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TECHNICAL NOTE 02

WINCHESTER PROPOSED SUBMISSION LOCAL PLAN (REGULATION 19) CONSULTATION (OCTOBER 2024)

TRANSPORT FEASIBILITY REPORT

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Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage

Control Sheet

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1 INTRODUCTION

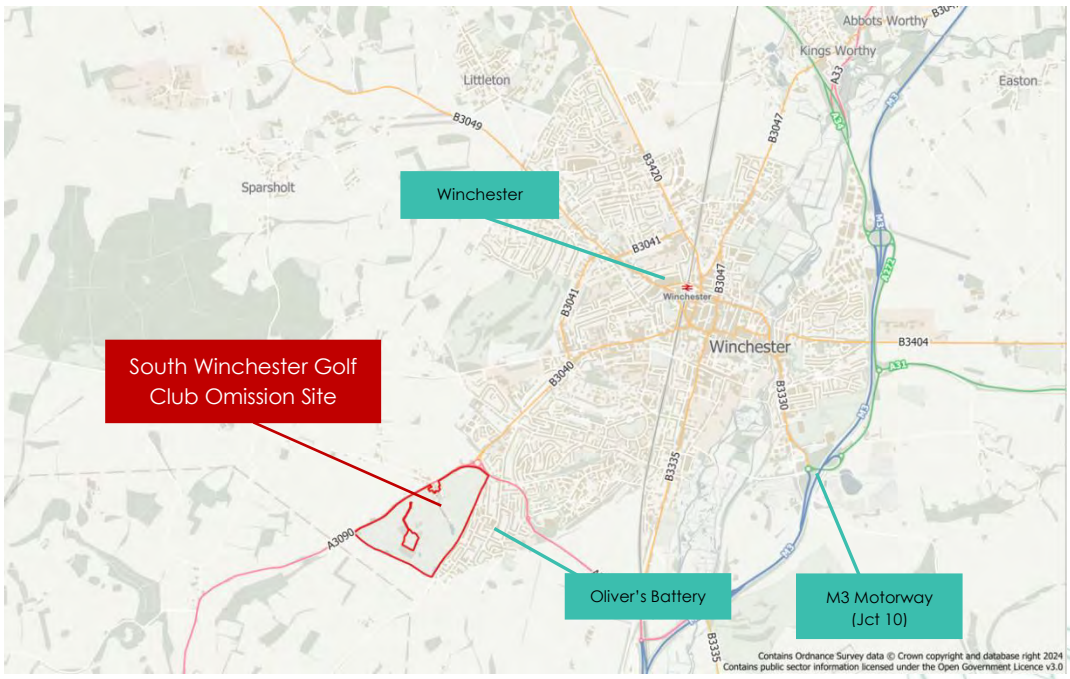
1.1.1 Calibro has been appointed by Bloor Homes Ltd to undertake a strategic appraisal of the transport, highways and accessibility credentials of a site known as Manor Parks (formerly promoted as South Winchester Golf Club), with a view to establishing its development potential for phased development comprising of up to circa 1,100 dwellings, a neighbourhood centre, primary school and Park & Ride facility.

1.1.2 The appraisal has been undertaken in the context of the Winchester Proposed Submission Local Plan (Regulation 19) consultation (October 2024). The report follows the same format as the Transport Feasibility Report provided during the previous consultation process, dated December 2022. It provides the Authority and Inspector with the requisite evidence that demonstrate, with confidence, that the site is both complaint with the objectives and principles of current policy and that there are no fundamental technical issues that would impact on the site's delivery from a transport perspective. The report should be read in conjunction with the wider representations prepared by Savills.

1.2 Site Location

1.2.1 This study has been commissioned in respect of the site known as 'Manor Parks', which comprises some 69.28-hectares (172.7-acres). The majority of the site comprises of the South Winchester Golf Club, which abuts the southern extents of the existing built-up area of the city of Winchester to the north, and to the immediate east the site abuts the residential suburb of Oliver's Battery.

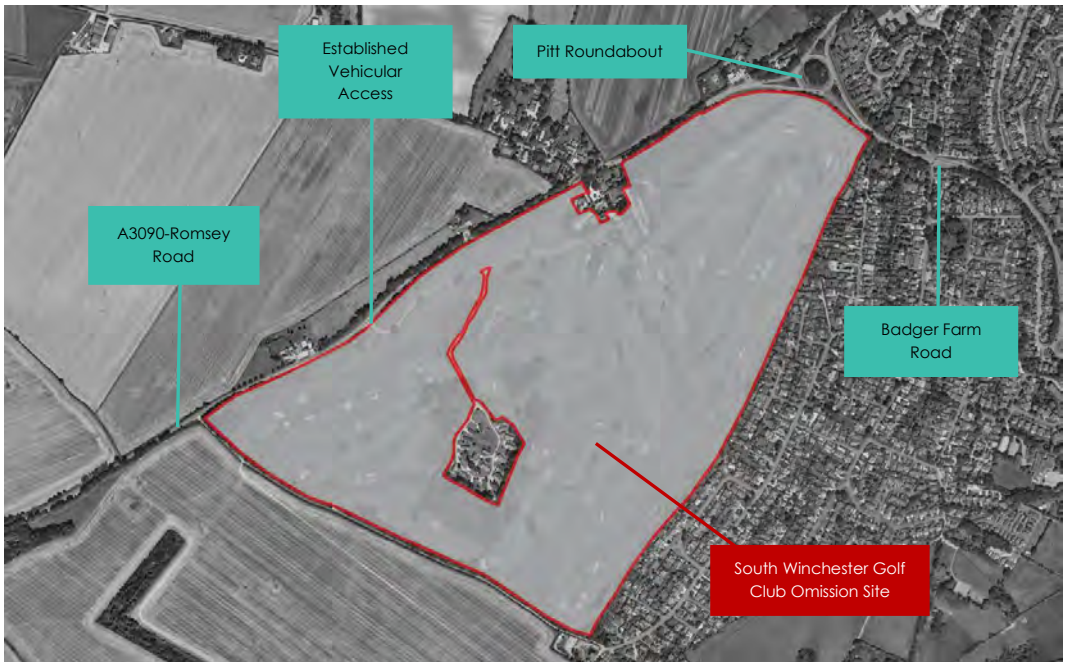
Figure 1-1 Site in Regional Context



1.2.2 The South Winchester Golf Club omission site benefits from established vehicular access via a standard form priority T-junction at the site's northern boundary onto the A3090-Romsey Road and is located some 1-kilometre west of the Pitt Roundabout, which connects with the M3 Motorway via Badger Farm Road.

1.2.3 The site is shown in its local context in the below Figure.

Figure 1-2 Site in Local Context



1.3 Report Structure

1.3.1 This report has been prepared with the purpose of providing the Planning Authority and Local Plan Inspector with an evidence base that considers the Site's suitability for residential development, considering relevant planning policy matters and technical constraints.

1.3.2 The report sets out the various considerations under the following structure:

Section 2. **Policy Context -** This section of the report critiques the relevant national and local sustainable transport policies such that the degree of compliance can be assessed in the subsequent section of the report.

Section 3. **Policy Compliance – Spatial Location** - The report considers the locational merits of the site and how such ingrained opportunities would support the Council's sustainable transport and climate change objectives and policies.

Section 4. **Policy Compliance – CO_2 Emissions** - The report evidences the spatial context of the site in respect of likely resultant transport-derived emissions, compared with other locations in the district.

Section 5. **Policy Compliance – Local Credentials** - The report evaluates the non-car accessibility credentials of the site in this section of the report as a measure of compliance with the locational aspects of sustainable transport policy.

Section 6. **Deliverability (Access Strategy)** - By way of assessing whether there are any abnormal barriers to delivery of the site, the opportunities and constraints associated with the creation of a technically compliant vehicular and non-car access are considered within this section of the report.

Section 7. **Summary & Conclusions –** A summary of the salient findings of the report are provided within this section and these are used to evidence an overarching conclusion regarding the suitability of the site for residential development.

2 POLICY CONTEXT

2.1 Introduction

2.1.1 This section of the sets out the relevant national and local sustainable transport policies that provide the context for evaluating and prioritising Local Plan strategies for the achievement of sustainable development.

2.2 National Planning Policy Framework (NPPF), December 2023

2.2.1 The NPPF sets out the Government's planning policies for England and how it expects these to be applied. The Framework clarifies at Paragraph 7 that **"the purpose of the planning system is to contribute to the achievement of sustainable development"** and this is the only occasion within the entirety of the Framework that the purpose of the planning system is stated.

2.2.2 It is therefore evident that the sole purpose of the planning system is to achieve sustainable development, and the achievement of sustainable development is therefore to be given the highest degree of weight in the Local Plan process. Moreover, since the policies within the NPPF must be considered in the preparation of Local Plans, there is a requirement for the Local Plan to evaluate with evidence the likely outcomes in the context of achieving sustainable development.

2.2.3 In concise terms, Paragraph 8 identifies that sustainable development is achieved via three mutually dependant dimensions (economic, social and environmental) and these give rise to the need for the planning system to perform a number of roles:

- **"an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure.**

- **a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and**

- **environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigation and adapting the climate change, including moving to a low carbon economy."**

2.2.4 In the case of transport-related sustainability, Paragraph 108 of the Framework requires that **"transport issues should be considered at the earliest stages [emphasis added] of plan-making"** so that the **"the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains"**. This is supplemented by Paragraph 109 of the Framework which requires that **"the planning system should actively manage patterns of growth"** and "**significant development should be focused in locations which are or can be made sustainable, through limiting the need to travel and offering a genuine transport modes**".

2.2.5 To help inform the appropriate pattern of growth, Paragraph 110 (b) requires that planning policies should be **"prepared with the active involvement [emphasis added] of local highway authorities, other transport infrastructure providers and operators"**.

2.2.6 Taking this together, the NPPF therefore seeks to deliver development (in this case, housing development) in locations and with appropriate strategies that minimise the need to travel, reduce consequential greenhouse gas emissions and help to conserve natural resources effectively.

2.2.7 It is the case therefore that Government policy is concerned in the significant part with the location of development relative to supporting jobs, shops, and local amenities, which create the need to travel. In this context, Paragraph 109 of the Framework requires that locations that minimise the need to travel should be the focus of future development as these can help to **"reduce congestion and emissions and improve air quality and public health".**

2.2.8 The above policy requires that journey lengths are minimised, which is a threshold set at a higher level than "reduce" and which suggests of a requirement to reduce journeys to the smallest possible degree. It is therefore fundamental that each allocation demonstrate that it is located where the need to travel can be minimised and non-car travel options be maximised.

2.2.9 This requirement is implicitly transposed to Paragraph 32 which requires that **"significant adverse impacts… should be avoided and, where possible, alternative options which reduce or eliminate [emphasis added] such impact should be pursued".**

2.3 Proposed reforms to the National Planning Policy Framework – July 2024

2.3.1 This report notes the proposed revised NPPF, as of July 2024, it is considered that the majority of transport related items remain the same as the NPPF detailed above. However, a fundamental shift toward a vision led strategy is detailed in paragraphs 112 and d, as included below: -

a) A vision led approach to promote sustainable transport modes is taken, taking account of the type of development and its location;

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 Decarbonising Transport: A Better, Greener Britain

2.4.1 In the foreword to the Government's 'Decarbonising Transport; A Better, Greener Britain' report (2021), The Rt Hon Grant Shapps (then Secretary of State for Transport) wrote:

> **"We must also do better at joining up our transport, decarbonisation, and planning goals in both urban and rural areas. Too many new developments – not just by housebuilders, but by public-sector bodies – are difficult to reach without a car. But if we do development in a greener way, and if we join it to existing places, we can make it lower-carbon, lower-emission and lower-traffic – and more acceptable to local communities."**

2.4.2 The document recognises that increased levels of walking and cycling can reduce greenhouse gas emissions from cars by 1-6 mega tonnes of CO2e between 2022 and 2050, and that would help to save between 50 and 120 thousand premature deaths and reduce work absence by around 50-140 million days. In this context, the policy recognises the significant benefits to decarbonising transport.

2.4.3 The document commits the Government to embedding transport decarbonisation principles within spatial planning and across transport policy, to ensure that new development is designed in a way that promotes sustainable travel choices. However, it is accepted that there is no uniform approach to decarbonisation and each local area in the UK will have its own role to place in ensuring that the UK meets its target of net zero by 2050.

2.4.4 In this context, it is implicit that the Government expects local authorities to maximise their contribution towards the goal of achieving net zero targets using spatial planning and related policies.

2.5 Winchester District Proposed Submission Local Plan (Regulation 19) 2020-2040

2.5.1 The Local Plan sets out the Council's vision and objectives for future development across the Winchester district, outside the South Downs National Park. Within its Foreword, it recognises that **"the biggest challenge we face is climate change"** (paragraph 1.2) and it helpfully confirms at paragraph 2.5 that **"This Local Plan will run until 2040 and will represent a significant change from our previous plan".**

2.5.2 In this regard, the Plan places climate emergency as its heart, around which themes of carbon neutrality, sustainable transport and active travel, high quality and well-design places and living well, are considered.

2.5.3 Under the living well category at page 34 of the Plan, there is a requirement on the Plan to **"promote health by improving air quality, increasing opportunities for walking and cycling and enhancing access to outdoor recreation and the natural environment"** (part i) whilst also **"supporting measures which encourage sustainable and active travel and minimising the need to use the private car to travel."** (part iii)

2.5.4 The Plan enshrines these objectives at Strategic Policy SP1 (Vision and Objectives) which confirms that **"the Plan will meet the aims set out in the Vision and Objectives by ensuring that new development contributes towards them"** by ensuring compliance with the vision and ensuring that development proposals demonstrate how they contribute to the objectives of the plan.

2.5.5 Strategic Policy SP2 (Spatial Strategy and Development Principles) identifies the distribution of new development throughout the district. In so doing it recognises that Winchester City is a suitable location for development. It goes on to require that development will **"make the use of public transport, walking and cycling easy, and integrate the development of homes, jobs, services and facilities, to reduce car use"** (part vi). This principle is further supported by Strategic Policy CN1(Mitigating and adapting to climate change) part iii, which will require that development is designed to ensure **"sustainable travel modes of transport have been fully incorporated into the layout in a way that encourage people to use more sustainable forms of transport such as buses, cycles or walking and reduces car dependency."**

2.5.6 This thread of encouraging active and sustainable forms of travel extends into Strategic Policy D1 (High Quality, well designed and inclusive places) where it requires development to be **"connected to green/blue infrastructure, public places and street patterns, including creating safe and accessible walking and cycling routes to/from existing local services, public transport and green spaces within and beyond the development, to encourage active travel."** (part iii). Whereas Strategic Policy D5 (Masterplans) will require developments to **"reduce the need for car use and encourage sustainable modes of travel, including current provision for public transport, cycle routes, footpaths and bridleways."**(part vi) and **"include measures to mitigate the traffic impacts of the proposed development on the strategic and local road networks"** (part viii)

2.5.7 It is evident therefore that the Plan acknowledges and understands the important role that the location and design of development will play in delivering on its objectives and vision. Indeed, it enshrines this within Strategic Policy T1 (Sustainable and Active Transport and Travel) which will require planning application for development to prioritise :-

i. **A genuine choice of sustainable and active transport modes of travel; prioritising [emphasis added] walking, cycling and public transport, followed by car clubs, electric/hydrogen vehicles and lastly private fossil-fuelled vehicle;**

ii. **Development so that is reduces the number of trips made by private motor vehicle as well as maximising opportunities to walk and cycle in compliance with the Hampshire Movement and Place Framework and Healthy Streets Approach as set in the adopted LTP4;**

iii. **The concept of 20 minute neighbourhoods;**

iv. **Integrating sustainable and active travel routes into the layout with connections to the wider network..”**

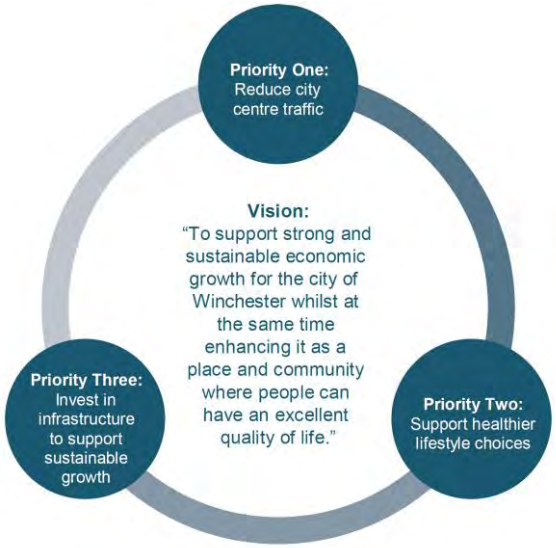
2.5.8 Based on the above, the implication here is that sustainable travel options must be delivered from first occupation. This inherently, this will therefore require development in locations that offer ingrained sustainability credentials or where development mitigation can be delivered from day one, in a commercial and viable manner, without impacting on the long-term viability of the scheme.

2.6 Winchester Movement Strategy (WMS)

2.6.1 In 2019, Winchester District Council adopted their own Movement Strategy which set out an agreed vision and long term goals for traffic and transport improvements in the City over the next 20 to 30 years. It provides a framework from which detailed proposals and specific target measures can be developed. It is very comprehensive and particularly helpful in charting a course for the promotion of the Site.

2.6.2 It has an overall vision to support the sustainable economic growth of the city, underpinned by the following three ‘priorities.

*"**Priority One** - Reduce city centre traffic, instead of 'achieve the right balance between different types of traffic'. People told us the right balance did not say what that balance should be and that we should be clear it really meant reducing levels of vehicle traffic in the city centre.*



Priority Two - Support healthier lifestyle choices, instead of a single focus on 'improving air quality'. People told us that air quality was important but not the only health issue and that active travel was also important.

Priority Three - Invest in infrastructure to support sustainable growth, instead of 'support growth and economic vibrancy'. People told us that growth in the economy was important but that it needed to be the right type of growth, supported by well-planned infrastructure.

All three of the priorities are critically related to each other. In most cases the second and third priorities are not deliverable without first achieving Priority One."

2.6.3 To address the issues, the Council has developed an action plan comprising of the following most salient aspects:

i. Extension to the Park & Ride to deliver potential -10% reduction in city centre traffic volumes. Investigations and business case on going.

ii. Bus Priority measures in unspecified locations. Further scoping work required but there is an opportunity for the Site to promote such measures.

iii. Traffic Demand Management to include travel plans and behaviour change campaigns. The development of the Site has a critical opportunity to be delivered to support this approach, deploying MaaS (Mobility as a Service) which could also be rolled out to the wider area.

iv. Re-allocation of road space in favour of pedestrians and cyclists, including contraflow cycle lanes, improved crossing facilities and route enhancements to the railway station.

2.7 Section Conclusion

2.7.1 It is implicit from the above that there will be an underlying requirement in determining an optimal spatial strategy to ensure that proposed allocations are located close to relevant amenities and job opportunities (to minimise the need to travel and reduce public transport journey times where required) and to provide a choice of non-car travel options (to minimise emissions and other costs of private car use).

2.7.2 Whilst the emerging policies are clearly seeking to respond positively to the opportunities to support sustainable living, the local plan evidence base in combination with the spatial strategy failed to properly and comprehensively evaluate and optimise the successful delivery of these polices. For example, the council's own evidence states that have modelled a predict and provide approach which does not reflect the WMS in any way. In this way, the spatial strategy works against the plans own policy objectives, rendering the contrary to policy and therefore unsound.

3 POLICY COMPLIANCE – SPATIAL LOCATION

3.1 Introduction

3.1.1 It is noted that Strategic Policy SP2 identifies the Councils proposed distribution of housing throughout the District. It does this across three defined geographical areas as follows.

- Winchester Town = 5,670 dwellings;
- South Hampshire Urban Areas = 5,700 dwellings; and
- Market Towns and Rural Area = 4,250 dwellings (of which 500 to be delivered in the South Downs National Park Local Plan area.

3.1.2 Whereas it is not for this report to comment on the suitability of the above distribution, it is noteworthy that the Plan recognises that Winchester City is a suitable and sustainable place for development to occur. Indeed, this report should be read in conjunction with the wider representations prepared by Savills.

3.1.3 This section of the report reinforces the suitability of Winchester City for sustainable development in the context of sustainable travel opportunities and the associated prospects for supporting adaptation to climate change (Policy CN3). It does this by providing a strategic level assessment of travel-to-work travel behaviour for all movement to and from the District.

3.1.4 It focuses on travel-to-work behaviour as this represents one of the largest travel requirements by frequency and distance, and which therefore has a disproportionate influence on the environmental effects of transport.

3.1.5 Of course, many commentators refer to increased levels of home working after the Covid pandemic and this is certainly the case in 2021. However, there is an increasing realisation that this will most likely take the form of a hybrid way of working, with the office still playing an important role in people's work regime – and some commentators believe a more traditional return to work will be seen over the course of several years.

3.1.6 On this basis, the study considers the travel behaviour at a strategic level considering patterns observed within the national census (2011) – with 2011 data representing unaffected by COVID-19.

3.2 Is Winchester (District) Self Contained?

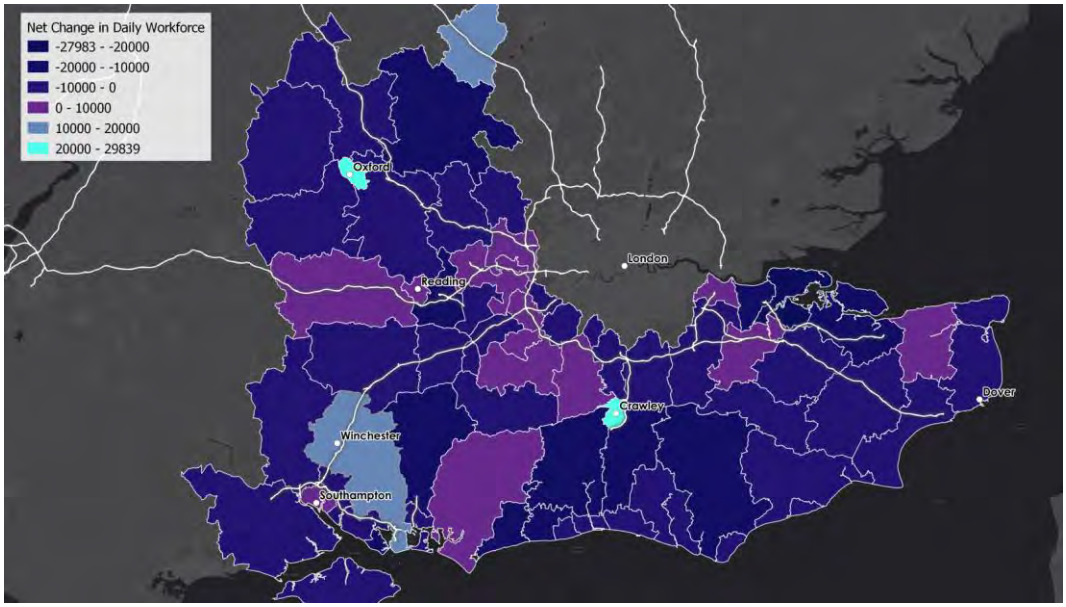
3.2.1 Consideration has been given to the balance of inward vs outward commuting to Winchester (District) which is shown as the change in daily population for each Local Area District (LAD).

3.2.2 The below Figure, which is replicated to a larger scale at Appendix A, suggests that Winchester (District) does not only experience net in-commuting (meaning that more people commute into the District from outlying areas than those people that leave the District), but that the difference is amongst the highest in the region – with only Oxford City and Crawley being comparable.

3.2.3 This suggests that there are possibly more employment opportunities within the District than there are people, or at least there are more jobs than people with the right skills – a point recognised within the Stage 1 Transport Assessment contained within the Regulation 18 Consultation evidence base.

3.2.4 Similarly, it may be a symptom of relatively high house prices in certain parts of the District, as a consequence, encourage people to live further afield where affordability is more favourable.

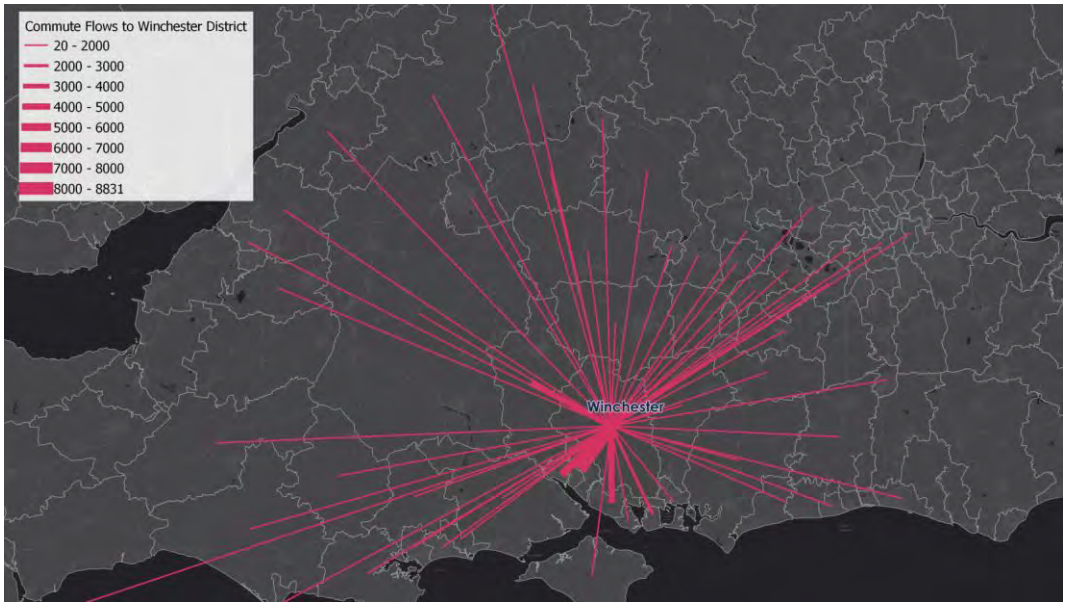
Figure 3-1 Net Change in Workforce Population



3.2.5 On this basis, the results indicate that Winchester (District) is not self-sufficient in the context that, on balance, it relies on an influx of workforce to meet the needs of the plentiful employment opportunities that exist within its limits.

3.2.6 Indeed, further interpolation of the census allows for consideration of the origins of journeys occurring into the District. The below Figure, which is again replicated to a larger scale at Appendix A, shows the relative area of influence of the District, which extends as far as central London, Bristol and Dorset. However, it also identifies that the bias of trip origins relate to Southampton, Eastleigh and Fareham, to the south.

Figure 3-2 Flow Mapper – Working in Winchester LAD from external LADs



3.2.7 Interestingly, therefore, the Local Area Districts lying immediately north, which are shown to lose daytime population in Figure 3-1 (suggestive of net out-commuting) are likely to be more closely attracted to places along the M4 corridor, such as Reading.

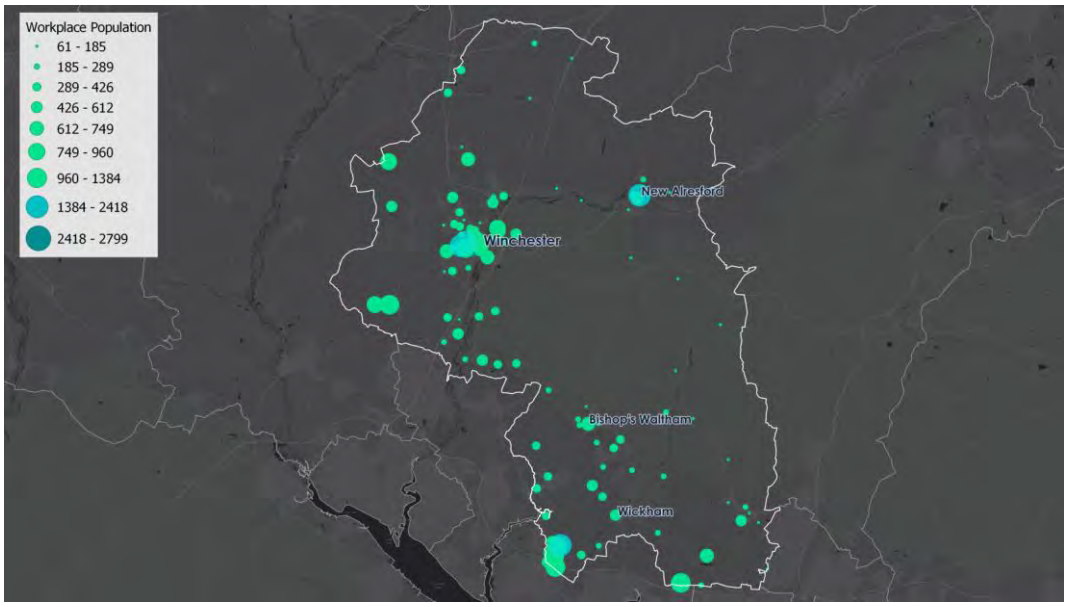
3.2.8 Consequently, there exists a relatively focused geography that could be more sensitive to policy interventions or infrastructure proposals; a more disparate picture may otherwise dilute the return from policy investments.

3.3 Where are people travel within Winchester (District)

3.3.1 If one were to then consider the distribution of the employment opportunities that exist throughout Winchester (District), it becomes clear that Winchester (City) is the focus of all activity – as shown in the below Figure and to a larger scale at Appendix A.

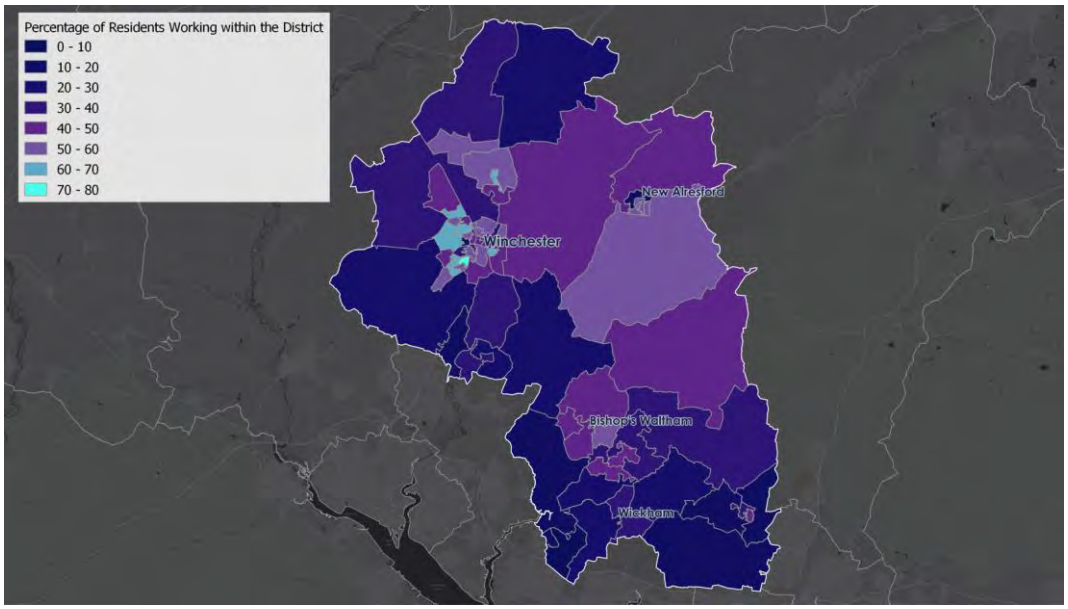
3.3.2 Indeed, Winchester (City) accounts for some 40% of all jobs within the District and which is almost four times that of the next most significant centre for job opportunity of just 11%. With the statistical analysis corroborated by the Transport Assessment (August 2024).

Figure 3-3 Workplace Zones within Winchester LAD



3.3.3 It is also interesting to note that residents that are closest to the greatest number of jobs are also less likely to leave Winchester (District) than in other locations. This is clearly evidenced in the below Figure (replicated at Appendix A) which indicates that the percentage of residents working within the District (i.e. not out commuting) is greatest around Winchester City as compared with the fringes of the District which see particularly low retention levels.

Figure 3-4 % of jobs taken by Winchester LAD residents

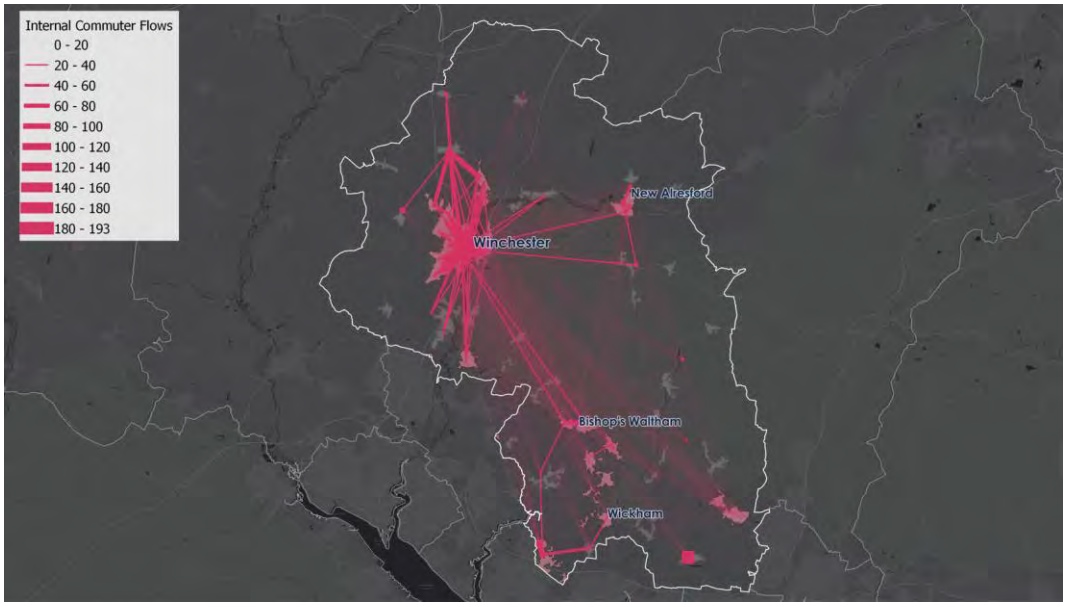


3.3.4 The influence of Winchester (City) is also clearly shown in the subsequent Figure which illustrates where people within the District begin and end their travel-to-work journey. It confirms the significant attraction of Winchester (City) relatively to any other location in the District.

3.3.5 Thus, there is a very clear picture emerging from the strategic modelling that suggest that the District attracts a workforce from much further afield and that the majority of the workforce is associated with employment in Winchester (City).

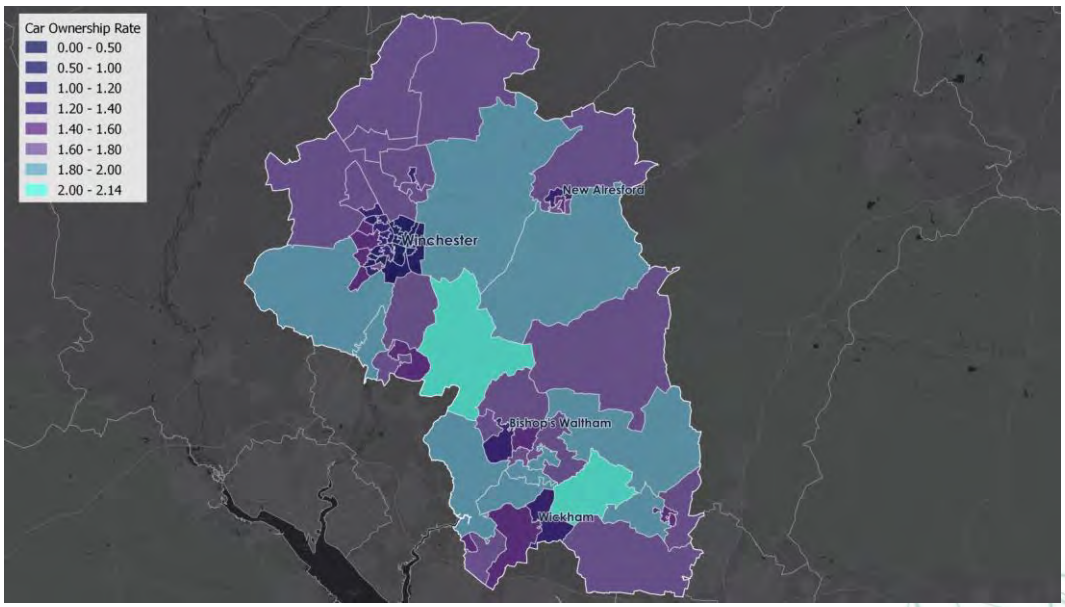
3.3.6 Consequently, in the context of responding to a climate emergency, there is the beginning of a logical argument to suggest that the majority of housing growth should be focused towards Winchester (City)

Figure 3-5 Internal Commute flows across Winchester District



3.3.7 If we explore how people undertake their journeys across the District, the below Figures identify that car ownership is amongst the very lowest in Winchester, with notable pockets at Bishops Waltham and Wiskham.

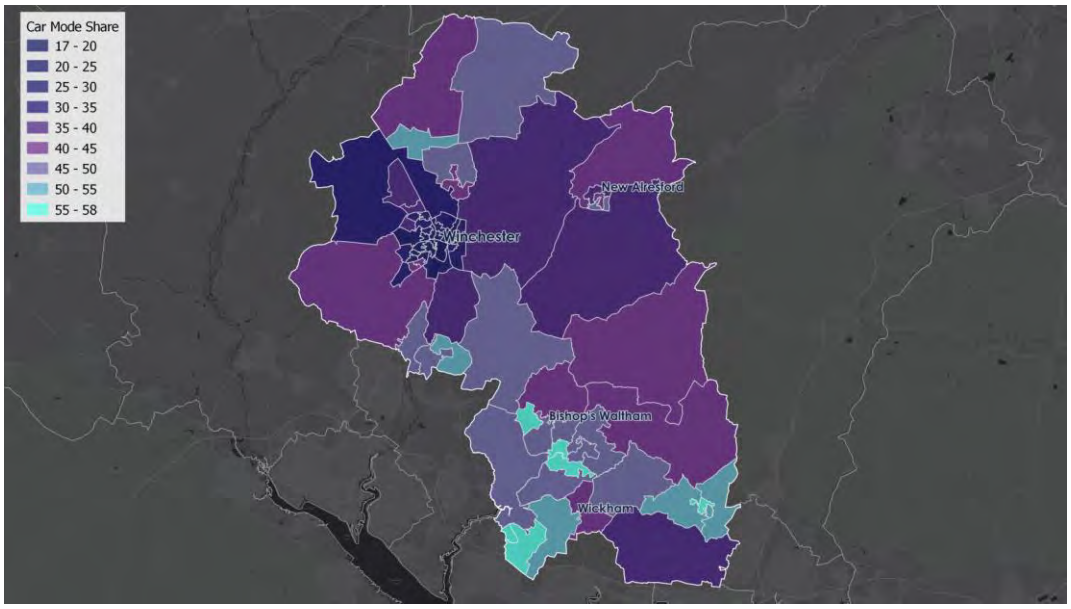
Figure 3-6 Car Ownership



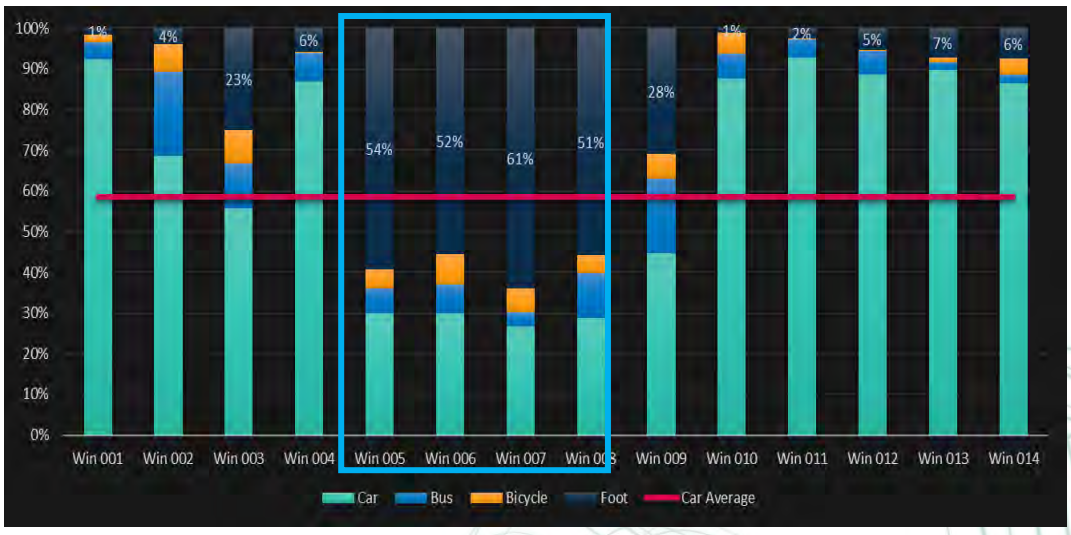
3.3.8 However, car ownership doesn't correlate directly with the number of commuter journeys undertaken by car, as evidenced in the below Figure, which shows that the immediate areas around Winchester are significantly lower than any other location within the District.

3.3.9 In this context, there appears to be an existing and ingrained behaviour in favour of non-car travel modes amongst residents that are within reach of Winchester (City). There is therefore the suggestion that further growth in these areas represent 'low hanging fruit' in maximising non-car travel behaviour amongst a growing population.

Figure 3-7 Car Mode Share for Journeys to Work



3.3.10 This is shown in a different way in the below Table, which shows the contribution of each travel mode for each Output Area within the District, and which clearly shows how the contribution of car journeys is much less in the areas that comprise Winchester (City) which are shown highlighted blue. More importantly, however, is how the balance of journeys in this area strongly favours those by foot, with journeys by foot accounting for an average of 55% of all trips within the City.



3.4 Section Conclusion

3.4.1 In summary, the Winchester (District) daytime population grows significantly which is suggestive of large-scale inward commuting patterns. These unnecessarily increase vehicle kilometres, emissions and congestion. The largest origins of trips commuting into the District are from adjoining authority areas such that proximity is a relevant consideration in the spatial distribution of new homes.

3.4.2 However, jobs are not evenly distributed throughout the District and Winchester (City) is the focus of all economic activity, accounting for 40% of all jobs and four times more significant than its next closest cluster. However, of the trips that start and end in and close to Winchester (City) 50% of trips are completed by foot, with corresponding reductions in car ownership.

3.4.3 As such, there are potentially more job opportunities within the district than there are homes – or at least affordable homes. However, the focus of those job opportunities is at Winchester (City) where affordability is known to be an issue, and which is likely to be compounding levels of inward commuting to the city.

3.4.4 Thus, Winchester (City) should be a focus of growth - not least as there is existing data that demonstrates that this is the only location within the District that enables truly sustainable travel patterns to become established.

3.4.5 Thus, development at Winchester (City) appears to be the most appropriate way to respond to the climate emergency.

4 POLICY COMPLIANCE – CO_2 EMISSIONS

4.1 Introduction

4.1.1 Further work has been undertaken to build-upon Census movement patterns identified in the previous Section of this report. In this way, a comprehensive Variable Demand Model (VDM) has been developed to enable comparison of the annualised CO_2 emissions generated from respective locations within the District.

4.1.2 A VDM model is a form of traffic model used by Local Highway Authorities and other public bodies in the cost benefit appraisal of new infrastructure projects. It adopts the principles of cost/utility – the premise being that the more costly something is, the less likely it is to be used. The model therefore considers the costs of each journey within the model – covering the whole of district and beyond – taking into account travel time by trip purpose, fuel and fare costs. A dampening component is added to reflect the 'attractiveness' value of each mode.

4.1.3 In this context, the model creates a formula for each Census Output Area that replicates people's propensity to travel by each mode. That equation can then be used to distribute journeys throughout the network, calibrated to Census 2011 data, and the mode choice determined. The residual car use is then added to the emissions model to determine CO_2 emissions.

4.1.4 Full details of the modelling process are provided in the VDM Validation Report contained at Appendix B.

4.2 Preliminary Results (Baseline Position / Without Enhancement)

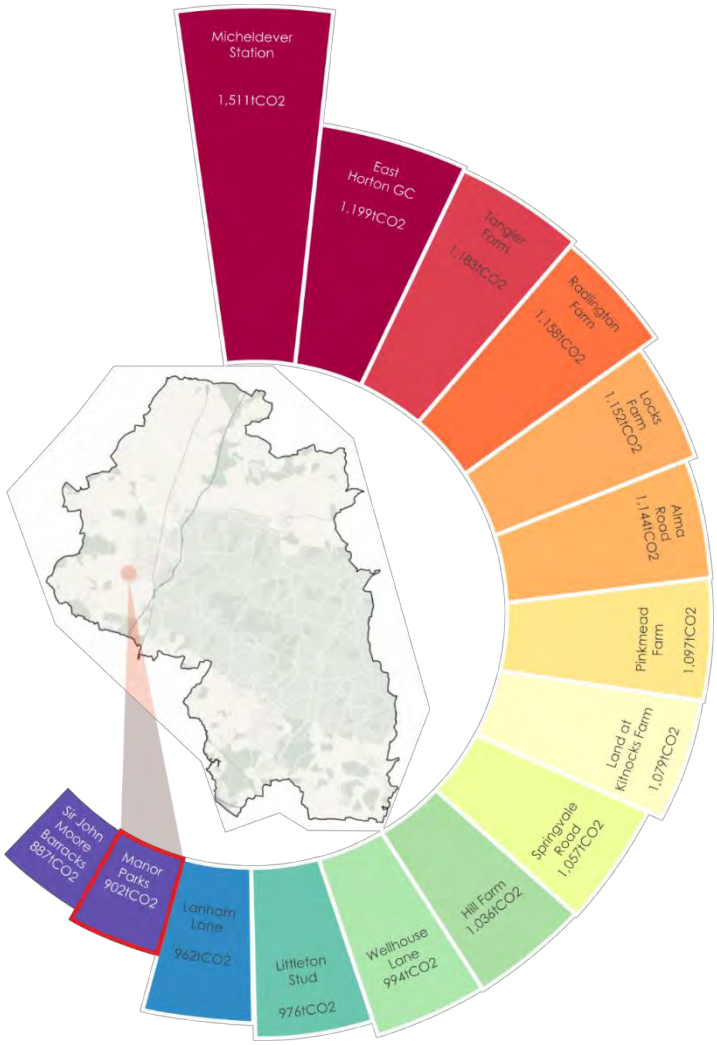
4.2.1 The calibrated and validated VDM model was used to established annualised CO_2 emissions for each of the SHEELA sites within the district, assuming that each site had capacity to deliver 1,000 dwellings. This being despite the fact that many sites were unable to deliver such a quantum. However, the approach enables fair and direct comparison in emissions.

4.2.2 The results are summarised in the below infographic which demonstrates that Sir John Moore Barracks and Manor Parks are the two stand-out locations where development can contribute to the climate emergency and minimise emissions. The results are unsurprising given that that Page 12 of the Transport Assessment (August 2024) outlines that ***"Whilst most of those who live and work in the city walk or cycle to work (60%), three quarters of those travelling into and out of Winchester for work do so by car.*** Indeed, the findings of this analysis support those contained within the Transport Assessment (August 2024).

4.2.3 Indeed, the difference between Manor Parks and the next location (Lanham Lane), as an example, equates to a carbon saving of 893 tonnes achieved from 387,000 fewer vehicle kilometres and 25,500 fewer car trips each year.

4.2.4 The carbon savings are equivalent to a car travelling around the earth 5 times over the course of the Local Plan.

Figure 4-1 Transport Carbon Emissions by SHEELA site



4.2.5 On the basis of the above, Manor Parks has been evidenced to be one of the top two locations to help deliver the objectives and vision of the Local Plan and contribute in a meaningful way to the adaptation to climate change.

4.2.6 In this regard, Manor Parks is not only a suitable location for development but is considered should be an essential component of any Local Plan. Indeed, Manor Parks would not jeopardise the aims of the plan, as other locations - which are shown to be materially less sustainable.

5 POLICY COMPLIANCE – LOCAL CREDENTIALS

5.1 Introduction

5.1.1 In recognition of the policy emphasis on the locational characteristics of development, and its influence on overall sustainability, this section of the report considers the non-car accessibility credentials of the site.

5.1.2 In this way, the report describes the availability and quality of the various travel networks accessible from the application site. The existing non-car credentials are considered by way of GIS-based modelling, using centralised travel networks and public transport data to identify the geographical catchment of each mode and the amenities located therein.

5.2 Accessibility by Foot

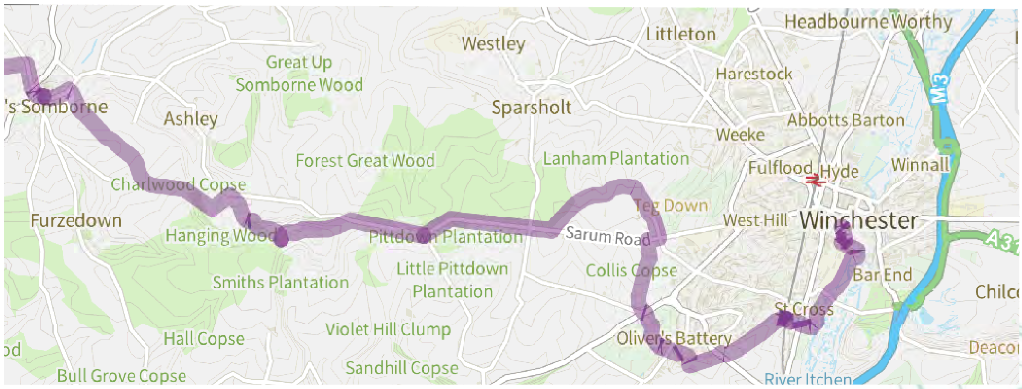
5.2.1 The site is an existing golf course with little formal pedestrian infrastructure located within the site, save for an existing Public Right of Way (PRoW) that broadly runs through the centre of the site and connects with Treble Close in Oliver's Battery to the immediate east, and onto the A3090-Romsey Road a short distance to the east of Enmill Lane, to the west.

5.2.2 The Public Right of Way is well used by local residents, dog walkers and indeed it forms part of The Clarendon Way; a 42-kilometre recreational walk route that runs from Salisbury to Winchester. The route is split into nine smaller loops – meaning it is accessible to people of all abilities, with the section incorporating the site being Route 6, which runs between Winchester and Broughton (around 14-kilometres in length).

5.2.3 The existing PRoW surface through the site is unmade. The development of the site therefore has the potential to upgrade this section to an all-weather surface to courage use throughout the seasons, helping to improve access to the countryside and support wider health policies.

5.2.4 The salient part of the Route is shown below for context.

Figure 5-1 Route 6 of The Clarendon Way



5.2.5 Adjoining the site, a network of contiguous footways exists on both sides of the A3090-Romsey Road boundary. These commence at Enmill Lane in proximity of the existing PRoW that runs through the site, and which continue eastwards into the Winchester City Centre. Contiguous footways are also available on both sides of Badger Farm Road, on the site's northern boundary, whilst the existing PRoW through the site connects onto Treble Close within Oliver's Battery, where there is a network of contiguous footways.

5.2.6 Subject to suitable connections being made to the existing infrastructure, the Site would become accessible by a well-formed network of pedestrian footpaths that provide connectivity to local bus stops on the A3090-Romsey Road and Badger Farm Road although, as discussed later in this report, the site provides an opportunity for betterment by diverting existing bus services through the site.

5.2.7 In respect of other local amenities, the St Peter's Primary School and Oliver's Battery neighbourhood centre (incorporating a convenience store and post office, bicycle shop and hair salon) lie comfortably within a 10-minute walk of the centre of the site, whilst the King's Secondary School and a Sainsbury's food supermarket are within a 20-minute walk of the centre of the site.

5.2.8 On the basis that the above amenities are all within the maximum desirable distances, as advocated the Institute of Highways & Transportation (IHT) guidance entitled Guidelines for Providing for Journeys on Foot (refer below), it is evident that the application site is located where it would afford future residents with the opportunity to walk to key local facilities.

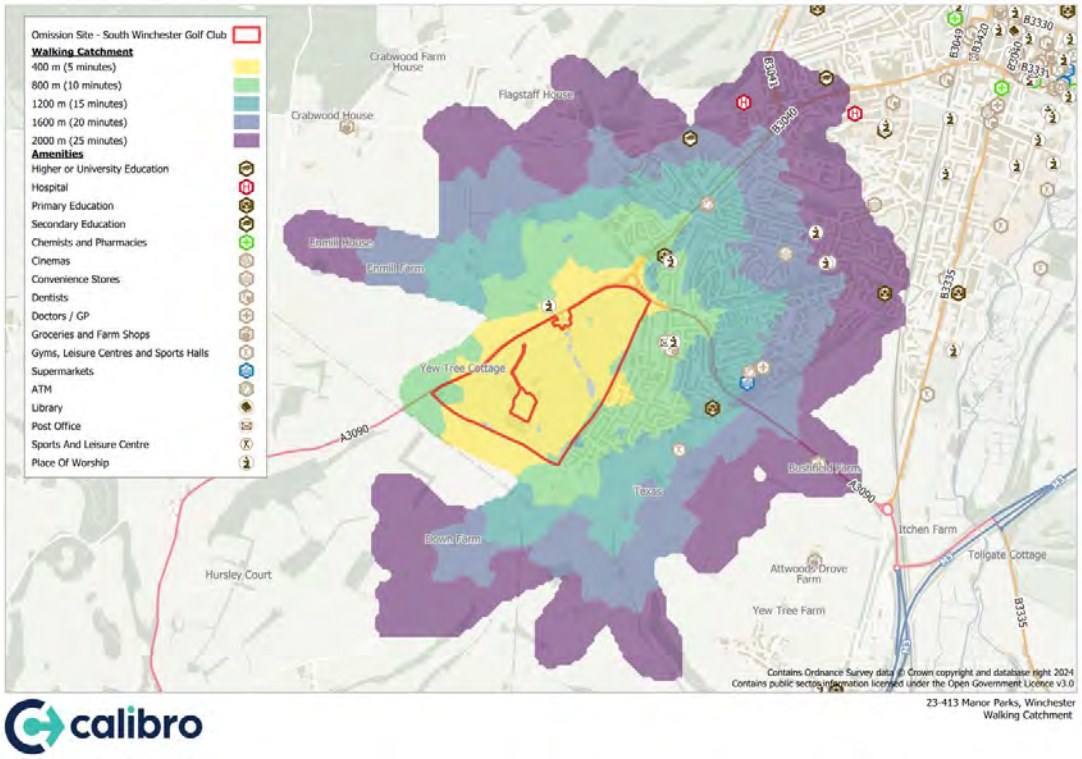
- Maximum desirable distance to nearest bus stop = 400-metres.
- Maximum desirable distance to Town Centre = 800-metres.
- Maximum desirable distance to food shopping = 1-kilometre.
- Maximum desirable distance to all other uses = 2-kilometres.

5.2.9 Moreover, the location of the site accords with the principles of the 20-minute neighbourhood, taking into account the range of other uses that would accompany the development of the site.

5.2.10 The accessible areas within these thresholds have been identified by way of a GIS-based accessibility model which has been constructed with reference to the available travel infrastructure.

5.2.11 The results are provided below and at a larger scale at Appendix A.

Figure 5-2 Modelled Walk Catchment



5.2.12 Consequently, a development of the Site would afford an opportunity for journeys to and from the site to be undertaken by foot, in line with current local and national sustainable transport policy objectives.

5.3 Accessibility by Bicycle

5.3.1 The industry-accepted distance over which cycling is considered feasible for most of the population is 5-kilometres, although it is noted that there will always be a part of the population that have a natural propensity to cycle and will be willing and able to travel further by bike, particularly for commuting purposes.

5.3.2 Indeed, National Travel Survey (Table NTS0306) highlights that the average cycle trip is currently 3.5 miles (5.6-kilometres), whereas Local Transport 1/04 indicates that "journeys up to three times [the average distance] are not uncommon for regular commuters" and noted that "fitness, physical ability, journey purpose….and conditions" were relevant factors.

5.3.3 The site is located a relatively short distance from the City Centre, the Hospital and University, with the whole of the built-up area of Winchester City lying within a comfortable 5-kilometre (20-minute) cycle ride of the site.

5.3.4 The A309-Romsey Road, which links the site to the city centre, hospital and university, is identified by the Local Highway Authority and the Council as apriority walking and cycling route, where provisional design interventions are being developed as part of the Local Cycling Walking Infrastructure Plan (LCWIP).

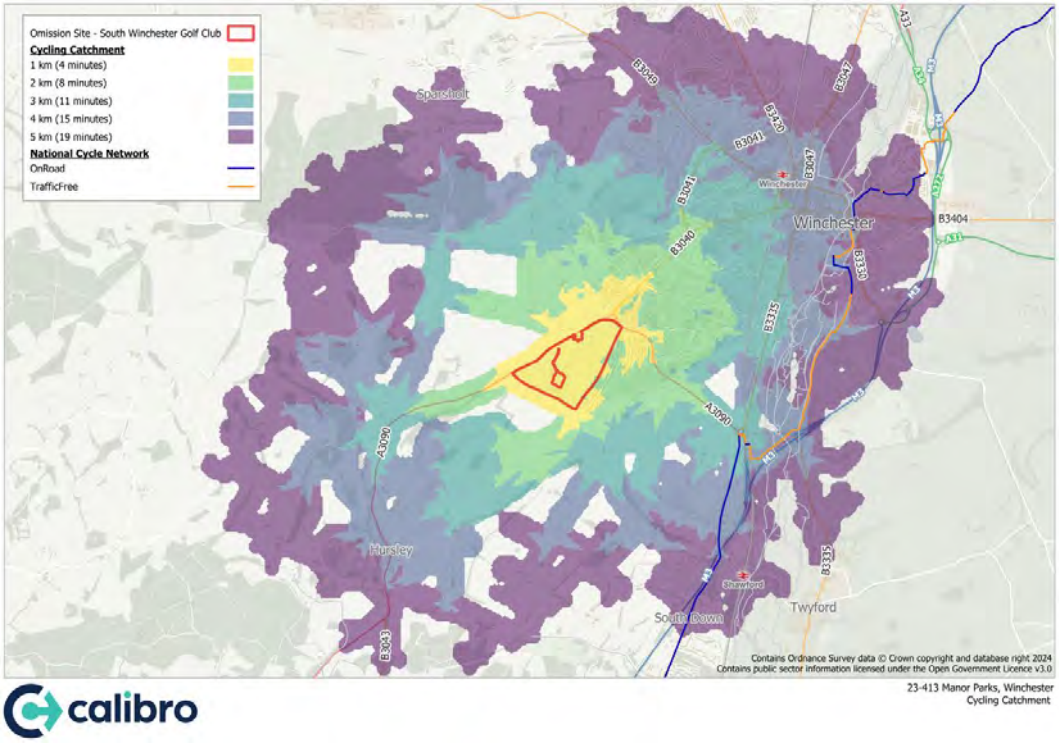
5.3.5 In this context the site lies on a future strategic cycle route towards the City Centre and delivery of the site can help to realise part of this strategic infrastructure, earlier in the Plan Period.

5.3.6 Notwithstanding, review of the STRAVA heatmap (refer below) indicates that the above cycle routes - in addition to other surrounding roads, including the A3090-Romsey Road - are well used by cyclists. It is implicit that the surrounding road network is not only safe and suitable for travelling by bike but that the spatial context of the site would help to maximise the number of journeys undertaken by bike.

Figure 5-3 Relative Cycle Use on Surrounding Road Network (Source: STRAVA)

5.3.7 On the basis of the above, the accessibility model has been used to identify the geographical areas that are accessible within 5-kilometres of the application site. The results are illustrated below whilst a larger scale plan is provided at Appendix A.

Figure 5-4 Modelled Cycle Catchment



5.3.8 Based on the model results above, residents of the South Winchester Golf Club omission site would be able to access a significant geographical area by bike, including the entirety of the build-up areas of Winchester City and Hursley, and much of Compton.

5.3.9 Consequently, a development of the Site for residential use would afford an opportunity for journeys to and from the site to be undertaken by bike, in line with current local and national sustainable transport policy objectives.

5.4 Accessibility by Bus

5.4.1 It is accepted that public transport accessibility comprises two principal aspects:

- Access **to** public transport which is concerned with how far the development is from the public transport network and the level of service on that network; and
- Access **by** public transport which takes account of where the services go and the opportunities to access amenities located within the catchment areas served.

5.4.2 In the case of the first criterion, the South Winchester Golf Club omission site is located adjacent to the Number 66 bus service which operates along the A3090-Romsey Road, whilst Park & Ride bus routes operate along Badger Farm Road. In combination, the site therefore benefits from peak frequencies of up to 16 services per hour (equivalent to one service every 4-minutes), within a walkable distance of just 400-metres of the centre of the site.

5.4.3 The distance to the nearest serviced bus stops is therefore compliant with the maximum desirable distance of 500-metres identified by the Chartered Institute of Highways & Transportation (IHT) document 'Buses in Urban Developments'.

5.4.4 In respect of bus frequencies and the areas serviced, the following Figure demonstrates that the proposal site would be accessible by several frequent bus services throughout the week, whilst the subsequent Figure illustrates the frequency service of each bus stop in the locality.

Figure 5-5 Weekday Morning Peak Bus Stop Frequencies

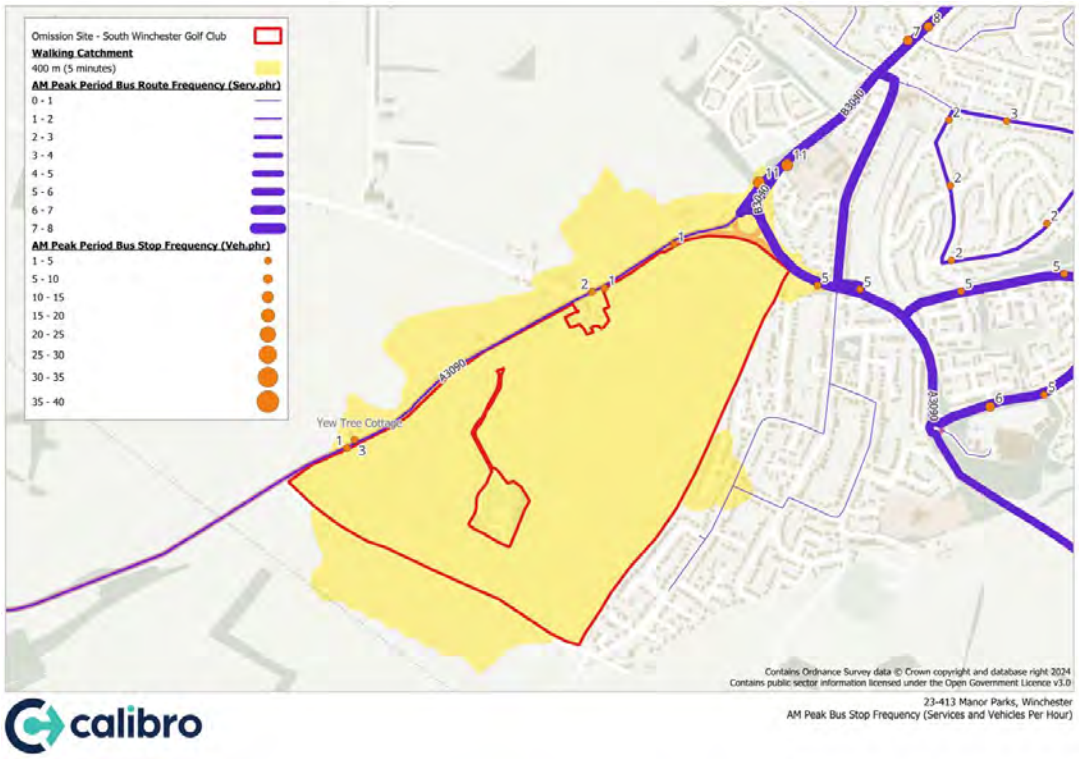
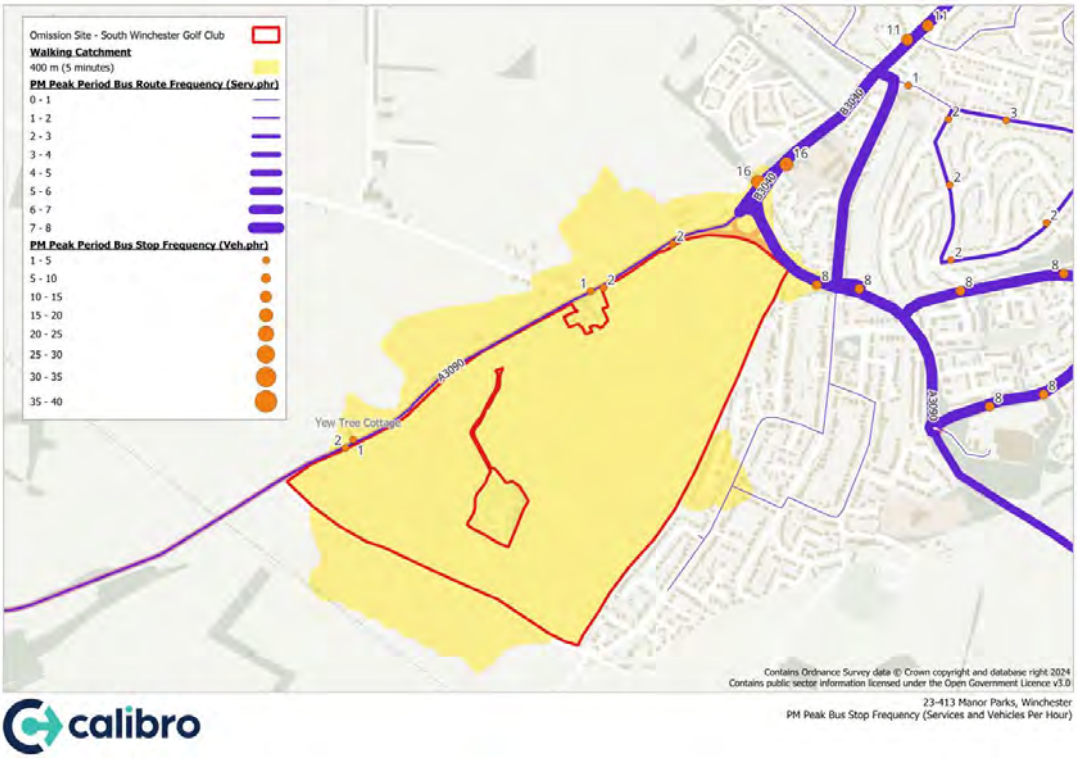


Figure 5-6 Weekday Evening Peak Bus Stop Frequencies

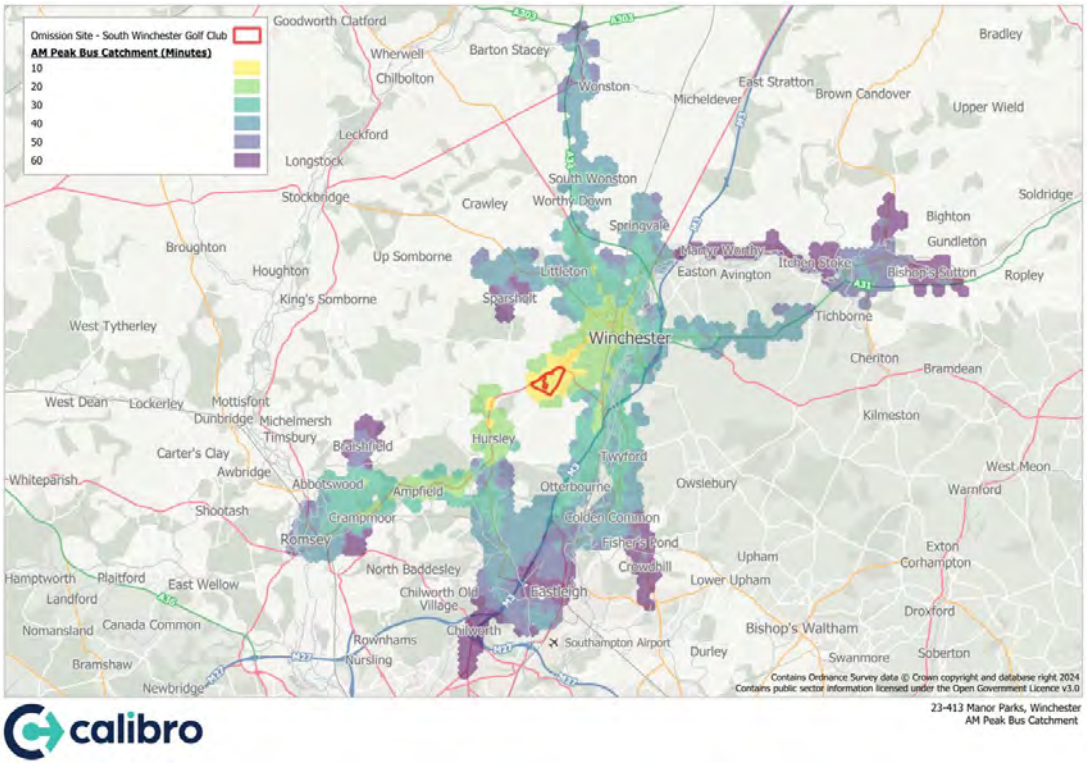


5.4.5 Further analysis has been undertaken to ascertain the value of the available bus services and in this way, the accessibility model has been used to identify geographical areas that would be accessible within a bus journey of 38-minutes, which reflects the average bus journey for commuter journeys in the South West1.

5.4.6 The results are provided in the following three Figures which represent the accessible catchments during a weekday morning and evening peak. Larger scale copies of the plans are available at Appendix A.

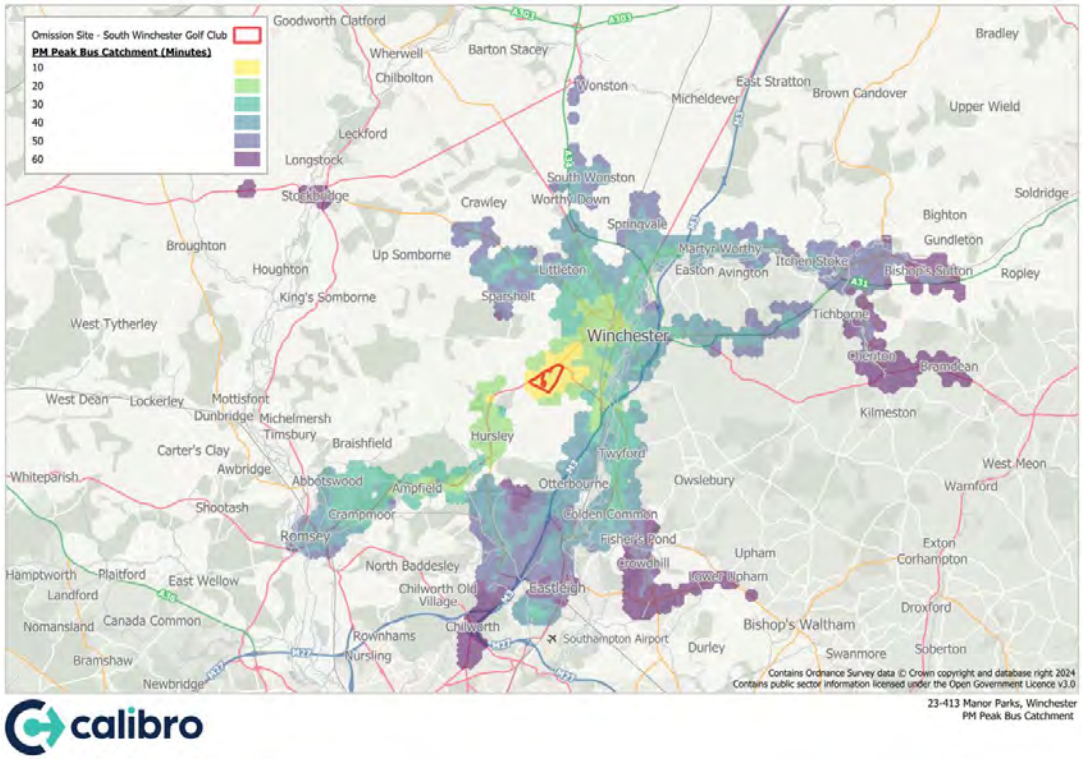
5.4.7 On the basis of the evidence above and below, the location of the Site affords good opportunities to travel by bus.

Figure 5-7 Weekday Morning Peak Bus Catchment



[1] *Table TSGB0111 – Average Time Taken to Travel to Work by Region of Workplace and Usual Method of Travel - Transport Statistics Great Britain*

Figure 5-8 Weekday Evening Peak Bus Catchment



5.5 Accessibility by Rail

5.5.1 The nearest rail station is Winchester which is located some 3.5-kilometres to the northeast of the site. The railway station is accompanied by 286 sheltered cycle storage spaces with CCTV in operation in the secure compound.

5.5.2 Services stopping at Winchester Railway Station provide onward connectivity to such destinations as Weymouth, Southampton Central, Portsmouth Harbour, Poole, Manchester Piccadilly via Coventry and Stoke-on-Trent, and London Waterloo.

5.6 Section Conclusion

5.6.1 The evidence set out within this section of the report confirms that proposal site would afford future residents with the opportunity to access a range of local amenities by several non-car travel modes, in line with the objectives of sustainable travel policies.

5.6.2 Indeed, it is evident that the development of the Site would be complimentary to Paragraph 105 of the National Planning Policy Framework (NPPF) whereby **"development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes [which can] help to reduce congestion and emissions and improve air quality and public health".**

5.6.3 In this regard, the Site presents a unique opportunity to deliver a sustainable new community with access to a range of amenities by foot, cycle, bus and car in line with the principles of a 15-minute neighbourhood. The Site would therefore not only support current sustainable transport policies but would also respond to the Council's declared Climate Emergency.

6 DELIVERABILITY (ACCESS STRATEGY)

6.1 Introduction

6.1.1 Paragraph 16(b) of the NPPF requires that Local Plan Authorities should **"be prepared positively, in a way that is aspirational but deliverable** [emphasis added]".

6.1.2 As such, there is a requirement in addressing the soundness test or meeting the basic conditions of the local plan, for the Authority (and Inspector / examiner) to satisfy themselves that there are no obvious barriers that would preclude delivery of the future allocation of the site. Albeit the level of information required is to be proportionate to the complexity of the issue.

6.1.3 In this regard, this section of the report sets out the currently envisaged access strategy covering all modes of travel, which are both deliverable and which further maximise the already excellent non-car credentials of the site's location.

6.2 Sustainable Transport Strategy (STS)

6.2.1 The evidence set out in the preceding sections of this report demonstrates that the baseline travel credentials of the site are amongst the very best options in the district. In this context, the site is not subject to potential concerns regarding long term commercial viability of bus services or reliant upon the delivery of costly infrastructure projects. Rather, the site is acceptable on its own merits.

6.2.2 Notwithstanding, in response to the climate resilience policy (CN1), the site provides an opportunity to deliver further enhancements to maximise the non-car travel opportunities for future residents of the site, together with the existing local community.

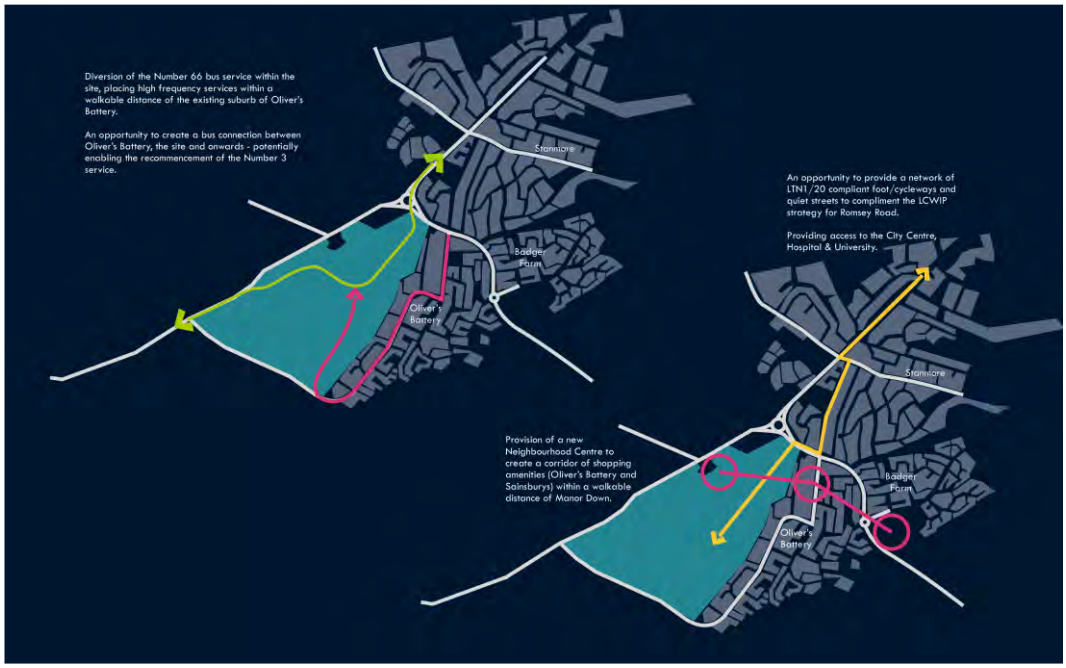
6.2.3 In this context, the proposals envisage an ability to divert existing bus services away from the A3090-Romsey Road into the site. This would not only bring high frequency bus services to the doorstep of future residents of the development but would also bring such services closer to residents of the adjoining Oliver's Battery, promoting containment, whilst avoiding existing delay at the Pitt Roundabout.

6.2.4 To facilitate this approach, an upgraded access onto the A3090-Romsey Road would work in combination with bus priority and road space reallocation measures at the Pitt Roundabout / Badger Farm Road. This would also facilitate the opportunity to deliver a new Park & Ride facility on the site's northern boundary, to resolve existing capacity limitations at the Pitt Park & Ride facility.

6.2.5 New pedestrian and cycle crossing facilities would be incorporated into the bus priority measures on Badger Farm Road, enabling connection to dedicated on-site infrastructure and potential upgrades to help deliver on the LCWIP vision – to improve connectivity to the City Centre by foot and bike.

6.2.6 A summary the strategy is provided below for context.

Figure 6-1 Sustainable Transport Strategy Overview



Endorsement of the Public Transport Operator

6.2.7 In line with the Framework (106b), the promotion of the site has been – and is continuing to be – developed alongside the valuable input of the local bus operator, Stagecoach – as detailed within the Transport Feasibility Report provided during the last consultation periods. For context, Stagecoach's view has been provided below, whilst the letter of support is contained at Appendix C of this report: -

> **"This promotion appears one of the best options for the city to delivery housing adjacent to proven commercial bus corridors. We welcome the ambition to unlock bus priority at the Pitt Roundabout, Badger Farm Road and Romsey Road [refer to Section 6.] – main roads with intense bus frequency, high patronage and further growth / modal shift potential.**
>
> **If journey-time improvements can be met for existing commercial bus services, the promotion offers an unusual opportunity to focus kick-start investment in off-peak, evening and weekend trips, to provide a truly accessible service for key workers in particular".**
>
> **Commercial Director, Stagecoach South**

6.2.8 Following from the above, collaboration with Stagecoach has continued, working toward a Statement of Common Ground, which is appended herewith at Appendix D.

6.2.9 It is therefore clear that the development opportunity at Manor Parks is of such significance, that it should form an important part of any strategy on which the need to deliver climate resilience through sustainable travel is at its heart.

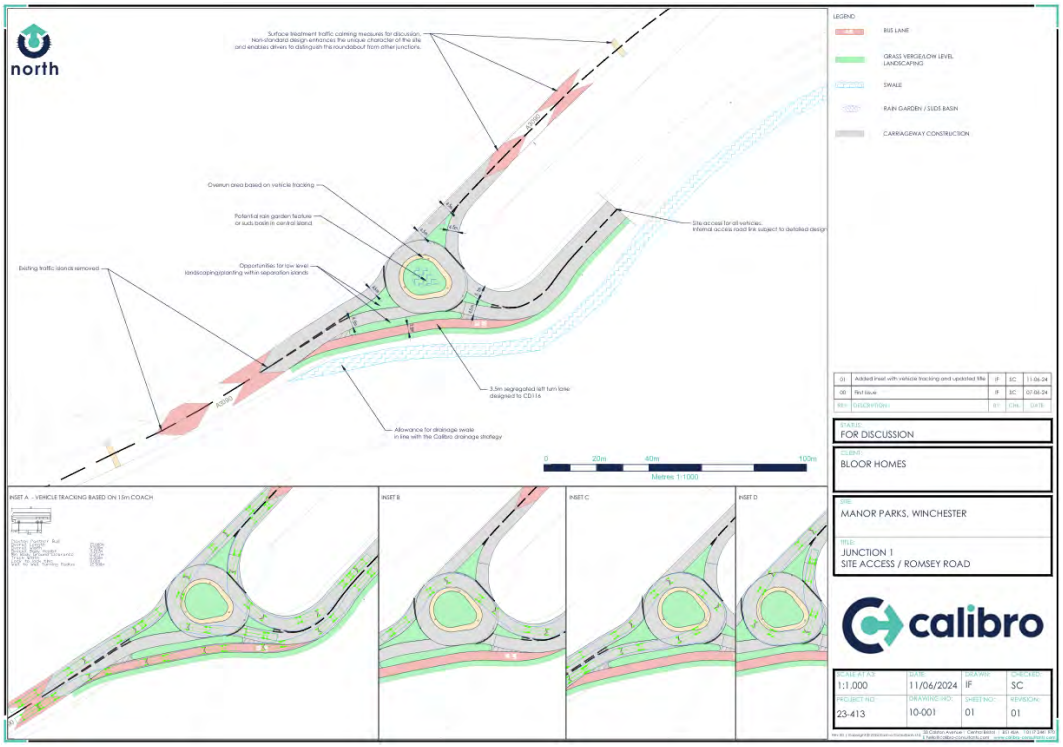
6.3 Vehicular Access Strategy

Means of Access

6.3.1 To facilitate the sustainable travel strategy, a new landscaped tear-drop roundabout junction is envisaged to be created onto the A3090-Romsey Road in the broad vicinity of the existing T-junction access to the Golf Course. The design of the roundabout would create a new gateway to Winchester whilst punctuating arrival to the development and therein respond to the principles of good design.

6.3.2 The below Figure illustrates the potential format and broad location of the junction, noting that discussions are also underway with the public transport operator regarding the potential to create bus priority for vehicles exiting the development.

Figure 6-2 Primary Vehicular Access (Romsey Road)



6.3.3 As can be seen, the above is entirely deliverable within land controlled by Bloor Homes and or public highway. In this context, the junction proposals are entirely deliverable.

Park and Ride and Bus Priority Measures

6.3.4 It is envisaged that a circa 200 space Park and Ride facility will be provided from Badger Farm Road in combination with associated bus priority measures delivered at and around the existing Pitt Roundabout. In this way, it is envisaged that, through the use of Variable Message Signs (VMS), the existing Pitt P&R could accommodate trips travelling from the A3090-Romsey Road, whilst the proposed on-site P&R would accommodate trips from the A3090-Badger Farm Road. Indeed, this report notes that Page 14 of the Winchester Movement Strategy outlines the reliability of buses and park and ride and states ***"Survey feedback indicates that users of the park and ride service are frustrated about being caught in the same congestion as all other road traffic. Delays mean that the park and ride service is no more attractive than driving, even if it is cheaper."*** As such, the identified strategy would comprise a P&R in a location that has been shown to elicit modal shift, as with the Pitt P&R – which in combination with the reallocation of existing road capacity – as advocated by the Winchester Movement Strategy – would act to improve access and journey time reliability of bus services travelling along both the A3090-Romsey Road and Badger Farm Road.

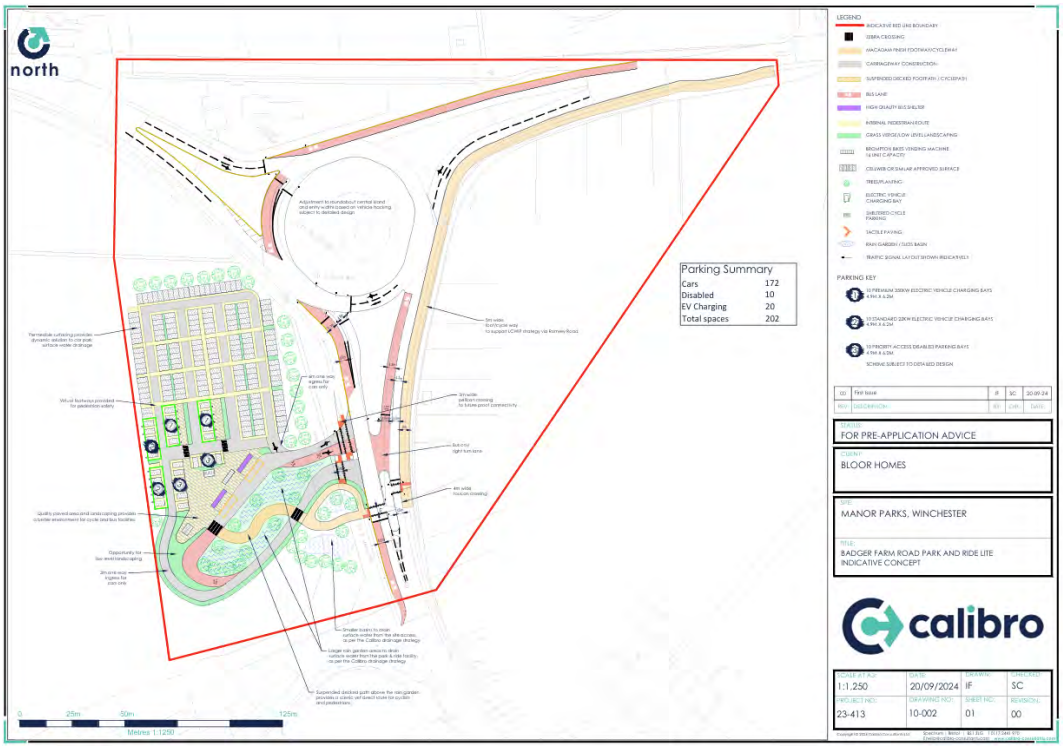
6.3.5 Such improvements would also benefit existing Park & Ride bus services operating from the South Winchester facility and in this way, the proposals would deliver disproportionality positive gains in the reliability of public transport services in the southern part of the City. The proposals therefore help to address a problem identified within the Winchester Movement Strategy.

6.3.6 Specifically, bus priority measures are envisaged to include the partial signalisation of the Pitt Roundabout and a new signalised junction that creates access into the site for buses and any traffic related to a potential new Park & Ride facility. For the avoidance of doubt, there would be no through-route for residents of the site.

6.3.7 All signals would operate via linked MOVA and incorporate loop detectors on approaches to prioritise bus movements.

6.3.8 The currently envisaged junction arrangements are shown in the below Figure and to a larger scale at Appendix E.

Figure 6-3 Potential P&R & Re-Allocation of Highway Capacity (Pitt Roundabout)



6.3.9 As can be seen, the above is entirely deliverable within land controlled by Bloor Homes and or public highway. In this context, the junction proposals are entirely deliverable.

6.3.10 Whilst further work will be required to consider issues of highway capacity, the approach advocated by the Winchester Movement Strategy to allocate road capacity in favour of public transport and non-car travel modes, means that this would be a process of finding the right balance for all road users. In this way, there are no envisaged highway capacity issues that would preclude delivery of the site.

6.4 Section Summary

6.4.1 The evidence above sets the basic framework of a sustainable travel strategy that maximises already significant opportunities to travel by non-car modes, and which deliver improvements to bus journey time reliability and reallocation of highway capacity, in support of the adopted Winchester Movement Strategy.

6.4.2 The envisaged transport strategy has the explicit support of the local bus operator.

6.4.3 Consideration has also been given to means of access by all modes, which confirm that the site can be delivered without any incumbrance.

7 SUMMARY & CONCLUSIONS

7.1 Report Summary

7.1.1 This report has been prepared on behalf of 'Bloor Homes Ltd' to support the promotion of the Manor Parks site in Winchester (formally promoted as South Winchester Golf Club).

7.1.2 By way of summary, the report has considered the following: -

- It is evident from a review of national policy that the underlying requirement in determining the adequacy of Preferred Site Allocations is to ensure that they are located close to relevant amenities and job opportunities (to minimise the need to travel and reduce public transport journey times where required) and to provide a choice of non-car travel options (to minimise emissions and other costs of private car use).

- In this context, existing policy acknowledges that the Site's proximity to Winchester and existing employment, leisure and educational amenities will be a key feature in its ability to deliver sustainable development, and potential more so that other locations further afield.

- The report has considered the site's location to the existing non-car travel networks and the type of amenities that would be accessible within a reasonable journey of the site. In this regard, the evidence concludes that the site would provide residents of a future residential development of the site with an opportunity to access an array of local amenities, including jobs, jobs and services, by a range of non-car travel modes. On this basis, the site accords with the thrust of sustainability that runs through the whole of the Framework.

- The report therefore concludes that a residential development of the site would support the social, economic and environmental strands of sustainability, as they relate to transport matters. In this regard, development of the site for residential uses would be in compliance with the NPPF.

- Deliverability has been considered in the context of ensuring that options exist to create vehicular and non-car access to the site. In this respect, the report identifies the various options that have been explored, and which remain open for further consideration, but provides detail on the preferred option.

- Specifically, the report provides detail concerning the potential to create a new access road through the railway cutting and how this could connect onto the existing public highway at Western Way, with more detailed work provided on a potential capacity upgrade at the Roman Road / A36 junction. In this context, it is considered that the report demonstrates the availability of the technically suitable accesses, as required by Paragraph 114 of the NPPF.

- The report has identified the opportunity for the site to provide a P&R lite to address the recognised need in the south of the city, – as concluded by the WMS and also supported by Stagecoach within the Statement of Common Ground.

- The report therefore concludes that there are no abnormal deliverability issues related to the on-going promotion of the site for mixed-use residential purposes.

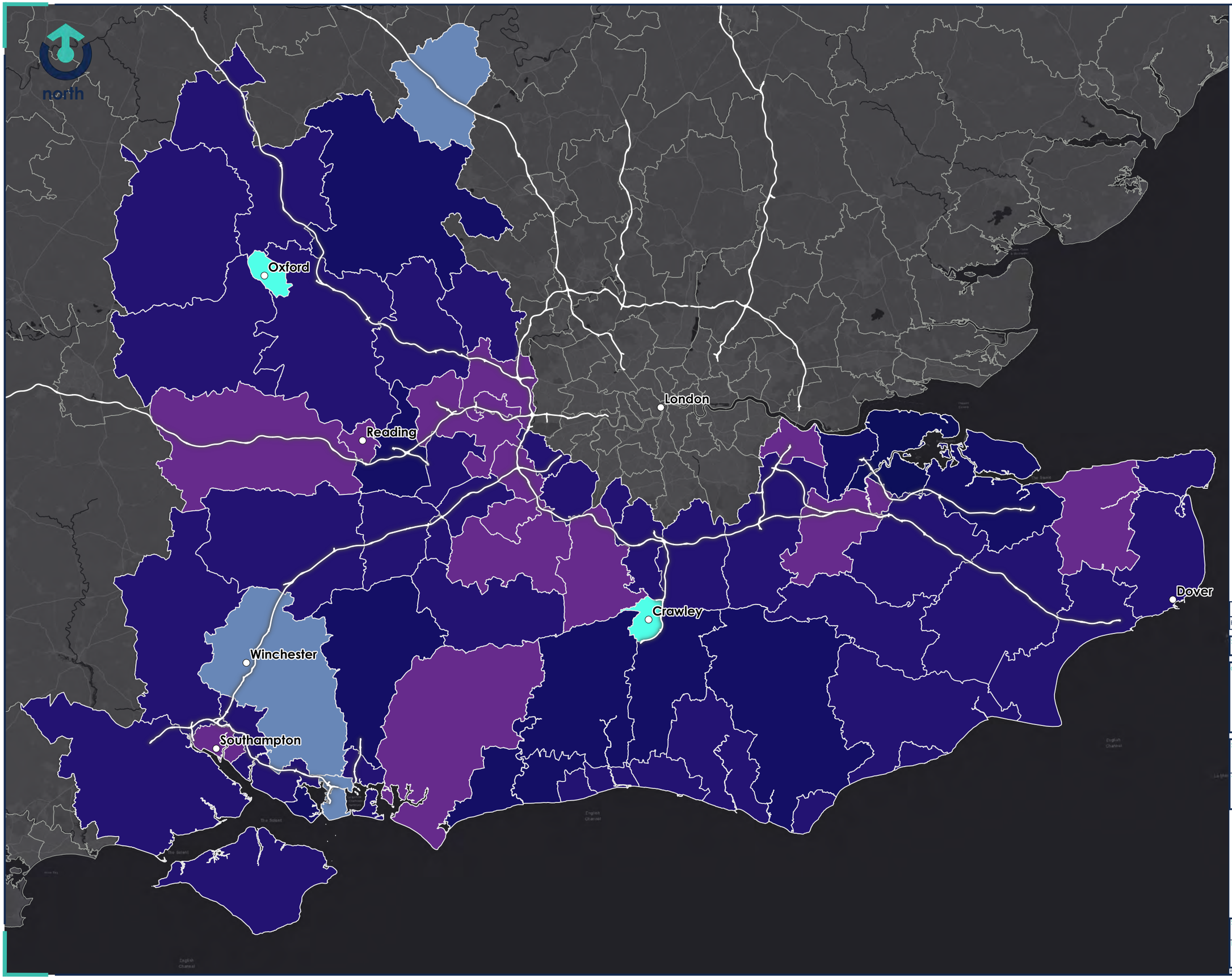
7.1.3 In light of the above, Manor Parks is located in most the sustainable location – as concluded the Council's own evidence. The site presents an unparalleled opportunity to minimise the need to travel by car to therefore maximise the opportunity for active travel, helping to increase the health and wellbeing of local communities. The site also has the opportunity to positively contribute to delivery of key sustainable travel infrastructure for the benefit of the proposed development, residents of the adjoining Oliver's battery, and the existing communities along the specified travel routes. Specifically, Manor Parks would provide additional P&R capacity in the right location to achieve meaningful modal shift which would reduce city bound car trips in line with the WMS, whilst it would also help to deliver key cycle and walking infrastructure identified in the LCWIP, earlier than would otherwise be possible.

7.1.4 Taken together, the transport credentials of accommodating development at Manor Parks would minimise the need to travel by car and to therefore reduce relative carbon dioxide emissions to the lowest levels possible.

APPENDICES

APPENDIX A

Accessibility Model Outputs



Legend

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- -20000 - -10000
- -10000 - 0
- 0 - 10000
- 10000 - 20000
- 20000 - 29839

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-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: NET CHANGE IN WORKFORCE POPULATION

calibro
Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage
81 Whiteladies Road| Bristol | BS8 2NT | T 0117 2441 970
E hello@calibro-consultants.com www.calibro-consultants.com

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:700000	01/10/2021	AF	RW
PROJECT NO:		DRAWING NO:	REVISION:
21-268		10-002	-

north

Winchester

Legend

LADs to Winchester

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- 20 - 2000
- 2000 - 3000
- 3000 - 4000
- 4000 - 5000
- 5000 - 6000
- 6000 - 7000
- 7000 - 8000
- 8000 - 8831

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: WORKING IN WINCHESTER LAD FROM EXTERNAL LADs

calibro

Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage
81 Whiteladies Road | Bristol | BS8 2NT | T 0117 2441 970
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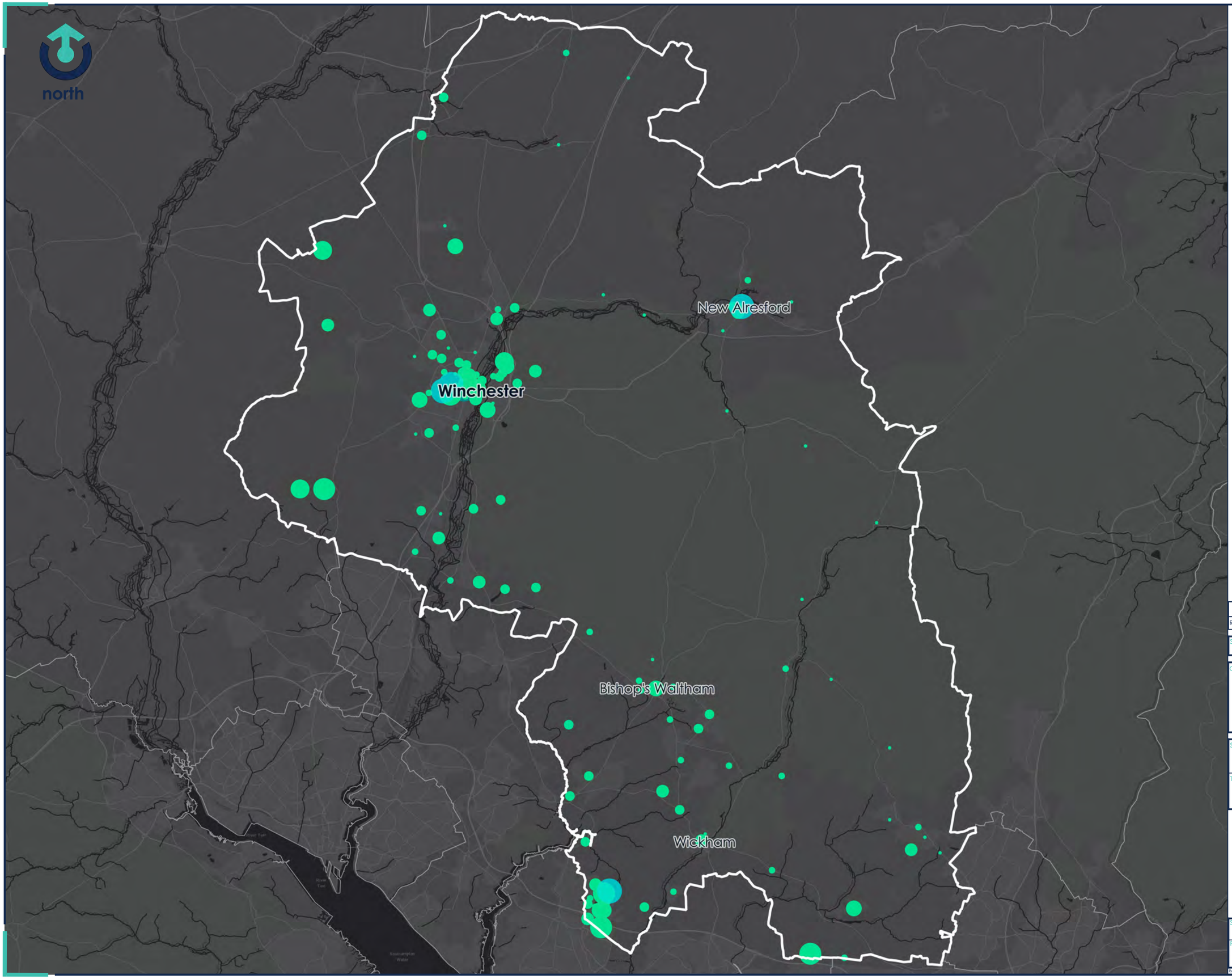
SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:700000	01/10/2021	AF	RW
PROJECT NO: 21-268		DRAWING NO: 10-002	REVISION: -



Legend

Number of Workers

- 61 - 185
- 185 - 289
- 289 - 426
- 426 - 612
- 612 - 749
- 749 - 960
- 960 - 1384
- 1384 - 2418
- 2418 - 2799

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: WORKPLACE ZONES WITHIN WINCHESTER LAD

calibro
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81 Whiteladies Road | Bristol | BS8 2NT | T 0117 2441 970
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SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:140000	01/10/2021	AF	RW
PROJECT NO: 21-268		DRAWING NO: 10-003	REVISION: -

north

Legend

% of workers living in Winchester LAD

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: % OF WORKERS LIVING IN WINCHESTER LAD

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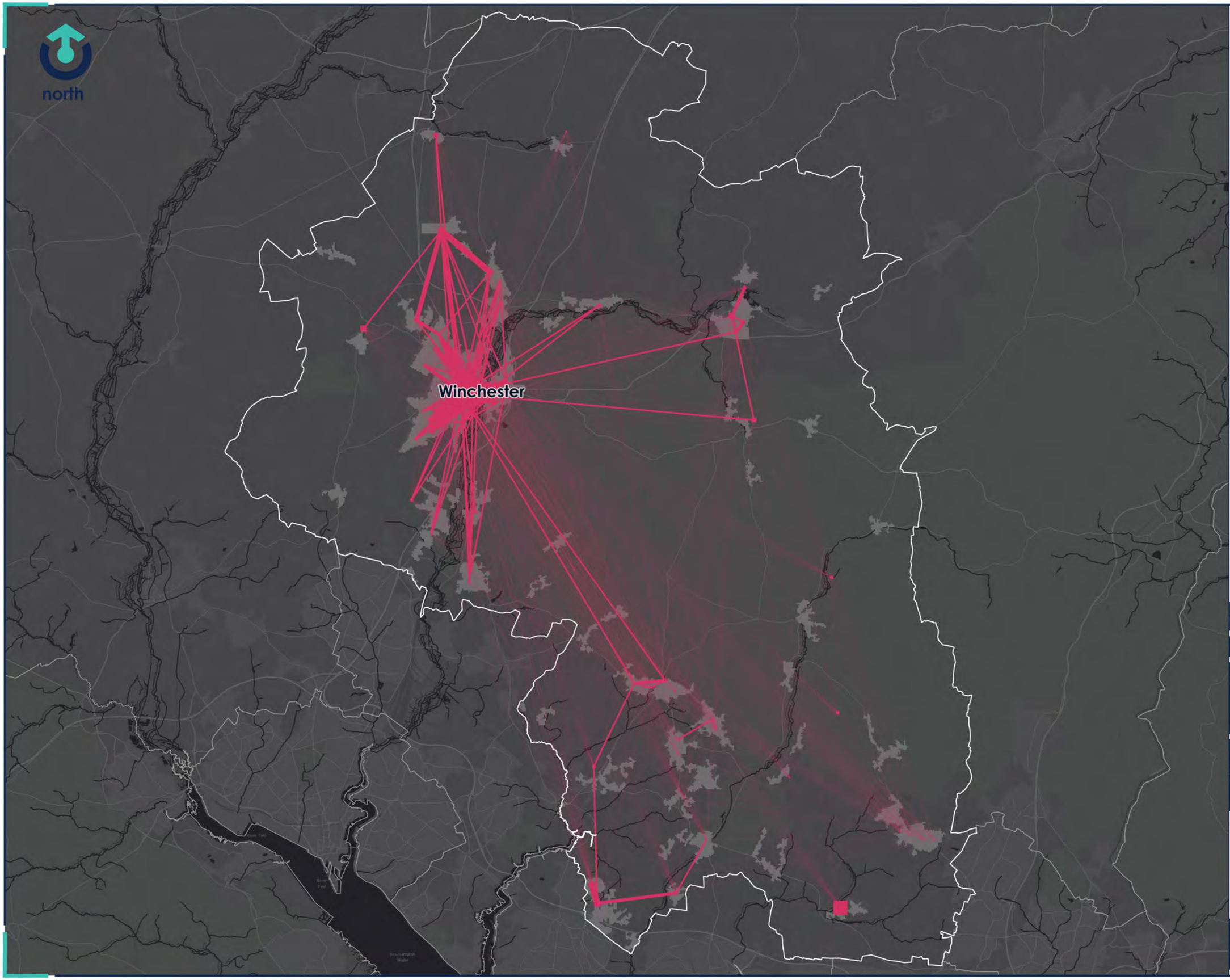
PROJECT NO: 21-268		DRAWING NO: 10-005	REVISION: -



Legend

Internal Commute Flows

- 0 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- 100 - 120
- 120 - 140
- 140 - 160
- 160 - 180
- 180 - 193

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: INTERNAL COMMUTE FLOWS WINCHESTER DISTRICT

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PROJECT NO: 21-268		DRAWING NO: 10-007	REVISION: -

north

Legend

Car Ownership

- 0.00 - 0.50
- 0.50 - 1.00
- 1.00 - 1.20
- 1.20 - 1.40
- 1.40 - 1.60
- 1.60 - 1.80
- 1.80 - 2.00
- 2.00 - 2.14

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: CAR OWNERSHIP

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1:140000	01/10/2021	AF	RW
PROJECT NO:		DRAWING NO.:	REVISION:
21-268		10-007	-

north

Legend

Car Mode Share

- 17 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 58

REV:	DESCRIPTION:	BY:	DATE:
-	FIRST ISSUE	MK	01/10/2021

STATUS: FOR INFORMATION

CLIENT: BLOOR HOMES

SITE: SOUTH WINCHESTER GOLF CLUB, WINCHESTER

TITLE: MODE SHARE - CAR

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1:140000	01/10/2021	AF	RW
PROJECT NO: 21-268		DRAWING NO.: 10-008.4	REVISION: -

Omission Site - South Winchester Golf Club

Walking Catchment

400 m (5 minutes)

800 m (10 minutes)

1200 m (15 minutes)

1600 m (20 minutes)

2000 m (25 minutes)

Amenities

Higher or University Education

Hospital

Primary Education

Secondary Education

Chemists and Pharmacies

Cinemas

Convenience Stores

Dentists

Doctors / GP

Groceries and Farm Shops

Gyms, Leisure Centres and Sports Halls

Supermarkets

ATM

Library

Post Office

Sports And Leisure Centre

Place Of Worship

calibro

23-413 Manor Parks, Winchester
Walking Catchment

Omission Site - South Winchester Golf Club

Cycling Catchment

1 km (4 minutes)

2 km (8 minutes)

3 km (11 minutes)

4 km (15 minutes)

5 km (19 minutes)

National Cycle Network

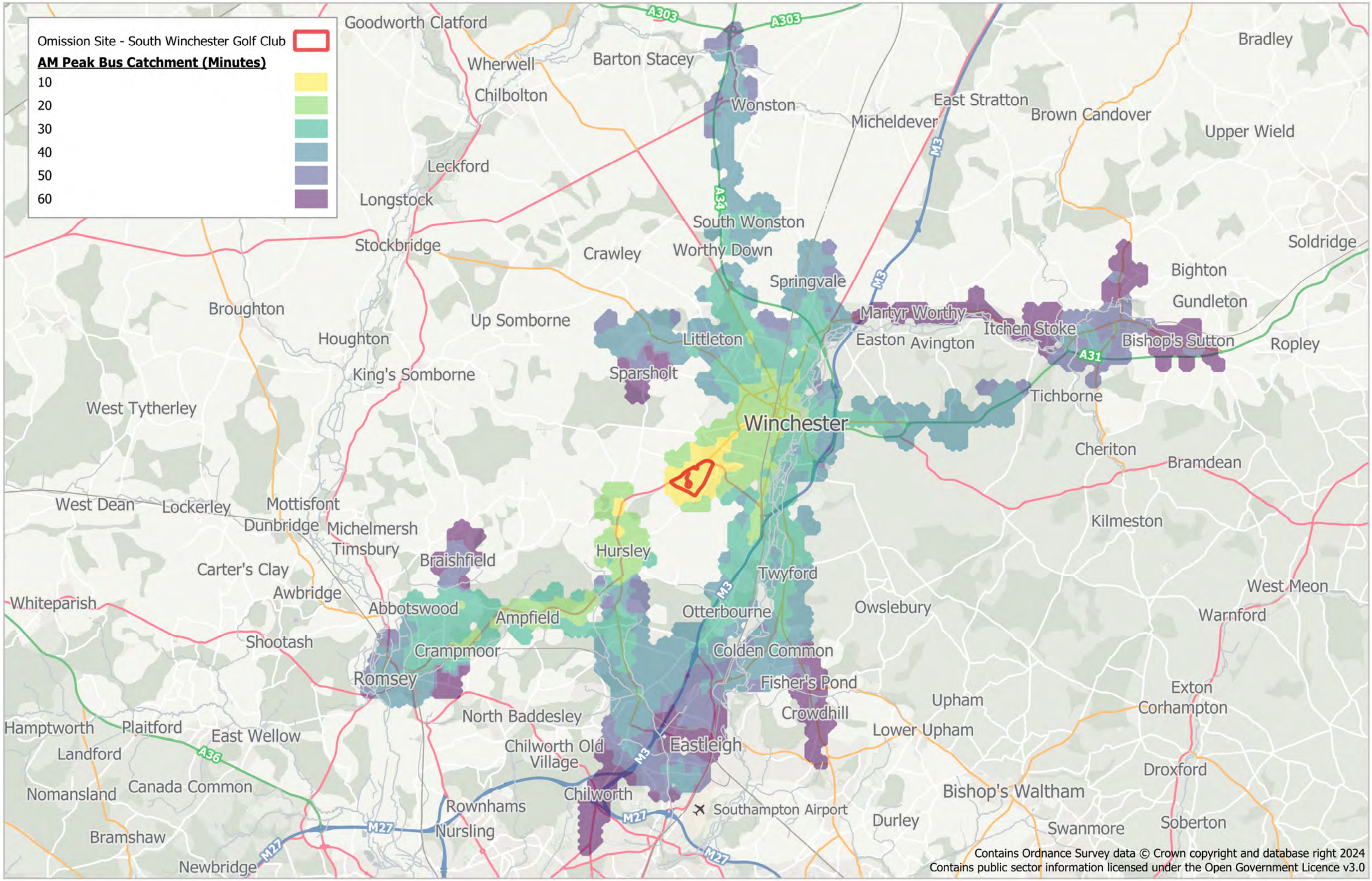
OnRoad

TrafficFree

Sparsholt
B3049
B3420
B3041
B3047
A33
A34
M3
A272
Winchester
B3404
A31
B3330
B3335
B3040
A3090
Hursley
B3043
Shawford
Twyford
South Down

calibro

23-413 Manor Parks, Winchester
Cycling Catchment



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23-413 Manor Parks, Winchester
AM Peak Bus Catchment

Omission Site - South Winchester Golf Club

PM Peak Bus Catchment (Minutes)

10
20
30
40
50
60

Goodworth Clatford
Wherwell
Barton Stacey
Chilbolton
Wonston
Bradley
East Stratton
Brown Candover
Micheldever
Upper Wield
Leckford
Longstock
Stockbridge
South Wonston
Worthy Down
Crawley
Springvale
Soldridge
Bighton
Gundleton
Broughton
Up Somborne
Martyr Worthy
Itchen Stoke
Easton
Avington
Bishop's Sutton
Ropley
Houghton
Littleton
Sparsholt
King's Somborne
Tichborne
West Tytherley
Winchester
Cheriton
Bramdean
West Dean
Lockerley
Mottisfont
Dunbridge
Michelmersh
Timsbury
Braishfield
Hursley
Kilmeston
Carter's Clay
Awbridge
Twyford
West Meon
Whiteparish
Abbotswood
Ampfield
Otterbourne
Owslebury
Warnford
Shootash
Crampmoor
Colden Common
Romsey
Fisher's Pond
Exton
Corhampton
Upham
North Baddesley
Crowdhill
Hamptworth
Plaitford
East Wellow
Lower Upham
Landford
Chilworth Old Village
Eastleigh
Droxford
Nomansland
Canada Common
Chilworth
Bishop's Waltham
Rownhams
Southampton Airport
Durley
Bramshaw
Nursling
Swanmore
Soberton
Newbridge

A303
A34
M3
A31
A36
M27

calibro

23-413 Manor Parks, Winchester
PM Peak Bus Catchment

APPENDIX B

VDM Validation Report

MANOR DOWN, WINCHESTER

(AKA SOUTH WINCHESTER GOLF CLUB)

VARIABLE DEMAND MODEL REPORT

Project No	21-268-10
Revision No	02
Issue date	12/08/22

Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage

Control Sheet

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Appendices

1 INTRODUCTION

1.1 Background

1.1.1 This report has been prepared on behalf of Bloor Homes who have commissioned Calibro to develop an objectively derived evidence base that responds to the emerging Winchester District Local Plan (2018-2039), which considers how location influences where people travel to, how they travel, and what affect this has on emissions.

1.1.2 Specifically, Bloor Homes recognise Winchester District's declaration of a climate emergency and their net zero aspirations, which imply of a need to deliver growth that not only delivers 'sustainable development', but which rather achieves 'the most sustainable' forms of development. Yet, despite the aspirations, it is unclear how this would be achieved within the scope of traditional Sustainability Appraisal.

1.1.3 To help overcome some of the limitations of a traditional Sustainability Appraisal, Calibro have developed a multi-stage carbon emissions model to evaluate the implications of any given spatial strategy / mix of site allocations.

1.1.4 The modelling approach incorporates a cost-based variable demand model using Department for Transport (DfT) WebTAG principles. This is used to determine the distribution, mode choice, and basic-level assignment of trips, whilst a sub model determines resultant tailpipe emissions for the resultant car-based journeys, at an annualised level.

1.1.5 The base model has been constructed with the use of Census 2011 data, whilst sensitivity and realism tests have been undertaken to confirm that the model is fit-for-purpose and provides a suitable platform against which it is possible to pivot and consider the implications of different interventions.

1.2 Structure of the Report

1.2.1 This report has been prepared with the purpose of aiding early engagement with Hampshire County Council, as the Local Highway Authority, and to agree the model as fit-for-purpose and suitable for testing of transport interventions.

1.2.2 It is divided into a number of sections designed to set out the nuanced approach taken in response to the net zero agenda, as follows:

- **Section 2: Justification for Variable Demand Modelling** – sets out the benefits of variable demand modelling in the context of the current purpose.
- **Section 3: Model Overview** – sets out the system approach that makes up the overall Winchester Variable Demand Model (WVDM). In this context, this section introduces the relationship that exists between each component model and establishes the transfer of data within the 'system'.
- **Section 4: Reference Travel Demand** – outlines the parameters used to define the reference demand, with reference to standard guidance.

- **Section 5: Assignment Model** – sets out the approach taken in the assignment model and outlines the independent data sources used within this assessment.
- **Section 6**: **Variable Demand Model** – details the structure and form of the component models.
- **Section 7**: **Model Validation** – evidences the results of base year validation and sensitivity tests, providing confidence in the potential for scenario testing.
- **Section 8**: **CO_2 Emissions Model** – sets out the methodology behind the transference of VDM output into the calculation of carbon dioxide emissions for each vehicle journey undertaken.

2 SETTING THE MODEL SCOPE

2.1 Introduction

2.1.1 This section of the report describes the need for and the scope of the Winchester Variable Demand Model (WVDM).

2.1.2 The WVDM has been developed to appropriately estimate the impact of potential changes to journey costs - borne from land-use changes or changes to the transport network - on peoples travel patterns. This is achieved through the creation of a validated base year model, from which future scenarios or location testing can be undertaken.

2.2 Why Variable Demand Modelling?

2.2.1 In line with preferred methodologies, the WVDM follows the variable demand structure to allow for an informed representation of the transfer of trips from one mode to another, as opposed to 'own-cost' elasticity or standard elasticity models, which more 'simplistically' calculate changes for that mode in isolation.

2.2.2 Within the variable demand structure, WebTAG identify three possible model forms, which are summarised below:

- Absolute Models – use a direct estimate of the number of trips in each category. Base year and future models are independent of each other and often require 'arbitrary' factors to replicate the observed year travel pattern. Indeed, the fit of such models for the observed base year can often be quite poor with particularly onerous calibration required.

- Absolute Models applied incrementally – use absolute model estimates to apply changes to a base matrix.

- Pivot-point or Incremental Models – use changes in cost to estimate the changes in the number of trips from a base matrix. In this way, the predictive relative changes are applied to the base matrix so that the complexities observed are preserved.

2.2.3 In accordance with the Department's recommendation, this study adopts the pivot-point / incremental model form. Given this, Calibro have considered the sample sizes contained within the base matrix to minimise the number of occurrences with zero movements. This is discussed further a Section 4 of this report.

2.3 Journeys Considered

2.3.1 As a test of the sustainability credentials of the site, this study has only considered 'home-based travel', whereby those trips to and from the site are included, whilst trips from the workplace to shopping destinations and then back to work (tours) are excluded. Indeed, the linking of trips (or trip tours) would act to misrepresent the sustainability of location.

2.4 Modelled Study Area

2.4.1 Given the intended purpose of the model, Calibro have identified the study area for the WVDM which accounts for approximately 95% of the non-car commuting traffic from the Winchester District. The study area covers an extent stretching from Southampton in the south to West Berkshire in the north incorporating an area of approximately 6,260km². For context, the modelled study area is shown in the Figure below.

Figure 2-1 WVDM Study Area

2.4.2 The identified study area incorporates circa 722,000 daily commuting trips, which have subsequently been replicated within the WVDM.

3 THE WVDM 'SYSTEM'

3.1 Introduction

3.1.1 The WVDM has been developed via the application of a series of models that have been constructed with reference to WebTAG guidance. This section provides context for each of the component models and identifies their inter-dependencies within the overall 'system' of models.

3.2 Model System

3.2.1 The WVDM follows the structure established within WebTAG Unit M1 and in this way comprises the following models and input components. Further explanation of each of the component models is provided in subsequent sections of this report.

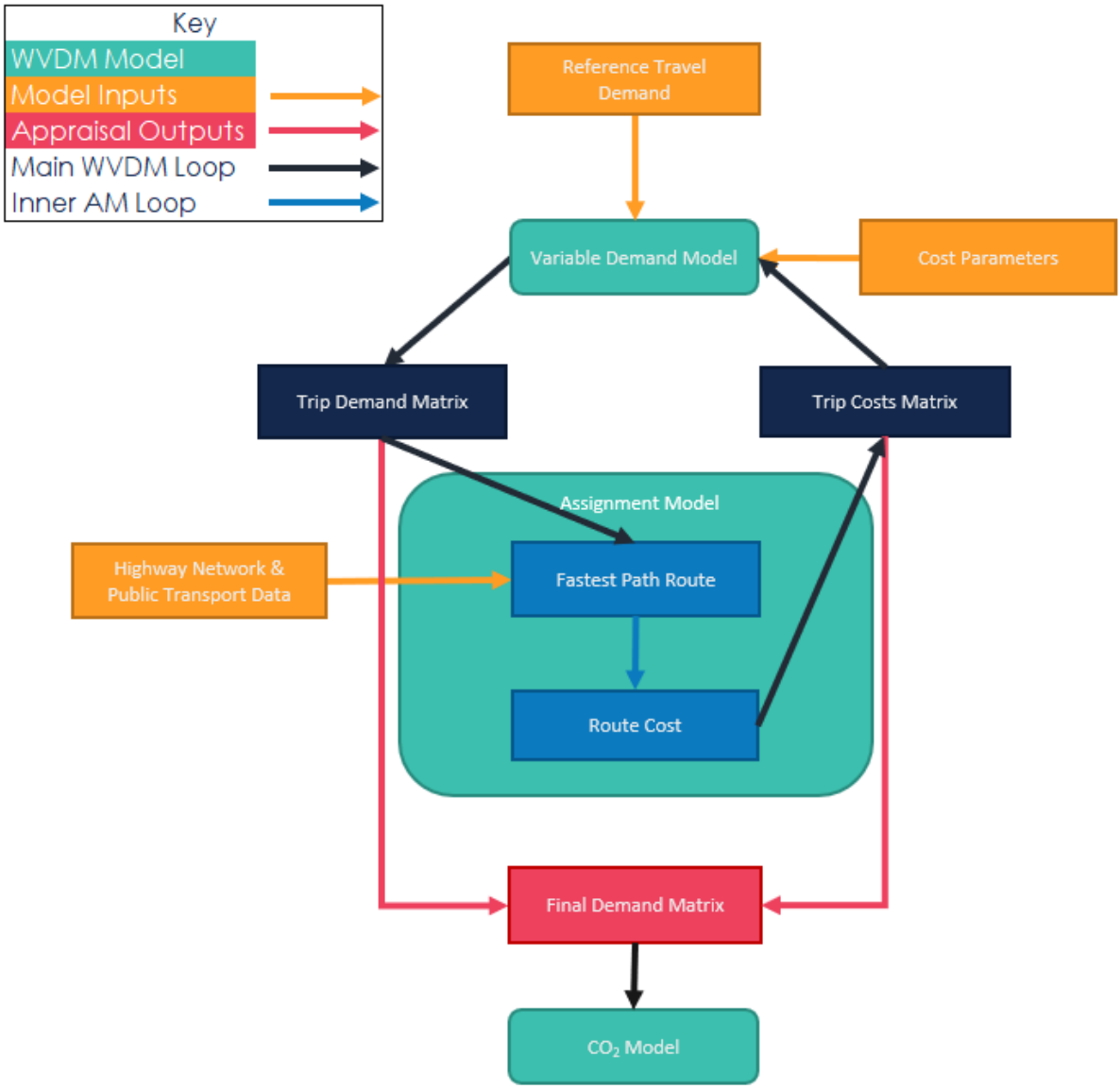
- **Variable Demand Model (VDM)** – the incremental (or Pivot) model is formed as a series of models scripted within Excel. The models receive the journey time and distance data output from the Assignment Model and alongside the input Travel Demand determine the travel costs associated with each journey. In conjunction with the Cost Parameters input, the Demand Model defines the behavioural response to those journey costs to determine the choice of mode and destination. Following Validation of the model, compilation of those choices defines the final demand matrix which are input into the CO_2 Emissions Model. Detailed discussion of the VDM is provided at Section 6 of this report.

- **Assignment Model (AM)** – highway assignment has been determined through application of a bespoke GIS based accessibility model created within Basemap TRACC. The model utilises national datasets to run multiple calculations for fastest path and shortest distance routes between zones for all modes. Subsequent journey time/distance results are then skimmed and input into the Variable Demand Model. Section 5 of this report identifies the data input and model form.

- **CO_2 Emissions Model (COM)** – following model validation, the final demand matrices are combined with tailpipe emission rates to determine the volume of CO_2 produced by each journey undertaken. Emission rates are calculated through application of UK vehicle fleet forecasts via the Defra produced Emissions Factor Toolkit, version 11.0. Further information is provided at Section 8 of this report.

3.2.2 The suite of models outlined above have been constructed in accordance with the latest WebTAG guidance and is shown diagrammatically in the figure below.

Figure 3-1 Winchester Variable Demand Model (WVDM) Structure



3.2.3 In line with standard practice, the Trip Demand Matrix output is converted from Production/Attraction to Origin/Destination for the purpose of assignment.

3.2.4 In consideration of the Trip Costs Matrix, the assignment model calculates the travel time, distance, and any relevant travel charges – such as bus fares, transfer etc – through the process of 'skimming'.

3.2.5 The demand model utilises a generalised cost matrix, which is a combination of the Trip Costs Matrix and a series of Cost parameters – informed by both local & WebTAG factors. The generalised cost matrix is expressed in units of time.

4 REFERENCE TRAVEL DEMAND

4.1 Introduction

4.1.1 This section of the report outlines the model inputs and parameters that define the WVDM system.

4.2 Model Zoning

4.2.1 In line with WebTAG guidance, the study area has been split into a 'Fully Modelled Area' and an 'Area of Detailed Modelling' (ADM) within which the zones become more smaller and more detailed. The ADM includes the entirety of Winchester District, whilst extending to incorporate zones within, Eastleigh, Test Valley, and Fareham districts. The FMA and ADM areas have been shown in the figure below for context.

Figure 4-1 FMA & ADM Areas within the Study Area

4.2.2 The zoning system developed for the WVDM is in accordance 2011 Census and TEMPro boundaries allowing for the direct comparison of planning and land-use data.

4.2.3 Given the nature of the district of Winchester and the use of Census 2011 data, this study has sought to balance the granularity of the model with statistically reliable sample sizes from which to base or 'pivot' future year results from. As such, the model incorporates 331 zones across the study area.

4.2.4 The summary of the WVDM zones by District is shown in the table below

Figure 4-2 WVDM Zoning Structure

District	Number of Zones
Basingstoke and Deane	22
Chichester	13
East Hampshire	20
Eastleigh	69
Fareham	33
Gosport	10
Hart	11
Havant	17
New Forest	23
Portsmouth	25
Rushmoor	12
Southampton	32
Test Valley	33
West Berkshire	21
Wiltshire	19
Winchester	70
Total	**430**

Intrazonal Trips

4.2.5 With regards to intrazonal trips, WebTAG guidance recommends that the size of zones within the FMA need to be considered carefully in relation to the proportion of trips that may remain intrazonal. With larger zones typically consuming more trips internally – the modelling of intrazonal trips is of importance, ensuring travel costs are realistic to reduce any bias within the model. Indeed, at the distribution stage of the model, intrazonal trips should be able to redistribute to become interzonals and vice versa.

4.2.6 As such, and in line with guidance, the WVDM has considered intrazonal trips through calculation of the average travel time to nearest three neighbouring zones. The average values have then been fixed to one third of the average value calculated.

4.3 Travel Demand Data

4.3.1 In line with guidance, and in order to correlate within national planning data, the initial travel demand has been input into the model as Production / Attraction (P/A) values. In this way, the model zones presented above have a singular value for their respective Production and Attraction potentials.

4.3.2 In line with best practice, the use of P/A within the demand model requires conversion to Origin/Destination by time period matrices for the Assignment Model. This has been detailed in Section 4.5.2 – following the description of the time periods contained within the model.

4.4 Car Availability & Journey Purpose

4.4.1 In line with WebTAG guidance, the travel demand patterns within the WVDM are segmented by person type and journey purpose as described below:

4.4.2 The person type segmentation within the model is provided as those with a Car Available (CA) and those with No Car Available (NCA). This distinction is made to ensure that any estimation of modal shift is not overestimated.

4.4.3 To ensure consistency with both Census 2011 and TEMPro datasets, this assessment has considered Journey to Work (Commuting) trip purposes only.

4.5 Temporal Scope

4.5.1 Commensurate with WebTAG guidance, the MVDM operates as a 24-hour model, represented by four-time periods; the morning peak (AM), the inter-peak (IP), evening peak (PM), and off-peak (OP). The time periods have been assigned within the model across the following peak hours:

- AM – 07:00-09:00hrs;
- IP – 10:00-16:00hrs;
- PM – 16:00:18:00hrs; and
- OP – 19:00-07:00hrs.

4.6 Origin/Destination Conversion

4.6.1 To convert P/A to O/D, the P/A matrix needs to be allocated between outbound and return movements – with return journeys transposed from the outbound. This ensures that if a mode or destination choice is made in the morning it is made in mirror for the return evening trip for example. The results of the allocation of journey to work trips, with reference to the National Travel Survey is shown below for reference.

Figure 4-3 Journey to Work Trips Breakdown

		Return Time Period				Total
		AM	IP	PM	OP	
Outbound Time Period	AM	3%	14%	45%	6%	**67%**
	IP	0%	4%	7%	3%	**14%**
	PM	0%	0%	3%	3%	**7%**
	OP	2%	4%	3%	4%	**12%**
	Total	**4%**	**21%**	**58%**	**16%**	-

5 ASSIGNMENT MODEL

5.1 Introduction

5.1.1 This section of the report considers the assignment model created for the WVDM, detailing the external inputs, calculation methods, and outputs looped back into the VDM.

5.1.2 In this way, the fastest route path between model zones has been informed by a bespoke accessibility model constructed within Basemap TRACC and in line with best practice, trips to and from zones have been produced from and attracted to population weighted centroids – provided by the Office for National Statistics.

5.2 Road Network Data

5.2.1 In line with WebTAG Unit M1.2 the modelled road network utilises the latest Ordnance Survey detailed road network 'Rrami + Urban Paths' which has replaced the Integrated Transport Network (ITN) as the most detailed road network available. Indeed, the model area currently contains approximately 645,624 network links.

Congestion Data

5.2.2 Congestion data has been provided via the implementation of INRIX speed data for all links across the Rrami road network. INRIX data is collected from observed GPS devices to provide speed data across all modelled time periods. For context, an excerpt of the road network with congestion data has been included in the Figure below.

Figure 5-1 Detail of Road Network and AM Peak Road Speeds

5.3 Public Transport Data

5.3.1 Public transport stop and timetable information has been informed by the following independent datasets: -

- Traveline National Dataset;
- Association of Train Operating Companies (ATOC); and
- National Public Transport Access Node (NaPTAN) database.

6 VARIABLE DEMAND MODEL

6.1 Introduction

6.1.1 This section of the report details the structure and form of the Variable Demand Model components within the overall WVDM system. The parameters requiring calibration within the VDM have been discussed in Section 7 of this report.

6.2 Variable Demand Model Structure

6.2.1 The VDM is an incremental model which pivots off the base year matrix to estimate the change in the number of trips as a consequence of changes to travel costs. This is the DfT's preferred method of demand modelling as it allows for the changes in travel costs to be applied directly to the base matrix whilst maintaining the complexities contained within said base matrix.

6.2.2 In line with guidance, the incremental model is formed as a hierarchical logit choice model; incorporating mode and destination choice mechanisms prior to assignment through the network. The hierarchy of the logit models is established within WebTAG and is outlined below for context: -

Figure 6-1 Variable Demand Model Hierarchy

6.2.3 The hierarchical sequence shown above follows that established within WebTAG Unit M2.1 and with this, the mechanisms placed higher in the hierarchy are reflective of the composite cost of the choice(s) made lower in the order. As such, through a cycle of the VDM the composite costs start at the bottom of the hierarchy and works its way up the levels adding a choice at each logit model stage. The choice calculations are then made down the hierarchy to provide mode share and destination outputs.

Mode Choice

6.2.4 WebTAG guidance states that it is almost always desirable to include a representation of modal choice in variable demand modelling, but the level of detail is dependent on the importance the study attaches to it. In this way, it may be acceptable to include alternative modes to car as merely a set of fixed costs.

6.2.5 This study includes the calculation of generalised costs for all 'common' modes, inclusive of car, bus, rail, cycling, and walking and is therefore more realistic in considering the possibility of modal shift.

Destination Choice

6.2.6 The destination choice logit model involves the calculation of trips between different destination zones as a result of the change in travel costs. In line with guidance, the VDM uses a doubly constrained model as zones can only attract a set number of commuters, commensurate with the recorded data.

Scaling Parameters

6.2.7 Given the incremental hierarchical model used within this assessment, it is necessary to include scaling parameters (thetas) to refer the probability of nests of alternatives or composite alternatives.

6.2.8 As destination choice is at the bottom of the hierarchy (as shown above), its sensitivity is provided by lambda, whilst mode choice is scaled by theta in line with the composite costs that are passed up the hierarchy.

Logit Model Form

6.2.9 For reference, Appendix D of WebTAG Unit M2.1 specifies the standard incremental hierarchical logit model as: -

$$p_p = \frac{p_p^0 \exp\left(\theta \Delta U_p\right)}{\Sigma_q p_q^0 \exp\left(\theta \Delta U_q\right)}$$

Where:

- p_p is the forecast probability of choosing alternative *p*
- p_p^0 is the reference case probability of choosing alternative *p* (calculated from the reference demand input into the model)
- θ is the scaling parameter (=1 for most sensitivity level of the hierarchy)
- ΔU_p is change in utility (or generalised cost) for alternative *p*, *which is given as one of two equations, depending on the level in the hierarchy:*

  Bottom level in hierarchy:

  $$\Delta U_{ijmtpc} = -\lambda(C_p - C_p^0)$$

  Above bottom level in hierarchy:

  $$\Delta U = ln \sum_n p_p^0 \exp\left(\Delta U_p\right)$$

Where:

- C_p^0 is the reference generalised cost from zone *i* to zone *j* by mode *m* in time period *t*, by trip purpose *p* and person type *c*
- C_p is the forecast generalised cost
- λ is the destination spread or dispersion parameter

6.1 Model Formulation

6.1.1 In consideration of the above, the starting point for the VDM is the calculation of generalised costs for journeys between the zones. Generalised cost incorporates elements such as, journey time, car operating costs, public transport fare cost, and parking costs (where relevant) – the calculation of generalised costs per mode is given below.

Generalised Cost Equations

6.1.2 The WVDM utilises the WebTAG equations for the definition of generalised costs for private car, public transport, and active modes. The following section outlines the equations for each mode. As per guidance, the generalised costs provided below are measured in units of time (minutes).

Private Car

$$GC_{car} = t_{walk} * v_{walktime} + t_{ride} + \frac{d * VOC}{(occ * VOT)} + \frac{c_{park}}{(occ * VOT)}$$

Where:

- t_{walk} is the total walk time to and from the car
- $v_{walktime}$ is the weight applied to walking time
- t_{ride} is the journey time spent in the car
- VOC is the vehicle operating costs per km – dependent on journey purpose
- occ is the number of people in the car (assumed to share the cost)
- VOT is the appropriate value of time
- c_{park} is the parking cost

6.1.3 The calculation of VOC within the model follows the form and coefficients provided within the DfT TAG Data Book. The equations used are outlined below: -

Fuel / energy Consumption Costs:

$$L = a/V + b + c * V + d * V^2$$

Non-Fuel Operating Costs:

$$C = a1 + b1/V$$

Where:

- L is the consumption in litres per kilometre
- V is the average vehicle speed in kilometres per hour
- a, b, c are the DfT defined coefficients for each category
- $a1$ is the coefficient for distance related operating costs
- $b1$ is the vehicle capital saving for each vehicle category (N.B. this is only relevant to working vehicles)

6.1.4 Vehicle occupancy has been informed by Census 2011 data on a zonal basis.

Public Transport

$$GC_{pt} = t_{walk} * v_{walktime} + t_{wait} * v_{waittime} + t_{ride} + \frac{c_{fare}}{VOT} + c_{interchange}$$

Where:

- t_{walk} is the total walk time to and from the service
- $v_{walktime}$ & $v_{waittime}$ are the weights applied to walking and waiting time, respectively
- t_{wait} is the total waiting time for all services used on the journey
- t_{ride} is the journey time spent in the vehicle
- c_{fare} is the fare
- VOT is the appropriate value of time
- $c_{interchange}$ is the interchange penalty for any interchanges from one service to another.

Active Modes

6.1.5 In line with WebTAG guidance the generalised costs for Active Modes; walking and cycling is given as a linear relationship with journey time.

Change in Utility

6.1.6 In line with WebTAG, the first step is to calculate the change in utility for the lowest level of the hierarchy, given by the equation: -

$$\Delta U_{ijmtpc} = -\lambda(C_{ijmtpc} - C^0_{ijmtpc})$$

Where:

- C^0_{ijmtpc} is the reference generalised cost from zone *i* to zone *j* by mode *m* in time period *t*, by trip purpose *p* and person type *c*
- C_{ijmtpc} is the forecast generalised cost
- λ is the mode specific distribution parameter

Destination Choice

6.1.7 Given the current nature of the model, the lowest level of the hierarchy is a doubly constrained distribution model. The equation for the doubly constrained distribution model is as below:

$$T_{ijmtpc} = O_{imtpc} \frac{B_{jp} T^0_{ijmtpc} \exp\left(\Delta U_{ijmtpc}\right)}{\sum_{k=1}^{N} B_{kp} T^0_{ikmtpc} \exp\left(\Delta U_{ikmtpc}\right)}$$

Where:

- T_{ijmtpc} is the forecast number of trips from zone *i* to zone *j* by mode *m* in time period *t*, by trip purpose *p* and person type *c*
- O_{imtpc} is the forecast production from zone *i* by mode *m* in time period *t*, by trip purpose *p* and person type *c*
- T^0_{ijmtpc} reference number of trips from zone *i* to zone *j* by mode *m* in time period *t*, by trip purpose *p* and person type *c*
- B_{jp} is the matrix balancing factor calculated iteratively

6.1.8 The iterative calculations to find B_{jp} ensure the destination trip end constraints are met and follow the process outlined below:

$$\sum_{imtc} T_{ijmtpc} = D_{jp}$$

$$D_{jp} = \sum_{imtc} T^0_{ijmtpc}$$

Where:

- D_{jp} is the destination trip end constraint

6.1.9 Noting that the balancing factors are normalised so that:

$$\sum_{j} B_{jp} = N$$

Where:

- N is the number of destination zones

6.1.10 The determination of the doubly constrained distribution was undertaken through the Furnessing method; whereby a number of iterative loops were conducted until the destination constraints were met.

6.1.11 As per WebTAG guidance, the first iteration of the model used the origin trip ends determined from the reference demand matrix, with subsequent iterations utilising the conditional probabilities outlined below.

Composite Utilities

6.1.12 The change in composite utility from the destination choice model is calculated as:

$$\Delta U_{imtpc} = ln \sum_{j} B_{jp} \frac{T^0_{ijmtpc}}{o^0_{imtpc}} \exp\left(\Delta U_{ijmtpc}\right)$$

Conditional Probabilities

6.1.13 Following the calculation of the composite utilities, the conditional utilities for each level if the model is given as:

Distribution (destination choice)

$$P_{j/imtpc} = \frac{B_{jp} T^0_{ijmtpc} \exp\left(\Delta U_{ijmtpc}\right)}{\sum_{k=1}^{N} B_{kp} T^0_{ikmtpc} \exp\left(\Delta U_{ikmtpc}\right)}$$

Mode Choice:

Car Available Person Type

$$p_{m/ipc} = \frac{p^0_{m/ipc} \exp\left(\theta_c^{mode} \Delta U_{impc}\right)}{\Sigma_k p^0_{k/ipc} \exp\left(\theta_c^{mode} \Delta U_{ikpc}\right)}$$

No Car Available Person Type

$$p_{m/ipc} = \begin{cases} 1 \; if \; m = public \; transport \\ 0 \; otherwise \end{cases}$$

Where:

- θ_c is the scaling parameter for the hierarchical level specified by person type c
- $p^0_{m/ipc}$ is the reference case probability, calculated from the input reference demand as below:

$$p^0_{m/icp} = \frac{\sum_{jt} T^0_{ijmtpc}}{\sum_{ijk} T^0_{ijmtpc}}$$

Updated Trip Matrix

6.1.14 The application of the conditional probabilities presented above can then be used to provide and updated trip matrix with the equations below:

For forecast origin totals:

$$O_{imtpc} = T^0_{ipc} p_{m/ipc}$$

For forecast trip totals:

$$T_{ijmtpc} = T^0_{ipc} p_{m/ipc} p_{j/imtpc}$$

6.2 Cost Damping

6.2.1 Cost damping was incorporated into the model in accordance with WebTAG guidance, whereby the following form was applied to all trips within the model:

$$G'' = t + \frac{c}{VOT_d}$$

Where:

- G'' is the modified generalised cost
- t, c are the trip time and monetary costs, respectively.
- VOT_d is the value of time which varies with distance – specified by the equation:

$$VOT_d = VOT \cdot \left(\frac{\max(d, d_c)}{d_0}\right)^{n_c}$$

Where:

- d is the trip length
- d_0 is the distance (in kilometres) underpinning the national average VOT
- d_c is the calibrate parameter to prevent short-distance trips becoming unduly sensitive to changes in utility.
- VOT is the average value of time
- n_c is the distance elasticity – 0.248 for commuting and 0.315 for other trip purposes.

6.2.2 In line with guidance, the trip length value has been calculated along the minimum distance paths between all origin-destination pairs within the base year network.

7 VARIABLE DEMAND MODEL VALIDATION

7.1 Introduction

7.1.1 This section of the report discusses the realism tests required to evidence a fully validated base year model from which to pivot off for scenario testing. Beyond this, this section details the additional Sensitivity Testing undertaken to provide further confidence in the results of scenario testing.

7.2 Base Year Realism Tests

7.2.1 As stated within WebTAG Unit M2.1 *'Once a variable demand model has been constructed, it is essential to ensure that is behaves 'realistically', by changing the various components of travel costs and times and checking that overall demand response accords with general experience'*. Calibration of such parameters is required until acceptable responses are achieved.

7.2.2 Following WebTAG guidance, the test to check if the model behaves realistically and is therefore acceptable for scenario testing is determined by its demand elasticities.

7.2.3 The demand elasticities are calculated by changing a cost or time component by a small global proportionate amount and calculating the proportionate change in travel made, the equation the calculate he demand elasticity is as below:

$$e = (\log(T^1) - \log(T^0))/(\log(C^1) - \log(C^0))$$

7.2.4 Where the superscripts 0 and 1 indicate the values of demand T, and cost C, before and after the change in cost, respectively.

7.2.5 In line with WebTAG guidance, this study has tested changes to, car fuel cost, public transport fare, and car journey time. The subsequent response changes have been detailed within the summary table below, detailed results are presented at Appendix A:

Table 7-1 Base Year Elasticity Results

	Model Elasticities				WebTAG Range	
Scenario	AM	IP	PM	OP	High	Low
Car Fuel	-0.274	-0.268	-0.274	-0.250	-0.35	-0.25
Car Journey Time	-0.232	-0.211	-0.230	-0.181	No stronger than -2.00	
Bus Fare	-0.883	-0.900	-0.889	-0.837	-0.90	-0.20

7.2.6 It is evident from the above results that with respect to the required changes in car journey time, bus fare, and car fuel costs, the base year model provides acceptable responsiveness by way of its demand elasticity results.

Sensitivity Parameters

7.2.7 The demand elasticities presented above were achieved through calibration of both the cost and through the sensitivity parameters – theta and lambda values for mode choice and distribution, respectively. With this, WebTAG outline a range that both values are expected reside – without further examination of the model. The table below shows the theta and lambda values used within the WVDM and their acceptability with reference to guidance.

Figure 7-1 Base Year Model Parameter Values

		WebTAG Range	
	Base Year Model	Minimum	Maximum
Main Mode Choice θ	0.763	0.50	0.83
Destination Choice λ			
Car	0.065	0.054	0.113
Bus	0.023	0.023	0.043
Rail	0.023	0.023	0.043
Active	0.058	-	-

7.2.8 It is noted that WebTAG guidance does not provide a recommended range for active mode destination choice. Consequently, in accordance with WebTAG unit M2.1, this assessment has sought to calibrate lambda from the observed distribution curve provided by all active mode trips within the study area.

7.2.9 The determination of the lambda distribution parameter follows the equations provided in Appendix C of WebTAG Unit M2.1 and the standardised methodology contained within 'Alternative Gravity Modelling Approaches for Trip Matrix Synthesis' produced by Feldman et al. 2012. The equations used to calculate distribution within this assessment have taken the exponential form as below:

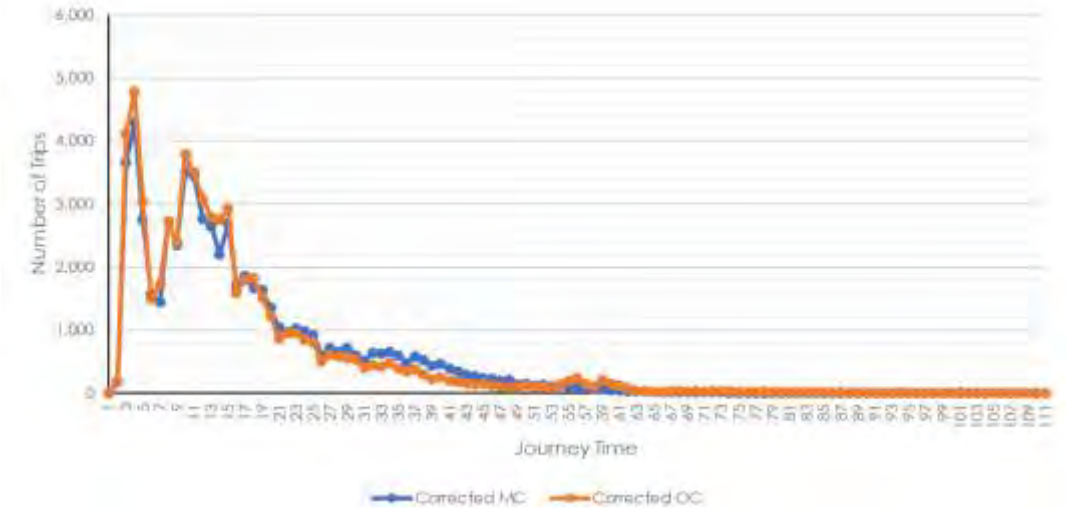
$$f(G_{ij}) = \exp(-\lambda G_{ij})$$

Where:

- fG_{ij} is the deterrence function
- λ is the mode specific distribution parameter
- G_{ij} is the reference generalised cost from zone *i* to zone *j*

7.2.10 In line with the standard methodology, lambda values were iteratively adjusted until the average travel time across the model area matched that of observed. Following multiple iterations of the model, the average travel time across the observed data and synthesised model show an excellent fit - with percentage change of -0.0027%. Further to this, the construction of a histogram of distribution evidences an R^2 value of 0.9868, whilst the distribution profiles for both the observed and synthesised data are shown below.

Figure 7-2 Active Mode Distribution - Observed vs. Synthesised



7.3 Model Adjustment/Calibration

7.3.1 In line with WebTAG Unit M2.1 the VDM was adjusted through calibration of the following parameters: -

- Sensitivity Parameters (logit model demand mechanisms)
- Values of Time
- Cost Damping function

8 CARBON DIOXIDE EMISSIONS MODEL

8.1 Introduction

8.1.1 This section of the report outlines the calculation of tailpipe carbon dioxide emissions from the results of the scenario tests output from the VDM. In this way, the Carbon Dioxide Emissions Model (COM) determines the anticipated grams of CO_2 produced for each car vehicle journey undertaken to and from each SHELAA site.

8.2 Calculation of CO_2 Emission Rate

8.2.1 In order to be able to reflect both the anticipated change in composition and the introduction of new technologies to the vehicle fleet across the UK with accuracy for future scenario testing, this study has utilised the Defra produced 'Emissions Factor Toolkit' (version 11.0) to determine CO_2 emission rates in grams per kilometre for each journey undertaken. With this, the EFT incorporates the following components to determines emission rates:

$$g/km = Vehicle\ Type\ x\ Vehicle\ Speed\ x\ Constants\ x\ Fuel\ Type\ x\ Euro\ Composition\ x\ Road\ Type$$

Vehicle Type, Fuel Type & Euro Composition

8.2.2 Given the above, the EFT incorporates detailed UK Government fleet projections from the National Atmospheric Emissions Inventory, which incorporate overall vehicle and fuel type statistics alongside the corresponding Euro composition for each fuel type. With this, this assessment has used the EFT's standard fleet projections – with no adjustments made. For context, Table 8-1 below shows the composition of the UK vehicle fleet for the current year 2022, whilst Table 8-2 shows the corresponding Euro Composition for petrol cars.

Table 8-1 UK Basic Fleet Composition by Vehicle & Fuel Type - 2022

Vehicle &Fuel Type	Percentage of UK Fleet 2022
Electric car	0.8%
Petrol car	48.2%
Diesel car	32.0%
Electric LGV	0.1%
Petrol LGV	0.2%
Diesel LGV	15.5%
Rigid	0.9%
Artic	0.4%
PSV	0.8%
Motorcycle	1.0%
Total	**100.0%**

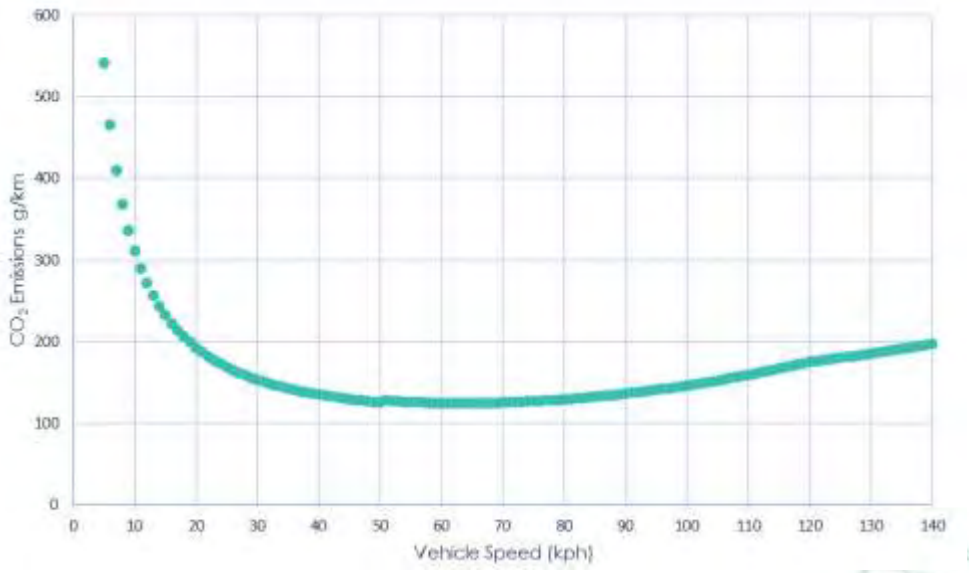
Table 8-2 Excerpt of UK Petrol Car Fleet Composition by Euro Standard and Catalyst Status

Euro Standard	Catalyst Status	% Of Petrol Car Fleet
Pre-Euro 1	NA	0.00
Euro 1	OK	0.00
Euro 1	FAIL	0.00
Euro 2	OK	0.00
Euro 2	FAIL	0.00
Euro 3	OK	0.01
Euro 3	FAIL	0.00
Euro 4	OK	0.05
Euro 4	FAIL	0.00
Euro 5	OK	0.17
Euro 5	FAIL	0.00
Euro 6_1	OK	0.11
Euro 6_1	FAIL	0.00
Euro 6_2	OK	0.25
Euro 6_2	FAIL	0.00
Euro 6_3	OK	0.30
Euro 6_3	FAIL	0.00

Vehicle Speed

8.2.3 This study has input the average vehicle speed recorded for each journey to determine the typical emission rate, with this we have assumed that each vehicle is not carrying additional load and travels on a 0% average gradient. For context, the figure below shows tailpipe CO_2 emissions produced at varying vehicle speeds - for the current year 2022.

Figure 8-1 Indicative CO_2 Emission Rates – 2022 (0% load & 0% Avg. Gradient)



Total Carbon Dioxide Emissions

8.2.4 The calculated emission rates are then factored by the total distance travelled for each journey and then by the number of vehicles undertaking that journey in line with the results of the VDM scenario tests to determine the tonnes of CO_2 anticipated from the site per annum.

APPENDICES

APPENDIX A

Realism Test Summary

		Number of Trips		Vehicle KM		
	Time Period	Observed	Modelled	Observed	Modelled	Elasticity
Car Fuel	AM	348,440	339,459	4,947,957	4,820,231	-0.274
	IP	72,808	70,970	1,042,065	1,015,724	-0.268
	PM	36,404	35,466	520,303	506,901	-0.274
	OP	62,407	60,936	880,546	859,783	-0.250
	Time Period	Observed	Modelled	Observed	Modelled	Elasticity
Car Journey Time	AM	348,440	340,807	-	-	-0.232
	IP	72,808	71,360	-	-	-0.211
	PM	36,404	35,615	-	-	-0.230
	OP	62,407	61,339	-	-	-0.181
	Time Period	Observed	Modelled	Observed	Modelled	Elasticity
Bus Fare	AM	23,711	21,796	-	-	-0.883
	IP	5,213	4,785	-	-	-0.900
	PM	2,472	2,271	-	-	-0.889
	OP	3,992	3,686	-	-	-0.837

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APPENDIX C

Stagecoach Letter of Support

6th December 2022

Stuart Choak
Director
Calibro Consultants Ltd.
81 Whiteladies Road
Bristol
BS8 2NT

Dear Stuart,

City of Winchester Local Plan Review – South Winchester Golf Club Residential Promotion

I write with regard to your client's current promotion of the site referenced above as a residential-led development for about 1000 dwellings, including a significant proportion of affordable tenures, through the City of Winchester Local Plan Review. We have been in some discussion about maximising the quality of the sustainable transport offer for some time, to fully realise the very evident opportunities that the site presents by virtue of its location in the round, and also in view of its position with regard to the existing and potential bus network.

We are aware that the Local Plan Review is currently under consultation.

Stagecoach is happy to offer its support to your client's promotion. We set out below for all stakeholder's benefit, the basis for our willingness to take this position in this case.

First, there is a very clear, significant and pressing and pressing need for affordable housing in the City of Winchester itself. The vast majority of employment in the Plan area is in and adjoining the city. Our own local business, running buses not just within the city itself but across central Hampshire, is operated from a depot in the city and we are a substantial local employer as well as a key service provider. The serious challenges we currently face recruiting drivers and other staff to maintain our operation are ultimately rooted to a great extent in the exceptionally high cost and limited availability of housing in the city. It has long been apparent from nationally available datasets that housing costs across a range of tenures relative to earnings are among the highest in the UK. This problem is not merely local but has a very clear local impact. Recent short-term retrenchment of our local network has more to do with our ability to staff the operation than demand for public transport. Looking to the future, national and local policy is seeking a greater availability and quality of public transport. For this to be deliverable requires much more affordable housing to be available, and for this supply to come on line as soon as possible.

As a local employer we are surely not alone.
Furthermore, the existing problems of traffic congestion in and on most of the approaches to Winchester can simply be explained by the gross imbalance of jobs to homes in the City, and the consequential very substantial, even exceptional house price differentials looking across the city's wider economic hinterland. This has a direct consequential impact on the efficiency reliability and operating costs of bus services in the City.

Therefore, we strongly support the principle of at least one additional strategic site to meet Winchester's acute housing needs being identified, subject to a suitable location being identified.

Your clients' site offers a clear and indeed exceptional opportunity to start to better balance the distribution of housing and jobs by providing for a rather higher level of growth adjoining Winchester itself, in a suitable and otherwise unconstrained location.

With this strategic need in mind, the South Winchester Golf Course site presents some very specific and unique characteristics that mean that growth here can benefit from an exceptional level of service by sustainable modes, and in particular buy bus services.

In addition to the fact that the site is directly adjacent to the existing built up area, providing a relatively compact built form and reducing travel distances by all modes, we would wish to highlight the following site-specific features:

- The site is at the confluence of two significant existing public transport corridors: that from Badgers Farm and that on the Romsey Road. It is served by buses from first occupation at some of the highest frequencies in the area. This includes the Park and Ride service, service 5 from Badgers Farm and service 66 from Romsey. As many as 12 buses per hour pass the site in each direction. Nowhere else around Winchester is is so high a level of existing service available to be leveraged by a site access and mobility strategy.
- The Romsey Road corridor is the focus for some of the greatest concentrations of employment – and especially service employment - in the City. The Royal Hampshire County Hospital is directly on this corridor within 2800m of the centre of the site, and immediately adjoining this are the two main University facilities. These are very substantial trip attractors, for which both bus and cycle would represent highly relevant and attractive offers, both in terms of frequency of service and relative journey time, before the larger destinations of the city centre and rail station are even considered. The majority of County Council business functions are housed in premises at the bottom of Romsey Road, or just off it. Notwithstanding a high degree of home working, the Council is itself a substantial employer and trip generator. This means that the contribution of all sustainable modes to meeting travel needs from this site can be expected to be that much higher.
- There is opportunity to provide significant additional bus advantage, allowing bus services to by-pass queueing traffic approaching the Romsey Road roundabout. There may also be opportunity to intercept and consolidate existing traffic heading into town on Romsey Road, supplementing the existing Pitt park and Ride, thus serving to avoid as far as possible any aggravation of current pressure further east on Romsey Road, which will be crucial part of the transport strategy for the site, and which will support and drive forward the achievement of the objectives in Hampshire County Council's Winchester Area Transport Strategy
- The development adjoins the established Oliver's Battery neighbourhood and there is scope to create connectivity between this and the new development. Oliver's Battery is not of sufficient size to generate demand to support a regular bus service. However it is likely to be possible to provide regular bus services within the site that are quite accessible to existing residents in the existing development, and we understand that urban design will seek to maximise this potential.

- The site is of a scale sufficient to allows for on-site delivery of a range of local services and facilities, reducing need to travel off-site, as well as making a substantial contribution to meeting housing needs.

I trust that the foregoing is clear. We look forward to working collaboratively with you and your client to maximise the opportunities for sustainable transport inherent in your project.

Yours sincerely

APPENDIX D

Statement of Common Ground

WINCHESTER PROPOSED SUBMISSION LOCAL PLAN (REGULATION 19) CONSULTATION (OCTOBER 2024)

MANOR PARKS, WINCHESTER

STATEMENT OF COMMON GROUND

Between

Bloor Homes &

Stagecoach (South) Ltd.

Project No	23-413-10
Revision No	Choose an item.03
Issue date	11/10/24

Control Sheet

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Prepared by	Signature	Date
Stuart Choak MSc CMILT MCIHT CTPP Managing Director		11/10/2024

Reviewed by	Signature	Date
Richard Woods BSc MSc Head of Transport Planning		11/10/2024

Approved for issue by	Signature	Date
Stuart Choak MSc CMILT MCIHT CTPP Managing Director		11/10/2024

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1 INTRODUCTION

1.1 Background

1.1.1 This Statement of Common Ground ('the statement') has been prepared between *Bloor Homes Ltd* (and agents acting on their behalf; *Calibro Consultants Limited* and *Savills*) and *Stagecoach*, as the relevant local bus operator in the Plan area, hereafter referred to as "the parties".

1.1.2 The purpose of the statement is to set out the parties' support for the proposed allocation and future residential-led development of a site known as Manor Parks (formerly promoted as South Winchester Golf Club). In so doing, the statement is aimed at demonstrating those matters that are in agreement between the parties and establishes a commitment to on-going collaboration to further optimise the accessibility of the site by bus.

1.1.3 In particular, this Statement assists in demonstrating that the relevant planning policies have been prepared with the active involvement of transport operators so that strategies and investments for supporting sustainable transport and development patterns are aligned (NPPF, 10b).

1.1.4 This SoCG is produced without prejudice to any other matters of detail the parties may wish to address at a future examination or intervening consultation processes.

2 OPENING COMMENTS & BACKGROUND

2.1 Stagecoach UK Bus

2.1.1 Stagecoach Bus operates an extensive network of scheduled bus and coach services both within the Plan area and is the main public transport operator serving the Winchester region.

2.1.2 Stagecoach, as a major transport provider, recognises its important role in contributing key information and advice to the plan-making process, in line with the National Planning Policy Framework and is actively involved in supporting all stakeholders involved in the development process, from planning and site identification to construction and handover.

2.1.3 Their commitment to effective partnership is evidenced by their own guidance document entitled "*Bus Services & New Residential Developments: General Highways and Urban Design advice to applicants and Highways Authorities*", dated 2017.

2.1.4 In line with the requirements of paragraph 110(b) of the National Planning Policy Framework (NPPF), the company anticipates and would welcome an opportunity to actively work with Winchester District Council and Hampshire County Council – as the Planning and Highway Authorities, respectively - to support the former's Local Plan aspirations as they relate or rely upon unlocking opportunities to travel by bus.

2.1.5 Notwithstanding, the company plans to make representations in support of the production of the Local Plan Review and this Statement should be viewed as part of the commitment towards positive engagement.

2.2 Bloor Homes Limited

2.2.1 Bloor Homes is one of the leading privately owned housebuilders in the UK housebuilding sector. We are able to meet the increasing demands from a wide range of customers, including housing for both the affordable and open market sectors. In this way, Bloor Homes are well positioned to help the Council deliver their plan objectives regarding delivery of much needed sustainable homes for all demographics.

2.3 Partnership Approach

2.3.1 The parties have a long-standing history of working in partnership to deliver non-car transport solutions at new developments around the Country and this Statement provides a basic framework for collaboration as it relates to Land at Manor Parks, Winchester.

2.3.2 The existing relationship is therefore considered by both parties to be conducive to delivering mutually positive outcomes to enable further sustainable development in

the area whilst supporting commercial operations of Stagecoach Bus and thereby maximising the long-term viability of bus services across the network.

2.3.3 Both parties agree to continue to work effectively and positively to identify an optimised bus strategy to service the opportunity at Manor Parks, Winchester, as part of a comprehensive and vision-led sustainable transport strategy.

3 THE LOGICAL LOCATION FOR GROWTH

3.1 Locational Context

3.1.1 The parties are cognisant of the need under the National Planning Policy Framework (NPPF) to provide the right homes in the right locations which are or can be made sustainable. Notwithstanding, both parties agree that the legal obligation to achieve Net Zero at the national level creates an implicit requirement to prioritise those locations which can maximise the use of sustainable travel modes.

3.1.2 For both parties, this means prioritising those sites that are not reliant on retrofitting sustainability principles through costly investment in new infrastructure or services, given that the long-term sustainability of such investments can sometimes be questionable, but they can also negatively impact on the delivery of social/affordable housing and other social assets that are often funded by development.

3.1.3 Stagecoach (South) Ltd. supports the proposed allocation of Land at Manor Parks, Winchester as fundamentally the site is located on the fringe of the urban settlement with the highest frequency, most reliable and commercially viable public transport services in the district. Indeed, not only is it the best location but the alternatives out of Winchester are materially poorer and unsustainable. In this way, both parties agree with the baseline summaries in the Transport Assessment (August 2024). In terms of bus service frequency, it is noted that the combination of local and park and ride services the site provides an unparalleled opportunity to provide a combined frequency of circa 5 minutes in peak periods.

3.1.4 Beyond the benefits to the potential residents of the site, it is considered that the site also has the opportunity to provide connections to help restart a viable Oliver's Battery service although both parties agree this is not necessary to make the scheme acceptable in sustainability terms.

3.1.5 The parties therefore strongly agree that delivery of much needed new homes in this location is a logical way of meeting housing needs very close to established and successful day-to-day amenities. In so doing, delivery of housing at Manor Parks, Winchester is likely to make walking, cycling and public transport use greatly more relevant and attractive compared to other parts of the District.

4 EXISTING BUS SERVICES

4.1 Existing Bus Services & Frequency

4.1.1 Stagecoach (South) Ltd. operates Services 5, 46, 66, and the Winchester P&R via the Pitt P&R stop. In combination with services 63 and N1 (operated by others), these services provide a combined frequency of 11 to 16 buses per peak hour (morning and evening peaks, respectively), equivalent to circa one every 5-minutes throughout the busiest times of the day.

4.1.2 These services are operated under commercial contract without public subsidy. They are thus commercially viable, and Stagecoach (South) Ltd. have no concern regarding their commercial viability in the long term.

4.1.3 The parties therefore agree there is no foreseeable risk to material changes in bus service provision at this location.

5 MASTERPLANNING OPPORTUNITIES

5.1 The Need for an Additional Park & Ride

5.1.1 Both parties agree with the Winchester Movement Strategy in that there is a need for additional park and ride capacity in the city. Whilst both parties accept there is a need for new capacity in the north of the city, actually there is a greater need to the south - with the Manor Parks site providing the opportunity for a park and ride site in the right location. Conversely, the South Winchester park and ride is in the wrong location as it forces buses to wait in the same queues as experienced by normal traffic. The park and ride lite site would therefore help deliver a removing away from private car travel, reducing citybound traffic in line with the WMS.

5.2 P&R Lite at Manor Parks

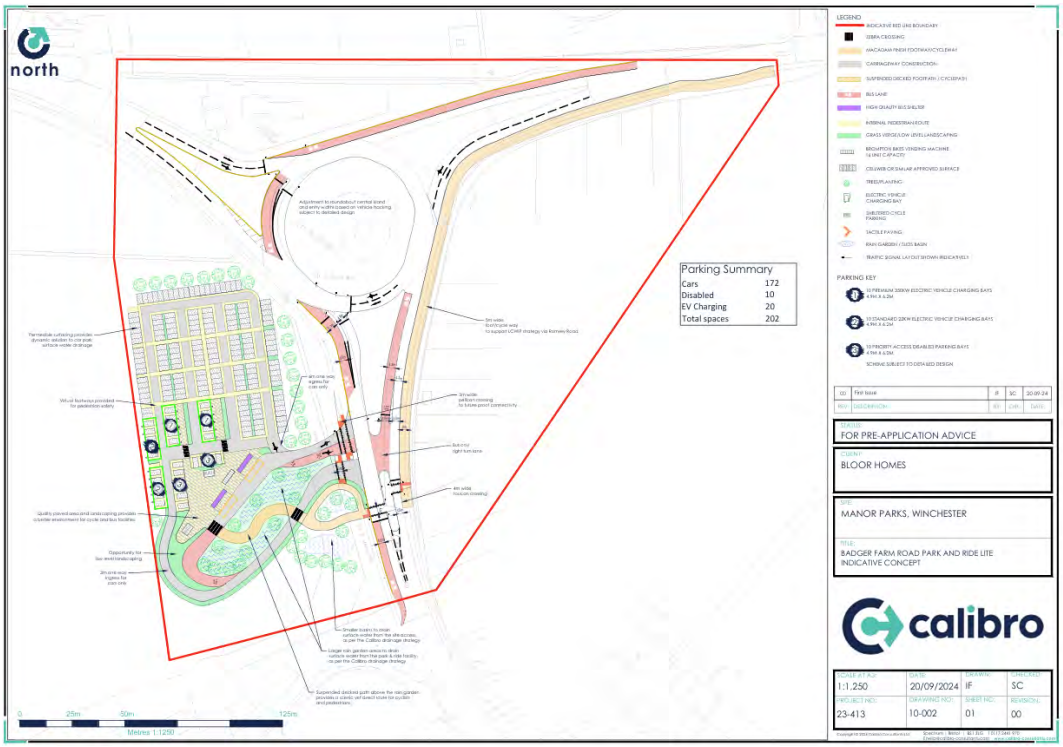
5.2.1 Given the above, both parties have worked collaboratively to design a circa 200 space Park and Ride facility – accessed from Badger Farm Road in combination with associated bus priority measures delivered at and around the existing Pitt Roundabout. In this way, it is envisaged that, through the use of Variable Message Signs (VMS), the existing Pitt P&R could accommodate trips travelling from the A3090-Romsey Road, whilst the proposed on-site P&R would accommodate trips from the A3090-Badger Farm Road. The identified strategy would comprise a P&R in a location that has been shown to elicit modal shift, as with the Pitt P&R – which in combination with the reallocation of existing road capacity – as advocated by the Winchester Movement Strategy – would act to improve access and journey time reliability of bus services travelling along both the A3090-Romsey Road and Badger Farm Road.

5.2.2 Such improvements would also benefit existing Park & Ride bus services operating from the South Winchester facility and in this way, the proposals would deliver disproportionality positive gains in the reliability of public transport services in the southern part of the City. The proposals therefore help to address a problem identified within the Winchester Movement Strategy.

5.2.3 Specifically, bus priority measures are envisaged to include the partial signalisation of the Pitt Roundabout and a new signalised junction that creates access into the site for buses and any traffic related to a potential new Park & Ride facility. For the avoidance of doubt, there would be no through-route for residents of the site.

5.2.4 The currently envisaged junction arrangements are shown in the below Figure and to a larger scale at Appendix A.

Figure 5-1 Potential P&R & Re-Allocation of Highway Capacity (Pitt Roundabout)



5.2.5 As can be seen, the above is entirely deliverable within land controlled by Bloor Homes and or public highway. In this context, the junction proposals are entirely deliverable.

5.2.6 The park and ride services are close to being commercially viable and whilst they are currently under contract to Winchester City Council, the combination of additional patronage from the site and from a new park and ride lite has the potential to tip this over. Stagecoach (South) Ltd. would in this situation actively try to operate the service on a commercial basis without the need for public financial support.

5.3 Rerouting of Existing Bus Services for Greater Access

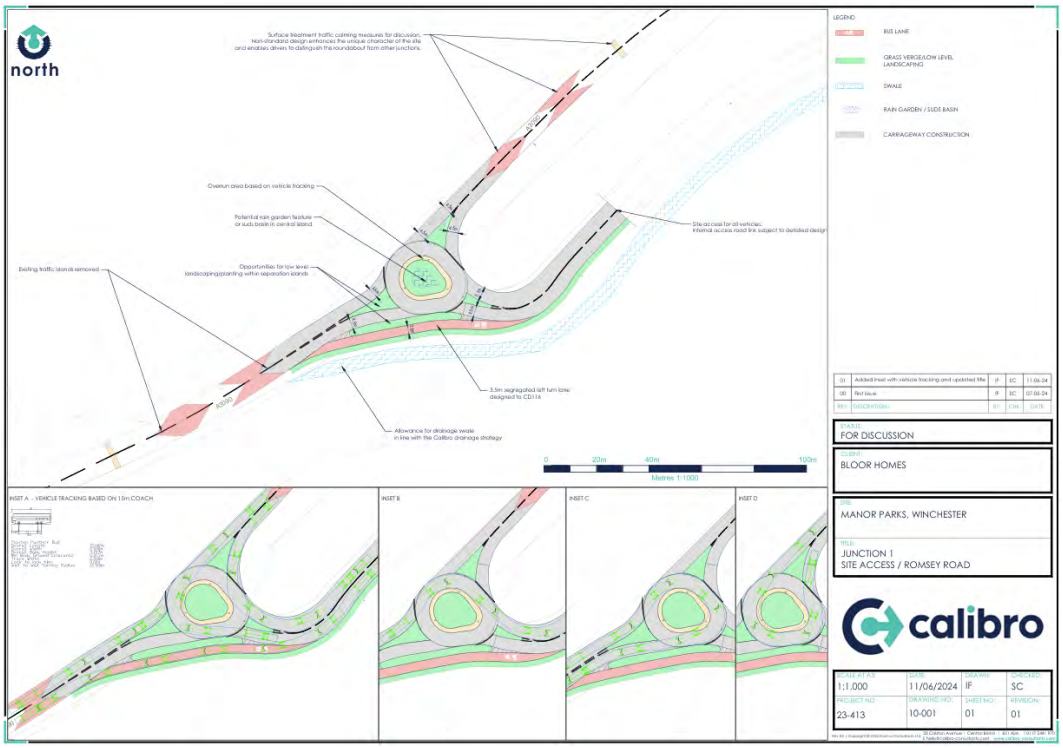
5.3.1 In addition to the P&R, both parties have collaborated on the site access junction leading to a new landscaped tear-drop roundabout junction envisaged to be created onto the A3090-Romsey Road in the broad vicinity of the existing T-junction access to the Golf Course. The design of the roundabout would provide bus priority for vehicles exiting the development.

5.3.2 The access junction would be combined with a suitably designed road through the site, connecting onto the aforementioned P&R access, facilitating bus movement into / out of Winchester. In this way, bus routes travelling along the A3090-Romsey Road in this location could re-route into the site, increasing patronage from the residents of the site and neighbouring Oliver's Battery.

5.3.3 It is therefore agreed that the site also has the potential to increase access to public transport for those residents of Oliver's Battery (and indeed beyond) through the provision of walking and cycling infrastructure.

5.3.4 The potential site access junction arrangement is shown in the below Figure and to a larger scale at Appendix B.

Figure 5-2 Primary Vehicular Access (Romsey Road)



5.3.5 As can be seen, the above is entirely deliverable within land controlled by Bloor Homes and or public highway. In this context, the junction proposals are entirely deliverable.

6 SIGNATURE TO AGREEMENT

Signed on behalf of Bloor Homes Ltd

James Matcham – Strategic Land Director, Bloor Homes Southern

Signed on behalf of Stagecoach (South) Ltd.

Rob Vince – Business Development Manager

Dated 11th October 2024

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APPENDICES

APPENDIX A

Potential P&R & Re-Allocation of Highway Capacity (Pitt Roundabout)

north

Garage

Pitt Hill Cottage

PITT ROUNDABOUT

ED & Ward Bdy

BS

Adjustment to roundabout central island and entry widths based on vehicle tracking, subject to detailed design

Permeable surfacing provides dynamic solution to car park surface water drainage

Virtual footways provided for pedestrian safety

Quality paved area and landscaping provides a better environment for cycle and bus facilities.

Opportunity for low level landscaping

3m one way ingress for cars only

6m one way egress for cars only

5m wide foot/cycle way to support LCWIP strategy via Romsey Road

3m wide pelican crossing to future proof connectivity

Bus only right turn lane

4m wide toucan crossing

Smaller basins to drain surface water from the site access, as per the Calibro drainage strategy

Larger rain garden areas to drain surface water from the park & ride facility, as per the Calibro drainage strategy

Suspended decked path above the rain garden provides a scenic yet direct route for cyclists and pedestrians

BADGER FARM ROAD

0 25m 50m 125m

Metres 1:1250

Parking Summary

Cars	172
Disabled	10
EV Charging	20
Total spaces	202

LEGEND

- INDICATIVE RED LINE BOUNDARY
- ZEBRA CROSSING
- MACADAM FINISH FOOTWAY/CYCLEWAY
- CARRIAGEWAY CONSTRUCTION
- SUSPENDED DECKED FOOTPATH / CYCLEPATH
- BUS LANE
- HIGH QUALITY BUS SHELTER
- INTERNAL PEDESTRIAN ROUTE
- GRASS VERGE/LOW LEVEL LANDSCAPING
- BROMPTON BIKES VENDING MACHINE: 16 UNIT CAPACITY
- CELLWEB OR SIMILAR APPROVED SURFACE
- TREES/PLANTING
- ELECTRIC VEHICLE CHARGING BAY
- SHELTERED CYCLE PARKING
- TACTILE PAVING
- RAIN GARDEN / SUDS BASIN
- TRAFFIC SIGNAL LAYOUT SHOWN INDICATIVELY

PARKING KEY

1. 10 PREMIUM 350KW ELECTRIC VEHICLE CHARGING BAYS 4.9M X 6.2M
2. 10 STANDARD 22KW ELECTRIC VEHICLE CHARGING BAYS 4.9M X 6.2M
3. 10 PRIORITY ACCESS DISABLED PARKING BAYS 4.9M X 6.2M

SCHEME SUBJECT TO DETAILED DESIGN

REV:	DESCRIPTION:	BY:	CHK:	DATE:
00	First Issue	IF	SC	20-09-24

STATUS: FOR PRE-APPLICATION ADVICE

CLIENT: BLOOR HOMES

SITE: MANOR PARKS, WINCHESTER

TITLE: BADGER FARM ROAD PARK AND RIDE LITE INDICATIVE CONCEPT

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SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:1,250	20/09/2024	IF	SC
PROJECT NO:	DRAWING NO:	SHEET NO:	REVISION:
23-413	10-002	01	00

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APPENDIX B

Primary Vehicular Access (Romsey Road)

north

Surface treatment traffic calming measures for discussion,
Non-standard design enhances the unique character of the site
and enables drivers to distinguish this roundabout from other junctions,

Overrun area based on vehicle tracking

Potential rain garden feature
or suds basin in central island

Opportunities for low level
landscaping/planting within separation islands

Existing traffic islands removed

Site access for all vehicles.
Internal access road link subject to detailed design

3.5m segregated left turn lane
designed to CD116

Allowance for drainage swale
in line with the Calibro drainage strategy

A3090

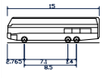
4.5m
4.5m
4.5m
4.5m
4.5m
5.1m
4.5m
3.5m

0 20m 40m 100m
Metres 1:1000

LEGEND

- BUS LANE
- GRASS VERGE/LOW LEVEL LANDSCAPING
- SWALE
- RAIN GARDEN / SUDS BASIN
- CARRIAGEWAY CONSTRUCTION

INSET A - VEHICLE TRACKING BASED ON 15m COACH



Plaxton Panther Bus	
Overall Length	15.000m
Overall Width	2.500m
Overall Body Height	4.157m
Min Body Ground Clearance	0.327m
Track Width	2.500m
Lock to lock time	5.00s
Wall to Wall Turning Radius	12.500m

INSET B

INSET C

INSET D

REV:	DESCRIPTION:	BY:	CHK:	DATE:
01	Added inset with vehicle tracking and updated title	IF	SC	11-06-24
00	First Issue	IF	SC	07-06-24

STATUS:
FOR DISCUSSION

CLIENT:
BLOOR HOMES

SITE:
MANOR PARKS, WINCHESTER

TITLE:
JUNCTION 1
SITE ACCESS / ROMSEY ROAD

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1:1,000	11/06/2024	IF	SC
PROJECT NO:	DRAWING NO:	SHEET NO:	REVISION:
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Registered in England & Wales: 9988524

Transport Planning | Flood Risk & Hydrology | Infrastructure & Drainage

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APPENDIX E

Access Strategy Drawings

north

Garage

Pitt Hill Cottage

PITT ROUNDABOUT

ED & Ward Bdy

BS

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