Highways England

HIGHWAYS ENGLAND DESIGNATED FUNDS - A27 NMU LINK IMPROVEMENTS PACKAGE

Ford to Arundel

FEBRUARY 2020

PUBLIC

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TYPE OF DOCUMENT PUBLIC

PROJECT NO. 70055187

DATE: FEBRUARY 2020

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Ford to Arundel

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	First Draft			
Date	February 2020			
Prepared by	Milly Bagshaw			
Signature				
Checked by	Chris Williams			
Signature	2020.02.04 20:34:11 Z			
Authorised by	Samantha Grant			
Signature	Grant, Samantha (UKSAG002) Digitally signed by Grant, Samantha (UKSAG002) DN: cn=Grant, Samantha (UKSAG002), ou=Basingstoke (Mountbatten House), email=Samantha.Grant@wsp.com Date: 2020.02.04 20:36:50			
Project number	70055187			
Report number				
File reference	\\uk.wspgroup.com\central data\Projects\700551xx\70055187 - CDF DF A27 NMU Links Feasibility Study\03 WIP\TP Transport Planning\03 Document\Scheme 12 Ford - Arundel			

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APPENDICES

1 INTRODUCTION

1.1.1. WSP have been commissioned by Highways England (HE) to undertake a feasibility study assessing the continuity of existing Non-Motorised User (NMU) routes across the A27 corridor in West Sussex as part of the Cycling, Safety and Integration Designated Funds programme. The schemes identified for feasibility study have been selected following completion of a local policy review, stakeholder workshop and Multi Criteria Assessment Framework (MCAF) process completed in late 2019.

1.1.2. This feasibility study considers the route between Ford and Arundel (via Ford Road) with the objective of facilitating trips to Ford railway station and Arundel town centre by active modes through the provision of improved pedestrian and cycle facilities. On this basis, the study also considers the potential to extend the route to the A259 west of Littlehampton.

1.2 PURPOSE OF STUDY

1.2.1. The purpose of the Feasibility Study is to explore the options to create a consistent, safe route for pedestrians and cyclists along Ford Road, which is a corridor running between the A27 and the A259. The route currently has no cycling provision and minimal provision for pedestrians.

1.2.2. This route is a high priority corridor for West Sussex County Council (WSCC). The scheme aims to facilitate journeys to both Ford train station and Arundel town centre via active modes. This an important link given the Local Plan development proposals for 1,500 homes at Ford Airfield and Burndell Road, Yapton. The wider network would also benefit from this improved connectivity, with the National Cycle Route 2 and neighbouring town, Littlehampton, within close proximity of the study area.

1.3 NATIONAL POLICY CONTEXT

HIGHWAYS ENGLAND – ROAD INVESTMENT STRATEGY 2015/16 TO 2019/20

1.3.1. In 2015, Highways England released a document outlining their strategy towards investing in the Strategic Road Network (SRN). Several key aims of the SRN outlined in this document support the development of the Ford Road Scheme, such as;

- Providing capacity and connectivity to support national and local economic activity;
- Supporting and improving journey quality, reliability and safety;
- Joining our communities and linking effectively to each other; and
- Supporting delivery of environmental goals and the move to a low carbon economy.

1.3.2. The Road Investment Strategy also acknowledges the following;

"*The government is committed to improving active travel options, such as cycling and walking. Too often the SRN often acts as a barrier to these activities, so we are committed to improving access through building new bridges, crossings and cycle paths. The Investment Plan has allocated £100 million to invest in 200 projects to improve cycling and walking across and alongside existing stretches of the SRN. The Company has also committed to cycle-proofing new schemes as standard, as well as working with Local Authorities to improve end-to-end cycling and walking journeys.*"

1.3.3. In order to realise their vision, Highways England have specified the following targeted outcomes;

- Making the network safer;
- Improving user satisfaction;
- Supporting the smooth flow of traffic;
- Encouraging economic growth;
- Delivering better environmental outcomes;
- Helping cyclists, walkers and other vulnerable users of the network;
- Achieving real efficiency; and
- Keeping the network in good condition.

1.3.4. Furthermore, the A27 is a road included in Highways England's feasibility studies.

> "*The Department committed to undertaking six feasibility studies to help identify and fund solutions to tackle some of the most notorious and long-standing road hot spots in the country*".
>
> *"The A27 is the only east-west trunk road south of the M25. It links the key coastal urban areas between Portsmouth and Eastbourne with each other and the rest of the SRN. Over three quarters of a million people are concentrated in the urbanised coastal area. The route also runs along and through the South Downs National Park. Over 60% of the 67 miles length of road is dual carriageway, while four stretches of the road remain single carriageway at Arundel, Worthing and east of Lewes."*
>
> *"The local economy has strengths in advanced engineering, tourism and other sectors and has accommodated substantial growth over the past decade. Over 60,000 new homes and substantial employment growth are expected to be developed over the next 15 years along the coast."*

1.3.5. An investment package of around £350 million is being injected into the A27 and surrounding areas. This will include the development of sustainable transport measures around Arundel.

THE CYCLING AND WALKING INVESTMENT STRATEGY (DFT, 2017)

1.3.6. The Cycling and Walking Investment Strategy (CWIS) was published by the government in 2017. This strategy outlines the government's ambition to make cycling and walking a natural choice for shorter journeys, with aims to:

- Double levels of cycling by 2025;
- Each year, reduce the rate of cyclists killed or injured on English road;
- Reverse the decline in walking activity; and
- Increase the percentage of children aged 5-10 who usually walk to school.

1.4 LOCAL POLICY CONTEXT

ARUN LOCAL PLAN 2011 - 2031

1.4.1. The Arun Local Plan 2011 – 2031 outlines a number of 'Strategic Allocation' sites, to provide residential and commercial development to address the local housing and employment needs

identified in the plan. The Strategic Allocation for Ford, as outlined in Policy H SP2c (Housing Delivery) specifies the following for development proposals;

- Provision of at least 1,500 dwellings;
- Consideration of sustainable links for all modes of transport between the development, Ford railways Station and Littlehampton/Arundel cycleway;
- School provision;
- Provision of a community hub;
- Provision of sports pitches and changing facilities;
- Improvements to the A259 between Climping and Littlehampton; and
- Consideration of new employment provision.

WEST SUSSEX WALKING AND CYCLING STRATEGY (2016)

1.4.2. The key stakeholder is WSCC, who published its Walking and Cycling Strategy for 2016 to 2026, which outlines the following objectives;

- "To ensure that cycling and walking are recognised as important travel modes and therefore part of the transport mix;
- To make cycling and walking the natural choice for shorter journeys (such as journeys to school), or as part of a longer journey;
- To reduce the number of cyclists and pedestrians that are killed or seriously injured on our roads;
- To support economic development by facilitating travel to work and services without a car;
- To reduce congestion and pollution by encouraging and enabling people to travel without a car;
- To increase levels of physical activity to help to improve physical health;
- To help to maintain good mental health and staying independent later in life;
- To increase the vitality of communities by improving access by bicycle and on foot; and
- To help people to access rural areas and enjoy walking and cycling".

WEST SUSSEX TRANSPORT PLAN 2011- 2016

1.4.3. The West Sussex Transport Plan 2011 – 2026 aims to improve the quality of life for all people living in West Sussex. The plan is an outline of how the following objectives will be achieved:

- "Promoting economic growth;
- Tackling climate change;
- Providing access to services, employment and housing; and
- Improving safety, security and health".

1.4.4. The implementation plan specified for the Arun District, where Ford Road is located, acknowledges the issues caused by the lack of cyclist and pedestrian provision. The plan outlines the following aims to mitigate these issues;

- "Encouraging sustainable travel by improving the existing cycle and pedestrian network through improved signing, connecting routes where appropriate and repairing and maintaining surfaces;
- Working with the Sussex Community Rail Partnership through the Arun Valley Line Group to further promote rail travel amongst residents and visitors to Arun;
- Improving pedestrian accessibility throughout the District by enhancing existing pedestrian crossings and providing new pedestrian crossing facilities at identified key locations; and
- Supporting opportunities which will improve and protect the rights of way network throughout the District".

1.5 METHODOLOGY

1.5.1. The main objective of the scheme is to develop proposals which improve the existing level of pedestrian and cycling infrastructure on Ford Road, thereby facilitating active mode trips between Ford and Arundel. This will be informed by a review of existing conditions to identify gaps in the existing NMU infrastructure which will incorporate data from a variety of sources this including site visits, desk-based assessments and stakeholder consultation. The existing conditions assessment will include a full Cycling Level of Service (CLoS) assessment, as detailed in **Section 3**.

1.5.2. Once the gaps in existing cycle infrastructure have been identified, an optioneering exercise has been completed for the route considering safety, comfort, directness, coherence and attractiveness. A preferred option will then be set out for scheme development and preliminary design, taking into consideration input from stakeholder consultation and appraisal criteria.

1.5.3. Once the preferred option has been chosen, a desktop environmental study will be conducted to outline the existing environmental situation and set out any environmental constraints that may have to influence the design. The preferred option with then be costed and a Scheme Appraisal Report (SAR) completed to provide some high-level value for money (VfM) to be determined.

1.6 REPORT STRUCTURE

1.6.1. The structure of this feasibility report is as outlined below:

- Section 2: Outlines the existing conditions within the study area;
- Section 3: Assesses the cycling conditions in the area;
- Section 4: Details survey data for the study area, including Collision data, NMU Surveys and Traffic data;
- Section 5: Considers and appraises options available for the corridor;
- Section 6: Provides details of the preliminary route design of the preferred option;
- Section 7: Summarises stakeholder consultation outcomes;
- Section 8: Provides a summary of the desktop Environmental Study;
- Section 9: Provides a summary of the desktop Ecology Study;
- Section 10: Summarises the findings of the road safety review of the proposals;
- Section 11: Details the finding of the Scheme Appraisal Report; and
- Section 12: Provides Conclusions and Recommendations

2 EXISTING CONDITIONS

2.1.1. This section outlines the existing conditions in the areas of Ford and Arundel. This provides context to the requirements of the specific scheme with regard to local and strategic trip generators and attractors, taking into consideration existing and future desire lines.

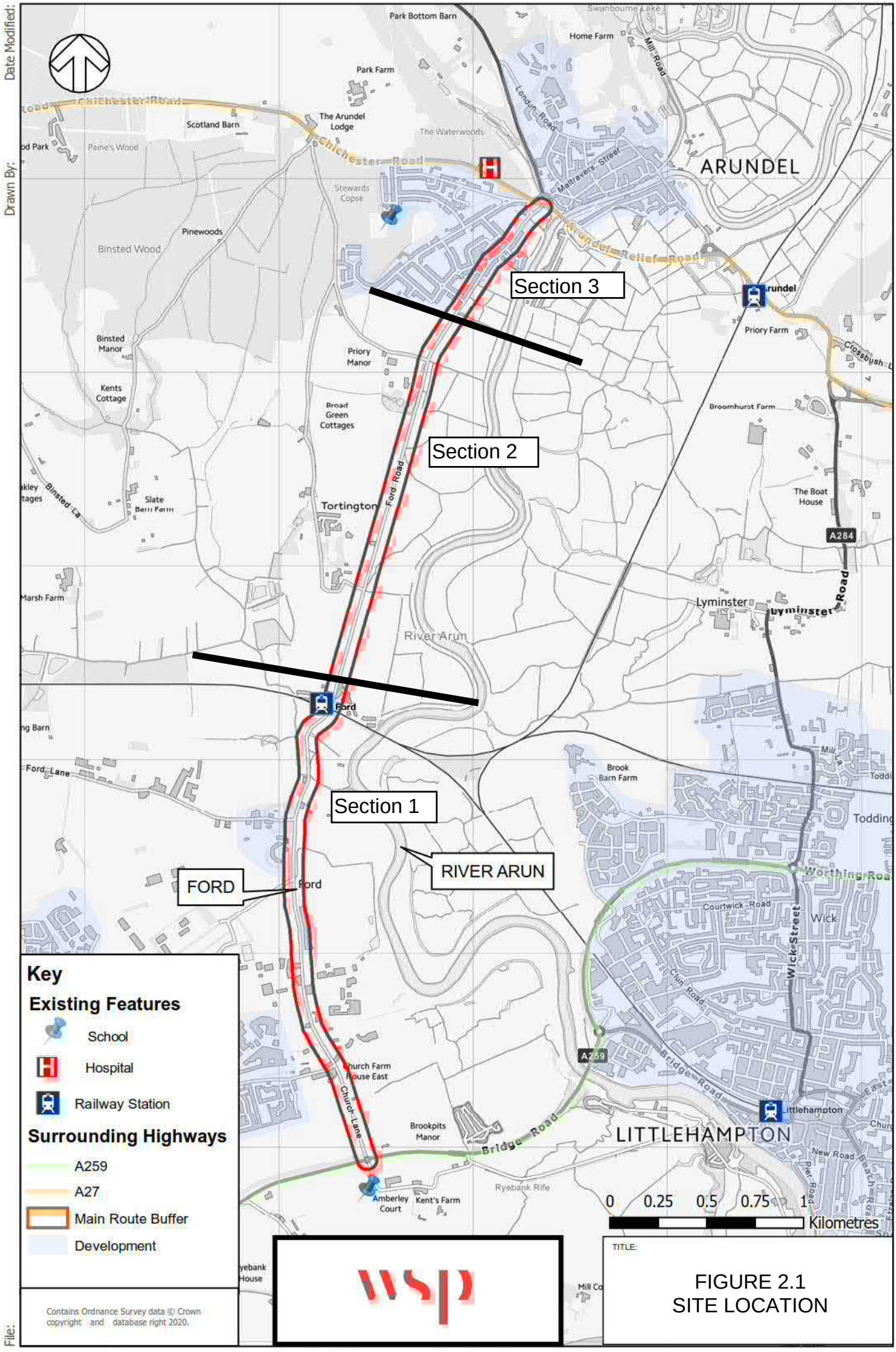
2.2 LOCATION / LAYOUT

2.2.1. As shown in Figure 2-1, the route runs through Ford Village, primarily following Ford Road between Church Lane in Ford to the roundabout joining the A27 Arundel Bypass, Ford Road, A27 Chichester Road, A284 Arundel Bypass and Maltravers Street. The route is approximately 3.3 miles long. The route falls entirely within the highway jurisdiction of WSCC.

2.2.2. The A27 is a major road running between East Sussex and Wiltshire and within the study area it is part of the Highways England network. It also acts as a gateway to other key destinations and main roads. For example, it leads to the M27, which runs between Portsmouth and Southampton. Moreover, Church Lane connects to the A259, which runs between more key destinations along the South coast. It starts in the east at Folkestone and offers an alternative route through Eastbourne, Brighton, Worthing, Bognor Regis, and Chichester, ending in Emsworth to the West.

2.2.3. Ford Road is single carriageway and changes between 30mph, 40mph and National Speed Limit. The road alternates between village / residential surroundings and a rural setting, passing through Ford village, Ford Station, and countryside before reaching Arundel. The road runs approximately parallel to the River Arun.

2.2.4. For sake of ease, the route described above has been separated into three sections based up the characteristics shown by the different parts of the route. Section One runs from Church Lane roundabout to just north of Ford Station. This area has a variety of uses, but has a consistent 40mph speed limit, pedestrian footways and similar surroundings. Section Two begins as the road transitions to a national speed limit and ends as the speed limit decreases to 30mph. This section is far more rural and has no pedestrian or cyclist facilities. Section Three begins at the 30mph speed limit and approach into Arundel. The road is residential in nature and is characterised by street parking and furniture. Section three ends at the A27 roundabout.


Date Modified:
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File:
Section 3
Section 2
Section 1
RIVER ARUN
FORD
ARUNDEL
LITTLEHAMPTON
Park Bottom Barn
Home Farm
Park Farm
Scotland Barn
The Arundel Lodge
Chichester Road
The Waterwoods
Stewards Copse
Pinewoods
Binsted Wood
Binsted Manor
Kents Cottage
Priory Manor
Broad Green Cottages
Tortington
Ford Road
Slate Barn Farm
Marsh Farm
River Arun
Ford
Ford Lane
Church Farm House East
Church Lane
Brookpits Manor
Amberley Court
Kent's Farm
Ryebank Rife
Mill Road
London Road
Mattravers Street
Arundel Relief Road
Priory Farm
Broomhurst Farm
The Boat House
A284
Lyminster
Lyminster Road
Brook Barn Farm
Courtwick Road
Wick
Wick Street
Worthing Road
Clun Road
A259
Bridge Road
New Road
Pier Road
Key
Existing Features
School
Hospital
Railway Station
Surrounding Highways
A259
A27
Main Route Buffer
Development
0 0.25 0.5 0.75 1
Kilometres
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TITLE:
FIGURE 2.1
SITE LOCATION

2.3 LAND AT CLIMPING (PLANNING PERMISSION CM-1-17-OUT)

2.3.1. While a full review of existing conditions has been completed it should be noted that the Mulgrave Estates planning application CM-1-17-OUT was granted planning permission at appeal in September 2019. As part of this planning permission, the existing A259 / Church Road roundabout at the southern end of the study area will be re-aligned to within the boundary of the site, with the existing highway along this section being stopped up, with this stopped up highway would becoming a cycleway to link into the A259 cycle route as shown in Figure 2-2 below.

Figure 2-2 - Land at Climping Masterplan

2.4 EXISTING PEDESTRIAN FACILITIES

2.4.1. There are intermittent footways along Ford Road. The footways vary in width, quality, side of the road and distance from the road. Notably, pedestrian facilities are absent between Ford Railway Station and Maxwell Road. This stretch is particularly rural in nature and is subject to national speed limit. It begins just north of Ford Station and ends as the speed limit decreases to 30mph as the area becomes residential. While there is unlikely to be significant pedestrian demand within this area alone, the lack of provision severs any potential for longer distance trips to be made between Ford and Arundel.

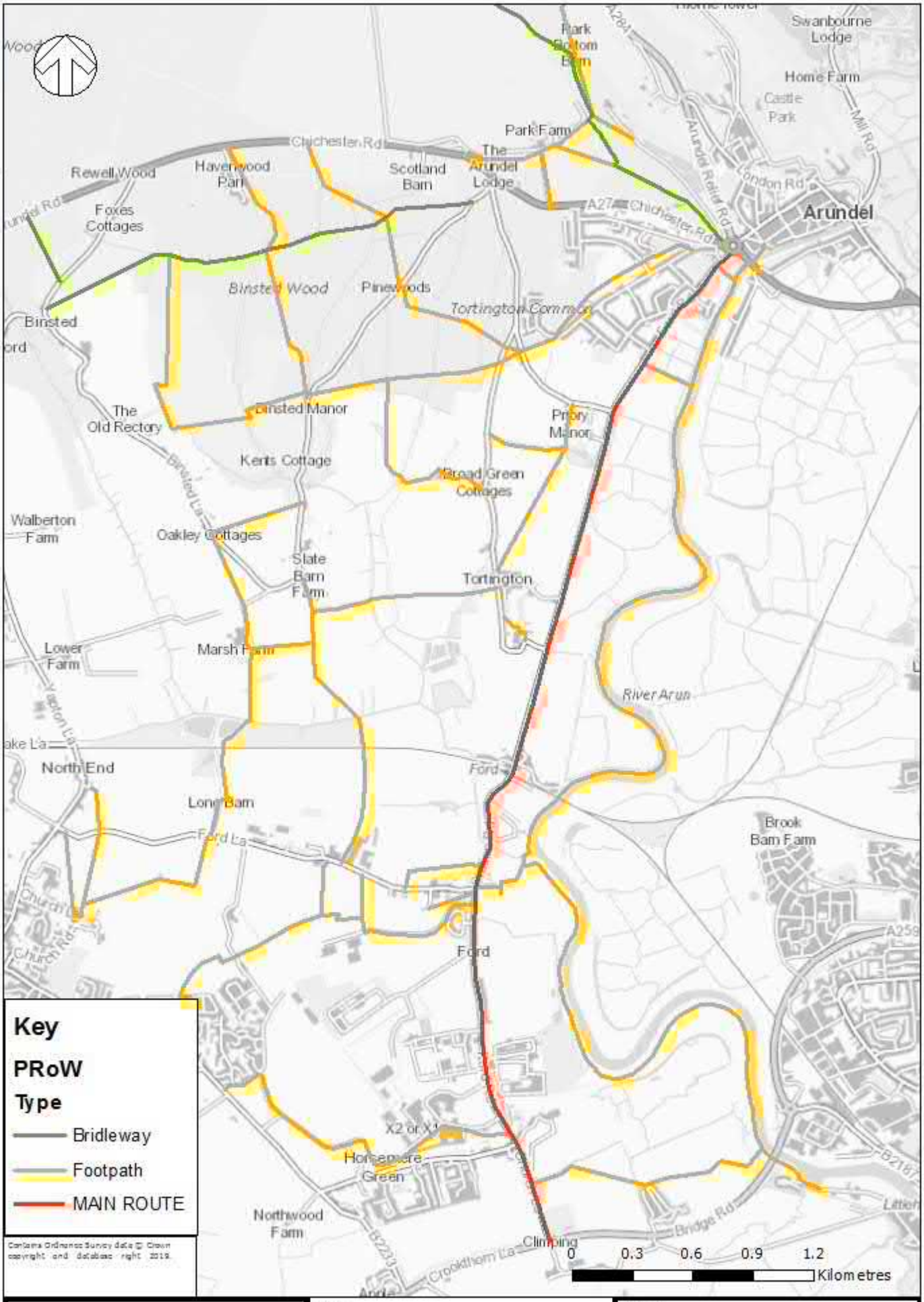
2.4.2. The table below describes the pedestrian facilities along the different sections of the route.

Table 2-1 – Existing Pedestrian Facilities

Section	Location in Section	Approximate Section length (m)	Description
1	Church Lane	730	▪ East side footway only ▪ Approx. 1.8m in width ▪ No segregation from road
	Ford Road	1,100	▪ West side with brief two-sided footway outside HMP Ford ▪ Approx. 2m in width ▪ Segregated from road – Metal railings separating ▪ Signalled crossing between HMP Ford sites ▪ Tactile at crossing
	Station Road / Ford Road	720	▪ West side Footway only ▪ Varies between 1.5m and 2m ▪ No segregation from road ▪ Level crossing at train station
2	Ford Road	2050	▪ No Pedestrian Provision
3	Ford Road (Arundel)	720	▪ Footways alternate sides ▪ Varies between 1.5m and 2m ▪ Street furniture present reducing usable width

2.5 PUBLIC RIGHTS OF WAY (PROW)

2.5.1. Figure 2-3 below illustrates the local Public Rights of Way within close proximity to the study area.



TITLE:

FORD - ARUNDEL ROUTE

FIGURE No:

FIGURE 2.3
PUBLIC RIGHTS OF WAY

2.5.2. The network of public footpaths and bridleways provide access to the wider area at various points along the study route. Access is restricted from the east due to the River Arun, however there is Footpath 206 which runs along the west bank and is a key route between Littlehampton and Arundel. To the west Ford Road, the PRoW network also connects Ford to Yapton via Footpaths 175, 200, 363 and 360.

2.6 CYCLIST FACILITIES

2.6.1. There is little dedicated cyclist provision within the study area, however the geometry of Ford Road is relatively flat and straight, making it a manageable route for cyclists.

2.6.2. The road width varies along the route between 5.5-7m wide. The available road width significantly decreases as the route enters into Arundel, due to the presence of on-street parking.

2.6.3. It is worth noting that the A259, accessible from Church Lane, is a part of the National Cycle Network Route 2 which locally connects with Bognor Regis and Littlehampton

2.7 BUS SERVICES

2.7.1. There are limited bus services that operate in the Ford area, with just one bus using the Ford – Arundel route. This is Bus Number??? 668, provided by Compass Travel, which is a school service for Ormiston Six Villages Academy. The bus stops in the villages surrounding Ford and is available for public use but is directed by the needs of the school. It only runs on school days during the AM and PM school run.

2.7.2. In addition to the school service, Arundel Community Bus also operates within the study area on Tuesday and Thursday mornings. It is a hail and ride service with the purpose of transporting individuals who may need some help in to town and back. Single journeys cost 80p for adults and 45p for children.

2.8 RAIL SERVICES

2.8.1. Ford Station is located on Ford Road, which has a level crossing on it. The train line is operated by Southern Railway, with direct services running to London, local towns and key destinations in the South. The approximate journey time to Chichester is 13 minutes, to Worthing is 16 minutes and to Brighton is 40 minutes. Table 2-2 summarises the services available and their frequency from Ford station.

Table 2-2 – Rail Services within the study area.

Service via Ford	Weekday Frequency	Weekend Frequency
Bognor Regis – Littlehampton	5 trains per hour	4 trains per hour
Southampton, Portsmouth, Chichester - Brighton	Up to 4 trains per hour	3 trains per hour
London Bridge via Horsham	2 trains per hour	1 train per hour

Southern Railway

2.8.2. There is no dedicated car parking at the station, but 14 unsheltered cycle spaces are available.

2.8.3. Arundel has a train station outside of the study area. It is also on the service line to London Bridge via Horsham.

2.9 LOCAL FACILITIES

2.9.1. There are a number of amenities within the area of the scheme, including schools, medical facilities, local businesses and places of worship. These are presented in Figure 2-4 and described below.

SCHOOLS

2.9.2. The table below shows the provision of schools within 3 km of the study area, none of which fall within the immediate study area of Ford Road

Table 2-3 – Schools within 3km of the study area

School Name	Location	Approximate Distance from study area (Km)
Saint Philip's Catholic Primary School	Arundel	0.40
Arundel C of E Primary School	Arundel	0.50
Clymping C of E Primary School	Climping	0.75
Yapton C of E Primary School	Yapton	2.30
White Meadows Primary Academy	Littlehampton	2.30
Lyminster Primary School	Littlehampton	2.60
River Beach Primary School	Littlehampton	2.70
St Catherine's Catholic Primary School	Littlehampton	2.80
The Littlehampton Academy	Littlehampton	2.85
Cornfield School	Littlehampton	3.00

HEALTHCARE

2.9.3. There is one Hospital within proximity of the study area. Arundel and District Hospital is in Arundel, just off of Chichester Road, less than half a mile from the end of Ford Road.

2.9.4. Whilst there are no General Practitioners (GP) in the immediate vicinity of Ford, there are a number of services in the wider area. Arundel, Yapton and Littlehampton all have multiple GP surgeries.

EMPLOYMENT CENTRES

2.9.5. There are several key centres of employment within the study area that act as trip generators. These include the following locations;

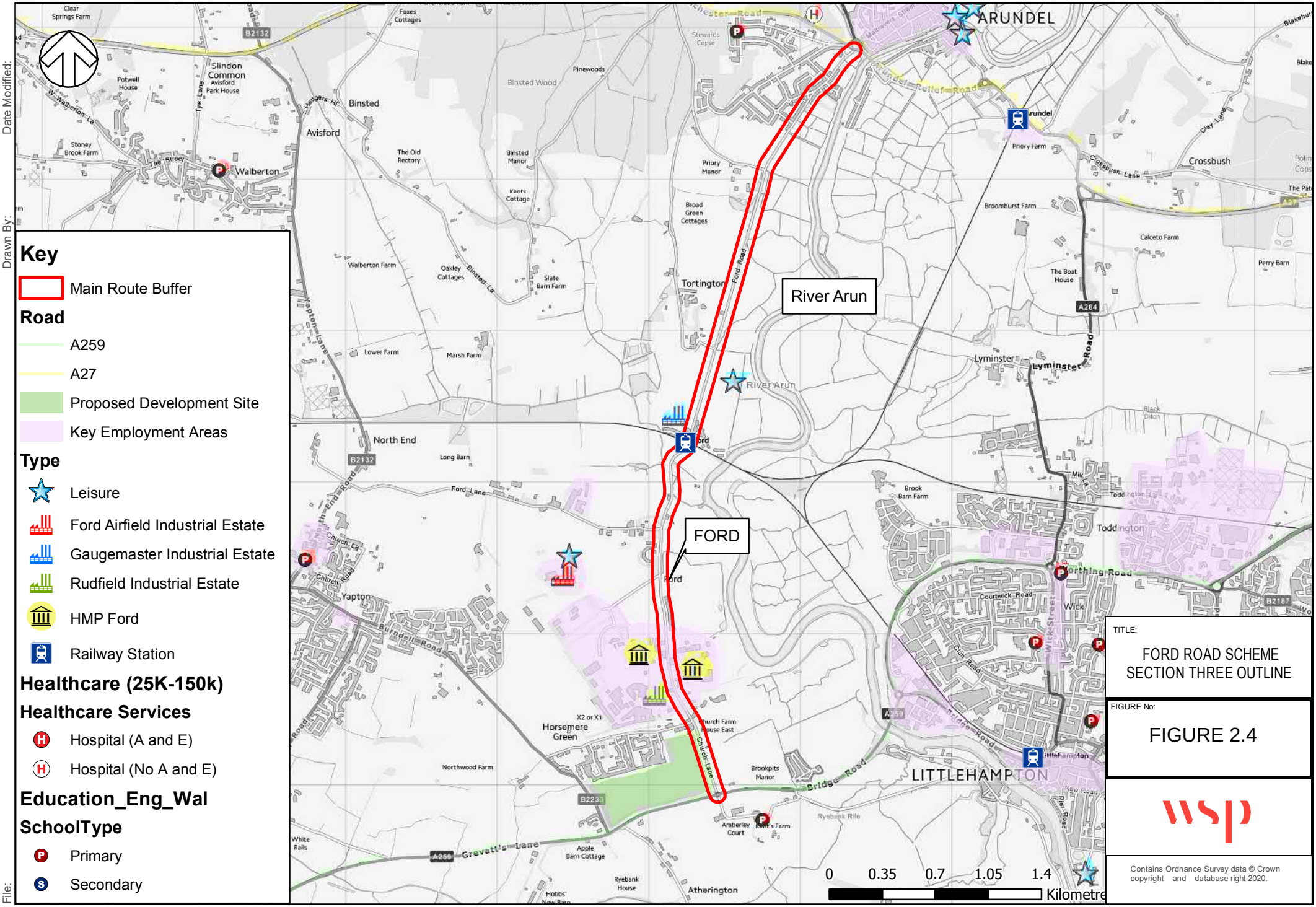
- Rudfield Industrial Estate;
- Ford Lane Trading Park;
- HMP Ford; and
- Arundel Town Centre.

There is also a wealth of local businesses that are active in the area.

OTHER AMENITIES

2.9.6. There are plenty of other amenities within in the Ford and Arundel area that will attract visitors. These include;

- A multitude of Cafes, Restaurants and Pubs;
- Many Places of Worship, including Arundel Cathedral;
- Arundel Castle;
- Wildfowl and Wetlands Trust Arundel;
- Ford Airfield Market and Car boot sale;
- Several Hotels, Holiday / Caravan Parks and Camping opportunities; and
- Leisure opportunities, such as The Flying Fortress children's indoor play area and Arundel Lido.


Date Modified:
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File:
Key
Main Route Buffer
Road
A259
A27
Proposed Development Site
Key Employment Areas
Type
Leisure
Ford Airfield Industrial Estate
Gaugemaster Industrial Estate
Rudfield Industrial Estate
HMP Ford
Railway Station
Healthcare (25K-150k)
Healthcare Services
Hospital (A and E)
Hospital (No A and E)
Education_Eng_Wal
SchoolType
Primary
Secondary
River Arun
FORD
ARUNDEL
LITTLEHAMPTON
Walberton
Binsted
Avisford
Slindon Common
Tortington
North End
Yapton
Horsemere Green
Atherington
Lyminster
Crossbush
Wick
Todd ington
0 0.35 0.7 1.05 1.4
Kilometre
TITLE:
FORD ROAD SCHEME
SECTION THREE OUTLINE
FIGURE No:
FIGURE 2.4
wsp
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3 CYCLING CONDITIONS

3.1.1. This section presents the findings from the site analysis, including an assessment of the cycling conditions. As outlined in the existing conditions sections, the route between Ford and Arundel has been split into three sections based on similar highway conditions. The first and third sections have existing pedestrian facilities, but the second not. The purpose of the site visit was to gain a physical perspective of the route from the viewpoint of an NMU and to identify any particular issues that were not evident when assessing the route via a desktop study alone.

3.1.2. Weather conditions on the day of the site visit were mild and skies were clear, however it had been raining the previous night meaning the roads were damp. These conditions were considered appropriate.

3.2 METHODOLOGY

3.2.1. The site visit allowed for a thorough examination of the existing cycle conditions. The assessment considered the core design principles such as Safety, Accessibility and Attractiveness as identified within 'DfT Local Transport Note 1/12: Shared Use Routes for Pedestrians and Cyclists (September 2012)' and 'Sustrans Design Manual: Handbook for cycle-friendly design (April 2014)'.

3.2.2. The Cycling Level of Service (CLoS) assessment toolkit was used to assess each link along the route. This allows for an objective assessment of the cycle conditions based on six key themes:

- Safety;
- Directness;
- Coherence;
- Comfort;
- Attractiveness; and
- Adaptability.

3.2.3. Within these key themes, the CLoS assessment is further broken down into 42 individual factors. Eight of these factors are identified as 'critical', giving them a greater weighting in the scoring system. The London Cycle Design Standards (LCDS) guidance recommends that factors causing routes to fail against 'critical' criteria should be addressed as a priority regardless of the overall score for a link, which is considered to be a robust methodology for defining priorities along the corridor The criteria identified as 'critical' are:

- Risk of collision with turning vehicles at junctions;
- Risk of collision from the side or behind;
- Level of kerbside activity;
- Traffic speed;
- Traffic volume;
- Interaction with Heavy Goods Vehicles (HGVs);
- Quality of surface; and
- Width of allocated cycling area.

3.2.4. All links are scored out of 100. However, some of the scoring factors that are associated with connections to other routes within an urban environment are not applicable to this route, due to the street typology. Therefore, a percentage score is used to indicate the level of service provided.

- Routes with an overall total of less than 40% are considered to have a ‘low’ level of service;
- Those between 40 and 70% an ‘improved’ level of service; and
- Scores above 70% represents ‘good’ provision for cycling.

3.2.5. The CLoS does not factor street typologies into its assessment, and this can have a significant bearing upon the CLoS scores for different street typologies against different scoring criteria. Therefore, when reviewing CLoS scores, it is important to be mindful of what level of infrastructure is appropriate for cyclists on these different street typologies.

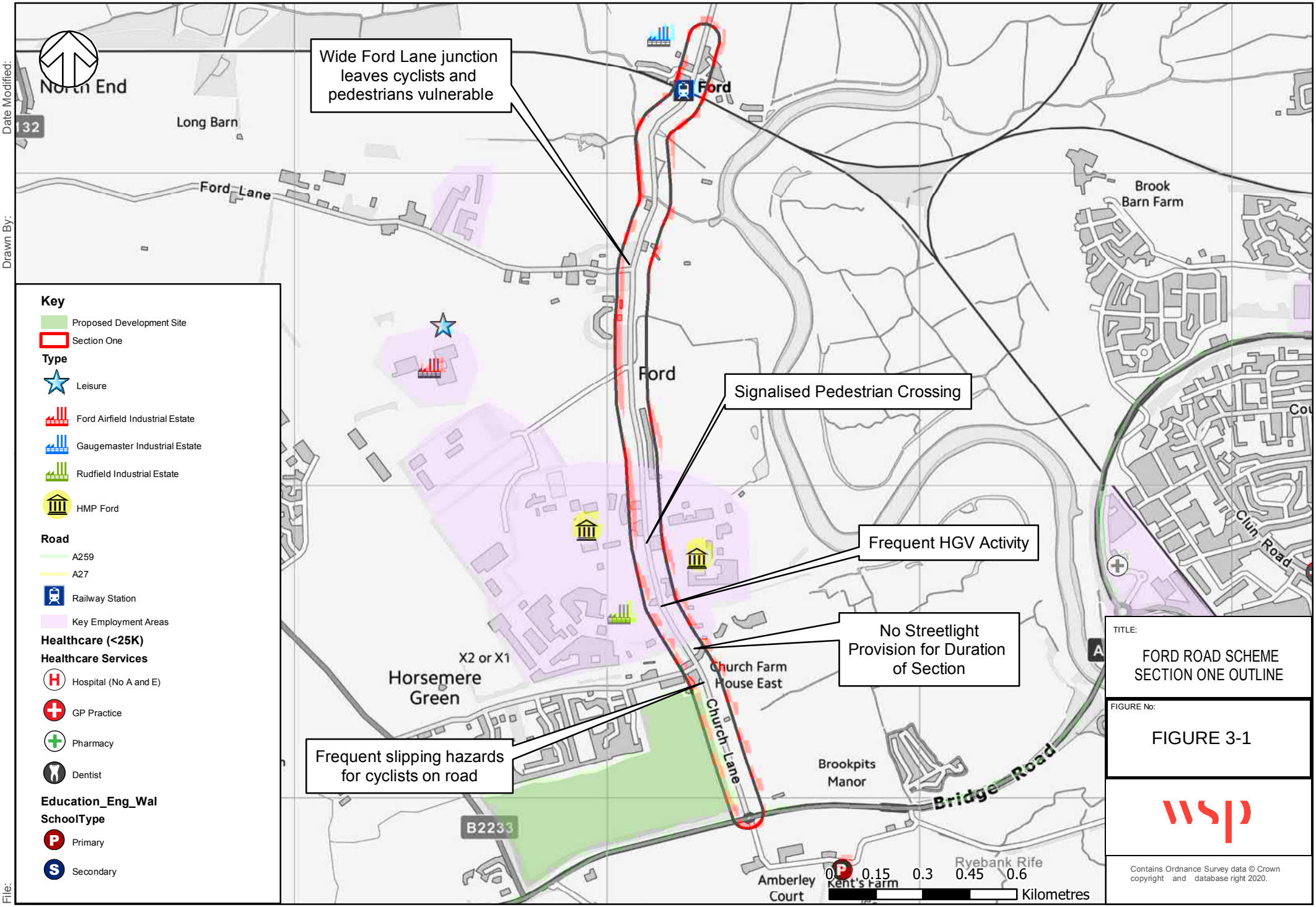
3.2.6. In order to undertake the assessment for all streets within the study area using data available, additional assumptions have been made when scoring against certain criteria such as traffic speed, traffic volume, levels of HGVs, noise and air quality.

3.2.7. Full details of the LCDS CLoS scoring criteria and modifications for this study are provided in Appendix A.

3.3 SECTION 1 – CHURCH LANE AND FORD ROAD

3.3.1. Section 1 runs between Church Lane and just north of Ford Station, on Ford Road. Church Lane joins with the A259 roundabout. The A259 is part of the National Cycle Network Route 2. This Section is a mixed-use area servicing a prison, several small industrial estates and residential estates. There are no cycle lanes, however there are footways on at least one side of the road for the duration of the section.

3.3.2. Key findings from the CLoS assessment in Section 1 showed that the Ford Lane junction is particularly wide, leaving crossing pedestrians and cyclists on Ford Road vulnerable to motorists looking to turn in and out of the junction. Moreover, there was a lot of HGV activity in the area, particularly around the industrial estate on Church Lane. Figure 3-1 outlines the area Section 1 covers and Table 3-1 presents the CLoS assessment for this section.


Wide Ford Lane junction leaves cyclists and pedestrians vulnerable
Signalised Pedestrian Crossing
Frequent HGV Activity
No Streetlight Provision for Duration of Section
Frequent slipping hazards for cyclists on road
North End
Long Barn
Ford Lane
Ford
Brook Barn Farm
Clun Road
Horsemere Green
X2 or X1
Church Farm House East
Church Lane
Brookpits Manor
Bridge Road
B2233
Amberley Court
Kent's Farm
Ryebank Rife
0 0.15 0.3 0.45 0.6
Kilometres
Key
Proposed Development Site
Section One
Type
Leisure
Ford Airfield Industrial Estate
Gaugemaster Industrial Estate
Rudfield Industrial Estate
HMP Ford
Road
A259
A27
Railway Station
Key Employment Areas
Healthcare (<25K)
Healthcare Services
Hospital (No A and E)
GP Practice
Pharmacy
Dentist
Education_Eng_Wal
SchoolType
Primary
Secondary
Date Modified:
Drawn By:
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TITLE:
FORD ROAD SCHEME SECTION ONE OUTLINE
FIGURE No:
FIGURE 3-1
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Table 3-1 – Summary of Section 1 CLoS

Factor	Description	CLoS Score
Safety	▪ No cycle provision on road, cyclists in general traffic lanes ▪ Some junctions have poor visibility / poor provision for pedestrians and cyclists. ▪ Site visit showed high HGV activity at several industrial estates along the road. ▪ 500+ peak hourly traffic flow. ▪ Observed 85th percentile speed is greater than 50mph. ▪ No streetlights, little natural surveillance and high vegetation.	4% failing the following criteria: Collision alongside or from behind Speed of traffic
Directness	▪ Direct route. ▪ Cyclists do not have room to overtake when the road is busy in both directions.	50%
Coherence	▪ Several signs detailing directions of South Coast Cycle Routes and PRoW.	50%
Comfort	▪ Overall good road quality with some surface wear and potholes. Road is frequently covered by mud and other vegetation due to use by HGVs presenting a slipping hazard for cyclists. ▪ Some small stretches of road with increased gradient.	55%
Attractiveness	▪ Pleasant rural area. ▪ Good provision of sign posting, a few speed limit signs show wear. ▪ One disused / unnecessary crossing reducing usable width of road	70%
Adaptability	▪ Cycling facility can be provided or layout adapted within area constraints but junction improvements may be constrained by vehicle capacity limitations.	25%
	Total CLoS Score	26%

Figure 3-2 - Signage for cylists, Section 1

Figure 3-3 – HGV activity / little space for overtaking, Section 1

Figure 3-4 - Level crossing surface, Section 1

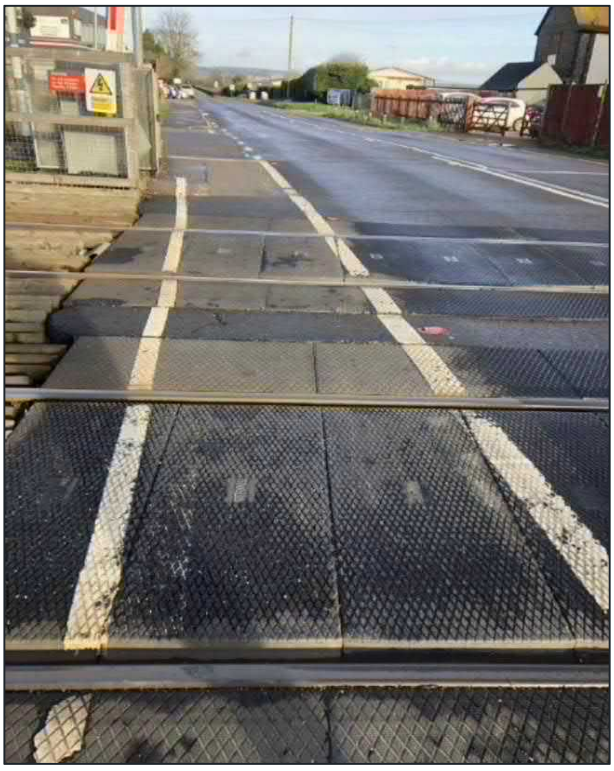

Figure 3-5 - Pothole in Section 1

Figure 3-6 - Muddy conditions / cars mounting footway, Section 1

Figure 3-7 - Crossing with no dropped kerb, reducing road width, Section 1

3.4 SECTION 2 – FORD ROAD, NORTH OF STATION

3.4.1. Section 2 consists of the stretch of Ford Road north of the railway station, leading into Arundel. It is subject to the national speed limit and is rural in nature. There is no pedestrian or cyclist provision. The site visit showed that there were several cyclists using this stretch of the route and were, on more than one occasion, overtaken by motor vehicles with little room to spare.

3.4.2. Figure 3-8 shows the part of the route that Section 2 covers and Table 3-2 summarises the CLoS assessment for this section.

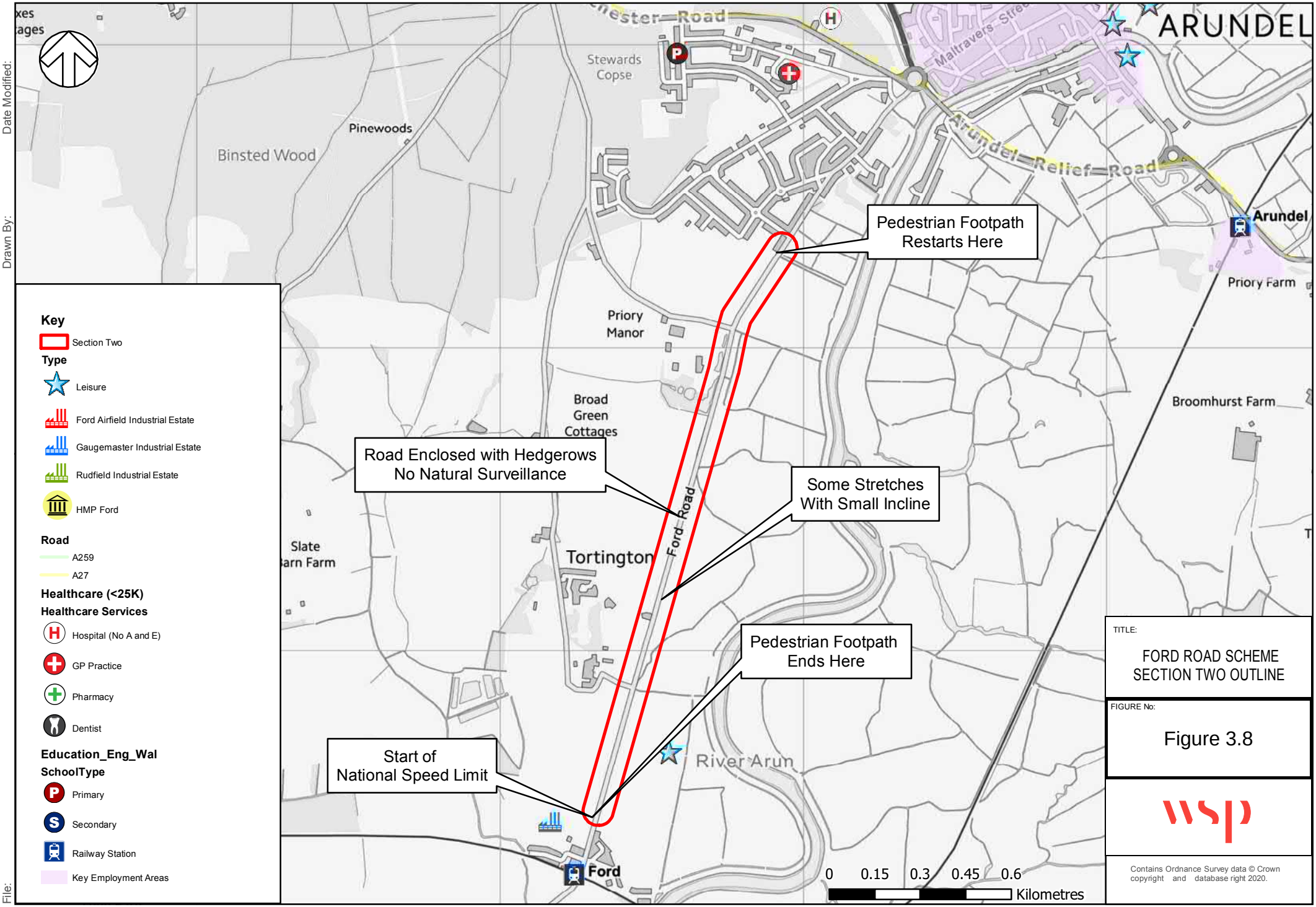
Date Modified:
Drawn By:
File:
Key
Section Two
Type
Leisure
Ford Airfield Industrial Estate
Gaugemaster Industrial Estate
Rudfield Industrial Estate
HMP Ford
Road
A259
A27
Healthcare (<25K)
Healthcare Services
Hospital (No A and E)
GP Practice
Pharmacy
Dentist
Education_Eng_Wal
SchoolType
Primary
Secondary
Railway Station
Key Employment Areas
Pedestrian Footpath Restarts Here
Road Enclosed with Hedgerows No Natural Surveillance
Some Stretches With Small Incline
Pedestrian Footpath Ends Here
Start of National Speed Limit
ARUNDEL
Arundel
Arundel Relief Road
Chester Road
Stewards Copse
Pinewoods
Binsted Wood
Priory Manor
Priory Farm
Broad Green Cottages
Broomhurst Farm
Slate Farm
Tortington
Ford Road
River Arun
Ford
0 0.15 0.3 0.45 0.6
Kilometres
TITLE:
FORD ROAD SCHEME
SECTION TWO OUTLINE
FIGURE No:
Figure 3.8
wsp
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Table 3-2 – Summary of Section 2 CLoS

Factor	Description	CLoS Score
Safety	▪ Country lane with no cyclist provision. ▪ No separation from traffic. ▪ No streetlights, road enclosed by hedgerows and no natural surveillance. ▪ 85th percentile speed over 50mph.	23% Failing the following criteria: Collision alongside or behind Speed of traffic
Directness	▪ Cyclists follow the same route as motor traffic. ▪ Direct route.	50%
Coherence	▪ Cyclists share connections with motor traffic. ▪ Notably little wayfinding signs travelling south.	50%
Comfort	▪ Minor on-road surface defects. ▪ Road is frequently covered by mud and other vegetation presenting a slipping hazard for cycles. ▪ Some small areas of increased gradient, otherwise route is generally flat. Brow of hill does reduce visibility.	55%
Attractiveness	▪ Rural area with quiet surroundings. ▪ Assumed Relatively low / medium PM10 NOX and noise pollution values based on rural nature of route and low traffic volumes.	60%
Adaptability	Cycling facility can be provided or layout adapted within area constraints, but junction improvements may be constrained by vehicle capacity limitations.	25%
	Total CLoS Score	33%

Figure 3-9 - Direct route, no street lights or natural surveillance, hedge lined, Section 2

Figure 3-10 - Large speed limit signs upon entry into Arundel, Section 2

3.5 SECTION 3 – FORD ROAD, APPROACHING A27 ROUNDABOUT

3.5.1. Section 3 begins on Ford Road, at the beginning of the 30mph speed limit just before the Maxwell Road junction. Ford Road notably transitions into a residential area, where the road width is reduced by parked cars, which also present a dooring risk to cyclists. Figure 3-12 outlines the area of the route that section 3 covers and Table 3-3 below summarises the CLoS assessment for this section.

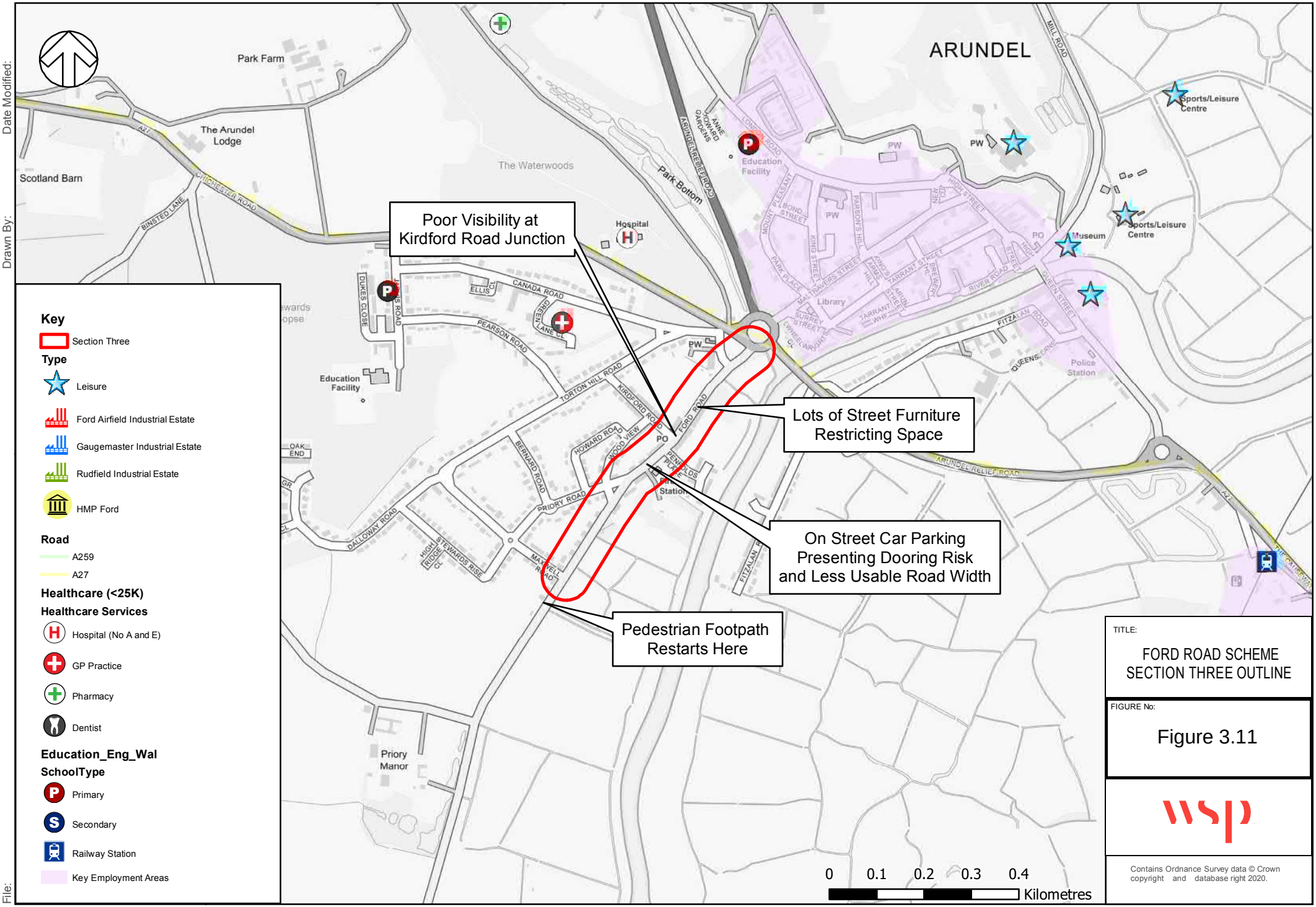

Date Modified:
Drawn By:
File:
Poor Visibility at Kirdford Road Junction
Lots of Street Furniture Restricting Space
On Street Car Parking Presenting Dooring Risk and Less Usable Road Width
Pedestrian Footpath Restarts Here
ARUNDEL
Park Farm
The Arundel Lodge
Scotland Barn
The Waterwoods
Park Bottom
Hospital
Education Facility
Sports/Leisure Centre
Museum
Library
Police Station
Priory Manor
Key
Section Three
Type
Leisure
Ford Airfield Industrial Estate
Gaugemaster Industrial Estate
Rudfield Industrial Estate
HMP Ford
Road
A259
A27
Healthcare (<25K)
Healthcare Services
Hospital (No A and E)
GP Practice
Pharmacy
Dentist
Education_Eng_Wal
SchoolType
Primary
Secondary
Railway Station
Key Employment Areas
0 0.1 0.2 0.3 0.4
Kilometres
TITLE:
FORD ROAD SCHEME
SECTION THREE OUTLINE
FIGURE No:
Figure 3.11
wsp
Contains Ordnance Survey data © Crown copyright and database right 2020.

Table 3-3 – Summary of Section 3 CLoS

Factor	Description	CLoS Score
Safety	▪ Some junctions have poor visibility ▪ On kerb / street parking reduce usable width and creating risk of collision with doors ▪ On street parking may also encourage aggressive driving over right of way confusion ▪ 85th percentile speed is ~25mph. Low speeds are encouraged with frequent signage and traffic calming upon entry into section. ▪ Site visit showed much lower HGV presence in this section.	35% Failing the following criteria: Collision alongside or behind Kerbside activity or risk of collision with door
Directness	▪ Cyclists may find overtaking difficult due to the road width being restricted by parked cars.	50%
Coherence	▪ Cyclists share connections with motor traffic.	50%
Comfort	▪ Some potholes but overall good quality road. ▪ No gradient in this area. ▪ Some pinch points created by parked cars and beginning / end of footways.	65%
Attractiveness	▪ Cluttered roadside environment in terms of street furnity ie; refuse bins and bags, bollards and cars obstruct footways and roads.	60%
Adaptability	Cycling facility can be provided or layout adapted within area constraints, but junction improvements may be constrained by vehicle capacity limitations.	25%
	Total CLoS Score	40%

Figure 3-12 - Parked cars in Section 3

Figure 3-13 – On-Street parking in Section 3

Figure 3-14 - Street furniture in Section 3

Figure 3-15 –Restricted road width in Sec. 3

Figure 3-16 - Side road junctions with poor visibility in Section 3

3.6 SUMMARY

3.6.1. The CLoS assessment has identified aspects of each section that are most in need of improvements. The table below summarises the scores for each section.

Table 3-4 – CLoS Section Summary

Section	CLoS
1. Church Lane / Ford Road / Ford Station	26%
2. Ford Road North of Station	33%
3. Ford Road / A27 Roundabout Approach	40%
Average CLoS	33%

3.6.2. The results from the CloS assessment have primarily identified safety as being the critical factor within the assessment, with this factor resulting in the lowest CLoS score for each of the respective sections and being classified as failing. The safety factor relates to the speed of traffic, which failed in Sections 1 and 2 due to the 85th percentile speeds being recorded as greater than 30mph, as well as the risk of collision between cyclists and vehicles considered high due to the nearside lane

being between 3.2m-4m in width. The safety factor was scored somewhat greater within Section 3, although it was still classified as having failing criteria due to risk of collision from kerbside activity, due to having an 85th percentile speed of below 30mph.

3.6.3. The route was assessed as being the same directness as the route taken by traffic, with no journey time savings when compared against vehicular routes. It was identified within Section 3 that on-carriageway car parking reduced the effective width of the carriageway, resulting in potential difficulties and delay for cyclists moving past these vehicles. The coherence for the route was reduced slightly due to an absence of wayfinding signs, however cyclist share connections with vehicular traffic. With reference to comfort on the route it was noted that the road surface was often encroached by vegetation within Sections 1 and 2, resulting in a potential hazard for cyclists. The road surface was assessed as having improved, with an absence of potholes and vegetation, within Section 3 of the route. The gradient was assessed as being relatively flat and constant for the duration of the route. Finally, for the attractiveness factor of the assessment, it was noted that there were low/medium levels of PM10 and NOX with low levels of noise pollution due to the rural nature of the route in Sections 1 and 2. Within Section 3 it was noted that the presence of refuse bags, parked cars and street furniture reduced the attractiveness of the route within Section 3.

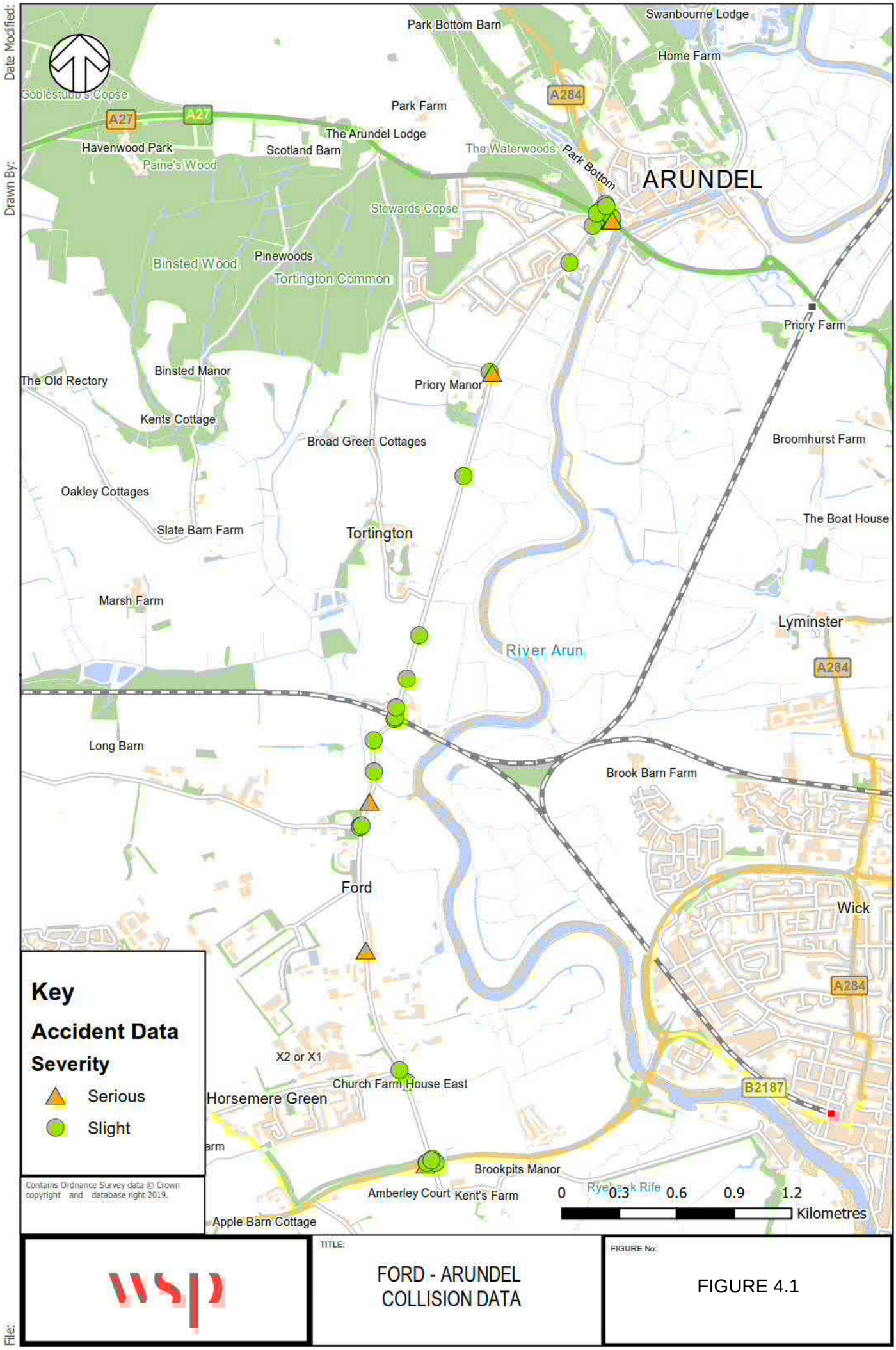
4 SURVEY DATA

4.1 COLLISION DATA

4.1.1. Personal Injury Accident data for the Ford Road study area has been reviewed. The data covers a five-year period between 01/01/2014 and 31/10/2019. Collision points have been plotted onto a map, which is presented in Figure 4-1. Within the extent of the study area, 40 collisions were recorded, 8 of which were of a serious severity.

4.1.2. The complete dataset, including full descriptions of individual collisions, is included in Appendix B.

4.1.3. 14 of the accidents involved an NMU, these incidents are outlined in further detail below. The data has been split into the three sections of the route along Ford Road.


Date Modified:
Drawn By:
File:
Park Bottom Barn
Swanbourne Lodge
Home Farm
Goblestubb's Copse
A27
A27
A284
Park Farm
The Arundel Lodge
Havenwood Park
Paine's Wood
Scotland Barn
The Waterwoods
Park Bottom
ARUNDEL
Stewards Copse
Binsted Wood
Pinewoods
Tortington Common
Priory Farm
Binsted Manor
The Old Rectory
Priory Manor
Kents Cottage
Broad Green Cottages
Broomhurst Farm
Oakley Cottages
The Boat House
Slate Barn Farm
Tortington
Marsh Farm
Lyminster
River Arun
A284
Long Barn
Brook Barn Farm
Ford
Wick
A284
X2 or X1
Church Farm House East
B2187
Horsemere Green
Brookpits Manor
Amberley Court
Kent's Farm
Apple Barn Cottage
0
0.3
0.6
0.9
1.2
Kilometres
Key
Accident Data
Severity
Serious
Slight
Contains Ordnance Survey data © Crown copyright and database right 2019.
TITLE:
FORD - ARUNDEL
COLLISION DATA
FIGURE No:
FIGURE 4.1

SECTION 1 CHURCH LANE / FORD ROAD / STATION ROAD / FORD STATION

4.1.4. Table 4-1 below summarises the collision data for section 1 of the route. Most collisions involving NMU's have occurred here, totalling at 11. Two of these collisions resulted in a serious injury to the cyclist. The majority of collisions in this section occurred at A259 / Climping Roundabout, where a driver failed to see a cyclist who was already negotiating the roundabout.

Table 4-1 – Summary of collisions in Section 1

Section	Users	Severity	Description	Police Reference
1	2 x Cars and 1 x Cycle	Serious	Car attempted to overtake cyclist too close	1500146
1	1 x Car and 1 x Cycle	Serious	Driver failed to see cyclist at roundabout	1701828
1	1 x Car and 1 x Cycle	Slight	Cycle was clipped by vehicles wing mirror	1503914
1	1 x Car and 1 x Cycle	Slight	Cyclist went into the front side of vehicle when it stopped unexpectedly.	1507691
1	1 x Car and 1 x Cycle	Slight	Driver rear ended cycle at approach to roundabout	1605611
1	1 x Car and 1 x Cycle	Slight	Driver failed to see cyclist at roundabout	1703207
				1605774
				1705454
				1803888
				1806307
				0891011

SECTION 2 FORD ROAD

4.1.5. There were no collsions involving NMU's in section 2.

SECTION 3 FORD ROAD APPROACHING A27 ROUNDABOUT

4.1.6. Of the three collisions in Section 3, one resulted in a serious injury to a cyclist at the A27 roundabout in Arundel. The other two were caused by a car pulling out of a side road and failing to see an oncoming cycle. Both were of a *slight* severity.

Table 4-2 – Summary of collisions in Section 3

Section	Police Reference	User	Severity	Description
3	1507658	1 x Car and 1 x Cycle	Serious	Cyclist dismounted by oncoming car at roundabout
3	1604602	1 x Car and 1 x Cycle	Slight	Car pulled out of junction in front of moving cycle
3	1604964	1 x Car and 1 x Cycle	Slight	Car pulled out of junction in front of moving cycle

SUMMARY OF PERSONAL INJURY ACCIDENT DATA ANALYSIS

4.1.7. In summary, the Personal Injury Accident data showed 14 incidents involving a cyclist, representing 35% of the total 40 collisions recorded. No collisions involved any pedestrians. The most common occurrence, 50% of cyclist collisions, was for a driver to fail to see a cyclist at the Church Lane / A259 roundabout, causing collision. Moreover, several incidents were caused by poor judgement of drivers at junctions and during over-taking a cyclist. Whilst most of these accidents were of a 'slight' severity, it demonstrates the vulnerability of cyclists on the road, and improvements to encourage cycling should seek to provide segregated cyclist facilities. This could reduce the opportunity for drivers to fail to see a cyclist on the road and therefore lower the risk of collision

4.2 TRAFFIC SURVEY DATA

4.2.1. Traffic Survey Data was obtained from the West Sussex County Council Traffic Monitoring Database. Data was collected from the following monitoring site in Section 2:

- C17 Ford, Ford Road, just south of junction with Tortington.

4.2.2. Average traffic flow data was obtained for both hourly and daily movements for the month of September 2019. A summary of this data is provided in Table 4-1.

Table 4-3 – Traffic Data Summary

			Northbound	Southbound	Two-way
Weekday	AM Peak	Time	08:00 – 09:00		
		Flow (Veh/hr)	364	211	575
		% HGVs	-	-	0.9%
	PM Peak	Time	16:00 – 17:00		
		Flow (Veh/hr)	250	340	567
		% HGVs	-	-	1.2%
Weekend	AM Peak	Time	11:00 – 12:00		
		Flow (Veh/hr)	324	226	550
	PM Peak	Time	12:00 – 13:00		
		Flow (Veh/hr)	326	233	559
AADT (24 hour)			6628		
AADT % HGVs			0.5%		

WSCC Traffic Monitoring Database

4.2.3. Table 4-3 shows that traffic flows on Ford Road remain consistent across AM and PM peaks across the average weekday and weekend with two-way traffic flows of between 550-600 vehicles per hour. It should also be noted however that existing traffic volumes along Ford Road are likely to increase in the future, as a result of the permitted development at Climping and Ford Strategic Allocation which will provide 1,500 homes on the existing site of Ford Airfield.

4.2.4. The proportion of HGVs using the corridor was recorded at 0.9-1.2% in the weekday peak hours and 0.5% over the average 24-hr day. This is lower than the A259 west of Ford Road / Church Lane, which has an HGV proportion of 2.1% of AADT flows (DfT traffic flows, 2018) which reflects that the A259 forms part of the WSCC Advisory Lorry Route network.

4.2.5. Speed data was also obtained from the data collection point stated above. A summary of this is provided in table 4-2.

Table 4-4 – A summary of speed data

Section	Speed limit at data collection point	85th Percentile Speed (mph)	
		Northbound Carriageway	Southbound Carriageway

1	40mph	41	41
2	60mph	52	55
3	30pmh	26	28

WSCC Traffic Monitoring Database

4.3 NMU SURVEYS

4.3.1. Non-Motorised User surveys have been taken from the Bellamy Roberts Transport Assessment (December 2016) for the development that has planning permission on the Land West of Church Lane & South of Horsemere Green Lane in Climping (Planning application reference number: CM/1/17/OUT). The following tables present the number of cyclists to turn on and off of Church Lane at the Church Lane / A259 / Crookthorn Lane roundabout. The data was collected on Thursday 24th September 2015.

Table 4-5 – 2016 Base Cyclist Flows – from Church Lane onto A259 and Crookthorn Lane

Time		Cycle Count			
		From: Church Lane Left To: A259 (East)	From: Church Lane Straight To: Crookthorn Lane	From: Church Lane Right To: A259 (West)	From: Church Lane U Turn To: Church Lane
AM Peak	07:30 – 9:30	0	1	0	0
PM Peak	16:30 – 18:30	3	9	0	0
Total for both peaks		2	10	0	0

Table 4-6 – 2016 Base Cyclist Flows – From A259 and Crookthorn Lane onto Church Lane

Time		Cycle Count		
		From: A259 (East) Left To: Church Lane	From: Crookthorn Lane Straight To: Church Lane	From: A259 (West) Right To: Church Lane
AM Peak	07:30 – 09:30	0	0	0
PM Peak	16:30 – 18:30	1	6	1

Total for both peaks	1	6	1

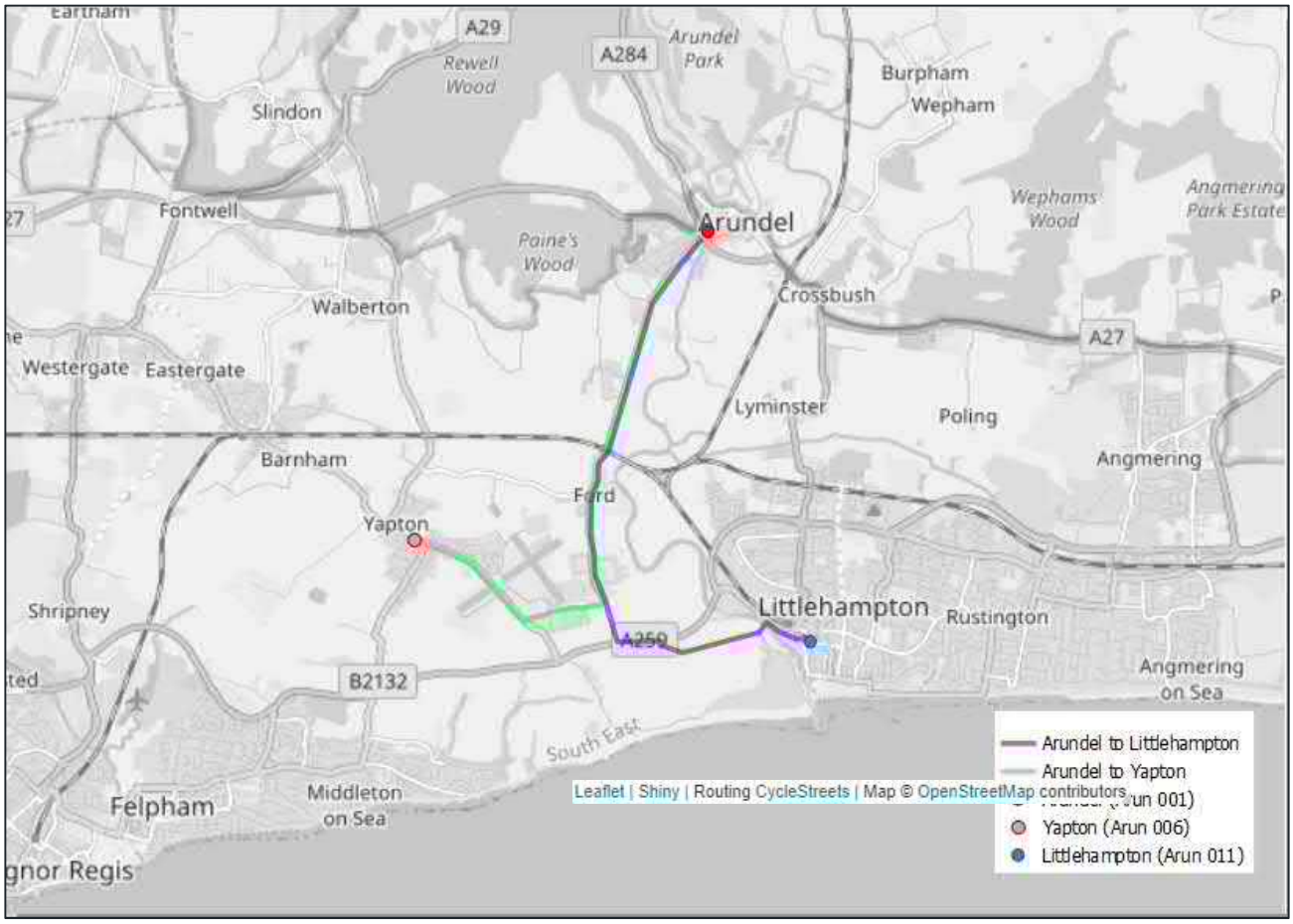
4.4 CYCLING DEMAND

4.4.1. Cycling demand data has been obtained from the DfT Propensity to Cycle Tool (PCT) which is an open access website tool that shows existing levels of cycling in every local authority in England, using 2011 Census travel to work data. By utilising the start and end points of journey to work data, the tool allows users to visualise the number of people commuting to work by bike between Census Middle Super Output Areas (MSOA). The Arundel to Ford study area was identified as consisting of two separate journey to work start and end points;

- Arundel (MSOA: Arun 001) to Yapton (MSOA: Arun 006); and
- Arundel (MSOA: Arun 001) to Littlehampton (MSOA 011).

4.4.2. The tool can use this data to map the fastest routes between the given MSOAs (shown in Figure 4-2 below) and while it will result in slightly different flows from the traffic surveys summarised in Section 4.4, the tool provides an estimate of cycle usage across the whole study area.

Figure 4-2 - Arundel to Yapton and Littlehampton PCT Flows



4.4.3. The journey to work cycle flows have been identified for each of the start to end points shown in the map above. These add up to give an overall picture of the commuting cycle flows through the Arundel to Ford study area and are shown in Table 4-5 below.

Table 4-7 – Arundel to Yapton and Littlehampton Flows (Census 2011)

Journey to Work Start/End Point	Total Commuter Flows	Cyclists
Arundel – Yapton	132	7 (5%)
Arundel – Littlehampton	97	5 (5%)
Totals	**229**	**12 (5%)**

4.4.4. The flows above show 12 people cycling to work along the corridor. Whilst numbers are low, as a percentage of all traffic, a 5% proportion of total traffic shows higher flows compared to the average for West Sussex (3%) and the UK (2%). It is important to note the figures only show commuter cycling trips recorded from 2011 Census journey to work data, and as such journeys for other purposes, i.e. leisure, shopping, school traffic etc, are not captured. However, the 5% cycling to work figure indicates there is relatively high demand for journeys to be made by bike.

4.4.5. The PCT allows for the testing of different scenarios to determine what levels of cycling could be achieved for different scenarios. For the purposes of this study area the following scenarios have been tested;

- Government Target – based on the UK government target of doubling journeys by bike by 2025; and
- Go Dutch – if commuters had the same propensity to cycle as in the Netherlands with an allowance for hilliness;

4.4.6. The flows for each scenario are shown below in Table 4-6.

Table 4-8 – PCT Scenario Flows

Journey to Work Start/End Point	Total Commuter Flows	Cyclists (Government Target)	Cyclists (Go-Dutch)
Arundel – Yapton	132	14 (10%)	43 (32%)
Arundel – Littlehampton	97	10 (10%)	24 (25%)
Totals	**229**	**24 (10%)**	**67 (29%)**

4.4.7. By showing what the rate of cycling could feasibly look like in different parts of cities and regions and illustrating the associated increase in cycle use on the road network, the PCT should inform policies that seek a wider shift towards sustainable transport. In this instance, it can be assumed that infrastructure improvements along the Arundel – Ford study area, that facilitate safer and more comfortable journeys, has the potential to see increases in cycling uptake. For all scenarios, a list of quantitative benefits can be output which will be used to inform the Scheme Appraisal Report (SAR) outlined in Section 11.

5 ROUTE IMPROVEMENT: OPTIONS DEVELOPMENT AND APPRAISAL

5.1 INTRODUCTION

5.1.1. Following on from the initial stakeholder consultation and review of baseline conditions several improvement options have been considered for the Ford Road route, each taking account of the scheme objectives of facilitating trips to Ford railway station and Arundel town centre by active modes through the provision of improved pedestrian and cycle facilities. The options considered can be summarised as follows:

- Option A: Provision of off-carriageway pedestrian and cycle infrastructure improvements along Ford Road between the A259 and A27;
- Option B: Provision of on-carriageway improvements along Ford Road between A259 and A27; and
- Option C: Provision of pedestrian and cycle infrastructure improvements along PRoW Footpath 206, which runs along the western bank of the River Arun between the A259 and Arundel town centre.

5.1.2. Design guidance for cycle traffic is set out in CD 195 of the Design Manual for Roads and Bridges (DMRB). This appraisal takes account of the guidance set out in this document when assessing each of the three options. Each option has taken into account key design factors, outlined within Table E/1.1.1 of the Highways England guidance, to achieve the best balance between the criteria within the optioneering process. Table E/1.1.1. has been re-produced in Figure 5-1 below.

Figure 5-1 - CD 195 Table E/1.1.1

Table E/1.1.1 Cycling design criteria

Coherence	Cycle networks link trip origins and destinations, including public transport access points and are continuous and easy to navigate.
Directness	Cycle networks serve all the main destinations and seek to offer an advantage in terms of distance and journey time.
Comfort	Infrastructure meets design standards for alignment and surface quality, and caters for all types of user, including children and disabled people.
Attractiveness	Aesthetics, noise reduction and integration with surrounding areas are important.
Safety	Cycle networks not only improve cyclists' and other road users' safety, but also their feeling of how safe the environment is (their personal security).

5.1.3. Additionally, within the optioneering process, reference has been made to Table E/1.1 Minimum provision for cycle routes to assess the cycle infrastructure provision required in relation to AADT flows. Table E/1.1 is re-produced below.

Figure 5-2 - CD195 Table E/1.1

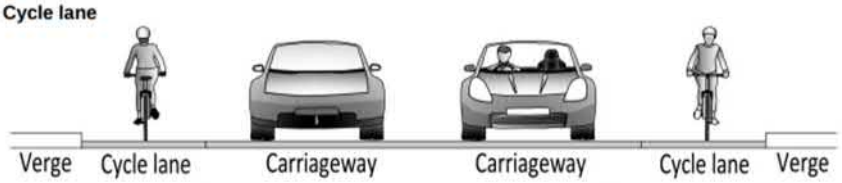
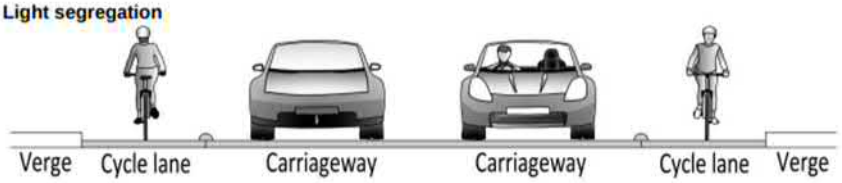
Table E/1.1 Minimum provision for cycle routes

Speed limit (mph)	Motor traffic flow (AADT-Average annual daily traffic)	Minimum provision for cycle routes
40 and over	All flows	Cycle tracks (excluding stepped cycle tracks)
30	>5,000	Cycle tracks
	0-5,000	Cycle lanes
20	>5000	Cycle tracks
	2,500-5,000	Cycle lanes
	<2500	Quiet streets

5.1.4. To determine the required widths of proposed cycle infrastructure, based upon peak hour cycle flow, reference has been made to Table E/3.1 of the Highways England guidance. Table E/3.1 has been re-produced below in Figure 5.3.

Figure 5-3 - CD195 Table E/3.1

Table E/3.1 Minimum widths of cycle routes

Cycle route type	Peak hour cycle flow (either one-way or two-way depending on cycle route type)	Desirable minimum width	Absolute minimum width (for sections up to 100 metres)
Cycle lane	<150	2.0 metres	1.5 metres
Cycle lane 			
Cycle route type	**Peak hour cycle flow (either one-way or two-way depending on cycle route type)**	**Desirable minimum width**	**Absolute minimum width (for sections up to 100m)**
Cycle lanes with light segregation	<150	2.5 metres	1.5 metres
Light segregation 			
Cycle route type	**Peak hour cycle flow (either one-way or two-way depending on cycle route type)**	**Desirable minimum width**	**Absolute minimum width (for sections up to 100m)**
One-way cycle track (including stepped cycle track)	<150	2.5 metres	1.5 metres
	150-750	3.0 metres	2.5 metres
	>750	4.0 metres	3.5 metres

5.2 OPTION APPRAISAL

OPTION A

5.2.1. Option A considers the provision of predominately off-carriageway pedestrian and cycle infrastructure improvements along Ford Road between the A259 and A27. The implementation of this option would mean the provision of a continuous off-carriageway connection for pedestrians and cyclists between Ford and Arundel. Preliminary designs for this option consist of a shared-use path adjacent to the carriageway. Due to spatial constraints within the available highway land, the shared-use path proposed within this option can only be accommodated on one side of the carriageway, at any given point. The side of the carriageway which is able to accommodate the shared-use path alternates at several points along the route. At points where cyclists are required to cross from one side of the carriageway to the other, informal crossing points would be required.

5.2.2. As can be seen within the relevant design guidance, vehicular traffic speeds are set out as a key consideration when determining minimum provisions for cyclists on a link. As is set out in the existing conditions section of this report, Ford Road is a relatively high-speed and highly trafficked link, with signposted speed limits exceeding 30mph in all three sections, and an AADT flow of 6,682 vehicles. As can be seen, Table E/1.1 of CD 195 states that off-carriageway 'cycle tracks' are the minimum desirable provision for roads with a speed limit of 30mph and over, and an AADT of >5,000 vehicles. This guidance indicates that off-road provisions for cyclists are the most appropriate for this link.

5.2.3. In line with the guidance set out in CD 195, the preliminary design for the shared-use path in Option A is able to meet desirable minimum requirements set out in Table E/3.1 and retain a 3m width for the entirety of the route.

5.2.4. The proposals for Option A take account of the majority of the 'critical' criteria set out in the LCDS as described in Section 3 of this report. The design takes into account the traffic speed and volume on the road and minimises the need for cyclists to interact with vehicular traffic by removing them from the carriageway. The removal of cyclists from the carriageway will also considerably lessen the risk of collision of cyclists with all types of motorised traffic, as well as minimising the interaction between cyclists and HGV's on the road. The implementation of a shared-use path on this link will also help to considerably improve the quality of surface for cyclists and the available width.

OPTION B

5.2.5. The initial design process for Option B related to the provision of on-carriageway improvements along Ford Road between the A259 and A27. However, after further design considerations, this Option was discounted from the scheme due to identified constraints relating to the speed and volume of vehicles between the A259 and A27 as well as a high number of PIA involving cyclists being identified along this route.

5.2.6. Following a detailed review of PIA data within the baseline conditions of this report, covering a five-year period between 01/01/2014-31/10/2019, there were a total of 14 collisions identified involving cyclists across all three sections of the route of which three were classified as serious and the remaining 11 were classified as slight. The most common causation factor listed related to drivers failing to observe cyclists at the A259 / Climping Roundabout. The analysis of the PIA has concluded that there is an existing issue relating to the safety of cyclists on-carriageway within the study area, within particular proximity of the A259 / Climping Roundabout, and that the provision of

additional on-carriageway cycling infrastructure would exacerbate this issue relating to further safety constraints.

5.2.7. A review of the baseline conditions for the study area has identified that the 85th percentile speeds for Sections 1 and 2 of the route are above 50mph, with the 85th percentile speed for Section 3 being 25mph highlighting the residential characteristics of that Section. Guidance taken from Highways England, contained within Table E/1.1 of CD 195 Designing for Cycle Traffic, states that roads with a speed limit of 40mph and over, regardless of traffic flow, should have a minimum provision of off-carriageway cycle-tracks for cycling design criteria. The guidance from Highways England identifies that on-carriageway cycle improvements should not be provided within the Ford – Arundel study area due to the 85th percentile speeds being greater than the recommended 40mph, in the interest of safety, resulting in the proposals for Option B being discounted within this study. Table E/1.1 from Highways England is provided in Figure 5-1. If Option B were to be progressed further, traffic calming measures would need to be introduced to reduce the 85th percentile speed of the study area to 30mph to enable on-carriageway cycle improvements to be constructed. Whilst the implementation of traffic calming features, in the potential form of raised tables and narrowing of lanes, would reduce speeds this would increase the financial cost of this Option reducing its feasibility.

OPTION C

5.2.8. The design process for Option C has been based on the provision of pedestrian and cycle infrastructure improvements on Footpath 206 that runs adjacent to the western bank of the River Arun between the A259 and Arundel town centre. This Option has been predominantly established as a potential design proposal from Arun District Council as a leisure route for cyclists and pedestrians, however this Option has been discounted from further detailed design due to the route not providing the best opportunities for cycling infrastructure improvements for commuting journeys.

5.2.9. The proposed route adjacent to the River Arun is not the most direct route to/from Arundel Town Centre with no cycle/pedestrian links being provided to Ford Railway Station, reducing the attractiveness of the route for commuting journeys due to the increased journey time. Following a walk-over of the proposed route there were several flooding risks identified with the river path being raised in various locations to protect from flooding, resulting in potential environmental and ecological constraints if this proposal was to be developed. The walk-over of the route also identified an absence of lighting, raising concerns relating to personal safety and making the proposed route unattractive during the hours of darkness. Additionally, it was observed that the footpath contained restricted widths in certain sections, reducing the effective width to provide cycling infrastructure.

5.3 SUMMARY OF OPTIONS APPRAISAL

5.3.1. Following a review of the three options for NMU improvements on the link between Ford and Arundel, the preferred option to be taken forward to preliminary design is Option A. Option A was deemed to be the most appropriate route for further consideration as it offers a direct route between Ford and Arundel and provides a safe and convenient route for all users. It will also provide the most appropriate solution to feed into the Ford Strategic site (1,500 dwellings) at Ford Airfield.

Table 5-1 – Summary of Options Appraisal

Section	CLoS	Existing Infrastructure	Option A	Proposed CLoS	Option B	Proposed CLoS	Option C	Proposed CLoS
1. Church Lane and Ford Road	26%	Some cycling related signposting Cyclists share road with motor vehicles	3m Wide, Segregated Shared Use Path starting midway down Church Lane Alternates sides at Level crossing Junction alterations giving SU path priority	79%	On Carriageway Cycle Improvements	45%	'Riverside option' Footpath and Cycle provision improvement along footpath 206	74%
2. Ford Road, North of Station	33%	None Cyclists share road with motor vehicles	3m Wide Shared Use path on East Side, with 1.5m wide verge segregating the path from the road. Breaks in verge to allow users to exit via junctions	87%	On Carriageway Cycle Improvements	49%	Footpath and Cycle provision improvement along footpath 206	74%
3. Ford Road, Approaching A27 Roundabout	40%	None Cyclists share road with motor vehicles	Existing Public Footway by-passing residential road to be resurfaced and designated as a bridleway Residential Ford Road will have additional traffic calming measures (chicanes)	91%	On Carriageway Cycle Improvements	62%	Footpath and Cycle provision improvement along footpath 206	74%

6 PRELIMINARY DESIGN

6.1.1. The preferred option, Option A, has been taken forward for preliminary design. This section provides a section by section summary of this preliminary design. The preliminary design drawings are shown in Appendix C.

SECTION 1

6.1.2. Section 1 of the route runs between Church Lane and just north of Ford Road level crossing with the proposed preliminary design shown on Drawings 5187-GA-404 to 407 . It is proposed that the shared use path included within Option A will start just north of the proposed realignment of the Church Lane and the A259 Crookhorn Lane / Church Lane Roundabout as proposed as part of Land at Climping housing development.

6.1.3. For the entirety of Section 1, the proposed shared use path meets desirable minimum width standards and is 3m wide. In Section 1, a 0.5m verge is also proposed to give adequate separation between NMU's and vehicular traffic. The proposed shared-use path in this section runs adjacent to the eastern side of the carriageway for approximately 320m from its commencement at the junction of A259 Crookhorn Lane / Church Lane and the access junction for 'Field Place'. At this junction, the proposed shared-use path crosses to the western side of the carriageway and continues on this side for approximately 2.2km to the level crossing at Ford Railway Station. The proposed shared-use path in Section 1 intersects ten junctions with side roads, these junctions are as follows:

- Priority junction of Ford Road / Yapton Access Road.
- Priority junction of Ford Lane / Ford Road / Station Road;
- Priority junction of Ford Road / Substation Access Road;
- Priority junction of Ford Road / Rodney Crescent;
- Priority junction of Ford Road / Airfield Access Road;
- Priority junction of Ford Road / HMP Ford Access Road (north entrance);
- Priority junction of Ford Road / HMP Ford Access Road (south entrance);
- Priority junction of Ford Road / Rudford Industrial Estate Access Road (exit only);
- Priority junction of Ford Road / Rudford Industrial Estate Access Road / Church Lane; and
- Priority junction of Church Lane / Horsemere Green Lane.

6.1.4. At all locations where the proposed route intersects a side road, cyclists are given continual priority over motorised traffic through the use of proposed mandatory on-carriageway cycle lanes across the junction. The proposed 3m width is retained at all locations where on-carriageway sections are provided at side roads. In Section 1, a minimum carriageway width of 6.5m is retained at all points.

SECTION 2

6.1.5. Section 2 spans for approximately 2.2km between the level crossing at Ford Railway Station in the south and the junction of Ford Road / Maxwell Road in the north with preliminary designs shown on Drawings 5187-GA-401 to 404. North of the level crossing at Ford Railway Station, the proposed cycle route crosses from the western side of the carriageway to the eastern side. Due to land constraints, cyclists will be required to dismount at the level crossing cyclists on walk to the shared-use path south of the level crossing.

6.1.6. The proposed shared use path runs adjacent to the eastern side of the carriageway, again retaining the minimum desired width set out in the relevant design guidance of 3m. This proposed shared use path is separated from vehicular traffic by a 2m wide verge for the majority of this Section. As with Section 1, a 6.5m carriageway width will be retained along the length. The proposed shared-use path does not intersect any side roads, however, at points where the route passes directly opposite a priority junction with a side road, the preliminary design includes removal of the proposed verge to facilitate u-turning vehicles.

6.1.7. Approximately 80m south of the priority junction with Maxwell Road, the preliminary design shows the proposed cycle track transitioning to join the main carriageway. At this point, the signposted speed limit is 30mph, with the surroundings becoming increasingly residential in nature. This change in road characteristic is deemed sufficient to allow for cyclist to travel safely on carriageway.

SECTION 3

6.1.8. Section 3 spans approximately 600m between the priority junction of Ford Road / Maxwell Road and the roundabout of Ford Road / A27 / A284 with the preliminary desing shown on Drawing 5187-GA-401. In this section, the proposed improvements are predominately on carriageway, and include the introduction of intermittent protected parking bays on carriageway as a means of traffic calming. These protected parking bays will formalise existing on-street parking in this area, and act to lower the speed of vehicular traffic, thus creating a more amicable environment for cyclists.

7 STAKEHOLDER ENGAGEMENT AND CONSULTATION

7.1.1. A stakeholder consultation meeting was held on 8th January 2020 with WSCC and Arun District Council to discuss initial proposals for the scheme. This section provides a summary of the key points discussed at the meeting.

7.2 FORD ROAD ROUTE (OPTION A AND B)

7.2.1. The draft proposals were presented as a mix of traffic calming measures within the urban sections of the road and an off-road, shared us pathway alongside Ford Road where vehicular speeds are greater. Proposals were also put forward for a shared-use path, which is to be provided with verge to separate users from the carriageway where space permits. The following feedback was received from WSCC and Chichester District Council:

- Operational concerns were put forward in respect to the level crossing, particular concerns were put forward about the level queueing of vehicles at this crossing.
- There were some safety concerns put forward regarding the speed limits on Ford Road, and the appropriateness of this route for use by vulnerable road users. Concerns were also raised by stakeholder about existing poor driver behaviour on this route.
- Stakeholders requested further investigating into upgrading the footpath which currently passes by alongside the river to a bridleway, with it being noted that this would be dependent on landowner permissions.
- Some concerns were raised by stakeholders that the proposals presented did not take into account the proposals put forward in permitted Climping development (Redrow Developments. Planning permission granted CM-1-17-OUT). The permitted Climping development consists of 1,500 houses, a secondary school, and junction improvements at the Church Road / A259 roundabout, and cycle improvements in the area.
- Concerns were also raised regarding the level of HGV activity along the route.

7.3 RIVER ARUN ROUTE (OPTION C)

7.3.1. Stakeholders were informed that a riverside route had been considered, but had previously been discounted due to additional complications, including planning requirements, habitat and environmental impacts. It was noted that flood modelling will be required, which falls outside of the Highways England scope and programme and this route will have a larger environmental impact than the on-carriageway route. It was also noted that the riverside route is not direct and does not link to Ford Station. It was noted by stakeholders representing Arun DC that this route is intended to serve a leisure / recreational purpose as opposed to serving commuters.

8 ENVIRONMENTAL CONSTRAINTS

8.1 OVERVIEW

8.1.1. An Environmental Desktop Study has been prepared to collate existing information from desktop sources in order to identify key potential environmental constraints and impacts associated with the proposed NMU works within the study area, with the following environmental factors being assessed:

- Air Quality;
- Biodiversity (in the form of a standalone report);
- Cultural Heritage;
- Geology and Soils;
- Landscape and Visual;
- Noise and Vibration;
- Population and Health; and
- Road Drainage and the Water Environment.

8.1.2. The main sensitive receptors within the Study Area are residential. These are concentrated in Arundel in the north and Climping in the south. Additionally, commercial and community facilities are present within 1km; industrial estates (Rudford, Ford Airfield and Ford Lane), Ford railway station, education facilities (three primary schools), medical facilities (Arundel and District Hospital and Arundel Surgery GP), Arundel Castle and caravan parks (Climping and Ford). Of these, multiple residential receptors are within 200m of the Site as well commercial facilities, Ford railway station and St Mary's Church of England primary school.

8.2 AIR QUALITY

8.2.1. Due to the nature and scale of the proposed works, air quality impacts are unlikely to be significant beyond 200m from the scheme boundary. The construction phase may result in impacts from emissions of dust and particulates from construction vehicles and activities such as earthworks. The urban location and proximity of residential receptors to elements of the Scheme means that, while the works in each area are small in scale, surrounding properties, people and other receptors may be affected by emissions during construction. No operational phase impacts or constraints are anticipated due to the nature of the Scheme which will provide NMU infrastructure, not resulting in an increase in motorised vehicles.

8.2.2. It is likely that potential construction impacts can be managed by standard best practice implemented through a Construction Environmental Management Plan (CEMP), including dust management measures. Due to the proximity of sensitive receptors this consideration is a priority in any CEMP. Consultation with Natural England would be required regarding the Sites of Special Scientific Interest Impact Risk Zones, as the Site falls within these boundaries.

8.3 CULTURAL HERITAGE

8.3.1. There is the potential for adverse construction impacts on nearby listed buildings, particularly those adjacent to the Site. However, it is likely that these impacts can be managed and mitigated through standard Best Practice Measures (BPMs) implemented though a CEMP. There is also the potential for the presence of undiscovered archaeology due to the historic context of Arundel in the north of

the Study Area and Tortington. However, due to the Scheme taking place on previously disturbed ground, the potential for such discoveries and disturbances is low.

8.3.2. The nature of the Scheme will not result in major land-use change or changes in traffic conditions on the associated road network. As a result, no operational phase impacts are anticipated.

8.4 GEOLOGY AND SOILS

8.4.1. During the construction phase there is the potential for the accidental release of pollutants to the environment from sources such as spilled fuel or material. The soil quality in unlikely to be affected by this in the urban portions of the Study Area but there is increased potential for adverse impacts in the rural portions of the Study Area due to the surrounding land use containing large areas of arable land. These impacts would be managed and mitigated through BPMs outlined and implemented in a CEMP. In addition, there is the potential for discovery and disturbance of pre-existing contamination during construction works is a potential constraint. This would be addressed through Ground Investigation (GI) works prior to construction, alongside associated geotechnical investigations if required.

8.4.2. Operational impacts of the Scheme are unlikely to occur due to the lack of changes to the soil environment, the proposed works are to take place on previously disturbed ground and will not introduce increased traffic levels and the associated pollution risks.

8.5 LANDSCAPE AND VISUAL

8.5.1. The Study Area intersects the South Downs National Park (SDNP), however the Site does not fall within the SDNP and the Scheme will not alter the landscape characterises of the area. The works may require alteration or removal of some roadside trees, some of these being subject to TPOs. The detailed design stage should ensure that tree removal is avoided. Where this is not possible this would cause impacts to the visual amenity of the immediate surroundings of the streets and may result in adverse impacts to retained trees due to the proximity of the construction works. Construction impacts would then need to be managed and mitigated through BPMs implemented through a CEMP.

8.6 NOISE AND VIBRATION

8.6.1. During the construction phase there is the potential for adverse impacts on adjacent and nearby receptors from increased noise and vibration levels. These increases would be associated with construction activities and temporary disruptions to traffic flow to facilitate the completion of the works. It is likely that potential impacts from construction noise and vibration can be managed be standard BPMs implemented through a CEMP. Due to the proximity of sensitive receptors, particularly residential receptors, this would be a priority issue in any CEMP.

8.6.2. The Scheme would improve accessibility to NMU transports methods. There is the potential for positive effects on noise and vibration levels due to any associated reduction in motorised vehicle usage due to this improved accessibility, however these effects are not anticipated to be significant.

8.7 POPULATION AND HEALTH

8.7.1. There is the potential for existing NMU routes, PRoW routes and the existing road network to be adversely affected during the construction phase. These impacts would be temporary but would affect multiple factors such as journey time, NMU and public transport accessibility, journey stress

and community connectivity. Due to the small-scale nature of the works, these are not anticipated to be significant.

8.7.2. The aim of the Scheme is to increase the connectivity of cycle infrastructure and improve pedestrian accessibility as well. Due to this the Scheme is considered to have a positive long-term impact on people and communities.

8.8 ROAD DRAINAGE AND WATER ENVIRONMENT

8.8.1. The Site runs alongside the River Arun, a statutory main river and source of flood risk. Due to this proximity there is the potential for adverse impacts as a result of construction activities in the construction phase. There is the potential for impacts on the river and other water bodies from the release of pollutants from sources such as accidental spillage or run-off from improperly stored materials.

8.8.2. The Scheme is located within Flood Zone 2 and Flood Zone 3 areas, This means the Scheme would be vulnerable, or increase the vulnerability of other receptors, to flood risk. Measures to mitigate flood risk would be required for both the construction phase (through implementation through a CEMP) and the operation phase (through adequate drainage provision).

8.8.3. Due to the nature of the works none of these constraints and effects are anticipated to be significant.

8.9 SUMMARY

8.9.1. Table 8-1 provides a summary of the key constraints and mitigation measures, categorised by environmental topic, discussed within this Chapter. The full Environmental Constraints Report can be found in Appendix D.

Table 8-1 – Summary of Key Constraints

Environmental Topic	Key Constraints	Mitigation
Air Quality	▪ Residential Receptors; ▪ Education Facilities; and ▪ Arundel Park SSSI and Climping Beach SSSI IRZ.	▪ Consultation with the EA over SSSI IRZ; and ▪ BPM inputs into a CEMP.
Biodiversity	▪ A standalone biodiversity report has been prepared. ,	▪ A standalone biodiversity report has been prepared.
Cultural Heritage	▪ Arundel Listed Buildings; and ▪ Tortington Scheduled Monuments.	▪ BPM inputs into a CEMP.
Geology and Soils	▪ Local soilscape.	▪ GI and associated testing; and ▪ BPM inputs into a CEMP.
Landscape and Visual	▪ SDNP; ▪ TPOs; and ▪ Designated Agricultural Land.	▪ BPM inputs into a CEMP; and ▪ Avoidance of tree removal in the detailed design stage.

Noise and Vibration	▪ Residential Receptors; and ▪ Education Facilities.	▪ BPM inputs into a CEMP.
Population and Health	▪ Road and NMU network users; ▪ Residential Receptors; ▪ Education Facilities; ▪ Community and commercial facilities; and ▪ PRoW network and users.	▪ BPM inputs into a CEMP.
Road Drainage and the Water Environment	▪ Surface Water bodies (River Arun); ▪ Flood vulnerable receptors; and ▪ The Scheme.	▪ BPM inputs into a CEMP.

9 ECOLOGY CONSTRAINTS

This section provides a summary of the ecology desktop study completed for the Ford Road corridor. The desk study was undertaken in January 2020 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within various radii around the Indicative Site boundary. A full version of the document is included in Appendix E.

9.1 DESIGNATED SITES

STATUTORY DESIGNATED SITES OF INTERNATIONAL IMPORTANCE

9.1.1. The desk study identified no internationally designated nature conservation site within 5km of the Indicative Site boundary.

STATUTORY DESIGNATED SITES OF NATIONAL IMPORTANCE

9.1.2. Three nationally designated sites are located within 2km Study Area. These sites are described in Table 9-1 below.

Table 1. National statutory designated sites

Table 9-1 – National Statutory Designated Sites

Site Name	Designation	Size (ha)	Distance from Study Area	Description
Arundel Park	SSSI	134.0	0.5km, North	Arundel Park lies within the South Downs National Park and is considered one of the most important sites in the country for invertebrates.
Climping Beach	SSSI	65.0	1.2km, South	Climping Beach is a stretch of coast with a vegetated shingle beach, behind which is a sand dune system. The intertidal zone supports important populations of wintering birds and the numbers of wintering sanderling
West Beach	LNR	15.0	1.8km, South	West Beach is one of only a few undeveloped stretches of coastline between Brighton and Bognor Regis and attracts many visitors from outside the County. The dunes are part of one of only two sand dune systems in West Sussex.

NON-STATUTORY DESIGNATED SITES

9.1.3. Three non-statutory nature conservation sites (Local Wildlife Sites (LWS)) are present within the 1km Study Area and detailed in below Table 2.

Table 9-2 – Non-Statutory Designated Sites

Site Name	Designation	Size (ha)	Distance from Study Area	Description
Rewell Wood Complex	LWS	678.0	0km, West	Rewell Wood is a large ancient woodland complex. It has a diversity of habitats, including ancient semi-natural woodland. Wide rides and glades support a rich flora and butterfly fauna.
Binstead Wood Complex	LWS	217.0	0.5km, West	Binstead Wood is a complex of woodland sites, which includes Hundred House Copse in the west and Stewards Copse to the east. There is a mixture of ancient woodland, recent woodland, conifer plantation, species-rich pasture and old tracks and shaws. The mix of habitats and geology gives rise to a very rich and diverse flora.
Arun Valley, Watersfield to Arundel	LWS	782.0	1.0km, East	This section of the River Arun and its floodplain forms an extensive tract of wetland, a nationally declining habit. Although many of the flood meadows have been improved, the wet grassland is important for breeding and wintering waders and wildfowl. The unimproved meadows of Watersfield Brooks are of great botanical interest.

9.2 HABITATS

OTHER HABITATS OF CONSERVATION IMPORTANCE

9.2.1. Within the 500m Study Area the closest patch of ancient woodland mapped is 170m north of the Indicative Site. HPIs including areas of deciduous woodland, several patches of coastal & floodplain grazing marsh, coastal saltmarsh and traditional orchard were also found within the Study Area.

9.2.2. The desk study returned five designated road verges1 (DRV). DRVs are areas of roadside verge that have been designated for their special wildlife interest. They can hold spectacular displays of wild flowers, including rare orchids and other plant species indicative of old meadows, and can be of great importance to invertebrates and fungi.

9.3 PROTECTED/NOTABLE SPECIES

A summary of the desk study results returned for protected and notable species is provided below. Focus has been given to species which may utilise the Indicative Site and its surrounding area.

- Bats: 14 species were returned from the desk study;

[1] 'Designated Wildlife Verge' is a local non-statutory designation which identifies highway verges in East Sussex that have wildlife habitat significance.

- Badgers: No records of badger were returned from the desk study, as such information is confidential and must be requested;
- Hazel Dormouse: 13 records were returned from the desk study;
- Water Vole and Otter: No record of otter, while 31 records of water vole were returned;
- Other Mammals: Records included West European hedgehog and European rabbit ;
- Birds: Records of 98 bird species were returned by the desk study;
- Reptiles: The desk study returned three species of reptile;
- Amphibians: Four specifies were returned from the desk study;
- Invertebrates: 101 records of invertebrate species were returned from the desk study;
- Plants: Forty protected and/or notable plant species were returned in the desk study;
- Invasive Non-Native Species: The desk study returned records for Japanese knotweed and variegated yellow archangel within 500m of the Indicative Site.

9.4 RECOMMENDATIONS

Further survey, avoidance and mitigation recommendations have been outlined below to ensure the potential effects of the Proposed Development on biodiversity is avoided and minimised and to enable compliance with legislation and planning policy where appropriate. Recommendations for ecological enhancement have also been made.

10 ROAD SAFETY REVIEW

10.1.1. This section provides a summary of the road safety review of the proposed scheme infrastructure improvements has been undertaken for the identified preferred route as outlined in Section 6. The review has been based upon the proposed scheme drawings and a desktop review using Google Earth imagery. The road safety review does not constitute a full Road Safety Audit but the review has been based upon Highways England Road Safety Audit guidance to ascertain if the proposals include any inherent design risks that need to be addressed at this stage. The full Road Safety Review report is included in Appendix F.

10.2 SUMMARY OF ROAD SAFETY REVIEW

10.2.1. The following general issues have been identified as part of the road safety review:

- Bus Stops: Further information is required as to how conflicts are mitigated between cyclists and people waiting at bus stops or boarding /alighting from buses.
- Vegetation and trees: Existing vegetation will need to be trimmed or removed in various locations along the route to remove restrictions to visibility between users.
- Vehicle and farm accesses: Further consideration is required of all vehicle and farm and how these interact with the proposals.
- Side road crossings: Further consideration is required of all vehicle and farm and how these interact with the proposals to ensure that there is a consistent approach across the scheme.
- Level differences between carriageway and footway: Increased height and gradience difference between carriageway and footway may unnerve cyclists.
- Proposed verge segregating carriageway and shared route: the proposed segregation will take some time to mature, leaving cyclists unnerved by passing vehicles.
- Carriageway widths: Reduced carriageway widths may lead to side swipes by larger vehicles.

10.2.2. In addition to the general issues, the following location specific concerns have been identified:

- South of Footpath 207: Further detail needed on how the shared-use path will pass over the existing culvert and how to carriageway narrowing will be achieved
- Ford Level Crossing: Further detail needed of how the shared-use path will switch between eastern and western sides of the carriageway.
- Bridge to South of Ship and Anchor access road: Further detail needed on how shared-use path width will be maintained over bridge.
- Opposite Nelson Row access: Further information needed on how the existing pedestrian desire line will be maintained.
- HMP Ford: Further information needed on how guard-railing, signalised crossing and adjacent buildings will be impacted.
- Southern extent of proposed route: Alternative proposal is required should the South of Climping scheme not come forward.

10.2.3. Each of these issue have been reviewed and are considered to require only minor design alternation or submission of further information rather than fundamental changes to the proposed scheme. As such each of these items should be included on the design risk register and considered individually during the detailed design stage of the project.

11 SCHEME APPRAISAL REPORT

11.1.1. A Scheme Appraisal Report (SAR) has been carried out to determine the economic benefits of the proposed scheme

11.1.2. SAR is a Highways England, Excel based tool, which records the results of a Department for Transport (DfT) WebTAG based appraisal of a small highway improvement scheme. It allows the study to take quantified impacts, e.g. journey time savings, accident savings and then monetise them in accordance with WebTAG methodology.

11.1.3. The highest indicative benefits are predicted to come from increased physical activity, a reduction in road traffic collsions and improved journey quality.

11.1.4. The scheme has been costed at £3,840,000 based on estimates undertaken in Q1 2020. This price inclusive of the following assumptions:

- Work by statutory undertakers and others at 20% of the basic construction cost;
- Professional fees at 20% of the basic construction cost; and
- Risk / optimism bias at 45% of basis construction cost.

11.1.5. Exclusions to the cost estimate include VAT, legal issues land-take and future inflation beyond Q1 2020.

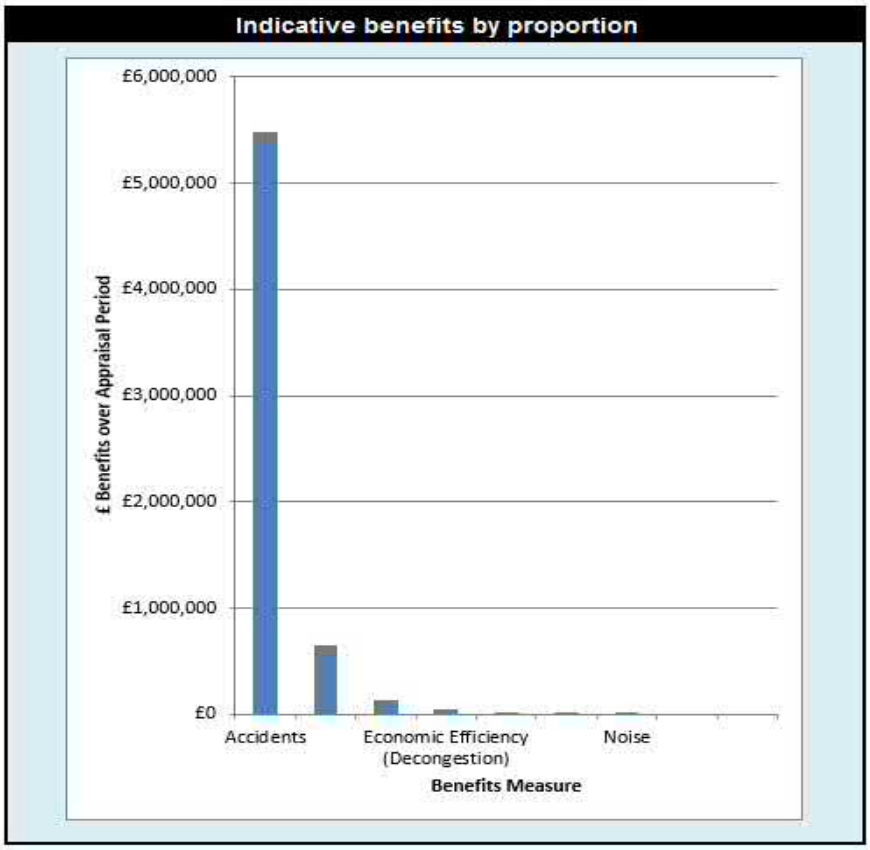
11.1.6. Using the SAR, the overall impacts of the scheme produce a Net Present Value (NPV) of £2,330,723 with a positive Benefit to Cost Ratio (BCR) of 1.6. The SAR Analysis of Monetised Costs and Benefits (AMCB) is shown in Figure 11-1. A full breakdown of the SAR is included in Appendix G.

11.1.7. According to the WebTAG Value for Money Framework guidance (DfT, 2015) this is categorised as a medium value for money proposal, where low includes a BCR of between 1.5 and 2.0.

Figure 11-1 - SAR Summary

AMCB		
Noise	£	440
Local Air Quality	£	-
Greenhouse Gases	£	3,183
Journey Quality	£	655,100
Physical Activity	£	135,605
Absenteeism	£	13,353
Accidents	£	5,485,865
Economic Efficiency (Decongestion)	£	42,333
Wider Public Finances (Indirect Tax Revenues)	-£	14,102
Present Value of Benefits (PVB)	**£**	**6,321,777**
Broad Transport Budget		
Present Value of Costs (PVC)	**£**	**3,991,055**
OVERALL IMPACTS		
Net Present Value (NPV)	**£**	**2,330,723**
Benefit to Cost Ratio (BCR)		**1.6**

PA Table				
Funding	Walk / Cycle		Road	
Revenue				
Operating costs	£	220,278	-£	511
Investment costs	£	3,771,287		
Developer and other contributions				
Grant / Subsidy payments				
Indirect tax revenues			£	14,102
Broad Transport Budget	£			3,991,055
Wider Public Finances	£			14,102



12 CONCLUSIONS AND RECOMMENDATIONS

12.1 SUMMARY

12.1.1. This report has provided a feasibility study of implementing improved pedestrian and cycle facilities on the Ford Road corridor between Arundel and Ford. The proposals have been based upon the objective of facilitating trips to Ford railway station and Arundel town centre by active modes. This route is considered as a high priority corridor for West Sussex County Council and was identified for feasibility study through stakeholder consultation and the MCAF process completed in late 2019.

12.1.2. A review of existing conditions along the Ford Road corridor were assessed including pedestrian and cycle facilities, local facilities, the nearby PRoW network, accident data, traffic flows and NMU data. A preliminary ecological and environmental assessment has also been undertaken to identify significant constraints to development of the proposals.

12.1.3. At present there is lack of dedicated pedestrian and cycle facilities along the Ford Road corridor to link users to connect Arundel and Ford. collsion data has shown there to be a small number of incidents involving NMUs, mainly at junctions at either end of the Ford Road corridor, but the low levels of existing use along the corridor itself shown on the NMU surveys.

12.1.4. Following on from the of the exiting conditions, an optioneering exercise was completed to assess the options available to improve pedestrian and cycle infrastructure along the corridor. Each of these options were rated against the scheme objectives, existing conditions and design guidance with a preferred option being taken forward for stakeholder consultation.

12.1.5. The preferred option proposes a mainly off-carriageway shared-use path, which will run between the southern edge of Arundel (south of the A27) and the A259. Within Arundel itself the proposals incorporate traffic calming measures to facilitate cycle use on-carriageway. The proposals have been discussed with relevant stakeholders, with comments incorporated into the final preliminary designs. This proposal is considered to provide the most appropriate walking and cycling infrastructure for the corridor, taking into account existing traffic flows and future increases related to permitted development at Climping and the Ford Strategic Allocation included within the Arun Local Plan.

12.1.6. The final scheme proposal was then subject to a road safety review, which did not highlight any fundamental concerns with the proposals and only issues that can be mitigated as part of the detailed design process.

12.2 CONCLUSION

12.2.1. Following on from the completion of preliminary designs, these were subject to a costing exercise and assessed through a SAR. The report found that the proposals produce a BCR of 1.6, which is categorised as representing medium value for money in WebTAG guidance. AS a result, it is recommended that the scheme is taken forward for detailed design as part of the next stage of Designated Fund projects.

12.3 NEXT STEPS

12.3.1. Once this report has been published the proposals will be subject to a technical review by Highways England. Following on from this review, the decision to apply for Designated Funds for the next

stage of work will be made by Highways England. Should detailed design commence, there will be further consultation with key stakeholders and user groups.

Appendix A

CYCLING LEVEL OF SERVICE ASSESSMENT

Cycling Level of Service assessment matrix

**For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)*

Factor	Indicator	Critical * (fail)	Basic CLoS (score=0)	Good CLoS (score=1)	Highest CLoS (score=2)	Desktop Score		Site Visit Score	Comments	Option A	Option B	Option C
Safety	**(max possible = 48)**											
Collision risk	Left/right hook at junctions	Heavy streams of turning traffic cut across main cycling stream	Side road junctions frequent and/or untreated. Conflicting movements at major junctions not separated	Fewer side road junctions. Use of entry treatments. Conflicting movements on cycle routes are separated at major junctions	Side roads closed or footway is continuous. All conflicting streams separated at major junctions	3	x3	0	Some junctions with poor visibility Ford Lane junction very wide, crossings for pedestrians on footway / cycles on main road leave them vulnerable.	6	3	6
	Collision alongside or from behind	Nearside lane in range 3.2m to 4.0m	Cyclists in wide (4m+) nearside traffic lanes or cycle lanes less than 2m wide	Cyclists in dedicated cycle lanes at least 2m wide	Cyclists separated from motorised traffic	Fail	x3	Fail	No cycle provision on road, width of road varies but is narrow in some sections.	6	3	6
	Kerbside activity or risk of collision with door	Cycle lanes <1.5m alongside parking / loading with no buffer	Frequent kerbside activity / effective width for cyclists of 1.5m	Less frequent kerbside activity / effective width for cyclists of 2m	No kerbside activity / No interaction with vehicles parking or loading	Fail	x3	0	No cyclist provision on road	6	3	6
	Other vehicle fails to give way or disobeys signals		Poor visibility, no route continuity across junctions and unclear priority	Clear route continuity through junctions, good visibility, priority clear for all users, visual priority for cyclists across side roads	Cycle priority at signalised junctions; visual priority for cyclists across side roads	1		1	Low number of junctions, relatively quiet area. Regular HGV activity on side roads.	2	1	2
Feeling of safety	Separation from heavy traffic		Cyclists in general traffic lanes or cycle lanes less than 2m	Cycle lanes at least 2m wide	Cyclists physically separated from other traffic at junctions and on links, or no heavy freight	0		0	Cyclists in general lanes with traffic.	2	1	2
	Speed of traffic (where cyclists are not separated)	85th percentile greater than 30mph	85th percentile greater than 25mph	85th percentile 20-25mph	85th percentile less than 20mph	Fail	x3	Fail	85th percentile is greater than 50mph	n/a	0	n/a
	Total volume of traffic (where cyclists are not separated)	>1,000 vehicles/ hour at peak	500 - 1,000 vehicles / hour at peak (but becomes 'critical' if 5 per cent or more are HGVs)	200 - 500 vehicles / hour at peak (but becomes 'basic' if 2 per cent or more are HGVs)	<200 vehicles / hour at peak	0	x3	0	between 500-600 per hour during peaks	n/a	1	n/a
	Interaction with HGVs	Frequent, close interaction	Frequent interaction	Occasional interaction	No interaction	3	x3	0	site visit showed lots of local HGV activity several industrial estates along road.	3	0	6
Social safety	Risk/fear of crime		High risk: 'ambush spots', loitering, poor maintenance	Low risk: area is open, well designed and maintained	No fear of crime: high quality streetscene and pleasant interaction	0		0	Isolated area, few houses, little to no natural surveillance and high vegetation.	0	0	0
	Lighting		Long stretches of darkness	Short stretches of darkness	Route lit thoroughly	0		0	No street lights in section	0	0	0
	Isolation		Route passes far from other activity, for most of the day	Route close to activity, for all of the day	Route always overlooked	1		1	Route goes near prison (Cat D) and small residential area. Some areas not overlooked	1	1	0
	Impact of highway design on behaviour		Layout encourages aggressive behaviour	Layout controls behaviour throughout	Layout encourages civilised behaviour: negotiation and forgiveness	0		0		2	1	1
						8		2				

Directness	**(max possible = 8)**											
Journey time	Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle ahead (including other cyclists)	Cyclists can usually pass other vehicles (including cyclists)	Cyclists can always pass other vehicles	0		1	Little room for overtaking if cars occupy both directions	2	1	1
	Delay to cyclists at junctions		Journey time longer than motor vehicles	Journey time around the same as motor vehicles	Journey time less than motor vehicles	0		0		1	1	0
Value of time	For cyclists compared to private car use (normal weather conditions)		VOT greater than private car use value due to some site- specific factors	VOT equivalent to private car use value: similar delay-inducing factors and convenience	VOT less than private car use value due to attractive nature of route	1		1		1	1	0
Directness	Deviation of route (against straight line or nearest main road alternative)		Deviation factor greater than 40 per cent	Deviation factor 20-40 per cent	Deviation factor less than 20 per cent	2		2	Direct route	2	2	0
						3		4				
Coherence	**(max possible = 4)**											
Connections	Ability to join/leave route safely and easily		Cyclists cannot connect to other routes without dismounting	Cyclists share connections with motor traffic	Cyclists have dedicated connections to other routes	1		1		1	1	1
	Density of other routes		Network density mesh width >400m	Network density mesh width 250-400m	Network density mesh width <250m	n/a		n/a	N/A Beyond Scope of Works	n/a	n/a	n/a
Way-finding	Signing		Basic direction signing (cyclists follow road signs and markings)	Some cycle-specific direction signing	Consistent signing of range of routes and destinations at decision points	0		1	Several signposts detailing directions of South Coast Cycle Routes	1	1	1
						1		2				
Comfort	**(max possible = 20)**											
Surface quality	Defects: non cycle friendly ironworks, raised/ sunken covers/gullies	Major defects	Many minor defects	Few minor defects	Smooth, high-grip surface	3	x3	3	Overly good quality road with some surface wear and potholes. Frequently covered by mud and other vegetation presenting slipping hazard for cycles. Level crossing uncomfortable for cyclists.	6	3	6
Surface material	Construction		Hand-laid asphalt or unstable blocks/sets	Machine laid asphalt concrete or HRA; smooth blocks	Machine laid asphalt concrete; smooth and firm blocks undisturbed by turning vehicles	1		1		2	2	2
Effective width without conflict	Clear nearside space in secondary position or motor vehicle speed/ volume in primary position	Secondary: <1.5m Primary: high motor vehicle flow	Secondary: 1.5m Primary: medium motor vehicle flow	Secondary: 1.5-2.0m Primary: low motor vehicle flow	Secondary: >2.0m Primary: no overtaking by motor vehicles	3	x3	3		3	3	6
Gradient	Uphill gradient over 100m		>5 per cent	3-5 per cent	<3 per cent	2		1	Some small stretches of road with increased gradient.	1	1	1
Deflections	Pinch points caused by horizontal deflections		(Remaining) lane width <3.2m	(Remaining) lane width >4.0m or <3.0m (low motor vehicle flow)	Traffic is calmed so no need for horizontal deflections	1		1		2	1	1
Undulations	Vertical deflections		Round top humps	Sinusoidal humps	No vertical deflections	2		2		2	2	2
						12		11				
Attractiveness	**(max possible = 10)**											
Impact on walking	Pedestrian Comfort Level (PCL)		Reduction in PCL to C, D or E	No impact on pedestrian provision or PCL never lower than B	Pedestrian provision enhanced by cycling provision or PCL A	1		1		2	1	2
Greening	Green infrastructure or sustainable materials incorporated into design		No greening element	Some greening elements	Full integration of greening elements	1		1		1	1	2
Air quality	PM10 & NOX values referenced from concentration maps		Medium to High	Low to Medium	Low	2		2		2	2	2
Noise pollution	Noise level from recommended riding range		>78DB	65-78DB	<65DB	2		1		2	2	2
Minimise street clutter	Signing required to support scheme layout		Large amounts of regulatory signing to conform with complex layout	Moderate amount of signing, particularly around junctions	Minimal signing, eg for wayfinding purposes only	2		2		2	1	1
Secure cycle parking	Ease of access to secure cycle parking on- and off-street		No additional secure cycle parking	Minimum levels of cycle parking provided (ie to London Plan standards)	Cycle parking is provided to meet future demand and is of good quality and securely located	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
						8		7				
Adaptability	**(max possible = 4)**											

Public transport integration	Smooth transition between modes or route continuity maintained through interchanges		No consideration for cyclists within interchange area	Cycle route continuity maintained through interchange and some cycle parking available	Cycle route continuity maintained and secure cycle parking provided. Transport of cycles available.	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
Flexibility	Facility can be expanded or layouts adopted within area constraints		No adjustments are possible within constraints. Road works may require some closure	Links can be adjusted to meet demand but junctions are constrained by vehicle capacity limitations. Road works will not require closure; cycling will be maintained although route quality may be compromised to some extent	Layout can be adapted freely without constrain to meet demand or collision risk. Adjustments can be made to maintain full route quality when roadworks are present	0		0		2	1	1
Growth enabled	Route matches predicted usage and has exceedence built into the design		Provision does not match current levels of demand	Provision is matched to predicted demand flows	Provision has spare capacity for large increases in predicted cycle use	1		1		2	1	1
						1		1				
TOTAL (max 100)						**33**		**27**	Option CLoS Score / 82 (Minus n/a criteria)	79%	45%	74%

For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)

(Max 94, Minus n/a criteria)

Cycling Level of Service assessment matrix

**For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)*

Factor	Indicator	Critical * (fail)	Basic CLoS (score=0)	Good CLoS (score=1)	Highest CLoS (score=2)	Desktop Score		Site Visit Score	Comments	Option A	Option B	Option C
Safety	**(max possible = 48)**											
Collision risk	Left/right hook at junctions	Heavy streams of turning traffic cut across main cycling stream	Side road junctions frequent and/or untreated. Conflicting movements at major junctions not separated	Fewer side road junctions. Use of entry treatments. Conflicting movements on cycle routes are separated at major junctions	Side roads closed or footway is continuous. All conflicting streams separated at major junctions	6	x3	3	Several junctions to private areas with poor visibility	6	3	6
	Collision alongside or from behind	Nearside lane in range 3.2m to 4.0m	Cyclists in wide (4m+) nearside traffic lanes or cycle lanes less than 2m wide	Cyclists in dedicated cycle lanes at least 2m wide	Cyclists separated from motorised traffic	fail	x3	Fail	Country Lane with no cyclist provision	6	3	6
	Kerbside activity or risk of collision with door	Cycle lanes <1.5m alongside parking / loading with no buffer	Frequent kerbside activity / effective width for cyclists of 1.5m	Less frequent kerbside activity / effective width for cyclists of 2m	No kerbside activity / No interaction with vehicles parking or loading	fail	x3	3	Country Lane with no cyclist provision	6	3	6
	Other vehicle fails to give way or disobeys signals		Poor visibility, no route continuity across junctions and unclear priority	Clear route continuity through junctions, good visibility, priority clear for all users, visual priority for cyclists across side roads	Cycle priority at signalised junctions; visual priority for cyclists across side roads	1		0	Several junctions to private areas with poor visibility	2	2	2
Feeling of safety	Separation from heavy traffic		Cyclists in general traffic lanes or cycle lanes less than 2m	Cycle lanes at least 2m wide	Cyclists physically separated from other traffic at junctions and on links, or no heavy freight	0		0	No separation. Road enclosed by hedgerows and no natural surveillance.	2	0	2
	Speed of traffic (where cyclists are not separated)	85th percentile greater than 30mph	85th percentile greater than 25mph	85th percentile 20-25mph	85th percentile less than 20mph	fail	x3	fail	85th percentile over 50mph	n/a	0	n/a
	Total volume of traffic (where cyclists are not separated)	>1,000 vehicles/ hour at peak	500 - 1,000 vehicles / hour at peak (but becomes 'critical' if 5 per cent or more are HGVs)	200 - 500 vehicles / hour at peak (but becomes 'basic' if 2 per cent or more are HGVs)	<200 vehicles / hour at peak	0	x3	0		n/a	0	n/a
	Interaction with HGVs	Frequent, close interaction	Frequent interaction	Occasional interaction	No interaction	3	x3	3		6	1	6
Social safety	Risk/fear of crime		High risk: 'ambush spots', loitering, poor maintenance	Low risk: area is open, well designed and maintained	No fear of crime: high quality streetscene and pleasant interaction	1		1	Rural area with little activity, quiet so unlikely to be targetted	1	1	0
	Lighting		Long stretches of darkness	Short stretches of darkness	Route lit thoroughly	0		0	No Streetlights along entire section	0	0	0
	Isolation		Route passes far from other activity, for most of the day	Route close to activity, for all of the day	Route always overlooked	0		0	No natural surveillence - hedgerows	0	0	0
	Impact of highway design on behaviour		Layout encourages aggressive behaviour	Layout controls behaviour throughout	Layout encourages civilised behaviour: negotiation and forgiveness	1		1	Direct route	2	2	1
						12		11				

Directness	**(max possible = 8)**											
Journey time	Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle ahead (including other cyclists)	Cyclists can usually pass other vehicles (including cyclists)	Cyclists can always pass other vehicles	1		1	Quiet road but not wide enough to overtake with 2 cars occupying width	2	2	1
	Delay to cyclists at junctions		Journey time longer than motor vehicles	Journey time around the same as motor vehicles	Journey time less than motor vehicles	1		0	Follows same direct route as traffic	1	1	0
Value of time	For cyclists compared to private car use (normal weather conditions)		VOT greater than private car use value due to some site- specific factors	VOT equivalent to private car use value: similar delay-inducing factors and convenience	VOT less than private car use value due to attractive nature of route	1		1		1	1	0
Directness	Deviation of route (against straight line or nearest main road alternative)		Deviation factor greater than 40 per cent	Deviation factor 20-40 per cent	Deviation factor less than 20 per cent	2		2	Direct Route	2	2	0
						5		4				
Coherence	**(max possible = 4)**											
Connections	Ability to join/leave route safely and easily		Cyclists cannot connect to other routes without dismounting	Cyclists share connections with motor traffic	Cyclists have dedicated connections to other routes	0		1		2	1	1
	Density of other routes		Network density mesh width >400m	Network density mesh width 250-400m	Network density mesh width <250m	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
Way-finding	Signing		Basic direction signing (cyclists follow road signs and markings)	Some cycle-specific direction signing	Consistent signing of range of routes and destinations at decision points	0		1	Notably very little way finding going South.	1	1	1
						0		2				
Comfort	**(max possible = 20)**											
Surface quality	Defects: non cycle friendly ironworks, raised/ sunken covers/gullies	Major defects	Many minor defects	Few minor defects	Smooth, high-grip surface	3	x3	3	Overly good quality road with some surface wear and potholes. Frequently covered by mud and other vegetation presenting slipping hazard for cycles.	6	6	6
Surface material	Construction		Hand-laid asphalt or unstable blocks/sets	Machine laid asphalt concrete or HRA; smooth blocks	Machine laid asphalt concrete; smooth and firm blocks undisturbed by turning vehicles	1		1		2	1	2
Effective width without conflict	Clear nearside space in secondary position or motor vehicle speed/ volume in primary position	Secondary: <1.5m Primary: high motor vehicle flow	Secondary: 1.5m Primary: medium motor vehicle flow	Secondary: 1.5-2.0m Primary: low motor vehicle flow	Secondary: >2.0m Primary: no overtaking by motor vehicles	3	x3	3		6	3	6
Gradient	Uphill gradient over 100m		>5 per cent	3-5 per cent	<3 per cent	2		1	Some small areas of increased gradient, otherwise generally flat. Brow of hill creates reduced visibility.	1	1	1
Deflections	Pinch points caused by horizontal deflections		(Remaining) lane width <3.2m	(Remaining) lane width >4.0m or <3.0m (low motor vehicle flow)	Traffic is calmed so no need for horizontal deflections	2		1	Traffic data shows a number of motors speeding.	2	2	1
Undulations	Vertical deflections		Round top humps	Sinusoidal humps	No vertical deflections	2		2		2	2	2
						13		11				
Attractiveness	**(max possible = 10)**											
Impact on walking	Pedestrian Comfort Level (PCL)		Reduction in PCL to C, D or E	No impact on pedestrian provision or PCL never lower than B	Pedestrian provision enhanced by cycling provision or PCL A	0		1		2	1	2
Greening	Green infrastructure or sustainable materials incorporated into design		No greening element	Some greening elements	Full integration of greening elements	0		0		1	1	2
Air quality	PM10 & NOX values referenced from concentration maps		Medium to High	Low to Medium	Low	2		2		2	2	2
Noise pollution	Noise level from recommended riding range		>78DB	65-78DB	<65DB	2		2		2	2	2
Minimise street clutter	Signing required to support scheme layout		Large amounts of regulatory signing to conform with complex layout	Moderate amount of signing, particularly around junctions	Minimal signing, eg for wayfinding purposes only	1		1		1	1	1
Secure cycle parking	Ease of access to secure cycle parking on- and off-street		No additional secure cycle parking	Minimum levels of cycle parking provided (ie to London Plan standards)	Cycle parking is provided to meet future demand and is of good quality and securely located	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
						5		6				
Adaptability	**(max possible = 4)**											

Public transport integration	Smooth transition between modes or route continuity maintained through interchanges		No consideration for cyclists within interchange area	Cycle route continuity maintained through interchange and some cycle parking available	Cycle route continuity maintained and secure cycle parking provided. Transport of cycles available.	0		0	n/a beyond scope of works	n/a	n/a	n/a
Flexibility	Facility can be expanded or layouts adopted within area constraints		No adjustments are possible within constraints. Road works may require some closure	Links can be adjusted to meet demand but junctions are constrained by vehicle capacity limitations. Road works will not require closure; cycling will be maintained although route quality may be compromised to some extent	Layout can be adapted freely without constrain to meet demand or collision risk. Adjustments can be made to maintain full route quality when roadworks are present	0		0		2	1	1
Growth enabled	Route matches predicted usage and has exceedence built into the design		Provision does not match current levels of demand	Provision is matched to predicted demand flows	Provision has spare capacity for large increases in predicted cycle use	1		1		2	1	1
						1		1				
TOTAL (max 100)						**36**		**35**	Option CLoS Score / 82 (Minus n/a criteria)	87%	49%	74%

For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)

(Max 94, Minus n/a criteria)

Cycling Level of Service assessment matrix

**For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)*

Factor	Indicator	Critical * (fail)	Basic CLoS (score=0)	Good CLoS (score=1)	Highest CLoS (score=2)	Desktop Score		Site Visit Score	Comments	Option A	Option B	Option C
Safety	**(max possible = 48)**											
Collision risk	Left/right hook at junctions	Heavy streams of turning traffic cut across main cycling stream	Side road junctions frequent and/or untreated. Conflicting movements at major junctions not separated	Fewer side road junctions. Use of entry treatments. Conflicting movements on cycle routes are separated at major junctions	Side roads closed or footway is continuous. All conflicting streams separated at major junctions	3	x3	3	Some junctions with poor visibility	6	6	6
	Collision alongside or from behind	Nearside lane in range 3.2m to 4.0m	Cyclists in wide (4m+) nearside traffic lanes or cycle lanes less than 2m wide	Cyclists in dedicated cycle lanes at least 2m wide	Cyclists separated from motorised traffic	fail	x3	fail		6	3	6
	Kerbside activity or risk of collision with door	Cycle lanes <1.5m alongside parking / loading with no buffer	Frequent kerbside activity / effective width for cyclists of 1.5m	Less frequent kerbside activity / effective width for cyclists of 2m	No kerbside activity / No interaction with vehicles parking or loading	fail	x3	fail	On street/kerb car parking increasing risk of doors	6	3	6
	Other vehicle fails to give way or disobeys signals		Poor visibility, no route continuity across junctions and unclear priority	Clear route continuity through junctions, good visibility, priority clear for all users, visual priority for cyclists across side roads	Cycle priority at signalised junctions; visual priority for cyclists across side roads	0		1		2	2	2
Feeling of safety	Separation from heavy traffic		Cyclists in general traffic lanes or cycle lanes less than 2m	Cycle lanes at least 2m wide	Cyclists physically separated from other traffic at junctions and on links, or no heavy freight	0		0		2	1	2
	Speed of traffic (where cyclists are not separated)	85th percentile greater than 30mph	85th percentile greater than 25mph	85th percentile 20-25mph	85th percentile less than 20mph	3	x3	3	85th percentile is around 25mph - residential area where locals support low speed. Traffic calming measure at beginning of road.	n/a	1	n/a
	Total volume of traffic (where cyclists are not separated)	>1,000 vehicles/ hour at peak	500 - 1,000 vehicles / hour at peak (but becomes 'critical' if 5 per cent or more are HGVs)	200 - 500 vehicles / hour at peak (but becomes 'basic' if 2 per cent or more are HGVs)	<200 vehicles / hour at peak	0	x3	0		n/a	1	n/a
	Interaction with HGVs	Frequent, close interaction	Frequent interaction	Occasional interaction	No interaction	3	x3	3	Notably lower HGV use than further south on the road.	6	1	6
Social safety	Risk/fear of crime		High risk: 'ambush spots', loitering, poor maintenance	Low risk: area is open, well designed and maintained	No fear of crime: high quality streetscene and pleasant interaction	1		2	Pleasant residential area with low rates of crime	1	2	0
	Lighting		Long stretches of darkness	Short stretches of darkness	Route lit thoroughly	2		2		1	2	0
	Isolation		Route passes far from other activity, for most of the day	Route close to activity, for all of the day	Route always overlooked	2		2		1	2	0
	Impact of highway design on behaviour		Layout encourages aggressive behaviour	Layout controls behaviour throughout	Layout encourages civilised behaviour: negotiation and forgiveness	0		1	May encourage aggressive driving due to on-road parking and right of way confusion.	2	1	1
						14		17				

Directness	**(max possible = 8)**												
Journey time	Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle ahead (including other cyclists)	Cyclists can usually pass other vehicles (including cyclists)	Cyclists can always pass other vehicles	0		0	Less usable road width due to on street parking. Pavement furniture also reduces pavement width.	2	1	1
	Delay to cyclists at junctions		Journey time longer than motor vehicles	Journey time around the same as motor vehicles	Journey time less than motor vehicles	1		1		1	1	0
Value of time	For cyclists compared to private car use (normal weather conditions)		VOT greater than private car use value due to some site- specific factors	VOT equivalent to private car use value: similar delay-inducing factors and convenience	VOT less than private car use value due to attractive nature of route	1		1		2	1	0
Directness	Deviation of route (against straight line or nearest main road alternative)		Deviation factor greater than 40 per cent	Deviation factor 20-40 per cent	Deviation factor less than 20 per cent	2		2		2	2	0
						4		4				
Coherence	**(max possible = 4)**											
Connections	Ability to join/leave route safely and easily		Cyclists cannot connect to other routes without dismounting	Cyclists share connections with motor traffic	Cyclists have dedicated connections to other routes	1		1		2	1	1
	Density of other routes		Network density mesh width >400m	Network density mesh width 250-400m	Network density mesh width <250m	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
Way-finding	Signing		Basic direction signing (cyclists follow road signs and markings)	Some cycle-specific direction signing	Consistent signing of range of routes and destinations at decision points	0		1		1	1	1
						1	0	2				
Comfort	**(max possible = 20)**											
Surface quality	Defects: non cycle friendly ironworks, raised/ sunken covers/gullies	Major defects	Many minor defects	Few minor defects	Smooth, high-grip surface	3	x3	3	Some potholes but overly good quality road.	6	6	6
Surface material	Construction		Hand-laid asphalt or unstable blocks/sets	Machine laid asphalt concrete or HRA; smooth blocks	Machine laid asphalt concrete; smooth and firm blocks undisturbed by turning vehicles	1		2		1	2	2
Effective width without conflict	Clear nearside space in secondary position or motor vehicle speed/ volume in primary position	Secondary: <1.5m Primary: high motor vehicle flow	Secondary: 1.5m Primary: medium motor vehicle flow	Secondary: 1.5-2.0m Primary: low motor vehicle flow	Secondary: >2.0m Primary: no overtaking by motor vehicles		x3	3		6	3	6
Gradient	Uphill gradient over 100m		>5 per cent	3-5 per cent	<3 per cent	2		2	No gradient in this area	2	2	1
Deflections	Pinch points caused by horizontal deflections		(Remaining) lane width <3.2m	(Remaining) lane width >4.0m or <3.0m (low motor vehicle flow)	Traffic is calmed so no need for horizontal deflections	1		1	Some pinch points created by parked cars and beginning / end of pedestrian footways.	2	2	1
Undulations	Vertical deflections		Round top humps	Sinusoidal humps	No vertical deflections	2		2		2	2	2
						9	0	13				
Attractiveness	**(max possible = 10)**											
Impact on walking	Pedestrian Comfort Level (PCL)		Reduction in PCL to C, D or E	No impact on pedestrian provision or PCL never lower than B	Pedestrian provision enhanced by cycling provision or PCL A	1		1		2	1	2
Greening	Green infrastructure or sustainable materials incorporated into design		No greening element	Some greening elements	Full integration of greening elements	0		0		2	1	2
Air quality	PM10 & NOX values referenced from concentration maps		Medium to High	Low to Medium	Low	2		2		2	2	2
Noise pollution	Noise level from recommended riding range		>78DB	65-78DB	<65DB	2		2		2	2	2
Minimise street clutter	Signing required to support scheme layout		Large amounts of regulatory signing to conform with complex layout	Moderate amount of signing, particularly around junctions	Minimal signing, eg for wayfinding purposes only	1		1	Busy environment furniture-wise. Refuse bins and bags, bollards and cars obstruct footways and roads.	1	1	1
Secure cycle parking	Ease of access to secure cycle parking on- and off-street		No additional secure cycle parking	Minimum levels of cycle parking provided (ie to London Plan standards)	Cycle parking is provided to meet future demand and is of good quality and securely located	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
						6		6				
Adaptability	**(max possible = 4)**											

Public transport integration	Smooth transition between modes or route continuity maintained through interchanges		No consideration for cyclists within interchange area	Cycle route continuity maintained through interchange and some cycle parking available	Cycle route continuity maintained and secure cycle parking provided. Transport of cycles available.	n/a		n/a	n/a beyond scope of works	n/a	n/a	n/a
Flexibility	Facility can be expanded or layouts adopted within area constraints		No adjustments are possible within constraints. Road works may require some closure	Links can be adjusted to meet demand but junctions are constrained by vehicle capacity limitations. Road works will not require closure; cycling will be maintained although route quality may be compromised to some extent	Layout can be adapted freely without constrain to meet demand or collision risk. Adjustments can be made to maintain full route quality when roadworks are present	0		0		2	1	1
Growth enabled	Route matches predicted usage and has exceedence built into the design		Provision does not match current levels of demand	Provision is matched to predicted demand flows	Provision has spare capacity for large increases in predicted cycle use	1		1		2	1	1
						1		1				
TOTAL (max 100)						**35**		**43**	Option CLoS Score / 82 (Minus n/a criteria)	91%	62%	74%

For highlighted critical indicators, score is multiplied by 3 (basic = 0, good = 3, highest = 6)

(Max 94, Minus n/a criteria)

Appendix B

ACCIDENT DATA

Ford to Arundel – WSP –

Collision report 01/01/2014 – 31/10/2019

Date produced
23 December 2019

The information included in this report is provided for analysis and is based on the data provided by Sussex Police. Some of the data included in this report is subjective and as such is not considered suitable for general release. In view of this it should not be transmitted to any other person in its original form, including in any report which may be available to the public. If you have any doubt regarding how this data may be used other than for analysis please contact SSRP for advice.

Sussex Safer Roads
PARTNERSHIP

Safer Roads
Safer Communities
Sharing the Responsibility

Produced by Sussex Safer Roads Partnership on behalf of Sussex Police

Data regarding personal injury collisions is recorded by Sussex Police in accordance with the DfT Stats 19 requirements. The data is subsequently used by Sussex Safer Roads Partnership for monitoring and planning. While every effort is made to ensure that this data is accurate, it is subject to change should further information become available.

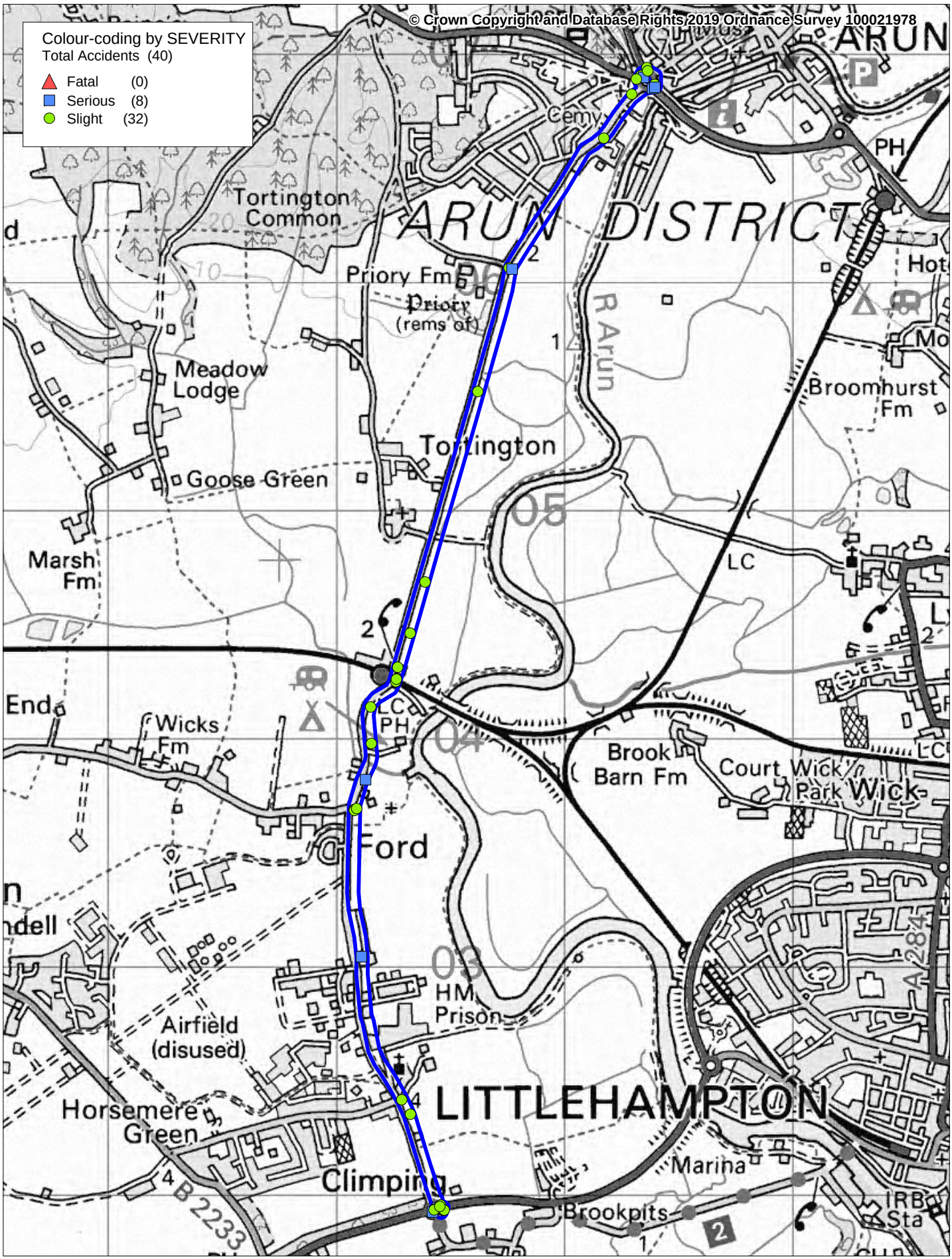
This data may not be fully validated and while every effort is made to ensure its accuracy any statistics provided may not match those published elsewhere.

Sussex Safer Roads Partnership does not hold collision data either where there are no recorded casualties or the incident has not been reported to Sussex Police.

For further information:

web: www.sussexsaferroads.gov.uk

email: data@sussexsaferroads.gov.uk



Sussex Safer Roads PARTNERSHIP

Ford to Arundel
Collision data: 01/01/2014 to 31/10/2019

SCALE	1 : 22000
DATE	23/12/2019
DRAWING No.	
DRAWN BY	

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties			
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev			
	Date										
Road No.	Time										
2nd Road No.											
Grid Ref.	D/L										
	R.S.C										
	Weather										
	Speed										
	Account of Accident										
Causation Factor:											

1404864 Friday 22/08/2014 1840hrs — U STATION ROAD FORD 293M NORTH OF U FORD LANE

Veh 1	Car	Going ahead	N	to	S				
Veh 2	Car	Stopping	N	to	S	FSP	M	22	Slight

R1: U
Daylight:street lights present
E 500,153
Dry
N 103,977
Fine without high winds
30 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

V2 HAS STOPPED FOR SLOWER MOVING TRAFFIC WHEN V1 HAS FAILED TO REACT TO STATIONARY TRAFFIC AND HAS COLLIDED WITH REAR OF V2.

1404695 Thursday 14/08/2014 2056hrs — U FORD ROAD FORD AT JUNCTION OF U PRIORY LANE

Veh 1	M/C < 125 cc	Going ahead LH bend	NE	to	S	Dri	M	21	Slight

R1: U
R2: U
Darkness: no street lighting
E 500,757
Wet/Damp
N 106,062
Raining without high winds
60 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Inexperienced or learner driver/rider	Vehicle 1	Very Likely
2nd:	Loss of control	Vehicle 1	Very Likely

DRIVER OF V1 BECOME DISORIENTATED AT BEND IN THE ROAD AND MISTOOK A RIGHT HAND TURN FOR THE ROAD AHEAD. V1 LOST CONTROL CAUSING THE RIDER TO BECOME DISMOUNTED.

1407550 Monday 22/12/2014 1735hrs — U FORD ROAD FORD 60M NORTH OF U GUAGEMASTER WAY

Veh 1	Car	Going ahead	N	to	S				
Veh 2	Car	Wait go ahead held	0	to	0	Dri	F	45	Slight
Veh 3	Car	Wait go ahead held	0	to	0				

R1: U
Darkness: no street lighting
E 500,324
Dry
N 104,460
Fine without high winds
60 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Loss of control	Vehicle 1	Very Likely

V1 TRAVELLING SOUTH ON FORD ROAD TOWARDS LEVEL CROSSING WHICH WAS DOWN. DRIVER OF V1 FAILED TO SEE STATIONARY VEHICLES AHEAD AND COLLIDED INTO REAR OF V2 PUSHING INTO V3. MINOR WHIPLASH SUSTAINED BY DRIVER OF V2.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties			
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev			
	Date										
Road No.	Time										
2nd Road No.											
Grid Ref.	D/L										
	R.S.C										
	Weather										
	Speed										
	Account of Accident										
Causation Factor:											

1500146	Wednesday	U STATION ROAD FORD. 150M	Veh 1	Car	O/take m/veh o/side	N	to S				
	03/12/2014	NORTH OF U FORD LANE OUTSIDE	Veh 2	Pedal cycle	Going ahead	N	to S	Dri	M	41	Serious
R1: U	1730hrs	NONE NEAR.	Veh 3	Car	Going ahead	N	to S				
	Darkness: no street lighting										
E 500,128	Dry										
N 103,818	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to judge other persons path or speed	Vehicle 1	Possible

V1 (CAR), V2 (PEDAL CYCLE) AND V3 (CAR) ALL HEADING SOUTH ON STATION ROAD. V1 WENT TO PASS V2 AND THIS CAUSED RIDER TO FALL FROM HIS BIKE. V3 THEN IS REPORTED TO HAVE DRIVEN OVER THE PEDAL CYCLE (V2).

1407241	Sunday	A284 ARUNDEL BY PASS ARUNDEL	Veh 1	Car	Wait go ahead held	N	to SE				
	30/11/2014	AT JUNCTION OF A27 CHICHESTER	Veh 2	M/C > 500 cc	Going ahead	N	to SE	Dri	M	77	Slight
R1: A 284	1433hrs	ROAD									
R2: A 27	Daylight:street lights present										
E 501,361	Dry										
N 106,940	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

V2 STATIONARY AT R/A WHEN V1 FAILED TO SEE AND COLLIDED INTO REAR OF V2. RIDER FELL OFF AND BIKE FELL ONTO HIS ANKLE CAUSING MINOR INJURY.

1503914	Thursday	U STATION ROAD FORD 750M	Veh 1	Car	Going ahead	N	to S				
	09/07/2015	NORTH OF U FORD LANE OUTSIDE	Veh 2	Pedal cycle	Going ahead	N	to S	Dri	M	42	Slight
R1: U	0830hrs	FORD LEVEL CROSSING									
	Daylight:street lights present										
E 500,260	Dry										
N 104,248	Fine without high winds										
	30 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Passing too close to cyclist, horse rider or pedestrian	Vehicle 1	Very Likely

V2 (CYCLIST) WAS HEADING IN A SOUTHERLY DIRECTION. V1, ALSO HEADING IN THE SAME DIRECTION, HAS CLIPPED V2 WITH NEARSIDE WING MIRROR, CAUSING CYCLIST TO COME OFF. BOTH PARTIES EXCHANGED DETAILS AT THE SCENE.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1501762	Monday	U STATION ROAD FORD 49M SOUTH	Veh 1	Car	Going ahead	S	to N				
	30/03/2015	OF U PRIVATE ENTRANCE THE	Veh 2	Car	Going ahead	S	to N				
R1: U	1426hrs	WILLOWS OUTSIDE RAILWAY	Veh 3	Car	Wait go ahead held	N	to S	Dri	M	37	Slight
	Daylight:street lights present		Veh 4	Car	Wait go ahead held	N	to S	Dri	F	56	Slight
E 500,263	Dry		Veh 5	Car	Wait go ahead held	N	to S				
N 104,259	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Aggressive driving	Vehicle 1	Very Likely
2nd:	Vehicle in course of crime	Vehicle 1	Very Likely

V2 A MARKED POLICE VEHICLE WAS IN PURSUIT WITH V1 TRAVELLING NORTH ON STATION ROAD TOWARDS THE FORD RAILWAY CROSSINGS. THE CROSSINGS WERE SET TO SHUT AND V1 CONTINUED THROUGH SMASHING THROUGH THE BARRIERS. V3 A MARKED POLICE VEHICLE WAS STATIONARY ON THE
OPPOSITE SIDE OF THE BARRIER. V1 CAME THROUGH THE BARRIERS AND ATTEMPTED TO SQUEEZE BETWEEN V3 AND V4. V1 CAME TO A SUDDEN STOP COMING TO A REST AGAINST V5.

1501798	Tuesday	U FORD LANE FORD AT JUNCTION	Veh 1	Car	Turning right	W	to S	Dri	M	28	Slight
	31/03/2015	0M OF U FORD ROAD	Veh 2	Car	Turning left	S	to W				
R1: U	0940hrs										
R2: U	Daylight:street lights present										
E 500,078	Dry										
N 103,688	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to signal/Misleading signal	Vehicle 2	Very Likely
2nd:	Poor turn or manoevre	Vehicle 1	Very Likely

VEH 2 WAS TRAVELLING N/B ON FORD ROAD INDICATING TO TURN LEFT (WEST) INTO FORD LANE. VEH 1 HAD COME EAST ALONG FORD LANE AND WAS TURNING RIGHT (SOUTH) INTO FORD ROAD. VEH 2 CANCELLED THE INDICATOR AT THE LAST OPPORTUNITY AFTER CHANGING HIS MIND AND DUE T
O THE MISLEADING SIGNAL, VEH 1 HAS PULLED OUT OF THE JUNCTION AND INTO THE PATH OF VEH 2.

1506275	Tuesday	A27 AT JUNCTION OF A284 LONDON	Veh 1	Car	Going ahead	W	to E				
	27/10/2015	ROAD OUTSIDE ON R/BT	Veh 2	Car	Going ahead	W	to E	Dri	F	42	Slight
R1: A 27	1756hrs										
R2: A 284	Darkness: street lights present a										
E 501,334	Wet/Damp										
N 106,905	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

APPARANTLY VEH 1 FAILED TO NOTICE THE QUEING TRAFFIC IN FRONT AND DROVE INTO THE REAR OF VEH2.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1506302 Wednesday 28/10/2015 0132hrs — A27 ARUNDEL ROAD ARUNDEL AT JUNCTION OF A284 OUTSIDE FORD ROUNDABOUT

Veh 1 Goods < 3.5t Going ahead W to E Dri M 57 Serious

R1: A 27
R2: A 284
E 501,347
N 106,897

Darkness: street lights present a
Wet/Damp
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Careless/Reckless/In a hurry	Vehicle 1	Possible
2nd:	Impaired by alcohol	Vehicle 1	Possible
3rd:	Fatigue	Vehicle 1	

VEH/1 LARGE VAN TRAVELLING EAST ON A27 TRAVELS DOWN HILL IN 40MPH LIMIT TOWARDS ROUNDABOUT JUNCTION, FAILS TO REACT TO JUNCTION , MOUNTS CENTRAL ISLAND AT JUNCTION ENTERS ROUNDABOUT, MOUNTS LARGE ROUNDABOUT AND TRAVELS 15M INTO CENTRE BEFORE IMPACTING WI
TH A TREE CAUSING SIGNIFICANT DAMAGE TO VEHICLE AND INJURY TO DRIVER.

1506786 Monday 16/11/2015 1519hrs — A259 CROOKTHORN LANE CLIMPING AT JUNCTION OF U CHURCH LANE

Veh 1 Car Turning right N to W
Veh 2 M/C < 50 cc Going ahead W to E Dri M 16 Slight

R1: A 259
R2: U
E 500,456
N 101,948

Daylight:street lights present
Wet/Damp
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Careless/Reckless/In a hurry	Vehicle 2	Possible

VEH 1 WAS AT THE ROUNDABOUT COMING FROM FORD (CHURCH LANE) INDICATING TO TURN RIGHT (WEST) ONTO A259 TOWARDS BOGNOR REGIS. VEH 2 WAS TRAVELLING ACROSS THE ROUNABOUT EAST ALONG THE A259 TOWARDS LITTLEHAMPTON WHEN BOTH COLLIDED.

1507558 Monday 21/12/2015 0710hrs — A27 ARUNDEL BY PASS ARUNDEL AT JUNCTION OF C17 FORD ROAD

Veh 1 Car Stopping E to W
Veh 2 Car Stopping E to W Dri M 55 Slight

R1: A 27
R2: C 17
E 501,394
N 106,850

Daylight:street lights present
Wet/Damp
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Possible

VEHICLE 2 WESTBOUND A27 ARUNDEL BY PASS WHEN DRIVER SLOWS AND STOPS AT ABOVE ROUNDABOUT JUNCTION. VEHICLE 1 ALSO WESTBOUND BEHIND VEHICLE 2 FAILS TO SLOW IN TIME COLLIDING WITH REAR OF VEHICLE 2.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection: **Notes:**
Selected using Manual Selection

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No. **2nd Road No.**	Time									
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1507691 Wednesday 23/12/2015 1740hrs — U FORD ROAD FORD AT JUNCTION OF U FORD LANE

Veh 1 Car Turning right W to S
Veh 2 Pedal cycle Going ahead S to N Dri M 53 Slight

R1: U
R2: U Darkness: no street lighting
E 500,079 Dry
N 103,683 Fine without high winds
60 mph

Causation Factor:		Participant:	Confidence:
1st:	Failed to look properly	Vehicle 1	Possible

DRIVER VEHICLE 1 MERGED FROM JUNCTION, THEN STOPPED SUDDENLY. CYCLIST (VEHICLE 2) RAN INTO THE FRONT OFFSIDE WING OF VEHICLE 1, WENT OVER THE BONNET AND LANDED ON THE OTHER SIDE CAUSING INJURIES.

1600322 Friday 15/01/2016 1326hrs — U FORD ROAD ARUNDEL AT JUNCTION OF U UNAMNED ROAD OUTSIDE AT JUNCTION OF

Veh 1 Car Going ahead RH bend S to NE Dri M 30 Serious
Veh 2 Car Going ahead LH bend NE to S

R1: U
R2: U Daylight:street lights present
E 500,770 Dry
N 106,057 Fine without high winds
60 mph

Causation Factor:		Participant:	Confidence:
1st:	Impaired by alcohol	Vehicle 1	Very Likely

V1 TRAVELLING NORTHBOUND ON FORD ROAD, ARUNDEL APPROACHING SLIGHT RIGHT HAND BEND. V1 STATES THAT A VEHICLE TRAVELLING SOUTHBOUND APPROACHING ON WRONG SIDE OF CARRIAGEWAY CAUSED V1 TO SWERVE AND LEAVE CARRIAGEWAY TO THE NEARSIDE AND LEAVE CARRIAGEWAY EN
DING UP IN FIELD.

1600339 Saturday 16/01/2016 1829hrs — U FORD ROAD CLIMPING 753M SOUTH OF U HORSEMERE GREEN LANE OUTSIDE OF CHURCH FARM

Veh 1 Car Going ahead S to N Dri F 24 Slight
Veh 2 Car Wait to turn right S to E

R1: U
Darkness: no street lighting
E 500,325 Dry
N 102,352 Fine without high winds
40 mph

Causation Factor:		Participant:	Confidence:
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Very Likely
3rd:	Impaired by alcohol	Vehicle 2	

V2 TRAVELLING NORTHBOUND, SLOWED AND INDICATED RIGHT TO TURN INTO PRIVATE DRIVE. V1 ALSO TRAVELLING NORTHBOUND. V1 COLLIDED WITH V2. V2 LEFT THE ROAD TO THE OFFSIDE AND MOUNTED VERGE.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No. **2nd Road No.**	Time									
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1602271 Tuesday 19/04/2016 0732hrs — U FORD ROAD FORD AT JUNCTION OF U NELSON ROW OUTSIDE AT JUNCTION

Veh 1	Taxi	Going ahead	S	to N					
Veh 2	Car	Wait to turn right	S	to N	Dri	M	38	Serious	

R1: U
R2: U
Daylight:street lights present
E 500,109
Dry
N 103,042
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely

VEHICLE 2 TRAVELLING NORTH ON FORD ROAD, SLOWED WITH INTENTION TO TURN INTO NELSON ROW WHEN VEHICLE 1 FOLLOWING BEHIND FAILED TO NOTICE V2 SLOWING AND DROVE INTO REAR OF V2 CAUSING MINOR NECK PAIN INJURY TO DRIVER OF V2.

1602432 Wednesday 27/04/2016 0820hrs — C17 STATION ROAD ARUNDEL AT JUNCTION OF U FORD LANE

Veh 1	Car	Turning right	W	to S	Dri	M	74	Slight	
Veh 2	Goods < 3.5t	Going ahead	S	to N					

R1: C 17
R2: U
Daylight:street lights present
E 500,089
Wet/Damp
N 103,692
Fine without high winds
30 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Careless/Reckless/In a hurry	Vehicle 1	Possible

V1 TURNING RIGHT/SOUTH, FROM FORD LANE JUNC INTO STATION ROAD FORD ARUNDEL. V1 COLLIDED WITH V2 WHICH WAS TRAVELLING NORTH BOUND ON STATION ROAD.

1507658 Saturday 26/12/2015 1137hrs — A27 ARUNDEL BY PASS ARUNDEL AT JUNCTION OF C17 FORD ROAD

Veh 1	Car	Starting	E	to W					
Veh 2	Pedal cycle	Going ahead	N	to S	Dri	M	50	Serious	

R1: A 27
R2: C 17
Daylight:street lights present
E 501,386
Dry
N 106,849
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Possible

A PEDAL CYCLIST TRAVELLING SOUTH ACROSS THE ROUNDABOUT WAS IN COLLISION WITH A VEHICLE TRAVELLING FROM THE EAST. THE PEDAL CYCLIST WAS DISMOUNTED AND SUFFERED A SERIOUS INJURY TO HIS RIGHT ANKLE.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1604602 Saturday 30/07/2016 1240hrs — U FORD ROAD ARUNDEL AT JUNCTION OF U PENFOLDS PLACE

Veh 1 Car Turning right SE to NE
Veh 2 Pedal cycle Going ahead NE to SW Dri F 38 Slight

R1: U
R2: U Daylight:street lights present
E 501,173 Dry
N 106,631 Fine without high winds
30 mph

Causation Factor:		Participant:	Confidence:
1st:	Failed to look properly	Vehicle 1	Very Likely

VEHICLE 1 WAITING AT JUNCTION OF PENFOLDS PLACE TO JOIN FORD ROAD, VEHICLE 2 TRAVELLING WEST ALONG FORD ROAD TOWARDS JUNCTION. THE DRIVER OF VEH 1 WAS FLASHED BY ANOTHER VEHICLE, ALLOWING HIM TO PULL OUT AND IN DOING SO, PULLED INTO THE PATH OF VEH 2
.

1605774 Friday 23/09/2016 1905hrs — A259 CLIMPING AT JUNCTION OF U CROOKTHORN LANE

Veh 1 Car Going ahead E to W
Veh 2 Pedal cycle Turning right N to W Dri M 55 Slight

R1: A 259
R2: U Darkness: street lights present a
E 500,469 Dry
N 101,930 Fine without high winds
40 mph

Causation Factor:		Participant:	Confidence:
1st:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

VEHICLE 1 WAS TRAVELLING WESTBOUND ALONG THE A259 AND FAILED TO SEE CYCLIST(VEHICLE 2) TRAVELLING SOUTH ACROSS THE ROUNDABOUT FROM CHURCH LANE AND COLLIDED WITH THE CYCLIST CAUSING THEM TO IMPACT THE BONNET AND DAMAGE CAUSED TO THEIR BIKE.

1605679 Monday 19/09/2016 2357hrs — A259 CLIMPING AT JUNCTION OF U CHURCH LANE

Veh 1 Car Going ahead W to E Dri M 25 Slight

R1: A 259
R2: U Darkness: street lights present a
E 500,427 Wet/Damp
N 101,932 Fine without high winds
30 mph

Causation Factor:		Participant:	Confidence:
1st:	Poor turn or manoevre	Vehicle 1	Very Likely
2nd:	Impaired by alcohol	Vehicle 1	Very Likely

SINGLE VEHICLE ENTERED ROUNDABOUT MOUNTED CURB HIT CHEVRON AND THEN CONTINUED TO EAST SIDE OF RA HITTING RAILINGS

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1701578 Tuesday 21/03/2017 1700hrs — U FORD ROAD ARUNDEL 50M SOUTH OF U TORTINGTON LANE

Veh 1	Car	Going ahead	N	to	S				
Veh 2	Car	Wait go ahead held	0	to	0	Dri	M	71	Slight

R1: U
Daylight:street lights present
E 500,389
Dry
N 104,685
Fine without high winds
60 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Illness or disability, mental or physical	Vehicle 1	Very Likely

VEHICLE 2 STOPPED ON CARRIAGE WAY DUE TO RAILWAY CROSSING BEING DOWN. VEHICLE 1 HAS NOT SEEN THE QUEUING TRAFFIC AND HAS NOT ATTEMPTED TO SLOW OR STOP HITTING VEHICLE 2 TO THE REAR. AIR BAGS DEPLOYED IN VEHICLE 1 AND SUBSTANTIAL DAMAGE TO FRONT OF VEHICL
E. WHIPLASH INJURIES TO DRIVER OF VEHICLE 2. VEHICLE 1 SEEN BY WITNESSES TO DRIVE UP TO CROSSING TURN AROUND AND LEAVE SCENE WITHOUT EXCHANGING DETAILS.

1701828 Thursday 30/03/2017 0832hrs — A259 CROOKTHORN LANE CLIMPING AT JUNCTION OF U CHURCH LANE

Veh 1	Car	Going ahead	W	to	E				
Veh 2	Pedal cycle	U turn	E	to	E	Dri	M	47	Serious

R1: A 259
R2: U
Daylight:street lights present
E 500,444
Dry
N 101,942
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely

V1 TRAVELLING EASTBOUND ENTERED ONTO R/A AND FAILED TO OBSERVE PEDAL CYCLIST WHO WAS IN THE MIDDLE OF A MANOUVERE TO COMPLETE A U-TURN ON THE R/A. THE REAR OF V2 CONTACTED WITH V1 CAUSING HIM TO BECOME DISMOUNTED.

1701586 Tuesday 21/03/2017 1749hrs — A27 ARUNDEL AT JUNCTION OF U FORD ROAD OUTSIDE ON R/A

Veh 1	Car	Change lane to right	W	to	S				
Veh 2	M/C > 500 cc	Going ahead	N	to	SE	Dri	M	22	Slight

R1: A 27
R2: U
Darkness: street lights present a
E 501,395
Dry
N 106,866
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

VEH 1 WENT TO MOVE ACROSS INTO THE INSIDE LANE OF THE ROUNDABOUT AND FAILED TO NOTICE VEH 2, THE MOTORCYCLE WHO WAS ALREADY OCCUPYING THE LANE.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										

1703207 Saturday 10/06/2017 1904hrs — A259 CROOKTHORN LANE CLIMPING AT JUNCTION OF U CHURCH LANE OUTSIDE ON R/A

Veh 1	Car	Going ahead	N	to	S				
Veh 2	Pedal cycle	Going ahead	W	to	E	Dri	M	33	Slight

R1: A 259
R2: U
E 500,450
N 101,944
Daylight:street lights present
Dry
Fine without high winds
40 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Disobeyed Give Way or Stop sign or markings	Vehicle 1	Very Likely

APPARENTLY VEH 1 APPROACHED THE ROUNDABOUT AND FAILED TO NOTICE VEH 2 THAT WAS ALREADY NEGOCIATING THE R/A. VEH 1 FAILED TO GIVE WAY AND COLLIDED WITH VEH 2.

1605611 Thursday 15/09/2016 1745hrs — U CHURCH LANE LITTLEHAMPTON AT JUNCTION OF A259 CROOKTHORNE LANE

Veh 1	Car	Change lane to right	N	to	S				
Veh 2	Pedal cycle	Wait go ahead held	N	to	S	Dri	F	68	Slight

R1: U
R2: A 259
E 500,457
N 101,954
Daylight:street lights present
Dry
Fine without high winds
50 mph

V2 (CYCLIST) HAD STOPPED IN LANE 1 JUST BEFORE ROUNDABOUT WITH THE ATTENTION OF GOING STRAIGHT ON. V1 HAS COLLIDED WITH REAR OF V2, KNOCKING HER OFF HER CYCLE. DRIVER OF V1 JUST SHOUTED OUT OF THE WINDOW "ARE YOU OK?" THEN TURNED RIGHT AND AWAY FROM TH
E SCENE WITHOUT EXCHANGING DETAILS.

1705454 Wednesday 27/09/2017 1100hrs — A259 CLIMPING AT JUNCTION OF U CHURCH LANE

Veh 1	Car	Turning left	W	to	N				
Veh 2	Pedal cycle	Turning right	E	to	N	Dri	M	66	Slight

R1: A 259
R2: U
E 500,440
N 101,935
Daylight:street lights present
Dry
Fine without high winds
30 mph

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely

V1 WAITING TO TURN LEFT AT ROUNDABOUT. V2 PEDAL CYCLE ON ROUNDABOUT TURNING RIGHT HEADING NORTH. V1 FAILS TO SEE V2 AND PULLS OUT AND COLLIDES WITH PEDAL CYCLE CAUSING HIM TO COME OFF AND FALL ON THE ROAD.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles						Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class						Sex / Age / Sev		
	Date										
Road No. **2nd Road No.**	Time										
Grid Ref.	D/L										
	R.S.C										
	Weather										
	Speed										
	Account of Accident										
Causation Factor:											
1705520	Saturday	U CHURCH LANE CLIMPING AT	Veh 1	Car	Starting	W	to S	Dri	M	90	Slight
	30/09/2017	JUNCTION OF U HORSEMERE GREEN	Veh 2	Car	Going ahead	S	to N	Dri	F	31	Slight
R1: U	1143hrs	LANE									
R2: U	Daylight:street lights present										
E 500,286	Dry										
N 102,415	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Disobeyed Give Way or Stop sign or markings	Vehicle 1	Very Likely
2nd:	Failed to look properly	Vehicle 1	Very Likely

V1 AT T JUNCTION FACING EAST FAILS TO GIVE WAY AT JUNCTION AND PULLS DIRECTLY INTO THE PATH OF V2 TRAVELLING NORTH CAUSING COLLISION RESULTING IN DAMAGE AND INJURY TO BOTH PARTIES

1604964	Monday	U FORD ROAD ARUNDEL AT	Veh 1	Car	Going ahead	N	to S				
	15/08/2016	JUNCTION OF U TORTON HILL ROAD	Veh 2	Pedal cycle	Going ahead	SW	to N	Dri	M	34	Slight
R1: U	1515hrs										
R2: U	Daylight:street lights present										
E 501,295	Dry										
N 106,823	Fine without high winds										
	30 mph										

V2 WAS CYCLING IN A NORTHERLY DIRECTION WHEN V1 HAS COME OUT OF SIDE ROAD AND HIT V2, CAUSING HIM TO COME OFF CYCLE.

1800208	Saturday	U FORD ROAD FORD AT JUNCTION	Veh 1	Car	Turning right	W	to S	Dri	F	25	Slight
	13/01/2018	OF U GAUGEMASTER WAY OUTSIDE	Veh 1	Car	Turning right	W	to S	RSP	F	0	Slight
R1: U	2027hrs	JUNCTION RTC	Veh 1	Car	Turning right	W	to S	RSP	M	29	Slight
R2: U	Darkness: street lights present a		Veh 2	Car	Going ahead	N	to S				
E 500,269	Dry										
N 104,311	Fine without high winds										
	40 mph										

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Possible
2nd:	Failed to judge other persons path or speed	Vehicle 1	Possible

V2 S/B TOWARDS JUNCTION O/S V1 ENTERS MAIN ROAD FROM JUNCTION INTO PATH OF V2.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties			
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev			
	Date										
Road No.	Time										
2nd Road No.											
Grid Ref.	D/L										
	R.S.C										
	Weather										
	Speed										
	Account of Accident										
Causation Factor:											

1801304
Wednesday 28/02/2018 1115hrs
R1: A 27
R2: A 27
E 501,315
N 106,890
A27 CHICHESTER ROAD ARUNDEL AT JUNCTION OF A27 OUTSIDE OPP PARK BOTTOM LODGES
Daylight:street lights present
Frost/Ice
Fine without high winds
40 mph

Veh 1	Car	Change lane to right	W	to	E					
Veh 2	Car	Going ahead	W	to	E	Dri	F	30	Slight	

BOTH VEHS HAD BEEN EASTBOUND TOWARDS FORD RD ROUNDABOUT V2 WAS IN LANE 2 BEHIND OTHERVEHS AS WAS INTENDING TO U TURN ON ROUNDABOUT TO GO BACK WEST ON A27 V1 WAS IN LANE 1 BEHIND OTHER VEHS AS VEHS CLEARED BOTH V1 & 2 MOVED FORWARD STILL APPROACHING ROUND
ABOUT BUT V1 CUT ACCROSS INTO LANE 2 STRIKING V2

1802916
Monday 28/05/2018 1308hrs
R1: A 27
R2: U
E 501,396
N 106,853
A27 ARUNDEL AT JUNCTION OF U FORD ROAD
Daylight:street lights present
Dry
Fine without high winds
40 mph

Veh 1	Car	Starting	SE	to	NW					
Veh 2	M/C < 125 cc	Wait go ahead held	SE	to	NW	Dri	F	19	Serious	

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely
2nd:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

VEH 2 M/CYCLE HAS BEEN STATIONARY ON A27 WAITING TO PROGRESS AHEAD ONTO R/A. VEH 1 PMC HAS BEEN DIRECTLY BEHIND. VEH 1 HAS ANTICIPATED VEH 2 MOVING OFF AND AS SUCH HAS IMPACTED WITH THE REAR OF IT, VEH 2 M/CYCLE RIDER HAS BEEN DISMOUNTED CAUSING SLIGHT I
NJURIES TO RIGHT FOOT AND LEG. SLIGHT DAMAGE CAUSED TO BOTH VEHS.

1803888
Friday 13/07/2018 1444hrs
R1: A 259
R2: U
E 500,440
N 101,938
A259 CROOKTHORN LANE CLIMPING AT JUNCTION OF U CHURCH LANE OUTSIDE R/A
Daylight:street lights present
Dry
Fine without high winds
30 mph

Veh 1	Car	Starting	W	to	E					
Veh 2	Pedal cycle	Going ahead	S	to	N	Dri	M	69	Slight	

Causation Factor:		**Participant:**	**Confidence:**
1st:	Failed to look properly	Vehicle 1	Very Likely

V2 CYCLIST N/B CROSSING R/A. V1 CAR ENTERS R/A HEADING EAST IMPACTS WITH CYCLIST.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles							Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class							Sex / Age / Sev		
	Date											
Road No. **2nd Road No.**	Time											
Grid Ref.	D/L											
	R.S.C											
	Weather											
	Speed											
	Account of Accident											
Causation Factor:												
1803709	Wednesday 04/07/2018	U FORD ROAD FORD 500M SOUTH OF U PRIORY LANE	Veh 1	Car	Going ahead	N	to S					
			Veh 2	Car	Going ahead	S	to N	FSP	F	19	Slight	
R1: U	2217hrs		Veh 2	Car	Going ahead	S	to N	RSP	F	19	Slight	
	Darkness: no street lighting											
E 500,620	Dry											
N 105,520	Fine without high winds											
	60 mph											

Causation Factor:		**Participant:**	**Confidence:**
1st:	Swerved	Vehicle 1	Possible
2nd:	Failed to look properly	Vehicle 1	Possible
3rd:	Failed to judge other persons path or speed	Vehicle 2	

OFFSIDE OF V1 TRAVELLING SOUTH HAS COLLIDED WITH V2 TRAVELLING NORTH, V2 LEFT THE ROAD TO THE EAST OF ROAD AND ROLLED ONTO SIDE

1805385	Saturday 29/09/2018	A259 CROOKTHORN LANE CLIMPING AT JUNCTION OF U CHURCH LANE (CLIMPING)	Veh 1	M/C > 500 cc	O/take m/veh o/side	E	to W	Dri	M	50	Serious	
			Veh 2	Car	Going ahead	E	to W					
R1: A 259	1532hrs											
R2: U	Daylight:street lights present											
E 500,422	Dry											
N 101,923	Fine without high winds											
	40 mph											

Causation Factor:		**Participant:**	**Confidence:**
1st:	Poor turn or manoevre	Vehicle 1	Very Likely
2nd:	Deposit on road (eg oil, mud, chippings)	Vehicle 1	Very Likely

MOTORCYCLE V1 TRAVELLING EAST TO WEST, AFTER EXITING THE ROUNDABOUT WENT TO OVERTAKE VEHICLE IN FRONT, SKIDDED ON LOOSE MATERIAL ON CENTRAL HATCHED AREA CAUSING HIM TO LOSE CONTROL AND FALL OFF.

1806307	Thursday 15/11/2018	A259 CLIMPING ROUNDABOUT CLIMPING AT JUNCTION OF A259	Veh 1	Car	Starting	E	to W					
			Veh 2	Pedal cycle	Going ahead	N	to S	Dri	M	47	Slight	
R1: A 259	1535hrs											
R2: A 259	Daylight:street lights present											
E 500,473	Dry											
N 101,931	Fine without high winds											
	30 mph											

Causation Factor:		**Participant:**	**Confidence:**
1st:	Nervous/Uncertain/Panic	Vehicle 1	Possible

V1 TRAVELLING WEST ON A259. STOPPED AT ROUNDABOUT. MOVED OFF IN SAME DIRECTION AND DID NOT SEE CYCLIST ALREADY ON ROUNDABAOUT TRAVELING SOUTH. HIT CYCLIST ON NEARSIDE CAUSING DAMAGE TO BIKE AND MINOR INJURY TO CYCLIST.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection: **Notes:**
Selected using Manual Selection

			Vehicles					Casualties			
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev			
	Date										
Road No.	Time										
2nd Road No.											
Grid Ref.	D/L										
	R.S.C										
	Weather										
	Speed										
	Account of Accident										
Causation Factor:											

0844595 Saturday 01/06/2019 1500hrs — ARUNDEL RELIEF ROAD (A284) NEAR JUNCTION WITH CHICHESTER ROAD (A27)
R1: A 284 **R2: A 27** **E 501,365** **N 106,926**
Daylight:street lights present; Dry; Fine without high winds; 40 mph

Veh 1	Car	Going ahead	NW	to	SE						
Veh 2	Car	Wait go ahead held	NW	to	SE	Dri	F	34	Slight		

Causation Factor:		Participant:	Confidence:
1st:	Careless/Reckless/In a hurry	Vehicle 1	Very Likely

V2 WAS STATIONARY AT THE ROUNDABOUT, LOOKING RIGHT, WAITING FOR A GAP. V1 WAS TRAVELLING AT SPEED AND WENT INTO THE BACK OF V2. HE APOLOGISED, SAID IT WAS HIS FAULT. DRIVER OF V2 IS C1

0865703 Wednesday 07/08/2019 0338hrs — FORD ROAD - 150 METRES FROM JUNCTION WITH UNCLASSIFIED ROAD
R1: U
E 500,150 **N 104,137**
Daylight:street lights present; Dry; Fine without high winds; 60 mph

Veh 1	Car	Going ahead RH bend	S	to	NE						
Veh 2	Car	Going ahead LH bend	NE	to	S	Dri	M	56	Slight		

Causation Factor:		Participant:	Confidence:
1st:	Inexperience of driving on the left	Vehicle 1	Very Likely
2nd:	Illegal turn or direction of travel	Vehicle 1	Very Likely

V1 AND V2 TRAVELLING IN OPPOSITE DIRECTIONS ON FORD ROAD. V1 WAS DRIVING ON THE WRONG SIDE OF THE RIDE AND HIT V2 HEAD ON. V1 IS FROM SWITZERLAND AND WAS HEADING HOME HAVING ONLY JUST LEFT A CAMPSITE. V1 WAS DRIVING ON THE RIGHT AS FORGOT DUE TO NO OTHER
TRAFFIC AROUND.

0873599 Monday 02/09/2019 2350hrs — CROOKTHORN LANE (A259) NEAR JUNCTION WITH CHURCH LANE ROUNDABOUT (A259)
R1: A 259 **R2: A 259**
E 500,428 **N 101,932**
Darkness: street lights present a; Dry; Fine without high winds; 40 mph

Veh 1	Car	Going ahead	W	to	E						
Veh 2	Car	Going ahead	W	to	E	Dri	F	20	Slight		
Veh 2	Car	Going ahead	W	to	E	FSP	F	20	Slight		

Causation Factor:		Participant:	Confidence:
1st:	Failed to judge other persons path or speed	Vehicle 1	Very Likely

V1 TRAVELLING EAST ON A259 APPROACHING ROUNDABOUT JUNCTION WITH CHURCH LANE, CLIMPING COLLIDED WITH REAR OF V2, SHUNTING IT ACROSS THE CENTRE OF THE ROUNDABOUT.

Details of Personal Injury Accidents for Period - **01/01/2014** **to** **31/10/2019** (70) months

Selection:
Selected using Manual Selection

Notes:

			Vehicles					Casualties		
Police Ref.	Day	Location Description	Veh No / Type / Manv / Dir / Class					Sex / Age / Sev		
	Date									
Road No.	Time									
2nd Road No.										
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									
Causation Factor:										
0891011	Wednesday	CHURCH LANE ROUNDABOUT	Veh 1	Car	Starting	W to E				
	23/10/2019	(A259) AT JUNCTION WITH CHURCH	Veh 2	Pedal cycle	Going ahead	N to S	Dri	M	57	Slight
R1: A 259	1350hrs	LANE								
R2: U	Daylight:street lights present									
E 500,453	Dry									
N 101,947	Fine without high winds									
	30 mph									

V1 WAS TRAVELLING EAST ON A259 ON RIGHT HAND LANE AT ROUNDABOUT OF CHURCH LANE, V2 PEDAL CYCLIST WAS TRAVELLING ACROSS ROUNDABOUT AND JUST GOT PAST THE ROUNDABOUT WHEN V1 HIT PEDAL CYCLIST AND RAN OVER THE REAR OF V2 BIKE CAUSING CYCLIST TO DISMOUNT. DRI
VER OF V1 STOPPED AT SCENE AND WROTE HIS NAME AND ADDRESS ON PAPER FOR V2 PEDAL CYCLIST

Appendix C

PRELIMINARY DESIGNS

DO NOT SCALE

CYCLE ROUTES TO LINK TO UNDERPASS UNDER A27

EXISTING FOOTWAY TO BE DESIGNATED AS BRIDLEWAY AND RESURFACED

EXISTING PARKING FORMALISED TO ACT AS A TRAFFIC CALMING FEATURES

EXISTING FOOTWAY TO BE DESIGNATED AS BRIDLEWAY AND RESURFACED

EXISTING FOOTWAY TO BE DESIGNATED AS BRIDLEWAY AND RESURFACED

PARKING IN THIS SECTION TO BE AS PER EXISTING ARRANGEMENT. TRAFFIC CALMING TO BE INTRODUCED TO REDUCE VEHICULAR SPEEDS IF SPEEDS ARE FOUND TO BE HIGH.

EXISTING FOOTWAY TO BE DESIGNATED AS BRIDLEWAY AND RESURFACED

ACCESS/EGRESS POINT FROM OFF-ROAD SHARED USE PATH

EXISTING FOOTWAY TO BE DESIGNATED AS BRIDLEWAY AND RESURFACED

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

CUTLINE

KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	21/01/2020	KM	FIRST ISSUE	HL	AK

DRAWING STATUS: S2 - FOR INFORMATION

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ARCHITECT: ------

PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 1 OF 7

SCALE @ A1:	CHECKED:		APPROVED:
1:1000	HL		AK
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

DRAWING No: 5187-GA-401 REV: P01

File name \\UK.WSPGROUP.COM\CENTRAL DATA\PROJECTS\70055\XX\70055187 - CDF DF A27 NMU LINKS FEASIBILITY STUDY\03 WIP\D DEVELOPMENT\02 DRAWING\AUTOCAD\GA GENERAL ARRANGEMENT\5187-GA-401 TO 407.DWG, printed on 31 January 2020 17:45:59, by Littler, Helen

DO NOT SCALE

KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

VERGE WIDTH REDUCED TO FIT CYCLE LANE WITHIN HIGHWAY BOUNDARY.

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

VERGE WIDTH REDUCED TO FIT CYCLE LANE WITHIN HIGHWAY BOUNDARY.

CUTLINE

FORD ROAD

Hanger Down House
The Priory
Brooklands
Priory Manor
Pond
Tortington Priory Barn
Tortington Priory Farm
Remains of Priory (Augustinian, founded 1180)
Ponds
Pond
Pond
Pond
Drain
Drain
Gas Gov
Track
Sloping Masonry
FB
BT
ESS
+ 2.1m

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	21/01/2020	KM	FIRST ISSUE	HL	AK

DRAWING STATUS: S2 - FOR INFORMATION

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CLIENT: HIGHWAYS ENGLAND

ARCHITECT: -----

PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 2 OF 7

SCALE @ A1:	CHECKED:		APPROVED:
1:1000	HL		AK
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

DRAWING No: 5187-GA-402 REV: P01

File name \\UK.WSPGROUP.COM\CENTRAL DATA\PROJECTS\70055\XX\70055187 - CDF DF A27 NMU LINKS FEASIBILITY STUDY\03 WIP\D DEVELOPMENT\02 DRAWING\AUTOCAD\GA GENERAL ARRANGEMENT\5187-GA-401 TO 407.DWG, printed on 31 January 2020 17:44:29, by Littler, Helen

DO NOT SCALE

KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

CUTLINE

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

EXISTING VERGE TO BE WIDENED TO 3m SHARED USE PATH WITH 1.5m VERGE. CARRIAGEWAY REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

CUTLINE

Tortington Manor
The Arundel Wing
9
12
13
14 to 18
4
3
2
1
The Stable Courtyard
1
3 to 5
The Goodwood Wing
8
1 to 7
1 to 7
1 to 8
The New England Wing
The Manor House
El Sub Sta
Manor Cottage
The Norfolk Wing
Tortington
The Lodge
Drain
3.7m
Ary Magdalene's Church
Manor Farm
Tortington
Drain
4.6m
2.4m
Drain
Track
Drain
B

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REV	DATE	BY	DESCRIPTION	CHK	APP
P01	21/01/2020	KM	FIRST ISSUE	HL	AK

DRAWING STATUS: S2 - FOR INFORMATION

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CLIENT: HIGHWAYS ENGLAND

ARCHITECT: ------

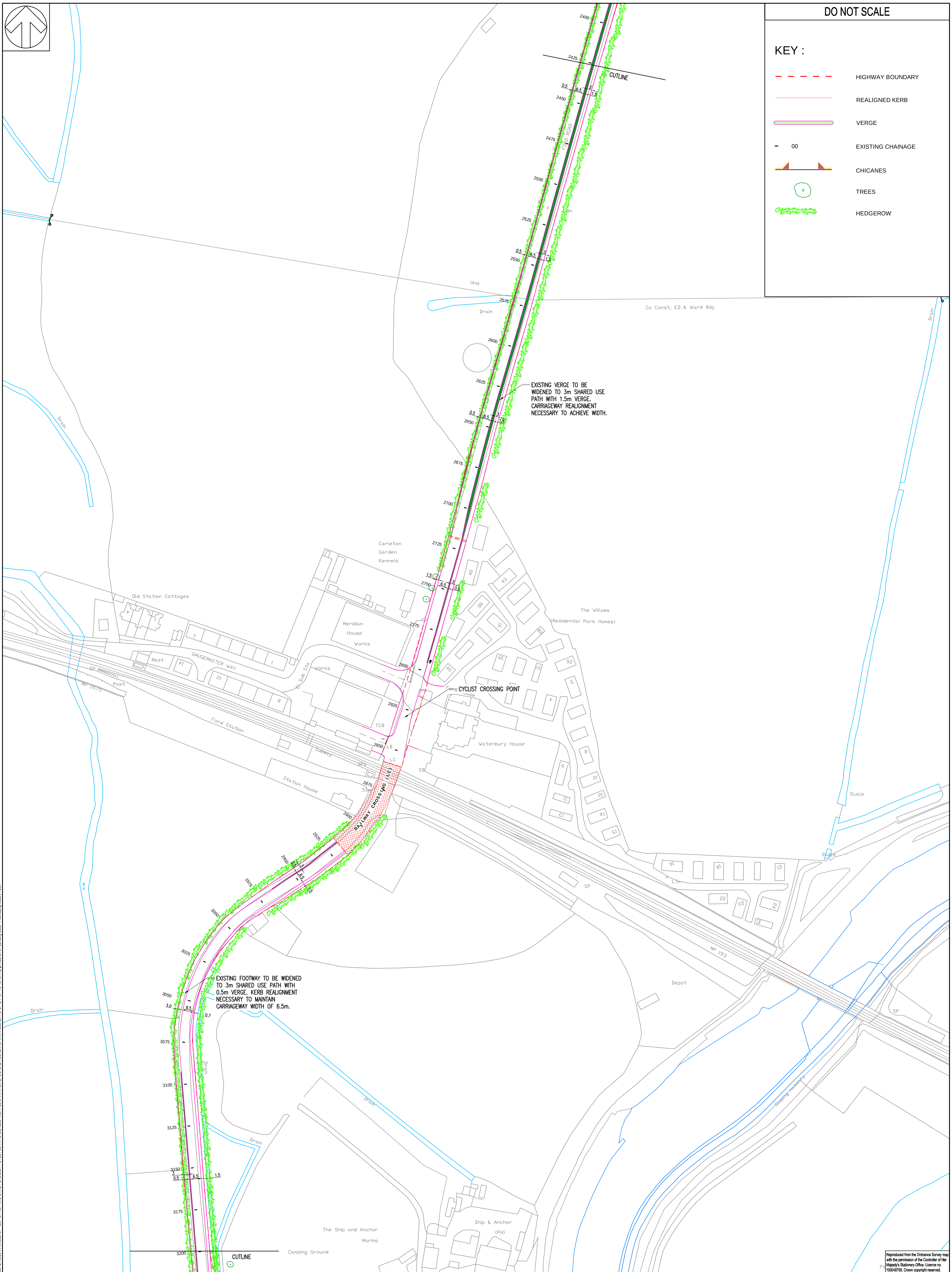
PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 3 OF 7

SCALE @ A1:	CHECKED:		APPROVED:
1:1000	HL		AK
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

DRAWING No: 5187-GA-403 REV: P01

File name \\UK.WSPGROUP.COM\CENTRAL DATA\PROJECTS\70055187XX70055187 - CDF DF A27 NMU LINKS FEASIBILITY STUDY\03 WIP\D DEVELOPMENT\02 DRAWING\AUTOCAD\GA GENERAL ARRANGEMENTS\5187-GA-401 TO 407.DWG, printed on 31 January 2020 17:42:35, by Littler, Helen



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P01	21/01/2020	KM	FIRST ISSUE	HL	AK

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ARCHITECT: ------

PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 4 OF 7

SCALE @ A1: 1:1000	CHECKED: HL		APPROVED: AK
PROJECT No: 70055187	DESIGNED: KM	DRAWN: KM	DATE: January 20
DRAWING No: 5187-GA-404			REV: P01

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DO NOT SCALE

KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

CUTLINE

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

ROUTE ALIGNED TO AVOID LOSS OF MATURED TREES

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE. KERB REALIGNMENT NECESSARY TO ACHIEVE WIDTH.

ROUTE ALIGNED TO AVOID LOSS OF MATURED TREES

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE

ROUTE ALIGNED TO AVOID LOSS OF MATURED TREES

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE

CUTLINE

Marina
Camping Ground
Caravan Park
Sluice
Lock Cottage
Path (um)
St Andrew's Church
Drain
STATION ROAD
RODNEY CRESCENT
FORD ROAD
El Sub Sta
FB
2.7m
2.0m
4.8m
5.2m
4.7m
5.3m

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PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 5 OF 7

SCALE @ A1:	CHECKED:		APPROVED:
1:1000	HL		AK
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

DRAWING No: 5187-GA-405 REV: P01

File name \\UK.WSPGROUP.COM\CENTRAL DATA\PROJECTS\70055\XX\70055187 - CDF DF A27 NMU LINKS FEASIBILITY STUDY\03 WIP\D DEVELOPMENT\02 DRAWING\AUTOCAD\GA GENERAL ARRANGEMENT\5187-GA-401 TO 407.DWG, printed on 31 January 2020 17:36:42, by Littler, Helen

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KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

CUTLINE

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH MIN 0.5m VERGE. GREATER WIDTH OF VERGE INCLUDED DUE TO LEVEL DIFFERENCES.

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE. KERB REALIGNMENT REQUIRED TO ACHIEVE WIDTH

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

EXISTING FOOTWAY TO BE WIDENED TO 3m SHARED USE PATH WITH 0.5m VERGE

CUTLINE

PROPOSED CONTINUOUS FOOTWAY/CYCLEWAY ACROSS SIDE ROAD

Drain
Ponds
Track
Vincent Cottage
Rudford Industrial Estate
HM Prison
Hall
St Mary's Church
Lych Gate
Church House
NELSON ROW
ARUN FIELD CL
FORD ROAD
H21
CF
CR
FS
Und

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PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 6 OF 7

SCALE @ A1:	CHECKED:		APPROVED:
1:1000	HL		AK
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

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DO NOT SCALE

KEY :

- HIGHWAY BOUNDARY
- REALIGNED KERB
- VERGE
- 00 EXISTING CHAINAGE
- CHICANES
- TREES
- HEDGEROW

CUTLINE

GAP IN VERGE TO ENABLE CYCLISTS TO JOIN ROUTE

EXISTING VERGE TO BE CONVERTED TO 3m SHARED USE PATH WITH 0.5m VERGE

END OF PROPOSALS. SCHEME TO TIE INTO HIGHWAY PROPOSALS FOR CLIMPING DEVELOPMENT SITE.

St Mary's Church
Lych Gate
Church House
Church Farm
Church Barn
Church Farm Cottages
Silver Birch
Old Forge
Track
Church Farm Barn
The Laurels
El Sub Sta
HORSEMERE GREEN LANE
The Barn
Waggoners
Flettons
Padang
Hobbitts
Church Farm Cottage
Church Farm House West
Church Farm House East
CHURCH LANE
Allotment Gardens
Drain
Field Place
Playground
CROPTHORNE DR
Climping
Playing Field
Village Hall

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PROJECT: A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY SCHEME 2

TITLE: CYCLING INFRASTRUCTURE PREFERRED OPTION ARUNDEL TO LITTLEHAMPTON SHEET 7 OF 7

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PROJECT No:	DESIGNED:	DRAWN:	DATE:
70055187	KM	KM	January 20

DRAWING No: 5187-GA-407 REV: P01

Appendix D

ENVIRONMENTAL REPORT

Highways England

A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY -

Scheme 2 - Arundel to Littlehampton - Desktop Environmental Study

70055187
JANUARY 2020

CONFIDENTIAL

Highways England

A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY -

Scheme 2 - Arundel to Littlehampton - Desktop Environmental Study

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70055187

OUR REF. NO. 70055187

DATE: JANUARY 2020

Highways England

A27 DESIGNATED FUNDS NMU LINKS FEASIBILITY STUDY -

Scheme 2 - Arundel to Littlehampton - Desktop Environmental Study

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	P01			
Date	January 2020			
Prepared by	Jerome Kreule			
Signature				
Checked by	Matt Shephard			
Signature				
Authorised by	Patricia Mwaniki			
Signature				
Project number	70055187			

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 OVERVIEW

1.1.1. WSP has been commissioned by Highways England to undertake a high-level environmental constraints desktop study for the proposed works contained within the A27 Designated Funds Non-Motorised User (NMU) Feasibility Study prepared by WSP (70055187-FDRD).

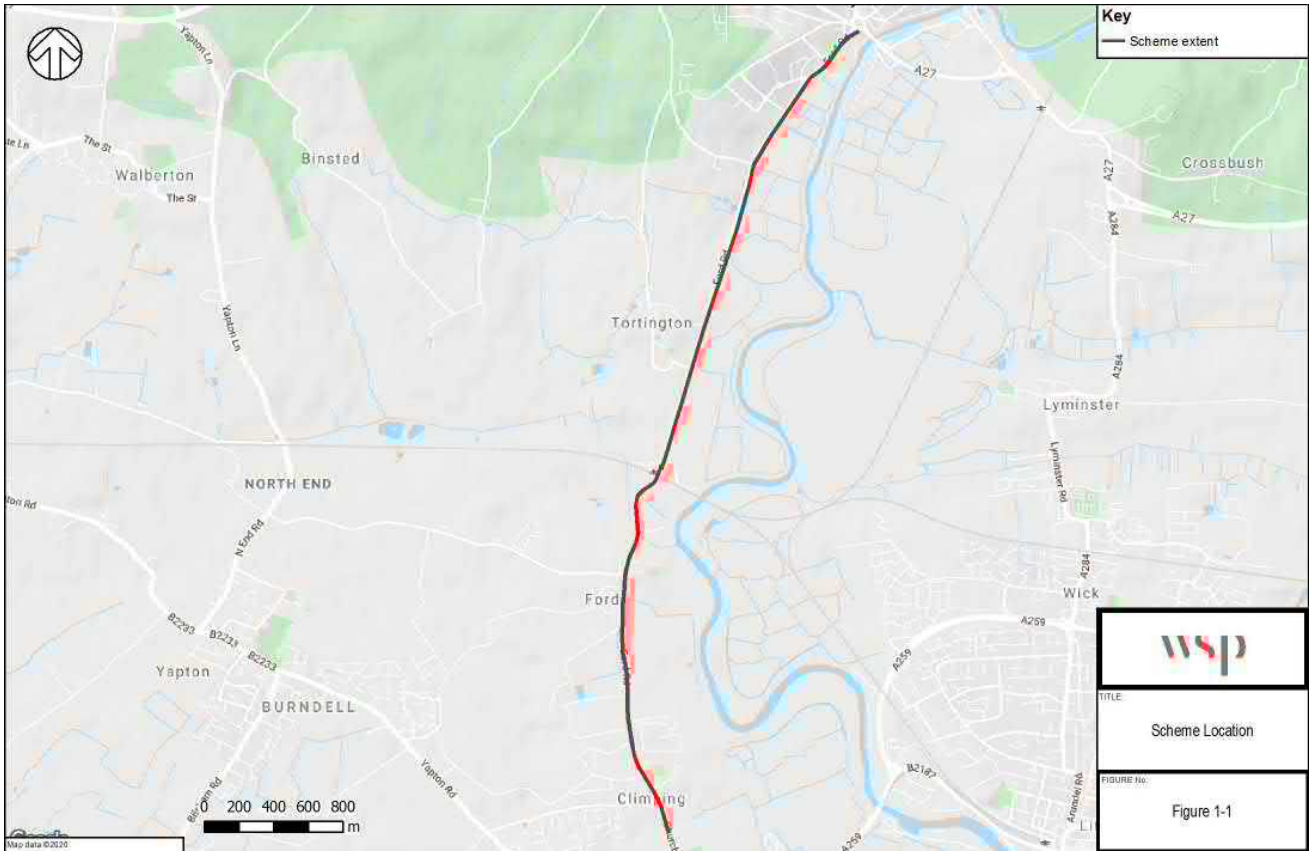
1.1.2. This report provides a desktop review of 'Scheme 2' of the potential NMU projects (hereafter known as the 'Scheme').

1.2 THE PROPOSED DEVELOPMENT

1.2.1. The Scheme is located between the A27 at Arundel and the A259 at Climping. The area of works (the 'Site') runs alongside Church Lane in Climping, then north to Ford and Station Road through Ford and Ford Road in Arundel (see Figure 1-1). The scheme is approximately 5.3 km long. The Site falls within Arun District, in West Sussex.

1.2.2. The purpose of the Scheme is to construct a series of infrastructure improvements along the existing road network to enhance access for pedestrians, cyclists and equestrians at high priority locations on the A27 and A259.

Figure 1-1 – Location Plan



2 APPROACH TO THE REPORT

2.1 PURPOSE OF THE REPORT

2.1.1. The purpose of this Environmental Desktop Study is to collate existing information from desktop sources in order to identify key potential environmental constraints and impacts associated with the proposed NMU works in the vicinity of the A27.

2.2 SCOPE

2.2.1. This constraints report is exclusively a desktop study, the sources of information are detailed in section 3. The following environmental topics are covered:

- Air Quality;
- Biodiversity (in the form of a standalone report);
- Cultural Heritage;
- Geology and Soils;
- Landscape and Visual;
- Noise and Vibration;
- Population and Health; and
- Road Drainage and the Water Environment.

2.2.2. At this stage, the report provides an overview of the potential environmental constraints based on current, publicly available information.

2.2.3. Baseline information has been collected through readily available desk-based sources, baseline information sources include, but are not limited to, the following:

- MagicMap Geographic Information website[1];
- EA Catchment Data Explorer[2];
- Natural England website[3]; and
- Arun District Council website[4].

[1] Defra (2019) MagicMap GIS [Available at: https://magic.defra.gov.uk/MagicMap.aspx ; Accessed on 10/01/2020]
[2] Environment Agency (2019) Catchment Data Explorer [Available at: https://environment.data.gov.uk/catchment-planning/ ; Accessed on 10/01/2020]
[3] Natural England (2019) main website [Available at: https://www.gov.uk/government/organisations/natural-england ; Accessed on 10/01/2020]
[4] Arun District Council (2020) main website [Available at: https://www.arun.gov.uk/ ; Accessed on 10/01/2020]

3 BASELINE AND POTENTIAL CONSTRAINTS

3.1 INTRODUCTION

3.1.1. The following section provides an overview of each environmental topic, the associated study area, baseline levels as they currently exist, and outlines any potential constraints.

3.2 AIR QUALITY

STUDY AREA

3.2.1. For the purposes of this report, the study area for air quality has been limited to within 1km of the Scheme. Sensitive receptors within 200m have been highlighted as of particular importance.

BASELINE

3.2.2. The main sensitive receptors within the Study Area are residential. These are concentrated in Arundel in the north and Climping in the south. Additionally, commercial and community facilities are present within 1km; industrial estates (Rudford, Ford Airfield and Ford Lane), Ford railway station, education facilities (three primary schools), medical facilities (Arundel and District Hospital and Arundel Surgery GP), Arundel Castle and caravan parks (Climping and Ford). Of these, multiple residential receptors are within 200m of the Site as well commercial facilities, Ford railway station and St Mary's Church of England primary school.

3.2.3. One ecological designated site is present within 1km of the Site. This is a Site of Special Scientific Interest (SSSI) (Arundel Park) in the northern extent of the Study Area. The Site falls inside this SSSI Impact Risk Zone (IRZ). The Climping Beach SSSI (located on the coast west of Littlehampton) lies outside of the Study Area, however the SSSI IRZ is inside the Study Area, with the Site falling inside the IRZ.

3.2.4. No Air Quality Management Areas (AQMAs) are present within 1km of the Site.

3.2.5. The main air pollutants associated with road traffic emissions are:

- Nitrogen dioxide (NO_2) – Impacts human health;
- Nitrogen oxides (NO_x) – Impacts sensitive vegetation;
- Particulates less than 10 micrometres in diameter (PM_{10}) – Impacts human health; and
- Particulates less than 2.5 micrometres in diameter ($PM_{2.5}$) – Impacts human health.

3.2.6. Defra's Ambient Air Quality Map[5] shows that the Site has low levels of background pollutant levels:

- NO_2 – <10 to 10-20 μm^{-3};
- NO_x – 10-20 μm^{-3};
- PM_{10} – 13-17 μm^{-3}; and
- $PM_{2.5}$ – 5-10 μm^{-3}.

[5] Defra (2019) UK Ambient Air Quality Map [Available at: https://uk-air.defra.gov.uk/data/gis-mapping/ ; Accessed on 10/01/2020]

3.2.7. The Ambient Air Quality Map does not contain any information on roadside pollutant levels.

POTENTIAL CONSTRAINTS

3.2.8. Due to the nature and scale of the proposed works, air quality impacts are unlikely to be significant beyond 200m from the Scheme boundary. The construction phase may result in impacts from emissions of dust and particulates from construction vehicles and activities such as earthworks. The urban location and proximity of residential receptors to elements of the Site means that, while the works in each area are small in scale, surrounding properties, people and other receptors may be affected by emissions during construction.

3.2.9. No operational phase impacts or constraints are anticipated due to the nature of the Scheme which will provide NMU infrastructure, not resulting in an increase in motorised vehicles.

3.2.10. It is likely that potential construction impacts can be managed by standard best practice implemented through a Construction Environmental Management Plan (CEMP), including dust management measures. Due to the proximity of sensitive receptors this consideration is a priority in any CEMP.

3.2.11. Consultation with Natural England would be required regarding the SSSI IRZs, as the Site falls within these boundaries.

3.3 BIODIVERSITY

3.3.1. An assessment of potential biodiversity constraints can be found in the standalone report.

3.4 CULTURAL HERITAGE

STUDY AREA

3.4.1. Statutory designated historic assets have been identified within 1km of the Scheme and non-statutory historic assets within 300m have been identified.

BASELINE

3.4.2. The Site is adjacent, though not within (approximately 50m at its closest point), to Arundel Conservation Area.

3.4.3. Three Scheduled monuments are located within 1km of the Site (St Mary's Church Medieval Earthworks, Tortington Augustinian priory and ponds and Arundel Castle). Two of these assets (the Medieval Earthworks and Tortington Augustinian priory and ponds) and directly adjacent to the Site.

3.4.4. Arundel Castle designated Park is within the Study Area, located in the northern extent of the Study Area.

3.4.5. There are 218 listed buildings (six grade I, six grade II* and 206 grade II) within the Study Area. The majority of these (196) are within the Arundel Conservation Area in the north of the study area.

3.4.6. Arun District Council has produced a list of non-statutory heritage assets[6] which show non-statutory designated assets are present within the Study Area in Arundel, Tortington, Ford and Climping. These numbers of these assets are distributed as follows:

- Arundel – 130 assets;
- Tortington – 4 assets;
- Ford – 4 assets; and
- Climping – 2 assets.

POTENTIAL CONSTRAINTS

3.4.7. There is the potential for adverse construction impacts on nearby listed buildings, particularly those adjacent to the Site. However, it is likely that these impacts can be managed and mitigated through standard Best Practice Measures (BPMs) implemented though a CEMP. There is also the potential for the presence of undiscovered archaeology due to the historic context of Arundel in the north of the Study Area and Tortington. However, due to the Scheme taking place on previously disturbed ground, the potential for such discoveries and disturbances is low.

3.4.8. The nature of the Scheme will not result in major land-use change or changes in traffic conditions on the associated road network. As a result, no operational phase impacts are anticipated.

3.5 GEOLOGY AND SOILS

STUDY AREA

3.5.1. For the purposes of this report, the Study Area has been limited to within 1km of the Scheme.

BASELINE

3.5.2. Various superficial geology deposits persist in the Study Area, these are as follows[7]:

- Raised Marine Deposits – Clay, Silt, Sand and Gravel;
- Raised Beach Deposits – Sand and Gravel; and
- River Terrace Deposits (undifferentiated) – Sand, Silt and Clay.

3.5.3. The bedrock geology of the Study Area consists of the following:

- Spetisbury Chalk Member – Chalk;
- Lambeth Group – Clay, Silt and Sand;
- London Clay Formation – Clay Silt and Sand; and
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) – Chalk.

[6] Arun District Council (2005) Buildings or Structures of Character Supplementary Planning Document [Available at: https://www.arun.gov.uk/buildings-of-character-frequently-asked-questions/, accessed on 09/01/2020]
[7] British Geological Survey (2019) Geology of Britain Viewer [Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html? ; Accessed on 10/01/2020]

3.5.4. The soilscape of the Study Area is divided into the following classifications[8]:

- Shallow lime-rich soils over chalk or limestone – northern Arundel;
- Slow permeable seasonally wet slightly acid but base-rick loamy and clayey soils – western Arundel;
- Loamy and clayey soils of coastal flats with naturally high groundwater – eastern extent of the Study Area near the River Arun; and
- Freely draining slightly acid loamy soils – western extent of the Study Area around Climping, Ford and Tortington.

3.5.5. No Groundwater Source Protection Zones (SPZs) are present within the Study Area.

3.5.6. Within the Study Area there is one Regionally Important Geological and Geomorphological Site (RIGS) (ID TQ00-52)[9]. This is located at Black Rabbit Quarry to the north-east of Arundel.

3.5.7. An area of designated agricultural land is present in the south-west of the Study Area, between the Ford Airfield Industrial Estate and Rudford Industrial Estate. The majority of the land is a Grade 2 classification, with a minority of 3a and 'Other' classification.

3.5.8. The Unexploded Ordnance Risk (UXO) throughout the study area is deemed low risk with the exception of the Arundel area, which is classed as a moderate risk[10].

POTENTIAL CONSTRAINTS

3.5.9. During the construction phase there is the potential for the accidental release of pollutants to the environment from sources such as spilled fuel or material. The soil quality in unlikely to be affected by this in the urban portions of the Study Area but there is increased potential for adverse impacts in the rural portions of the Study Area due to the surrounding land use containing large areas of arable land. These impacts would be managed and mitigated through BPMs outlined and implemented in a CEMP. In addition, there is the potential for discovery and disturbance of pre-existing contamination during construction works is a potential constraint. This would be addressed through Ground Investigation (GI) works prior to construction, alongside associated geotechnical investigations if required.

3.5.10. Operational impacts of the Scheme are unlikely to occur due to the lack of changes to the soil environment, the proposed works are to take place on previously disturbed ground and will not introduce increased traffic levels and the associated pollution risks.

[8] UK Soil Observatory (2019) UKSO Viewer [Available at: http://mapapps2.bgs.ac.uk/ukso/home.html ; Accessed on 10/01/2020]
[9] Sussex Biodiversity Record Centre (2012) Sussex Geodiversity Partnership – Sussex Local Geological Sites [Available at: https://www.geodiversitysussex.org.uk/riggs.php, accessed on 09/01/2020]
[10] Zetica (2019) Unexploded Ordnance Risk Maps [Available at: https://zeticauxo.com/downloads-and-resources/risk-maps/ ; 14/01/2020]

3.6 LANDSCAPE AND VISUAL

STUDY AREA

3.6.1. For the purposes of this report, the Study Area has been limited to within 1km of the Scheme.

BASELINE

3.6.2. The South Downs National Park (SDNP) is located in the northern extent of the Study Area, north of Arundel.

3.6.3. Multiple trees subject to a Tree Preservation Order (TPO) are within the Study Area. There are TPOs adjacent to the Site in the extreme north and south of the Study Area, located adjacent to Crookthorn Lane in Climping and the A27 in Arundel.

3.6.4. The majority of the Study Area lies within the South Coast Plain National Character Area (NCA) (NCA no. 126). The area is described as *"a flat, coastal landscape with an intricately indented shoreline lying between the dip slope of the South Downs and South Hampshire Lowlands and the waters of the English Channel, Solent and part of Southampton Water"*[11]. The northern extent of the Study Area is in the South Downs NCA (NCA no. 125). The area is described as *"a 'whale-backed' spine of chalk stretching from the Hampshire Downs in the west to the coastal cliffs of Beachy Head in East Sussex* […] *an extremely diverse and complex landscape with considerable local variation representing physical, historical and economic influences; much of it has been formed and maintained by human activity, in particular in agriculture and forestry"*.

3.6.5. The majority of the Scheme lies within a rural environment, adjacent to an existing road, with sparsely concentrated residential and commercial properties. The environment is far more suburban in the north, focused around Arundel, and industrial in the south (north of Climping).

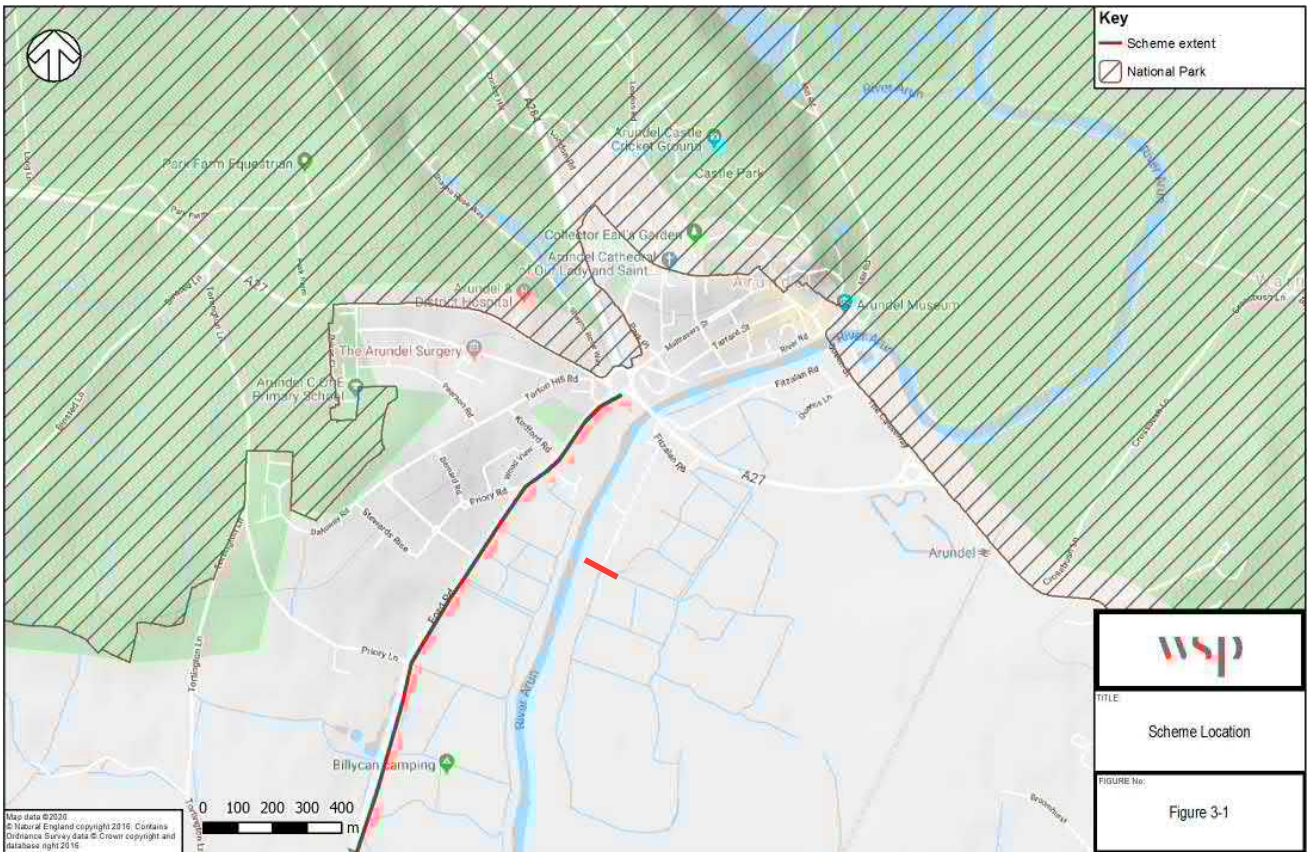
POTENTIAL CONSTRAINTS

3.6.6. The Study Area intersects the SDNP (see Figure 3-1), however the Site does not fall within the SDNP and the Scheme will not alter the landscape characterises of the area. The works may require alteration or removal of some roadside trees, some of these being subject to TPOs. The detailed design stage should ensure that tree removal is avoided. Where this is not possible this would cause impacts to the visual amenity of the immediate surroundings of the streets and may result in adverse impacts to retained trees due to the proximity of the construction works. Construction impacts would then need to be managed and mitigated through BPMs implemented through a CEMP.

3.6.7. No operational phase constraints are anticipated. Impacts of the Scheme in the operation phase are likely to be positive, improving the visual aesthetic of the road network and accessibility to the surrounding landscape.

[11] Natural England (2014) National Character Area profiles [Available at: https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-south-east-england-and-london, accessed on 09/01/2020].

Figure 3-1 - South Downs National Park Boundary



Note - Northern extent of the site marked in red, SDNP marked by hatch area

3.7 NOISE AND VIBRATION

STUDY AREA

3.7.1. For the purposes of this report, the Study Area has been limited to within 1km of the Scheme. Sensitive receptors within 200m have also been highlighted.

BASELINE

3.7.2. Within the Study Area there are multiple Noise Action Planning Important Areas (NIAs). These all occur on the A27 in Arundel or the A259 south of Climping. Four NIAs are present on the A27 and one on the A259.

3.7.3. The major source of noise in the study area are roads. In particular the A27 and A259 in the north and south of the Study Area respectively, which see average roadside noise levels exceeding 75dB

(Lden). Rail noise is also present, with the rail network passing through the study area north of Ford. Average noise levels from rail reach 65-70dB (Lden)[12].

3.7.4. The main sensitive receptors within the study area are residential. These are concentrated in Arundel in the north and Climping in the south. Additionally, commercial and community facilities are present within 1km; industrial estates (Rudford, Ford Airfield and Ford Lane), Ford railway station, education facilities (three primary schools), medical facilities (Arundel and District Hospital and Arundel Surgery GP), Arundel Castle and caravan parks (Climping and Ford). Of these, multiple residential receptors are within 200m of the Site as well as commercial facilities, Ford railway station and St Mary's Church of England primary school.

POTENTIAL CONSTRAINTS

3.7.5. During the construction phase there is the potential for adverse impacts on adjacent and nearby receptors from increased noise and vibration levels. These increases would be associated with construction activities and temporary disruptions to traffic flow to facilitate the completion of the works. It is likely that potential impacts from construction noise and vibration can be managed be standard BPMs implemented through a CEMP. Due to the proximity of sensitive receptors, particularly residential receptors, this would be a priority issue in any CEMP.

3.7.6. The Scheme would improve accessibility to NMU transports methods. There is the potential for positive effects on noise and vibration levels due to any associated reduction in motorised vehicle usage due to this improved accessibility, however these effects are not anticipated to be significant.

3.8 POPULATION AND HEALTH

STUDY AREA

3.8.1. For the purposes of this report, the Study Area has been limited to within 1km of the Scheme. Sensitive receptors within 200m have also been highlighted.

BASELINE

3.8.2. Multiple Public Rights of Way (PRoW) are present in the Study Area. A major PRoW route runs alongside the west bank of the River Arun along the entire length within the Study Area. Additional PRoWs are located to the west of the Road associated with the Scheme, concentrated around Tortington Common and Ford. Part of the Sustrans National Cycle Network (route number 2) runs alongside the A259.

3.8.3. The main sensitive receptors within the study area are residential. These are concentrated in Arundel in the north and Climping in the south. Additionally, commercial and community facilities are present within 1km; industrial estates (Rudford, Ford Airfield and Ford Lane), Ford railway station, education facilities (three primary schools), medical facilities (Arundel and District Hospital and Arundel Surgery GP), Arundel Castle and caravan parks (Climping and Ford). Of these, multiple

[12] Extrium (2020) England Noise and Air Quality Viewer [Available at: http://www.extrium.co.uk/noiseviewer.html ; Accessed on 10/01/2020]

residential receptors are within 200m of the Site as well commercial facilities, Ford railway station and St Mary's Church of England primary school.

POTENTIAL CONSTRAINTS

3.8.4. There is the potential for existing NMU routes, PRoW routes and the existing road network to be adversely affected during the construction phase. These impacts would be temporary but would affect multiple factors such as journey time, NMU and public transport accessibility, journey stress and community connectivity. Due to the small-scale nature of the works, these are not anticipated to be significant.

3.8.5. The aim of the Scheme is to increase the connectivity of cycle infrastructure and improve pedestrian accessibility as well. Due to this the Scheme is considered to have a positive long-term impact on people and communities.

3.9 ROAD DRAINAGE AND THE WATER ENVIRONMENT

STUDY AREA

3.9.1. For the purposes of this report, the Study Area has been limited to within 1km of the Scheme.

BASELINE

3.9.2. The River Arun is the major surface water feature within the Study Area and the river's catchment area (Arun and Western Streams) encompasses the entirety of the study area, it is a statutory main river running in a north to south direction. The river is the main source of any flood risk within the Study Area.

3.9.3. A large number of surface water streams and ponds are also present in the Study Area, these are concentrated branching off the River Arun, in particular the east bank.

3.9.4. The east of the Study Area, along with the central area around Ford, are within a Flood Zone 3 (high probability of flooding from rivers of >1%) and Flood Zone 2 (medium probability of flooding, an annual of flooding probability from rivers of 0.1-1%) area[13]. A large proportion of the Site is within the Flood Zone 3, in particular the areas south of Arundel and north of Ford.

POTENTIAL CONSTRAINTS

3.9.5. The Site runs alongside the River Arun, a statutory main river and source of flood risk. Due to this proximity there is the potential for adverse impacts as a result of construction activities in the construction phase. There is the potential for impacts on the river and other water bodies from the release of pollutants from sources such as accidental spillage or run-off from improperly stored materials.

3.9.6. The Scheme is located within Flood Zone 2 and Flood Zone 3 areas , this means the Scheme would be vulnerable, or increase the vulnerability of other receptors, to flood risk. Measures to mitigate

[13] Environment Agency (2020) Flood Map for Planning [Available at: https://flood-map-for-planning.service.gov.uk/confirm-location?easting=474819&northing=106334&placeOrPostcode=emsworth ; Accessed on 10/01/2020]

flood risk would be required for both the construction phase (through implementation through a CEMP) and the operation phase (through adequate drainage provision).

3.9.7. Due to the nature of the works none of these constraints and effects are anticipated to be significant.

4 SUMMARY AND RECOMMENDATIONS

4.1.1. The findings of this desktop environmental constraints study are summarised in the table below:

Table 4-1 – Summary of Key Constraints

Environmental Topic	Key Constraints	Mitigation
Air Quality	▪ Residential Receptors; ▪ Education Facilities; and ▪ Arundel Park SSSI and Climping Beach SSSI IRZ.	▪ Consultation with the EA over SSSI IRZ; and ▪ BPM inputs into a CEMP.
Biodiversity	▪ A standalone biodiversity report has been prepared. ,	▪ A standalone biodiversity report has been prepared.
Cultural Heritage	▪ Arundel Listed Buildings; and ▪ Tortington Scheduled Monuments.	▪ BPM inputs into a CEMP.
Geology and Soils	▪ Local soilscape.	▪ GI and associated testing; and ▪ BPM inputs into a CEMP.
Landscape and Visual	▪ SDNP; ▪ TPOs; and ▪ Designated Agricultural Land.	▪ BPM inputs into a CEMP; and ▪ Avoidance of tree removal in the detailed design stage.
Noise and Vibration	▪ Residential Receptors; and ▪ Education Facilities.	▪ BPM inputs into a CEMP.
Population and Health	▪ Road and NMU network users; ▪ Residential Receptors; ▪ Education Facilities; ▪ Community and commercial facilities; and ▪ PRoW network and users.	▪ BPM inputs into a CEMP.
Road Drainage and the Water Environment	▪ Surface Water bodies (River Arun); ▪ Flood vulnerable receptors; and ▪ The Scheme.	▪ BPM inputs into a CEMP.

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Appendix E

ECOLOGY REPORT

MEMO

TO	Samantha Grant, Chris Williams	**FROM**	Victoria Johnston
DATE	03 February 2020	**CONFIDENTIALITY**	Confidential
SUBJECT	A27 NMU Links Improvements Package – Ford Road		

HIGHWAYS ENGLAND – FORD ROAD NON- MOTORISED USER (NMU) LINKS FEASIBILITY STUDY

Introduction

This memo will support a feasibility study, which will examine the infrastructure improvements to Ford Road for Non-Motorised Users (NMUs). The 'gold option' for these works comprises a continuous north-south cycle route using a shared-use path system, with all works confined to the highway boundary, hereafter referred to as the 'Proposed Development'. Ford Road is situated in southern Arundel and runs southwards through Climping Village, West of the River Arun.

This memo provides a summary of the desk-based assessment in the absence of field surveys at this stage. The Indicative Site location for the area to be affected by the Proposed Development is shown in Figure 1. The Proposed Development aims to upgrade and connect existing cycle provisions along Ford Road for a length of approximately 10km to provide a safe and continuous cycle route.

The aerial and street view inspection of the Indicative Site footprint indicates that the surrounding habitat comprises residential housing estates, arable land, small areas of deciduous woodland, dense and continuous scrub and larger areas of amenity grassland. The northern portion of the Indicative Site is mainly dominated by residential areas, however arable land spans most of the area to the centre and southern portions of the Indicative Site footprint.

Methods

The desk study was undertaken in January 2020 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within various radii around the Indicative Site boundary (as noted below). Various radii were used due to the minimal footprint of the Proposed Development, therefore aerial species such as bats and birds were recorded within 2km whereas all terrestrial species were recorded within 1km due to their typically smaller ranges.

FREELY AVAILABLE SOURCES

Freely downloadable datasets (available from Natural England) were consulted for information regarding the presence of statutory designated sites[1] and habitats within 2km of the Indicative Site. This search was extended to 5km for Natura 2000 sites[2] of European importance and internationally designated Ramsar sites. Freely downloadable datasets (available from Natural England) were also consulted for information regarding Habitats of Principal Importance (HPI)[3] within 500m and woodland listed on the Ancient Woodland Inventory[4]. In addition, open source 1:25,000 Ordnance Survey mapping was used to identify any mapped water bodies and watercourses within 500m of the Indicative Site.

SPECIES RECORDS PROVIDED BY BIOLOGICAL RECORDS CENTRE

To provide the baseline data for the ecological desk study, the following information was requested from Sussex Biological Records Centre (SxBRC):

- records of legally protected, notable and invasive non-native (INNS) species within 1km of the Indicative Site including Species of Principal Importance (SPI)[5];
- bat and bird records within a 2km radius of the Indicative Site; and
- records of non-statutory sites designated for nature conservation value within 1km of the Indicative Site.

LIMITATIONS

Every effort has been made to provide a comprehensive desk-based assessment of the ecology of the Indicative Site; however, the following specific limitation applies to this assessment:

- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.

Results

DESIGNATED SITES

STATUTORY DESIGNATED SITES OF INTERNATIONAL IMPORTANCE

The desk study identified no internationally designated nature conservation site within 5km of the Indicative Site boundary.

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[1] Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

[2] Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

[3] Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances, these are primarily based on aerial photograph analysis rather than field survey.

[4] The ancient woodland inventory in England lists areas over two hectares in size which have been continuously wooded since at least 1600.

[5] Species of Principal Importance (SPI) are those species listed under Section 41 of the Natural Environment and Rural Communities Act 2006, and are therefore a material consideration in the planning process.

STATUTORY DESIGNATED SITES OF NATIONAL IMPORTANCE

Three nationally designated sites are located within 2km Study Area. These sites are described in Table 1 below and are shown in Figure 2.

Table 1. National statutory designated sites

Site Name	Designation	Size (ha)	Distance from Study Area	Description
Arundel Park	SSSI	134.0	0.5km, North	Arundel Park lies within the South Downs National Park and is considered one of the most important sites in the country for invertebrates. It is known to hold a variety of rare and notable species, including the field cricket *Gryllus campestris* and the beetle *Laemophloeus monilis.* The park supports up to 25 species of breeding butterflies, including the Duke of Burgundy fritillary *Hamearis lucina*, brown argus *Aricia agestis* and chalk hill blue *Lysandra coridon*. The breeding bird community consists of hobby *Falco subbuteo*, tawny owl *Strix aluco*, nightingale *Luscinia megarhynchos* and all three British species of woodpecker. There is a variety of woodland at Arundel Park, including beech *Fagus sylvatica*, yew *Taxus baccata,* holly *Ilex aquifolium*, ash *Fraxinus excelsior*, oak *Quercus robur* and sycamore *Acer pseudoplatanus* (Natural England, 2020a).
Climping Beach	SSSI	65.0	1.2km, South	Climping Beach is a stretch of coast with a vegetated shingle beach, behind which is a sand dune system. The intertidal zone supports important populations of wintering birds and the numbers of wintering sanderling *Calidris alba* are of European significance. The vegetation running along the shingle beach includes yellow horned poppy *Gaucium flavum*, sea dale *Crambe maritima*, sea beet *Beta vulgaris*, curled dock *Rumex crispus* and sea holly *Eryngium maritimum*. The sand dunes are dominated by marram-grass *Ammophila arenaria,* however, red fescue grass *Festuca rubra*, sand catchfly *Silene conica*, sand sedge *Carex arenaria* and viper's bugloss *Echium vulgare* are also present alongside the locally uncommon plant, Nottingham catchfly *Silene nutans*. Climping Beach also supports numbers of grey plover *Pluvialis squatarola* and oystercatcher *Haematopus ostralegus* (Natural England, 2020b).
West Beach	LNR	15.0	1.8km, South	West Beach is one of only a few undeveloped stretches of coastline between Brighton and Bognor Regis and attracts many visitors from outside the County. The dunes are part of one of only two sand dune systems in West Sussex. The sand lizards *Lacerta agilis* are rare enough to warrant European protection, and four Nationally Scarce burrowing bees and wasps have been recorded in the dunes. The vegetated shingle, though locally common, is internationally rare. The sand flats host large numbers

Site Name	Designation	Size (ha)	Distance from Study Area	Description
				of migratory waders in the winter months, including sanderling and oystercatcher.

NON-STATUTORY DESIGNATED SITES

Three non-statutory nature conservation sites (Local Wildlife Sites (LWS)) are present within the 1km Study Area and detailed in below Table 2.

Table 2. Non-statutory designated sites

Site Name	Designation	Size (ha)	Distance from Study Area	Description
Rewell Wood Complex	LWS	678.0	0km, West	Rewell Wood is a large ancient woodland complex. It has a diversity of habitats, including ancient semi-natural woodland comprised of sweet chestnut *Castanea sativa* coppice, conifer plantation, beech *Fagus sylvatica* plantation and species-rich chalk grassland. Wide rides and glades support a rich flora and butterfly fauna. The disused gravel pits are of entomological importance. The semi-natural woodland contains pedunculate oak *Quercus robur*, beech, ash *Fraxinus excelsior*, field maple *Acer campestre* and hazel *Corylus avellana*. These are extensive areas of worked chestnut coppice. Both types of woodland have dense carpets of bluebells *Hyacinthoides nonscripta* with wood spurge *Euphorbia amygdaloides*, honeysuckle *Lonicera periclymenum*, pignut *Conopodium majus*, bugle *Ajuga reptans*, early-purple orchid *Orchis mascula*, tutsan *Hypericum androsaemum* and spurge laurel *Daphne laureola*. The rare small teasel *Dipsacus pilosus* has been recorded in Screens Wood. Many of the wide rides and woodland glades support species-rich chalk grassland. The interesting flora includes cowslip *Primula veris*, sweet violet *Viola odorata*, hairy violet *Viola hirta*, columbine *Aquilegia vulgaris*, fairy flax *Linum catharticum*, wild strawberry *Fragaria vesca*, marjoram *Origanum vulgare*, salad burnet *Sanguisorba minor* and musk mallow *Malva moschata*. The rare white mullein *Verbascum lychnitis* has been found at the eastern end. Rewell Wood supports a good population of hazel dormice *Muscardinus avellanarius* and approximately six pairs of nightjar *Caprimulgus europaeus* breed annually.
Binstead Wood Complex	LWS	217.0	0.5km, West	Binstead Wood is a complex of woodland sites, which includes Hundred House Copse in the west and Stewards Copse to the east. There is a mixture of ancient woodland, recent woodland, conifer plantation, species-rich pasture and old tracks and shaws. The mix of habitats and geology gives rise to a very rich and diverse flora. This is the largest block of ancient semi-natural woodland south of the South Downs in Sussex. Oak dominates the canopy with silver birch *Betula pendula* and sweet chestnut and an irregular understorey of hazel. The ground flora is mostly bracken *Pteridium aquilinum* and bramble *Rubus fruticosus* agg. with carpets of bluebell and wood anemone *Anemone nemorosa*.

Site Name	Designation	Size (ha)	Distance from Study Area	Description
				There is a rich butterfly fauna, including ringlet *Aphantopus hyperantus*, silver-washed fritillary *Argynnis paphia*, white admiral *Limenitis camilla* and purple emperor *Apatura iris*. Freshwater cockles, first recorded from Binstead Brook in 1896, still occur there. Glow-worms *Lamb Hyridae* have also been seen. Within Binstead woods, Scotland Lane is a wide, damp ride with a very diverse flora, including various sedges with large stands of long-stalked yellow-sedge *Carex lepidocarpa* as well as green ribbed sedge *C.binervis*, wood sedge *C.sylvatica,* oval sedge *C.ovalis* and grey sedge *C.divulsa* along with lesser skullcap *Scutellaria minor*, ragged robin *Lychnis flos-cuculi*, and betony *Stachys officinalis*. The drier margins of the ride support gorse *Ulex europaeus* and ling *Calluna vulgaris.*
Arun Valley, Watersfield to Arundel	LWS	782.0	1.0km, East	This section of the River Arun and its floodplain forms an extensive tract of wetland, a nationally declining habit. Although many of the flood meadows have been improved, the wet grassland is important for breeding and wintering waders and wildfowl. The unimproved meadows of Watersfield Brooks are of great botanical interest. Some of the ditches, particularly those west and north of Amberley and around North Stoke, have rich floras with rarities such as cut-grass *Leersia oryzoides*, sharp leaved pondweed *Potamogeton acutifolius*, small water-pepper *Polygonum minus* and common meadowrue *Thalictrum flavum*, plus many other notable species, including mare's-tail *Hippuris vulgaris*, fan-leaved water-crowfoot *Ranunculus circinatus*, frogbit *Hydrocharis morsusranae*, arrowhead *Sagittaria sagittifolia*, tubular water-dropwort *Oenanthe fistulosa*. A rare native tree, the black poplar *Populus nigra* grows in the Arun Valley. Marsh violet *Viola palustris* and a large population of the nationally scarce marsh fern *Thelypteris palustris* grows in an area of Alder carr. The wetlands here support breeding redshank *Tringa totanus*, lapwing *Vanellus vanellus*, snipe *Gallinago gallinago* and yellow wagtail *Emberiza citronella*, and in winter attract large numbers of waders and wildfowl, including teal *Anas crecca* and Bewick's swan *Cygnus columbianus bewickii*. The grasslands are important feeding grounds for whimbrel *Numenius phaeopus* on spring passage. The reedbeds of the Arundel Wildfowl and Wetlands Trust reserve and along the River Arun and ditches are a major stronghold of breeding reed warblers *Acrocephalus scirpaceus* in West Sussex.

HABITATS

OTHER HABITATS OF CONSERVATION IMPORTANCE

Within the 500m Study Area the closest patch of ancient woodland mapped is 170m north of the Indicative Site. HPIs including areas of deciduous woodland, several patches of coastal & floodplain grazing marsh, coastal saltmarsh and traditional orchard were also found within the Study Area, which are shown in Table 3 below and Figure 3. All waterbodies within 500m of the Indicative Site were also mapped within Figure 4.

Table 3. HPI within 500m of the Indicative Site

HPI	Distance of closest parcel from Indicative Site
Coastal and floodplain grazing marsh	0km
Deciduous woodland	0.1km
Mudflats	0.2km
Traditional orchard	0.3km
Coastal saltmarsh	0.5km

The desk study returned five designated road verges[6] (DRV). DRVs are areas of roadside verge that have been designated for their special wildlife interest. They can hold spectacular displays of wild flowers, including rare orchids and other plant species indicative of old meadows, and can be of great importance to invertebrates and fungi. There is no statutory protection for road verges, but they can be found within both non-statutory and statutory designations. As linear features, road verges naturally traverse a wide range of habitat types, soils and geology. The species composition of DRVs can therefore be varied. Swathes of cow parsley *Anthriscus sylvestris*, cuckoo flower *Cardamine pratensis*, primroses *Primula vulgaris* and orchids *Orchidaceae* can be found. Down land herbs, meadow flowers and heathers support a range of insects, as do the areas of bare ground which are used by nesting bees and wasps. Reptiles, amphibians and mammals can find shelter along these verges and use them as valuable green corridors.

PROTECTED/NOTABLE SPECIES

A summary of the desk study results returned for protected and notable species is provided below. Focus has been given to species which may utilise the Indicative Site and its surrounding area. A number of these are identified as SPI under Section 41 of the NERC Act (2006). Under Section 40 of this legislation, every public body (including planning authorities) must, 'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'.

BATS

Fourteen species of bat were returned from the desk study, including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii,* noctule *Nyctalus noctula*, Leisler's bat *Nyctalus leisleri,* serotine *Eptesicus serotinus*, brown long-eared bat *Plecotus auritus,* western barbastelle *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii,* Daubenton's bat *Myotis daubentonii,* Natterer's bat *Myotis nattereri,* Brandt's bat *Myotis brandtii*, Alcathoe bat *Myotis alcathoe* and whiskered bat *Myotis mystacinus.*

[6] 'Designated Wildlife Verge' is a local non-statutory designation which identifies highway verges in East Sussex that have wildlife habitat significance.

Some records were only identified to genus level, including *Myotis, Plecotus, Pipistrellus* and *Nyctalus* species. There were also records provided where no identification was made and so were identified as a bat species. The nearest activity records to the Indicative Site are for both common pipistrelle and soprano pipistrelle which have been recorded approximately 60m away. The closest roost recorded was for a serotine bat, also at approximately 60m from the Indicative Site boundary. All bat records are shown in Figure 5.

BADGER

No records of badger *Meles meles* were returned from the desk study, as such information is confidential and must be specially requested. Badger are widespread and adaptable species able to create setts and forage in a wide range of semi-natural habitats.

HAZEL DORMOUSE

Thirteen records of hazel dormouse were returned from the desk study and shown in Figure 6. The nearest dormouse record, approximately 830m from the Indicative Site boundary, was collected in 2018. Rewell Wood Complex LWS (refer to Table 2), which is immediately adjacent to the Indicative Site boundary and has been recorded to support a good population of hazel dormice.

WATER VOLE AND OTTER

No records of otter *Lutra lutra* were returned for the desk study, while 31 records of European water vole *Arvicola amphibius* were returned. The closest water vole record was 50m from the Indicative Site boundary, see Figure 6.

OTHER MAMMALS

Records of other mammal species returned from the desk study include West European hedgehog *Erinaceus europaeus*, European rabbit *Oryctolagus cuniculus* and brown hare *Lepus europaeus*.

BIRDS

Records of 98 bird species were returned by the desk study and shown in Figure 7. These included 35 species listed under Schedule 1 of the Wildlife and Countryside Act, such as barn owl *Tyto alba*, firecrest *Regulus ignicapilla*, hobby *Falco subbuteo* and red kite *Milvus milvus*. Records for Cetti's warbler *Cettia cetti*, kingfisher *Alcedo atthis* and yellowhammer *Emberiza citrinella* within 100m were returned as well as records for cuckoo *Cuculus canorus* immediately adjacent to the Indicative Site.

REPTILES

The desk study returned three species of reptile; slow-worm *Anguis fragilis*, adder *Vipera berus* and grass-snake *Natrix helvetica*. Of these, the closest to the Indicative Site was slow worm, recorded approximately 540m away and is shown in Figure 8.

AMPHIBIANS

Four species of amphibians were returned in the desk study (see Figure 8), most abundantly great crested newt (GCN) *Triturus cristatus* of which 17 records were returned, the closest in distance being 250m from the Indicative Site. Common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and common frog *Rana temporaria* were recorded at 540m from the Indicative Site close the waterbodies shown in Figure 4.

INVERTEBRATES

The desk study returned 101 records of invertebrate species within the Study Area, which are shown in Figure 9. Among these species were records for species afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981, as amended, including purple emperor *Apatura iris* and swallowtail *Papilio machaon* at 350m from the Indicative Site boundary. Stag beetle *Lucanus cervus*, a SPI as listed under Section 41 of the NERC Act 2006, was recorded within 83m of the Indicative Site.

PLANTS

Forty protected and/or notable plant species were returned in the desk study from within the 1km Study Area. The closest of these records was corn parsley *Petroselinium segetum* at 90m from the Indicative Site boundary. Records also provided included divided sedge *Carex divisa* (Section 41 NERC Act 2006) at 350m and bluebell (Schedule 8 of the Wildlife and Countryside Act) at 460m from the Indicative Site.

INVASIVE NON-NATIVE SPECIES (INNS)

The desk study returned records for Japanese knotweed *Reynoutria japonica* and variegated yellow archangel *Lamiastrum galeobdolon* within 500m of the Indicative Site. These results are shown in Figure 10. Both species are listed as invasive under Schedule 9 of the Wildlife and Countryside Act (1981) and therefore it is an offence to cause these species to spread or grow in the wild. The closest record to the Indicative Site was for three-cornered garlic *Allium triquetrum*, approximately 200m away. Other non-native invasive species returned from the desk study included American mink *Neovison vison,* harlequin ladybird *Harmonia axyridis* and 146 records of the mandarin duck *Aix galericulata*, all as listed under Schedule 9 of the Wildlife and Countryside Act (1981).

Recommendations

Further survey, avoidance and mitigation recommendations have been outlined below to ensure the potential effects of the Proposed Development on biodiversity is avoided and minimised and to enable compliance with legislation and planning policy where appropriate. Recommendations for ecological enhancement have also been made.

FURTHER SURVEYS

Further surveys may be required depending on the detailed design of the Proposed Development and the extent to which semi-natural habitats will be affected. Where works do not significantly affect soft estate, it may be possible to avoid the need for any further survey (see Preliminary Avoidance and Mitigation measures below). The requirements for further ecological assessment should be reviewed as proposals emerge.

If required, in the first instance, this would include an extended Phase 1 habitat survey of the Indicative Site based on published guidelines (JNCC, 2010). This survey would map and describe the habitats present, as well as note the potential for protected or notable species to be present, thereby identifying constraints to the Proposed Development.

Dependent on the potential for protected or notable species, further species group surveys may be recommended. Given the data returned from the desk study, several protected species have been recorded using the area surrounding the Indicative Site, therefore the following further surveys may be necessary:

- Preliminary bat roost assessment (PBRA);
- Bat activity;
- Hazel dormouse;

- Water vole;
- Breeding bird;
- Reptiles;
- Great crested newt; and
- INNS

The results of these further surveys will inform the requirement or otherwise for ecological avoidance, mitigation and compensation measures to reduce the effects upon ecological features.

PRELIMINARY AVOIDANCE AND MITIGATION MEASURES (DESIGN)

At this stage outline mitigation recommendations (subject to confirmation) only are given to avoid and minimise potential ecological effects associated with the proposed development.

- Effects to the adjacent designated LWS, HPI and designated road verges should be avoided. Where unavoidable, further ecological assessment would be required.
- The detailed design should seek to retain HPI, mature trees, hedgerows, grassland and areas of woodland where possible. Where unavoidable and effects to these habitats occur, they should be replaced in line with Biodiversity net gain (BNG) requirements in accordance with the NPPF (2019) .
- The landscape design for the proposed works should seek to include habitats of known value to wildlife, including the establishment of wildflower-rich grassland and areas of scrub. Locally sourced species should be used, and the use of fertilisers avoided. Natural regeneration should be promoted where appropriate and the importation of topsoil should be avoided as far as possible to help to maintain local biodiversity.

LIGHTING

Any new or additional lighting associated with the Proposed Development should be sensitively designed in order to minimise effects upon wildlife, especially bat species. The following broad principles should be considered during lighting design (in accordance with the guidance in 'Bats and artificial lighting in the UK' (ILP, 2018):

- Lighting should be used only where necessary.
- Where lighting is necessary, it should be directed away from and avoid light spill into adjacent habitats.
- Lights that emit UV and blue-white short wavelengths should be avoided.

Recommendations can be defined further following the progression of design and undertaking the necessary ecology surveys.

MITIGATION MEASURES (CONSTRUCTION PHASE)

Several precautions should be taken to ensure legal compliance during the construction phase. Ideally, these would be included within a Construction Environmental Management Plan (CEMP), which will provide details of appropriate mitigation measures, including programme, and their integration with the construction activities. The following provides an example of what could be included in the CEMP.

- Any necessary clearance of scrub and trees should be timed to be undertaken outside of the breeding bird season (indicatively March-August inclusive). If this is not possible nesting bird checks should be undertaken prior to clearance with active nests checked for and retained with a suitable buffer until such time that young birds have fledged and left the nest.
- Appropriate construction phase precautions will need to be implemented to ensure that incidental pollution of adjacent habitats does not occur.
- Any deep excavations should not be left uncovered or if this is unavoidable, a means of escape (e.g. a ramp) should be provided to ensure animals including common amphibians and mammals (e.g. badgers) do not get trapped.

Conclusions

Given the results of the desk-based assessment, requirements for further surveys should be reviewed to inform detailed design. It is however, highly likely that further ecological assessment will be required.

Vicki Johnston
Graduate Ecologist

Reviewed by Verity Dickie, Principal Ecologist

Authorised by Adrian Hutchings, Technical Director

References

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Figures

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Indicative Site location plan

Drawing No: Figure 1
Date: February 2020
Scale: 1:27,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

N

Key

- Indicative Site
- 2km Study Area
- Local Nature Reserve
- Site of Special Scientific Interest

0 0.5 1 1.5 2 km

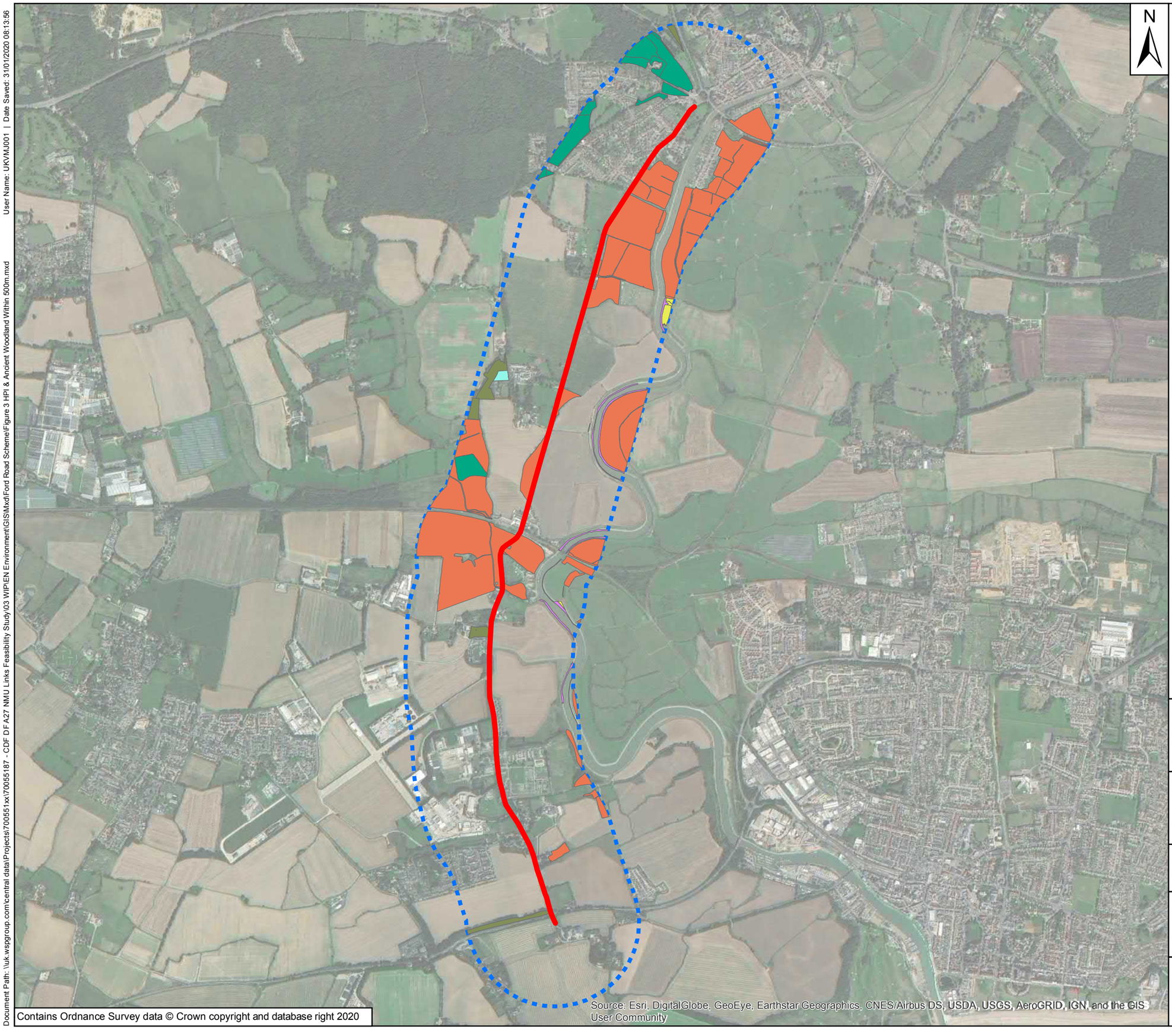
wsp

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: UK statutory designated sites within 2km

Drawing No:	Figure 2	Drawn:	VJ
Date:	February 2020	Checked:	VD
Scale:	1:35,000 @ A3	Approved:	AH



Client:
Highways England

Project:
A27 NMU Links Feasibility Study - Ford Road Scheme

Title
Habitats of principal importance (HPI) & ancient woodland (AW) within 500m

Drawing No: Figure 3
Date: February 2020
Scale: 1:22,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

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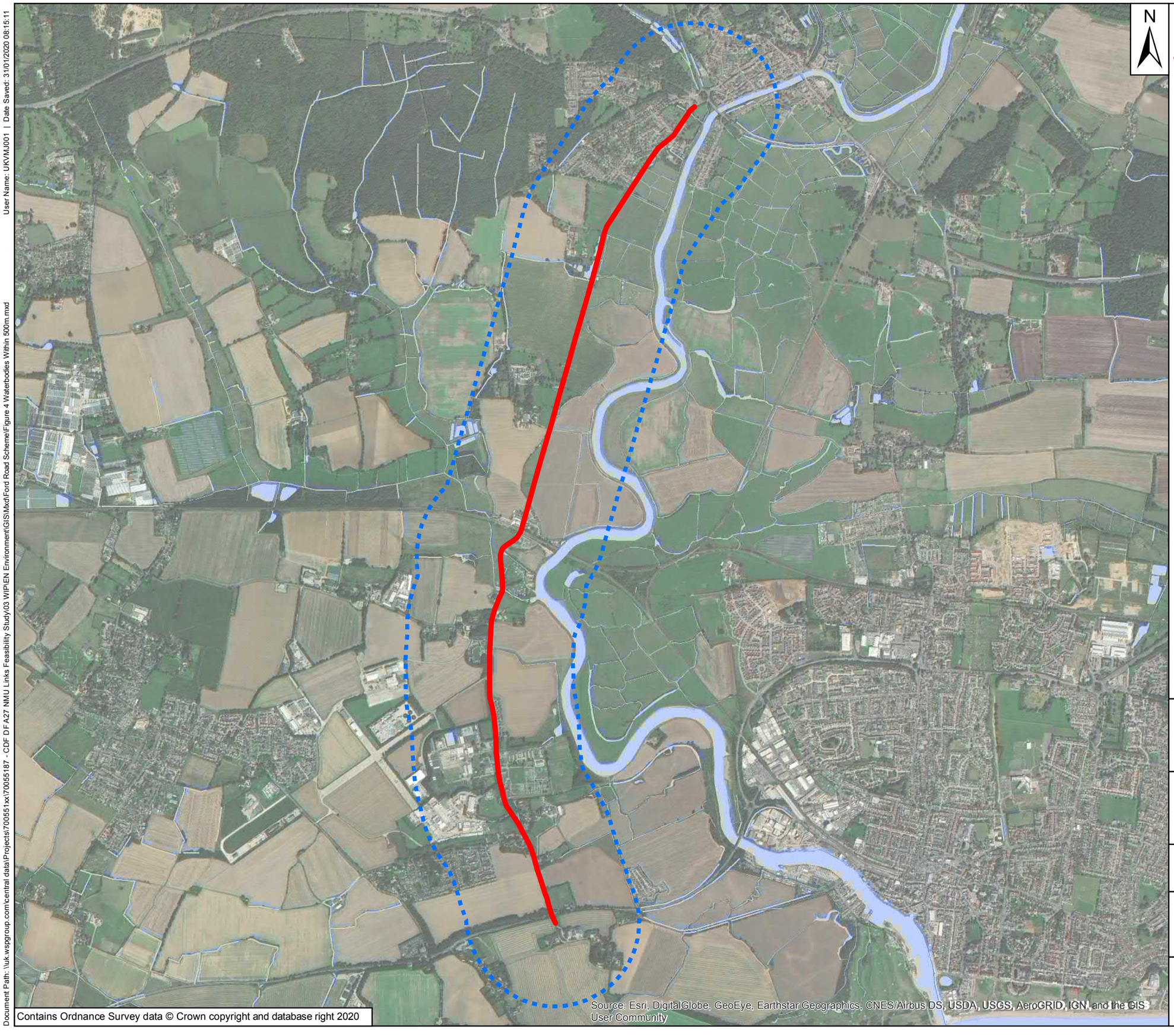

Client:
Highways England

Project:
A27 NMU Links Feasibility Study - Ford Road Scheme

Title
Waterbodies within 500m

Drawing No: Figure 4
Date: February 2020
Scale: 1:22,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

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Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Notable bat species records within 2km

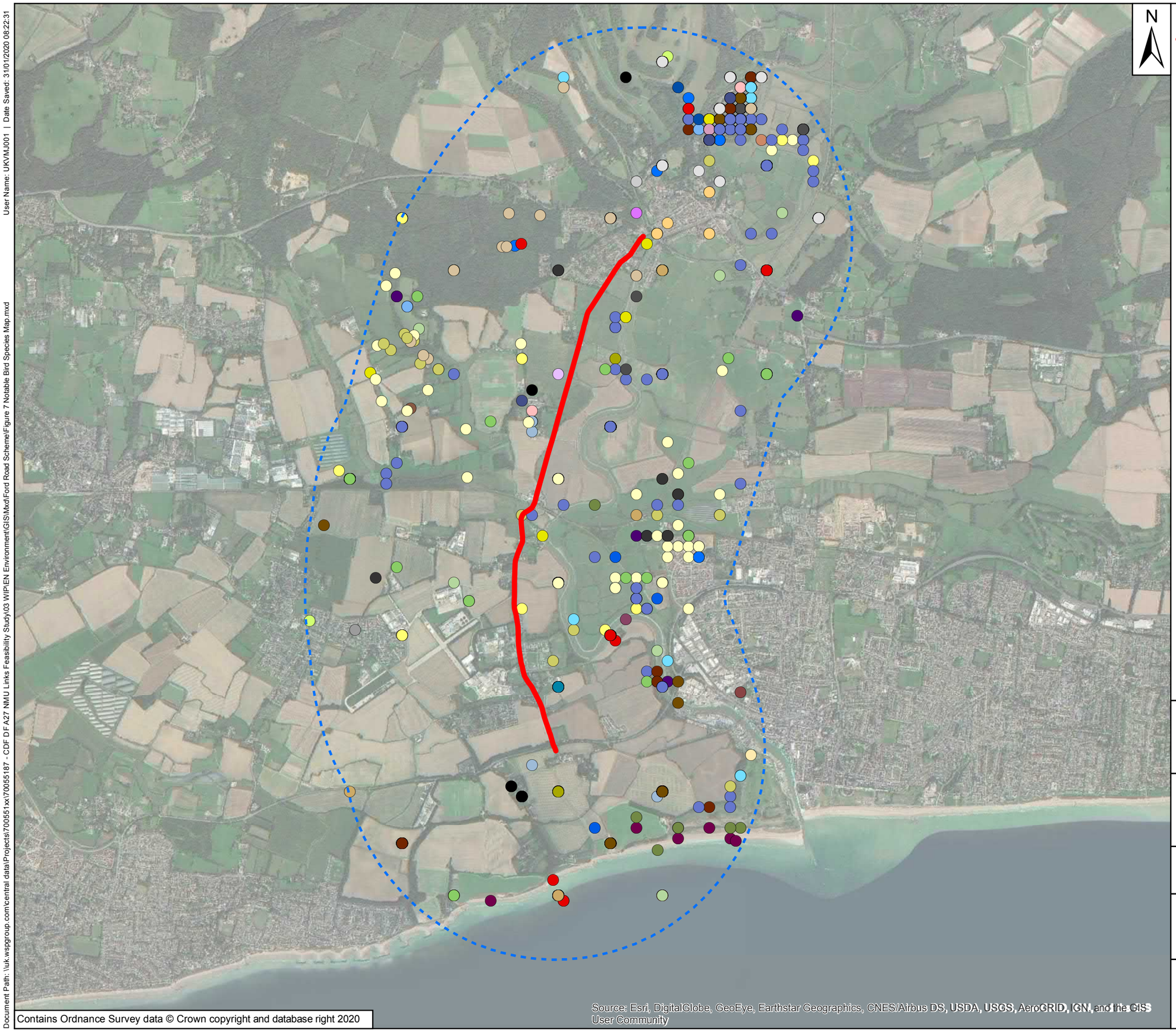
Drawing No: Figure 5
Date: February 2020
Scale: 1:35,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Notable mammal species records within 1km

Drawing No: Figure 6
Date: February 2020
Scale: 1:27,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH



N

Key

- Indicative Site
- 2km Survey Area

Notable Bird Species

- Avocet
- Barn Owl
- Bearded Tit
- Bee-eater
- Bewick's Swan
- Bittern
- Black Tern
- Black-headed Gull
- Black-tailed Godwit
- Black-throated Diver
- Bullfinch
- Cetti's Warbler
- Common Crossbill
- Common Gull
- Common Sandpiper
- Common Scoter
- Common Shelduck
- Common Tern
- Corn Bunting
- Cuckoo
- Curlew
- Dunnock
- Firecrest
- Gadwall
- Garganey
- Grasshopper Warbler
- Great Black-backed Gull
- Great Northern Diver
- Green Woodpecker
- Grey Partridge
- Grey Wagtail
- Hawfinch
- Herring Gull
- Hobby
- House Martin
- House Sparrow
- Kestrel
- Kingfisher
- Lapwing
- Lesser Black-backed Gull
- Lesser Redpoll
- Lesser Spotted Woodpecker
- Linnet
- Little Egret
- Little Grebe
- Little Ringed Plover
- Little Tern
- Mallard
- Marsh Tit
- Meadow Pipit
- Mediterranean Gull
- Merlin
- Mistle Thrush
- Mute Swan
- Nightingale
- Nightjar
- Osprey
- Oystercatcher
- Pied Flycatcher
- Pintail
- Pochard
- Quail
- Red Kite
- Red-throated Diver
- Redshank
- Redstart
- Reed Bunting
- Ring Ouzel
- Ringed Plover
- Ruff
- Sand Martin
- Scaup
- Shoveler
- Skylark
- Slavonian Grebe
- Snipe
- Song Thrush
- Spoonbill
- Spotted Flycatcher
- Starling
- Stock Dove
- Swallow
- Swift
- Tawny Owl
- Teal
- Tree Pipit
- Tree Sparrow
- Tufted Duck
- Turtle Dove
- Wheatear
- Whinchat
- White-fronted Goose
- White-tailed Eagle
- Whitethroat
- Whooper Swan
- Wigeon
- Willow Warbler
- Wood Warbler
- Woodcock
- Woodlark
- Yellow Wagtail
- Yellow-legged Gull
- Yellowhammer

0 0.5 1 1.5 2 km

wsp

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Notable bird species records within 2km

Drawing No:	Figure 7	Drawn:	VJ
Date:	February 2020	Checked:	VD
Scale:	1:35,000 @ A3	Approved:	AH

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Notable herptile species records within 1km

Drawing No: Figure 8
Date: February 2020
Scale: 1:27,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Notable invertebrate species records within 1km

Drawing No: Figure 9
Date: February 2020
Scale: 1:27,000 @ A3
Drawn: VJ
Checked: VD
Approved: AH

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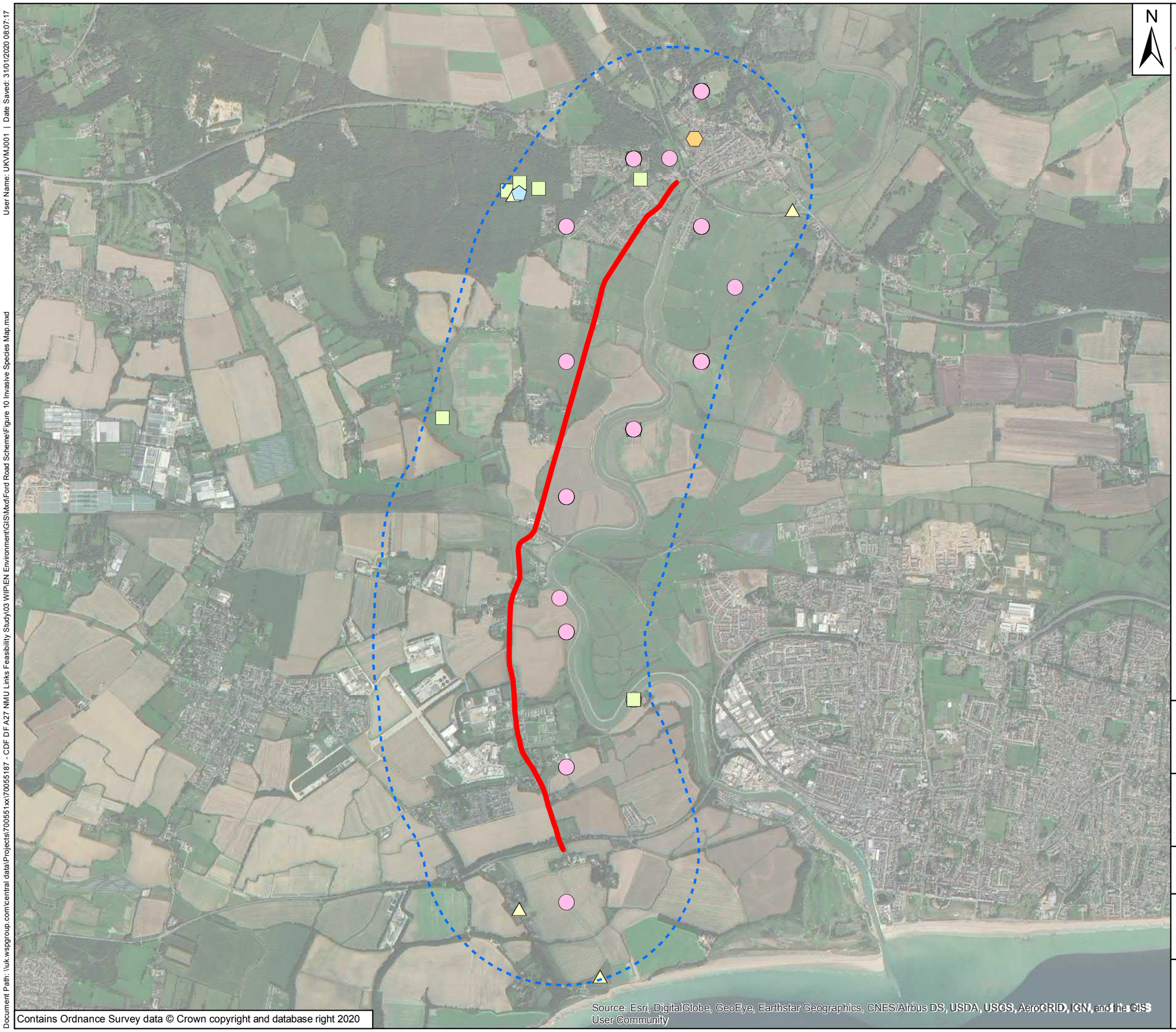


Client: Highways England

Project: A27 NMU Links Feasibility Study - Ford Road Scheme

Title: Invasive non-native species records within 1km

Drawing No:	Figure 10	Drawn:	VJ
Date:	February 2020	Checked:	VD
Scale:	1:27,000 @ A3	Approved:	AH

Appendix F

ROAD SAFETY REVIEW

ROAD SAFETY REVIEW

Introduction

A road safety review of the proposed Ford Road cycle infrastructure improvements has been undertaken for the identified preferred route as outlined earlier in the main report.

This review is on the proposed scheme as outlined in the drawings supplied (5187-GA-401-407, Rev P01); actual or forecast traffic flows, NMU flows and existing collision patterns have not been considered in this review. This desktop review was conducted using the drawings supplied and Google Earth imagery.

General Issues/Problems Throughout Scheme

Bus Stops

Throughout the proposed scheme, there are a number of bus stops. It is not clear how the proposed cycle route impacts the location and operation of these stops. This could lead to conflict between cyclists and people waiting to board the bus, or when people are stepping from the bus.

If there are bus shelters at the bus stops, these may restrict space for users to pass, or any overhanging roof may be too low for cyclists to pass under.

Vegetation and trees

Throughout the scheme, there are areas where there are dense hedgerows parallel to the footway or mature trees close to the scheme route with overhanging vegetation, restricting the available width and height. The proposed route also passes close to mature trees in a number of locations.

To enable cyclists to use the full width of the shared route, vegetation should be trimmed back beyond the back of the footway and a minimum headroom provided of 2.4m. Where the route passes close to mature shrubs and trees, there may be difficulty maintaining the existing footway level due to tree roots. The tall hedgerows may also restrict visibility between cyclists and other users at farm accesses, private drives, side roads and areas where existing footways and bridleways join the scheme.

A survey of the route should be undertaken to identify where tree roots may be a problem, with appropriate protection or changes in route or height considered as tree root damage to the footway could result in pedestrians tripping or cyclists losing control.

Vehicle and farm accesses

Throughout the route, there are a number of farm/field accesses tracks, with gaps in the verge proposed to facilitate vehicular access. There were a number of field accesses that were not identified in the proposed scheme, with no gap in the verge provided. Vehicles entering/leaving the accesses will have to cross the shared footway, verge and full-height kerbs. Continued overrunning could lead to the kerbs and footway becoming damaged resulting in pedestrian trips and falls or cycle collisions.

Vehicles joining Ford Road from the tracks and accesses may have reduced visibility due to the hedgerows alongside the proposed route. Cyclists using the route will not be anticipating vehicles emerging from these accesses.

There are a number of existing field accesses that have a hard standing / grass verge with a gate set back from the carriageway which allows vehicles to pull fully off the carriageway and open / close the access gates. The proposed shared cycle route across the access means vehicles may now have to wait on the shared route, which may force pedestrians and cyclists to enter the carriageway. Gates / hard standing areas may need to be relocated to prevent

this. Vehicles may choose to stop on the carriageway instead of the shared footpath, creating difficulties for passing traffic.

Side road crossings

Throughout the scheme, there are a number of locations where the shared facility crosses side roads and private drives. At a number of these, it is noted on the drawings that “Pedestrians and cyclists given priority across side road”. It is unclear how this would be achieved.

A number of these locations would have restricted visibility to/from the shared route due to vegetation, building lines and fences. Drivers exiting the side roads would not see users on the shared route until they emerge beyond the visibility barrier. This could lead to conflict between vehicles and users of the shared route.

Not all accesses and side roads were identified as having pedestrian/cycle priority, as a result, users of the shared facility may become confused about who has priority along the route. It is recommended that one approach is followed throughout the whole route to remove any ambiguity.

The radii of a number of side road junctions have been tightened or changed to enable the shared route to be provided. Combined with the reduced carriageway width, these accesses may be difficult for large vehicles to enter/leave the side road. All side roads should be tracked to check the required vehicle classes can enter/leave safely as required.

Level differences between carriageway and footway

To the south of the level crossing, there are a number of locations where there is a difference between the existing carriageway and verge levels. Where the proposed cycle route widens into the existing verge, the route becomes closer to the edge of carriageway, with an increased gradient and height difference. Cyclists may shy away from the edge of the route or become unnerved by passing vehicles and the drop down to carriageway level.

Proposed verge segregating carriageway and shared route

In a number of locations the width of the verge is less than 0.5m. Pedestrians and cyclists using the shared route may feel unnerved by the vehicles passing in close proximity to them. It is recommended that a minimum verge width of 0.5m is provided throughout, with the width of the shared route reduced as needed.

Where the speed limit is 40mph or greater, cyclists may be uncomfortable with vehicles passing close by the edge of the shared footway. A verge or buffer zone 0.5m or greater is recommended in these locations.

Carriageway widths

There are locations where the footway is widened into the carriageway adjacent to central islands, reducing the available lane width. Where there are lane widths between 3 and 4m, drivers may attempt to pass cyclists that are still using the carriageway when there is insufficient width to do so.

Where there are narrow lanes over prolonged sections, this could lead to large vehicles such as HGVs and buses having difficulty passing in opposing directions. This could lead to side swipes collisions between vehicles or vehicles mounting the shared footway in order to pass.

Reduced carriageway widths near horizontal alignment changes need to be considered carefully to permit larger loads and trailers, particularly as there Rudford Industrial Centre located off of Ford Road which may encourage a higher proportion of HGV’s.

Location-specific Issues/Problems

Commencement of cycle route parallel to carriageway

Approximately 700m from the Ford Road roundabout, the cycle route joins Ford Road at a right-angle from an existing footpath coming up from the river. At this location the carriageway appears to pass over a culvert and there is an existing concrete post and rail system on either side of the carriageway. It is not clear if the shared footway starts from this location. Adequate width should be provided for cyclists turning through 90 degrees onto / from the shared cycleway into the footpath as well as providing adequate width for the carriageway without creating a pinchpoint. This may require the carriageway to be widened over the culvert, including provision of new parapets. Alternatively, if cyclists are encouraged to join the carriageway at this location, the carriageway should be widened to provide adequate width for cyclists to join the carriageway without forming a pinchpoint near to the vicinity of the culvert.

From this point, the route continues south as a shared route with a verge between the carriageway and shared route. At the commencement of the verge, the carriageway width reduces to 6.5m. It is not clear from the drawings how the road narrowing will be achieved.

If the footway is raised at this location, southbound vehicles may strike the kerb or swerve to avoid the narrowing carriageway at the last minute, resulting in sideswipes or loss of control collisions.

Ford level crossing

The proposed cycle route passes through Ford and the level crossing close to Ford Railway Station. To the north of the level crossing, the shared route is on the eastern side of Ford Road, switching to the western side to the south of the level crossing. Pedestrians and cyclists will need to cross from one side to the other to continue on the route.

Due to the level crossing, vehicular accesses and the bends immediately to the south of the level crossing, pedestrians and cyclists may attempt to cross at unsuitable locations, where there is restricted visibility, turning vehicles or in the controlled area around the crossing. Ensure a safe location is identified and crossing facilities are provided to enable users to cross safely.

Bridge to the south of the Ship and Anchor access road

To the south of the access road leading to the Ship and Anchor Public House, there is a bridge over a water course. The bridge is also located on a slight bend, with the proposed shared route on the inside of the bend. There is existing vegetation and mature trees restricting forward visibility for footway users, with the bridge parapet creating a pinchpoint. The vegetation and trees should be cleared to provide forward visibility for all users. Adequate width for both carriageway and shared footway should be carefully considered and widening of the bridge may be required.

The bridge parapet should be reviewed to assess the height and suitability for cyclists using the shared route.

Opposite Nelson Row access

Opposite the access to Nelson Row, the carriageway has been reduced to 6m, with a 1m verge and 3m shared route proposed. There is currently a ramp down from the existing footway level on the western side and a dropped kerb to provide a pedestrian route across to Nelson Row. Due to the widened shared route and the differing level between carriageway and footway, it is not clear how this pedestrian desire line is catered for.

HMP Ford

Between Chainage 4300 and 4400, the proposed shared route passes close to buildings at HMP Ford. In this area there is existing pedestrian guardrail, brick retaining walls, raised banks, buildings and a signalised crossing. In this area, the existing footway is to be widened to 3m, and a 0.5m verge provided. It is not clear how the existing guardrail, signalised crossing and adjacent buildings will be impacted by the proposed scheme.

Southern extent of the proposed route

To the south of the junction between Ford Road and Horsemere Green Lane, the scheme is to tie-in with the highway proposals for the Climping development site. Should this development site not come forward to tie in with the proposed scheme as anticipated, alternative provision for the termination of the route should be considered.

Considerations for the Detailed Design Stage

- Street furniture, lighting columns, signal infrastructure, walls and railings etc – recommended lateral clearances
- Lighting – Undertake a lighting review at locations where cyclists may be joining the carriageway
- Signs and markings – consistent approach throughout the scheme, including tactile warnings at non-shared pedestrian entry/exit points

Appendix G

SAR FORD SCHEME

Cycling, Safety and Integration SAR (V2.0)

Page: Document Title

CSI SAR Name:	**(A27) A27 Ford NMU Crossing Feasbility Study CSI SAR**
Area / DBFO:	Area 10
Trunk road number:	A27
Full Title:	A27 Ford NMU Crossing Feasbility Study

Completed / Amended by:	
Name:	Laurie Carrigan
Email:	Laurie.Carrigan@wsp.com
Organisation:	WSP
Role:	Assistant Transport Planner
Date:	04/02/2020

Quality Checked by:	
Name:	Philip Moss
Email:	Philip.Moss@wsp.com
Organisation:	WSP
Role:	Senior Transport Planner
Date:	04/02/2020

Comments regarding the robustness of appraisal:
Assumptions used recorded in separate Word document saved in same directory.

Page: **(A27) A27 Ford NMU Crossing Feasbility Study CSI SAR Project Details**

Problem to be addressed: **(Brief reasons for carrying out the project)**	Stakeholders have previously highlighted the need to improve the Ford Road route, which is a key route connecting Littlehampton and Arundel, and, due to the location of Ford Station, commuters in the local area. Currently there is little to no cyclist provision, and very limited pedestrian facilities, particularly in the part of the road just north of Ford Station.
Proposed solution: **(Brief description of proposed project)**	al The solution is to provide a segregated shared use path along the duration of the route to accommodate an increase in those using active modes of transport in the area.
Other solutions considered: **(State 'None' if there are none - do not leave blank)**	A shared use path following footpath 206 that runs alongside the River Arun. This option has been discounted due to it's failure to meet the purpose of serving the commuter, as well as too many environmental constraints.
Expected outcomes: **(Results considered probable given analyses conducted)**	Increased NMU numbers associated with improved provision.
Construction year / quarter:	2020 Q2
Expected Date of Opening:	March 2021
Assessment Period:	20 Years !
Annual traffic growth (%):	1.1%

Page: Cost Estimates

Year of cost estimates:	2020	
Investment Costs:	£ 3,840,000	*Construction + Land + Other costs in real prices*
Contributions:	£ -	
Risk Allowance:	£ 34,354	
Scheme appraisal stage:	Stage 1	
Optimism bias (%):	44.0%	
Total scheme implementation cost:	£ 4,626,862	*Risk and optimism bias adjusted cost*
Annual maintenance costs:	£ 18,000	*Risk and optimism bias adjusted cost*
Total Estimated Present Value Costs (PVC):	£ 3,991,565	in £ 2010 market prices, discounted to 2010

Page: Vehicular growth forecasts

Will the intervention benefit pedestrians?:	Yes				
Current number of cycling trips (daily):	12	in	2011		
Current number of walking trips (daily):	0		2011		
Proportion of journeys which are round trips:	100%				
Proportion of trips that are commuting trips:	100.0%				
		57.85			**% Growth**
Anticipated extra cycling trips (daily):	15.6	in	2020	or	130.0%
Anticipated extra walking trips (daily):	0		2020		0.0%
				Cycle	Walk
Background cycling/walking annual growth rate:	West Sussex			0.25%	0.18%
Proportion of car owners who choose an active mode:	27.3%				
Decay rate (%):	0.0%				
Average cyclist journey length (km):	25		50%	% of average journey length on scheme	
Average walking journey length (km):	20		50%	% of average journey length on scheme	

!

Cycling, Safety and Integration SAR (V2.0)

Page: **Project Intervention Details**

What is the type of intervention?:	Cycle Lane
What is the type of cycle Lane?:	Off-road segregated cycle track
Is the intervention upgrade to existing cycle lane?:	No
Length of cycling facilities (one direction)? (km):	5.3
Average speed (kph):	65
What is the scheme's impact on severance?:	Moderate Beneficial
New pedestrian facilities provided:	
Street lighting	Yes
Kerb level	Yes
Crowding	No
Pavement evenness	Yes
Information panels	No
Benches	No
Directional signage	No

Page: Accident savings

Predicted number of Personal Injury Accidents saved in Opening Year: (If the scheme results in a predicted increase in accident rates, enter as a NEGATIVE value).	2.8	*Only applicable if scheme prevents road accidents & casualties*
Road Type:	50/60/70 mph Speed Limit, Single	
Geographic Area:	Rural	
Average cost of accidents in opening year:	£ 178,056	
Annual accident benefit in opening year:	£ 498,557	
Accident benefits capitalisation factor:	16.045	
Accident benefits over Assessment Period discounted to Opening Year:	£ 7,999,298	
Accident benefits over Assessment Period discounted to 2010:	£ 5,479,085	
Number of accidents saved over Assessment Period:	51.5	

Page: **Benefits override sheet**

Measure:		Current Value:	Override Value:		Amount passed to AMCB	Comments:
Noise	£	440.19		£	440.19	
Local Air Quality	£	-		£	-	
Greenhouse Gases	£	3,183.19		£	3,183.19	
Journey Quality	£	655,100.44		£	655,100.44	
Physical Activity	£	135,605.23		£	135,605.23	
Absenteeism	£	13,352.70		£	13,352.70	
Accidents (total from Accidents and MEC)	£	5,485,864.57		£	5,485,864.57	
Economic Efficiency (Decongestion)	£	42,333.18		£	42,333.18	
Journey Time Disbenefit	£	-		£	-	
Wider Public Finances (Indirect Tax Revenues)	£	(14,102.31)		£	(14,102.31)	

Notes:

Benefits Sensitivity Worksheet

Current BCR (no sensitivity testing): **1.6**

Sensitivity test of Decay Rates and Appraisal Periods

Decay Rate	Appraisal Period 5	10	15	20
-5%	0.5	0.9	1.3	1.6
0%	0.5	0.9	1.2	1.6
10%	0.5	0.9	1.2	1.6
50%	0.5	0.9	1.2	1.5
100%	0.5	0.9	1.2	1.5

= BCR > 2
= BCR > 1.5
= BCR >1
= BCR <1

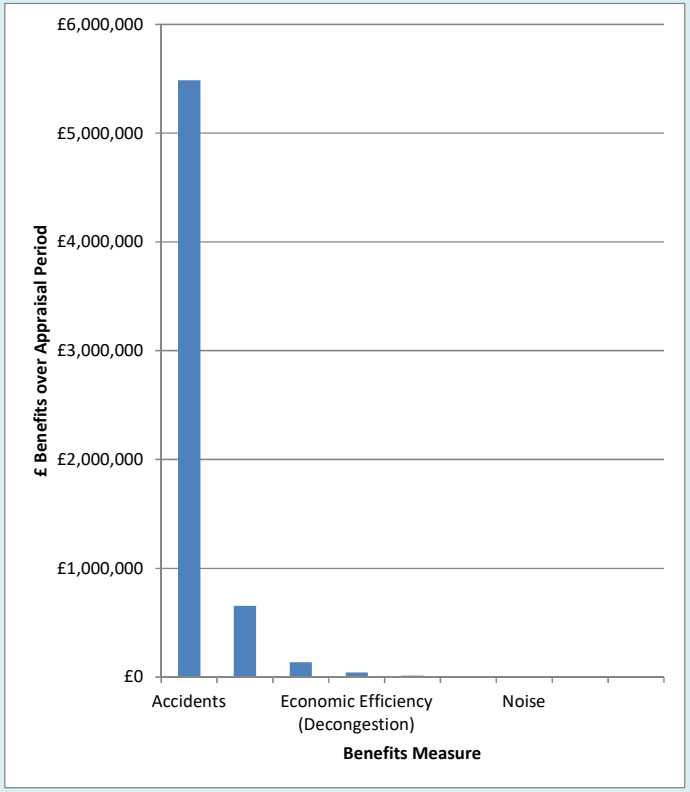
Quality Benefits Factor						
0.125	0.25	0.5	1	2	4	8
1.4	1.5	1.5	1.6	1.7	2.1	2.7

Page: Summary of costs and benefits

AMCB		
Noise	£	440
Local Air Quality	£	-
Greenhouse Gases	£	3,183
Journey Quality	£	655,100
Physical Activity	£	135,605
Absenteeism	£	13,353
Accidents	£	5,485,865
Economic Efficiency (Decongestion)	£	42,333
Wider Public Finances (Indirect Tax Revenues)	-£	14,102
Present Value of Benefits (PVB)	**£**	**6,321,777**
Broad Transport Budget		
Present Value of Costs (PVC)	**£**	**3,991,055**
OVERALL IMPACTS		
Net Present Value (NPV)	**£**	**2,330,723**
Benefit to Cost Ratio (BCR)		**1.6**

PA Table				
Funding	Walk / Cycle		Road	
Revenue				
Operating costs	£	220,278	-£	511
Investment costs	£	3,771,287		
Developer and other contributions				
Grant / Subsidy payments				
Indirect tax revenues			£	14,102
Broad Transport Budget	£			3,991,055
Wider Public Finances	£			14,102

Indicative benefits by proportion



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