

DfT Transport Consultancy Advice: East Grinstead

Review of A22 Corridor DRAFT

April 2009

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1. Introduction

Atkins Transport Planning and Management have been engaged by the DfT Housing Growth and Eco-Town Team to provide strategic transport planning consultancy advice to selected Local Planning Authorities and to compile a 'Lessons Learnt' document for the DfT.

Atkins Transport Planning and Management attended a meeting on the 27th of February 2009 with Officers from West Sussex County Council (WSSCC), Mid-Sussex District Council (MSDC), Three Tiers Group (3TG) and the DfT. At this meeting, the scope of the project was discussed and the services that Atkins can provide to the partners were explored. Following this meeting an initial methodology) was submitted to the DfT for Atkins planned interaction with WSSCC.

To begin this process, a Workshop was held between senior members of the Atkins Transport Planning and Management Team and ATLAS, West Sussex County Council, East Sussex County Council, Mid Sussex District Council and Surrey County Council on the 19th of March 2009.

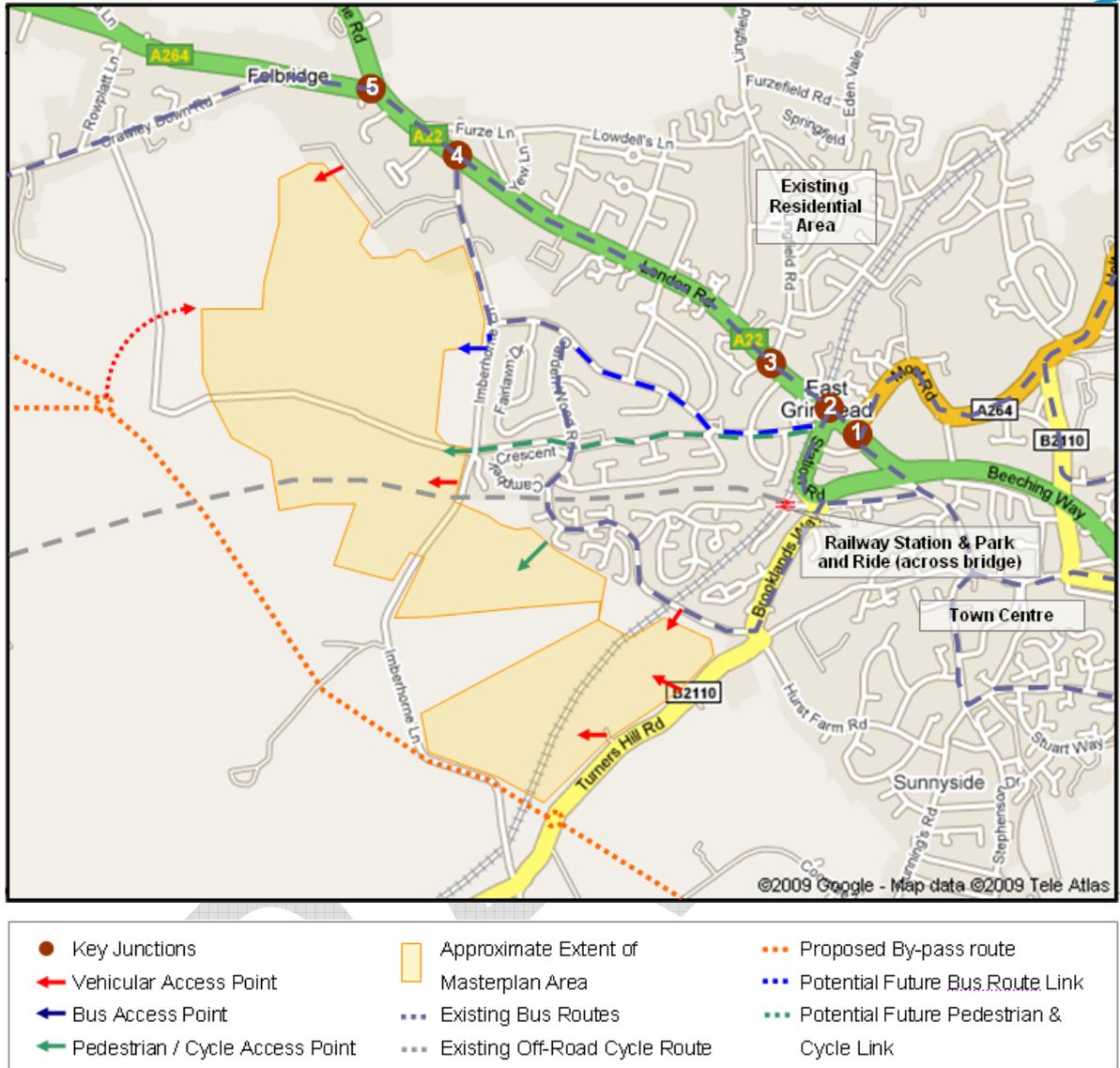
Following on from the workshop Atkins have produced two technical notes as follows:

- A spreadsheet modelling exercise based on previous work, designed to explore possible measures and actions that could mitigate the impact of the strategic development at East Grinstead. This is the subject of a separate report; and
- This report, a junction review and improvement study for the five main junctions along the A22 through East Grinstead.

2. Key Junctions

The locations of the five junctions that are considered by the Stakeholders as being key components to the movement of vehicles along the A22 London Road are illustrated in Figure 2.1. These junctions are considered based on observations made during a site visit on Wednesday 11th March 2009. Consideration was given to how improvements, some radical, could be made at each junction to enable an increase in capacity to cater for both natural background traffic growth and that resulting from the proposed development area located to the South West. Observations on how best to accommodate all modes of travel; vehicles, cyclists and pedestrians, in a safe and reliable manner were considered for each junction. The close proximity of Junctions 1 and 2 warrants their combined consideration of possible future improvements. As will be discussed within this Technical Note there are current proposals for the upgrading of Junction 3, however there is opportunity for this junction to operate in tandem with Junctions 1 and 2. The current rate of traffic growth anticipated at these junctions up to 2021 will be significant when taking account of the level of planned growth in the town and across region and will need to be considered in any proposed improvements to the junctions. Junctions 4 and 5, although not in as-close proximity to each other will also be considered for possible operational amalgamation. The current rate of growth of traffic at these two junctions is likely to be in the order of 15% or greater.

Figure 2.1 – Local Highway Network Proximate to Masterplan Area



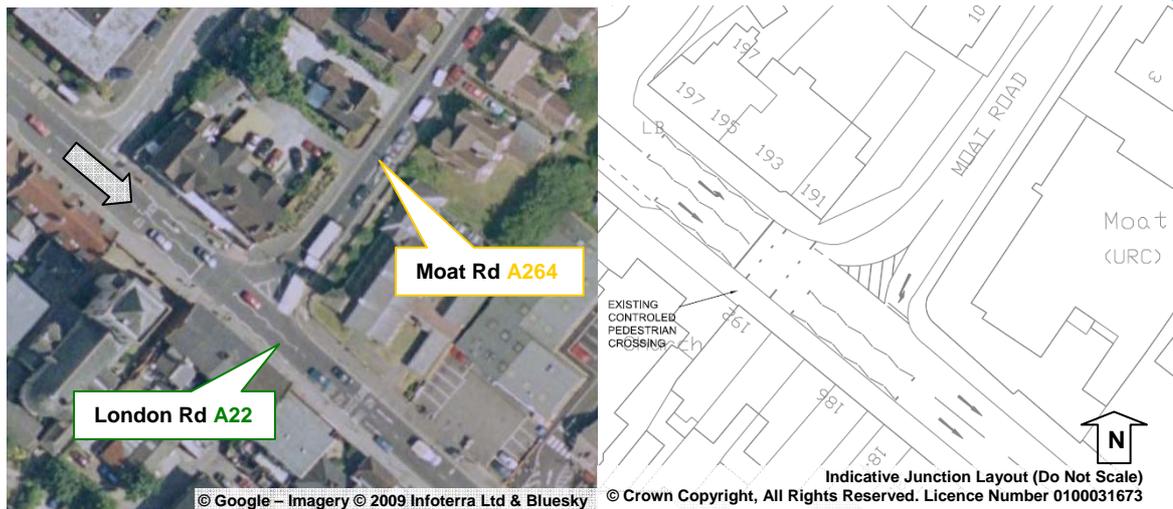
3. Review of Junctions

3.1 Junction 1: A22 (London Road) / Moat Road (A264)

3.1.1 Layout and Overview

This is a three arm priority junction between the major arm (London Road) running north-west to south-east, and the minor arm of Moat Road connecting from the north-east. This length of London Road is restricted to one-way traffic running in a south-easterly direction as part of the local gyratory system. The configuration of the junction is shown in **Figure 3.1**.

Figure 3.1 – Layout of London Road / Moat Road Junction



London Road comprises two lanes, each of approximately 3.65m in width. These are assigned for the straight ahead and left turning movements respectively in proximity to the junction. As all the traffic in the left hand lane should turn left into Moat Road, traffic from the minor arm (Moat Road) turning on to London Road into the same left hand lane should generally be unopposed. However, observations on site showed that some traffic in this left hand turning lane on London Road continues ahead at this junction.

Approximately 150m to the south-east of this junction, London Road forks, with traffic in the left hand lane feeding onto A22 Beeching Way (East) and traffic in the right hand lane feeding on to A22 Beeching Way (West) and London Road (South). Therefore, traffic must filter into the correct lanes on the section of highway immediately to the south of this junction.

Moat Road has a single lane in each direction and a total road width of approximately 7.3m widening in proximity to the junction. Turns from the junction are restricted to left only in accordance with the one-way system operating on London Road. A section of white hatching, a directional turning arrow and the words 'TURN LEFT' have been painted on to the highway on Moat Road to re-enforce that right turns from this junction are prohibited. These are shown in **Figure 3.2**.

A narrow bay of approximately 1.3m in width and 30m in length is present on the western side of London Road to the north of the junction. Parking is restricted in this bay by double yellow lines. It is therefore assumed that it is for deliveries to the retail outlets adjacent to this bay on London Road. Double yellow line markings are present on Moat Road in proximity to the junction and on London Road beyond the extents of the white zig-zag road markings.

The road markings in proximity to this junction appear to generally accord with Traffic Signs Regulations and General Directions (TSRGD.)

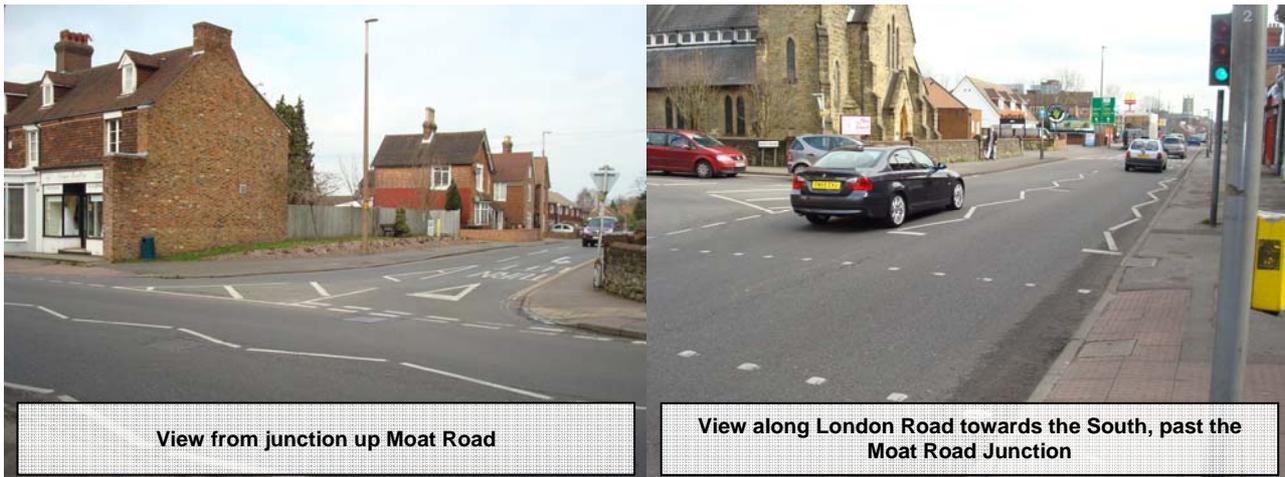
Street lighting is provided on both roads forming this junction.

3.1.2 Pedestrian & Cyclist Provision

A controlled pedestrian crossing is located immediately to the north of the junction on London Road, with white zig-zag markings extending approximately 10m back along London Road, with further zig-zag markings on London Road opposite the intersection with the minor arm at the junction.

Pedestrian footways are provided along the entire length of both roads. These are generally between 1.5 and 2 metres wide on Moat Road, and 2 to 3.5m wide on London Road adjacent to the shops. Dropped kerb tactile paving is present on the Pelican Crossing as shown in **Figure 3.2**, and also across Moat Road.

Figure 3.2 – London Road / Moat Road Junction



View from junction up Moat Road

View along London Road towards the South, past the Moat Road Junction

There is no cycle provision at this junction.

3.1.3 Constraints and Opportunities

There is potential to improve pedestrian provision at this junction, particularly on Moat Road. There is currently a hatched area between traffic flowing in either direction on this minor arm, however there is no protection for pedestrians wishing to seek refuge there. A more formalised pedestrian crossing could be introduced at this location and include a pedestrian refuge island to improve safety. An indication of the possible alterations is included in Appendix A to this Technical Note.

As part of any larger East Grinstead cycling strategy, it is recommended that cycle advisory lanes are considered in the environs of this junction, especially along London Road, giving due consideration to the one-way flow of traffic on this route. The presence of retail and commercial units on either side of London Road in this location mean that it is likely to generate moderate levels of pedestrian footfall and therefore a shared pedestrian/cycle provision may not be appropriate.

These proposed changes are unlikely to make a significant change to the capacity of this junction. The major traffic flow, being along the A22 London Road, is predominantly unhindered at this point. However lane changes are required prior to the junction and are discussed further in Junction 2. Generally traffic turning left from London Road into Moat Road will provide opportunities for the egress of traffic left turning from Moat Road into the one-way gyratory. However, as observed and shown in the photograph in **Figure 3.2** some of the traffic in the left hand lane on London Road continues in this lane past the junction. Further consideration to the management of traffic using London Road may enable freer flow of vehicles thus reducing potential delays, to the A22 movement by allowing two forward lanes, however this may reduce the opportunities for Moat Road vehicles to access London Road.

A more radical consideration is to reduce the footway width and introduce a 3rd lane, two for A22 traffic with a 3rd lane on the left catering for vehicles accessing/egress Moat Road. Naturally such an arrangement would be detrimental to the non-motorised road user with less footfall area and potentially increase in speeds because of the wider geometry.

3.2 Junction 2: A22 (London Road) / A22 (Station Road)

3.2.1 Layout and Overview

This is a three arm priority junction on the A22, and marks the start of a one-way clockwise loop, which passes the railway station, for south bound A22 traffic flows. To the north of this junction there is two-way traffic flow along London Road.

Located immediately to the east side of the junction is a fire station, as indicated in **Figure 3.3**. It is accessed from the minor arm of Station Road, via a dedicated lane between the two traffic

islands which separate the right and left turning lanes from this arm. A hatched yellow box is present on London Road immediately in front of this lane to prevent obstruction from any queuing traffic heading in a south easterly direction. A series of waiting restrictions in the form of double yellow lines are present in proximity of the junction supplemented by illuminated “Wig-Wag” signs on each approach and ‘KEEP CLEAR’ markings painted on the carriageway in front of the Fire Station.

Stop lines are present on Station Road in advance of the junction, adjacent to the conventional Wig Wag warning signs associated with the fire station. These are to aid the egress of fire engines when leaving the station on an emergency call. Arrows and hatching are present on the highway to guide drivers to the respective directions of flow on London Road.

London Road has an approximate total width of 7.6m to the north and south of the junction. Signage and street lighting are also present at the junction.

Figure 3.3 - Layout of London Road / Station Road Junction



3.2.2 Pedestrian and Cycle Provision

Pedestrian footways are provided along the entire length of both sides of each arm in proximity to the junction. These vary in width from approximately 2 to 4 metres.

There are no controlled pedestrian crossing facilities on London Road at the junction. However, uncontrolled pedestrian crossing points are present on the Station Road arm, separated by two traffic islands either side of the Fire Station access lane as indicated in **Figure 3.3**. As shown in **Figure 3.4**, these crossings do include dropped kerb crossings.

Figure 3.4 – London Road / Station Road Junction



Controlled pedestrian crossings are present on Station Road and on the south-east arm of London Road. Both of these facilities are approximately 50m from the junction.

There is no cycle provision at this junction.

3.2.3 Constraints and Opportunities

There is significant opportunity to improve pedestrian and cycle provision at this junction, as well as potentially improve the management of traffic as it leaves the junction and travels south to Junction 1. This could be achieved by introducing controlled crossing points at the locations of the existing uncontrolled crossing points on Station Road, as indicated in Appendix A. Combined with the introduction of a signalised crossing point on London Road, and maybe even a second south bound lane fronting the fire station area, the flow of south bound vehicles can be controlled to remove the weaving effect of vehicles wishing to travel from Station Road, crossing London Road and left turning into Moat Road, at Junction 1.

Observations made on site noted that vehicles travelling from Station Road to Moat Road, would wait for a convenient space in the A22 south bound flow, causing congestion along Station Road, and delays to A22 south bound vehicles as they permit entry of these vehicles. The introduction of such signals could also benefit Junction 1, by enforcing breaks in the A22 south bound traffic flows, thus enabling opportunities for vehicles to egress Moat Road, and thus facilitate 2 lanes of dedicated A22 flows between Junctions 2 and 1, enhancing opportunity for cycling facilities.

These signals could be co-ordinated with the controlled crossing point approximately 50m along Station Road. Toucan crossings could also be given consideration as part of a wider cycling strategy.

The possible toucan crossings can be linked to shared pedestrian cycle routes on the narrow stretch of London Road to the north-west of the junction, and also link into the advisory lanes running to the south-east towards Junction 1 and linkages to the rail station.

The provision of signals and controlled pedestrian crossings should benefit the safety of both pedestrian and cyclist, as well as increase the safe flow of traffic through this junction and Junction 1 to the south.

Greater benefits may also be realised by linking any new signals at Junction 2, to the proposed signals at Junction 3.

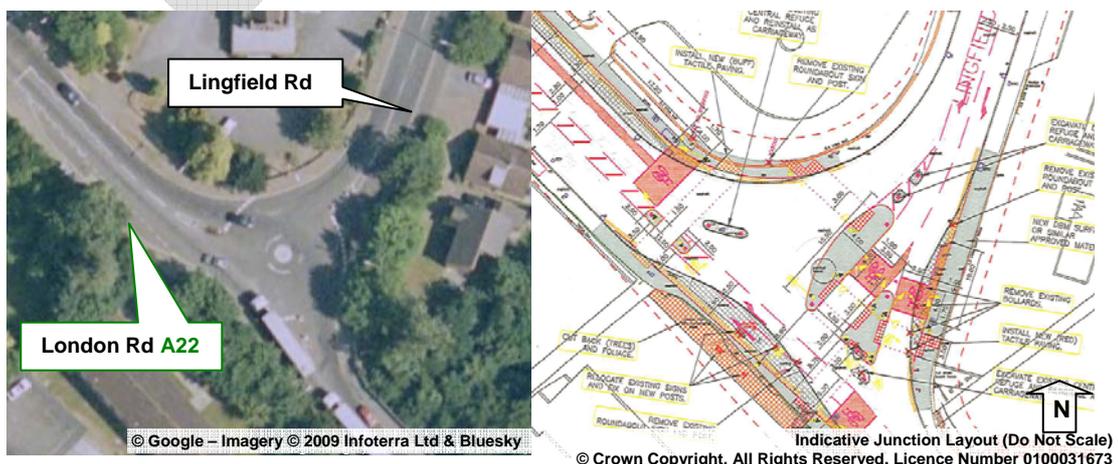
3.3 Junction 3: A22 (London Road) / Lingfield Road

3.3.1 Layout and Overview

This is currently a three arm mini-roundabout junction between the major arm, A22 (London Road,) running north-west to south-east and the minor arm, Lingfield Road, connecting from the north-east. Each arm has a single lane of traffic running in each direction. A bus bay is provided on London Road immediately to the north-west of the junction for northbound vehicles. To the south east the highway alignment is constrained by an existing bridge over a dismantled railway line. Street lighting is provided at this junction.

The existing configuration of the junction is shown in the aerial photograph in **Figure 3.5**. Improvements to the junction have already been proposed and it is planned to be implemented shortly. An extract of this design is also provided in **Figure 3.5**.

Figure 3.5 – London Road / Lingfield Road (Existing and Proposed)



There is a current proposal to signalise the junction, with flared approaches on all arms to accommodate turning movements. The proposal also includes for cycling and pedestrian movements through the junction.

3.3.2 Pedestrian and Cyclist Provision

Pedestrian footways are currently provided along the entire length of both sides of the highway on each arm in proximity to the junction. This provision will be realigned in accordance with the changing shape of the junction based on the signalisation proposals, with footway access retained on both sides of the carriageway on each arm.

Currently pedestrian refuges are provided on each arm of the mini roundabout. Dedicated pedestrian phases will be incorporated into the proposed signal arrangement for this junction. Pedestrian refuges and islands will be used to separate this movement into two stages on London Road and three phases on Lingfield Road. This will be achieved by separating right and left turning movements from the minor arm with a traffic island, enabling both movements to run independently of each other.

Advance cycle stop lines will be provided on all arms. A cycle lane between the left turning and straight ahead lanes will be provided on London Road (north) to enable access to this facility.

3.3.3 Constraints and Opportunities

The proposed advanced cycle stopping facilities could be linked into shared cycle/pedestrian footways on London Road to the northwest and beyond the existing bridge structure to the south east of the junction. The structure forms a major constraint for the A22 London Road route, with barely sufficient width to enable 2 lanes of traffic and 2 footways to cross. It affords no opportunity for additional flares on the approach and departure from the adjacent junction, thus restricting capacity of the junction. It also has a significant safety concern for cyclist and pedestrians.

Consideration should be given to a cantilevered footway and/or cycleway to enable the carriageway width to be increase, thus improving the flow of vehicles at this pinch point. It is noted that the northeast side of the structure forms the greater opportunity subject to 3rd party land considerations.

To enhance the maximum opportunity for cycle usage of the proposed junction, consideration should also be given to advisory cycle lanes on the minor arm of Lingfield Road.

In terms of capacity, it is likely that the reconfiguration and signalisation (including for pedestrian phases) of this junction will have some impact on its capacity. In addition, the existing bus bay does not appear to have been re-located to the north of the junction. Based on service frequencies, this may also have some impact on the capacity of this junction.

Should a form of signal control be introduced at Junction 2, as discussed above, the signals of the two junctions should be linked, and use the latest technology to ensure the capacity of the combined junctions is maximised.

3.4 Junction 4: A22 (London Road) / Imberhorne Lane

3.4.1 Layout and Overview

This is a three arm signalised junction between the major arm, A22 (London Road,) running from north-west to south-east and the minor arm, Imberhorne Lane, connecting from the south. The layout of the junction, believed to have been upgraded some 10 years ago, is indicated in **Figure 3.6**.

Figure 3.6 – London Road / Imberhorne Lane



London Road has a total carriageway width of approximately 8m to the south of the junction. It consists of a single lane running in each direction which is flared on both arms in proximity to the junction to create dedicated straight and turning lanes. Similarly, the minor arm, Imberhorne Lane is flared in proximity to the junction to create dedicated right and left turning lanes.

Hatching has been used to separate traffic flows in either direction on London Road, with a physical islands on the northern arm providing a limited refuge for pedestrians on the signalised crossing if required. Street lighting is provided at the junction.

3.4.2 Pedestrian and Cycle Provision

Pedestrian footways are provided along the entire length of both sides of the highway of all three arms in proximity to the junction. These are generally between 1.5 and 2m in width. A much wider footway is provided on the parade where numerous local shop units are located, on the northern arm of London Road.

A pedestrian phase across the northern arm of London Road is incorporated into the existing signals at this junction. This crossing provides controlled pedestrian access from the northern side of London Road to Imberhorne Lane. Drop kerbs are provided on either side of this crossing.

An uncontrolled crossing point is marked across the minor arm, Imberhorne Lane. This is split into three stages. The first, from the footway between London Road (south) and Imberhorne Lane is approximately 11 metres in length, and links to a refuge between the flows of traffic in to and out of the junction as shown in **Figure 3.7**. The second stage is approximately 4.5m in length and runs across the right turning lane from Imberhorne Lane. The final stage is approximately 4m in length and runs across the left turning lane from the minor arm. Dropped kerbs are provided from the footways at either side of this crossing, and at the traffic island.

There is no cyclist provision at this junction.

Figure 3.7 – London Road / Imberhorne Lane



View of Junction from footway between London Road (south) and Imberhorne Lane

View of Junction from London Road (south), looking towards London Road (north)

3.4.3 Constraints and Opportunities

There are significant opportunities to improve pedestrian provision for those wishing to cross Imberhorne Lane. This could be achieved by incorporating a pedestrian crossing stage into the existing traffic signals. If the pedestrian crossing across Imberhorne Lane is split into two discrete stages of movement, there will be a requirement to enlarge the existing pedestrian refuge on Imberhorne Way to enable this. Even if a single pedestrian phase is used to cross the whole road, there are still advantages of an enlarged refuge for the mobility impaired who may be unable to complete the entire crossing in a single phase.

In addition, on the uncontrolled pedestrian refuge on London Road (south) the pedestrian refuge could also be enlarged. An indication of these changes is included in Appendix A to this Technical Note.

It is proposed that advance cycle stop lines be introduced on all approaches. On Imberhorne Lane, access to this facility will be via a cycle lane running between the right and left turning lanes so that cyclists can access it when cars are queuing at a stop signal.

In terms of capacity, the introduction of pedestrian phases at the lights may have some impact however this may be compensated for and even improved by giving consideration to the local kerbline geometry on each approach to the junction, without impacting on pedestrian movements. Capacity may also be improved at the junction by reviewing the current signal timings and stages, ensuring that these are best optimised for the present day vehicle movements. Naturally any improvements would be constrained by the adjacent 3rd party land and/or may require some significant narrowing of pedestrian footways. Consideration should also be given to linking the signals at this junction to those at Junction 5 to ensure that they maximise capacity.

A more radical change to the junction could be the removal of signals and introduction of a priority junction or roundabout geometry. A priority junction may aid the flow of north bound vehicles along the A22, however it would significantly impact on those right turning into Imberhorne Lane from the north, and those waiting to egress Imberhorne Lane. A roundabout would be more beneficial however would probably have to be a mini-roundabout unless 3rd party land is acquired. It would also have serious safety concerns, especially for cyclist and pedestrians.

3.5 Junction 5: A22 (London Road) / A264 (Cophorne Road)

3.5.1 Layout and Overview

Junction 5 is a three arm signalised junction between the major arm, A22 (London Road) running from north to south and the minor arm, A264 (Cophorne Road,) connecting from the west. London Road has a single lane running in each direction, flaring to a dedicated 'straight ahead' and turning lane in proximity to the junction. Cophorne Road is also flared in proximity of the junction, to separate lanes for right and left turning traffic. The junction configuration is illustrated in **Figure 3.8**.

Figure 3.8 – London Road / Copthorne Road



Street lighting is present at the junction.

3.5.2 Pedestrian and Cyclist Provision

Footways are provided on both sides of the carriageway on all arms in proximity to the junction. There are no pedestrian signals incorporated into the crossing phases. Islands are provided on London Road on both the northern and southern arms, as shown in **Figure 3.9**. On the minor arm, Copthorne Road, which links to the M23, there is an area of hatching between traffic flows in either direction, however there is no pedestrian refuge.

Figure 3.9 – London Road / Copthorne Road



There is no cycle provision at this junction.

3.5.3 Constraints and Opportunities

The existing visual appearance of the junction is that of a vast area of road surfacing with painted road markings to direct vehicles. A major opportunity exists to improve pedestrian and cyclist provision at this junction. This can be achieved through the incorporation of the pedestrian crossings within the existing traffic signals at the junction. It is proposed to provide Pedestrian Crossings on all arms and to introduce pedestrian refuges. A review of the turning radius from London Road (south) to Copthorne Road also provides opportunities for widening the pedestrian footway and/or introducing a cycling lane. An indication of the possible changes is included in Appendix A to this Technical Note.

For cyclists, advanced cycle stop lines will be provided on all approaches. Advisory cycle lanes could also be added on London Road to the north and potentially linking through to Junction 4, to the south.

Opportunities may exist to improve the junction capacity through a review of the signal timings and stages to reflect current turning movements and the potentially optimised to maximise the capacity of the junction.

Noting that this junction forms a gateway to East Grinstead for the southbound vehicle, consideration should also be given to commencing a 30mph speed limit from this point. Currently it is 40mph which was considered to be inappropriate for the geometry of the highway and the environs. This reduction in speed limit and the linking of the signals with those at Junction 4, should hopefully provide additional capacity at this junction and also improve safety for the highway user.

A more radical consideration for this junction would be to introduce a roundabout, however this would be at the detriment of the non-motorised highway user.

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4. Summary

As part of Atkins Transport Planning and Management engagement by the Department for Transport's (DfT) Housing Growth and Eco-Town team, strategic transport planning consultancy advice, to compile a 'Lessons Learnt' document for the DfT, we have given a brief overview of five key junctions along the A22 through the town of East Grinstead. These junctions have been considered by the Stakeholders as being key components to the movement of vehicles along the A22 London Road. Consideration was given to how improvements, some radical, could be made at each junction to enable an increase in capacity to cater for both natural background traffic growth and that resulting from the proposed development area located to the South West. Observations on how best to accommodate all modes of travel; vehicles, cyclists and pedestrians, in a safe and reliable manner were considered for each junction.

This Technical Note proposes measures to improve the capacity and/or operational efficiency and possible further areas of investigation. With the current proposal for a new development off Imberhorne Lane to the South West of East Grinstead it is hoped that measures can be identified that will address some of the concerns relating the potential impact of the new development on the existing busy road network.

The relative location of the five junctions warrants consideration to these being linked in two groups, the three further south and nearer the town centre (Junctions 1, 2 and 3) and independent to this group, the two junctions to the north (Junctions 4 and 5).

It is understood that proposal to change Junction 3 from the existing mini-roundabout geometry, to a fully signalised junction, is soon to be implemented with full cycling and pedestrian consideration. A significant constraint linking this Junction 3 to those that form part of the gyratory system (Junctions 1 and 2) is an existing bridge structure spanning a disused rail corridor. Consideration to cantilevering a footway/cycleway to the structure, thus enabling greater road space within the structure is seen as a necessity to alleviate this throttle point.

From Junction 3 cycling provisions should radiate in each direction via a combination of advisory cycle lanes, cycle ways and shared footways/cycle ways.

Junction 2, adjacent to the fire station is in need of signalisation, not only to improve safety of all road users and increase capacity on this strategic A22 junction, but also to aid the movement of southbound vehicles between this junction and Junction 1 at Moat Road.

Consideration should not only be given to linking each of these junctions to maximise capacity along the A22, but also linking them with improved cycling and pedestrian linkages.

At various locations along the A22 route constrained by Junctions 1 and 5, consideration to a number of right turning movements, from the A22, may prove beneficial to the movement of vehicles. Naturally these would need to be carefully selected, ensure adequate alternative routes are available for those living in the locality.

Junction 5 is noted as a gateway to East Grinstead for south bound vehicles entering the town. It is recommended that as part of this gateway prominence, consideration should be given to commencing a 30mph zone from this point.

The characteristics of Junction 5 can be vastly improved by giving consideration to central islands, forming refuge for pedestrians at key crossings points. Capacity at this junction, especially for those egressing East Grinstead should be improved by incorporating new signals with the latest technology. The operation of this junction should also be considered as an extension to Junction 4 to the south. Although Junction 4 was improved approximately 10 years ago it requires consideration to the signals equipment to ensure the latest technology is available and facilities for pedestrians and cyclist are accommodated.

Each of the five junctions has opportunity to address the more sustainable mode of movement, whilst at the same time, the introduction of signal control and upgrading at those junction already with signals, should improve the capacity of each.

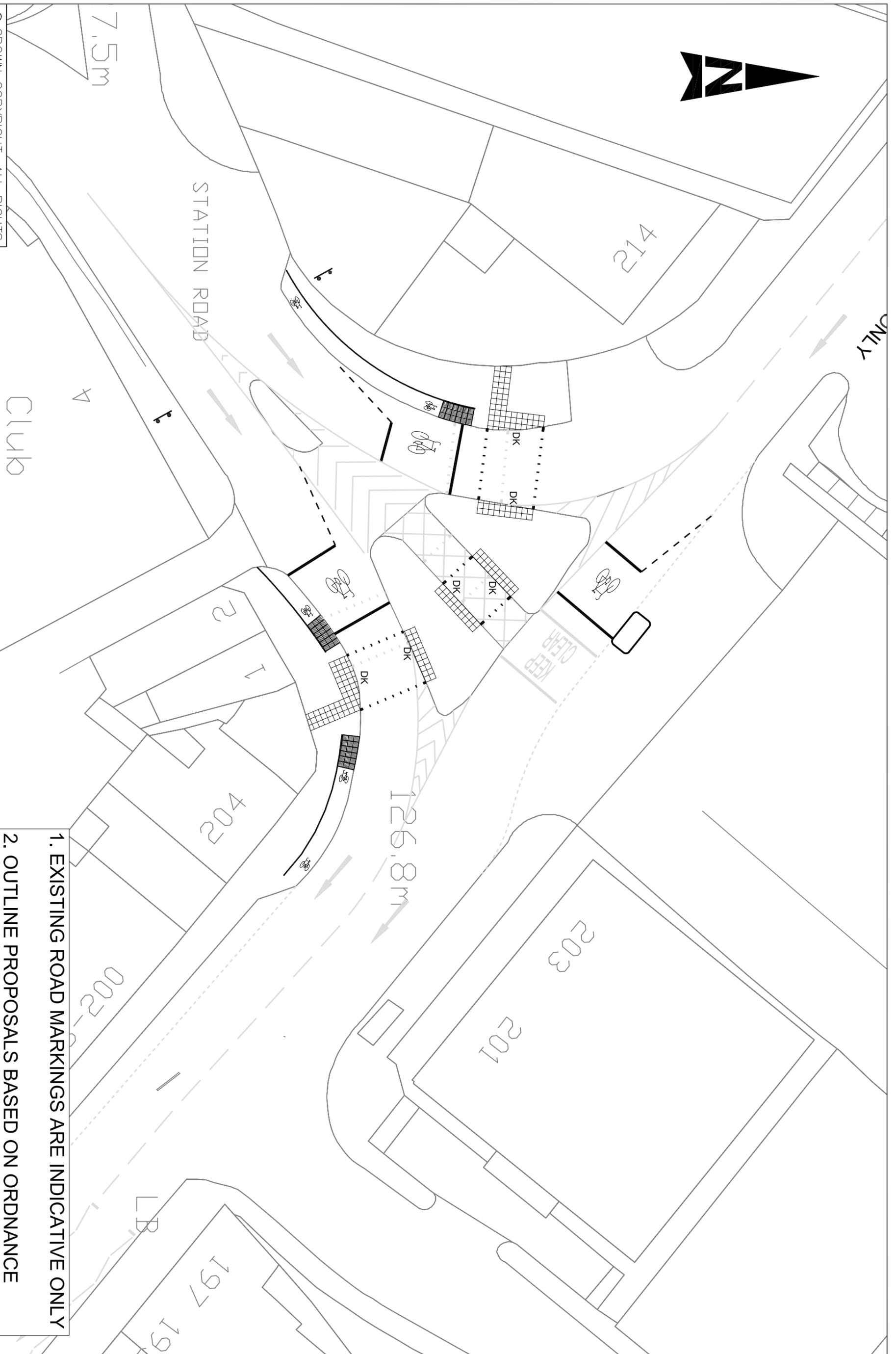
Appendix A

Possible Alterations to Existing Junctions

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ONLY



Club

STATION ROAD

7.5m

126.8m

214

2

1

202

203

201

197

19

LB

002

1. EXISTING ROAD MARKINGS ARE INDICATIVE ONLY

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JUNCTION 2

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CONSIDERATION TO SHARED FOOTWAY/ CYCLEWAY

Southwick House

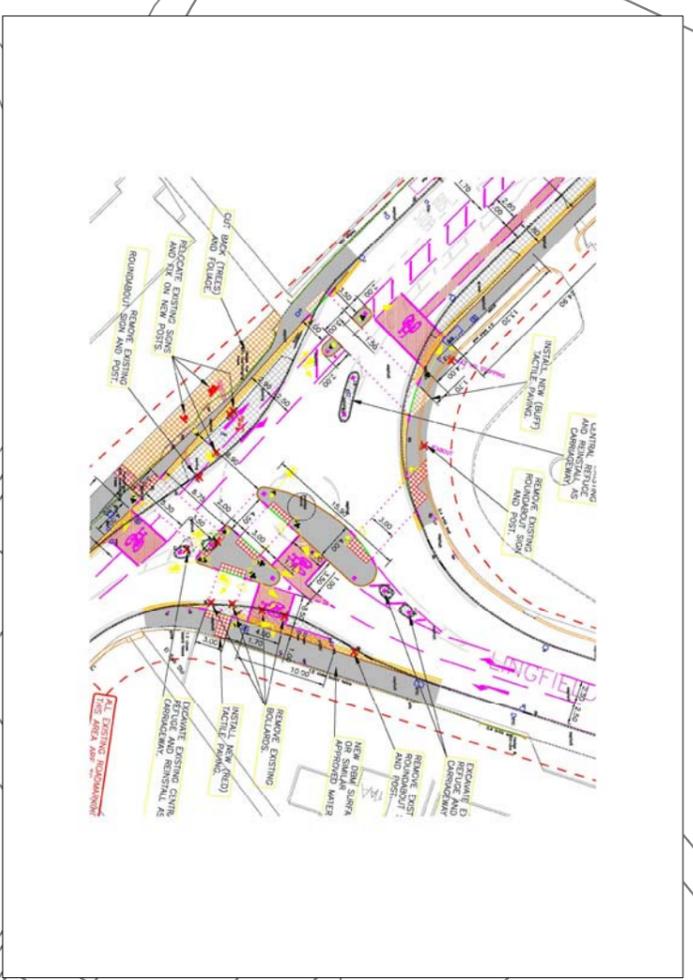
Trinity Methodist Church

CONSIDERATION TO ON-ROAD CYCLING LANES (ADVISORY)

SIGNALISED JUNCTION WITH CYCLING PROVISION TO BE IMPLEMENTED SHORTLY.

CONSIDER CANTILEVER CYCLE OR FOOTWAY.

CONSIDERATION TO SHARED FOOTWAY/ CYCLEWAY



Sloping Wall

ED & Ward Bdy
Dismantled Railway

GRIN

219 to

128.1m

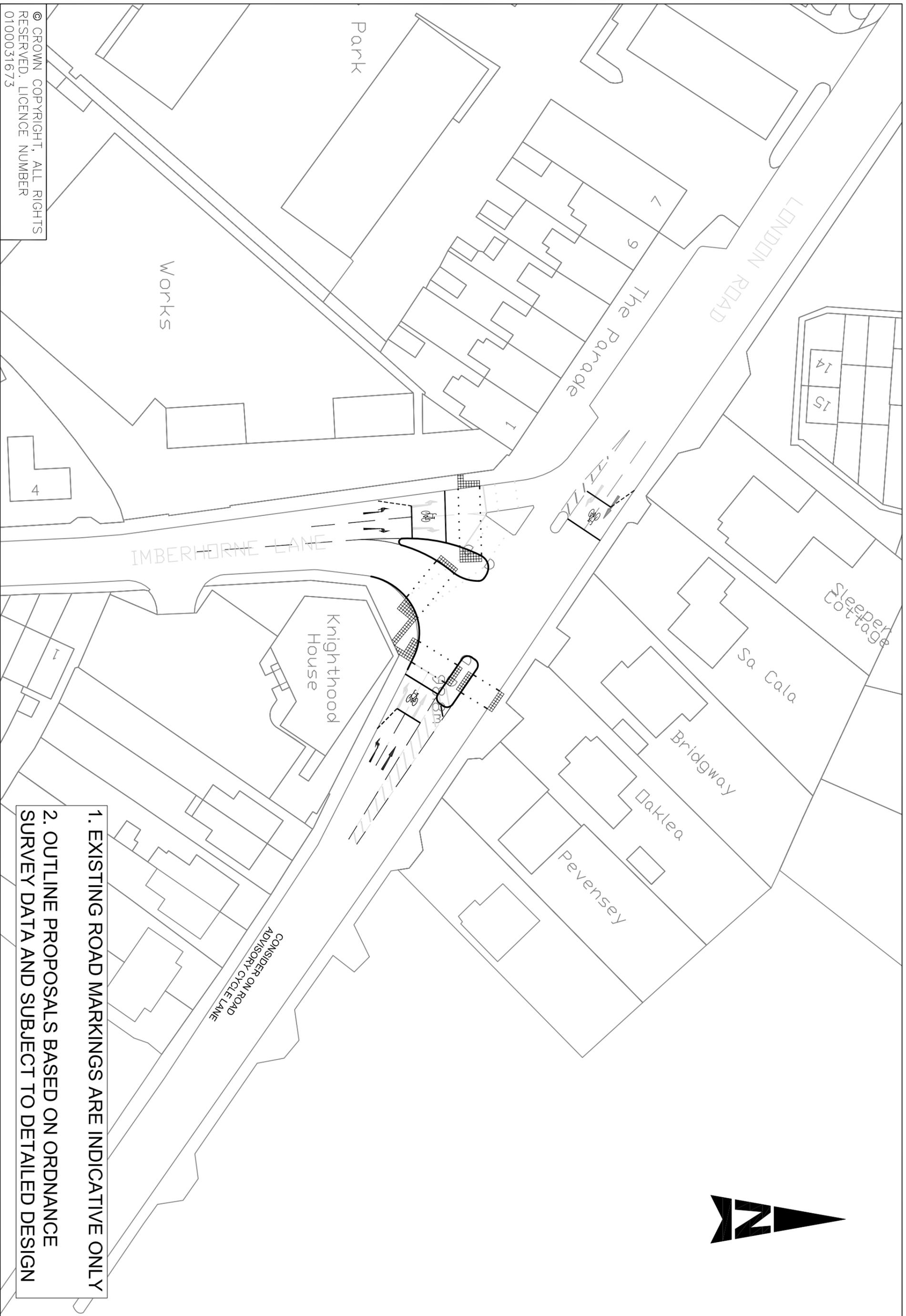
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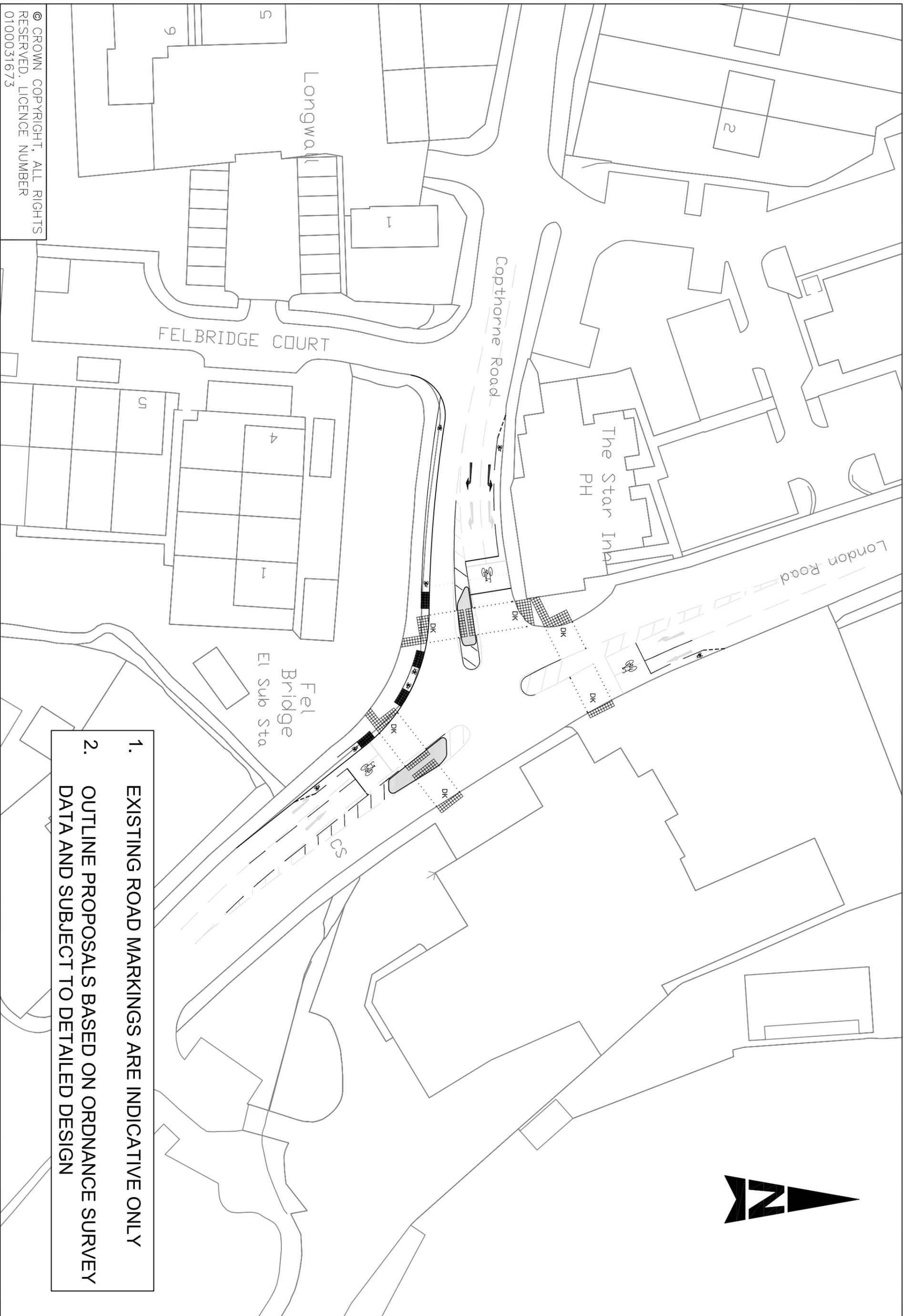
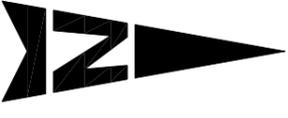
CONSIDER ON ROAD
ADVISORY CYCLE LANE

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JUNCTION 4

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