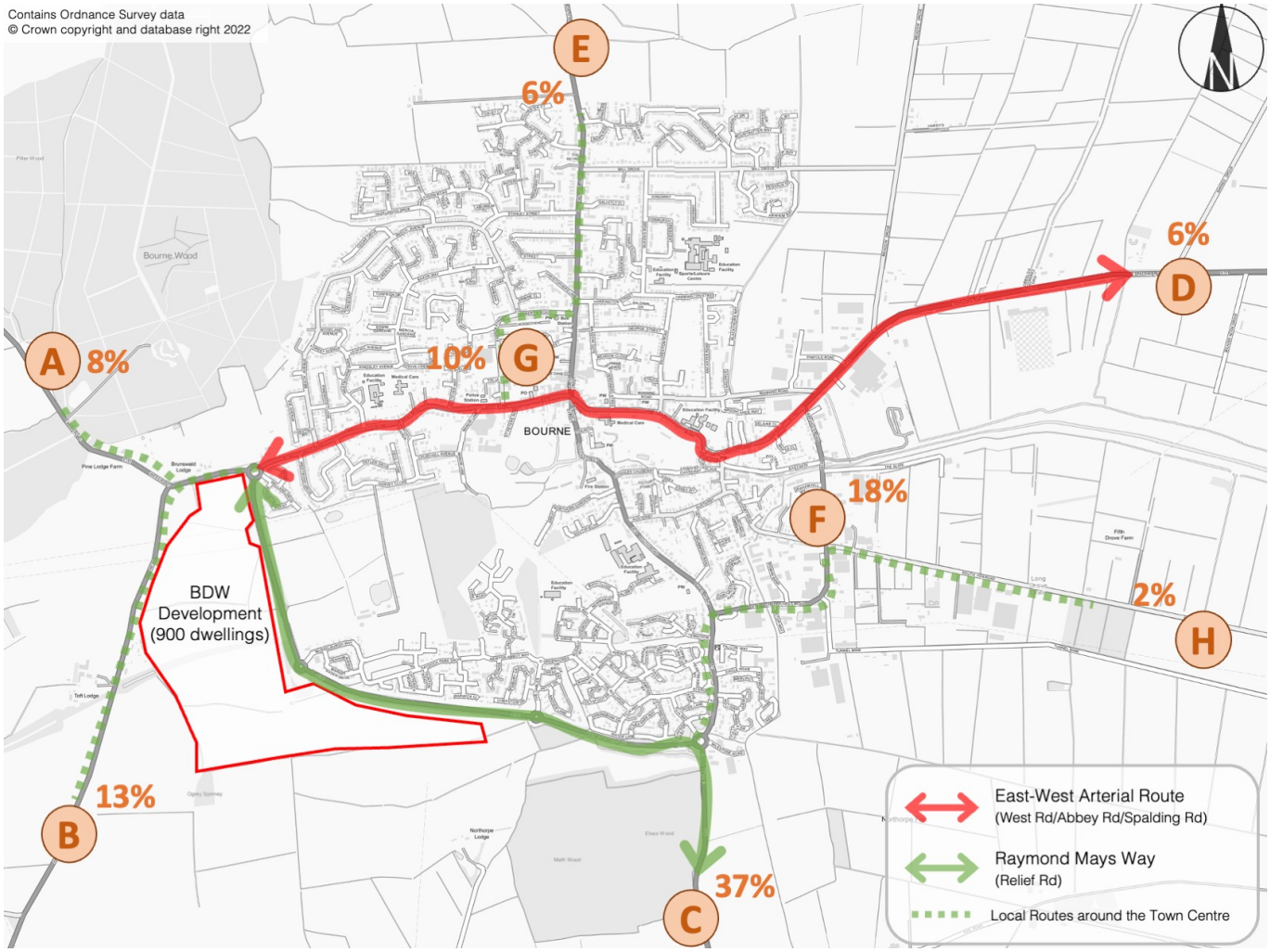
7.1.5 The resultant distribution percentages and associated traffic generation is summarised in **Table 7.1**.

Table 7.1 Journey to Work – Traffic Distribution

Zone	Route Assignment	Distribution	Two-Way Traffic Flows	
			AM	PM
A	West Road / A151	8%	43	42
B	West Road / A6121	13%	70	68
C	Raymond Mays Way / Bourne Road	37%	199	194
D	West Road / Abbey Road / Spalding Road	6%	32	31
E	West Road / Exeter Street / St Gilbert's / North Road	6%	32	31
F	Raymond Mays Way / South Road / Cherry Holt Road	18%	97	94
G	West Road / Exeter Street	10%	54	52
H	Raymond Mays Way / South Road / Cherry Holt Road / S Fen Road	2%	11	10

7.1.6 The Zones for the residential distribution model were classified based on the primary routes leading into/out of the BDW development site during the morning and evening peak times. These Zones can be seen in **Figure 7.1**.

Figure 7.1 Residential Distribution Zones & %



7.2 Primary School

7.2.1 The distribution of primary school vehicular trips has been calculated based on a Gravity Model using resident population data, obtained from the 2011 Census[7]. Resident population data from the 2021 Census is not available at the time of this assessment and is not expected to be published until late 2023/early 2024.

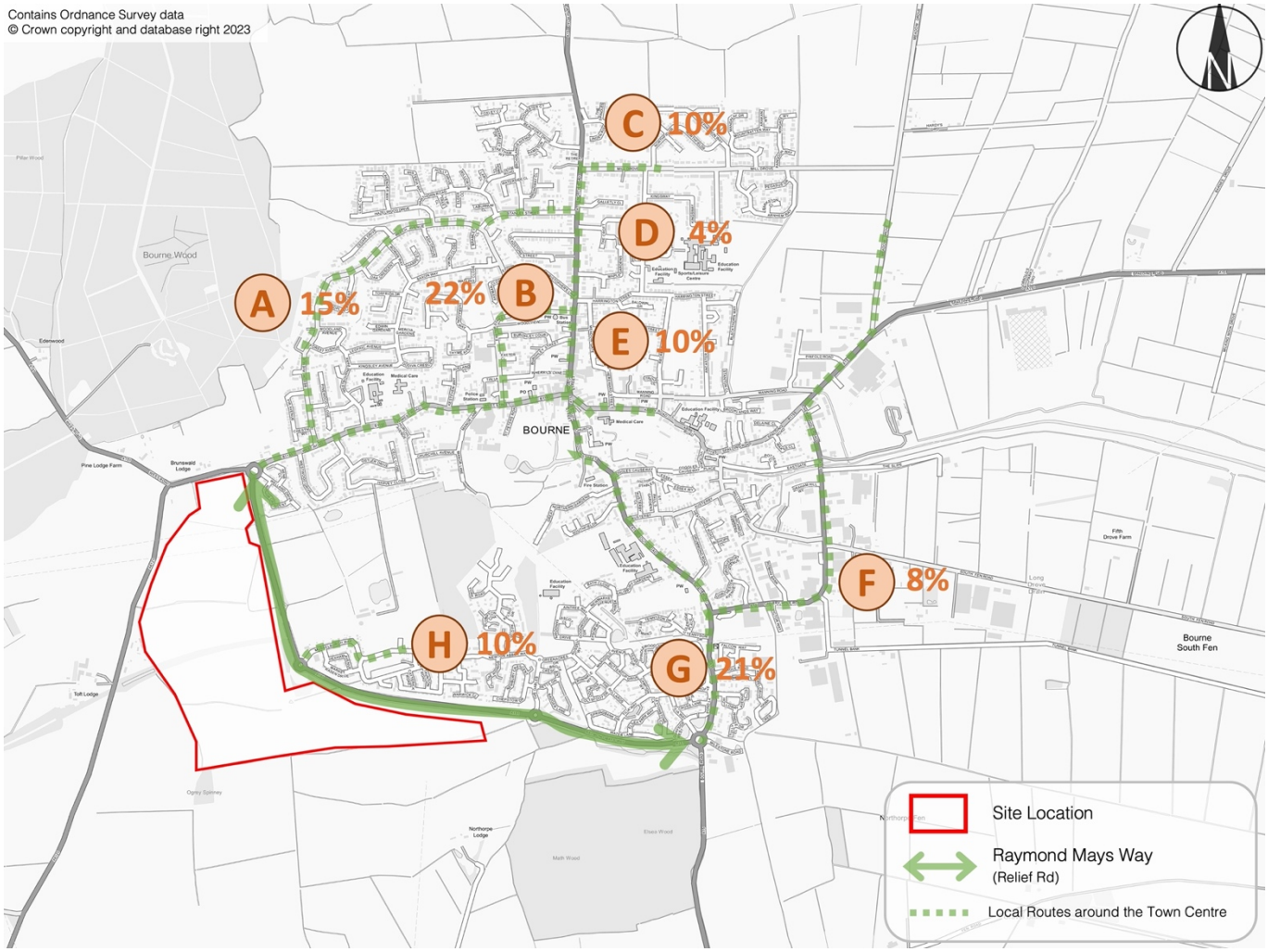
[7] KS101EW - Usual resident population, dataset.

7.2.2 For the purpose of the assessment, the Lower Super Output Areas (LSOAs) South Kesteven 010A, 010B, 010C, 010D, 011B, 011C, 011D, 011E 011F and 011G were all used. There areas are considered to be representative of where children travelling to the primary school may live, which encompasses the entirety of Bourne, for robustness.

7.2.3 Journeys to the primary school via the Raymond Mays Way access[8], from the highest populated area of each LSOA have been routed using Google Maps 'Directions' function to assign the forecast trips onto the local highway network. The likely routes taken to and from the proposed primary school have been assigned to a 'Zone'.

7.2.4 These Zones can be seen in **Figure 7.2**.

Figure 7.2 School Distribution Zones & %



7.2.5 The resultant distribution percentages and associated traffic generation is summarised in **Table 7.2**.

[8] Presumed to be the main access which will be utilised by all external vehicular traffic – considering the current siting of the school within the concept masterplan, also loading traffic into this location (one point of access is considered robust).

Table 7.2 Journey to School – Traffic Distribution Assignment

Zone	Route Assignment	Distribution	Two-Way Traffic Flows	
			AM	PM
A	Beech Avenue	15%	32	3
B	Exeter Street	22%	48	4
C	North Road / Mil Drove	10%	21	2
D	North Road / Mil Drove	4%	7	1
E	North Street	10%	22	2
F	South Road / Cherry Holt Road	8%	16	1
G	A15/A151	21%	46	4
H	Raymond Mays Way/ Musselburgh Way	10%	22	2

8. Traffic Impacts & Capacity Assessments

8.1 Overview

8.1.1 This chapter highlights the junctions that will be significantly impacted by the site.

8.2 Initial 'RAYG' Impact Assessment

8.2.1 The network operation has been graphically summarised using a 'RAYG' traffic light system[9] rating as follows:

- 0–30 two-way flows in the peak hours (Equating to up to 1 trip per 2 minutes);
- 31–60 two-way flows in the peak hours (Equating to 1 trip per 2-minutes to 1 trip per minute);
- 61–120 two-way flows in the peak hours (Equating to 1 trip to 2 trips per minute); and,
- 120+ two-way flows in the peak hours (Equating to over 2 trips per minute).

8.2.2 **Figures 8.1** and **8.2** illustrate the impact based in the total number of two-way trips[10] through each relevant junction throughout Bourne; these are displayed in diagrammatic form, comprising of the aforementioned traffic-light rating system, for both the AM and PM peak hours.

[9] 'RAYG' is an adaptation of the typical RAG, which allows for an additional parameter banding ('Yellow') for extra context and analysis.
[10] Including forecast residential and education trips

Figure 8.1 Initial Impact Assessment AM Peak

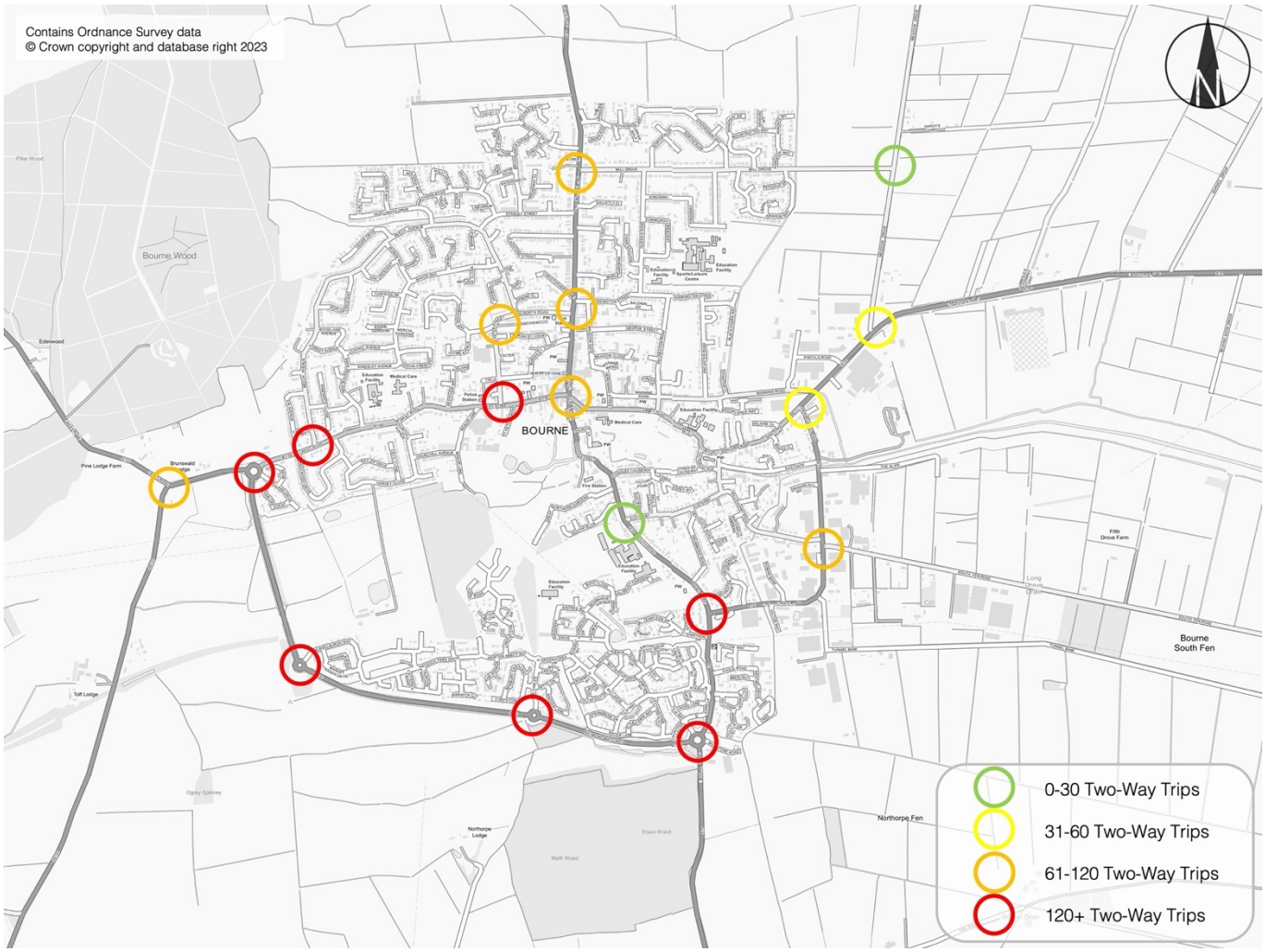
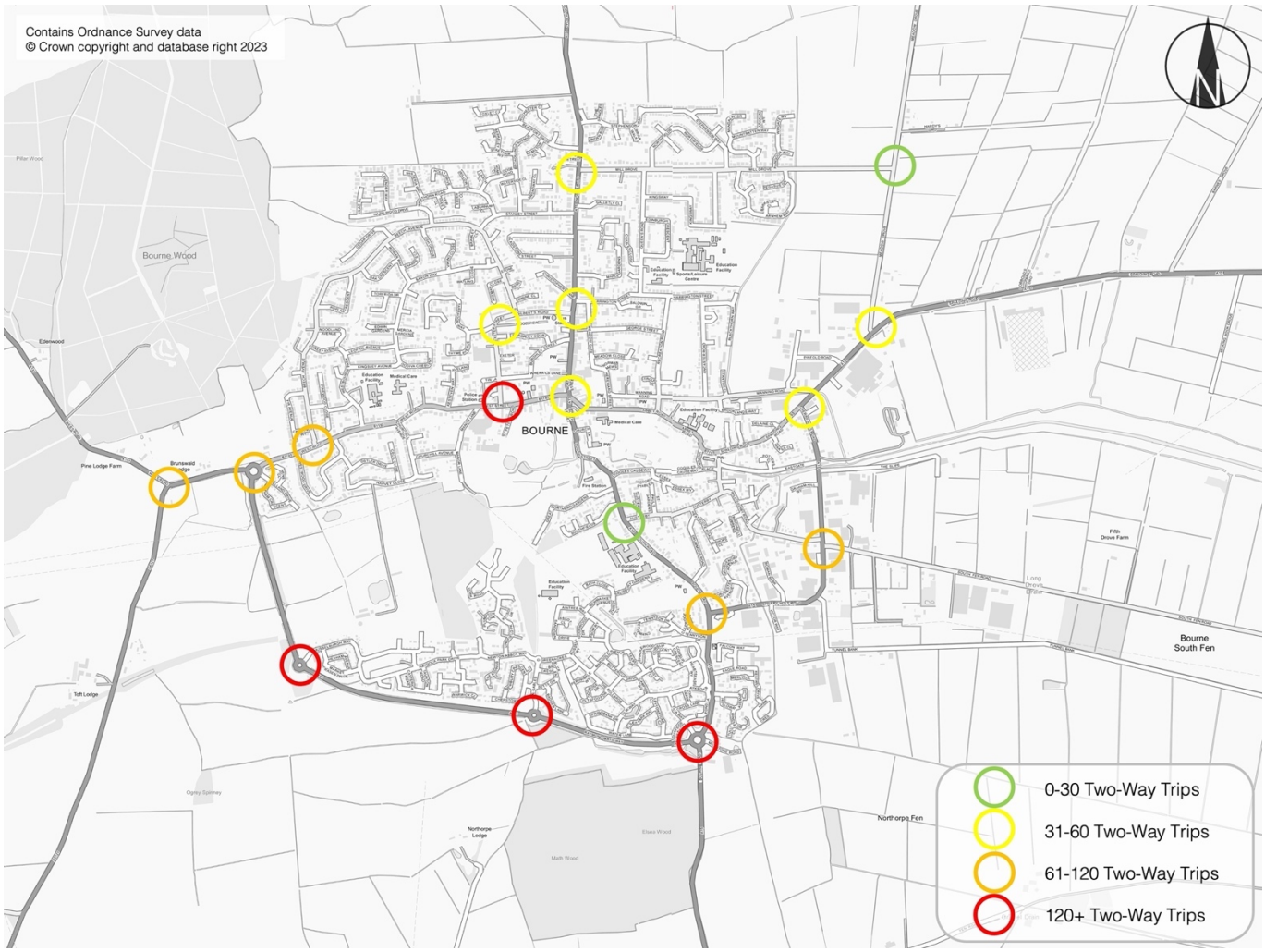


Figure 8.2 Initial Impact Assessment PM Peak



8.2.3 Figures 8.1 and 8.2 illustrate that the highest impacts (+120 two-way trips) of the development traffic from the site that will be focused along the arterial and periphery routes around the town centre. In the AM peak, high levels of traffic will be expected to route along West Road and through the South Road / Cherry Holt Road junction.

For both the AM and PM peak hour the largest levels of traffic will be routed along Raymond Mays Way, acting as a southern relief road/route for traffic heading to the south towards Peterborough. However, it is considered that Raymond Mays Way is a higher order road that is capable of, and more suitable for, accommodating additional traffic from the development proposals.

8.3 Future Traffic Growth

8.3.1 A 2036, end of plan period, future year assessment has been considered as part of the additional highways analysis. Future year background traffic growth has therefore been calculated using TEMPro and adjusted using an average of the study area of MSOAs South Kesteven 010 and South Kesteven 011 within which the local highway network is located.

8.3.2 For the interrogation of the TEMPro database the growth factors for 'car drivers only' were selected, with the trip end type being defined as 'origin/destination'. Growth factors were obtained for the weekday AM and PM peak periods. Once the trip rates had been calculated, an adjustment was applied to provide a local growth rate. An NTM growth calculation for 'All Roads' was weighted to the TEMPro growth rates.

8.3.3 The TEMPro assessment has predicated growth from 2023 to the 2036 assessment year for . A summary of the TEMPro factors is provided in **Table 8.1**.

Table 8.1 TEMPro Growth Factors

Year	AM	PM
2023 – 2036	1.1121	1.1154

8.4 Capacity Assessment Scenarios

8.4.1 The capacity assessments have been undertaken for the following scenarios:

- 2036 'Baseline' AM Peak (08:00 – 09:00);
- 2036 'Baseline' PM Peak (17:00 – 18:00);
- 2036 'Baseline' AM Peak (08:00 – 09:00) + Proposed Development (900 Dwellings and 2FE Primary School); and,
- 2036 'Baseline' PM Peak (17:00 – 18:00) + Proposed Development (900 Dwellings and 2FE Primary School).

8.4.2 Traffic flow diagrams for the study area have been developed using the baseline future year scenarios and distributed development traffic flows described above; these are contained in **Appendix X**, for reference.

8.5 Junction Capacity Analysis

8.5.1 A summary of the detailed modelling results is presented in the paragraphs and tables below, and full model output reports are provided in **Appendix X**, for reference.

8.5.2 The specific junctions that have currently been fully assessed are:

- West Road / A6121 Priority Junction;
- West Road / Site Access Junction;
- West Road / Raymond Mays Way Roundabout;
- Raymond Mays Way / Site Access Roundabout;

- Raymond Mays Way / The Gables Roundabout;
- Raymond Mays Way / South Road Roundabout;
- South Road / Cherry Holt Road Signalised Junction; and,
- North Road / Abbey Road Signalised Junction.

8.5.3 When assessing junction capacity, it is generally accepted that a Degree of Saturation (DoS) or Ratio to Flow Capacity (RFC) value of below 0.85 (RFC value for priority junctions/roundabouts) or 85% (DoS for signal junction (LinSig)) represents a junction that is considered to be operating satisfactorily.

8.5.4 At junctions operating close to zero Practical Reserve Capacity (PRC), which equates to a DoS/RFC value of approximately 0.90 or 90%, small reductions in capacity may result in exponential delay and/or queueing. Therefore, junctions operating above 0.90/90% should be carefully reviewed to ensure that queues and the delay, is not significantly impacted upon to ensure that the new development will not have a 'severe' impact upon the existing highway infrastructure.

West Road / A6121 Priority Junction

8.5.5 An PICADY assessment has been undertaken for the West Road / A6121 priority junction, and the results of the relevant traffic modelling for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are summarised in **Table 8.2**.

Table 8.2 West Road / A6121 Priority Junction

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
West Road						
A6121						
West Road						
A6121						

West Road / Site Access Priority Junction

8.5.6 An PICADY assessment has been undertaken for the West Road / Site Access priority junction, and the results of the relevant traffic modelling for the 2036 + Dev ('Do Something') scenario is summarised in **Table 8.3**.

Table 8.3 West Road / Site Access Priority Junction

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
West Road						
Site Access						

West Road / Raymond Mays Way Roundabout

8.5.7 An ARCADY assessment has been undertaken for the West Road / Raymond Mays Way roundabout, and the results of the relevant traffic modelling for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are summarised in **Tables 8.4**.

Table 8.4 West Road / Raymond Mays Way Roundabout

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
West Road (East)						
Welland Drive						
Raymond Mays Way						
West Road (West)						
West Road (East)						
Welland Drive						
Raymond Mays Way						
West Road (West)						

Raymond Mays Way / Site Access Roundabout

8.5.8 An ARCADY assessment has been undertaken for the Raymond Mays Way / Site Access roundabout, and the results of the relevant traffic modelling for the 2036 + Dev ('Do Something') scenario is summarised in **Tables 8.5**.

Table 8.5 Raymond Mays Way / Site Access Roundabout

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
Raymond Mays Way (North)						
Musselburgh Way						
Raymond Mays Way (South)						
Site Access						

Raymond Mays Way / The Gables Roundabout

8.5.9 An ARCADY assessment has been undertaken for the Raymond Mays Way / The Gables roundabout, and the results of the relevant traffic modelling for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are summarised in **Tables 8.6**.

Table 8.6 Raymond Mays Way / The Gables Roundabout

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
The Gables						
Raymond Mays Way (East)						
Raymond Mays Way (West)						
The Gables						
Raymond Mays Way (East)						
Raymond Mays Way (West)						

Raymond Mays Way / South Road Roundabout

8.5.10 An ARCADY assessment has been undertaken for the Raymond Mays Way / South Road roundabout, and the results of the relevant traffic modelling for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are summarised in **Tables 8.7**.

Table 8.7 Raymond Mays Way / South Road Roundabout

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
South Road (North)						

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	RFC	Delay (s)	Q (Veh)	RFC	Delay (s)	Q (Veh)
Milestone Road						
Bourne Road						
South Road (West)						
Tilia Way						
South Road (North)						
Milestone Road						
Bourne Road						
South Road (West)						
Tilia Way						

South Road / Cherry Holt Road Signalised Junction

8.5.11 The industry standard software package LinSig, has been used to assess the capacity of the South Road / Cherry Holt Road signalised junction. A summary of the modelling results for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are shown in **Table 8.8**, with the full detailed report attached as **Appendix X**.

Table 8.8 South Road / Cherry Holt Road Signalised Junction

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	DoS (%)	Ave Delay (s/pcu)	MMQ (pcu)	DoS (%)	Ave Delay (s/pcu)	MMQ (pcu)

North Road / Abbey Road Signalised Junction

8.5.12 The industry standard software package LinSig, has been used to assess the capacity of the North Road / Abbey Road signalised junction. A summary of the modelling results for the 2036 ('Do Minimum') and 2036 + Dev ('Do Something') scenarios are shown in **Table 8.9**, with the full detailed report attached as **Appendix X**.

Table 8.9 North Road / Abbey Road Signalised Junction

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 1800)		
	DoS (%)	Ave Delay (s/pcu)	MMQ (pcu)	DoS (%)	Ave Delay (s/pcu)	MMQ (pcu)

8.5.13 Xxx

9. Summary, Conclusion & Next Steps

9.1 Summary & Conclusion

9.1.1 Xxx <TBC & completed once analysis has been undertaken in September>

9.2 Next Steps

9.2.1 The following are recommended:

9.2.2 Xxx

9.2.3 Xxx

mode
transport planning

APPENDICES

APPENDIX A

[Insert Appendix title]

APPENDIX B

[Insert Appendix title]

mode

transport planning

keep up with mode:

Birmingham London Manchester Reading