



Transport Statement

Project: Land West of Arundel Road,
Angmering

Client: Redrow Homes

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EXECUTIVE SUMMARY

This Transport Statement has been prepared for a proposed development in Angmering, Arun. The development will comprise 160 dwellings and 1,393sqm of commercial/employment land use (Class E) on land to the west of Arundel Road, Angmering. An outline planning application with the reference A/122/19/OUT was submitted to Arun District Council in September 2019 and approved with some matters reserved in March 2020.

This Transport Statement will accompany a hybrid planning application – with full planning permission sought for the residential element of the site and outline planning application for the other land uses.

A previous Transport Statement relating to this site was issued to support application A/122/19/OUT in August 2019. This Transport Statement makes use of the information and data available within the CTS Transport Statement, where relevant and appropriate.

This Transport Statement presents a review of national and local policy documents. This includes The National Planning Policy Framework (2021), Arun District Local Plan 2011-2031 (2018) and the West Sussex Transport Plan 2011 – 2026 (2011) (LTP3). and. The Arun District Council Parking Standards Supplementary Planning Document (SPD) (2020) has also been reviewed.

A review of both the site access arrangements and the internal site layout is presented within this Transport Statement. A new access will be constructed on Arundel Road, towards the northern boundary of the site, which will serve the residential dwellings. The access was approved within the outline consent and has since been submitted for technical approval under a Section 278 agreement.

An existing site access towards the southern boundary will be upgraded under the proposals and will serve the Class E land use. A Section 73 application was submitted to Arun District Council to amend the general arrangement of the access and was approved in November 2021.

The internal layout of the residential aspect of the site, which is seeking full planning approval, has been reviewed within this Transport Statement. Matters which have been reviewed include junction and forward visibility splays, highway geometry and parking provision.

Swept path analysis has been carried out for both a refuse vehicle and a fire tender, with the layout meeting all requirements for refuse carry distances, reverse distances and fire tender hose distances.

This Transport Statement also sets out the trip rates and trip generation associated with the proposed development. Given that the quantum of development which was approved under the outline scheme has not changed, this TS has reviewed the approved trip dates and trip generation and has also undertaken a sensitivity test using up to date trip rates from the TRICS database.

The trips generated by the proposed development are not expected to have a detrimental impact on the safety and operation of the surrounding highway network.

A Highway Impact Assessment was previously carried out for the proposed development within the Transport Assessment for the outline scheme. The results of each of the junction models are presented within this Transport Statement for completeness. The highway Impact assessment concluded that key intersections in the vicinity of the development would continue to operate in a similar manner to the base situation when development trips are added to the network.

The Transport Statement concludes that the proposals will not generate unacceptable impacts on highways safety or capacity, the two grounds for which a recommendation for refusal is warranted under paragraph 111 of the NPPF (2021).

1 INTRODUCTION

1.1 Introduction

- 1.1.1 JNP have been appointed by Redrow Homes to prepare a Transport Statement (TS) in support of the construction of 160 dwellings and 1,393sqm of commercial/employment land on land to the west of Arundel Road, Angmering.
- 1.1.2 An outline planning application (ref. A/122/19/OUT) with some matters reserved was submitted to Arun District Council in September 2019. The application was approved with conditions in March 2020. A Transport Assessment and Residential Travel Plan were prepared by Croft Transport Solutions (CTS) and submitted in support of the application. No objections were raised by the Local Highway Authority at West Sussex County Council (WSCC).
- 1.1.3 Subsequent to the outline consent being granted, the site has been acquired by Redrow Homes, who are seeking to submit a hybrid planning application for the development proposals to the Local Planning Authority (LPA) at Arun District Council. Under the hybrid application, the residential element of the scheme is seeking full planning permission and the commercial elements are seeking outline planning permission. No changes are proposed to the quantum of development which was proposed and approved under the outline scheme.
- 1.1.4 The site will be served by two points of access from Arundel Road, with the north access serving the residential portion of the site and the south access connecting to the commercial/industrial land use. The commercial/employment access is an existing access route into the site and will be upgraded under the proposals. Both access points were approved under the outline scheme (A/122/19/OUT).
- 1.1.5 The residential access to the north was submitted as part of a Section 278 application for technical approval. Variations to the general arrangement of the commercial access have been submitted by Gladman Developments Ltd under application A/207/21/PL to Arun District Council. The application was approved with conditions on 23rd November 2021.
- 1.1.6 Off-site highway improvements in the form of a new signalised crossing on Arundel Road, to the south of the development, will also be provided. Matters relating to the site access arrangements are discussed further in Section 4 of this report.
- 1.1.7 The location of the site is shown below as Figure 1.1 and the proposed layout of the development is provided at the rear of this report.

Figure 1.1 - Site Location



- 1.1.8 As per the outline scheme, the proposed development includes the construction of 160 dwellings and 1,393 square metres (sqm) of Class E commercial units with associated parking provision. Several existing commercial units on site will be demolished under the proposals.

1.2 Planning History

- 1.2.1 In March 2018, an outline planning application (ref. A/36/18/OUT) for the erection of up to 200 dwellings with access, public open space, sustainable drainage systems and one full-sized adult football pitch was submitted to ADC by Gladman Developments. The application was supported by Croft Transport Solutions who prepared a TS (along with supplementary documents and addendums to support the TS), a Travel Plan and site access proposals. The application was refused in September 2018 by Arun District Council.
- 1.2.2 The proposed development was adapted to better accord with the council's development aspirations under the local plan. A new outline planning application (ref. A/122/19/OUT) was submitted in September 2019.
- 1.2.3 Changes to the proposed development include a reduction in the number of residential dwellings (from 200 dwellings to 160 dwellings) and the specification of 1,393sqm of Class E commercial units with associated parking. A Transport Assessment and Travel Plan was submitted by CTS in support of the proposals. Application A/122/19/OUT was approved with conditions by Arun District Council in March 2020.
- 1.2.4 A summary of the planning history for the site is detailed below in Table 1.1.

Table 1.1 - Summary of Site Planning History

Planning Application Reference	Description	Status
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A/36/18/OUT	Outline planning application with some matters reserved for the erection of up to 200 dwellings with access, public open space, landscaping and sustainable drainage system (SuDS) with vehicular access point from Arundel Road, one full-sized adult football pitch and the demolition of industrial units and one residential dwelling. Departure from the Development Plan.	Refused (07/09/2018)
A/122/19/OUT	Outline application with some matters reserved for the erection of up to 160 dwellings with public open space, landscaping and sustainable drainage systems (SuDs), vehicular access point from Arundel Road; together with up to 1,393 square metres (15,000 square feet) of B1/B2 units with associated parking provision and vehicular access point from Arundel Road and land made available for expansion of current sports pitch provision (following the demolition of existing commercial units and one bungalow) (re-submission following A/36/18/OUT). This application is a Departure from the Development Plan.	App Cond with S106 (31/03/2020)
A/207/21/PL	Variation of condition following grant of A/122/19/OUT relating to Conditions Nos 4 - approved plans and 16 - vehicular access.	Granted (November 2021)
A/235/21/DOC	Approval of details reserved by condition imposed under A/122/19/OUT relating to condition 5-design code master plan.	Pending consideration (as of November 2021)

- 1.2.5 In addition to the above, a Section 278 application has also been submitted to WSCC to gain technical approval for the off-site highway works for the access junction to the residential portion of the site. At the time of this TS being prepared, the Section 278 application was under consideration by WSCC.

1.3 Report Structure

- 1.3.1 This TS builds on the previous TS which was prepared by Croft Transport Solutions (CTS) in support of the outline application. Following this introductory section, the Transport Statement is structured as follows:

- **Section 2 – Policy and Good Practice Guidance:** This section summarises policy and good practice relevant to the development proposals.
- **Section 3 – Baseline Conditions:** This section examines the existing opportunities to access the site by a variety of means and also assesses road safety records.
- **Section 4 – Development Proposals:** This section describes the proposed residential development, focusing on vehicular and pedestrian access arrangements.

- **Section 5 – Trip Generation and Modal Split:** This section quantifies the likely trip generation arising from the site and provides a modal split of travel methods based on 2011 census data.
- **Section 6 – Highway Impact Assessment:** This section describes the assessment scenarios and provides background on the junction models prepared before reporting on the highway capacity implications of development.
- **Section 7 – Summary and Conclusions:** This section concludes the report and summarises its findings.

2 POLICY AND GOOD PRACTICE GUIDANCE

2.1 Introduction

- 2.1.1 The following policy and guidance documents have been reviewed within the Transport Statement:

National Policy and Guidance

- National Planning Policy Framework (NPPF), 2021;
- Planning Practice Guidance (PPG), 2014; and
- Local Transport Note 1/20 – Cycle Infrastructure Design, 2020.

Local Policy and Guidance

- Arun District Local Plan 2011-2031 (2018);
- West Sussex Transport Plan 2011 – 2026 (2011) (LTP3);
- West Sussex County Council Guidance on Parking at New Developments (2020); and
- Arun District Council Parking Standards Supplementary Planning Document (SPD) (2020).

2.2 National Planning Policy Framework, July 2021

- 2.2.1 The Ministry of Housing, Communities and Local Government published the revised NPPF in July 2021, which replaces the previous versions of NPPF published in 2012, 2018 and 2019.
- 2.2.2 It revokes and replaces the previous system of Planning Policy Guidance Notes and Planning Policy Statements, all of which are superseded by NPPF except the Waste Policies. The NPPF should be consulted and considered when local plans are drawn up and it is also an important part of the planning decision making process. The revised versions of NPPF implement around 85 reforms, which were announced within the Housing White Paper and consultation regarding planning for the right homes in the right places.
- 2.2.3 The July 2021 revisions to the NPPF place a greater emphasis on beauty, place-making, the environment, sustainable development and underlines the importance of local design codes. The revised Framework implores Local Authorities to provide maximum clarity about design expectations at an early stage, including through the preparation of design guides or codes. This reflects the principles set out within the National Design Guide and National Model Design Code.
- 2.2.4 National Planning Policy reflects and responds to growing concerns over environmental issues and a greater public awareness of the problems associated with unrestrained car use. Current policies place a greater emphasis on increasing accessibility by more sustainable modes, such as walking, cycling and public transport. The NPPF also states that sustainable developments are more favourable, and this approach should be reflected by local planning authorities in their local plans and the decision-making process.
- 2.2.5 Paragraph 104 of the NPPF states that transport should be considered from the earliest stages of plan making so that:

- *'The potential impacts of development on transport networks can be addressed;*
- *Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*
- *Opportunities to promote walking, cycling and public transport use are identified and pursued;*
- *The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- *Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.'*

2.2.6 Paragraph 105 goes on to state that *'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help reduce congestion and emissions and improve air quality and public health'.*

2.2.7 Paragraph 110 of NPPF provides information on the transport considerations that should be given in determining applications for development. These are as follows:

- *'Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the development type and its location;*
- *Safe and suitable access to the site can be achieved for all users;*
- *The design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National design Guide and the National Model Design Code; and*
- *Any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.'*

2.2.8 Paragraph 111 states that *'development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.'*

2.2.9 Paragraph 113 states that all developments which will generate significant amounts of movement must be supported by a Travel Plan and a Transport Statement / Transport Assessment so that the cumulative impacts of the proposal can be assessed.

2.3 Planning Practice Guidance, March 2014

2.3.1 Planning Practice Guidance provides advice on when Transport Assessments and Transport Statements are required, as well as the information they should contain.

2.3.2 Paragraph 15 of 'Planning Practice Guidance on Travel Plans, Transport Assessments and Statements' presents the level of detail that a Transport Assessment must go to and what must be included. The following criteria are necessary:

- Information about the proposed development, site layout (particularly proposed transport access and layout across all modes of transport);
- Information about neighbouring uses, amenity and character, existing functional classification of the nearby road network;
- Data about existing public transport provision, including provision/frequency of services and proposed public transport changes;
- A qualitative and quantitative description of the travel characteristics of the proposed development, including movements across all modes of transport that would result from the development and near the site;
- An assessment of trips from all directly relevant committed development in the area (i.e. development that there is a reasonable degree of certainty will proceed within the next three years);
- Data about current traffic flows on links and at junctions (including different modes of transport and the volume and type of vehicles) within the study area and identification of critical links and junctions on the highway network;
- An analysis of the injury accident records on the public highway near the site access for the most recent three-year period, or five-year period if the proposed site has been identified as being within a high accident area;
- An assessment of the likely environmental impacts of transport related to the development, particularly in relation to proximity to environmentally sensitive areas (such as air quality management areas or noise sensitive areas);
- Measures to improve the accessibility of the location (such as provision/enhancement of nearby footpath and cycle linkages) where these are necessary to make the development acceptable in planning terms;
- A description of parking facilities in the area and the parking strategy of the development;
- Ways of encouraging environmental sustainability by reducing the need to travel; and
- Measures to mitigate the residual impacts of the development (such as improvements to the public transport network, introducing walking and cycling facilities, physical improvements to existing roads).

2.4 Local Transport Note 1/20 – Cycle Infrastructure Design, July 2020

- 2.4.1 The Department for Transport (DfT) Published Local Transport Note 1/20 (LTN1/20) on cycle infrastructure design in July 2020. The Note provides national guidance for local authorities and designers to help cycling become a form of mass transport in more areas than at present.
- 2.4.2 LTN1/20 sets out five core design principles which present the essential requirements to achieve more people travelling by cycle or on foot. The key principles state that networks and routes should be:

- Coherent – planned and designed to allow people to reach their day-to-day destinations easily;
- Safe – The cycle infrastructure must be safe and also perceived as safe by those using it;
- Direct – Cycle routes should preferably be more direct than the routes available for motor vehicles;
- Comfortable – The route should have good quality, well-maintained, smooth surfaces; and
- Attractive – cycle infrastructure should help deliver public spaces that are well designed and finished in attractive materials. They should be places which people want to spend time using.

2.5 Arun District Local Plan 2011-2031 (2018)

2.5.1 The Arun District Local Plan 2011 – 2031 was adopted on the 18th of July 2018, with a stated central purpose:

- *“...to encourage sustainable development and manage future growth whilst ensuring that change across the District is appropriate to meet local need.”*

2.5.2 Where transport is concerned, the strategic objectives are to:

- *“Reduce the need to travel and promote sustainable forms of transport;*
- *Plan for climate change and work in harmony with the environment to conserve natural resources and increase biodiversity;*
- *Create vibrant, attractive, safe and accessible towns and villages that build upon their unique characters to provide a wide range of uses and which are a focus for quality shopping, entertainment, leisure, tourism and cultural activities;*
- *Promote strong, well integrated and cohesive communities, through the promotion of healthy lifestyles, provision of good quality accessible community facilities and a safe environment, which delivers an enhanced quality of life to all. This includes meeting the needs of a growing elderly population; and*
- *Strengthen Arun's economic base and provide local job opportunities by increasing, diversifying and improving the quality of employment within the District through the provision of appropriate employment sites, better infrastructure, including road and rail access, quality affordable accommodation and the development of business support and partnerships.”*

2.5.3 Policy T SP1, Transport and Development, is stated as follows;

- *“To ensure that growth in the District strengthens Arun's economic base, reduces congestion, works to tackle climate change and promotes healthy lifestyles; the Council will ensure that development: provides safe access on to the highway network; contributes to highway improvements and promotes sustainable transport, including the use of low emission fuels, public transport improvements and the cycle, pedestrian and bridleway network.*

- *The Council will support transport and development which:*
 - a) *Is designed to reduce the need to travel by car by identifying opportunities to improve access to public transport services and passenger transport services whilst making provision for safe access to the highway network through improvements to the existing road network and the promotion of vehicles which use low-carbon energy;*
 - b) *Is incorporated into the District's green infrastructure network and gives priority to pedestrian and cycle movements;*
 - c) *Protects committed and indicative lines of major road schemes from development and, where applicable, contributes towards new road schemes which improve north-south links between Bognor Regis and Littlehampton and the A27, to ensure that they are delivered in line with strategic growth in the District;*
 - d) *Incorporates appropriate levels of parking in line with West Sussex County Council guidance on parking provision and the forthcoming Arun Design Guide taking into consideration the impact of development upon on-street parking and;*
 - e) *Is supported by an effective and deliverable Transport Assessment which demonstrates that the transport effects of development on the local and strategic road network can be satisfactorily mitigated and a Travel Plan, which is effective and deliverable;*
 - f) *Explains how the development has been designed to:*
 - i. *Accommodate the efficient delivery of goods and supplies;*
 - ii. *Give priority to pedestrian and cycle movements and have access to high quality public transport facilities;*
 - iii. *Create safe and secure layouts for traffic, cyclists and pedestrians whilst avoiding street clutter;*
 - iv. *Incorporate facilities for charging electric and plug-in hybrid vehicles (where charging facilities are to be omitted from the development, evidence of market demand and viability must be provided); and*
 - v. *Consider the needs of people with disabilities by all modes of transport; and*
 - g) *Provides improved crossing points over the railway line to improve transport links between the coast and the A27, in particular at Ford."*

2.5.4 Policy T DM1, Sustainable Travel and Public Rights of Way, is stated as follows;

- *"New development must ensure ease of movement, prioritising safe pedestrian and cycle access to the green infrastructure network and access to public transport and community transport services where a need has been identified. Access to alternative modes of transport including public transport services, the public right of way and cycle networks, must be available and accessible to all members of the community.*

- *Proposals for all new development must:*
 - a) *Be located within easy access of established public transport service(s), existing pedestrian and cycle networks, the committed and aspirational cycle networks and the green infrastructure network which links the development with key destinations including places of work, education, leisure and town centres;*
 - b) *Where applicable, contribute to the extension of public transport services to serve the development and community transport services to ensure that a wide range of transport services are available to all residents;*
 - c) *Make provision for cycling and pedestrian facilities to meet the County Council Parking Standards, including cycle storage, convenient and secure cycle parking in association with retail and educational uses and sufficient secure parking and changing/showering facilities at places of work; and*
 - d) *Contribute towards the provision of a joined up cycle network and Public Rights of Way network, taking into account the aspirational cycle network, which provides convenient, accessible, safe, comfortable and attractive routes for pedestrians and cyclists and; where appropriate, horse riders, both within the development and in the form of links between the development and;*
 - i. *Places of work, education, leisure and food retail;*
 - ii. *The South Downs National Park;*
 - iii. *Along the coast particularly between Bognor Regis and Littlehampton;*
 - iv. *Along the coast to Chichester;*
 - v. *Bognor Regis to Arundel; and*
 - vi. *Littlehampton to Goring."*

2.5.5 The plan makes specific reference to the village of Angmering in the Visions and Objectives section:

- *Visions and Objectives*
 - a) *Barnham, Eastergate, Westergate and Angmering will develop their roles as well-connected large villages serving inland Arun; providing an enhanced range of shops, employment, housing, community facilities and local services, supported by improved transport links.*

2.6 West Sussex Transport Plan 2011 – 2026 (2011) (LTP3)

- 2.6.1 West Sussex's 3rd Local Transport Plan (LTP3) was adopted in 2011 and covers the period through to 2026.
- 2.6.2 It provides a framework for guide highways and infrastructure investment and the transport infrastructure requirements associated with future development across the County.
- 2.6.3 The four guiding strategies for LTP3 are stated as:

1. *"Promoting economic growth;*
2. *Tackling climate change;*
3. *Providing access to services, employment and housing; and*
4. *Improving safety, security and health."*

2.6.4 The overall vision of LTP3 is to:

- *"... achieve efficient, safe and less congested transport networks, which contribute towards:*
 - *a more competitive and thriving economy;*
 - *reductions in emissions;*
 - *improved access to services;*
 - *jobs and housing, especially for those in need; and*
 - *improved quality of life for all those who live and work within our beautiful and unique County."*

2.6.5 The key transport issues within Arun that are specifically identified within LTP3 are:

- *"Access by road and rail, and local perception of parking provision and cost, deters visitors and businesses from Littlehampton and Bognor Regis, inhibiting aims for regeneration of the District;*
- *Road congestion during peak periods affects many parts of the highway network, especially the A27 at Arundel, A29 and A259, disrupting journey times and causing poor air quality. The lack of safe crossing points on these routes also causes community severance;*
- *Large numbers of access links (estate roads and private drives) onto the A259 increase journey times, levels of congestion and traffic pollution within Bognor Regis;*
- *Traffic travelling between the A27 and A259 via the A284 and A29 to access Littlehampton, Bognor Regis and the coastal area is often delayed due to the level crossings at Wick and Woodgate which also create congestion and poor air quality;*
- *In order to avoid congestion and maintain journey times HGVs are diverting onto unsuitable residential and rural roads, causing concerns over safety;*
- *Rail services to and from the District, particularly between both Littlehampton and Bognor Regis, and London, are perceived as slow and there is a limited supply of modern rail stock available to provide extra capacity along the West Coastway;*
- *Bognor Regis Station, in particular, is in need of improvement to make it a more attractive transport interchange for visitors and local commuters;*
- *The current provision of pedestrian and cycling facilities throughout the District, and in particular within Bognor Regis and Littlehampton, are unable to support and maintain sustainable travel, as much of the network is disjointed and suffers from inadequate signing, safe crossing points and poor surfacing;*

- *The current public right of way network linking the South Downs with the coastal plain is disjointed, deficient in terms of bridleway access and requires surface enhancements in many places;*
- *Due to the low use of some bus services, there is uncertainty over the future viability of some services; and*
- *There is limited funding available for infrastructure improvements.”*

2.6.6 Accordingly, the key transport aims to address the above issues within Arun district specifically as identified within LTP3 are:

- *“Major improvements to the A27 at Arundel, such as a bypass, to reduce congestion and rat-running, and to improve the safety record and community cohesion.*
- *Maintaining roads and public rights of way to a good standard.*
- *Improving street lighting through the contract with Southern Electric.*
- *All new development should be designed to promote ‘local living’, for example shops, jobs and homes all being within easy reach of each other.*
- *All new development should provide enough secure cycle parking to meet the needs of the development and be within close proximity to public transport.*
- *Parking provision at new residential development should provide enough spaces to accommodate the expected number of vehicles at the site or provide measures such as car clubs which reduce the number of vehicles to match the space available.*
- *Ensuring that all new development contributes to the regeneration aspirations and the transport issues in Bognor Regis and Littlehampton.*
- *Continuing to work towards the development-led completion of the A259 Bognor Regis relief road and provide an associated package of measures, including junction improvements to Comet Corner (in Middleton-on-sea), traffic management measures (in Felpham and North Bersted) and a cycle route on Rowan Way.*
- *Developing opportunities through new development that will improve the access along the A29, including the potential to bridge the railway level crossing at Woodgate.*
- *Developing opportunities through new development to improve the access along the A259 including improvements that will achieve better bus journey times.*
- *Generating opportunities through new development to secure the delivery of the Fitzalan Link Road Extension and Lyminster bypass to improve safety, accessibility and contribute to regeneration in Littlehampton and Bognor Regis.*
- *A series of town centre measures in Bognor Regis, including improvements to The Esplanade, provision of a 20mph (limit or zone), and the introduction of variable message signs to support the use of car parks.*
- *Making the best use of the existing road network and improving the way in which the network is managed to reduce levels of congestion. For example, through the introduction of intelligent transport systems and improving public transport reliability.*

- *Safeguarding against traffic generated by new development resulting in the capacity of the highway network being exceeded, by including measures to encourage sustainable travel behaviour. Liaising with the rail industry to ensure the best possible service provision to Arun as a result of the evolving Thameslink Programme, and also explore opportunities for the provision of faster services between both Littlehampton and Bognor Regis, and London.*
- *Liaising with the rail industry to encourage the provision of additional modern rail capacity and faster services along the West Coastway while retaining a suitable balance of stopping services, and plan for signalling works along the Arun Valley Line which improve service timings.*
- *Liaising with the rail industry to investigate ways to reduce the delays caused by level crossings.*
- *Working with partners to explore opportunities for improving Bognor Regis Station, and others in the District, to improve access and integration with other modes of transport.*
- *Working with the Sussex CRP through the Arun Valley Line Group to further promote rail travel amongst residents and visitors to Arun.*
- *Discourage HGVs from less suitable local routes while maintaining access to areas which businesses need access to.*
- *Manage any AQMAs that might be declared by Arun District Council through development and implementation of AQAPs, while avoiding potential poor air quality areas in the first place by developing a Low Emissions Strategy.*
- *Encouraging sustainable travel by improving the existing cycle and pedestrian network through improved signing, connecting routes where appropriate and repairing and maintaining surfaces.*
- *Developing and implementing schemes which contribute to the completion of the Bognor Regis and Littlehampton cycle networks, particularly maximising opportunities for seafront cycle routes and enhancing routes which will be of particular interest to tourists.*
- *Improving pedestrian accessibility throughout the District by enhancing existing pedestrian crossings and providing new pedestrian crossing facilities at identified key locations.*
- *Encourage the use of cleaner vehicles such as electric cars, by for example providing electric recharging posts and recharging bays in partnership with the District Council as part of a wider network available to all users of electric vehicles.*
- *Promoting sustainable transport choices through projects such as Safer Routes to School.*
- *Supporting opportunities which will improve and protect the rights of way network throughout the District.*
- *Improving access through the urban rights of way network within the Littlehampton area, to help improve community cohesion, community safety, tourism, access to local shops and services and to change travel modes and habits.*

- *Manage on-street parking in Littlehampton, Bognor Regis and Arundel and introduce controlled parking zones, where appropriate, which balance the needs of residents, visitors and businesses.*
- *Continuing to work with our bus operators and developing quality bus partnerships, to improve the capacity and quality of the bus fleet, and to improve the way services are marketed, particularly supporting the Coastal Transport System major scheme when funding is available to deliver it.*
- *Improving the accessibility and quality of information available through the introduction of RTPI at well used bus stops and where the whole life costs are affordable.”*

2.7 West Sussex County Council Guidance on Parking at New Developments (2020)

- 2.7.1 The WSCC Guidance on Parking at New Developments document details the expected parking requirements at residential and non-residential developments for each district within West Sussex.
- 2.7.2 Guiding Principles for parking standards are described within the guidance. The principles are as follows:
- A – Accommodate Parking Demand;
 - B – Electric Vehicle Charging Infrastructure;
 - C – Sustainable Transport;
 - D – Traffic Regulation Orders;
 - E – Design Considerations; and
 - F – Sustainable Drainage.
- 2.7.3 The districts within the county are split into ‘Parking Behaviour Zones’, which determine the expected parking provision per dwelling based on bedrooms / number of habitable rooms. The village of Angmering is designated as a Parking Behaviour Zone 2 – Peri-Rural.
- 2.7.4 The parking requirements for new residential developments in Parking Behaviour Zone 2 are as follows:
- 1 Bedroom (1 - 3 Habitable Rooms) – 1.4 parking spaces per dwelling;
 - 2 Bedrooms (4 Habitable Rooms) – 1.7 parking spaces per dwelling;
 - 3 Bedrooms (5 – 6 Habitable Rooms) – 2.1 parking spaces per dwelling; and
 - 4 or more Bedrooms (7 or more Habitable Rooms) – 2.7 parking spaces per dwelling.
- 2.7.5 The standards outline above accommodate for the likely occurrence of parking obstructions, such as refuse skips and caravans.
- 2.7.6 WSCC state that:
- *“To accommodate potential variations in parking demand within a single ward, consideration may be given to varying the expected parking demand by 10% above*

or below, which is based on the average variation in demand between PBZs. In order to determine whether or not this is acceptable, the applicant will need to provide justification through, for example, the provision of parking beat surveys.”

2.7.7 It is acknowledged that demand for electric vehicles is likely to change rapidly over time and so any standard detailed would become quickly out of date. Therefore, developers should consider the Guiding Principles for parking standards when designing parking provision.

2.7.8 The guidance also states that:

- *“As part of their planning application, applicants will be expected to provide a schedule of parking provision, detailing the number of allocated and unallocated spaces, including garages and EV charging facilities (active and passive). The planning application should include an explanation of how the provision of parking will meet the needs of the development”*

2.8 Arun District Council Parking Standards Supplementary Planning Document (SPD) (2020)

2.8.1 Arun District Council adopted its own parking standards on the 15th of January 2020. Residential parking requirements for new development are set out within this document.

2.8.2 Arun District Council’s parking standards are based on standards outlined in the WSCC Guidance on Parking at New Developments (2020), but with simplified integer values. As with West Sussex County Council Guidance on Parking at New Developments (2020), the ADC’s guidance splits Arun into ‘Parking Behaviour Zones’, with Angmering being located within Parking Behaviour Zone 2 – Peri-rural (large villages or small settlements close to towns e.g., Angmering, Barnham).

2.8.3 Accordingly, the below extract has been taken from Table 3.1 of the Parking Standards SPD:

- 1 Bedroom (1 - 3 Habitable Rooms) – 2 parking spaces per dwelling;
- 2 Bedrooms (4 Habitable Rooms) - 2 parking spaces per dwelling;
- 3 Bedrooms (5 – 6 Habitable Rooms) – 2 parking spaces per dwelling; and
- 4 or more Bedrooms (7 or more Habitable Rooms) – 3 parking spaces per dwelling.

2.8.4 In terms of EV parking the parking standards note that 100% of parking spaces provided as driveways or garages should be provided with EV charging points. For other parking spaces not on plot, a phased approach should be taken, with developments proposed to come forward in 2018, 2023, 2028 and 2033 providing 20, 30, 50 and 100% of parking spaces with EV charging facilities, respectively.

2.8.5 Visitor Parking should be provided at a rate of 0.2 spaces per dwelling.

2.8.6 Garages will not count towards parking provision unless they have internal dimensions of at least 6m x 3m, in which case they will count as 0.5 parking spaces. Open car ports / car barns of the same dimensions will count as a full parking space.

2.8.7 Cycle parking should be provided per the recommended levels:

- 1 – 2 Bedroom House – 1 cycle parking space;
- 3 + Bedroom House – 2 cycle parking spaces;

- 1 – 2 Bedroom Flat – 1 cycle parking space; and
- 3 + Bedroom Flat – 1 cycle parking space.

2.9 Summary

- 2.9.1 The review demonstrates that the proposed residential development accords with policy and guidance, both at a national and local level. In accordance with the policy analysed within this section of the report, the Transport Statement seeks to encourage sustainable travel behaviour among residents, with the aim of minimising the impact of the development on the surrounding highway network.

3 EXISTING CONDITIONS

3.1 Introduction

- 3.1.1 This chapter provides information on the existing site, summarising the baseline conditions in respect of the development proposals. Consideration is made to the accessibility of the site to local amenities, public transport services, pedestrian and cycle linkages.

3.2 Site Location

- 3.2.1 The site is located on Arundel Road, to the north of the village of Angmering, in West Sussex. Arundel Road provides a direct link between the village centre and the A27 dual carriageway, 1.3km to the north. The site location is shown below on Figure 3.1.

Figure 3.1 - Site Location



- 3.2.2 As shown above, the site is located on the edge of the urban extent of Angmering, approximately 1km north of the village centre and 0.3km south of the A27. The site is bound to the north and west by greenfield land and bound to the south by sports pitches. The site is bound to the east by Arundel Road and commercial units situated along Arundel Road.

3.3 Local Highway Network

- 3.3.1 The site is bound to the east by Arundel Road, which is a single carriageway road in a north-south orientation through Angmering. The carriageway is approximately 7.3m wide in the vicinity of the site, with one lane for each direction of traffic. The road is broadly straight; however, the northern access point is on the outside of a gentle curve and the southern access is on the inside of a gentle curve.

- 3.3.2 An ATC was carried out on Arundel Road during November 2017 to support the TS produced by CTS and the previous planning application. The ATC was located in the vicinity of the proposed residential site access, which is located approximately 170m south of the Arundel Road / A27 junction. The speed limit in this location is 70mph. However, the ATC survey recorded that vehicles are travelling at much lower speeds than 60mph. The ATC survey recorded the 85th percentile speed as 37.6mph for northbound traffic and 35.7mph for southbound traffic.
- 3.3.3 There is an existing access to the site approximately 350m south of the A27, where the road is subject to a speed limit of 40mph. The junction provides access to the existing commercial premises on the site; however, it has no road markings or footways. This junction will be upgraded under the development proposals, which are discussed further in Section 4 of this report.
- 3.3.4 Approximately 30m south of the existing commercial access point is a traffic calming measure in the form of a chicane, with priority for northbound vehicles.
- 3.3.5 Arundel Road has streetlighting along its southern end, near to the existing residential properties, however the streetlighting extends no further north than the location of the existing access to the commercial premises on the development site.
- 3.3.6 At its southern end Arundel Road meets Water Lane/Station Road, which runs in a northeast – southwest orientation through the village. Water Lane leads northeast from Arundel Road to meet the A280 near to the eastern boundary of the village. Station Road leads southwest from Arundel Road to meet Roundstone Bypass Road, at the southern edge of the village.
- 3.3.7 At its northern end Arundel Road meets the westbound carriageway of the A27 dual carriageway. The A27 leads west towards the market town Arundel and leads east towards Worthing, however, vehicle users will need to drive 2.0km west along the A27 to reach the first available turning point onto the eastbound carriageway.

3.4 Strategic Highway Network

- 3.4.1 As noted in the Local Highway Network section, the A27 passes in an east-west orientation approximately 300m to the north of the site. The A27 is a dual carriageway that spans a large swathe of towns and cities along the south coast, between Portsmouth and Eastbourne.
- 3.4.2 To the east of the junction with Arundel Road the A27 leads to Worthing (8km), Brighton (27km), Newhaven (42km) and Eastbourne (60km). To the west of the junction with Arundel Road the A27 leads to Arundel (11km), Chichester (28km) and Portsmouth (51km).
- 3.4.3 The A27 meets the A23 near to Brighton, which leads north from Brighton towards the M23, the M25 and London.
- 3.4.4 The A27 meets the A3 near to Portsmouth, which also leads northeast towards the M25 and London.

3.5 Analysis of Collision Data

- 3.5.1 A review of crashmap.co.uk has been undertaken to determine the amount and frequency of collisions resulting in personal injury which have occurred in the vicinity of the site. Data

has been reviewed for the latest five-year period (2016-2020). An extract of the map is provided below as Figure 3.2.

Figure 3.2 - Collisions in the Vicinity of the Proposed Development



- 3.5.2 As shown in Figure 3.2, there have not been any recorded traffic incidents in the immediate vicinity of the proposed access points in the latest five-year period. There has been one recorded 'slight' collision at the north end of Arundel Road in the latest five-year period and several collisions of varying degrees of severity along the A27 in the same time frame.
- 3.5.3 The collision at the north end of Arundel Road was recorded in August 2018 and is located at the junction where Arundel Road joins the westbound carriageway on the A27. There are two further slight collisions recorded on the A27 near to the Arundel Road junction and one fatal collision recorded in the latest five-year period. These collisions took place approximately 160m north of the proposed residential access point.
- 3.5.4 There is one other slight collision recorded on the A27 western carriageway approximately 350m west of the Arundel Road junction.
- 3.5.5 There are several other instances of collisions in latest five period on the A27, however, all these collisions are on the eastbound carriageway or on a more easterly part of the westbound carriageway. Although these collisions are close to the site in distance, vehicles leaving the site must turn left and head westbound at the junction with the A27, and so cannot pass the location of these collisions unless they turn back at a turning point further west.

3.6 Pedestrian and Cyclist Accessibility

Walking

- 3.6.1 Walking is traditionally recognised as a sustainable mode of travel which can replace shorter trips that are often made by car, particularly those under 2km. This was reflected in the now withdrawn 'PPG:13 Transport' guidance. Although the guidance has been superseded, it provides a useful indication of the walking distances that are considered reasonable for pedestrians.
- 3.6.2 The Institution of Highways and Transportation (IHT) publication 'Providing for Journeys on Foot' provides preferred maximum walking distances to key facilities based upon their purposes. The document considers 2km a maximum walk distance for commuting purposes, 800m a preferred maximum for town centres and 1.2km for other purposes.
- 3.6.3 CIHT's 'Planning for Walking' (2015) guidance document recognises that most short journeys are made wholly on foot, however walking also forms part of longer, multi-modal journeys. The guidance states that people will choose to walk if the length of their journey is less than one mile (1.6km).
- 3.6.4 In summary, 2km can be viewed as a maximum acceptable walking distance though preferably destinations should be accessible within one mile (1.6km). A summary of local facilities, amenities, and services accessible to future residents of the site are contained in Table 3.1 below. Distances are indicative from an approximate centre of the site.

Table 3.1 - Existing Local Facilities, Amenities and Services

Journey Purpose/Facility	Destination	Walking Distance
Transport	Chantryfield Road Bus Stops	0.5km
Retail	Arundel Road Garage	0.9km
	Big Fry Fish & Chip Shop	1.2km
	The Cooperative	1.2km
	Lloyds Pharmacy	1.3km
Leisure	Angmering Sports & Social Club / Palmer Road Recreation Ground	0.5m
	The Woodman Arms	0.6km
	Angmering Library	1.1km
	St Margaret's Church	1.1km
	The Lamb at Angmering Public House	1.2km
Education	St Margaret's C of E Primary School	0.35km
	Saint Wilfrid's Catholic Primary School	0.9km

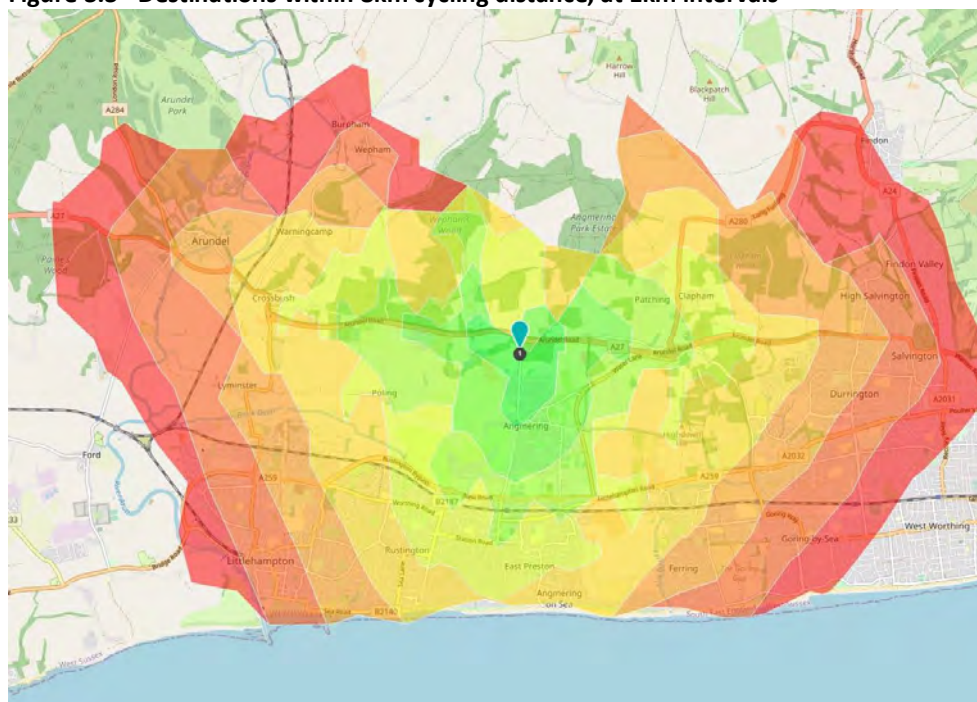
- 3.6.5 As shown above in Table 3.1, there are a wide range of amenities available within a 2km walking distance from the site at present, including a bus stop, shops, pubs and schools.
- 3.6.6 Angmering Medical Centre and Angmering Surgery are located on Station Road, to the southwest of the junction with Arundel Road. They are approximately a 1.3km walk from the site.

- 3.6.7 Arundel Road has a footway on the western side of the carriageway for its entire length, including in the vicinity of the site. It has a footway on the eastern side of the carriageway at its southern end that terminates outside St Margaret's C of E Primary School, approximately 130m of the proposed commercial access point. The road has streetlights at the south end of the road. The surrounding network of footways are 1.7m in the vicinity of the site and are expected to be suitable for pedestrians.
- 3.6.8 A Public Right of Way (PROW) Footpath runs in a north-south orientation along the western boundary of the site, which the internal site layout will provide a link to. The PROW Footpath provides a pedestrian route between the A27 and Saint Wilfrid's Catholic Primary School.

Cycling

- 3.6.9 CIHT's 'Planning for Cycling' (2014) guidance document states that the majority of cycling trips are made over short distances, with 80% being less than 5 miles (8km) and 40% being less than 2 miles (3.2km). Similarly, 'Chapter 10 – Cycling in New Developments' of the Sustrans Design Manual (draft, 2015) advises that distances up to five miles (8km) represents a reasonable cycling commute for most users.
- 3.6.10 The Department for Transport's 'Walking and Cycling Statistics, England: 2016' statistical release was published in January 2018. It states that shorter cycling trips under five miles (8km) made up 79% of all cycling trips in 2016, with 43% of all trips being under two miles (3.2km). The most common purpose for cycling trips is commuting, which accounts for an average of 36% of trips made by this mode.
- 3.6.11 The consensus among recent guidance and statistics is that 8km represents the maximum reasonable cycling distance, however a significant proportion of cycling trips are likely to be around 3km. Figure 3.3 shows the destinations accessible within an 8km cycling distance of the site utilising the OpenRouteService.org.

Figure 3.3 - Destinations within 8km cycling distance, at 1km intervals



Source: openrouteservice.org

- 3.6.12 As shown in Figure 3.3, all of Angmering is within an 8km cycling distance from the site and much of Arundel, Littlehampton and Worthing are too. Some of the key locations that are accessible within this distance include; Angmering Station, Angmering Community Centre, Angmering Skate Park, Littlehampton Station, East Preston Beach, Littlehampton Pier and Arundel Station.
- 3.6.13 Many of the roads in and around the local area are likely to be suitable for cyclists due to their gentle inclines and smooth surfacing. It is expected that the carriageways within the site will similarly be suitable for cycle users.

3.7 Public Transport Provision

Bus Travel

- 3.7.1 CIHT's 'Buses in Urban Developments' (2018) publication considered 400m as a maximum walking distance to bus stops. It recognises that in some instances it may be appropriate to increase this distance in order to access services on core bus corridors.
- 3.7.2 The nearest pair of bus stops are the Chantryfield Road bus stops, which are located on Arundel Road, near the junction with Chantryfield Road. This is approximately 500m south of the site's southern boundary, with longer walking distances for those who reside further north within the development.
- 3.7.3 Table 3.2 summarises the existing frequency of the number 9 bus from the Chantryfield Road bus stops.

Table 3.2 - Bus routes, frequencies, and destinations accessible from Chantryfield Road

No.	Route	Bus Frequency			Journey time (weekday)
		Weekday	Saturday	Sunday	
9	Arundel – Shoreham-BySea	Hourly between 0800 – 1800	Hourly between 0800 – 1800	N/A	Roundstone ByPass – 10mins Marine Parade, Worthing – 40mins Worthing Hospital – 50mins Holmbush Shopping Centre – 1hr 30mins
	Shoreham-BySea - Arundel	Hourly between 0700 – 1900	Hourly between 0800 – 1900	N/A	Angmering Station – 10mins Beaumont Park, Littlehampton – 20mins Arundel Station – 50mins Arundel – 1hr

**Correct as of November 2021*

- 3.7.4 As shown in Table 3.2, the number 9 bus route provides a regular service to several key locations in and around Angmering on weekdays and Saturdays. Several urban centres can be accessed via the bus including Littlehampton, Worthing and Shoreham-By-Sea. The frequency of the bus service may be suitable for those travelling for both commuting and leisure purposes.

- 3.7.5 The number 9 service also provides a connection that may be suitable for persons travelling to nearby railway stations. This includes stations in Angmering, Littlehampton, Arundel, Durrington-on-Sea, West Worthing, and Lancing.

Rail

- 3.7.6 The nearest railway station to the site is Angmering Station. The station is managed by Southern and is situated on the West Coastway Line, which connects Brighton to Portsmouth/Southampton. Key stations which are directly accessible from Angmering Station include Littlehampton, Portsmouth Harbour, Southampton, Brighton, Worthing and London Victoria.
- 3.7.7 The station is approximately a 2.4km walk from the site and is expected to take 30 minutes by foot, depending on speed and ability of the person. The number 9 bus also delivers passengers from the Chantryfield Road bus stop to the station within 10 minutes.
- 3.7.8 The main entrance and ticket office is located to the north of Platform 1 and be accessed from Station Road. There is step-free access available to Platform 1 via a locked gate, which can be unlocked upon request from the ticket office. Step-free access to Platform 2 is available directly from Station Road via a ramp that leads from the footway.
- 3.7.9 Passengers wishing to cross between Platform 1 and Platform 2 using step-free methods will have to leave the station, cross the level crossing and re-enter the station using the respective platform's step-free access. Table 3.3 Table 3.3 - Existing Rail Services at Angmering Stationsummarises key services that operate from Angmering Station and their frequencies during the AM and PM peak periods.

Table 3.3 - Existing Rail Services at Angmering Station

Destination	Services Per Weekday Peak Hours		Journey Time
	AM Peak (08:00-09:00)	PM Peak (17:00-18:00)	
Littlehampton	2 services	2 services	10mins
Worthing	5 services	4 services	10mins
Brighton	3 services	3 services	15mins
Portsmouth & Southsea	2 services	0 services	50mins
Gatwick Airport	2 services	2 services	1hr
Southampton	1 service	1 service	1hr 10mins
London Victoria	2 services	2 services	1hr 40mins

- 3.7.10 As shown in Table 3.3, a range of towns and cities are accessible via train from Angmering Station. The short journey times between some of the destinations may be suitable for those commuting to and from work in nearby towns and cities. The information presented in Table 3.3 was correct at the time of this report being prepared.

3.8 Summary

- 3.8.1 A review of the existing walking, cycling and public transport provision has confirmed that there are several opportunities to travel by sustainable modes in the vicinity of the proposed development.

4 DEVELOPMENT PROPOSALS

4.1 Introduction

- 4.1.1 This section of the Transport Statement discusses the development proposals, including the means of access, servicing and parking arrangements.

4.2 Development Proposals

- 4.2.1 The development proposals comprise the construction of 160 dwellings and 1,393sqm of Class E commercial/employment land use. An area of open space will also be constructed along the site's southern boundary. There are several existing commercial units on site, which will be demolished under the proposals.
- 4.2.2 The quantum of development under each land use is identical to that which was approved under application A/122/19/OUT.
- 4.2.3 The proposed dwelling mix associated with the residential development is provided below in Table 4.1. The proposed site layout is provided at the rear of this report as drawing 20232 - Arundel Rd Angmering - P101.

Table 4.1 - Accommodation Schedule

Dwelling Type	No.
1 bedroom flat	8
2 bedroom house	37
3 bedroom house	46
4 bedroom house	61
5 bedroom house	8
Total	160

- 4.2.4 Of the 160 proposed dwellings, 48 (30%) are to be affordable properties (rented or shared ownership) and 112 (70%) are to be in private ownership. The private ownership element of the development will be marketed by Redrow.
- 4.2.5 A quantum of commercial developments are proposed at the south-east of the site with a cumulative Gross Floor Area (GFA) of 1,393sqm. The units fall under the Class E land use class. Access arrangements to the commercial land use are discussed further in section 4.3 of this report.

4.3 Site Access

- 4.3.1 The development will be served by two separate access points from Arundel Road. The site access proposals were previously approved under the outline application for the site (A/122/19/OUT). Each access is discussed in turn below.

Residential Access (Northern Access Junction)

- 4.3.2 The northern access point is located approximately 170m south from the A27 along Arundel Road and will provide access to the residential element of the site. The access will take the form of a simple priority junction, with a carriageway width of 5.5m and kerb radii of 6m. A footway will be provided on both the north and south sides of the access, which will tie into

the existing footway provision along Arundel Road. Dropped kerbs and tactile paving will be provided at the bellmouth to facilitate pedestrian access across the carriageway.

- 4.3.3 The residential access has been submitted to WSCC for technical approval under a Section 278 agreement in August 2021. At the time of this report being prepared, the submission is under consideration by WSCC. The Engineering Layout for the access is provided at the rear of this report for reference (drawing C86473-JNP-90-XX-DR-C-2501).
- 4.3.4 An ATC survey was carried out in November 2017 to support the outline application and initial access design. The results of the survey identified that the 85th percentile for vehicles travelling in the vicinity of the site is 37.6mph for northbound traffic and 35.7mph for southbound traffic. The recorded 85th percentile speeds are below the posted speed limit of 60mph.
- 4.3.5 Based on MfS guidance, the required visibility splays at the junction are 2.4m x 59.61m northbound and 2.4m x 55.19m southbound. The maximum achievable visibility splay to the north of the access is 2.4m x 91m and the maximum achievable visibility splay to the south of the access is 2.4m x 168m. As such, the proposed site access is considered suitable.
- 4.3.6 Within the outline scheme, a ghost island right turn arrangement was proposed on Arundel Road, adjacent to the site access. The approved design of the arrangement under the outline application was reviewed in further detail to support the full application and the Section 278 submission. This process identified that the approved design for the ghost island right turn lane was not deliverable when using available space within the adopted highway boundary and red line boundary of the site.
- 4.3.7 Table 5.22 of DMRB CD 123 lists the following requirements for a 60kph design speed (which aligns with the recorded 85th percentile speeds):
- Direct taper – 5m;
 - Turning length – 10m;
 - Deceleration length – 15m;
 - Right turn lane width – 3m;
 - Through lane width – 3m; and
 - Taper length: 30m (1:20).
- 4.3.8 Under the Section 278 submission, the following geometry is proposed:
- Direct taper – 5m;
 - Combined turning length and deceleration length – 15m;
 - Right turn lane width – 3m;
 - Through lane width – 3m; and
 - Taper length: 30m (1:20).
- 4.3.9 The combined turning length and deceleration lane length is 15m, which is 20m short of the requirements set out in DMRB. All other geometries are achievable. The geometries are annotated on drawing C86473-JNP-66-XX-SK-T-7002, which is provided at the rear of this report. A departure in standards form was submitted alongside the Section 278 application.

- 4.3.10 Footways will be constructed on both sides of the northern access road. The footway on the north side of the access road will extend 20m into the site and the footway on the southern side of the road will follow the internal carriageway throughout the site.
- 4.3.11 **Commercial Access (Southern Access)**
- 4.3.12 The southern site access point is located a further 170m south of the northern access point along Arundel Road. An existing informal vehicular access point exists in this location at present; however, it does not have footways or road markings. This access point will be redesigned and constructed as a simple bellmouth priority junction.
- 4.3.13 The general arrangement of the commercial access was designed by CTS and approved under the outline application (A/122/19/OUT). The construction of the access was secured under Condition 16 of the planning consent. The approved geometry of the commercial access was as follows:
- 5.5m wide carriageway, extending into the site;
 - 6m kerb radii; and
 - 2no footways with a width of 2m, tying into the existing footway provision on Arundel Road.
- 4.3.14 The general arrangement of the access was drawn to OS mapping. A review confirmed that the general arrangement of the approved commercial access was not viable or deliverable within the constraints of the land ownership and adopted highway boundary. This was not accurately reflected on the OS mapping which was used within the approved plans, as it showed a more generous geometry between the land ownership extents than what exists in reality.
- 4.3.15 The commercial access design was subsequently revised to provide a deliverable solution. The revised geometry is as follows:
- 5.5m carriageway;
 - 6m kerb radii;
 - 1no footway on the north side of the carriageway with a width of 2m;
 - 0.5m wide service strip on the south side of the carriageway; and
 - Dropped kerbs and tactile paving at the bellmouth, forming an uncontrolled crossing.
- 4.3.16 The revised proposals are demonstrated on drawing C86473-JNP-77-XX-SK-7007, which is provided at the rear of this report.
- 4.3.17 The revisions to the commercial access were approved by ADC under a Section 73 application in November 2021 (ref: A/207/21/PL). The application proposes to vary Condition 16 of the outline planning consent to refer to the revised design, as shown on drawing C86473-JNP-77-XX-SK-7007. The application was approved in November 2021.
- 4.3.18 The speed limit in the vicinity of the southern site access point is 30mph, however, as mentioned previously, the 85th percentile speed recorded on the site is approximately 37mph. As such, visibility splays of 2.4m x 59m to both the north and south are achievable in line with the West Sussex Highway Design Guide and the Manual for Streets.

Summary

- 4.3.19 In summary, the proposed development will be served by two access points. Each access point will form a simple priority junction with Arundel Road and the principle of the accesses was agreed under the outline planning consent for the site. Given that no changes are proposed to the quantum of development on site, the principle of the access arrangements is considered to remain acceptable to both ADC and WSCC.
- 4.3.20 The viability of both access points was reviewed following the outline planning consent, with the northern (residential) access submitted for technical approval under a Section 278 agreement and the southern (commercial) access being revised and submitted under a Section 73 application. The Section 278 proposal for the northern access forms part of the proposal which will be submitted within the full planning application. The section 73 application for the southern access was approved in November 2021.

4.4 Internal Road Layout

- 4.4.1 The proposed northern access point will lead to a spine road that runs through the residential site towards the western boundary. Several secondary roads will form junctions with the spine road, providing access to the dwellings. It should also be noted that the internal road network will not provide a connection between the two junctions which will provide access to the site from Arundel Road.
- 4.4.2 The geometry of the internal road network accords with the proposed design speed of 20mph. The spine road maintains a width of 5.5m throughout the site, with 2m footways on both sides of the carriageway throughout.
- 4.4.3 Traffic calming in the form of raised tables will be provided throughout the site. Localised widening has been provided on the bends within the site to facilitate a car to travel side by side with a larger vehicle (e.g., refuse collection vehicle). Footways are provided on both sides of the spine road from the first bend within the site onwards, with a width of 2m. At the site access, the north footway terminates around 20m west of the bellmouth.
- 4.4.4 The secondary roads are primarily 4.8m wide, though localised widening to 5.0m and 5.5m has been incorporated throughout the site where a larger vehicle is expected to pass a smaller vehicle. This is in a similar manner to that of the spine road. Secondary roads have 2m footways on at least one side of the carriageway and other pedestrian routes are incorporated throughout the site via landscaped areas. Turning heads are provided on each secondary road.
- 4.4.5 Junction visibility splays have been assessed at each priority junction with the site, in accordance with the design speed of 20mph. Visibility splays of 2.4m x 25m are achievable from each priority junction, as shown on drawing C86473-JNP-66-XX-DR-T-7009, which is provided at the rear of this report.
- 4.4.6 Forward visibility has been assessed with recognition that the presence of a sharp bend will lead itself to lower speeds (Manual for Streets 2, Paragraph 8.3.8).
- 4.4.7 Table 8.2 in MfS2 sets out the percentage speed reduction at bends and has been used to interpolate the reduction in speed typically associated with radii within the site layout. The calculator used to establish this along with the SSD requirements are provided as outputs under **Appendix A**. Suitable forward visibility splays are achievable on each bend within the

site and are shown on drawing C86473-JNP-66-XX-DR-T-7009, which is provided at the rear of this report.

4.5 Off-Site Highway Improvements

- 4.5.1 As discussed in Section 4.3 of this report, a ghost island right turn lane will be introduced on Arundel Road. This will be located adjacent to the residential access to the site, which the majority of vehicles travelling to/from the development as a whole are expected to utilise. The ghost island right turn lane arrangement seeks to ensure that vehicles waiting on Arundel Road to turn right into the site do not cause queuing on the highway for vehicles continuing southbound.
- 4.5.2 As part of the agreed matters within outline planning application A/122/19/OUT, a pedestrian crossing is to be provided across Arundel Road adjacent to St Margaret's C of E Primary School. The crossing will be a signalised crossing with minimum 50m visibility along the carriageway on either side.
- 4.5.3 The agreed design for the pedestrian crossing is shown on drawing 2020-F05 which was produced by CTS. The drawing is provided at the rear of this report and no changes to the general arrangement of the crossing are proposed under this application.

4.6 Swept Path Analysis

- 4.6.1 A swept path analysis for the internal site layout has been prepared for both a refuse vehicle and a fire tender.
- 4.6.2 Refuse vehicle tracking has been carried out for a 9.620m Phoenix 2-18W (Elite 2 6x2RS chassis) refuse vehicle. In accordance with The Building Regulations Approved Document H (2010), the refuse vehicle tracking has been assessed with a maximum residents carry distance of 30m and operatives carry distance of 15m. The refuse tracking is demonstrated on the drawing C86473-JNP-66-XX-DR-T-7010.
- 4.6.3 Fire tender tracking has been carried out for an 8.680m DB32 Fire Appliance. In accordance with Building Regulations Approved Document B (2020), the fire tender is able to reach within 45m of all parts each dwelling, reversing no more than 20m. The fire tender tracking is demonstrated on the drawing C86473-JNP-66-XX-DR-T-7011.

4.7 Vehicular Parking Provision

- 4.7.1 There are two relevant parking standards associated with residential developments in Angmering, namely the 'Arun District Council Parking Standards Supplementary Planning Document' (SPD) (2020) and the 'West Sussex County Council Guidance on Parking at New Developments' (2020).
- 4.7.2 The two standards are marginally different, with the ADC standards setting a parking requirement per dwelling and the WSCC standards presenting the expected parking demand per dwelling. The standards produce different parking requirements. The level of parking provision at the proposed development falls between the requirements of both standards.
- 4.7.3 The parking requirements for new residential developments in Angmering as detailed in the 'West Sussex County Council Guidance on Parking at New Developments' are shown below as Table 4.2.

Table 4.2 - Parking Requirements based on WSCC Guidance on Parking at New Developments

No. of Bedrooms	No. of Dwellings	Parking Demand per Dwelling	Total Demand
1	8	1.4	11.2
2	37	1.7	62.9
3	46	2.1	96.6
4+	69	2.7	186.3
Total			357

- 4.7.4 The WSCC standards state that a 10% discrepancy between the provision of parking and the WSCC standard across any given site may be considered acceptable in order to accommodate for variation in demand if the applicant can provide justification. Based on the parking demand presented in Table 4.2, this would result in a lower level of 321 spaces or a higher provision of 393 spaces.
- 4.7.5 The calculations shown in Table 4.2 factor visitor spaces into the requirement per dwelling. It should also be noted that garages count as 0.5 spaces if they accord with the required internal dimensions of 6m x 3m.
- 4.7.6 The parking requirements for new residential developments in Angmering as detailed in Arun District Council SPD are shown below as Table 4.3.

Table 4.3 - Parking Requirements based Arun District Council Parking Standards SPD

No. of Bedrooms	No. of Dwellings	Parking Demand per Dwelling	Total Demand
1	8	2	16
2	37	2	74
3	46	2	92
4+	69	3	207
Visitor Spaces (0.2 per dwelling)			32
Total			421

- 4.7.7 As shown above, Arun District Council's standards require 64 additional parking spaces when compared to WSCC's parking standards for this site.
- 4.7.8 As with the WSCC standards, garages count as 0.5 spaces if they accord with the required internal dimensions of 6m x 3m.
- 4.7.9 The proposed parking provision at the residential development is summarised in Table 4.4.

Table 4.4 - Proposed Residential Parking Provision

No. Bedrooms	Dwelling Type	No. Dwellings	Total Parking Spaces (incl. compliant garages)
1	1 bed, 2 spaces	8	16
2	2 beds, 2 spaces	37	74
3	3 beds with 2 spaces, 0 garage	17	34
	3 beds with 1 space, 1 garage	1	1.5
	3 beds with 2 space, 1 garage	28	70
4	4 beds with 1 space, 1 garage	1	1.5
	4 beds with 2 spaces, 1 garage	40	100
	4 beds with 2 spaces, 2 non-compliant garages	7	14
	4 beds with 3 spaces, 0 garage	13	39
5	4 beds with 3 spaces, 2 non-compliant garages	8	24
Visitor Spaces			34
Total			408

4.7.10 It should be noted that several dwelling types throughout the site have double garages, but the internal dimensions of the garage do not accord with the 6m x 3m length and width requirements prescribed by WSCC and ADC. As such, these garages have not been counted towards the parking provision within the site.

4.7.11 As shown in Table 4.4, there are a total of 408 parking spaces proposed on site, which falls between the requirements of ADC and WSCC. The level of parking provision is considered relevant and appropriate in accordance with each Council's standards, ensuring that sufficient parking is provided on plot for residents. Visitor spaces are provided throughout the development at a rate of 0.2 spaces per dwelling, which seek to discourage instances of on-street parking for non-residents.

4.8 Cycle Parking Provision

4.8.1 Arun District Council outline the Cycle Parking standards for residential developments in 'Arun District Council Parking Standards Supplementary Planning Document (2020)'. The requirements are shown below:

- 1 – 2 Bedroom House – 1 cycle parking space;
- 3 + Bedroom House – 2 cycle parking spaces;
- 1 – 2 Bedroom Flat – 1 cycle parking space; and
- 3 + Bedroom Flat – 1 cycle parking space.

4.8.2 Cycle parking will be provided within the residential curtilage of each dwelling to meet these standards. Garages will serve as cycle parking for dwellings which are provided with a garage, while those without garages will be provided with a suitable covered storage area. Each dwelling has rear access, ensuring that the bicycle does not need to be carried through the dwelling.

5 TRIP GENERATION

5.1 Introduction

- 5.1.1 This section of the Transport Statement provides details of the forecast vehicular, pedestrian and cycle trip generation. Trip generation calculations were carried out by Croft Transport Solutions (CTS) to accompany the Transport Assessment submitted with the outline planning application A/122/19/OUT. The data collected by CTS is summarised within this section of the TS and a sensitivity test has also been carried out to verify the validity of the vehicle trip generation data.

5.2 Existing Trip Generation

- 5.2.1 The residential element of the existing site is mostly greenfield and is deemed to generate no vehicular trips at present. Any trips associated with the use of the site for agricultural purposes are considered negligible and have therefore been discounted from the assessment.
- 5.2.2 A review of the CTS Transport Assessment has confirmed that existing trips associated with the employment/commercial land use on site were not quantified. The same methodology has been utilised within this TS and this is considered to represent a robust scenario.

5.3 Consented Vehicular Trip Generation

- 5.3.1 The vehicular trip generation associated with the residential and commercial land use were presented within the Transport Assessment prepared by CTS. The trip rates were extracted by CTS from the TRICS database (v.7.2.2) and the outputs are dated August 2015. The proposed trip generation has been considered in two parts; residential trips and commercial trips.

Residential Land Use

- 5.3.2 The following criteria was used by CTS to ascertain the vehicle trip rates associated with the residential development:
- Category '03 – Residential – A – Houses Privately Owned';
 - Sites in England, Scotland and Wales, excluding Greater London;
 - Sites with a total number of dwellings between 100 and 800 units;
 - Weekday surveys only;
 - Edge of Town Centre, Suburban Area and Edge of Town sites only; and
 - Sites within Residential Zones or with no Sub Category.
- 5.3.3 Based on the above search criteria, a total of 15 sites were deemed suitable for comparison to the proposed development. A summary of each site is shown in Table 5.1.

Table 5.1 - Residential Sites extracted from the TRICS Database by CTS

Reference	Nature of Development	County	Town/City	No. of Dwellings	Date of Survey
CF-03-A-02	MIXED HOUSES	CARDIFF	CARDIFF	196	05/10/07
CH-03-A-02	HOUSES/FLATS	CHESHIRE	CREWE	174	14/10/08
CH-03-A-06	SEMI-DET./ BUNGALOWS	CHESHIRE	CREWE	129	14/10/08
EX-03-A-01	SEMI-DET.	ESSEX	STANFORD-LE-HOPE	237	13/05/08
FA-03-A-02	MIXED HOUSES	FALKIRK	FALKIRK	161	29/05/13
FI-03-A-03	MIXED HOUSES	FIFE	DUNFERMLINE	155	30/04/07
LN-03-A-01	MIXED HOUSES	LINCOLNSHIRE	LINCOLN	150	15/05/07
LN-03-A-02	MIXED HOUSES	LINCOLNSHIRE	LINCOLN	186	14/05/07
NE-03-A-02	SEMI DETACHED & DETACHED	NORTH EAST LINCOLNSHIRE	SCUNTHORPE	432	12/05/14
NE-03-A-03	PRIVATE HOUSES	NORTH EAST LINCOLNSHIRE	SCUNTHORPE	180	20/05/14
NY-03-A-06	BUNGALOWS & SEMI DET.	NORTH YORKSHIRE	BOROUGHBRIDGE	115	14/10/11
SF-03-A-02	SEMI DET./ TERRACED	SUFFOLK	IPSWICH	230	24/05/07
SH-03-A-04	TERRACED	SHROPSHIRE	SHREWSBURY	108	11/06/09
SR-03-A-01	DETACHED	STIRLING	STIRLING	115	23/04/07
WS-03-A-04	MIXED HOUSES	WEST SUSSEX	HORSHAM	151	11/12/14
TRICS CALCULATION REFERENCE: AUDIT-851401-150818-0832					

5.3.4 The TRICS output data is provided in **Appendix B** of this report. The vehicular trip rates and associated trip generation for 160 dwellings is shown in Table 5.2.

Table 5.2 – Residential Vehicular Trip Rates and Trip Generation (Table 6.1 of CTS Transport Assessment)

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	0.15	0.41	0.56	0.35	0.22	0.57
Vehicular trip generation (160 dwellings)	23	65	88	56	36	92

**Errors in arithmetic are due to rounding*

5.3.5 As shown in Table 5.2, the residential element of the proposed development was forecast to generate approximately 88 two-way trips in the AM peak period and 92 two-way trips in the PM peak period. This equates to one vehicle arriving or departing the site every 45 seconds in each peak period, on average.

Commercial Land Use

5.3.6 It is noted that the planning application A/122/19/OUT is approved for the provision of 1,393 sqm of commercial land. However, the previous TS which was approved under the outline scheme based trip calculations on the provision of 557 sqm of B1/B2 land use. To ensure consistency with the previously approved methodology, this TS has included the trip generation estimates calculated by CTS for 557 sqm. The same trip rates have been utilised to quantify the trips associated with for 1,393 sqm of land use, as approved.

5.3.7 Given that the application A/122/19/OUT has been approved for proposed commercial land use of 1,393 sqm GFA, it is assumed that the quantum of trips associated with the higher GFA was acceptable to the Local Highway Authority.

5.3.8 The following criteria was used by CTS to ascertain the vehicular trip rates associated with the commercial development:

- Category '02 – Employment – A – Office';
- Sites in England, Scotland and Wales, excluding Greater London;
- Sites with a gross floor area between 178-175,000 sqm;
- Weekday surveys (excl. Friday) only;
- Town Centre and Edge of Town Centre sites removed; and
- Sites within Industrial, Commercial, Residential or Built-Up Zones and sites with no Sub Category.

5.3.9 Based on the above search criteria, a total of 14 sites were deemed suitable for comparison to the proposed development. A summary of each site is proposed below in Table 5.3.

Table 5.3 - Commercial Sites extracted from the TRICS Database by CTS

Reference	Nature of Development	County	Town/City	Gross Floor Area	Date of Survey
CA-02-A-04	OFFICE	CAMBRIDGESHIRE	PETERBOROUGH	6483 sqm	20/10/11
CA-02-A-06	OFFICES	CAMBRIDGESHIRE	PETERBOROUGH	4040 sqm	19/10/16
CO-02-A-01	GOVERNMENT OFFICES	CONWY	LLANDUDNO JUNCTION	6186 sqm	28/03/18
DH-02-A-02	CONSTRUCTION COMPANY	DURHAM	BOWBURN	2000 sqm	27/11/12
ES-02-A-11	HOUSING COMPANY	EAST SUSSEX	ORE VALLEY	186 sqm	17/11/15
HC-02-A-11	DIY CO. HQ	HAMPSHIRE	CHANDLER'S FORD	26100 sqm	17/10/11
HC-02-A-12	HMRC	HAMPSHIRE	COSHAM	10100 sqm	23/11/15
KC-02-A-07	KCC HIGHWAYS REG.	KENT	ASHFORD	2525 sqm	05/12/11
KC-02-A-08	KCCS HIGHWAYS REG.	KENT	AYLESFORD	3168 sqm	28/11/11
LC-02-A-09	OFFICES	LANCASHIRE	BLACKBURN	2600 sqm	04/06/13
SC-02-A-16	BANK OF AMERICA	SURREY	CAMBERLEY	39230 sqm	10/05/11
SC-02-A-17	PHARMACEUTICALS	SURREY	WEYBRIDGE	10293 sqm	18/10/11
WM-02-A-04	OFFICE	WEST MIDLANDS	BIRMINGHAM	1800 sqm	10/11/15
WY-02-A-05	OFFICES	WEST YORKSHIRE	CASTLEFORD	1230 sqm	23/05/17
TRICS CALCULATION REFERENCE: AUDIT-851401-190715-0715					

5.3.10 The TRICS output data is provided in **Appendix C** of this report. The vehicular trip rates and associated trip generation for a GFA of 557 sqm (as presented within the CTS TA) and for the approved GFA of 1393 sqm is shown in Table 5.4.

Table 5.4 - Commercial Vehicular Trip Rates and Trip Generation

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	1.64	0.12	1.76	0.09	1.44	1.53
Trip Generation by CTS (557 sqm)	9	1	10	0	8	8
Trip Generation (1,393 sqm)	23	2	25	1	20	21

**Errors in arithmetic are due to rounding*

- 5.3.11 As shown in Table 5.4, the commercial element of the proposed development was forecast to generate approximately 10 two-way trips in the AM peak period and 8 two-way trips in the PM peak period when calculated by CTS for a 557 sqm GFA.
- 5.3.12 When recalculated to account for a GFA of 1,393 sqm, this equates to 25 two-way trips in the AM peak period and 21 two-way trips in the PM peak period. This approximately equates to one vehicle arriving or departing the site every 3 minutes in each peak period, on average.

5.4 Pedestrian & Cycle Trip Generation

- 5.4.1 CTS carried out a Walking, Cycling & Horse-Riding Assessment using multi-modal survey data from the TRICS database.
- 5.4.2 A summary of the pedestrian trip rates and potential trips calculated by CTS are presented below in Table 5.5. At the time that these estimates were calculated, the site proposed development included 200 new dwellings. The estimates calculated by CTS have been scaled within Table 5.5 to reflect the trips associated with 160 dwellings.

Table 5.5 - Pedestrian Trip Generation

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	0.048	0.161	0.208	0.081	0.042	0.123
Trip Generation by CTS (200 dwellings)	10	32	42	16	8	24
Trip Generation (160 Dwellings)	8	26	34	13	7	20

**Errors in arithmetic are due to rounding*

- 5.4.3 As shown in Table 5.5, the proposed residential development is expected to generate 34 two-way walking trips in the AM peak and 20 two-way walking trips in the PM peak. The TRICS output data is provided in **Appendix D** of this report.
- 5.4.4 A summary of the cycle trip rates and potential trips calculated by CTS are presented below in Table 5.6. At the time that these estimates were calculated, the site proposed development included 200 new dwellings. The estimates calculated by CTS have been scaled within Table 5.6 to reflect the trips associated with 160 dwellings.

Table 5.6 - Cycle Trip Generation

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	0.002	0.016	0.018	0.017	0.009	0.026
Trip Generation by CTS (200 dwellings)	0	3	3	3	2	5
Trip Generation (160 Dwellings)	0	3	3	3	1	4

**Errors in arithmetic are due to rounding*

5.4.5 As shown in Table 5.6, the proposed residential development is expected to generate 3 two-way cycling trips in the AM peak and 4 two-way cycling trips in the PM peaks. The TRICS output data is provided in **Appendix D** of this report.

5.5 Trip Generation Sensitivity Test

5.5.1 The Trip rates detailed above were calculated by CTS in 2015. Although the data is still considered to be valid and formed part of the approved Transport Assessment, JNP have undertaken a sensitivity test in order to ensure that the data still offers a robust estimation of the trips which will be generated by the commercial and residential land uses.

5.5.2 For the vehicle trip rate estimates carried out by CTS, JNP Group have duplicated the search criteria in TRICS with the same parameters to produce trip rate estimates using more up-to-date traffic surveys, including surveys that were carried out since 2015.

5.5.3 A summary of the residential trip rate sensitivity test is shown as Table 5.7.

Table 5.7 - Summary of Residential Trip Sensitivity Test

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential Trip Rate (2015 CTS Estimates)	0.15	0.41	0.56	0.35	0.22	0.57
Residential Trip Generation (2015 CTS Estimates)	23	65	88	56	36	92
Residential Trip Rate (2021 JNP Estimates)	0.14	0.375	0.515	0.342	0.165	0.507
Residential Trip Generation (2021 JNP Estimates)	22	60	82	55	27	81
Trip Rate Difference	-0.01	-0.035	-0.045	-0.008	-0.55	-0.063
Trip Generation Difference	-1	-5	-6	-1	-9	-11

**Errors in arithmetic are due to rounding*

5.5.4 As shown in Table 5.7 the residential trip rate/generation calculations carried out by JNP have yielded marginally lower values than the values calculated by CTS in 2015, meaning that the volume of traffic generated by the residential site may be lower than the estimates previously provided by CTS. The trip rates and trip generation presented within the

approved Transport Assessment therefore by CTS remain robust. The TRICS report produced by JNP Group for the residential trip rate/generation is provided in **Appendix E** of this report.

5.5.5 A summary of the commercial trip rate sensitivity test is shown below as Table 5.8.

Table 5.8 - Commercial Trip Sensitivity Test for 557sqm GFA

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Commercial Trip Rate (2015 CTS estimate)	1.64	0.12	1.76	0.09	1.44	1.53
Commercial Trip Generation (2015 CTS Estimates, 557 sqm)	9	1	10	0	8	8
Commercial Trip Rate (2021 JNP Estimates)	1.6	0.104	1.704	0.137	1.443	1.58
Commercial Trip Generation (2021 JNP Estimates, 557 sqm)	9	1	10	1	8	9
Trip Rate Difference	-0.04	-0.016	-0.056	+0.047	+0.003	+0.05
Trip Generation Difference	0	0	0	+1	0	+1

5.5.6 As shown in Table 5.8, the commercial trip rate/generation calculations carried out by JNP have yielded very similar values as the calculations carried out by CTS in 2015. Both calculations estimate the commercial site to generate 10 two-way vehicle trips in the AM peak period for a GFA of 557sqm. For a GFA of 557 sqm, the sensitivity test trip rates result in the generation of 9 two-way vehicle trips in the PM Peak, compared to 8 calculated by CTS. The trip rates presented within the approved Transport Assessment therefore remain robust.

5.5.7 The TRICS report produced by JNP Group for the commercial trip rate/generation is provided in **Appendix F** of this report.

5.5.8 As stated in Section 5.3.6, the trip generation assessment for the commercial/employment land use within the TA prepared by CTS assessed the trips which would be generated by 557 sqm GFA. Permission was granted for a higher GFA of 1,393 sqm and this value will be maintained within the hybrid application submission. The trip generation associated with a GFA of 1,393sqm is shown in Table 5.9.

Table 5.9 – Commercial Trip Generation Sensitivity Test for 1,393sqm GFA

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Commercial Trip Rate (2015 CTS estimate)	1.64	0.12	1.76	0.09	1.44	1.53
Commercial Trip Generation (using 2015 CTS trip rate, 1393sqm)	23	2	25	1	20	21
Commercial Trip Rate (2021 JNP estimate)	1.6	0.104	1.704	0.137	1.443	1.58
Commercial Trip Generation (using 2021 JNP trip rate, 1393sqm)	22	1	24	2	20	22
Trip Generation Difference	-1	-1	-1	+1	0	+1

- 5.5.9 As shown in Table 5.9, the 1,393 sqm GFA is expected to generate approximately 24 two-way trips in the AM peak period and 22 two-way trips in the PM peak period. The trip rates presented within the previous TS remain robust and have been applied to both GFA values.

6 HIGHWAY IMPACT ASSESSMENT

6.1 Introduction

- 6.1.1 This section describes the assessment scenarios and provides background on the junction models prepared before reporting on the highway capacity implications of development.
- 6.1.2 The surveys and flow calculations described in this section were carried out by CTS and submitted with the Transport Assessment included with planning application A/122/19/OUT. As the quantum of proposed development has not changed since these calculations were carried out, it is not deemed necessary to re-assess the junction capacity assessments.
- 6.1.3 This is further supported by the trip generation sensitivity test, which demonstrated that the trip generation figures assessed within the previous Transport Assessment remain robust. This section of the Transport Statement therefore presents the highway capacity impact assessment which was carried out by CTS within their Transport Assessment. No additional surveys or assessments have been carried out.
- 6.1.4 Given the site's primary development is residential, it was deemed the most appropriate to consider the AM and PM weekday peak travel hours as those with the most significant impact on the local highway network. As such, surveys and calculations were carried out to reflect the weekday AM and PM peak periods.

6.2 Survey Data

- 6.2.1 To establish the base traffic flows on the highway network surrounding the site, CTS arranged for full turning count surveys to be carried out on Wednesday 15th November 2017 at the following junctions:
- A27 / Arundel Road (Left in / Left out);
 - Arundel Road / Water Lane;
 - A529 New Road / Station Road / Roundstone Bypass Road / B2140; and
 - Roundstone Bypass Road / A280 / Repair Smart (previously Chips Away) / A529 / B2140 Old Worthing Road.
- 6.2.2 The surveys were undertaken from 07:30 to 09:30 for the AM period and from 16:30 to 18:30 for the PM period. The surveys identified that the AM peak travel hour is 07:45-08:45 and the PM peak travel hour is 16:45-17:45.
- 6.2.3 The results of the survey data described above is provided in **Appendix G**.
- 6.2.4 The data was also supplemented with additional data from another Transport Assessment associated with a development to the north of Water Lane (ref no. A/40/18/OUT). The data from this TA included the following junctions:
- A280 / Titnore Lane / A27 Slips (southern A27 Dumbbell Roundabout)
 - A280 Long Furlong / A27 Slips / Arundel Road (northern A27 Dumbbell Roundabout)
 - Water Lane / High Street; and

- Roundstone Bypass Road / Roundstone Lane.

6.2.5 The additional surveyed flows described above were added to the study network, which was extended take account of the A27 dumbbell roundabouts and A27 'U' turn movements at Poling Corner, as requested by Highways England.

6.3 Trip Distribution

6.3.1 Within the TA prepared by CTS, the directional distribution of the traffic associated with the proposals was assigned to the local highway network in line with Travel to Work Census Data. This mirrors a methodology which was utilised in the Transport Assessment associated with App ref no. A/82/12, which refers to the construction of 138 residential dwellings on land to the east of Roundstone Lane.

6.3.2 Following discussions with the highways officer a WSCC, the previously assumed 'U' turn movements at the A27/Arundel Road 'U' turn facility (at Poling Corner) were transferred to utilise the A280/Water Lane junction. This was considered to be reasonable given the announcement of a preferred route for the Road Investment Strategy (RIS) scheme at Arundel.

6.3.3 With reference to the Google Maps routing function, the highways officer at WSCC agreed that the journey times are considered to be comparable and so this was considered to be acceptable.

6.3.4 The resulting traffic assignment for the AM and PM peak periods are shown in **Appendix H (Figures 17, 18)**.

6.4 Assessment Scenarios

6.4.1 The scenarios agreed for assessment with WSCC and Highways England are as follows:

- 2021 Without Development Flows;
- 2021 With Development Flows;
- 2031 Without Development Flows; and
- 2031 With Development.

6.4.2 The 2031 assessments coincide with end of the Local Plan period were therefore considered to be robust.

6.4.3 The 2021 assessments were undertaken only for the junctions along the A27 which are maintained by Highways England, as only Highways England requested a 2021 assessment.

6.5 Network Study Area

6.5.1 As already stated, vehicular access into the site is proposed directly from Arundel Road.

6.5.2 CTS agreed with WSCC that only assessments for the 2031 flow scenario are required, in line with the end of the Local Plan period. This will test the junctions on the local highway network and the A27 junctions, which form the strategic highway network, maintained by Highways England.

- 6.5.3 The following section will mainly consider the operation of the A27 junctions maintained by Highways England for 2021, with the exception of the A27/Arundel Road junction, which will also be tested in 2031.
- 6.5.4 In addition to the proposed site access, the following junctions were assessed within the highway capacity impact assessment:
- Arundel Road/Water Lane/Station Road/High Street;
 - A280/Water Lane - Existing & Proposed Layouts;
 - A529 New Road/Station Road/Roundstone Bypass Road/32140; and
 - Roundstone Bypass Road/A280/Chips Away/A529/B2140 Old Worthing Road.
- 6.5.5 Following feedback on the original TA from the highways officer at WSCC, it was also requested that the following junctions are included within the assessments:
- Water Lane/High Street (to be modelled with the Arundel Rd/Station Rd junction);
 - A280/Titnore Lane/A27 (southern A27 dumbbell Roundabout) - Existing & Proposed Layouts); and
 - A280 Long Furlong/A27 (northern A27 dumbbell Roundabout) - Existing & Proposed Layouts.
- 6.5.6 In their response, Highways England also requested that assessments be undertaken for the A27/Arundel Road priority junction. A total of eight junctions were assessed, including the residential site access. A review of the Transport Assessment prepared by CTS has confirmed that the commercial site access was not included within the highway capacity assessment.
- 6.6 Calculation of Growth Factors**
- 6.6.1 To derive the baseline 2021 flows, the 2017 surveyed flows have been growthed to 2021 using National Traffic Model (NTM) factors adjusted using the Trip End Model Program (TEMPro) local growth factors. The resultant 2021 factored traffic flows are provided in **Appendix H (Figures 3, 4)**.
- 6.6.2 To derive the baseline 2031 flows, the 2017 surveyed flows have been growthed to 2031 using National Traffic Model (NTM) factors adjusted using the Trip End Model Program (TEMPro) local growth factors. The resultant 2031 factored traffic flows are provided in **Appendix H (Figures 7, 8)**.
- 6.6.3 The resultant growth factors which were utilised by CTS are provided below:
- 2017-2021 AM Peak – 1.0531
 - 2017-2021 PM Peak – 1.0514
 - 2017-2031 AM Peak – 1.1563
 - 2017-2031 PM Peak – 1.1574

6.7 Committed Development

6.7.1 Consideration was also given to any committed developments in the area that will have an impact on the local highway network. The following developments were considered in the calculation of future traffic flows:

- A/82/12 – 138 residential units;
- A/144/15/PL – 246 residential units;
- A/27/16/PL – 53 bed care home;
- A/40/18/OUT – 525 residential units & 3ha commercial development; and
- A/99/17/OUT – 175 residential units

6.7.2 CTS noted that they were aware of other proposed developments in the area, however the size of the developments was small enough that the impact on the highway network could be considered negligible.

6.7.3 The total committed development flows are provided as **Appendix H (Figures 9f, 10f)**.

6.8 Without Development Flows

6.8.1 To establish the 2021 'Without Development' flows, the total committed development flows for the AM and PM peaks respectively have been added to the factored 2021 flows (grown from 2017 to 2021). The resulting 2021 'Without Development' traffic flows are presented in **Appendix H (Figures 11, 12)**.

6.8.2 To establish the 2031 'Without Development' flows, the total committed development flows for the AM and PM peaks respectively have been added to the factored 2031 flows. The resulting 2031 'Without Development' traffic flows are presented in **Appendix H (15, 16)**.

6.9 With Development Flows

6.9.1 In order to calculate the 2021 'With Development' flows, the trips which are generated by the proposed development were added to the 2021 'Without Development' flows. The resulting 2021 'With Development' flows are presented in **Appendix H (Figure 21, 22)**.

6.9.2 In order to calculate the 2031 'With Development' flows, the development flows were added to the 2031 'Without Development' flows. The resulting 2021 'With Development' flows are presented in **Appendix H (Figures 25, 26)**.

6.10 Site Access / Arundel Road

6.10.1 The proposed site access off Arundel Road will be a priority-controlled junction and so has been assessed using PICADY.

6.10.2 The junction was modelled within the 2031 With Development Scenario and the results are summarised within Table 6.1. The full results are detailed in **Appendix I**.

Table 6.1 - Summary of PICADY Results for Site Access/Arundel Road

Arm	2031 With Development			
	AM		PM	
	RFC	Q	RFC	Q
Site Access	0.15	0	0.10	0
Arundel Road	0.03	0	0.05	0

- 6.10.3 As can be seen above, the results show the new site access junction will operate efficiently in both the AM and PM peak hours in the 'With Development' 2031 flow scenarios.
- 6.10.4 The above demonstrates that the proposed site access is suitable in terms of its geometric layout and design and will provide a safe point of access into the site.

Wider Highway Network

6.11 A259 Corridor

- 6.11.1 In regard to the wider highway network, CTS confirmed following discussions with the highway offer at WSCC proposals have been developed by the Council to improve the A259 to the south of Angmering.
- 6.11.2 The identified survey area included the A259 within the Arun District from the River Arun (west of Littlehampton) up to and including the Goring Crossways junction within the Borough of Worthing. The study area is shown in Figure 6.1.

Figure 6.1 - A259 Improvements Study Area



- 6.11.3 The proposals were the subject of a formal public consultation and were expected to be funded from developer contributions and funding from WSCC and Government grants, secured through the Coast to Capital Local Enterprise Partnership.

- 6.11.4 The proposals are expected to be delivered in several phases, as local development comes forward. A review of the WSCC website has confirmed that the main construction phase for the works commenced in September 2020, with an expected duration of 28 months. As such, consideration for this corridor is still considered relevant within the highway impact assessment.

6.12 A280 / Water Lane

- 6.12.1 The Transport Assessment prepared by CTS also stated that a nearby application (Land to the North of Water Lane) was proposing to re-configure the A280/Water Lane junction from a limited movement priority junction (no right turns out of Water Lane are currently permitted) to a roundabout which will allow all movements. The submitted TA for the above application confirms the anticipated changes in traffic on the surrounding highway network as a result of this and for ease, this is replicated in Table 6.2.

Table 6.2 - Summary of Changes in Traffic

Movement	Junction	Two-Way Traffic Flows	
		AM	PM
Water Lane/A280	Water Lane (Right)	+180	+120
	Water Lane (Left)	+0	+0
	Net Change	+180	+120
A280/A259 Roundabout	A280 Left	+82	+71
	A280 Right	+98	+49
	A259 (e)	-82	-71
	Net Change	+98	+49
Roundstone Lane/ Roundstone Bypass	Roundstone Lane Left	-82	-49
	A259 (w)	+83	+56
	A259 (e)	0	0
	Net change	+1	+7
Station Road/Roundstone Bypass Road	Station Road Right	-63	-42
	Station Road Left	0	0
	Station Road (s)	-20	-14
	A259 (w)	+63	+42
	A259 Left	+20	+14
	Net Change	0	0

- 6.12.2 As shown above, the provision of the right turn at the Water Lane/A280 junction would provide a reduction in traffic travelling towards the centre of Angmering. This change would improve conditions on the local highway network, which are summarised as follows:

- Roundstone Lane – 96 fewer vehicles in the AM peak / 65 fewer vehicles in the PM peak
- Weavers Hill - 60 fewer vehicles in the AM peak / 32 fewer vehicles in the PM
- High Street - 37 fewer vehicles in the AM peak / 32 fewer vehicles in the PM
- Station Road - 96 fewer vehicles in the AM peak / 65 fewer vehicles in the PM

- 6.12.3 Given the calculations shown above, an additional assessment was undertaken for Water Lane / A280 junction based on the potential new movement roundabout and re-distributed traffic. To establish this, the 2021 traffic flows in the relevant TA (which included committed developments) have been growthed up to 2031. This was considered to be robust given that committed development would be included within the applied growth.
- 6.12.4 The corresponding traffic flows for this assessment showing the reassigned traffic at the A280/Water Lane junction are shown in **Appendix H (Figures A-L)**.
- 6.13 A280 / Titnore Lane / A27 Slips (Southern A27 Dumbbell Roundabout)**
- 6.13.1 From a review of the Land North of Water Lane TA, it is understood that mitigation measures are proposed by way of widening the A280 south-western approach to two lanes. The assessment results for the existing and improved layouts are presented in this section for 2031 and the following section for 2021.
- 6.14 A280 Long Furlong / A27 Slips / Arundel Road (Northern A27 Dumbbell Roundabout)**
- 6.14.1 The Transport Assessment prepared by CTS stated that improvements were proposed to the northern dumbbell roundabout as part of the Arun District Transport Study (Phase 3).
- 6.14.2 The TA states that while the scheme is committed, it did not yet have funding and so the TA concluded that it was unlikely that developer funding would be sought. At the time of this TS being prepared, a review of the Arun District Council website indicated that Phase 3 of the scheme was still ongoing and was supported by the Arun Active Travel Study. The assessment results for the existing and improved layouts are presented in this section for 2031 and the following section for 2021.
- 6.15 Arundel Road / Water Lane / Station Road / High Street**
- 6.15.1 The Arundel Road / Water Lane / Station Road junction is a priority junction and so is the Water Lane / High Street junction. The junctions therefore form a staggered crossroads with a pedestrian crossing in between.
- 6.15.2 CTS note within the TA that the highways officer requested that the two junctions be modelled together, using the slope and intercept values from the PICADY models to calibrate to the local conditions. For the purpose of the model, the same assumptions were used as included in the Land North of Water Lane TA i.e., 100 pedestrians each way, equating to 60 calls an hour, with a 60 second cycle time. The junctions were therefore modelled using LINSIG.
- 6.15.3 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 are summarised within Table 6.3. The full results are detailed in **Appendix I**.

Table 6.3 - Summary of LINSIG Results for Arundel Road/Water Lane/Station Road/High Street

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	DOS	MMQ	DOS	MMQ	DOS	MMQ	DOS	MMQ
High Street (R&L)	66.9	1	36.8	0	67.4	1	36.9	0
Station Road (nb) exit (Ahead & Right)	44.5	3	34.8	2	45.8	3	35.6	2
Station Road at Arundel Road (exit)	23.5	0	44.9	4	25.3	0	46.3	4
Station Road (sb) at Arundel Road	11.3	1	31.0	3	11.3	1	31.0	3
Station Road (nb) at Arundel Road	27.2	2	19.8	2	27.2	2	19.8	2
Arundel Road (Left & Right)	20.4	0	19.5	0	24.7	0	22.5	1
Station Road (sb)	19.9	0	29.8	1	19.9	0	30.9	1
Station Road (nb)	16.3	0	29.8	0	18.0	0	30.9	0
Pedestrian Link	19.9	0	14.5	0	19.9	0	14.5	0

6.15.4 The 2031 'Without Development' results for the AM and PM peak hour show the junction will operate with reserve capacity.

6.15.5 The results for the 2031 'With Development' assessments show that the junction will continue to operate efficiently in both peak hours, in a similar manner to the base situation.

6.16 A280 / Water Lane (Existing Layout)

6.16.1 The A280/Water Lane junction is priority controlled, but only permits left turns out of Water Lane. It was assessed using PICADY.

6.16.2 The results for the 'Without Development' and 'With Development' Flow scenarios for 2031 are summarised within Table 6.4. The full results are available in **Appendix I**.

Table 6.4 - Summary of PICADY Results for A280/Water Lane

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Water Lane	1.20	82	0.62	2	1.23	97	0.64	2
A280	0.71	2	1.32	130	0.71	2	1.32	130

6.16.3 The 2031 'Without Development' results for the AM and PM peak hour show the junction will operate above its theoretical capacity, although it should be noted that the model is over predicting the levels of queuing in both peaks.

6.16.4 The 'With Development' assessment shows the junction continuing to operate above capacity, as would be expected.

6.16.5 The TA states that a review of the observed levels of queuing, which are very low, indicate that the model is not properly replicating what is taking place on the ground.

6.17 A280/ Water Lane (Potential Roundabout Layout)

- 6.17.1 Notwithstanding the above and as already mentioned, it is understood that a scheme has been proposed as part of the Land North of Water Lane development that would convert the existing priority junction into a standard roundabout.
- 6.17.2 As such, the junction was also tested based on this new roundabout layout, to demonstrate that these proposals can be adequately accommodated.
- 6.17.3 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 are summarised within Table 6.5. The full results are available in **Appendix I**.

Table 6.5 - Summary of ARCADY Results for A280/Water Lane - Improved

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A280 (s)	0.24	0	0.28	0	0.25	0	0.28	0
Water Lane	0.68	2	0.40	1	0.71	2	0.42	1
A280 (n)	0.50	1	0.72	3	0.50	1	0.72	3

- 6.17.4 The 2031 'Without Development' results for the AM and PM peak hour show the junction will operate with reserve capacity in both flow scenarios.
- 6.17.5 The results for the 2031 'With Development' assessment show that the junction will continue to operate in a similar manner to the base situation and the proposed development traffic can be accommodated.

6.18 A529 New Road / Station Road / Roundstone Bypass Road / B2140

- 6.18.1 The A529 New Road / Station Road / Roundstone Bypass Road / B2140 junction is a roundabout and so has been assessed using ARCADY.
- 6.18.2 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 are summarised within Table 6.6. The full results are available in **Appendix I**.

Table 6.6 - Summary of ARCADY Results for A529 New Road/Station Road/Roundstone Bypass Road/B2140

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Station Road	1.29	86	0.95	11	1.35	105	0.99	15
Roundstone Bypass Road	1.23	164	1.31	210	1.23	168	1.32	229
B2140	0.84	5	0.79	4	0.84	5	0.80	4
A529 New Road	0.91	10	0.79	4	0.92	10	0.80	4

- 6.18.3 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating over its theoretical capacity with extensive queuing.

- 6.18.4 The results for the 2031 'With Development' assessment show that the junction will continue to operate above capacity, but the TA states that it is understood that contribution could be sought as part of the A259 improvement scheme to mitigate any impact at this junction.
- 6.18.5 In respect to the results, reference should be made to the queue survey data at **Appendix G**, which shows while queuing does occur, it is not to the extent shown in the model and so should be seen as a worst-case scenario.
- 6.18.6 A review of the approved Section 106 agreement under the A/122/19/OUT consent confirms that a financial contribution of £576,000 was agreed to be used towards improvements for either the A280/A27/Long Furlong junction or the A259 junctions (A259/Station Road roundabout and S259/S280 roundabout). It is assumed that the same contribution would be secured within any Section 106 agreement which was agreed, should full planning permission be granted under these proposals.

6.19 Roundstone Bypass Road / A280 / Repair Smart (previously Chips Away) / A52 (e) / B2140 Old Worthing Road

- 6.19.1 The A529 New Road/Station Road / Roundstone Bypass Road/32140 junction is a roundabout and so has been assessed using ARCADY.
- 6.19.2 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 are summarised within Table 6.7. The full results are available in **Appendix I**.

Table 6.7 - Summary of ARCADY Results for Roundstone Bypass Road/A280/Repair Smart/A529/B2140 Old Worthing Road

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A280	0.64	2	0.64	2	0.64	2	0.65	2
Repair Smart (previously Chips Away)	0.21	0	0.11	0	0.22	0	0.11	0
A529 (e)	0.58	1	0.70	2	0.59	1	0.71	4
B2140 Old Worthing Road	0.70	2	0.33	1	0.71	2	0.34	1
Roundstone Bypass Road	1.17	133	1.05	59	1.18	141	1.06	63*

**It is noted that Table 6.11 of the TA prepared by CTS listed a queue length of 158 in the '2031 with Development' PM Peak scenario on the Roundstone Bypass Road. A review of the modelling outputs contained within Appendix 9 of the CTS TA has confirmed that the correct queue length is 63 vehicles. Table 6.7 has therefore been amended to reflect the correct value.*

- 6.19.3 The 2031 'Without Development' results for the AM and PM peak hours show the junction will be operating above its theoretical capacity.
- 6.19.4 The results for the 2031 'With Development' assessment show that the junction will operate in a similar manner. The TA prepared by CTS notes a contribution to the proposed A259

improvement scheme could be sought to mitigate the impact at this junction. A review of the approved Section 106 agreement under the A/122/19/OUT consent confirms that a financial contribution of £576,000 was agreed to be used towards improvements for either the A280/A27/Long Furlong junction or the A259 junctions (A259/Station Road roundabout and S259/S280 roundabout). It is assumed that the same contribution would be secured within any Section 106 agreement which was agreed, should full planning permission be granted under these proposals.

- 6.19.5 As with the A529 New Road / Station Road / Roundstone Bypass Road / B2140 junction, a review of queue lengths from the survey data indicates that queening does indeed occur, but not to the extent which is predicted by the model. The additional development flows have a minimal impact on queue lengths.

6.20 A280 / A27 / Titnore Lane (South)

- 6.20.1 The A280 / A27 / Titnore Lane (A2700) junction is a roundabout and so has been assessed using ARCADY.
- 6.20.2 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 are summarised within Table 6.8. The full results are available in **Appendix I**.

Table 6.8 - Summary of ARCADY Results for A280/A27/Titnore Lane (South) - Existing

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A27 wb Off Slip	0.59	1	0.64	2	0.59	1	0.64	2
Titnore Lane	0.56	1	0.7	2	0.56	1	0.70	2
Water Lane	1.14	85	0.69	2	1.16	99	0.71	2
A280 (n)	0.76	3	0.85	5	0.77	3	0.85	6

- 6.20.3 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating over its theoretical capacity in the AM peak but within capacity in the PM peak.
- 6.20.4 The results for the 2031 'With Development' assessment show that the junction will continue to operate in a similar manner to the 'Without Development' situation with some increased queueing.
- 6.20.5 However, the TA prepared by CTS states that, during their liaison with WSCC, it was identified that two improvements are proposed as part of the Water Lane developments (Application ref no's A/99/17 and A/40/18), one for the interim situation and a final for when the developments are both complete.
- 6.20.6 In light of the above and given this section of the TA is considering a 2031 flow scenario, it has been assumed that the two developments (now approved) would be fully built out and occupied and so on that basis, the junction was modelled based on the final set of improvements, as referred to in the associated TA and so the junction was re-run assuming these improvements are in place.

- 6.20.7 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 based on the improved layout are summarised within Table 6.9. The full results are available in **Appendix I**.

Table 6.9 - Summary of ARCADY Results for A280/A27/Titnore Lane (South) - Improved

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A27 wb Off Slip	0.61	2	0.64	2	0.61	2	0.64	2
Titnore Lane	0.56	1	0.70	2	0.56	1	0.70	2
Water Lane	0.89	7	0.54	1	0.91	9	0.55	1
A280 (n)	0.77	3	0.85	5	0.78	3	0.85	6

- 6.20.8 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating with reserve capacity based on the improved layout.
- 6.20.9 The 2031 'With Development' results show the junction will be operating at a similar level to the baseline scenario and that the development traffic can be accommodated.
- 6.20.10 As stated in Section 1.2 of this report, an outline application for the construction of 200 dwellings was submitted to ADC in 2018 (ref: A/36/18/OUT) and ultimately refused. The TA which was submitted in support of the application was also prepared by CTS and identified that further mitigation was required at the A280/A27/Titnore Lane (South) junction. However, as the scale of the residential development was reduced from 200 dwellings to 160 dwellings, this requirement is no longer necessary. This remains to be the case under the proposals which are the subject of this Transport Statement.
- 6.20.11 For completeness, a summary of the improved flow scenarios is still included below in Table 6.10. The full results are available in **Appendix I**.

Table 6.10 - Summary of ARCADY Results for A280/A27/Titnore Lane (South) - Further Improved

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A27 wb Off Slip	0.61	2	0.64	2	0.61	2	0.64	4
Titnore Lane	0.56	1	0.70	2	0.56	1	0.70	4
Water Lane	0.89	7	0.54	1	0.88	7	0.54	2
A280 (n)	0.77	3	0.85	5	0.78	3	0.85	6

- 6.20.12 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating with reserve capacity based on the improved layout.
- 6.20.13 The 2031 'With Development' results show the junction will be operating at a similar level and shows the development traffic can be accommodated.

6.21 A280 / A27 / Arundel Road / Long Furlong (North)

- 6.21.1 The A280 / A27 / Arundel Road / Long Furlong junction is a roundabout and so has been assessed using ARCADY.
- 6.21.2 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 based on the improved layout are summarised within Table 6.11Table 6.12. The full results are available in **Appendix I**.

Table 6.11 - Summary of ARCADY Results for A280/A27/Arundel Road/Long Furlong (North) - Existing

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A280 Long Furlong	0.73	3	0.88	7	0.74	3	0.89	7
A280 (s)	0.64	2	0.47	1	0.65	2	0.48	1
A27 Off Slip	0.85	5	0.44	1	0.86	6	0.45	1
Arundel Road	0.16	0	0.09	0	0.17	0	0.09	0

- 6.21.3 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating with reserve capacity.
- 6.21.4 The results for the 2031 'With Development' assessment show that the junction will continue to operate efficiently albeit with some increase in queuing.
- 6.21.5 It is understood however, that an improvement scheme has been identified as part of the Arun Transport Study (Stage 3) and so the junction has also been tested based on the improvement layout.
- 6.21.6 The improvements comprise the widening of the entry width on the A280 (sb) Long Furlong approach from 7.3 metres to 8.40 metres, which in turn extends the flare from 29 metres.
- 6.21.7 A plan showing the proposed improvements as detailed above is included in **Appendix I**.
- 6.21.8 The results for the 'Without Development' and 'With Development' flow scenarios for 2031 based on the improved layout are summarised within Table 6.12. The full results are available in **Appendix I**.

Table 6.12 - Summary of ARCADY Results for A280/A27/Arundel Road/Long Furlong (North) - Improved

Arm	2031 Without Development				2031 With Development			
	AM		PM		AM		PM	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
A280 Long Furlong	0.56	1	0.68	2	0.57	1	0.69	2
A280 (s)	0.64	2	0.47	1	0.65	2	0.48	1
A27 Off Slip	0.85	5	0.44	1	0.86	6	0.45	1
Arundel Road	0.16	0	0.09	0	0.17	0	0.09	0

6.21.9 The 2031 'Without Development' results for the AM and PM peak hour show that overall, the junction will be operating with reserve capacity.

6.21.10 The results for the 2031 'With Development' assessment show that the junction will continue to operate efficiently in both peak hours.

6.22 Summary

6.22.1 In the previous TS, CTS provided a summary of their traffic impact analysis. The summary shown below is based on the CTS summary, which is considered to remain accurate and robust.

6.22.2 The capacity assessments undertaken demonstrate that overall, the local highway network would remain operating in a similar manner to the base situation and the addition of the development traffic will have a minimal impact on capacity.

6.22.3 Traffic flows through the village will reduce should the potential roundabout junction be implemented as part of the Land North of Water Lane application.

6.22.4 It is understood that the A259 corridor currently experiences congestion during the peak hours and that an improvement scheme has been identified. It is likely that developer contributions will be sought to assist in mitigating the impact of the proposals along this section of the road network.

6.22.5 The assessments have also shown that the development traffic can be accommodated onto the wider highway network at the A27 dumbbell roundabout junctions (north and south), assuming the improvements are implemented. The conclusion within the CTS TA is that the impact at both of these junctions is just 29 vehicles in the AM peak and 24 in the PM peak and so the development traffic is not considered to have a material impact. Given that the same quantum of development is proposed under the hybrid application, this conclusion is still considered appropriate.

6.22.6 It is concluded that the development can be accommodated and were deemed necessary, contributions to the identified improvements schemes have been accommodated within the Section 106 agreement for the outline consent. On that basis, it is considered that the proposed development will have a minimal impact on the local network and will not give rise to any highways or transportation issues.

7 SUMMARY AND CONCLUSION

7.1 Summary

- 7.1.1 JNP Group have been appointed by Redrow Homes to prepare a Transport Statement in support of a proposed development in Angmering, Arun. The proposals comprise the construction of 160 dwellings and the development of 1,393sqm of Class E commercial units on land to the west of Arundel Road, Angmering.
- 7.1.2 This Transport Statement will be submitted to support a hybrid planning application, with full consent sought for the residential element of the scheme and outline consent sought for the other land uses. Outline planning consent for the same quantum of development was approved by Arun District Council (ADC) in 2020 under application A/122/19/OUT.
- 7.1.3 This Transport Statement has been prepared to take account of local and national planning policy, including the National Planning Policy Framework (2021), Arun District Local Plan 2011-2031 (2018) and the West Sussex Transport Plan 2011 – 2026 (2011).
- 7.1.4 Arundel Road links the Angmering village centre to the A27. The site is located approximately 170m south of the A27, west of Arundel Road. Two vehicular access points are proposed; one for the residential development and a separate one for the commercial development. The commercial access will form an upgrade of an existing access junction. The access points have been approved by the WSCC under the outline planning consent (A/122/19/OUT) and have been progressed separately through a Section 278 application for the residential access and a Section 73 application for the commercial access. The section 73 application has been approved in November 2021.
- 7.1.5 A review has been undertaken of the baseline conditions on the highway network surrounding the site, including the public transport provision. The development is within a reasonable walking distance of a range of amenities, including shops, leisure facilities and schools. The amenities can be accessed via the footways along Arundel Road. A new signal-controlled pedestrian crossing point is to be constructed to the south of the site to improve safety for pedestrians on Arundel Road.
- 7.1.6 The nearest bus stop to the site has been identified as the Chantryfield bus stop, 500m south of the site. The bus stop is served by one hourly bus service which visits a wide range of local amenities and surrounding towns, including Angmering Station. Angmering Station is located approximately 2.3km south of the site (2.4km walking distance) and is served by passenger services leading to a wide range of local and regional destinations including Littlehampton, Portsmouth, Brighton and London.
- 7.1.7 Parking has been provided in accordance with the standards set out by ADC and WSCC. Junction visibility splays, forward visibility splays and pedestrian visibility splays are all achievable without obstruction. Swept path analysis has also confirmed the suitability of the layout for a 9.62m refuse vehicle and a fire tender.
- 7.1.8 Trip generation data that was calculated by Croft Transport Solutions (CTS) using the TRICS database has been extracted from the Transport Assessment associated with the previous planning application and associated with the proposed development. It is expected that the residential development will generate 88 two-way vehicle movements in the AM Peak and 92 in the PM Peak. This equates to one vehicle arriving or departing the site every 40 seconds on average. It is expected that the commercial development will generate 25 two-

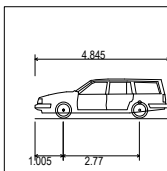
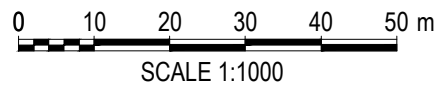
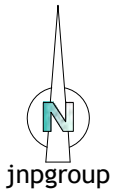
way vehicle movements in the AM Peak and 21 in the PM Peak. This equates to one vehicle arriving or departing the site every 2-3 minutes on average.

- 7.1.9 A Walking, Cycling & Horse-Riding Assessment was carried out by CTS as part of the previous outline planning application. This assessment provided estimates for pedestrian and cycle trip generation based on data from TRICS. These estimates have been modified for this Transport assessment to reflect the current residential proposal. While the majority of trips are expected to be made by car, residents of the proposed development are also expected to travel on foot and by cycle in each peak period.
- 7.1.10 The highway impact assessment has identified that many of the junctions near to the site are likely to continue operating at a similar level if the site developed, with some operating very efficiently, and some areas around Angmering that will require forms of traffic mitigation in the coming years to reduce congestion.
- 7.1.11 A Travel Plan has also been prepared for the proposed development, which should be read alongside this Transport Statement. The Travel Plan sets out a range of objectives and measures which aim to reduce reliance on the private car, thus increasing the number of journeys which are made by sustainable modes of transport.

7.2 Conclusion

- 7.2.1 This report has identified that the proposals will not generate unacceptable impacts on highways safety or capacity, the two grounds for which a recommendation for refusal is warranted under paragraph 111 of the NPPF (2021).

FIGURES AND DRAWINGS



Estate Car	4.845m
Overall Length	1.750m
Overall Width	1.424m
Min Body Height	0.189m
Max Track Width	1.655m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	4.950m

Junction Visibility

- 2.0m x 25m in accordance with 20mph design speed.
- Vis splays shown to nearside edge of vehicle track in accordance with Para 10.5.3 of MfS2.

Forward Visibility assessed in accordance with Manual for Streets (MfS)

- Reductions in stopping sight distance (SSD) around speed control bends have been manually calculated in accordance with Para 8.3.8 of MfS2.
- Bend Radius (R) determined using the centre of the carriageway lane for robustness.

Refer to JNP Transport Statement, Appendix A for full method of calculation.

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Rev.	Date	First Issue	Description	Dm / Chkd / App'd
-	25/11/2021	First Issue		EL/SW/SW

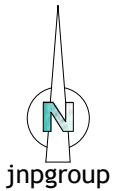
Suitability: S2 - Suitable for Information



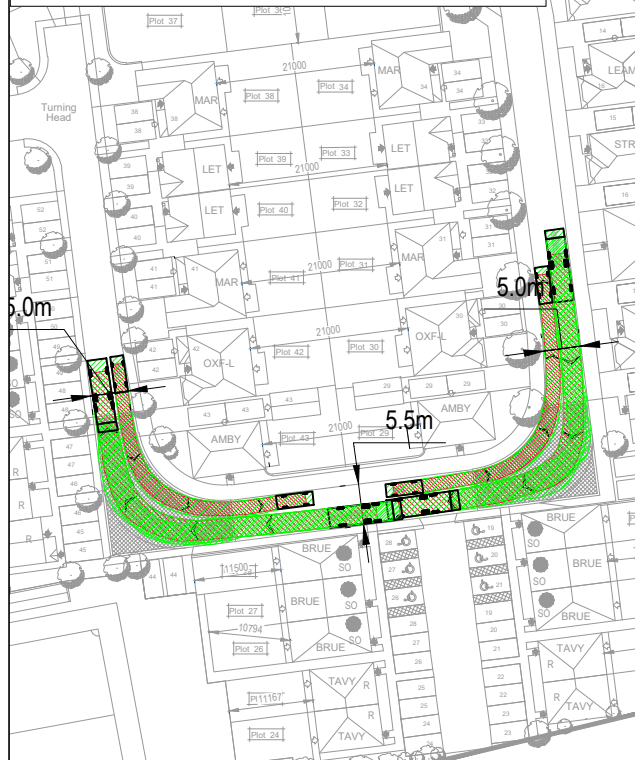
Client:	Redrow Homes Limited
Job:	Arundel Road, Angmering
Title:	Highway Geometry and Visibility Splays

Classification:	FI_60_20
Scale @ A2:	1:1000

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number	Revision:
C86473 - JNP - 66 - XX - DR - T - 7009	-



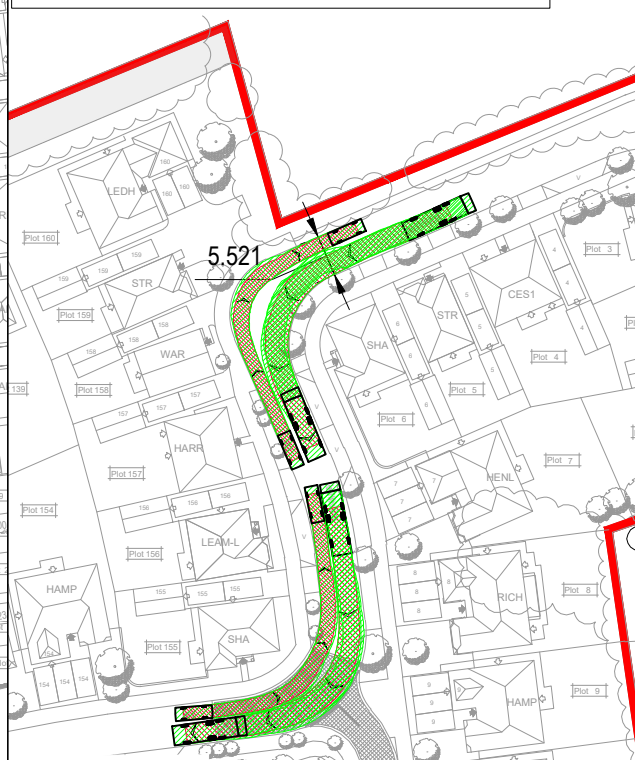
Refuse Entry, Estate Car Egress Near Plots 29 & 43



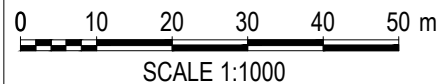
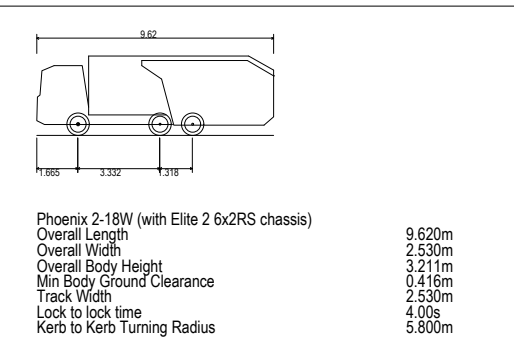
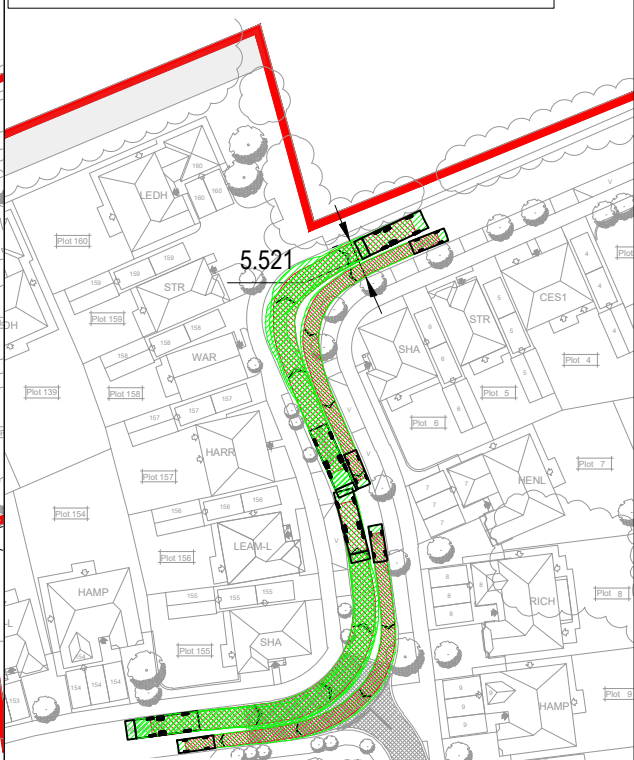
Refuse Egress, Estate Car Entry Near Plots 29 & 43



Refuse Entry, Estate Car Egress Near Plots 6 & 155



Refuse Egress, Estate Car Entry Near Plots 6 & 155



Legend

30m residents carry distance in accordance with Paragraph 1.8 of The Building Regulations 2010 Approved Document H - Drainage and Waste Disposal (2015 edition)

25m operatives carry distance in accordance with Paragraph 1.8 of The Building Regulations 2010 Approved Document H - Drainage and Waste Disposal (2015 edition)



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-	25/11/2021	First Issue	EL/SW/SW

Suitability: S2 - Suitable for Information

Client Logo:



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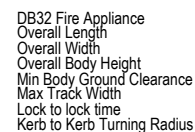
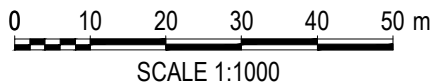
Client: Redrow Homes Limited

Job: Arundel Road, Angmering

Title: Refuse Vehicle Swept Path Analysis

Classification: FI_60_20	BMTRADA	HAS	Constructionline	Supplier No: 000026
Scale @ A2: 1:1000	Accredited Contractor			

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number	Revision: -
C86473 - JNP-66-XX-DR-T-7010	
Document/Drawing Number	



8.680m
2.180m
3.452m
0.337m
2.121m
6.00s
7.910m

Maximum 20m reversing distance for fire tenders in accordance with Building Regulations Approved Document B (2020)

- | | | | |
|---|------------|-------------|----------|
| - | 25/11/2021 | First Issue | EL/SW/SW |
|---|------------|-------------|----------|

Rev.	Date	Description	Dm / Chk'd / App'd
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Suitability

Client Logo



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Client:

Job

Title

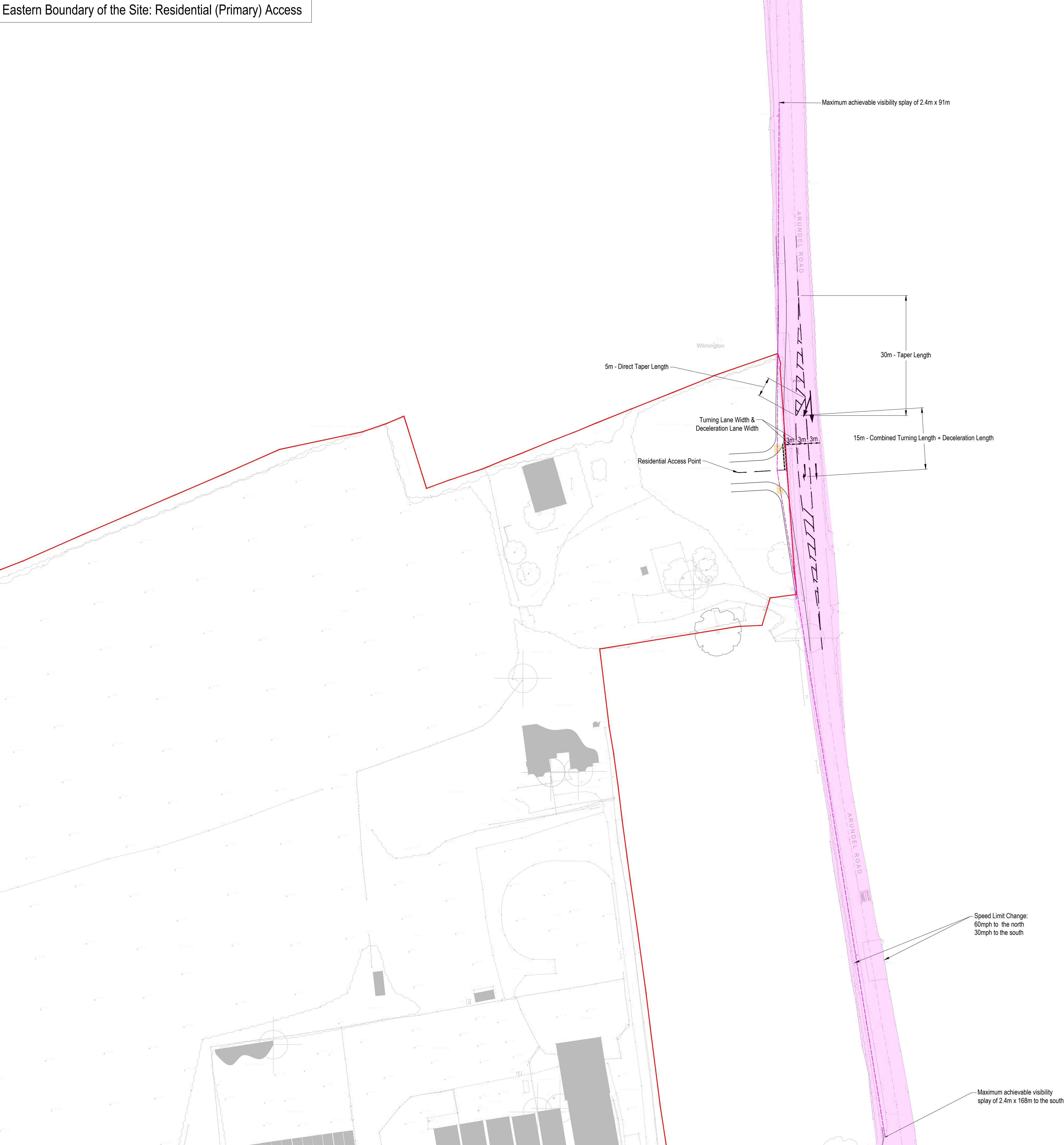
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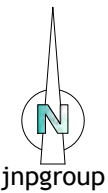
C86473 - JNP-66-XX- DR -T- 7011

Revision



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Legend

Adopted highway boundary data provided by WSCC, dated 25/01/2021

P01	03/08/2021	First Issue	EL/SWSW
	28/03/2021	First Draft	EL/SWSW
Rev.	Date	Description	Drn / CHK / Appd

Suitability
S2 - Suitable for Information



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Client Redrow			
Job: Arundel Road, Angmering			
Title: Primary Site Access General Arrangement			
Classification FL_60_20	   		
Scale @ A1: 1:500	Project - Originator - Volume/System - Level/Location - Type - Discipline - Number C86573 - JNP-XX-66 - DR - T - 7002		
	Document/Drawing Number	Revision: P01	

Drainage & Road Layout
Drawing Notes

- The contractor is to check and verify all buildings, site dimensions and levels, including sewer invert levels, before works start on site.
- The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
- The contractor is to check the level of existing sewers which are to be used as an out-fall prior to commencement of any onsite drainage works. Any discrepancies are to be reported to the Engineer.
- This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, specifications and any structural, geotechnical or other specialist document provided.
- Any anomaly or contradiction between any of the above or difference between actual and drawn details is to be reported to Redrow
- Drainage to be adopted under Section 104 of the Water Industries Act 1991, shall be constructed and tested in accordance with the current edition of *Sewerage Sector Guidance Appendix C, Design and Construction Guidance*.
- Roads, footpaths and parking areas which form part of the highway to be adopted under Section 38 of the Highways Act 1980 shall comply with the relevant Councils Highway Specification.
- All subgrade structures and unconsolidated material within the road construction width to be removed
- Formation preparation to be in accordance with Highways Agency Specification for Highway Works (SHW) cl. 616. No prepared formation to be continuously exposed to rain causing degradation below design CBR or to be left uncovered overnight.
- Any soft, damaged or weak spots including peat contaminated material are to be excavated and replaced with SHW Type 1 in accordance with SHW cl.803 laid and compacted to cl.802, Table 8/4
- Where ground conditions are deemed to be frost susceptible, refer to Ground Investigation report, track thickness shall be 450mm minimum thickness. All material within 450mm of road construction to be non-frost susceptible.
- Positions of existing services/statutory undertaker's apparatus adjacent to or crossing proposed sewers are to be checked by the contractor prior to starting work.

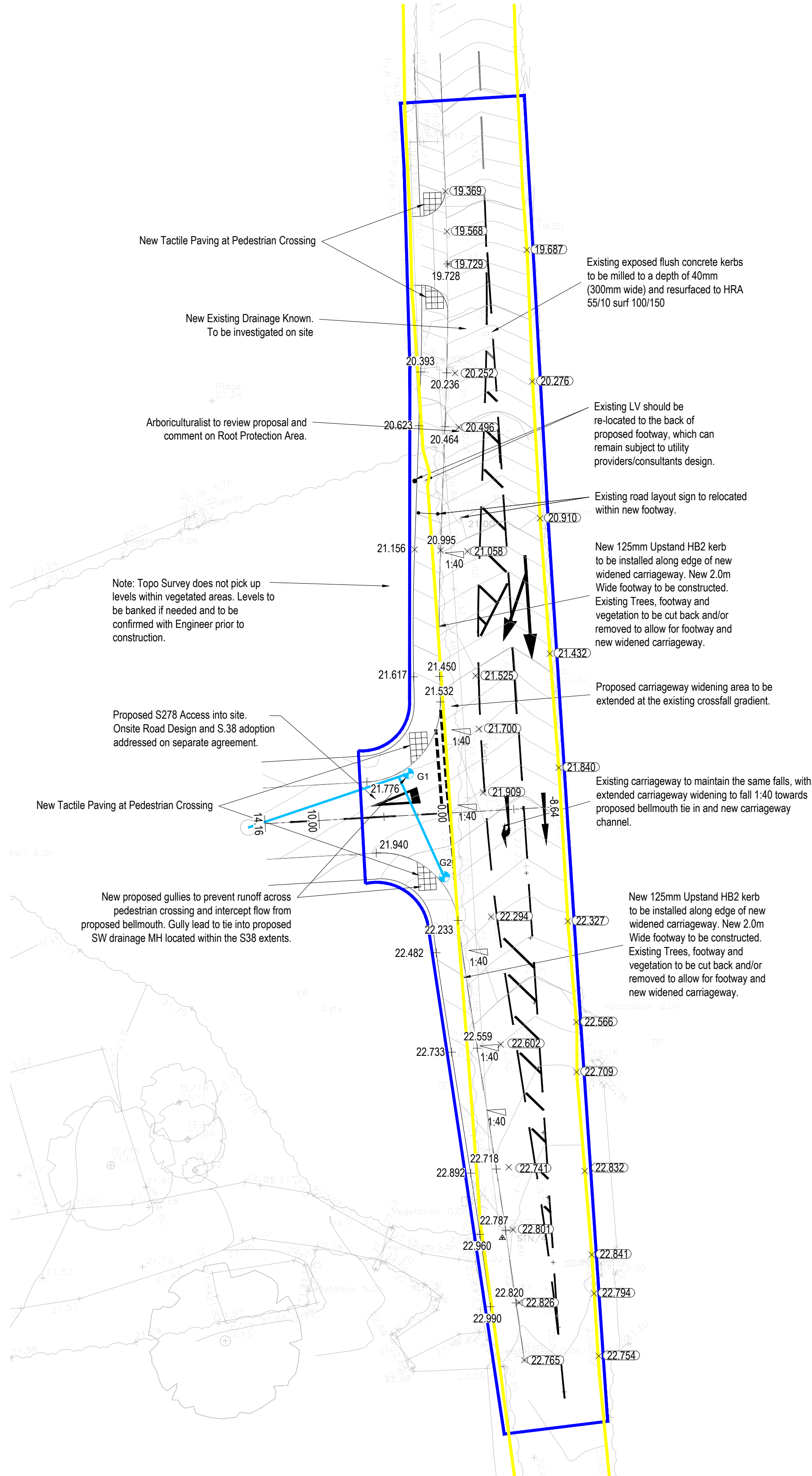
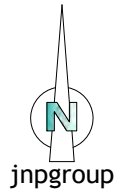
Design Notes

- Section 278 Works to be carried out in accordance with West Sussex design guide and standard construction details.
- Contractor to establish locations of all existing services prior to commencing, services diversions to be co-ordinated.
- Existing trees to be protected where excavations run close.
- Highway works subject to a Section 278 Agreement with West Sussex County Council prior to commencement.
- Highway Lighting Design to be designed by others.

West Sussex County Council Highway Notes

No works shall commence within the existing public highway until the Agreement is signed:

- Any soft spots within the proposed highway shall be dug out and the void backfilled in layers up to formation level with selected granular material as directed and to the satisfaction of the highway inspector.
- All fill material up to foundation level of the proposed highways to be approved and compacted in layers as directed and to the satisfaction of the highways inspector.
- Any damage caused to the existing highway during the course of the works to be repaired as directed and to the satisfaction of the highways inspector and/or Local Authority.
- Continuity of access to occupied areas to be maintained to satisfaction of Highways Inspector, Area Office Engineer and/or Local Authority.
- Any abandoned/redundant pipes and chambers that fall within the proposed highway shall be grubbed up and the void backfilled in layers up to formation level of the carriage way with selected granular material or permanently filled with concrete (or similar filler).
- Any redundant connections in existing manholes/chambers that are affected by the works shall be sealed and the benching made good as directed and to the satisfaction of the Highways Inspector and/or the utility company involved.
- Any existing live drains, sewers, ducts, cables, etc. that will pass under the proposed highway shall be surveyed, probed, traced, rodded, jetted, ccdv etc. to ascertain there structural condition and suitability to fall within the new highway. If deemed necessary, special protection and/or replacement may be required as directed and to satisfaction of the Highways Inspector, Area Engineer and/or Utility Company involved. Developer/Contractor to provide suitable and effective wheel washing facilities to prevent mud from been conveyed onto the public highway and to provide the means to clean the highway to the satisfaction of the Highways Inspector, Area Engineer an/or Local Authority.
- No concrete to be poured or laid in temperatures below 2deg Celsius on a falling max/min thermometer or before the temperature reaches 2deg Celsius on a rising max/min thermometer (to be provided by the Contractor and displayed in a position agreed by the Highways Inspector)
- All road signs and markings to comply with the Traffic Signs Manual.
- All road marking to be thermoplastic
- Contractor to comply with Chapter 8 of the Traffic Signs Manual 2009
- Refer to W.S.C.C 278/38 Highway Agreement Standard Details drawings 01-21 and revisions thereof.
- *All adoptable highway works to be carried out in accordance with DfT Specification of Highway Works or as amended by the West Sussex County Council Standard Details (2015) - both Available on the Internet"



Engineering Layout Key

GENERAL

- Existing survey station. It is important that the survey grid is maintained during the course of the works. The Contractor will be responsible for maintaining the existing grid and establishing new stations as necessary.
- S278 Boundary
- Highway Boundary

LEVELS

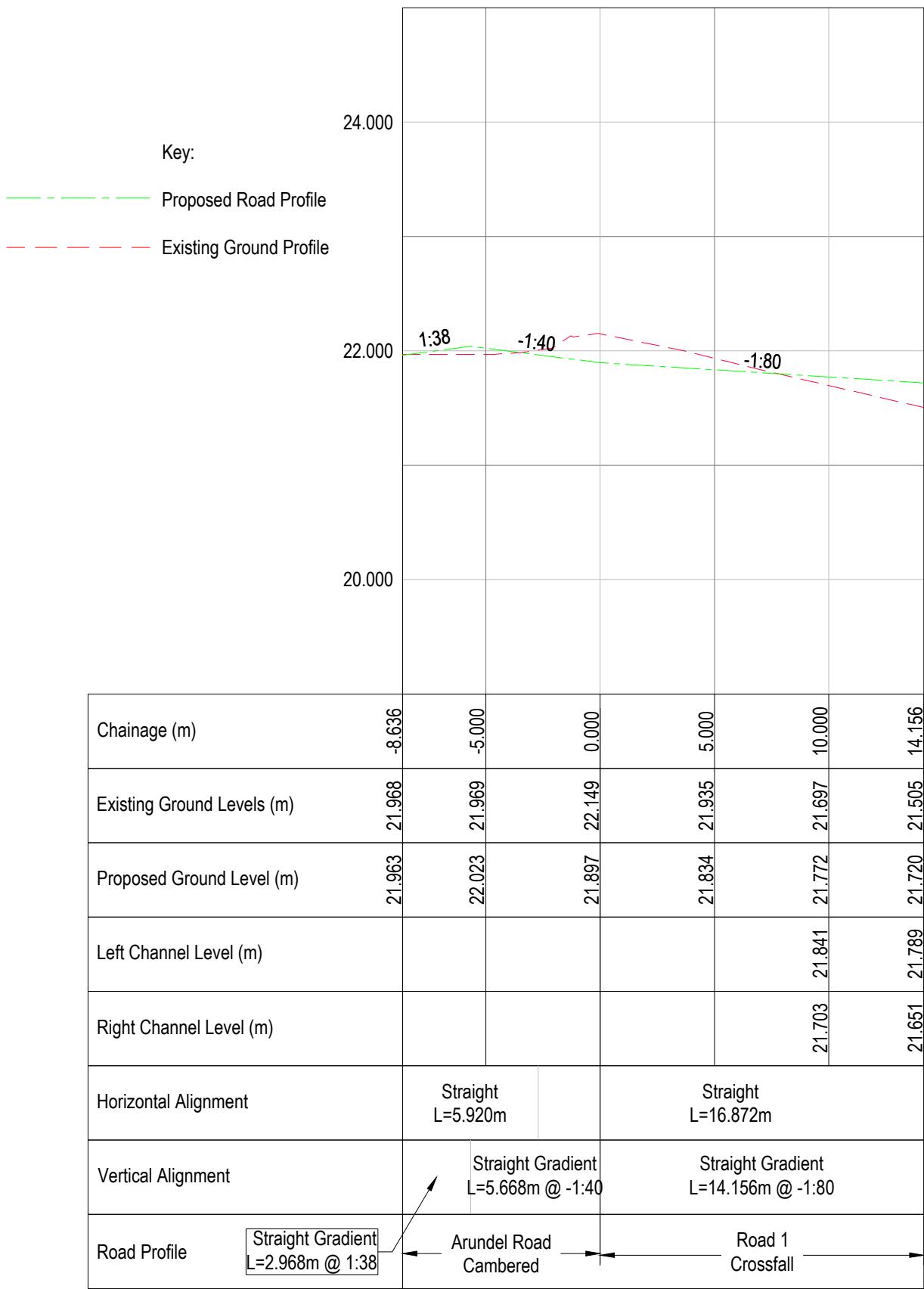
- Existing Level
- Existing Camber/Crossfall of Hard Surfacing
- Proposed Level

DRAINAGE

- 150mm dia. gully lead in accordance with Standard Detail located on dwg. 'C86473-JNP-90-XX-DR-C-3500 P01 S278 Road Construction Details'.
- New entry gully pot & ref. no., cover and frame

Notes

- Awaiting existing street lighting from W.S.C.C
- Any highway verge reinstatement works should be carried out using a clean local subsoil and seeded with an appropriate mixed grass and wild flower mix.



Road 1 Bellmouth Longitudinal Section

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Health & Safety Note

The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

HAZARD IDENTIFICATION BOX			
This table is provided to assist the Principal Contractor to fulfil their obligations under the CDM Regulations 2015			
Hazard Ref	Hazard Type Construction/Maintenance Cleaning/Operation/Maintenance	Hazard Description	Mitigation Measures/ Residual Risk

P02	20/08/2021	Added notes to drawing.	ZS/BID/BID
P01	16/08/2021	First Issue.	ZS/BID/BID
Rev.	Date	Description	Dwn/Chk'd / App'd
Subsidiary			
S4 - Suitable for Stage Approval			

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Client: Redrow

Job: Arundel Road, Angmering

Title: Engineering Layout

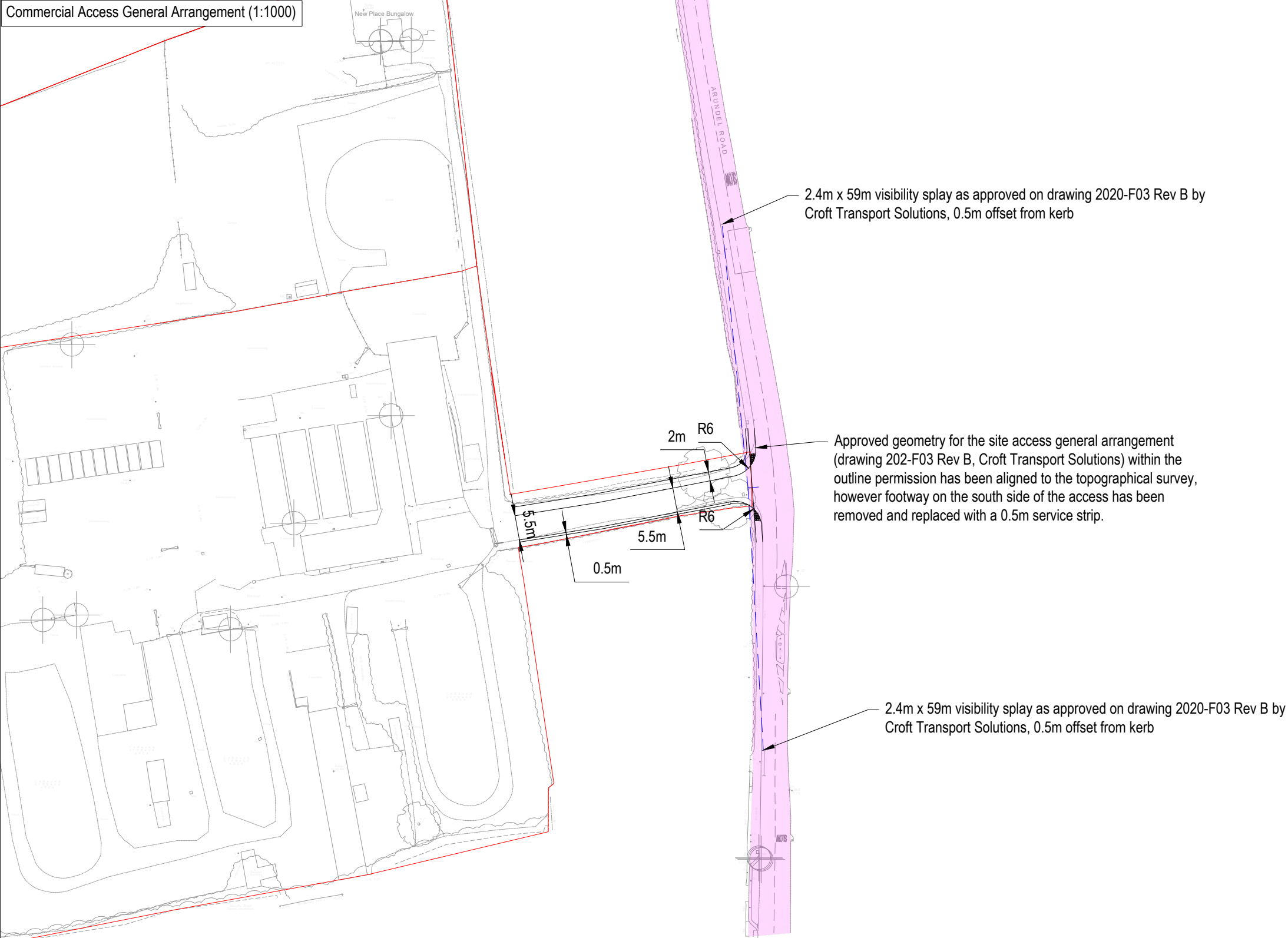
Classification: FL 60_20
Scale @ A1: As Shown

Project: Originator - Volume/System - Level/Location - Type - Discipline - Number
C86473 - JNP - 90 - XX - DR - C - 2501

Reason: P02

Document/Drawing Number

Commercial Access General Arrangement (1:1000)



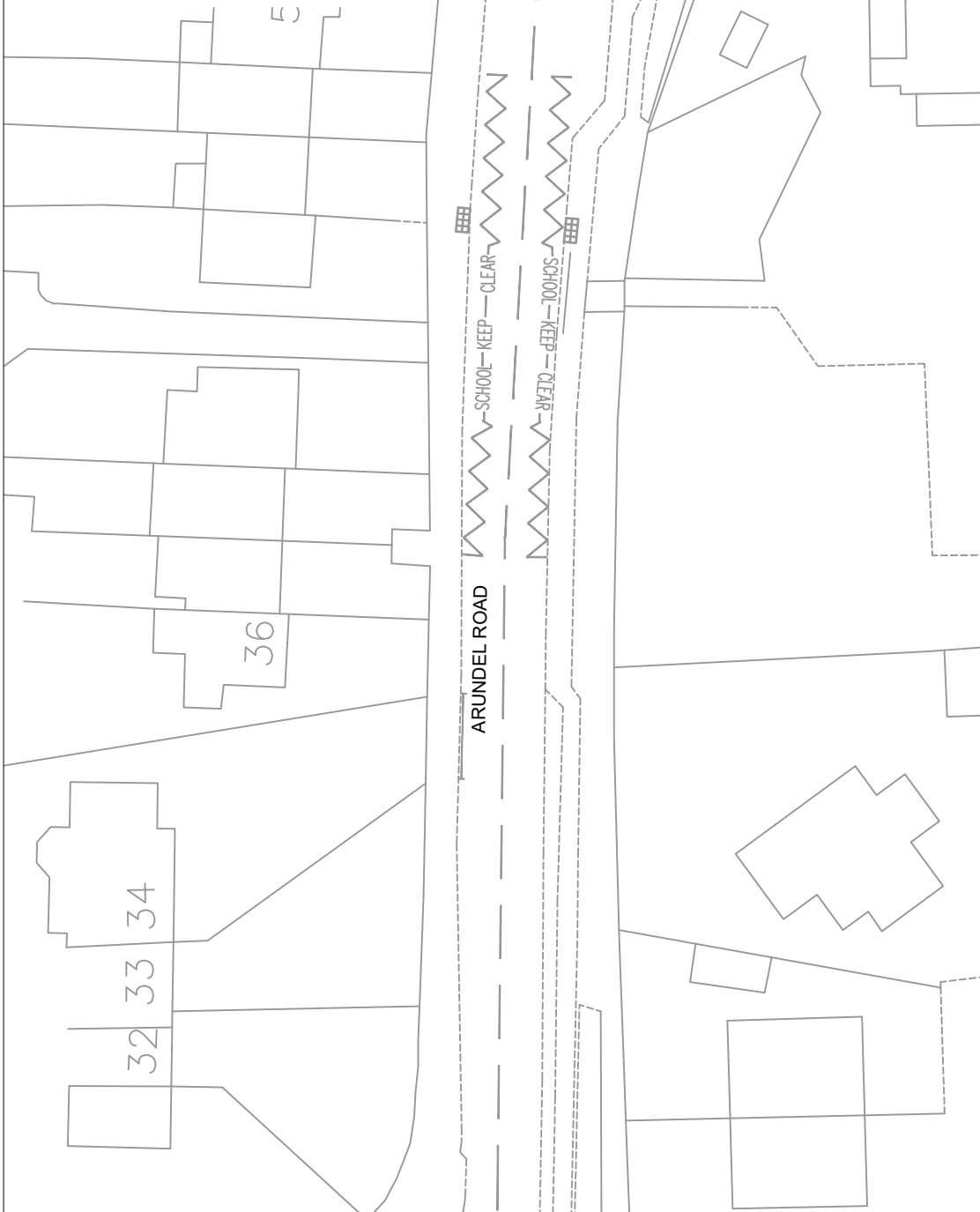
					Client: Redrow		 Chesham • Brighouse • Glasgow • Hartlepool Leamington Spa • Sheffield www.jnpgroup.co.uk
					Job: Arundel Road, Angmering		
					Title: Commercial Access - General Arrangement 1no Footway, North Side		
	P02	06/10/2021	Minor Wording Change to Annotation	EL/SW/SW			
	P01	19/08/2021	Second Issue	EL/SW/SW			
	-	12/08/2021	First Issue	EL/SW/SW			
	Rev.	Date	Description	Dm / Chk'd / App'd	Classification: FI_60_20		
	Suitability: S2 - Suitable for Information				Scale @ A3: 1:1000		
					   		
					Project - Originator - Volume/System - Level/Location - Type - Discipline - Number C86473 - JNP - 66 -XX- SK - T - 7007		

Revision: P02	
Document/Drawing Number	

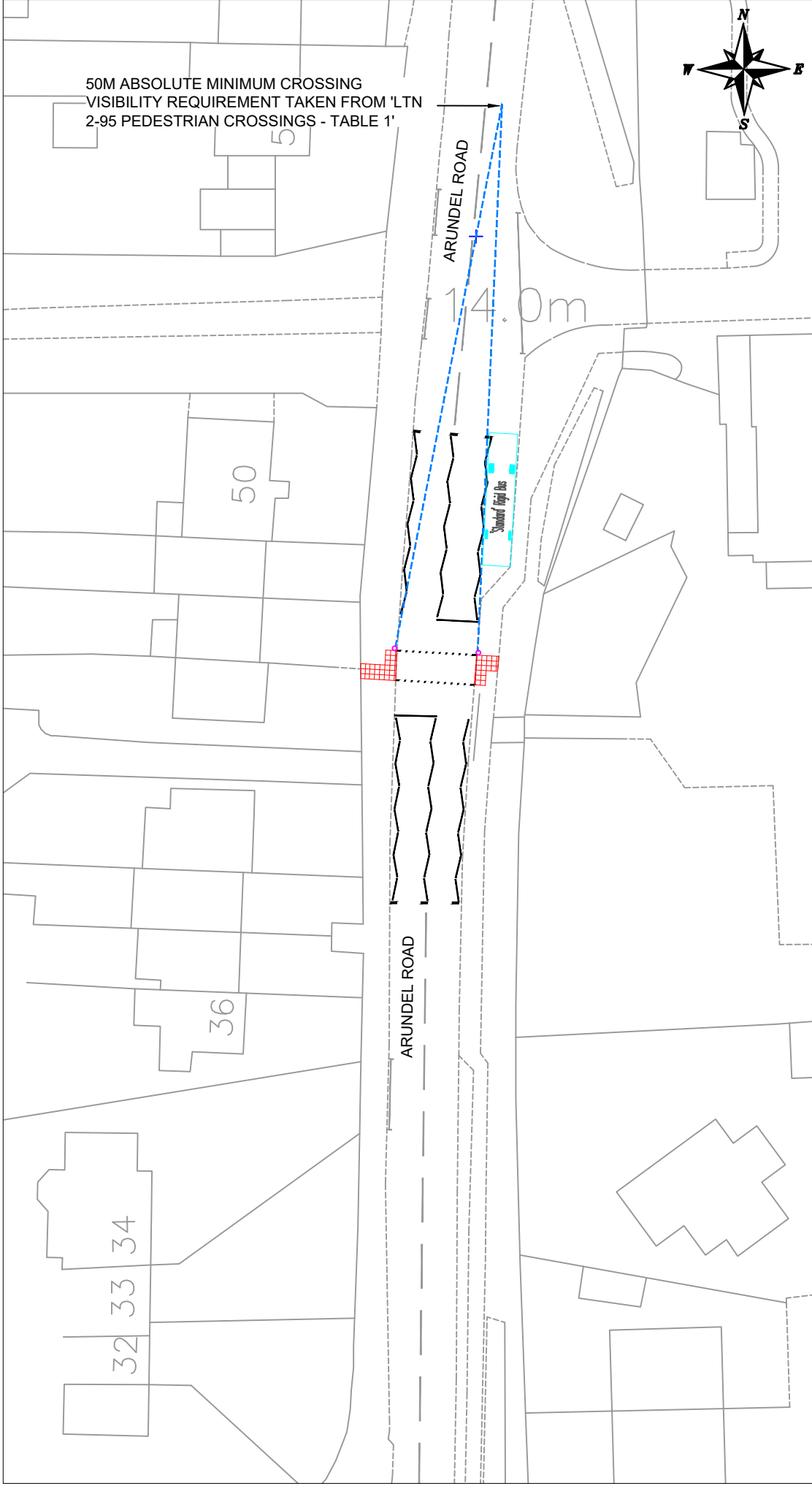
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NORTH SOUTH AERIAL VIEW



CURRENT LAYOUT OF ARUNDEL ROAD

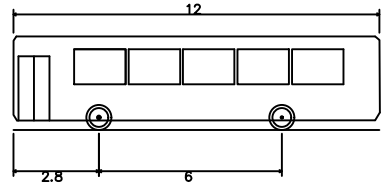


PROPOSED CONTROLLED CROSSING ON ARUNDEL ROAD

NOTES

THIS IS NOT A CONSTRUCTION DRAWING AND IS FOR INDICATIVE PURPOSES ONLY.
THE DRAWING WILL BE SUBJECT TO CHANGE FOLLOWING LOCAL AUTHORITY REVIEW AND CONFIRMATION OF PUBLIC HIGHWAY AND THIRD PARTY LAND BOUNDARIES.

PROPOSED SIGNAL HEAD



'Standard' Rigid Bus	12.000m
Overall Length	2.550m
Overall Width	3.069m
Overall Body Height	0.309m
Min Body Ground Clearance	2.350m
Track Width	4.00s
Lock to lock time	10.771m
Wall to Wall Turning Radius	



A	RSA AMENDMENTS	LB	MC	OCT 19
REV	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
GLADMAN

PROJECT:
ARUNDEL ROAD, ANGMERING

DRAWING TITLE:
PROPOSED CONTROLLED CROSSING

SCALES:
1:500 @ A3

DRAWN: LB	CHECKED: MR	DATE: JUL 19
-----------	-------------	--------------

Croft Transport Planning & Design
340 Deansgate
Manchester
M3 4LY

Email: info@croftts.co.uk
Tel: 0161 837 7380
Web: www.croftts.co.uk

DRAWING NUMBER: 2020-F05	REVISION: A
------------------------------------	-----------------------



ARUNDEL DISTRICT COUNCIL 7/20/21/001

APPENDIX A: MFS2 PERCENTAGE SPEED REDUCTION AT BEND CALCULATIONS

Speed Reduction Bend SSD Calculator

Bend Near Plot 6

Design Speed (KPH)	32
Radius (M)	8



	V ²	Radius of vehicle path (M)
20mph (32kph)	1024	8

V ² /R	From 50%ile speed	Calc to get 50%ile Speed
20	3.5	0.175
28	5	0.178571429
40	7	0.175
56	10	0.178571429
80	14	0.175
128	23	0.176428571

Design Speed	Units	Adjustment factor (%)	Adjusted Design Speed
20	mph	23%	15.48 mph
32	kph	23%	24.77 kph

Speed	15.48	MPH
SSD =	16.71988211	M
V	6.921711909	MPS
T	1.5	secs
D	3.68	m/s ²

Speed Reduction Bend SSD Calculator

Bends Near Plot 29 and Plot 43



Design Speed (KPH)	32
Radius (M)	13.375

	V ²	Radius of vehicle path (M)
20mph (32kph)	1024	12.25

V ² /R	From 50%ile speed	Calc to get 50%ile Speed
20	3.5	0.175
28	5	0.178571429
40	7	0.175
56	10	0.178571429
80	14	0.175
84	15	0.176428571

Design Speed	Units	Adjustment factor (%)	Adjusted Design Speed
20	mph	15%	17.05 mph
32	kph	15%	27.28 kph

Speed	17.05	MPH
SSD =	19.11825345	M
V	7.622211859	MPS
T	1.5	secs
D	3.68	m/s ²

Speed Reduction Bend SSD Calculator

Bend Near Plot 155

Design Speed (KPH)	32
Radius (M)	13.375



	V ²	Radius of vehicle path (M)
20mph (32kph)	1024	13.375

V ² /R	From 50%ile speed	Calc to get 50%ile Speed
20	3.5	0.175
28	5	0.178571429
40	7	0.175
56	10	0.178571429
80	14	0.175
77	14	0.176428571

Design Speed	Units	Adjustment factor (%)	Adjusted Design Speed
20	mph	14%	17.30 mph
32	kph	14%	27.68 kph

Speed	17.30	MPH
SSD =	19.5098884	M
V	7.733121142	MPS
T	1.5	secs
D	3.68	m/s ²

APPENDIX B: CTS RESIDENTIAL TRIP RATES

Calculation Reference: AUDIT-851401-150818-0832

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED

VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	EX ESSEX	1 days
	WS WEST SUSSEX	1 days
04	EAST ANGLIA	
	SF SUFFOLK	1 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	2 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NE NORTH EAST LINCOLNSHIRE	2 days
	NY NORTH YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	2 days
10	WALES	
	CF CARDIFF	1 days
11	SCOTLAND	
	FA FALKIRK	1 days
	FI FIFE	1 days
	SR STIRLING	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
 Actual Range: 108 to 432 (units:)
 Range Selected by User: 100 to 800 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/07 to 11/12/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	4 days
Tuesday	5 days
Wednesday	1 days
Thursday	3 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	15 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	6
Edge of Town	8

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	12
No Sub Category	3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3	15 days
----	---------

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	1 days
10,001 to 15,000	3 days
15,001 to 20,000	6 days
20,001 to 25,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	2 days
50,001 to 75,000	2 days
75,001 to 100,000	3 days
100,001 to 125,000	5 days
125,001 to 250,000	3 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	11 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	14 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CF-03-A-02	MIXED HOUSES	CARDIFF
	DROPE ROAD		
	CARDIFF		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	196	
	Survey date: FRIDAY	05/10/07	Survey Type: MANUAL
2	CH-03-A-02	HOUSES/ FLATS	CHESHIRE
	SYDNEY ROAD		
	CREWE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	174	
	Survey date: TUESDAY	14/10/08	Survey Type: MANUAL
3	CH-03-A-06	SEMI-DET./ BUNGALOWS	CHESHIRE
	CREWE ROAD		
	CREWE		
	Suburban Area (PPS6 Out of Centre)		
	No Sub Category		
	Total Number of dwellings:	129	
	Survey date: TUESDAY	14/10/08	Survey Type: MANUAL
4	EX-03-A-01	SEMI-DET.	ESSEX
	MILTON ROAD		
	CORRINGHAM		
	STANFORD-LE-HOPE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	237	
	Survey date: TUESDAY	13/05/08	Survey Type: MANUAL
5	FA-03-A-02	MIXED HOUSES	FALKIRK
	ROSEBANK AVENUE & SPRINGFIELD DRIVE		
	FALKIRK		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:	161	
	Survey date: WEDNESDAY	29/05/13	Survey Type: MANUAL
6	FI-03-A-03	MIXED HOUSES	FIFE
	WOODMILL ROAD		
	DUNFERMLINE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	155	
	Survey date: MONDAY	30/04/07	Survey Type: MANUAL
7	LN-03-A-01	MIXED HOUSES	LINCOLNSHIRE
	BRANT ROAD		
	BRACEBRIDGE		
	LINCOLN		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	150	
	Survey date: TUESDAY	15/05/07	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

8	LN-03-A-02	MIXED HOUSES	LINCOLNSHIRE
	HYKEHAM ROAD		
	LINCOLN		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:		186
	Survey date: MONDAY		14/05/07
9	NE-03-A-02	SEMI DETACHED & DETACHED	NORTH EAST LINCOLNSHIRE
	HANOVER WALK		
	SCUNTHORPE		
	Edge of Town		
	No Sub Category		
	Total Number of dwellings:		432
	Survey date: MONDAY		12/05/14
10	NE-03-A-03	PRIVATE HOUSES	NORTH EAST LINCOLNSHIRE
	STATION ROAD		
	SCUNTHORPE		
	Edge of Town Centre		
	Residential Zone		
	Total Number of dwellings:		180
	Survey date: TUESDAY		20/05/14
11	NY-03-A-06	BUNGALOWS & SEMI DET.	NORTH YORKSHIRE
	HORSEFAIR		
	BOROUGHBRIDGE		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:		115
	Survey date: FRIDAY		14/10/11
12	SF-03-A-02	SEMI DET./ TERRACED	SUFFOLK
	STOKE PARK DRIVE		
	MAIDENHALL		
	IPSWICH		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:		230
	Survey date: THURSDAY		24/05/07
13	SH-03-A-04	TERRACED	SHROPSHIRE
	ST MICHAEL'S STREET		
	SHREWSBURY		
	Suburban Area (PPS6 Out of Centre)		
	No Sub Category		
	Total Number of dwellings:		108
	Survey date: THURSDAY		11/06/09
14	SR-03-A-01	DETACHED	STIRLING
	BENVIEW		
	STIRLING		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:		115
	Survey date: MONDAY		23/04/07
			Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

15 WS-03-A-04 MIXED HOUSES WEST SUSSEX
 HILLS FARM LANE
 BROADBRIDGE HEATH
 HORSHAM
 Edge of Town
 Residential Zone
 Total Number of dwellings: 151
 Survey date: THURSDAY 11/12/14 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
AN-03-A-06	ldn/ire
AN-03-A-08	ldn/ire
AR-03-A-01	ldn/ire
DL-03-A-02	ldn/ire
DL-03-A-03	ldn/ire
DL-03-A-06	ldn/ire
DN-03-A-05	ldn/ire
WA-03-A-04	ldn/ire

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	181	0.074	15	181	0.270	15	181	0.344
08:00 - 09:00	15	181	0.145	15	181	0.408	15	181	0.553
09:00 - 10:00	15	181	0.154	15	181	0.182	15	181	0.336
10:00 - 11:00	15	181	0.139	15	181	0.176	15	181	0.315
11:00 - 12:00	15	181	0.153	15	181	0.153	15	181	0.306
12:00 - 13:00	15	181	0.180	15	181	0.167	15	181	0.347
13:00 - 14:00	15	181	0.172	15	181	0.162	15	181	0.334
14:00 - 15:00	15	181	0.168	15	181	0.187	15	181	0.355
15:00 - 16:00	15	181	0.286	15	181	0.201	15	181	0.487
16:00 - 17:00	15	181	0.311	15	181	0.191	15	181	0.502
17:00 - 18:00	15	181	0.352	15	181	0.222	15	181	0.574
18:00 - 19:00	15	181	0.247	15	181	0.202	15	181	0.449
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates			2.381			2.521			4.902

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP \times FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 108 - 432 (units:)
 Survey date date range: 01/01/07 - 11/12/14
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 9

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

TAXIS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	181	0.003	15	181	0.002	15	181	0.005
08:00 - 09:00	15	181	0.002	15	181	0.003	15	181	0.005
09:00 - 10:00	15	181	0.002	15	181	0.002	15	181	0.004
10:00 - 11:00	15	181	0.003	15	181	0.003	15	181	0.006
11:00 - 12:00	15	181	0.001	15	181	0.001	15	181	0.002
12:00 - 13:00	15	181	0.002	15	181	0.002	15	181	0.004
13:00 - 14:00	15	181	0.001	15	181	0.001	15	181	0.002
14:00 - 15:00	15	181	0.002	15	181	0.002	15	181	0.004
15:00 - 16:00	15	181	0.004	15	181	0.004	15	181	0.008
16:00 - 17:00	15	181	0.003	15	181	0.002	15	181	0.005
17:00 - 18:00	15	181	0.002	15	181	0.001	15	181	0.003
18:00 - 19:00	15	181	0.001	15	181	0.001	15	181	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates			0.026			0.024			0.050

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP \times FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 108 - 432 (units:)
 Survey date date range: 01/01/07 - 11/12/14
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 9

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

OGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	181	0.003	15	181	0.002	15	181	0.005
08:00 - 09:00	15	181	0.003	15	181	0.003	15	181	0.006
09:00 - 10:00	15	181	0.003	15	181	0.001	15	181	0.004
10:00 - 11:00	15	181	0.003	15	181	0.003	15	181	0.006
11:00 - 12:00	15	181	0.001	15	181	0.002	15	181	0.003
12:00 - 13:00	15	181	0.003	15	181	0.003	15	181	0.006
13:00 - 14:00	15	181	0.002	15	181	0.003	15	181	0.005
14:00 - 15:00	15	181	0.001	15	181	0.003	15	181	0.004
15:00 - 16:00	15	181	0.001	15	181	0.001	15	181	0.002
16:00 - 17:00	15	181	0.002	15	181	0.001	15	181	0.003
17:00 - 18:00	15	181	0.000	15	181	0.000	15	181	0.000
18:00 - 19:00	15	181	0.000	15	181	0.000	15	181	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates			0.022			0.022			0.044

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP \times FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 108 - 432 (units:)
 Survey date date range: 01/01/07 - 11/12/14
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 9

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

PSVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	181	0.000	15	181	0.000	15	181	0.000
08:00 - 09:00	15	181	0.001	15	181	0.001	15	181	0.002
09:00 - 10:00	15	181	0.000	15	181	0.000	15	181	0.000
10:00 - 11:00	15	181	0.000	15	181	0.000	15	181	0.000
11:00 - 12:00	15	181	0.000	15	181	0.000	15	181	0.000
12:00 - 13:00	15	181	0.000	15	181	0.000	15	181	0.000
13:00 - 14:00	15	181	0.000	15	181	0.000	15	181	0.000
14:00 - 15:00	15	181	0.000	15	181	0.000	15	181	0.000
15:00 - 16:00	15	181	0.000	15	181	0.001	15	181	0.001
16:00 - 17:00	15	181	0.000	15	181	0.000	15	181	0.000
17:00 - 18:00	15	181	0.000	15	181	0.000	15	181	0.000
18:00 - 19:00	15	181	0.000	15	181	0.000	15	181	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates			0.001			0.002			0.003

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP \times FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 108 - 432 (units:)
 Survey date date range: 01/01/07 - 11/12/14
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 9

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	15	181	0.006	15	181	0.010	15	181	0.016
08:00 - 09:00	15	181	0.004	15	181	0.015	15	181	0.019
09:00 - 10:00	15	181	0.004	15	181	0.003	15	181	0.007
10:00 - 11:00	15	181	0.003	15	181	0.006	15	181	0.009
11:00 - 12:00	15	181	0.004	15	181	0.003	15	181	0.007
12:00 - 13:00	15	181	0.006	15	181	0.005	15	181	0.011
13:00 - 14:00	15	181	0.003	15	181	0.004	15	181	0.007
14:00 - 15:00	15	181	0.003	15	181	0.004	15	181	0.007
15:00 - 16:00	15	181	0.017	15	181	0.011	15	181	0.028
16:00 - 17:00	15	181	0.009	15	181	0.005	15	181	0.014
17:00 - 18:00	15	181	0.011	15	181	0.010	15	181	0.021
18:00 - 19:00	15	181	0.011	15	181	0.006	15	181	0.017
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates			0.081			0.082			0.163

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP \times FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 108 - 432 (units:)
 Survey date date range: 01/01/07 - 11/12/14
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 9

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX C: CTS COMMERCIAL TRIP RATES

Calculation Reference: AUDIT-851401-190715-0715

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT

Category : A - OFFICE

VEHICLESSelected regions and areas:

02 SOUTH EAST	
ES EAST SUSSEX	1 days
HC HAMPSHIRE	2 days
KC KENT	2 days
SC SURREY	2 days
04 EAST ANGLIA	
CA CAMBRIDGESHIRE	2 days
06 WEST MIDLANDS	
WM WEST MIDLANDS	1 days
07 YORKSHIRE & NORTH LINCOLNSHIRE	
WY WEST YORKSHIRE	1 days
08 NORTH WEST	
LC LANCASHIRE	1 days
09 NORTH	
DH DURHAM	1 days
10 WALES	
CO CONWY	1 days

*This section displays the number of survey days per TRICS® sub-region in the selected set***Secondary Filtering selection:***This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.*

Parameter: Gross floor area
 Actual Range: 186 to 33180 (units: sqm)
 Range Selected by User: 178 to 175000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/11 to 04/10/18

*This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.*Selected survey days:

Monday	4 days
Tuesday	7 days
Wednesday	2 days
Thursday	1 days

*This data displays the number of selected surveys by day of the week.*Selected survey types:

Manual count	14 days
Directional ATC Count	0 days

*This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.*Selected Locations:

Suburban Area (PPS6 Out of Centre)	5
Edge of Town	9

*This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.*Selected Location Sub Categories:

Industrial Zone	2
Commercial Zone	6
Residential Zone	3
Built-Up Zone	1
No Sub Category	2

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

B1 14 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS@.

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	7 days
10,001 to 15,000	2 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

50,001 to 75,000	1 days
75,001 to 100,000	3 days
100,001 to 125,000	1 days
125,001 to 250,000	5 days
250,001 to 500,000	3 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	6 days
1.1 to 1.5	7 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	6 days
No	8 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	14 days
-----------------	---------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	CA-02-A-04	OFFICE	CAMBRIDGESHIRE
	BRETTON WAY PETERBOROUGH		
	Edge of Town Commercial Zone		
	Total Gross floor area:	6483 sqm	
	Survey date: THURSDAY	20/10/11	Survey Type: MANUAL
2	CA-02-A-06	OFFICES	CAMBRIDGESHIRE
	LYNCH WOOD PETERBOROUGH		
	Edge of Town Commercial Zone		
	Total Gross floor area:	4040 sqm	
	Survey date: WEDNESDAY	19/10/16	Survey Type: MANUAL
3	CO-02-A-01	GOVERNMENT OFFICES	CONWY
	NARROW LANE LLANDUDNO JUNCTION		
	Edge of Town Commercial Zone		
	Total Gross floor area:	6186 sqm	
	Survey date: WEDNESDAY	28/03/18	Survey Type: MANUAL
4	DH-02-A-02	CONSTRUCTION COMPANY	DURHAM
	DURHAM ROAD NEAR DURHAM BOWBURN		
	Edge of Town Industrial Zone		
	Total Gross floor area:	2000 sqm	
	Survey date: TUESDAY	27/11/12	Survey Type: MANUAL
5	ES-02-A-11	HOUSING COMPANY	EAST SUSSEX
	THE SIDINGS HASTINGS ORE VALLEY		
	Suburban Area (PPS6 Out of Centre) Residential Zone		
	Total Gross floor area:	186 sqm	
	Survey date: TUESDAY	17/11/15	Survey Type: MANUAL
6	HC-02-A-11	DIY CO. HQ	HAMPSHIRE
	CHESTNUT AVENUE CHANDLER'S FORD		
	Edge of Town Commercial Zone		
	Total Gross floor area:	26100 sqm	
	Survey date: MONDAY	17/10/11	Survey Type: MANUAL
7	HC-02-A-12	HMRC	HAMPSHIRE
	NORTHERN ROAD PORTSMOUTH COSHAM		
	Suburban Area (PPS6 Out of Centre) No Sub Category		
	Total Gross floor area:	10100 sqm	
	Survey date: MONDAY	23/11/15	Survey Type: MANUAL
8	KC-02-A-07	KCC HIGHWAYS REG.	KENT
	KAVELIN WAY ASHFORD HENWOOD IND. ESTATE		
	Edge of Town Commercial Zone		
	Total Gross floor area:	2525 sqm	
	Survey date: MONDAY	05/12/11	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

9	KC-02-A-08	KCC HIGHWAYS REG. OFFICE	KENT
	ST MICHAEL'S CLOSE		
	AYLESFORD		
	CLAY WOOD		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	3168 sqm	
	Survey date: MONDAY	28/11/11	Survey Type: MANUAL
10	LC-02-A-09	OFFICES	LANCASHIRE
	FURTHERGATE		
	BLACKBURN		
	Suburban Area (PPS6 Out of Centre)		
	Built-Up Zone		
	Total Gross floor area:	2600 sqm	
	Survey date: TUESDAY	04/06/13	Survey Type: MANUAL
11	SC-02-A-16	BANK OF AMERICA	SURREY
	STANHOPE ROAD		
	CAMBERLEY		
	Edge of Town		
	Commercial Zone		
	Total Gross floor area:	39230 sqm	
	Survey date: TUESDAY	10/05/11	Survey Type: MANUAL
12	SC-02-A-17	PHARMACEUTICALS	SURREY
	ST GEORGE'S AVENUE		
	WEYBRIDGE		
	THE HEATH		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	10293 sqm	
	Survey date: TUESDAY	18/10/11	Survey Type: MANUAL
13	WM-02-A-04	OFFICE	WEST MIDLANDS
	BOURNVILLE LANE		
	BIRMINGHAM		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	1800 sqm	
	Survey date: TUESDAY	10/11/15	Survey Type: MANUAL
14	WY-02-A-05	OFFICES	WEST YORKSHIRE
	PIONEER WAY		
	CASTLEFORD		
	WHITWOOD		
	Edge of Town		
	No Sub Category		
	Total Gross floor area:	1230 sqm	
	Survey date: TUESDAY	23/05/17	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

VEHICLES**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	10100	0.406	1	10100	0.030	1	10100	0.436
06:30 - 07:00	1	10100	0.703	1	10100	0.139	1	10100	0.842
07:00 - 07:30	14	7679	0.227	14	7679	0.015	14	7679	0.242
07:30 - 08:00	14	7679	0.454	14	7679	0.053	14	7679	0.507
08:00 - 08:30	14	7679	0.773	14	7679	0.054	14	7679	0.827
08:30 - 09:00	14	7679	0.864	14	7679	0.065	14	7679	0.929
09:00 - 09:30	14	7679	0.446	14	7679	0.080	14	7679	0.526
09:30 - 10:00	14	7679	0.205	14	7679	0.066	14	7679	0.271
10:00 - 10:30	14	7679	0.131	14	7679	0.054	14	7679	0.185
10:30 - 11:00	14	7679	0.104	14	7679	0.053	14	7679	0.157
11:00 - 11:30	14	7679	0.084	14	7679	0.057	14	7679	0.141
11:30 - 12:00	14	7679	0.091	14	7679	0.076	14	7679	0.167
12:00 - 12:30	14	7679	0.093	14	7679	0.161	14	7679	0.254
12:30 - 13:00	14	7679	0.131	14	7679	0.155	14	7679	0.286
13:00 - 13:30	14	7679	0.159	14	7679	0.154	14	7679	0.313
13:30 - 14:00	14	7679	0.127	14	7679	0.098	14	7679	0.225
14:00 - 14:30	14	7679	0.098	14	7679	0.104	14	7679	0.202
14:30 - 15:00	14	7679	0.091	14	7679	0.162	14	7679	0.253
15:00 - 15:30	14	7679	0.075	14	7679	0.187	14	7679	0.262
15:30 - 16:00	14	7679	0.053	14	7679	0.200	14	7679	0.253
16:00 - 16:30	14	7679	0.062	14	7679	0.318	14	7679	0.380
16:30 - 17:00	14	7679	0.079	14	7679	0.492	14	7679	0.571
17:00 - 17:30	14	7679	0.043	14	7679	0.872	14	7679	0.915
17:30 - 18:00	14	7679	0.044	14	7679	0.566	14	7679	0.610
18:00 - 18:30	13	8175	0.030	13	8175	0.349	13	8175	0.379
18:30 - 19:00	13	8175	0.014	13	8175	0.166	13	8175	0.180
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			5.587			4.726			10.313

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP* FACT. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected:	186 - 33180 (units: sqm)
Survey date date range:	01/01/11 - 04/10/18
Number of weekdays (Monday-Friday):	14
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

TAXIS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	10100	0.000	1	10100	0.000	1	10100	0.000
06:30 - 07:00	1	10100	0.000	1	10100	0.000	1	10100	0.000
07:00 - 07:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
07:30 - 08:00	14	7679	0.005	14	7679	0.005	14	7679	0.010
08:00 - 08:30	14	7679	0.003	14	7679	0.002	14	7679	0.005
08:30 - 09:00	14	7679	0.006	14	7679	0.006	14	7679	0.012
09:00 - 09:30	14	7679	0.007	14	7679	0.007	14	7679	0.014
09:30 - 10:00	14	7679	0.008	14	7679	0.007	14	7679	0.015
10:00 - 10:30	14	7679	0.007	14	7679	0.007	14	7679	0.014
10:30 - 11:00	14	7679	0.002	14	7679	0.003	14	7679	0.005
11:00 - 11:30	14	7679	0.003	14	7679	0.003	14	7679	0.006
11:30 - 12:00	14	7679	0.002	14	7679	0.002	14	7679	0.004
12:00 - 12:30	14	7679	0.004	14	7679	0.004	14	7679	0.008
12:30 - 13:00	14	7679	0.002	14	7679	0.002	14	7679	0.004
13:00 - 13:30	14	7679	0.004	14	7679	0.004	14	7679	0.008
13:30 - 14:00	14	7679	0.002	14	7679	0.002	14	7679	0.004
14:00 - 14:30	14	7679	0.002	14	7679	0.002	14	7679	0.004
14:30 - 15:00	14	7679	0.003	14	7679	0.003	14	7679	0.006
15:00 - 15:30	14	7679	0.003	14	7679	0.003	14	7679	0.006
15:30 - 16:00	14	7679	0.003	14	7679	0.003	14	7679	0.006
16:00 - 16:30	14	7679	0.002	14	7679	0.002	14	7679	0.004
16:30 - 17:00	14	7679	0.005	14	7679	0.004	14	7679	0.009
17:00 - 17:30	14	7679	0.005	14	7679	0.005	14	7679	0.010
17:30 - 18:00	14	7679	0.007	14	7679	0.008	14	7679	0.015
18:00 - 18:30	13	8175	0.006	13	8175	0.006	13	8175	0.012
18:30 - 19:00	13	8175	0.003	13	8175	0.003	13	8175	0.006
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.094			0.093			0.187

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP* FACT. Trip rates are then rounded to 3 decimal places.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	10100	0.000	1	10100	0.000	1	10100	0.000
06:30 - 07:00	1	10100	0.010	1	10100	0.010	1	10100	0.020
07:00 - 07:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
07:30 - 08:00	14	7679	0.000	14	7679	0.001	14	7679	0.001
08:00 - 08:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
08:30 - 09:00	14	7679	0.002	14	7679	0.002	14	7679	0.004
09:00 - 09:30	14	7679	0.004	14	7679	0.003	14	7679	0.007
09:30 - 10:00	14	7679	0.004	14	7679	0.005	14	7679	0.009
10:00 - 10:30	14	7679	0.004	14	7679	0.001	14	7679	0.005
10:30 - 11:00	14	7679	0.001	14	7679	0.002	14	7679	0.003
11:00 - 11:30	14	7679	0.003	14	7679	0.003	14	7679	0.006
11:30 - 12:00	14	7679	0.005	14	7679	0.006	14	7679	0.011
12:00 - 12:30	14	7679	0.001	14	7679	0.001	14	7679	0.002
12:30 - 13:00	14	7679	0.002	14	7679	0.001	14	7679	0.003
13:00 - 13:30	14	7679	0.000	14	7679	0.003	14	7679	0.003
13:30 - 14:00	14	7679	0.002	14	7679	0.001	14	7679	0.003
14:00 - 14:30	14	7679	0.001	14	7679	0.002	14	7679	0.003
14:30 - 15:00	14	7679	0.003	14	7679	0.002	14	7679	0.005
15:00 - 15:30	14	7679	0.003	14	7679	0.003	14	7679	0.006
15:30 - 16:00	14	7679	0.003	14	7679	0.002	14	7679	0.005
16:00 - 16:30	14	7679	0.004	14	7679	0.003	14	7679	0.007
16:30 - 17:00	14	7679	0.001	14	7679	0.001	14	7679	0.002
17:00 - 17:30	14	7679	0.000	14	7679	0.003	14	7679	0.003
17:30 - 18:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
18:00 - 18:30	13	8175	0.000	13	8175	0.000	13	8175	0.000
18:30 - 19:00	13	8175	0.000	13	8175	0.000	13	8175	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.055			0.055			0.110

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP* FACT. Trip rates are then rounded to 3 decimal places.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

PSVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	10100	0.000	1	10100	0.000	1	10100	0.000
06:30 - 07:00	1	10100	0.000	1	10100	0.000	1	10100	0.000
07:00 - 07:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
07:30 - 08:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
08:00 - 08:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
08:30 - 09:00	14	7679	0.002	14	7679	0.000	14	7679	0.002
09:00 - 09:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
09:30 - 10:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
10:00 - 10:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
10:30 - 11:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
11:00 - 11:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
11:30 - 12:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
12:00 - 12:30	14	7679	0.001	14	7679	0.001	14	7679	0.002
12:30 - 13:00	14	7679	0.001	14	7679	0.001	14	7679	0.002
13:00 - 13:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
13:30 - 14:00	14	7679	0.001	14	7679	0.001	14	7679	0.002
14:00 - 14:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
14:30 - 15:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
15:00 - 15:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
15:30 - 16:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
16:00 - 16:30	14	7679	0.000	14	7679	0.000	14	7679	0.000
16:30 - 17:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
17:00 - 17:30	14	7679	0.000	14	7679	0.001	14	7679	0.001
17:30 - 18:00	14	7679	0.000	14	7679	0.000	14	7679	0.000
18:00 - 18:30	13	8175	0.000	13	8175	0.000	13	8175	0.000
18:30 - 19:00	13	8175	0.000	13	8175	0.000	13	8175	0.000
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.007			0.004			0.011

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP* FACT. Trip rates are then rounded to 3 decimal places.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE

CYCLISTS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	10100	0.010	1	10100	0.000	1	10100	0.010
06:30 - 07:00	1	10100	0.010	1	10100	0.000	1	10100	0.010
07:00 - 07:30	14	7679	0.007	14	7679	0.000	14	7679	0.007
07:30 - 08:00	14	7679	0.010	14	7679	0.001	14	7679	0.011
08:00 - 08:30	14	7679	0.028	14	7679	0.000	14	7679	0.028
08:30 - 09:00	14	7679	0.024	14	7679	0.000	14	7679	0.024
09:00 - 09:30	14	7679	0.007	14	7679	0.000	14	7679	0.007
09:30 - 10:00	14	7679	0.005	14	7679	0.000	14	7679	0.005
10:00 - 10:30	14	7679	0.001	14	7679	0.001	14	7679	0.002
10:30 - 11:00	14	7679	0.002	14	7679	0.002	14	7679	0.004
11:00 - 11:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
11:30 - 12:00	14	7679	0.001	14	7679	0.000	14	7679	0.001
12:00 - 12:30	14	7679	0.001	14	7679	0.002	14	7679	0.003
12:30 - 13:00	14	7679	0.000	14	7679	0.001	14	7679	0.001
13:00 - 13:30	14	7679	0.001	14	7679	0.000	14	7679	0.001
13:30 - 14:00	14	7679	0.000	14	7679	0.001	14	7679	0.001
14:00 - 14:30	14	7679	0.001	14	7679	0.003	14	7679	0.004
14:30 - 15:00	14	7679	0.002	14	7679	0.005	14	7679	0.007
15:00 - 15:30	14	7679	0.000	14	7679	0.004	14	7679	0.004
15:30 - 16:00	14	7679	0.002	14	7679	0.007	14	7679	0.009
16:00 - 16:30	14	7679	0.003	14	7679	0.005	14	7679	0.008
16:30 - 17:00	14	7679	0.000	14	7679	0.013	14	7679	0.013
17:00 - 17:30	14	7679	0.000	14	7679	0.028	14	7679	0.028
17:30 - 18:00	14	7679	0.000	14	7679	0.022	14	7679	0.022
18:00 - 18:30	13	8175	0.001	13	8175	0.008	13	8175	0.009
18:30 - 19:00	13	8175	0.000	13	8175	0.002	13	8175	0.002
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			0.117			0.105			0.222

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP* FACT. Trip rates are then rounded to 3 decimal places.

APPENDIX D: CTS PEDESTRIAN AND CYCLIST TRIP RATES

Calculation Reference: AUDIT-851401-170106-0102

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED

MULTI-MODAL CYCLISTS

Selected regions and areas:

02	SOUTH EAST	
	ES EAST SUSSEX	1 days
	EX ESSEX	1 days
	HC HAMPSHIRE	1 days
	SC SURREY	1 days
	WS WEST SUSSEX	2 days
03	SOUTH WEST	
	DV DEVON	3 days
	SM SOMERSET	1 days
04	EAST ANGLIA	
	NF NORFOLK	3 days
	SF SUFFOLK	2 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	1 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	4 days
	ST STAFFORDSHIRE	1 days
	WK WARWICKSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NE NORTH EAST LINCOLNSHIRE	1 days
	NY NORTH YORKSHIRE	5 days
	SY SOUTH YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	4 days
	GM GREATER MANCHESTER	1 days
	MS MERSEYSIDE	1 days
09	NORTH	
	CB CUMBRIA	2 days
	TW TYNE & WEAR	1 days
10	WALES	
	PS POWYS	1 days
11	SCOTLAND	
	AG ANGUS	1 days
	EA EAST AYRSHIRE	1 days
	FA FALKIRK	2 days
	HI HIGHLAND	1 days
	PK PERTH & KINROSS	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set