

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices **Appendix A13 Traffic and Transport** **A13.1 Transport Assessment Report**

Portsmouth Water Ltd.

03/09/20

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Notice

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Foreword

by Bob Taylor, Chief Executive of Portsmouth Water

I feel extremely privileged to be the Chief Executive Officer at Portsmouth Water at this moment as we submit our planning application for the Havant Thicket Reservoir.

It has taken some years to reach this stage and as a Havant-based company we're delighted to be in a position to deliver this vital strategic water resource for the South East and create a unique leisure and wildlife environment for local communities.

Portsmouth Water has a long history since 1857 of supplying water to this area, and we've continually maintained a proud record of some of the highest service standards and the lowest water supply charges of all the water companies in England and Wales.

We believe in 'doing the right thing', a belief further embedded in our Community Pledge, launched earlier this year, and our Community Partnership, launched in the Spring which ensures society benefit is considered in all our decisions. Our aim is to make sure our objectives are in line with those of our communities.

Nowhere is this more important than in the development and delivery of a large infrastructure project like a reservoir, the first to be progressed in the South East since the 1970s.

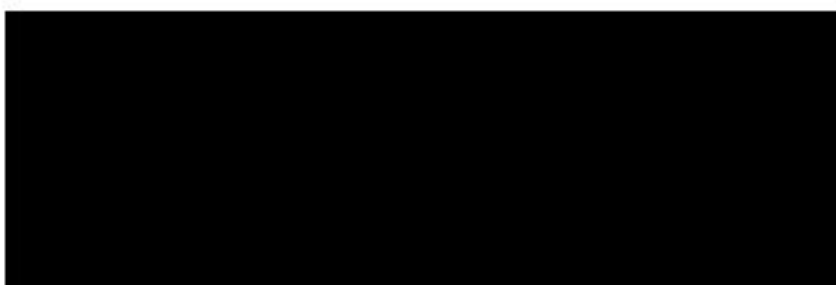
This project has always had the potential to provide many additional benefits, over and above its core purpose of securing vital water supplies for our customers and those of Southern Water – ensuring we're ready for housing growth, climate change and protecting two world-famous rare chalk streams in Hampshire.

We believe we've captured that potential in this application, not least through the creation of a wetland for threatened bird species, extensive tree, hedgerow and wildflower planting, drought resilience and the educational, training and employment opportunities these also bring. Our plans also create a green leisure space with paths and play areas – offering priceless benefits for health and wellbeing – with a visitor centre aimed at bringing communities together.

And with our eye on future challenges, we've also considered the role we'll play in meeting our unique commitment as an industry to become carbon net zero by 2030.

We've listened carefully to the ideas and thoughts of our customers, communities, partners and regulators – held discussion groups, drop-in sessions, delivered talks, chatted on Facebook, spent time with young people and engaged tirelessly with our regulators, environmental organisations and the planning authorities. We believe this is part of the reason we have such strong support.

We think this application embodies not only our hopes and aspirations for the reservoir, but also those of the communities who will benefit and be part of its delivery, and we look forward to continuing to work in partnership with our neighbours over the months and years to come.



Bob Taylor, Chief Executive Officer, Portsmouth Water

1. Introduction

Overview

- 1.1. Portsmouth Water has appointed Atkins as Principal Designer for the Havant Thicket Reservoir including an associated pipeline to Bedhampton Pumping Stations. The reservoir forms part of Portsmouth Water's Approved Water Resource Management Plan, for the period of April 2020 to 2025. The Scheme will create a new leisure facility as part of the reservoir to include a Visitor Centre and a network walking, cycling and horse-riding paths. Two access vehicular access points to the reservoir will be provided as part of the Scheme, via the north, off the B2149 which will be signed as the main access, and via the south off Swanmore Road serving as a secondary, local access point.
- 1.2. In support of the Scheme, Atkins has been commissioned to prepare a planning application and associated Transport Assessment (TA), which will inform an Environmental Impact Assessment (EIA).
- 1.3. In accordance with the recommendations made by the Local Highway Authority (LHA), this report forms the TA undertaken to assess the traffic impact of the Scheme during construction and traffic from the associated Visitor Centre which is the subject of this application.
- 1.4. This TA been prepared with reference to the Department for Transport's (DfT) Planning Practice Guidance documents 'Travel Plans, Transport Assessments and Statements in decision-taking' and 'Transport Evidence Bases in Plan Making and Decision Taking'.

Background

Havant Thicket Reservoir: visitor number, and recreational and amenity facilities review

- 1.5. Portsmouth Water commissioned Planning Solutions Consulting Limited (PSL) to estimate the potential number of visitors to the reservoir post construction, which was based on market research of comparable visitor facilities across the UK, and drew on PSLs experience as supporting consultants for the management of regional parks operated by Hampshire County Council (HCC) parks department. The assessment and accompanying report, in addition to a comprehensive assessment of comparable attractions across the UK, were based on local and regional demographic data. The full report is presented in **Appendix A**, which considers varying levels of commercial offering from limited facilities (Low Scenario) through to a comprehensive leisure offering inclusive of water sports (High Scenario).
- 1.6. The Medium Plus scenario, which forms the basis of this planning application, is based on an enhanced country park facility with high quality visitor infrastructure and services including a main hub in the form of a purpose-built Visitor Centre.

Public Consultation

- 1.7. The Scheme has been in development for several years, with substantial technical development and public consultation being undertaken since 2009. The most recent public consultation exercise was undertaken in May and June 2020, with the views collected during this exercise informing the development of the scheme and the approach to assessing the impacts.

Scoping

- 1.8. The development of the TA has been prepared with reference to scoping discussions with HCC as the Local Highway Authority (LHA) and Highways England. The scoping discussions have been focussed on a series of Technical Notes, informing the LHA and Highways England of the intended approach to assessment, with reference to visitor forecasts, and subsequent trip generation and distribution expectations. The EIA supporting the planning application also assesses the expected construction impact of constructing both the reservoir and pipeline, the intended approach to which is summarised within this TA.
- 1.9. The scoping information, inclusive of meeting notes, is provided in **Appendix B**.

Report Structure

- 1.10. This report is structured as follows:
- Chapter 2 – Policy Review;
 - Chapter 3 – Existing Transport Conditions;
 - Chapter 4 - The Scheme;
 - Chapter 5 – Development Impact Assessment;
 - Chapter 6 – Framework Travel Plan; and
 - Chapter 6 – Summary and Conclusion.

2. Policy Review

Introduction

- 2.1. This Chapter provides an overview of the key policy documents which set the context within which this development should be considered. The policy documents taken into account when developing the assessment include:
- National Policy
 - National Planning Policy Framework;
 - Planning Practice Guidance: Transport evidence bases in plan making and decision taking; and
 - Planning Practice Guidance: Travel plans, transport assessments and statements in decision-taking.
 - Regional and Local Policy
 - Hampshire Local Transport Plan 2011-2031;
 - Hampshire Cycling Strategy;
 - Hampshire Walking Strategy;
 - Transport Delivery Plan 2012-2026;
 - Draft Havant Borough Local Plan 2036, and;
 - Draft East Hampshire District Council Local Plan 2017–2036.

National Policy

National Planning Policy Framework¹

- 2.2. The revised National Planning Policy Framework (NPPF) 2019 sets out the requirements and objectives of the Government for planning policies in England and how they should be applied. At the heart of NPPF is a presumption in favour of sustainable development, the three dimensions to which are economic, social and environmental.
- 2.3. The NPPF states that planning policies should:
- Support an appropriate mix of uses across an area, and within larger scale sites, to minimise the number and length of journeys needed for employment, shopping, leisure, education and other activities;
 - Be prepared with the active involvement of local highway authorities, other transport infrastructure providers and operators and neighbouring councils so that strategies and investments for supporting sustainable transport and development patterns are aligned;
 - Identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice and realise opportunities for large scale development;
 - Provide for high quality walking and cycling networks and supporting facilities such as cycle parking (drawing on Local Cycling and Walking Infrastructure Plans); and
 - Provide for any large-scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy.
- 2.4. NPPF states that 'development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe'.

¹ Department for Communities and Local Government (2019) *National Planning Policy Framework*. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

Planning Practice Guidance

- 2.5. PPG was launched on March 6th, 2014 and provides an internet-based source of all national planning guidance. Two guidance documents relevant to traffic and transport include: 'Transport evidence bases in plan-making and decision-taking' and 'Travel plans, transport assessments and statements in decision-taking'.
- 2.6. 'Transport evidence bases in plan-making and decision-taking²', states that it is important for Local Planning Authorities (LPAs) to undertake assessments of the transport implications of developments in developing or reviewing their Local Plan. This is for the purpose of developing a robust transport evidence base that can support the preparation and / or review of the Local Plan.
- 2.7. 'Travel plans, transport assessments and statements in decision-taking³' describes how Travel Plans (TPs), TAs and Statements (TS) are ways of assessing and mitigating the negative transport impacts of development.

Regional Policy

Hampshire Local Transport Plan 2011-2031⁴

- 2.8. The Hampshire Local Transport Plan 2011-2031 (LTP) outlines how HCC will enable 'safe, efficient and reliable ways to get around a prospering and sustainable Hampshire' over the next 20 years'. Of particular note, Chapter 7 of the LTP provides a joint strategy for 'South Hampshire', incorporating HCC, Portsmouth City Council (PCC) and Southampton City Council (SCC).
- 2.9. It outlines that the vision South Hampshire is to create: 'a resilient, cost effective, fully-integrated sub-regional transport network, enabling economic growth whilst protecting and enhancing health, quality of life and the environment'. Within the strategy seven outcomes have been developed, which are:
- Reduced dependence on the private car through an increased number of people choosing public transport and the 'active travel' modes of walking and cycling;
 - Improved awareness of the different travel options available to people for their journeys, enabling informed choices about whether people travel and how;
 - Improved journey time reliability for all modes;
 - Improved road safety within the sub-region;
 - Improved accessibility within and beyond the sub-region;
 - Improved air quality and environment, and reduced greenhouse gas emissions; and
 - Promoting a higher quality of life.

Hampshire Cycling Strategy⁵

- 2.10. The HCC Cycling Strategy accompanies the LTP and covers how the Authority will achieve the following vision for cycling in Hampshire: 'In 2025, cycling will be a convenient, safe, healthy, affordable and popular means of transportation and recreation within Hampshire'.
- 2.11. The vision for cycling in Hampshire will be met by 2025 through achieving the following objectives:
1. To make cycling a daily travel choice for more people;
 2. To reduce cyclist casualties and safety concerns;
 3. To encourage regular cycling as part of a healthy lifestyle;

² Department for Communities and Local Government (October 2014). *Planning Practice Guidance. Transport evidence bases in plan making and decision taking*.
<http://planningguidance.planningportal.gov.uk/blog/guidance/transport-evidence-bases-in-plan-making/transport-evidence-bases-in-plan-making-guidance/>

³ Department for Communities and Local Government (March 2014). *Planning Practice Guidance. Travel plans, transport assessments and statements in decision-taking*.
<http://planningguidance.planningportal.gov.uk/blog/guidance/travel-plans-transport-assessments-and-statements-in-decision-taking/overarching-principles-on-travel-plans-transport-assessments-and-statements/>

⁴ Hampshire County Council (2013) *Hampshire Local Transport Plan 2011-2031*. Available online:
<http://documents.hants.gov.uk/transport/HampshireLTPPartALongTermStrategy2011-2031RevisedApril2013.pdf>

⁵ Hampshire County Council (2015) *Hampshire County Council Cycling Strategy*. Available online: <http://documents.hants.gov.uk/transport-strategy-documents/HampshireCyclingStrategy.pdf>

4. To enable more people to enjoy Hampshire by cycling; and
5. To ensure an appropriate balance between the needs of all road users.

Hampshire Walking Strategy⁶

- 2.12. The HCC Walking Strategy has also been produced to accompany the LTP and sets a range of objectives and aims to achieve an overall vision for walking in Hampshire. The vision for walking in Hampshire is: *'By 2025, walking will be the travel mode of choice for short trips and the most popular and accessible means of recreation'*.
- 2.13. This vision for walking in Hampshire will be achieved through the following objectives:
 1. To make walking the most popular mode of travel for short trips;
 2. To improve the quality and usability of the main walking routes within our urban and rural settlements (including links to the countryside);
 3. To promote walking as a healthy means of travel and recreation;
 4. To improve the perceived and actual safety and security of pedestrians; and
 5. To improve the quality of rural walking routes of local and strategic importance.

Draft Havant Borough Local Plan 2036⁷

- 2.14. The Draft Havant Borough Local Plan 2036 went through a public consultation exercise from February 4th to March 18th, 2019.
- 2.15. The Havant Local Plan, when adopted, is expected to set out a vision and framework for future development, growth and prosperity in the administrative area. Ultimately, the Havant Local Plan seeks to meet the development needs for the Authority in a sustainable way.
- 2.16. Policy KS8 in the local plan relates to the Havant Thicket winter storage reservoir, comprising recreational provision including a Visitor Centre. It refers to the importance of minimising construction and public visitor traffic through residential areas where possible and highlights the importance of providing a network of paths within the site for walking, cycling and horse-riding. It also refers to the access being taken off the B2149, outside of the Havant Borough, though this pre-dates the current access option appraisal process (described in more detail in Section 4 of this report).
- 2.17. The policy also refers to the pipeline corridor route, and states that development proposals will not be permitted in the pipeline route buffer zone (as shown on the proposals map), where they could prevent the future delivery of the pipeline.

Draft East Hampshire District Council Local Plan 2017–2036⁸

- 2.18. The Draft East Hampshire District Council Local Plan sets out the priorities and policies for development, and was adopted in 2014, however a new Draft Local Plan, covering 2017-2036 is currently being developed.
- 2.19. The Draft Local Plan states that the vision for the area is: *'By 2036 our communities' sense of place will have been maintained and reinforced, respecting their unique individual needs. We will have provided a good quality home to meet the differing needs of all our residents, a successful and growing local economy and achieved environmental excellence'*.
- 2.20. The Draft Local Plan 2017-2036 has three main objectives:
 - Core Objective A: Providing sustainable levels of growth in the LPA area;
 - Core Objective B: Provide well-designed new developments that are in the right location and adaptable to climate change; and
 - Core Objective C: Enabling infrastructure in the Local Planning Authority's area to improve and support growth.

⁶ Hampshire County Council (2016) *Hampshire County Council Walking Strategy*. Available online: <https://www.hants.gov.uk/get-decision-document?documentId=16315&file=Hampshire%20Walking%20Strategy%20-%20Appendix%202.pdf&type=pdf>

⁷ Havant Borough Council (2019) *Draft Havant Borough Local Plan 2036*. Available online: https://www.havant.gov.uk/sites/default/files/documents/The%20Draft%20Local%20Plan%202036_for%20web%20with%20policy%20numbers%20%281%29.pdf

⁸ East Hampshire District Council (2019) *Draft Local Plan 2017–2036*. Available online: <https://www.easthants.gov.uk/sites/default/files/documents/Draft%20Local%20Plan.pdf>

- 2.21. Policy S30 sets transport objectives for the area and states development should seek to minimise the need to travel, promote opportunities for sustainable transport modes, and improve accessibility to local facilities and linkages with the surrounding pedestrian and cycle network. Policy S31 relates to Havant Thicket Reservoir, and refers to the need to minimise construction traffic through residential areas, the need to establish an appropriate means of access to the satisfaction of the LHA and to ensure that the recreation provision within the site includes a network of paths for walking, cycling and horse riding.

3. Existing Transport Conditions

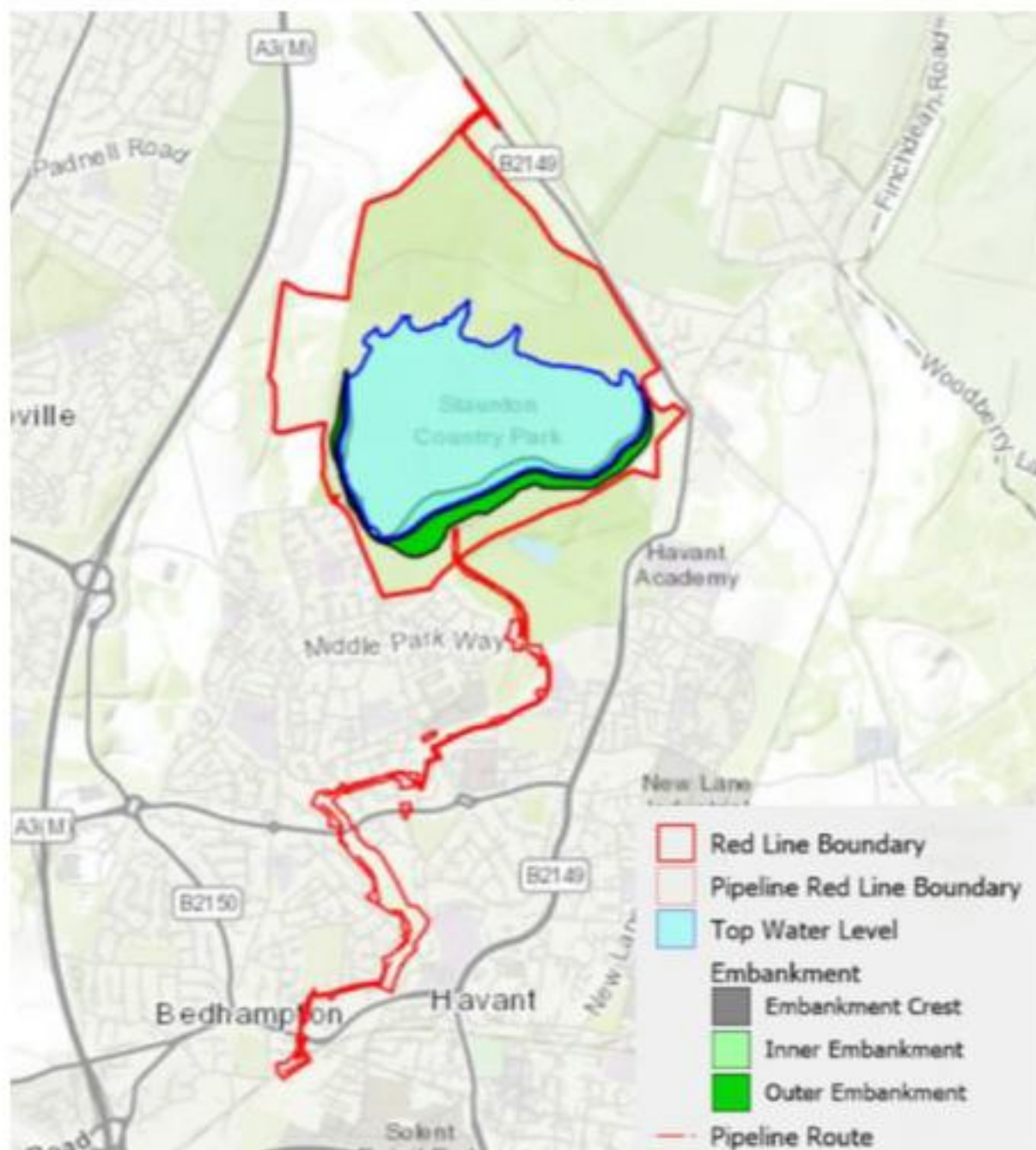
Introduction

- 3.1. This Chapter summarises a review of the existing conditions surrounding the site, including active travel, public transport provision and the local highway network. The findings are based on a desktop study and a site visit, undertaken in October 2019.

Site Context

- 3.2. The reservoir will be constructed approximately 3.5km north of Havant Town Centre. The reservoir will be constructed on a 160-hectare site which has been owned by Portsmouth Water since 1965. The site surrounded by the residential settlements of Rowlands Castle, Leigh Park and Warren Park. It is bordered by the Havant Thicket woodland to the north, owned by Forestry England and Staunton Country Park to the south, which is owned by HCC. It exists as grazed grassland with small areas of trees and public paths, used for walking, cycling and horse-riding.
- 3.3. A new pipeline will also be constructed to transfer water from the Havant and Bedhampton springs to fill the reservoir.
- 3.4. The location of the reservoir, route of the pipeline corridor and the surrounding environment can be seen in Figure 3-1.

Figure 3-1 - Location of the Reservoir and Pipeline



- 3.5. The site can be accessed at a number of locations, including active travel points along the existing perimeter of the site and a vehicular connection to an existing car park off the B2149.

- 3.6. There are a number of active travel access points spaced along the eastern, southern and west perimeter of the site, with some forming informal access points (e.g. at Winterslow Drive). The formal access points include the entry and exit of Bridleway 120 and 121.
- 3.7. There is an existing access to a car park at Havant Thicket off the B2149 (Manor Lodge Road) via a priority junction serving approximately 40 spaces. A right turn ghost island is provided which prevents southbound traffic being delayed by vehicles waiting to turn into the car park.
- 3.8. The existing car park can be seen in Figure 3-2.

Figure 3-2 - Existing Car Park at Havant Thicket



Imagery ©2020 Google, Map Data ©2020 Google

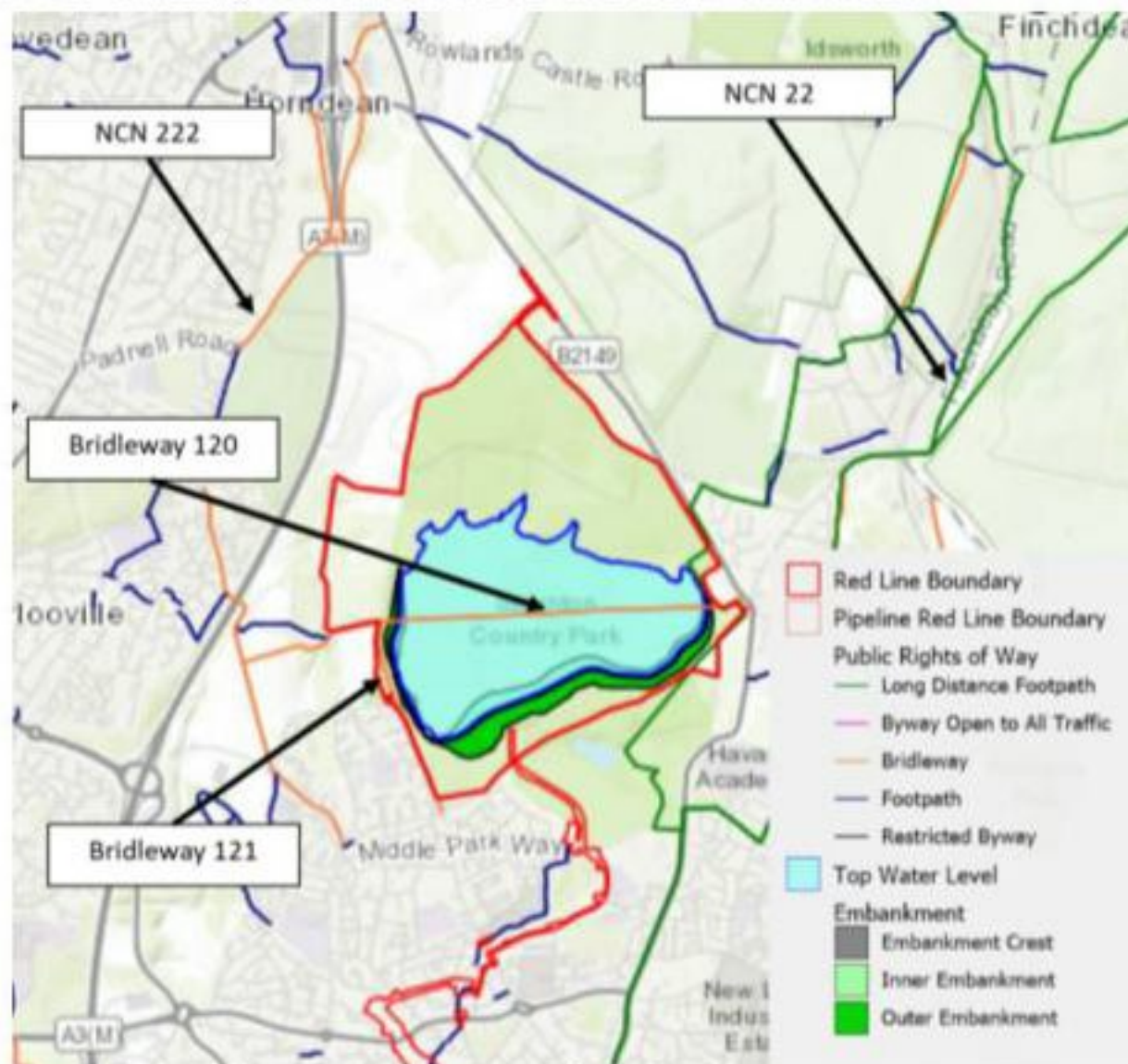
Active Travel

Pedestrians

- 3.9. The majority of the local roads benefit from pedestrian infrastructure, except for the A3(M) and the northern section of the B2149. Manor Lodge Road which serves the residential area of Red Hill has a footway along its eastern side for the majority of its length, with the northern section of footway segregated from the carriageway via a grass verge. Dropped kerbs are provided at crossing points such as its junction with Mallard Road. The route is well lit with street lighting provided along its length, the footways are also in reasonable condition and generally of suitable width.
- 3.10. Manor Lodge Road connects to the southern section of the B2149 via two mini-roundabouts. The southernmost of which benefits from an uncontrolled pedestrian crossing with dropped kerbs and a pedestrian refuge island. The B2149 also has a footway along its eastern side, dropped kerbs are provided at crossing points such as its junction with Durrant Gardens. Approximately 130 m to the south of Durrant Gardens, footway provision is also provided on the western side serving the residential properties at this location. The footway on the eastern side then forms a walking and cycling path which continues to the south to its junction with Middle Park Way and onwards into the surrounding residential areas. Street lighting is provided along this route and the footways are generally in reasonable condition and of suitable width.

- 3.11. A grade separated crossing of the B2149 is provided near its junction with Middle Park Way in the form of an underpass providing a safe crossing location for pedestrians. Dropped kerbs and tactile paving are provided at this crossing location, as well as at the crossing of Middle Park Way. There is pedestrian provision along both sides of Middle Park Road in form of a Share Use Path (SUP) on the northern side and a footway on the southern side. The surface quality is of reasonable condition and the widths generally appear suitable, with street lighting being provided along its length. Several uncontrolled crossings are provided along Middle Park Way which include dropped kerbs and tactile paving, with some providing access to bus stops.
- 3.12. Footways are present on both sides of the southern section of Swanmore Road from its junction with Middle Park Way to Mewsey Court, north of Mewsey Court there are footways on the western/southern sides only. The footways are of reasonable width and are segregated from the carriageway by a grass verge for much of their length; in addition, street lighting is provided throughout. Several uncontrolled crossings with dropped kerbs and tactile paving are also provided.
- 3.13. There are several Public Rights of Way (PRoWs) located in the vicinity of the site, with the routes most relevant to the Scheme shown in Figure 3-3.
- 3.14. The network of existing PRoWs includes Bridleway 121 which runs along part of the western boundary of the development site, along Swanmore Road routing north along the edge of Cabbagefield Row before meeting Bridleway 120 just south of Bells Copse. Bridleway 120 crosses the site on an east-west alignment. It passes the north edge of Middle Clearing before crossing The Avenue. To the east of The Avenue it continues east past Gipsies Plain before emerging on Manor Lodge Road adjacent the War Memorial at Rowland Castle.
- 3.15. There are potential opportunities to improve provision in the area, by ensuring that there are continuous links through the site as well as connections to the neighbouring residential areas Rowlands Castle to the east and Leigh Park to the south, as well as the existing Staunton Country Park.

Figure 3-3 - Existing Network of PRoWs and Active Travel Routes



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Cycling

- 3.16. Off-road cycling provision is provided within the locality of the site. There is a walking and cycling path along the eastern side of the B2149 (southern section), as well as a SUP along the western side where the B2149 enters the Leigh Park residential area. There is also a SUP along the northern side of Middle Park Way which is segregated from the carriageway by a grass verge. The underpass adjacent to the B2149 / Middle Park Way junction also provides a safe crossing point for cyclists with ramps and suitable widths. There are also on-road cycle lanes along Swanmore Road for a distance of approximately 600m from its junction with Middle Park Way. These routes are generally in good condition, are well-lit and appropriate signage is provided.
- 3.17. With the exception of the A3(M), and the northern section of the B2149, the majority of the roads in the vicinity of the site are residential in nature with a speed limit of 30mph in place. This, along with the generally level gradient, the reasonable surface quality and the suitable carriageway widths creates an environment which could be conducive to on-road cycling.
- 3.18. As shown in Figure 3-3, there are two National Cycle Network (NCN) routes near the site, including Route 222 and 22. To the east of the site Route 22 will connect Banstead (near Epsom) and Brockenhurst via Dorking, Guildford, Farnham, Petersfield, Havant, Portsmouth and the Isle of Wight between Ryde and Yarmouth. Route 222 provides a north south link between the sections of Route 22 to the west of the site. Both routes are made up of on-road and off-road sections, Route 22 includes the SUP along the eastern side of the B2149 in the Leigh Park residential area.

Surrounding Highway Network

- 3.19. The existing highway within the vicinity of the site, and key local junctions are shown in Figure 3-4.

Figure 3-4 - Existing Local Highway Network



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Highway Links

A3(M)

- 3.20. The A3(M) is the main distributor road in the area connecting Portsmouth to London. For much of its 67mile (108 km) length, it is classified as a trunk road and is therefore managed by Highways England.
- 3.21. Key junctions on the A3(M) in the vicinity of the site include Junctions 2, 3 and 4.

B2149

- 3.22. The B2149 is a principle road linking Junction 2 of the A3(M) to the north and Havant Town Centre to the south. In the vicinity of the site the road is single carriageway and has a north-south alignment. The southern part of the road near the site forms the northern arm of the Red Hill Road/Whichers Gate Mini Roundabouts.
- 3.23. Access to the existing car park at Havant Thicket is located approximately 350m north of the Red Hill Road/Whichers Gate Mini Roundabouts.
- 3.24. A 30mph speed limit is enforced on the road for a distance of 950m north of the Red Hill Road/Whichers Gate mini roundabouts. The road then adopts the national speed limit from this point.

Middle Park Way

- 3.25. Middle Park Way is a residential distributor road linking the B2149 via a priority junction at its eastern end and forming the northern arm of the Purbrook Way/Middle Park Way Roundabout at its south western end. Middle Park Way provides access to residential roads and schools across its length.
- 3.26. From its junction with the B2149 a speed limit of 30mph is enforced for 350m. The speed limit then lowers to 20mph near the High Lawn Way mini roundabout and is enforced for 1.4km until the road returns to 30mph. Traffic calming measures are present across its length in the form of build-outs and speed cushions.

Swanmore Road/Calshot Road

- 3.27. Swanmore Road/Calshot Road is a single carriageway residential access road that forms a northern loop from a priority junction with Middle Park Way to the east and the northern arm of the Fitzwygram Way/Woolston Road Roundabout to the west. Traffic calming measures such as build-outs are present on the road near Warren Park School approximately 500m north of the junction with Middle Park Way. A 30mph speed limit is maintained along the length of the road.
- 3.28. Several bus stops are present along the length of the road. The nearest to the site is the Pennerly Court bus stop which has easy access kerbing and signage.

Key Highway Junctions

- 3.29. The key junctions on the local network are summarised below, though it should be noted that on the basis of suggestions by the LHA a number of additional junctions were surveyed. More detail on the traffic surveys are provided in Section 0.

Swanmore Road/Middle Park Way Priority Junction

- 3.30. Swanmore Road forms the minor arm of the Swanmore Road/Middle Park Way priority junction to the south of the site. A 20mph speed limit is enforced on Middle Park Way at the junction, this is increased to 30mph on entry to Swanmore Road. Speed cushions are present on Middle Park Way to the west with on road cycle lanes in front of the give way line. Footways are located on both sides of all arms with street lighting provided.

Dell Piece East/B2149 Roundabout

- 3.31. The Dell Piece East/B2149 four-armed roundabout provides one of the main links to the A3(M) to the north of the site. The northern and southern arms of the junction are formed by the B2149 the eastern arm provides access to a building and western arm is Dell Piece East. Footways with street lighting are present on the northern side of the roundabout. An uncontrolled crossing with dropped kerbs and a pedestrian refuge island is present on the northern B2149 arm.

Woolston Road/Middle Park Way Mini Roundabout

- 3.32. The Woolston Road/Middle Park Way Mini Roundabout has three arms. The north eastern and south western arms are formed by Middle Park Way and the north western arm is Woolston Road. Footways and pedestrian refuge islands are present on all arms with tactile paving and dropped kerbs. Traffic calming measures in the form of speed cushions are provided near the junction on the north eastern Middle Park Way arm.

A3(M) Junction 2

- 3.33. Junction 2 of the A3(M) is a large grade separated gyratory junction. The northern and southern arms are formed by the north and south on and off slips of the A3(M) which have two lanes on entry and exit. Dell Piece Road and the B2149 form the junction's eastern and western arms.

A3(M) Junction 3

- 3.34. Junction 3 of the A3(M) is a large grade separated gyratory junction. The northern and southern arms are formed by the north and south on and off slips of the A3(M) which have two lanes on entry and exit. Hulbert Road forms the junction's eastern and western arms.

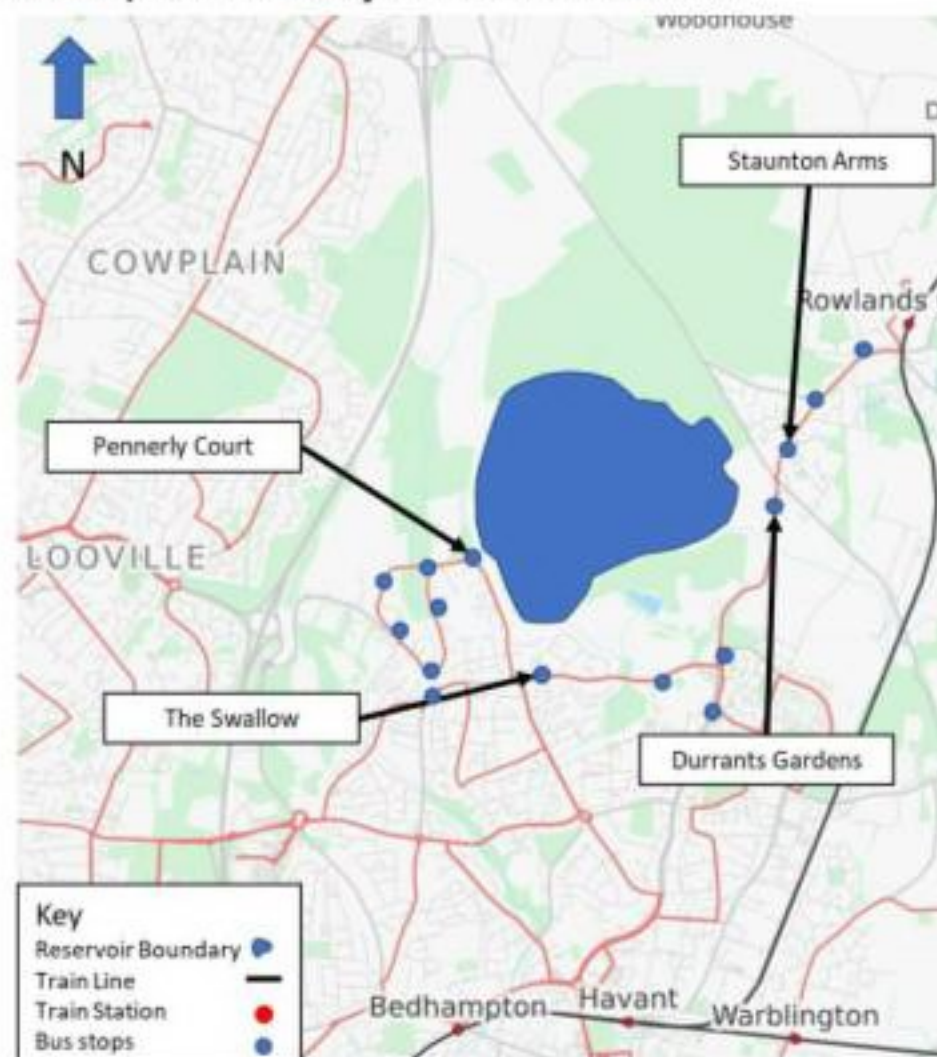
A3(M) Junction 4

- 3.35. Junction 4 of the A3(M) is a partial movement dumbbell junction. The junction does not provide north facing slip roads, with provision only for northbound off slips and southbound on slips. These form the southern arms of the west and east roundabouts respectively. Purbrook Way forms the eastern and western arms of both roundabout with two lanes in both directions.

Public Transport

- 3.36. The site is well served by public transport with reasonable bus links located nearby. In addition, there are a number of railway stations located approximately two miles south of the site and a station approximately one mile to the east. The locations of the bus stops within 300m of the site boundary and the nearest railway stations are shown in Figure 3-5.

Figure 3-5 - Bus Stops and Railway Stations near the site



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Bus

- 3.37. Several bus stops are located within close proximity to the site. The most notable stops with the most frequent services near the site include:
- Pennerly Court;
 - The Swallow;
 - Durrants Gardens, and;
 - Staunton Arms.
- 3.38. The Pennerley Court stops include easy access kerbing, a flagpole and timetable, a shelter is provided for southbound services. The Swallow stop also includes easy access kerbing, a flagpole and timetable as well as a shelter. The Durrant Gardens and Staunton Arms stops consist of flagpoles and timetables only.
- 3.39. The services that serve the bus stops listed above are detailed in Table 3-1.

Table 3-1 - Bus Services Near the Site

Service	Route	Frequency
23	Leigh Park - Southsea	05:10 – 22:11 every 15 mins
20	Havant - Portsmouth - The Hard	06:15 – 18:15 every 30 mins
21	Havant - Portsmouth	05:25 – 21:00 every 30 mins
27	Rowlands Castle - Havant - Emsworth	Four services 10:00, 12:00, 14:40 and 16:40

Rail

- 3.40. The nearest railway stations to the site are Rowlands Castle, Bedhampton and Havant. Rowlands Castle is on the Portsmouth Direct line which runs between London Waterloo and Portsmouth Harbour. The station has two tracks, and two platforms, and the standard service is hourly to both Portsmouth and Waterloo by South Western Rail.
- 3.41. Bedhampton and Havant are also located on the Portsmouth Direct line. Havant is served by trains operated by South Western Railway, Southern, and Great Western Railway. Havant is a junction station and provides passengers with an interchange between the West Coastway line and the Portsmouth Direct line. It therefore has services to Portsmouth, London Waterloo, London Victoria via Gatwick Airport, Brighton, Southampton and less frequent long-distance services to Wales and the west country.

Collision Data

- 3.42. Collision data has been obtained from HCC for the latest 5-year period between 01/01/2015 and 31/12/2019 cordons within the vicinity of the site accesses on the B2419 and Swanmore Road.
- 3.43. For the key junctions within the study area a review of CrashMap9 data, from the latest 5-year period has been used undertaken.

B2419

- 3.44. The locations of the collisions on the B2419 from data provided by HCC are shown in Figure 3-6 and summarised in Table 3-2.

⁹ <https://www.crashmap.co.uk>

Figure 3-6 - Collisions on the B2419



Table 3-2 - Summary of Collisions on the B2419

Year	Severity			Total number of Collisions	Total Number of Casualties
	Fatal	Serious	Slight		
2015	0	1	1	2	3
2016	0	0	3	3	7
2017	0	0	0	0	0
2018	0	0	0	0	0
2019	0	0	0	0	0
Totals	0	1	4	5	10

- 3.45. As shown in Table 3-2, there were a total of five collisions (one serious and four slight) along the B2419 within the latest 5-year period, though no collisions have been recorded in the last three years. When compared with similar locations, the pattern and frequency of collisions at this location is not considered inconsistent. No trends have been identified in the causation factors and no collisions since the first 2 years of the review period.

Swanmore Road / Calshot Road

- 3.46. The locations of the collisions on the Swanmore Road / Calshot Road from data provided by HCC are shown in Figure 3-7 and summarised in Table 3-3

Figure 3-7 - Collisions on Swanmore Road/Calshot Road



Table 3-3 - Summary of Collisions on Swanmore Road/Calshot Road

Year	Severity			Total number of Collisions	Total Number of Casualties
	Fatal	Serious	Slight		
2015	0	2	1	3	3
2016	0	0	1	1	1
2017	0	1	0	1	1
2018	0	1	1	2	2
2019	0	0	2	2	2
Totals	0	4	5	9	9

3.47. As shown in Table 3-3, there were a total of nine collisions (five serious and seven slight) resulting in nine casualties on Swanmore Road / Calshot Road within the latest 5-year period.

3.48. Further review of the causation factors of the collisions shown in Figure 3-7 has not identified any common collision causation factors that give rise to a safety concern in this area.

Dell Piece East/B2419 Roundabout

3.49. The locations of the collisions within 100m of the Dell Piece East/B2419 roundabout are shown in Figure 3-8 and summarised in Table 3-4. Collision data for the most recent 5-year period at the junction has been taken from CrashMap.

Figure 3-8 - Collisions on the Dell Piece East/B2419 Roundabout



Source: <https://www.crashmap.co.uk/Search>

Table 3-4 - Summary of Collisions on the Dell Piece East/B2419 Roundabout

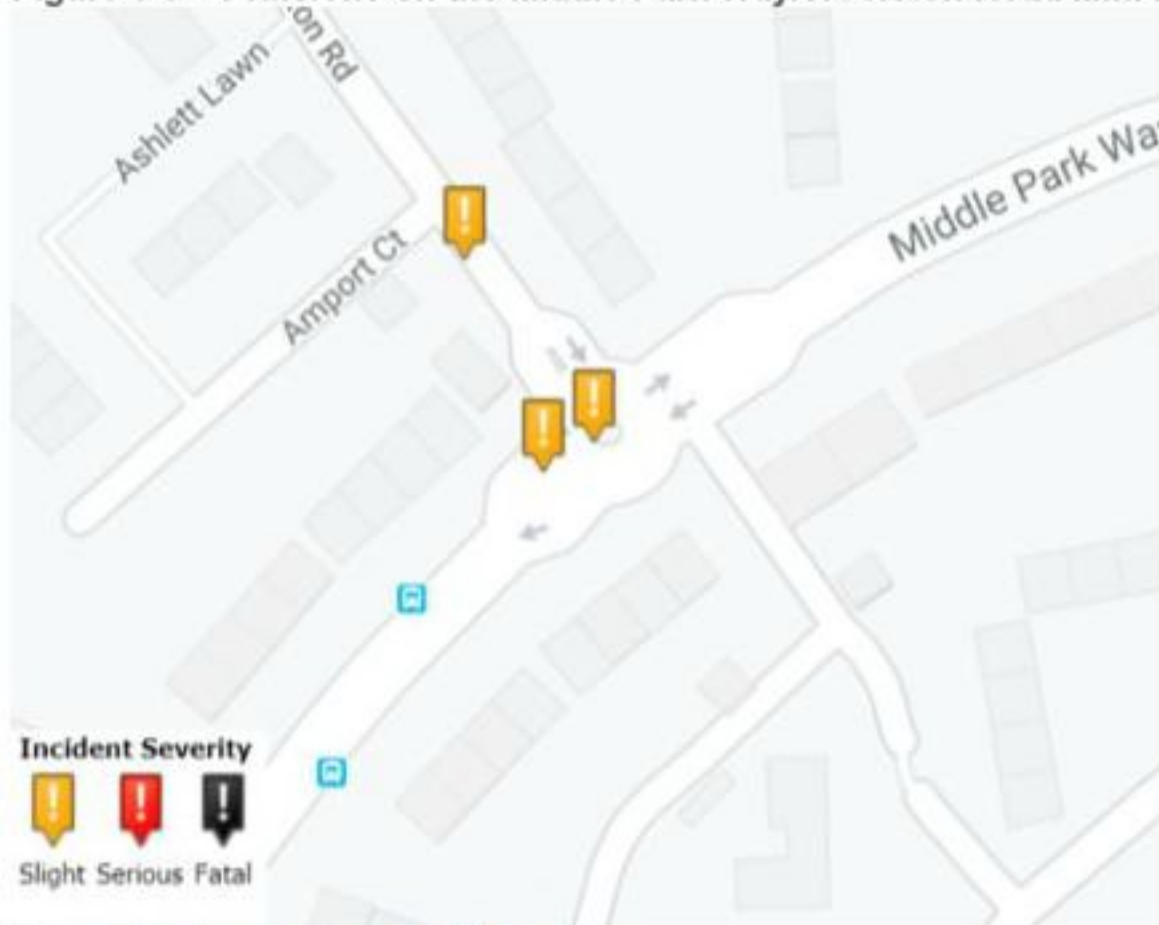
Year	Severity			Total number of Collisions	Total Number of Casualties
	Fatal	Serious	Slight		
2015	0	0	1	1	1
2016	0	1	1	2	2
2017	0	0	0	0	0
2018	0	0	0	0	0
2019	0	0	0	0	0
Totals	0	1	2	3	3

3.50. As shown in Table 3-4, there were a total of three collisions (one serious and two slight) resulting in 3 casualties at the Dell Piece East/B2419 Roundabout within the latest 5-year period.

Middle Park Way/Woolston Road Mini Roundabout

3.51. The locations of the collisions within 100m of the Middle Park Way/Woolston Road Mini Roundabout are shown in Figure 3-9 and summarised in Table 3-5. Collision data for the most recent 5-year period at the junction has been taken from CrashMap.

Figure 3-9 - Collisions on the Middle Park Way/Woolston Road Mini Roundabout



Source: <https://www.crashmap.co.uk/Search>

Table 3-5 - Summary of Collisions on the Middle Park Way/Woolston Road Mini Roundabout

Year	Severity			Total number of Collisions	Total Number of Casualties
	Fatal	Serious	Slight		
2015	0	0	0	0	0
2016	0	0	0	0	0
2017	0	0	0	0	0
2018	0	0	2	2	2
2019	0	0	1	1	2
Totals	0	0	3	3	4

3.52. As shown in Table 3-5, there were a total of three collisions (three slight) resulting in four casualties at the Middle Park Way/Woolston Road Mini Roundabout within the latest 5-year period.

Middle Park Way/Purbrook Way Roundabout

3.53. The locations of the collisions within 100m of the Middle Park Way Purbrook Way Roundabout are shown in Figure 3-10 and summarised in Table 3-6. Collision data for the most recent 5-year period at the junction has been taken from CrashMap.

Figure 3-10 - Collisions on the Middle Park Way/Purbrook Way Roundabout



Table 3-6 - Summary of Collisions on the Middle Park Way/Purbrook Way Roundabout

Year	Severity			Total number of Collisions	Total Number of Casualties
	Fatal	Serious	Slight		
2015	0	0	1	1	1
2016	0	0	2	2	2
2017	0	1	2	3	3
2018	0	0	4	4	8
2019	0	0	1	1	1
Totals	0	1	10	11	15

3.54. As shown in Table 3-6, there were a total of eleven collisions (one serious and ten slight) resulting in fifteen casualties at Middle Park Way/Purbrook Way Roundabout within the latest 5-year period. A slight cluster of five slight collisions has been identified on the western Purbrook Way arm, though it is noted that no serious collisions or fatalities have occurred.

Summary

3.55. The review of CrashMap statistics has identified a number of collisions at the key local junctions, though it is noted that the majority of these collisions are slight in their severity. Given the urban nature of these junctions, and the likely traffic patterns associated within them it is not considered that this pattern is above what would be expected. Therefore, no further assessment of collision causations has been undertaken.

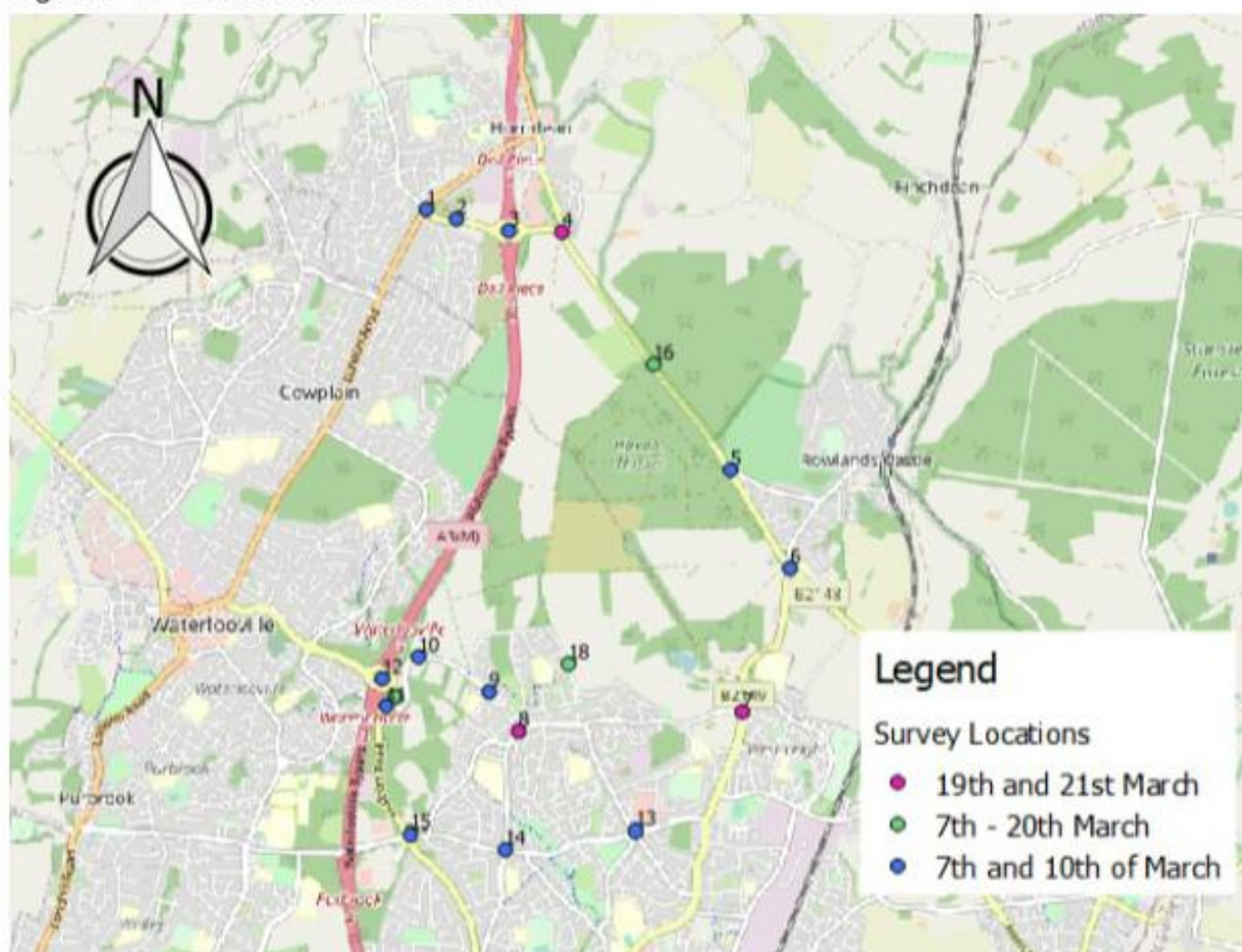
Traffic Data

3.56. Junction turning counts (JTCs) were undertaken at separate locations on Saturday the 7th and Tuesday the 10th of March 2020 and on Thursday the 19th and Saturday 21st March 2020. Three 2-week Automatic Traffic Counts (ATCs) were also undertaken from 7th to the 20th March 2020. The dates and locations of the surveys are summarised in Table 3-7 and presented in Figure 3-11.

Table 3-7 - Traffic Survey Summary

Junction Turning count surveys (JTCs)		Automatic Traffic Counts (ATCs)
Saturday 7th and Tuesday 10th of March	Thursday 19th and Saturday 21st March	2 weeks between 07/03/20 – 20/03/20
A3/Catherington Lane/B2149	Dell Piece East/B2149	B2149
B2149/Morrisons	B2149/Middle Park Way	Hulbert Road,
J2 A3(M);	Woolston Road/Middle Park Way	Swanmore Road
Manor Lodge/Castle Road		
Durrants Road/Red Hill Road		
Fitzwgram/Calshot Road		
Fitzwgram Way Roundabout		
Fitzwgram/Hulbert Road		
J3 A3(M);		
Stockheath Rd/Bedhampton Way/Purbrook Way/Dunsbury Way;		
Middle Park Way/Purbrook Way/Park Lane		
Purbrook Way/B2150/Hulbert Way		

Figure 3-11 - Location of Traffic Counts



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3.57. Following a review of the traffic survey data, it is considered that the peak hours on the local highway network are:

- Weekday:
 - AM peak – 08:00-09:00
 - PM peak – 17:00-18:00
- Saturday Peak – 12:00-13:00.

4. The Scheme

Introduction

- 4.1. This Chapter summarises the proposals being submitted as part of the planning application and includes reference to the active travel routes within the site, as well as the access to and from the site. The development of the masterplan for the reservoir site has evolved over the course of consultation with the relevant authorities, and the significant public consultation exercises held within the project lifecycle.

General Site Layout

- 4.2. The provision of a reservoir will be the principal function of the development, however it will be supported by a Visitor Centre and a network of active travel paths around the perimeter of the waterbody.
- 4.3. The Visitor Centre will be located on the north western boundary of the reservoir, adjacent to the car park, which will provide a focal point for leisure visits to the site. The location of the Visitor Centre and facilities at the reservoir are shown in Figure 4-1.

Figure 4-1 - General Site Layout



- 4.4. It is intended that the Visitor Centre will include catering facilities and serve as a community venue hosting educational visits from local schools and clubs. The layout of the Visitor Centre in the north western corner of the site is shown in Figure X.

Figure 4-2 – Visitor Centre Layout



Vehicular Access

- 4.5. The development of the access from the local roads will serve two main user groups: construction and operational traffic. In total 11 potential access roads were identified; which have been subject to a comprehensive four stage evaluation process based on the following criteria:
 - Environmental Assessment;
 - Engineering and Safety; and
 - Meeting Project Drivers.
- 4.6. The findings are summarised in HTR-ATK-XX-XX-RP-Z-0021 Technical Note Access Route - Options Appraisal at Havant Thicket contained in **Appendix C**. The two options, a north and south option that scored highest in the evaluation process were taken forward for public consultation.
- 4.7. The northern and southern accesses to the site are shown in Figure 4.3.

Figure 4-3 - Northern and Southern Access Roads



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- 4.9. An access strategy has been developed whereby both the northern and southern options will serve as access points, diluting the impacts across the highway network and within the site. However, the northern access will be signed as the main access point on all Visitor Centre material, ensuring the impact on the local road network is minimised, as it provides a direct link to the principle road network via the B2149. It is intended that the southern access point would serve as a secondary access for local trips.
- 4.10. During scoping discussions, the LHA noted that the two access points should not provide opportunities for rat-running through the site. This has been taken on-board in the development of the access roads. They have been designed as single access tracks, with passing places, that will ensure low vehicles speeds are maintained. In addition, both access roads will meet at the visitor car park in the centre of the site, which further reduces the attractiveness of a through route. On this basis, it is not considered that the provision of two accesses and internal road layout would be conducive for through-traffic movement.
- 4.11. Both access points have been designed with reference to HCC's design guidance and have been the subject of a Stage One Road Safety Audit (RSA). The Designer's Response to the RSA, which has been submitted to HCC and includes the RSA issues, is provided in **Appendix D** for reference.
- Northern Access**
- 4.12. The location and layout of the northern access priority junction has been optimised to limit as far as possible the loss of ancient woodland. The access comprises a ghost island priority junction that is compliant with the Design Manual for Roads and Bridges (DMRB). The northern access consists of a 3.65m single lane carriageway with passing bays to enable two-way traffic. Inclusive of verge, the overall construction width of the northern access road is typically 6.45m, with a widening on a tight bend where it is 7.45m. The access is anticipated to accommodate a large majority of the construction traffic and a large proportion of the visitor traffic. The design of the access can be seen in Figure 4-4.
- 4.13. The access junction achieves 215m visibility splays in accordance the standards set in Hampshire's 'Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays'¹⁰ for a 40mph road.

¹⁰ <https://documents.hants.gov.uk/highways/TG3TechnicalGuidanceNote-StoppingSightDistancesandVisibilitySplays.pdf>

Figure 4-4 - Northern Access



Southern Access

- 4.14. The southern access off Swanmore Road consists of a simple priority junction and the design is compliant with the DMRB and HCC design standards. The access design is shown in Figure 4-5. The southern access road is offset by a distance of 15 metres from the ancient woodland boundary, which may be used for SUDs drainage depending other detailed design considerations. The southern access is a two-way single carriageway, which connects to the visitor car park, as well as the maintenance track routeing around the crest of the reservoir.
- 4.15. The access junction achieves 43m visibility splays in accordance the standards set in Hampshire's 'Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays' for a 30mph road.

Figure 4-5 - Southern Access



Car Park

- 4.16. A core parking area of 193 spaces will be provided at the site, the size of which has been determined on a first principles approach, described in more detail in Section 5. Consideration has been given to both East Hampshire and Havant Borough Council's parking policies and standards to determine whether there is any prescribed guidance with regards to the appropriate level of parking, however it is not considered that there is a specific land use comparable to the Havant Thicket Reservoir within the standards.
- 4.17. Based on the calculations presented within Section 5, it is considered that this level of parking will be sufficient to accommodate the typical parking demand at the site. However, for busy periods a supplementary over-flow parking area of 75 spaces will be developed to allow for instances where the parking demand exceeds the average peak.
- 4.18. The car park will be designed in compliance with the standards set out in HCCs Parking Strategy and Guidance with 5% of the total allocation designed as accessible parking. The layout and landscaping for the car park area are shown indicatively in Figure 4-6.

Figure 4-6 - Car park arrangement



Active Travel Movement

- 4.19. To accommodate the reservoir, it is necessary to divert the Bridleway 120 running east to west through the site, in addition to some north-south routes. The network of paths at the reservoir site will provide good linkage into the existing public rights of way including Staunton Way, Shipwrights Way and Dunsbury Park to A3(M) crossing to Cowplain.
- 4.20. The bridleway will be permanently diverted to the south of the embankment along an operational maintenance track and form part of a wide circular path which will run around the perimeter of the reservoir, providing an approximate three-and-a-half-mile route. It is considered that this will maintain and enhance the existing use of the bridleway, particularly at the eastern section which is used by horse riders currently accessing Havant Thicket. The paths are designed with reference to HCC design standards, which for bridleways suggests a minimum 3 metre wide path.
- 4.21. The operational maintenance track and a crest pathway are 4 metres in width, and permissive paths around the Visitor Centre, which will be partly formed by the temporary diversion of paths during construction, will be a minimum 2 metres in width.
- 4.22. The surfacing of adjacent paths will be improved as part of the development providing additional links for the visitors to the reservoir, particularly from Staunton Country Park (SCP).
- 4.23. To offer variety to visitors there is a long circular route of approximately three miles around the reservoir utilising the crest, and a shorter circuit of just over one mile through the woodland to the north.
- 4.24. The longest circular route on site will be approximately three and a half miles in length and there will be opportunities to connect to existing neighbouring routes. A summary of the circular routes is presented in Figure 4-7.

Figure 4-7 - Active Travel Circuit Routes



- 4.25. Access will be provided for mobility impaired users at the main entry points to the site including the Visitor Centre, Swanmore Road and Rowlands Castle. These locations will allow access onto the embankment crest and the circular route. Due to the steepness of the embankment slopes not all paths can be made permissive. All Public rights of way will maintain access for mobility impaired users.

Maintenance

- 4.26. To allow for maintenance of the reservoir, maintenance vehicles will be required to access the site via the southern access road and onto the crest track. A vehicle turning point will be located at the end of the eastern embankment. This will allow vehicles coming off the crest track to turn safely and return west towards the Control House (shown in Figure 4-1) and back to the southern access.

Construction

- 4.27. The reservoir will be constructed over a period of 10 years and in 4 phases. The development phases and associated years are detailed as follows:
- Phase 1: Early preparatory work 2019 -2020;
 - Phase 2: Site preparation phase 2021 – 2023;
 - Phase 3: Main construction phase 2023 – 2026; and
 - Phase 4: Construct visitor facilities and fill reservoir 2026-2029.
- 4.28. The pipeline will be constructed in three periods, to minimise the impact on the local road network.
- 4.29. It is intended that construction HGVs principally use the northern access, to avoid the residential streets to the south of the site, with the most direct route to the A3(M) being via the B2149. There will however be a need to use the southern access for a short period of time to construct part of the pipeline. More information on the construction traffic and routeing is provided in Chapter 5.
- 4.30. As the reservoir will be situated in place of an existing bridleway, consideration has been given to the temporary diversion, in advance of the full reservoir site and associated paths being complete. In discussions with Forestry England it has been agreed that a temporary diversion will be put in place to the north of the bridleway during the construction period until a safe access can be provided via the Portsmouth Water land south of the new embankment. This temporary diversion could become a permissive route allowing for a circular bridleway route approximately three and a half miles. The route of the temporary diversion can be seen in Figure 4-8.

[illegible]

5. Development Impact Assessment

Introduction

- 5.1. This Chapter considers the impact of the Scheme on the surrounding highway network, with reference to a forecast of vehicular trip generation and highway network capacity analysis. Consideration is also given to the construction traffic strategy, which will be fully developed through the preparation of a Construction traffic Management Plan.

Assessment Scenarios

- 5.2. The operational assessment considers the impact of visitors and maintenance on the surrounding road network, for the opening year of 2029, the earliest year that the reservoir and Visitor Centre will be operational. Consideration has been given to the typical network peak hours, as derived from the traffic surveys introduced in Section 0. Due to the nature of the development however, consideration has also been given to the development peak, when the visitor trips to and from the site are expected to be highest.
- 5.3. The assessment scenarios therefore which form the basis of this TA include:
- 2020 Baseline AM Peak (08:00-09:00);
 - 2020 Baseline PM Peak (17:00-18:00);
 - 2020 Baseline Saturday Peak (12:00-13:00);
 - 2029 Baseline AM Peak, including committed developments (08:00-09:00);
 - 2029 Baseline PM Peak, including committed developments (17:00-18:00);
 - 2029 Baseline Saturday Peak, including committed developments (12:00-13:00);
 - 2029 With Development AM Peak, including committed developments (08:00-09:00);
 - 2029 With Development PM Peak, including committed developments (17:00-18:00); and
 - 2029 With Development Saturday Peak, including committed developments (12:00-13:00).
- 5.4. The assessment scenario flow diagrams are presented within **Appendix E** for reference.

2020 Baseline

- 5.5. The 2020 Baseline scenario is based on the programme of traffic surveys introduced within Section 0, which were undertaken during March 2020. It is noted that the surveys were undertaken during the early stages of the government directive to limit travel due to the on-going COVID-19 pandemic, and as such the validity of the surveys have been discussed with the LHA.
- 5.6. The LHA advised that consideration will need to be given to the representative nature of any surveys undertaken after the 16th March 2020; the point at which travel patterns were considered to be affected by the travel limitations. To mitigate the impact of this directive, reference has been made to the two-week ATC surveys, which cover the period before and after the travel limitation directive. It has been agreed with the LHA that a factor derived from the ATC surveys can be applied to the three¹¹ JCTs undertaken after the 16th March, to uplift traffic levels to a more typical volume.

2029 Baseline

Background Traffic Growth

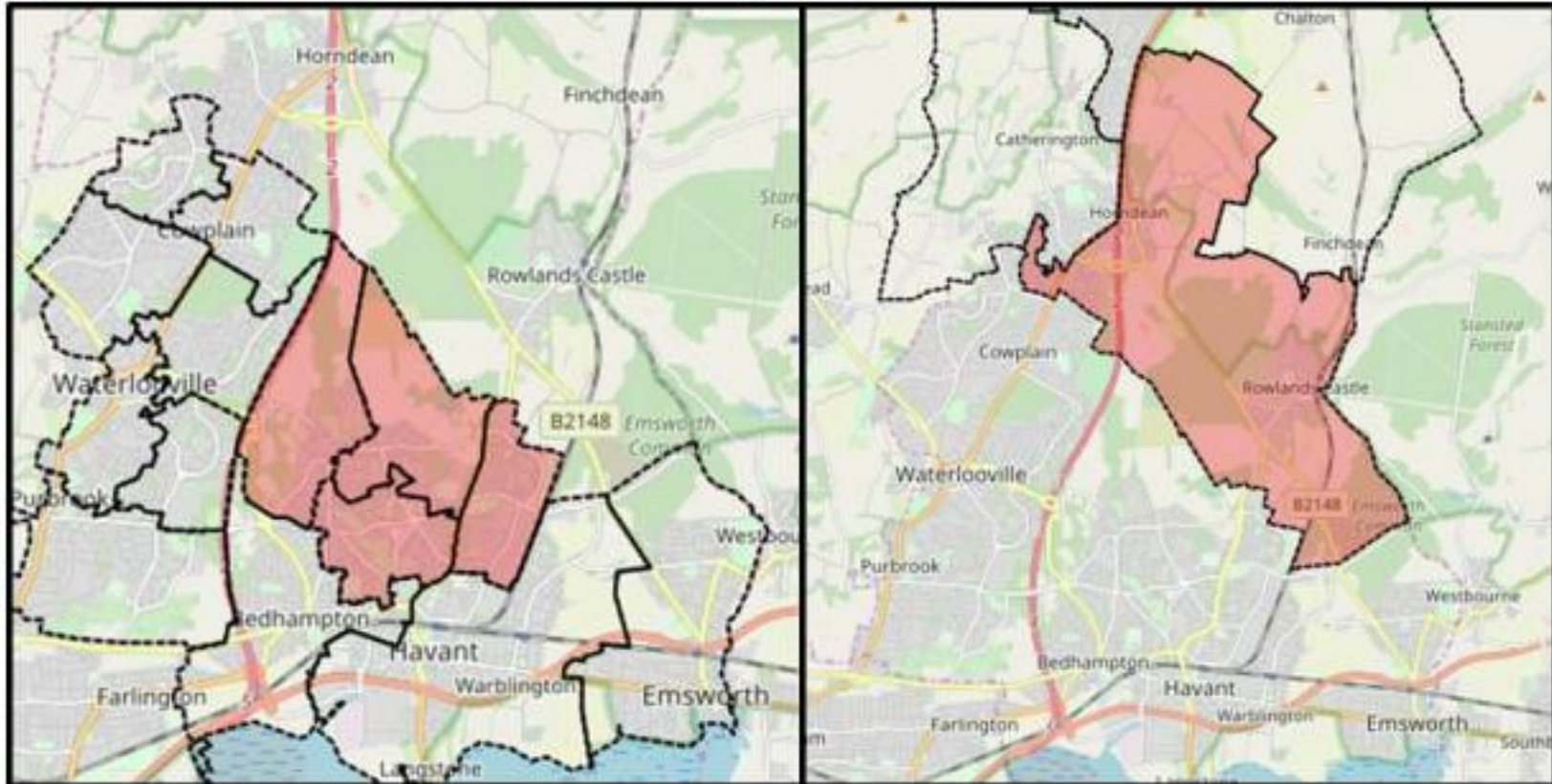
- 5.7. To forecast the 2029 future year traffic flows, growth factors from the Department for Transport (DfT) industry standard software TEMPro has applied to the survey data. Growth factors have been derived using the following areas, based on Middle Super Output Area (MSOA) boundaries:
- E02004767: Havant 006;
 - E02004769: Havant 008;

¹¹ Dell Piece East / B2149; B2149 / Middle Park Way; Woolston Road / Middle Park Way.

- E02004770: Havant 009;
- E02004771: Havant 010, and;
- E02006829: East Hampshire 016.

5.8. These MSOAs cover the area surrounding the reservoir as shown in Figure 5-1.

Figure 5-1 - MSOA wards included within the growth forecasts



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5.9. During discussions with the LHA it was suggested that consideration be given to including growth rates for additional wards including Bedhampton and Havant. The impact of including growth rates from these wards has been reviewed and the impact results in a change that is not considered material. Therefore, the growth rates included within the assessment are considered valid and are inclusive of traffic flows of nearby developments / allocated sites of relevance.

Committed Developments

5.10. In addition to DfT growth rates, consideration has been given to specific developments within the immediate vicinity of the site. Traffic flows from the nearby developments of Land East of Horndean (ref: 55562) and Dunsbury Hill Farm (Ref: 00338) have been manually included within the future baseline flows. The DfT growth rates have been adjusted accordingly to avoid double counting of committed development trips.

5.11. With regards to the Land East of Horndean development, which gained planning approval in June 2020, a number of improvements have been proposed to the highway network. Most notably, improvements or changes to the network have been proposed as:

- A new arm on the Dell Piece East/B4129 Roundabout for the employment land;
- A new four-armed roundabout on the B4219 providing access to residential development via the eastern arm and a new school and local centre via the western arm,
- Two new priority junctions with the B4219 providing access to residential dwellings; and
- Signalisation of Junction 2 of the A3(M).

5.12. The TA supporting the Land East of Horndean planning approval has been reviewed and it is considered that the development of the reservoir will have a limited impact at the new four-arm roundabout and priority junctions which provide access to the Horndean development. Consideration has also been given to the offsite signalisation improvements to Junction 3 of the A3(M). The improvements are expected to enhance the operation of the junction and, given the limited impact of the visitor traffic during peak hours, with the supporting TA forecasting a Practical Reserve Capacity of up to 12% during the peak hours.

- 5.13. The flow diagrams which illustrate the 2029 Baseline flows on the network can be seen in Appendix E.

2029 With Development

Trip Generation

- 5.14. The trip generation for the reservoir has been submitted to the LHA in a Technical Note, included within Appendix B, which is summarised below.
- 5.15. The estimated number of visitors that will visit the reservoir site is based on a comprehensive assessment of comparable attractions across the UK and local / regional demographic data. The full assessment is presented in the report titled Havant Thicket Winter Storage Reservoir: Visitor number and recreational and amenity facilities review (Planning Solutions Consulting Limited, July 2019), included in Appendix A.
- 5.16. The PSL report referred to above forecasts an annual total of 317,598 visitors, based on local demographic information derived from Census data and a review of comparable sites, including:
- Stanwick Lakes;
 - Attenborough;
 - Whitlingham Country Park;
 - Rushcliffe Country Park; and
 - Itchen Valley Country Park.
- 5.17. Table 5-1, taken directly from the PSL report, details the penetration rates, level of repeat visits and total visits for the reservoir site and Visitor Centre¹².

Table 5-1 - Visitor Estimations the reservoir site and Visitor Centre¹³

Market	Size	Penetration	Level of repeat visits (Per Year)	Visitors
Up to 15 mins ¹⁴	248,580	12%	5	149,148
16 to 30 mins	449,329	5%	3	67,399
31 to 60 mins	1,045,720	3%	1.25	39,215
61 to 90	2,502,115	1%	1	12,511
Dual use visitors from Leigh Park Gardens (Staunton)	180,000	7.5%	1	13,500
Tourists (excl staying with friends or relatives (SFR)	227,000	1.25%	1	2,838
SFR	129,000	8%	1	9,675
Day visits	2,218,000	0.3%	1	5,545
Passing visitors	23,780,480	0.05%	1	14,268
Education				2,500
Events				1000
Estimated total				317,598

*Passing traffic 1.2 persons per car

¹² The reservoir is based on the 'Medium Plus' scenario included within the visitor forecasts report.

¹³ Extract from The Havant Thicket Winter Storage Reservoir: Visitor number and recreational and amenity facilities review (Planning Solutions Consulting Limited, July 2019)

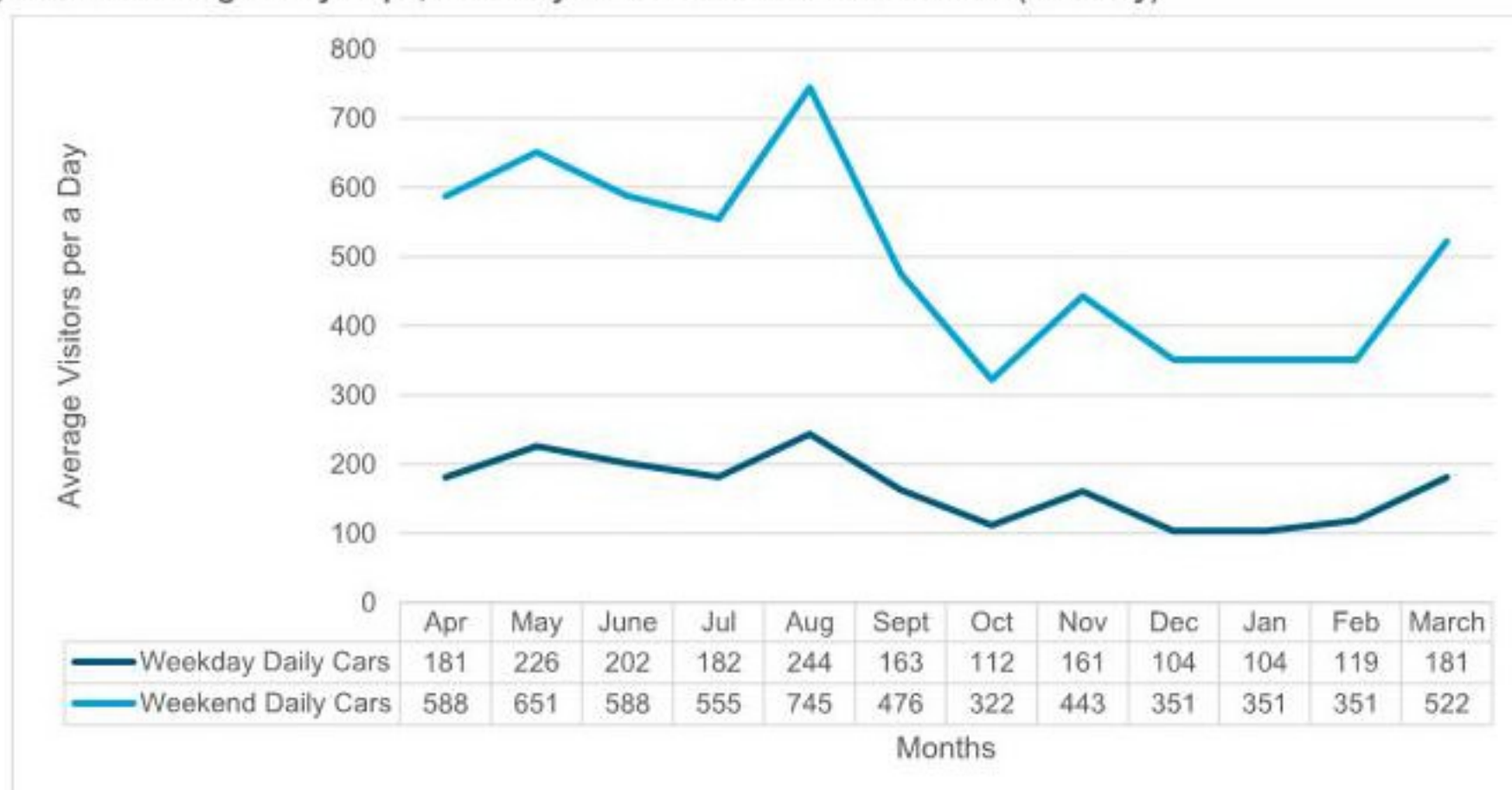
¹⁴ Drivetime catchment based on normal driving speeds derived by CACI using Geometric Buffering method.

- 5.18. The total annual visitor number of 317,598 has been taken forward as the basis for estimating the number of vehicular trip generation at the reservoir.
- 5.19. Data provided by the HCC Parks Department from the car park at Queen Elizabeth Country Park (QECF) has been used as a comparable scheme to determine the likely annual profile of visitors using the reservoir and Visitor Centre. It is estimated that the busiest period at the reservoir will be during the school summer holidays, with the month of August potentially accounting for up to 13% of the annual visitors. Conversely, the visitor totals are expected to reduce to approximately 5% during the mid-winter months.
- 5.20. The split of visitors who would visit the facility on a weekday, or a weekend has been determined using the average split per month captured by the HCC QECF data, for 'winter' and 'summer' months. The number of 'weekend' days and 'weekday' days has been assumed based on the typical number of days within a calendar month.
- 5.21. The proportional split of weekday versus weekend visitors for each month has been applied to the total monthly visitors expected at Havant Thicket Reservoir, with the number of weekdays and number of weekend days per month being applied to establish the average number of visitors per typical weekday and typical weekend day, for each month.
- 5.22. The visitor numbers have been translated to a daily vehicle number using a visitor to vehicle ratio of 1 vehicle for every 3.45 visitors. This is based on the assumed split of visitors expected to make up the annual visitor total derived from the 2019 Portsmouth Water total¹⁵. This briefly assumes that:
 - 70% of visitors within the 15 min drivetime catchment will drive¹⁶;
 - 20% of dual visitors (with Leigh Valley Park) will drive;
 - 75% of visitors staying with friends will drive;
 - 100% of all other visitors will drive; and
 - Vehicle occupancy rate of 2.2 for all visitors except for passing traffic, which assumes an occupancy of 1.2.
- 5.23. It is pertinent to note that the vehicle occupancy rates are considered conservative, with some country parks capturing vehicle occupancy rates of 2.9, it is therefore considered that the vehicle number estimates are robust.
- 5.24. The subsequent number of daily vehicular trips (one-way) to the site during a weekday and weekend for each month can be seen in Figure 5-2.

¹⁵ Planning Solutions Consulting Limited (PSL) on behalf of Portsmouth Water: *Havant Thicket Winter Storage Reservoir: Visitor number and recreational amenity facilities review* (July 2019).

¹⁶ Based on a comparison against other country parks as presented within the PSL report.

Figure 5-2 - Average Daily Trips, Weekday and Weekend for Each Month (one-way)



- 5.25. The car park data at QECP has been collected using Automatic Number Plate Recognition (ANPR) technology. It details the profile of arrivals during the winter and summer months. In the absence of recorded departures at QECP car park, reference has been made to the ticketing information from the QECP car park to establish a departure profile. The proportion of each ticket type has been applied to each of the hours across the day.
- 5.26. To determine the trip generation profile for each month, the arrival / departure profile for summer and winter months has been applied to the number of average daily trips estimated.
- 5.27. To present a reasonable assessment of the potential impact of the reservoir on the local highway network, the typical weekday peaks and a weekend development peak for the average summer month has been assessed. This provides a balance between assessing when the network is expected to be at its busiest, and when the trip generation of the reservoir itself is expected to be at its busiest
- 5.28. The number of arrivals and departures at the site during these periods are presented in Table 5-2.

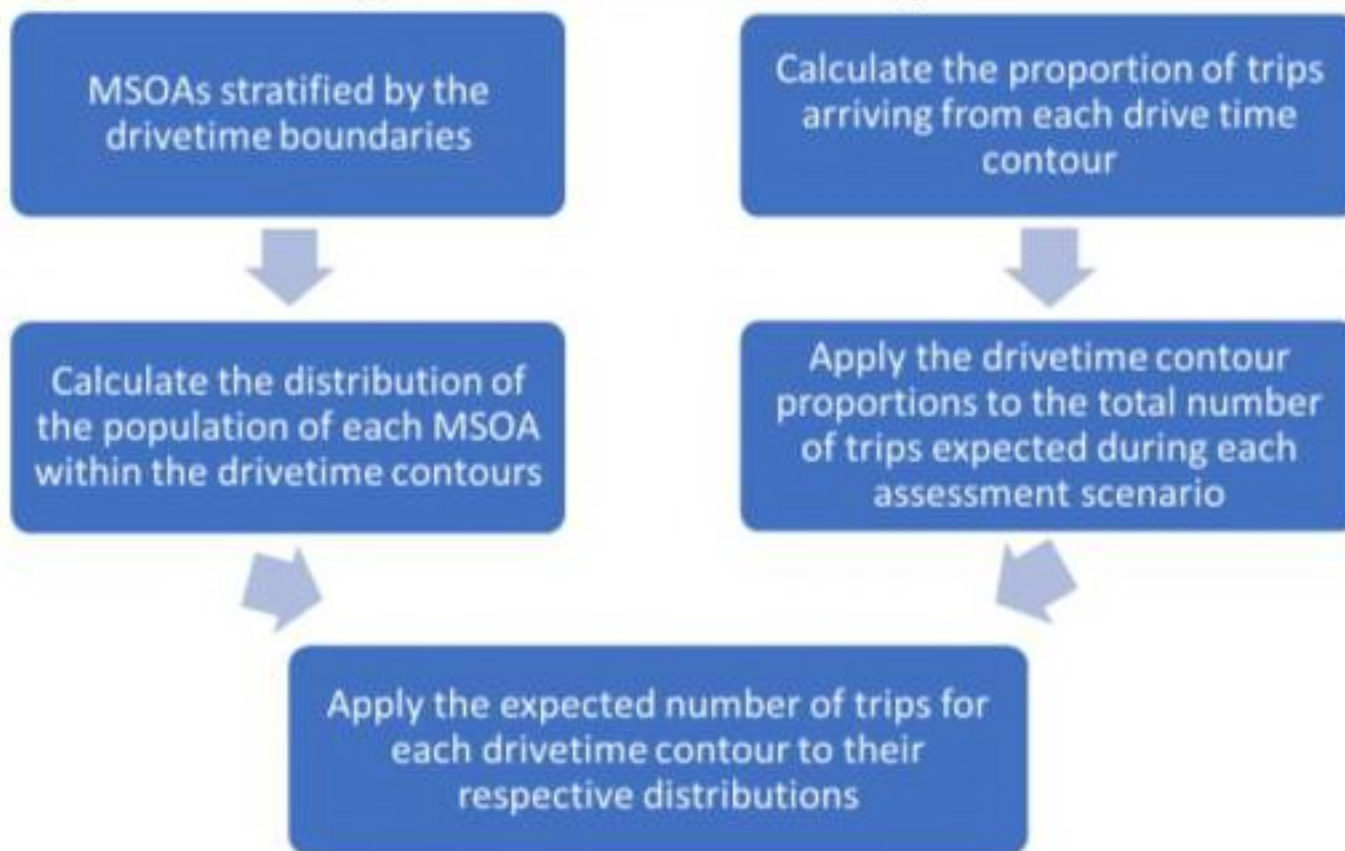
Table 5-2 - Number of Trips Generated by the Site

Scenario	Arrival	Departure	Two-Way
Weekend Development Peak (12:00-13:00)	92	69	161
Weekday Network AM Peak (08:00-09:00)	5	1	6
Weekday Network PM Peak (17:00-18:00)	12	13	25

Visitor Trip Distribution

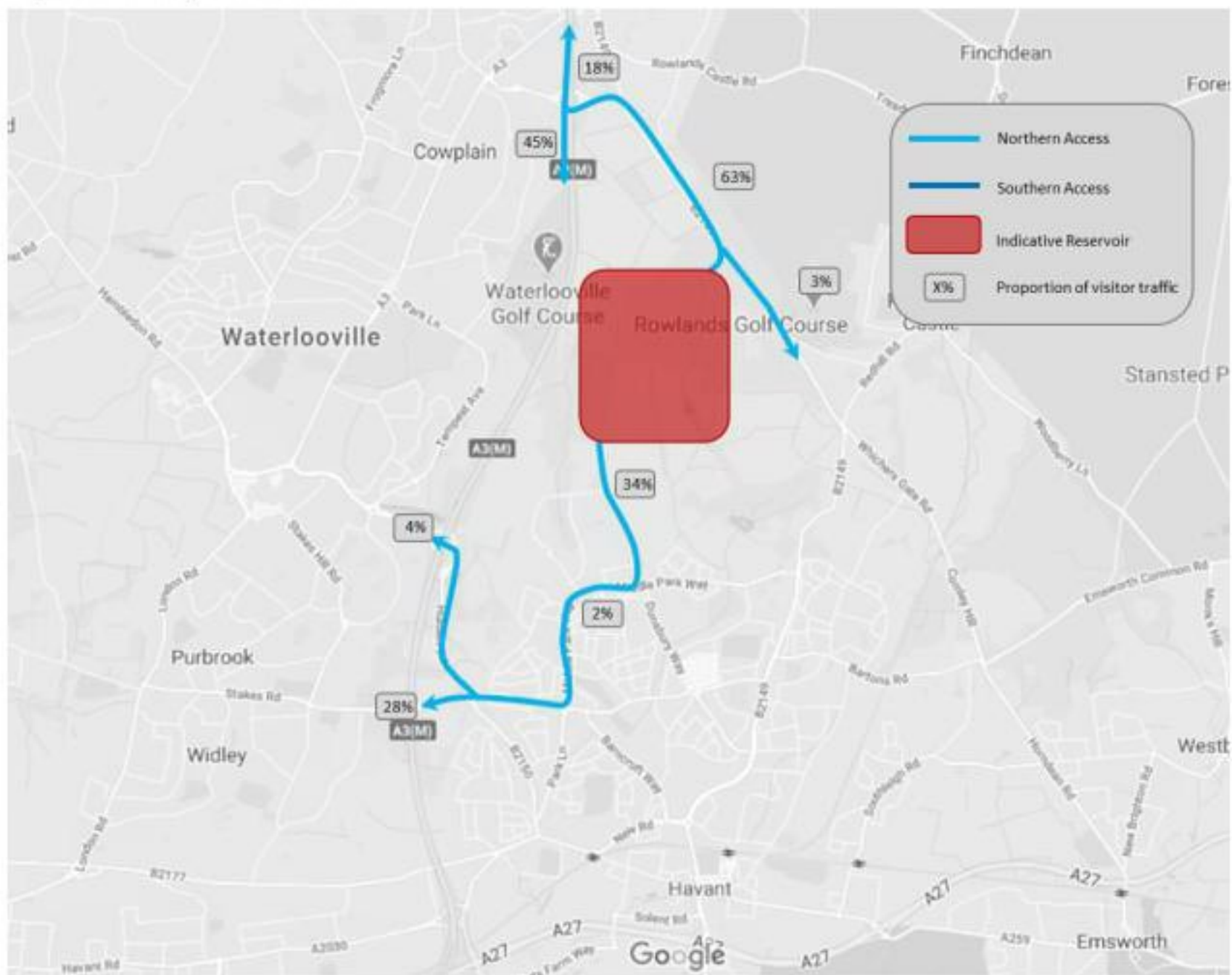
- 5.29. The Visitor Centre trip distribution has been calculated based on a combination of population and distance information from the reservoir. A Technical Note summarising the expected distribution, which accounts for the access strategy described in Chapter 4, was submitted and discussed with the LHA. The Technical Note is presented in Appendix B for reference. The population information has been derived from 2011 Census Data for MSOAs, with distance information has been calculated using journey time cordons that have been derived using straight line distances from the site (with an assumed average speed of 55kph). A distribution model has been developed which assigns a spatial proportion of each travel catchment band from the visitor forecasts. The flow diagram presented in Figure-5-3 summarises the steps taken to derive the distribution model.

Figure 5-3 - Flow Diagram of Distribution Methodology



5.30. The resulting distribution of visitor trips is presented in Figure 5-4.

Figure 5-4 - Trip Distribution



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2029 With Development Traffic Flows

5.31. The 2029 'with development' flows have been calculated by adding the assigned development trips to the 2029 Base traffic flows. The 2029 With Development traffic flow diagrams are provided in Appendix E.

Impact Assessment

5.32. The impact of development traffic in the 2029 Opening Year has been calculated by comparing the 2029 year 'with development' traffic flows with the 2029-year base traffic flows. During early scoping discussions with the LHA, a number of junctions were referenced as being of interest to the study and subsequently surveyed. A summary of the key links in the vicinity of the site where the impact of the development is greater than 5% for the AM (08:00-09:00), PM (17:00-18:00) or Saturday (12:00-13:00) scenarios is provided in Table 5-3 with a network flow diagram presented in Appendix E.

Table 5-3 - 2029 Development Traffic Impact – Two-way Vehicles

Link Name	Percentage Impact		
	AM	PM	SAT
Dell Piece East between A3(M) and roundabout with B2149	0%	1%	6%
Middle Park Way North of Jct with Purbrook Way	0%	1%	5%
A3(M) Jct 2 south slips	0%	1%	5%
North of Northern Access B2149	0%	1%	9%
Swanmore Road	1%	4%	41%
Middle Park Way West of Swanmore Road	0%	1%	8%

- 5.33. As shown in Table 5-3, there are seven links on the local highway where the development traffic has an impact of 5% or higher.

Junction Capacity Analysis

- 5.34. With consideration given to the impacts of the development shown in Table 5-3, the following junctions at which at least one arm is predicted to experience an impact of greater than 5% resulting from the development have been considered further within the assessment:
- The Dell Piece East/B4129 Roundabout;
 - The Northern Site Access/B4219;
 - The Southern Site Access/Swanmore Road;
 - Swanmore Road/Middle Park Way Priority Junction;
 - The Woolston Road/Middle Park Way Mini Roundabout, and;
 - The Purbrook Way/Middle Park Way Roundabout.
- 5.35. With regards to the A3(M) Junction 2, it has been described that improvements to the junction are proposed as part of the Land East of Horndean development. The supporting TA forecasts a Practical Reserve Capacity of up to 12% during the peak hours, where the impact of traffic associated with the reservoir is expected to be minimal. It is understood that the specific design of the improved junction is still under development, and it is considered that it would provide sufficient capacity to accommodate the expected level of traffic from the reservoir. On this basis, no further assessment of this junction is considered necessary.
- 5.36. The junction analysis has been undertaken using the PICADY or ARCADY junction modelling programmes as appropriate. Both PICADY and ARCADY are part of the Junctions 9 programme produced by the Transport Research Laboratory (TRL) which is an industry standard software package used for the analysis of priority junctions and roundabouts. The capacity analysis results are expressed in terms of the Ratio of Flow to Capacity (RFC), Delay (seconds) and the maximum Queue (PCU). The theoretical capacity of each approach is taken at the RFC value of 1.0 and the design capacity is taken at an RFC value of 0.85 (i.e. 85% of the theoretical capacity). A junction is therefore considered to operate within design capacity if all approaches have an RFC of less than 0.85.
- 5.37. The Junctions 9 Output files are provided in **Appendix F**.

Northern Site Access

- 5.38. The northern site access is a priority junction with a right turn lane and has therefore been modelled using the PICADY section of Junctions 9. As the access junction is a new junction, only the 'with development' scenario has been tested. A summary of the results from Junctions 9 can be seen in Table 5-4.

Table 5-4 - Capacity Assessment Results for the Northern Site Access

	AM (08:00 – 09:00)			PM (17:00 - 18:00)			Sat (12:00 - 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2029 Base + Dev								
Stream B-C	<1	0	0	<1	7.03	0.02	<1	6.77	0.08
Stream B-A	<1	0	0	<1	0	0	<1	17.46	0.01
Stream C-AB	<1	7.72	0.01	<1	7.89	0.02	<1	7.91	0.12

A = B2419 South, B = Site Access, C = B2419 North

- 5.39. As shown in Table 5-4 the northern site access remains within capacity in all scenarios. The highest RFC modelled at the junction is on Stream C-AB which reaches 0.12 during the 2029 With Development Saturday peak scenario. This remains well within the theoretical capacity of 0.85.

Southern Site Access

- 5.40. The southern site access is a priority junction and has therefore been modelled using the PICADY section of Junctions 9. As the access junction is a new junction, only the 'with development' scenario has been tested. A summary of the results from Junctions 9 can be seen in Table 5.5..

Table 5-5 - Capacity Assessment Results for the Southern Site Access

	AM (08:00 – 09:00)			PM (17:00 - 18:00)			Sat (12:00 - 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2029 Base + Dev								
Stream B-AC	<1	0	0	<1	5.48	0.01	<1	5.53	0.03
Stream C-AB	<1	5.6	0	<1	5.4	0.01	<1	5.89	0.05

A = Swanmore Road West, B = Site Access, C = Swanmore Road East

- 5.41. As shown in Table 5-5 the southern site access remains within capacity in all scenarios. The highest RFC modelled at the junction is on Stream C-AB which reaches 0.05 during the 2029 With Development Saturday peak scenario. This remains well within the theoretical capacity of 0.85.

Dell Piece East/B2419 Roundabout

- 5.42. The Dell Piece East/B2419 Roundabout has been modelled using the ARCADY section of Junctions 9.

The roundabout model has included the capacity improvements proposed as part of the Land East of Horndean development. The design of the roundabout improvement contained in the supporting TA can be seen in Figure 5-5.

Figure 5-5 - Improvements to the Dell Piece East/B2419 Roundabout



5.43. A summary of the results from Junctions 9 can be seen in Table 5-6.

Table 5-6 - Capacity Assessment Results for the Dell Piece East/B2419 Roundabout (inclusive of committed improvements)

	AM (08:00 – 09:00)			PM (17:00 - 18:00)			Sat (12:00 - 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020									
1 - B2419 N	<1	4.47	0.41	<1	3.66	0.27	<1	3.53	0.32
2 - Church Access	<1	8.46	0.04	<1	0	0	<1	0	0
3 - B2419 S	<1	3.3	0.36	<1	3.02	0.34	<1	2.93	0.31
4 - Horndean Employment Access	<1	0	0	<1	0	0	<1	0	0
5 - Dell Piece East	<1	2.68	0.35	<1	2.95	0.41	<1	2.48	0.31
2029 Base									
1 - B2419 N	1	6.28	0.53	<1	5.07	0.37	<1	3.89	0.37
2 - Church Access	<1	13.31	0.08	<1	0	0	<1	0	0
3 - B2419 S	2	5.41	0.6	<1	3.84	0.48	<1	3.17	0.35
4 - Horndean Employment Access	<1	4.99	0.01	<1	4.14	0.03	<1	0	0

	AM (08:00 – 09:00)			PM (17:00 - 18:00)			Sat (12:00 - 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
5 - Dell Piece East	<1	3.32	0.47	2	4.39	0.6	<1	2.64	0.34
2029 Base + Dev									
1 - B2419 N	1	6.19	0.53	<1	5.02	0.37	<1	4.03	0.38
2 - Church Access	<1	13.38	0.08	<1	0	0	<1	0	0
3 - B2419 S	2	5.28	0.6	<1	3.77	0.48	<1	3.27	0.37
4 - Horndean Employment Access	<1	5.01	0.02	<1	4.07	0.03	<1	0	0
5 - Dell Piece East	<1	3.28	0.47	1.5	4.36	0.6	<1	2.74	0.37

- 5.44. As shown in Table 5-6, the Dell Piece East/B2419 Roundabout is predicted to remain within capacity in all scenarios. The highest RFC modelled at the junction is on the northern arm of the B2419 which reaches 0.53 during the 2029 With Development AM peak scenario. This is well within the theoretical capacity of 0.85.

Middle Park Way/Woolston Road Mini Roundabout

- 5.45. The Middle Park Way/Woolston Road Mini Roundabout has been modelled using the ARCADY section of Junctions 9. A summary of the results from Junctions 9 can be seen in Table 5-7.

Table 5-7- Capacity Assessment Results for the Middle Park Way/Woolston Road Mini Roundabout

	AM (08:00 – 09:00)			PM (17:00 - 18:00)			Sat (12:00 - 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020 Base									
1 - Woolston Road	1	7.02	0.37	<1	6.24	0.21	<1	5.91	0.23
2 - Middle Park Way E	1	6.84	0.41	<1	5.37	0.31	<1	5.29	0.31
3 - Middle Park Way W	1	4.93	0.37	2	6.59	0.53	1	4.88	0.39
2029 Base									
1 - Woolston Road	1	7.7	0.42	<1	6.74	0.25	v	6.4	0.27
2 - Middle Park Way E	1	7.46	0.47	<1	5.57	0.35	1	5.7	0.35
3 - Middle Park Way W	1	5.18	0.41	2	7.53	0.6	1	5.31	0.43
2029 Base + Dev									
1 - Woolston Road	1	7.73	0.42	<1	6.78	0.25	<1	6.64	0.27
2 - Middle Park Way E	1	7.47	0.47	<1	5.61	0.35	1	5.92	0.38
3 - Middle Park Way W	1	5.2	0.42	2	7.6	0.6	1	5.58	0.46

- 5.46. As shown in Table 5-7 the Middle Park Way/Woolston Road Mini Roundabout is predicted to remain within capacity in all scenarios. The highest RFC modelled at the junction is on the northern arm of

the B2419 which reaches 0.6 during the 2029 With Development PM peak scenario. This is well within the theoretical capacity of 0.85.

Middle Park Way/Purbrook Way Roundabout

- 5.47. The Middle Park Way/Purbrook Way Roundabout has been modelled using the ARCADY section of Junctions 9. A summary of the results from Junctions 9 can be seen in Table 5-8.

Table 5-8- Capacity Assessment Results for the Middle Park Way/Purbrook Way Roundabout

	AM (08:00 – 09:00)			PM (17:00 – 18:00)			Sat (12:00 – 13:00)		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020 Base									
1 – Middle Park Way	2.3	14.58	0.69	1.4	11.08	0.58	1.1	9.37	0.53
2 – Purbrook Way E	4.5	22.34	0.82	8.6	37.13	0.91	3	14.97	0.75
3 – Park Lane	0.7	8.51	0.4	1.2	11.94	0.56	0.6	7.59	0.38
4 – Purbrook Way W	2.5	10.64	0.71	4	16.43	0.81	2.1	9.16	0.68
2029 Base									
1 – Middle Park Way	4.7	27.69	0.83	2.2	16.32	0.69	1.7	12.8	0.64
2 – Purbrook Way E	14.9	68.47	0.95	35.5	120.83	1.04	5.9	27.16	0.87
3 – Park Lane	1	10.69	0.49	1.9	16.31	0.66	0.8	9.23	0.45
4 – Purbrook Way W	4.3	16.61	0.81	9.5	35.99	0.92	3.3	12.98	0.77
2029 Base + Dev									
1 – Middle Park Way	4.8	27.9	0.83	2.3	16.63	0.7	2	13.99	0.67
2 – Purbrook Way E	15	68.92	0.95	36.3	123.2	1.05	6.4	29.53	0.88
3 – Park Lane	1	10.71	0.49	1.9	16.41	0.66	0.8	9.52	0.46
4 – Purbrook Way W	4.4	16.76	0.81	9.9	37.22	0.93	3.8	14.69	0.8

- 5.48. As shown in Table 5-8 the Middle Park Way/Purbrook Way Roundabout is expected to operate above capacity in all scenarios except during the AM and Saturday peak periods during the 2020 Baseline scenario. The eastern Purbrook Way arm experiences the highest delay (123.2 seconds) and RFC (1.05) during the 2029 With Development PM peak scenario. Although the roundabout is predicted to exceed capacity in the 2029 With Development scenario, when compared with the 2029 Baseline scenario the impact of the development on capacity at the junction is considered minimal.
- 5.49. The differences in the delay at the Middle Park Way/Purbrook Way Roundabout between the 2029 Baseline and 2029 With Development scenarios is summarised for each arm and scenario in Table 5-9.

Table 5-9 - 2029 Baseline and With Development Capacity Differences - Middle Park Way/Purbrook Way Roundabout

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
1 - Middle Park Way	0.1	0.21	0	0.1	0.31	0.01	0.3	1.19	0.03
2 - Purbrook Way E	0.1	0.45	0	0.8	2.37	0.01	0.5	2.37	0.01
3 - Park Lane	0	0.02	0	0	0.1	0	0	0.29	0.01
4 - Purbrook Way W	0.1	0.15	0	0.4	1.23	0.01	0.5	1.71	0.03

- 5.50. As shown in Table 5-9, the development has minimal impact on the maximum queue, delay and RFC of the roundabout when comparing the 2029 with and without development scenarios. The Purbrook Way East arm experiences an increase in delay of just 2.37 seconds during the PM and Saturday Peak scenarios. This is the maximum increase in delay as a result of the development. Consequently, the impact of the development on the roundabout's capacity is considered negligible and no mitigation attributable to the impact of the reservoir is considered necessary. It is also pertinent to note that the roundabout operation appears constrained due to the presence of cycle lane provision at the junction; a capacity improvement at the junction could potentially conflict with the intention of accommodating cyclists.

Summary of Capacity Analysis

- 5.51. The analysis has shown that the junctions on the network, with the exception of the Middle Park Way/Purbrook Way Roundabout, remain within capacity in all scenarios with the Scheme in place. It is notable that the Middle Park Way/Purbrook Way Roundabout exceeds capacity in all scenarios except during the AM and Saturday Peak periods during the 2020 Baseline scenario. The capacity analysis has shown that the development has limited impact on the delay at the roundabout, with the maximum increase in delay when the with and without development scenarios are compared is 2.37 seconds during the PM and Saturday Peaks. This is considered a negligible impact on capacity.

Reservoir Parking

- 5.52. Consideration has been given to both East Hampshire and Havant Brough Council's parking policies and standards to determine whether there is any prescribed guidance with regards to the appropriate level of parking. It is considered that there is not a specific land use comparable to the Havant Thicket Reservoir within the standards. Using the trip generation data across the year, a parking accumulation exercise has been undertaken to estimate the number of vehicles parking at the site during the summer and winter periods is summarised in Table 5-10.

Table 5-10 - Forecast Number of Parked Vehicles

	Winter		Summer	
	Weekday	Weekend	Weekday	Weekend
Average	47	140	59	196
Peak	71	204	73	247

- 5.53. As shown in Table 5-10, the analysis indicates that during the absolute peak there could be demand for up to 247 spaces, though it is not considered that this represents 'typical' demand. The core parking area of 193 spaces, in addition to the overflow area of 75 spaces is considered sufficient to ensure that there would be no overspill parking or parking impact on nearby residential streets.

Consideration of Construction Impact

- 5.54. The volume of construction traffic, for both the reservoir site and pipeline, has been estimated based on the required construction activities and an assumed programme as stated in the outline construction programme, which includes the ancillary pipeline to Bedhampton. The number of construction vehicles likely to be required for each activity has been established based on typical vehicle payloads and known material requirements for the reservoir construction. The assessment within the EIA accompanying the planning application has applied an indicative 'peak construction day', whereby there are assumed to be concurrent activities generating HGV movements associated with both the construction of the reservoir and of the pipeline.
- 5.55. The main welfare facilities and laydown areas for the pipeline will be located within the red line boundary of the reservoir site, requiring pipeline construction traffic to route between the reservoir and the relevant section of the pipeline.

Reservoir site and access roads

- 5.56. It is anticipated that during the peak construction period there will be a potential for 200 HGV movements a day (100 arrivals, and 100 departures) associated with the construction of the reservoir, which will be undertaken during the main embankment construction activity in 2023.
- 5.57. In addition to construction HGVs, there will also be staff trips to and from the reservoir, with up to 125 staff expected to be on site at the peak of construction.

Pipeline

- 5.58. For assessment purposes within the EIA accompanying the planning application, it has been assumed that the pipeline construction will be undertaken concurrently with the reservoir. The pipeline is expected to generate up to 30 HGV movements a day (15 arrivals and 15 departures).
- 5.59. There will also be staff trips associated with the pipeline, with up to 125 staff likely to be constructing the pipeline at the peak. Pipeline construction staff will be transported to and from the pipeline using minibuses, or a comparable light goods vehicle (LGV). This will result in approximately 20 trips a day using the robust assumption that staff will be transported back to the reservoir welfare facilities for lunch and then returned to the pipeline.

Combined construction

- 5.60. A summary of all construction traffic assessed for the robust case is provided in Table 5-11.

Table 5-11 - Construction Traffic Trip Generation for Assessment

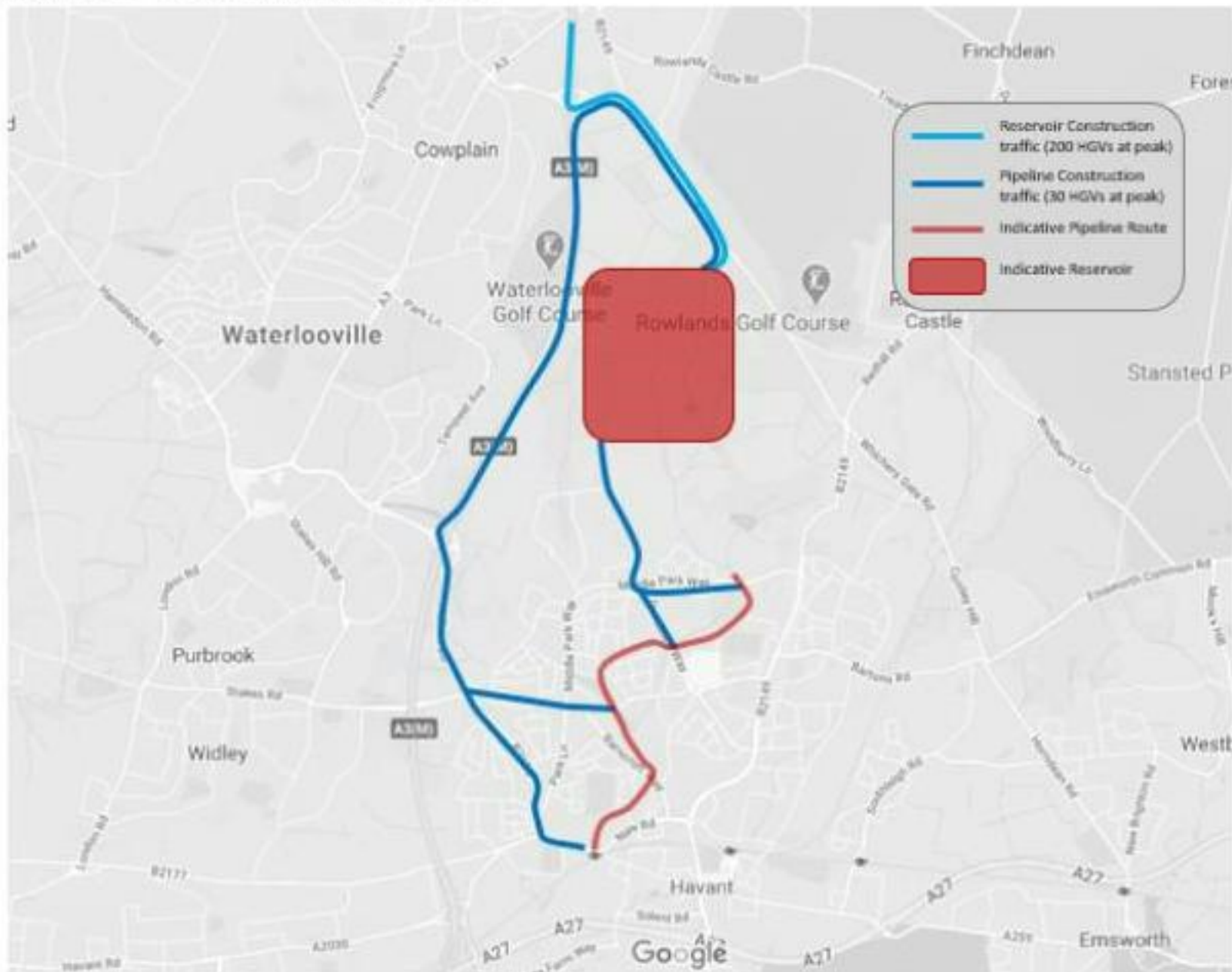
Activity	Daily HGVs (two-way)	Daily Cars / LGVs (two-way)
Reservoir	200	250
Pipeline	30	270

- 5.61. The construction HGV traffic has been distributed across the highway network, on the principle that construction vehicles will take the most suitable and direct route to the principal road network (i.e. the A3(M)). This routing is expected to be included within the Construction Traffic Management Plan (and Appendix A2.1 Outline Environmental Management Plan in ES Volume 4) that the appointed contractors will be required to follow.
- 5.62. Whilst it is expected that both the northern and southern access points will be available, the HGV construction traffic will be required to use the northern access as the main access point, with the southern access only being used for part of the pipeline construction.
- 5.63. All reservoir HGV traffic is therefore expected to use the B2149 to access the A3(M) directly via junction 2, routing through the Dell Piece East Roundabout. HGV traffic associated with the pipeline is expected to be split into three time periods where the peak HGV generation will occur.
- 5.64. During Period One, the pipeline HGV traffic will route between the northern site access and the A3(M) at junction 2, before routing south to leave the A3(M) at junction 3; accessing the pipeline construction area principally via Purbrook Way. During Period Two, the pipeline HGV traffic will

route between the northern site access and the A3(M) at junction 2, before routing south to leave the A3(M) at junction 3; accessing the pipeline construction area principally via the B2150 and Bedhampton Way. During Period Three, pipeline HGV traffic will access the northern part of the pipeline using the southern reservoir access, Swanmore Road and principally Middle Park Way.

- 5.65. A summary of the construction HGV traffic used within the assessment included within the EIA is presented in Figure 5.6. It is noted that the pipeline assessment of 30 HGV movements (two-way) has been assessed on each construction link, however these routes will not be in use concurrently.

Figure 5-6 - Construction HGV Routes



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- 5.66. It should also be noted that during construction of the reservoir site and access roads it will be necessary to divert a PRow, as set out in Chapter 4 of this TA.
- 5.67. For the pipeline, it may also be necessary to introduce the temporary diversion of PRow or public highway, which is unrelated to the volume of construction traffic. Whilst it is acknowledged that any road closure would have a local impact, the closures will be carefully coordinated through on-going dialogue with the LHA to minimise the impact to local residents.

6. Framework Travel Plan

Introduction

- 6.1. In order to seek opportunities to maximise travel to and from the reservoir and Visitor Centre by means of travel other than the private car. It is intended that a Travel Plan will be developed once the Visitor Centre is opened. This Chapter of the TA presents a framework within which the Travel Plan could be developed, identifying potential measures for development once the baseline travel conditions are fully understood.

Baseline Travel Surveys

- 6.2. Given that the facility is a new provision in the area, it is not possible to determine existing travel patterns, with forecasts forming the basis of this TA. In order to ensure that Travel Plan is fully informed, travel surveys will be undertaken at the site once it is fully operational. These surveys will determine travel patterns of visitors and staff to and from the site, which will allow future targets to be established on observed data.

Aims and Objectives

- 6.3. Specific Aims and Objectives will be set within the Travel Plan, to provide direction and focus, and will be informed by the existing patterns captured by the travel surveys. The potential Aims of the Travel Plan could be:
- To effectively manage the travel behaviour of staff and visitors to / from the site, recognising the opportunities of its location in terms of public transport accessibility and the highway network, and;
 - To develop a strategy for the ongoing management / coordination and marketing of the Travel Plan, ensuring that it remains a live document.
- 6.4. In order to achieve these aims the following objectives could be included in the Travel Plan:
- Objective 1 – To minimise the total number of vehicle trips to and from the reservoir and Visitor Centre by encouraging staff and visitors to use modes of transport other than driving by car;
 - Objective 2 – To maximise opportunities to travel to and from the reservoir and Visitor Centre by walking or cycling in a safe and secure manner; and
 - Objective 3 – To improve the overall sustainability of the reservoir and Visitor Centre.

Targets

- 6.5. The Travel Plan will identify targets to meet the objectives. Travel Plan targets are required to monitor the success of meeting the objectives. Targets are measurable goals with achievable timescales associated with them. They should be SMART (Specific, Measurable, Achievable, Realistic and Timebound).
- 6.6. Potential targets that could be relevant to the objectives are set out in Table 6-1. These specific targets will be reviewed once the baseline travel conditions at the reservoir and Visitor Centre are understood.

Table 6-1 -Travel Plan Objectives and Targets

Travel Plan Objectives	Travel Plan Targets
To minimise the total number of vehicle trips to and from the reservoir and Visitor Centre by encouraging staff and visitors to use modes of transport other than driving by car.	100 percent of staff to be provided with Site Travel Packs 100 percent of new starters to be provided with Site Travel Pack prior to starting work. To update visitor travel information on a six-monthly basis.
To maximise opportunities to travel to and from the reservoir and Visitor Centre by walking or cycling in a safe and secure manner.	To increase the proportion of visitors entering the reservoir and Visitor Centre by bike or foot by 5 percent within 4 years.
To improve the overall sustainability of the reservoir and Visitor Centre.	To reduce the proportion of visitors entering the reservoir and Visitor Centre using private vehicles by 10 percent within 4 years.

- 6.7. Although only a small number of staff will be employed at the Visitor Centre, a number of measures could be introduced to influence their travel behaviour and help meet the objectives / targets of the Travel Plan as detailed in Table 6-2.

Table 6-2 - Potential Staff Travel Plan Measures

Measure	Detail
Site Travel Pack	A key factor in the travel mode choice of staff is awareness of available options. The Site Travel Pack could provide information on: • The Travel Plan and its objectives / measures; • Public transport services / times; • Walk / cycle routes; • Local car clubs; • Local bike shops; • Key contacts for travel queries; and • Links to journey planning websites (such as walkit.com and traveline.info).
Travel information boards	Effective marketing and communication of travel information will contribute to raising the awareness of the Travel Plan amongst staff and engage staff to support its aims and objectives. The notice boards will keep staff up to date with any new travel initiatives and any changes to public transport services / changes to travel at the reservoir.
Discounts on cycle/walking equipment from local stores	Local cycle / walking stores will be engaged to promote walking and cycling amongst staff. Initiatives such discounts / loyalty cards could be explored to offer staff incentives to use the stores for their equipment needs.
Car share matching	Information on staff post codes and shift patterns could be collated by a Travel Plan Coordinator, and opportunities for car sharing could be explored.
Cycle training	Cycle training could be offered to staff to ensure that they are able to cycle safely on the public highway. The training will be focused on raising awareness of appropriate cycle behaviour and current best practice.
Cycle maintenance	Cycle maintenance days could be held to ensure staff bicycles are kept in sufficient condition. Staff associated with local cycle stores will be engaged to provide support and advice for cycle maintenance classes.

Visitor Travel Measures

- 6.8. The focus of the Travel Plan measures is to influence visitor travel. Recognising the ever-changing baseline of visitors to the reservoir and Visitor Centre, the measures will focus on improvements to information provision to help visitors make informed choices about their mode of travel. The potential visitor measures are presented in Table 6-3.

Table 6-3 - Potential Visitor Travel Plan Measures

Measure	Detail
Provide travel information on the Visitor Centre website	Information on the website will help visitors from outside of the area.
Signage at entrance points (wayfinding)	Signage focused on local walking / cycling routes will be provided at the entrances, allowing visitors to navigate to local amenities / public transport points from the park itself. The signage will also provide information on facilities at the reservoir to assist in providing an enhanced user experience, including directions to cycle parking.
Improved signage from local bus stops	As part of the signage strategy routes from local bus stops to the park could be identified. A consistent signage style will direct visitors from the bus stops to the park entrances.
Visitor Centre information leaflet to include up to date travel information	The public information leaflet could provide up to date travel information including walking / cycling routes and public transport provision.
Incentives for local schools to walk rather than get a coach	Local schools could be engaged and appropriate walking routes between the schools and the Visitor Centre will be identified. Schools will be encouraged to walk rather than using coach travel. Incentives such as discounted catering prices will be considered.
Cycle / walking maps around the reservoir and at entrance points.	To accompany the signage strategy walking / cycling maps will be placed in prominent locations around the reservoir, including the park entrances. This will provide information on routes within the park itself and linkages to surrounding external areas.

Travel Plan Monitoring

- 6.9. Within 6 months of the Travel Plan implementation a survey could be carried out. This will monitor and review the progress of the Travel Plan against its aims, objectives and targets. If the Travel Plan aims and targets are not being met, the document will should be reviewed with the potential to introduce further measures.

7. Summary and Conclusion

- 7.1. A comprehensive Transport Assessment has been undertaken, to consider the potential impacts of the Scheme. The assessment has been developed through on-going discussion with the Local Highway Authority and includes a multi-modal review of the existing transport network.
- 7.2. Consideration has been given to the future operation of the highway network, and the impact of the development assessed at key local junctions within the vicinity of the reservoir. The assessment has demonstrated that the access strategy developed for the reservoir site, with two access points, will dilute visitor traffic to the extent where the highway network is not materially impacted.
- 7.3. Junctions that experience more than a 5% impact resulting from the development have been considered in the traffic assessment. All of these junctions are predicted to remain within capacity during the 2029 With Development scenario, with the exception of the Purbrook Way/Middle Park Way Roundabout. Further analysis has shown that the maximum increase in delay resulting from the development is on the Purbrook Way East arm with an increase of just 2.37 seconds during the PM and Saturday Peaks. This is considered to be a negligible impact on capacity.
- 7.4. The Scheme is located where there is good access to the principal road network and the development will help promote Hampshire's active transport ambitions. The facilities at the reservoir will provide local people with an education and leisure destination as well as enhanced leisure facilities.
- 7.5. The assessments undertaken demonstrate that the development proposal will not have any significant adverse impacts in highway terms. The residual cumulative impacts of the development are not considered severe and as a consequence the development proposal should be considered acceptable in transport planning terms.

Appendices



Appendix A. Havant Thicket Reservoir: visitor number, and recreational and amenity facilities review



Havant Thicket Winter Storage Reservoir: Visitor number and recreational amenity facilities review



Prepared by:

Planning Solutions Consulting Limited

July 2019

FINAL

CONFIDENTIAL – COMMERCIALY SENSITIVE

Client	Portsmouth Water
Client contacts	Simon Hughes, Tracey Viney
Title	Havant Thicket Winter Storage Reservoir: Visitor number and recreational and amenity facilities review
Version	Final
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Executive summary

It is clear the Havant Thicket Winter Storage Reservoir (HTWSR) will act as an attraction for additional visitors and this study aims to assess the respective merits of different levels and intensity of recreation provision.

In developing HTWSR, Portsmouth Water identifies seven drivers or 'touchpoints'. The main elements of these which relate to the recreation provision on the site focus on quality, connectivity (with customers and the local community) and the environment. It is essential that any project and its uses gain positive community buy-in, respect the historic landscape and foster a net biodiversity gain. Visitor flows to the site must be managed effectively in line with its environmental capacity and it is important to ensure that the HTWSR site has a distinctive offer which complements and does not draw visitors away from the neighbouring Staunton Country Park.

The study considers three lead scenarios for the recreation provision. The research also aims to identify the likely level of visitor generation for each scenario and the associated level of car parking provision to service each level of provision.

Scenario 1

A low level of intervention with a kiosk and range of external trails.

Scenario 2

A medium level of intervention with a visitor centre and supporting facilities with external play and recreation routes. This Option is akin to a country park facility with high quality infrastructure and services, including a main hub in the form of a purpose-built visitor centre. This scenario is closely in line with the post public consultation plan (2009) of Portsmouth Water.

Scenario 3

This scenario represents a higher level of intervention creating more of a visitor destination with a greater intensity of recreation and commercial use. It incorporates a beach and commercial water-sports provision with facilities on a larger scale compared to Scenario 2.

Our approach has been to carry out a detailed market assessment including a demographic analysis, a competitive review and detailed case example comparisons which comprise different levels of facilities and activities to reflect the different scenarios evaluated. The case example sites were chosen in conjunction with the client to provide an extensive range of comparable examples for the different scenarios relating to elements such as site

characteristics, range of built facilities, presence of a large waterbody and urban edge locations.

Our work has also included a facilities' review of varied component elements and establishes the respective pros and cons of each.

From the market and facilities review we have considered the different options and provided a weighted scoring matrix analysis based on the priority strategic objectives for the scheme. **The Medium Scenario (Option 2) emerges as the highest scoring proposal.**

From the demographic review and case examples we have carried out visitor modelling and produced a schedule of estimated visitor throughput for each scenario. This shows an incremental approach whereby the larger degree of visitor provision and intensity of use will attract higher volumes of visitors.

The estimated level of visitor numbers in an established year for the three scenarios is shown in the table below:

Table ES1: Estimated visitor numbers to HTWSR

Estimated visitor throughput	Current users	Additional visitors	Total estimated visitors
HTWSR Scenario 1 (Low)	93,176	95,325	188,501
HTWSR Scenario 2 (Medium)	93,176	224,422	317,598
HTWSR Scenario 3 (High)	93,176	331,861	425,037

These estimated visitor numbers are cross-referenced against the case examples and also compared to the multiple of the residential population within 30 and 60 minutes against selected examples for each scenario.

The study also assesses the car parking requirements for each of the scenarios based on TRICS analysis and case example comparators. The overall requirement in terms of car parking provision, adjusted to allow for future population growth, is shown in the table below:

Table ES2: Estimated car parking requirements for HTWSR

Parking Space Requirement (Additional)	Scenario 1 (low level)	Scenario 2 (medium level)	Scenario 3 (high level)
Main car park	70	193	281
Overflow (including contingency)*	20-26	70-75	81-120
Total	90-96	263-268	362-401

* Contingency relates to allowance for future population growth within core market area

The preferred option for recreation provision to emerge from the study is Scenario Two (Medium Option) which would respond to the strategic priorities and service the main user market groups (likely to be families and older people).

The study findings suggest that Scenario 2 has the strongest fit with the key objectives and the site's environmental capacity. This scenario is also best aligned with the planning opportunity and community aspirations.

1.0 Introduction

Planning Solutions Consulting Limited has been commissioned by Portsmouth Water to identify and assess three development scenarios in respect of the recreational services and facilities which will be introduced as part of the Havant Thicket Winter Storage Reservoir (HTWSR) project.

Potential visitor numbers have also been forecast for each of the development options. From the visitor modelling the number of car parking spaces (including overflow spaces) have been identified.

1.1 Report structure

The report is structured as follows:

- **Section Two:** Site review sets out our observations from a visitor experience and operational perspective. The key strengths, weaknesses, opportunities and threats are summarised in a SWOT analysis.
- **Section Three:** Understanding the market provides an overview of the demographic profile of residents living within the 15, 30, 60 and 90 minute drivetime contours of the site. Vehicle movements are also considered on the nearby A3 south of Horndean.

The tourism profile of the area has been reviewed along with the competitive landscape. Trends within the wider visitor attractions sector with a focus on country parks and nature reserves have been reviewed.

A SWOT has been used to set out the key strengths, weaknesses, opportunities and threats associated with the market place.

- **Section Four:** Case examples – a range of additional case examples have been identified and reviewed. This builds on the work carried out in 2008/2009 and helps to support the assumptions which underpin the visitor projections for HTWSR.
- **Section Five:** Option appraisal provides a summary of the community and stakeholder research carried out in 2008, which helps to provide a ‘framework’ for the development options. We also set out a longlist of individual potential recreational uses/facilities which could potentially be accommodated within the site

(included as an Appendix). The associated 'pros' and 'cons' associated with each use/facilities have been identified.

There are three lead development scenarios considered with different scales of intensity and visitor facilities/intervention.

A weighted scoring matrix developed with Portsmouth Water is used to assess the three development scenarios to identify the lead option to take forward.

- **Section Six:** Visitor modelling - we set out the key elements which will help to drive visitor numbers. Using a penetration rate analysis cross referenced case examples, consultation and our direct management experience, we set out a visitor model for each development scenario based on an established year of operation.
- **Section Seven:** This section reviews the anticipated level of population growth in the core market catchment and sets out a suggested contingency, relating in particular to future overflow car parking provision.
- **Section Eight:** Stakeholder engagement and feedback summarises the responses, issues and preferences among stakeholder partners and other representative bodies.
- **Section Nine:** Car parking requirements are considered for each development scenario. This takes into account permanent and overflow car parking spaces.
- **Section Ten:** Concluding remarks, summarises the lead findings

1.2 Methodology

Our approach has involved background research including site visits and consultation with key staff and stakeholder, review of data held by Portsmouth Water, a market review and analysis and review of a number of case studies.

Along with our consultancy experience, we have also drawn on our sister company's direct involvement in managing visitor centres, these include:

- CONKERS – an environmental, education and activity experience in the National Forest
- Kent Life – a heritage farm park in Maidstone
- The National Brewery Centre – a heritage experience in Burton upon Trent
- The Cotswold Country Park and Beach – a country park in the Cotswolds

2.0 Site review

2.1 Site observations

Location

The site is located to the north of Havant, to the north east of Warren Park and west of Rowlands Castle, in Hampshire. To the south the site's boundary abuts Staunton Country Park which is managed by Hampshire County Council and Forestry Commission land also borders the site, both of whom have expressed interest to become involved with running the leisure facilities at HTWSR.

Interestingly, the boundary of the South Downs National Park is less than half a mile from the north east boundary of Havant Thicket WSR site on the edge of Rowlands Castle.



Location plan. Source: Portsmouth Water

Size and topography

The reservoir project covers approximately 160 hectares of which some 120 hectares will be the waterbody itself. The site topography is undulating which will impact on the movement of people – careful consideration will need to be given to the design of the paths and trails to ensure the offer is accessible to families with pushchairs and for people with mobility issues.

Accessibility and connectivity

The site benefits from good macro access with links through to the A3 and the A27. The Forestry Commission has a small car park located off the B2149/Manor Lodge Road at Rowlands Castle.

Also Havant town centre is served by trainlines to two of London's main rail stations (Waterloo and Victoria) and the south coast through to Chichester and Brighton to the east and Southampton to the west. Rowlands Castle train station is located within walking distance (approximately one mile) of the eastern boundary of the site.

The closest bus routes are the number 27 bus linking Emsworth with Rowlands Castle and number 23 bus at Swanmore Road linking Southsea with Leigh Park. Other nearby routes include: the number 20 (Havant to Portsmouth) and number 21 (Havant to Portsmouth). Although both of these routes are to the south of the site (some 800 metres towards the main entrance to the farm at Staunton Country Park).

The Staunton Way which links Staunton Country Park through to Queen Elizabeth Country Park runs close to the south eastern corner of the site. A bridleway links through to Cowplain and runs along part of the west boundary of the site.

There are a number of access points to the site. A bridleway crosses east to west through the planned location of the reservoir and there is an existing network of trails around the perimeter of the site which link through to Staunton Country Park and Havant Thicket woodland.

To the south there is a cycle route and National Route 22 passes by the farm at Staunton Country Park. The 'accessibility' to the site has a number of sustainable transport benefits.

Existing usage

There is some established existing informal recreation use of the site. We understand that this is focussed on quiet recreation usage - jogging, walking, horse riding and mountain biking.

There have been some reports of anti-social behaviour within the wider site, but Portsmouth Water, Hampshire County Council and The Forestry Commission are working in partnership to address this issue.

Consideration should be given to providing some form of replacement area for motorcycles/quad bikes if the area of land used by motorcyclists and owned by Portsmouth City Council does become a site for housing.

Havant Thicket is already marketed as being part of Staunton Country Park in their marketing material. There is a trail leaflet, produced in partnership with Portsmouth Water and the Forestry Commission, showing permissive paths available for walking and cycling between Staunton Country Park and Havant Thicket.

Landscape and environmental considerations

The landscape is varied predominantly comprising undulating grassland. This forms a natural bowl in which the reservoir will be located.

The site is mainly surrounded by woodland and there are approximately 13 hectares of woodland within the reservoir site.

Part of the site is within the Staunton Country Park historic park and gardens which is an important consideration in respect of future uses and activities in these areas.

From a visitor experience perspective, the landscape is attractive and it will be enhanced through the introduction of a large landlocked water body, which is a relatively unique offer within the sub-region. Visitor flows to the site must be managed effectively in line with its environmental capacity.



An attractive landscape with different habitats – in the future there will be vistas across a large water body

In terms of the site, it is important to acknowledge the wider eco-system service which the existing site provides and will continue to provide. These are set out in the table below.¹

Provisioning Services	Food: Ecosystems provide the conditions for growing food. Site used for grazing animals
	Raw materials: For example, timber to construct furniture and wood fuel.
	Fresh water: Ecosystems provide surface water.
Cultural Services	Wild species diversity: Ecosystems provide everything that an individual plant or animal needs to survive.
	Recreation: Accessible greenspace offers an opportunity for recreation which influences physical health.
	Aesthetic Values & Sense of Place: People benefit from a view on beautiful landscapes which also improves mental health.
Regulating Services	Climate regulation: On the one hand vegetation captures and stores carbon; on the other hand, it mitigates extreme high temperatures in urban settings.
	Moderation of extreme events: Ecosystems create buffers against natural hazards such as flooding events.
	Water and air quality improvement: Micro-organisms and plants remove and decompose pollutants from air and water bodies.

Note: This list is not exhaustive.

The above designations and eco-system service considerations:

- Helps to create a 'special quality' about the wider site
- Help to create a 'reason to visit' by preserving the landscape, habitats and wildlife
- Could form an important part of any future interpretation strategy
- Could provide a core part of the education offer

¹ Ecosystem services classification used by the UK National Ecosystem Assessment.

2.2 Summary strengths, weaknesses, opportunities and threats (SWOT)

The schedule below provides a summary SWOT assessment in respect of the current site and the project proposals at HTWSR.

Strengths	Weaknesses
• An accessible site via car, public transport and walking/cycling • Existing physical links to Staunton Country Park and Forestry Commission land • Existing throughput of visitors • Varied and interesting landscape	• Some issue of anti-social behaviour • Multiple access points • Difficult to secure site • Environmental designations • Reliant upon good working relationships with key partners to delivery visitor experience element
Opportunities	Threats
• Manage visitor flows (walking, cycling, horse riding) via introduction of specific trails • Reinforce identity of key official entry points • During the design, building and operational phases demonstrate commitment to sustainability (exemplar in terms of transport policy, health and wellbeing, inclusivity, bio-diversity, building etc) • Develop low impact visitor offer	• Continued anti-social behaviour • Breakdown in relationship with the Forestry Commission and/or Hampshire County Council • Potential significant negative impact of large throughput of visitors (which could impact the objective of achieving a net biodiversity gain) • Breakdown in relationship with community which has been developed over a number of years • Drawdown of water could impact on some water uses and make the

• Continue to work in partnership with HCC and FC to benefit from their visitor experience expertise • Large water body likely to have positive appeal for quiet recreation and nature appreciation • Education – increased opportunity for land based, wetland and potential for training facilities associated with the open water	views less attractive to general visitors
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3.0 Market review

3.1 Demographics

Demographic analysis

In terms of understanding the likely visitation level and pattern for HTWSR it is important to understand the local and wider sub-regional demographic profile. The local residential market, particularly within the immediate 30-minute drive-time contour is likely to be the key driver of users on a year-round basis. It should be noted that visitor flows generated from the tourism market are subject to seasonal flows and have different needs to the local residential market-place.

As part of this study we have carried out a demographic review of the residential population living within the 0 to 15-minute drivetime contour, 16 to 30 minute and 31 to 60 minute and 61 to 90 drivetime doughnuts. All demographic data has been sourced from CACI².

The further residents are located away from the reservoir, the propensity to visit will decrease and the degree of competition will be greater (people have more alternative leisure options open to them).

Headline profile

Headline residential figures are presented in the table below. Within the immediate core 15 minute drivetime market place the population is just under 250,000 which is relatively strong. Within the overall 30 minute contour the population increases to approximately 700,000 and close to 1.75 million within an hour. The population within 90 minutes rises to more than 4 million which represents a relatively high density, particularly as the site is close to the coast where a significant proportion of the catchment contour falls in the sea.

² Crown copyright 2013. Source: Office for National Statistics licensed under the Open Government Licence v.3.0. © Crown Copyright. Data supplied by National Records of Scotland. Source: NISRA : Website: www.nisra.gov.uk Contains Ordnance Survey data © Crown copyright and database right 2013

Table 3.1.1 Headline demographic profile

Drivetime contour (minutes)	Households	Population
0 to 15	103,101	248,580
16 to 30	188,692	449,329
31 to 60	440,086	1,045,720
61 to 90	1,042,176	2,502,115
Total	1,774,055	4,245,744

Source: CACI

Age profile

We set out below a breakdown of the age profile of residents living within all four drivetime catchment areas³

Interestingly, in terms of the main family market, the representation of adults aged 25-44 years old are below the index figures for the catchments up to one hour.

The number of toddlers and school children aged 5 to 15 is above the national average index (100 = the national average), within the immediate local catchment but drops off below the index in the wider contours.

There is a significant over-representation of senior citizens aged over 60 – within all the drive-times. This may be a reflection that nearby areas represent popular retirement locations (including Hayling Island in common with many seaside resorts).

There is a higher proportion of 18-24 year olds in the 16-30 minute catchment primarily due to the high volume of students in Portsmouth and Chichester.

³ Please note in all demographic tables, the figures are highlighted with shading where the difference is 10% greater (green) or less (pink) than the index figure (for which 100 represents the national average)

Table 3.1.2 Age profile

Population by Age	0 to 15 minutes			16 to 30 minutes			31 to 60 minutes			61 to 90 minutes		
	Area population	Area % by age group	Index av=100	Area population	Area % by age group	Index av=100	Area population	Area % by age group	Index av=100	Area population	Area % by age group	Index av=100
0-4	15,392	6.2	100	26,182	5.8	94	59,005	5.6	91	154,171	6.2	100
5-7	8,671	3.5	102	14,661	3.3	96	33,424	3.2	94	84,793	3.4	99
8-9	5,483	2.2	103	8,950	2.0	93	21,460	2.1	96	52,585	2.1	98
10-14	15,538	6.3	108	24,467	5.4	94	58,447	5.6	97	142,405	5.7	98
15	3,363	1.4	111	5,259	1.2	96	12,566	1.2	98	29,611	1.2	97
16-17	6,707	2.7	109	10,398	2.3	94	24,714	2.4	96	59,916	2.4	97
18-19	6,524	2.6	101	15,207	3.4	130	27,615	2.6	101	60,707	2.4	93
20-24	14,616	5.9	87	36,346	8.1	119	67,784	6.5	95	156,210	6.2	92
25-29	14,706	5.9	87	28,954	6.4	95	59,265	5.7	83	159,734	6.4	94
30-44	47,063	18.9	92	86,428	19.2	94	198,575	19.0	93	534,522	21.4	104
45-59	50,780	20.4	104	86,512	19.3	98	208,169	19.9	102	493,197	19.7	101
60-64	15,457	6.2	103	27,231	6.1	100	69,722	6.7	110	149,298	6.0	99
65-74	22,737	9.1	105	40,093	8.9	103	103,423	9.9	114	212,644	8.5	98
75-84	15,461	6.2	112	27,201	6.1	109	70,160	6.7	120	164,093	5.8	105
85-89	4,009	1.6	110	7,366	1.6	112	20,059	1.9	131	42,494	1.7	116
90+	2,073	0.8	110	4,074	0.9	120	11,332	1.1	144	23,735	0.9	126

Source: CACI

The 'Area' category shows the population for each age group within the contours for each respective drivetime from Havant Thicket. The index compares the percentage of each age group with the national average and provides an index figure (where 100 represents the average)

Socio-economic profile

We set out below a breakdown of the social grades of residents.

The profile is noticeably different between the immediate 15 minute catchment and the contours beyond this drivetime distance.

Table 3.1.3 Socio-economic profile

Social Grade	0 to 15 minutes			16 to 30 minutes			31 to 60 minutes			61 to 90 minutes		
	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100
AB: Higher/intermediate managerial /admin / professional	14,977	20.3	96	33,060	24.2	108	96,294	28.1	126	226,980	22.3	133
C1: Supervisory, clerical, jr managerial/admin/professional	21,994	29.8	96	46,754	34.2	111	97,869	31.8	103	255,980	30.9	108
C2: Skilled manual workers	17,587	23.8	114	28,111	20.6	98	62,333	20.3	97	146,321	20.9	92
DE: Semi-skilled and unskilled manual workers, on state benefit, unemployed, lowest grade workers	19,248	26.1	101	28,846	21.1	81	60,979	19.8	77	136,259	25.9	69

Source: CACI

In the 0-15 minute drivetime, there is a lower representation of residents from the AB (higher/intermediate managerial /admin / professional) and C1 (supervisory, clerical, junior managerial/admin/professional) social grades and conversely with the C2 social grade group there is a higher representation (i.e. 14% higher than the index figure).

This pattern is more or less reversed within the other drivetimes with a higher level of professional grades and a more affluent demographic profile. Beyond 30 minutes the higher proportion of socio economic grades is even greater and the degree of affluence is even stronger, (ABs rising to 33% above national norm in the 60 to 90 minute catchment).

Economic profile

Table 3.1.4 Economic profile

Economic Activity	0 to 15 minutes			16 to 30 minutes			31 to 60 minutes			61 to 90 minutes		
	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100	Area Profile	Area %	Index av=100
Economically active	127,460	71.4	103	233,062	70.4	101	539,270	71.0	102	1,343,164	73.5	106
- Employee full-time	69,962	39.2	102	130,588	39.4	102	296,158	39.0	101	770,792	42.2	109
- Employee part-time	27,974	15.7	114	46,212	14.0	102	107,840	14.2	104	250,308	13.7	100
- Self employed	16,588	9.3	98	30,317	9.2	96	83,520	11.0	116	202,060	11.1	116
- Unemployed	7,016	3.9	89	11,122	3.4	76	22,946	3.0	69	57,936	3.2	72
- Fulltime student economically active	5,950	3.3	96	14,823	4.5	129	28,766	3.8	110	62,068	3.4	98
Economically inactive	51,130	28.6	94	98,107	29.6	98	219,997	29.0	95	483,064	26.5	87
- Retired	26,445	14.8	106	46,594	14.1	101	115,739	15.2	110	237,952	13.0	94
- Full-time student economically inactive	7,061	4.0	69	23,732	7.2	124	40,598	5.3	92	88,361	4.8	84
- Carer (looking after home or family)	7,811	4.4	103	12,579	3.8	89	30,119	4.0	93	76,884	4.2	99
- Long term sick or disabled	6,698	3.8	88	10,096	3.0	72	21,582	2.8	67	49,836	2.7	64
- Other economically inactive	3,015	1.7	78	5,106	1.5	71	11,959	1.6	73	30,031	1.6	76
Unemployed aged 16-24	1,998	1.1	90	3,191	1.0	78	6,102	0.8	65	14,951	0.8	66
Unemployed aged 50-74	1,425	0.8	98	2,276	0.7	84	5,334	0.7	86	12,933	0.7	87
Unemployed: never worked	877	0.5	70	1,309	0.4	56	2,488	0.3	47	6,143	0.3	48
Long-term unemployed	2,828	1.6	92	4,176	1.3	73	8,772	1.2	67	21,761	1.2	69
All people aged 16 to 74	178,590			331,169			759,267			1,826,228		

Employment levels in the immediate catchment are above national averages and are reasonably strong and this is repeated across all contours. There is a high level of part time employment in the immediate 15 minute catchment.

As previously mentioned, there is a high proportion of students within the 16-30 'doughnut'. The level of people in retirement is also above the national average within the data sets up to one hour drivetime.

3.2 Road traffic

The Department for Transport has installed a number of traffic count points across the UK. These are used to record vehicle movements and calculate the average annual daily flows. The closest point to the site is located on the A3, just to the south of Horndean.

The latest data from the 2017 manual count indicates an average annual daily flow of traffic at 65,152 vehicles per day, which has increased from some 47,500 in the year 2000.

Traffic data from the earlier transport assessment on the B2149 showed daily two-way vehicle numbers at 979 per hour or approximately 11,747 per day (12 hour flow). This is likely to have also shown growth over the past ten years.

It is interesting to look at the roadside signage which RSPB Pulborough Brooks has introduced to engage with passing traffic (see below) and to encourage people passing by to pop in for refreshments. Clearly different operations can decide if they wish to aim to attract significant volumes of passing traffic.



3.3 Tourism

Tourist visits to the site are likely to represent a minor proportion of overall visits and it is unlikely that the reservoir will become a major tourism destination in its own right. However, as a large waterbody on the edge of the South Downs National Park it could attract day visitors, people staying with friends and relatives and some tourists in the sub region to visit the site for outdoor recreation. Visits from tourists will be stronger for the more intense form of development scenario considered in the options.

The table below shows the relative scale of tourism volumes by district in Hampshire for 2015/16 which is the latest data currently available:

Table 3.3.1 Hampshire tourism figures by local authority area

Tourism Sector	Overnight trips		Tourism day visits		Total trips (overnight & day)	
	2016	2015	2016	2015	2016	2015
County	4,901,000	4,632,000	43,539,167	47,649,000	48,440,167	52,281,000
Portsmouth	792,000	719,000	7,280,261	7,930,000	8,072,261	8,649,000
New Forest	1,053,000	928,000	6,610,000	7,840,000	7,663,000	8,768,000
Southampton	655,000	659,000	6,862,000	6,960,000	7,517,000	7,619,000
Winchester	375,000	333,000	4,519,500	4,901,000	4,894,500	5,234,000
Basingstoke	292,000	290,000	3,305,406	3,900,000	3,597,406	4,190,000
East Hants	216,000	212,000	3,172,000	3,673,000	3,388,000	3,885,000
Test Valley	262,000	244,000	2,929,000	3,260,000	3,191,000	3,504,000
Havant	356,000	331,000	2,218,000	2,572,000	2,574,000	2,903,000
Fareham	220,000	221,000	2,172,000	1,680,000	2,392,000	1,901,000
Eastleigh	211,000	212,000	1,431,000	1,680,000	1,642,000	1,892,000
Gosport	133,000	137,000	1,306,000	1,364,000	1,439,000	1,501,000
Hart	168,000	166,000	1,010,000	999,000	1,178,000	1,165,000
Rushmoor	168,000	180,000	724,000	890,000	892,000	1,070,000

Source: Great Britain Tourism Survey (GBTS)/ Cambridge Model

Total tourism sector in Havant worth £162 million (£68 million staying visitors, £93 million day visitors – source GBTS / Cambridge Model).

Havant Borough Council area is 5th by overnight trips, 8th by day trips and 8th overall among the Council areas within Hampshire. The main base of tourism in the borough is at Hayling Island a well-known seaside resort with good access to the south west London conurbations.

Of the overnight trips more than a third (129,000 per annum, equivalent to 37%) are for those staying with friends and relatives which represents a strong potential user group for Havant Thicket.

3.4 Visitor centres and country parks

The popularity of country parks in the UK remains strong as visits to the countryside continue to be very popular for regular recreation visits often driven by the search for healthier lifestyles, cost effective family days out and informal recreation.

Country parks represent a value for money day out where the 'admission' charge is likely to be a relatively low level car parking fee⁴.

⁴ While car parking fees are relatively low they do (or should) represent one of the key income drivers for the country park.

All visitor attractions reported a 2% increase in annual visits during 2017⁵. The annual growth in visitor numbers has remained constant at this level since 2014.

In terms of the types of attractions, country parks with no admission fees reported a 3% increase in visitor numbers during the 2017 season, slightly ahead of the overall average for the attraction sector.

However, looking at long-term trends going back to 1989, the index figure for visits to all attractions is 155 (i.e. visits to all attractions in England have increased by 55% between 1989 and 2016). Visits to country parks have outperformed the overall sector – by 31 percentage points.

We set out as Appendix 1, examples of country park visitor experiences and visitor numbers.

3.5 Competitive landscape

We review a range of examples of outdoor recreation sites within Section 4 on case examples.

In addition, we set out in the schedule below the attractions which represent facilities and activities which may act as competition for people's leisure time serving all or part of the same catchment market:

⁵ Visitor Attraction Trends in England 2017, VisitEngland

Table 3.5.1 Range of local competition in day's out sector

Name	Description of visitor experience	Admission charge or car parking	Distance in miles (from Havant Thicket)
Stansted Park	Stansted Park overlooks the coast on the Hampshire–Sussex border from the South Downs National Park. The house displays the state rooms upstairs and the servants quarters downstairs. The Stansted Farm Shop offers local food supplies. At the weekends there is a maze, light railway and craft workshops. The site is host for many events such as open air festivals and garden shows, the venue can also be hired for weddings and parties.	Grounds Entry Free. House - Adults £7.00, Concessions £6.00, Children £3.50, Family Ticket £18.00. Parking - Free	5.0
Portsmouth Hill Activity Centre	This centre combines two historic forts (Purbrook and Widley) with impressive views over Portsmouth) as a setting in which to enjoy a range of challenging activities. The operating Trust runs the centre as Peter Ashley Activity Centres and aims to expand and upgrade the facilities which include residential accommodation for groups. The centre offers a wide range of activities along with club programmes and packages	Mainly pre-bookable paid for activities	6.0
Butser Ancient Farm	Butser Ancient Farm – a unique experimental archaeological site nestled into the rolling South Downs National Park, this ancient farm displays ongoing constructions of Iron Age buildings based on real sites, crops from prehistory and rare breeds of animals. They have a full programme of special events including Celtic festivals and workshops (such as for making a coracle, Roman cooking, bushcraft skills or cave painting). The visitor centre includes a shop and a section selling light refreshments and locally sourced produce with picnic tables admiring the views.	Adults £8.50, Child £4.50, Family £22.00, Concession £7.50, Annual Family Pass £49.00. Parking - Free	7.0
Cobner Activities Centre	Specialists in RYA sailing courses and powerboat courses, BCU canoeing and kayaking courses and British Cycling mountain bike courses. But the Centre is not just about outdoor adventure activities; schools, colleges and universities throughout the UK use the site for outdoor education courses. There are also log cabins which sleep 40 for groups who would like a residential trip. Day tickets can be booked which includes taster sessions of sports.	No Entry Fee. Pay for activities. Parking - Free.	9.0
The Sustainability Centre	The Sustainability Centre is located within an attractive 55 acre site. It has a focus on learning (which includes residential experiences), that extend beyond children. They run a number of events, courses and team building days. There is a small cafe and a retail area which focusses on books. The cafe has a limited but impressive menu and provides organic, fairtrade and vegetarian food. The Centre also offers accommodation (Yurts, Tipis, camping and a lodge) and they promote breaks for cyclists and walkers. The Centre also incorporates an area for natural burials.	NA	9.0
Kingley Vale Nature Reserve	Kingley Vale is known for its twisted and ancient yews and includes a grove of veteran trees which are among the oldest living things in Britain. Several are at least 500 years old, with the oldest measuring more than 5 metres in girth. It also has superb chalk grassland and is one of the most important archaeological sites in southern England, with 14 scheduled ancient monuments. The site has no cafe or visitor facilities.	Entry - Free. Parking - Free	10.0

West Walk, Forest of Bere	West Walk is a popular wood offering a family day out with walking trails, cycling and picnic spots. The site extends to 350 hectares and is the largest remaining fragment of a former medieval hunting ground, the Forest of Bere. There are two waymarked walking trails (including a 3-mile trail which provides a loop through the historic landscape of the Forest), extensive natural paths and attractive play features with climbing frames, scramble nets and swings. Other elements include a mobile café, educational trails and barbecues for hire.	Parking £1.89 up to 2 hours, £3.50 up to 4 hours, £5 all day. Discovery Pass available.	12.0
Fishbourne Roman Palace	The largest Roman home in Britain can be found here and the site holds the largest collection of mosaics in situ in the UK. There is also a recreated Roman gardens to wonder around. There are purpose built education rooms which hold workshops based on Roman history and the palace itself. Events are held at different times around the year which mostly consist of special exhibitions. The venue can be hired for weddings and corporate events. The café serves lunch or an afternoon refreshments.	Adult £8.70, Child £4.30, Concessions £7.70, Family £22.00. Parking - Free	12.0
Petersfield Lake	This area covers some 69 acres and incorporates a 22 acre pond. Boats are available for hire during the summer months and fishing in the lake is permitted. The Plump Duck is an award winning kiosk and features a 50 cover all-weather seating area overlooking the lake. A small children's play area is situated on site.	Entry - Free. Parking - Free.	12.0
Eastern Road Activity Centre	Andrew Simpson Activity Centre in Langstone Harbour, Portsmouth. Provides extensive range of watersports activities along with instructor training and a wide range of land based activities, mainly targeted at groups. Offers range of holiday clubs and school group sessions.	Mainly pre-bookable paid for activities	14.0
Rotherlands Local Nature Reserve	Rotherlands is managed by volunteers of Rotherlands Conservation Group on behalf of the owners, the Town Council and East Hampshire District Council. There are no onsite visitor facilities available.	Free entry - Parking unknown	15.0
East Head	East Head is one of the last surviving pieces of natural coastline in West Sussex and is one of the fastest moving sand and shingle spits. The main focus of the site is around how natural it is kept and there is a cafe in the main West Wittering car park which is a ten minute walk away but nothing directly on site.	Entry - Free. Parking - Pay & Display (Fees Up to £8.50 per day)	19.0
Weald & Downland Open Air Museum	The museum has traditional buildings in a rural landscape that tell the story of the people who lived and worked in them over a 600-year period. The 50-acre site has some 50 exhibit buildings. There are also special event days, inspired by the Museum's collections, such as the Rare Breeds Show, the Festival of Steam or the Autumn Countryside Show. The site also run an extensive programme of adult-education courses in traditional rural trades and crafts, historic domestic life and building conservation. The site is available to hire for weddings, parties, filming and corporate hire.	Adult £11.90, Senior £10.90, Children £6.50, Family £33.50, Children Under 4 Free, Registered disabled / single helper £4.15. Parking - Free	20.0

Other sites are included within the case examples including Staunton Country Park, Queen Elizabeth Country Park, Testwood Lakes and Lakeside Country Park (Section 4 and Appendix 2).

It is important to note the Havant Thicket site is on the edge of the South Downs National Park and there are many opportunities for accessing open countryside. There are also a number of landmark attractions within easy reach including the Spinnaker Tower and Historic Dockyard in Portsmouth.

It is worth highlighting that Hampshire County Council is undertaking a major programme of investment at their five country parks including the neighbouring Staunton Country Park.

3.6 Summary Market SWOT

We set out below a summary of the strengths, weaknesses, opportunities and threats for Havant Thicket WSR from a market perspective:

Strengths	Weaknesses
- Existing usage by a range of communities and activity type - Population on door step with urban edge location - Easy access via A3 to large market in Hampshire / Surrey and South West London	- Significant level of competition serving same catchment - Havant is not a strong tourist destination (outside Hayling Island) - Under-representation of 25-44 year olds compared to national average across all demographic contours (key family age market) - Competition for outdoor recreation visits within the adjacent South Downs National Park and the nearby coast / beaches
Opportunities	Threats
High density population likely to generate strong level of visits from those staying with friends and family	- If site becomes well known, it could be difficult to manage levels of passing traffic (deemed low risk) - Risk of drawing visitors away from the neighbouring SCP if not developed in close collaboration

4.0 Case examples

A number of case examples have been selected in conjunction with the project team to compare facilities of different scale outdoor recreation sites, along with visitor numbers and car parking provision. The organisations which manage the sites were contacted to provide baseline information.

These examples include local country parks and other examples nationally and these are set out in detail in Appendix Two.

The sites were chosen to provide an extensive range of comparable examples for the different scenarios relating to elements such as site characteristics, range of built facilities, presence of a large waterbody and urban edge locations.

Table 4.1 Summary of case example response information

Examples	Visitor numbers			Car parking spaces		Number of times it has reached capacity over the last 12 months	Percentage of visitors using a car?
	2015	2016	2017	Permanent	Overflow		
Abberton Reservoir Visitor Centre, EWT	32,084	42,351	50,941	70	30 + 100	Not on a normal day. Only for big events	98%
Alice Holt	400,000	450,000	465,000	500	100	Yes – at least twice a week during holiday periods	Unknown
Ardingly*			120,000	70+		No, car park is large and is never totally full.	70% to 80%
Arlington*			120,000	50+	N/A	Approximately 6 times per annum	90%+
Bedgebury	400,000	430,000	440,000	600	1,500	Regular use of overflow.	Unknown
Blashford Lakes Nature Reserve	22,997	23,151	23,158	65	40	Yes - 3	95%
Itchen Valley Country Park	153,122	157,782	178,385	250		Approximately 20 times	90%
Lakeside Country Park	134,299	159,271	223,788	140	170	Approximately 10 times – mainly when railway or watersports events are on.	70%
Leigh Park Gardens	120,000 (excl. HLF forecast)	120,000	120,000	0	250-350	Main car park but not overflow	Unknown
Llandegfedd Reservoir (including the visitor centre and watersports centre)**			140,000	125		Approximately 12 times this year	100%?
Queen Elizabeth Country Park	368,710	382,990	342,566	420	80	Full on approximately 10 days per year.	88.00%
Royal Victoria Country Park	300,000	350,000	400,000	400	1,300	Yes, twice	75%
Rushcliffe Country Park	250,000	250,000	250,000	156	38 (plus staff)	During school holidays and summer weekends	90%
Salcey Forest	146,000	190,000	165,000	350	70	Regular use of overflow.	Unknown
Stanwick Lakes	275,000	295,000	300,000	250	300	About 15 times per year	At least 85%
Staunton Country Park	166,580	165,760	167,827	207	250- 350	Main car park 28 times and overflow car park 2 times	95%
Swanick Lakes Nature Reserve	Unknown	Unknown	Unknown	18	-	Approx. twice a month (when we have events running).	Unknown
Testwood Lakes Nature Reserve	25,000 (low estimate)	25,000 (low estimate)	25,000 (low estimate)	90	40	Yes, approximately 200 days (estimate)	90%
Wendover Woods	400,000	400,000	480,000	400	100	Regular use of overflow.	Unknown
West Walk	160,000	200,000	210,000	Unknown	Unknown	Individual car parks approx. 6 times per annum	Unknown
Whitlingham Country Park	211,937	209,633	204,735	400		Yes - Open Water Swim 22/7 plus possibly two other occasions	Majority (80-90%)
WWT Arundel	93,829	96,127	99,508	145	15	Approximately 10 to 20 times a year	80%
WWT Washington	49,881	70,737	81,344	96	50	Yes approximately 8 to 10 day per annum.	90%

* Assumes Ardingly generates the same as Arlington (based on ticket sales and guestimate of number of people per car)

** Estimate for 2018

5.0 Options appraisal

5.1 Context (previous community/stakeholder research)

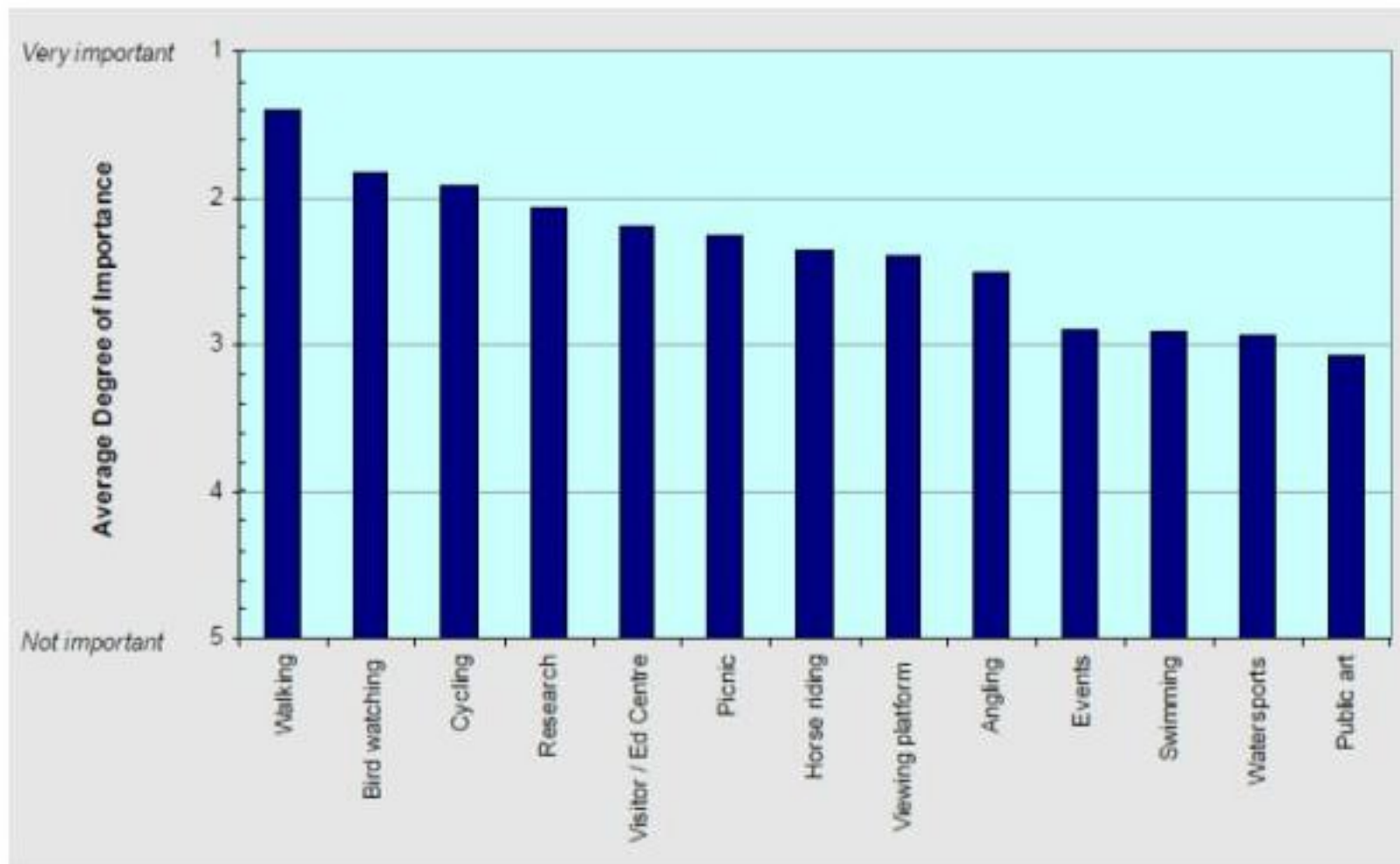
In effect the development framework for the visitor experience element of the project is provided by the community and stakeholder research which was carried out in 2008. This involved sending out approximately 17,000 letters to local residents, along with posters to help promote an exhibition. The exhibition was also promoted by other community groups and organisations. Presentations were also given to some 19 interested groups and organisations, community workshops were run and a programme of engagement with schools was also carried out. Throughout the development programme, Portsmouth Water has also produced a newsletter and a supporting website.

Findings of the engagement are set out in detail in the Interim Report on Community and Stakeholder Involvement, October 2008 (Arup).

There were concerns about disturbance to wildlife, environmental impacts and the impact of traffic on the local road network. Further responses were received in respect of the provision of the landscape and habitat creation. A number of responses provided positive feedback in particular in relation to wetland creation and woodland planting in the wider landscape. Less favourable feedback was received in terms of creating a beach.

In terms of recreation development initiatives, 13 ideas were suggested. Facilities and activities which generated the highest levels of support included: walking, bird watching, cycling, a visitor/education centre, picnic areas, horse riding and a viewing platform. Please see the chart below.⁶

⁶ Interim Report on Community and Stakeholder Involvement, October 2008 (Arup). P21.



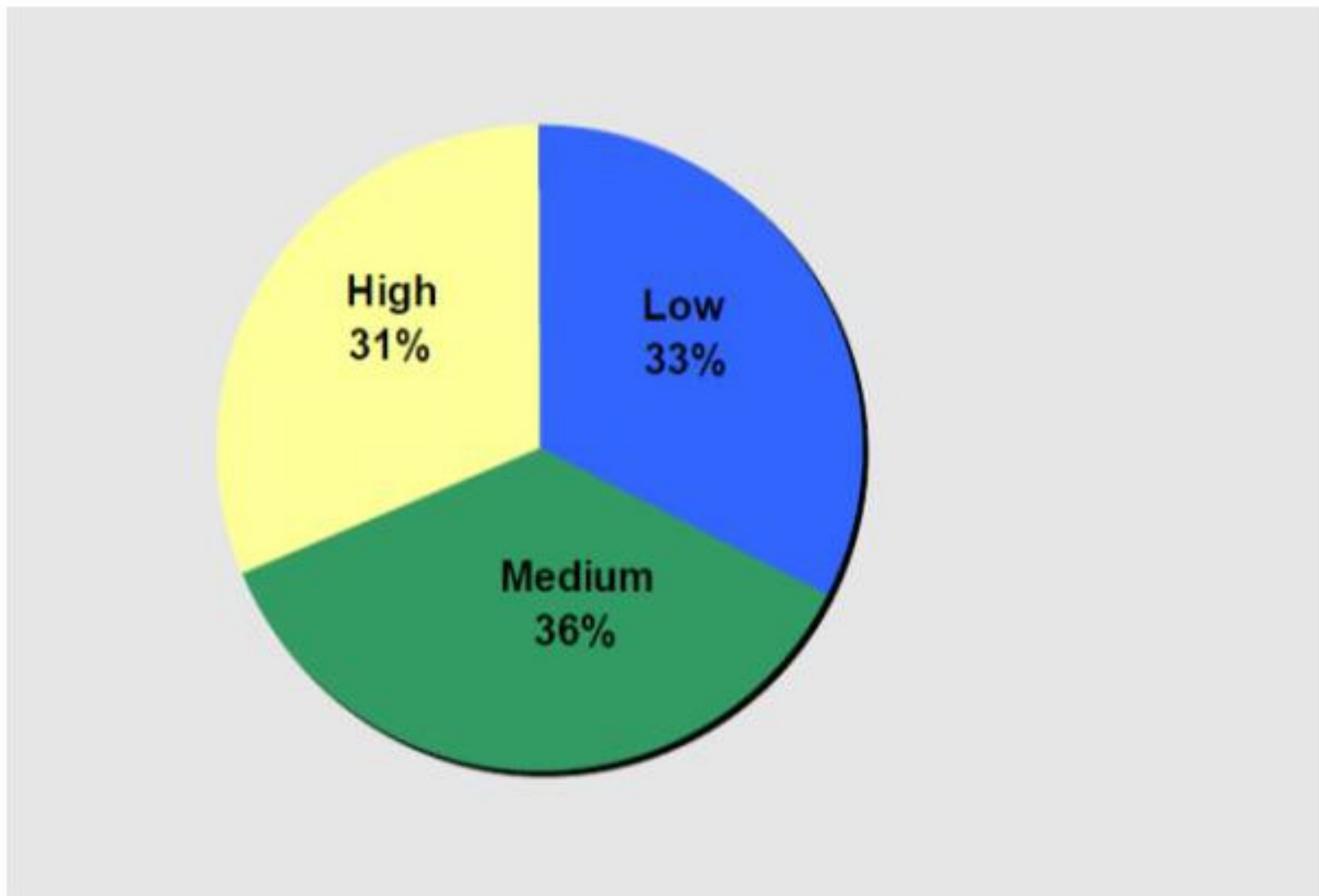
There was concern that the special qualities of the site including tranquillity would be negatively impacted on by the introduction of water-based activities. It was felt that these could potentially attract a high level of visitor throughput which would impact negatively on the environment/habitats and also the local road network. A careful balance needs to be achieved between opening the site up, protecting the environment and bio-diversity, introducing recreational uses and meeting the needs of different groups (members of the public, community groups, young children, stakeholders and statutory organisations).

The public were presented with three development scenarios in terms of the recreation offer:

- **“Low activity scenario:** Provide improved access to the area for walking, cycling and riding, with an emphasis on promoting a quiet environment for wildlife and informal recreation.
- **Medium activity scenario:** Provide improved access to the site for walking, cycling and riding, with the emphasis on providing a quiet environment, whilst also providing some additional play, education and improved recreation facilities for angling and bird watching.

- **High activity scenario:** Provide for larger numbers of visitors with facilities for a wide range of water sports including sailing and swimming, a larger education / visitor centre, opportunities for events and a research facility.”⁷

Interestingly, the options generated broadly similar responses – please see chart⁸ below.



There was a clear difference between the public responses and responses for specific groups. For example, in respect of young people, 58.2% supported the high level of intervention, 35.8% the medium option and 6% the low option.

Looking to the future in terms of the management of the site, the community workshops identified that “there is a need for an overarching management strategy for Staunton Country park, the reservoir site and Forestry Commission land at Havant Thicket in relation to recreation and habitat conservation and creation(and) the open, wild nature of the site needs to be retained.”

⁷ Interim Report on Community and Stakeholder Involvement, October 2008 (Arup). P21 & 22

⁸ Interim Report on Community and Stakeholder Involvement, October 2008 (Arup). P22

5.2 Long list of potential uses/facilities considered

We have evaluated a long list of options as part of the overall product mix at Havant Thicket WSR. The options appraisal assesses various product elements including those considered in the original consultation as well as existing examples of good practice elsewhere. For ease of reference as Appendix 3 we have included elements of the options by category and incorporated the pros and cons for each use in the context of HTWSR.

We set out below the long list of potential uses considered. These options and uses have been grouped using the following themes:

- Main building
- Standalone catering (café and kiosk)
- Cluster of craft units
- Bike hire, shop and workshop for repairs
- Indoor play (standalone)
- Education use (Multi-use space, non-commercial water based activities for education and other groups, Pond dipping areas)
- Play (Adventure play, sand and water play, play trail, natural play)
- Wildlife related
- Visitor infrastructure (External sense of welcome, external interpretation and signage, picnic area and seating, Outdoor shelter, network of trails, accessible island)
- Events (Events and activity programmes, amphitheatre)
- Adventure type of activities (Aerial experience, BMXing area and/or jumps area)
- Commercial water-based activities (Beach, solar boat, inflatable floating play, stand-up paddleboards /canoes, floating lido, dive centre)

- Other (Onsite transport, dog agility area, viewing tower, seasonal mobile catering vehicle, cluster of seasonal yurts, hostel type of accommodation linked to watersports uses)

5.3 Development scenarios

We set out below three different levels of intervention: low, medium and high scenarios. The medium level is based on the post public consultation outline plan (2009) of Portsmouth Water and the high-level scenario is based upon a visitor destination with a more intense level of recreation and commercial use.

It is important to emphasise that visitor flows to the site must be managed effectively in line with its environmental capacity and it is important to ensure that the HTWSR site has a distinctive offer which complements and does not draw visitors away from the neighbouring Staunton Country Park.

5.3.1 Scenario 1 (low level of intervention)

This level of intervention represents a low-key visitor experience with a limited range of facilities as described in the table below.

This option will incorporate an attractive external environment with a range of recreational trails and activities (also shown below).

The facility will be accessible year-round although the catering kiosk will operate on a restricted seasonal basis.

Low level intervention	
Key built facilities	• Seasonal catering (kiosk), with external seating • Toilets (all integrated into one block for ease of use/operation and security)
External environment	• Network of trails with sections of boardwalks (including shorter loops) • Limited interpretation • Single play area adjacent to the kiosk

	• Seating • Picnic area • Car parking
Commercial or other water-based activities	• NA
Key markets	• Continued local community appeal • Some appeal beyond the local community • Limited education appeal
Comparable examples in terms of facilities	• 100 Acre Woods/West Walk, • Haughmond Hill, Nr Shrewsbury • Chopwell Wood, Gateshead

Pros	Cons
• Low capital cost in comparison to other options • Low operating costs • Low revenue generation • Lower long-term liability in terms of ongoing maintenance and capital replacement costs • Low visitor numbers (less impact on environment) • No formal use of water presents lower health and safety risks	• Unlikely to meet ambitions of Portsmouth Water or members of the local community • Seasonal opening hours of kiosk • Requires ongoing revenue support • May not meet requirements set out in the local plan • A missed opportunity, given the scale of the site and the large waterbody proposed • Does not fit with ambitions of key partners (Hampshire and Isle of

• Could be managed by a community group or Trust • Limited need for additional land (for built facilities and car parking) • Straightforward to deliver • Maintains rural character of site	Wight Wildlife Trust, Hampshire County Council or The Forestry Commission) • Visitors could be disappointed with walking to the site only to find the kiosk is closed outside of the main season
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5.3.2 Scenario 2 (medium level of intervention)

As stated previously, the medium scenario is based on the post public consultation outline plan (2009) of Portsmouth Water. In effect this medium level builds on the elements in Scenario 1 and represents an enhanced country park facility with high quality visitor infrastructure and services including a main hub in the form of a purpose-built visitor centre.

Please see original outline plan below (source: Portsmouth Water):

Plan 5.3.2 Havant Thicket Winter Storage Reservoir Outline Plan (May 2009)



The component elements within this option for both the internal space and external environment are summarised in the table below:

Medium	
Key built facilities	Visitor centre (overlooking the reservoir), incorporating: • Unmanned welcome/lobby area with interpretation linking through to the cafe • Café (kitchen and stores) • External seating • Flexible room (venue for social functions, meetings and education) • Toilets (including Changing Places Toilet) • Office • Plantroom • Secure area for waste
External environment	• Bird-hide and screens • Network of trails with shorter loop options • Outdoor shelter • Pond-dipping area • Play area adjacent to visitor centre • Play trail • Interpretation • Seating

	- Picnic area - Car parking
Water-based activities (non-commercial)	- Potential to introduce pre-booked water-based activities for education groups or provide base for Sea Cadets or similar organisation. - Dependent upon identifying a partner to deliver this element - Need to include separate changing / shower facilities if this option is taken forward.
Key markets	- Continued local community appeal - Strong appeal beyond the local community - Able to attract day visitors - Education based visits - Appeals to tourism market place (including those visiting friends and relatives)
Comparable examples in terms of facilities	- Stanwick Lakes - Attenborough - Whitlingham Country Park - Rushcliffe Country Park - Itchen Valley Country Park

Pros	Cons
Meets the needs of the community	Potential for significant visitor throughput

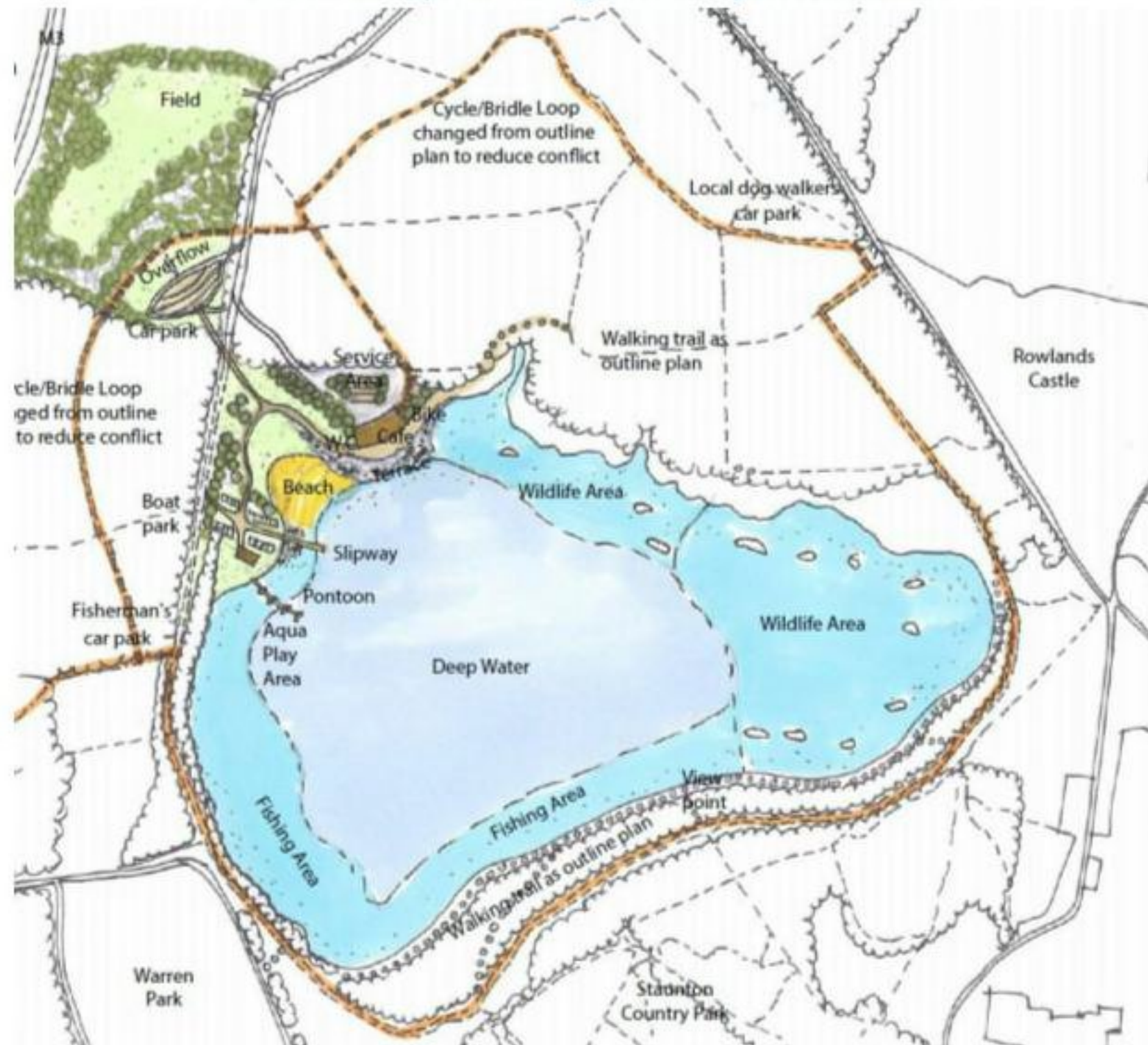
• Complements the offer at Staunton Country Park (helping to create a 'day out') • Adds positively to place-making for Havant • Visitor centre element has potential to cover its own costs through car parking and catering income • Maintains rural character of the site • Strong links to education provision • Fits the aspirations of The Hampshire and Isle of Wight Wildlife Trust and Hampshire County Council (and potentially for The Forestry Commission as first stage) • Takes advantage of sheltered quiet waterbody for watersports education which embraces public consultation feedback	• Potentially some cannibalisation of visits to Staunton Country Park and Leigh Park Gardens (will require positive liaison between the two 'centres') • Potential impact on bio-diversity and habitats (which will require appropriate management / mitigation) • Higher level of visitor throughput may alienate some members of the local community
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5.3.3 Scenario 3 (high level of intervention)

The high level based upon a visitor destination with a more intense level of recreation and commercial use compared to Scenario 2 above. The main difference relates to the introduction of a beach and commercial watersports and built facilities on a larger scale.

Please see concept plan below:

Plan 5.3.3 Concept Plan for higher intensity of recreation use



High	
Key built facilities	Visitor centre incorporating the following (introduced on a larger scale compared with other scenarios above): • Major café (with full service kitchen and stores) with external seating /terrace area overlooking water) • Welcome area with interpretation space • Toilets including changing places toilet • Office(s) • Yard for waste • Plantroom • Separate changing space, showers and toilets etc (accessible without using main entrance to the visitor centre)
External environment	• Bird-hide(s) and screens • Network of trails, including wetland boardwalks and range of circular loop options • Outdoor shelter • Picnic areas • Play area adjacent to visitor centre • Play trail with wild natural play • Interpretation

Commercial water-based activities	Publicly assessible organised water-based activities: • Beach • Pontoon, safety boat • Commercial water-based activities (such as inflatable floating play (e.g. Wibit adventure), Stand Up Paddleboarding (SUPs), kayaking, rowing boats etc) • Changing facilities (see above) • Payment point • Water sport equipment for hire • Secure storage area for equipment and boats <i>Note: there is no proposed provision for the public to bring their own boats or other watercraft for use on the reservoir</i>
Key markets	• Continued local community appeal (although likely to alienate some members of the local community) • Strong appeal beyond the local community • Able to attract day visitors in its own right, especially families and younger people • Education based visits • Appeals to tourism market place (including those visiting friends and relatives (VFR)) • Specialist appeal among activity market place
Comparable examples in terms of facilities	• Cotswolds Country Park and Beach

	- Hollingworth Lake Country Park - Grafham Water - Alice Holt
Other	Bike hire

Pros	Cons
- Attractive to a range of partners and commercial operators - Adds to place-making for Havant - Number of benefits of securing long-term partner such as the Forestry Commission (expertise, knowledge, brand recognition) - Potential for main visitor facility to 'wash its face' and for recreational element to make a financial contribution (although will continue to need separate sinking fund to refresh the visitor experience) - Areas in Solent have reached capacity in terms of watersports (acknowledged by Partnership for Urban South Hampshire), therefore could relieve pressure and become popular water-based destination - Demonstrates innovative partnership working	- Significant visitor throughput – could impact on planning application - Risk to environmental quality, especially biodiversity even with careful management (zoning) and mitigation - Potential impact on protected species and habitats - Exceeds some community expectations (conflicts with previous public consultation findings) - Potentially too commercialised – impacts on rural tranquillity. Does not maintain rural character of the site as required by the Local Planning Authority and public consultation (potentially considered as urbanisation of the site). As a result not in keeping with Portsmouth Water's preferred strategy of quiet enjoyment of the site

	• Potentially low fit with ambitions of Hampshire County Council (although Hampshire and Isle of Wight Wildlife Trust not necessarily against all non-motorised watersport uses if biodiversity priorities can be met) • Does not complement offer at Staunton Country Park • Potentially some demand drawn away from Staunton Country Park and Leigh Park Gardens • Potential concern that not in keeping with the historic landscape and character of the existing site, part of which is designated as a historic conservation area • Increased health and safety risks • Commercial water-based activities are of significant concern to Portsmouth Water (water quality and reputational risk) • Water levels will fluctuate, especially in summer months, if reservoir is drawn down for drinking water supply which would impact on appeal and practicality of watersport uses
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For all options it is assumed that there will be a need for secure working yard which will incorporate welfare facilities as well as a dry and secure building/facility for equipment. This should include space for both staff and volunteer use. This does not necessarily need to be located near the main visitor hub.

Further consideration would need to be given to the impact of periods of drawdown. This would expose mud and could impact access to the water and the appeal of the reservoir to visitors, especially in relation to any commercial activity being considered.

5.4 Assessment criteria

We have used a range of criteria to assess the three development scenarios identified above in Section 5.3.

The criteria are set out in the table below.

Scoring criteria	Commentary
Education	• Ability of development scenario to accommodate and deliver education services • Opportunities for interpretation • Appeal to schools and families for formal and informal (self-guided) activities
Potential environmental impact	• Risk of harmful impact on habitats and biodiversity of the site (including protected species) • Threat to maintaining rural character in keeping with historic landscape
Potential health and safety issues	• Health and safety implications related to development scenario
Market appeal - local catchment	• Potential to continue to engage with existing users • Potential to attract <u>additional</u> local community and immediate population (up to 30 minutes drivetime)

Market appeal – wider catchment and tourist market	• Potential to attract people outside immediate catchment • Potential to engage with tourism market place (including day visitors)
Contributing to local authority strategic policy outcomes	• Will the project contribute to wider policy outcomes such as health and wellbeing, place making, economic development?
Financial considerations	• Indicative level of capital investment • Potential need for revenue support (for visitor facing elements, excluding landscape management of the whole site)
Deliverability	• Ease of deliverability including planning and development process • Level of risk associated with the development scenario • Potential partner interest

Scoring and weighting

Scores in the matrix are ranked from 1 to 10. Within the scoring matrix itself we have applied a weighting (from +3 to -3) which reflects the strategic objectives and priorities for the project. Some of the weighting scores are negative to reflect that the criteria in these cases represent an unfavourable outcome for the project. For example, the level of project risk will have a score attributed which is then multiplied by the weighting index of -2 (minus two) to produce a negative score for this particular category. A higher capital cost and health and safety risks are also considered to have negative weighting. Drawing in large numbers of people from outside the wider area is also weighted negatively to reflect the impact of increased visitors on the environment and biodiversity.

As a further example, for ease of deliverability, there is a positive weighting index and so the score attributed will then be multiplied by +2.5 (plus 2.5) to produce a positive score for this category.

Table 5.4.1 Scoring matrix for scenarios considered

Scenarios	Learning	Environment		Health and safety	Market appeal				Contributing to policy	Financial considerations		Deliverability			Total weighted score
	Opportunity to deliver education experiences	Potential impact on bio-diversity*	Maintains rural character	Health and safety implications related to intervention *	Potential to attract existing users	Potential to attract additional local community and immediate population (up to 30 minutes)	Potential to attract people living outside 30 minute catchment*	Potential to engage with tourism market place*	To what degree will the intervention contribute to policy outcomes	Indicative capital cost*	Potential need for revenue support	Ease of deliverability	Level of risk*	Potential partner interest	
Weighting	2.0	-3.0	3.0	-3.0	2.0	2.0	-1.0	-1.0	2.0	-1.5	1.5	2.5	-2.0	2.5	
Scenario 1: Minimum level of intervention	4.0	4.0	7.5	4.0	8.0	6.0	3.0	3.0	3.0	2.0	2.0	7.0	3.0	1.0	48.5
Scenario 2: Medium level of intervention – visitor centre	7.0	6.0	5.0	5.0	8.0	8.0	6.0	6.0	7.0	6.0	5.0	5.0	5.0	8.0	51.0
Scenario 3: High level intervention – visitor centre and associated water uses	7.0	7.5	3.0	7.5	7.5	9.0	8.0	8.0	8.0	8.0	6.0	4.0	7.0	5.0	16.5

* Negative weighting shows that lower score is preferable outcome in this category

Summary comments on scoring matrix

Scenario 2 emerges as the preferred option from the matrix scoring system.

In terms of the impact on the environment and the fit with the lead target markets, Scenario 1 (Low) gains a slightly higher score but it fails to deliver strongly on strategic and policy outcomes.

Scenario 3 (High) scores poorly on environmental impact and deliverability.

Scenario 2 (Medium) scores significantly higher on deliverability and gains the highest overall weighted score, ahead of Scenario 1 with a large differential over Scenario 3.

Without applying a weighting system, Scenario 1 and Scenario 2 are within half a point of each other's score, with both scenarios significantly ahead of Scenario 3. (Please see Appendix 4 for the scoring matrix with standard weighting).

5.4.1 Other considerations

Accessibility and inclusivity

Accessibility and developing inclusive visitor experiences has come more to the forefront with the Equality Act 2010. Accessibility is a key element of the visitor journey and it is important to ensure that future development reflects the needs of all visitors.

In terms of accessibility the site needs to consider: the visitor facilities, infrastructure information provision and customer service (staff training).

It is important to ensure that the different elements of the visitor experience are accessible to all groups including low income families and ethnic minorities.

There are barriers and challenges which make it difficult for adults and children with disabilities to visit and enjoy a number of recreation sites.

In terms of immediate actions, it would be positive to involve key user groups to help 'shape' the visitor experience and to act as a sounding board for ideas.



Hampshire County Council have introduced accessible / inclusive play at Royal Victoria Country Park. Photos kindly supplied by Greenspan Projects Ltd www.greenspanltd.com

Wellbeing value

There is a strong evidence base, which reaches a consensus that access to the outdoors and nature contributes to enhanced wellbeing, mental development and personal fulfilment. Natural, green environments are places to relax, escape and unwind from the daily stresses of modern life; places to socialise and be physically active, thus having a positive effect on our wellbeing. There is also emerging evidence of the benefits of engagement with the natural environment for those living with dementia.

A recent Fields in Trust study attempted to place a value on the greenspace to each user (Fields in Trust, Revaluing Parks and Green Spaces, 2018). The Total Economic Value to an individual is £30.24 per year (£2.52 per month), and includes benefits gained from using their local park or green space. The 'Wellbeing Value' associated with the frequent use of local parks and green spaces is worth £34.2 billion per year to the entire UK adult population. Parks and green spaces are estimated to save the NHS around £111 million per year based solely on a reduction in GP visits and excluding any additional savings from prescribing or referrals.

6.0 Visitor modelling

6.1 Charging options

We set out below a commentary on the different 'charging / admission options' to consider as the approach will impact on visitor throughput.

- **Free admission option** - not charging an admission fee will help to drive visitor numbers and will make the scheme accessible to people on low incomes. Some visitor centre sites attract a high number of visitors partly because they do not charge an admission fee (though a car parking fee can be levied). It is possible to encourage donations by providing key messages relating to the important environmental improvement work of Portsmouth Water (or the end operating organisation) e.g. habitat creation, development of an important education resource and recreation facility.
- **Full admission charge** - to introduce a charge to enter the visitor centre and site itself there will need to be a significant number of elements/activities for visitors to interact with.

Additionally, the overall site will need to be secured and fenced with a single-entry point. In our view we believe that it would be difficult to introduce an admission fee due to the proposed level of facilities available onsite. Additionally, introducing an admission fee is likely to go against the open and community ethos of Portsmouth Water of making the visitor centre and parts of the wider site accessible to all.

Also, as there is already a baseline level of existing informal recreation usage the introduction of an admission charge would alienate members of the local community.

- **Car parking charge option** – charging for car parking is an established process at a number of recreation and visitor sites (e.g. Forestry Commission sites and country parks) and has also become more 'expected' in the minds of visitors. This could be managed by a simple pay and display machine and daily inspections to ensure visitors are paying the car parking fee. Although there is likely to be a benefit in investing in a more technology driven car parking and management/control system to have a secure, resource efficient payment system which minimises leakages (through non payment).

It will be important to liaise with Hampshire County Council (and the Forestry Commission if they were to introduce charging) to ensure that car parking pricing structure is in line to minimise the potential for conflict with neighbouring Staunton Country Park.

In our view the introduction of car parking charges is an appropriate approach to generating income. Tariffs would be linked to dwell-time. The notion of a 'value for money' visit and inclusive ethos of Portsmouth Water is maintained and the suggested tariffs are relatively low. This will also help to generate income from people who park there but don't necessarily spend any time (or money) within the visitor centre itself, providing income to help maintain visitor facilities, paths, signage, etc.

Car parking charges can also be used to manage visitor numbers and importantly they do not exclude local residents from Leigh Park, Rowlands Castle and Havant from walking or cycling to the site.

It is important to communicate and inform visitors where their money is going. Moors Valley Country Park has introduced a number of signs to thank visitors and explain how the income generated from visitors helps to support the country park (please see photos below).



It is also interesting to look at the example used at Lulworth Cove in Dorset (please photo below).



6.2 Internal and external factors impacting on visitor throughput

In considering the development of the visitor experience at Havant Thicket it is important to recognise that the future development proposals and corresponding visitor throughput are influenced by the following drivers:

External factors	
The economy	The economy is showing signs of some growth although the 'unknowns' around Brexit are presenting some challenges.
Market size and profile - including tourism flows (demand side)	The wider tourism market place is strong (albeit there are seasonal visitation patterns) although Havant is not an established tourist destination. The primary catchment

	residential markets are positive and there is already recreational usage of the site.
Competitive position (supply side)	There are a range of other recreation/leisure activities within the sub-region from free admission attractors such as the beach at Hayling Island through to Leigh Park Gardens. Interestingly the adjacent site at Staunton Country Park (and Leigh Park Gardens) generates a significant and growing throughput and visitor flows are likely to increase with the current HLF project in Leigh Park Gardens. The leisure market is highly competitive, dynamic and fast changing.
Political landscape	A key example at present is that exiting the EU is having an impact on the availability of funding and potentially an impact on environmental legislation.
Local strategic priorities, including destination development priorities	Investment in destination development can act as a catalyst to generate a higher level of tourists and day visitors
Weather	Weather will impact on visitor throughput.
Internal factors	
Location	- The site benefits from some visibility from the B2149 and has good access from the nearby A3(M) junction 2. There is also good pedestrian access from Warren Park, Havant, Cowplain and Rowlands Castle. - As mentioned earlier Havant is not an established or known 'destination.'

Product – range and scale of facilities, including events and activities provided and car parking capacity	- The three scenarios are different in type, scale and appeal which will impact on visitor throughput. The introduction of a new major waterbody in itself will have a major 'WOW' factor associated with it particularly during the first year(s) of operation. - Clearly car parking capacity can also help to manage or set visitor numbers
Price / perceived value for money	We believe that it would be difficult to justify an admission charge and an appropriate car parking charge should be levied. This will reduce the barriers to access and help create an accessible destination.
Customer service	Whichever organisation ends up managing the site, the staff will be trained to a high standard and act as a key point of contact between Portsmouth Water and local residents (in effect ambassadors for Portsmouth Water)
Marketing and promotional activities, including social media and branding	- Usually it will be important to ensure that the visitor centre receives appropriate marketing which can target the residential (including education groups) and the tourist market places. - Additionally, the cachet of the brand can also help to attract visitors. - Visibility of the site from the A3(M) (signage for the medium and large scenarios)

Visitor numbers will be driven by market conditions, appeal of the offer, pricing policy (perceived value for money in terms of car parking or admission tariff), accessibility, capacity, opening times and marketing carried out and this is factored into our analysis.

6.3 Existing users

6.3.1 Portsmouth Water's 2018 survey work

The figures below are based on survey work carried out at various entry point locations on site in the Summer of 2018 (August Bank Holiday, 27th August 2018 and a weekday after the Summer holiday in September 2018) by Portsmouth Water with adjustments made for estimates of throughput at different periods through the year by season and day of the week. A further adjustment has been included to reflect the estimated level of duplication in the counting process caused by individuals using more than one entry / exit point as there are multiple entry points.

When a further programme of onsite survey work is carried out, this can be cross-referenced against the current estimated levels of existing use and used to update the data and analysis. We set out an assessment on the different approaches to carrying out the visitor research in Appendix 5.

Table 6.3.1 Summary of current users

Current Users (estimated)				
Period		Adults	Children	Overall
Weekends	Summer weekend per day (actual as per survey)	492	99	
	No of days (June July Aug Sept)	35	35	
		17,056	3,432	20,488
	Shoulder months per day	295	59	
	No of days April May Oct Nov	35	35	
		10,234	2,059	12,293
	Winter months per day	211	53	
	No of days December, Jan, Feb, March	35	35	
		7,303	1,854	9,157
	Total	34,593	7,345	41,937
Weekdays	Summer weekday per day (actual as per survey)	245	34	
	No of days (June July Aug Sept)	87	87	
		21,233	2,947	24,180
	Shoulder months per day	172	24	
	No of days (April May Oct Nov)	87	87	
		14,863	2,063	16,926
	Winter months per day	166	60	
	No of days (December, Jan, Feb, March)	86	86	
		14,262	5,189	19,450
	Total	50,358	10,198	60,556
Annual total		84,951	17,543	102,494
Less 10% for double counting				93,176

Note: this may need to be reassessed once further onsite survey is carried out.

In our experience of operating leisure facilities and assessing visitor throughput at many outdoor leisure sites, it is reasonable to expect that the pattern of average visitation reduces in the shoulder and Winter months. To reflect expected seasonal fluctuations, we have assumed the reduction for weekends is estimated at 40% less in the shoulder months and 60% less in the winter months. The weekday throughput is also reduced but at a slightly lesser rate (30% and 50% respectively) due to the higher proportion of dog walkers as a percentage of the total visitor levels. From the case examples a significant number of the case examples have strong seasonal visitation patterns and many receive 70% or more of the annual visitor numbers in the six months from April to September.

Dog walkers represent a high proportion of visitors surveyed (just under 50% at weekends) which leads to a high level of daily (repeat use). It is worth noting that the existing Forestry Commission carpark is able to cope with the current level of car borne visits to the site via this entry point.

6.3.2 Staunton Country Park and Leigh Park Gardens

At the moment there is paid admission to the farm element of the country park. Leigh Park Gardens which adjoins the reservoir site is currently free to enter and has been the subject of a successful HLF Lottery Bid with a focus on education use. The HLF project includes bringing the coach house back into use (including a café) and enhancing the historic landscape (Regency).

Currently Staunton attracts in excess of 280,000 admissions including Leigh Park Gardens which is estimated to attract some 120,000 annually. Leigh Park Gardens is forecast to boost this figure by some 60,000 annual visits to 180,000 following the HLF project. Clearly there is some overlap between these visitors and a proportion of the visits are made by the same people. The Forestry Commission has no current data for Havant Thicket.

6.4 Case examples: summary visitor numbers

The table below shows the recent levels of visitor flows to a range of case examples considered. The sites were chosen to provide an extensive range of comparable examples for the different scenarios relating to elements such as site characteristics, range of built facilities, presence of a large waterbody and urban edge locations.

Table 6.4 Summary of case example visitor numbers and car parking provision

Examples	Visitor numbers			Car parking spaces	
	2015	2016	2017	Permanent	Overflow
Abberton Reservoir Visitor Centre, EWT	32,084	42,351	50,941	70	30 + 100
Alice Holt	400,000	450,000	465,000	500	100
Ardingly*			120,000	70+	
Arlington*			120,000	50+	N/A
Bedgebury	400,000	430,000	440,000	600	1,500
Blashford Lakes Nature Reserve	22,997	23,151	23,158	65	40
Itchen Valley Country Park	153,122	157,782	178,385	250	
Lakeside Country Park	134,299	159,271	223,788	140	170
Leigh Park Gardens	120,000 (excl. HLF forecast)	120,000	120,000	0	250-350
Llandegfedd Reservoir (including the visitor centre and watersports centre)**			140,000	125	
Queen Elizabeth Country Park	368,710	382,990	342,566	420	80
Royal Victoria Country Park	300,000	350,000	400,000	400	1,300
Rushcliffe Country Park	250,000	250,000	250,000	156	38 (plus staff)
Salcey Forest	146,000	190,000	165,000	350	70
Stanwick Lakes	275,000	295,000	300,000	250	300
Staunton Country Park	166,580	165,760	167,827	207	250- 350
Swanick Lakes Nature Reserve	Unknown	Unknown	Unknown	18	-
Testwood Lakes Nature Reserve	25,000 (low estimate)	25,000 (low estimate)	25,000 (low estimate)	90	40
Wendover Woods	400,000	400,000	480,000	400	100
West Walk	160,000	200,000	210,000	Unknown	Unknown
Whitlingham Country Park	211,937	209,633	204,735	400	
WWT Arundel	93,829	96,127	99,508	145	15
WWT Washington	49,881	70,737	81,344	96	50

* Assumes Ardingly generates the same as Arlington (based on ticket sales and guestimate of number of people per car)

** Estimate for 2018

6.5 Visitor forecast analysis

The work carried out by Arup in 2009 forecast some 125,000 visitors per annum might be expected to use the reservoir site.

For each of the three development scenarios described in Section 5.3, we have based the analysis on a stabilised year of operation. We have applied different penetration rates to the three Scenarios based on existing population levels. The projections are best estimates and have not been based on any specific organisation or branded operator managing the site. We have carried out an additional demographic comparative analysis for five relevant case examples selected in discussion with project team based on their range of facilities, scale of activity and the location in respect of nearby urban areas (one for Scenario One, and two each for Scenarios Two and Three).

6.5.1 Scenario 1 (low level)

We set out below the estimated throughput for the low level scenario which builds upon existing usage. We have applied different penetration rates (representing the proportion of the population within each category who would be expected to visit over a 12 month period) and frequency (levels of repeat visits) to the key core market categories.

This shows a relatively high level of local regular use which will impact upon the later analysis relating to car parking requirements.

Clearly with this option there is limited appeal beyond the 30 minute drive-time catchment.

Table 6.5.1.1 Summary of estimated users – Scenario 1

Market	Size	Penetration	Level of repeat visits	Estimated visits
Residential market (drive-time catchment)				
Up to 15 mins	248,580	12.0	4.0	119,318
16 to 30 mins	449,329	4.0	2.0	35,946
31 to 60 mins	1,045,720	1.0	1.0	10,457
61 to 90	2,502,115	0.1	1.0	2,502
Dual use visitors from Leigh Park Gardens (Staunton)	180,000	0.05	1.0	9,000
Tourists				
Tourists (excl staying with friends and relatives, SFR)	227,000	0.5	1.0	1,135
SFR (staying with friends and relatives)	129,000	3.0	1.0	3,870
Day visits	2,218,000	0.10	1.0	2,218
Passing traffic*	23,780,480	0.01	1.0	2,854
Education				1,000
Events				200
Estimated total				188,501

*Passing traffic 1.2 persons per car

Note: Please note for Leigh Park Gardens this includes the additional visitors forecast by Hampshire County Council who will be attracted to Leigh Park Gardens following the HLF project implementation.

In common with most of the case examples (Appendix 2), a high proportion of the total visitors are derived from the residential population within the 30 minute drivetime contour.

This is higher among the sites with limited facilities which have a low destination profile and consequently a limited market reach. Our projections show just over 80% (some 82%) of estimated visitors emanate from the 30 minute catchment for the low level scenario.

In terms of the catchment up to 15 minutes there is already a strong level of use and we anticipate this will continue and will grow. The penetration within those living within easy walking distance of the site is likely to be particularly strong and this is accounted for in the average penetration and repeat visitor levels.

The level of visitation will reduce the further away people live from the site with only minimal use by residents living between an hour and an hour and a half from the site (i.e. there is limited market reach). We have allowed for a proportion of visitors to Leigh Park Gardens to extend their visit into the Havant Thicket site although it is acknowledged that there is a significant distance to reach the proposed location of the main site services. In this low development scenario, it is unlikely that significant numbers will drive around to the main services area (assumed at one in 20 for this low intervention option).

The ability to attract the tourist and day visitor market for this option is limited although there is likely to be greater penetration among those staying with friends and relatives (the SFR market).

With this option it is not likely to attract motorists from the A3M in significant numbers and the education and events activities will be restricted to small-scale low-key activities.

The overall visitor numbers projected reach some 189,000 which is just over double the estimated existing levels of use.

The table below provides an indicative comparison demographics and penetration for another low-level recreation site.

Table 6.5.1.2 Comparison of population multiples and estimated users – Scenario 1

Market	Annual visitors (ave last 3 years)	Residential market 30 mins	Residential market 1 hour	Multiple 30 minutes	Multiple 60 minutes
West Walk (nr Wickham, Hants)	190,000	662,234	1,752,897	0.29	0.11
HTWSR Scenario 1	188,501	697,909	1,743,629	0.27	0.11

Demographics sourced from CACI.

West Walk is a relevant example as it is within 12 miles of Havant Thicket and so draws on part of the same catchment and currently provides a low intensity of visitor services. The multiple of the estimated annual visitor figures as a proportion of the residential population for Havant Thicket Reservoir for the low level of intervention represents an **equivalent rate** of 0.26 for the 30 minute catchment and 0.11 for the 60 minute drivetime catchment if

considered separately. These multiples are closely in line with the West Walk levels as shown in the above table. Whilst Havant Thicket is more urban edge, West Walk is well established and benefits from the Forestry Commission's brand.

The total visitor figures are equivalent to 5% of the population within 30 minutes visiting just over 5 times each over a twelve month period.

6.5.2 Scenario 2 (medium level)

In effect this is an enhanced country park facility with high quality visitor infrastructure and services including a main hub in the form of a purpose-built visitor centre as described in Section 5.3.2. The component elements within this option include both the internal space and external environment.

This represents an incremental level of development compared with Scenario One with a higher level of penetration. The site becomes more of a destination which will extend market reach and penetration.

Table 6.5.2.1 Summary of estimated users – Scenario 2

Market	Size	Penetration	Level of repeat visits	Estimated visits
Residential market (drive-time catchment)				
Up to 15 mins	248,580	12.0	5.00	149,148
16 to 30 mins	449,329	5.0	3.00	67,399
31 to 60 mins	1,045,720	3.0	1.25	39,215
61 to 90	2,502,115	0.5	1.00	12,511
Dual use visitors from Leigh Park Gardens (Staunton)	180,000	0.075	1.0	13,500
Tourists and others				
Tourists (excl staying with friends and relatives, SFR)	227,000	1.25	1.0	2,838
SFR (staying with friends and relatives)	129,000	7.5	1.0	9,675
Day visits	2,218,000	0.25	1.0	5,545
Passing traffic*	23,780,480	0.05	1.0	14,268
Education				2,500
Events				1,000
Estimated total				317,598

*Passing traffic 1.2 persons per car

Note: Please note for Leigh Park Gardens this includes the additional visitors forecast by Hampshire County Council who will be attracted to Leigh Park Gardens following the HLF project implementation.

As previously described this medium scenario is comparable to a country park style facility. The forecasts show strong local usage with just under 50% within the 15-minute catchment and just under 70% (68%) within 30 minutes. This is in common with many of the case examples (Appendix 2) showing the higher predominance of local usage and the importance of such facilities for local greenspace providing opportunities for outdoor activity. It is assumed the main focus of any marketing and PR is typically directed at local residents.

For Scenario 2 with its extended range of facilities, it is likely to draw more visitors from a wider audience and the schedule is based on a higher penetration rate among the one hour and 90-minute catchments compared to the low-key scenario. Similarly, the level of dual use visitors from Leigh Park Gardens is likely to increase which has been factored in to the figures.

The level of penetration among tourists and the day visitor market for this option will grow but still remains at a relatively low proportion of overall visitors as these users are hard to reach and will not be a primary focus in terms of target audiences for any marketing activities. There is likely to be a reasonably strong penetration among those staying with friends and relatives (the SFR market) as it is expected that such a facility will engender local pride and become a resource that people living locally will want to bring their guests.

Again, with this option it is not likely to attract motorists from the A3(M) in significant numbers. Education and events activities will be enhanced in respect of the low-key option but will remain relatively small-scale, not least as it is important to avoid duplicating activities staged at Staunton / Leigh Park Gardens.

The overall visitor numbers projected reach some 318,000 which is an appropriate level for a high-quality country park style facility with no direct admission charge (other than parking charges).

The table below provides an indicative comparison demographics and penetration for two other country park style recreation sites. These were selected due to their scale, presence of major waterbody, range of facilities and urban edge locations.

Table 6.5.2.2 Comparison of population multiples and estimated users – Scenario 2

Market	Annual visitors (ave last 3 years)	Residential market 30 mins	Residential market 1 hour	Multiple 30 minutes	Multiple 60 minutes
Whitlingham Lakes, Nr Norwich	208,768	335,944	866,767	0.62	0.24
Hollingworth Lake, Nr Rochdale	300,000	547,226	4,866,761	0.55	0.11
HTWSR Scenario 2	317,598	697,909	1,743,629	0.46	0.18

The multiple of the estimated annual visitor figures as a proportion of the residential population for the medium level of intervention at Havant Thicket represents 0.46 **equivalent rate** for the 30 minute and 0.18 for the 60 minute catchment populations. The comparable multiple for Havant Thicket is below the Whitlingham level mainly due to

Havant Thicket site having a higher level of destination visits (attracting visitors from a wider catchment).

At Hollingworth Lake, the 30 minute penetration is more closely aligned however the one hour absorbs the dense urban conurbation of Greater Manchester within which there is strong competition and psychological barriers in terms of where people spend their leisure time.

6.5.3 Scenario 3 (high level)

The high level based upon a visitor destination with a more intense level of recreation and commercial use compared to Scenario 2 above. The main difference relates to the introduction of a beach and commercial water-sports and built facilities on a larger scale as described in Section 5.3.3. This represents a further incremental level of development compared with Scenario Two with a consequential increased level of market reach and penetration.

Table 6.5.3.1 Summary of estimated users – Scenario 3

Market	Size	Penetration	Level of repeat visits	Estimated visits
Residential market (drive-time catchment)				
Up to 15 mins	248,580	12.0	7.00	208,807
16 to 30 mins	449,329	6.0	3.00	80,879
31 to 60 mins	1,045,720	4.0	1.25	52,286
61 to 90	2,502,115	0.75	1.00	18,766
Dual use visitors from Leigh Park Gardens (Staunton)*	180,000	0.1	1.0	18,000
Tourists				
Tourists (excl staying with friends and relatives, SFR)	227,000	2.0	1.0	4,540
SFR (staying with friends and relatives)	129,000	10.0	1.0	12,900
Day visits	2,218,000	0.50	1.0	11,090
Passing traffic**	23,780,480	0.05	1.0	14,268
Education				2,500
Events				1,000
Estimated total				425,037

* Some visitors will drive round

**Passing traffic 1.2 persons per car

Note: Please note for Leigh Park Gardens this includes the additional visitors forecast by Hampshire County Council who will be attracted to Leigh Park Gardens following the HLF project implementation.

This scenario incorporates a much more intense level of facilities and activities to represent a higher profile leisure destination, comparable to a regional 'honeypot' outdoor recreation site. It also includes a beach and a level of supervised commercial watersports activities which will drive additional specialist and general visitor use. The figures assume the beach is available for use for at least a four month 'season.'

There is still a high proportion of local use (approximate two-thirds) but the number of visitors from outside the immediate catchment is far stronger than the other two scenarios considered.

It is expected that the marketing and PR strategy for such a site would have a strong regional presence and also target specific tourist markets.

The schedule is based on a higher penetration rate among the one hour and 90 minute catchments compared to the other scenarios and the level of dual use visitors from Leigh Park Gardens increases.

This option will also start to have greater penetration among passing motorists but the overall level remains relatively low

Education and events activities will be at the same level as the medium scenario (Scenario 2) as the available space would not alter.

The overall visitor numbers projected reach some 426,000 which is an appropriate level for a high-quality destination with no direct admission charge. Clearly the addition of the beach and watersports activities will create a draw in their own right and build visitor throughput.

The table below provides an indicative comparison demographics and penetration for Alice Holt near Farnham and Kingsbury Water Park in the West Midlands, both of which are acknowledged as successful destination sites.

Table 6.5.3.2 Comparison of population multiples and estimated users – Scenario 3

Market	Annual visitors (ave last 3 years)	Residential market 30 mins	Residential market 1 hour	Multiple 30 minutes	Multiple 60 minutes
Alice Holt	438,333	309,219	2,494,665	1.42	0.18
Kingsbury Water Park	358,120	1,304,149	6,117,974	0.27	0.06
HTWSR Scenario 3	425,037	697,909	1,743,629	0.61	0.24

The multiple of the estimated annual visitor figures as a proportion of the residential population for the high level of intervention at Havant Thicket represent 0.61 **equivalent rate** for the 30 minute and 0.24 for the 60 minute catchment. For Havant Thicket, the multiple for the 30 minutes drivetime population is between the figures for the case examples considered at Alice Holt and Kingsbury Water Park. The 30 minute catchment is below the Alice Holt level mainly due to Alice Holt representing a very high performing site in a rural location. Also, Havant Thicket has a larger population within walking / cycling distance than Kingsbury which will generate significant annual throughput.

The 60 minute multiple for Havant Thicket is more closely in line with Alice Holt - indeed the multiple is above the Alice Holt figure which derives a lower proportion of visitors from the densely populated south western quadrant of Greater London. The Kingsbury figure is lower which is partially due to the limited reach for the site beyond 30 minutes and perceived access / congestion issues.

7.0 Allowance for future population growth

The projections are based on a snapshot of the population and tourism data. It is prudent to consider likely changes in the population and the residential marketplace which will impact on future visitor numbers (confirmed and supported by the stakeholder workshop). The table below shows the projected growth over the decade to 2026 for UK regions.

Table 7.1: Projected population change for English Regions, mid-2016 to mid-2026

Region	Mid-2016 population	Mid-2026 population	Population change over 10 years	Percentage change
London	8,770,000	9,543,000	774,000	8.8
East	6,129,000	6,573,000	444,000	7.3
South West	5,517,000	5,881,000	364,000	6.6
South East	9,030,000	9,605,000	574,000	6.4
East Midlands	4,725,000	5,008,000	283,000	6.0
West Midlands	5,811,000	6,125,000	314,000	5.4
Yorkshire and The Humber	5,425,000	5,616,000	190,000	3.5
North West	7,224,000	7,467,000	243,000	3.4
North East	2,637,000	2,687,000	50,000	1.9
England	55,268,000	58,506,000	3,238,000	5.9

Source: Office for National Statistics

For the South East this shows a total of 6.4% growth, ahead of the average for England at 5.9% over this ten year period.

We set out below a table showing the projected growth over the ten years to 2026 by local authority area in the core catchments for Havant Thicket WSR:

Table 7.2: Projected population change for Districts, mid-2016 to mid-2026

Region	Percentage change (%)
Havant	4.8
East Hants	4.7
Portsmouth	4.6
Fareham	5.5
Chichester	6.3

Source: Office for National Statistics

This shows Havant at some 4.8% below the regional and national average growth rate. It is also interesting to note that Havant Borough Council in their Local Plan Summary forecast a growth of some 6.4% to 2036 (i.e. over a twenty year period).

It is also important to acknowledge how in Hampshire the increase is mainly among older age groups (for example those over 85 will increase by 30% to 2023 (source: Hantsweb). For Havant the population aged 16-64 is only forecast to increase by 1% over the ten year period to 2026.

It is important to recognise that there are large new housing developments within the core catchment area (eg land east of Horndean and Emsworth area and Portsmouth City Council has plans to build 115 houses adjacent at Cabbagefield Row and a further development of 75 houses.

In terms of our visitor projections and car parking space analysis, there is a reasonable 'cushion' in the visitor and car parking estimates insofar as we have used a low occupancy per car (2.2 persons and some country parks quote as high as 2.9 persons per car). If a higher occupancy level is used, this would reduce the projected level of visitor spaces needed. Also, the peak day (Sunday) represents 15.05% of weekly flows which is at the high end of the estimated range of 12-15% as gleaned from HCC. Again a lower peak day (@say 12%) would lower the parking space requirement calculation.

We can say that if population increases in all catchments by c. 6% over the next decade (and if we assume that tourist numbers and passing traffic also show similar levels of growth), then visitor numbers would be higher by the same proportion. On this basis, it could be prudent to allow for this additional growth i.e **plus 6%** of the estimated car parking spaces in the design process as additional overflow capacity. This does not need to be within Phase 1

but should be allowed for within a later phase ensuring there is space for growth. The design should consider how this extra space for car parking should be provided, on the understanding that it does not need to be included in the initial design and construction. The additional overflow allocation may not be needed if current projections are not realised.

At the same time, it will be important to keep a watching brief on (1) forecast population growth, against actual achieved (2) plans at Staunton and Leigh Park Gardens along with their visitor numbers (3) the tourism marketplace and (4) the wider competitive landscape as these will impact on visitor numbers in the future. Also, reinvestment by Portsmouth Water in the offer at the site in the future (to refresh the visitor experience) and marketing strategy will impact directly on visitor numbers.

Over time it is important to note that a number of leisure / recreation sites have experienced growth in visitor numbers and subsequently some operators correspondingly increase the number of car parking spaces to reflect this (e.g. some FC sites).

To manage visitor numbers operators may not decide to increase spaces due to carrying capacity issues as clearly this can negatively impact on the environment and different habitats.

Also, it is possible that use of the motor car may decline in future years with concerns over pollution caused by motor vehicles. It is possible to manage demand through pricing to reach a natural balance for the site, although increasing parking costs could have an adverse impact on attracting the more disadvantaged socio-economic community in the local drive time catchment. Greater use of local bus transport and other cycle and footpath links can also lead to a potential reduction in car-based visits.

8.0 Stakeholder engagement and feedback

A stakeholder review meeting was held in Havant on the 1st March to discuss findings with lead stakeholder partners from HCC and FC (HloWWT not able to attend) and to gauge feedback in advance of the wider stakeholder group meeting.

The site will be different things to different people:

- A local park for adjacent residents
- A social hub for the local community
- A day visitor experience

It is acknowledged that it is very important to create an environment people are proud of and want to take friends and family to visit. The water landscape itself will draw in more people although there was consensus that a proposal based on educational use of the water alone is unlikely to be viable.

The facilities offered must fit in with Staunton Country Park/Leigh Park Gardens. There is a general desire for the new proposals to complement not conflict with these and other facilities already provided by HCC and FC.

In terms of the three scenarios, Scenario 1 lacks proper facilities and may fail to service demand effectively. Scenario 2 aims to attract local people and is not commercially driven. Scenario 3 is commercially driven and trying to attract visitors from further afield.

The scoring matrix in the report for the different scenarios was deemed very useful. The overall preference is for a phased Scenario 2 albeit with larger spaces for car parking in the future being earmarked now. All parties felt the Scenario 2 proposal was about right in terms of likely visitors, especially given multiple local 'landing points' close by but this would depend on the decision relating to the use of the water. It is possible to build capacity in a phased way – an incremental approach to planning needs to be adopted at an early stage to allow for delivery of the project in phases. Overall there was general agreement that Scenario 2 was the preferred option.

Other points discussed

Drawdown of water

There is a concern over the impact on the commercial operation if the water level of the reservoir is drawn down as this will affect the appeal of the site and the quality of the visitor experience.

Wildlife impact:

Carrying capacity for the new proposals must be considered to ensure net biodiversity gain. Initiatives to manage the impact on the natural environment should include:

- Design of routes and trails to minimise impact.
- forest design plan needs to be integrated
- Managing the edge of habitats could be used to discourage access

Future design

The future design must consider anti-social behaviour and design it out. There is a need to consider where anti-social behaviour occurs and how it can be managed to map issues and sources of anti-social behaviour.

8.1 Wider stakeholder group presentation and workshop

Portsmouth Water hosted a presentation and workshop session on 7th March 2019 to present the study findings and to gain feedback and opinions on the three different lead scenarios, both in terms of the proposed visitor offer, the forecast level of visitor numbers and the associated car parking space requirements.

The presentation summarised the research and findings from the study and the session then broke out into a workshop format to allow for debate around the issues and preferences. Summary sheets for each scenario were distributed prior to the meeting along with the draft report.

General agreement that figures presented for visitor numbers and car parking spaces represent a reasonable profile for the different scenarios. There was general support for Scenario 2 as Scenario 1 and Scenario 3 raised concerns which are summarised below:

Scenario 1

- Does not meet the policy requirements of Havant Borough Council to replace community amenities
- Too low-key, widespread feeling that the project would immediately grow to medium, so need to plan for medium
- Visitors would only be attracted by the environment, not by the facilities

Scenario 2

- Scenario 2 is the bare minimum

- Could be flexed slightly to provide slightly enhanced or slightly reduced level of facilities
- This scenario is in line with proposals which received a high level of support from customers previously
- Needs flexibility to meet potential increased demand and requires scope to extend, particularly if a reduction in car use does not happen by 2029

Scenario 3

- Concern about water-based activities which it is felt would create its own problems, swamp the site, pollution, attract antisocial behaviour
- Attract too many people, which needs to be discouraged
- Key concern is that it becomes something else other than for water supply – a ‘Butlins on water.’ If it becomes too big impact there are concerns that it would impact negatively on the local community

Some respondents felt there was merit in considering future potential growth based mainly around concerns with respect to growth in the forecast level of residential population in the core catchment areas. As a result, it was felt that it would be prudent to ensure that there was space allowance for future expansion of facilities, in particular car parks to accommodate such growth (as shown in previous section (Section 7.0)).

Car parking

In response to concerns over the need to make sure that car parking allocation can absorb any increases as a result of future population growth the overflow parking has been adjusted to act as a form of contingency. This does not necessarily need to be constructed in Year One but space should be allocated within the site for future development as and when needed.

In terms of charges, most people accept the approach to charge for parking as long as it is explained that the income is used to invest in facilities. Car parking charges can help to control visitor numbers to some extent.

There will be a need to have a common charging policy across FC and HCC car parks and in particular to align with Staunton Country Park on car parking charges. The charging policy should not be excessive otherwise it may risk displacing car parking to local residential roads

There will be a need for electric charge points (this is now Havant Borough Council policy for new projects).

It is seen as vitally important not to displace cars to park on local roads which will impact on local residents in Rowlands Castle and North Havant.

Overall the suggested car parking space requirements felt adequate to most attendees. It was acknowledged that there may be times once or twice a year when the capacity would be exceeded but this is to be expected.

Visitor numbers and facilities

Visitor numbers are considered broadly right by consultees for Scenario 2 (medium) and it was felt the numbers were a reasonable judgement. It is important to ensure the forecast visitor numbers have to reflect the link to Staunton Country Park

It is recognised that the visitor forecasts are based on current population levels but need to make allowances for future population growth, particularly in terms of car parking spaces

There is also a need to consider and agree the environmental carrying capacity of the site and, in particular, it is important to ensure the visitor experience proposals do not conflict with the wetland.

Overall the workshop was in favour of a local countryside amenity that is not swamped by people so have moderate facilities. It was recognised however that too many people will turn up for low level facilities and so need to plan for a medium level. It would be desirable if the café facility could be designed to complement natural landscape, overlooking the water.

Water sports

It is deemed important to maintain the rural character of area and many felt that the water use would change the character and make it too busy. Some also had concerns around health and safety issues and the impact on biodiversity.

From the sessions some people wanted to retain the potential for future watersports use (possibly as a future stage of Option 2) although others are opposed to low level watersports usage. Some felt a low-key level of watersports use would be desirable although the majority believed this could send out mixed messages and that it is better to have no use of the water as this is easier to explain and control.

General / Other

Policy requires the plan to respect the natural environment, and important not to compromise on the essential biodiversity of the site.

There are some concerns around anti-social behaviour particularly as the site won't be staffed in the evening. But the group felt that there are a number of solutions which could be built into the design.

It was highlighted how important it is for Portsmouth Water to work in close cooperation with partners and neighbours, including SCP and LPG.

Overall there is strong support for Option 2 which offers the most benefit and could be augmented in future as part of a phased programme.

9.0 Car parking requirements

The TRICS data for country parks and similar sites provides information relating to the rate of hourly flows to the sample of comparable sites in this category on its database (eight in total). This shows the flows of visitors both in terms of arrivals and departures based on average dwelltimes. This information is summarised in the table below:

Table 9.0.1 Hourly vehicle movements in country parks

Hourly vehicle movements	Arrivals (%)	Departures (%)	Cumulative (% vehicles on site)
0700-0800	1.3	0.6	0.7
0800-0900	3.6	1.5	2.8
0900-1000	5.5	2.9	5.4
1000-1100	7.5	4.7	8.2
1100-1200	11.3	7.2	12.3
1200-1300	11.2	7.3	16.2
1300-1400	12.9	7	22.1
1400-1500	13.7	10.2	25.6
1500-1600	11	14.2	22.4
1600-1700	7.4	15	14.8
1700-1800	5.9	10.8	9.9
1800-1900	4.4	7.6	6.7
1900-2000	4	9	1.7
2000-2100	0.3	1.9	0.1

Source: TRICS 2018

The table shows the peak hours for arrivals and departures and from this the cumulative position can be calculated which represents the peak level of onsite people and vehicles. The average across the country parks sampled shows this peak as between 2pm and 3pm when some 25.6% of daily flows are on site. This proportion is useful in calculating the required rate of car parking spaces to accommodate these visitors.

9.1 Scenario 1 (low level)

The table below shows the forecast number of additional car-borne visitors to Havant Thicket:

Table 9.1.1 Summary of car borne users and additional cars – Scenario 1

Market	Visits	Additional car borne visitors	Additional cars
Residential market (drive-time catchment)			
Up to 15 mins	119,318	13,071	5,941
16 to 30 mins	35,946	35,946	16,339
31 to 60 mins	10,457	10,457	4,753
61 to 90	2,502	2,502	1,137
Dual use visitors from Leigh Park Gardens (Staunton)	9,000	450	205
Tourists			-
Tourists (excl SFR)	1,135	1,135	516
SFR	3,870	2,709	1,231
Day visits	2,218	2,218	1,008
Passing traffic	3,022	3,022	2,519
Education	1,000	-	-
Events	200	-	-
Estimated total	188,669	71,511	33,650

In Scenario 1 there is a relatively high proportion of local users who will continue to walk or cycle to the site and will not require car parking provision.

From the immediate 15-minute drivetime contour, visits are forecast to be some 119,318 of which 93,176 are existing visits.

For the additional visits generated by people living within the immediate 15-minute drivetime contour we consider it is reasonable to assume that 50% of the additional visitors will walk or cycle and 50% will arrive by car (this can be tested by any future user research). This represents 13,071 additional users who will arrive by car or 5,941 additional cars annually, based on 2.2 visitors per car. This level of persons per car are at the lower end of the likely range for countryside sites and hence allows a degree of caution in terms of the projected car parking space provision.⁹

⁹ A 2016 study in Ashdown Forest (Visitor Survey 2016) determined the average persons per car at 2.216 from observation surveys. The Forestry Commission tend to use between 2.5 and 2.7 persons per car.

In addition, a small proportion (5%) of the projected dual use visitors from Leigh Park Gardens will travel by car between the sites.

Beyond the immediate catchment we have assumed that all visitors will be car borne from within the 16 to 90 minutes drivetime contours.

In terms of general tourist visitors and day visitors all will arrive by car. For tourists staying with friends and relatives (including locals) it is assumed that 70% will arrive by car.

The overall position shows a total of some 71,511 car borne visitors, equivalent to some 33,650 cars, assuming 2.2 persons per vehicle for general visitors and 1.2 persons per car for passing motorists.

In calculating the parking requirements there will be a need to provide disabled spaces close to the facilities and also to provide space for minibuses and coaches to at least be able to drop off and turn around safely. It would be preferable to have dedicated provision for coaches although it is not anticipated that there will be significant group arrivals by coach or minibus.

The events for this option will be low key and mostly operate outside core hours and so will not impact on peak parking requirements.

We have attributed a ratio of 15.05% of total annual visitors arriving in the peak month (assumed to be August). This figure is derived from car parking tickets at Queen Elizabeth Country Park QECP in Hampshire as a proportion of the overall year latest full year available 2013/14) and is in line with our own experience and previous project work at outdoor recreation sites.

Applying this percentage shows the additional cars which will need to be accommodated within the peak month to be just over 5,000 (5,047) as shown in the table below:

Table 9.1.2 Car parking space requirements – Scenario 1

Parking Spaces Analysis		Additional cars	Notes and assumptions	
Peak month		5,047	15.05%	Based on QECF car parking tickets
Peak day	Absolute peak	353	6.94%	Based on QECF August peak
	Average peak day	273	5.39%	Based on QECF Peak August weekend days
Car parking spaces required	Absolute peak	90	6.94%	25.6% TRICS
	Average peak day	70	5.39%	25.6% TRICS

To calculate the peak day usage the table shows a range based firstly on the absolute peak day (again using QECF car parking ticket data based on the single peak day in August) and also the average peak (based on the average of peak weekend days in August).

Following the TRICS data shown above, this level of throughput shows a car parking requirement of an additional 90 spaces based on the absolute peak and 70 based on the average peak (this assumes that the Forestry Commission car park remains operational to service Havant Thicket which currently caters for the car borne element of the existing throughput of 93,176 users to the site). Based on the TRICS data the table below shows the distribution of the absolute peak across the day which is highest between 1pm and 4pm.

Table 9.1.3 Car parking space requirements on hourly basis – Scenario 1

Scenario 1		
Hourly vehicle movements	Cumulative (vehicles on site)	Max car parking spaces
0700-0800	0.7	2.5
0800-0900	2.8	9.9
0900-1000	5.4	19.1
1000-1100	8.2	29.0
1100-1200	12.3	43.5
1200-1300	16.2	57.2
1300-1400	22.1	78.1
1400-1500	25.6	90.5
1500-1600	22.4	79.1
1600-1700	14.8	52.3
1700-1800	9.9	35.0
1800-1900	6.7	23.7
1900-2000	1.7	6.0
2000-2100	0.1	0.4

9.2 Scenario 2 (medium level)

The table below shows the forecast number of additional car-borne visitors to Havant Thicket for Scenario 2:

Table 9.2.1 Summary of car borne users and additional cars – Scenario 2

Market	Visits	Additional car borne	Additional cars
Residential market			
Up to 15 mins	149,148	39,180	17,809
16 to 30 mins	67,399	67,399	30,636
31 to 60 mins	39,215	39,215	17,825
61 to 90	12,511	12,511	5,687
Dual use visitors from Leigh Park Gardens (Staunton)	13,500	2,700	1,227
Tourists and others			-
Tourists (excl SFR)	2,838	2,838	1,290
SFR	9,675	7,256	3,298
Day visits	5,545	5,545	2,520
Passing traffic	14,268	14,268	11,890
Education	2,500	-	-
Events	1,000		-
Estimated total	317,598	190,912	92,183

In Scenario 2 (Medium Level), there is a significant, albeit lower, proportion of local users who will continue to walk or cycle to the site compared to Scenario 1.

From the immediate 15-minute drivetime contour, visits are forecast to be some 149,148 of which 93,176 are existing visits.

For the additional visits generated by people living within the immediate 15-minute drivetime contour, we have assumed that 70% of the additional visitors will arrive by car and 30% will walk or cycle. This represents approximately 40,000 additional users (39,180) who will arrive by car or 17,809 additional cars annually, based on 2.2 visitors per car.

In addition, 20% of the projected dual use visitors from Leigh Park Gardens will travel by car between the sites.

Beyond the immediate catchment we have assumed that all visitors will be car borne from within the 16 to 90 minutes drivetime contours.

In terms of general tourist visitors and day visitors, all will arrive by car. For tourists staying with friends and relatives (including locals) it is assumed that 75% will arrive by car.

The overall position shows a total of some 191,000 car borne visitors, equivalent to some 92,000 cars, assuming 2.2 persons per vehicle for general visitors and 1.2 persons per car for passing motorists. As stated, these figures for persons per car are at the lower end of the likely range for countryside sites and hence allow a degree of caution in terms of the projected car parking space provision.

In calculating the parking requirements there will be a need to provide disabled spaces close to the facilities and also to provide space for minibuses and coaches to at least be able to drop off and turn around safely. It would be preferable to have dedicated provision for coaches although it is not anticipated that there will be significant group arrivals by coach or minibus. Education visits will be programmed to fall outside the peak periods.

The events for this option will remain low key and mostly operate outside core hours and so will not impact on peak parking requirements.

We have attributed a ratio of 15.05% of total annual visitors arriving in the peak month (assumed to be August). This figure is derived from car parking tickets at Queen Elizabeth Country Park in Hampshire as a proportion of the overall year and is in line with our own experience and previous project work at outdoor recreation sites.

Applying this percentage shows the additional cars which will need to be accommodated within the peak month to be just under 14,000 (13,979) as shown in the table below:

Table 9.2.2 Car parking space requirements – Scenario 2

Parking Spaces Analysis		Additional cars	Notes and assumptions	
Peak month		13,979	15.05%	Based on QECP car parking tickets
Peak day	Absolute peak	970	6.94%	Based on QECP August peak
	Average peak day	753	5.39%	Based on QECP Peak August weekend days
Car parking spaces required	Absolute peak	248	6.94%	25.6% TRICS
	Average peak day	193	5.39%	25.6% TRICS

Following the TRICS data shown above, this level of throughput shows a car parking requirement of an additional **248** spaces based on the absolute peak and **193** based on the average peak (this assumes that the existing FC car park is still operational to service Havant Thicket). Based on the TRICS data the table below shows the distribution of the absolute peak across the day which is highest between 1pm and 4pm.

Table 9.2.3 Car parking space requirements on hourly basis – Scenario 2

Scenario 2		
Hourly vehicle movements	Cumulative (vehicles on site)	Max car parking spaces
0700-0800	0.7	6.8
0800-0900	2.8	27.2
0900-1000	5.4	52.4
1000-1100	8.2	79.6
1100-1200	12.3	119.3
1200-1300	16.2	157.2
1300-1400	22.1	214.4
1400-1500	25.6	248.4
1500-1600	22.4	217.3
1600-1700	14.8	143.6
1700-1800	9.9	96.0
1800-1900	6.7	65.0
1900-2000	1.7	16.5
2000-2100	0.1	1.0

9.3 Scenario 3 (high level)

The table below shows the forecast number of additional car-borne visitors to Havant Thicket for the High Scenario:

Table 9.3.1 Summary of car borne users and additional cars – Scenario 3

Market	Visits	Additional car borne	Additional cars
Residential market			
Up to 15 mins	208,807	86,723	39,420
16 to 30 mins	80,879	80,879	36,763
31 to 60 mins	52,286	52,286	23,766
61 to 90	18,766	18,766	8,530
Dual use visitors from Leigh Park Gardens (Staunton)	18,000	5,400	2,455
Tourists			
Tourists (excl SFR)	4,540	4,540	2,064
SFR	12,900	10,320	4,691
Day visits	11,090	11,090	5,041
Passing traffic	14,268	14,268	11,890
Education	2,500	-	-
Events	1,000	-	-
Estimated total	425,036	284,272	134,619

In Scenario 3 (High Level), there is a greater level of destination-based use although existing users and a proportion of additional local users will walk or cycle to the site.

From the immediate 15-minute drivetime contour, visits are forecast to be some 208,807 of which 93,176 are existing visits.

For the additional visits generated by people living within the immediate 15-minute drivetime contour we have assumed that 75%¹⁰ of the additional visitors will arrive by car and 25% will walk or cycle. This represents approximately 86,723 additional users who will arrive by car or 39,420 additional cars annually, based on 2.2 visitors per car.

In addition, 30% of the projected dual use visitors from Leigh Park Gardens will travel by car between the sites.

¹⁰ This assumption is based on the premise that a high proportion of people who are likely to access the site on foot or by bicycle already do so and hence a higher proportion of new visitors arrive by car.

Beyond the immediate catchment we have assumed that all visitors will be car borne from within the 16 to 90 minutes drivetime contours.

In terms of general tourist visitors and day visitors, all will arrive by car. For tourists staying with friends and relatives (including locals) it is assumed that 85% will arrive by car. The overall position shows a total of some 284,000 car borne visitors, equivalent to some 135,000 cars, assuming 2.2 persons per vehicle for general visitors and 1.2 persons per car for passing motorists. As previously stated, these figures for persons per car are at the lower end of the likely range for countryside sites and hence allows a degree of caution in terms of the projected car parking space provision.

In calculating the parking requirements there will be a need to provide disabled spaces close to the facilities and also to provide space for minibuses and coaches to at least be able to drop off and turn around safely. It would be preferable to have dedicated provision for coaches although it is not anticipated that there will be significant group arrivals by coach or minibus. Education visits will be programmed to fall outside the peak periods.

The events for this option will remain low key and mostly operate outside core hours and so will not impact on peak parking requirements.

We have attributed a ratio of 15.05% of total annual visitors arriving in the peak month (assumed to be August). This figure is derived from car parking tickets at Queen Elizabeth Country Park QECP in Hampshire as a proportion of the overall year and is in line with our own experience and previous project work at outdoor recreation sites.

Applying this percentage shows the additional cars which will need to be accommodated within the peak month to be just over 20,000 (20,366) as shown in the table below:

Table 9.3.2 Car parking space requirements – Scenario 3

Parking Spaces Analysis		Additional cars	Notes and assumptions	
Peak month		20,366	15.05%	Based on QECP car parking tickets
Peak day	Absolute peak	1,413	6.94%	Based on QECP August peak
	Average peak day	1,098	5.39%	Based on QECP Peak August weekend days
Car parking spaces required	Absolute peak	362	6.94%	25.6% TRICS
	Average peak day	281	5.39%	25.6% TRICS

Following the TRICS data shown above, this level of throughput shows a car parking requirement of an additional **362** spaces based on the absolute peak and **281** based on the average peak (this assumes that the existing FC car park is still operational to service Havant Thicket). Based on the TRICS data the table below shows the distribution of the absolute peak across the day which is highest between 1pm and 4pm.

Table 9.3.3 Car parking space requirements on hourly basis – Scenario 3

Scenario 3		
Hourly vehicle movements	Cumulative (vehicles on site)	Max car parking spaces
0700-0800	0.7	9.9
0800-0900	2.8	39.6
0900-1000	5.4	76.3
1000-1100	8.2	115.9
1100-1200	12.3	173.8
1200-1300	16.2	229.0
1300-1400	22.1	312.4
1400-1500	25.6	361.8
1500-1600	22.4	316.6
1600-1700	14.8	209.2
1700-1800	9.9	139.9
1800-1900	6.7	94.7
1900-2000	1.7	24.0
2000-2100	0.1	1.4

9.4 Summary parking requirements and comments

The table below summarises the calculations above for the three scenarios. As mentioned this is in addition to the existing FC car park near Rowlands Castle.

Table 9.4.1 Car parking summary space requirements all scenarios

Parking Spaces Analysis	Scenario 1 (low level)	Scenario 2 (medium level)	Scenario 3 (high level)
Absolute peak	90	248	362
Average peak day	70	193	281

The level of car parking provision required should be able to cope with the average day peak and if it is possible to create overflow parking then this provision can absorb additional

traffic for the absolute peak day (and possibly special events). Additional spaces will be required for overflow parking to meet exceptional peaks particularly for Scenario Three with the beach and watersport based activities.

It is also important to emphasise that there needs to be consideration given to the planning policy and environmental carrying capacity of the site in terms of controlling the overall visitor throughput and car parking space provision.

Overflow parking does provide operational flexibility in managing flows to the site and as shown in the Table above, as a minimum, **an additional 20 spaces** would be required for **Scenario 1, a further 55 for Scenario 2 and 81 for Scenario 3.**

In order to allow for potential future population growth and related increased usage our assessment as shown in Section 8.0 shows that it would be prudent to allow a further 6% allocation of car parking spaces as overflow capacity. This represents a contingency in terms of space use planning and does not form part of any initial construction programme. This additional contingency provision equates to an additional **6 spaces for Scenario 1, 15 spaces for Scenario 2 and 22 spaces for Scenario 3.**

In addition to this level of provision there will be a need for some staff car parking provision. A proportion of car parking spaces will need to be able to accommodate disabled users

This level of provision does not specifically cater for spikes in demand related to natural spectacles within the wetland environment (e.g. if for example a rare or unique bird is seen on site) however it is likely that such spectacles will occur outside normal peak visitor times.

Visits for Scenarios 2 and 3 will be dominated by car borne users. In the longer term, there are ways to reduce car-based visits by promoting car sharing, bicycle, foot and public transport use.

Car parking space ratios from case examples

We set out below a table showing the individual case examples, visitor numbers and the number of car parking spaces. We have set out the number of permanent spaces per visitor based on the data provided by each site.

Some local authorities include country parks as a category of use within their guidance for planning on acceptable car parking standards. Where these are stipulated, for example in Kent, the standard set is 1 space for every 400 visitors per annum (source). This is inflexible in many ways as it does not reflect variances in the ratios of car borne visitors and pedestrians / cyclists. None of the case examples examined attain this standard based on permanent car parking provision.

From the selected case example research, it is evident that car parking ratios do vary greatly. For example, Rushcliffe Country Park has one space for every 1,600 visitors and Salcey Forest has one space for every 470 or so visitors. Please see the table below:

Table 9.4.2 Case example summary information with parking spaces

Examples	Visitor numbers	Car parking spaces		No of visitors per permanent space
	2017	Permanent	Overflow	
Ardingly	120,000	70+	-	N/A
Alice Holt (FC)	465,000	500	100	930
Bedgebury (FC)	440,000	600	1,500	733
Itchen Valley Country Park	178,385	250		714
Lakeside Country Park	223,788	140	170	1,598
Llandegfedd Reservoir (including the visitor centre and watersports centre)*	140,000	125		1,120
Queen Elizabeth Country Park (car parking spaces to increase to 600 with investment)	342,566	420	80	816
Royal Victoria Country Park	400,000	400	1,300	1,000
Rushcliffe Country Park	250,000	156	38	1,603
Salcey Forest (FC)	165,000	350	70	471
Stanwick Lakes	300,000	250	300	1,200
Staunton (including Leigh Park Gardens). Excludes HLF	287,827	207	350	1,390
Wendover Woods (FC)	480,000	400	100	1,200
Whitlingham Country Park	204,735	400		512
WWT Arundel	99,508	145	15	686
WWT Washington	81,344	96	50	847
			Average	988

The average overall from these case examples is one space for close to every 1,000 visitors (988). This is in line with the earlier work completed by Arup.

The table below shows the car parking space requirement if this approach is used for car borne visitors to the new reservoir and compares the result with the TRICS based calculations.

Table 9.4.3 Car parking summary space requirements comparison data

Parking Space Comparison	Scenario 1 (low level)	Scenario 2 (medium level)	Scenario 3 (high level)
Existing users arriving by car	71,511	191,755	285,115
Number of additional car parking spaces needed (ave of 1 space per 1,000 visitors)	72	192	285
Average peak day from TRICS based calculation	70	193	281

These figures are very close to the average peak day requirement figures using the TRICS methodology (Table 9.4.1) and provide a strong degree of confidence.

In addition to the above there will be a need for staff parking spaces, minibus parking and coach turning (and /or parking). A proportion of all spaces should be for disabled use.

10.0 Conclusions and recommendations

The preferred option for recreational provision to emerge from the study is Scenario Two (Medium Option) which would respond to the strategic priorities and service the main user market groups (likely to be families and older people).

Visitor projections range from 188,501 to 425,037 in respect of the different scenarios considered. Please see table below:

Table 10.0.1 Estimated visitor numbers all scenarios

Estimated visitor throughput	Current users	Additional visitors	Total estimated visitors
HTWSR Scenario 1 (Low)	93,176	95,325	188,501
HTWSR Scenario 2 (Medium)	93,176	224,422	317,598
HTWSR Scenario 3 (High)	93,176	331,861	425,037

Car parking requirements range from 90 to 382 including overflow. The overall recommendation in terms of car parking provision is shown in the table below including an additional 6% contingency overflow to allow for potential future population growth:

Table 10.0.2 Estimated car parking space requirements all scenarios

Parking Space Requirement (Additional)	Scenario 1 (low level)	Scenario 2 (medium level)	Scenario 3 (high level)
Main car park	70	193	281
Overflow (including contingency)*	20-26	70-75	81-120
Total	90-96	263-268	362-401

* Contingency relates to allowance for future population growth within core market area

Overall, the study findings suggest that Scenario 2 (the medium option) has the strongest fit with the key objectives considered and the site's environmental capacity. This scenario is also best aligned with the planning opportunity and community aspirations.

Appendix 1: Visits to country parks

Country parks and selected wildlife sites	Region	2015	2016	2017	Charge	Size
Anglers Country Park	Y&H	250,000	275,000	241,000	Free	Over 200,000
Astbury Mere Country Park	NW	183,000	245,000	252,564	Free	Over 200,000
Beacon Park	WM	874,000	850,000	900,000	Free	Over 200,000
Beechenhurst; Symonds Yat; Mallards Pike	SW	272,547	377,400	338,741	Paid	Over 200,000
Betteshanger Sustainable Parks	SE	DK	83,064	123,895	Free	100,001 - 200,000
Burton Dassett Country Park	WM	49,767	37,389	41,214	Free	20,001 - 50,000
Cannock	WM	341,064	379,729	278,067	Free	Over 200,000
Cardinham	SW	286,196	279,093	279,903	Free	Over 200,000
Clare Castle Country Park	EAST	100,000	100,000	110,000	Free	100,001 - 200,000
Clumber Park	EM	631,000	648,352	653,065	Paid	Over 200,000
Dalby Forest Visitor Centre	Y&H	181,385	450,000	470,000	Paid	Over 200,000
Delamere Forest	NW	750,000	400,704	339,882	Free	Over 200,000
East Carlton Countryside Park	EM	DK	280,000	290,000	Free	Over 200,000
Fairlands Valley Park	EAST	500,000	500,000	500,000	Free	Over 200,000
Gibside	NE	228,784	272,628	284,017	Paid	Over 200,000
Guisborough Forest and Walkway	NE	DK	200,000	250,000	Free	Over 200,000
Haldon Forest Park - Forestry Commission	SW	DK	DK	381,827	Free	Over 200,000
Hamsterley Forest	NE	140,860	493,646	454,695	Free	Over 200,000
Hardwick Park	NE	425,000	456,000	450,000	Free	Over 200,000
Harrold-Odell Country Park	EAST	300,000	DK	300,000	Free	Over 200,000
Hartshill Country Park	WM	54,942	58,391	54,981	Free	50,001 - 100,000
Hartsholme Country Park	EM	200,000	200,000	250,000	Free	Over 200,000
High Lodge Forest Centre	EAST	364,351	469,325	506,522	Free	Over 200,000
Kingsbury Water Park & Nature Reserve	WM	366,371	357,347	350,642	Free	Over 200,000
Moors Valley Country Park	SW	723,030	735,651	850,000	Free	Over 200,000
Mount Edgcumbe House and Country Park	SW	240,000	248,900	251,000	Free	Over 200,000
Poole's Cavern & Country Park	EM	46,599	47,786	54,017	Paid	50,001 - 100,000
River Lee Country Park	EAST	DK	1,630,521	1,589,282	Free	Over 200,000
Rother Valley Country Park	Y&H	737,792	504,794	680,000	Free	Over 200,000
Ryton Pools Country Parks	WM	188,674	202,930	189,445	Free	100,001 - 200,000
Sandwell Valley Country Park	WM	500,000	DK	500,000	Free	Over 200,000
Southwater Country Park	SE	130,000	200,000	150,000	Free	100,001 - 200,000
Top Lodge, Fineshade Woods	EM	79,386	89,806	73,077	Free	50,001 - 100,000
Wandlebury Country Park	EAST	100,000	100,000	110,000	Free	100,001 - 200,000
Westonbirt, The National Arboretum	SW	369,274	522,208	538,605	Paid	Over 200,000
Worden Park	NW	250,000	250,000	250,000	Free	Over 200,000
Arundel Wetland Centre	SE	93,329	96,127	99,508	Paid	50,001 - 100,000
Needham Lake and Nature Reserve	EAST	320,000	384,000	384,372	Free	Over 200,000
Ogden Water Country Park	Y&H	300,000	300,000	300,000	Free	Over 200,000
R S P B Pagham Harbour	SE	168,187	209,865	269,420	Free	Over 200,000
RSPB Bempton Cliffs Reserve	Y&H	80,686	101,996	107,407	Paid	100,001 - 200,000
RSPB Minsmere Nature Reserve	EAST	123,428	123,235	111,212	Paid	100,001 - 200,000
RSPB Titchwell Marsh Nature Reserve	EAST	78,800	76,289	78,461	Free	50,001 - 100,000

Source: Visitor Attraction Trends in England, 2016

Note: size is visitor numbers (DK = do not know)

Appendix 2: Case examples

The following sites were reviewed:

Abberton Reservoir Visitor Centre, Essex Wildlife Trust (visitor numbers to the centre only)

Alice Holt

Ardingly

Arlington

Bedgebury

Blashford Lakes Nature Reserve

Itchen Valley Country Park

Lakeside Country Park

Leigh Park Gardens

Llandegfedd Reservoir (including the visitor centre and watersports centre)

Queen Elizabeth Country Park (car parking spaces to increase to 600 with investment)

Royal Victoria Country Park

Rushcliffe Country Park

Salcey Forest

Stanwick Lakes

Staunton Country Park

Swanwick Lakes Nature Reserve

Testwood Lakes Nature Reserve

Wendover Woods

West Walk

Whitlingham Country Park

WWT Arundel

WWT Washington

Below we set out a Summary Table followed by individual site summaries.

Summary case example table

Examples	Location	Short description	Is the site open year-round?	Visitor numbers			Car parking spaces		Number of times it has reached capacity over the last 12 months	Average dwelltime	Percentage of visitors using a car	Proportion of visitors between Easter and the end of Sept	Percentage of visitors from within the 30 minute drivetime contour	Method for collecting data on visitor numbers
				2015	2016	2017	Permanent	Overflow						
Abberton Reservoir Visitor Centre, Essex Wildlife Trust (visitor numbers to the centre only)	South west of Colchester	Abberton Reservoir Visitor Centre is managed by the Essex Wildlife Trust. Core elements of the visitor experience include: • Visitor centre overlooking the water • Tea room • Gift shop • Network of trails • Programme of events • Range of habitats from wetlands to grasslands • Wild play Similar to other membership based organisations, the Essex Wildlife Trust benefit from their regional membership scheme	Yes, apart from Christmas Day and Boxing Day	32,084	42,351	50,941	70	30 + 100 on Old Post Road	Not on a normal day. Only for big events so Wildlife & Country Fair in June and this year (2018) when we had Outdoor Cinema.	Half a day	98%	2015 - 56% 2016 - 55% 2017 - 54%	57%	Questionnaire (not completed for a while). At our Wildlife & Country Fair this year we did a survey asking where people had come from. Now we use clickers and a door counter.
Alice Holt	South west of Farnham	Alice Holt forest visitor centre near Farnham is one of the Forestry Commission's leading recreation sites. It offers extensive opportunities for walking and cycling trails alongside play areas and natural play structures. Strong family focus - includes a Timberline play trail and GoApe Tree Top course Alice Holt includes: 4 Walking trails 2 Cycling trails - Go Ape - Play areas - Gruffalo sculptures - Picnic area - BBQ hire - Bike hire at our Activity Centre - Cafe	Yes	400,000	#####	465,000	500	100	Yes – at least twice a week during holiday periods	2 to 3 hours	Unknown	65%	Unknown	Vehicle, face to face, car parking infrastructure

Ardingly*	Within a rural setting to the east of Balcombe and west of Ardingly	Core elements of the visitor experience include: • Water sports activity centre (offering a range of water based activities including triathlons). The centre is an RYA centre • Café • Fishing • Kingfisher trail (which does not go around the whole of the boundary) • Bridleway • Designated picnic area • Toilet	Yes			120,000	70+		No, car park is large and is never totally full.	1.5 hours	70% to 80%	75%	80% to 90%	Mainly through money collection
Arlington*	The closest settlement is Berwick, a small hamlet with a train station and pub. The A27 is located approximately 1.5 miles to the south.	Arlington Reservoir is managed by South East Water and core visitor facilities include: • Car parking • Toilets • Catering offer • Walking routes • Fishing (seasonal) • Attractive views of the Downs • Interpretation panels	Yes			120,000	50+	N/A	Approximately 6 times per annum	2 hours	90%+	70%+	70%	Mainly through money collection
Bedgebury	South east of Lamberhurst in Kent	Bedgebury is an award winning visitor attraction with a focus on healthy outdoor activity. Open all year, it is home to The National Pinetum and the forest has miles of family cycling and mountain-biking, walking, and running, as well as Go Ape tree top adventure, and an adventure play trail. Regular events are held throughout the year. Bedgebury includes: • 3 walking trails • 3 cycling trails • 4 orienteering trails • Running trails • Go Ape • Horse riding • Play areas • Bike hire • Café	Yes	400,000	430,000	440,000	600	1,500	Regular use of overflow.	3 to 5 hours	Unknown	70%	Unknown	Vehicle, face to face, car parking infrastructure

Blashford Lakes Nature Reserve	North of Ringwood	Core facilities include: • Six bird hides • 8km of rolled gravel paths • Education centre • Toilets • Varied landscape e.g. water and woodlands The Reserve is managed by the Isle of Wight and Hampshire Wildlife Trust	Yes	22,997	23,151	23,158	65	40	Yes - 3	2 to 3 hours	95%	"General visitors" – i.e. birdwatchers/walkers etc not engaged in staff led activity = 45% Visitors with schools/groups/engaged in public events = 75%	50%	Face-to-face surveys, and estimates based on vehicle movements and size of groups of people backed up by baseline data collection of regular (2 hourly) car and people counts
Itchen Valley Country Park	North of Southampton and is very accessible from the M27	Core elements of the visitor experience include: • Visitor centre (barn) expanded café and indoor play, separate meeting room • Education visits are welcome and there is a forest school area • Play trail • Pond dipping • Go Ape • Programme of events The landscape is varied and includes water meadows, open grassland and woodland. The River Itchen runs alongside the park.	Yes	153,122	157,782	178,385	250		Approximately 20 times	2 to 3 hours	90%	62%	Unknown	Vehicle counter
Lakeside Country Park	Eastleigh	Lakeside country park combines an edge of town greenspace around a large waterbody with a heritage railway attraction. It is located on the southern edge of Eastleigh although most visitors arrive by car as off-road links are limited. The park is a former gravel working site and now includes three separate but adjoining lakes, woodland areas and meadows.	Yes	134,299	159,271	223,788	140	170	Approximately 10 times – mainly when railway or watersports events are on.	2-3 hours, more if using the conference room.	70%	Approximately 70%	Not recorded but it is estimated that 60% do	Vehicle counter

Leigh Park Gardens	Havant	Leigh Park Gardens is an attractive landscape of grassland, woodlands and a key water feature and is marketed as part of the Staunton Country Park Farm offer. The Gardens already links directly through to the Havant Thicket Winter Storage Reservoir site (and is marketed as part of Staunton Farm and Country Park).	Yes	120,000 (excl. HLF forecast)	120,000	120,000	0	350 (Storey Gardens-grass/seasonal parking). These will cease to exist with completion of new car park (will increase 400 space)	Main car park but not overflow	Unknown	Unknown	Unknown	Unknown	
Llandegfedd Reservoir (including the visitor centre and watersports centre)***	Llandegfedd Reservoir is located to the north of Newport, access via the M4 is good	Llandegfedd Reservoir is located to the north of Newport, access via the M4 is good and the reservoir is within a short drive of Cardiff. The site incorporates: • A visitor and watersports centre (with café and gift shop), which in 2016 won the Building of the Year at the Welsh Architecture Awards. The building overlooks the water and can host meetings • Four walking trails • Sailing, windsurfing, power boating, stand-up paddleboarding, canoeing and kayaking are available • Education visits are catered for	The visitor centre is open all year round but the walks around the reservoir and watersports are seasonal only due to the SSSI restrictions			140,000	125		Yes every time a large event is hosted and on Bank Holidays. Approximately 12 times this year	1 hour and 51 minutes	100%?	75%	Unknown, but 88% are local residents	Face to face surveys. Vehicle and people counters

Queen Elizabeth Country Park (car parking spaces to increase to 600 with investment)	To the south of Petersfield, immediately adjacent to the A3	Leading recreation park and potential gateway to the South Downs National Park. Total number of car parking spaces will increase to 600 Core offer includes: • Visitor centre with associated catering and retail offer and theatre / presentation room • Two additional kiosk • Play areas • Assault course • BBQ area • Dog agility area • Network of trails and popular mountain biking routes • Site is split in two by the A3 (although linked via underpass) • Attractive and varied landscapes and long distance views from parts of the park • Events programme • Strong education offer Partnership between Hampshire County Council and the Forestry Commission.	Yes	368,710	382,990	342,566	420	80	The whole Park will be full on approximately 10 days per year. The Visitor Centre and Juniper car parks (200 hard surface spaces in total and covering the key facilities and secondary spend areas will be at capacity on most weekends and all other high days and holidays.	The three time periods split the total pretty much in to thirds, with the 1-hour payment averaging 40 mins, the 2 hour- 90 mins and the All Day- 4 hours.	88.00%	53%	75%	People counters inside the main facilities and out on the trails.
Royal Victoria Country Park	To the west of the M27 and is bounded by Southampton water to the west.	Royal Victoria Country Park is managed by Hampshire County Council Core visitor facilities include: • Extensive network of trails • Café • Heritage offer - Chapel with new offer (secured HLF funding) • Play areas (including accessible play) • Miniature railway • A programme of events	Yes	300,000	350,000	400,000	400	1,300	Yes, twice	3 hours	75%	65%	85%	Face-to-face surveys, use of people counters and vehicle counters
Rushcliffe Country Park	Rushcliffe Country Park is located on the urban fringe of Nottingham (near Ruddington).	There is a small-scale visitor centre adjacent to a lake which creates a focal point for wildlife with a network of trails (over 8kms). Other elements of the visitor experience include: • Play area (some of which is accessible play) • Jump track (BMX) • Skateboard midi half pipe • Kiosk	Yes	250,000	250,000	250,000	156	38 (plus additional 30 for staff)	During school holidays and summer weekends capacity is reached on a daily basis, usually from 11.30-12.00	It depends on time of year and why visiting. Walking dog, with children etc. Winter 30-60 mins. Summer 1-4 hours	90%	75%	90%	Face to face surveys using our Friends group

Salcey Forest	Approximately 7 miles from the centre of Northampton	Salcey Forest is a large forest recreation and it is an ancient forest offering a range of activities which include: • 3 walking trails • 1 cycling trail • 1 horse riding trail • Play areas • Picnic area • Café The high profile tree top walk is currently closed off due to safety concerns.	Yes	146,000	190,000	165,000	350	70	Regular use of overflow,	2 to 3 hours	Unknown	64%	Unknown	Vehicle, face to face, car parking infrastructure
Stanwick Lakes	To the north east of Northampton	Stanwick Lakes is a countryside attraction and nature reserve located in Northamptonshire's Nene Valley, extending to 750 acres. There are extensive and imaginative play areas, open spaces and paths that families, walkers, cyclists and nature enthusiasts can explore. The visitor centre, with café, shop and function space. Stanwick Lakes is a social enterprise Rockingham Forest Trust in partnership with East Northamptonshire Council. Main facilities and activities include: • Visitor centre with Lakeside cafe / restaurant • Heritage trail • Assault course • Outdoor theatre • Adventure playground • Picnic areas		275,000	295,000	300,000	250	300	Yes, including the overflow. Happens about 15 times per year	In summer 4+ hours, off-peak a couple of hours	At least 85%	Probably around two thirds	Off-peak the majority, at sunny weekends and in peak season maybe half to two thirds. This summer we had people travelling down for the day from Leeds!	We use car numbers through barrier system plus an estimate for those who walk or cycle in

Staunton Country Park	Havant	Staunton Farm is a popular paid for heritage farm attraction which is linked to the adjacent Leigh Park Gardens. Core elements of the visitor experience include: • Café • Retail • Farm animals • Indoor play • Outdoor play • Walled garden and tropical hothouse • Events • Education offer In addition to the visitors to the farm it is estimated that there are an additional 120,000 visits to Leigh Park Gardens per annum (some of whom will be visiting the farm and some walking in).	Yes, apart from Christmas Day and Boxing Day	166,580	165,760	167,827	207	250-350	Main car park 28 times and overflow car park 2 times	3 hours	95%	58%	96%	EPOS and people counters
Swanick Lakes Nature Reserve	Swanick	Core facilities include: • Dipping pond • Flower meadows with many orchids in spring • Grazing animals • Classroom facilities in the log cabin building • Toilets • Cycle storage • Archaeology	Yes	Unknown	Unknown	Unknown	18	-	Approx. twice a month (when we have events running).	Unknown	Unknown	Unknown	Unknown	
Testwood Lakes Nature Reserve		Core facilities include: • Large classroom for 70 pupils and accompanying adults • Meeting room for up to 25 adults • Bird hides • Dipping ponds • Bronze Age Round house • Wildlife friendly gardens • Log circle outdoor classrooms • Free hire of all terrain wheelchair • Toilets, including accessible toilet and baby changing • Network of trails • Birthday party packages	Yes	25,000 (low estimate)	25,000 (low estimate)	25,000 (low estimate)	90	40	Yes, approximately 200 days (estimate)	1 hour	90%	70%	95% estimate	Face to face

Wendover Woods	To the south east of Aylesbury	Wendover Woods is a popular site for a wide range of outdoor activities including orienteering, play and our fitness trail assault course. The Forest Centre is now undergoing a £4.5 million re-development. This will include a brand new car park increasing capacity to over 500 spaces. There will also be a brand new café developed. Our new play trail is now under construction. Overall facilities include: • 3 walking trails • Family cycle trail • Horse riding • Orienteering trails • Go Ape • BBQs • Picnic Area • Café	Yes	400,000	400,000	480,000	400	100	Regular use of overflow,	2 to 3 hours	Unknown	62%	Unknown	Vehicle, face to face, car parking infrastructure
West Walk	To the north of Fareham	West Walk offers a family day out with walking trails, cycling and picnic spots. It provides access to some 350 hectares of a former medieval hunting ground in the Forest of Bere. The site offers: • 2 Walking trails • 2 Cycling trails • Horse riding • Mobile café • Children's play area • Educational trails • BBQs	Yes	160,000	200,000	210,000	Unknown	Unknown	Yes – individual car parks approx. 6 times per annum	Unknown	Unknown	Unknown	Unknown	Vehicle, face to face, car parking infrastructure
Whitlingham Country Park	South eastern edge of Norwich	A popular country park located on the edge of Norwich. Core elements of the visitor experience include: • Café • Outdoor pursuits including watersports and National Cycle Route 1 runs through/by the country park • Events • Major water feature • Solar powered boat	Yes	211,937	209,633	204,735	400		Yes - Open Water Swim 22/7 plus possibly two other occasions – Triathlon and Tour De Broads	Approximately 2 to 2.5 hours	Majority (80-90%)	2017/2018 figs : April- Sept : 144,971 Oct – Nov : 59,764	No data available (respondee estimates over 90% of visitors fit this category. S.B.)	People counters in visitor centre and customer satisfaction survey's

WWT Arundel	To the north of Arundel.	Core elements of the visitor experience include: • Centre/café overlooking the water (which can be hired out including separate meeting rooms) • Retail offer • Network of trails • Boat safaris • Network of trails • Themed play area • Pond dipping area • Bird hide (with guide) • Programme of education • Education service	Yes	93,829	96,127	99,508	145	15	Yes, approximately 10 to 20 times a year during specific time slots	2 to 3 hours	80%	60%	64%	All visitors pay or provide a membership card so all data is logged
WWT Washington	To the west of Sunderland and south of Newcastle	WWT Washington and is managed by the Wildfowl and Wetlands Trust. Core elements of the visitor offer/service include: • Café • Gift shop • Network of trails • Play • Accessible wetlands and meadow environments • Stunning wildlife offer including otters • Bird hide • Programme of events • Education offer	Yes	49,881	70,737	81,344	96	50	Yes approximately 8 to 10 day per annum.	3 hours	90%	69%	80%	All visitors pay or provide a membership card so all data is logged

* Assumes Ardingly generates the same as Arlington (based on ticket sales and guestimate of number of people per car)

** Number to centre

*** Estimate for 2018

Abberton Reservoir Visitor Centre

Short description	Abberton Reservoir Visitor Centre is managed by the Essex Wildlife Trust and is located in some five miles to the south west of Colchester in Essex. Core elements of the visitor experience include: • Visitor centre overlooking the water • Tea room • Gift shop • Network of trails • Programme of events • Range of habitats from wetlands to grasslands • Wildplay Similar to other membership based organisations the Essex Wildlife Trust benefit from their regional membership scheme in terms of having a 'captive' audience.		
Visitor numbers	2015: 32,084	2016: 42,351	2017: 50,941
Number of car parking spaces	Permanent: 70	Overflow: 30 + 100 on the old road	
Current car parking charges	Free		
Is the site open year-round?	• Yes 9am-5pm summer months • 9am-4pm winter months • Closed Christmas Day & Boxing Day		
Does your car park reach capacity? If yes approximately how many times has	Not on a normal day. Only for big events so Wildlife & Country Fair in June and this year (2018) when we had an outdoor cinema.		

it reached capacity over the last 12 months?	
What is the average dwelltime of your visitors?	Half a day
What percentage of your visitors travel to the site using a car?	98%
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	2015 - 56% 2016 - 55% 2017 - 54%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	57%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	We did have a questionnaire, but haven't done this for a while. At our Wildlife & Country Fair this year we did a survey asking where people had come from. We have counted visitors in the past using stickers, then we went to clickers and now we use clickers and a door counter.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	- Seven wooden mice were installed creating the Brambly Hedge trail – this is for families with young children. Hard standing was put down on the footpath to make this accessible for wheelchairs and pushchairs. They follow the trail using a map to find the mice. - Two swings were put in to the play area to increase equipment in there; one swing was specifically for disabled children. - Mini observatory & mounted telescope was put in to add an extra element to our stargazing events.

	• Turtle dove plot has been planted to try and encourage them to use the nature reserve. • Off road wheelchair (Boma) and storage unit was sourced to allow our visitors with limited mobility more access to more of the site. • Second mobility scooter was provided for general access out on to the nature reserve. • Tearoom counter was put in for Sir David Attenborough's visit in 2015. Since then the tearoom has grown and therefore we have employed another full-time member of staff in there to help provide the offer and give good customer service. • Events offer has increased providing new events on site to reach a new audience, these include mobile planetarium; outdoor cinema; outdoor theatre productions; music events; owl and bird of prey evenings • EPOS till systems have been installed in the tearoom and centre shop. • Third hide was installed over looking hide bay, providing great views of the bay and the pools when the water levels drop.
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Photos kindly provided by the Essex Wildlife Trust. Photo credit: Mark Draper

Alice Holt

Short description	Alice Holt forest visitor centre near Farnham is one of the Forestry Commission's leading recreation sites. It offers extensive opportunities for walking and cycling trails alongside play areas and natural play structures. It has a strong family focus and includes a Timberline play trail and Go Ape Tree Top adventure course Alice Holt includes: 4 Walking trails 2 Cycling trails - Go Ape - Play areas - Gruffalo sculptures - Picnic area - BBQ hire - Bike hire at our Activity Centre - Cafe		
Visitor numbers	2015: 400,000	2016: 450,000	2017: 465,000
Number of car parking spaces	Permanent: 500	Overflow: 100	
Current car parking charges	Charges at peak times (weekends, school holidays, bank holidays) • Up to 1 hour £3.00 • Up to 2 hours £5.00 • Up to 3 hours £7.00 • Up to 4 hours £9.00 • All day £12.00 Off peak charges (weekdays, term time only) • Up to 1 hour £2.00		

	• Up to 2 hours £3.50 • Up to 3 hours £5.00 • Up to 4 hours £6.50 • All day £8.00
Is the site open year-round?	Yes
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes – at least twice a week during holiday periods
What is the average dwelltime of your visitors?	2-3 hrs
What percentage of your visitors travel to the site using a car?	Unknown
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	65%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Vehicle, face to face, car parking infrastructure
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Capital investment • New cycle hire centre / workshop • Upgraded play areas • New extended cafe



Ardingly Reservoir, South East Water

Short description	Ardingly Reservoir is located within a rural setting to the east of Balcombe and west of Ardingly, some six miles north of Haywards Heath in West Sussex. Core elements of the visitor experience include: • Water sports activity centre (offering a range of water based activities including triathlons). The centre is an RYA centre • Café • Fishing • Kingfisher trail (which does not go around the whole of the boundary) • Bridleway • Designated picnic area • Toilet		
Visitor numbers	2015:	2016:	2017: 120,000
Number of car parking spaces	Permanent: 70+	Overflow:	
Current car parking charges	£1.00 all day parking		
Is the site open year-round?	The site is open year round		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	No, car park is large and is never totally full.		
What is the average dwelltime of your visitors?	1.5 hours		
What percentage of your visitors travel to the site using a car?	70-80%		
What proportion of visitors come between Easter and the end of Sept	75%		

(even approx. estimate would be useful)?	
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	80-90%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Mainly through money collection
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Picnic benches purchased, visitor trail waymarker posts have been replaced, a new leaflet has been produced.

Arlington Reservoir, South East Water

Short description	Arlington Reservoir in East Sussex is managed by South East Water and is situated in a relatively remote rural area. The closest settlement is Berwick, a small hamlet with a train station and pub. Road access is good with the A27 located approximately 1.5 miles to the south. Core visitor facilities include: • Car parking • Toilets • Catering offer • Walking routes • Fishing (seasonal) • Attractive views of the Downs • Interpretation panels We understand that the site has been designated as a SSSI and as a Local Nature Reserve. The site is popular amongst birdwatchers.		
Visitor numbers	2015:	2016:	2017: 120,000
Number of car parking spaces	Permanent: 50+	Overflow: None	
Current car parking charges	£1 up to 2 hours and £2 all day.		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Approximately 6 times per annum		

What is the average dwelltime of your visitors?	2 hours
What percentage of your visitors travel to the site using a car?	90% +
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	70%+
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	70%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Mainly through money collection
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Public footpath upgrades undertaken – soil track upgraded to type 1 / gravel fines path. 365m in total. This has now made a circular walk 90% walkable even during periods of wet winter weather. The trail waymarker posts have been replaced and a new leaflet printed. Picnic benches also replaced. Small bridge upgrades completed.



Bedgebury

Short description	Bedgebury is located in Kent close to the Sussex border, three miles north of Flimwell on the A21. Bedgebury is an award winning visitor attraction with a focus on healthy outdoor activity. Open all year, it is home to The National Pinetum and the forest has miles of family cycling and mountain-biking, walking, and running, as well as Go Ape tree top adventure, and an adventure play trail. Regular events are held throughout the year. Bedgebury includes: • 3 walking trails • 3 cycling trails • 4 orienteering trails • Running trails • Go Ape • Horse riding • Play areas • Bike hire • Café The visitor centre has been extended since opening.		
Visitor numbers	2015: 400,000	2016: 430,000	2017: 440,000
Number of car parking spaces	Permanent: 600	Overflow: 1,500	
Current car parking charges	Peak times (weekends, school holidays and bank holidays) • All day £13.00 Off peak charges (Monday-Friday, term time only)		

	- All day £10.00 8am-11am all year round - Early bird exit before 11.00 £3.00
Is the site open year-round?	Yes
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Regular use of overflow.
What is the average dwelltime of your visitors?	3-5hrs
What percentage of your visitors travel to the site using a car?	Unknown
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	70
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Vehicle, face to face, car parking infrastructure
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Capital – commercially sensitive



Blashford Lakes Nature Reserve

Short description	Core facilities include: • Six bird hides • 8km of rolled gravel paths • Education centre • Toilets • Varied landscape e.g. water and woodlands The Reserve is managed by the Isle of Wight and Hampshire Wildlife Trust		
Visitor numbers	2015: 22,997	2016: 23,151	2017: 23,158
Number of car parking spaces	Permanent: 65	Overflow: 40	
Current car parking charges	Nil – entry by donation. On average estimated at about 50p per visitor		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes - 3		
What is the average dwelltime of your visitors?	2-3 hours		
What percentage of your visitors travel to the site using a car?	95%		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	"General visitors" – i.e. birdwatchers/walkers etc not engaged in staff led activity = 45% Visitors with schools/groups/engaged in public events = 75%		
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	50%		

In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	face-to-face surveys, and estimates based on vehicle movements and size of groups of people backed up by baseline data collection of regular (2 hourly) car and people counts
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	In the last 3 years there have been no significant improvements but in the past prior to that time we have noted a significant increase in visitors following investment in new facilities including bird hides and footpaths. We are currently (Spring 2019) working on an extensive project to improve visitor experience and anticipate a rise in visitors (and dwell time) as a result



Itchen Valley Country Park

	Itchen Valley Country Park is an attractive country park, which is very accessible from the M27 to the north of Southampton. It is located on the southern edge of Eastleigh, alongside the River Itchen. Core elements of the visitor experience include: • Visitor centre (barn) expanded café and indoor play, separate meeting room • Education visits are welcome and there is a forest school area • Play trail • Pond dipping • Go Ape • Programme of events The landscape is varied and includes water meadows, open grassland and woodland. The River Itchen runs alongside the park.		
Visitor numbers*	2015: 153,122	2016: 157,782	2017 178,385:
Number of car parking spaces	Permanent: 250	Overflow:	
Current car parking charges	• 1 hour £1.30 • 2 hours £2.50 • 3 hours £3.70 • 4 hours + £4.30		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Approximately 20 times		
What is the average dwelltime of your visitors?	2 – 3 hours		

What percentage of your visitors travel to the site using a car?	90%
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	62%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Not available
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	We have in the past but no longer, vehicle counter is still used.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Approximately £300,000 to increase size and offering of café in 2018. This has had a very positive impact on throughput.

*Vehicle data is calculated from the raw data, vehicle's entering x 2.3 to calculate visitor numbers.



Lakeside Country Park

Short description	Lakeside country park combines an edge of town greenspace around a large waterbody with a heritage railway attraction. It is located on the southern edge of Eastleigh although most visitors arrive by car as off-road links are limited. The park is a former gravel working site and now includes three separate but adjoining lakes, woodland areas and meadows. The country park extends to some 60 acres in total, adjacent to further greenspace in the form of the University sports ground.		
Visitor numbers	2015: 134,299	2016: 159,271	2017: 223,788
Number of car parking spaces	Permanent: 140	Overflow: 70	
Current car parking charges	None, restricted to 4 hours on a weekday		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Approximately 10 times – mainly when railway or watersports events are on.		
What is the average dwelltime of your visitors?	2-3 hours, more if using the conference room.		
What percentage of your visitors travel to the site using a car?	70%		
What proportion of visitors come between Easter and the end of Sept	Approximately 70%		

(even approx. estimate would be useful)?	
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Not recorded but it is estimated that 60% do
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Data has been collected in the past, but no longer, vehicle counter is still used.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	£3.6 million was spent on the new buildings on site, these provide staff and tenant offices, conference centre, public toilets and storage including a weightlifting gym. Improved car park facilities are planned. This has increased the number of new visits especially to the conference centre.

*Vehicle data is calculated from the raw data, vehicle's entering x 2.3 to calculate visitor numbers. The LCP data appears to pick up vehicle's in both directions so the data is then halved to account for this.



Leigh Park Gardens

Note to be read alongside Staunton case example

Short description	Leigh Park Gardens is an attractive landscape of grassland, woodlands and a key water feature and is marketed as part of the Staunton Country Park Farm offer. The Gardens already links directly through to the Havant Thicket Winter Storage Reservoir site to the north (and is marketed as part of Staunton Farm and Country Park).		
Visitor numbers	2015: 120,000 (est)	2016: 120,000 (est)	2017: 120,000 (est)
Number of car parking spaces	Permanent: 0	Overflow: 250 - 350 (Storey Gardens-grass/seasonal parking). These will cease to exist with completion of new car park.	400 (new permanent car park) to be constructed in 2019
Current car parking charges	1hr - £2.00, 3hrs - £2.50, all day-£4.00 Automatic Number Plate Recognition (ANPR) introduced @ SCP Farm in 2018.		
Is the site open year-round?	The site is open year round. Currently, 200 permanent spaces at the Staunton Country Park Farm site and up to 350 seasonal overflow spaces in Storey Gardens (that can be used Easter through to October depending on weather).		

Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Leigh Park Gardens currently has one overflow grass car park (Storey Gardens) which will be replaced by a new purpose-built site, to be completed towards the end of 2019. All high days and holidays from Easter to the October half term we would expect the main car park to be full. This Summer the overflow did not fully reach capacity.
What is the average dwell time of your visitors?	No data available on dwell time for Leigh Park Garden visitors.
What percentage of your visitors travel to the site using a car?	No data available on car travel for Leigh Park Garden visitors).
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	No data available on dwelltime for Leigh Park Gardens
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	No data available for 30-minute drive time.
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Significant work was carried out by external consultants for the HLF Activity Plan: 'Staunton Country Park: A Regency Landscape revealed' (Jan 2017)'.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	The investment has started with the current HLF project. To be completed towards the end of 2019.



Images kindly supplied by Hampshire County Council

Llandegfedd Reservoir (including the visitor centre and watersports centre)

Short description	Llandegfedd Reservoir is located to the north of Newport, access via the M4 is good and the reservoir is within a short drive of Cardiff. The site incorporates: • A visitor and watersports centre (with café and gift shop), which in 2016 won the Building of the Year at the Welsh Architecture Awards. The building overlooks the water and can host meetings • Four walking trails • Sailing, windsurfing, power boating, stand-up paddleboarding, canoeing and kayaking are available • Education visits are catered for • Fishing is also available • A sailing club is located onsite Interestingly, due to the SSSI both watersports and angling will not open until 1st March 2019 (at the time of writing December 2018).		
Visitor numbers	Estimate 140,000 during 2018*		
Number of car parking spaces	Permanent: 125	Overflow: 0	

Current car parking charges	None however there are plans to implement a charge in the 2019 season of £2 per day
Is the site open year-round?	The visitor centre is open all year round but the walks around the reservoir and watersports are seasonal only due to the SSSI restrictions
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes every time a large event is hosted and on Bank Holidays. Approximately 12 times this year
What is the average dwelltime of your visitors?	1hr 51mins
What percentage of your visitors travel to the site using a car?	100%?
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	75%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown, but 88% are local residents
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Face to face surveys Vehicle and people counters
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	We upgrade improve product, kit and activities every year, as yet this has been approximately £200,000 since 2015

*Visitor numbers are counted on entering the café and counting cars on an induction loop system, because of the demographic of the site not all visitors are captured



Images kindly supplied Welsh Water <http://www.llandeafedd.co.uk/>

Queen Elizabeth Country Park

Short description	Leading recreation park and potential gateway to the South Downs National Park, less than 5 miles south of Petersfield. Core offer includes: • Visitor centre with associated catering and retail offer and theatre / presentation room • Two additional kiosk • Play areas • Assault course • BBQ area • Dog agility area • Network of trails and popular mountain biking routes • Site is split in two by the A3 (although linked via underpass) • Attractive and varied landscapes and long distance views from parts of the park • Events programme • Strong education offer Partnership between Hampshire County Council and the Forestry Commission		
Visitor numbers	2015/16: 368,710	2016/17: 382,990	2017/18: 342,566
Number of car parking spaces	Permanent: 420	Overflow: 80	
Current car parking charges	1 hour-£2.00, 3 hours-£3.00, All day £5.00		
Is the site open year-round?	Yes		

Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Currently there are 500 spaces in the Park altogether (80 of which are on grass). This will rise to at least 600 with current capital program. The whole Park will be full on approximately 10 days per year. The Visitor Centre and Juniper car parks (200 hard surface spaces in total and covering the key facilities and secondary spend areas will be at capacity on most weekends and all other high days and holidays.
What is the average dwelltime of your visitors?	The three time periods split the total pretty much in to thirds, with the 1-hour payment averaging 40 mins, the 2 hour- 90 mins and the All Day-4 hours.
What percentage of your visitors travel to the site using a car?	88%
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	53%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	75%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	People counters inside the main facilities and out on the trails.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Spring 2018 investment of approximately £300,000 of adventure play, dog activity and assault course. This is the first stage of a larger capital program that will re-vamp all the main facilities.



Photos kindly supplied by Hampshire County Council

Royal Victoria Country Park

Short description	Royal Victoria Country Park is managed by Hampshire County Council and is located to the west of the M27 and is bounded by Southampton water to the west. Core visitor facilities include: • Extensive network of trails • Café • Heritage offer - Chapel with new offer (secured HLF funding) • Play areas (including accessible play) • Miniature railway • A programme of events		
Visitor numbers	2015: 300,000	2016: 350,000	2017: 400,000
Number of car parking spaces	Permanent: 400	Overflow: 1,300	
Current car parking charges	£2 up to 1hr, £3 for up to £3hrs, £ 5 over 3hrs £60 annual pass £25 Blue Badge Annual pass		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes, twice		
What is the average dwelltime of your visitors?	3hrs		
What percentage of your visitors travel to the site using a car?	75%		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	65%		

Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	85%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	All of the methods listed
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	• Chapel refurbishment c.£3.5 million investment • Play offer improvement £50,000 • Sheltered seating area £30,000k • Trails £10,000 • New signage ongoing • Yes, there has been a positive impact on visitor numbers





Photos kindly provided by Hampshire County Council

Rushcliffe Country Park

Short description	Rushcliffe Country Park is located on the urban fringe of Nottingham (near Ruddington). There is a small-scale visitor centre adjacent to a lake which creates a focal point for wildlife with a network of trails (over 8kms). Other elements of the visitor experience include: • Play area (some of which is accessible play) • Jump track (BMX) • Skateboard midi half pipe • Kiosk		
Visitor numbers	2015: 250,000	2016: 250,000	2017: 250,000
Number of car parking spaces	Permanent: 156	Overflow: 38	Volunteer/Staff 30
Current car parking charges	£1 per day Annual permit £30.00 per annum		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	During school holidays and summer weekends capacity is reached on a daily basis, usually from 11.30-12.00		
What is the average dwell time of your visitors?	It depends on time of year and why they are visiting. Walking dog, visiting with children etc. Winter 30-60 mins. Summer 1-4 hours		
What percentage of your visitors travel to the site using a car?	90%		

What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	75%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	90%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Face to face surveys using our Friends group.
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	£90,000 spent car park improvements to change from voluntary to compulsory car parking charges. The change has been widely accepted by visitors and I think this is down to the fact that we have kept charges at a £1

Salcey Forest

Short description	Salcey Forest is a large forest recreation site just 7 miles from the centre of Northampton. It is an ancient forest offering a range of activities which include: • 3 walking trails • 1 cycling trail • 1 horse riding trail • Play areas • Picnic area • Café The high profile tree top walk is currently closed off due to safety concerns.		
Visitor numbers	2015: 146,000	2016: 190,000	2017: 165,000
Number of car parking spaces	Permanent: 350	Overflow: 70	
Current car parking charges	• Up to 1 hour £1.50 • All day £4.00		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Regular use of overflow.		
What is the average dwelltime of your visitors?	2-3hrs		
What percentage of your visitors travel to the site using a car?	Unknown		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	64%		

Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Vehicle, face to face, car parking infrastructure
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	None

Stanwick Lakes

Short description	Stanwick Lakes is a countryside attraction and nature reserve located in Northamptonshire's Nene Valley, extending to 750 acres. There are extensive and imaginative play areas, open spaces and paths that families, walkers, cyclists and nature enthusiasts can explore. The visitor centre has café, shop and function space. Stanwick Lakes is a social enterprise Rockingham Forest Trust in partnership with East Northamptonshire Council. Main facilities and activities include: • Visitor centre with Lakeside cafe / restaurant • Heritage trail • Assault course • Outdoor theatre • Adventure playground • Picnic areas		
Visitor numbers	2015: 275,000	2016: 295,000	2017: 300,000
Number of car parking spaces	Permanent: 250	Overflow: 300	
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes, including the overflow. Happens about 15 times per year		
What is the average dwelltime of your visitors?	In summer 4+ hours, off-peak a couple of hours		
What percentage of your visitors travel to the site using a car?	At least 85%		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	Probably around two thirds		

Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Off-peak the majority, at sunny weekends and in peak season maybe half to two thirds. This summer we had people travelling down for the day from Leeds!
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	We use car numbers through barrier system plus an estimate for those who walk or cycle in
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	We have improved the visitor centre by creating a coffee lounge on the mezzanine, and outdoors we have improved/replaced various pieces of play equipment and added a wet woodland boardwalk and sculpture area. We invest around £50k per year. It means the numbers of visitors just keep rising.

Staunton Farm Country Park

Note: to be read alongside Leigh Park Gardens

Short description	Staunton Farm is a popular paid for heritage farm attraction which is linked to the adjacent Leigh Park Gardens in Havant. Core elements of the visitor experience include: • Café • Retail • Farm animals • Indoor play • Outdoor play • Walled garden and tropical hothouse • Events • Education offer In addition to the visitors to the farm it is estimated that there are an additional 120,000 visits to Leigh Park Gardens per annum (some of whom will be visiting the farm and some walking in). Leigh Park Gardens • Attractive landscape with water feature • Network of trails • Events Hampshire County Council has secured significant HLF funding to enhance the visitor experience within Leigh Park Gardens and visitor numbers are forecast to increase by 60,000.
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	The figures below are related to the farm although car parking is used by people visiting Leigh Park Gardens.		
Visitor numbers	2015/16 166,580	2016/17 165,760	2017/18 167,827
Number of car parking spaces	Permanent: 207	Overflow: 250-350	
Current car parking charges	1 hour £2.00, up to 3 hours £2.50, All day £4.00 (currently included within farm entrance)		
Is the site open year-round?	363 days per year		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	• Main car park 28 times • Overflow car park 2 times		
What is the average dwelltime of your visitors?	3 hours		
What percentage of your visitors travel to the site using a car?	95%		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	58%		
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	96%		
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	• Epos till system • People counters		
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	• Play • Path Networks • Customer engagement		



Images kindly supplied by Hampshire County Council

Swanwick Lakes Nature Reserve

Short description	Core facilities include: • Dipping pond • Flower meadows with many orchids in spring • Grazing animals • Classroom facilities in the log cabin building • Toilets • Trails • Cycle storage • Archaeology The reserve is managed by the Isle of Wight and Hampshire Wildlife Trust.		
Visitor numbers	2015: Unknown	2016: Unknown	2017: Unknown
Number of car parking spaces	Permanent: 18	Overflow:	
Current car parking charges	Nil		
Is the site open year-round?	Yes. Some paths are shut during the winter months.		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes Approx. twice a month (when we have events running).		
What is the average dwelltime of your visitors?	Unknown		
What percentage of your visitors travel to the site using a car?	Unknown		
What proportion of visitors come between Easter and the end of Sept	Unknown		

(even approx. estimate would be useful)?	
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Yes
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Short accessible looped path and pond dipping area resurfaced. The main aim of the reserve is to combine conservation with education delivery and public access. We are actively trying to manage our footfall on the reserve and keep it to a sustainable level, so a positive impact for us is maintaining rather than increasing numbers of visitors.

Testwood Lakes Nature Reserve

Short description	Core facilities include: • Large classroom for 70 pupils and accompanying adults • Meeting room for up to 25 adults • Bird hides • Dipping ponds • Bronze Age Round house • Wildlife friendly gardens • Log circle outdoor classrooms • Free hire of all terrain wheelchair • Toilets, including accessible toilet and baby changing • Network of trails • Birthday party packages		
Visitor numbers	2015: 25,000 low estimate?	2016: 25,000 Low estimate?	2017: 25,000 low estimate?
Number of car parking spaces	Permanent: 90	Overflow: 40	
Current car parking charges	0		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes, approximately 200 days (estimate)		
What is the average dwelltime of your visitors?	1 hour		
What percentage of your visitors travel to the site using a car?	90%		
What proportion of visitors come between Easter and the end of Sept	70% estimate		

(even approx. estimate would be useful)?	
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	95%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Face to face
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Tarmacing of car park, yes made a small difference especially in winter



Wendover Woods

Short description	Wendover Woods is some four miles south west of Tring in Buckinghamshire. It is a popular site for a wide range of outdoor activities including orienteering, play and our fitness trail assault course. The Forest Centre is now undergoing a £4.5 million re-development. This will include a brand new car park increasing capacity to over 500 spaces. There will also be a brand new café developed. Our new play trail is now under construction. Overall facilities include: • 3 walking trails • Family cycle trail • Horse riding • Orienteering trails • Go Ape • BBQs • Picnic Area • Café		
Visitor numbers	2015: 400,000	2016: 400,000	2017: 480,000
Number of car parking spaces	Permanent: 400	Overflow: 100	
Current car parking charges	• 0 – 2 hours £2.20 • 2 – 4 hours £4.30 • 4+ hours £8.00		
Is the site open year-round?	Yes		

Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Regular use of overflow.
What is the average dwelltime of your visitors?	2-3hrs
What percentage of your visitors travel to the site using a car?	Unknown
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	62%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Vehicle, face to face, car parking infrastructure
If applicable, what investment has been made in improving the visitor experience over the last 3 years	None - currently capital project under way

West Walk, Forest of Bere

Short description	West Walk is located some two miles to the east of Wickham in Hampshire (approximately six miles north of Fareham). The forest offers a family day out with walking trails, cycling and picnic spots. It provides access to some 350 hectares of a former medieval hunting ground in the Forest of Bere. The site offers: • 2 Walking trails • 2 Cycling trails • Horse riding • Mobile café • Children's play area • Educational trails • BBQs		
Visitor numbers	2015: 160,000	2016: 200,000	2017: 210,000
Number of car parking spaces	Permanent: Unknown	Overflow: N/A	
Current car parking charges	• Up to 2 hours £1.80 • Up to 4 hours £3.50 • All day £5.00		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes – individual car parks approx. 6 times per annum		
What is the average dwelltime of your visitors?	Unknown		
What percentage of your visitors travel to the site using a car?	Unknown		
What proportion of visitors come between Easter and the end of Sept	Unknown		

(even approx. estimate would be useful)?	
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	Unknown
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	Vehicle, face to face, car parking infrastructure
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	None



Whitlingham Country Park

Short description	A popular country park located on the edge of Norwich. Core elements of the visitor experience include: • Café • Outdoor pursuits including watersports and National Cycle Route 1 runs through/by the country park • Events • Major water feature • Solar powered boat		
Visitor numbers	2015/16 211,937	2016/17 209,633	2017/18 204,735
Number of car parking spaces	5 car parks offering approx. 400 spaces		
Current car parking charges			
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes - Open Water Swim 22/7 plus possibly two other occasions – Triathlon and Tour De Broads		
What is the average dwelltime of your visitors?	Approximately 2 to 2.5 hours		
What percentage of your visitors travel to the site using a car?	Majority (80-90%)		
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	2017/2018 figs : April- Sept : 144,971 Oct – Nov : 59,764		
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	No data available (I would estimate over 90% of visitors fit this category. S.B.)		
In the past how have you collected data about your visitor numbers e.g. face-to-	People counters in visitor centre and customer satisfaction survey's		

face surveys, use of people counters or vehicle counters?	
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	The investment has mainly been in the quality of the landscape (land & lake) with paths being opened up, vegetation cleared to allow views across the lake and scrub and tree management.



WWT Arundel

Short description	WWT Arundel is located to the north of Arundel. Core elements of the visitor experience include: • Centre/café overlooking the water (which can be hired out including separate meeting rooms) • Retail offer • Network of trails • Boat safaris • Network of trails • Themed play area • Pond dipping area • Bird hide (with guide) • Programme of education • Education service Site benefits from national presence of WWT brand and membership.		
Visitor numbers	2015: 93,829	2016: 96,127	2017: 99,508
Number of car parking spaces	Permanent: 145 (inc. 8 disabled)	Overflow: 15	
Charge	Adults £13.00, child £7.00 and family £34.00		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes, approximately 10 to 20 times a year during specific time slots		
What is the average dwelltime of your visitors?	2 to 3 hours		

What percentage of your visitors travel to the site using a car?	80%
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	60%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	64%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	All visitors pay or provide a membership card so all data is logged
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Ongoing investment



WWT Washington

Short description	WWT Washington is a nature reserve located to the west of Sunderland and south of Newcastle and is managed by the Wildfowl and Wetlands Trust. Core elements of the visitor offer/service include: • Café • Gift shop • Network of trails • Play • Accessible wetlands and meadow environments • Stunning wildlife offer including otters • Birdhide • Programme of events • Education offer Site benefits from national presence of WWT brand and membership.		
Visitor numbers	2015: 49,881	2016: 70,737	2017: 81,344
Number of car parking spaces	Permanent: 96 (inc. 8 disabled)	Overflow: 50	
Charge	Adults £10.50, child £6.00 and family £28.00		
Is the site open year-round?	Yes		
Does your car park reach capacity? If yes approximately how many times has it reached capacity over the last 12 months?	Yes approximately 8 to 10 days per annum.		

What is the average dwelltime of your visitors?	3 hours
What percentage of your visitors travel to the site using a car?	90%
What proportion of visitors come between Easter and the end of Sept (even approx. estimate would be useful)?	69%
Approximately what percentage of your visitors come from within the 30 minute drivetime contour?	80%
In the past how have you collected data about your visitor numbers e.g. face-to-face surveys, use of people counters or vehicle counters?	All visitors pay or provide a membership card so all data is logged
If applicable, what investment has been made in improving the visitor experience over the last 3 years and has this had a positive impact on throughput?	Ongoing investment

Appendix 3: Long list of individual uses considered (facilities and services)

We set out below a long list of potential uses considered as part of the study and their associated 'pros' and 'cons'. These have been grouped using the following themes:

- 1.0 Main building
- 2.0 Standalone catering
 - 2.1 Standalone café
 - 2.2 Seasonal permanent kiosk
- 3.0 Cluster of craft units
- 4.0 Bike hire, shop and workshop for repairs
- 5.0 Indoor play (standalone)
- 6.0 Education use
 - 6.1 Multi-use space
 - 6.2 Non-commercial water based activities for education and other groups
 - 6.3 Pond dipping areas
- 7.0 Play
 - 7.1 Adventure play
 - 7.2 Sand and water play
 - 7.3 Play trail
 - 7.4 Natural play
 - 7.5 Covered or non-covered play area
- 8.0 Wildlife
- 9.0 Visitor infrastructure
 - 9.1 External sense of welcome, external interpretation and signage
 - 9.2 Picnic area and seating
 - 9.3 Outdoor shelter
 - 9.4 Network of trails

- 9.5 Accessible island
- 10.0 Events
 - 10.1 Events and activity programmes
 - 10.2 Major amphitheatre
 - 10.3 Minor amphitheatre
- 11.0 Adventure type of activities
 - 11.1 Aerial experience
 - 11.2 BMXing area and/or jumps area
- 12.0 Commercial water-based activities
 - 12.1 Beach
 - 12.2 Solar boat
 - 12.3 Inflatable floating play
 - 12.4 Stand-up paddleboards /canoes
 - 12.5 Floating lido
 - 12.6 Dive centre
- 13.0 Other
 - 13.1 Onsite transport
 - 13.2 Dog agility area
 - 13.3 Viewing tower
 - 13.4 Seasonal mobile catering vehicle
 - 13.5 Cluster of seasonal yurts
 - 13.6 Hostel type of accommodation linked to watersports uses

1.0 Main building

Visitor centre

Core component elements

The visitor centre is likely to be a core component element in respect of the visitor experience and represents the main hub building and focal point for the site.

There are different elements which could be included within the visitor centre.

Depending on scale and ambition it could include a mix of the following elements:-

Essential:

- Welcoming entrance and information point for wider site
- Cafe and servery (with some menu items having a focus on local produce) with kitchen (dry stores and lockable store) and WIFI
- External seating / patio space with cover (providing additional covers)
- Small retail space (linked to cafe for dual management)
- Toilets (visitors and staff)
- Changing places toilet
- Flexible space or dedicated spaces (able to accommodate education and other groups)
- Office
- Welfare space for staff and volunteers
- Working yard (associated with building)

	Optional: • Gallery / exhibition / interpretation space enabling Portsmouth Water to promote core messages to visitors
Pros	Cons
• Builds wet weather resilience • Meets visitors' expectation • Adds to the tourism profile in a positive manner • Potential to re-use site materials during construction e.g. timber	• Unlikely to generate an admission charge • Complex to deliver • Some issues of seasonality • Potential impact on offer at Staunton Country Park and Farm (could draw some visitors away from the farm and Leigh Park Gardens). Emphasises the need to work closely with HCC particularly as HCC are investing in Leigh Park Gardens • Ongoing need for maintenance and reinvestment to refresh the experience (otherwise will generate negative feedback) • Will drive parking demand



Bedgebury Pinetum, Forestry Commission



Brockholes a floating visitor centre, Lancashire Wildlife Trust



The visitor centre at Stanwick Lakes

2.0 Standalone catering

If a visitor centre was not developed there are two catering options which could be considered as set out below:

2.1 Standalone café

Standalone cafe	
Core component elements	• Cafe and servery, with WIFI, kitchen (dry stores and lockable store) • External covers on seating / terrace space with cover • Toilets (visitors and staff) • Small office (staff) • Potentially incorporate community room/space which could be hired out for community use, functions etc
Pros	Cons
• Success dependent on throughput generated by wider masterplan proposals for the site • Potential to become a destination waterside cafe • Use of space for social functions outside of core operating hours to maximise revenue generation and use of asset • Could act as 'first phase of development'	• Missed opportunity • Likely to need high footfall on year round basis to operate commercially • Catering is a specialist activity and requires dedicated qualified staff which may have high associated costs • Ongoing need for maintenance and reinvestment to refresh the experience (otherwise potential to generate negative feedback)

Generates a commercial rent for Portsmouth Water	- Size / attractiveness will drive increased parking demand - Would add to urbanisation of the site and detract from the rural character.
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Velo Café at The Level, Brighton



New café at Weald and Downland Living Museum and café at Alice Holt

2.2 Seasonal permanent kiosk

Seasonal permanent kiosk (satellite catering offer as second phase if there is demand or could be a core element if the 'low activity' offer is selected).

Core component elements	- Small-scale kiosk - Linked toilets - Potential architectural treatment of the kiosk (see:
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	http://tonyhobba.com/865004006353/) or architectural competition
Pros	Cons
• Low risk intervention • Low capital costs • Low level of rental secured • Catering is essential component element for the development of the wider site (could be second phase) • Straightforward to deliver	• Does not add in a major way to the profile of the site • Still requires a level of services and infrastructure which may be difficult to deliver to more remote part of the site • Security could be a potential issue



Example of low key catering outlets at London Wetland Centre WWT



Seasonal kiosk incorporating toilets – Queen Elizabeth Country Park

3.0 Cluster of craft units

Cluster of craft units	
Core component elements	• Craft units • Toilet facilities
Pros	Cons
• Adds to things going on at the site • Opportunity for local producers / makers / crafts people	• Can be very difficult to manage e.g. rent collection, crafts people being on site when visitors are onsite (e.g. weekends and holiday periods) • Low rent roll and void periods • Will be reliant on significant footfall to attract crafts practitioners, artists and artisans • To create destination will need additional infrastructure e.g. cafe, toilet etc (i.e. very unlikely to create significant footfall in its own right) • Seasonal opening periods • Extra built space would urbanise the site, which is not in keeping with maintaining the rural character • Impact on historic landscape



Ferrers Centre Workshops and Carsington Reservoir



4.0 Bike hire, shop and workshop for repairs

Bike hire, shop and workshop for repairs	
Core component elements	• Front of house retail space • Back of house workshop area • Bike wash • Could be integrated within visitor centre if demand • Option for mobile offer which could be brought to the site to meet demand
Pros	Cons
• Fit with wider site masterplan, which includes cycle paths • Generates 'rental payment' (albeit low level) • Fits with health and wellbeing agenda • Straightforward to deliver • Could involve community group during design phase/operation • Partners have experience in the sector • 5km route around the reservoir, which is ideal for family cycling	• Reliant on high throughput generated from wider proposals (therefore potential later phase of development) • Area not an established cycling destination (Queen Elizabeth Country Park has a good reputation for mountain biking) • Conflict of use between different user groups • Seasonal operation • Low rental level • Ongoing maintenance of cycling routes



Bike hire at Sherwood Pine and bike wash at Glyncorrwg



Bike hire at Alice Holt prior to refurbishment – note use of shipping containers

5.0 Indoor play (standalone)

Indoor play (standalone)	
Core component elements	• Play areas (age defined) • Catering offer and separate party rooms • Reception point and office • Toilets • Stores • Office Potentially integrated within the visitor centre (would reduce capital costs)
Pros	Cons
• Engaging with the family market • Increases appeal of the offer • Creates a balanced product offer • Builds wet weather resilience	• Competes with Havant Leisure Centre and play barn at Staunton Country Park • Staffing requirement • Increased building size which conflicts with maintaining rural character • Difficulty of finding an operator • Potential to increase parking demand • Typically developed in large 'box type' buildings which would impact negatively on the landscape and would be visually intrusive



Bespoke indoor play offer at Pensthorpe Natural Park, building designed by Adam Khan

6.0 Education use

Education offer	
Core component elements	• Area for welcome / briefing and to leave bags in as the outdoor environment will be key part of the education experience • Potentially separate toilets and changing area • Outdoor shelter and separate fenced off area within the wider site which could incorporate a pond dipping area • Non-commercial water based activities (see below) • Could be integrated within ground floor of visitor centre with separate access
Pros	Cons
• Strong fit with ethos of project • Potential to work with HCC and HIWWT to deliver education service (building on existing partnerships) • Could attract forest school offer or nursery use	• Competes with existing market at Staunton and QECP (reinforces need to work in partnership with HCC) • Potential conflict with other users (careful consideration to be given to design/location of any education space)

• Considerable community benefits for Portsmouth Water and opportunity to deliver subjects linked to national curriculum • Opportunity to delivery information on wider issues such as water safety, water resource management	• Outdoor shelter element could be prone to vandalism and this will need to be carefully considered during the design phase
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Itchen Valley Country Park

6.1 Multi-use space

In terms of the multi-use room/space which could accommodate different groups e.g. education, meetings, social uses and community group meetings

Pros	Cons
• Maximises revenue generation (higher revenue / occupancy for a single space) • Lower capital cost to build a flexible space rather than individual dedicated rooms/spaces • Enables local children to use the site in a positive way	• Costs of making the room ready for different uses (setting up / clear down) • Likely to require significant space for storage of equipment and furniture • Can't decorate or theme space in a significant way (needs to remain neutral)

• Enables community groups to get involved at the site	• Potential for conflict of use but avoided by pre-booking
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6.2 Non-commercial water based activities for education and other groups

There may be opportunities for group pre-booked based water activities linked to specific education groups or organisations such as the Scouts, Guides or Sea Cadets. This would be dependent upon securing a third-party operator.

Indicative requirements in terms of facilities are set out under 12.0.

We set out the associated pros and cons below.

Pros	Cons
• Engaging with education and other groups • Limited impact on visitor throughput / car parking requirements • Makes good use of water body without conflict with biodiversity as all activity supervised and low intensity of use	• Schools market is becoming more challenging (lack of funding and health and safety) • School based 'water activity offers' are struggling (financially) and are seeking to diversify their offer (engaging with the public to generate income) • Existing competition – Andrew Simpson Watersports Centre (in Portsmouth) and Calshot Activities Centre • Similar to commercial water based activities there are ongoing risks of accidents generating negative PR for Portsmouth Water

6.3 Pond dipping areas

Pond dipping areas	
Core component elements	The site could accommodate more than one pond dipping area which would reduce the visitor pressure within a single point.
Pros	Cons
• Positive PR opportunities • Enables visitors to engage with nature • Strong fit with site ethos	• H&S concerns linked to water usage • Ongoing maintenance



Pond dipping at Slimbridge



Blashford Lakes and Testwood Lakes

7.0 Play

There are multiple forms of play which could be considered as part of the project and we set out several examples below.

7.1 Adventure play

Adventure play	
Core component elements	• Different play elements, linked to age of visitors (4-8, 8-11 and 12+) • Can be within fenced area
Pros	Cons
• Key to engaging with the family market • Increases appeal of the offer • Increases dwell-time • Opportunity to reuse material from the site (timber)	• Ongoing maintenance and health and safety implications • Risk of some duplication with Staunton CP and other nearby sites • Does not readily address issues around wet-weather resilience



Dinton Pastures Country Park – climbing tree trunks and an interesting play feature at Castell Henllys



Play in the trees at Black Park

7.2 Sand and water play

Sand and water play	
Core component elements	Water and sand play elements for under 12s)
Pros	Cons
- Opportunity to promote safety messages round water - Linked into science / technology (STEM subjects) - Key to engaging with the family market - Increases appeal of the offer - Increases dwell-time - Unique offer compared to play offered at other local sites e.g. Staunton, Stansted and local parks	- Ongoing maintenance (can be issues with maintenance which can be costly and time consuming to resolve) - Capital and ongoing costs can be higher than other forms of play - Costs in terms of running play e.g. electrically powered water pumps - Health and safety implications



Water play at Pensthorpe Natural Park in Norfolk

7.3 Play trail

Play trail (spaced play)	
Core component elements	• Play elements placed along an existing trail for whole family • Opportunity to provide interpretation alongside play
Pros	Cons
• Help to manage visitor flows around the site (i.e. away from sensitive areas) • Encourages 'family to play and explore together' • Key to engaging with the family market	• Ongoing maintenance • More difficult to secure compared to other forms of play • More difficult to create dog-free area for children's play features which has health and hygiene considerations

• Reuse of materials from the site (timber) • Increases appeal of the offer • Increases dwell-time • Encourages children and families to be active. In keeping with health and wellbeing agenda	• Health and safety implication • Ongoing inspections
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Start of the play trail at Bewilder Wood in Norfolk and a play station at Pensthorpe

7.4 Natural play

Natural play	
Core component elements	• Use of wood and other natural materials to create piece of interesting play for under 12s (usually in a dedicated space)

Pros	Cons
• Relatively inexpensive • Easy to replace • Could potentially use felled trees from The Avenue • Key to engaging with the family market • Increases appeal of the offer • Increases dwell-time • In line with health and wellbeing agenda	• Needs regular inspection for Health and safety concerns • A number of recreation site have added natural play so perhaps distinctiveness of play features has been diminished



Natural play at Box Hill, Surrey

7.5 Covered or non-covered play area

Covered play area

Pros	Cons
• Encourages year-round usage (helping to support café in shoulder periods) • Key to engaging with the family market (likely to target younger children) • Increases appeal of the offer • Increases dwell-time	• Capital costs of cover • Ongoing maintenance and cleaning • May compete with urban based play centres • Health and safety inspection requirements • Careful consideration needs to be given to location and design of cover to reduce risk of vandalism / damage



Play undercover at Springfields Adventure Land

Non-covered play area

Pros	Cons
• Lower capital cost and ongoing support (than covered play) • Can be placed in attractive outdoor setting	• Ongoing health and safety and maintenance • No wet weather resilience (and also lack of shade on hot sunny days) • Decreases appeal of the offer • Decreases dwell-time during periods of inclement weather • More accessible for anti-social behaviour outside opening hours

8.0 Wildlife

An essential part of the wider offer at Havant Thicket Winter Storage Reservoir is linked to creating a wetland area, which will become a haven for wildlife.

Innovative bird hide/bird screen	
Core component elements	Clearly, there are a number of different options open in terms of the design and scale of bird hides and / or screens. There are landmark / destination / interpretation hides with large sealed windows, which are comfortable to make them accessible to all members of the community and not just bird watchers.

	Potential to create larger floor areas which are suitable for education groups and guided groups / non-guided group visits.
Pros	Cons
• Engaging with new audiences (linked to new habitat creation), who have different seasonal visitation patterns to general visitors • Work with third party e.g. Wildlife Trust and community environmental groups to deliver 'wildlife' projects / initiatives and encourage volunteering • Strong links to education and learning opportunities • Provides opportunities for interpretation, highlighting messages from Portsmouth Water, environmental and education groups • Bird hides provide wet weather resilience	• Structures need to make sure they blend into environment • Can be difficult to construct close to wetland areas • Requires ongoing maintenance budget and regular inspection • Careful design considerations e.g. siting to minimise disturbance, need to avoid south facing to ensure good visibility • Security at night. Design to minimise vandalism risk

It is interesting to note that the Leicestershire and Rutland Wildlife Trust have reported: *"The Rutland Osprey Project has enjoyed its best year yet, with 23 adult ospreys returning to the area and a record eight pairs of breeding birds. Visitor numbers were high – over 26,000 people came to see the ospreys at the Lyndon area of Rutland Water Nature Reserve and many more followed online and watched our webcam."*¹¹

¹¹ <http://www.lrwat.org.uk/news-events/news/433-record-breaking-year-rutland-ospreys/>



Large-scale and significant level of investment – Slimbridge



A noticeboard highlighting recent sightings and lowkey bird hide at Paxton Pits Nature Reserve



Bridgewater Steart and Newport Wetland Centre viewing screens

It is recognised that the site currently faces some challenges in terms of anti-social behaviour and this will need to be considered carefully in the design, development and operational phases of the project. It is interesting to note at the Teifi Marshes nature reserve one of the bird hides was recently burnt down and the Welsh Wildlife Trust are raising funds to replace it and a key component element of the new design is to create a vandal 'proof' hide which is being built by <http://greenfuturebuilding.org.uk/>

9.0 Visitor infrastructure

9.1 External sense of welcome, external interpretation and signage

External sense of welcome, external interpretation and signage	
Core component elements	• Welcoming entry signage • Provision of orientation map within car park, built facilities and main entry points • Route/network of brand trail signage and interpretation • There is need to ensure that signage is in keeping with the rural character and heritage landscape of the site
Pros	Cons
• Comparably low level of capital expenditure • Essential part of the visitor experience • Provision of information helps to manage visitor flows and encourage exploration of the wider site (avoiding any sensitive environments) • Provides opportunity for Portsmouth Water to present messages about their work alongside educational messages • Increases dwelltime	• Not a direct revenue generator • Need to factor in long-term maintenance costs • Need to avoid over-proliferation of external signs and unsightly panels (must be in keeping with rural character of the site)

- Access gate provides a potential opportunity for a landmark feature incorporating art opposite South Downs National Park boundary



A positive sense of welcome at Martin Mere and Slimbridge WWT

9.2 Picnic area and seating

Picnic area and seating	
Core component elements	Picnic and seating is considered as a key element or basic element of a recreation site. Seating along trails is particularly important for older visitors.
Pros	Cons
• Meets a basic visitor need • There is an opportunity make a feature out of the seating itself, for example, incorporating art	• Ongoing maintenance costs • Need to make sure potential littering is managed effectively • Risk of becoming a target for vandalism. Robust design is needed



Seating can become an architectural feature – Hayling Island and Littlehampton



Picnic area at RSPB Middleton Lakes

9.3 Outdoor shelter

Outdoor shelter	
Core component elements	Small-scale outdoor shelter which could take different forms
Pros	Cons
- Provides wet weather cover - Used by rangers as a 'storytelling hut' during holiday periods and for education groups - Could be used by groups visiting e.g. education groups	- Ongoing maintenance - Risk of becoming a target for vandalism. Robust design required - Careful consideration is respect of the location to minimise risk of use for anti-social behaviour and wildlife disturbance (especially at night)



Shelter at Denham Country Park, Buckinghamshire

9.4 Network of trails

Network of trails	
Core component elements	• Network of circular trails linking key elements or nodes within the site boundary (perhaps graded on time taken to complete/accessibility) • Boardwalks potentially could be used to access some of the wetlands (e.g. a pond dipping area) • Design consideration given to surface materials / gradients to ensure access to visitors (people with disabilities through to parents with pushchairs) • The different types of paths/trails can be used to manage access e.g. primary routes with good surfacing and secondary paths in more sensitive areas are narrower, not surfaced e.g. in wetland and

	woodland areas. Main paths kept away from the wetland and other sensitive areas. • Potentially themed trails
Pros	Cons
• Increases accessibility • Used to manage visitor flows • Could provide access to areas which some visitors may not have first-hand experience of e.g. wetlands environment • Opportunity to introduce education/interpretation elements	• Ongoing maintenance costs • Needs to address how to accommodate different users (e.g. pedestrians, cyclists, horse-riders)

It is interesting to note a comment in Forest Enterprise's England Annual Report and Accounts 2016-17 in respect of themed trails: *"visitor numbers have been driven by **strong marketing campaigns around the Gruffalo and Stick Man books, with new activity trails delivering significant uplifts in off-peak visitor numbers.**"* The report continued *"A wide range of marketing activity has helped to promote the trail across digital channels, advertising, PR, marketing partners and on-site promotion. This has reached more than 70 million people and has seen 78,000 people actively engage with us on social media. Since launch the campaign has attracted 1.1 million visitors to the trails and an 18% increase in visits to participating forest centres. More than 102,000 activity packs have been sold on-site, generating more than £0.3 million of revenue for Forest Enterprise England's leisure business."*



Pensthorpe trails have been made interesting and integrate learning – boardwalks providing access to a wetland environment at Arundel

9.5 Accessible island 'feature'

Accessible island	
Core component elements	Island with trail, view point, picnic area and landmark hide linked to shore
Pros	Cons
- Key part of feedback from younger people during consultation - By providing controlled access to one island may help to reduce desire for visitors to access other islands - Can be created before area is flooded to provide bespoke interesting land form	- Health and safety considerations - Potential impact on wildlife on neighbouring islands (careful design e.g. screening and siting to minimise disturbance to wildlife) - Ongoing maintenance to manage visitor impact

10.0 Events

10.1 Events and activity programmes

Events and activity programmes	
Core component elements	The site could accommodate a range of different events from locally organised wildlife walks through to bush craft activities and large-scale sporting and music events.
Pros	Cons
• Positive PR opportunities • Small-scale events to engage with local community • Visitor centre provides opportunity for pre-booked talks by specialists e.g. wildlife talks (if held in the evening there are operational implications and potential impacts on the bio-diversity e.g. lighting) • Engages with local community	In respect of major events: • Significant congestion on local road network • Car parking on site not able to cope with extra demand at single time • H&S concerns for any water-based events • Security • Competition from HCC at Staunton and Queen Elizabeth Country Parks (both sites are geared up to host large events) • Negative impact on environment and day-to-day operation of 'visitor offer'

There will be a number of opportunities to develop a range of low impact events and activities such as pond dipping, wildlife walks, bushcraft and survival skill courses.



Low key ranger events involving the local community

10.2 Major amphitheatre

Major events amphitheatre / viewpoint

Core component elements

Introduce dedicated covered events space. This would need to be linked to another intervention and would not operate as a standalone facility/use.

- Landscaped amphitheatre or similar space with cover
- Staging + lighting (purchased and brought in for specific events)
- Power and utilities to distribution point on site

	• Toilets bought in when needed per event
Pros	Cons
• Rental/licence fee secured • Adds to critical mass of facilities and works well alongside visitor centre • Helps to extend offer into the evening period	• Low level of return • Need to bring in stage/lighting and assemble / dismantle for each show • Seasonal usage • Relatively remote therefore need for onsite security during periods of shows • May not be looked upon favourably by local community • Competition with Staunton • Impact on local road network • Onsite car parking • Night time usage has low fit with local community • Night time usage will impact on biodiversity • Security and ongoing maintenance of the cover itself • Careful consideration will need to be given to location otherwise danger of negatively impacting on character of the landscape



Amphitheatre at CONKERS – used during the day and evening periods

10.3 Minor amphitheatre

Minor events amphitheatre	
Core component elements	Low key intervention overlooking the reservoir, near Leigh Park. The amphitheatre would be created as part of the land forming exercise (with no hard landscaping or cover). Multiple low impact uses/user groups: • Schools and other groups • As a viewpoint • For picnics
Pros	Cons
• Low environmental impact • Straightforward to deliver • Difficult to vandalise	• Very limited income generation potential • Seasonal usage • Ongoing maintenance

11.0 Adventure type of activities

11.1 Aerial experience

Aerial experience (pole or tree based)	
Core component elements	Likely to be fenced off / secure area of land and include a number of component elements: • Paypoint/kiosk • High and low rope offer • Climbing wall • Zip wire • Power descender • Fenced area
Pros	Cons
• Adds to profile of the site as an 'activity destination' (differentiating itself from Staunton) • Potentially attracts third party operator • Secures rent roll • Broadens appeal	• Level of investment required • Successful examples generally located on sites with existing throughput (therefore may be a secondary phase of development if taken forward) • Conflicts with mitigation and compensation requirements for remaining woodland around the site



Vertigo Adventures at Stanborough Park, managed by our sister company Planning Solutions Limited

11.2 BMXing area and/or jumps area

BMXing area and/or jumps area	
Core component elements	• Specific jumps / track area • At Moors Valley we understand that local teenagers were involved in the design process
Pros	Cons
• Involves local community (teenagers) in the project. Engendering pride and commitment to the project from a group which can be difficult to engage with • Can be used for competition level events	• Ongoing management • Health and safety • Risk of creating a 'no-go' zone for general visitors • Conflicts with biodiversity objectives • Potentially competes with Queen Elizabeth Country Park



Biking area at Rushcliffe Country Park



Biking area at Trysil, a ski resort in Norway seeking to extend their offer outside of the ski season

12.0 Commercial water-based activities

12.1 Beach

Beach	
Core component elements	• Creating a beach area with sand • Lifeguard posts • Buoy-line to control movements • Rescue boat Would need supporting infrastructure of café/visitor centre, including toilets and changing rooms.
Pros	Cons
• Broadens market appeal and helps to create destination	• Significant health and safety liability • Ongoing costs in terms of lifeguarding and operating costs e.g. keeping sand clean • Local beaches on Hayling Island and further afield at West Wittering and Southsea • Potential impact on water/island habitats (people swimming out to islands) • Likely to encourage out of hours use (increasing risk of injury) and swimming in other areas of the reservoir (mixed message)

	• May prove difficult to access water during periods of water drawdown and may render beach area unattractive • Did not have widespread support during previous consultation. Public felt that adequate facilities were available locally so not required. There were also significant health and safety concerns.
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Beach at Cotswold Country Park and Beach (inland beach no local competition)

12.2 Solar boat

Solar boat	
Core component elements	• Solar boat • Pontoon to access boat with charging point • Secure yard for storage when not in use • Slipway (likely to be a requirement of Portsmouth Water to access the reservoir for inspection)
Pros	Cons

• Safe and controlled access to water body • Accessible experience for people with disabilities • Solar / electric boat no potential to pollute the water itself • Direct income generation	• Health and safety considerations • Chichester Harbour also offers a similar experience • May prove difficult to operate if water levels recede (also applies to other water based uses)



Solar boat operated by the Broads Authority - photo kindly provided by the Broads Authority www.broads-authority.gov.uk

12.3 Inflatable floating play

Inflatable floating play	
Core component elements	• Wibit or waterplay elements • Rescue boat • Payment point with office (could be low key e.g. converted shipping container)

	• Toilets / changing area • Wetsuits/buoyancy aids • Lifeguards • Access point to the water • Slipway • Secure compound
Pros	Cons
• Helps to raise profile of site • Significant revenue generator • Creating a 'destination' • Relatively easy to install and deliver as start-up operation	• Seasonal use (and requires cleaning, annual set up and takedown along with storage) • Destination usage (i.e. attract significant throughput of users) • Health and safety / first aid (including access for ambulances) • Relies on specialist operator to invest in and set up the offer • Potentially excludes members of the local community (high tariff) • Concerns about anti-social uses as could encourage out of hours usage as remains inflated for the season • Established competition (Chichester) • Could be a leisure 'fad'



Floating play and lifeguard at Cotswold Country Park and Beach operated by our sister company Planning Solutions Limited

12.4 Stand-up paddleboards /canoes

Stand-up paddleboards, canoes etc

Core component elements

Managed by a separate operator, who would hire out stand-up paddleboards and canoes to members of the public.

- Equipment
- Rescue boat
- Payment point with office (could be low key e.g. converted shipping container)
- Toilets / changing area
- Lifeguards
- Access point to the water
- Secure storage required
- Slipway
- Secure compound

Pros	Cons
• Attractive low impact use • Appeals to broad range of potential users	• Seasonal use • Health and safety • Relies on specialist operator to invest in and set up the offer • Encourage out of hours usage • Cost may exclude some members of the local community • More difficult to stop local community bringing in their own craft to the site • Potential conflict with biodiversity objectives. Would require careful zoning and management



Hollingworth Lake Activity Centre, Rochdale (linked to the wider country park)



Canoes in use

12.5 Floating lido

Floating lido	
Core component elements	• Floating lido • Café • Reception area • Staff area • Storage/plant room • Toilets and changing area • Lifeguards For example please see: https://www.archdaily.com/11216/copenhagen-harbour-bath-plot
Pros	Cons
• Potentially a significant revenue generator (via third partner) • Positive PR for Portsmouth Water • Step-change for Havant	• Transform the offer (attracting significant number of visitors) • Large installation may compromise environmentally sensitive areas • Health and safety

	• Relies on specialist operator to invest in and set up the offer • Consideration given to water pollution and water quality of the reservoir • Significant capital investment required • Competition from nearby beaches, Havant and Waterloo Leisure Centres
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12.6 Dive centre

Dive centre	
Core component elements	This could take two different forms. Either (1) as a commercial 'dive centre' operation or (2) as a club membership structure. • Office / meeting / briefing / training spaces • Changing facilities • Secure storage compound and workshop area • Slipway to access water • Potential need for own parking adjacent to the building/water • Specialist equipment e.g. air recharging facility • Potential to create interesting 'sunken' features / staging posts for divers prior to filling of the reservoir • Boat

	• Pontoon
Pros	Cons
• Low key irregular use with minimal impact on other users • Potential demand at a regional level	• May exclude other uses from the water in a defined area • No real link to the community • Providing facility for such a niche user group may cause some disharmony among some locals / visitors • Local competition e.g. http://www.andarklake.co.uk/ near Southampton. But diving depth at Andark Lake is limited. Closest diving centre with a depth greater than 5m is located approximately 3 hours away • Invasive species on diving equipment used elsewhere could impact on biodiversity • Access to water during periods of draw down could be difficult • Health and safety issues • Feeling of urbanisation of the site with separate standalone building alongside visitor centre

13.0 Other

13.1 Onsite transport

Onsite transport	
Core component elements	Could take a number of different forms: • Land train type of operation • Miniature railway • Secure storage yard and office space • Own network of roadway / track
Pros	Cons
• High capital cost • Adds a memorable element to the experience • Helps visitors to explore the wider site • Adds to the appeal of the offer • Could be managed by 'community' or small volunteer group e.g. similar to offer at Stansted House	• Revenue implications e.g. staffing and maintenance • Potential conflict of use if not set up on separate trail/track • Possible negative environmental impact • Tranquillity and rural feeling of wider site will be impacted on



Train at Lakeside Country Park, photo kindly supplied by Portsmouth Water

13.2 Dog agility area

Dog agility area	
Core component elements	• Dog agility elements • Potentially with a fenced or controlled area
Pros	Cons
• Makes the site appealing to dog owners • Helps to control movement of dogs	• Depending on attractiveness site could become 'overwhelmed' with dog walkers and this would impact on the visitor experience and habitats • Ongoing maintenance / operating costs associated with day-to-day management • Competition at Queen Elizabeth Country Park

	• Woodland needed for biodiversity mitigation/compensation. Lack of space for other leisure uses • Potential impact on biodiversity
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New dog agility area at Queen Elizabeth Country Park, photo kindly provided by Hampshire County Council

13.3 Viewing tower

Viewing tower	
Core component elements	• Accessible viewing tower with different levels • Interpretation panels • Potentially integrate within / adjacent to the visitor centre
Pros	Cons

• Offers attractive views over water and wider parkland / forest • Provides elevated views and provides a different perspective to the reservoir • Adds positively to the visitor experience • Potential to create a 'wow' factor	• Limited revenue generation opportunity • Need to secure outside of operating hours • Health and safety considerations • Ongoing maintenance
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Viewing tower at CONKERS and view from observatory at Slimbridge

13.4 Seasonal mobile catering vehicle

Seasonal moveable catering offer	
Core component elements	• Small-scale moveable seasonal food offer (e.g. ice-cream van, coffee etc). Similar to offer at West Walk

Pros	Cons
• Low risk intervention • Low capital costs • Rental secured • Straightforward to deliver	• Does not add in a major way to the profile of the site • Still requires a level of services and infrastructure which may be difficult to deliver to more remote part of the site such as power and water



Examples of low-key catering outlets at Dinton Pastures Country Park and Langley Park

13.5 Cluster of seasonal yurts

Cluster of seasonal yurts	
Core component elements	• Secure area to introduce yurts • Requires supporting facilities (shower + toilet block)

Pros	Cons
• Provides a unique accommodation offer and encourages overnight stays • Potential to be marketed and let by a third-party agency such as Canopy and Stars • Overnight stays help to generate additional income compared to day visitors • Straightforward to deliver • Adds to tourism profile of area	• Difficult to secure area within the site to leave yurts unoccupied (may be issues of vandalism) • Not an established destination for overnight stays • Seasonal nature of business • May not meet local need and might generate some resistance • Lack of available space onsite • Night time use (e.g. lighting) conflicts with biodiversity objectives especially in relation to bats • Staffing/supervision • Maintenance



Interior of a yurt with a wood burning stove

13.6 Hostel type of accommodation linked to watersports uses

Hostel type of accommodation	
Core component elements	More likely to be a secondary / long-term phase of development: • Accommodation spaces able to accommodate different group sizes (some rooms ensuite) • Toilets / washing facilities • Kitchen preparation area (for use by guests) • Briefing space/recreation room (with wood burning stove) • WI-FI • Small office space • Storage area
Pros	Cons
• Overnight stays generate greater income than day visitors • Adds to accommodation base in Havant Borough	• Site is not an established destination • More appealing areas locally • Difficult to introduce built structure into countryside site which is undeveloped (in planning and aesthetic terms) • Urbanisation of the site as requires additional building with own car parking • Lack of available space on site

- Night time use and lighting conflicts with biodiversity objectives, especially in relation to bats.



Southease YHA

Appendix 4: Scoring matrix (with standard weighting at + or - 1)

Options	Learning	Environment		Health and safety	Market appeal				Contributing to policy	Financial considerations		Deliverability			Total score
	Opportunity to deliver education experiences	Potential impact on bio-diversity*	Maintains rural character	Health and safety implications related to intervention*	Potential to attract existing users	Potential to attract additional local community and immediate population (up to 30 minutes drivetime)	Potential to attract people living outside 30 minute catchment*	Potential to engage with tourism market place*	To what degree will the intervention contribute to policy outcomes	Indicative capital cost*	Potential need for revenue support	Ease of deliverability	Level of risk*	Potential partner interest	
Weighting index (multiplier)	1.0	-1.0	1.0	-1.0	1.0	1.0	-1.0	-1.0	1.0	-1.0	1.0	1.0	-1.0	1.0	
Option 1: Minimum level of intervention	4.0	4.0	7.5	4.0	8.0	6.0	3.0	3.0	3.0	2.0	2.0	7.0	3.0	1.0	19.5
Option 2: Medium level of intervention – visitor centre	7.0	6.0	5.0	5.0	8.0	8.0	6.0	6.0	7.0	6.0	5.0	5.0	5.0	8.0	19.0
Option 3: High level intervention – visitor centre and associated water based uses	7.0	7.5	3.0	7.5	7.5	9.0	8.0	8.0	8.0	8.0	6.0	4.0	7.0	5.0	3.5

* Negative index shows that lower score is preferable outcome in this category

Appendix 5: Approaches to data collection (Draft)

There is already informal recreation use at the site (walking, dog walking, cycling and jogging).

The overall site (including the Forestry Commission's and HCC's land) does not have a secure boundary. There are multiple points whereby people access the site. The site is also served by a small Forestry Commission car park on the B2149 located to the west of Rowlands Castle.

In future it would be desirable to capture onsite research data to help calculate the latest baseline visitor numbers and forecast future visitor numbers. Potential approaches to capturing data are set out below with their associated 'pros' and cons.

Face-to-face survey/counting

Description	Surveys using questionnaires are a popular method of trying to estimate and total visitor numbers. They are useful for providing a range of information about a site, its users, types of activity and associated motivations of visitors. The face-to-face interview is a labour intensive method but can be useful as a complementary approach, to consult with a sample of visitors to query their profile, characteristics and activities. It can also be used to understand visitor flows and preferences seeking information on routes and visit behaviours, both past and intended. The positioning and timing of the data collection requires a sampling strategy, particularly where there are multiple entry points. Interviews will need to take place throughout the day, on both weekdays and weekends.
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	Seasonality should also be considered where possible.
Pros	Cons
• Accurate, flexible and mobile • Can include descriptive data (e.g. visitor characteristics, behavior, intentions and motivations) • Data can be collected on weather conditions along with any other factors that might have an influence on the results • Is a preferred method for calibrating other counts • No infrastructure requirements	• Costly in staff time in terms of set up, resourcing and analysing data, (although potentially could work with students from South Downs College) • Staff safety is also a consideration • Normally produces a small sample size • Often used in unsystematic and opportunistic ways • Subjective unless highly structured • Site crowding can bias the sample as on busy days a smaller proportion of the visitors are sampled, however this can be corrected by weighting the sample • No information provided on non-site users • Less feasible away from permanent sites or key access points and routes • Potential multiple counting as people pass more than one survey point (which would require extensive supporting face to face surveys rather than counting) • At peak times can be difficult to accurately record count while engaged in face to face surveys

Vehicle counters at the Forestry Commission car park

There are several approaches to counting vehicles at the Forestry Commission's car.

Pneumatic Road Tube Counting

Description	Pneumatic Road Tube Counting - an older style of vehicle counter - one or more rubber hoses are stretched across the road and connected to a data logger. The data logger can establish vehicle direction by recording which tube is crossed first.
Pros	Cons
• Reportedly very accurate on number counts although less so on speed indicators and type of vehicle (however some errors cancel each other out - see https://trid.trb.org/view/1257430) • Relatively low cost and non-invasive • Can assess vehicle classification and direction of travel • Temporary or permanent solutions available • Can be battery powered	• Counts need to be physically downloaded • Does not estimate average numbers in cars • Two vehicles close together can be confused as an articulated vehicle • Equipment can fail or get vandalised

Inductive loop

Description	A square of wire embedded into or under the road. A device at the roadside records the signals generated.
Pros	Cons
• Can assess vehicle classification and direction of travel to identify trends in visitors	• Does not estimate average numbers in cars

• Temporary or permanent solutions available • Can be solar powered and 3G	• Two vehicles close together can be confused as an articulated vehicle • Equipment can fail
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Example: <https://metrocount.com/products/mc5805-inductive-loops-counter/>

Magnetic sensor

Description	Detects vehicles by measuring the change in the magnetic field as the vehicles pass over the detector. The sensor is either buried in the road, or enclosed in a box by the side of the road.
Pros	Cons
• Can be self-contained with no wires or tubes, installed above or below ground • Maximum range: 8m (26ft.) • Ideal for rural, rugged and remote roads • Permanent or portable • Very small and easy to hide — reduces vandalism risk • Long battery life/solar powered • Large storage capacity (millions of counts) • Low operating costs • Used in many national parks. Low cost.	• Does not estimate average numbers in cars • Equipment can fail • If vehicles are following each other very closely, the magnetic detector may have difficulty discriminating between them • Most require manual data download

Examples: <https://www.trafx.net/products.htm> - can be put into pedestrian or bike mode.
https://www.trafx.net/case_studies.htm
<http://www.chambers-electronics.com/automag-car-counter.html>

Passive infrared and active infrared

Description	Passive infrared devices sense temperature changes and are more commonly known as motion detectors. Active infrared devices are used as a beam technology that provides an invisible line that counts when it is broken.
Pros	Cons
• Passive is more precise than active infrared • Small size • High sensitivity • Automatic adaptation to the room temperature	• Most require power/internet infrastructure • Equipment can fail • Variable detection range depending on an object's infra-red characteristics relative to the background • Sudden lighting changes may trigger false counts • Lenses may be obscured or soiled • Requires careful placement to minimise environmental variations

Other options:

Doppler and Radar Microwave Sensors

A continuous signal of low-energy microwave radiation or radar is transmitted at a target area. The detector registers a change in the frequency of waves which allows the device to detect moving vehicles.

Radar is capable of detecting distant objects and determining their position and speed of movement. With vehicle detection, a device directs high frequency radio waves at the roadway to determine the time delay of the return signal, thereby calculating the distance to the detected vehicle.

Ultrasonic

A vehicle moving into or through the detection area reflects a high frequency signal back to the detector. The presence of standing vehicles can be detected and continuously monitored, unlike with passive infra-red or radar sensors, which require movement.

People counters

Description	Suited to sites with many visitors and where the majority of visitors use paths where counters can be placed. Generally the same type of technology is used as for vehicle counting, including infra-red and radio beam systems.
Pros	Cons
- Counters can be used that can distinguish between walkers, cyclists and horse riders - Some people counters can identify and track groups of people to understand movement habits. - Some systems offer high levels of accuracy - Most offer remote management and reporting - Generally small and light - Can be inexpensive - Sensitivity and interval can be adjusted to exclude some false counts - Can obtain time and date information - Low power consumption	- Rough estimates of visitor numbers are needed to be able to validate the measurements - Technical failure due to weather or damage can occur - Can count wild animals as well as people - Wet jackets can mask a visitor's infra-red signature - May undercount groups if distance between sensor and groups are large - May require power/internet - Price ranges hugely

Example: <https://www.eco-compteur.com/en/products/multi-range/multi-nature> - combines a variety of different technologies. Price ranges from £2,000-£4,000 per unit plus around £300 per year maintenance costs.

<https://www.eco-compteur.com/blog/2017/07/20/new-mobile-multi-count-pedestrians-cyclists/>

Pressure sensors - similar to vehicle tube sensors

Description	Pads or slabs fitted under gates or on stiles
Pros	Cons
• Small size and weight • Inexpensive • Accurate if used appropriately • Not sensitive to temperature • Long range across wider tracks • Sensitivity, interval and placement can be adjusted to exclude some false counts • Can be used to obtain time and date information	• Need careful alignment of transmitter and receiver (or reflector if not a through-beam system) • Alignment is highly sensitive to disturbance • Can be hard to conceal making them susceptible to vandalism • Lenses/reflectors may be obscured or soiled • Wildlife may trigger counts • Results vary depending on gradient of travel

Example: <http://www.linnetop.co.uk/sensors.htm>

Video counting

Video traffic counting typically takes place continuously, year-round, giving precise figures.

Description	Video counting can now offer similar accuracy to that of people watching a video. It is cost-effective for monitoring high-volume traffic area as only one camera is needed for several lanes or exits at a junction. Counts are uploaded in real-time via the internet, so can be viewed live (down to 15 minute intervals for example) and historic counts from their web browsers.
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	Counts are easily verified simply by watching the video and checking the automated counts. Video traffic counting typically takes place continuously, year round, giving precise figures.
Pros	Cons
• Can allow visual interpretation of visitor characteristics • Highly accurate in multiple directions - 98% • Enables different types of visitors to be identified e.g. joggers, dog walkers, cyclists etc • Continuous measurement over time and can provide values per time interval • Variable settings to optimise the count accuracy • An embedded video server lets you view live video footage and verify the counts via the internet at any time of the day or night • Motion-triggered recording or time-lapse video with adjustable recording intervals allow for longer observation periods without tape change	• Difficult to estimate average numbers in cars • If manually checking - staff time is needed to interpret films • Less accurate if large proportion of visitors arrive on foot • Requires power/internet infrastructure • Equipment is costly to use and maintain and is vulnerable to damage • Difficult to distinguish passenger numbers when using vehicle counts • Power requirements mean it is not a long-term option at unattended sites • Can raise ethical privacy issues • Possible security / vandalism at site

Example: <http://videoturnstile.com/people-counting-outdoors.html>

Summary commentary

Research has shown that a variety of techniques are often needed to build a detailed picture of the baseline visitor numbers. We believe that it would be beneficial to carry out a module of research among current users (including users of the Forestry Commission's car park). This would help to, for example:

- Identify a more reliable baseline of existing users
- Examine usage pattern
- Identify future intentions e.g. likelihood of people visiting Leigh Park Gardens extending their visit to incorporate the new visitor offer at HTWSR.

However, the site does present a number of challenges – there are multiple points of formal and informal entry and these can't all be covered. During the summer of 2018, Portsmouth Water carried out a module of visitor research at the site and difficulties were encountered with duplication of recorded visitors and limited face to face engagement alongside counting process. Calculating visitor numbers can be problematic - it is interesting to note the experience of the National Portrait Gallery which reported issues with the equipment used to count visitors to the museum. We understand that the system uses infra-red and optical sensors to count visitors through the museum's entrance.¹²

We would recommend that a multi-channel approach is adopted:

- At formal entry points (e.g. route leading from FC carpark, Staunton Way leading to HTWSR site, path opposite Shell Garage and Warren Park entry point) introduce people counters, which record the number of people entering the site and times of use. This will build up quantitative data. However, this does have its limitations and we believe it would be beneficial to periodically use field researchers to identify qualitative characteristics e.g. motivations of current and future usage, repeat visits/frequency of visits, future intentions etc. This field research should cover Summer and Winter weekends and weekdays on multiple occasions (at least four completed days for each category).
- Forestry Commission's car park – introduce a vehicle counter. The FC is likely to have a preferred system and supplier and it would be prudent to use the same approach. A key consideration is that vehicle counters do not count/estimate the number of people in each vehicle. Therefore, it would be beneficial to count the number of people per car over a specific period of time on multiple dates to work out the average number of people per car.

It is recognised that this approach does not cover all bases but given the informal access points it will help to build the baseline of evidence.

¹² <https://www.forestresearch.gov.uk/research/estimating-visitor-and-visit-numbers-to-woodlands/>

Appendix B. Scoping information

Technical Note

Project:	Havant Thicket Reservoir Project (HTRP)		
Subject:	Transport Assessment TN02: Trip Generation		
Author:			
Date:	20/04/2020	Project No.:	5169117
Distribution:	Tom Fisher	Representing:	Hampshire County Council

Document history

Revision	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
Rev 1.0	Draft for Comment	LV	CW	SL/AH	WI	20/04/2020

Client signoff

Client	Portsmouth Water
Project	Havant Thicket Reservoir Project (HTRP)
Project No.	5169117
Client signature / date	

Introduction

Background and Purpose

This technical note provides an update to the estimated trip generation of the proposed Havant Thicket reservoir and the ancillary Visitor Centre. The detail contained within this note follows the scoping note submitted to the local highway authority (LHA) at Hampshire County Council (HCC) in February 2020, to initiate discussions for a Transport Assessment (TA) to support the planning application. The previously submitted scoping note included an early estimate of trip generation based on a number of assumptions, due to the unique non-standard development being proposed.

The purpose of this note is to provide an update to the operational trip generation forecasts, following receipt of additional data from a comparable visitor attraction in Hampshire, namely the Queen Elizabeth Country Park (QECF), and should be read in conjunction with the spreadsheet provided within **Appendix A**.

It is considered that the information provided by QECF provides a more robust evidence base to determine how the trip generation at the Havant reservoir may change across the year, and this note presents the updated analysis and presents the intended trip generation to be used within the TA.

Data Sources and parameters

The trip generation forecasts have been derived using a first principles approach, utilising the follow key data sources and assumptions:

- Visitor Number and Recreational Amenity Facilities Review, by Planning Solutions Consulting Limited (PSL)¹ – The annual visitor numbers expected to be generated at the site is presented within the Havant Thicket Winter Storage Reservoir: Visitor number and recreational amenity facilities review, which is broadly based on:
 - Local population and demographics analysis;
 - Existing user surveys (of Havant Thicket); and
 - Penetration rates based on other comparable visitor attractions².
- The Visitor Number and Recreational Amenity Facilities Review has also been used to derive the visitor number to vehicle ratio, with references to vehicle mode share assumptions for each visitor user type, and overarching vehicle occupancy.
- Hampshire County Council Automatic Number Plate Recognition Data (ANPR) – ANPR data has been provided for the nearby Queen Elizabeth Country Park which has been used to determine:
 - Annual profile of visitors month on month;
 - The split of weekday and weekend visitors within a given month; and
 - The average daily arrival profile for winter and summer periods.
- Hampshire County Council ticketing information – Ticketing information at the Queen Elizabeth Country Park has been used to inform assumptions on the departure profile of visitors in winter and summer periods.

The process within which these trip generation parameters have been applied are set out within the remainder of this technical note.

¹ Planning Solutions Consulting Limited (PSL) on behalf of Portsmouth Water: *Havant Thicket Winter Storage Reservoir: Visitor number and recreational amenity facilities review* (July 2019).

² Representing the proportion of the population within each category who would be expected to visit over a 12-month period.

Trip Generation Calculations

Annual Visitor Numbers

The number of annual visitors expected to be generated at the site is presented in the PSL report, and is based on a comprehensive review of comparable visitor attractions across the UK. The analysis estimates the potential penetration rate that the reservoir may have on the local / regional population³.

The estimated number of visitors from each market catchment, and the calculated annual total visitor number of 317,598 can be seen in **Table -1**⁴.

Table -1 – Summary of Annual Visitors

Market	Size	Penetration	Level of repeat visits (Per Year)	Visitors
Up to 15 mins ⁵	248,580	12%	5	149,148
16 to 30 mins	449,329	5%	3	67,399
31 to 60 mins	1,045,720	3%	1.25	39,215
61 to 90	2,502,115	1%	1	12,511
Dual use visitors from Leigh Park Gardens (Staunton)	180,000	7.5%	1	13,500
Tourists and others				
Tourists (excl SFR ⁶)	227,000	1.25%	1	2,838
SFR	129,000	8%	1	9,675
Day visits	2,218,000	0.3%	1	5,545
Passing visitors	23,780,480	0.05%	1	14,268
Education				2,500
Events				1000
Estimated total				317,598

The total annual visitor number of **317,598** has been taken forward as the basis for estimating the number of vehicular trip generation at the reservoir.

Annual Profile of Visitors

Automatic Number Plate Recognition (ANPR) Data from the car park at QECP has been provided by HCC for 10 months of the financial year 2019/20 (April 2019 – January 2020). In the absence of data being available for months of January to March, it has been assumed that in terms of the proportion of annual visitor numbers, the months of January and February would be broadly consistent with December, whilst March would be broadly consistent with April.

The monthly distribution of visitors observed at QECP is presented in **Figure 1**, and is available within the 'Monthly Profile' page of Appendix A.

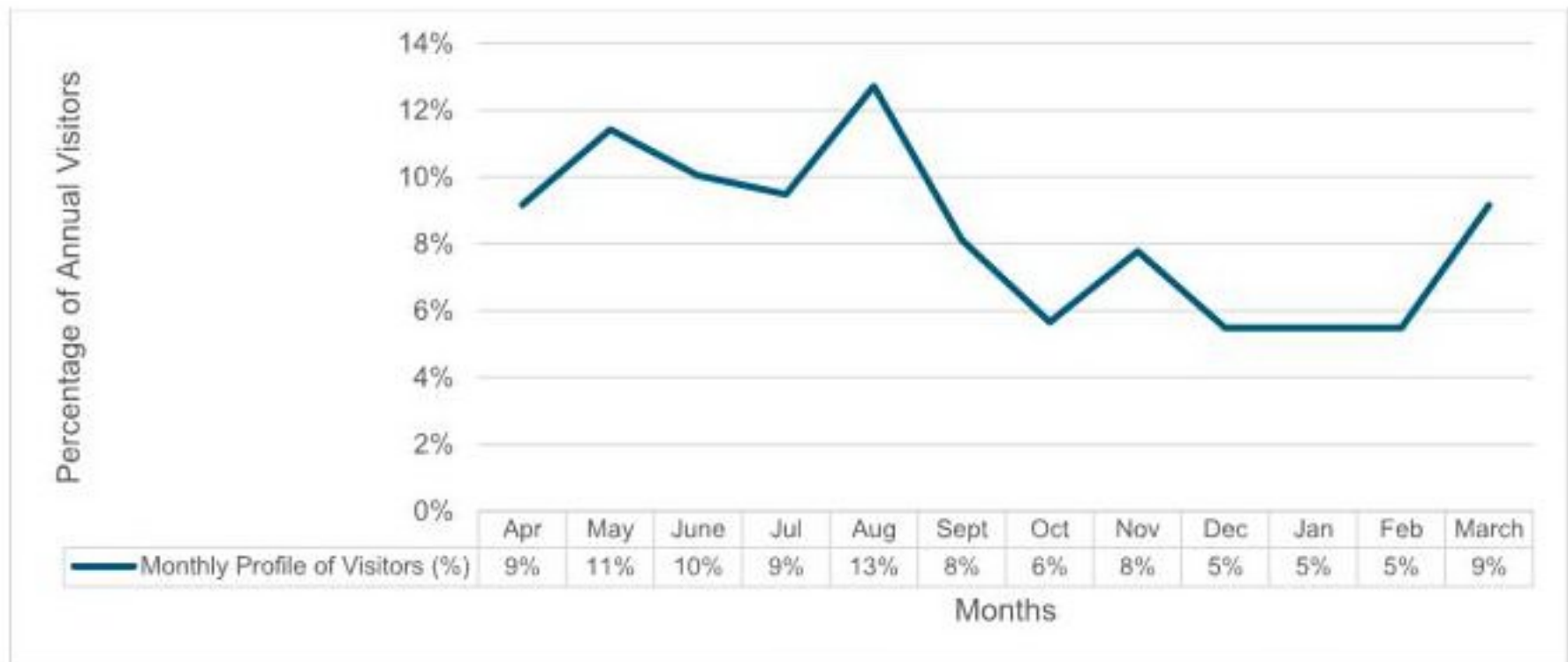
³ Derived by CACI using Office for National Statistics data, undertaken by CACI.

⁴ As presented in Table 1 of the Initial Scoping Note.

⁵ Drivetime catchment based on normal driving speeds derived by CACI using Geometric Buffering method.

⁶ Staying with friends or relatives.

Figure-1 – Annual Monthly Distribution of Visitors at QECP from ANPR Data.



As shown in **Figure 1**, during the peak month of August 13% of the annual visitors visit the site, with monthly visitor totals dropping to approximately 5% during the mid-winter months. The monthly profile presented in **Figure 1** has been applied to the annual total of visitors (317,598) forecast for the visitor centre. This provides the monthly visitor totals in **Table -2**.

Table -2 – Summary of Annual Visitors

Month	Monthly visitors
Apr	29103
May	36300
June	31901
Jul	30117
Aug	40413
Sept	25813
Oct	17970
Nov	24690
Dec	17396
Jan	17396
Feb	17396
March	29103
Total	317,598

Weekday and Weekend split

The split of visitors who would visit the facility on a weekday, or a weekend has been determined using the average split per month captured by the HCC QECP data, for 'winter' and 'summer' months. The number of 'weekend' days and 'weekday' days has been assumed based on the typical number of days within a calendar month.

A summary of the weekday and weekend split, in the winter and summer months, is presented in **Table -3**.

Table -3 – Weekend and Weekday Proportional Splits, Summer and Winter

Scenario		Proportion
June-Sept	Weekday (Mon – Fri inclusive)	44%
	Weekend (Sat & Sun)	56%
Oct-May	Weekday (Mon – Fri inclusive)	46%
	Weekend (Sat & Sun)	54%

As shown in Table 3, it is expected that during the summer months 44% of the total weekly visitors will arrive on a weekday and 56% during a weekend. During the winter months, the weekend becomes marginally less dominant with 54% of visitors arriving.

The proportional split of weekday vs weekend visitors for each month, in **Table -3**, has been applied to the total monthly visitors expected at Havant Thicket Reservoir, presented in **Table -2**. The number of weekdays and number of weekend days per month has then been applied to establish the average number of visitors per typical weekday and typical weekend day, for each month.

The subsequent number of visitors on a typical weekday and weekend for each month can be seen in **Table -4**.

Table -4– Number of Daily Visitors on a Weekday and Weekend for Each Month

Month	Average Weekday Daily Visitors	Average Weekend Daily Visitors
Apr	607	1968
May	757	2182
June	675	1969
Jul	609	1859
Aug	817	2494
Sept	546	1593
Oct	375	1080
Nov	540	1484
Dec	347	1177
Jan	347	1177
Feb	399	1177
March	607	1750

Monthly Visitor to Vehicle Numbers

The visitor numbers have been translated to a daily vehicle number using a visitor to vehicle ratio of 1 vehicle for every 3.45 visitors. This is based on the assumed split of visitors expected to make up the annual visitor total derived from the 2019 Portsmouth Water total⁷. This briefly assumes that:

- 70% of visitors within the 15 min drivetime catchment will drive⁸;
- 20% of dual visitors (with Leigh Valley park) will drive;
- 75% of visitors staying with friends will drive;
- 100% of all other visitors will drive; and

⁷ Planning Solutions Consulting Limited (PSL) on behalf of Portsmouth Water: *Havant Thicket Winter Storage Reservoir: Visitor number and recreational amenity facilities review* (July 2019).

⁸ Based on a comparison against other country parks as presented within the PSL report.

- Vehicle occupancy rate of 2.2 for all visitors except for passing traffic, which assumes an occupancy of 1.2. It is pertinent to note that the vehicle occupancy rates are considered conservative, with some country parks capturing vehicle occupancy rates of 2.9, it is therefore considered that the vehicle number estimates are robust. The subsequent number of daily vehicular trips (one-way) to the site during a weekday and weekend for each month can be seen in **Figure-2**.

Figure-2 – Average Daily Trips, Weekday and Weekend for Each Month (One-way)



Profile of Arrivals and Departures

The ANPR car park data at QECP details the profile of arrivals during the winter and summer months. In the absence of recorded departures at QECP car park, reference has been made to the ticketing information from the QECP car park to establish a departure profile. The proportion of each ticket type has been applied to each of the hours across the day, with a summary being provided in

Table -5 for the summer and winter months.

Table -5 – Seasonal Ticketing Data

Season	1 hour	2 hours	4 hours	All day Tickets
Summer	21%	31%	36%	12%
Winter	21%	34%	31%	14%

To determine the trip generation profile for each month, the arrival / departure profile for summer and winter months has been applied to the number of average daily trips estimated within the 'daily trips' page of Appendix A.

Average Trip Generation

The average two-way summer and winter month trips are presented in **Table -6** and **Table -7** for a weekday and weekend respectively.

Table -6 – Average Weekday Trips (two-way)

Weekday (Two-way trips)		
Scenario	Average Winter Month	Average Summer Month
Weekday AM Network Peak (08:00-09:00)	5	6
Weekday PM Network Peak (17:00-18:00)	14	25

Table -7 – Average Weekend Trips (two-way)

Weekend (Two-way) trips		
Scenario	Average Winter Month	Average Summer Month
Weekend Development Peak (12:00-13:00)	124	161

Assessment Scenarios

To present a reasonable assessment of the potential impact of the reservoir on the local highway network, it is proposed to assess the typical weekday peaks and a weekend development peak for the average summer month. This provides a balance between assessing when the network is expected to be at its busiest, and when the trip generation of the reservoir itself is expected to be at its busiest.

Table -8 – Assessment Scenarios

Scenario	Arrival	Departure	Two-Way
Weekend Development Peak (12:00-13:00)	92	69	161
Weekday Network AM Peak (08:00-09:00)	5	1	6
Weekday Network PM Peak (17:00-18:00)	12	13	25

Next Steps

This Technical Note is intended to set out a comprehensive summary for the methodology used to determine the trip generation for a non-standard development using a first principles approach. Proposed assessment scenarios have been put forward, and the views of the Local Highway Authority are sought to establish an acceptable assessment methodology.

Appendices

DRAFT

Technical Note

Project:	Havant Thicket Reservoir Project (HTRP)		
Subject:	Transport Assessment TN03: Trip Distribution		
Author:			
Date:	29/05/2020	Project No.:	5169117
Distribution:	Tom Fisher	Representing:	Hampshire County Council

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Author-ised	Date
Rev 1.0	Draft for Comment	LV	CW	SL	SL	29/05/2020
Rev 2.2	Update due to refinement of access strategy	LV	CW	SL	SL	23/06/2020

Client signoff

Client	Portsmouth Water
Project	Havant Thicket Reservoir Project (HTRP)
Project No.	5169117
Client signature / date	

Introduction

Background and Purpose

This technical note supplements previous Technical Notes intended to establish an agreed methodology for the Transport Assessment of the proposed Havant Thicket Reservoir and the ancillary Visitor Centre. The detail contained within this note follows an initial scoping note submitted to the local highway authority (LHA) at Hampshire County Council (HCC) in February 2020, to initiate discussions for a Transport Assessment (TA). A Technical Note titled 'TN02 Trip Generation' has also been submitted to the LHA.

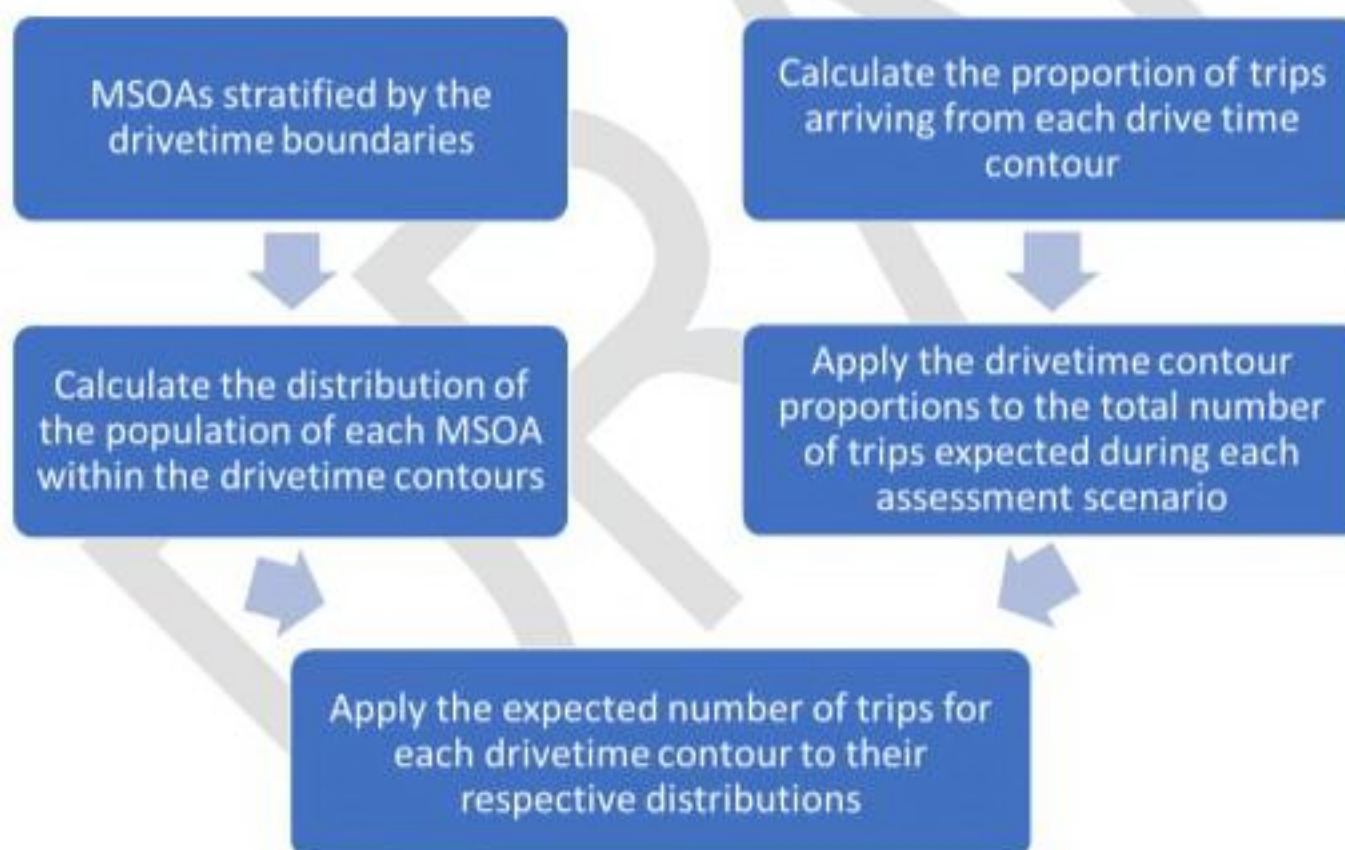
The purpose of this note is to provide more detail regarding the proposed trip distribution and assignment relating to the operational assessment of the reservoir and visitor centre.

Distribution Model

Methodology

The trip distribution has been calculated based on a combination of population and distance information. The population information has been derived from 2011 Census Data¹ for Medium Super Output Areas (MSOAs). Distance information has been calculated using journey time cordons that have been derived using straight line distances from the site (with an assumed average speed of 55kph). A distribution model has been developed which assigns a spatial proportion of each travel catchment band. The flow diagram presented in **Figure-1** summarises the steps taken to derive the distribution model.

Figure-1 - Flow Diagram of Distribution Methodology



Access Strategy

The current proposals include two potential accesses which are from the B2149, and Swanmore Road / Calshot Road, referred to as the 'north access' and 'south access' respectively. The access locations are indicatively shown in Figure 2.

¹ <https://www.nomisweb.co.uk/query/construct/summary.asp?mode=construct&version=0&dataset=144>

Figure-2 – Access Proposal Locations



The distribution of trips has assumed that both accesses will be available for visitors of the site, with route choice being based on the most direct route in terms of journey time from the origin (place of residence) to the destination (the reservoir).

It is intended that the northern access is designated as the main access, and will be signed as such, with the southern access being available as a minor local access.

Distribution catchments

Reference is made to the forecasted number of annual visitor number forecast to the site from each visitor market, as presented within the technical note TN02 - Trip Generation. The proportion of visitors from each visitor market is summarised in Table 1.

Table -1 – Market Category Visitor Proportions

Market	Visitor Proportions
Residential market	
Up to 15 mins	19.3%
16 to 30 mins	33.2%
31 to 60 mins	19.3%
61 to 90	6.2%
Dual use visitors from Leigh Park Gardens (Staunton)	1.3%
Tourists and Others	

Tourists (excl SFR ²)	1.4%
SFR	3.6%
Day visits	2.7%
Passing traffic*	12.9%
Education	N/A
Events	
Estimated total	

The distribution used for the non-residential markets (Tourists and Others) has been assumed as follows:

- Dual use visitors from Leigh Park Gardens (Staunton) – Most direct route between the two sites
- Tourists (excluding SFR) – 15-minute drivetime distribution
- SFR– 15-minute drivetime distribution
- Day visits– 15-minute drivetime distribution
- Passing traffic – 15-minute drivetime distribution

To account for the potential difference in route choice between local and regional trips, in addition to the visitor number forecasts the distribution and assignment has been calculated for the following drivetime cordons³:

- 0-15 minutes;
- 16-30 minutes;
- 31-60 minutes, and;
- 61-90 minutes.

The population weighted centroids of each MSOA has been referenced in allocating them within an appropriate drivetime cordon, to account for the location of the dominant population density.

0- 15-minutes drivetime contour

Judgement on the access and route choice to the site has been made based on the most efficient route to the principle road network and / or subsequent access to wider residential areas to distribute a proportion of the visitor traffic across local roads. The MSOAs served by the north and south accesses within the 15-minute contour can be seen in **Figure 3**.

² Staying with friends or relatives

³ Based on a 'crow-flies' drive speed of 55kph

Figure-3 – Northern and Southern Access Distribution – Up to 15 Minutes⁴



Above the 15-minutes drivetime contour

In broad terms, the assignment of trips on to key routes for the longer distance bands, i.e. above a 15-minute drivetime, have been attributed to the northern access. This will be supported by signage strategy as well as information and directions on the site's website.

The principle routes expected to be used when travelling outside the 15-minute drivetime boundary network are shown in **Figure 5**. The TA will therefore review the impact at Junction 2 on the A3(M) as the most direct route to either to north or south junctions. The distribution and assignment of traffic on the A3(M) has not been calculated beyond these junctions.

⁴ Labels refer to access choice and legend refers to origin

Figure-4 –Traffic Routes When Travelling Outside the 15 Minute Boundary



Distribution model Outputs

Using the most direct routes along the principle road network to the site, the distribution of trips for each of the residential catchments from each of the accesses is shown in **Table 2**.

Table -2 – Visitor Trip Distribution Proportions

Visitor Origin	Drivetime Catchment							
	Up to 15 mins ⁵		16 to 30 mins		31 to 60 mins		61 to 90	
	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access
Regional North	11%	0%	3%	0%	46%	0%	64%	0%
Regional South / South East	0%	70%	17%	0%	17%	0%	12%	0%
Regional West	0%	0%	80%	0%	36%	0%	25%	0%
West of the A3 (Waterlooville)	0%	10%	-	-	-	-	-	-
Calshott Road	0%	1%	-	-	-	-	-	-
Middle Park Way	0%	1%	-	-	-	-	-	-
Hulbert Road	0%	2%	-	-	-	-	-	-
Bartons Road	1%	0%	-	-	-	-	-	-
Purbrook Road	0%	2%	-	-	-	-	-	-
Petersfield Road	2%	0%	-	-	-	-	-	-

⁵ Inclusive of non-residential markets

North/South
Access Split
Total

14%

86%

100%

0%

100%

0%

100%

0%

DRAFT

Appendices

DRAFT

Appendix A. Distribution of Trips for Each Market

DRAFT

Visitor Origin	Drivetime Catchment																	
	Up to 15 mins		16 to 30 mins		31 to 60 mins		61 to 90		Dual use visitors		Tourists (excl SFR)		SFR		Day visits		Passing traffic	
	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access	North Access	South Access
Regional North	0%	2%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Regional South / South East	0%	0%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Regional West	0%	0%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West of the A3 (Waterlooville)	0%	0%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Calshott Road	0%	0%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Middle Park Way	0%	0%	-	-	-	-	-	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hulbert Road	0%	0%	-	-	-	-	-	-	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bartons Road	2%	0%	1%	0%	9%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Purbrook Road	0%	13%	6%	0%	3%	0%	1%	0%	0%	0%	0%	1%	0%	2%	0%	2%	0%	9%
Petersfield Road	0%	0%	27%	0%	7%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North/South Access Split Total	3*%	17*%	33%	0%	19%	0%	6*%	0%	1%	0%	1%	1%	1%*	3%*	0%	2%	2%	11%

*rounding applied

Technical Note

Project:	Havant Thicket Reservoir Project (HTRP)		
Subject:	Transport Assessment TN04: Construction		
Author:			
Date:	06/07/2020	Project No.:	5169117
Distribution:	Tom Fisher	Representing:	Hampshire County Council

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Draft for Comment	CW	AH	SL	WI	07/07/2020

Client signoff

Client	Portsmouth Water
Project	Havant Thicket Reservoir Project (HTRP)
Project No.	5169117
Client signature / date	

Introduction

Background and Purpose

This Technical Note supplements previous Technical Notes intended to establish an agreed methodology for the Transport Assessment (TA) of the proposed Havant Thicket Reservoir and the ancillary Visitor Centre. The detail contained within this note follows an initial scoping note submitted to the local highway authority (LHA) at Hampshire County Council (HCC) in February 2020, to initiate discussions for a TA. A Technical Note titled 'TN02 Trip Generation' and 'TN03 Distribution' has also been submitted to the LHA.

The purpose of this note is to provide a brief overview of the current proposals for the construction traffic expected as part of the Havant Reservoir, in addition to the ancillary pipeline between Havant Reservoir and Bedhampton. It sets out the 'peak' construction trip generation, which will be taken forward for assessment as part of the EIA.

Construction Traffic

Methodology

The volume of construction traffic has been estimated based on the required construction activities and an assumed construction programme as stated in the outline construction programme, which includes the proposed ancillary pipeline to Bedhampton.

The number of construction vehicles likely to be required for each activity has been established based on typical vehicle payloads and known material requirements for the reservoir construction. The assessment will apply an indicative peak construction day, whereby activities that generate HGV movements associated with both the construction of the reservoir and of the pipeline are assumed to occur concurrently, although in practice they may not take place at the same time.

The main welfare facilities and laydown areas for the pipeline will be located within the red line boundary of the reservoir site, requiring pipeline construction traffic to route between the reservoir and the relevant section of the pipeline.

It is anticipated that during the peak construction period there would be a potential for 200 HGV movements a day (100 arrivals, and 100 departures) associated with the construction of the reservoir, which will be undertaken during the main embankment construction activity in 2023. For assessment purposes, it will be assumed that the pipeline construction will be undertaken concurrently, which is expected to generate up to 30 HGV movements a day (15 arrivals and 15 departures).

In addition to construction HGVs, there will also be staff trips to and from the reservoir and pipeline. There are expected to be approximately 250 construction staff at its peak. For assessment purposes it will be assumed that all staff will arrive to the reservoir site as the single occupant of a car, which is considered a robust assumption. Reservoir construction staff will remain on site for the duration of the working day. Pipeline construction staff will be transported to and from the pipeline using minibuses, or a comparable light goods vehicle (LGV).

This will result in approximately 20 trips a day using the robust assumption that staff will be transported back to the reservoir welfare facilities for lunch and then returned to the pipeline. A summary of all construction traffic assessed for the robust case is provided in the table below.

Construction traffic – assessed scenarios

Activity	Daily HGVs (two-way)	Daily Cars / LGVs (two-way)
Reservoir	200	250
Pipeline	30	270

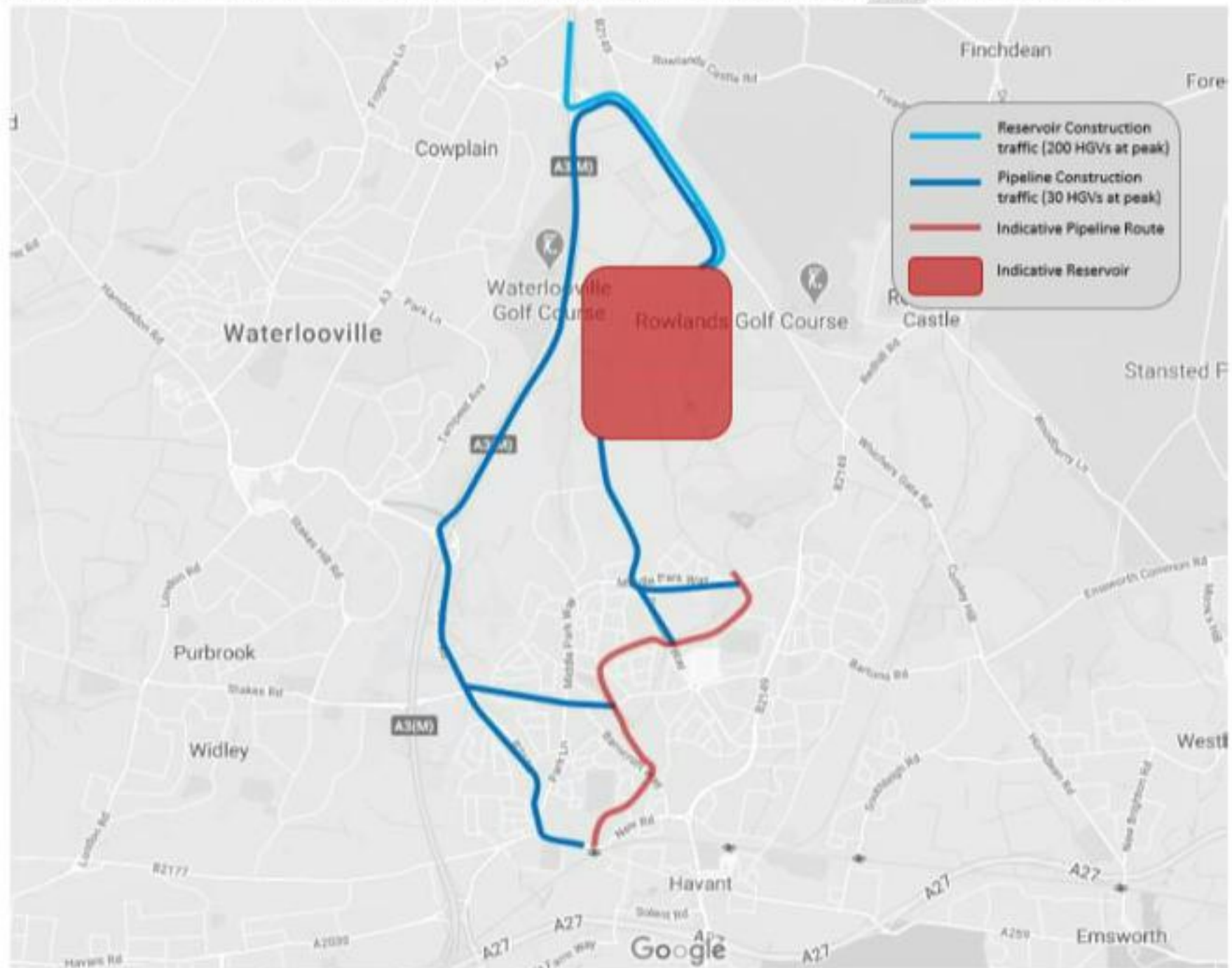
The construction HGV traffic will be distributed across the highway network, on the principle that construction vehicles will take the most suitable and direct route to the principal road network (i.e. the A3(M)). This routing will be set out in the draft Construction Traffic Management Plan that will form the basis of the Final Construction Management Plan that the appointed contractors will be required to agree with the LHA.

Whilst it is expected that both the north and south access points will be available, the HGV construction traffic will be required to use the northern access as the main access point, with the southern access only being used for part of the pipeline construction.

All reservoir HGV traffic is therefore expected to use the B2149 to access the A3(M) directly via junction 2, routing through the Dell Piece East roundabout. HGV traffic associated with the pipeline is expected to be split into three time periods where the peak HGV generation will occur, which are:

- Period One: pipeline HGV traffic will route between the northern site access and the A3(M) at junction 2, before routing south to leave the A3(M) at junction 3; accessing the pipeline construction area principally via Purbrook Way.
- Period Two, the pipeline HGV traffic will route between the northern site access and the A3(M) at junction 2, before routing south to leave the A3(M) at junction 3; accessing the pipeline construction area principally via the B2150 and Bedhampton Way.
- Period Three, pipeline HGV traffic will access the northern part of the pipeline using the southern reservoir access, Swanmore Lane and principally Middle Park Way.

A summary of the construction HGV traffic used within the assessment is presented in the figure below.



Consideration will be given to potential road closures that will be required during construction of the pipeline. A robust approach will be taken within the assessment, whereby a road closure is assumed if the pipeline is running along the length of road; however further development of the construction sequencing and methodology may allow a partial lane closure within a section of road removing the need for a full closure.

Meeting Notes

Project:	Havant Reservoir Project		
Subject:	Highway Access Options and Transport Assessment		
Meeting place:	Microsoft Teams	Meeting no:	n/a
Date and time:	05 May 2020 at 10:30	Minutes by:	Chris Williams
Present:	Andy Hills (AH) Chris Williams (CW) Simon Hughes (SH) Holly Drury (HD) Tom Fisher (TF) Oliver Joyce (OJ)	Representing:	Atkins Atkins Portsmouth Water Hampshire County Council Hampshire County Council Hampshire County Council

Introduction

The purpose of this note is to provide a brief summary of the items discussed during a meeting relating to the highway access options and associated Transport Assessment considerations for the Havant Reservoir Project. Specific actions are highlighted in bold, with specific initials bracketed where appropriate.

Meeting Notes

Access Options

- AH introduced the scheme, summarising the two access options (Northern route and Southern route). HCC to treat [REDACTED] as confidential due to on-going discussion with [REDACTED].

Northern Route

- AH presented the current junction design, inclusive of right-turn ghost island and visibility splays based on a 60mph road.
- TF highlighted that HCC have county specific guidance notes, which should be referred to. Atkins to check concept design against HCC guidance notes. *(Post meeting note: TF has circulated HCC guidance documents to Atkins).*
- TF advised that the Land East of Horndean (LEH) development includes a proposed reduction in speed limit, however visibility splays should be based on observed speeds (rather than existing or proposed speed limits). **Atkins to review observed speeds captured during ATC surveys on the B2149** *(Post meeting note: 85th percentile speeds captured at 53mph).* CW queried the

NOTE TO RECIPIENTS:

These meeting notes record SNC-Lavalin understanding of the meeting and intended actions arising therefrom. Your agreement that the notes form a true record of the discussion will be assumed unless adverse comments are received in writing within five days of receipt.

Contains *sensitive* information

acceptability of using speed limits for design, if speed surveys are deemed unacceptable due to the Covid-19 pandemic. TF advised that the fallback position would need to be discussed with HCC engineers on a case-by case basis, once the acceptability of surveys is understood.

- TF queried the possibility of rationalising access roads with the LEH site. SH advised that the reservoir scheme access is required early in the construction process, and would therefore come forward before the and East of Horndean development. SH also advised that discussions have been held with the land-owner for the LEH development, and a shared access does not appear feasible at this stage, although may be a future option.
- TF recommends that visibility splays are checked for any potential conflict with LEH access proposals. TF recommended additional context be added to access design plans (such as other nearby access points). **Atkins to update plans to include wider context.**

Southern Route

- AH presented the southern route junction, which takes the form of a simple priority T-junction due to the lower mainline flows and nature of surrounding streets.
- HD request detail on the traffic flows. AH provided brief summary, explaining fluctuation across the year, and CW highlighted the trip generation note that has been issued to TF. **HCC to provide comment on the acceptability of the proposed trip generation.**
- SH provided brief summary of background to visitor number forecasts. **Atkins to share PSL visitor number report with HCC.**
- AH queried the potential relaxation of the bus corridor link between Fitzwygram Way and Woolston Road. HD confirmed that HCC would not support this and consider it inappropriate, as it would mean a through road is created with the use of residential roads in Leigh Park would be increased. This would not be acceptable, and it should not be considered further.
- AH queried the status of the road through Dunsbury Farm development. HD confirmed that HCC have asked for the stage 3 audit items to be completed to allow a Completion Certificate to be issued, a request which has not been completed by PCC. HCC therefore at present have no jurisdiction of the road and it is likely to still solely be under private ownership when the reservoir works are taking place. HCC would need to discuss the proposed use of the road for additional construction traffic and the implications on adoption with PCC directly once more information is available.

Pipeline

- HD requested information on the ancillary pipeline route. SH advised that Portsmouth Water are finalising route, but expect the route presented within the local plan is likely to be close to finalised scheme.
- HD queried consultation requirements. SH confirmed that the pipeline is included within the public consultation running through May 2020.
- HD is aware of a major DCO in the area, and is conscious that LPA have not consulted with HCC on pipeline. HCC raised the matter of the major DCO to highlight that there may be potential delays to road space in the area which could have implications on the delivery programme currently planned for Portsmouth Water. **HCC to discuss pipeline route with the local planning authority case officer.**

General

- SH queried whether HCC had any comments, or immediate concerns about the use of two access points (north and south). TF advised that HCC would be willing to explore this option, but would need to see evidence of control through the site.
- HCC raised concerns with regards to construction traffic using residential roads in Leigh Park, and withhold further comment until further understanding of impact on local roads is presented.
- TF recommends that pedestrians and cyclists be considered in terms of access, to make sure that opportunities are maximised for the local area. This is to ensure the mode share of 70% included within the trip generation stands up to scrutiny.

- CW advised that the mode share assumption is relative only to the local catchment, with wider visitors all broadly assumed to be driving. AH advised that the masterplan does consider pedestrians and cyclists.
- SH advised that discussions are continuing, to ensure connection between the three country park sites in the area (inclusive of the reservoir site), to ensure opportunities for non-car travel between sites are maximised.
- HCC raised the need to hold a discussion between the HCC PRow team and the Highways DM team when details are available to discuss the matter of crossing the PRow to gain access via Dunsbury.
- AH introduced potential construction approaches. HD advised that HCC need to be involved, to ensure any highway works can be coordinated.
- The impact of covid-19 on surveys was discussed. CW explained that some surveys were completed during the week the government announced restrictions on movement, but suggested that ATC surveys could be used to factor the turning counts affected by restricted movement. TF requested raw survey data (*Post meeting note: TF has circulated surveys within the area for a neighbouring development. Atkins to review potential for use in calibration. CW has circulated raw survey data for HCC review*).
- HD advised that guidance may be available on HCC website which outlines potential relaxations in Road Safety Audit processes, due to Covid-19.

Meeting Notes

Project:	Havant Reservoir Project		
Subject:	Highway Access Options and Transport Assessment		
Meeting place:	Microsoft Teams	Meeting no:	2
Date and time:	25 June 2020 at 14:30	Minutes by:	Chris Williams
Present:	Andy Hills (AH) Chris Williams (CW) Holly Drury (HD) Tom Fisher (TF)	Representing:	Atkins Atkins Hampshire County Council Hampshire County Council

Introduction

The purpose of this note is to provide a brief summary of the items discussed during a follow up meeting relating to the highway access options and associated Transport Assessment considerations for the Havant Reservoir Project. The discussion followed the structure of comments provided by HCC on the draft minutes from the previous meeting, in addition to the Technical Notes provided to HCC by Atkins. Specific actions are highlighted in bold, with specific initials bracketed where appropriate.

Meeting Notes

Previous Minutes

- Minutes from the previous meeting were discussed and agreed with specific reference to:
 - Status of the highway link through Dunsbury Park. **Atkins to update minutes in accordance with HCC clarification.**
 - HCC concerns over construction traffic using residential roads in Leigh Park. **Atkins to update minutes to reflect this.**
 - HCC not accepting opening of the bus gate at Dunsbury Park. **Atkins to update minutes in accordance with HCC clarification.**
 - HCC raised the matter of a DCO in the area, to regards to potential delays to road space and implications on the delivery programme for Portsmouth Water. **Atkins to update minutes in accordance with HCC clarification.**
 - HCC clarified that guidance on the COVID-19 impact on processes is in relation to Road Safety Audits. **Atkins to update minutes in accordance with HCC clarification.**
- Post meeting note: Revised minutes have been issued to HCC for agreement.*

NOTE TO RECIPIENTS:

These meeting notes record SNC-Lavalin understanding of the meeting and intended actions arising therefrom. Your agreement that the notes form a true record of the discussion will be assumed unless adverse comments are received in writing within five days of receipt.

Contains *sensitive* information

Access Strategy

- Atkins provided an update on the access strategy, specifically with reference to the southern access and potential use of PCC land. Discussions have ceased, and therefore a new link from Dunsbury Park is no longer being considered. This removes the need to cross the PRow to gain access via Dunsbury. HCC highlighted that a joint meeting with the PRow and DM team would still be beneficial. **Atkins to liaise with colleagues with a view to setting a meeting up. Atkins to share minutes of the meeting separately held with the HCC PRow team.**
- Atkins explained the vehicular access strategy includes two access points (north and south), with the north being the signed as the main access, with the south used for local trips.
- HCC raised concerns about the creation of a rat-run through the site. Atkins explained that the access routes would be to and from a car park, and the nature of the access route would not be conducive to through traffic. **Atkins to share plans of the car park layout in relation to the access routes with HCC. Atkins to provide commentary within TA on the consideration of a rat-run.**
- During construction, the north access would be the main access, with the southern access only being used for a short period of time for a section of the pipeline. HCC highlighted that Leigh Park is an unfavourable route for construction traffic. Atkins explained that this has been considered in developing the dual access strategy, and efforts have been made to avoid local roads through Leigh Park where possible. **Atkins to share a briefing note on construction traffic proposals.**

Trip Generation

- The circulation of the report *Visitor number and recreational amenities review* report was noted. HCC raised no specific comments or concerns with regards to the visitor report.
- The circulation of the trip generation spreadsheet was noted. HCC had reviewed the spreadsheet in terms of principles but not had a detailed check of the analysis at the time of the meeting.
- It was agreed that the trip generation should reflect the 'busy period' of May to August. Atkins clarified that this is what is presented within TN02 Trip Generation, and will be assessed.
- Clarification on the basis of the proposed occupancy levels was provided by Atkins, with reference to information included within the *Visitor number and recreational amenities review* report and the close working partnership with Hampshire County Council parks.
- The data provided by the Hampshire County Council parks department was discussed, and Atkins explained the similarities between the proposed facilities at the reservoir and the QECP site used to inform the trip generation assessment.
- Clarification was provided by Atkins on the term 'pass-by' visitors, explaining that this is a visitor catchment group, but for transport assessment purposes these would not be netted off the trip generation (i.e. they would be assumed as new trips within the assessed network).
- Subject to a detailed check of the working spreadsheet, HCC appear content with the trip generation, raising no further comment on the principles of the trip generation approach.

Distribution

- HCC raised queries with regards to the distribution presented within TN03 Distribution, in relation to the southern access appearing dominant, and suggested that more traffic would route along the Park Road North corridor.
- Atkins explained that the distribution presented was on the basis of a new link being constructed through PCC land, and this is no longer proposed. The distribution is expected to reflect the access strategy with the northern access being the dominant access, with the southern access being used for local trips. Atkins explained the expected route assignment. **Atkins to re-issue technical note TN02 Distribution to reflect access strategy.**

Data

- Atkins explained the proposed approach to mitigation the potential impact of the COVID-19 pandemic on traffic surveys. HCC were comfortable with the approach of using the ATC data to factor any surveys captured prior to UK Government lockdown measures.
- HCC advised that consideration should be given to the need for annualisation factors within the TA. *Post meeting note – The surveys were undertaken in March, which is a neutral month (according to TAG Unit M1.2). A review of Highways England data indicates that there is a difference of 4% between data from March and the annual average which is not considered a material difference, and it is considered unlikely difference would be this high on the local road network. Therefore, no factoring is considered necessary.*
- The programme of surveys was discussed, with clarification given to the locations captured in relation to the recommendations from HCC and the uncertainty with access strategy at the time. It was discussed that the survey locations may now be reasonable on the basis of the proposed access strategy and distribution of trips.

General

- HCC were not in a position to comment on the design of the access junctions. **Atkins to share general arrangement plans of revised access proposals for north and south access junctions.**
- The first principles approach to parking was explained by Atkins, to justify the level of parking being proposed. HCC suggested that the parking requirements should be discussed with Havant Borough Council. *Post meeting note: Havant BC have seen parking numbers, and have not raised any concerns.*
- HCC suggested that if there is the potential for parking overspill, there may be a need to seek contributions towards a TRO associated with parking or waiting restrictions in the local residential areas.
- The committed developments that need to be taken account of within the assessment were discussed, with HCC providing information on Land East of Horndean. HCC advised that it is expected that the development will be built out at a rate of 80 dwellings per year.

Appendix C. HTR-ATK-XX-XX-RP-Z-0021

Technical Note Access Route - Options Appraisal at Havant Thicket

Technical Note

Project:	Havant Thicket Outline Design		
TN Ref. No:	HTR-ATK-XX-XX-RP-Z-0021		
Subject:	Access Route Option Evaluation		
Author:	LV		
Date:	03/03/20	Project No.:	5169117
Distribution:	Andy Forestiero	Representing:	Portsmouth Water

Document history

Revision	Status	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
C01	A1	First Issue	LV	CW	SL	KIO	03/03/20

1. Introduction

1.1. Background

- 1.1.1. Atkins has been commissioned by Portsmouth Water to prepare a planning application for the Havant Thicket Reservoir Project. To inform the design of the reservoir site, potential access routes have been assessed as part of an option appraisal. This Technical Note provides a summary of this option appraisal. It is noted that the review is entirely focussed on the access *route* to the proposed reservoir and does not consider the method of connecting the access route to the existing highway network (e.g. junction form) that will be the subject of further design development and assessment.
- 1.1.2. This technical note has been informed by a desktop study and makes reference to the previous study undertaken by Arup; the previous consultant engaged by Portsmouth Water.

1.2. Purpose

- 1.2.1. The purpose of this report is to reassess the existing proposals developed by Arup and investigate new options. The assessment considers the impact of the routes on local environment and any changes since the Arup assessment in 2010.

1.3. Approach to Appraisal

- 1.3.1. A four-stage appraisal approach has been used in considering the most appropriate access route to the reservoir;
- **Stage One:** Review of background information;
 - **Stage Two:** Development of a long list of route options;
 - **Stage Three:** Multidisciplinary analysis and appraisal of options. This has two key streams of appraisal with separate methodologies and are as follows:
 - Environment;
 - Engineering and
 - Project Drivers
 - **Stage Four:** Identification of next steps.

1.4. Limitations and Assumptions

- 1.4.1. The appraisals included in the report are based on the desk top analysis of each option. Further survey and ground investigation work will be required.
- 1.4.2. The following assumptions have therefore been made:
- The cost per metre is the same for all routes;
 - The cost per metre is only used for the length of new access construction on each option and not the overall length used for assessment and
 - Where the option traverses over root protection areas then a cellular construction method will be used. Elsewhere a traditional form of pavement construction will be utilised.

2. Background Information Review

2.1. Previous Study

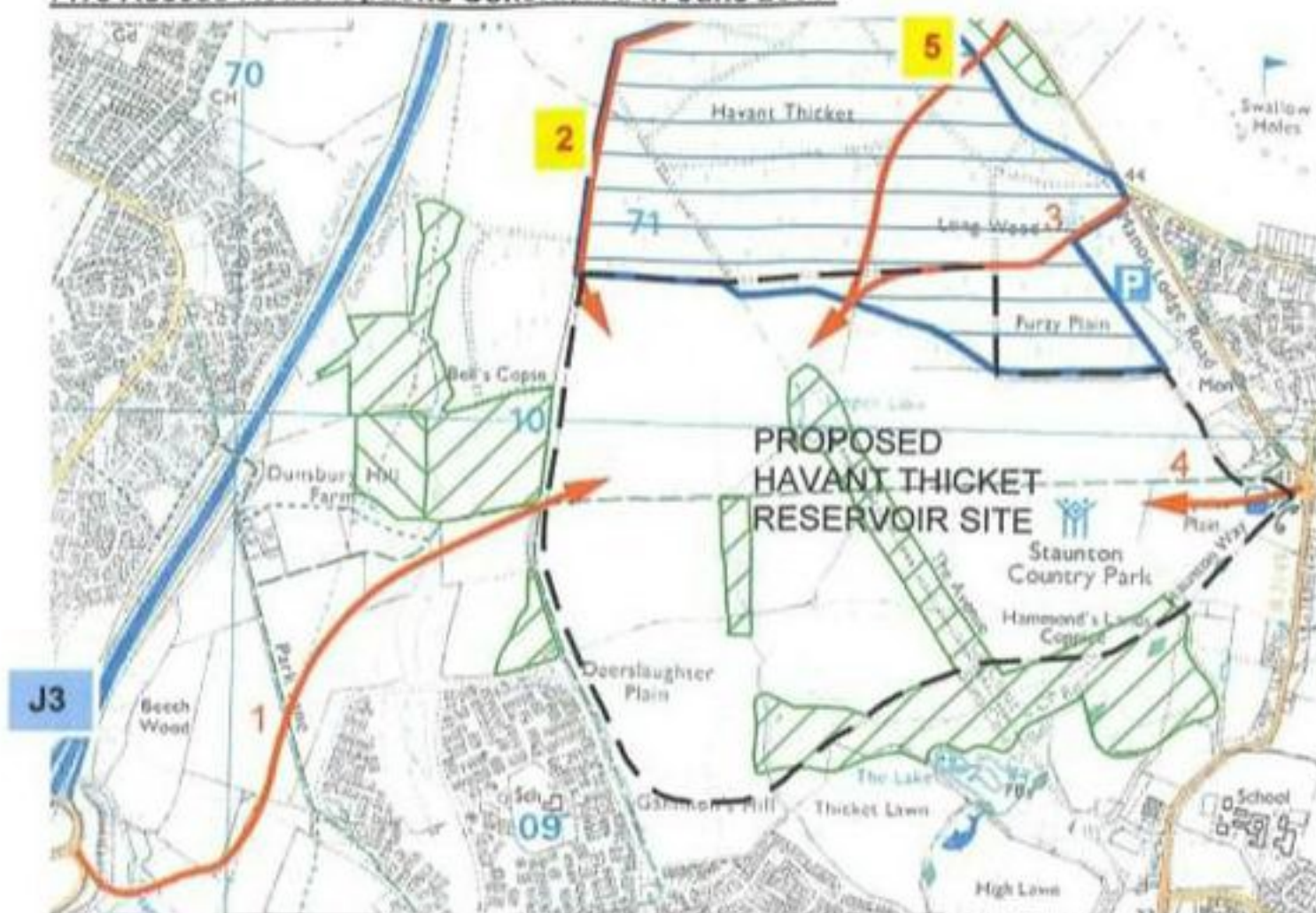
2.1.1. Several options for accessing the reservoir site were previously considered by Arup in the *Traffic Route Options Considered by the HTWSR Stakeholder Group Report* dated December 2010. The previous work considered five separate access route options for the site between 2006 and 2008. The access route options are listed below. It is noted that the Arup report states that for the purposes of this previous study it was assumed that 'the construction and permanent access should be the same to minimise detrimental effects':

- Access Route Option 1 – Access via the A3(M) Junction 3 Roundabout;
- Access Route Option 2 – Access from the A3(M) Junction 2 via the B2149/Manor Lodge Road;
- Access Route Option 3 – North-east Access from Manor Lodge Road at its junction with Castle Road;
- Access Route Option 4 – East Access from the Manor Lodge Road/Durrants Road, and;
- Access Route Option 5 – North-east Access from Manor Lodge Road North of Castle Road.

2.1.2. The indicative alignments of each route are illustrated in **Figure 1-1**. The main advantages and disadvantages for routes 1-5 identified by Arup in 2010 are also detailed in paragraphs 2.1.3 to 2.1.16 together with observations made by members of the stakeholder group. It is important to note that the routes identified by Arup in 2010 have been reassessed in this report. Further detail regarding the reassessment is included in Section 3.

Figure 1-1 - Access Locations and Routes Proposed by Arup

Five Access Route Options Considered in June 2006:



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Access 1 – Access via the A3(M) Junction 3 Roundabout

- 2.1.3. As shown in Figure 1-1, Access 1 is towards the south western corner of the site.
- 2.1.4. The main advantage was that it would provide a direct access off the A3(M) and keep traffic off local roads. Main disadvantages;
- No roadway or path exists at present; therefore, a new road would have a significant impact on the landscape & environment, which is currently mainly open countryside and as a result any new road would be very visible.
 - There would be a need to cross two streams (Park Lane and Hermitage Streams) and the associated wetland habitat. This would be difficult requiring significant engineering which would increase the complexity and the environmental impact. The Environment Agency (EA) expressed concerns.
 - The route crosses a Site of Importance for Nature Conservation (SINC EA), wet woodland (with bluebells) and mature hedgerows, the environmental impacts would need to be considered.
 - There would be health & safety (H&S) issues associated with crossing two rights of way including the bridleway.
 - This is the longest (1635m) most undulating and expensive route. (It should be noted that 235m of this route has been built as part of the Dunsbury Hill Farm development and the revised length of new pavement is 1400m).
 - Havant Borough Council (HBC) expressed concerns about a potential conflict with the Dunsbury Hill Farm development.
- 2.1.5. Note: There is also potentially a concern that providing a new road through this area of open countryside may increase pressure for development to the north of Leigh Park.

Access 2 – Access from the A3(M) Junction 2 via Manor Lodge Road

- 2.1.6. As shown in Figure 1-1, Access 2 is towards the north western corner of the site.
- 2.1.7. The main advantage would be that traffic could enter the site from the A3(M) to the north, without passing through any residential areas. In addition;
- The majority of the route follows an existing Forestry Commission (FC) track which could be upgraded minimising the landscape & environmental impact. Only 200m of completely new track would be required through young birch dominated woodland.
 - The route would be screened by the existing trees on either side minimising any visual impact.
 - The route would not create a significant disturbance in the centre of the woodland.
 - The route does not divide the woodland, minimising H&S concerns with respect to recreational users of the site.
- 2.1.8. The main disadvantages are that the route;
- Is within the ancient woodland and the environmental impacts need to be considered.
 - Is a longer route (1,400m).
 - The track is currently used by walkers, if this route were adopted there would be a need to consider H&S issues and provide a safe path for walkers

Access 3 – North-east Access from Manor Lodge Road at its junction with Castle Road

- 2.1.9. As shown in Figure 1-1, Access 3 is towards the eastern perimeter of the site.
- 2.1.10. The main advantage would be that it follows an existing FC access track that could be upgraded, and traffic would avoid most of the residential area of Manor Lodge Road. The route would be screened by the existing woodland. The disadvantages;
- The entrance on to Manor Lodge Road is opposite a residential area, concerns were expressed about disturbance and safety issues, especially during construction. Concern was expressed that construction traffic may stray on to local roads.
 - The woodland area close to Rowlands Castle and the existing FC car park is heavily used by walkers giving rise to H&S concerns with respect to recreational users of the site.
 - The route would create a significant disturbance in the centre of the woodland and the environmental impacts need to be considered.
 - The new route would divide the ancient woodland giving rise to H&S concerns with respect to recreational users of the site.
 - The route crosses a small stream along the line of the existing track.
 - The route passes through nightjar territory
 - It is a longer route 1390m.

Access 4 – East Access from the Manor Lodge Road/Durrants Road

- 2.1.11. As shown in Figure 1-1, Access 4 is towards the south western corner of the site.
- 2.1.12. This is the shortest most direct route for access. The route avoids the ancient woodland and utilises a direct access which is already present off the roundabout in Rowlands Castle. The main disadvantages identified were;
- Significant concerns about increased traffic and H&S issues associated with use of this busy double mini-roundabout and traffic backing up on to the local roads, especially during peak times.
 - The proximity to a local school was raised as a H&S concern.
 - The track is a key existing pedestrian access point, which also provides footpath and cycleway access to SCP, as it is part of the Staunton Way.
 - There were significant concerns about disturbance in the short and long-term to immediately adjacent residents, especially during construction.
 - Concern that the work force may use local roads and park in residential areas.
 - It is the longest route of all the routes (2155m) considered in terms of pavement construction

Access 5 – North-east Access from Manor Lodge Road North of Castle Road

- 2.1.13. As shown in Figure 1-1, Access 5 is towards the north eastern corner of the site.
- 2.1.14. This is a slightly longer route which for 2/3 of its length follows an existing FC track which would need to be upgraded. Traffic would enter from the north avoiding the residential area of Rowlands Castle. The route would be screened by the existing woodland. The disadvantage sare:
- New 400m track required through the ancient woodland, whereas route 2 only requires a new track through less than 200m of woodland.
 - Area close to Rowlands Castle is heavily used by walkers giving rise to H&S concerns.
 - The new route would divide the ancient woodland giving rise to H&S concerns with respect to recreational users of the site.
 - The route would create a significant disturbance in the centre of the woodland and the environmental impacts need to be considered.

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- The route passes through nightjar habitat.
- It is 1,430m in terms of new pavement length/

2.1.15. As part of the previous assessment undertaken in 2006, Arup notably highlighted a number of engineering and environmental constraints with Access Route Option 1. In addition potential impacts on local residents and recreational users of the site were identified for Access Routes 3 and 4. This resulted in Access Routes 1, 3 and 4 being discounted from further assessment and Access Routes 2 and 5 being taken forward to the subsequent 2008 public consultation. (See Section 2.3 Stakeholder Engagement).

2.2. Planning Applications

- 2.2.1. A review has been undertaken to determine whether there are any potential developments within the surrounding area of Havant Thicket that could affect the feasibility and / or suitability of an access route. A summary of planning applications considered of relevance is provided below.
- 2.2.2. The locations of the planning applications in the vicinity are shown in drawing HTR-ATK-RZ-ZZ-GS-Z-003- **Figure 2.1**.
- 2.2.3. The locations of the allocations in the vicinity are shown in drawing HTR-ATK-RZ-ZZ-GS-Z-004- in **Figure 2.2**.
- 2.2.4. The applications and allocations located near the site are shown in **Figure 2.1 and 2.2** respectively and are as follows:
- **55562/001** | Development Land East of Horndean - Residential development for 700 dwellings, a care village including independent living units and extra care provision for older people, land for 2ha of B1 (business) and B2 (industrial) uses and a new primary school and land for future expansion | Development Land East of Horndean, Rowlands Castle Road, Horndean, Waterlooville
 - Status at time of assessment:
 - **PP/12/00338** | Hybrid planning application comprising a part outline application relating to development for employment uses and a hotel with conference facilities and a part detailed application for a new access link road with bus gate to Woolston Road; together with landscaping, infrastructure and associated works (approved 19.02.14). Request to discharge conditions A5, A10, A11, A12, A13, A14, A16, A17, A18, B4 and B10 (05.01.16). | Dunsbury Hill Farm, Park Lane, Cowplain, Waterlooville
 - Current status: several buildings built and occupied.
- 2.2.5. In the Havant Borough Council's draft *Pre-Submission Havant Borough Local Plan 2036 (2019)*, Cabbagefield Row site H34 allocation has been identified for 155 dwellings subject to planning requirements being met. This site is located off Swanmore Road. See **Figure 2.3**.

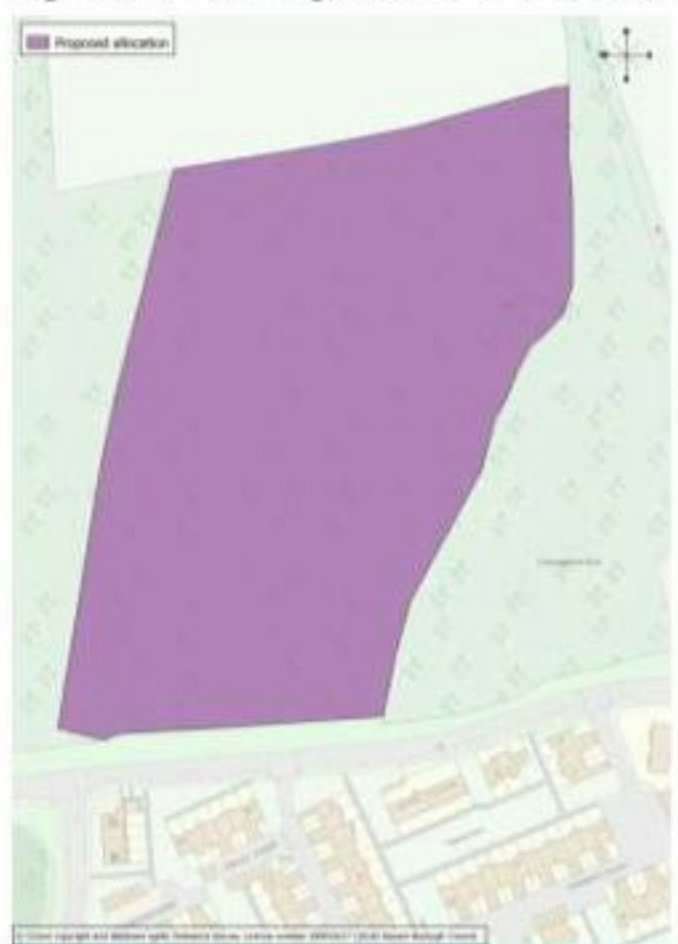
Legend:

- Parish of Havant & Boundary
- Local Authority District
- East Hampshire planning applications
- Havant Borough Council planning applications
- Havant District Council planning applications
- Havant District Council planning applications

Application Code	Date
AP/11/00001	11/01/11
AP/11/00002	11/01/11
AP/11/00003	11/01/11
AP/11/00004	11/01/11
AP/11/00005	11/01/11
AP/11/00006	11/01/11
AP/11/00007	11/01/11
AP/11/00008	11/01/11
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AP/11/00099	11/01/11
AP/11/00100	11/01/11

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Figure 2.3- Cabbagefield Row Site H34 Allocation



2.2.6. The masterplan for application 55562/001 is shown in **Figure 2.4** below.

Figure 2.4 – Masterplan for Application 55562/001¹



¹ Land East of Horndean - Application 55562/004 Source: <https://planningpublicaccess.easthants.gov.uk/online-applications/simpleSearchResults.do?action=firstPage>

Application:PP/12/00338 – Dunsbury Park and Fitzwygram Way

- 2.2.7. The analysis has identified application PP/12/00338 - Dunsbury Park which has a large impact on Access Route Option 1 as assessed by Arup. The masterplan of the application PP/12/00338 and associated Fitzwygram Way link road from the A3(M) to Woolston Road can be seen in **Figure 2-3**.

Figure 2-5 – Masterplan for Application PP/12/00338²



KEY

- Existing Pedestrian/ Cycle Routes
- Park Lane/ 123 Bridgeway
- Possible Trim Trail/ Leisure Route
- Opportunity or Landscape feature/ Public Art

² Portsmouth City Council (2010) *Dunsbury Hill Farm Design Code*

- 2.2.8. The Fitzwygram Way link road and application PP/12/00338 had not been submitted in 2010 and was not, therefore, considered by Arup in the previous access route options study. Access Route Option 1, as assessed by Arup would need to be incorporated into the masterplan of application PP/12/00338 as shown in **Figure 2-6** if it were to be taken forward.

Figure 2-6 – Access 1 shown on the Application: PP/12/00338 Dunsbury Park Masterplan



- 2.2.9. Further information about the proposals at Dunsbury Park can be found at: <https://dunsburypark.co.uk/>

2.3. Stakeholder engagement

Stakeholder Group

- 2.3.1. The HTWSR Stakeholder Group was formed in December 2004 in order to provide essential feedback to guide the direction of all aspects of the reservoir project. In 2006 the group comprised representatives from:
- Local Authorities; EHDC, HBC, HCC (councillor & officer representatives);
 - Environment Agency;
 - Rowlands Castle Parish Council;
 - Wildlife organisations; Hampshire & IOW Wildlife Trust & Hampshire Ornithological Society;
 - Consumer Council for Water;
 - Forestry Commission;
 - Staunton Country Park.
- 2.3.2. In June 2006 the Stakeholder Group was consulted on a number of reservoir layout and Access Route Options. The consultation included the provision of written information and a workshop. Section 2.1.1-2.1.16 above provides a summary of Arup's conclusions that include feedback from the engagement with the Stakeholder Group.
- 2.3.3. Overall, Access Routes Option 3 and 4 were not favoured by stakeholders due to the potential impacts on local residents and recreational users of the site. The stakeholder group feedback, in addition to Arup's conclusion on Access Route Option 1 (see Section 1), led to Access Route Options 2 and 5 being taken forward for full public consultation in 2008.

Public Consultation

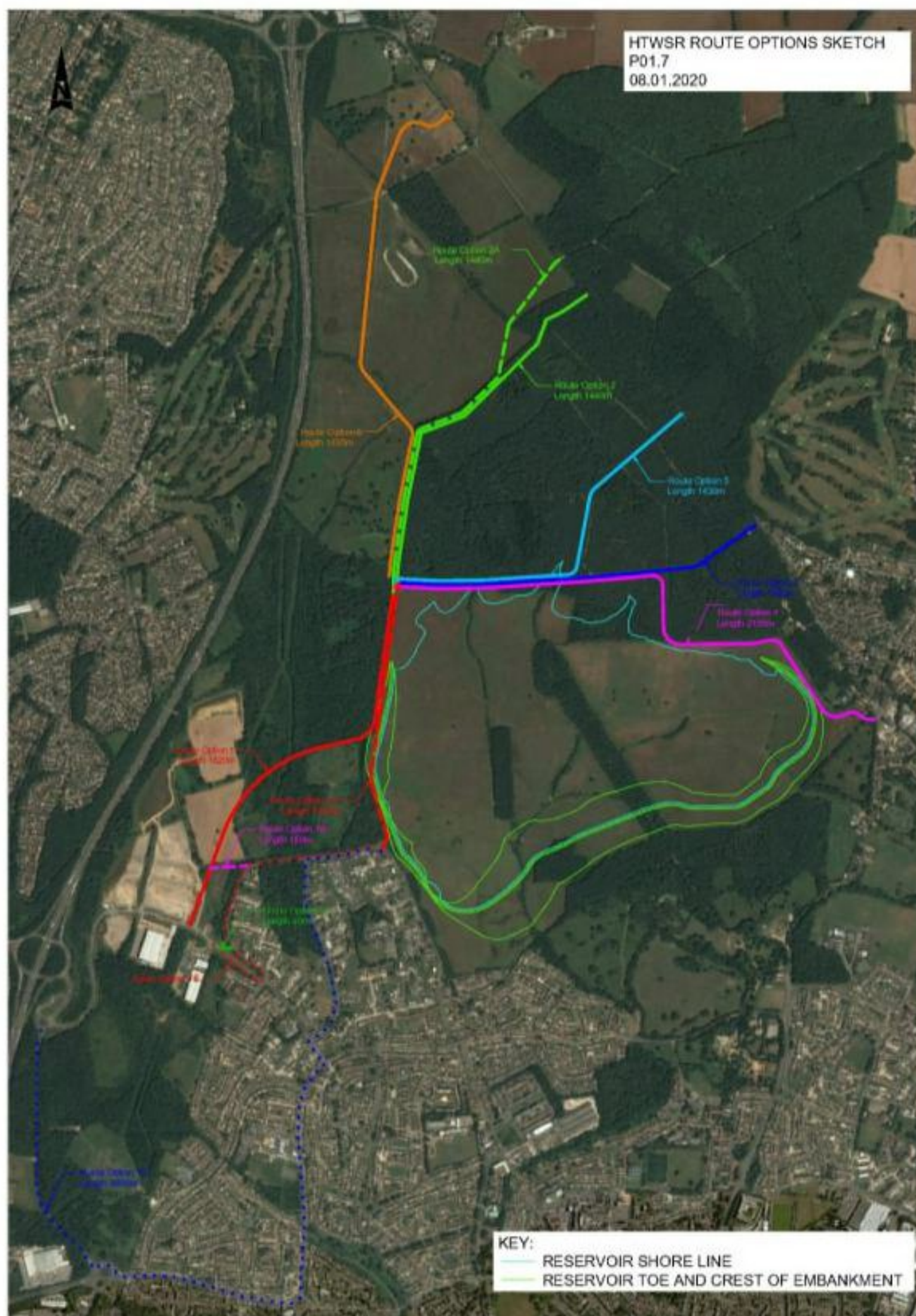
- 2.3.4. At the 2008 public consultation, local residents raised concerns about the potential impacts the reservoir proposal might have on traffic levels in Leigh Park and Rowlands Castle. The Arup report states that: *"of the two Access Route Options 2 and 5, a clear majority of respondents (79%) indicated they were in favour of the longer northern access route into the site from the B2149 Horndean to Havant Road (Option 2). This is the route closest to Junction 2 on the A3(M) and avoids the need for traffic to pass through Leigh Park and Rowlands Castle."*
- 2.3.5. It should be noted that Portsmouth Water has carried out further consultation with the key stakeholders since 2010, this consultation related to the development principle of the reservoir regarding its location and size, and not the access route.
- 2.3.6. In addition, a public exhibition was held in November 2019 to provide an update on the project. It is noted that feedback was received from attendees that highlighted concerns in relation to the increase in traffic along the B2149 and proposed future housing development in the area.
- 2.3.7. A Stakeholder Group workshop to be held on 4th February 2020 will include discussion around access route options.

3. Appraisal

3.1. Routes Options

- 3.1.1. In addition to the five Access Routes Options 1-5 included within the previous assessment as described in Section 2, several new options have been developed. These new options allow for changes introduced to the local highway layout through the development of Dunsbury Park (application PP/12/0033) and associated Fitzwygram Way link road and spur from the A3(M) to Woolston Road, as well as potential changes resulting from the Land East of Horndean development (application:55562/004).
- 3.1.2. The Access Route Options 1 – 5 considered by Arup have been re-assessed with the context of any changes along the indicative route alignments that have arisen since 2010, with the following variations included within the Access Route Options long-list:
- Access Route Option 1A;
 - Access Route Option 1B;
 - Access Route Option 1C;
 - Access Route Option 1D;
 - Access Route Option 2A and;
 - Access Route Option 6.
- 3.1.3. The alignment of each of the routes assessed can be seen in the respective **Figure 3.1**.

Figure- 3.1 – Indicative Alignments of the Route Options Assessed*



*Satellite imagery is from google maps and therefore may not be up to date
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Access Route Option 1A

- 3.1.4. Access Route Option 1A is a variation of Access Route Option 1 included within the Arup assessment in 2010. Access 1A is 1010m of new road and has a north-south alignment running parallel to the existing bridleway and is within land owned by Portsmouth Water. It runs from the proposed area identified for the visitor centre and car parking and joins the highway network at the north eastern corner of Swanmore Road. Access to Option 1A would come from A3(M) Junction 3 through the Dunsbury Park development via Fitzwygram Way and the dedicated bus corridor. The bus corridor runs on Fitzwygram Way between the entrance to Breeze Van Centre and the Calshot Road/ Fitzwygram Way roundabout. The status of the bus corridor is current closed to all traffic and would need to be revised when circumstances change. The alignment of Route Option 1A can be seen in **Figure 3.1.1A** below.

Figure- 3.1.1A – Access Route Option 1A



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Access Route Option 1B

- 3.1.5. Access Route Option 1B is a further development and variation of Access Route Option 1A. The Access Route Option 1B is 150m (1160m in total) of new road and links Swanmore Road and the Fitzwygram Way spur at Dunsbury Park, therefore providing a more direct route for traffic travelling to the A3(M) and avoids the requirement to suspend the bus corridor (see commentary in 3.1.4). The alignment of Route Option 1B can be seen in **Figure 3.1.1B**.

Figure- 3.1.1B – Access Route Option 1B

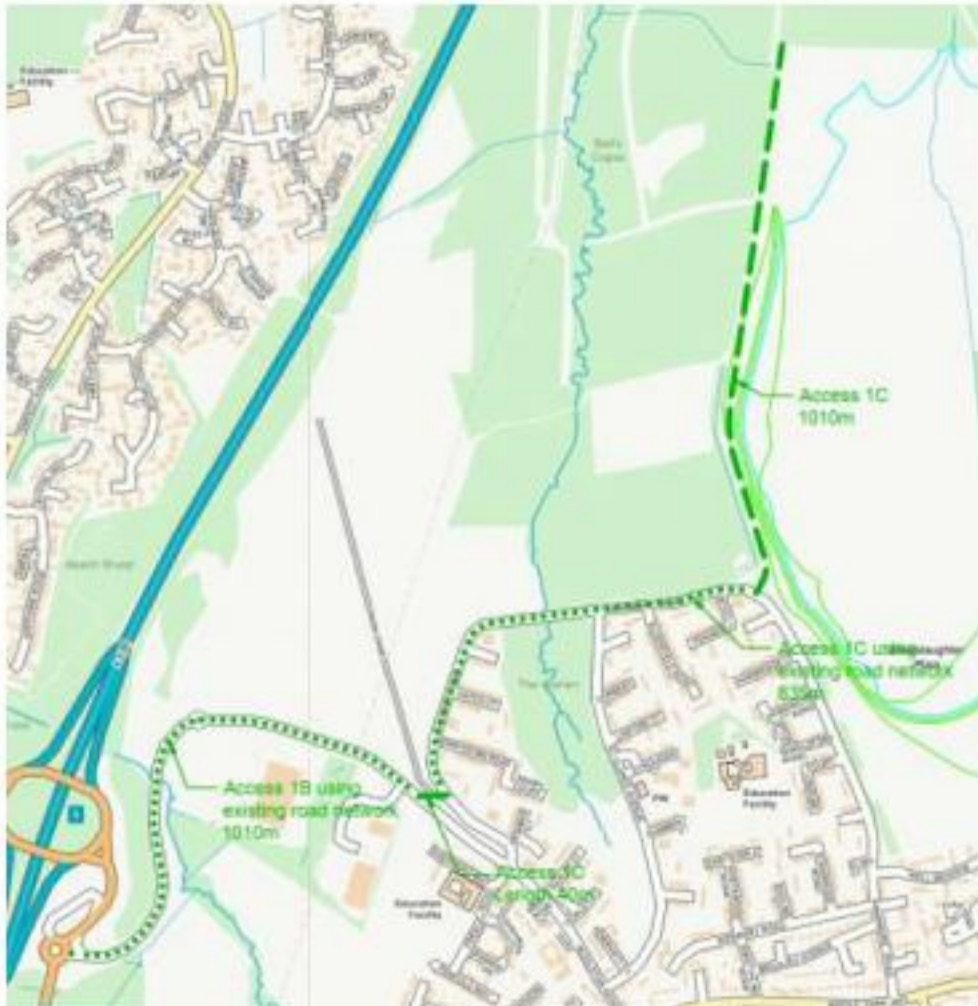


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Access Route Option 1C

- 3.1.6. Access Route Option 1C is a further development of Access Route Option 1B. Access Route Option 1C is 40m (1200m in total) and links Swanmore Road and Calshot Road to Fitzwygram Way at the eastern end of the bus gate. Access Route Option 1C therefore provides a more direct route for traffic travelling to the A3(M) and requires a partial suspension of the bus corridor (see commentary in 3.1.4). The alignment of Route Option 1C can be seen in **Figure 3.1.1C**.

Figure- 3.1.1C – Access Route Option 1C



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Access Route Option 1D

- 3.1.7. Access Route Option 1D is the proposed route for traffic travelling to the reservoir after its construction via Access Route Option 1A from the A3 (M). Access Route Option 1D is 3800 m and will utilise the existing road network via the most suitable and direct route to the A3(M). A signage strategy for traffic from the A3(M) will be developed with this option. This seeks to suspend the bus corridor during the construction phase and then reinstate at the operational phase (see commentary in 3.1.4). The alignment of Route Option 1D can be seen in **Figure 3.1.1D** below.

Figure- 3.1.1D – Access Route Option 1D



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Access Route Option 2A

- 3.1.8. Access Route Option 2A is a variation of Access Route Option 2 included within the Arup assessment in 2010. The Access 2A proposal forms a junction with the B2149 approximately 375m north of the existing Access Route Option 2 proposal and is 1480m long. This option was developed as an alternative to Access 2 to reduce the potential impact on the existing ancient woodland at Havant Thicket adjacent to the B2149. The alignment of Route Option 2A can be seen in **Figure 3.1.2A**.

Figure- 3-1.2A – Access Route Option 2A



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Access Route Option 6

- 3.1.9. Access Route Option 6 has been developed as a result of the submission of the Land East of Horndean application 55562/004, to the north of the reservoir. As shown in **Figure 3-2**, the turning head near the football pitch in the masterplan for application 55562/004 provides a possible location for an access road to be developed. The route would be 1480m long extending from the turning head and have an overall length of 1935m from the B2149. The masterplan of application:55562/004 with the link to Access Route Option 6 can be seen in **Figure 3.1.6**.

Figure- 3.1.6 – Access Route Option 6



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Figure 3.2 – Access Route Option 6 on the masterplan of application:55562/004



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3.2. Environmental Summary

Methodology

- 3.2.1. A high-level desk-based assessment of each access route option has been undertaken to assist in differentiating between the relative impacts of different access route options. A list of environmental topics and receptors was determined having regards to the Early Assessment and Sifting Tool (EAST) and other key drivers including the National Planning Policy Framework 2019 (NPPF 2019) and environmental context:
- Historic Environment;
 - Biodiversity;
 - Air Quality;
 - Noise;
 - Landscape and Visual;
 - Water;
 - Geology, Soils and Materials;
 - People and Communities, and;
 - Climate.
- 3.2.2. The approach was developed with reference to the decision-making criteria identified under the relevant environmental headings within the generic impacts section of NPPF. Consideration was given as to whether they were relevant to the environmental context and, in the interest of proportionality, could be meaningfully assessed on the basis of the information available.
- 3.2.3. A desk-based qualitative assessment of the potential impacts of each access route option was undertaken for each receptor by technical specialists, based primarily on the presence or absence of a receptor within, or in proximity to, each access route option.
- 3.2.4. A 5-point scale-based approach to scoring was adopted for the assessment of options against each environmental receptor, which were defined by technical specialists for each environmental receptor. Where feasible, the scoring considered adverse and beneficial effects.
- 3.2.5. Following the assessment against each environmental receptor, the technical specialists then provided an overall topic score. The 5-point scale provides an indication of the level of environmental risk or benefit associated with each access route option, based on the likelihood of impacts to high value receptors and the number of receptors likely to be affected. Based on the EAST methodology, it was not intended that 5-point scale scores for individual questions / criterion are aggregated or averaged to provide a final 5-point scale status for each topic. Each overall topic score was determined based on a qualitative assessment informed by a combination of assessments against individual receptors and expert judgement. The 5-point scale is set out in **Table 3-1**.

Table 3-1 - Point Scoring Scale

Numerical Scoring	Colour Code	Assessment	Scale
1		Moderate - high level of risk of an adverse impact to high value / sensitivity designations or receptors; or for adverse impacts on a moderate - large number of sensitive receptors within the route corridor	Very Poor
2		Low-moderate level of risk of an adverse impact to high value / sensitivity designations or receptors; or for adverse impacts on a low- moderate number of sensitive receptors within the route corridor	Poor
3		Neutral or limited effects or a low level of risk of an adverse impact to high value / sensitivity designations or receptors; or a limited number of sensitive receptors within the route corridor	Neutral
4		Potential for beneficial effects or enhancements to high value / sensitivity designations or receptors; or for beneficial effects to a low - moderate number of sensitive receptors within the route corridor	Good
5		Potential for substantial beneficial effects or enhancements (inbuilt as part of the scheme) to high value / sensitivity designations or receptors; or for beneficial effects to a moderate - large number of sensitive receptors within the route corridor	Very good

Baseline Screening

A desk-based qualitative assessment of potential impacts was undertaken for each environmental topic and corresponding receptors by technical specialists. This assessment was based primarily on the presence or absence of environmental receptors included in **Table 3-2** below within, or in proximity to each route access option.

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Table 3-2 - Environmental Receptors Point Scoring Scale

Environmental Receptors	Southern routes 1, 1A, 1B, 1C, & 1D	Northern routes 2, 2A, 3, 4, 5, 6
Sensitive receptors inc residential properties, PRow inc bridleways and cycle routes, and open space in the vicinity of Warren Park, Leigh Park, Rowlands Castle and Staunton Country Park, and local road network, as well as human health receptors using these	✓	✓
Hampshire Historic Environment Record (HER) records several finds of flint artefacts in the area, and records cropmarks	✓	x
Grade II Listed buildings along the B2149 at Rowlands Castle	x	✓
Site of Brickworks (HER Record 54724)	x	✓
Sir George Staunton Conservation Area	x	x
Staunton Historic Park and Garden	x	x
Noise Important Areas (IAs) (IA14795 and IA1859)	✓	✓
Air Quality Monitoring Sites (site 10 and 15)	✓	✓
South Downs National Park	x	✓
Staunton Country Park	✓	✓
Ancient woodland, ancient semi-natural woodland, and planted ancient woodland at Havant Thicket and Bells Copse	✓	✓
European protected species - bats, dormouse, reptiles and great crested newts	✓	✓
Priority habitats	✓	✓
Cabbage Field Row SINC, Dunsbury Hill Grassland 2 SINC, Dunsbury Hill Wood SINC and The Warren Havant SINC on Calshot Road and Cherry Tree Row SINC and Beechwood SINC and Bells Copse SINC	✓	✓
Hazelton Common LNR	✓	✓
Woodland owned by Forestry England with permitted access along logging tracks		✓
Park Lane Stream, Hermitage Stream unnamed watercourses	✓	✓
Source Protection Zone 1 associated with the regional Chalk Principal Aquifer	✓	✓
Bedhampton and Havant Springs groundwater Drinking Water Safeguard Zone	✓	✓
Flood Zones 1 and 3	✓	✓
Clay Minerals Safeguarding Area (MSA) and a Minerals and Waste Consultation Area	✓	✓
Grade 3 with low likelihood of BMV, Grade 4, and Grade 5	✓	✓
Historic landfill at Dunsbury Hill Farm, Padnell Farm, Pyle Fram and Five Heads Farm	✓	✓
Dunsbury Park Development	✓	x
Future housing at land east of Horndean and Cabbage Field Row	✓	✓

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Environmental Appraisal Results

- 3.2.6. Overall Option 1B is considered to have a low to moderate risk of an adverse impact to high value / sensitivity designations or receptors in comparison with other northern and southern options.
- 3.2.7. It is noted that the receptor count for Option 1B is lower than for Options 1, 1A, 1C, 1D, broadly equal to Option 4, but higher than Options 2, 2A, 3, 5 and 6. Further noise assessment will be required to assess the level of impact once traffic flows for the construction and operation scenarios is available.
- 3.2.8. A programme of archaeological evaluation and/or recording, are likely to mitigate impacts from all Options 1 and 1A, 1B, 2, 2A, 3, 4, 5 and 6 on the historic environment reducing impacts to neutral to low risk.
- 3.2.9. It is unlikely that Options 1, 1A, 1B, 2, 2A, 3, 4, 5, and 6 would have any significant impacts on statutory designated ecological sites due to the distance to such sites.
- 3.2.10. In the south, apart from Option 1, Options 1A, 1B, 1C and 1D have the potential to avoid significant impacts on woodland and grassland SINC, deciduous woodland priority habitat, and habitat likely to support notable and legally protected species. Mitigation measures during construction would limit indirect impacts through noise, air and water pollution on SINC and ancient woodland.
- 3.2.11. The majority of the access route options in the north are located along existing logging tracks. Option 2, 2A and 5 result in loss of irreplaceable ancient woodland habitat, designated as part of Idsworth Common SINC and Havant Thicket SINC that support EPS - dormice, bats and great crested newts (Option 5). Option 3, 4 and 6 would result in little or no tree clearance but a greater disturbance to woodland habitat than Option 2 and 2A.
- 3.2.12. Whilst Options 1, 1A, 1B, 1C and 1D would not impact directly on national or regional landscape designations, Options 2, 2A, 5 and 6 have the potential to have adverse landscape and visual impacts on the adjacent South Downs National Park, with Options 2 and 5 also resulting in the loss of existing woodland.
- 3.2.13. All options would impact on the visual amenity of users of PRow and permissive routes in Havant Thicket. Access route options in the south have the potential to detract from the local landscape character and visual amenity of Staunton Country Park although the design development of the reservoir site has the potential to mitigate this impact.
- 3.2.14. Option 1 requires a new crossing of Park Lane Stream and is considered to have a moderate – high risk to the water environment. The effect of 1A, 1B, 1C and 1D would depend on the level of modification work needed (if any) to existing stream crossings. Option 2 would not cross or run immediately adjacent to any watercourses and would have a negligible impact on flood risk.
- 3.2.15. There is a low to low-moderate risk that Options 1A, 1B, 1C, 1D, 2A, 3, 4, 5, and 6 would have an adverse impact on watercourses and flood risk. Suitable mitigation would need to be in place requiring: suitable flood compensation; sensitive design mitigation to manage water quality and morphological issues to ensure compliance with the Water Framework Directive (WFD); and implementation of environmental management measures.
- 3.2.16. Options 1A, 1B, 1C and 1D would result in a neutral or limited level of risk in relation to ground conditions. Option 1 in the north and Options 2, 2A and 6 would result in a moderate-high level of risk due to the presence of the landfill and the important agricultural and mineral resources, whilst within Options 2, 2A, and 6 the overall assessment is that Options 2, 2A and 6, would result in a moderate-high level of risk, Options 3, 4 and 5 would result in and a low-moderate level of risk.
- 3.2.17. All options in the north and south would affect the amenity of users of open space and non-vehicular routes, whilst Options 1A, 1B, 1C, and 1D would all adversely affect the local amenity in residential areas, with Options 1D and 1A having the highest receptor count. Options 2, 2A, 3, 4 and 5 would adversely affect the amenity of a significant number of recreational users of woodland.
- 3.2.18. Options 1 and Option 6 have the potential to impact on proposed development at Dunsbury Park and south of Horndean.
- 3.2.19. In terms of Climate effects and vulnerability, all options are likely to be negligible compared with overall UK emissions. Emissions from the construction of the route access options would vary

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according to the overall length and length of new highway. Options 1, 1A, 1B, 1C, and 1D all include at least 1010m of new highway. This means that even the shorter Route 1 Access Options may have higher emissions e.g. Options 1, 1B and 1C than other options where minimal or no new infrastructure is required e.g. Option 1C and Option 1D. Emissions from Option 2 will be higher than the Route 1 Access Options and Options 3 and 5, but lower than Options 4 (the highest), 6 and 2A.

Table 3-3 - Summary of Assessment Results for Each Option

Environmental Criteria	Option 1	Option 1A	Option 1B	Option 1C	Option 1D	Option 2	Option 2A	Option 3	Option 4	Option 5	Option 6
Historic Environment	3	3	3	3	3	3	3	3	3	3	3
Biodiversity	2	3	2	3	3	1	2	2	2	1	2
Air Quality	2	2	2	2	2	2	2	2	2	2	2
Noise	3	1	2	1	1	2	2	2	1	2	2
Landscape and Visual	2	2	2	2	2	2	2	3	2	1	2
Water	2	2	2	3	3	3	2	2	2	2	2
Ground Conditions	1	3	2	2	2	1	1	2	2	2	1
Material Resources and Waste	2	3	3	3	3	2	2	3	3	3	2
Population and Health	2	2	2	2	2	1	1	1	1	1	2
Climate Effects	2	2	2	2	2	2	2	2	2	2	2
Climate Vulnerability	3	3	3	3	3	3	3	3	3	3	3
Overall Assessment	1 (24)	1 (26)	2 (25)	1 (26)	1 (26)	1 (22)	1 (22)	1 (26)	1 (23)	1 (22)	1 (23)

Environmental Appraisal of Access Route Options

3.2.20. The highest scoring route option 1B fell into the low-moderate risk of an adverse impact. All other options fell into a moderate to high risk of an adverse impact.

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3.3. Engineering Summary

Methodology

- 3.3.1. The assessment of the engineering viability of each route has considered the criteria and 5-point scoring methodology detailed in **Table 3-4**. The categories and criteria developed to assess each route are based on the requirements of the site and professional judgement.

Table 3-4 - Engineering 5 Point Scoring Criteria

Impact	Low/good		Average/neutral		High/adverse
Score	5	4	3	2	1
Approximate length of proposed access road	<1.38KM	No entry	1.38-1.48km	No entry	1.485km and greater
Viability of the construction of the potential access with the existing highway network	Likely to meet standard and feasible	No entry	This is likely to have an adverse impact and liable to require additional work	No entry	Likely to require complete remodelling of existing junction
Safety of proposed junction location with the existing highway network	No concerns	No Entry	No Entry	Some concerns about safety	Does not meet visibility or safety standards due to constraints
Land Acquisition for access junction	No Entry	Agreement required from developer - PCC	May require additional land on the existing carriageway for widening and some tree loss for visibility splays	Will require land leading to tree/hedgerow loss.	Will require land leading to significant tree and hedgerow loss
Ease of construction for proposed access	No Entry	Green field and/or off public developer road	6m access road on existing logging road with width for widening, or developer road	6m access road in woodland small percentage, large percentage on logging road with width for widening, open field or utilisation of developer road	6m access road on woodland or large percentage on private developer road or over developer land

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Impact	Low/good		Average/neutral		High/adverse
Score	5	4	3	2	1
Potential legacy issues with road pavement construction	Low traditional road construction	No entry	Medium Mixture of traditional road pavement construction and pavement over tree root	Small traditional road pavement content with higher pavement over tree root content	Very high to all pavement over tree root pavement
Traffic impact at Warren Park, Leigh Park or Rowlands Castle	No impact	No entry	Exiting visitor traffic may leave through residential area		Large traffic impact
Status of potential land ransom	Land owned by East Hants DC/Forestry England	No entry	No Entry	Developer land	Developer land/private land
Status of Existing Stakeholder Engagement	Yes, the preferred option in previous public consultation	Yes, the second preferred option in public consultation	Not considered	No entry	No entry
Watercourse crossing	None	No Entry	Upgrade existing stream crossings	No Entry	Requirement for stream crossings

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Engineering Appraisal Results

3.3.2. The results of the engineering appraisal for each of the options is shown in **Table 3-5** below.

Table 3-5 - Engineering Appraisal Results

	Option 1	Option 1A	Option 1B	Option 1C	Option 1D	Option 2	Option 2A	Option 3	Option 4	Option 5	Option 6
Approximate length of proposed access road	3	5	5	5	5	3	3	3	0	3	0
Viability of the construction of the potential access with the existing highway network	5	5	5	5	5	5	5	3	0	3	5
Safety of proposed junction location with the existing highway network	5	5	5	5	5	5	0	5	2	0	5
Land Acquisition for access junction	4	4	4	4	4	3	0	3	0	0	5
Ease of construction for proposed access	0	0	3	3	3	0	3	3	3	0	0
Traffic impact at Warren Park, Leigh Park or Rowlands Castle	5	0	0	0	0	5	5	2	0	2	2
Potential Legacy issue of pavement construction	3	5	5	5	5	0	2	2	2	2	3
Status of potential land ransom	2	3	3	3	3	5	0	5	0	0	0
Status of Existing Stakeholder Engagement	0	3	3	3	3	5	3	0	0	4	3
Watercourse crossing	0	5	5	5	5	5	3	3	3	3	0
Overall Total	30	37	39	39	39	38	27	30	16	21	27
Ranking	6	5	1	1	1	4	8	6	11	10	8

Engineering Appraisal of Access Route Options.

3.3.3. Access Route Options 1B, 1C and 1D are the joint highest scoring options with a score of 39.

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3.4. Appraisal Against Project Drivers

- 3.4.1. An appraisal against the seven project drivers; quality, timeline, innovation, responsibility, flexibility, connectivity and environment has also been carried out. The criteria used to form this basis of assessment is shown in **Table 3-6** below. The appraisal has used a 3-point scale to remain consistent with project driver appraisals undertaken by different disciplines. The scoring criteria is as follows:
- 1 - High impact
 - 2 - Medium Impact
 - 3 - Low Impact

Table 3-6 - Appraisal Criteria Against the Seven Project Drivers

	High Impact	Medium Impact	Low Impact
	1	2	3
Quality			
Durability of access road	Cellweb granular pavement (low)	Mix	Flexible pavement (high)
Loss of existing amenity (track conversion to access)	High	Medium	Low
Timeline			
Programme (length of new pavement)	>1480	1200 - 1480	<1200
Ease of construction	Linear potential access issues	Linear enclosed site	Open site
Land owners	Private	PCC/EHDC/FE	PWC
Size/ features	Large (lengths and embankment)		Small
Innovation			
Technical Innovation		Standard	Specialist system
Responsibility			
Safety of access junction	High speed road/poor layout		Low speed road
Safety impact of additional traffic in residential areas	High	Medium	Low
Flexibility			
Whole Life Costing	High	Average	Low
Availability of asset		Regular intervention required	Nearly always available
Connectivity			
Third Party Land	Private developer	Neutral landowner	None
Operational access length	>4000m	>3000m and <4000m	<3000m
Environment			
Overall assessment	Moderate Impact	Low-moderate Impact	

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3.4.2. The appraisal results for each route against the project drivers in shown in **Table 3-7**

Table 3-7 - Project Driver Appraisal Results

Length new road (m)	1400	1010	1170	1040	1010	1440	1480	1390	2155	1430	1935
Operational length (m)	2510	3245	2775	2895	4810	2590	2480	3620	5225	3175	2770
	Option 1	Option 1A	Option 1 B	Option 1 C	Option 1 D	Option 2	Option 2A	Option 3	Option 4	Option 5	Option 6
Quality											
Durability of access road	3	3	3	3	3	1	1	2	2	1	3
Loss of existing amenity	2	3	3	3	3	1	1	1	1	1	3
Timeline											
Programme	2	3	3	3	3	2	2	2	1	2	1
Ease of construction	1	3	3	3	3	2	2	2	1	2	1
Land owners	2	2	2	2	2	2	1	2	1	1	1
Size/features	1	3	3	3	3	2	2	2	1	1	1
Innovation											
Technical Innovation	2	2	2	2	2	3	3	2	2	2	2
Responsibility											
Safety of access junction	3	3	3	3	3	1	1	1	1	1	3
Safety impact of additional traffic	3	1	2	2	1	3	3	3	3	3	1
Flexibility											
Whole Life Costing	3	3	3	3	3	1	1	2	1	2	2
Availability of asset	3	3	3	3	3	2	2	3	3	3	2
Connectivity											
Third Party Land	2	3	2	2	3	2	1	2	2	2	1
Operational access length	3	2	3	3	2	3	3	1	1	1	2
Environment											
Overall Impact	1	1	2	2	2	1	1	2	1	1	1
Total Score	31	35	37	37	36	26	24	27	21	23	24

3.4.3. As shown in

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- 3.4.4. **Table 3-7**, the appraisal against project drivers has identified route options 1B and 1C as scoring most favourably.

3.5. Overall recommendation

- 3.5.1. By comparing the results of the three appraisals; Option 1 B scores the best consistently.

3.6. Additional Access Points and Satellite Parking

- 3.6.1. Additional access points to the site from the existing highway network will be needed for maintenance purposes. These will provide the most accessible and direct routes to the relevant maintenance points in order to minimise the impact on the surrounding environment.
- 3.6.2. If Route Access Route Option 1B is taken forward, then the current proposal for an 8-12 car parking spaces from Swanmore Road will no longer be needed to be considered.

3.7. Junction Design

- 3.7.1. Once the preferred route is confirmed the carriageway and the access junction with the local highway will be designed to accommodate the number of trips generated by the site. Further details of the expected number of vehicular trips and visitor numbers generated by the site is detailed in a further technical note. This technical note is supported by the findings of the *Havant Thicket Visitor Numbers Review* produced by Planning Solutions Consulting in July 2019. As detailed in the note, it is expected that the site will generate 104 arrivals and 77 departures during the average Saturday peak (14:00-15:00) and 133 arrivals and 99 departures during the absolute Saturday peak (14:00-15:00).
- 3.7.2. The access junction will be subject to swept path analysis and will need to be provided with visibility splays in accordance the standards set in Hampshire's *Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays*³.

Strengths and Weakness Summary of Access Option 1 B

3.7.3. Key Strengths

- Avoids impacting on ancient woodland, most of the construction is on Portsmouth Water Company/ Portsmouth City Council land;
- Retains and maintains amenity of access to and on site on Forestry England land;
- Relative ease of construction due to mostly open site;
- Relative speed of construction of due to ease of access;
- Long life pavements
- Low intervention levels for maintenance of access pavement.
- Ease of access to site for residents of Leigh Park and Warren Park.

3.7.4. Key Weaknesses

- Construction traffic and operational traffic will pass through Leigh Park / Warren Park with commensurate noise, air quality and safety considerations. Mitigation – shortest length passing through Leigh Park/ Warren Park selected for non-local traffic thereby limiting the number of receptors;
- Need to gain access via Portsmouth City Council land – Dunsbury Park development. Mitigation close consultation on proposed development and traffic levels;

³Hampshire County Council (2019) *Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays* <https://documents.hants.gov.uk/highways/TG3TechnicalGuidanceNote-StoppingSightDistancesandVisibilitySplays.pdf>

- Potential use of road as rat-run from Warren Park/ Leigh Park to A3(M) leading to increase in non-visitor traffic. Mitigation – consideration given to additional traffic calming measures to discourage this behaviour; and
- Low quality visual approach through residential estate. Mitigation consider the potential to provide enhanced landscaping on the approach in agreement with Portsmouth CC and Hampshire CC.

4. Next Steps and Recommendations

- 4.1.1. Access Option 1B has been determined as the leading access option.
- 4.1.2. A key factor in gaining endorsement for the recommended option is the support of Portsmouth City Council as access through the Dunsbury Park development is required. Early discussions have already taken place. Further dialogue is required to secure their support to the scheme and to facilitate the delivery of the project.
- 4.1.3. Further consultation will be pursued with key stakeholders and the local highway authority to further investigate the viability of the leading access option.
- 4.1.4. If the support of Portsmouth City Council is not secured; then the next best solution would be access option 2. An arboriculture survey has been carried out in the area impacted by the alignment of option 2. This will determine whether the impact on the ancient woodland can be minimised to an appropriate level.
- 4.1.5. Following the stakeholder consultation, a clear preferred option should be confirmed or an alternative derived. This will then be proposed as the preferred option which will be subject to public consultation in May 2020 and the subsequent planning application.

Appendix D. Stage One Road Safety Audit (RSA)

Access Proposals to Havant Thicket Reservoir, Havant

Stage 1 Road Safety Audit Response Report

Hampshire County Council

July 2020



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This document and its contents have been prepared and are intended solely as information for Hampshire County Council and use in relation to the Stage 1 Road Safety Audit Response report.

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This document has 15 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev P01.1	Draft for Comment	EC				15/7/2020

Client signoff

Client	Hampshire County Council
Project	HTR Havant Thicket Outline Design
Job number	5169117
Client signature / date	

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Introduction

1. Authorisation Sheet

Project: HTR Havant Thicket Outline Design
Report Title: Stage 1 Road Safety Audit Response Report

PREPARED BY:

Name: Andrew Hills

Position: Design Team Leader

Signed: *Andrew Hills.*

Organisation: Atkins

Date: 15th July 2020

APPROVED BY:

Name:	Tom Fisher
Position:	Project Sponsor
Signed:	
Organisation:	Hampshire County Council
Date:	
Route Number:	Swanmore Rd / B2149
Road Name:	Swanmore Rd / B2149
Scheme:	HTR Havant Thicket Outline Design
Road Safety Audit:	Stage 1

Comments:

2. Introduction

2.1. Commission and Terms of Reference

Atkins has been commissioned by Hampshire County Council (HCC) to undertake a Stage 1 Road Safety Audit (RSA) of the proposals to provide two separate points of highway access to the Havant Thicket Winter Storage Reservoir, which will be located in the 'Upper Lake' area of Havant Thicket, between A3(M) to the west and B2149 to the east. Hampshire County Council is the highway authority for both the Swanmore Road and the B2149 and on this basis the RSA has been undertaken in accordance with GG 119 Road Safety Audit with the variations provided in the HCC TG18 (reference para. 2.2). Also noted are the relaxations under COVID 19 restrictions as described under the TG18 on the Hants CC webpage. This allows attendance on site by the RSA Team Leader only.

The RSA team comprised the following staff:

Rebecca Thomas	BSc (Hons), MCIHT, MSoRSA (Certificate of Competency in Road Safety Audit gained in 2017) Senior Operational Safety Consultant Atkins RSA team leader
Kate Hatton	BA (Hons), MCIHT (Certificate of Competency in Road Safety Audit gained in 2019) Transport Planner Atkins RSA team member

Both team members are approved by HCC.

The RSA consisted of:

- A review of the information provided in the RSA Brief; and
- The primary site visit completed to undertake the RSA inspection was carried out during daylight

hours on the 16 June 2020 Between 10:30am and 11:30am. During this visit weather conditions were bright and sunny and the road surface was dry.

Traffic conditions during the site visit were light to moderate.

The Team Leader only attended the site visit recording their observations with photographs and video evidence to share with the Audit Team Member. This was agreed by the Overseeing Organisation, HCC, as part of their COVID-19 requirements as follows:

For Stage 1 and 2 Road Safety Audits:

- *These audits are still required for a design submission to*

pass inception, however we will accept the either of the following:

a) The lead auditor visits the site, takes photos/video and then supplies this information to the other auditor, so they are both reviewing the same information. The report will need to clearly state how the audit was undertaken.

b) Both auditors visit the site, travelling independently and keep the 2m distance rule in place. Again report will need to clearly state how the audit was undertaken.

The site visit to the B2149 (northern point of access to the site) was conducted via a layby north of the site due to the absence of footway provision and drive-throughs were undertaken to obtain video evidence. The site off Swanmore Road (southern access) was visited on foot.

The RSA Brief was provided by Andrew Hills of Atkins to Tom Fisher of HCC as the nominated representative of the Overseeing Organisation and Rebecca Thomas of Atkins as the RSA team leader. As per para. 2.2 in TG18, the RSA brief does not require formal approval by the Project Sponsor before proceeding with the RSA.

This stage 1 RSA has been conducted in accordance with the procedures and scope set out in the Design Manual for Roads and Bridges, Volume 5, Section 2, Part 2, GG 119 Road safety audit. The RSA Team has examined and reported only on the road safety implications of the measures as proposed and has not specifically examined or verified the compliance of the designs to any other criteria. Where there are issues that may be of interest to the scheme designer, but not necessarily within the scope of the RSA, these have been provided to the client separately.

Details of the information provided within the RSA Brief are included in **Appendix A**. Problems and recommendation locations are indicated on the plan of the scheme included in **Appendix B**.

2.2. Scheme and Design Objectives

The RSA brief states:

"The scheme involves the construction of a storage reservoir for Portsmouth Water, in the 'Upper Lake' area of Havant Thicket, between A3(M) to the west and B2149 to the east. To provide access for construction and visitors traffic to/from the Havant Thicket Reservoir site, two options have been chosen to be developed at the preliminary design stage.

The South Option consists of a 6m wide new link (two lanes single carriageway) of new carriageway between Swanmore Road and the reservoir visitor's car park. This option joins the existing road network through a simple T junction with Swanmore Road. For this junction, 15m corner radiuses were adopted.

The North Option is designed as a new 3.65m wide single lane single carriageway, with passing bays to allow for two-way traffic. At locations where there are sharp bends there will be a need to widen the carriageway to prevent verge over-run. This design was adopted to reduce the loss of Ancient Woodland land. This option will be connected with the B2149 through a ghost island junction. The layout adopted for this junction is as per DMRB CD123 rev. 1, para. 5.6.3. The access road adjacent to the junction will be 6m wide and will then taper down to 3.65m.

The construction of the reservoir is programmed from 2021 to 2029. The construction of the access roads will have to be completed before this to provide access to reservoir construction traffic and will require temporary traffic management to be in place on both Swanmore Road and B2149.

The two junctions mentioned above are to be covered under the requested Road Safety Audit report.

A stage 2 Road Safety Audit will have to be undertaken after the completion of the detail design."

3. Items Raised at previous Road Safety Audits

This was the first Road Safety Audit produced for the scheme.

DRAFT

4. Road Safety Audit Decision Log

RSA Reference	RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
A	Problem A Location: A (drawing HTR-ATK-AR-RE-DR-D-0006) New access off Swanmore Road Summary: Absence of footway provision could lead to trips and falls The southern access to the site will be provided off Swanmore Road opposite a large housing estate. This residential area is likely to generate a large number of pedestrian trips to the site. Current pedestrian provision includes an informal path from Swanmore Road which leads into the wooded reservoir area and towards a stile over a fence where another footpath is provided. The drawings do not show any provision for pedestrians accessing the site (or retention of existing provision) such as footways along the access road or footpaths into the site. There are also no proposals to provide any crossing facilities to cater for a likely desire line between the housing estate and the site access which is likely to be due to the absence of proposals to provide pedestrian access into the site at this location. In the absence of pedestrian routes into the site from Swanmore Road pedestrians may walk along the grass verge of the access road where they will be at risk of slips and falls particularly during wet conditions. Furthermore, pedestrians may walk in the carriageway where they could be at risk of being struck by vehicles particularly during the hours of darkness when they would be less conspicuous. In the absence of a crossing facility on Swanmore Road, mobility impaired pedestrians and those in wheelchairs may experience difficulties at full height kerbs which present a trip hazard and could leave them stranded in the carriageway and at risk of being struck by a passing vehicle. The lack of crossing facility may also lead to pedestrians crossing at unsafe locations where visibility is compromised which could increase the risk of a pedestrian being struck by a vehicle.	Recommendation It is recommended that a safe means of pedestrian access into the site is provided from Swanmore Road and that a crossing facility based on likely flows is provided to assist pedestrians crossing between the housing estate and the site	Agreed We believe pedestrians can use the existing uncontrolled crossing, which is located adjacent to the existing bus stop, approx. 130m south from the new junction. There is a proposed pedestrian access to the site at the back of the bus shelter at that location which is connected with the operational maintenance track by a proposed footpath. Considering the low frequency of vehicle usage of the operational maintenance track and the low speed of these vehicles, it is proposed that the operational maintenance track will be shared with pedestrians/cyclists. Also, after joining/crossing the maintenance track, the proposed footpath joins the footpath which runs around the top of the reservoir embankment.		
B	Problem B Location: B (drawing HTR-ATK-AR-RE-DR-D-0006) New access off Swanmore Road Summary: On street parking could obstruct visibility and lead to junction collisions The proposals involve the construction of a new T-junction off Swanmore Road. There are currently no parking restrictions along either side of Swanmore Road. During periods of high demand the car parks within the site may be full to capacity. As a result, visitors may park along Swanmore Road close to the new junction. Vehicles parked along Swanmore Road in the junction visibility splay may obstruct intervisibility between drivers exiting the access	Recommendation It is recommended that parking within the visibility splay of the junction is discouraged through the use of double yellow lines extending along Swanmore Road and around the junction radii.	Agreed This was identified and is being in discussion with the Local Highway Authority with the view to include a Traffic Regulation Order to control on street parking. Double yellow lines will have to be included in the next design phase to discourage parking on the bellmouth of the new junction.		

	road and drivers approaching the junction. This may increase the risk of a driver pulling out into the path of a vehicle on Swanmore Road with a side impact or nose-to-tail collision occurring as a result.				
C	Problem C Location: C (drawing HTR-ATK-AR-RE-DR-D-0002) New access off B2149 Summary: Vegetation within visibility splay could lead to junction collisions A new T-junction will be constructed on the B2149 to provide access to the site from the north. The B2149 is subject to national speed limit with an 85th percentile speed of 53mph. Vegetation in the verge of the B2149 adjacent to the junction could obstruct the visibility splay increasing the risk of a driver pulling out of the access into the path of a vehicle on the mainline with a side-swipe or nose-to-tail collision resulting.	Recommendation It is recommended that all obstructions which fall within the junction visibility splay are removed.	Agreed We agree that vegetation trimming is required on both sides of the new junction and undertaken on a regular basis after opening.		
D	Problem D Location: D (drawing HTR-ATK-AR-RE-DR-D-0002) New access off B2149 Summary: Propensity for overtaking manoeuvres increases risk of junction collisions The B2149 is a high speed road subject to national speed limit. Four of the seven collisions which occurred along the route in the 7-year period to 31 December 2019 involved overtaking vehicles. Although this equates to less than one collision per year the new junction creates an additional hazard along the route. Drivers who fail to realise there is a junction ahead may attempt to overtake a slower moving vehicle and find themselves on the wrong side of the carriageway as another driver turns out of the site access road resulting in a head-on collision or they may encounter a stationary vehicle in the right turn lane and a nose-to-tail collision result.	Recommendation It is recommended that measures such as solid white lines are provided along the centre of the B2149 on the approaches to the junction (see figure 5-7 of Chapter 5 of the Traffic Signs Manual) to deter overtaking.	Agreed We agree with forbidding overtaking on the approaches to the new junction and with the use of double white lines around the ghost island. Formal agreement for extent of double white lines will have to be agreed with the Local Highway Authority. 'No overtaking' signs to be used on the approaches. Considering the new development further north of the proposed junction, the related section of road is proposed to have a 40mph speed restriction which is continued south until adjacent to the north end of the taper for the proposed ghost island junction. We believe the local Highway Authority are not too keen to extend the 40mph limit further south because this will be perceived as an urbanisation of a rural area, however, the start of the centre double white lines combined with the 'No overtaking' and the 'Side road' signs will prevent drivers going south from starting an overtaking manoeuvre on this section of road.		
E	Problem E Location: E (drawing HTR-ATK-AR-RE-DR-D-0002) Northbound and southbound on B2149 on access approaches Summary: Substandard Stopping Sight Distance increases risk of nose-to-tail and side impact collisions at the junction The B2149 is a high speed road with an 85th percentile speed of 53mph and during the drive through site visit it was observed that, particularly in a northbound direction, the junction was not immediately visible on the approach. Due to the vertical alignment which includes crest curve to the south of the junction, stopping sight distance on both approaches is substandard and this is confirmed by the visibility reports and long sections.	Recommendation It is recommended that measures are taken to achieve compliant SSD. These may include: • Alterations to the vertical alignment of the B2149 • Relocation of the junction • A reduction in speed limit with supporting measures to ensure compliance If none of the measures listed above can be implemented approval of a Departure from Standard will need to be sought with accompanying mitigation measures to ensure that the new junction does not compromise road user safety along the route.	Disagreed "As a result of reduced SSD, drivers waiting to turn out of the junction may not see a vehicle approaching the junction" – The visibility splays from the junction for both left and right directions meet the required length criteria. Agreed Only the 0.26m high target for the SSD check is not achieved for vehicles traveling along B2149. The required SSD is achieved for a target object higher than 0.5m above ground.		

	CD 109 paragraph 2.13 specifies that on immediate approaches to a junction there should not be any relaxations for SSD. As a result of reduced SSD, drivers waiting to turn out of the junction may not see a vehicle approaching the junction and may not be seen by a driver on the mainline until the last minute leading to an increased risk of nose-to-tail and side-impact collisions at the junction. The alignment is such that a driver may not see a vehicle ahead slowing to turn into the access leading to late braking and a subsequent nose-to-tail collision at the junction. The vertical alignment of the approaches may also increase the risk of a southbound vehicle turning right across the path of a northbound vehicle with a side-impact collision resulting due to reduced intervisibility between drivers.		Site will be open only during daylight hours which will help drivers having a better perception on the new junction layout and observing any vehicles ahead slowing down. Considering the new development further north of the proposed junction, the related section of road is proposed to have a 40mph speed restriction which is continued south until adjacent to the north end of the taper for the proposed ghost island junction. We believe the local Highway Authority are not too keen to extend the 40mph limit further south because this will be perceived as an urbanisation of a rural area, however, the start of the centre double white lines combined with the 'No overtaking' and the 'Side road' signs will inform drivers on the south bound about the new junction layout and make them concentrate more on the road ahead.		

Appendix A – Information Contained Within the Audit Brief

A.1. Documents

HTR-ATK-XX-ZZ-RP-Z-0002 - Havant Thicket Reservoir Access Route Access Options Basis of Design Technical Note

HTR-ATK-XX-XX-RP-Z-0021 - Technical Note Access Route Options Appraisal at Havant Thicket
BACSSR0620059 - MAP - CALSHOT ROAD (003).JPG – Swanmore Rd and Calshot Rd Accidents Map

BACSSR0620059 - REPORT - CALSHOT ROAD.PDF – Swanmore Rd and Calshot Rd Accidents Details

BACSSR0620059 - MAP - B2149 HORNDEAN (002).JPG – B2149 Accidents Map

BACSSR0620059 - REPORT - B2149 HORNDEAN.PDF – B2149 Accidents Details

A.2. Scheme Drawings

HTR-ATK-AR-RE-DR-D-0001 - HTR - Access Routes - Northern Option - Scale 1:2000

HTR-ATK-AR-RE-DR-D-0002 - HTR - Access Routes - Northern Option B2149 Junction - Scale 1:500

HTR-ATK-AR-RE-DR-D-0005 - HTR - Access Routes - Southern Option – Swanmore Road - Scale 1:2000

HTR-ATK-AR-RE-DR-D-0006 - HTR - Access Routes - Southern Option – Swanmore Road Junction - Scale 1:200

Appendix B – Locations of Problems

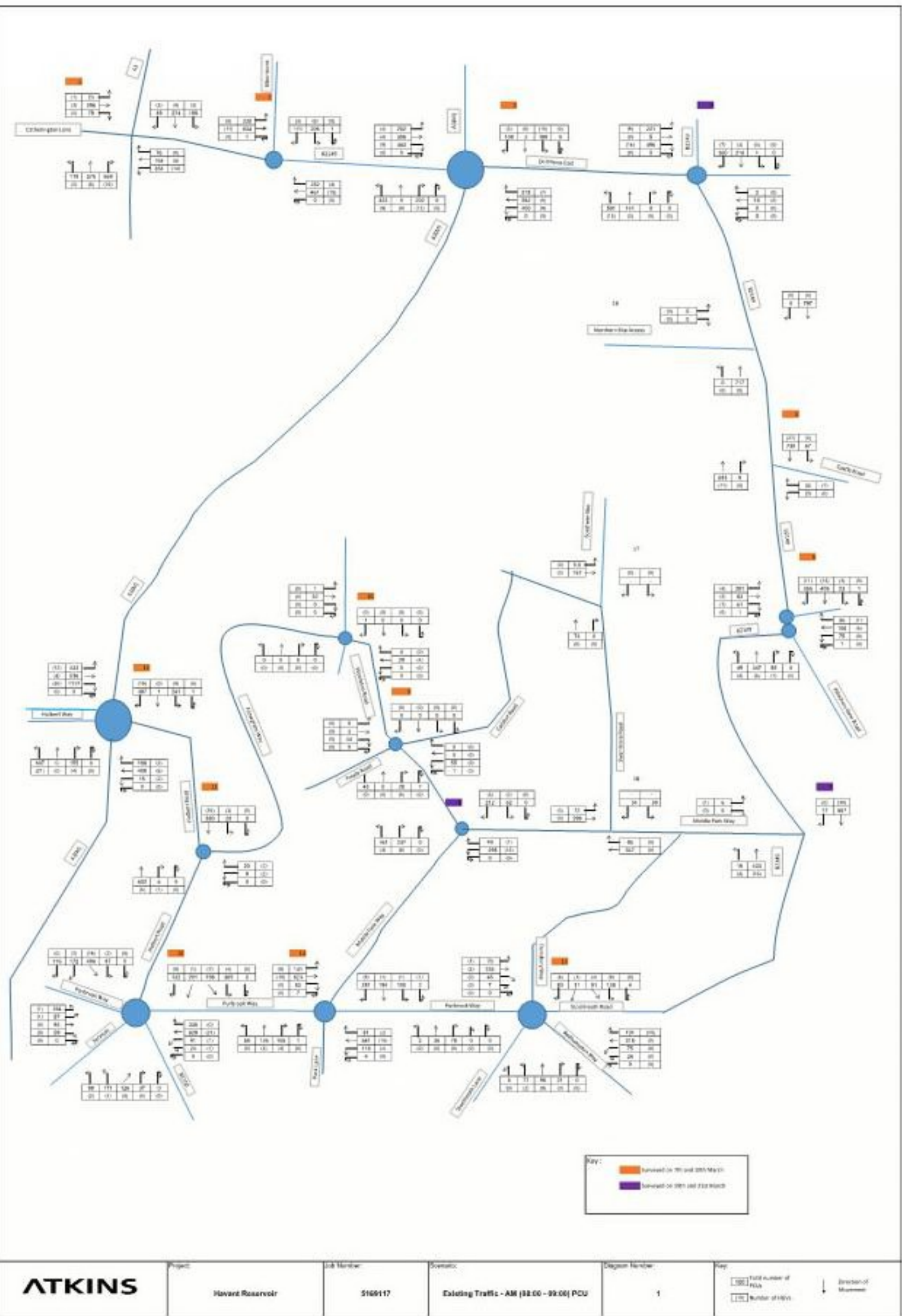


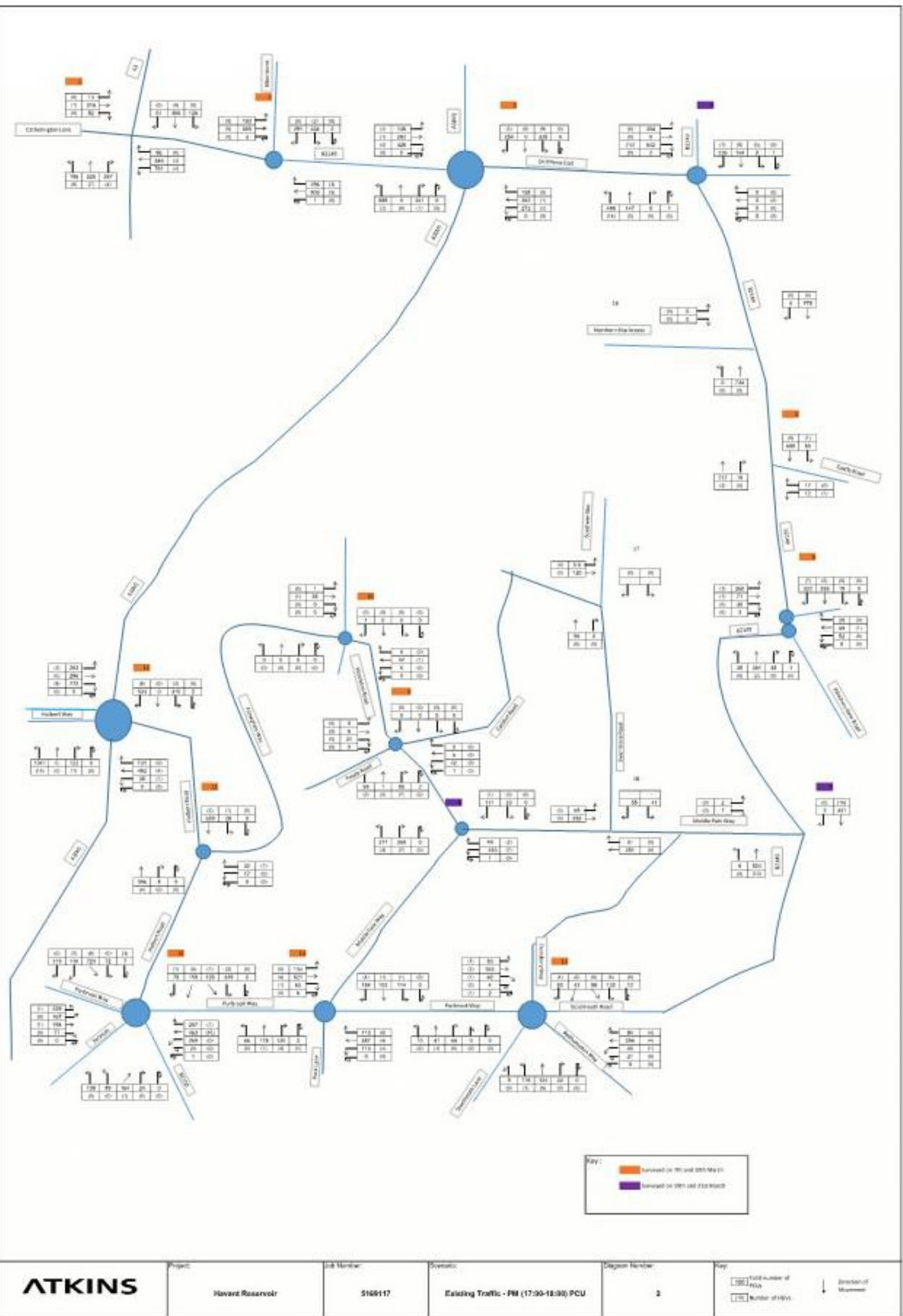


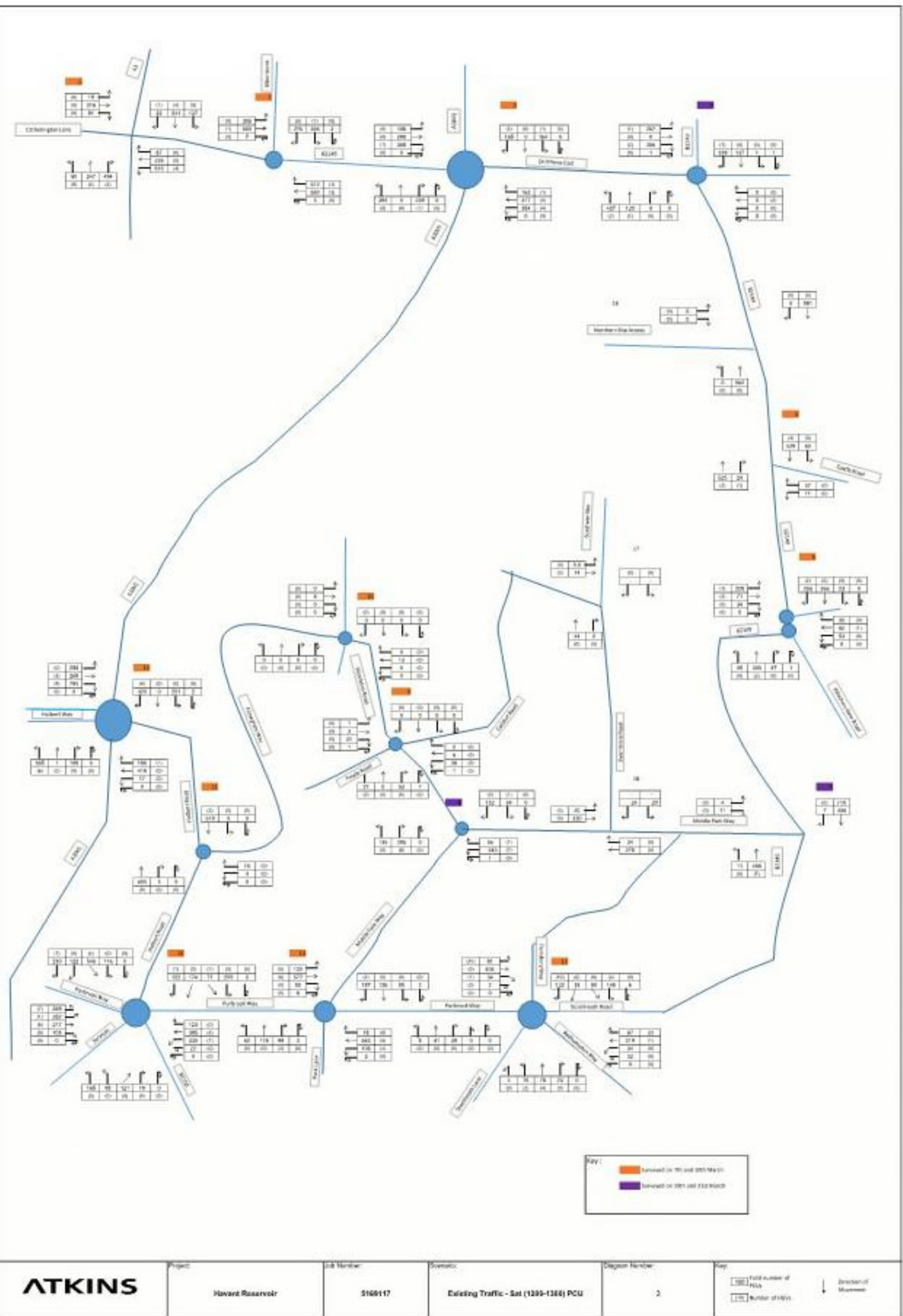
Andrew Hills
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Appendix E. Flow Diagrams

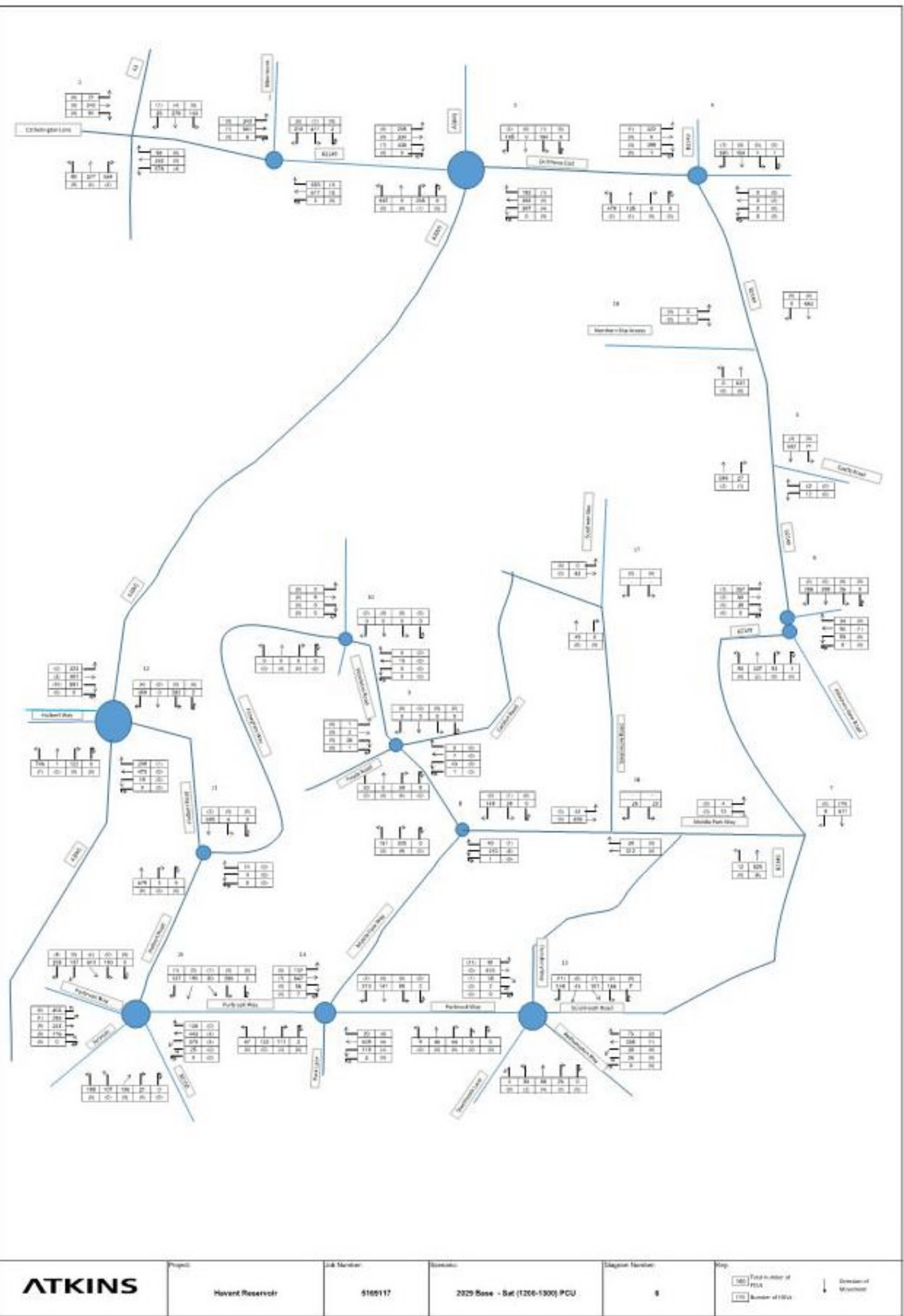




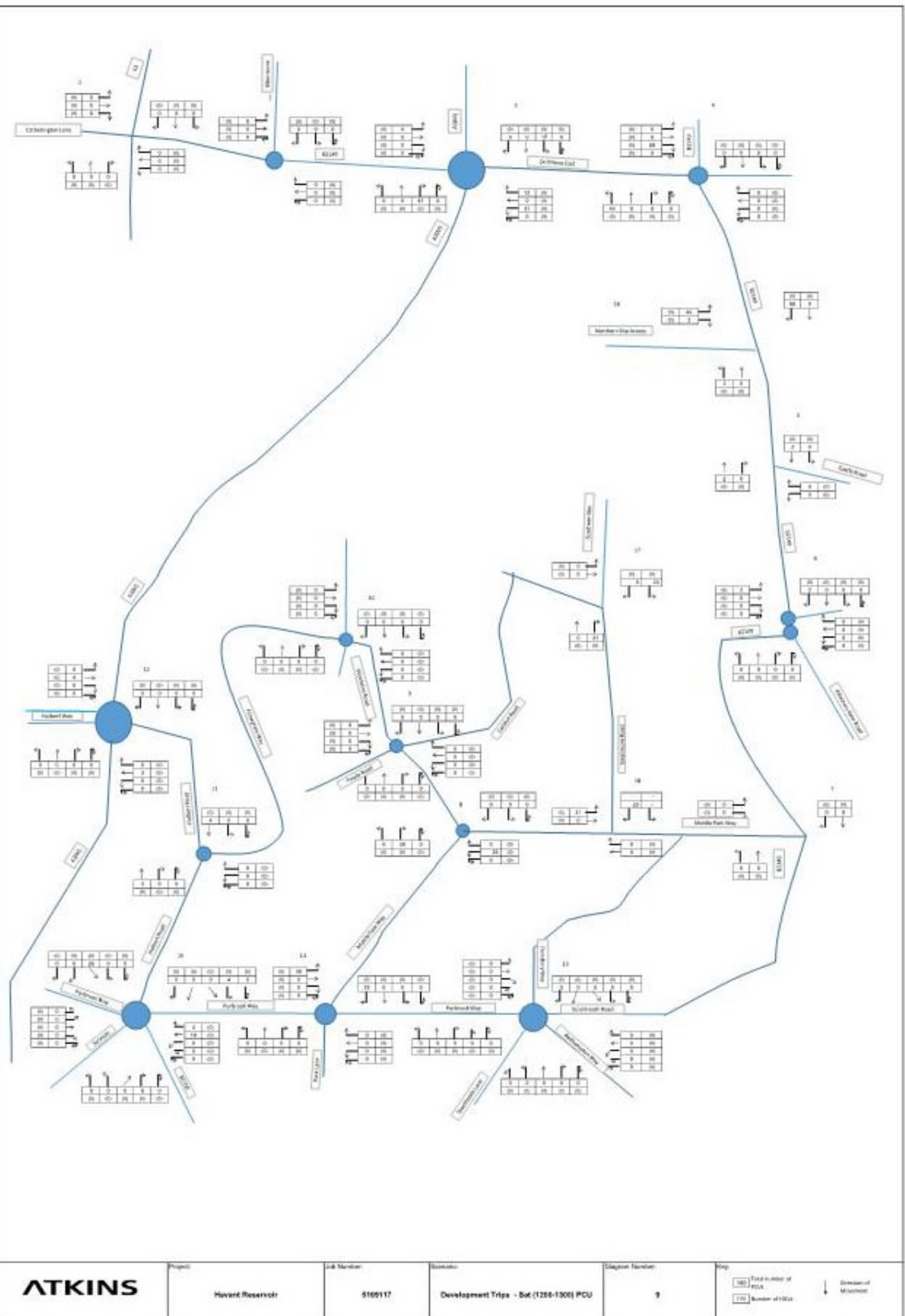


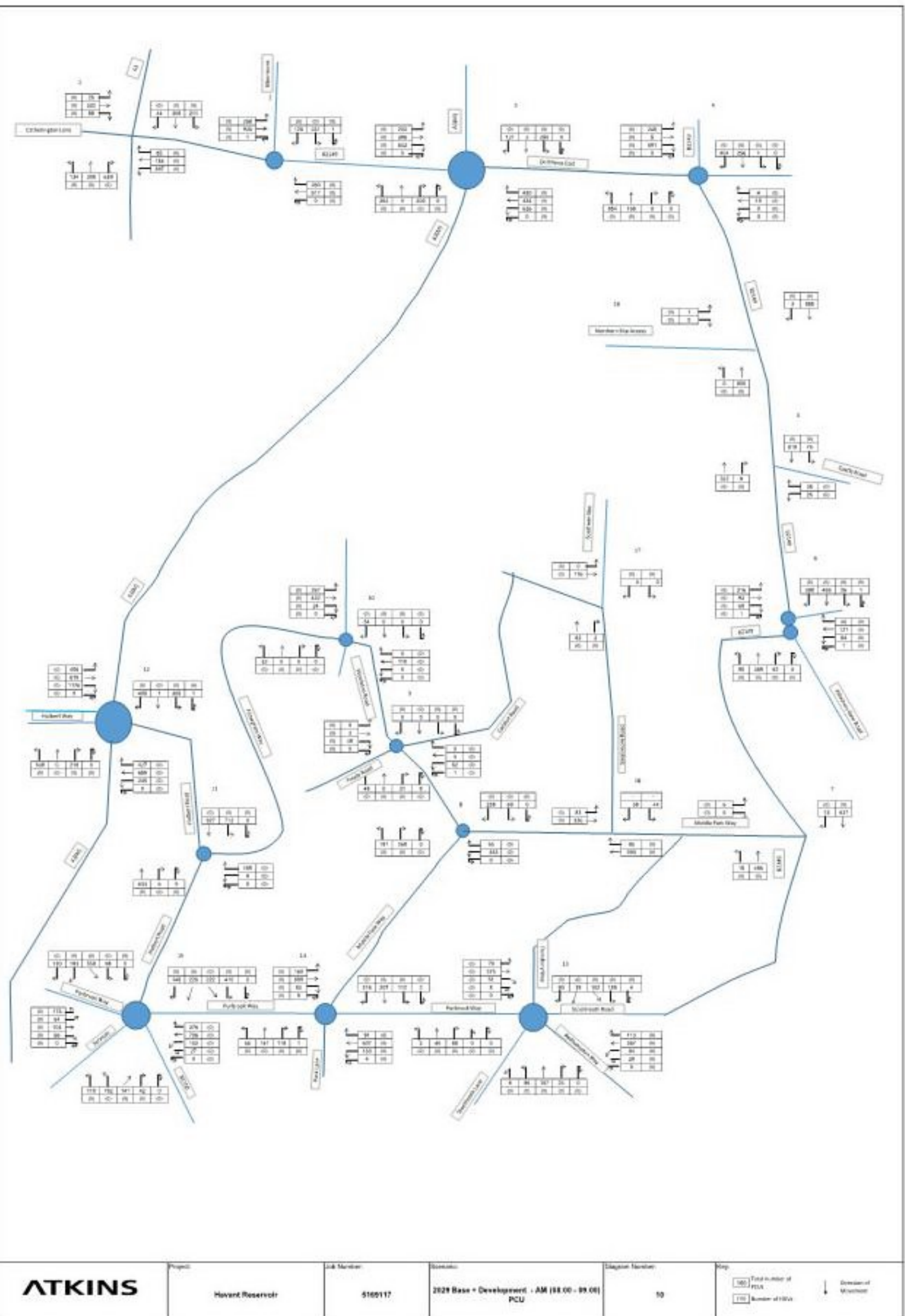
Step:

1990	Total number of PSLs	↓	Determination of Microclimate
2000	Number of PSLs		

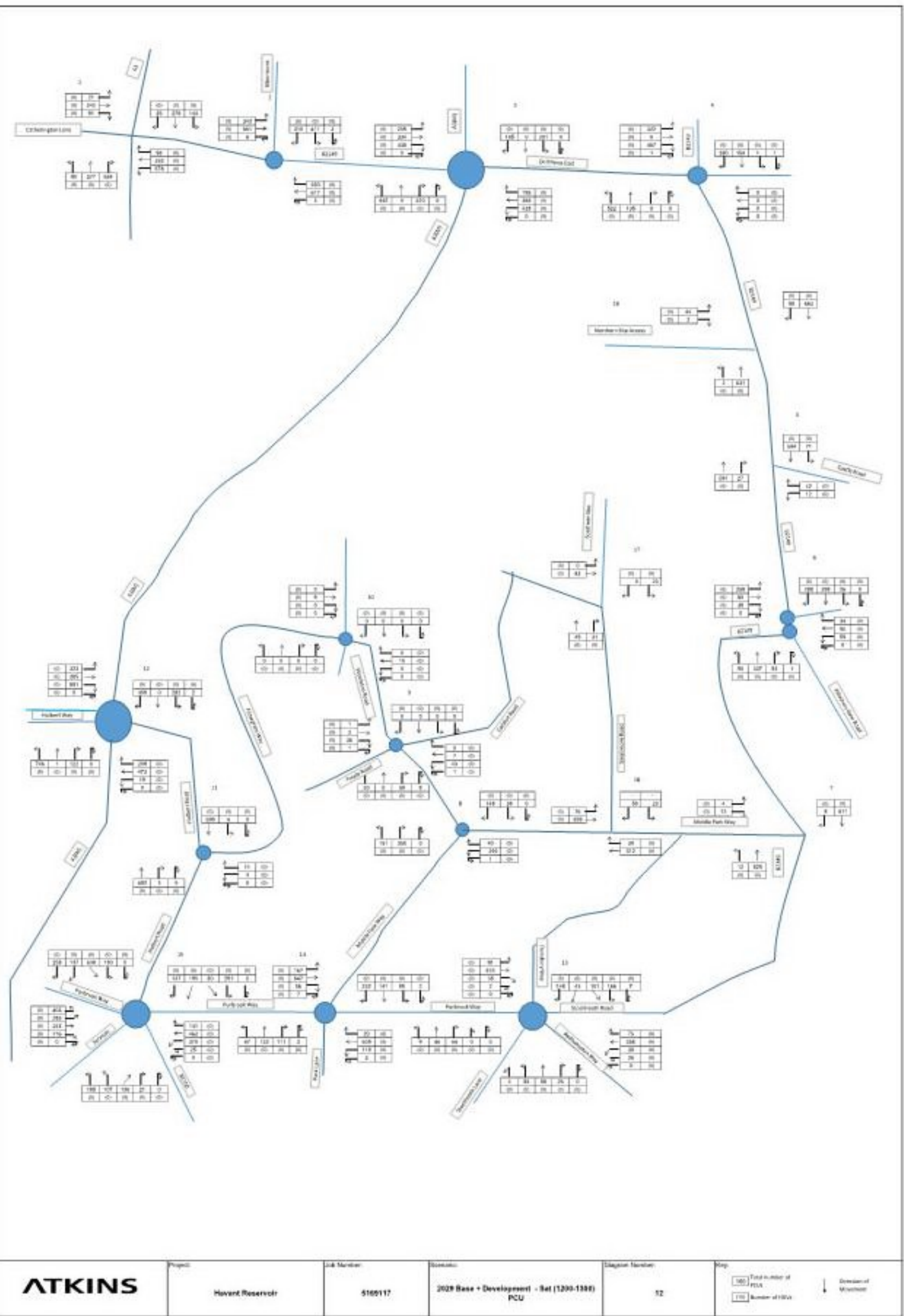


Department of
Microbiology





Dyckian pairs of
6-irreducibles



Appendix F. Junctions 9 Output

Junctions 9				
PICADY 9 - Priority Intersection Module				
Version: 9.5.0.6896 © Copyright TRL Limited, 2018				
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk				
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution				

Filename: Northern Site Access.B2419v2.j9

Path: P:\GBCFA\TP\KU\Projects\Development Planning\5169117 - Havant Reservoir - WILL6024\33_Analysis\Junction Analysis

Report generation date: 18/08/2020 11:50:23

»2029 Base + Dev, AM

»2029 Base + Dev, PM

»2029 Base + Dev, Sat

Summary of junction performance

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2029 Base + Dev									
Stream B-C	0.0	0.00	0.00	0.0	7.03	0.02	0.1	6.77	0.08
Stream B-A	0.0	0.00	0.00	0.0	0.00	0.00	0.0	17.46	0.01
Stream C-AB	0.0	7.72	0.01	0.0	7.89	0.02	0.1	7.91	0.12

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	09/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	WSATKINS\VAUG2614
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2029 Base + Dev	AM	ONE HOUR	07:45	09:15	15
D8	2029 Base + Dev	PM	ONE HOUR	16:45	18:15	15
D9	2029 Base + Dev	Sat	ONE HOUR	11:45	13:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2029 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		0.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	B2149 S		Major
B	Site Access		Minor
C	B2149 N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - B2149 N	7.00		✓	3.00	120.0	✓	4.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane plus flare	6.00	6.00	4.00	3.50	3.50	✓	1.00	120	120

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	578	0.101	0.255	0.160	0.364
1	B-C	699	0.103	0.259	-	-
1	C-B	699	0.259	0.259	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2029 Base + Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B2149 S		✓	805	100.000
B - Site Access		✓	1	100.000
C - B2149 N		✓	898	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	0	805
	B - Site Access	0	0	1
	C - B2149 N	895	3	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	0	0
	B - Site Access	0	0	0
	C - B2149 N	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.00	0.00	0.0	A
B-A	0.00	0.00	0.0	A
C-AB	0.01	7.72	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	542	0.000	0	0.0	0.000	A
B-A	0	315	0.000	0	0.0	0.000	A
C-AB	2	542	0.004	2	0.0	6.664	A
C-A	674			674			
AB	0			0			
AC	606			606			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	512	0.000	0	0.0	0.000	A
B-A	0	264	0.000	0	0.0	0.000	A
C-AB	3	512	0.005	3	0.0	7.069	A
C-A	805			805			
AB	0			0			
AC	724			724			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	470	0.000	0	0.0	0.000	A
B-A	0	193	0.000	0	0.0	0.000	A
C-AB	3	470	0.007	3	0.0	7.718	A
C-A	985			985			
AB	0			0			
AC	886			886			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	470	0.000	0	0.0	0.000	A
B-A	0	193	0.000	0	0.0	0.000	A
C-AB	3	470	0.007	3	0.0	7.718	A
C-A	985			985			
AB	0			0			
AC	886			886			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	512	0.000	0	0.0	0.000	A
B-A	0	264	0.000	0	0.0	0.000	A
C-AB	3	512	0.005	3	0.0	7.072	A
C-A	805			805			
AB	0			0			
AC	724			724			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	542	0.000	0	0.0	0.000	A
B-A	0	315	0.000	0	0.0	0.000	A
C-AB	2	542	0.004	2	0.0	6.667	A
C-A	674			674			
A-B	0			0			
A-C	606			606			

2029 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		0.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2029 Base + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B2149 S		✓	821	100.000
B - Site Access		✓	8	100.000
C - B2149 N		✓	875	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	0	821
	B - Site Access	0	0	8
	C - B2149 N	867	8	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	0	0
	B - Site Access	0	0	0
	C - B2149 N	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.03	0.0	A
B-A	0.00	0.00	0.0	A
C-AB	0.02	7.89	0.0	A
C-A				
AB				
AC				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	604	0.010	6	0.0	6.019	A
B-A	0	251	0.000	0	0.0	0.000	A
C-AB	6	539	0.011	6	0.0	6.750	A
C-A	653			653			
AB	0			0			
AC	618			618			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	569	0.013	7	0.0	6.404	A
B-A	0	210	0.000	0	0.0	0.000	A
C-AB	7	508	0.014	7	0.0	7.185	A
C-A	779			779			
AB	0			0			
AC	738			738			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	521	0.017	9	0.0	7.027	A
B-A	0	153	0.000	0	0.0	0.000	A
C-AB	9	465	0.019	9	0.0	7.888	A
C-A	955			955			
AB	0			0			
AC	904			904			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	521	0.017	9	0.0	7.027	A
B-A	0	153	0.000	0	0.0	0.000	A
C-AB	9	465	0.019	9	0.0	7.888	A
C-A	955			955			
AB	0			0			
AC	904			904			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	569	0.013	7	0.0	6.407	A
B-A	0	210	0.000	0	0.0	0.000	A
C-AB	7	508	0.014	7	0.0	7.185	A
C-A	779			779			
AB	0			0			
AC	738			738			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	604	0.010	6	0.0	6.021	A
B-A	0	251	0.000	0	0.0	0.000	A
C-AB	6	539	0.011	6	0.0	6.753	A
C-A	653			653			
AB	0			0			
AC	618			618			

2029 Base + Dev, Sat

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		0.57	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2029 Base + Dev	Sat	ONE HOUR	11:45	13:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B2149 S		✓	633	100.000
B - Site Access		✓	46	100.000
C - B2149 N		✓	721	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	2	631
	B - Site Access	2	0	44
	C - B2149 N	663	58	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - B2149 S	B - Site Access	C - B2149 N
From	A - B2149 S	0	0	0
	B - Site Access	0	0	0
	C - B2149 N	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	6.77	0.1	A
B-A	0.01	17.46	0.0	C
C-AB	0.12	7.91	0.1	A
C-A				
AB				
AC				

Main Results for each time segment

11:45 - 12:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	33	645	0.051	33	0.1	5.884	A
B-A	2	289	0.005	1	0.0	12.528	B
C-AB	44	576	0.076	43	0.1	6.754	A
C-A	499			499			
AB	2			2			
AC	475			475			

12:00 - 12:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	617	0.064	39	0.1	6.228	A
B-A	2	255	0.007	2	0.0	14.214	B
C-AB	52	552	0.094	52	0.1	7.200	A
C-A	596			596			
AB	2			2			
AC	567			567			

12:15 - 12:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	48	580	0.084	48	0.1	6.772	A
B-A	2	208	0.011	2	0.0	17.455	C
C-AB	64	519	0.123	64	0.1	7.905	A
C-A	730			730			
AB	2			2			
AC	695			695			

12:30 - 12:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	48	580	0.084	48	0.1	6.772	A
B-A	2	208	0.011	2	0.0	17.460	C
C-AB	64	519	0.123	64	0.1	7.910	A
C-A	730			730			
AB	2			2			
AC	695			695			

12:45 - 13:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	617	0.064	40	0.1	6.230	A
B-A	2	255	0.007	2	0.0	14.219	B
C-AB	52	552	0.094	52	0.1	7.207	A
C-A	596			596			
AB	2			2			
AC	567			567			

13:00 - 13:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	33	645	0.051	33	0.1	5.890	A
B-A	2	289	0.005	2	0.0	12.536	B
C-AB	44	576	0.076	44	0.1	6.767	A
C-A	499			499			
AB	2			2			
AC	475			475			

Junctions 9		
PICADY 9 - Priority Intersection Module		
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Filename: Southern Site Access.Swanmore Rdv2.j9

Path: P:\GBCFA\TP\KU\Projects\Development Planning\5169117 - Havant Reservoir - WILL6024\33_Analysis\Junction Analysis

Report generation date: 18/08/2020 15:17:54

»2029 Base + Dev, AM

»2029 Base + Dev, PM

»2029 Base + Dev, Sat

Summary of junction performance

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2029 Base + Dev								
Stream B-AC	0.0	0.00	0.00	0.0	5.48	0.01	0.0	5.53	0.03
Stream C-AB	0.0	5.60	0.00	0.0	5.40	0.01	0.1	5.89	0.05

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	09/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	WSATKINS\VAUG2614
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2029 Base + Dev	AM	FLAT	08:00	09:00	60	15
D8	2029 Base + Dev	PM	FLAT	17:00	18:00	60	15
D9	2029 Base + Dev	Sat	FLAT	12:00	13:00	60	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2029 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		0.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Swanmore Rd W		Major
B	Site Access		Minor
C	Swanmore Rd E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Swanmore Rd E	7.00			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane	3.50	60	60

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	553	0.096	0.244	0.153	0.348
1	B-C	695	0.102	0.258	-	-
1	C-B	632	0.234	0.234	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2029 Base + Dev	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Swanmore Rd W		✓	176	100.000
B - Site Access		✓	0	100.000
C - Swanmore Rd E		✓	84	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	176
	B - Site Access	0	0	0
	C - Swanmore Rd E	82	2	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	0
	B - Site Access	0	0	0
	C - Swanmore Rd E	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.00	5.60	0.0	A
C-A				
AB				
AC				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	563	0.000	0	0.0	0.000	A
C-AB	2	646	0.004	2	0.0	5.594	A
C-A	82			82			
A-B	0			0			
AC	176			176			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	563	0.000	0	0.0	0.000	A
C-AB	2	646	0.004	2	0.0	5.596	A
C-A	82			82			
A-B	0			0			
AC	176			176			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	563	0.000	0	0.0	0.000	A
C-AB	2	646	0.004	2	0.0	5.596	A
C-A	82			82			
A-B	0			0			
AC	176			176			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	563	0.000	0	0.0	0.000	A
C-AB	2	646	0.004	2	0.0	5.596	A
C-A	82			82			
A-B	0			0			
AC	176			176			

2029 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		0.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D8	2029 Base + Dev	PM	FLAT	17:00	18:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Swanmore Rd W		✓	134	100.000
B - Site Access		✓	4	100.000
C - Swanmore Rd E		✓	111	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	134
	B - Site Access	0	0	4
	C - Swanmore Rd E	107	4	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	0
	B - Site Access	0	0	0
	C - Swanmore Rd E	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.01	5.48	0.0	A
C-AB	0.01	5.40	0.0	A
C-A				
AB				
AC				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	4	660	0.006	4	0.0	5.484	A
C-AB	5	672	0.007	5	0.0	5.396	A
C-A	106			106			
AB	0			0			
AC	134			134			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	4	660	0.006	4	0.0	5.484	A
C-AB	5	672	0.007	5	0.0	5.396	A
C-A	106			106			
AB	0			0			
AC	134			134			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	4	660	0.006	4	0.0	5.484	A
C-AB	5	672	0.007	5	0.0	5.396	A
C-A	106			106			
AB	0			0			
AC	134			134			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	4	660	0.006	4	0.0	5.484	A
C-AB	5	672	0.007	5	0.0	5.398	A
C-A	106			106			
AB	0			0			
AC	134			134			

2029 Base + Dev, Sat

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Southern Site Access/Swanmore Rd	T-Junction	Two-way		1.75	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D9	2029 Base + Dev	Sat	FLAT	12:00	13:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Swanmore Rd W		✓	83	100.000
B - Site Access		✓	23	100.000
C - Swanmore Rd E		✓	80	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	83
	B - Site Access	0	0	23
	C - Swanmore Rd E	49	31	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Swanmore Rd W	B - Site Access	C - Swanmore Rd E
From	A - Swanmore Rd W	0	0	0
	B - Site Access	0	0	0
	C - Swanmore Rd E	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.03	5.53	0.0	A
C-AB	0.05	5.89	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

12:00 - 12:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	673	0.034	23	0.0	5.531	A
C-AB	34	645	0.052	33	0.1	5.886	A
C-A	46			46			
A-B	0			0			
A-C	83			83			

12:15 - 12:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	673	0.034	23	0.0	5.533	A
C-AB	34	645	0.052	34	0.1	5.889	A
C-A	46			46			
A-B	0			0			
A-C	83			83			

12:30 - 12:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	673	0.034	23	0.0	5.533	A
C-AB	34	645	0.052	34	0.1	5.889	A
C-A	46			46			
A-B	0			0			
A-C	83			83			

12:45 - 13:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	23	673	0.034	23	0.0	5.533	A
C-AB	34	645	0.052	34	0.1	5.892	A
C-A	46			46			
A-B	0			0			
A-C	83			83			

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Dell Piece East.B2419 Improved Hordean.j9

Path: P:\GBCFA\TP\KU\Projects\Development Planning\5169117 - Havant Reservoir - WILL6024\33_Analysis\Junction Analysis

Report generation date: 18/08/2020 15:35:11

«2020, AM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020									
1 - B2419	0.7	4.47	0.41	0.4	3.66	0.27	0.5	3.53	0.32
2 - Church Access	0.0	8.46	0.04	0.0	0.00	0.00	0.0	0.00	0.00
3 - B2419	0.6	3.30	0.36	0.5	3.02	0.34	0.4	2.93	0.31
4 - Hordean Employment Access	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00
5 - Dell Piece East	0.5	2.68	0.35	0.7	2.95	0.41	0.4	2.48	0.31
2029 Base									
1 - B2419	1.2	6.28	0.53	0.6	5.07	0.37	0.6	3.89	0.37
2 - Church Access	0.1	13.31	0.08	0.0	0.00	0.00	0.0	0.00	0.00
3 - B2419	1.5	5.41	0.60	0.9	3.84	0.48	0.5	3.17	0.35
4 - Hordean Employment Access	0.0	4.99	0.01	0.0	4.14	0.03	0.0	0.00	0.00
5 - Dell Piece East	0.9	3.32	0.47	1.5	4.39	0.60	0.5	2.64	0.34
2029 Base + Dev									
1 - B2419	1.1	6.19	0.53	0.6	5.02	0.37	0.6	4.03	0.38
2 - Church Access	0.1	13.38	0.08	0.0	0.00	0.00	0.0	0.00	0.00
3 - B2419	1.5	5.28	0.60	0.9	3.77	0.48	0.6	3.27	0.37
4 - Hordean Employment Access	0.0	5.01	0.02	0.0	4.07	0.03	0.0	0.00	0.00
5 - Dell Piece East	0.9	3.28	0.47	1.5	4.36	0.60	0.6	2.74	0.37

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	17/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	WSATKINS\VAUG2614
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2020	AM	FLAT	08:00	09:00	60	15

2020, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	5 - Dell Piece East - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Dell Piece East/B2419	Standard Roundabout		1, 2, 3, 4, 5	3.47	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	B2419	
2	Church Access	
3	B2419	
4	Hordean Employment Access	
5	Dell Piece East	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - B2419	3.10	8.26	23.6	15.9	52.0	37.5	
2 - Church Access	2.82	5.01	2.8	12.0	52.0	33.2	
3 - B2419	3.65	8.01	25.5	28.6	52.0	26.6	
4 - Hordean Employment Access	3.65	8.00	7.1	21.0	52.0	25.9	
5 - Dell Piece East	3.65	8.00	52.3	24.7	52.0	27.1	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B2419	0.605	1787
2 - Church Access	0.456	999
3 - B2419	0.665	2012
4 - Hordean Employment Access	0.581	1577
5 - Dell Piece East	0.696	2189

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - B2419		✓	579	100.000
2 - Church Access		✓	19	100.000
3 - B2419		✓	642	100.000
4 - Hordean Employment Access		✓	0	100.000
5 - Dell Piece East		✓	722	100.000

Origin-Destination Data

Demand (PCU/hr)

	To					
		1 - B2419	2 - Church Access	3 - B2419	4 - Hordean Employment Access	5 - Dell Piece East
From	1 - B2419	0	1	218	0	360
	2 - Church Access	3	0	0	0	16
	3 - B2419	0	0	141	0	501
	4 - Hordean Employment Access	0	0	0	0	0
	5 - Dell Piece East	221	5	496	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To					
		1 - B2419	2 - Church Access	3 - B2419	4 - Hordean Employment Access	5 - Dell Piece East
From	1 - B2419	0	0	2	0	2
	2 - Church Access	0	0	0	0	0
	3 - B2419	0	0	2	0	3
	4 - Hordean Employment Access	0	0	2	0	3
	5 - Dell Piece East	0	0	2	0	3

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - B2419	0.41	4.47	0.7	A
2 - Church Access	0.04	8.46	0.0	A
3 - B2419	0.36	3.30	0.6	A
4 - Hordean Employment Access	0.00	0.00	0.0	A
5 - Dell Piece East	0.35	2.68	0.5	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B2419	579	640	1400	0.413	576	0.7	4.431	A
2 - Church Access	19	1210	447	0.043	19	0.0	8.413	A
3 - B2419	642	377	1761	0.365	640	0.6	3.283	A
4 - Hordean Employment Access	0	1017	966	0.000	0	0.0	0.000	A
5 - Dell Piece East	722	143	2089	0.346	720	0.5	2.671	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B2419	579	642	1399	0.414	579	0.7	4.467	A
2 - Church Access	19	1215	444	0.043	19	0.0	8.463	A
3 - B2419	642	379	1760	0.365	642	0.6	3.300	A
4 - Hordean Employment Access	0	1021	984	0.000	0	0.0	0.000	A
5 - Dell Piece East	722	144	2088	0.346	722	0.5	2.678	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B2419	579	642	1399	0.414	579	0.7	4.467	A
2 - Church Access	19	1215	444	0.043	19	0.0	8.463	A
3 - B2419	642	379	1760	0.365	642	0.6	3.300	A
4 - Hordean Employment Access	0	1021	984	0.000	0	0.0	0.000	A
5 - Dell Piece East	722	144	2088	0.346	722	0.5	2.678	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B2419	579	642	1399	0.414	579	0.7	4.467	A
2 - Church Access	19	1215	444	0.043	19	0.0	8.463	A
3 - B2419	642	379	1760	0.365	642	0.6	3.300	A
4 - Hordean Employment Access	0	1021	984	0.000	0	0.0	0.000	A
5 - Dell Piece East	722	144	2088	0.346	722	0.5	2.678	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Middle Park Way.Woolston Roadv2.j9

Path: P:\GBCFA\TP\KU\Projects\Development Planning\5169117 - Havant Reservoir - WILL6024\33_Analysis\Junction Analysis

Report generation date: 18/08/2020 15:21:15

«2020 Base, AM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020 Base									
1 - Woolston Road	0.6	7.02	0.37	0.3	6.24	0.21	0.3	5.91	0.23
2 - Middle Park Way E	0.7	6.84	0.41	0.5	5.37	0.31	0.4	5.29	0.31
3 - Middle Park Way W	0.6	4.93	0.37	1.2	6.59	0.53	0.6	4.88	0.39
2029 Base									
1 - Woolston Road	0.7	7.70	0.42	0.3	6.74	0.25	0.4	6.40	0.27
2 - Middle Park Way E	0.9	7.46	0.47	0.5	5.57	0.35	0.5	5.70	0.35
3 - Middle Park Way W	0.7	5.18	0.41	1.5	7.53	0.60	0.8	5.31	0.43
2029 Base + Dev									
1 - Woolston Road	0.7	7.73	0.42	0.3	6.78	0.25	0.4	6.64	0.27
2 - Middle Park Way E	0.9	7.47	0.47	0.5	5.61	0.35	0.6	5.92	0.38
3 - Middle Park Way W	0.7	5.20	0.42	1.5	7.60	0.60	0.9	5.58	0.46

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	19/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	WSATKINS\VAUG2614
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2020 Base	AM	ONE HOUR	07:45	09:15	15

2020 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Woolston Road	Mini-roundabout		1, 2, 3	6.14	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Woolston Road	
2	Middle Park Way E	
3	Middle Park Way W	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Woolston Road	3.81	3.81	5.67	0.6	8.58	5.42	0.0	
2 - Middle Park Way E	3.34	3.34	4.06	27.1	11.03	13.65	0.0	
3 - Middle Park Way W	3.72	3.72	5.30	15.4	9.39	6.06	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Woolston Road	0.628	989
2 - Middle Park Way E	0.641	1079
3 - Middle Park Way W	0.663	1227

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Woolston Road		✓	274	100.000
2 - Middle Park Way E		✓	347	100.000
3 - Middle Park Way W		✓	399	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - Woolston Road	2 - Middle Park Way E	3 - Middle Park Way W
From	1 - Woolston Road	0	62	212
	2 - Middle Park Way E	49	0	298
	3 - Middle Park Way W	162	237	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1 - Woolston Road	2 - Middle Park Way E	3 - Middle Park Way W
From	1 - Woolston Road	0	4	2
	2 - Middle Park Way E	2	0	4
	3 - Middle Park Way W	2	3	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Woolston Road	0.37	7.02	0.6	A
2 - Middle Park Way E	0.41	6.84	0.7	A
3 - Middle Park Way W	0.37	4.93	0.6	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	206	178	878	0.235	205	0.3	5.454	A
2 - Middle Park Way E	261	159	977	0.267	260	0.4	5.206	A
3 - Middle Park Way W	300	37	1202	0.250	299	0.3	4.093	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	246	213	856	0.288	246	0.4	6.024	A
2 - Middle Park Way E	312	190	957	0.326	311	0.5	5.795	A
3 - Middle Park Way W	359	44	1198	0.300	358	0.4	4.410	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	302	261	826	0.365	301	0.6	6.997	A
2 - Middle Park Way E	382	233	930	0.411	381	0.7	6.812	A
3 - Middle Park Way W	439	54	1191	0.369	439	0.6	4.917	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	302	261	825	0.366	302	0.6	7.017	A
2 - Middle Park Way E	382	233	929	0.411	382	0.7	6.838	A
3 - Middle Park Way W	439	54	1191	0.369	439	0.6	4.925	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	246	213	855	0.288	247	0.4	6.049	A
2 - Middle Park Way E	312	191	956	0.326	313	0.5	5.824	A
3 - Middle Park Way W	359	44	1198	0.300	359	0.4	4.421	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Woolston Road	206	179	877	0.235	207	0.3	5.487	A
2 - Middle Park Way E	261	160	976	0.268	262	0.4	5.240	A
3 - Middle Park Way W	300	37	1202	0.250	301	0.3	4.109	A

Junctions 9

ARCADY 9 - Roundabout Module

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Filename: Purbrook Way Middle Park Wayv2.j9

Path: P:\GBCFA\TP\KU\Projects\Development Planning\5169117 - Havant Reservoir - WILL6024\33_Analysis\Junction Analysis

Report generation date: 18/08/2020 15:26:48

»2020 Base, AM
»2020 Base, PM
»2020 Base, Sat
»2029 Base, AM
»2029 Base, PM
»2029 Base, Sat
»2029 Base + Dev, AM
»2029 Base + Dev, PM
»2029 Base + Dev, Sat

Summary of junction performance

	AM			PM			Sat		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2020 Base									
1 - Middle Park Way	1.3	8.25	0.56	0.9	7.03	0.47	0.8	6.22	0.43
2 - Purbrook Way E	4.5	22.35	0.82	8.6	37.17	0.91	3.0	14.98	0.75
3 - Park Lane	0.7	8.51	0.40	1.2	11.95	0.56	0.6	7.59	0.38
4 - Purbrook Way W	2.5	10.64	0.71	4.0	16.43	0.81	2.1	9.16	0.68
2029 Base									
1 - Middle Park Way	2.0	11.47	0.67	1.2	8.94	0.55	1.0	7.65	0.51
2 - Purbrook Way E	15.0	68.92	0.95	35.7	121.36	1.04	5.9	27.18	0.87
3 - Park Lane	1.0	10.70	0.49	1.9	16.31	0.66	0.8	9.23	0.45
4 - Purbrook Way W	4.3	16.61	0.81	9.5	35.98	0.92	3.3	12.98	0.77
2029 Base + Dev									
1 - Middle Park Way	2.0	11.51	0.67	1.3	9.03	0.56	1.1	8.06	0.54
2 - Purbrook Way E	15.2	69.39	0.95	36.4	123.77	1.05	6.4	29.57	0.88
3 - Park Lane	1.0	10.71	0.49	1.9	16.42	0.66	0.8	9.52	0.46
4 - Purbrook Way W	4.4	16.76	0.81	9.9	37.21	0.93	3.8	14.69	0.80

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	19/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	WSATKINS\VAUG2614
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2020 Base	AM	FLAT	08:00	09:00	60	15
D2	2020 Base	PM	ONE HOUR	16:45	18:15		15
D3	2020 Base	Sat	ONE HOUR	11:45	13:15		15
D4	2029 Base	AM	FLAT	08:00	09:00	60	15
D5	2029 Base	PM	ONE HOUR	16:45	18:15		15
D6	2029 Base	Sat	ONE HOUR	11:45	13:15		15
D7	2029 Base + Dev	AM	FLAT	08:00	09:00	60	15
D8	2029 Base + Dev	PM	ONE HOUR	16:45	18:15		15
D9	2029 Base + Dev	Sat	ONE HOUR	11:45	13:15		15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2020 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	13.38	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Middle Park Way	
2	Purbrook Way E	
3	Park Lane	
4	Purbrook Way W	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Middle Park Way	4.95	4.95	0.0	19.9	50.0	35.0	
2 - Purbrook Way E	3.46	4.19	28.0	16.2	50.0	43.0	
3 - Park Lane	3.86	4.24	1.0	25.3	50.0	43.0	
4 - Purbrook Way W	3.93	4.78	27.3	25.0	50.0	44.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Middle Park Way	0.561	1473
2 - Purbrook Way E	0.494	1182
3 - Park Lane	0.500	1180
4 - Purbrook Way W	0.535	1370

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D1	2020 Base	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	567	100.000
2 - Purbrook Way E		✓	742	100.000
3 - Park Lane		✓	290	100.000
4 - Purbrook Way W		✓	854	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	100	184	281
	2 - Purbrook Way E	81	4	116	541
	3 - Park Lane	126	105	1	58
	4 - Purbrook Way W	141	623	83	7

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	50	1	1	3
	2 - Purbrook Way E	2	0	2	3
	3 - Park Lane	2	3	0	0
	4 - Purbrook Way W	6	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.56	8.25	1.3	A
2 - Purbrook Way E	0.82	22.35	4.5	C
3 - Park Lane	0.40	8.51	0.7	A
4 - Purbrook Way W	0.71	10.64	2.5	B

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	567	814	1017	0.557	562	1.3	7.983	A
2 - Purbrook Way E	742	553	908	0.817	726	4.1	18.813	C
3 - Park Lane	290	900	730	0.397	287	0.7	8.254	A
4 - Purbrook Way W	854	315	1201	0.711	844	2.4	10.047	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	567	823	1012	0.560	567	1.3	8.246	A
2 - Purbrook Way E	742	558	906	0.819	741	4.3	22.037	C
3 - Park Lane	290	915	722	0.402	290	0.7	8.496	A
4 - Purbrook Way W	854	319	1199	0.712	854	2.5	10.622	B

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	567	823	1012	0.560	567	1.3	8.251	A
2 - Purbrook Way E	742	558	906	0.819	742	4.4	22.264	C
3 - Park Lane	290	916	722	0.402	290	0.7	8.507	A
4 - Purbrook Way W	854	319	1199	0.712	854	2.5	10.638	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	567	823	1012	0.560	567	1.3	8.253	A
2 - Purbrook Way E	742	558	906	0.819	742	4.5	22.348	C
3 - Park Lane	290	916	722	0.402	290	0.7	8.508	A
4 - Purbrook Way W	854	319	1199	0.712	854	2.5	10.643	B

2020 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	21.21	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2020 Base	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	411	100.000
2 - Purbrook Way E		✓	813	100.000
3 - Park Lane		✓	346	100.000
4 - Purbrook Way W		✓	824	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	114	103	194
	2 - Purbrook Way E	113	0	113	587
	3 - Park Lane	178	120	3	45
	4 - Purbrook Way W	134	621	63	6

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	1	1	2
	2 - Purbrook Way E	0	0	2	1
	3 - Park Lane	1	3	33	0
	4 - Purbrook Way W	0	1	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.47	7.03	0.9	A
2 - Purbrook Way E	0.91	37.17	8.6	E
3 - Park Lane	0.56	11.95	1.2	B
4 - Purbrook Way W	0.81	16.43	4.0	C

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	309	608	1133	0.273	308	0.4	4.420	A
2 - Purbrook Way E	612	276	1045	0.586	606	1.4	8.207	A
3 - Park Lane	260	672	844	0.309	259	0.4	6.219	A
4 - Purbrook Way W	620	309	1204	0.515	616	1.1	6.144	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	369	728	1065	0.347	369	0.5	5.241	A
2 - Purbrook Way E	731	331	1018	0.718	727	2.5	12.320	B
3 - Park Lane	311	805	777	0.400	310	0.7	7.799	A
4 - Purbrook Way W	741	371	1171	0.632	738	1.7	8.352	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	453	887	976	0.464	451	0.9	6.942	A
2 - Purbrook Way E	895	405	982	0.912	875	7.6	29.557	D
3 - Park Lane	381	973	693	0.549	379	1.2	11.521	B
4 - Purbrook Way W	907	451	1128	0.804	899	3.8	15.302	C

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	453	894	972	0.466	452	0.9	7.030	A
2 - Purbrook Way E	895	406	981	0.913	891	8.6	37.172	E
3 - Park Lane	381	987	686	0.555	381	1.2	11.951	B
4 - Purbrook Way W	907	455	1126	0.806	907	4.0	16.433	C

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	369	739	1059	0.349	371	0.5	5.317	A
2 - Purbrook Way E	731	333	1017	0.719	755	2.7	15.014	C
3 - Park Lane	311	830	765	0.407	313	0.7	8.122	A
4 - Purbrook Way W	741	377	1168	0.634	750	1.8	8.876	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	309	615	1129	0.274	310	0.4	4.465	A
2 - Purbrook Way E	612	279	1044	0.586	617	1.5	8.633	A
3 - Park Lane	260	682	839	0.311	261	0.5	6.332	A
4 - Purbrook Way W	620	313	1202	0.516	623	1.1	6.315	A

2020 Base , Sat

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	10.27	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2020 Base	Sat	ONE HOUR	11:45	13:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	400	100.000
2 - Purbrook Way E		✓	669	100.000
3 - Park Lane		✓	262	100.000
4 - Purbrook Way W		✓	755	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	85	126	187
	2 - Purbrook Way E	18	2	106	543
	3 - Park Lane	118	99	3	42
	4 - Purbrook Way W	122	577	50	6

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	0	0	0
	2 - Purbrook Way E	1	0	2	1
	3 - Park Lane	0	0	0	0
	4 - Purbrook Way W	0	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.43	6.22	0.8	A
2 - Purbrook Way E	0.75	14.98	3.0	B
3 - Park Lane	0.38	7.59	0.6	A
4 - Purbrook Way W	0.68	9.16	2.1	A

Main Results for each time segment

11:45 - 12:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	301	552	1164	0.259	300	0.3	4.158	A
2 - Purbrook Way E	504	280	1043	0.483	500	0.9	6.653	A
3 - Park Lane	197	567	896	0.220	196	0.3	5.133	A
4 - Purbrook Way W	568	181	1273	0.447	565	0.8	5.110	A

12:00 - 12:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	360	661	1103	0.326	359	0.5	4.837	A
2 - Purbrook Way E	601	336	1016	0.592	599	1.4	8.694	A
3 - Park Lane	236	679	840	0.280	235	0.4	5.948	A
4 - Purbrook Way W	679	217	1254	0.541	677	1.2	6.284	A

12:15 - 12:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	440	808	1020	0.432	439	0.8	6.184	A
2 - Purbrook Way E	737	411	979	0.753	731	2.9	14.338	B
3 - Park Lane	288	829	765	0.377	288	0.6	7.524	A
4 - Purbrook Way W	831	266	1228	0.677	828	2.1	8.998	A

12:30 - 12:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	440	811	1019	0.432	440	0.8	6.225	A
2 - Purbrook Way E	737	412	978	0.753	736	3.0	14.979	B
3 - Park Lane	288	834	763	0.378	288	0.6	7.592	A
4 - Purbrook Way W	831	266	1227	0.677	831	2.1	9.160	A

12:45 - 13:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	360	666	1100	0.327	361	0.5	4.874	A
2 - Purbrook Way E	601	337	1015	0.593	607	1.5	9.051	A
3 - Park Lane	236	687	836	0.282	236	0.4	6.011	A
4 - Purbrook Way W	679	218	1253	0.542	682	1.2	6.403	A

13:00 - 13:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	301	556	1162	0.259	302	0.4	4.188	A
2 - Purbrook Way E	504	282	1042	0.483	506	1.0	6.812	A
3 - Park Lane	197	573	893	0.221	198	0.3	5.177	A
4 - Purbrook Way W	568	183	1272	0.447	570	0.8	5.183	A

2029 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	30.54	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2029 Base	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	636	100.000
2 - Purbrook Way E		✓	832	100.000
3 - Park Lane		✓	325	100.000
4 - Purbrook Way W		✓	958	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	112	207	315
	2 - Purbrook Way E	91	4	130	607
	3 - Park Lane	141	118	1	65
	4 - Purbrook Way W	158	699	93	8

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	50	1	1	3
	2 - Purbrook Way E	2	0	2	3
	3 - Park Lane	2	3	0	0
	4 - Purbrook Way W	6	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.67	11.47	2.0	B
2 - Purbrook Way E	0.95	68.92	15.0	F
3 - Park Lane	0.49	10.70	1.0	B
4 - Purbrook Way W	0.81	16.61	4.3	C

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	636	908	964	0.660	628	1.9	10.710	B
2 - Purbrook Way E	832	618	876	0.949	793	9.8	35.295	E
3 - Park Lane	325	990	685	0.475	321	0.9	10.008	B
4 - Purbrook Way W	958	350	1183	0.810	942	4.0	14.486	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	636	922	956	0.665	636	2.0	11.438	B
2 - Purbrook Way E	832	626	872	0.954	821	12.5	57.093	F
3 - Park Lane	325	1018	671	0.484	325	0.9	10.600	B
4 - Purbrook Way W	958	356	1179	0.812	957	4.2	16.440	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	636	923	956	0.665	636	2.0	11.466	B
2 - Purbrook Way E	832	626	872	0.954	826	14.0	64.447	F
3 - Park Lane	325	1022	669	0.486	325	1.0	10.669	B
4 - Purbrook Way W	958	356	1179	0.812	958	4.3	16.568	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	636	923	956	0.665	636	2.0	11.473	B
2 - Purbrook Way E	832	626	872	0.954	828	15.0	68.920	F
3 - Park Lane	325	1023	668	0.487	325	1.0	10.698	B
4 - Purbrook Way W	958	357	1179	0.813	958	4.3	16.609	C

2029 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	57.49	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2029 Base	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	460	100.000
2 - Purbrook Way E		✓	909	100.000
3 - Park Lane		✓	386	100.000
4 - Purbrook Way W		✓	922	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	128	115	217
	2 - Purbrook Way E	126	0	126	657
	3 - Park Lane	199	134	3	50
	4 - Purbrook Way W	150	695	70	7

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	1	1	2
	2 - Purbrook Way E	0	0	2	1
	3 - Park Lane	1	3	33	0
	4 - Purbrook Way W	0	1	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.55	8.94	1.2	A
2 - Purbrook Way E	1.04	121.36	35.7	F
3 - Park Lane	0.66	16.31	1.9	C
4 - Purbrook Way W	0.92	35.98	9.5	E

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	346	679	1093	0.317	344	0.5	4.869	A
2 - Purbrook Way E	684	308	1029	0.665	677	1.9	10.101	B
3 - Park Lane	291	751	804	0.361	288	0.6	7.066	A
4 - Purbrook Way W	694	345	1185	0.586	689	1.4	7.246	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	414	813	1018	0.406	413	0.7	6.029	A
2 - Purbrook Way E	817	369	999	0.818	809	4.1	18.275	C
3 - Park Lane	347	897	731	0.475	346	0.9	9.472	A
4 - Purbrook Way W	829	413	1149	0.722	824	2.5	11.045	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	506	980	924	0.548	504	1.2	8.667	A
2 - Purbrook Way E	1001	450	959	1.043	928	22.3	64.964	F
3 - Park Lane	425	1045	657	0.647	421	1.8	15.311	C
4 - Purbrook Way W	1015	496	1105	0.919	992	8.2	27.951	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	506	996	915	0.554	506	1.2	8.937	A
2 - Purbrook Way E	1001	453	958	1.045	947	35.7	121.361	F
3 - Park Lane	425	1063	648	0.655	425	1.9	16.312	C
4 - Purbrook Way W	1015	501	1102	0.921	1010	9.5	35.983	E

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	414	841	1002	0.413	416	0.7	6.247	A
2 - Purbrook Way E	817	374	997	0.820	937	5.7	73.620	F
3 - Park Lane	347	1010	675	0.514	350	1.1	11.380	B
4 - Purbrook Way W	829	435	1137	0.729	855	2.8	13.985	B

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	346	690	1087	0.319	347	0.5	4.947	A
2 - Purbrook Way E	684	311	1028	0.666	699	2.1	11.510	B
3 - Park Lane	291	771	794	0.366	293	0.6	7.334	A
4 - Purbrook Way W	694	352	1182	0.587	700	1.5	7.622	A

2029 Base, Sat

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	16.05	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2029 Base	Sat	ONE HOUR	11:45	13:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	448	100.000
2 - Purbrook Way E		✓	750	100.000
3 - Park Lane		✓	293	100.000
4 - Purbrook Way W		✓	847	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	95	141	210
	2 - Purbrook Way E	20	2	119	609
	3 - Park Lane	132	111	3	47
	4 - Purbrook Way W	137	647	56	7

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	0	0	0
	2 - Purbrook Way E	1	0	2	1
	3 - Park Lane	0	0	0	0
	4 - Purbrook Way W	0	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.51	7.65	1.0	A
2 - Purbrook Way E	0.87	27.18	5.9	D
3 - Park Lane	0.45	9.23	0.8	A
4 - Purbrook Way W	0.77	12.98	3.3	B

Main Results for each time segment

11:45 - 12:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	337	618	1127	0.299	336	0.4	4.540	A
2 - Purbrook Way E	565	314	1027	0.550	560	1.2	7.723	A
3 - Park Lane	221	635	862	0.256	219	0.3	5.588	A
4 - Purbrook Way W	638	202	1262	0.505	634	1.0	5.743	A

12:00 - 12:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	403	740	1058	0.381	402	0.6	5.479	A
2 - Purbrook Way E	674	376	996	0.677	671	2.0	11.088	B
3 - Park Lane	263	761	799	0.330	263	0.5	6.704	A
4 - Purbrook Way W	761	242	1240	0.614	759	1.6	7.513	A

12:15 - 12:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	493	904	967	0.510	492	1.0	7.548	A
2 - Purbrook Way E	826	460	955	0.865	812	5.4	23.586	C
3 - Park Lane	323	924	718	0.449	321	0.8	9.049	A
4 - Purbrook Way W	933	296	1211	0.770	926	3.2	12.442	B

12:30 - 12:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	493	909	964	0.512	493	1.0	7.646	A
2 - Purbrook Way E	826	461	954	0.866	824	5.9	27.184	D
3 - Park Lane	323	934	713	0.453	323	0.8	9.228	A
4 - Purbrook Way W	933	297	1211	0.770	932	3.3	12.984	B

12:45 - 13:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	403	749	1054	0.382	404	0.6	5.556	A
2 - Purbrook Way E	674	378	995	0.678	689	2.2	12.442	B
3 - Park Lane	263	777	791	0.333	265	0.5	6.854	A
4 - Purbrook Way W	761	244	1239	0.615	768	1.6	7.808	A

13:00 - 13:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	337	624	1124	0.300	338	0.4	4.588	A
2 - Purbrook Way E	565	316	1025	0.551	568	1.3	8.034	A
3 - Park Lane	221	643	858	0.257	221	0.3	5.658	A
4 - Purbrook Way W	638	204	1261	0.506	640	1.0	5.873	A

2029 Base + Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	30.73	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D7	2029 Base + Dev	AM	FLAT	08:00	09:00	60	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	637	100.000
2 - Purbrook Way E		✓	832	100.000
3 - Park Lane		✓	325	100.000
4 - Purbrook Way W		✓	960	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	112	207	316
	2 - Purbrook Way E	91	4	130	607
	3 - Park Lane	141	118	1	65
	4 - Purbrook Way W	160	699	93	8

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	50	1	1	3
	2 - Purbrook Way E	2	0	2	3
	3 - Park Lane	2	3	0	0
	4 - Purbrook Way W	6	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.67	11.51	2.0	B
2 - Purbrook Way E	0.95	69.39	15.2	F
3 - Park Lane	0.49	10.71	1.0	B
4 - Purbrook Way W	0.81	16.76	4.4	C

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	637	908	964	0.661	629	1.9	10.737	B
2 - Purbrook Way E	832	619	876	0.950	793	9.8	35.399	E
3 - Park Lane	325	991	684	0.475	321	0.9	10.020	B
4 - Purbrook Way W	960	350	1183	0.812	944	4.0	14.586	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	637	922	956	0.666	637	2.0	11.471	B
2 - Purbrook Way E	832	627	872	0.954	821	12.5	57.371	F
3 - Park Lane	325	1019	670	0.485	325	0.9	10.613	B
4 - Purbrook Way W	960	356	1179	0.814	959	4.3	16.584	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	637	923	956	0.666	637	2.0	11.502	B
2 - Purbrook Way E	832	627	872	0.954	826	14.1	64.831	F
3 - Park Lane	325	1023	668	0.486	325	1.0	10.683	B
4 - Purbrook Way W	960	356	1179	0.814	960	4.3	16.712	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	637	923	956	0.666	637	2.0	11.509	B
2 - Purbrook Way E	832	627	872	0.954	828	15.2	69.386	F
3 - Park Lane	325	1024	667	0.487	325	1.0	10.713	B
4 - Purbrook Way W	960	357	1179	0.814	960	4.4	16.760	C

2029 Base + Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	58.66	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
DB	2029 Base + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	464	100.000
2 - Purbrook Way E		✓	909	100.000
3 - Park Lane		✓	386	100.000
4 - Purbrook Way W		✓	926	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	128	115	221
	2 - Purbrook Way E	126	0	126	657
	3 - Park Lane	199	134	3	50
	4 - Purbrook Way W	154	695	70	7

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	1	1	2
	2 - Purbrook Way E	0	0	2	1
	3 - Park Lane	1	3	33	0
	4 - Purbrook Way W	0	1	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.56	9.03	1.3	A
2 - Purbrook Way E	1.05	123.77	36.4	F
3 - Park Lane	0.66	16.42	1.9	C
4 - Purbrook Way W	0.93	37.21	9.9	E

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	349	679	1093	0.320	347	0.5	4.889	A
2 - Purbrook Way E	684	311	1028	0.666	677	1.9	10.140	B
3 - Park Lane	291	753	803	0.362	288	0.6	7.086	A
4 - Purbrook Way W	697	345	1185	0.588	691	1.4	7.277	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	417	813	1018	0.410	416	0.7	6.065	A
2 - Purbrook Way E	817	373	997	0.819	808	4.1	18.420	C
3 - Park Lane	347	901	729	0.476	346	0.9	9.514	A
4 - Purbrook Way W	832	413	1149	0.725	828	2.5	11.161	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	511	980	924	0.553	509	1.2	8.748	A
2 - Purbrook Way E	1001	454	957	1.046	927	22.7	65.872	F
3 - Park Lane	425	1048	656	0.648	421	1.8	15.409	C
4 - Purbrook Way W	1020	495	1105	0.923	996	8.5	28.605	D

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	511	996	915	0.558	511	1.3	9.029	A
2 - Purbrook Way E	1001	457	956	1.047	946	36.4	123.771	F
3 - Park Lane	425	1066	647	0.657	425	1.9	16.419	C
4 - Purbrook Way W	1020	501	1102	0.925	1014	9.9	37.212	E

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	417	841	1002	0.416	419	0.7	6.293	A
2 - Purbrook Way E	817	378	995	0.821	940	5.9	76.601	F
3 - Park Lane	347	1015	672	0.516	350	1.1	11.486	B
4 - Purbrook Way W	832	435	1137	0.732	860	2.9	14.313	B

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	349	690	1087	0.321	350	0.5	4.968	A
2 - Purbrook Way E	684	314	1026	0.667	699	2.1	11.601	B
3 - Park Lane	291	775	792	0.367	293	0.6	7.358	A
4 - Purbrook Way W	697	352	1182	0.590	703	1.5	7.673	A

2029 Base + Dev, Sat

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Middle Park Way/Purbrook Way	Standard Roundabout		1, 2, 3, 4	17.42	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2029 Base + Dev	Sat	ONE HOUR	11:45	13:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Middle Park Way		✓	470	100.000
2 - Purbrook Way E		✓	750	100.000
3 - Park Lane		✓	293	100.000
4 - Purbrook Way W		✓	877	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	2	95	141	232
	2 - Purbrook Way E	20	2	119	609
	3 - Park Lane	132	111	3	47
	4 - Purbrook Way W	167	647	56	7

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1 - Middle Park Way	2 - Purbrook Way E	3 - Park Lane	4 - Purbrook Way W
	1 - Middle Park Way	0	0	0	0
	2 - Purbrook Way E	1	0	2	1
	3 - Park Lane	0	0	0	0
	4 - Purbrook Way W	0	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1 - Middle Park Way	0.54	8.06	1.1	A
2 - Purbrook Way E	0.88	29.57	6.4	D
3 - Park Lane	0.46	9.52	0.8	A
4 - Purbrook Way W	0.80	14.69	3.8	B

Main Results for each time segment

11:45 - 12:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	354	618	1127	0.314	352	0.5	4.635	A
2 - Purbrook Way E	565	330	1018	0.554	560	1.2	7.855	A
3 - Park Lane	221	651	854	0.258	219	0.3	5.658	A
4 - Purbrook Way W	660	202	1262	0.523	656	1.1	5.948	A

12:00 - 12:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	423	740	1058	0.399	422	0.7	5.647	A
2 - Purbrook Way E	674	396	986	0.684	671	2.1	11.415	B
3 - Park Lane	263	781	789	0.334	263	0.5	6.829	A
4 - Purbrook Way W	788	242	1240	0.636	786	1.7	7.942	A

12:15 - 12:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	517	903	967	0.535	516	1.1	7.933	A
2 - Purbrook Way E	826	483	943	0.876	811	5.8	25.157	D
3 - Park Lane	323	947	706	0.457	321	0.8	9.314	A
4 - Purbrook Way W	966	296	1211	0.797	958	3.7	13.879	B

12:30 - 12:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	517	909	964	0.537	517	1.1	8.061	A
2 - Purbrook Way E	826	485	942	0.877	824	6.4	29.574	D
3 - Park Lane	323	958	701	0.460	323	0.8	9.519	A
4 - Purbrook Way W	966	297	1211	0.798	965	3.8	14.686	B

12:45 - 13:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	423	750	1053	0.401	424	0.7	5.743	A
2 - Purbrook Way E	674	399	985	0.685	691	2.3	13.015	B
3 - Park Lane	263	799	780	0.338	265	0.5	7.001	A
4 - Purbrook Way W	788	244	1239	0.636	796	1.8	8.344	A

13:00 - 13:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Middle Park Way	354	624	1123	0.315	355	0.5	4.687	A
2 - Purbrook Way E	565	333	1017	0.555	569	1.3	8.190	A
3 - Park Lane	221	660	850	0.260	221	0.4	5.734	A
4 - Purbrook Way W	660	204	1261	0.524	663	1.1	6.101	A



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