TECHNICAL NOTE

Job Name: A944/ A9119 Active Travel Corridor Study

Job No: 3326-10462

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Subject: **Cycle Level of Service (Outline Design Stage)**

Introduction

This note describes a Cycle Level of Service (CLoS) assessment for the active travel route options along the A944 and A9119 between Westhill and Aberdeen city centre (the study corridor). These cycling, walking and wheeling proposals were developed and appraised as part of the A944/ A9119 Multi-modal Corridor Study that included a concept design for bus priority measures and active travel routes using both or either the A944 (Lang Stracht and Westburn Road) and A9119 (Skene Road and Queen's Road).

With Lang Stracht and Westburn Road being more suitable for the introduction of bus priority measures, the Council decided to further develop the active travel route along on the A9119 (Skene Road and Queen's Road). This led to the commissioning of the A944/ A9119 Active Travel Corridor Study with the aim of developing the concept designs for cycling, walking and wheeling to an outline level of design along the route shown in Figure 1.

A CLoS assessment offers a framework to ensure the cycle routes conform to good practice and that they are safe and accessible, encouraging new cyclists to switch journeys from other transport modes and maintain this modal shift for the long term. The framework is based on established cycle route design principles.

An assessment is generally completed for the existing road layout and then compared with the assessment of the proposed road layout. A comparison of the scores indicates the extent to which the proposals improve the provision for cyclists but also identify areas for further improvement. This can help refine the proposals, ensuring the final design optimises the environment for cycling and so create a cycle route which is attractive to all potential users.

Cycle by Design (CLoS)

Link Assessment

Local Transport Note 1-20 (LTN 1-20) describes a CLoS assessment[1] based on five core design principles of Safety, Directness, Coherence, Comfort and Attractiveness. It then breaks down the core design principles into factors and at the next level of detail, indicator scores are used to measure performance against each factor. For example, Safety is made up of 6 factors, one of which is collision risk that is defined by two indicators assessing the need for 'segregation to reduce the risk of collision alongside or from behind' and 'conflicting movements at junctions'[2]. For the five core design principles there are 23 factors and 27 indicators, but these are not equally distributed over the core design principles which results in scores being weighted by importance. For example, the Safety score has a maximum of 16 while for Cohesion it is 6.

In Cycle by Design (CbD) there is no equivalent assessment albeit the two guidance documents are based on the same core design principles listed above. CbD does however include a sixth design principle of Adaptability to reflect the scope to which proposed infrastructure could be changed to meet future needs.

Both guidance documents define the core design principles using similar indicators which in turn are scored either 0, 1, 2 in LTN 1-20) or Low, Medium, High 'Level of Service' (LoS) in CbD. They also include a 'Not Acceptable' score defined either as 'Critical Fail' in LTN 1-20 or 'Do Not Use' by CbD and indicate unsafe conditions for cycling which must be addressed (or an alternative route found).

[1] Section 4.5 and Appendix A

[2] A more detailed analysis of conflicting movements at junction is provided by the Junction Assessment Tool

When developing this CbD compliant CLoS, the indicators set out in LTN 1-20 has been used except when CbD provides a different definition. The assumptions and changes made to achieve a CbD compliant CLoS assessment are set out in Appendix A.

Junction Assessment

Junctions pose significant injury risk to cyclists caused by conflicting movements with motor traffic and where the greatest risk occurs at junctions where these movements are not controlled i.e. at priority T-junctions, cross-roads and roundabouts. Around 45 percent of all cyclist deaths occur at or near junctions, with more than half of these recorded at T-junctions and just under a third at roundabouts, mini-roundabouts and cross-roads[3].

Roundabouts are particularly hazardous for cyclists accounting for around 20 percent of all reported cyclist killed or seriously injured (KSI) casualties[4]. A key factor is that roundabouts designed to standard UK geometry usually have flared entries and exits with two or more lanes and wide circulatory carriageways which are often unmarked, leading to high speed differentials and inherent lane changing conflicts between cyclists and motor vehicles.

The CLoS assessment does not fully consider the risk cyclists encounter when travelling through junctions although there are indicators that score the following:

- Ability to join and leave the route safely and easily (considering all left and right turns)
- Stopping and give-way frequency
- Delay at junctions
- Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway
- Conflicting movements at junctions

LTN 1-20 includes a Junction Assessment Tool to provide a more detailed assessment of the extent to which each cycle movement at the junction meets the requirements of the core design principles. Each movement at the junction is colour coded with RED the most uncomfortable or unsafe for cyclists, and so on:

- RED: where conditions exist that are most likely to give rise to the most common collision types
- AMBER: where the risk of those collision types has been reduced by design layout or traffic management interventions
- GREEN: where the potential for collisions has been removed entirely

It has not been possible within the scope of this study to use the Junction Assessment Tool on each junction along the study corridor, but a qualitative assessment has been developed using the above indicators which broadly define the risks cyclists encounter at junctions. This assessment has been carried out on key junctions along the study corridor for both the existing and proposed road layouts to understand how the latter has reduced or eliminated the risk.

Scope

Links

The extent of the CLoS assessment is shown in Figure 1 which includes a Main Route along the A944 and A9119 between Westhill and the city centre (Links 1 to 7).

Highway capacity constraints identified in the previous study indicates that the impact of the cycle route on bus journey times could be reduced if the cycle route used parallel roads to the A9119 between the King's Gate and Queen's Cross roundabouts. This assessment therefore includes two alternative routes, Parallel Route A (Links 8 and 9) or Parallel Route B (Links 8, 10 and 11) that could be used as an alternative to this section of Queen's Road (see Figure 2).

In addition to understanding how well the proposals along the study corridor align with the core design principles set out in CbD, the CLoS assessment has been used to understand which of the routes between the King's Gate and Queen's Cross roundabouts offers the best provision for cyclists based on those principles.

It is important to note that the CLoS does not assess the engineering constraints i.e. how difficult the proposals are to implement, so any preferred route conclusions drawn from the CLoS scoring should be cross referenced

[3] https://www.brake.org.uk/get-involved/take-action/mybrake/knowledge-centre/active-travel/cycling
[4] Pedal Cycling Road Safety Factsheet, DfT, March 2018

with the Design Risk Register [TN03] which sets out the potential impact each route has on highway capacity, third party land, on-street parking, biodiversity, etc.

Junctions

There are 34 signal controlled, roundabout and priority[5] junctions along the study corridor and each one represents a significant injury risk to cyclists in terms of collisions caused by the conflicting movements and speed of motor traffic through the junction. As part of the concept design, those junctions that posed the greatest risk to cyclists (and pedestrians) where identified as:

- Westhill Drive j/w A944 (Roundabout - priority)
- A9119 j/w A944 (Cross-roads - signal controlled)
- A90 AWPR j/w A944 (Roundabout – signal controlled)
- Kingswells Causeway j/w A944 (T-junction - signal controlled)
- Fairley Road j/w A944 (Roundabout - signal controlled)
- A944 j/w Skene Road or 'Jessiefield roundabout' (Roundabout – part signal controlled)
- King's Gate j/w Queen's Road or 'King's Gate roundabout' (Roundabout - priority)
- Springfield Road j/w Queen's Road (T-junction - signal controlled)
- Anderson Drive j/w Queen's Road or 'Anderson Drive roundabout' (Roundabout - priority)
- Forest Road j/w Queen's Road or 'Forest Road roundabout' (Roundabout - priority)
- Queen's Road j/w Fountainhall Road, Carden Place & Albyn Place or 'Queen's Cross roundabout' (Roundabout - priority)
- Skene Street j/w Rosemount Viaduct (Cross-roads - signal controlled)

For each of these junctions, a qualitative assessment has been undertaken to establish the most significant risks to cyclists and how these have been either partially or completely mitigated. It should be noted that within the scope of this study only the cycle movements required to progress along the route have been assessed.

Should the Council wish to develop the active travel proposals for the study corridor beyond this outline design then the suitability of all permitted movements should be considered. It is therefore recommended that as part of the feasibility design stage, the Junction Assessment Tool (as defined by LTN 1-20) is used on each junction along the corridor to ensure all permitted movements for cyclists are safe but also that cyclists are provided a clear transition to and from the main corridor cycle route.

[5] Excludes side road junctions

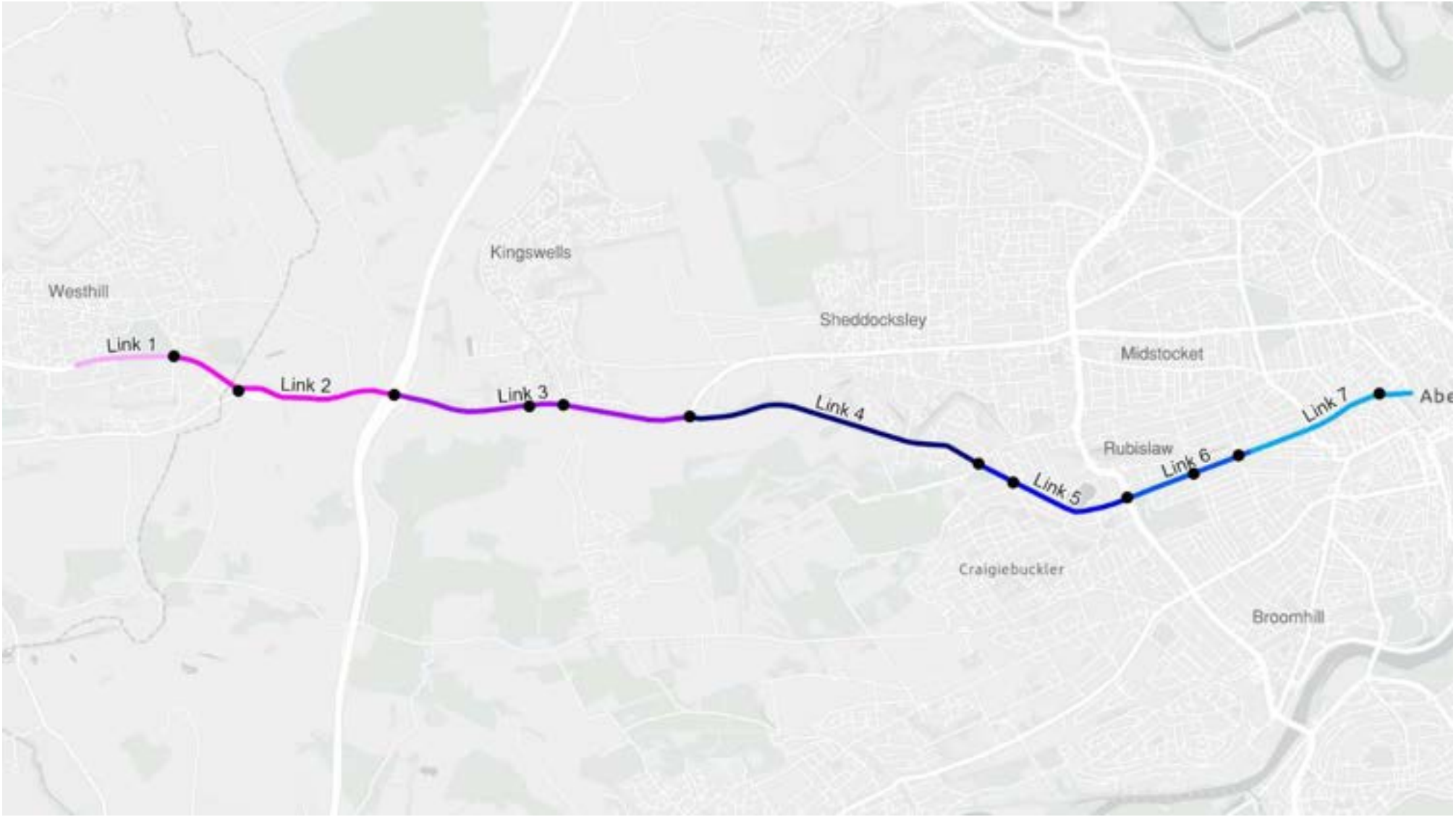

Figure 1: Main Route (Links 1 to 7)

Figure 2: Parallel Routes A and B (Links 8 to 11)

Methodology

Link Assessment

Each of the Routes (Main and Parallel) were divided into links which had a similar road layout and/ or traffic conditions. These are summarised below and illustrated in Figure 1 and Figure 2.

- Main Route (Link 1 to Link 7)
- Parallel Route A (Link 8 and Link 9)
- Parallel Route B (Link 8, Link 10 and Link 11)

Each link was then scored using the CLoS assessment for the existing and proposed road layouts. The scores for the existing road layout were based on google street view but also from the notes taken from site audits. Scores for the proposed road layouts where based on the first set of consultation plans which are provided in Appendix B.

It should be noted that following completion of the outline design, the Council undertook a public consultation process to gain local resident and stakeholder views and opinions of the scheme. As part of this process, the outline design was developed to produce consultation plans and as a result small changes were made to the proposed road layouts to reduce highway constraints and improve the provision for cyclists. As such this CLoS assessment is based on the consultation plans issued to the Council on the 14th June 2024 and which are described in the Cycle Route Design Summary technical note [TN01].

To score certain indicators within the CLoS (see Appendix A) additional data was required and these (with the data sources) are as follows:

- **Deviation Factor** (Indicator No. 4): This used google earth to estimate the route distance, the straight line (crow-fly) distance or (if required) the distance of the shortest alternative route by road
- **Gradient** (Indicator No. 8): Google earth was used to estimate the maximum elevation, minimum elevation, maximum slope and average slope of each link
- **Motor traffic volume on sections of shared carriageway** (Indicator No. 11): Data from the DfT road traffic counters was used to estimate the Annual Average Daily Total (AADT) and percentage of Heavy Goods Vehicles (HGV's)

As mentioned, an objective of the CLoS assessment was to help understand which of the proposed cycle routes between the King's Gate and Queen's Cross roundabouts i.e. the section of Main Route, Parallel Route A or Parallel Route B would provide the best route when compared against the core design principles. To do this an average of the following Link scores were calculated and compared.

- Main Route (Link 5 and Link 6)
- Parallel Route A (Link 8 and Link 9)
- Parallel Route B (Link 8, Link 10 and Link 11)

The only exception to the average score calculation was to the Deviation Factor and Gradient indicators where these where re-estimated using google earth between the start and end of the combined links.

Junction Assessments

To establish the risks cyclists' encounter at junctions and assess how the proposed road layouts have either reduced or eliminated this risk, a qualitative assessment has been undertaken at the 12 key junctions mentioned above. This assessment is based on four indicators related to core design principles of Safety, Directness, Coherence and Attractiveness but focused on the specific risks encountered at junctions.

- **Conflicting movements – motor traffic (Safety)*:** Accounts for the risk associated with;
  - left and right turn hooks
  - the flow of left turn movements including left turn slip lanes
  - the proportion of HGV movements
  - conditions for opposed right turns
  - motor vehicles accelerating into opportunistic gaps
  - motor vehicle lane changing particularly at roundabouts

- **Motor Traffic Speed Risk (Safety)*:** With motor traffic speed being the main contributing factor to the severity of road related injuries this considers the speed of motor traffic on the approach, through and exit to junctions and how this impacts the route cyclists take. For example, if cyclists are on-road and mixed with traffic it assesses the risk associated with the route through the junction. Alternatively, if the cycle route is off-road it assesses the risk associated with crossing arms of the junction.
- **Delay (Directness)*:** Accounts for the overall delay experienced by cyclists at junctions (compared to motor traffic) and considers both the frequency and duration of stopping/ give-ways but also the length of the route (i.e. the use of staggered or off-set crossings)
- **Ability to join and leave the route (Coherence):** Accounts for the ease to which cyclists can join and leave the route
- **Conflicting movements – pedestrians (Attractiveness):** Accounts for the level to which cyclists and pedestrians need to mix when crossing junctions

It should be noted that the outline design (on which this assessment is based) has not fully considered how cyclists negotiate all movements at the junctions, instead focusing on only those movements needed to progress along the designated cycle route. The indicators marked with an asterisk above do not therefore consider all cycle movements at the junction, with the recommendation being the Junction Assessment Tool (as defined by LTN 1-20) is used to inform on the next (feasibility) design stage.

Summary

The following section describes the analysis and results of the CLoS assessment. This includes the 11 individual links and the combined links that define the alternative routes between the King's Gate and Queen's Cross roundabouts which include the Parallel Routes A and B. The CLoS scoring for each of the 11 links and alternative route sections can be found in Appendix C while a detailed description of the assessment can be found in Appendix D. Appendix D provides a summary of each link which includes:

- Description of the existing road layout
- Description of the proposed road layout
- The overall CLoS score (sum of the core design principle scores) and areas for improvement.

Appendix E provides the outputs from the junction assessment based on the above indicators for the 12 key junctions identified along the study corridor. The aim of the assessment is to understand the extent to which these junctions have become safer for cyclists and pedestrians but also highlight areas for improvement.

Analysis and Results

Overview

Application of the CLoS tool provides a quantative assessment of how the existing provision for cyclists would change if the proposed road layouts provided in Appendix B where implemented. This assessment is based on the proposed road layouts compliance with the core design principles set out in CbD (Coherence, Directness, Safety, Comfort, Attractiveness and Adaptability) with the aim of:

- Identifying the key issues impacting the existing provision for cyclists
- Quantifying the extent to which the proposed road layout improves the provision for cyclists over the existing provision and that it achieves a minimum medium LoS as defined by CbD
- Identifying what further measures could be taken to improve the proposed road layouts for cyclists
- Understanding the most suitable route at locations where alternative cycle routes have been suggested

When assessing alternative routes, this applies to those proposed between the King's Gate and Queen's Cross roundabouts and which were developed because the introduction of cycle route infrastructure along this section of Queen's Road would result in a loss of bus priority and a likely increase in bus journey times. The alternative route to the Main Route (Link 5 and Link 6) is Parallel Route A (Link 8 and Link 9) and Parallel Route B (Link 8, Link 10 and Link 11).

A summary of the overall CLoS scores for the existing and proposed road layouts and for each link and alternative route sections is provided in Figure 3 . GREY bars relate to the existing road layout and BLACK bars the proposed road layout. Bars with a RED boarder are links that have one or more Critical Fail scores. To simplify the analysis, the overall Level of Service indicator has been given the following score ranges:

- Unsafe conditions for cyclists (●) – Score of zero or link with a Critical Fail
- Low Level of Service (●) – Score greater than zero and less than 33 percent
- Medium Level of Service (●●) – Score between 33 and less than 66 percent
- High Level of Service (●●●) – Score greater than 66 percent

Using these Level of Service definitions the next section provides a response to the above aims.

As the CLoS assessment does not fully consider the risk cyclists encounter at junctions and as it has not been possible to undertake the LTN 1-20 Junction Assessment Tool (JAT), a bespoke assessment has been adopted. This assessment, based on the core design principles set out in CbD, scores each of the key junctions along the study corridor (existing and proposed layouts) against the LoS indicators described above but using the following definitions. Note that only those indicators related to Safety use a Critical Fail score (●).

- Conflicting movements – motor traffic **(Safety):**
  - ● Cyclists exposed to a high level of significant conflicting movements
  - ● Cyclists exposed to a moderate level of significant conflicting movements
  - ●● All major and left turn conflicting movements removed
  - ●●● Conflicting movements eliminated

- Motor traffic speed risk **(Safety):**
  - ● Cyclists have a substantial interaction with motor traffic speeds greater than 30 mph
  - ● Cyclists have some interaction with motor traffic speeds greater than 30 mph (i.e. at crossings)
  - ●● Cyclists interact with motor traffic speeds (85th percentile) between 20 - 30 mph
  - ●●● Speeds (85th percentile) less than 20 mph on the approach, through and exiting the junction

- Delay **(Directness):**
  - ● Overall delay to cycle users at the junction is greater than the overall delay for motor traffic
  - ●● Overall delay to cycle users at the junction is equal to the overall delay for motor traffic
  - ●●● Overall delay to cycle users at the junction is less than the overall delay for motor traffic

- Ability to join and leave the route **(Coherence):**

- ● Cyclists cannot connect to other routes without dismounting
- ●● Cyclists can connect to other routes with minimal disruption to their journey
- ●●● Cyclists have dedicated connections to other routes provided, with no interruption to their journey

- Conflicting movements – pedestrians **(Attractiveness):**
  - ● Negative impact on pedestrian comfort levels
  - ●● No impact on pedestrian comfort levels
  - ●●● Pedestrian comfort levels enhanced by cycling provision

Compliance with Cycle by Design

Existing Link Provision

With reference to Appendix D and Figure 3, the existing provision along the main route (Links 1 to 7) scores poorly against the core design principles. The most compliant section with scores between 46 and 56 percent (●●) is ***between Westhill Drive and the A90 AWPR roundabouts*** (Links 1 to 2) due to the shared-use path and sections of cycle track along the northern side of the road. This shared-use path is however relatively narrow and does not always have a separation buffer with the road that has a 40 mph speed limit but the score is well within what can be considered a medium LoS as defined in CbD.

Along A944 ***between the A90 AWPR and Jessiefield roundabouts*** (Link 3) the CLoS score drops significantly to 34 percent to within what can just be considered a medium LoS. The reason for this relates to proximity of the shared-use path to the road (i.e. no separation buffer from the road), off-line and staggered crossing routes at junctions and a mixed traffic section along Old Skene Road which is a wide and heavily parked road with frequent driveway accesses. There is also a secluded shared-use path between Old Skene Road and the Jessiefield roundabout which has no natural surveillance along its length.

Along Skene Road and Queen's Road ***between the Jessiefield and King's Gate roundabouts*** (Link 4) the shared use-path continues along the northern side of the road until the Woodend Crescent junction where the footway narrows, and the cycle route is on-road for about 250 metres until the King's Gate roundabout. This shared-use path has a sub-standard width and has long sections were there is no buffer separation between the shared-use path and the road which has 30 and 40 mph speed limits. This results in an overall CLoS score of 34 percent (●●).

It should be noted that given the speed and flow of traffic on the mixed traffic section, the CLoS assessment should have possibly given a Critical Fail score to one or more of the indicators that define Safety. This was not done because of the relatively short on-road distance and there's also an alternative (unsigned) route via the adjacent residential road. If a Critical Fail score had been given to one of the Safety indicators, the overall CLoS score for Link 4 would have fallen to 24 percent (●).

Along Queen's Road ***between King's Gate and Anderson Drive roundabouts*** (Link 5) the cycle route is on-road. While advisory cycle lanes cover most of the link, they are narrow and provide little protection from the high traffic flows on a road with a 30 mph speed limit. Between Viewfield Road and Anderson Drive inbound cyclists are permitted to use the bus lane while outbound cyclists are on-road in what is likely to be the most heavily trafficked section of the link. This poor provision is reflected in a CLoS score of 24 percent (●) which includes a Critical Fail score for several of the indicators that define Safety.

Along Queen's Road ***between Anderson Drive and the Queen's Cross roundabout*** (Link 6) the link is made up of a wide single carriageway road with kerbside parking bays and bus stops located between frequent private driveway accesses. The cycling provision is on-road and mixed with traffic and given the flow and speed of motor vehicles combined with kerbside activity from parking bays, bus stops and the number of vehicle cross-overs, the CLoS score remains low at 24 percent (●) which again includes Critical Fail scores for several of the indicators that define Safety. The Queen's Cross roundabout presents a significant risk to all road users particularly those walking, wheeling and cycling.

Along Carden Place and Skene Street ***between the Queen's Cross roundabout and Rosemount Viaduct*** (Link 7) the existing road layout and operation is relatively consistent with Link 6. The link is made up of a wide single carriageway road with kerbside parking bays located between frequent private driveway accesses. The main difference when compared to Link 6 is that bus services do not operate along it, reducing the potential

conflict between buses and cyclists at bus stops. The cycling provision is on-road and mixed with traffic and given the flow and speed of motor vehicles combined with kerbside activity from parking bays and the vehicle cross-overs, the CLoS score is 26 percent (●) but which again includes Critical Fail scores for several of the indicators that define Safety.

The Links that define Parallel Route A (Links 8 and 9) and Parallel B (Links 8, 10 and 11) have CLoS scores that range from 22 to 32 percent.

- **Link 8** is mainly along King's Gate and scores relatively well with a CLoS score of 30 percent but this includes Critical Fail scores for several indicators that define Safety (●). The route taken by cyclists in the CLoS assessment is on-road as the footways are not shared-use but given the speed and flow of traffic it is acknowledged that most cycling is likely to be on the footway
- **Link 9** uses Carnegie Crescent, Rubislaw Den North, Desswood Lane, Fountainhall Road and Albert Lane and has a CLoS score of 32 percent (●). It scores relatively well on Safety (no Critical Fail scores) and Attractiveness with the route using predominantly quiet residential streets but scores low on Cohesion and Comfort due to poor continuity and difficult wayfinding
- **Link 10** uses Anderson Drive and scores poorly with a CLoS score of 22 percent that includes Critical Fail scores for several indicators that define Safety (●). The link also scores zero for Coherence due to a lack of potential connections to a wider cycle network. As with Link 8, the cycle route in the CLoS assessment is on-road but it is acknowledged that most cycling is likely to occur on the footway given the speed and flow of traffic
- **Link 11** is the equivalent of Link 9 for Parallel Route B using mainly quiet residential roads and lanes to connect to the Main Route on Carden Place. It has a CLoS score of 30 percent (●) with no Critical Fails which is slightly less than Link 9 mainly due to the greater use of 'Lanes' which result in a more secluded and therefore less Attractive route.

Proposed Link Provision (Main Route)

With reference to Figure 3 that summarises the link CLoS assessment (Appendix D) and the consultation plans (Appendix B) the proposed road layouts improve the CLoS score for each link substantially and well within the CLoS score that defines a high LoS (●●●). Importantly all Critical Fail scores are removed. This is as expected given the proposals provide either a fully segregated cycle route or when cyclists are mixed with traffic, it is within a low speed/ low flow motor traffic environment.

A summary of where improvements could be made to the proposals for the Main Route with reference to the core design principles is as follows:

- **Links 1 to 3** (A944): The buffer separation between cycle track and road plus enhanced street lighting, signage and road markings to support good wayfinding along the residential access road to the north of the Mayfield, Cherry Grove and Crommie Cottage residential properties are important to achieving an Attractive route. Changes at the A90 AWPR, Kingswells Causeway and Fairley Road junctions make a significant contribution to improving the Directness of the route. Directness would improve marginally if the alternative routes via a cycle track alongside the A944 replaced the route north of the above properties and the section along Old Skene Road.
- **Link 4** (Skene Road & Queen's Road): The lowest CLoS scores relate to Directness and Attractiveness but there is little scope for the proposals to improve on these scores given adjacent land uses (predominantly farmland) and route topography which remain unchanged.
- **Link 5** (Queen's Road west of Anderson Drive): Areas where the proposed road layout could be improved relate to Attractiveness where a reduction in shared-use areas at bus stops and at the Anderson Drive junction would reduce the impact of the proposals on pedestrian movement. It should be noted that a constrained highway boundary makes delivering fully segregated bus stop bypasses difficult and the most effective way to reduce the shared-use provision at the Anderson Drive junction would be to remove the roundabout and introduce a signal controlled cross-roads, but which would come at a substantial cost.
- **Link 6** (Queen's Road east of Anderson Drive): Again, the only area where the proposed road layout could be improved relates to Attractiveness and reducing areas of shared-use at bus stops and the Anderson Drive junction. Constraints as mentioned in Link 5 however still apply. Through discussions with businesses, hotel owners and schools it may be possible to improve the cycle parking provision along this link which would improve the Adaptability score.

- **Link 7** (Carden Place & Skene Street): The only area the proposed road layout could be improved is in Directness which includes indicators that measure delay at junctions. To do this the traffic signal off-set timings between junctions could be updated to give cyclists (not general traffic) a green wave through junctions.

Proposed Link Provision (Parallel Route)

Improvements that could be made to the proposed road layouts of the Parallel Routes are as follows:

- **Link 8** (Parallel Route A and B): The Cohesion of the route proposed along King's Gate could be improved further if a wider cycle route network was developed to the north, connecting to local schools and employment zones in Mastrick.
- **Link 9** (Parallel Route A): There are two scores of this link reflecting the cycle track (Option 1) and cycle street (Option 2) variants for Rubislaw Den North. Both scores indicate a high LoS as defined by CbD but suggest the cycle street layout has a slight advantage over the cycle track. The reason for this is that the cycle street layout scores slightly better for Adaptability and Safer than the cycle track. It should however be noted that each link includes a mix of cycle tracks and cycle streets, so the assessment is not making a direct comparison between a cycle street and a cycle track but road layouts that have more of one than the other. Both options have a reduced score for Attractiveness due to the limited levels of natural surveillance along Desswood Lane and Albert Lane.
- **Link 10** (Parallel Route B): There is little scope of improving the CLoS score further given the nature of the road (busy dual carriageway), highway constraints (trees) and the need to retain the cobblestone paving at the western end of Rubislaw Den North.
- **Link 11** (Parallel Route B): This link has a very similar score to Link 9 except for a higher Coherence score that can be attributed to this link requiring cyclists to make fewer turns. As with Link 9 the cycle street layout has a slight advantage over the cycle track but this time applied to Rubislaw Den South.

Main Route v's Parallel Route

To understand what the most suitable route between the King's Gate and Queen's Cross roundabouts the link scores were averaged over this section i.e. Main Route (Link 5 and Link 6), Parallel Route A (Link 8 and Link 9) and Parallel Route B (Link 8, Link 10 and Link 11). The result of this analysis is shown in Figure 3 and the following conclusion drawn.

- The Main Route is the preferred alignment with a CLoS score of 85 percent
- The next best route is Parallel Route B with a CLoS score of between 76 and 81 percent depending on whether a cycle track or cycle street is introduced along Rubislaw Den South
- The least good route (all provide a high LoS) is Parallel Route A with a CLoS score of between 73 and 77 percent again depending on whether a cycle track or cycle street is introduced along Rubislaw Den North
- When considering the most appropriate measure for Rubislaw Den North or Rubislaw Den South the above scores suggest the cycle street layout has a slight advantage over the cycle track

It is important to note that the CLoS assessment does not take account of engineering constraints i.e. how difficult the proposed road layouts are to implement, so the preferred alignment of the route suggested above should be cross referenced with the Design Risk Register [TN03] that sets out the potential impacts each route has on highway capacity, third party land, on-street parking, biodiversity, etc. For example, the Main Route between the King's Gate and Queen's Cross roundabouts requires substantial changes to major junctions including those at Anderson Drive, Forest Road and Queen's Cross and this is reflected in the Cost Plan [TN04]. These changes are also likely to reduce junction capacity which will increase journey times for general traffic and local bus services along this section of the corridor. The decision to recommend a preferred alignment for the cycle route should therefore take account of this CLoS assessment, the cost of implementing the proposed road layout and the impact the road layout will have on other road users particularly those using bus services.

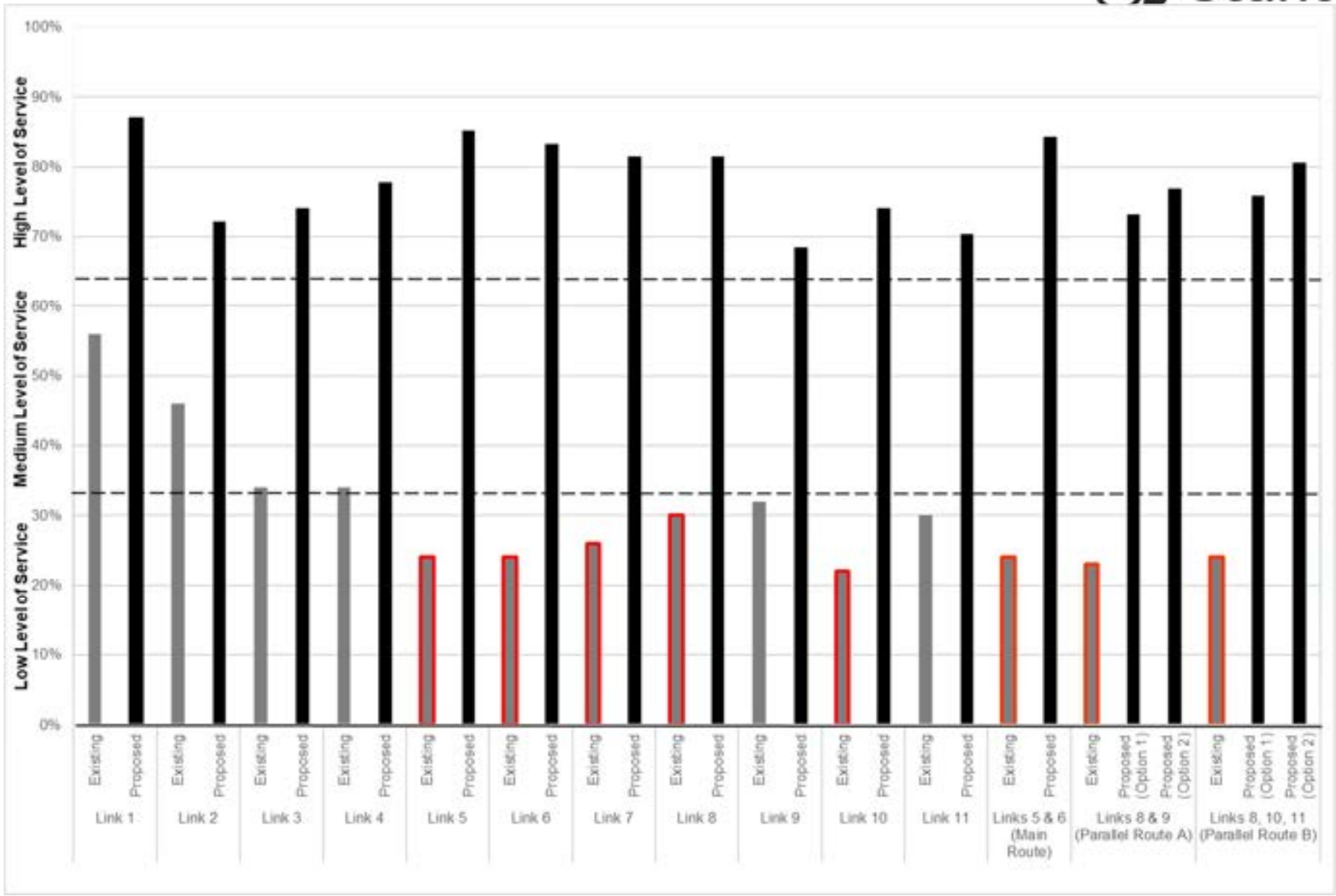

Figure 3: Summary of the link CLoS scores for the existing (base) and proposed road layouts

Existing & Proposed Junction Provision

Overview

With reference to the consultation plans (Appendix B) and junction CLoS (Appendix E), Table 1 summarises the qualitative assessment of 12 key junctions along the study corridor based on the indicators:

- Conflicting movements – motor traffic (Safety)*
- Motor Traffic Speed Risk* (Safety)
- Delay (Directness)*
- Ability to join and leave the route (Coherence)
- Conflicting movements – pedestrians (Attractiveness)

Those indicators with an asterisk only consider the movements cyclists need to take to progress along the proposed route. As such, the score for the ability of cyclists to join and leave the route is likely to improve as the design of the cycle route progresses from the outline to the feasibility design stages.

The following highlights the key issues, opportunities and challenges at each junction as part of the process to make the proposed junction layouts safe for cycling and support the delivery of a fully accessible and attractive route which encourages people to take up cycling as an everyday activity.

Westhill Drive j/w A944 (Roundabout - priority)

The provision of a signal controlled crossing on Westhill Drive removes a Critical Fail score (🔴) associated with the risk of conflicting movements from motor traffic and motor traffic speed at the roundabout. The proposals which improve the crossing on Straik Road and provide a new crossing on Westhill Drive make no significant reduction to delay, ability to join and leave the route or reduce conflicts with pedestrian movement which all have a low LoS (🔵). The next design stage should:

- Use traffic signal timings at the crossings to minimise the time that cyclists and pedestrians need to wait
- Ensure there are good connections to and from the route particularly along Westhill Drive
- Provide shared-use areas at the junction that are wide enough to minimise pedestrian and cycle conflict

A9119 j/w A944 (Cross-roads - signal controlled)

The cycle route bypasses the junction in both the existing and proposed layouts so there is no change to the scores for each of the above indicators with all achieving a medium LoS (🔵🔵) or better. With a low LoS (🔵) the area requiring most improvement is the ability for cyclists to leave and join the route particularly from the A9119 although this is unlikely to be an attractive connecting point given the speed and flow of traffic along this road.

A90 AWPR j/w A944 (Roundabout - signal controlled)

The proposals change the alignment of the cycle route from the northern perimeter of the roundabout to the northern perimeter of the island. This requires new signal controlled parallel crossings on the circulatory lanes on the roundabout but reduces the number of junction arms that need to be crossed.

The proposals reduce the risks associated with conflicting motor traffic movements and the speed of traffic with all other indicators achieving a medium LoS (🔵🔵). No further improvements required.

Kingswells Causeway j/w A944 (T-junction - signal controlled)

The proposals improve the cycle crossing provision on Kingswells Causeway replacing the signal controlled shared-use staggered crossing with a parallel crossing.

This will reduce the delay cyclists experience at the junction with all other indicators achieving a medium LoS (🔵🔵). No further improvements required.

Fairley Road j/w A944 (Roundabout - signal controlled)

The proposals improve the cycle crossing provision on Fairley Road replacing the signal controlled shared-use staggered crossing with a parallel crossing. The cycle route approaches to the junction are also improved.

This will reduce the delay cyclists experience at the junction and the potential conflict with pedestrian movements with the scores moving from a low LoS (🔵) to a medium LoS (🔵🔵). All other indicators achieve a medium LoS (🔵🔵) except for the ability to join and leave the route which remains at a low LoS (🔵) and which should be addressed at the next design stage.

Table 1: Summary of the junction CLoS scores for the existing (base) and proposed road layouts

Junction		Conflicting movements (motor traffic)		Motor Traffic Speed Risk		Delay		Ability to join and leave the route		Conflicting movements (pedestrians)	
		Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Westhill Drive j/w A944 (Roundabout - priority)		●	●●	●	●●	●	●	●	●	●	●
A9119 j/w A944 (Cross-roads - signal controlled)		●●	●●	●●	●●	●●●	●●●	●	●	●●	●●
A90 AWPR j/w A944 (Roundabout - signal controlled)		●	●●	●●	●●	●	●●	●●	●●	●●	●●
Kingswells Causeway j/w A944 (T-junction - signal controlled)		●●	●●	●●	●●	●	●●	●●	●●	●●	●●
Fairley Road j/w A944 (Roundabout - signal controlled)		●●	●●	●●	●●	●	●●	●	●	●	●●
A944 j/w Skene Road 'Jessiefield roundabout' (Roundabout – part signal controlled)		●	●●	●	●	●	●●	●	●	●	●●
King's Gate j/w Queen's Road (1) (Roundabout - priority)	Main	●	●●	●	●●	●	●	●	●●	●●●	●
	Parallel		●●●		●●●		●●		●		●
Springfield Road j/w Queen's Road (T-junction - signal controlled)		●	●●	●	●●	●●	●●	●	●●	●●	●●
Anderson Drive j/w Queen's Road (Roundabout - priority)		●	●●	●	●●●	●●	●	●	●	●	●●
Forest Road j/w Queen's Road (Roundabout - priority)		●	●●	●	●●	●●	●●	●	●●	●	●●●
Queen's Road j/w Carden Place 'Queen's Cross' (Roundabout - priority)		●	●●	●	●●●	●●	●●●	●	●●●	●	●●●
Skene Street j/w Rosemount Viaduct (Cross-roads - signal controlled)		●	●●	●	●●	●●	●●	●	●●	●●	●●

Notes:

●(Critical Fail) ●(Low Level of Service) ●●(Medium Level of Service) ●●●(High Level of Service)

(1) There are two designs for the King's Gate roundabout depending on whether the Main Route or Parallel Route is used

A944 j/w Skene Road or 'Jessiefield roundabout' (Roundabout – part signal controlled)
The existing provision based on an off-road route has a Critical Fail score (🔴) for the risk from conflicting motor traffic movements. This is based on anecdotal evidence that there is poor compliance of the traffic signal controls at the crossing on the northern arm of the roundabout travelling along the A944 east to north.

The proposals improve this crossing by replacing the signal controlled shared-use staggered crossing with a parallel crossing and relocating it further from the roundabout. The cycle route approaches to the junction are also improved.

This will reduce the delay cyclists experience at the junction and potential conflict with pedestrian movements which changes from a low LoS (🔵) to medium LoS (🔵🔵). Indicators that remain at a low LoS (🔵) include the ability to join and leave the route and motor traffic speed. Ability to join and leave the route relates to the suitability of the connection to Lang Stracht while motor traffic speed highlights the further work required to ensure the non-compliance issues related to the crossing are resolved.

King's Gate j/w Queen's Road (Roundabout - priority)
The existing provision at the King's Gate roundabout is based on an on-road cycle route and which has Critical Fail scores (🔴) associated with the risk from conflicting motor traffic movements and the speed of motor traffic. The proposed off-road provision removes both Critical Fail scores (🔴).

The proposals for this junction differ depending on whether the cycle route continues along the Main Route (Queen's Road) or uses the Parallel Routes (via King's Gate).

As part of the proposals for the Main Route, areas for improvement at the next design stage should include:

- Increased delay (compared to motor traffic) due to cyclists having to use the parallel Zebra crossings on King's Gate and Queen's Road to bypass the junction
- Increased conflict with pedestrian movement due to the shared-use areas (some of them minimum width) between the crossings – the roundabout is close to Hazlehead Primary School so footways will be well used at the start and the end of the school day

As part of the proposals for the Parallel Route, areas for improvement include:

- Ability to join and leave the route particularly to/ from Hazlehead Avenue and the Queen's Road (west)
- Increased conflict with pedestrian movement as described above

It is notable that the risk of pedestrian movement conflict increases under both sets of proposals going from a high LoS (🔵🔵🔵) to low LoS (🔵). This is because the existing route assumes cyclists are on-road and the proposed route puts cyclist off-road but on minimum width shared-use paths.

Springfield Road j/w Queen's Road (T-junction - signal controlled)
The existing cycle route provision is on-road and results in a Critical Fail score (🔴) related to the risks associated with conflicting motor traffic movements. The proposals remove this Critical Fail score, allowing cyclists on Queen's Road to access cycle Advance Stop Lines (ASLs) from segregated cycle tracks while a cycle lane provides access to the ASL on Springfield Road. For all other indicators the proposals move the cycle route provision to a medium LoS (🔵🔵).

Although not highlighted by the assessment, further design work is required to improve the right turn from Queen's Road to Springfield Road. This would reduce the risk from conflicting motor traffic movements and improve the opportunity for cyclists to leave the route.

Anderson Drive j/w Queen's Road (Roundabout - priority)
The Anderson Drive roundabout presents a significant risk to cyclists, and this is reflected in the Critical Fail scores (🔴) associated with the risk from conflicting motor traffic movements and the speed of motor traffic. The proposed off-road provision removes both these Critical Fail scores (🔴) but there are residual deficiencies with the proposals related to:

- Delay due to the proposed off-road route using off-set crossings on Anderson Drive decrease the LoS from medium (🔵🔵) to low (🔵). This is because the existing provision assumes an on-road route but this is unlikely given the significant risks to cyclists using the roundabout so the score for the existing route may be underestimating the delay cyclists currently experience at the junction
- Ability to join and leave the route remain at a low LoS (🔵) given the lack of a suitable cycle route along Anderson Drive

- A potential increase in conflicting movements with pedestrians if the road widening required for the shared-use areas cannot be achieved – the scoring reflects the proposed road layout being delivered where shared-use areas are sufficiently wide to increase the LoS from low (●) to medium (●●)

Forest Road j/w Queen's Road (Roundabout - priority)
The existing provision at the Forest Road roundabout is based on an on-road cycle route, has Critical Fail scores (●) associated with the risk from conflicting motor traffic movements and the speed of motor traffic.

The proposed road layout replaces the roundabout with a signal controlled cross-roads removing both Critical Fail scores (●) and achieving a medium LoS (●●) for delay and ability to join or leave the route. The risk associated with pedestrian movement conflict reduces going from a low LoS (●) to a high LoS (●●●) and the proposed road layout provides a protected on-road provision which should be effective at encouraging cyclists not to use the footway.

Queen's Road j/w Fountainhall Road, Carden Place & Albyn Place (Roundabout - priority)
The Queen's Cross roundabout presents a significant risk to cyclists, and this is reflected in the Critical Fail scores (●) associated with the risk from conflicting motor traffic movements and the speed of motor traffic.

The proposed protected track roundabout layout (or 'Dutch-style' roundabout) removes both these Critical Fail scores (●) and increases the scores for delay, ability to join and leave the route and pedestrian movement conflict to a high LoS (●●●). No further improvements required.

Skene Street j/w Rosemount Viaduct (Cross-roads - signal controlled)
The existing provision based on an on-road cycle route has a Critical Fail score (●) for the risk from conflicting motor traffic movements.

The proposed road layout with protected cycle lanes on the approach and exit to the junction and advisory cycle lanes within the junction removes this Critical Fail score (●) and increases the remaining indicator scores to a minimum of a medium LoS (●●). Due to the geometry of the junction further work should be undertaken to ensure the cycle route can be safely accessed from the other junction arms i.e. Rosemount Viaduct (north) and Skene Street (east).

Summary and Conclusions

Cycle Level of Service Assessment

This Cycle Level of Service (CLoS) assessment has been undertaken to understand the compliance of the cycle route infrastructure developed during the A944/ A9119 Active Travel Corridor Study with respect the core design principles set out in Cycle by Design (CbD).

The assessment is based on the CLoS tool described in LTN 1-20 but adapted to align more closely with the indicators that define the core design principles of Safety, Coherence, Directness, Comfort, Attractiveness and Adaptability in CbD. It should be noted that there is broad alignment between the two guidance documents with respect to how the indicators are defined and scored. Appendix A includes a table that shows how the LTN 1-20 indicators were adjusted to achieve this broad alignment and so create a CbD compliant CLoS tool.

For the cycle route infrastructure developed as part of the A944/ A9119 active travel study the CbD CLoS tool has been used to establish the following aims:

- Identify the key issues impacting the existing provision for cyclists
- Quantify the extent to which the proposed road layouts improve the provision for cyclists over the existing road layout and that they achieve a high LoS as defined in CbD
- Identify what further measures could be taken to improve the proposed road layouts for cyclists
- Understand the most suitable route at locations where alternative cycle routes have been suggested

The assessment defined the corridor into 11 links which covered the main and alternative routes and was based on the consultation plans (prepared from the outline design) and which can be found in Appendix B.

The existing and proposed road layouts were assessed using the CLoS tool and each link was given a score for each of the indicators that define the core design principles. The scores for Safety, Coherence, Directness, Comfort, Attractiveness and Adaptability where then combined to provide an overall CbD compliance score which was used to inform on the above aims. The CLoS scoring (and notes) for each of the 11 links and alternative route sections can be found in Appendix C while a detailed description of the assessment is provided in Appendix D.

The CLoS assessment does not fully consider the risk cyclists encounter when travelling through junctions, so a bespoke junction assessment was developed based on the cycle design principles set out in CbD. The assessment used the most relevant CLoS indicators and a qualitative review of the junction operation for the existing and proposed road layouts to understand the extent to which the risk of cyclist injury at junctions could be reduced under the proposals. The junction CLoS indicators used, along with the core design principles they relate to, were:

- Conflicting movements – motor traffic (Safety)*
- Motor Traffic Speed Risk* (Safety)
- Delay (Directness)*
- Ability to join and leave the route (Coherence)
- Conflicting movements – pedestrians (Attractiveness)

Link Assessment

The following table summarises the CLoS assessment for the Links including the combined Links that make up the section of the study corridor were an alternative route is proposed.

Table 2: Link CLoS assessment summary

Link	Description	Existing			Proposed		
		CLoS Score	CLoS Ranking	Critical Fail	CLoS Score	CLoS Ranking	Critical Fail
1	Brimmond Drive to Westhill Drive	56%	●●	No	87%	●●●	No
2	Westhill Drive to A90 AWPR roundabout	46%	●●	No	72%	●●●	No
3	A90 AWPR to Jessiefield roundabout	34%	●●	No	74%	●●●	No
4	Jessiefield roundabout to King's Gate	34%	●●	No	78%	●●●	No
5	King's Gate to Anderson Drive	24%	●	Yes	85%	●●●	No
6	Anderson Drive to Queen's Cross	24%	●	Yes	83%	●●●	No
7	Queen's Cross to Schoolhill	26%	●	Yes	81%	●●●	No
8	King's Gate to Anderson Drive	30%	●	Yes	81%	●●●	No
9	Anderson Drive to Carden Place (via Rubislaw Den North)	32%	●	No	69%(1) 76%(2)	●●●	No
10	Carnegie Crescent to Rubislaw Den South (via Anderson Drive)	22%	●	Yes	74%	●●●	No
11	Anderson Drive to Carden Place (via Rubislaw Den South)	30%	●	No	70%(1) 78%(2)	●●●	No
MR	Main Route (Alternative)	24%	●	Yes	84%	●●●	No
PRA	Parallel Route A (Cycle Track)	23%	●	Yes	73%	●●●	No
	Parallel Route A (Cycle Street)				77%	●●●	No
PRB	Parallel Route B (Cycle Track)	24%	●	Yes	76%	●●●	No
	Parallel Route B (Cycle Street)				81%	●●●	No

Notes:
(1) Cycle track option
(2) Cycle street option

Key outputs from the link CLoS assessment of the existing cycle route along the study corridor are:

- Westhill to the A90 AWPR junction (Link 1 and Link 2) has an adequate provision (●●) with a sufficient level of Safety and Directness. The route however is not Attractive and so unlikely to encourage new cyclists to use the route
- A90 AWPR to the King's Gate roundabout (Link 3 and Link 4) meets the minimum requirements for a medium LoS (●●) but there are significant issues that make it unsuitable as a cycle route. This includes narrow sections of shared-used paths, unprotected side roads and an on-road section where cyclists share the road with heavy traffic flows approaching a multi-lane roundabout
- The route between King's Gate roundabout and the city centre (Link 5, Link 6 and Link 7) does not meet the minimum requirements for a cycle route and there are frequent locations (particularly at junctions) that pose a significant risk to cyclists resulting in a Critical Fail score (●) that make the route unsuitable even for confident cyclists

The proposed road layouts as set out in Appendix B enhance the link provision for cyclists to a high LoS (●●●) but importantly remove all Critical Fail scores (●) which are related to Safety, from the route.

With respect to the most suitable route between the King's Gate and Queen's Cross roundabouts the Main Route is the preferred alignment with a CLoS score of 84 percent. The next best route is Parallel Route B with

a CLoS score of between 76 and 81 percent with the cycle street option along Rubislaw Den South producing the higher score.

Junction Assessment

The qualitative assessment of 12 key junctions along the study corridor indicated the proposed road layouts (Appendix B) achieved in most cases, a medium LoS (●●) or higher (●●●) across the five defined junction indicators. Areas where a medium LoS (●●) was not achieved highlights areas where the next design stage should seek to make improvements. These areas are summarised in Table 3.

Table 3: Junction assessment – areas of improvement

Junction (type)	Areas of improvement[6] ●
Westhill Drive j/w A944	Delay Ability to join and leave route Conflicting movements (pedestrians)
A9119 j/w A944	Ability to join and leave route
A90 AWPR j/w A944	None
Kingswells Causeway j/w A944	None
Fairley Road j/w A944	Ability to join and leave route
A944 j/w Skene Road 'Jessiefield roundabout'	Motor traffic speed risk Ability to join and leave route
King's Gate j/w Queen's Road	Delay Ability to join and leave route Conflicting movements (pedestrians)
Springfield Road j/w Queen's Road	None
Anderson Drive j/w Queen's Road	Delay Ability to join and leave route
Forest Road j/w Queen's Road	None
Queen's Road j/w Fountainhall Road, Carden Place & Albyn Place 'Queen's Cross'	None
Skene Street j/w Rosemount Viaduct	None

For each of the five junction indicators the following describes measures to improve the score and which should be considered at the next design stage. This should focus on the above areas of improvement but extend across all junctions with the aim of moving any medium LoS (●●) score to a high LoS (●●●) score.

To reduce the risk from **motor traffic conflicting movements** the following measures should be considered:

- Cyclists should be provided with a dedicated crossing phase within the traffic signal plan
- At locations where cyclists are on-road, signal controlled junctions should include a cycle 'early release'

[6] Areas of improvement assume the proposed road layout for the junction is fully deliverable. If changes are required to the layout due to engineering, highway capacity or land constraints then these improvements to achieve a medium LoS (as a minimum) may change

To reduce the risk from **motor traffic speed** the following measures should be considered:

- Junction geometries should be modified (tightened up) to reduce vehicle speeds on the approach, through and exit to the junctions particularly at roundabouts (all movements) and at cross-roads (left and right turns)
- Good visibility of traffic signal heads particularly those associated with standalone side road crossings

To reduce the **delay** cyclists experience at junctions the following measures should be considered:

- Where new or upgraded cycle crossings are introduced, cycle detection on the approaches should be introduced to bring forward the cycle crossing phase within the signal plan
- At locations where cyclists are on-road but where signal controlled junctions are frequently spaced, the off-set timing between these junction should be set to give cyclists (rather than motor traffic) a 'green wave' along the route

To improve the ability of cyclists to **join and leave the route** the following measures should be considered:

- Crossing facilities on all arms of the junction should be made suitable for cyclists
- Shared-use areas between crossing facilities should meet or exceed desired width standards
- A wider cycle route network should be developed[7] across the western areas of Aberdeen providing safe cycle routes between adjacent residential and employment areas to the main cycle route

To reduce **conflicting movements with pedestrians** the following measures should be considered:

- The use of shared-use areas should be minimised with cycle tracks linked directly to dedicated parallel cycle crossings
- If shared-use areas are required these should meet or exceed desired width standards

There are several junctions along the study corridor where significant layout changes are proposed to provide a suitable cycle route on the approach, through and exit to the junction. The extent of these changes is likely to reduce the capacity of the junction for motor traffic which could have an impact on the performance of local bus services. It is therefore recommended that as part of the feasibility design stage, traffic modelling assessments are undertaken to assess the extent of traffic delays and develop mitigation to reduce the impact on motor traffic, particularly for bus services.

[7] As a minimum the cycle route density over this wider area should be between 200-800m (ideally less than 200m) between key primary and secondary route. See CbD page 30.

Conclusions

- **CLoS link assessment**: The proposed road layouts as set out in Appendix B enhance the provision for cyclists to a high LoS (●●●) but importantly removes all critical cycle safety risks (●) from the route
- **Route improvements**: The CLoS link assessment suggests the proposed road layouts can be improved in the following areas
  - **Westhill to Jessiefield roundabout (Links 1 to 3)**: An adequate separation buffer between the cycle track and the road is an important element of maintaining the Attractiveness of this section of route
  - **Use of bypass roads (Links 3 and 4)**: There is no additional justification to use the alternative route sections between the A9119 j/w A944 and the Cormack Park access and between the Fairley Road and Jessiefield roundabouts. These alternative routes proposed a continuation of the two-way cycle track alongside the A944 compared to the proposed alignment that uses an existing but modified by-pass road i.e. the Mayfield, Cherry Grove and Crommie Cottage access road and Old Skene Road
  - **King's Gate to Queen's Cross (Link 5)**: Reducing shared-use areas at bus stops or at the Anderson Drive junction to reduce the impact on pedestrian comfort levels
  - **Cycle parking (Link 6 and 7)**: To improve Attractiveness and Adaptability locations for cycle parking along the route should be identified and integrated into the route designs
  - **Carden Place and Skene Road (Link 7):** The signal timing off-sets between junctions should give cyclists (travelling at a typical speed) a 'green wave' through the Albert Street and Rose Street junctions plus intermediate signal controlled crossings
  - **Whole route:** To improve the Cohesion of the route, a wider cycle route network should be developed, connecting the main route to nearby schools, colleges, leisure facilities and employment areas
  - **Whole route:** To improve the Comfort of the route a comprehensive signage strategy (including cycle route and network branding) should be implemented to support good wayfinding and route promotion
- **Preferred route alignment**: Based on the CLoS link assessment the most suitable route between the King's Gate and Queen's Cross roundabouts is the Main Route with a CLoS score of 85 percent. The next best route is Parallel Route B with a CLoS score of between 76 and 81 percent with the higher score associated with using a cycle street rather than cycle track along Rubislaw Den South
- It is important to note that the CLoS assessment does not take account the physical/ engineering (cost) constraints associated with the proposed road layouts i.e. how difficult the proposals are to implement, so any conclusions drawn on the preferred route alignment from the CLoS scoring should be done so with reference to the Design Risk Register [TN03] and Cost Plan [TN04]
- In this case, the CLoS assessment indicates the Queen's Road alignment is preferred but this section of the corridor includes several high capacity junctions that will need substantial change to accommodate the proposed cycle route, and which are likely to result in a higher cost than the Parallel Routes. The Queen's Road alignment will also have a greater negative impact on local bus services
- **Cycle streets v's cycle tracks**: The CLoS scoring for Link 9 and Link 11 suggests the cycle street layout has a slight advantage over the cycle track when proposals for Rubislaw Den North and Rubislaw Den South are considered. The reason for this is that the cycle street layout is slightly more Adaptable and Safer than the cycle track
- **CLoS junction assessment**: The proposed junction layouts as set out in Appendix B make substantial improvements to the cycle route provision at junctions removing Critical Fail (●) scores as defined by the five junction indicators defined above. Further design work is required to remove the low LoS (●) scores (i.e. areas of improvement) and move the medium (●●) LoS scores to a high (●●●) score.
- This can be achieved by making changes to improve

  Safety

  - Cyclists should be provided with a dedicated crossing phase within the traffic signal plan
  - Where cycle tracks or lanes extend to the stop lines a cycle 'early-release' should be introduced
  - Junction geometries should be modified to reduce the speed of motor traffic particularly turning movements
  - Good visibility of traffic signal heads particularly at standalone side road crossings

Directness

- Where new or modified pedestrian and cycle crossings are proposed, signal timings and/ or method of detecting cycles should be optimised to minimise crossing delay
- The off-set between signal controlled junctions should be set to provide cyclists a 'green wave' along the route

Coherence

- At signal controlled junctions introduce 2-stage right turns to make it easier for cyclists to join and leave the route

Attractiveness

- Shared-use areas should be minimised with cycle tracks linked directly to dedicated parallel cycle crossings and where shared-use areas are required these should meet or exceed desired width standards

- To improve the proposed junction layouts, it is suggested that at the next design stage the Junction Assessment Tool set out in LTN 1-20, is applied to all junctions and changes made so that for all permitted movements, cyclists have a direct and safe route through each junction, providing clear transitions to and from the proposed cycle route.
- **CLoS updates**: This CLoS assessment is based on the outline design which presents a best case layout for the cycling provision along the study corridor as the outline design does not fully account for all:
  - physical/ engineering (cost) constraints i.e. availability of land where road widening is required or a narrowing of the central reservation
  - highway capacity including those impacts on bus services and on-street parking
  - public consultation responses
- These physical/ cost/ highway capacity constraints and public consultation inputs will inevitably lead to design change and value engineering with potentially some downgrading of the cycle route infrastructure as the final road space reallocation is modified to comply more closely with the roads hierarchy set by the National Transport Strategy
- It is suggested this CLoS assessment is updated at each design stage to confirm changes made to the proposed road layouts maintain a high LoS (●●●) score along the proposed cycle route and so ensure a safe, fully accessible and attractive route is delivered which encourages people to take up cycling as an everyday activity.

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Appendix A: Cycle by Design CLoS Development

Contents

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
LTN 1-20 v's CbD

Stantec

				LTN 1-20 Level of Service					Cycle by Design Level of Service			
	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Design Principle	X Don't Use	● Low	●● Medium	●●● High
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	Cycling infrastructure should form a coherent network which links origins and destinations. This allows the cycle network to link communities, facilities and integrate with other modes of travel. Routes should be continuous from an origin to a destination, easy to navigate, well signed, intuitive and of a consistently high quality		Cycle users must dismount or are 'abandoned' at the end of a route	Cycle routes contribute to a network, but users experience some disruption when connecting between routes, and navigation may be difficult	Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions					
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 – 1000m	Route contributes to a network density mesh width <250m			*Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]*	*Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]*	*Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]*
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	Cycle users should be offered the most direct route based on existing and latent trip desire lines, minimising detours and delays. Directness has both geographical and time elements, with delays at junctions and crossings, as well as physical detours, affecting it		Cycle route is more than 20% less direct than the equivalent motor traffic journey, with frequent need to stop or give-way. Delay for cycle users at junctions is greater than for motor traffic	Cycle route is up to 20% less direct than the equivalent motor traffic journey, with some need to stop or give-way. Delay for cycle users at junctions is equal to motor traffic delay	Cycle route is at least as direct as the equivalent motor traffic journey, with minimal need to stop or give-way. Delay for cycle users at junctions is less than for motor traffic
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km			*At **priority junctions** cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]*	*At **priority junctions** cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]*	*At **priority junctions** motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]*
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)			*At **signalised junctions** the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]*	*At **signalised junctions** the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]*	*At **signalised junctions** the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]*
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed					
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Route includes sections steeper than the gradients recommended in Chapter 5	There are no sections of route steeper than the gradients recommended in Chapter 5	There are no sections of route which steeper than 2%			*Much of the route exceeds 3% gradient [p.60]*	*Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]*	*There are no sections of route steeper than 3% gradient [p.60]*

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
LTN 1-20 v's CbD

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				LTN 1-20 Level of Service						Cycle by Design Level of Service		
	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Design Principle	X Don't Use	● Low	●● Medium	●●● High
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph					
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph					
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT					
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic. See Figure 4.1. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide	Cyclists in cycle lanes at least 1.8m wide on-carriageway; 85th percentile motor traffic speed max 30mph	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph			In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	Designs should minimise the potential for actual and perceived accident risk. Perceived risk is a key barrier to cycle use. Users should feel safe as well as be safe at all stages of their journey, including parking at their origin and destination. It is important to provide consistency of design and avoid ambiguity		*At **signalised junctions** cycle users share the same space as motor traffic and move through the junction at the same time [p.174]* ***Suitability of crossings for cyclists** : See Section 2.4 and Table 4.1 [p.124].* *Not suitable for a range of users, including novice and intermediate users. Shall be avoided unless the risk to these users is conveyed to the Overseeing Organisation by the designer and accepted by the Overseeing Organisation*	*At **signalised junctions** cycle users are provided with separate time to move through junction from conflicting motor traffic, but may share the same space [p.174]* ***Suitability of crossings for cyclists** : See Table 4.1 [p.124].* *May not be suitable for some users, particularly novice users. Designer shall consider the lack of attractiveness of the facility to these users and how this can be overcome or mitigated*	*At **signalised junctions** cycle users are separated from conflicting motor traffic in both time and space when moving through the junction [p.174]* ***Suitability of crossings for cyclists:** See Table 4.1 [p.124]. Suitable for most users*
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout					
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m					
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.					

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
LTN 1-20 v's CbD

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				LTN 1-20 Level of Service					Cycle by Design Level of Service			
	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Design Principle	X Don't Use	● Low	●● Medium	●●● High
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	Cycle user comfort is critical to journey experience and making cycling an everyday choice for users. Routes should minimise mental and physical stress and effort, be convenient and avoid complex manoeuvres. Smooth, uninterrupted surfaces with gentle gradients and secure, sheltered cycle parking will enhance comfort. Cycling infrastructure should be well-maintained to ensure its continued comfort and appeal		Sections of the route are unbound, bumpy, not regularly maintained or otherwise hazardous. Desirable minimum widths or gradients are not achieved for the majority of the route	Sections of route are hand-laid with frequent joints. Route is maintained less frequently than the road network. Desirable minimum widths or gradients are not achieved for some of the route	Cycle route surfaces are machine laid, smooth and well-maintained (at least as regularly as the road network). Desirable minimum widths and gradients are fully achieved
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints	Machine laid smooth and non-slip surface – e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles			*Cycle route surface is unbound or deterioration has led to frequent defects [p.112]*	*Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]*	*Cycle route surface is machine laid and smooth, with no defects [p.112]*
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route			*Most of the route falls below desirable minimum widths. See Table 3.7 [p.64]*	*Some sections of the route fall below desirable minimum widths, or Most of the route falls below desirable minimum widths, but cycle user numbers are less than 50 per hour with limited scope for growth. See Table 3.7 [p.64]*	*Desirable minimum widths are fully achieved. See Table 3.7 [p.64]*
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions					
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most or all of route is unlit	Short and infrequent unlit/ poorly lit sections	Route is lit to highway standards throughout	Infrastructure should be designed in harmony with its surroundings in such a way that the whole experience makes cycling an attractive option. A route should complement and enhance the area through which it passes. Lighting, personal security, aesthetics, environmental quality and noise are important considerations		*Most of the link is infrequently lit or overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]*	*Some sections of the link are infrequently lit or overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]*	*The cycle link is well lit and overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]*
			22. Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length					
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A			The majority of the route is infrequently lit or not overlooked. Parking areas are not secure or are insufficient in number	Some sections of the route are infrequently lit or not overlooked. Parking areas are secure but not overlooked or are insufficient in number	Cycle route and parking areas are well lit, overlooked and do not create any personal security issues for users. The cycle route adds to the sense of place in the area, encouraging people to spend time there
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction					
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure non overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand			***Safety** : Not secure and below the desirable minimum level of provision [p211]*	***Safety** : Secure but not overlooked and/or only providing the desirable minimum level of provision [p211]*	***Safety** : Secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]*
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands							***Cycle route** : No scope to amend cycling infrastructure once installed [p.64]*	***Cycle route** : Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	***Cycle route** : Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*
	Cycle Parking		27. Cycle parking can be increased to meet future demands							***Cycle parking:** Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	***Cycle parking:** Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	***Cycle parking** : Has the flexibility to expand, evolve or adapt to changing demands [p211]*

Appendix B: Proposed Road Layouts (Consultation Plans)

Contents

Main Route Drawings

- Drawing Number: 332610462-STN-HGN-XX-DR-H-5501(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5502(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5503(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5504(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5505(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5506(P01)
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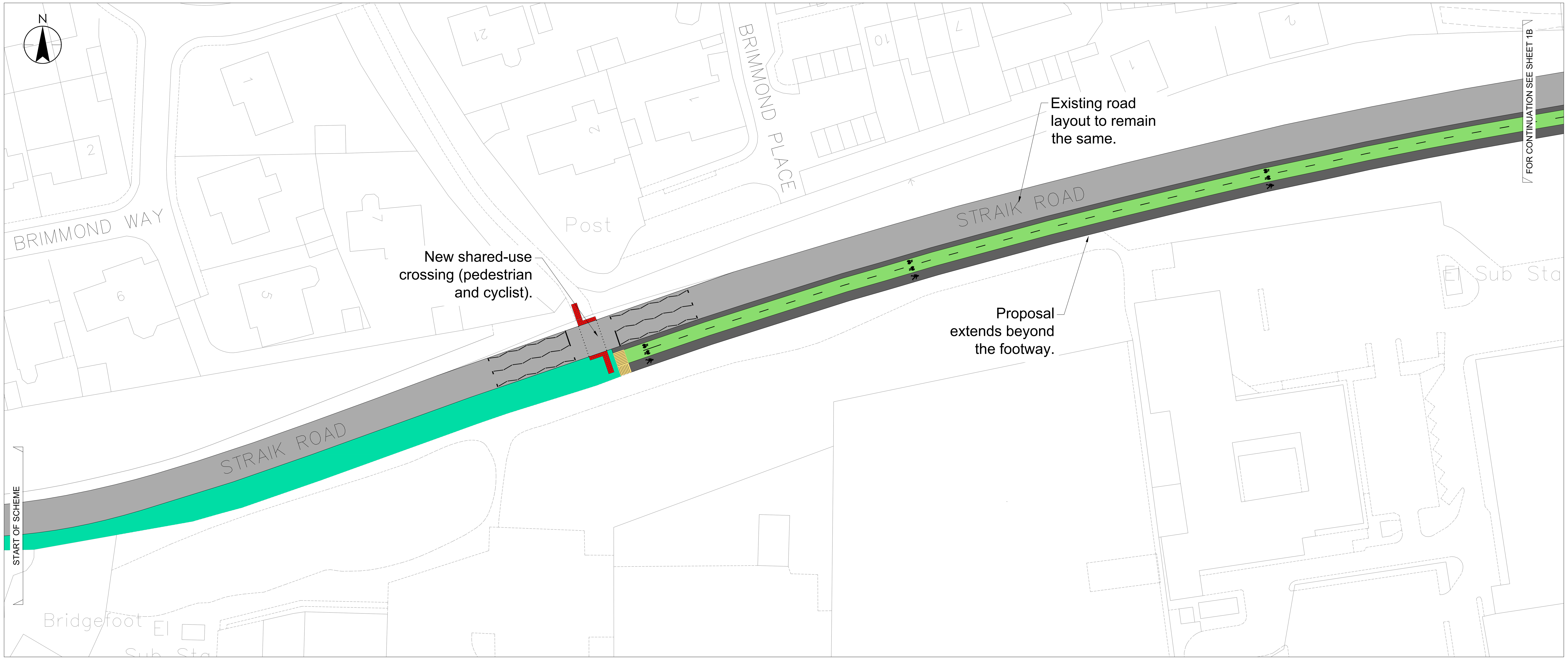
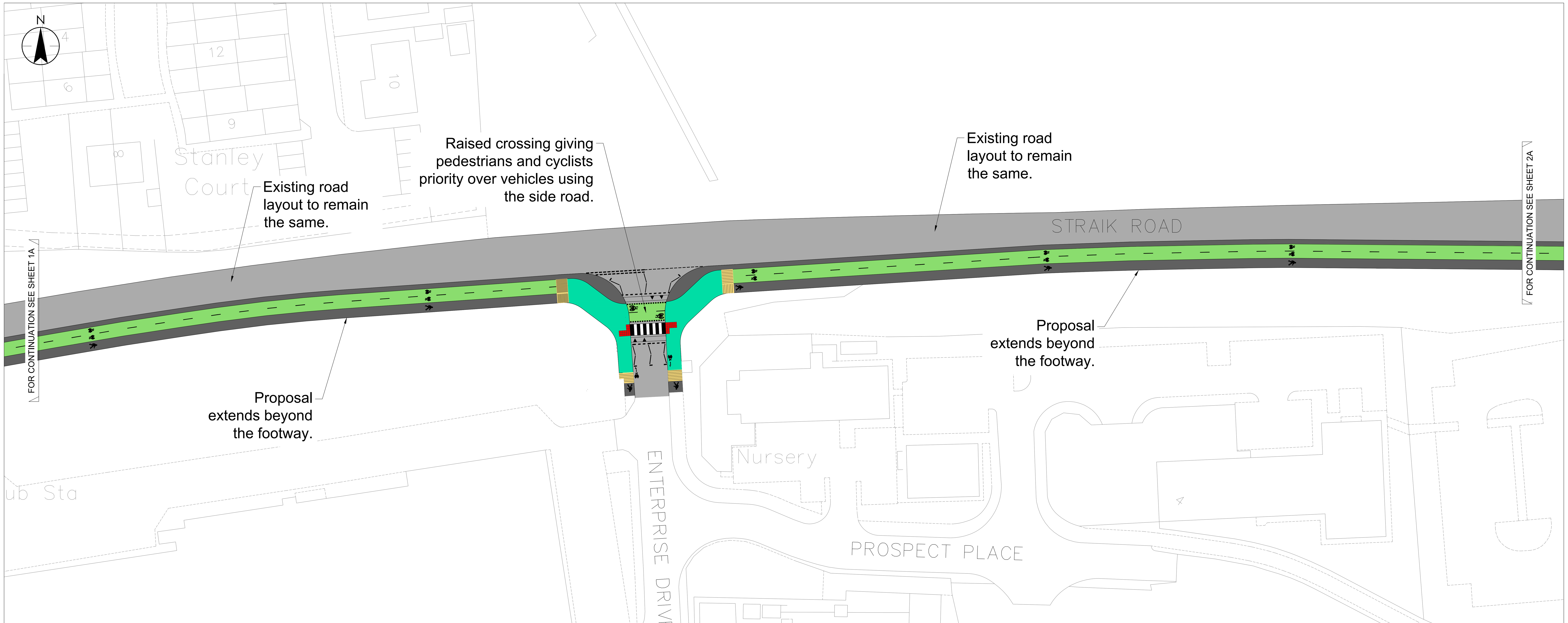
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5518(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5519(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5520(P01)





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Notes

1. The layout is subject to detailed design, highway capacity testing, road safety audit, ground investigations, earthworks modelling, utilities & services searches, and confirmation of land ownership.
2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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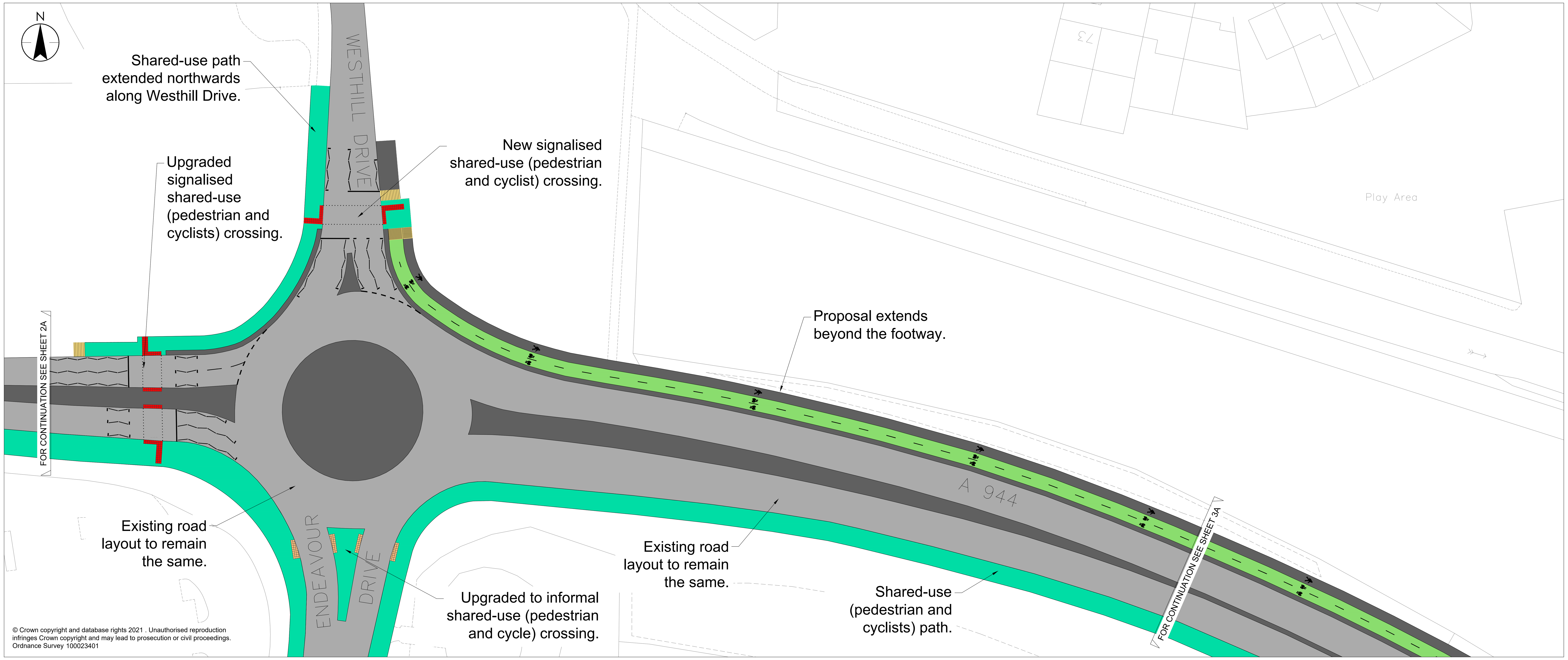
Client/Project
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 1 OF 28

Title
A944 - A9119 MAIN ROUTE
STRAIK ROAD (A944)
PROPOSED ROAD LAYOUT

Project No.	Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5501



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SHEET 2 OF 28

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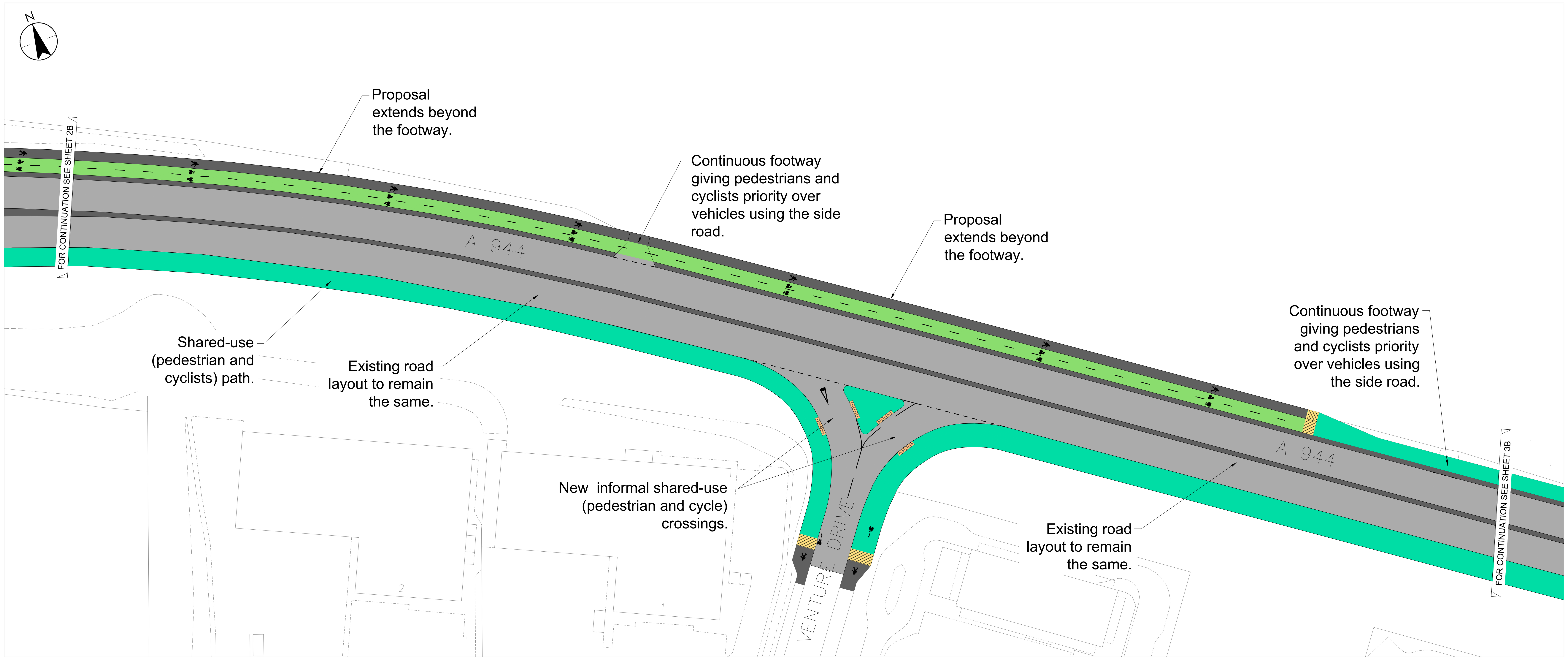
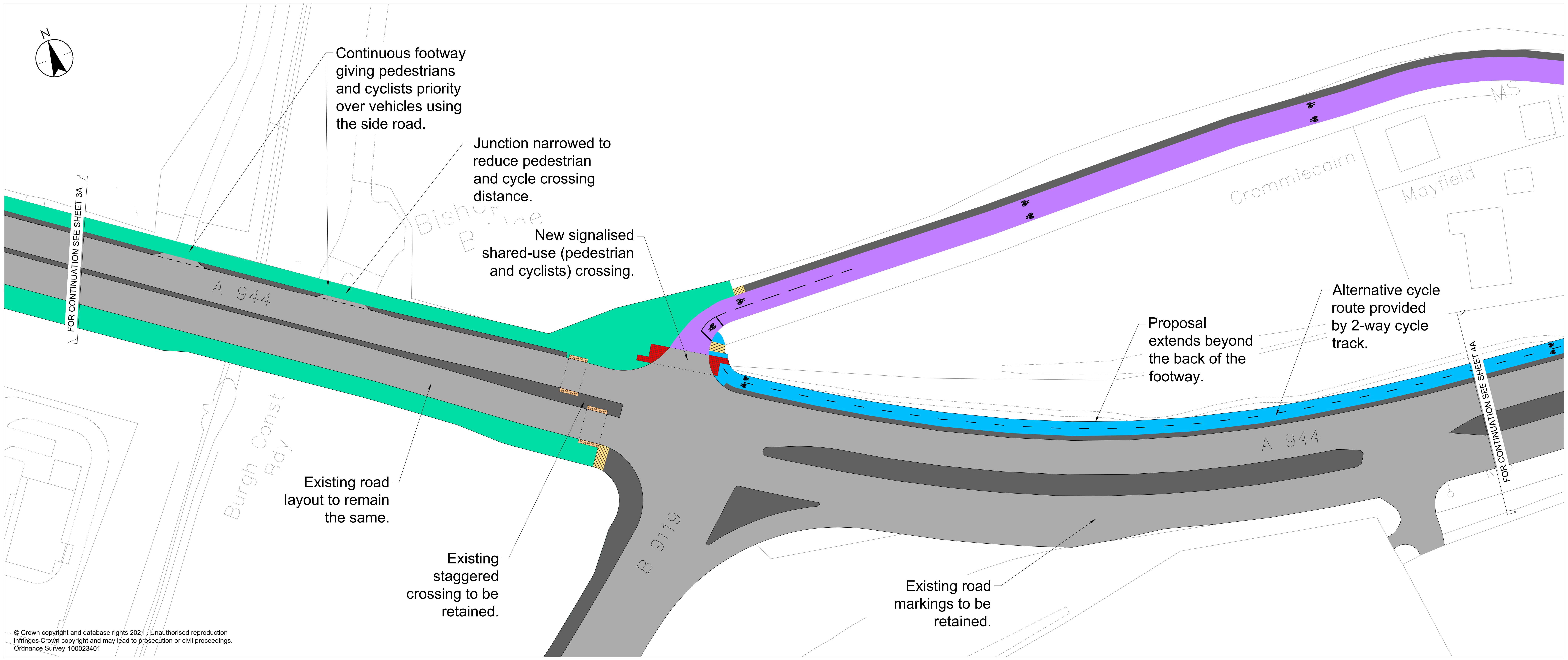
A944 - A9119 MAIN ROUTE
STRAIK ROAD (A944)
PROPOSED ROAD LAYOUT

Project No.	## Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5502





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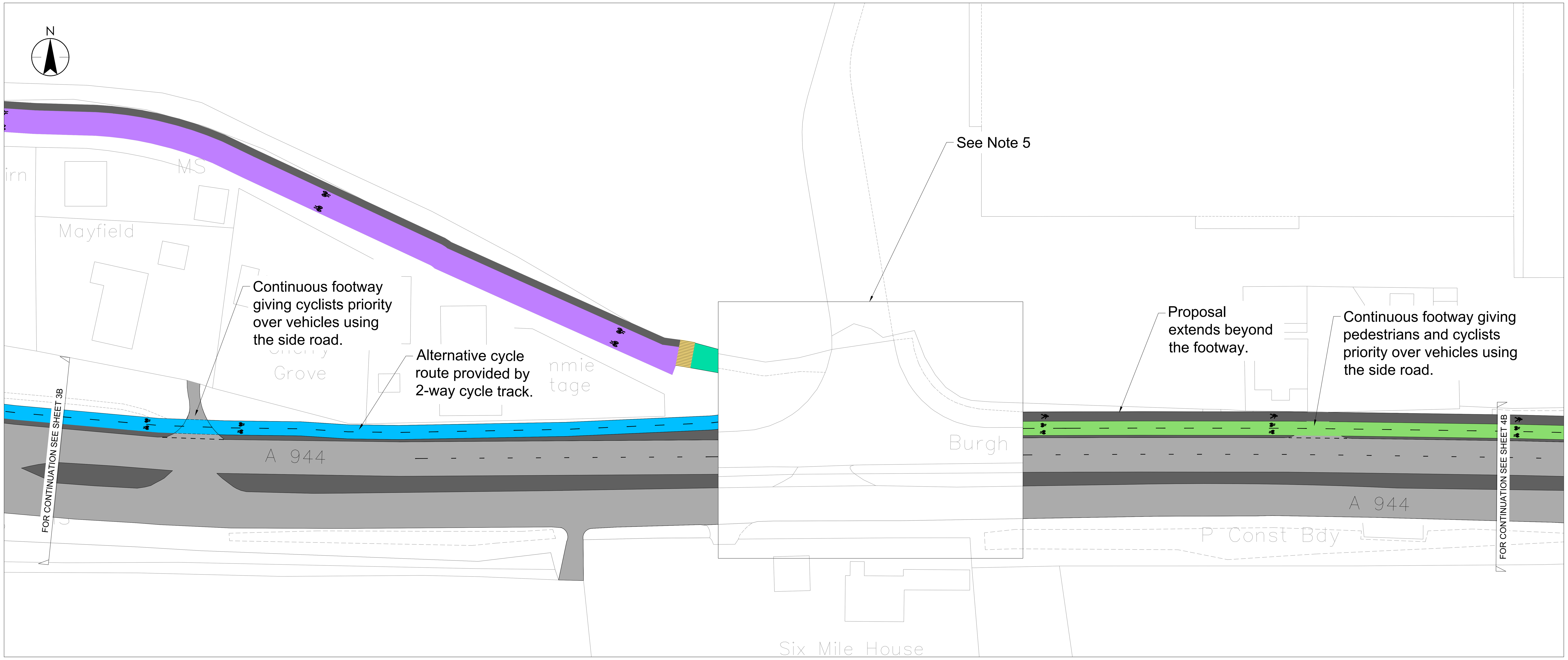
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

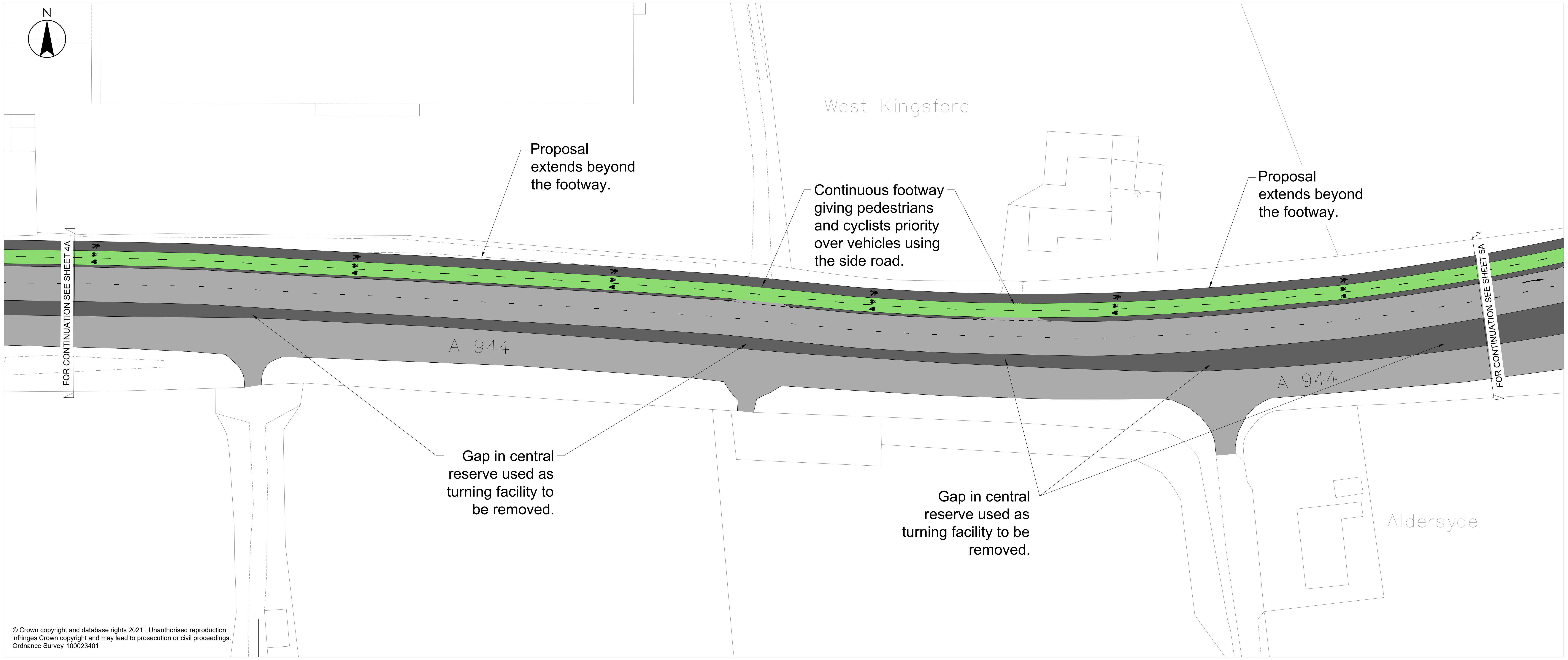
SHEET 3 OF 28

Title
A944 - A9119 MAIN ROUTE
STRAIK ROAD (A944)
PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500

Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5503





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4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. This junction has planning permission to be changed to support the new Aberdeen FC stadium. As these changes have not been confirmed it is not currently possible to show how the proposed cycle track and footway would be aligned through the junction.

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 4 OF 28

Title

A944 - A9119 MAIN ROUTE

STRAIK ROAD (A944)

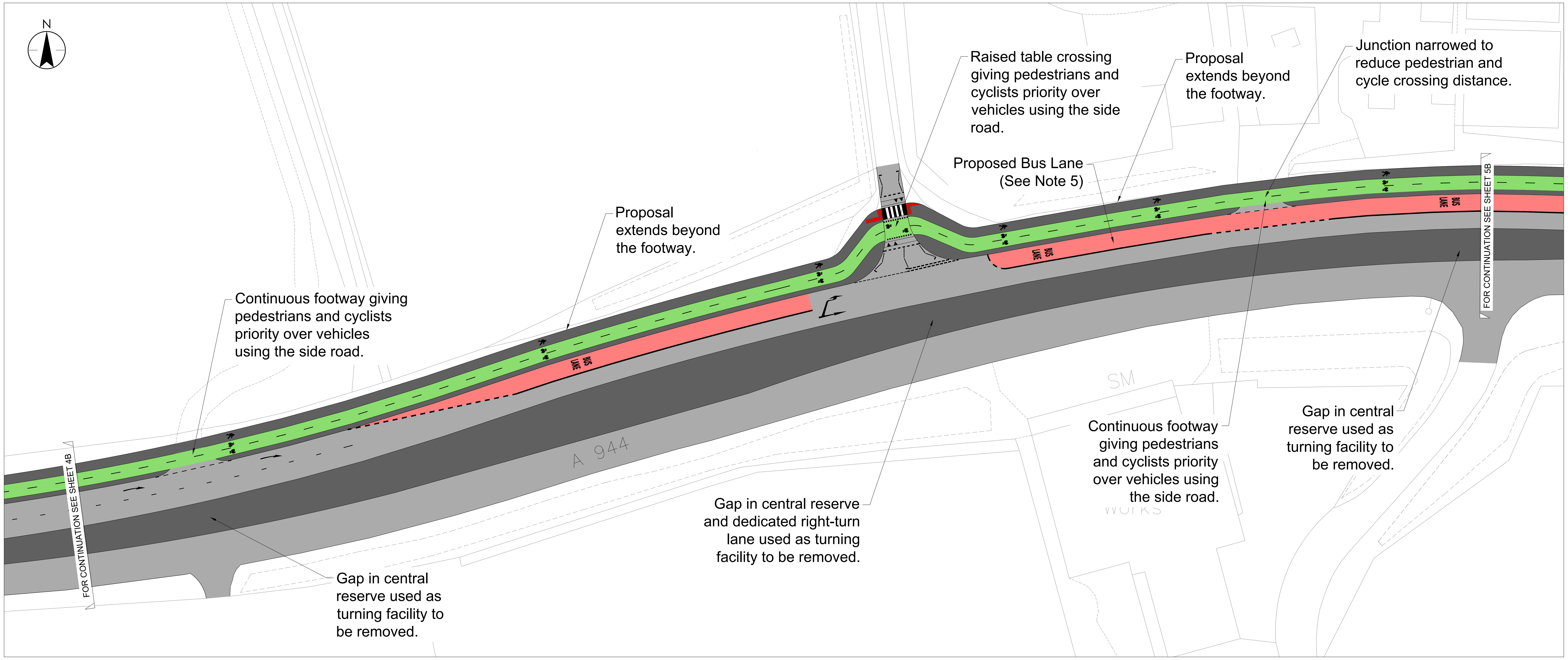
PROPOSED ROAD LAYOUT

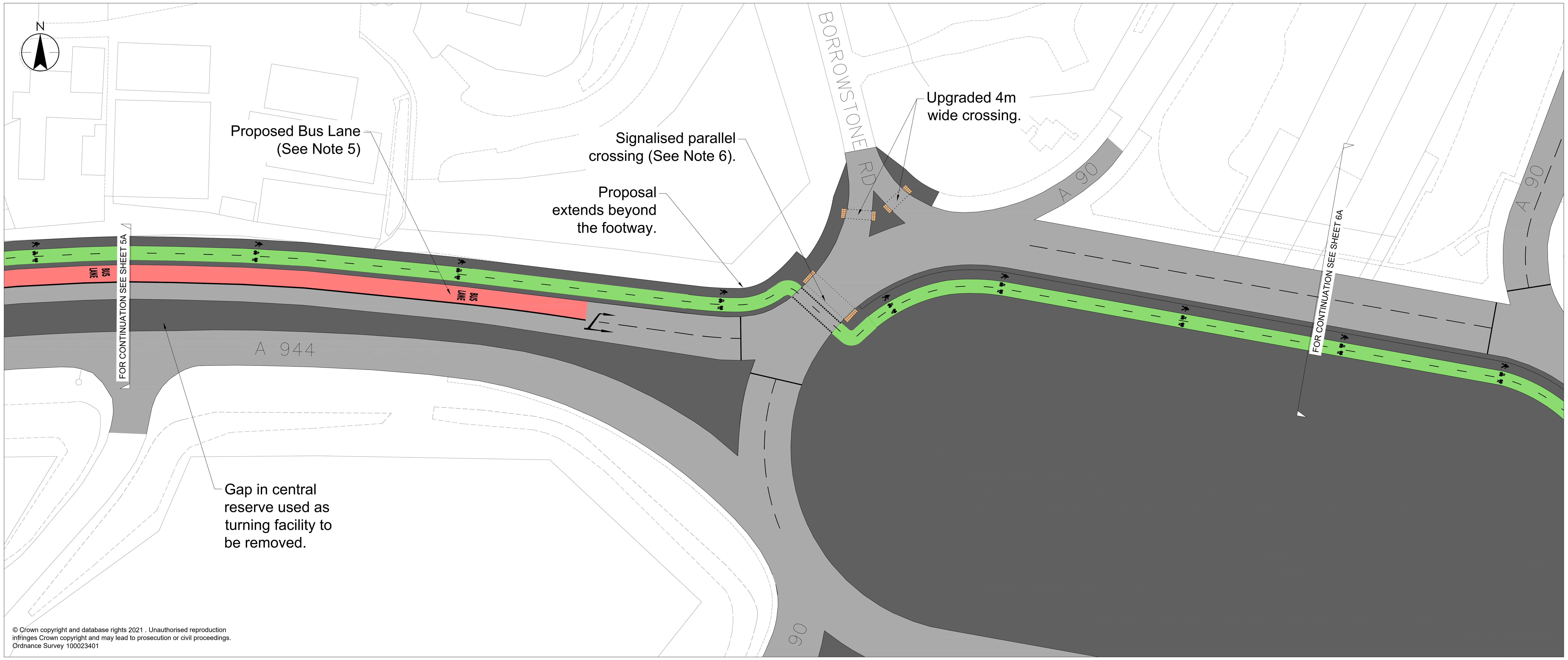
Project No. 332610462

Scale 1:500

Revision **P01**

Drawing No. **332610462-STN-HGN-XX-DR-H-5504**





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Notes

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4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. The proposed bus lane shown is part of a city-wide bus priority strategy being developed by the Council and to be consulted on separately later in the year. The bus lanes are shown as part of this consultation to demonstrate that both the bus and active travel proposals are compatible.
6. A signalised parallel crossing means that people travelling on foot and by bike can cross the road separately from each other, increasing safety and making it easier to carry on their journey. This type of crossing is also known as a 'sparrow crossing'.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
P01 FIRST ISSUE	M.G	G.D	2024.01.10

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M.G	M.G	M.O'S	2024.01.10

Issue Status

S3 - FOR REVIEW AND COMMENT

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ABERDEEN CITY COUNCIL

Client/Project

WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 5 OF 28

Title

A944 - A9119 MAIN ROUTE

STRAIK ROAD (A944)

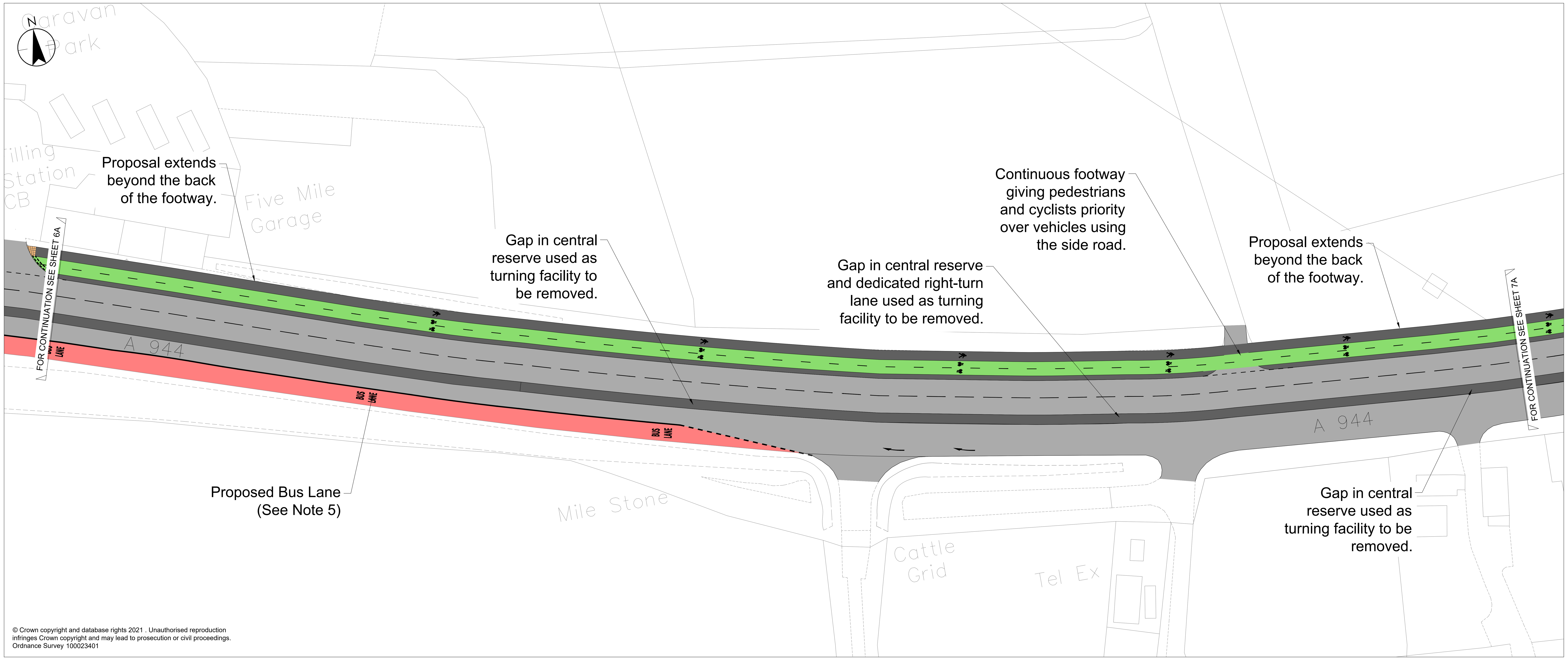
PROPOSED ROAD LAYOUT

Project No. 332610462

Scale 1:500

Revision P01

Drawing No. 332610462-STN-HGN-XX-DR-H-5505



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P01 FIRST ISSUE	M.G	G.D	2024.01.10	
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M.G	M.G	M.O'S	2024.01.10	
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 6 OF 28

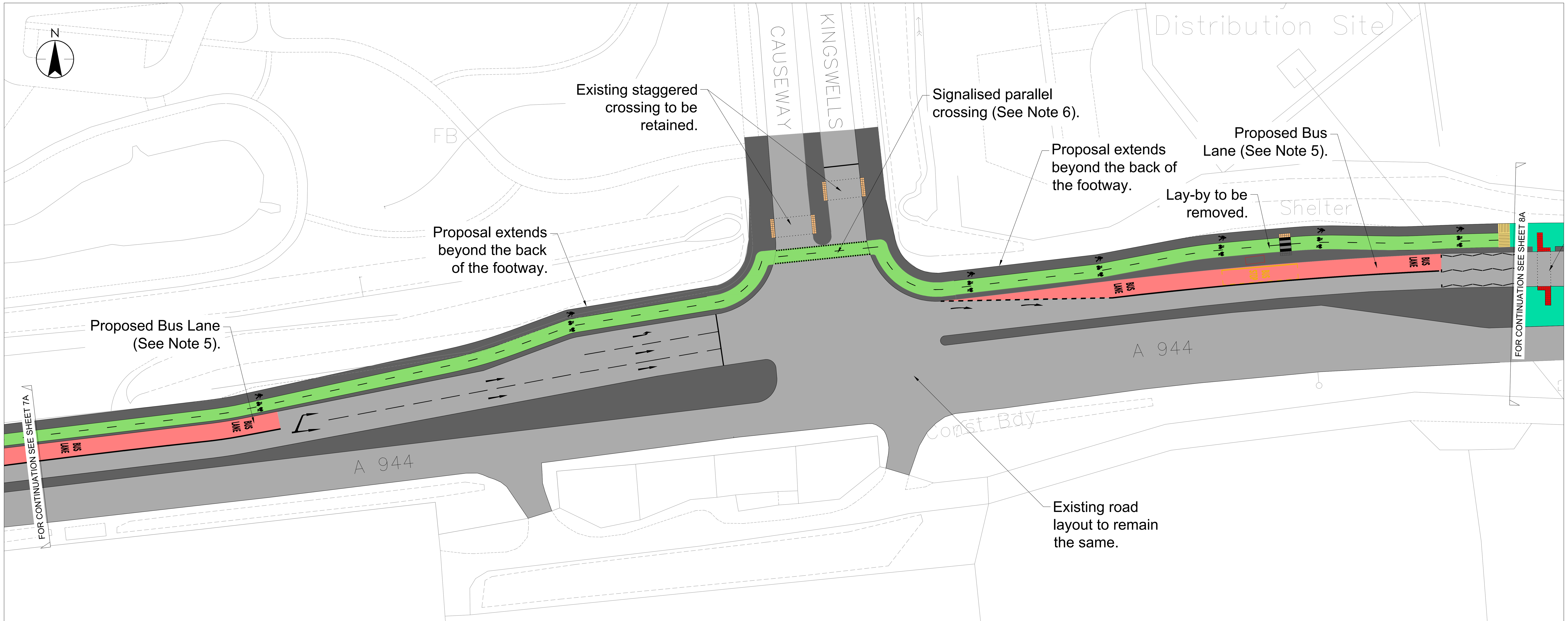
Title
A944 - A9119

STRAIK ROAD (A944)

PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500

Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5506



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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

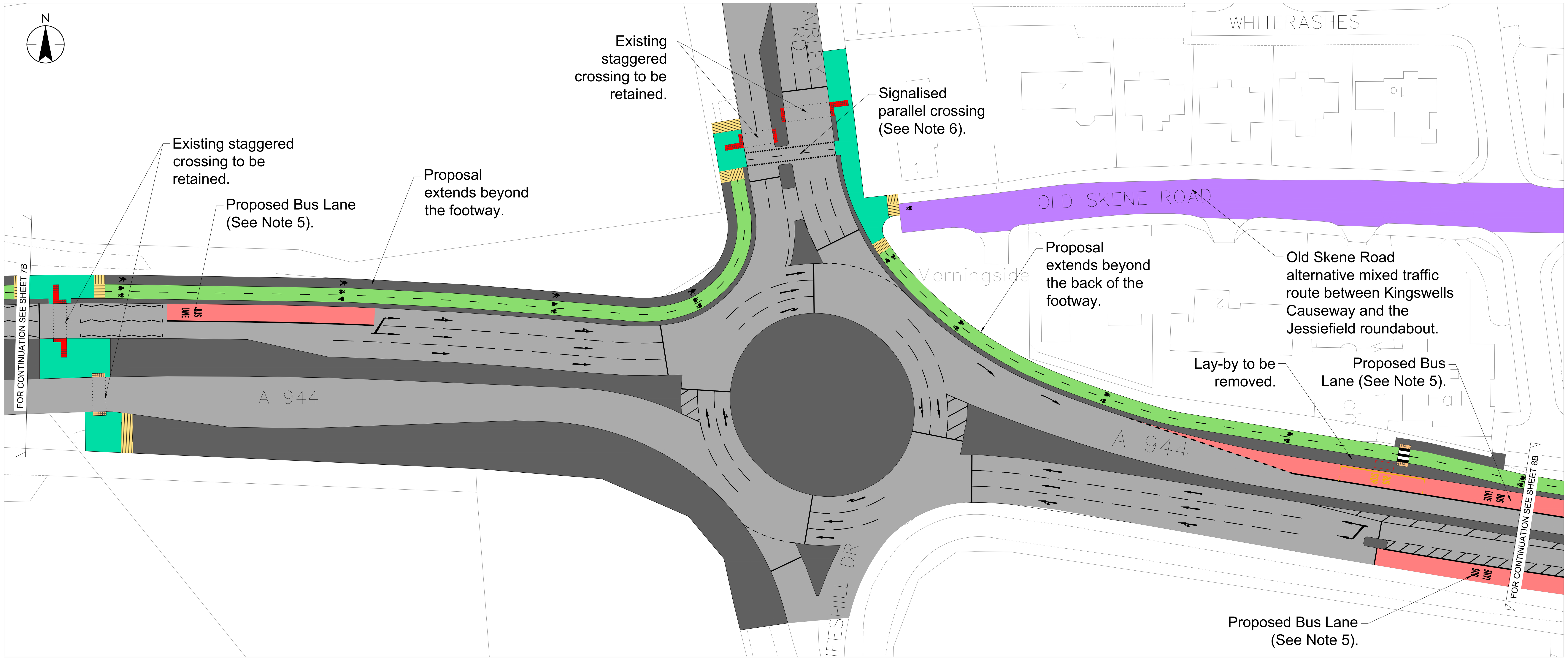
SHEET 7 OF 28

Title
A944 - A9119 MAIN ROUTE

STRAIK ROAD (A944)

PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500
Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5507



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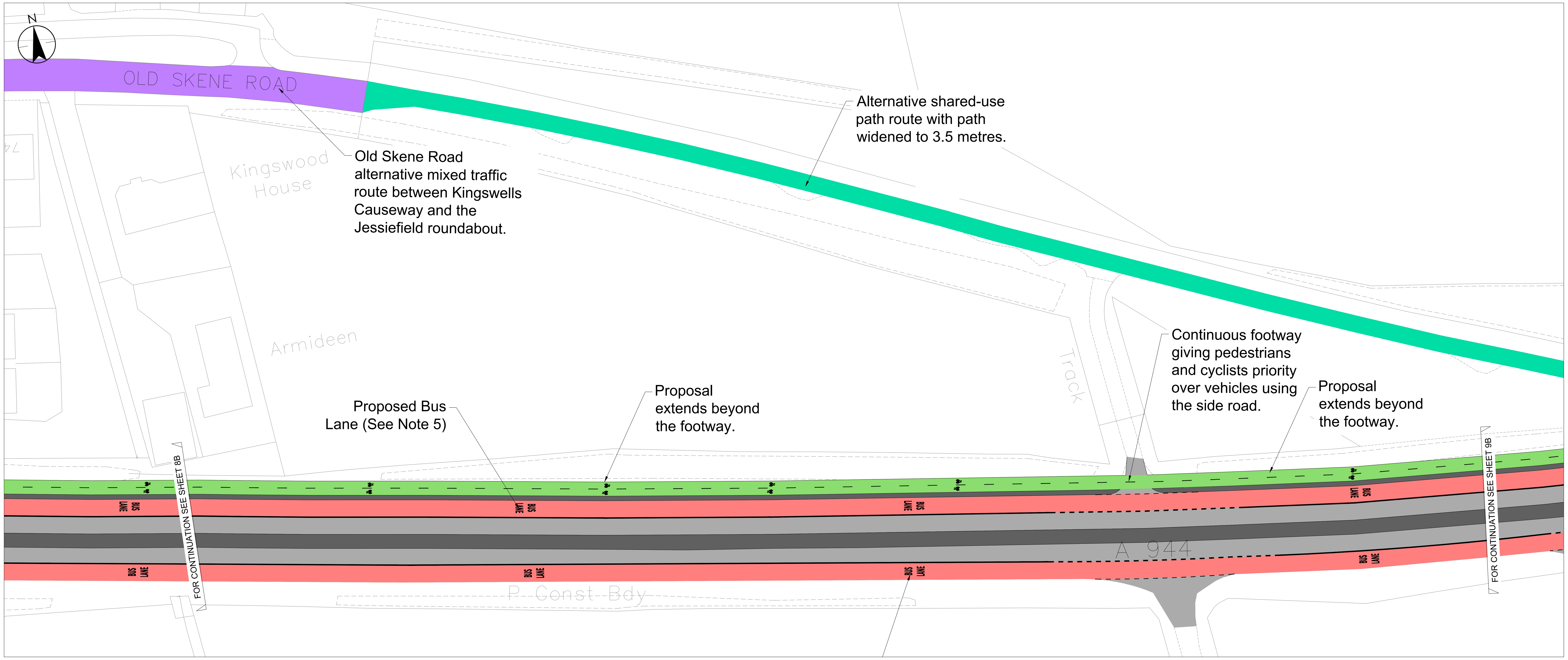
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

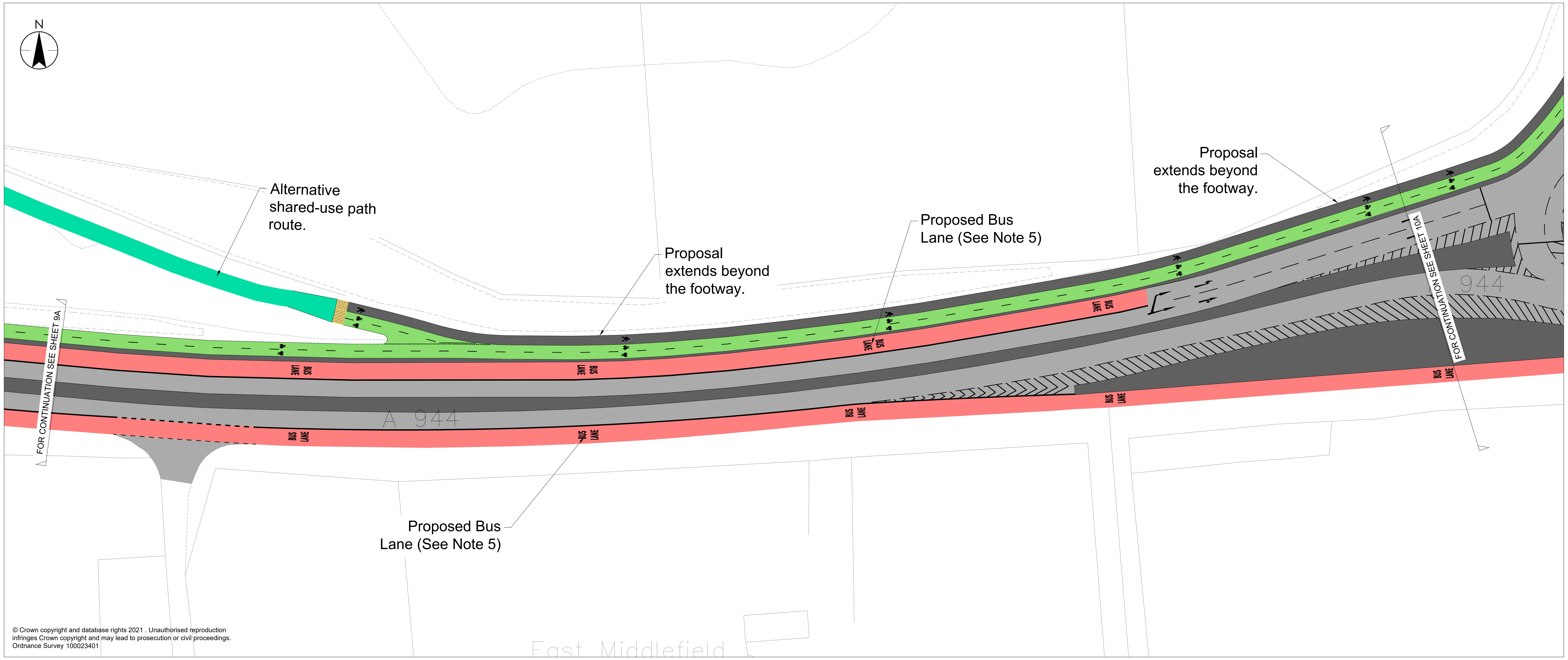
SHEET 8 OF 28

Title
A944 - A9119 MAIN ROUTE
STRAIK ROAD (A944)
PROPOSED ROAD LAYOUT

Project No.	Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5508





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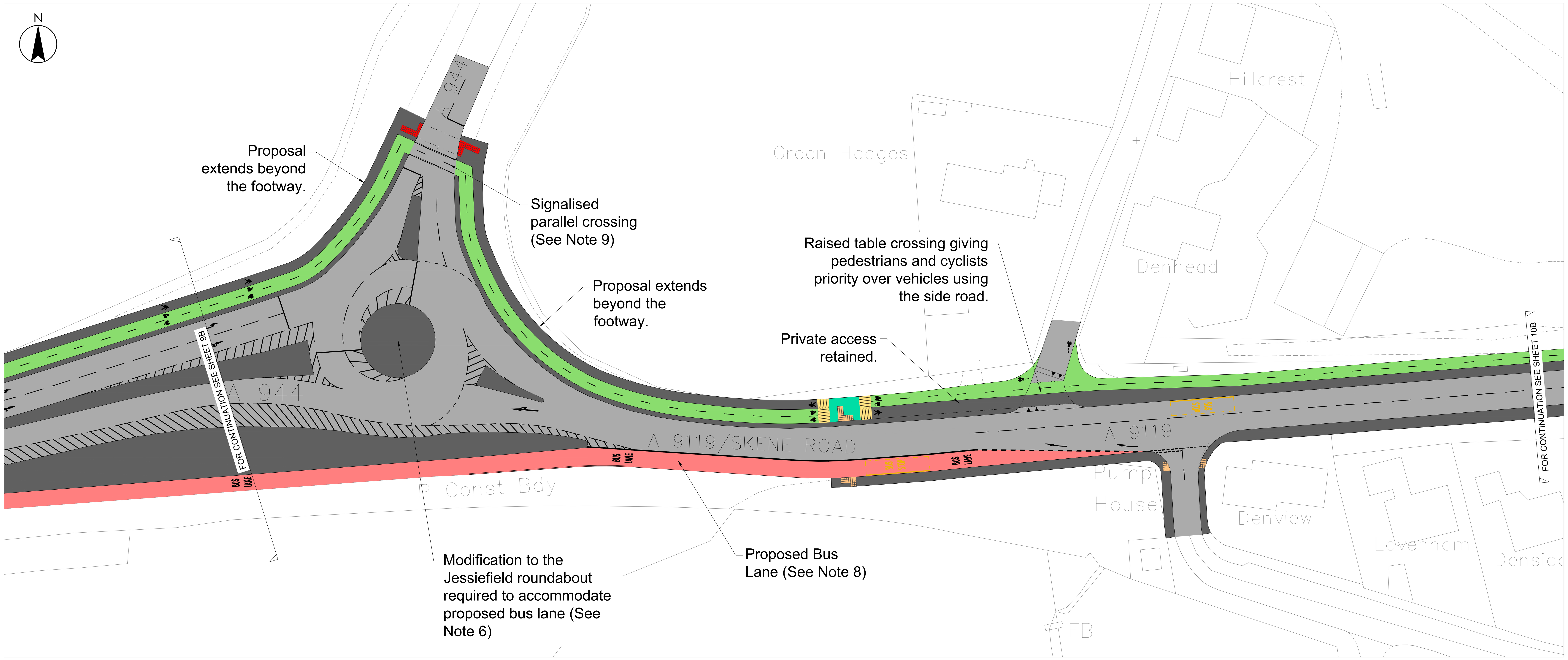
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 9 OF 28

Title
A944 - A9119 MAIN ROUTE
STRAIK ROAD (A944)
PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500
Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5509



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5. The bus lane and new footway require land outside the highway boundary with potential impacts of trees.
6. A traffic modelling assessment of the Jessiefield roundabout is required to understand the highway capacity impacts of the bus lane but also how this may affect the Countesswells development proposals which would add a fourth arm to this junction.
7. Potential impact on grass verges, shrubs and trees.
8. The proposed bus lane shown is part of a city-wide bus priority strategy being developed by the Council and to be consulted on separately later in the year. The bus lanes are shown as part of this consultation to demonstrate that both the bus and active travel proposals are compatible.
9. A signalised parallel crossing means that people travelling on foot and by bike can cross the road separately from each other, increasing safety and making it easier to carry on their journey. This type of crossing is also known as a 'sparrow crossing'.

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

Title

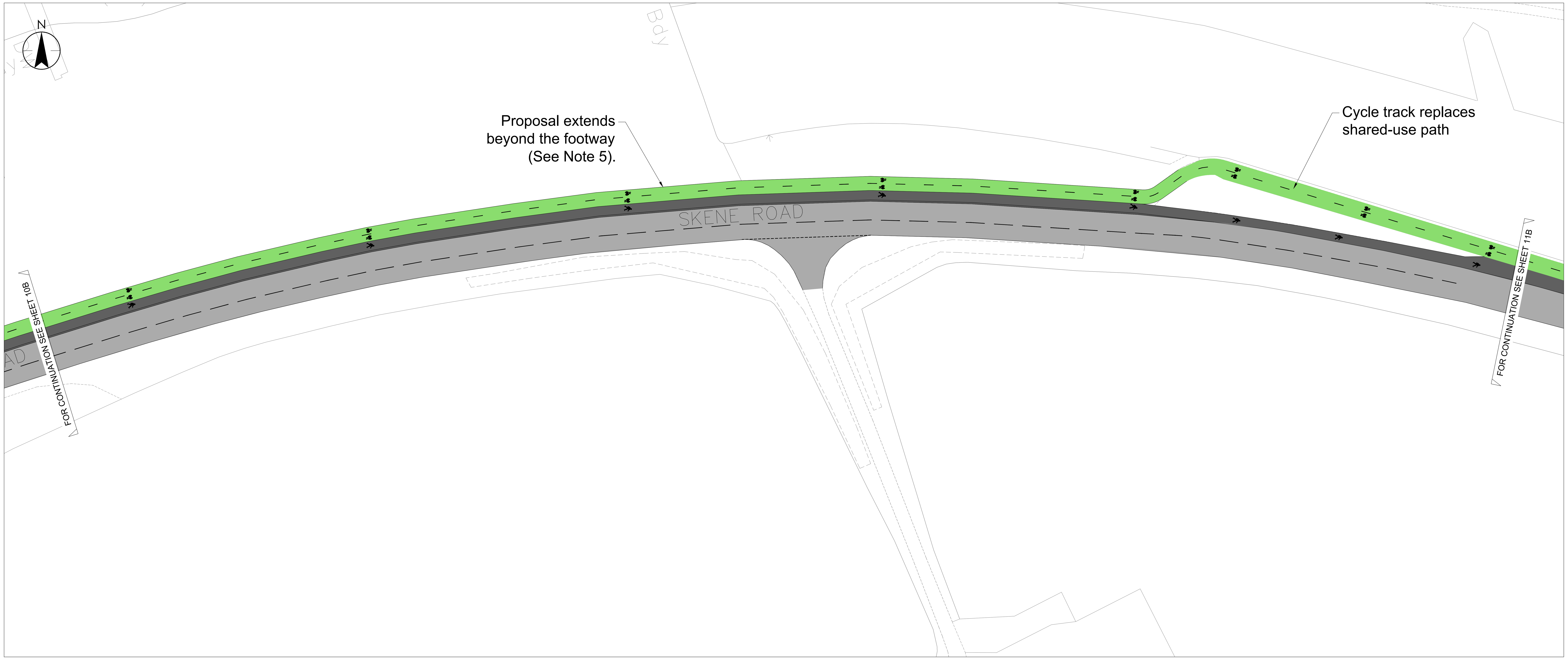
A944 - A9119 MAIN ROUTE

SKENE ROAD (A9119)

PROPOSED ROAD LAYOUT

Project No.	## Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5510



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5. Potential impact on grass verges, shrubs and trees.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
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- Tactile paving (shared use area)
- Indicative bus shelter location

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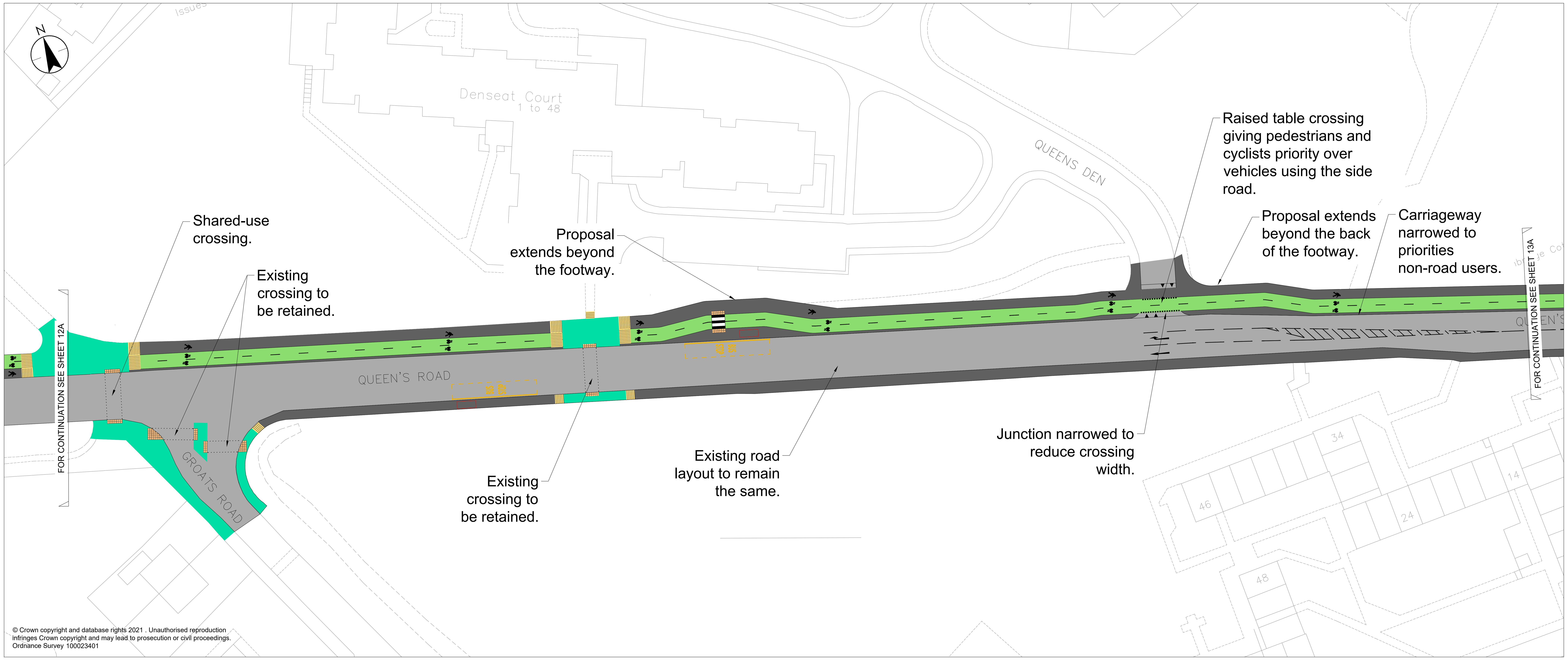
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 11 OF 28

Title
A944 - A9119 MAIN ROUTE
SKENE ROAD (A9119)
PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500
Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5511



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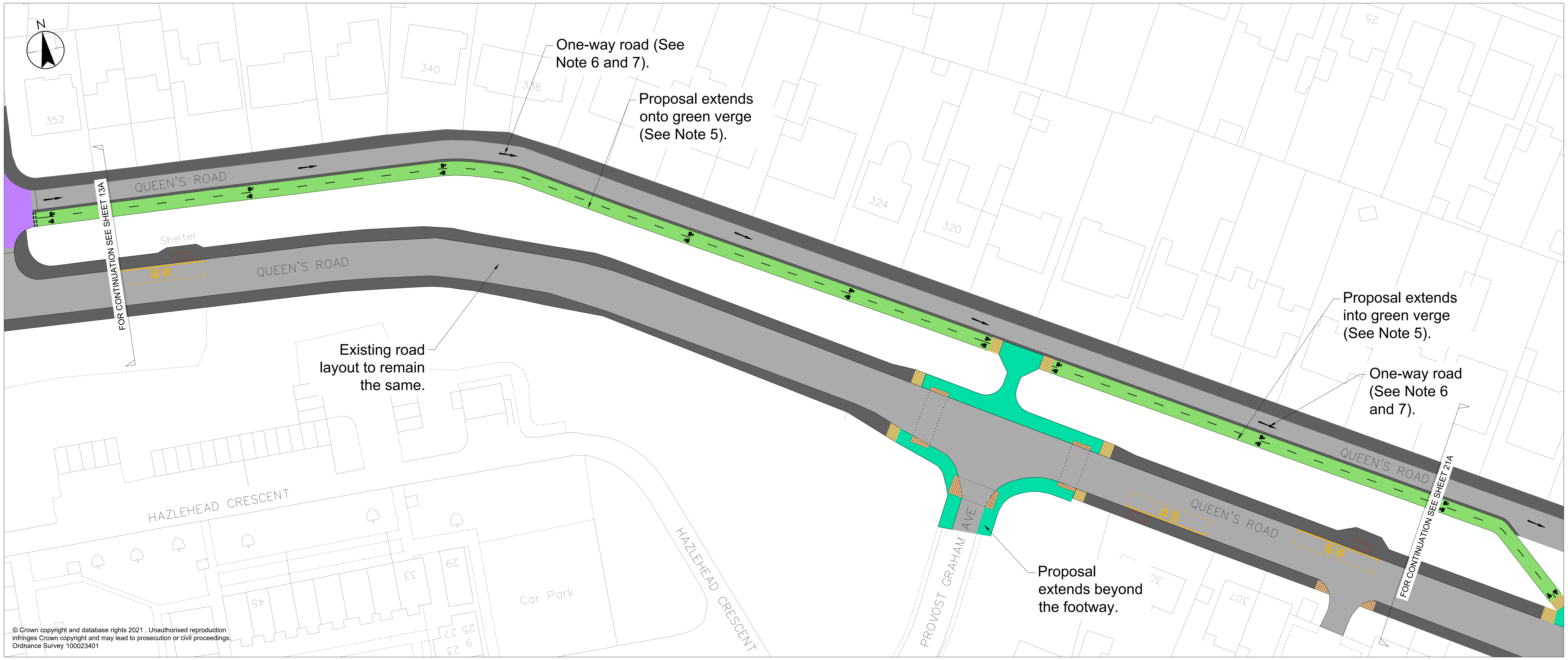
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 12 OF 28

Title
A944 - A9119 MAIN ROUTE
SKENE ROAD / QUEEN'S ROAD (A9119)
PROPOSED ROAD LAYOUT

Project No. 332610462
Scale 1:500
Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5512



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5. No dig construction method will be used to ensure delivery of the two-way cycle track has no impact on the trees.
6. On-street parking provision will be removed to maintain 4.0m width for one way general traffic.
7. Property accesses to be retained.

Key:

- Footway
- Road carriageway
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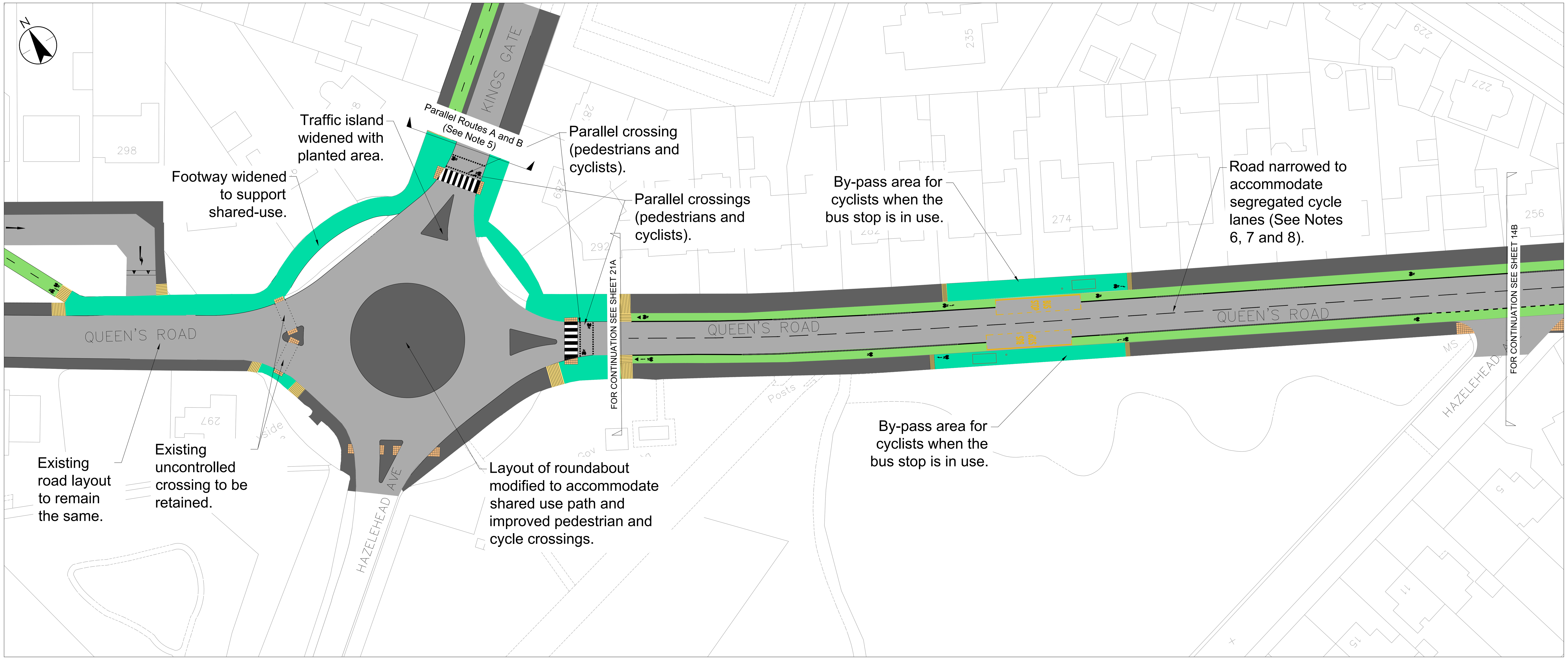
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

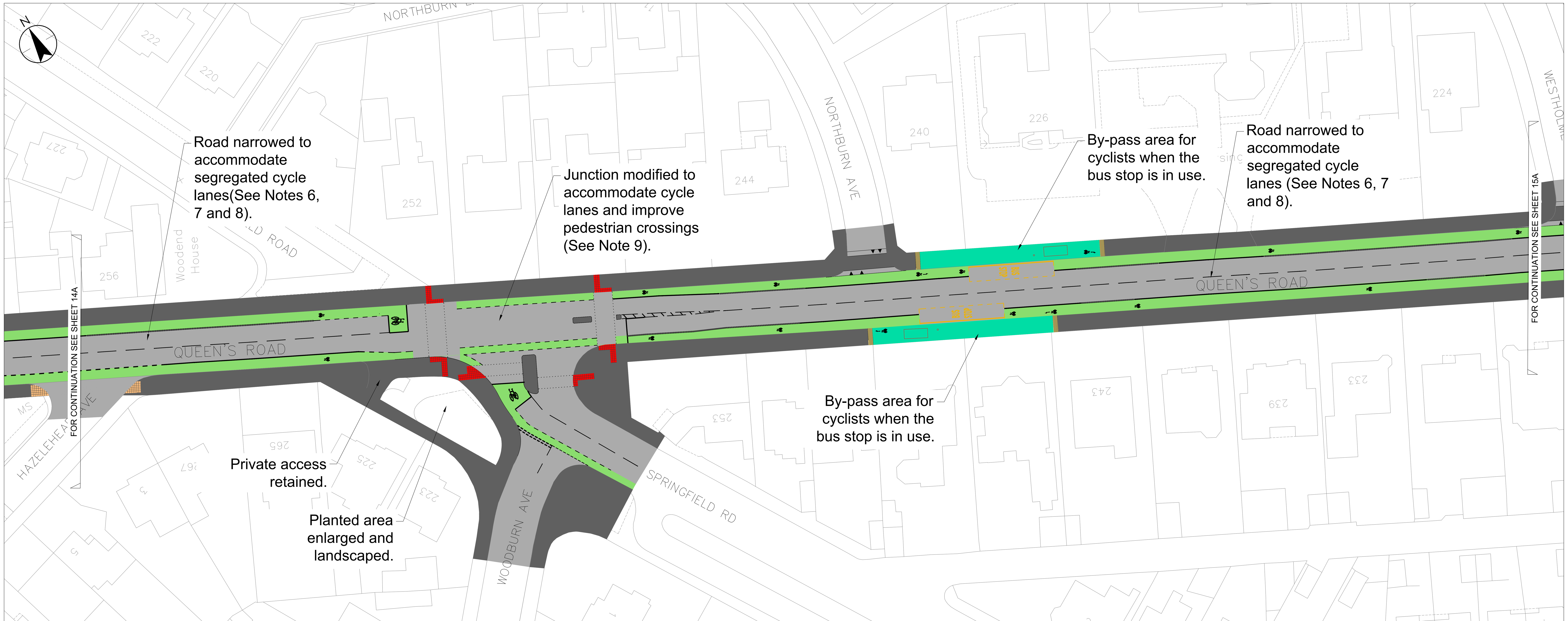
SHEET 13 OF 28

Title
A944 - A9119 MAIN ROUTE
QUEEN'S ROAD (A9119)
PROPOSED ROAD LAYOUT

Project No.	## Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5513





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5. See Sheets 21 to 28 for details of the proposed Parallel Routes A and B that use King's Gate, Carnegie Crescent/ Anderson Drive, Rubislaw Den North/ Rubislaw Den South, Desswood Place/ Queen's Lane North, Fountainhall Road and Albert Lane.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. A traffic modelling assessment will be undertaken at the next design stage to ensure the proposals minimise any impact on the capacity of the junction for traffic.

Key:

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 14 OF 28

Title

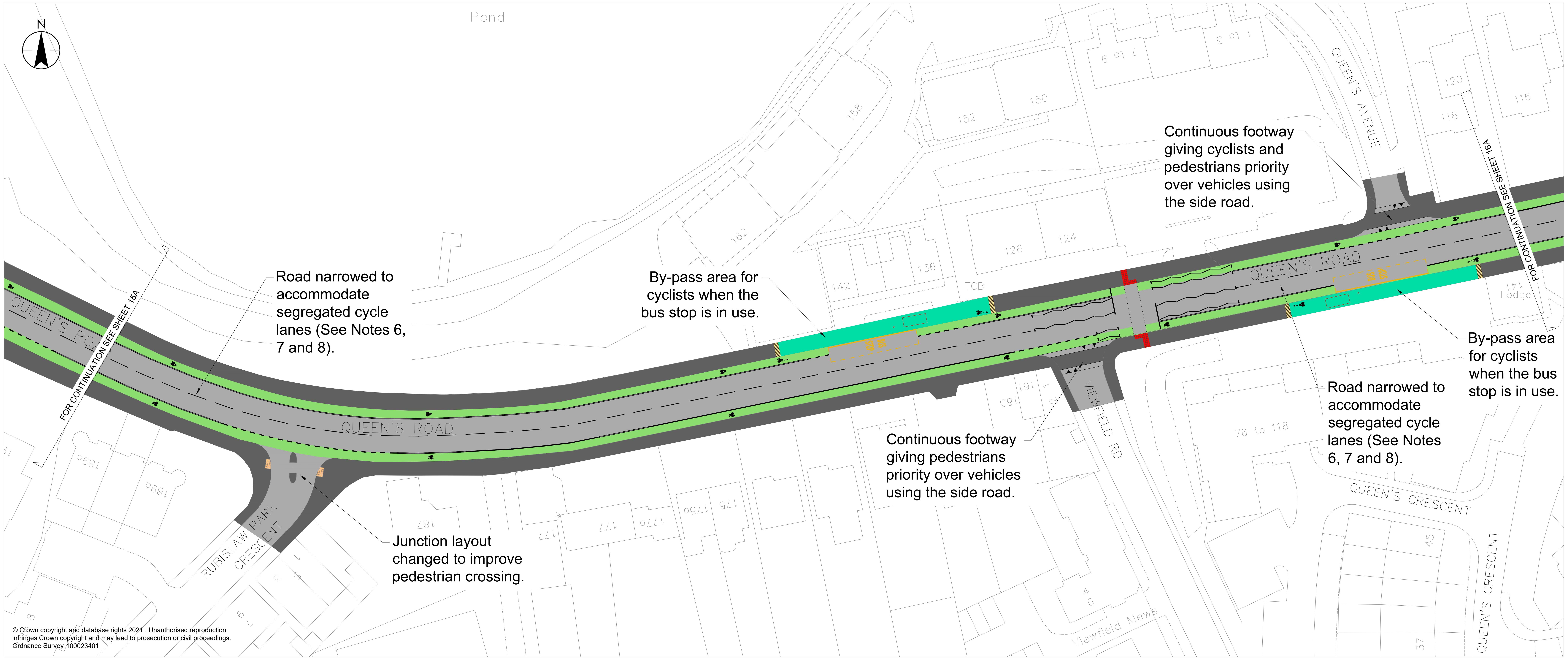
A944 - A9119 MAIN ROUTE

QUEEN'S ROAD (A9119)

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5514



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7. All vehicle accesses to properties retained.
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Client/Project

WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 15 OF 28

Title

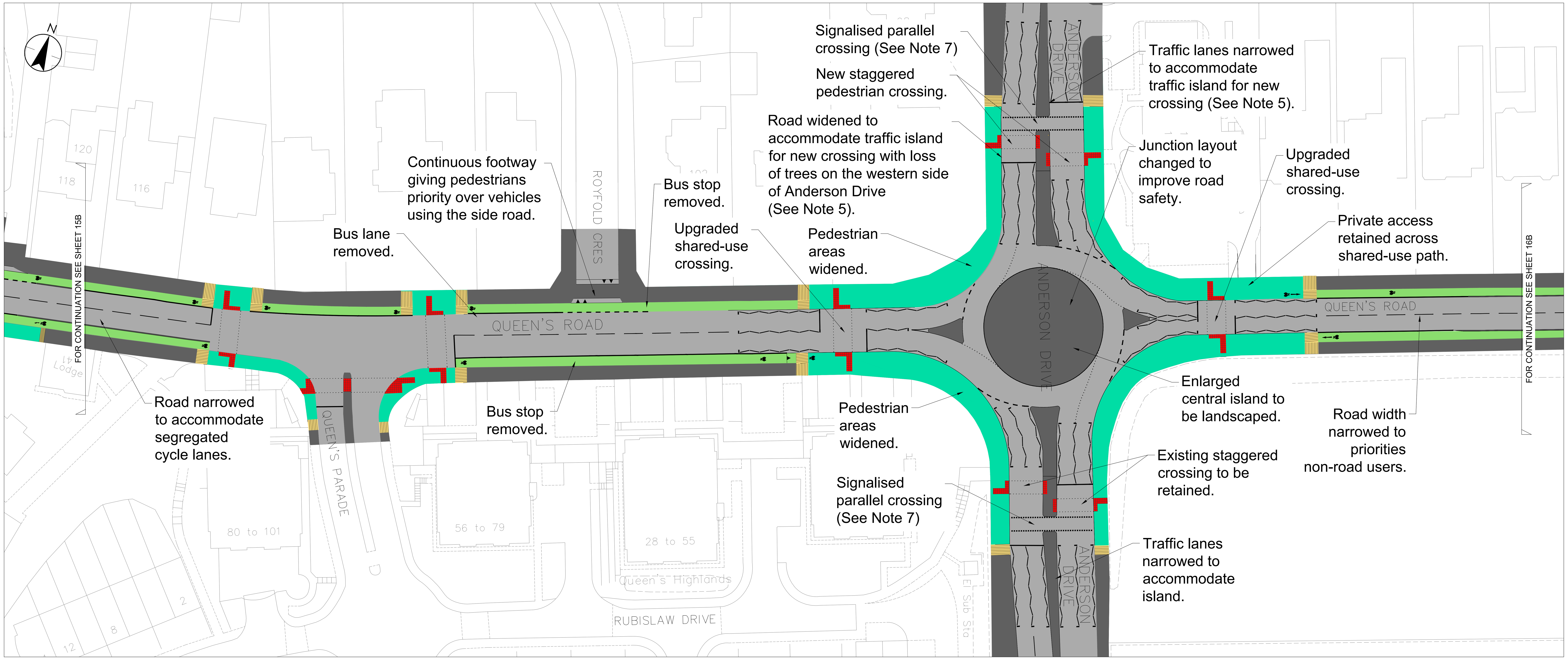
A944 - A9119 MAIN ROUTE

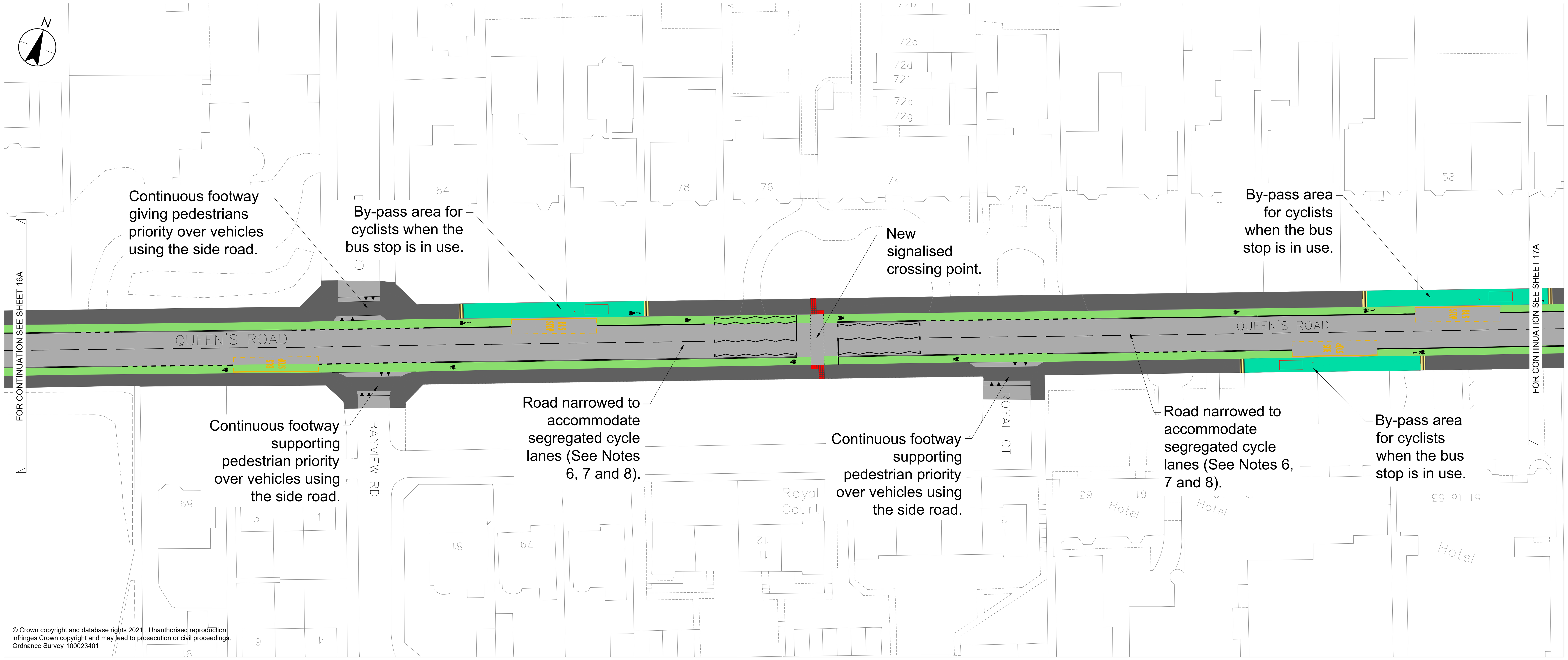
QUEEN'S ROAD (A9119)

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5515





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Notes

1. The layout is subject to detailed design, highway capacity testing, road safety audit, ground investigations, earthworks modelling, utilities & services searches, and confirmation of land ownership.
2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. To provide a crossing on the northern arm of the Anderson Drive roundabout a central island needs to be created. This central island requires traffic lanes to be narrowed (within permitted widths) and the road widened. This widening will have an impact on trees close to the proposed crossing and so further investigations are required to understand the extent of the tree loss but also what mitigations measures are available.
6. On-street parking provision to be removed to maintain two-way road7. All vehicle accesses to properties retained 8. Trees retained with additional trees planted where appropriate.
7. A signalised parallel crossing means that people travelling on foot and by bike can cross the road separately from each other, increasing safety and making it easier to carry on their journey. This type of crossing is also known as a 'sparrow crossing'.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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ABERDEEN CITY COUNCIL

Client/Project
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 16 OF 28

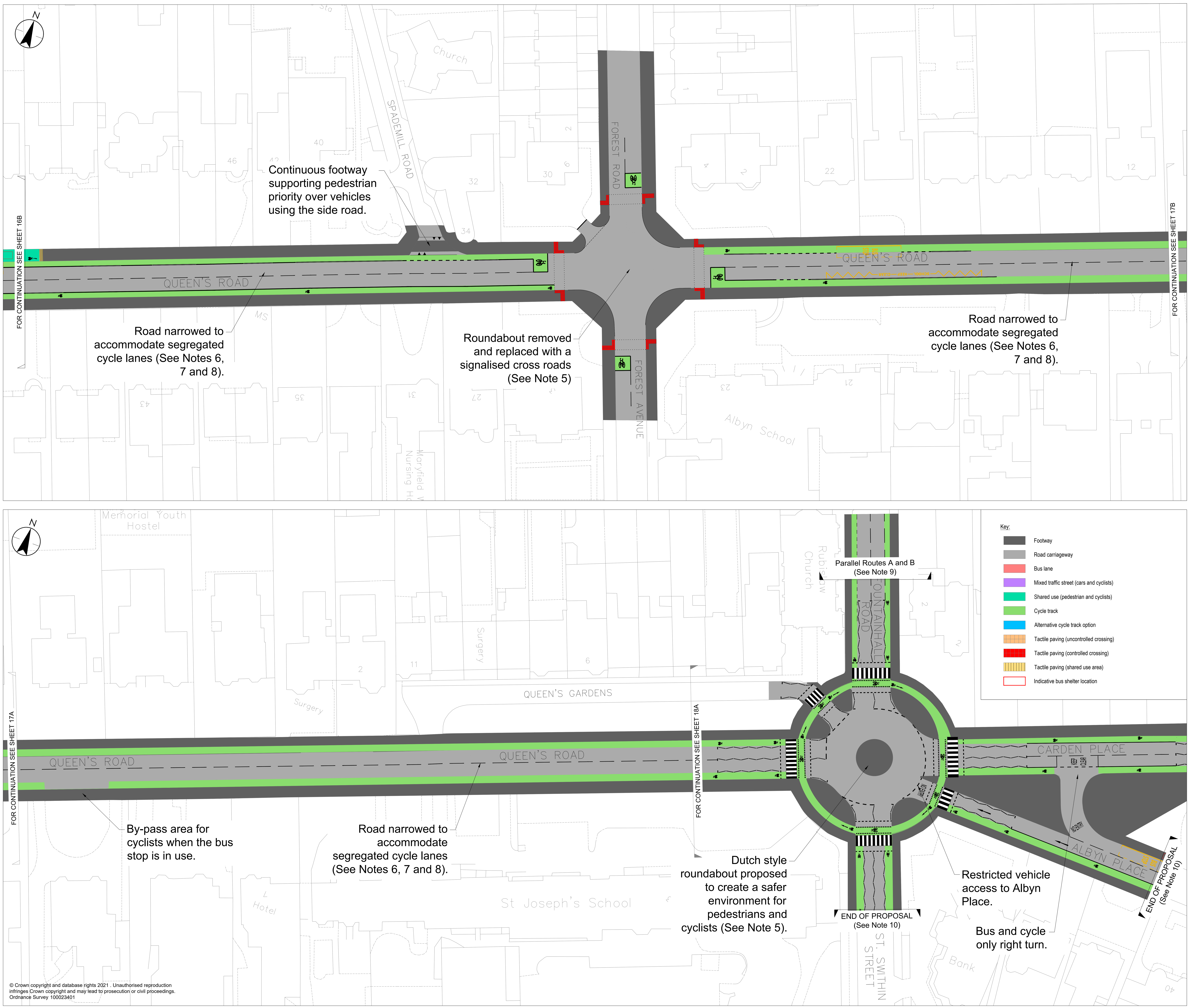
Title
A944 - A9119 MAIN ROUTE

QUEEN'S ROAD (A9119)

PROPOSE ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5516



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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. A traffic modelling assessment will be undertaken at the next design stage to ensure the proposals minimise any impact on the capacity of the junction for traffic.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate9. There are no proposals beyond the END OF PROPOSALS but there are opportunities to extend the cycle route if the A9119 proposals are implemented.
9. See Sheets 21 to 28 for details of the proposed Parallel Routes A and B that use King's Gate, Carnegie Crescent/ Anderson Drive, Rubislaw Den North/ Rubislaw Den South, Desswood Place/ Queen's Lane North, Fountainhall Road and Albert Lane.
10. There are no proposals beyond this cut line but there are opportunities to extend the cycle route if the A9119 proposals are implemented.

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 17 OF 28

Title

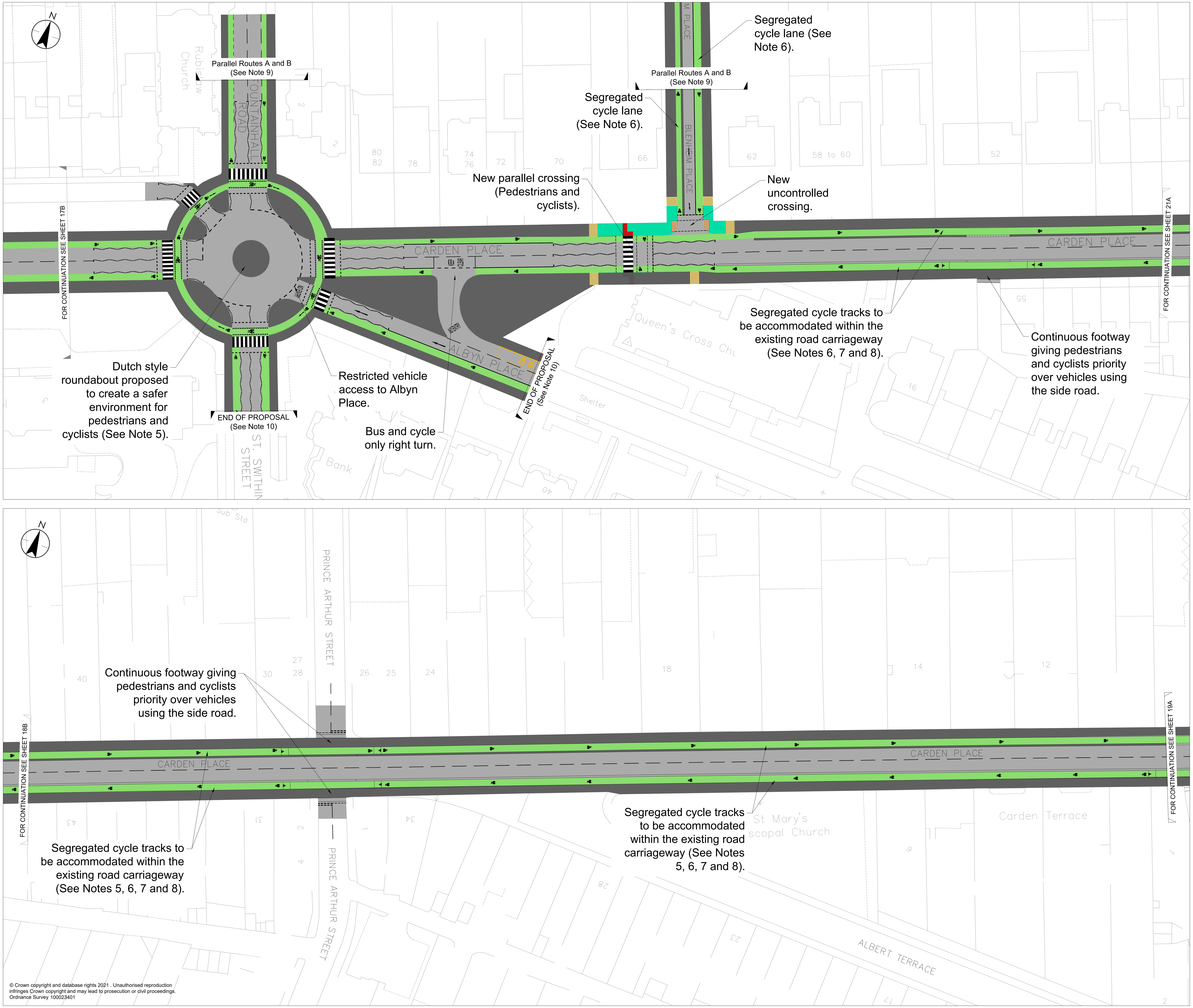
A944 - A9119 MAIN ROUTE

QUEEN'S ROAD/ CARDEN PLACE (A9119)

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5517



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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. Some localised road widening will be required.
6. On-street parking provision removed to accommodate cycle tracks.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. See Sheets 21 to 28 for details of the proposed Parallel Routes A and B that use King's Gate, Carnegie Crescent/ Anderson Drive, Rubislaw Den North/ Rubislaw Den South, Desswood Place/ Queen's Lane North, Fountainhall Road and Albert Lane.
10. There are no proposals beyond this cut line but there are opportunities to extend the cycle route if the A9119 proposals are implemented.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 18 OF 28

Title

A944 - A9119 MAIN ROUTE

CARDEN PLACE (A9119)

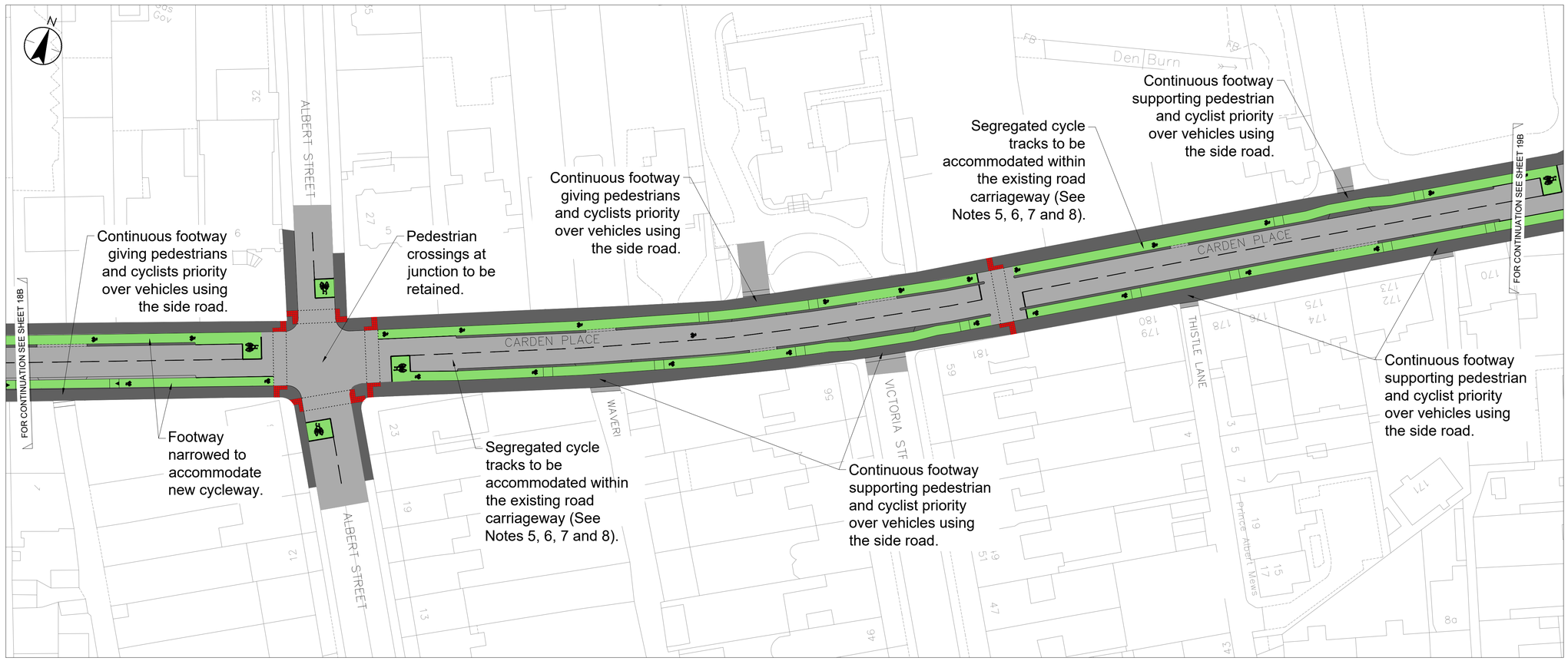
PROPOSED ROAD LAYOUT

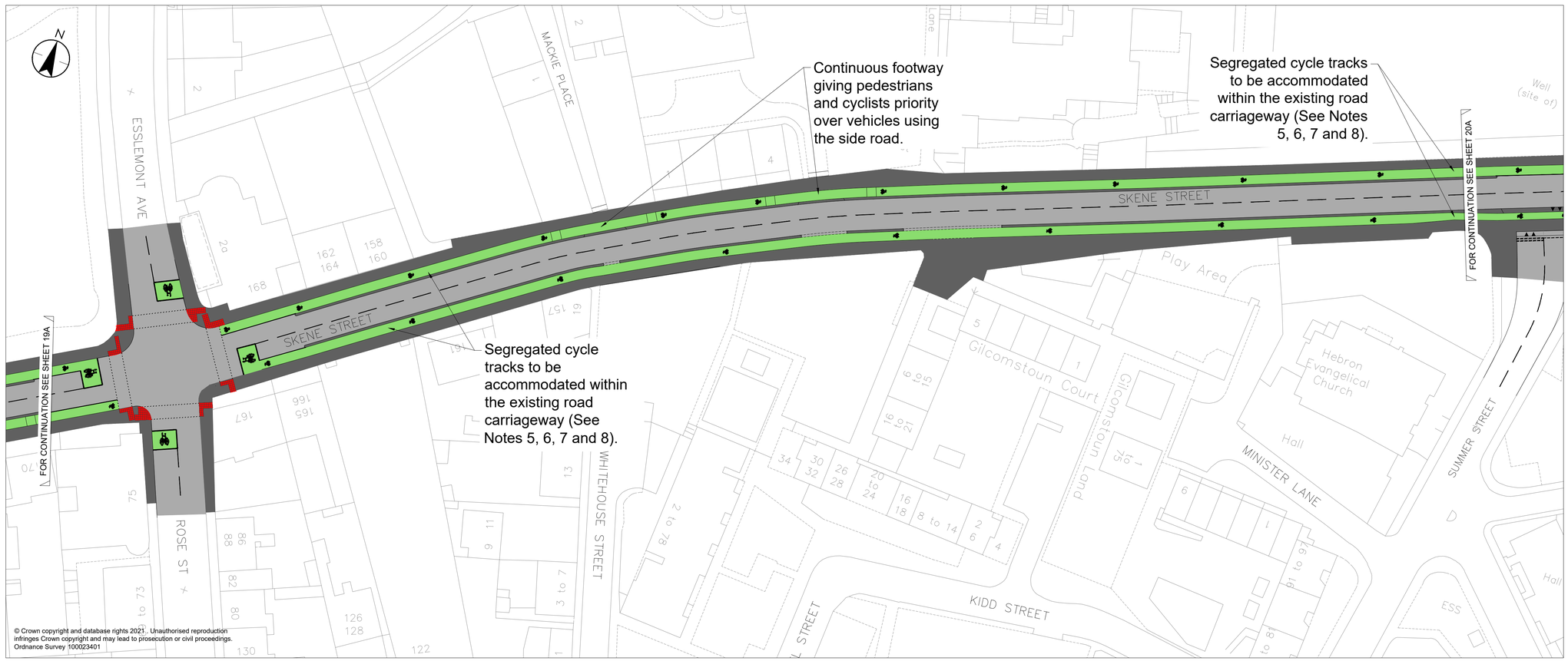
Project No. 332610462

A1 Scale 1:500

Revision P01

Drawing No. 332610462-STN-HGN-XX-DR-H-5518





Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Notes

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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. Some localised road widening will be required.
6. On-street parking provision removed to accommodate cycle tracks.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 19 OF 28

Title

A944 - A9119 MAIN ROUTE

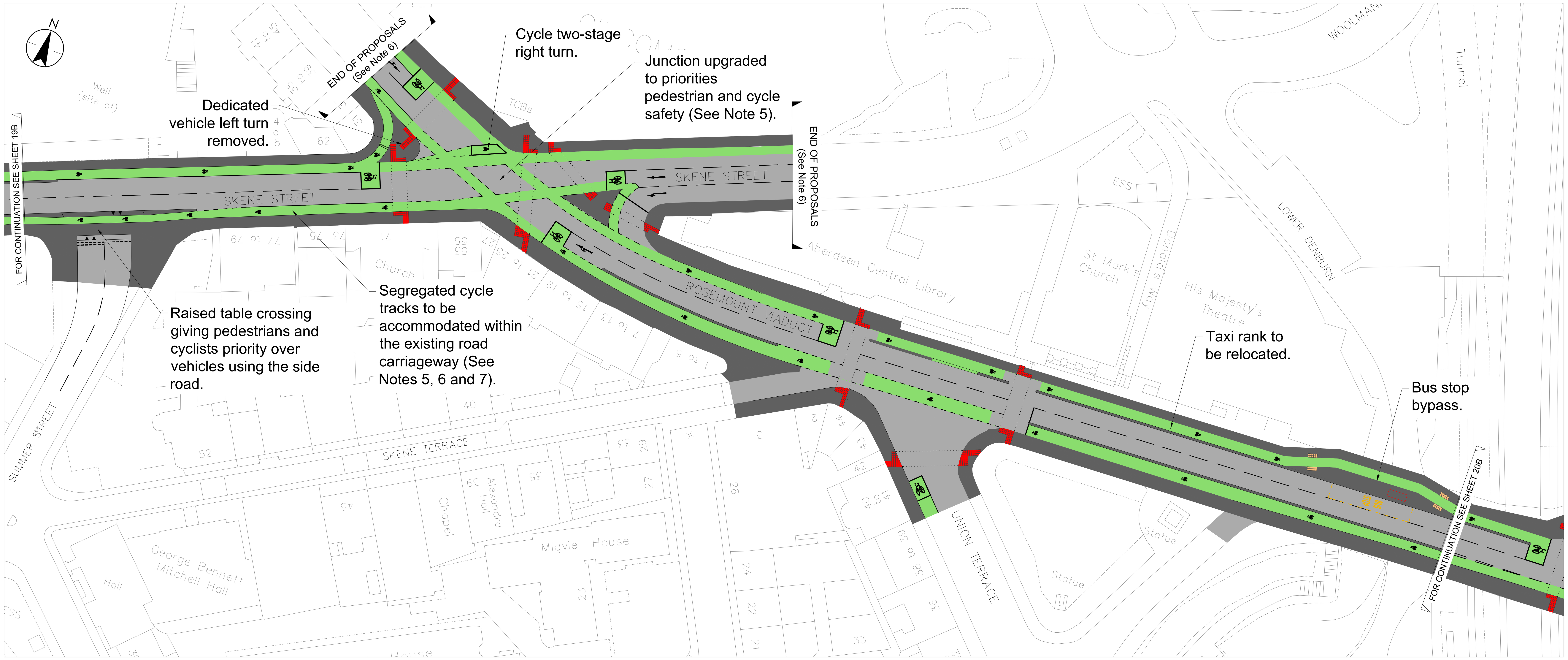
SKENE STREET / ROSEMOUNT VIADUCT

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	**332610462-STN-HGN-XX-DR-H-5519**

Plotted: 14.06.2024 @ 04:14 PM BY: Baker, Erin
DOCUMENT: 332610462-STN-HGN-XX-DR-H-5519 - active travel design\5. drawings\cad\sheet 2(0)\dwg\332610462-stn-hgn-xx-dr-h-5519 to a1.dwt - consultation - main route



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4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. A traffic modelling assessment will be undertaken at the next design stage to ensure the proposals minimise any impact on the capacity of the junction for traffic.
6. There are no proposals beyond this cut line but there are opportunities to extend the cycle route if the A9119 proposals are implemented.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision				
P01	FIRST ISSUE	M.G	G.D	2024.01.10
		By	Appd	YYYY.MM.DD

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 20 OF 28

Title

A944 - A9119 MAIN ROUTE

ROSEMOUNT VIADUCT

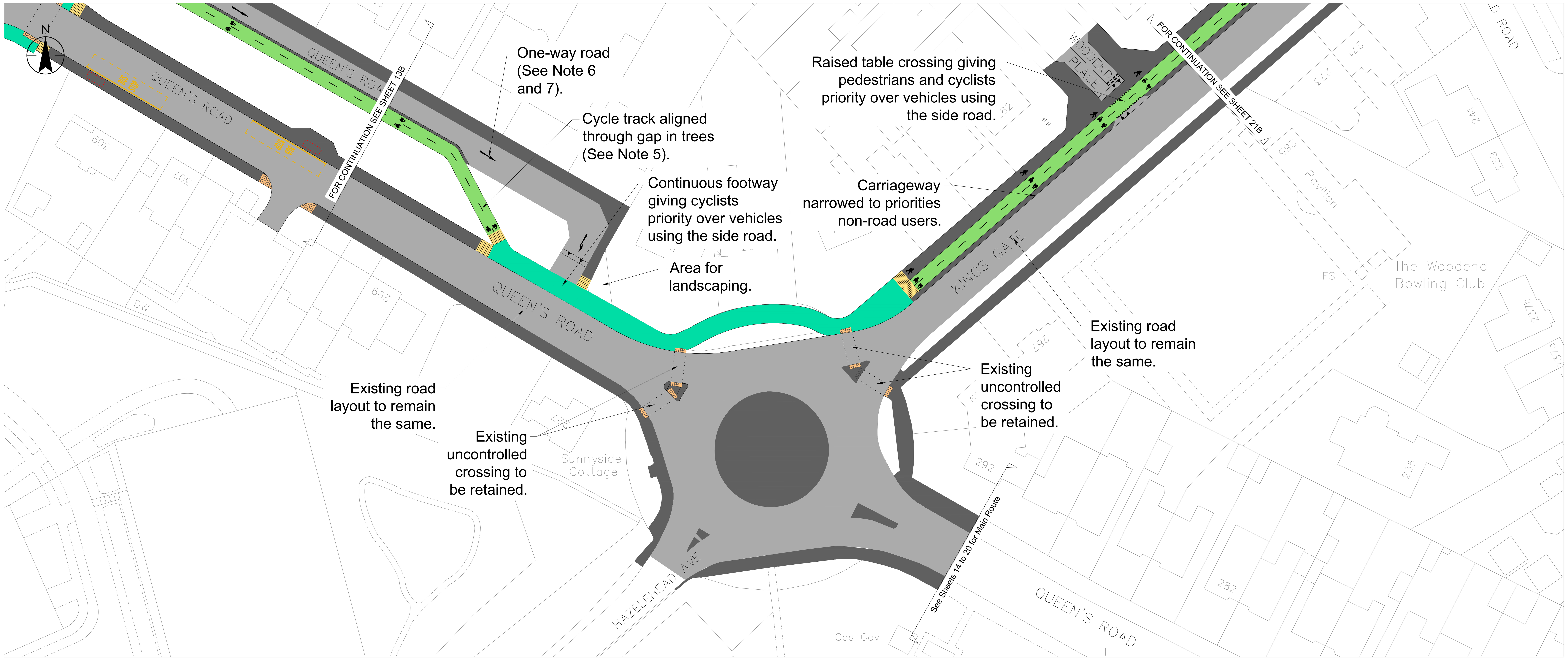
PROPOSED ROAD LAYOUT

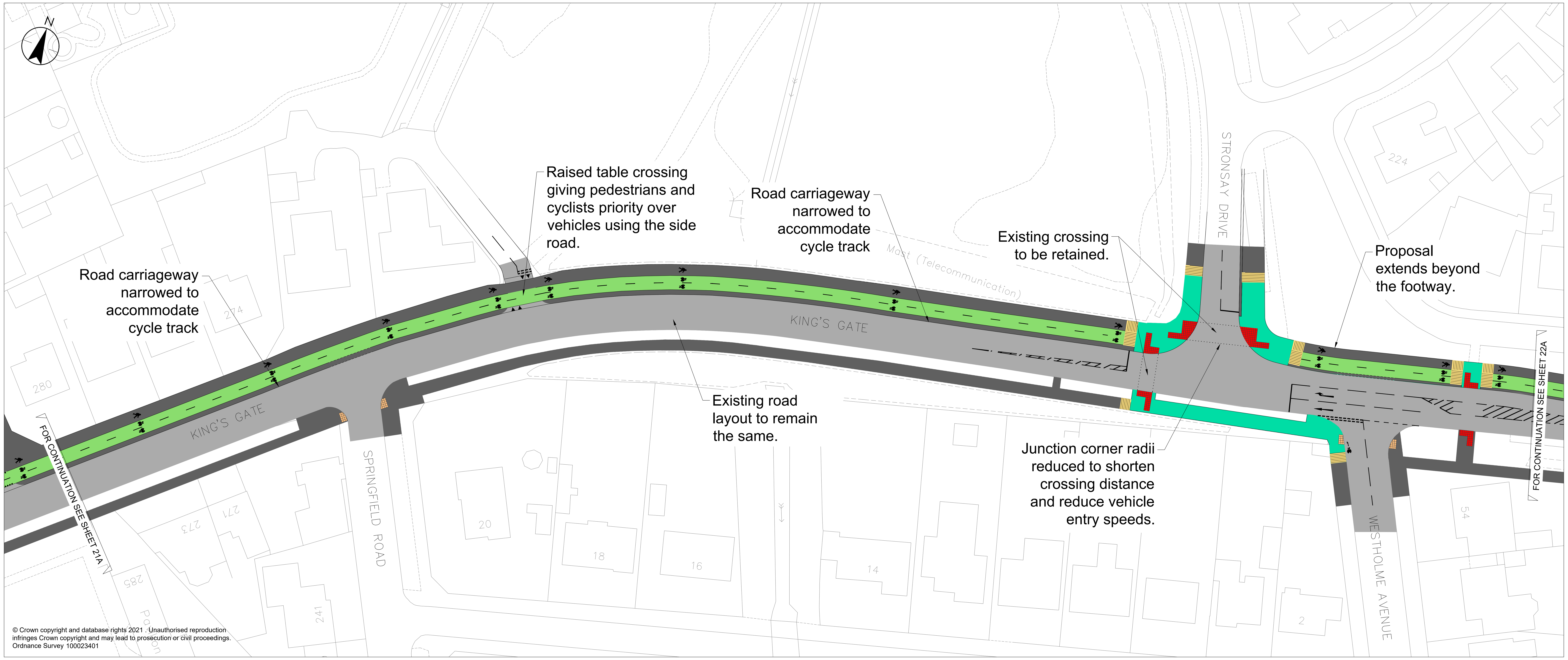
Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5520

Parallel Route A Drawings

- Drawing Number: 332610462-STN-HGN-XX-DR-H-5521(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5522(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5523CT(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5523CS(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5524CT(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5524CS(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5525(P01)





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4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. No dig construction method will be used to ensure delivery of the two-way cycle track has no impact on the trees.
6. On-street parking provision will be removed to maintain 4.0m width for one way general traffic.
7. All vehicle property accesses to be retained.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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Client/Project
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 21 OF 28

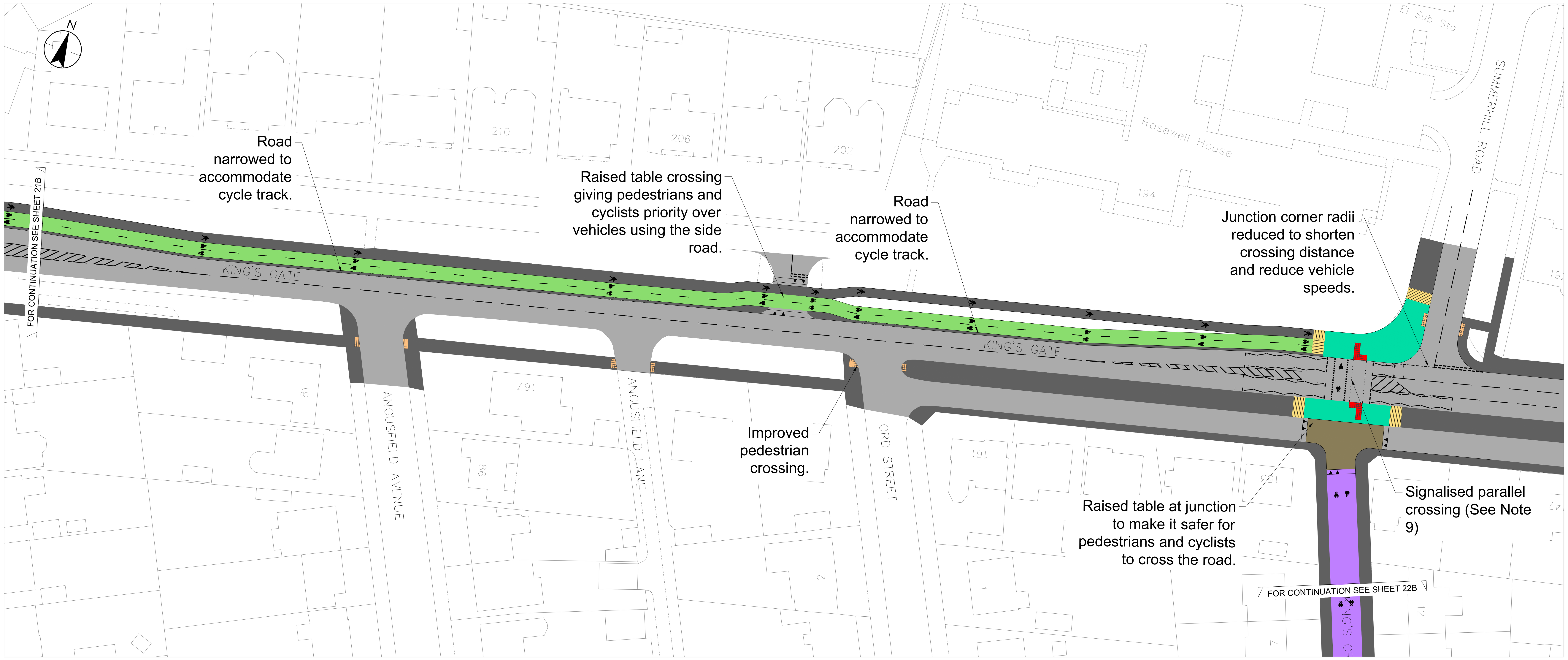
Title
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

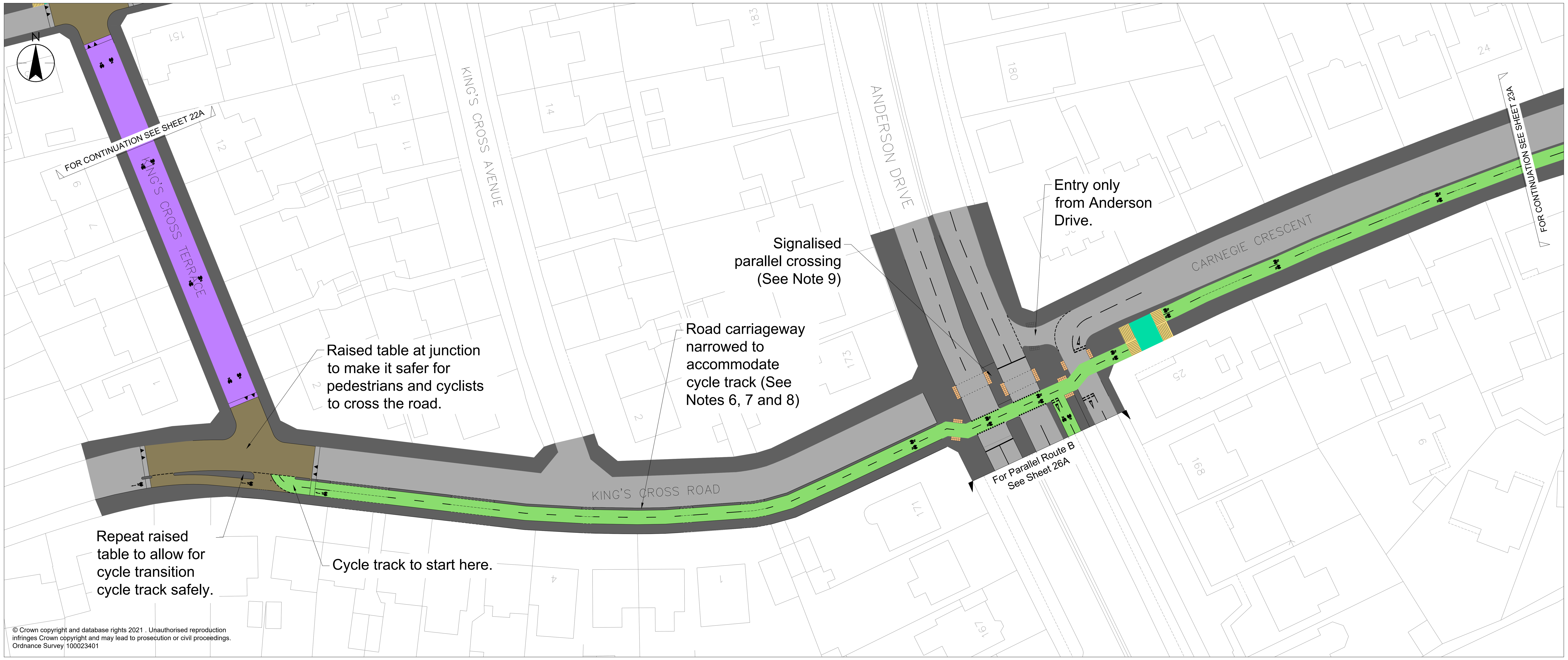
QUEEN'S ROAD / KING'S GATE

PROPOSED ROAD LAYOUT

Project No. 332610462
A1 Scale 1:500

Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5521





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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. Requires the closure of the Kings Cross Road access on Anderson Drive and entry only to Carnegie Crescent.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. A signalised parallel crossing means that people travelling on foot and by bike can cross the road separately from each other, increasing safety and making it easier to carry on their journey. This type of crossing is also known as a 'sparrow crossing'.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 22 OF 28

Title
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

KING'S GATE / KING'S CROSS ROAD

PROPOSED ROAD LAYOUT

Project No. 332610462

Scale 1:500

Revision P01

Drawing No. 332610462-STN-HGN-XX-DR-H-5522

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3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There are two options for the cycle route along Moray Place and Rubislaw Den North. This option shows the cycle route as a Cycle Track. For the Cycle Street option see Sheet 23-CS and 24-CS.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained8. Trees retained with additional trees planted where appropriate.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

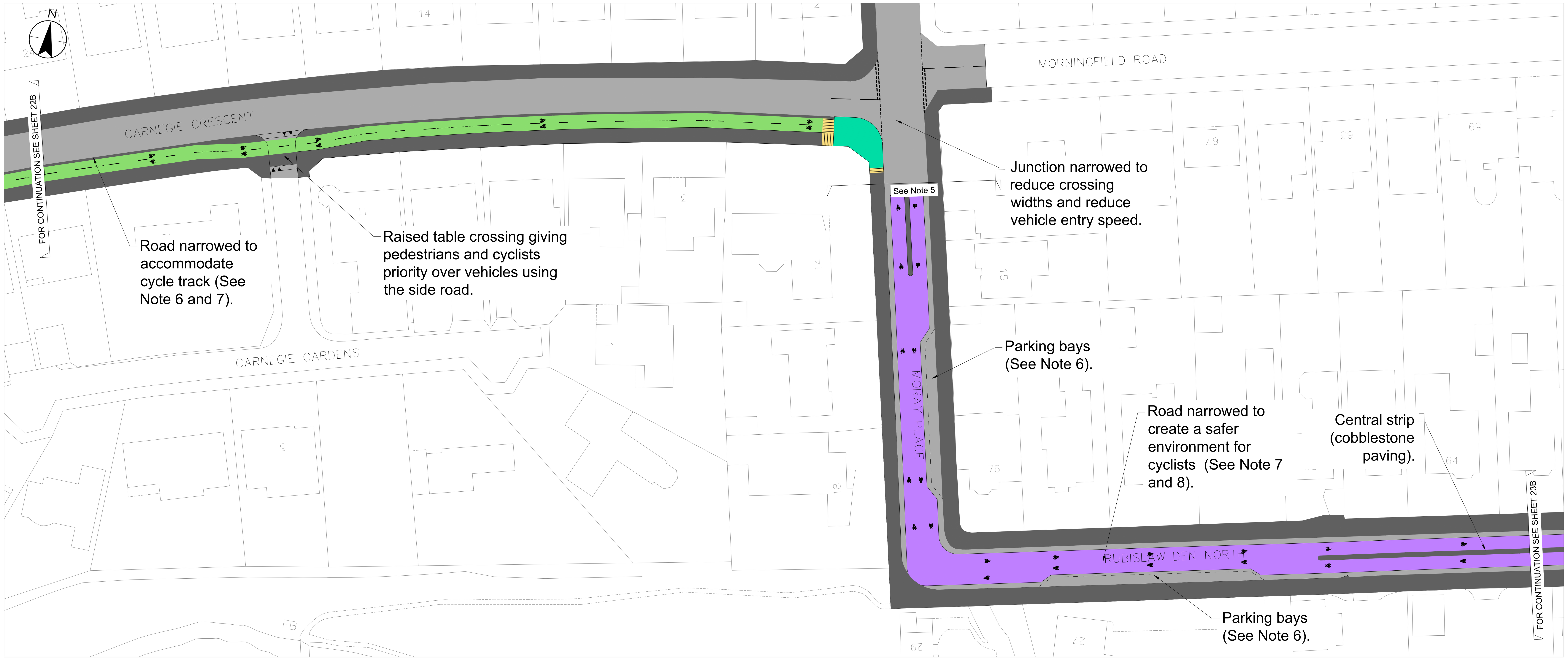
SHEET 23-CT OF 28

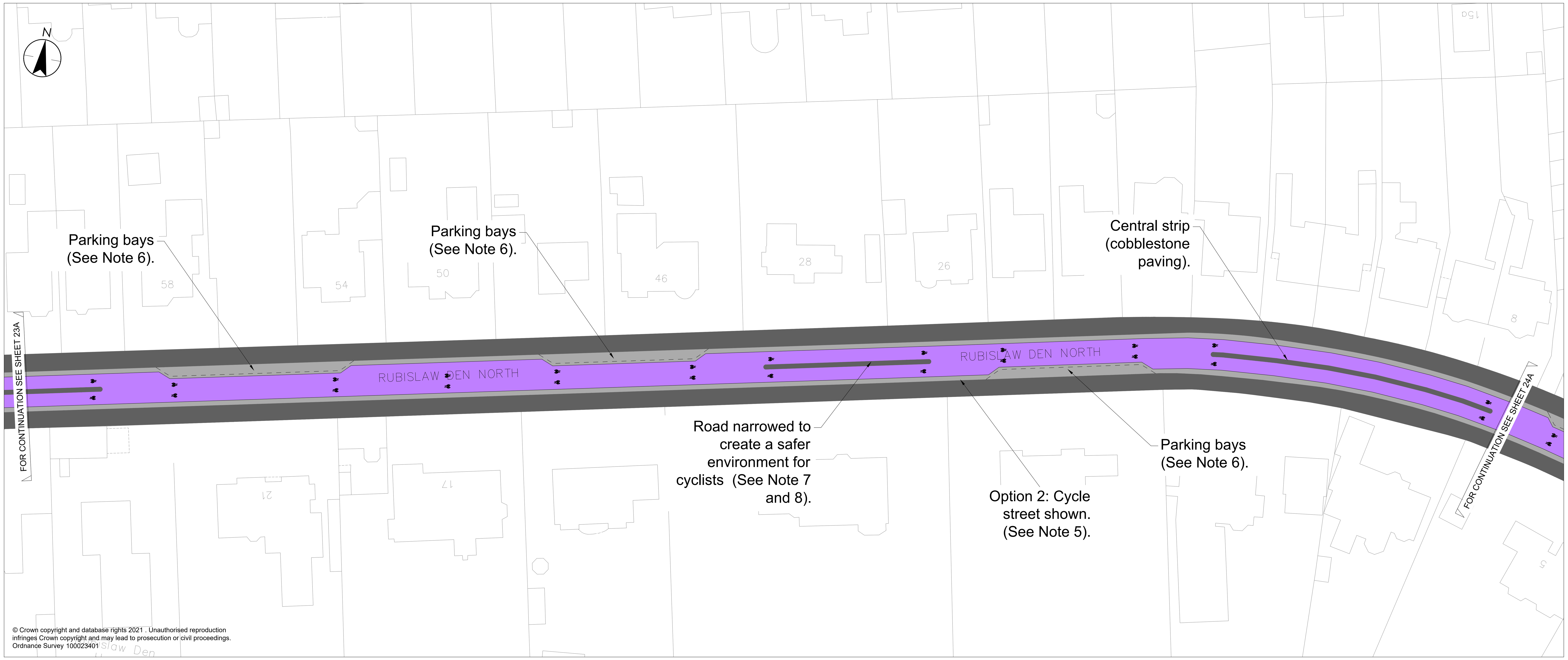
Title
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

CARNEGIE PLACE / RUBISLAW DEN NORTH

PROPOSED ROAD LAYOUT (CYCLE TRACK OPTION)

Project No. 332610462
A1 Scale 1:500
Revision P01
Drawing No. 332610462-STN-HGN-XX-DR-H-5523-CT





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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There are two options for the cycle route along Moray Place and Rubislaw Den North. This option shows the cycle route as a Cycle Street. For the Cycle Track option see Sheet 23-CT and 24-CT.
6. On-street parking rationalised with the provision of parking bays which can each accommodate 6-7 vehicles.
7. All vehicle accesses to properties retained8. Trees retained with additional trees planted where appropriate.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

P01 FIRST ISSUE	M.G	G.D	2024.01.10
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Client/Project

WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 23-CS OF 28

Title

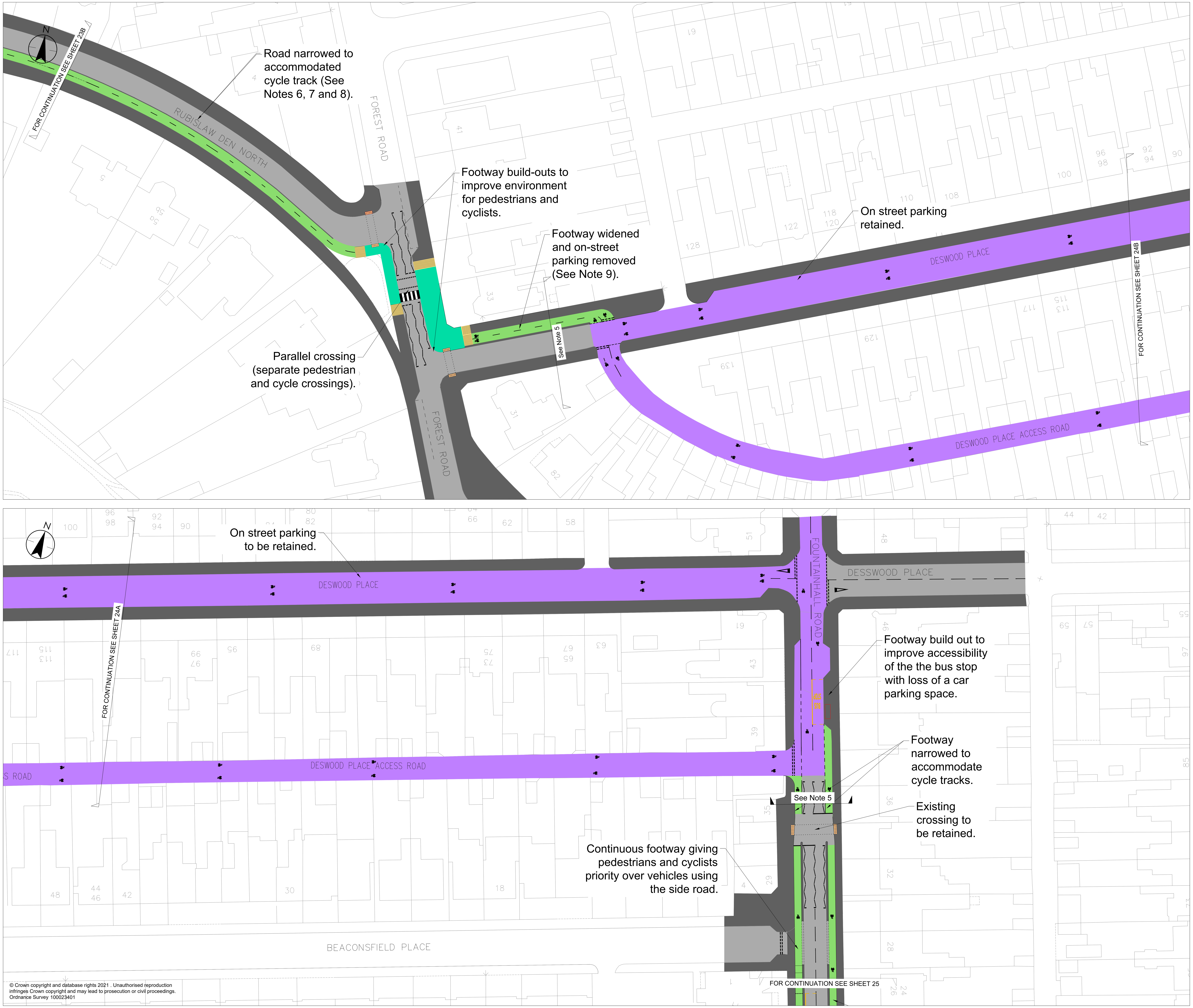
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

CARNEGIE PLACE / RUBISLAW DEN NORTH

PROPOSED ROAD LAYOUT (CYCLE STREET OPTION)

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5523-CS



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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There are two options for the cycle route using either Desswood Place or the Desswood Place Access Road. Both routes provide the cycle route within a mixed traffic street.
6. On-street parking rationalised with the provision of parking bays which can each accommodate 6-7 vehicles.
7. All vehicle accesses to properties retained
8. Trees retained with additional trees planted where appropriate
9. To provide the cycle track on Desswood Place on-street parking is removed between Forest Road and Desswood Place Access Road.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

		By	Appd	YYYY.MM.DD
P01	FIRST ISSUE	M.G	G.D	2024.01.10

Issued/Revision

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
M.G	M.G	M.O'S	2024.01.10

Issue Status

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ABERDEEN CITY COUNCIL

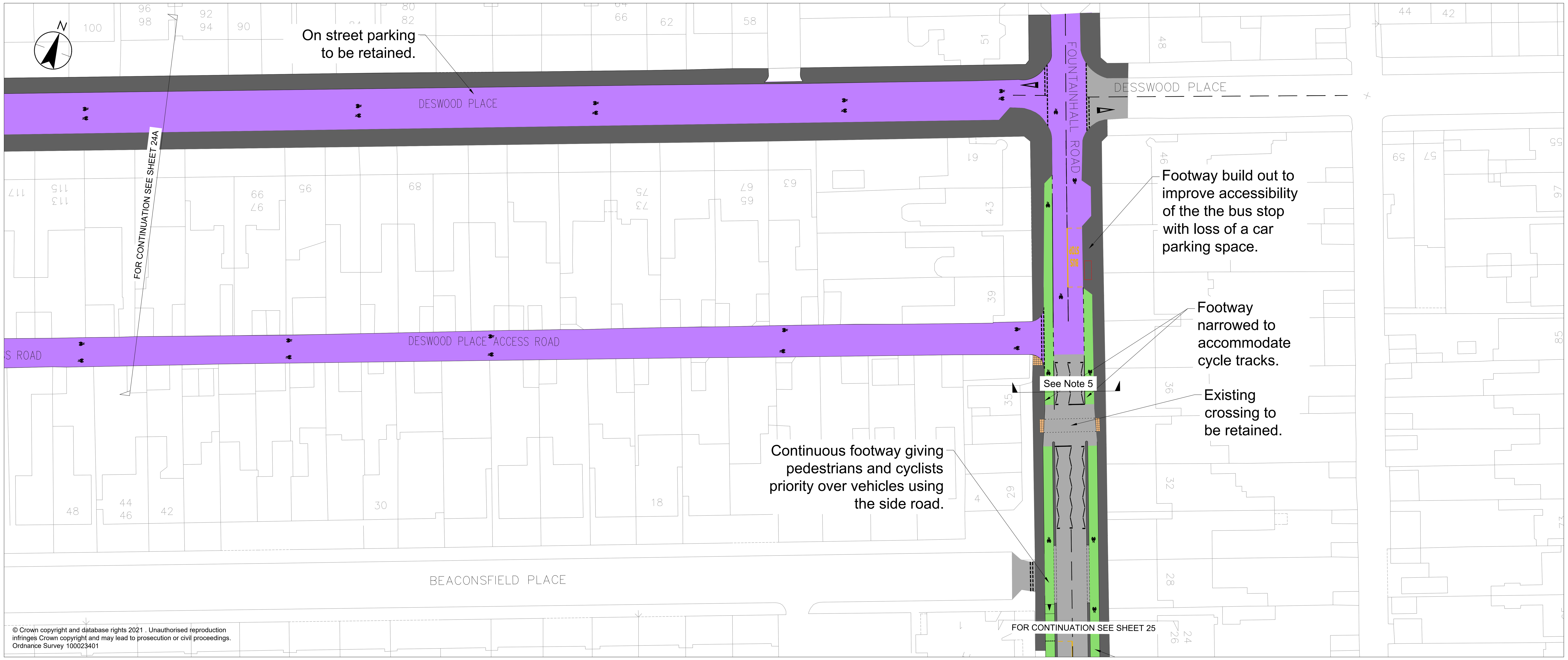
Client/Project
WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 24-CT OF 28

Title
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)
FOREST ROAD / DESSWOOD PLACE
PROPOSED ROAD LAYOUT (CYCLE TRACK OPTION)

Project No. 332610462 | A1 Scale 1:500

Revision P01 | Drawing No. 332610462-STN-HGN-XX-DR-H-5524-CT



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Notes

1. The layout is subject to detailed design, highway capacity testing, road safety audit, ground investigations, earthworks modelling, utilities & services searches, and confirmation of land ownership.
2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There are two options for the cycle route using either Desswood Place or the Desswood Place Access Road. Both routes provide the cycle route within a mixed traffic street.
6. On-street parking rationalised with the provision of parking bays which can each accommodate 6-7 vehicles.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 24-CS OF 28

Title

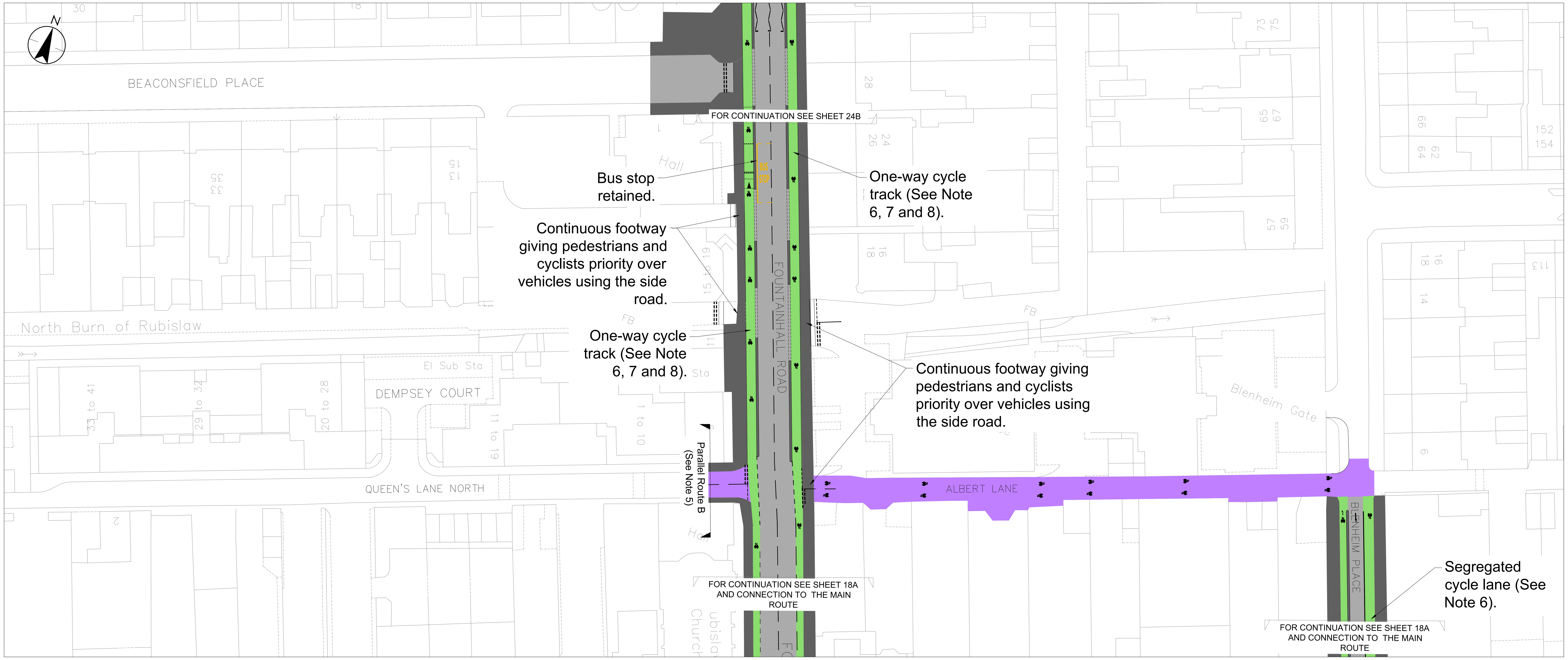
PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

FOREST ROAD / DESSWOOD ROAD

PROPOSED ROAD LAYOUT (CYCLE STREET OPTION)

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5524-CS



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3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. For Parallel Route B see Sheets 26, 27 and 28.
6. On-street parking provision removed to accommodate cycle tracks.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 25 OF 28

Title

PARALLEL ROUTE A (VIA RUBISLAW DEN NORTH)

FOUNTAINHALL ROAD / ALBERT LANE

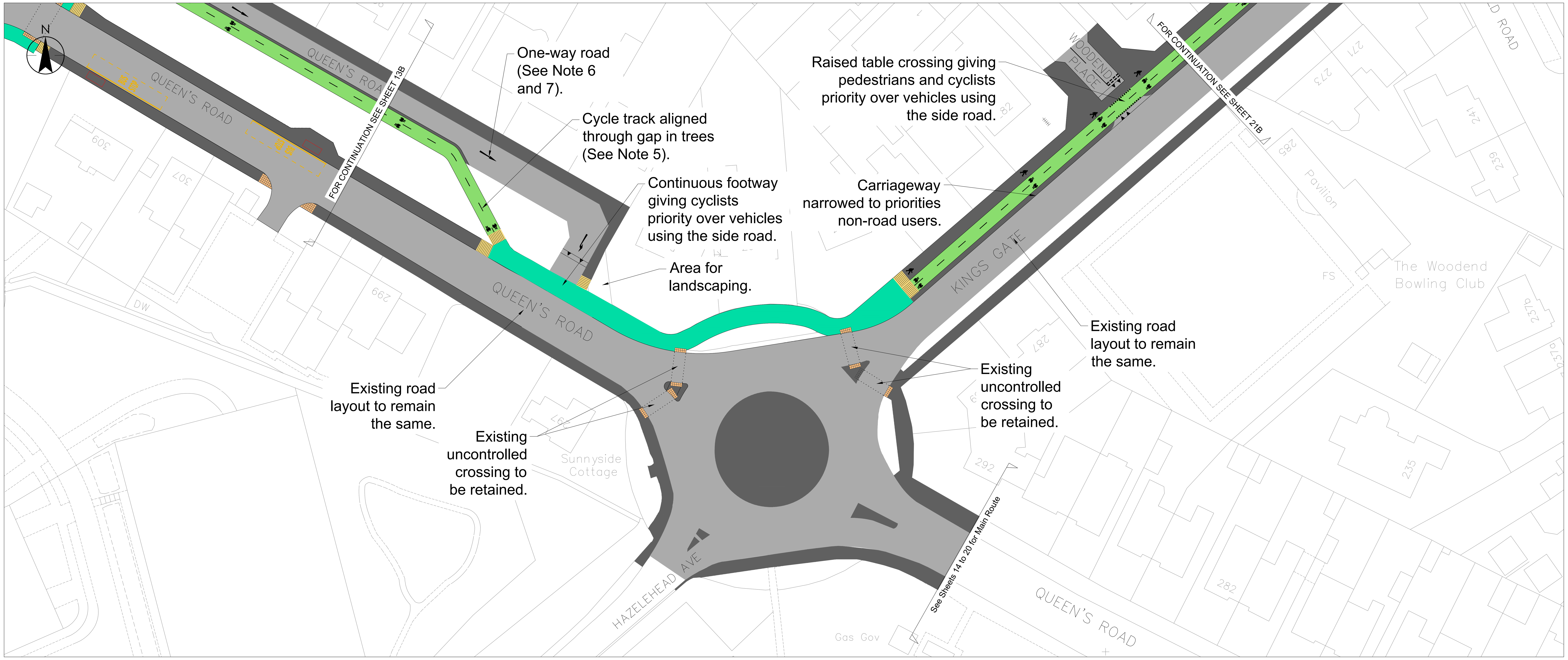
PROPOSED ROAD LAYOUT

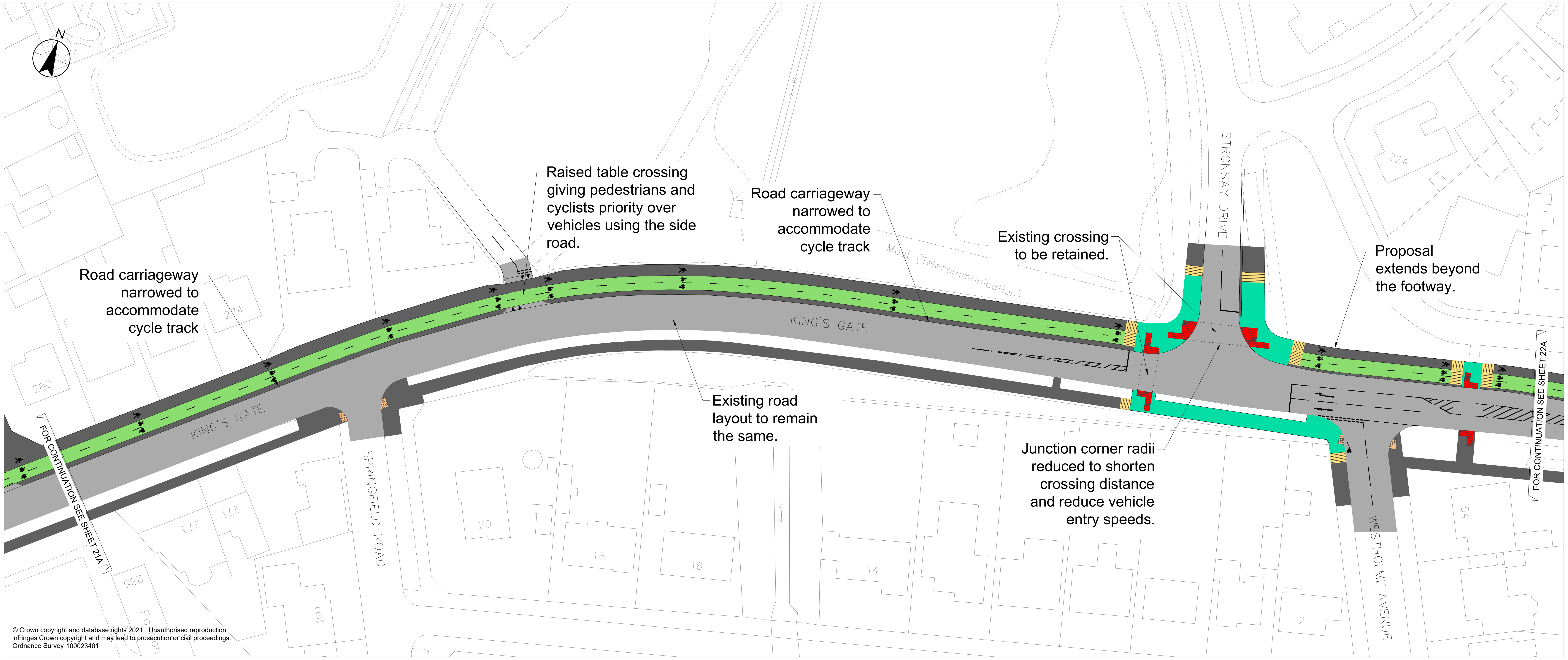
Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5525

Parallel Route B Drawings

- Drawing Number: 332610462-STN-HGN-XX-DR-H-5521(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5522(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5526CT(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5526CS(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5527CT(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5527CS(P01)
- Drawing Number: 332610462-STN-HGN-XX-DR-H-5528(P01)





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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. No dig construction method will be used to ensure delivery of the two-way cycle track has no impact on the trees.
6. On-street parking provision will be removed to maintain 4.0m width for one way general traffic.
7. All vehicle property accesses to be retained.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 21 OF 28

Title

PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

QUEEN'S ROAD / KING'S GATE

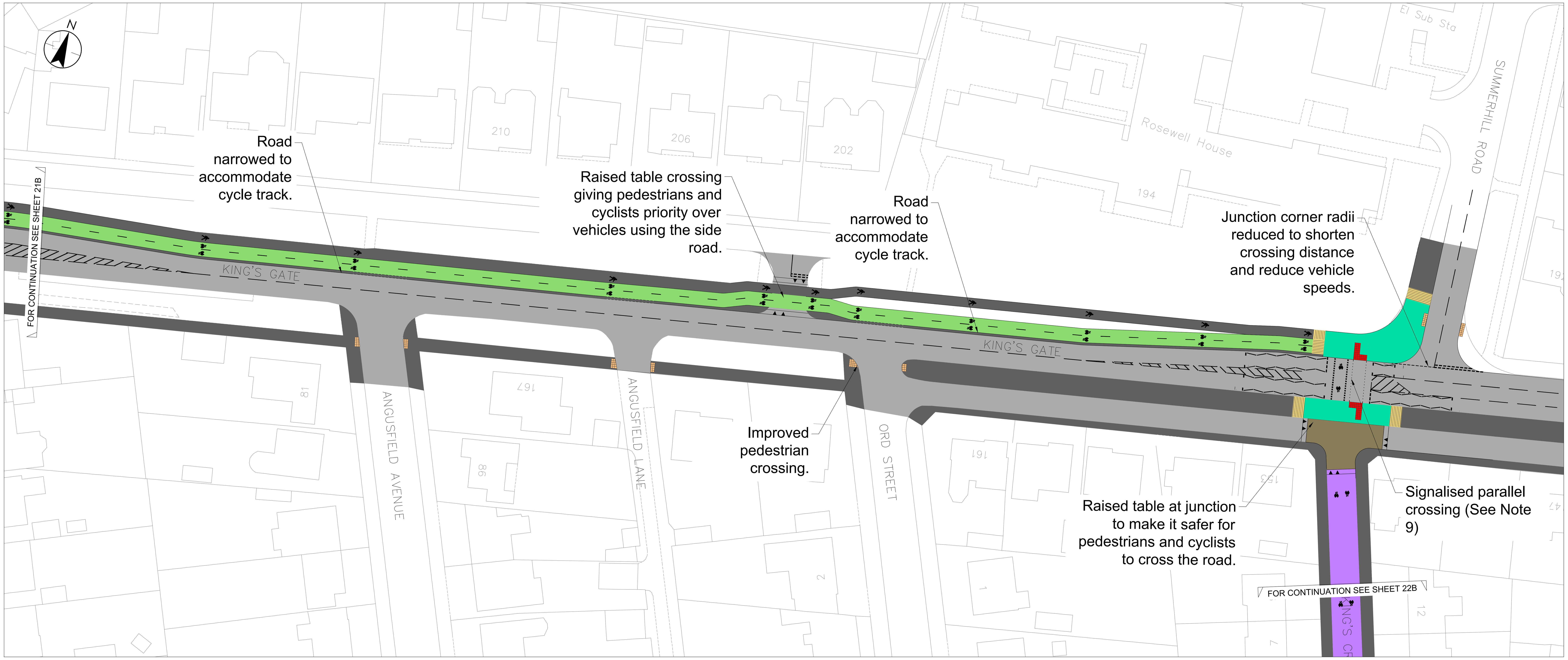
PROPOSED ROAD LAYOUT

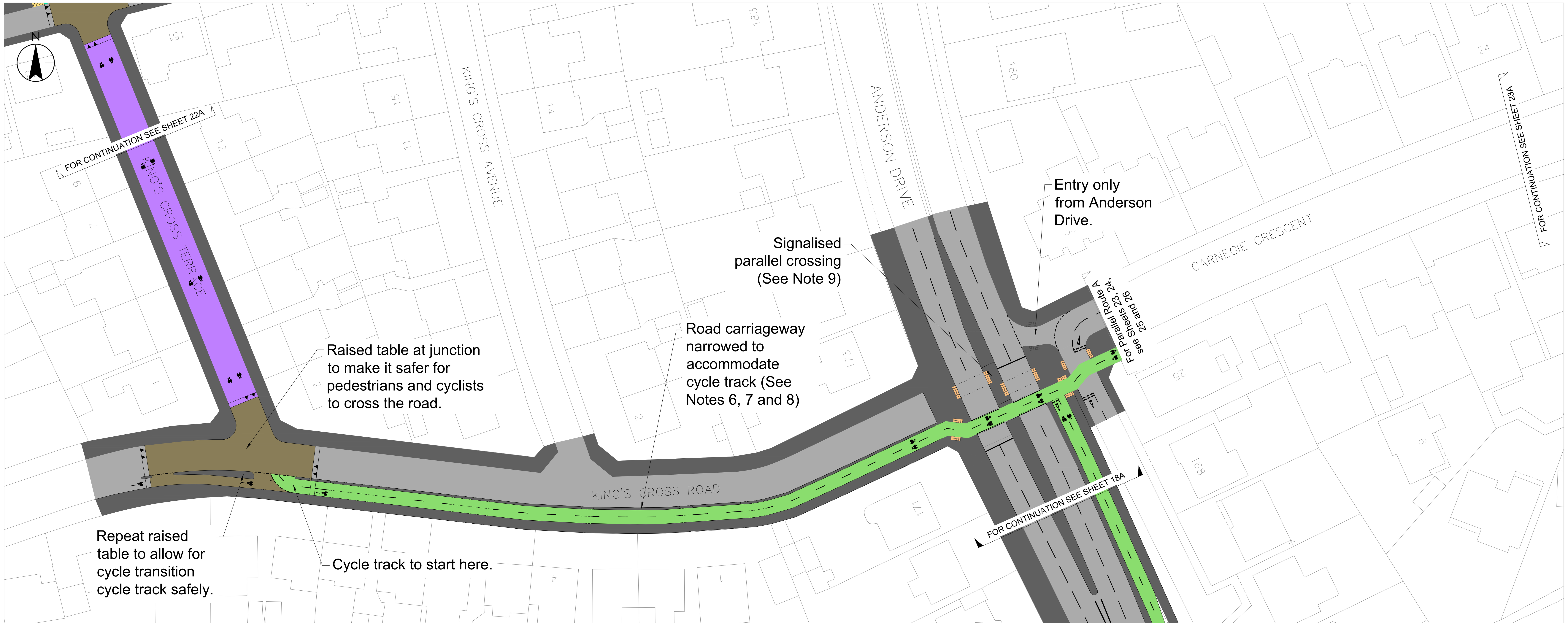
Project No.: 332610462

A1 Scale: 1:500

Revision: **P01**

Drawing No.: **332610462-STN-HGN-XX-DR-H-5521**





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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. Requires the closure of the Kings Cross Road access on Anderson Drive and entry only to Carnegie Crescent.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. A signalised parallel crossing means that people travelling on foot and by bike can cross the road separately from each other, increasing safety and making it easier to carry on their journey. This type of crossing is also known as a 'sparrow crossing'.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 22 OF 28

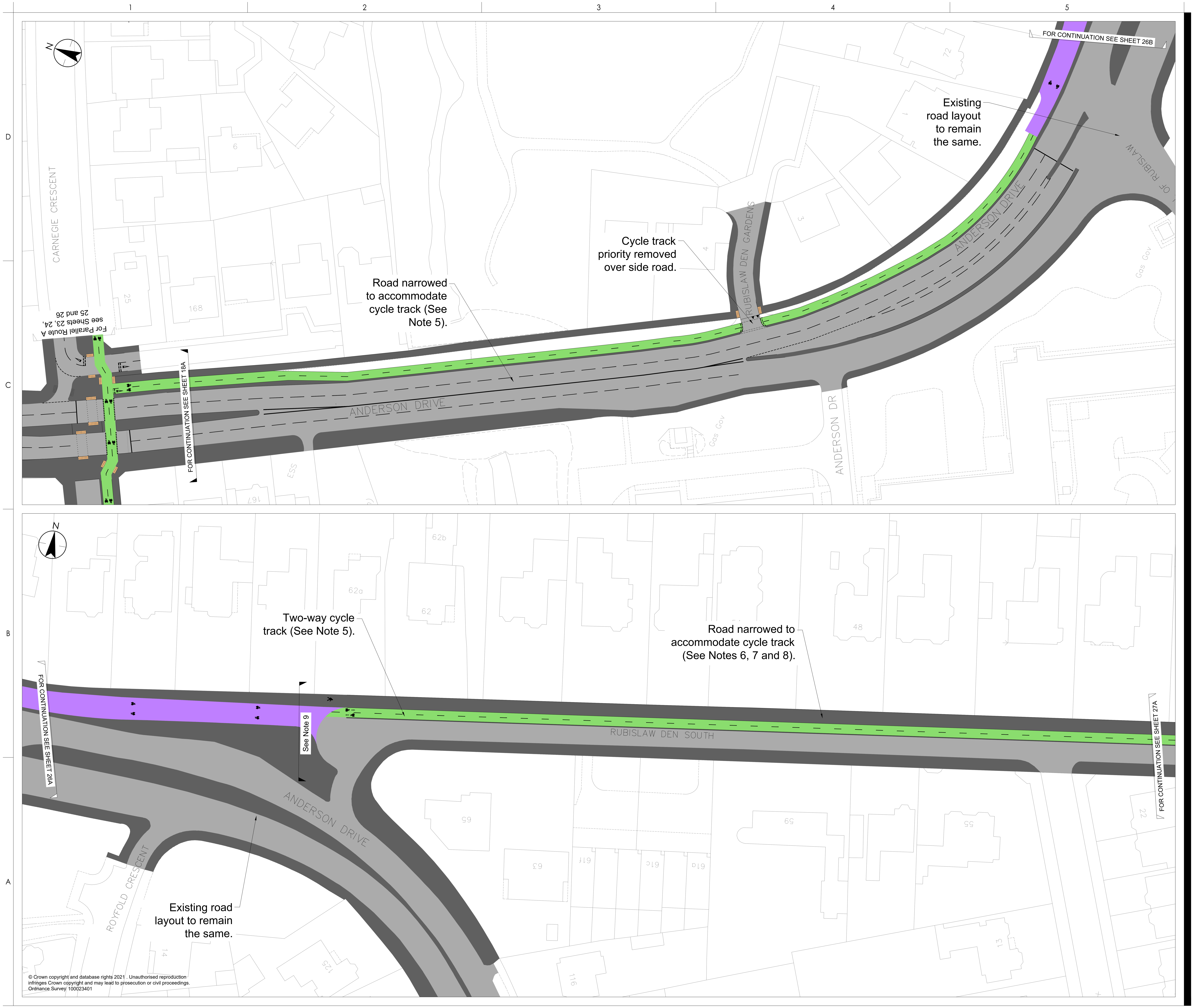
Title
PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

KING'S GATE / KING'S CROSS ROAD

PROPOSED ROAD LAYOUT

Project No.	## Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5522



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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. The central reservation is removed and traffic lanes narrowed (to within permitted widths) allowing the cycle track to be delivered without the loss of trees along this section of Anderson Drive.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. There are two options for the cycle route along Rubislaw Den South. This option shows the cycle route as a Cycle Track. For the Cycle Street option see Sheet 26-CS.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision		By	Appd	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 26-CT OF 28

Title

PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

ANDERSON ROAD / RUBISLAW DEN SOUTH

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5526-CT

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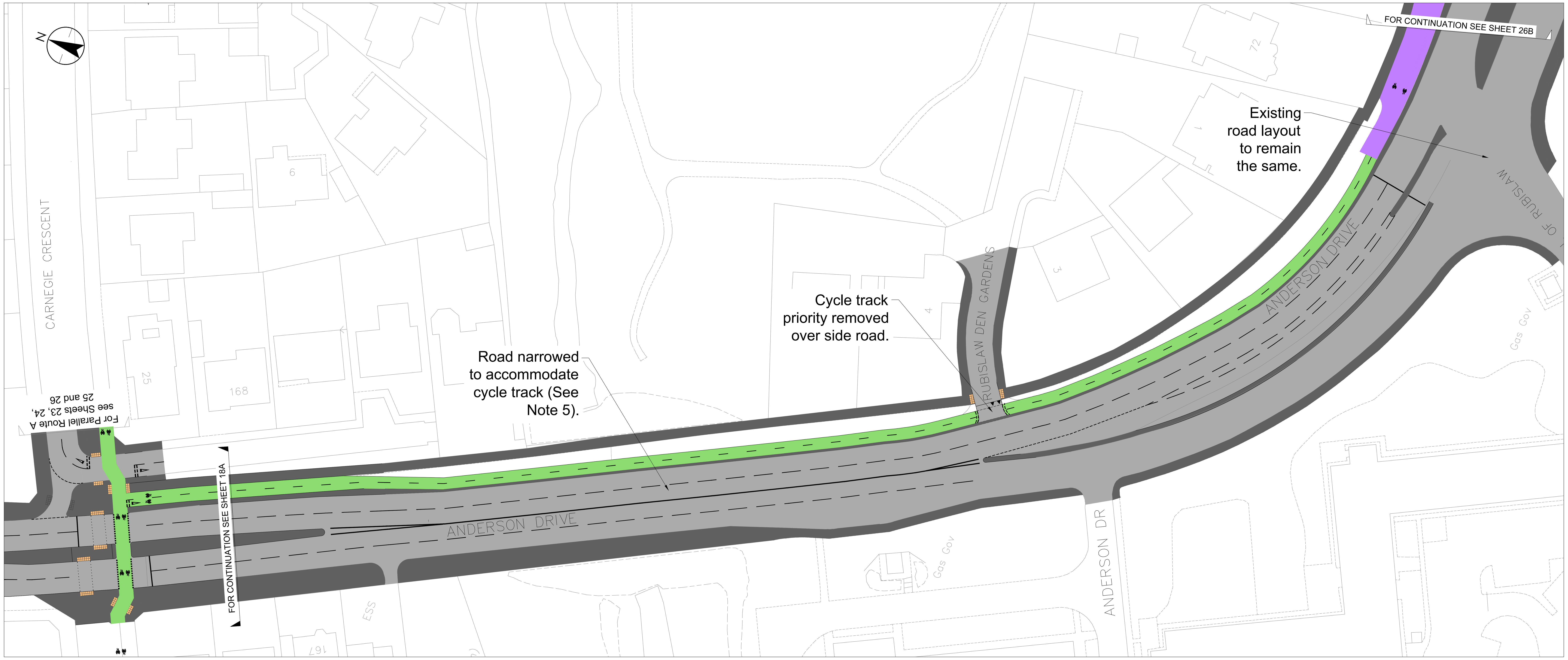
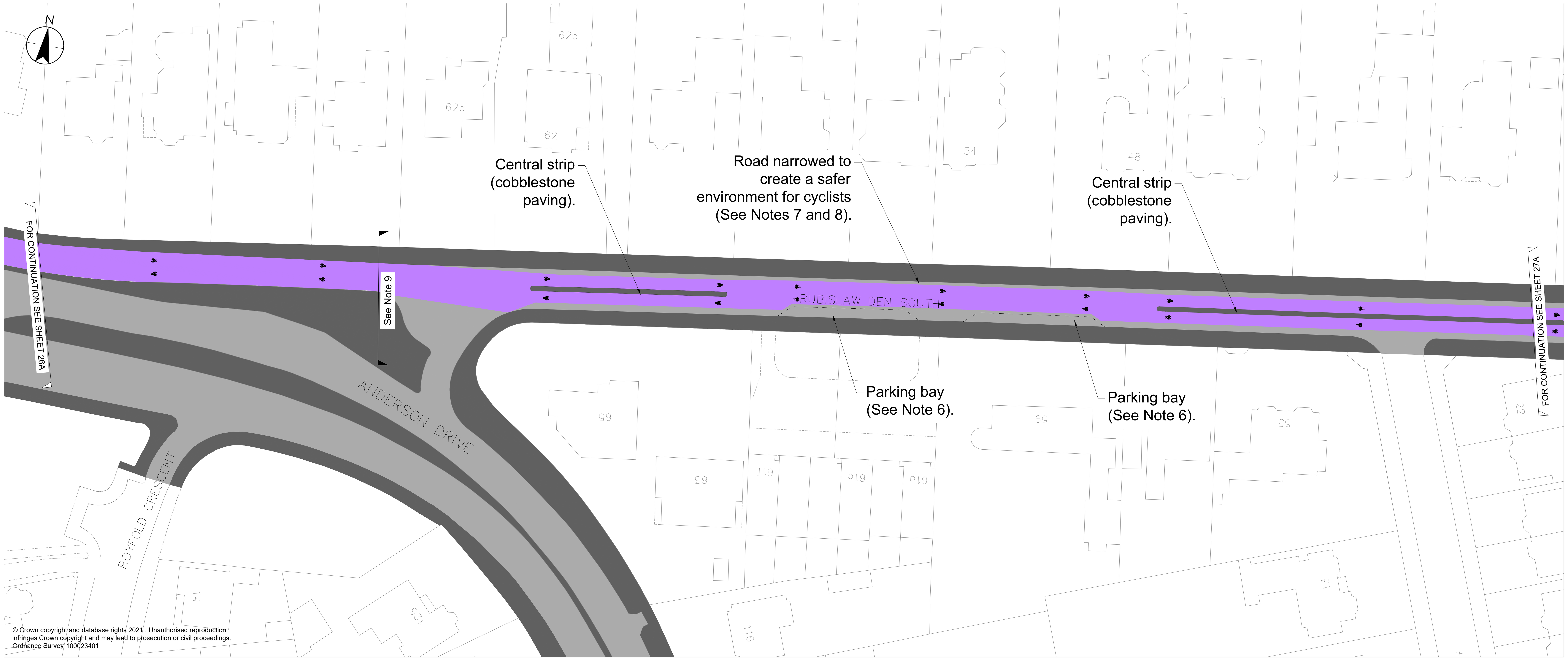
D C B A





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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use secions of shared-use areas instead of separated cycle track and footway.
5. The central reservation is removed and traffic lanes narrowed (to within permitted width) allowing the cycle track to be delivered without the loss of trees along this section of Anderson Drive.
6. On-street parking rationalised with the provision of parking bays which can each accommodate 6-7 vehicles.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. There are two options for the cycle route along Rubislaw Den South. This option shows the cycle route as a Cycle Street. For the Cycle Track option see Sheet 26-CT.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

Issued/Revision	By	Appd	YYYY.MM.DD
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 26-CS OF 28

Title
PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

ANDERSON ROAD / RUBISLAW DEN SOUTH

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5526-CS

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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There is an alternative proposal for Rubislaw Den South that provides the cycle route within a 'cycle street' or mixed traffic street as shown on Sheet 20B.
6. On-street parking provision to be removed to maintain two-way road.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. There are two options for the cycle route along Rubislaw Den South. This option shows the cycle route as a Cycle Track. For the Cycle Street option see Sheet 27-CS.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
- Tactile paving (controlled crossing)
- Tactile paving (shared use area)
- Indicative bus shelter location

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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 27-CT OF 28

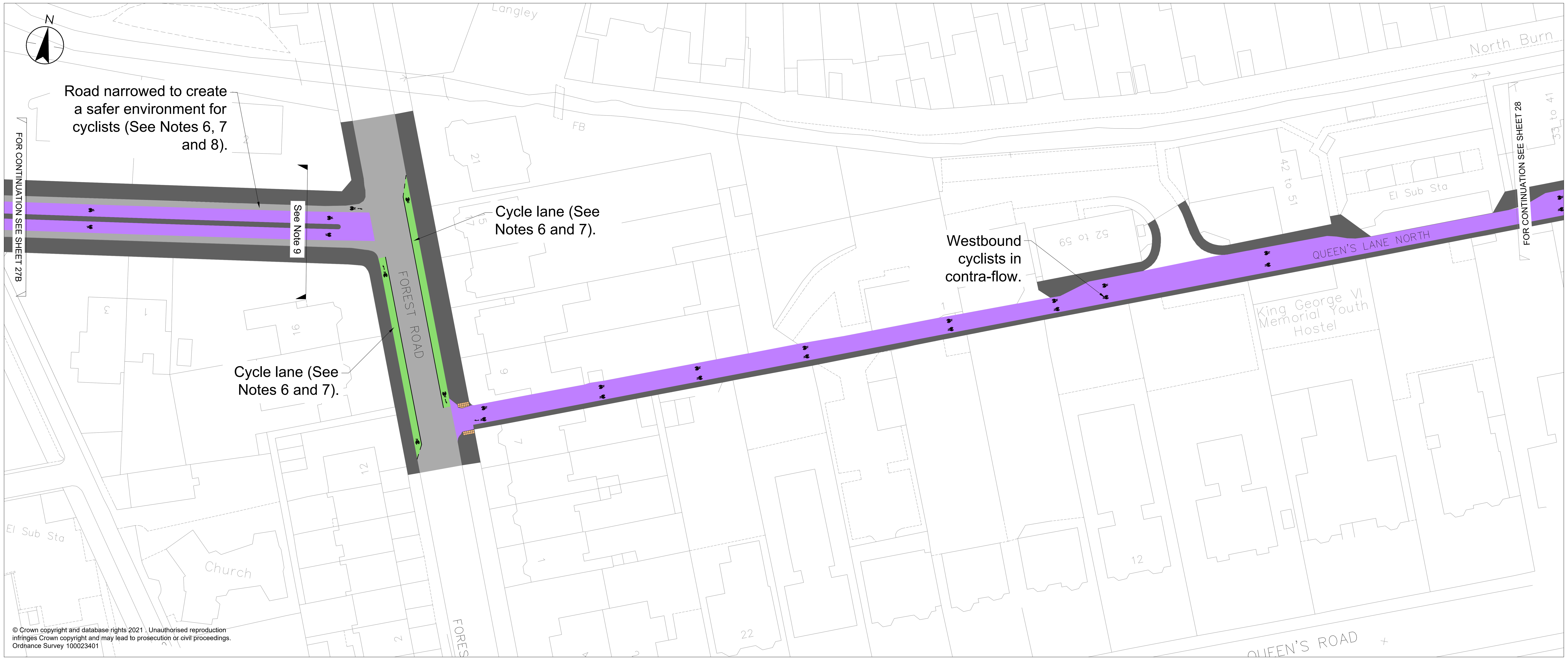
Title
PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

RUBISLAW DEN STH / FOREST ROAD / QUEEN'S LANE NTH

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5527-CT



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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. There is an alternative proposal for Rubislaw Den South that provides the cycle route using a two-way cycle track on the northern side of the road as shown on Sheet 20A.
6. On-street parking rationalised with the provision of parking bays which can each accommodate 6-7 vehicles.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.
9. There are two options for the cycle route along Rubislaw Den South. This option shows the cycle route as a Cycle Street. For the Cycle Track option see Sheet 27-CT.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
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SHEET 27-CS OF 28

Title

PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

RUBISLAW DEN STH / FOREST ROAD / QUEEN'S LANE NTH

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
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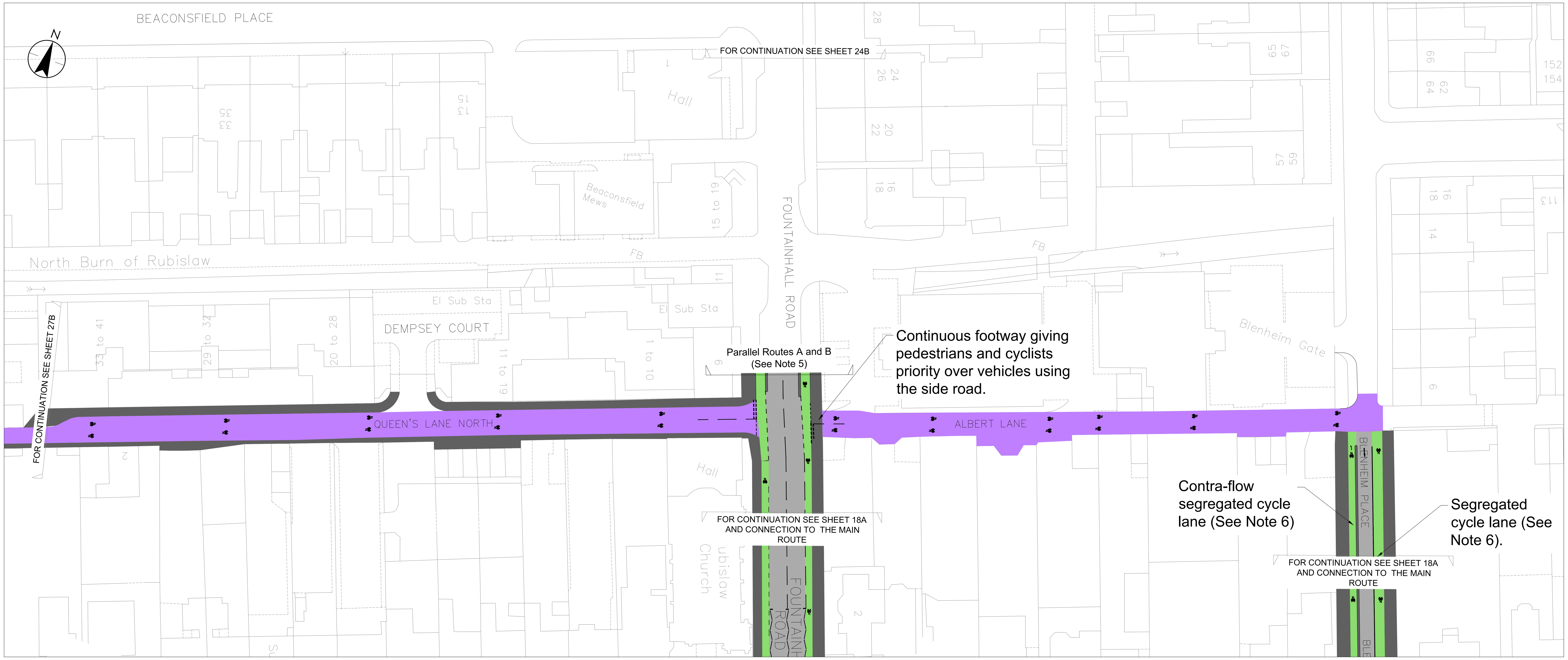

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2. The detailed design will be in accordance with all relevant design guidance and standards.
3. The use of third-party land to deliver the proposed road layout is subject to legal agreement.
4. Where proposals extend beyond the footway there may be opportunities avoid this widening by narrowing the central reservation, traffic lanes and bus lane or the greater use sections of shared-use areas instead of separated cycle track and footway.
5. For Parallel Route A see Sheets 22, 23, 24 and 25 .
6. On-street parking provision removed to accommodate cycle tracks.
7. All vehicle accesses to properties retained.
8. Trees retained with additional trees planted where appropriate.

Key:

- Footway
- Road carriageway
- Bus lane
- Mixed traffic street (cars and cyclists)
- Shared use (pedestrian and cyclists)
- Cycle track
- Alternative cycle track option
- Tactile paving (uncontrolled crossing)
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WESTHILL TO ABERDEEN - ACTIVE TRAVEL IMPROVEMENTS

SHEET 28 OF 28

Title

PARALLEL ROUTE B (VIA RUBISLAW DEN SOUTH)

FOUNTAINHALL ROAD / ALBERT LANE

PROPOSED ROAD LAYOUT

Project No.	A1 Scale
332610462	1:500

Revision	Drawing No.
P01	332610462-STN-HGN-XX-DR-H-5528

Appendix C: Detailed CLoS Assessment Scoring (Tables)

Contents

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 1

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	Factor	Design Principle	Indicators	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns	Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Cyclists can connect to other networks but there are no formal links	2	Crossing facilities allow for users to join other routes to south safely and easily		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route	Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	At breaks in the shared use path there are no formal crossings, signs, or route markings to indicate which direction to continue in	2	Route is continuous and intuitive, allowing cyclists to maintain consistent speed		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network	Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is a good selection of shared use paths between Straik Road and Old Skene Road but the connections to this network are poor	0	There is a good selection of shared use paths between Straik Road and Old Skene Road but the connections to this network remain poor		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative	Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 825m Crow Flies: 820m Deviation Factor: 0.6% Alignment: Route follows the main road	2	Link Length: 825m Crow Flies: 820m Deviation Factor: 0.6% Alignment: Route follows the main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency	At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	Cyclists give way to vehicles at side roads (assumes cyclists are using the shared-use path)	2	Formal crossings on side roads give cyclist and pedestrian priority		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions	At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	Toucan crossing on western arm of roundabout is offset, creating delay for users	1	Toucan crossing on western arm aligned to reduce delay to users		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links	Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	1	Width of shared use path could create delay to users	2	Segregated and bidirectional track allows choosing of appropriate speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient	Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	2	Elevation Max: 127m Elevation Min: 124m Max Slope: 3.2% Average Slope: 1.0% West to East: Gradual incline	2	Elevation Max: 127m Elevation Min: 124m Max Slope: 3.2% Average Slope: 1.0% West to East: Gradual incline		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 1

Stantec

	Factor	Design Principle	Indicators	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	There is a shared-use path on the southern side of the road so cyclists do not need to share the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
			10. Motor traffic speed on sections of shared carriageway	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	There is a shared-use path on the southern side of the road so cyclists do not need to share the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	2	There is a shared-use path on the southern side of the road so cyclists do not need to share the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	2	There is a shared-use path on the southern side of the road so cyclists do not need to share the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions	Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side road junctions are infrequent but untreated	2	Side road junctions have priority crossings to separate traffic streams		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout	Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Generally legible road markings and road layout but some elements could be improved	2	Clear, understandable, simple road markings to be provided		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2	Shared use path is separated from road by a verge, overall facility is 3m wide	2	Cycle track separated from carriageway and 3m wide		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards	Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	2	The route includes evasion room and avoids any physical hazards.	2	The route includes evasion room and avoids any physical hazards.		

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Cycle Level of Service Assessment
Link 1

Stantec

	Factor	Design Principle	Indicators	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects	Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Smooth high grip surface	2	Smooth high grip surface		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type	Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	2	Shared use path surface is machine laid and smooth, with no defects	2	Cycle route surface is machine laid and smooth, with no defects		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)	More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	2	Recommended widths are maintained throughout whole route		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing	Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	Route signing is poor with signs missing at key decision points.	2	Appropriate signage provided at key locations		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting	Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Street lighting is on the northern side of the road and so may not provide the levels required along the shared-use path located on the south side of the road	1	Street lighting is on the northern side of the road and so may not provide the levels required along the proposed cycle track located on the south side of the road		
			22. Isolation	Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained	2	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)	Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	0	Pedestrians currently have to share facilities with cyclists	2	Cyclists and pedestrians are separated and both have priority at crossings		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size	Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	2	Signing for wayfinding purposes only and not causing additional obstruction.	2	Signing for wayfinding purposes only and not causing additional obstruction.		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands	Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	No evidence of cycle parking	0	No cycle parking requirement		

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Cycle Level of Service Assessment
Link 1

Stantec

	Factor	Design Principle	Indicators	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands	*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited flexibility to expand, evolve or adapt the cycle route infrastructure provision to accommodate changing demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands	*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within the Westhill Industrial Estate and at the Tesco superstore)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	1	17%	4	67%	0	0%
	Directness (out of 10)	5	50%	9	90%	0	0%
	Safety (out of 16)	13	81%	16	100%	0	0%
	Comfort (out of 8)	4	50%	8	100%	0	0%
	Attractiveness (out of 10)	5	50%	7	70%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**28**	**56%**	**47**	**87%**	**0**	**0%**

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Cycle Level of Service Assessment
Link 2

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Limited opportunity to join the route given the inter urban location	1	Minor changes made to improve the connectivity of the cycle route		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	1	The route is a combination of share use path and mixed traffic provision which are poorly connected	2	Proposals create a more continuous route for cyclists using cycle tracks, shared-use and a mixed traffic road		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	Rural setting with limited options or need for a wider network of cycle routes	0	Rural setting with limited options or need for a wider network of cycle routes		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 1,920m Crow Flies: 1,850m Deviation Factor: 3.6% Alignment: Follows the main road except diversion via minor road near Cormack Park	2	Link Length: 1,920m Crow Flies: 1,850m Deviation Factor: 3.6% Alignment: Follows the main road except diversion via minor road near Cormack Park		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	Cyclists give way at side roads (assumes cyclists are using the shared-use path)	1	Proposals reduce the frequency cyclists give way but the speed of traffic and limited opportunity to off-set side road crossings suggesting only some improvement can be made		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	Overall delay for cyclists likely to be greater than the overall delay for motor traffic	1	Improvements at AWPR junction		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	1	Narrow shared use path makes it more difficult for cyclist to pass one another	2	Cycle track provide additional space for cyclists		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 137m Elevation Min: 115m Max Slope: 4.4% Average Slope: 2.3% West to East: Downhill to A9119 then uphill to the AWPR	1	Elevation Max: 137m Elevation Min: 115m Max Slope: 4.4% Average Slope: 2.3% West to East: Downhill to A9119 then uphill to the AWPR		

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Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 2

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	There is a shared-use path on the northern side of the road so cyclists do not need to use the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	There is a shared-use path on the northern side of the road so cyclists do not need to use the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	2	There is a shared-use path on the northern side of the road so cyclists do not need to use the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	2	There is a shared-use path on the northern side of the road so cyclists do not need to use the road	2	The 2-way cycle track provides a segregated provision so cyclists do not need to share the road		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side road junctions are infrequent but untreated	1	Side road are infrequent but priority crossings are provided where achievable		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Generally legible road markings and road layout but some elements could be improved	2	Clear, understandable, simple road markings to be provided as part of the proposed road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2	Urban clearway so no kerbside activity permitted. Shared use path has a verge	2	Urban clearway so no kerbside activity permitted. Cycle track and shared use path sections have a verge		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	1	The shared use path includes some physical obstacles (guard railing, sign posts) but there is sufficient space to avoid them	2	Proposals will reduce the number of physical obstacles within or close to the cycle track and footway		

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Link 2

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	Minor and occasional defects along shared use path and minor road	2	Resurfacing along the cycle tack/ footway will remove all defects		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	As above	2	As above		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	Shared use path width does not meet desirable minimum values	1	Proposed cycle track meets desirable minimum values assuming widen of the highway can be achieved. Section of shared-use path does not meet desirable minimum values		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	No route signing identified but linear route with few decision points	1	Proposals will include directional signing and route branding. Details to be provided at the next design stage		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Standard highway lighting	1	Standard highway lighting		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Majority of route alongside main road although vehicle speeds high. The section using the minor access road has poor natural surveillance	1	Majority of route alongside main road although traffic speeds high. The section using the minor access road has poor natural surveillance		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Narrow shared use path although pedestrian footfall likely to be low	2	Segregated provision provided and improved crossing provision		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	0	Directional road signage only	1	Proposals will introduce appropriate signage for cycle route wayfinding and branding. Details to be provided at the next design stage		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	No cycle parking identified/ required	0	No cycle parking identified/ required		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 2

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited flexibility to expand, evolve or adapt the cycle route infrastructure provision to accommodate changing demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within the Westhill Industrial Estate and at the Tesco superstore)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	2	33%	3	50%	0	0%
	Directness (out of 10)	4	40%	7	70%	0	0%
	Safety (out of 16)	12	75%	15	94%	0	0%
	Comfort (out of 8)	2	25%	6	75%	0	0%
	Activeness (out of 10)	3	30%	5	50%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**23**	**46%**	**39**	**72%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 3

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Limited opportunity to join the route given the inter urban location but connection to the residential areas of Kingswells available via Old Skene Road	1	Limited opportunity to join the route given the inter urban location but connection to the residential areas of Kingswells available via Old Skene Road		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	1	The route is linear with few decision points required but the route along Old Skene Road is not as clear as it could be	2	Proposals create a more continuous route for cyclists using cycle tracks, shared-use and a mixed traffic road (Old Skene Road)		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	Limited evidence of a wider cycle network connecting to Prime Four, the Park & Ride site, Fairley and Kingswells	1	Limited evidence of a wider cycle network but increased opportunityto connect the route to Prime Four, the Park & Ride site, Fairley and Kingswells		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 2,540m Crow Flies: 2,470m Deviation Factor: 2.8% Alignment: Route follows A944 and Old Skene Road	2	Link Length: 2,540m Crow Flies: 2,470m Deviation Factor: 2.8% Alignment: Route follows A944 and Old Skene Road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	Cyclists give way at side roads (assumes cyclists are using the shared-use path)	0	Proposals reduce the frequency cyclists give way but the speed of traffic and limited opportunity to off-set side road crossings suggesting only minor improvements can be made		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	Overall delay for cyclists likely to be greater than the overall delay for motor traffic	1	Improvements made to the AWPR, Kingswells Causeway and Fairley Road junctions		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Narrow shared use path makes it more difficult for cyclist to pass one another	2	Cycle track provide additional space for cyclists		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 147m Elevation Min: 135m Max Slope: 5.3% Average Slope: 1.5% West to East: Incline from the AWPR to the PFS, then level before short decline section before the Jessiefield r/a	1	Elevation Max: 147m Elevation Min: 135m Max Slope: 5.3% Average Slope: 1.5% West to East: Incline from the AWPR to the PFS, then level before short decline section before the Jessiefield r/a		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 3

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	At junctions there is a shared-use path on the northern side of the road so cyclists do not use the road. The only exception is along Old Skene Road which has a 30mph speed limit	2	At junctions there is a cycle track and shared-use facilities on the northern side of the road so cyclists do not use the road. Old Skene Road is traffic calmed within a cycle street reducing traffic speeds to less than 20mph		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	There is a shared-use path on the northern side of the road so cyclists do not use the road. The only exception is along Old Skene Road which has a 30mph speed limit	2	There is cycle track on the northern side of the road so cyclists do not use the road. Old Skene Road is traffic calmed within a cycle street reducing motor vehicle speeds to less than 20mph		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	2	There is a shared-use path on the northern side of the road so cyclists do not use the road. Traffic flows on Old Skene Road considered to be low	2	There is cycle track on the northern side of the road so cyclists do not use the road. Traffic flows on Old Skene Road will remain low		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	0	There is a shared-use path on the northern side of the road so cyclists do not use the road. Cyclists share the road along Old Skene Road which is a wide single carriageway road with on-street parking.	2	There is cycle track on the northern side of the road so cyclists do not use the road. Cyclists share the road along Old Skene Road which becomes a cycle street with narrow lanes allowing a safe primary riding position maintained		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side road junctions are infrequent and untreated	1	Side road junctions are infrequent but treated		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Generally legible road markings and road layout but some elements could be improved	2	Clear, understandable, simple road markings to be provided as part of the proposed road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1	Most of the route is an urban clearway so no kerbside activity permitted. The section of Old Skene Road is heavily parking but activity likely to be low	2	Urban clearway so no kerbside activity permitted. The layout of Old Skene Road is changed to a cycle street where buffer zones zones are provided around parking bays to reduce collision risk for cyclists		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	1	The shared use path includes some physical obstacles (guard railing, sign posts) but there is sufficient space to avoid them	2	Proposals will reduce the number of physical obstacles within or close to the cycle track and footway		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 3

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	Minor and occasional surface defects along shared use path and minor road	2	Resurfacing along the cycle track, shared-use and mixed traffic areas will remove all surface defects		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	As above	2	As above		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	Shared-use path and cycle track width do not meet desirable minimum values	2	Proposed cycle track and cycle street sections meet desirable minimum values. This assumes narrowing of the central reservation along the A944 can be achieved		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	No route signing identified but linear route with few decision points	1	Proposals will include directional signing and route branding. Details to be provided at the next design stage		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Standard highway lighting	1	Standard highway lighting		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Majority of route alongside main road although vehicle speeds high. The section using Old Skene Road has good natural surveillance given residential property frontages but the shared-use path is secluded with no natural surveillance	1	Majority of route alongside main road although vehicle speeds high. The section using Old Skene Road has good natural surveillance given residential property frontages but the shared-use path is secluded with no natural surveillance		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Narrow shared use path although pedestrian footfall likely to be low	2	Segregated provision and improved crossing provision provided		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	0	Directional road signage only	1	Proposals will introduce appropriate signage for cycle route wayfinding and branding. Details to be provided at the next design stage		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	No cycle parking identified/ required	0	No cycle parking identified/ required		

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Link 3

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited flexibility to expand, evolve or adapt the cycle route infrastructure provision to accommodate changing demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within Prime Four and at the P&R)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	2	33%	4	67%	0	0%
	Directness (out of 10)	3	30%	6	60%	0	0%
	Safety (out of 16)	7	44%	15	94%	0	0%
	Comfort (out of 8)	2	25%	7	88%	0	0%
	Activeness (out of 10)	3	30%	5	50%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**17**	**34%**	**40**	**74%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 4

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Limited opportunity to join the route given the inter urban location of Skene Road but the opportunites improve along Queen's Road which has more urban surrounding and increased side roads	1	Changes made to improve the connectivity of the cycle route to side roads although further work is required to ensure the cycle track is on the southern side of the road connects to areas to the north of Queen's Road		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	The shared-use path is not continuous and the designation between shared-use and footway is unclear. Cyclists are on-road between Woodend Crescent and the King's Gate roundabout	2	A continous route is provide predominalty using a 2-way cycle track but short sections of share-use path are required in areas where the highway boundary and/ or trees constrain road widening.		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but there are opportunities to make connections to wider destinations e.g. Hazlehead Academy and Woodend Hospital		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 2,510m Crow Flies: 2,430m Deviation Factor: 3.2% Alignment: Route follows main road	2	Link Length: 2,510m Crow Flies: 2,430m Deviation Factor: 3.2% Alignment: Route follows main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	Cyclists give way at side roads (assumes cyclists are using the shared-use path)	1	Proposals reduce the frequency cyclists give way but the speed of traffic and limited opportunity to off-set side road crossings suggests futher improvements could be made		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	Cyclist can bypass the Cemetery and Groats Road jucntions by using the share-use path but they share the road with traffic at the Provost Graham Avenue junction	2	The bypass of the Cemetery and Groats Road jucntions is improved with the two-way cycle track. A separate bypass road (again with a 2-way cycle track) is provided at the Provost Graham Avenue junction		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	The shared-use path is narrow and the traffic lane widths within the on-road section are narrow	2	The 2-way cycle track and short section of widened shared-use areas provide cyclists more space to maintain their own speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 135m Elevation Min: 97m Max Slope: 6.8% Average Slope: 2.2% West to East: Steady decline	1	Elevation Max: 135m Elevation Min: 97m Max Slope: 6.8% Average Slope: 2.2% West to East: Steady decline		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 4

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists have a narrow shared-use path on the northern side of the road. Some cyclists may therefore use the road which has a part 30 part 40 mph speed limit. Between Woodend Crescent and the King's Gate roundabout cyclists are on-road within a 30 mph speed limit	2	Cyclists have a segregated 2-way cycle track and short section of widened shared-use path which will reduce levels of on-road cycling and the risk/ severity of collisions		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists have a narrow shared-use path on the northern side of the road. Some cyclists may therefore use the road which has a part 30 part 40 mph speed limit. Between Woodend Crescent and the King's Gate roundabout cyclists are on-road within a 30 mph speed limit	2	Cyclists have a segregated 2-way cycle track and short section of widened shared-use path which will reduce levels of on-road cycling and the risk/ severity of collisions		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	0	Cyclists have a narrow shared-use path on the northern side of the road. Some cyclists may therefore use the road which has a high traffic flow (16,881 AADT with <2% HGV). Cyclists also on-road to the west of the King's Gate roundabout. Score reflects that only a short section is on-road i.e. no critical fail	2	Cyclists have a segregated 2-way cycle track and short section of widened shared-use path which will reduce levels of on-road cycling and the risk/ severity of collisions		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	0	Cyclists have a narrow shared-use path on the northern side of the road but there is a short section of on-road provision to the west of the King's Gate roundabout. Some cyclists may therefore use the road where they will be in a traffic lane with a critical width. Score reflects that only a short section is on-road i.e. no critical fail	2	Cyclists have a segregated 2-way cycle track and short section of widened shared-use path which will reduce levels of on-road cycling and therefore need to share a traffic lane with a critical width		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads infrequent but untreated. Cyclists on the share-use path need to give-way	1	Side roads treated but highway boundary constraints make it difficult to off-set the cycle track which reduced the level of protection cylsits have from turning vehicles		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	There is a lack of shared-use path signage and it is not clear when this shared-use path start/ ends close to Craigen junction	2	Clear, understandable, simple road markings to be provided as part of the proposed road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1	There is potentially some conflict between cyclists on the shared-use path at bus stops. There are no waiting and loading restrictions but there is little demand for kerbside parking	2	Bus stop bypasses are provided and car parking removed on the residential road between Woodend Crescent and the King's Cross roundabout to accommodate the cycle track		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	1	There is little street infrastructure along the link that would 'pen' cyclists into areas that would either contribute to or increase the severity of a collsion	2	The proposals remove the need for cyclists to mix with traffic and therefore need for "evasion room"		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 4

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	The condition of the shared-use path looks to be in good condition (based on google streetview). The same true for the road surface between Woodend Crescent and the King's Gate roundabout where cyclists are on-road	2	The proposed cycle track, shared-use path and new footways will have a smooth high grip surface		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	2	Cycle route surface is machine laid and smooth, with no defects	2	Cycle route surface will be machine laid with a smooth high grip surface		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	The shared-use path does not meet the minimum widths or buffer separation requirement set out in CbD	1	The 2-way cycle track is proposed to be 3m wide with a 2m footway meeting the requirements set out in CbD		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	No route signing identified but linear route with few decision points. Limited signing of shared-use path	1	Proposals will include directional signing and route branding. Details to be provided at the next design stage		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle route is adjacent to or within the road carriagway which has standard road lighting along its extents	2	Lighting columns to be adjusted to ensure the cycle track (located at the back of the footway is appropriately lit		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility	1	Some sections of the link are infrequently overlooked. Vegetation would be managed along the link to ensure good visibility levels are maintained		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	0	Most of the link includes a narrow shared-use path which increases this risk of pedestrians and cyclists coming into conflict. There is increase risk around bus stops	2	Pedestrian comfort levels will improve as the cycle track sections of the route segregate cyclists and pedestrians and where share-use paths exist these are widened		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	There are frequent locations where sign poles reduce the effective width of the shared-use path	1	The cycle track and widened shared-use path will require additional signage in a constrained highway boundary		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	No cycle parking identified/ required	0	No cycle parking identified/ required		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 4

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited flexibility to expand, evolve or adapt the cycle route infrastructure provision to accommodate changing demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within local schools and at Woodend Hospital)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	1	17%	4	67%	0	0%
	Directness (out of 10)	3	30%	8	80%	0	0%
	Safety (out of 16)	5	31%	15	94%	0	0%
	Comfort (out of 8)	4	50%	6	75%	0	0%
	Activeness (out of 10)	4	40%	6	60%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**17**	**34%**	**42**	**78%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Link 5

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0	No protection for cyclists turning left or right (to and from the corridor)	2	Junctions are modified to make it easy for cyclist to enter and exit the cycle tracks on each side of the road. There is no break in the cycle track provision except to negotiate the Anderson Drive junction		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	Continuation of route through junctions is unclear particularly on the approach to the Anderson Drive junction. Advisory cycle lanes end abruptly	2	The proposed cycle tracks and road markings provide a continuous and dedicated route along the road and through junctions		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but there are opportunities to make connections to wider destinations		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 1,350m Crow Flies: 1,270m Deviation Factor: 5.9% Alignment: Route is along the main road	2	Link Length: 1,350m Crow Flies: 1,270m Deviation Factor: 5.9% Alignment: Route is along the man road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	The only priority junctions are at the King's Gate and Anderson Drive roundabouts which are both unsuitable for cyclists	2	There are no priority junctions where cyclists need to give-way (excludes Anderson Drive junction)		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	There are no safe routes for cyclists to bypass traffic queuing at junctions	2	Cycle tracks provide a safe route to junction stop lines, allowing cyclists to bypass queued traffic and reduce their overall delay. The cycle tracks will operate at the sake time as the main traffic phases		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Cyclists are mixed with traffic and while the traffic lanes are relatively wide it may not be easy to over take other cyclists or queued/ slow vehicles	2	The cycle tracks along this link should be wide enough for cyclists to choose an appropriate speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 97m Elevation Min: 64m Max Slope: 6.5% Average Slope: 2.5% West to East: Steady decline	1	Elevation Max: 97m Elevation Min: 64m Max Slope: 6.5% Average Slope: 2.5% West to East: Steady decline		

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Cycle Level of Service Assessment
Link 5

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X	Cyclists share the road which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions at junctions		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	Cyclists share the road (within advisory cycle lanes) which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 AADT and <2% HGV	0-2500 AADT	X	Cyclists share the carriageway (within advisory cycle lanes) with traffic flows that are greater than 10,000 AADT. DfT site number 93006 measured an AADT of 16,881 with an HGV component of 0.4% approx. (2023)	2	The proposals segregate cyclists from this traffic, significantly reducing the risk and severity of collisions along the link		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X	Cyclists share a traffic lane whose width makes it difficult for drivers to overtake cyclists safely	2	The proposals segregate cyclists from motor traffic reducing risk of collision alongside or from behind		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads are frequent and untreated	2	Side roads are frequent but proposals reduce the risk of collisions		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Some road markings are worn particularly the advisory cycle lanes but they generally show a clear road layout	2	Road markings for the proposed scheme will show a clear road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1	Waiting and loading restrictions permit on-street parking for most of the day (except at junction) which requires cyclists to over-take parked cars. Level of kerb-side parking activity not known but considered low	2	The cycle track proposals will introduce a no waiting restriction at anytime. Loading provisions to be confirmed. Bus stop bypasses introduced using areas of shared-use		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	1	Few physical hazards but some lighting columns and all trees located at the front of the footway	2	Proposals will reduce the number of physical hazards along the link and ensure sufficient 'evasion space' is provided where necessary		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 5

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	Minor and occasional defects (based on google streetview)	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface within the cycle track		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	Cycle route surface is machine laid with some joint and surface defects	2	Cycle route will be machine laid providing a smooth continuous surface		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	No segregated provision for cyclists which is required by CbD given the speed and flow of traffic	2	Proposals introduce cycle tracks which will meet the recommended widths as set out in CbD		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	There is no directional signage only regulatory repeater signage for the advisory cycle lanes which terminate before junctions	2	Regulatory signage will be provided for the cycle track. The cycle route will be branded and included directional signage at key decision points		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	There is standard highway lighting along the link	2	The cycle tracks are located within the existing road (not footway) so will be adequately lit		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Existing provision for cyclists is on road so no impact on pedestrian comfort levels	1	The provision for cyclists is mainly on road (within cycle tracks) so no impact on pedestrian comfort levels. There is a proposed section of shared-use path at the Anderson Drive junction but any impact on pedestrians here will be off set by the improved crossing facilities elsewhere along the link. Bus stop bypasses rely on shared-use areas.		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The route follows a main road so there is a moderate amount of signage along the link and at junctions. Additional cycle dismount signage should be introduced at the Anderson Drive junction	1	The cycle track and shared-use areas at the Anderson Drive junction will require additional regulatory and directional signage but this should not cause obstructions within the footway / cycle track		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	There is no cycle parking reflecting the low demand for cycle parking in this residential area	0	Predominately residential land uses so justification for cycle parking along the link is low. No cycle parking is proposed		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 5

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to expand, evolve or adapt the cycle route infrastructure to accommodate changing demands. The cycle track widths should however be suitable to meet future demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1	There is some flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within Hill of Rubislaw Business Park)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	0	0%	5	83%	0	0%
	Directness (out of 10)	3	30%	9	90%	0	0%
	Safety (out of 16)	X	X	16	100%	0	0%
	Comfort (out of 8)	2	25%	8	100%	0	0%
	Activeness (out of 10)	7	70%	6	60%	0	0%
	Adaptability (out of 4)	N/A	N/A	2	50%	0	0%
Audit Score Total (out of 54)		**12**	**24%**	**46**	**85%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0	No protection for cyclists turning left or right (to and from the corridor)	2	Junctions are modified to make it easy for cyclist to enter and exit the cycle tracks on each side of the road. There is no break in the cycle track provision except to negotiate the Anderson Drive junction		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	Continuation of route through junctions is unclear particularly on the approach to the Anderson Drive junction and at the Queen's Cross roundabout	2	The proposed cycle tracks and road markings provide a continuous and dedicated route along the road and through junctions		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but there are opportunities to make better connections to wider destinations		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length:1,100m Crow Flies: 1,100m Deviation Factor: 0% Alignment: Route is along the main road	2	Link Length:1,100m Crow Flies: 1,100m Deviation Factor: 0% Alignment: Route is along the main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0	The only priority junctions are at the Anderson Drive and Queen's Cross roundabouts which are both unsuitable for cyclists	2	A dutch style roundabout design at the Queen's Cross junction gives cyclists priority through the junction. There are no other priority junctions along this link (excludes Anderson Drive junction)		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	There are no safe routes for cyclist to bypass traffic queuing at signalised junctions	2	Cycle tracks provide a safe route to junction stop lines, allowing cyclists to bypass queued traffic and reduce their overall delay. The cycle track will operate with the main traffic phases		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Cyclists are mixed with traffic and while the traffic lanes are relatively wide it may not be easy to over take other cyclists or queued/ slow vehicles	2	The cycle tracks along this link should be wide enough for cyclists to choose an appropriate speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 64m Elevation Min: 42m Max Slope: 4.8% Average Slope: 2.2% West to East: Steady decline	1	Elevation Max: 64m Elevation Min: 42m Max Slope: 4.8% Average Slope: 2.2% West to East: Steady decline		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X	Cyclists share the road which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions at junctions		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	Cyclists share the road which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	X	Cyclists share the carriageway with traffic flows that are greater than 10,000 AADT. DfT site number 967523 measured an AADT of 13,738 with an HGV component of 0.5% approx. (2019)	2	The proposals segregate cyclists from this traffic, significantly reducing the risk and severity of collisions along the link		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X	Cyclists share a traffic lane whose width makes it difficult for drivers to overtake cyclists safely	2	The proposals segregate cyclists from motor traffic reducing risk of collision alongside or from behind		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads are frequent and untreated	1	Side roads are frequent but proposals reduce the risk of collisions		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Some road markings are worn but they generally indicate a clear road layout	1	All road markings for the proposed scheme will show a clear road layout. The dutch style (protected track) roundabout at Queen's Cross will introduce a road layout unfamiliar to most drivers		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	X	There are parking bays (P&D and Parking Permit) plus frequently spaces bus stops. There are two schools and several hotels which will increase the level of kerbside activity particularly at the start and the end of the school day	2	The parking bays are removed to accommodate the cycle track and bus stop bypasses (using shared-use areas) provided at some but not all bus stops due to space constraints.		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0	Trees and some lighting columns located at the front of the footway. Bollards present to discourage parking on the footway and guard railing at junction and signal controlled crossings. On-street parking also reduces the 'evasion room' for cyclists	2	Proposals will reduce the number of physical hazards along the link and reduce the need for an 'evasion space'		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	Minor and occasional defects (based on google streetview)	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface within the cycle track		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	Cycle route surface is machine laid with some joint and surface defects	2	Cycle route will be machine laid providing a smooth continuous surface		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	No segregated provision for cyclists which is required by CbD given the speed and flow of traffic	2	Proposals introduce cycle tracks which will meet the recommended widths as set out in CbD		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	There is no dedicated cycle signage only regulatory and directional signage for motor traffic	2	Regulatory signage will be provided for the cycle track. The cycle route will be branded and included directional signage at key decision points		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	There is standard highway lighting along the link	2	The cycle tracks are located within the existing road (not footway) so will be adequately lit		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Existing provision for cyclists is on road so there is no impact on pedestrian comfort levels	1	Provision for cyclists is mainly on road (within cycle tracks) so no impact on pedestrian comfort levels. There is a proposed section of shared-use path at the Anderson Drive junction but any impact on pedestrians here will be off set by the improved crossing facilities elsewhere along the link. Bus stop bypasses rely on shared-use areas.		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The route follows a main road so there is a moderate level of signage along the link (parking) and at junctions. Additional cycle dismount signage should be introduced at the Forest Road and Queen's Cross junctions	1	The cycle track and dutch style (protected track) roundabout at Queen's Cross will require additional regulatory and directional signage but this should not cause obstructions to the footway/ cycle track		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	There is no cycle parking along the link	0	No cycle parking is proposed along the link although there is potential to increase cycle parking provision at schools, offices and hotels along the route		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to expand, evolve or adapt the cycle route infrastructure to accommodate changing demands. The cycle track widths should however be suitable to meet future demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (at schools, offices and hotels along this section of Queen's Road)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	0	0%	5	83%	0	0%
	Directness (out of 10)	3	30%	9	90%	0	0%
	Safety (out of 16)	X	X	14	88%	0	0%
	Comfort (out of 8)	2	25%	8	100%	0	0%
	Activeness (out of 10)	7	70%	6	60%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**12**	**24%**	**45**	**83%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 7

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	No protection for cyclists turning left or right (to and from the corridor) but ASL provided at signalised cross roads	2	Junctions are modified to make it easy for cyclist to enter and exit the cycle tracks on each side of the road		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	Continuation of route through junctions is unclear particularly on the approach to the Queen's Cross roundabout and the Rosemount Viaduct junction	2	The proposed cycle tracks and road markings provide a continuous and dedicated route along the road and through junctions		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but there are opportunities to make better connections to wider destinations		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 1,430m Crow Flies: 1,400m Deviation Factor: 2.0% Alignment: Route is along the main road	2	Link Length: 1,430m Crow Flies: 1,400m Deviation Factor: 2.0% Alignment: Route is along the main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	1	There are no priority junctions where cyclists need to give-way There are 4 signalised junctions where cyclists may need to stop	1	There are no priority junctions where cyclists need to give-way While the 4 signalised junctions will include an 'early release' for cyclists this does not reduced the potential stopping frequency		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	There are no safe routes for cyclist to bypass traffic queuing at signalised junctions	2	Cycle tracks provide a safe route to junction stop lines, allowing cyclists to bypass queued traffic and reduce their overall delay. The cycle track will operate with the main traffic phases		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Cyclists are mixed with traffic and while the traffic lanes are relatively wide it may not be easy to over take other cyclists or queued/ slow vehicles	2	The cycle tracks along this link should be wide enough for cyclists to choose an appropriate speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	0	Elevation Max: 42m Elevation Min: 22m Max Slope: 7.6% Average Slope: 1.7% West to East: Steady decline with slope greatest between Rose Street and Summer Street	0	Elevation Max: 42m Elevation Min: 22m Max Slope: 7.6% Average Slope: 1.7% West to East: Steady decline with slope greatest between Rose Street and Summer Street		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 7

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	Cyclists share the road which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions at junctions Proposed 'early release' at signalised junctions		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	Cyclists share the road which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	1	Traffic flows lower than Link 6 and no local bus services	2	The proposals segregate cyclists from this traffic, significantly reducing the risk and severity of collisions along the link		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X	Cyclists share a traffic lane whose width makes it difficult for drivers to overtake cyclists safely On-street parking increases the risk to cyclists	2	The proposals segregate cyclists from motor traffic reducing risk of collision alongside or from behind		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads and driveway accesses are frequent and untreated	1	Side roads and driveway accesses are frequent but proposals reduce the risk of collisions		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Some road markings are worn but they generally indicate a clear road layout	2	The proposals will include new road marking which will make the road layout clear and understandable		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1	There are frequent parking bays (P&D and Parking Permit). No bus stops c.f. link 6	2	The parking bays are removed to accommodate the cycle tracks		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0	Trees and some lighting columns located at the front of the footway. Bollards present to discourage parking on the footway On-street parking also reduces the 'evasion room' for cyclists	2	Proposals will reduce the number of physical hazards along the link and reduce the need for an 'evasion space'		

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Link 7

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	Minor and occasional defects (based on google streetview)	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface within the cycle track		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	Cycle route surface is machine laid with some joint and surface defects	2	Cycle route will be machine laid providing a smooth continuous surface		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	No segregated provision for cyclists which is required by CbD given the speed and flow of traffic	2	Proposals introduce cycle tracks which will meet the recommended widths as set out in CbD		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	There is no dedicated cycle signage only regulatory and directional signage for motor traffic.	2	Regulatory signage will be provided for the cycle track. The cycle route will be branded and included directional signage at key decision points		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	There is standard highway lighting along the link	2	The cycle tracks are located within the existing road (not footway) so will be adequately lit		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Existing provision for cyclists is on road so there is no impact on pedestrian comfort levels	2	Provision for cyclists is mainly on road (within cycle tracks) so no impact on pedestrian comfort levels There are improved pedestrian crossing facilities at all side roads and signalised junctions (particularly at the Rosemount Viaduct junction)		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The route follows a main road so there is a moderate level of signage along the link (parking) and at junctions. Additional cycle dismount signage should be introduced at the Queen's Cross junctions	1	The cycle track and modified junction with Rosemount Viaduct will require additional regulatory and directional signage but this should not cause obstructions to the footway/ cycle track		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	There is no cycle parking along the link	1	No cycle parking is proposed along the link although there is potential to increase cycle parking provision at eastern end of Skene Street where the street frontage becomes more retail plus church		

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Cycle Level of Service Assessment
Link 7

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	0	There is no scope to expand, evolve or adapt the cycle route infrastructure to accommodate changing demands. The cycle track widths should however be suitable to meet future demands		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1	There is some flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (at eastern end of Skene Street)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	1	17%	5	83%	0	0%
	Directness (out of 10)	3	30%	7	70%	0	0%
	Safety (out of 16)	X	X	15	94%	0	0%
	Comfort (out of 8)	2	25%	8	100%	0	0%
	Activeness (out of 10)	7	70%	8	80%	0	0%
	Adaptability (out of 4)	N/A	N/A	1	25%	0	0%
Audit Score Total (out of 54)		**13**	**26%**	**44**	**81%**	**0**	**0%**

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Cycle Level of Service Assessment
Link 8

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0	No protection for cyclists turning left or right (to and from the corridor)	1	There are good connections between the cycle track and side roads to the north of King's Gate. Access from sides roads to the south could be improved		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	There is no dedicated cycle route so cyclists are on-road relying on standard road signs	2	The proposed cycle track provides a continuous and dedicated route along the road and through junctions. The Toucan crossing near Summerhill Road provides a good connection to the mixed traffic section		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but there are opportunities to make connections to wider destinations		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	1	Link Length: 992m Crow Flies: 860m Deviation Factor: 13% Alignment: Route is close to the main road	1	Link Length: 992m Crow Flies: 860m Deviation Factor: 13% Alignment: Route is close to the main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	2	There are no priority junctions along the link (assumes cyclists are on-road)	2	The cycle track crosses several priority side roads by the proposals maintain cycle priority at these locations		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	There are no safe routes for cyclist to bypass traffic queuing at signalised junctions	1	The cycle track provides a safe and clear route to signalised junctions but the cycle crossing will operate as part of the pedestrian phases so the journey time benefit will be reduced		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Cyclists are mixed with traffic and while the traffic lanes are relatively wide it may not be easy to over take other cyclists or queued/ slow vehicles	2	The cycle tracks along this link is wide enough for cyclists to choose and appropriate speed. This will be the same for the mixed traffic street section		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 97m Elevation Min: 83m Max Slope: 6.6% Average Slope: 2.4% West to East: Slight decline	1	Elevation Max: 97m Elevation Min: 83m Max Slope: 6.6% Average Slope: 2.4% West to East: Slight decline		

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Link 8

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	Cyclists share the road with motor traffic which has a 30mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions at junctions. The mixed traffic section is within a 20mph zone		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X	Cyclists share the road with motor traffic which has a 30mph speed limit but 85th percentile speeds are likely to be higher	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road. The mixed traffic section is within a 20mph zone		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	1	Traffic flows estimated to have an AADT 2,500-5000 with the proportion of HGV likely to be <2%	2	The proposals segregate cyclists from this traffic, significantly reducing the risk and severity of collisions along the link. The mixed traffic section has and AADT of less than 2,500		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X	Cyclists share a traffic lane whose width makes it difficult for drivers to overtake cyclists safely i.e. in the critical range On King's Cross Road cyclists can safely adopt a primary riding position	2	The proposals segregate cyclists from motor traffic reducing risk of collision alongside or from behind. The mixed traffic section has narrow traffic lanes		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads are frequent and untreated	2	Side roads are frequent but proposals reduce the risk of collisions		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Some road markings are worn but they generally indicate a clear road layout	2	Road markings for the proposed scheme will show simple and clear road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2	The road has a mix of kerbside restrictions (no waiting at anytime and unrestricted). The residential frontages and service road suggests on-street parking demand is low. The King's Cross Road section has some on-street parking	2	The cycle track will isolate cyclists from any on-street parking provision		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0	Few physical hazards although some lighting columns and all trees located at the front of the footway	2	The cycle track will need to bypass mobile phone masts and utility cabinets and road signs relocated to reduce the number of physical hazards		

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Cycle Level of Service Assessment
Link 8

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	The road surface looks well maintained (based on google streetview)	2	The proposals will provide a surface along the cycle route which is free from defects		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	2	Cycle route surface (within the traffic lane) is machine laid providing a smooth, high grip and level surface	2	The proposals will provide a smooth, high grip level surface along the cycle track.		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	There is no segregated provision for cyclists which is required by CbD given the speed and flow of traffic along King's Gate	2	Proposals introduce a 2-way cycle track which will meet the recommended widths as set out in CbD		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	With no dedicated cycle route, cyclists rely on regulatory and directional signage for motor traffic	2	Regulatory signage will be provided for the cycle track. The cycle route will be branded and include directional signage at key decision points		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	There is standard highway lighting along the link	2	The cycle track is located between the footway and road carriageway. The lighting columns are located at the back of the footway. Existing lighting levels should therefore be adequate for the cycle track		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties	2	The cycle link has good levels of natural surveillance from those in passing vehicles and residents of adjacent properties		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	The existing provision for cyclists is on road so there is no impact on pedestrian comfort levels	2	The 2-way cycle track requires the verge and a narrowing of the road carriageway. There is no impact on the existing footway which will be widened at locations that are currently less than 2m. Pedestrian crossing facilities will be improved at Stronsay Road and a new Toucan crossing introduced to the west of the Summerhill Road		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The cycle route follows a main road with few junctions and a residential frontage so there is a moderate level of signage along the link and at junctions	1	The cycle track will require additional regulatory and directional signage but this should not obstruct the footway, cycle route or significantly increase street clutter		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	There is no cycle parking within the highway boundary reflecting low demand in residential areas	0	No cycle parking is proposed within the highway due to surrounding land uses likely to remain unchanged		

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Cycle Level of Service Assessment
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Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to expand, evolve or adapt the cycle track but the cycle track widths should be sufficient to accommodate future demand		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1	Established residential land uses and few destinations suggests the justification for increasing cycle parking in future is low		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (2)	
Sub-Totals	**Cohesion** (out of 6)	0	0%	4	67%	0	0%
	Directness (out of 10)	4	40%	7	70%	0	0%
	Safety (out of 16)	X	X	16	100%	0	0%
	Comfort (out of 8)	4	50%	8	100%	0	0%
	Activeness (out of 10)	7	70%	7	70%	0	0%
	Adaptability (out of 4)	N/A	N/A	2	50%	0	0%
Audit Score Total (out of 54)		**15**	**30%**	**44**	**81%**	**0**	**0%**

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Cycle Level of Service Assessment
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Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Cyclists can connect with other routes with minimal disruption to their journey via standard priority junctions	2	The proposals improve the safety of junctions along the route making it easier and safer for cyclists to connect to other routes	2	The proposals improve the safety of junctions along the route making it easier and safer for cyclists to connect to other routes
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	The route uses several residential roads and with no cycle route infrastructure cyclists must relying on standard road signs	1	The proposals include cycle tracks and mixed traffic sections using residential roads to form a dedicated cycle route	1	The proposals include cycle tracks, cycle street and mixed traffic sections using residential roads to form a dedicated cycle route
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but the route does create opportunities to make connections to wider destinations	1	The proposals do not improve the wider cycle route network but the route does create opportunities to make connections to wider destinations
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	0	Link Length: 1,730m Crow Flies: 1,420m Deviation Factor: 18% Alignment: Route is not along the main road	0	Link Length: 1,730m Crow Flies: 1,420m Deviation Factor: 18% Alignment: Route is not along the main road	0	Link Length: 1,730m Crow Flies: 1,420m Deviation Factor: 18% Alignment: Route is not along the main road
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists. The Desswood Place cycle track give-ways are compensated by the Parallel crossing on Forest Road and Carden Place	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists. The Desswood Place cycle track give-ways are compensated by the Parallel crossing on Forest Road and Carden Place
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	2	There are no signalised junctions along the link	2	There are no signalised junctions along the link	2	There are no signalised junctions along the link
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	1	Cyclists are mixed with traffic on residential streets which are relativley wide	2	The cycle tracks and mixed traffic street are wide enough for cyclists to choose an appropriate speed	2	The cycle tracks, cycle street and mixed traffic street are wide enough for cyclists to choose an appropriate speed
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	0	Elevation Max: 85m Elevation Min: 41m Max Slope: 7.7% Average Slope: 2.9% West to East: Steady decline	0	Elevation Max: 85m Elevation Min: 41m Max Slope: 7.7% Average Slope: 2.9% West to East: Steady decline	0	Elevation Max: 85m Elevation Min: 41m Max Slope: 7.7% Average Slope: 2.9% West to East: Steady decline

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Cycle Level of Service Assessment
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	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists share residential roads which have a 30mph speed limit except for Albert Lane which is part of a 20mph zone	1	Although the proposals segregate cyclists from motor traffic they are located within a 2-way cycle track on one side of the road. Drivers turning to and from side roads may not realise cycle flows are 2-way leading to a potential increase in collisions. The increased risk of collision compared to the existing layout is considered low given the low number of side roads	2	The proposals introduce traffic calming measures to reduce the 85th percentile speed to < 20mph and so reduce the risk and severity of collisions at junctions. Cyclists are also able to take up a primary riding position improving their visibility at junctions
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists share residential roads which have a 30mph speed limit except for Albert Lane which is part of a 20mph zone	2	The proposals segregate cyclists from motor traffic and so reduce the risk and severity of collisions along the carriageway	2	The proposals introduce traffic calming measures to reduce the 85th percentile speed to < 20mph and so reduce the risk and severity of collisions along the carriageway
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	1	Most roads are residential and so likely to have a AADT of <2,500. The only exceptions are Forest Road and Fountainhall Road where the AADT is likely to be between 2,500 and 5,000	2	Most roads are residential and likely to have a AADT of <2,500. The only exceptions are Forest Road and Fountainhall Road where the AADT is likely to be between 2,500 and 5,000 but where segregated cycle route infrastructure is proposed	2	Most roads are residential and likely to have a AADT of <2,500. The only exceptions are Forest Road and Fountainhall Road where the AADT is likely to be between 2,500 and 5,000 but where segregated cycle route infrastructure is proposed
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	1	Some cases include Forest Road and Fountainhall Road	2	Segregated cycle route infrastructure is proposed along Rubislaw Den North, Forest Road, Fountainhall Road and Blenheim Place. On Desswood Lane and Albert Lane traffic flows are below those needing segregated route infrastructure so overall the provision is in line with a high level of service stated within CbD (Table 3.2)	2	Traffic calming measures are introduced to remove the need for segregated cycle route infrastructure however cyclists will still be required to share a relatively busy but short section of Forest Road. Segregated cycle route infrastructure is provided along Fountainhall Road as in Option so overall the provision is in line with a high level of service stated within CbD (Table 3.2)
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads (which are infrequent) are untreated and busy priority junctions at Forest Road and Fountainhall Road offer no protection to cyclists from motor traffic turning movements	1	Side road junctions (which are infrequent) are treated and busier priority junctions on Forest Road and Fountainhall Road include measures to protect cyclists from motor traffic turning movements. Cyclists are less protected at the Fountainhall Road j/w Albert Lane	1	Side road junctions (which are infrequent) are treated and busier priority junctions on Fountainhall Road include measures to protect cyclists from motor traffic turning movements. Cyclists are slightly less well protected at the junctions on Forest Road where they are mixed with traffic and at the Fountainhall Road j/w Albert Lane
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1	Road markings are worn but generally indicate a clear road layout	1	The continuation of the 2-way and 1-way cycle track/s along these residential roads creates a slightly more complex design compared to the mixed traffic street layout of Option 2	2	The mixed traffic street provision creates a less complex street layout compared to the 2-way cycle track in Option 1
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1	It is unclear how much on-street parking activity occurs along Rubislaw Den North. Parking activity is higher on Fountainhall Road given the retail frontages (loading requirement) and as part of the local bus network (bus stops). There are P&D/ Ticket bays along Blenheim Place. There is limited parking along Desswood Lane due to the narrow width of the road	2	Segregated cycle route infrastructure will remove on-street parking along Moray Place, Rubislaw Den North, Fountainhall Road and Blenheim Place. Loading to be retained on Fountainhall Road which may require the cycle track to be suspended over a short section	2	Segregated cycle route will remove on-street parking along Fountainhall Road and Blenheim Place. Loading to be retained on Fountainhall Road which may require the cycle track to be suspended over a short section. Under this option some on-street parking will be retained on Moray Place and Rubislaw Den North cf Option 1 but the additional risk from kerbside activity this generates is likely to be small
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0	There are physical hazards that reduce the evasion space. They include parked cars, footway bollards/ guard railing (Fountainhall Road), boundary walls on road without footways (Albert Lane, Desswood Lane), lighting columns (front of footway), sign posts and utility cabinets	1	The proposals will minimise the physical hazards that reduce the 'evasion space' along the link. There is no perceived difference compared to Option 2	1	The proposals will minimise the physical hazards that reduce the 'evasion space' along the link. There is no perceived difference compared to Option 1

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	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	0	The road surface has numerous minor and several major defects along Rubislaw Den North and Albert Lane (based on google streetview)	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface along the cycle route. Full resurfacing proposed along Albert Lane	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface along the cycle route. Full resurfacing proposed along Albert Lane and Rubislaw Den North
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	0	Cycle route surface is machine laid but with frequent defects	2	The proposals will repair the road to provide a smooth level surface along the cycle route without defects	2	The proposals will repair the road to provide a smooth level surface along the cycle route without defects
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	1	The route uses residential roads that are wide but where the effective width is reduced by on-street parking. Other roads without parking are narrow. In all locations cyclists are comfortably able to adopt a primary riding position	2	The proposals introduce cycle tracks and mixed traffic streets with widths that comply with CbD	2	The proposals introduce cycle tracks, cycle streets and mixed traffic streets with widths that comply with CbD
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	With no dedicated cycle route, cyclist rely on regulatory and directional signage for motor traffic	2	Regulatory signage will be provided for the cycle track and mixed traffic streets. The cycle route will be branded and include directional signage at key decision points	2	Regulatory signage will be provided for the cycle track, cycle street and mixed traffic streets. The cycle route will be branded and include directional signage at key decision points
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	There is standard highway lighting along the link although the provision along Albert Lane may result in areas where levels are not sufficient	2	The existing highway lighting should provide sufficient levels for most of cycle route but a lighting assessment should be undertaken to confirm this focusing on Desswood Lane and Albert Lane. The proposal will deliver suitable lighting levels	2	The existing highway lighting should provide sufficient levels for most of cycle route but a lighting assessment should be undertaken to confirm this focusing on Desswood Lane and Albert Lane. The proposal will deliver suitable lighting levels
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	0	The link includes roads where pedestrians and cyclists may have increased personal safety concerns (particularly at night) due to the lack of natural surveillance. For example along Rubislaw Den North, Desswood Place Lane and Albert Lane	0	While the proposals will ensure good street lighting the route surroundings will not change. Removal of on-street parking on Rubislaw Den North will improve the visibility for pedestrians	0	While the proposals will ensure good street lighting the route surroundings will not change. Removal of on-street parking on Rubislaw Den North will improve the visibility for pedestrians
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	The existing provision for cyclists is on road so there is no impact on pedestrian comfort levels. The existing provision of pedestrians along the Desswood Lane and Albert Lane is poor due to a lack of footways	0	The proposals make changes to the pedestrian provision but these are both positive/ negative. Pedestrians will need to cross the cycle track (Rubislaw Den North) while new and upgraded crossings are provided (Forest Road, Fountainhall Road) and enhancements made to all side road crossings.	1	The proposals make changes to the pedestrian provision but these are small and positive/ negative. Pedestrians will need to cross the cycle track (Fountainhall Road) while new and upgraded crossings are provided (Forest Road, Fountainhall Road). The cycle street will make it easier to cross Rubislaw Den North
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The cycle route uses several residential roads where existing signage is minimal. There are greater levels of signage (and street furniture) along Fountainhall Road.	1	The proposed cycle route will require additional signage. A greater level of directional signage is required given the number of roads used. With the footways being relatively narrow this may create additional obstructions but the impact is likely to be minor	1	The proposed cycle route will require additional signage. A greater level of directional signage is required given the number of roads used. With the footways being relatively narrow this may create additional obstructions but the impact is likely to be minor
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	1	There is some cycle parking located on Fountainhall Road (outside the Co-op) which is in a prominent position and well overlooked	2	There are opportunities to improve the cycle parking provision along Fountainhall Road to support local businesses and those visiting the church	2	There are opportunities to improve the cycle parking provision along Fountainhall Road to support local businesses and those visiting the church

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 9

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to increase capacity of the proposed cycle route but the proposals meet recommended widths so should be sufficient to accommodate future demand	2	The cycle street has greater opportunity to accommodate a large increase in cycle demand than the cycle tracks whose widths are constrained by the highway boundary and need to maintain a 2-way road
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	Albert Lane provides access to private business car parking which could be used to increase cycle parking provision along the route	2	Albert Lane provides access to private business car parking which could be used to increase cycle parking provision along the route

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (Rubislaw Den North - Cycle	
Sub-Totals	**Cohesion** (out of 6)	1	17%	4	67%	4	67%
	Directness (out of 10)	4	40%	5	50%	5	50%
	Safety (out of 16)	6	38%	12	75%	14	88%
	Comfort (out of 8)	1	13%	8	100%	8	100%
	Activeness (out of 10)	4	40%	5	50%	6	60%
	Adaptability (out of 4)	N/A	N/A	3	75%	4	100%
Audit Score Total (out of 54)		**16**	**32%**	**37**	**69%**	**41**	**76%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 10

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0	The dual carriageway creates a severance to cycle crossing movements with no suitable and few convenient crossing facilities	1	The proposals provide a compliant cycle route along the eastern side of Anderson Drive with a new Toucan crossing at the northern extent (at King's Cross Road). There are no improvements proposed at the southern extent (at Hill of Rubislaw)		
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	There is no suitable cycle route due to the speed and volume of motor traffic on Anderson Drive. Cyclists are therefore more likely to use the footway which are continuous but too narrow for shared-use	2	The proposals provide a continuous cycle track although give-ways are likely at the side road crossing (Rubislaw Den Gardens) due to a lack of highway land to off-set a crossing		
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but the route does create opportunities to make connections to wider destinations		
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	0	Note: This includes Link 11 to make it comparable with Link 9 Link Length: 1,660m Crow Flies: 1,420m Deviation Factor: 14.5% Alignment: Route is not close to main road	0	Note: This includes Link 11 to make it comparable with Link 9 Link Length: 1,660m Crow Flies: 1,420m Deviation Factor: 14.5% Alignment: Route is not close to main road		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	2	There are no priority junctions along the link (assumes cyclists are on road)	2	A give way is proposed within cycle track at the Rubislaw Den Gardens junctions due to the lack of highway land to off-set a crossing. As this is a minor access the score remains unaffected		
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0	Given the speed and flow of traffic on Anderson Drive combined with the traffic lane widths, cyclists have no safe route to bypass traffic on the approach to the Hill of Rubislaw junction	0	The proposed cycle track bypasses the Hill of Rubislaw junction		
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0	Given the speed and flow of traffic on Anderson Drive combined with the traffic lane widths, cyclists have no safe route to bypass slow moving or queued traffic	2	The proposed cycle track gives cyclists a dedicated route which is wide enough for cyclists to choose an appropriate speed		
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	2	Elevation Max: 85m Elevation Min: 82m Max Slope: 4.5% Average Slope: 1.6% West to East: Level	2	Elevation Max: 85m Elevation Min: 82m Max Slope: 4.5% Average Slope: 1.6% West to East: Level		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 10

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X	Cyclists share the road with motor traffic which has a 40mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions at junctions		
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists share the road with motor traffic which has a 40mph speed limit	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road		
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	X	Cyclists share the carriageway with traffic flows that are greater than 10,000 AADT. DfT site number 91161 (SB) = 24,927/ 4.2% HGV (2023) DfT site number 50863 (NB) = 31,871 AADT/ 4.2% HGV (2018)	2	The proposals segregate cyclists from traffic, significantly reducing the risk and severity of collisions along the road		
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X	Cyclists share a traffic lane whose width makes it difficult for drivers to overtake cyclists safely i.e. in the critical range	2	The proposals segregate cyclists from motor traffic, significantly reducing the risk and severity of collisions alongside or from behind		
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	The only side road (Rubislaw Den Gardens) is untreated. This is a minor access so the risk of a collision from a vehicle turning movement is relatively low	1	Cycle track give-ways are introduced to reduce the risk of a collision from vehicles turning into and out of Rubislaw Den Gardens. The highway boundary does not allow the cycle track to be off-set which would remove the need for the give-ways		
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	The road markings are in good condition and indicate a clear road layout (google streetview)	2	The proposals add a cycle track on the eastern side of Anderson Drive which requires the removal of the central reservation and realignment of the road carriageway. The cycle track and new road alignment will have road marking which set out a clear and understandable road layout		
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2	Anderson Road is a strategic dual carriageway road with a 40mph speed limit so kerbside activity will be very limited (urban clearway?)	2	No change is proposed to the classification of the road and so kerbside activity is expected to remain the same		
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	2	There is a grass verge between the road carriageway and the footway and although lighting columns and trees are located within it they are located far enough back from the kerb line to ensure they do not present physical hazards or reduce the evasion space	2	The cycle track provides a route segregated from motor traffic. This cycle track will be close to the trees and the buffer will be a minimum width but this should not significantly impact the safety of the cycle route		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 10

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	The road surface looks well maintained (based on google streetview)	2	The proposals will introduce a surface along the cycle route free from defects		
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1	Cycle route surface is machine laid and smooth with few joint or surface defects. The cycle route however uses a section of cobbled paving which reduces the smoothness and grip of the cycle route surfacing	1	The proposals will introduce a cycle track with a smooth high grip surface. The proposed cycle route however uses a section of cobbled paving which reduces the smoothness and grip of the cycle route surfacing		
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	There is no segregated provision for cyclists which is required by CbD given the speed and flow of traffic along Anderson Drive	1	The proposals introduce a cycle track which will meet the minimum widths as set out in CbD [The width of the cycle track is constrained by trees and minimum traffic lane requirements along Anderson Lane		
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	With no dedicated cycle route, cyclists rely on regulatory and directional signage for motor traffic	2	Regulatory signage will be provided for the cycle track. The cycle route will be branded and include directional signage at key decision points		
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2	There is standard highway lighting along the link	2	The cycle track will be located between the lighting columns (located within the verge) and the road carriageway. Existing lighting levels should therefore be adequate for the cycle track		
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1	The cycle link has some level of natural surveillance from those in passing vehicles and residents of adjacent properties	1	The cycle link has some level of natural surveillance from those in passing vehicles and residents of adjacent properties		
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	0	The existing provision for cyclists is on road so in theory there should be no impact on pedestrian comfort levels. The speed and flow of traffic however makes on-road cycle unattractive so it can be assumed most cycling occurs on the narrow footways which will have an impact on pedestrian comfort levels	2	The 2-way cycle track requires the verge and a narrowing of the road carriageway. There is no impact on the existing footway but which will be widened at locations that are currently less than 2m (where achievable)		
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The cycle route follows a main road with few junctions. There is a low level of signage along Anderson Drive and on the approach to the Hill of Rubislaw junction	1	The cycle track will require additional regulatory and directional signage but given space constraints this may limit the opportunity to introduce signage to support the cycle route		
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0	There is no cycle parking within the highway boundary reflecting the lack of destinations accessed directly off this section of Anderson Road	0	No cycle parking is proposed within the highway due to surrounding land uses likely to remain unchanged		

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 10

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to increase capacity of the proposed cycle route. The cycle track only meets minimum desirable widths so may be insufficient to accommodate future demand		
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	There is flexibility to expand, evolve or adapt cycle parking provision to accommodate changing demands (within Hill of Rubislaw Business Park)		

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout	
Sub-Totals	**Cohesion** (out of 6)	0	0%	4	67%	0	0%
	Directness (out of 10)	4	40%	6	60%	0	0%
	Safety (out of 16)	X	X	15	94%	0	0%
	Comfort (out of 8)	3	38%	6	75%	0	0%
	Activeness (out of 10)	4	40%	6	60%	0	0%
	Adaptability (out of 4)	N/A	N/A	3	75%	0	0%
Audit Score Total (out of 54)		**11**	**22%**	**40**	**74%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Link 11

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Cyclists can connect with other routes with minimal disruption to their journey via standard priority junctions	2	The proposals improve the safety of junctions along the route making it easier and safer for cyclists to connect to other routes	2	The proposals improve the safety of junctions along the route making it easier and safer for cyclists to connect to other routes
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0	The route uses several residential roads and with no cycle route infrastructure cyclists must relying on standard road signs	2	The proposals include cycle tracks and mixed traffic sections using residential roads to form a dedicated cycle route	2	The proposals include cycle tracks, cycle street and mixed traffic sections using residential roads to form a dedicated cycle route
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0	There is no wider cycle route network to connect to and where cycle infrastructure is provided it does not meet the minimum requirements set out in CbD	1	The proposals do not improve the wider cycle route network but the route does create opportunities to make connections to wider destinations	1	The proposals do not improve the wider cycle route network but the route does create opportunities to make connections to wider destinations
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	1	Note: This includes Link 10 to make it comparable with Link 9 Link Length: 1,660m Crow Flies: 1,420m Deviation Factor: 14.5% Alignment: Route is close to the main road	1	Note: This includes Link 10 to make it comparable with Link 9 Link Length: 1,660m Crow Flies: 1,420m Deviation Factor: 14.5% Alignment: Route is close to the main road	1	Note: This includes Link 10 to make it comparable with Link 9 Link Length: 1,660m Crow Flies: 1,420m Deviation Factor: 14.5% Alignment: Route is close to the main road
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic [p.160]	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists. There is a cycle only contra-flow section on Queen's Lane North	1	At priority junctions cyclists give way to motor traffic on a similar number of occasions as motor traffic give way to cyclists. There is a cycle only contra-flow section on Queen's Lane North
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	2	There are no signalised junctions along the link	2	There are no signalised junctions along the link	2	There are no signalised junctions along the link
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	1	Cyclists are mixed with traffic and with lane/ road widths that are relatively narrow cyclists should be able to pass slow traffic and other cyclists	1	The cycle tracks and mixed traffic street are wide enough for cyclists to choose an appropriate speed	1	The cycle tracks, cycle street and mixed traffic street are wide enough for cyclists to choose an appropriate speed
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	0	Elevation Max: 82m Elevation Min: 41m Max Slope: 7.2% Average Slope: 3.2% West to East: Steady decline	0	Elevation Max: 82m Elevation Min: 41m Max Slope: 7.2% Average Slope: 3.2% West to East: Steady decline	0	Elevation Max: 82m Elevation Min: 41m Max Slope: 7.2% Average Slope: 3.2% West to East: Steady decline

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Cycle Level of Service Assessment
Link 11

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists share residential roads which have a 30mph speed limit except for Queen's Lane North and Albert Lane which are part of a 20mph zone	1	Although the proposals segregate cyclists from motor traffic they are located within a 2-way cycle track on one side of the road. Drivers turning to and from side roads may not realise cycle flows are 2-way leading to a potential increase in collisions. The increased risk of collision compared to the existing layout is considered low given the low number of side roads	2	The proposals either segregate cyclists from motor traffic or where they remain shared propose traffic calming measures to reduce the 85th percentile speed to < 20mph and so reduce the risk and severity of collisions at junctions
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Cyclists share residential roads which have a 30mph speed limit except for Queen's Lane North and Albert Lane which are part of a 20mph zone	2	The proposals either segregate cyclists from motor traffic or where they remain shared, introduce traffic calming measures to reduce the 85th percentile speed to < 20mph and so reduce the risk and severity of collisions along the carriageway	2	The proposals either segregate cyclists from motor traffic or where they remain shared, introduce traffic calming measures to reduce the 85th percentile speed to < 20mph and so reduce the risk and severity of collisions along the carriageway
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	1	Most roads are residential and so likely to have a AADT of <2,500. The only exceptions is along a short section of Forest Road where the AADT is likely to be between 2,500 and 5,000	2	Most roads are residential and likely to have a AADT of <2,500. The only exception is Forest Road where the AADT is likely to be between 2,500 and 5,000 but where segregated cycle route infrastructure is proposed	2	Most roads are residential and likely to have a AADT of <2,500. The only exception is Forest Road where the AADT is likely to be between 2,500 and 5,000 but where segregated cycle route infrastructure is proposed
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	1	Forest Road	2	Segregated cycle route infrastructure is proposed along Rubislaw Den South, Forest Road and Blenheim Place. On Queen's Lane North and Albert Lane traffic flows are below those needing segregated route infrastructure so overall the provision is in line with a high level of service stated within CbD (Table 3.2)	2	On most roads (Rubislaw Den South, Queen's Lane North, Albert Lane) traffic calming measures are introduced to remove the need for segregated cycle route infrastructure. Segregated cycle route infrastructure is provided on busier roads (Forest Road, Blenheim Place) so overall the provision is in line with a high level of service stated within CbD (Table 3.2)
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0	Side roads (which are infrequent) are untreated and busy priority junctions at Forest Road and Fountainhall Road offer no protection to cyclists from motor traffic turning movements	1	Side road junctions (which are infrequent) are treated and busy priority junctions on Forest Road include measures to protect cyclists from motor traffic turning movements. The Fountainhall Road junction remains untreated	1	Side road junctions (which are infrequent) are treated and busy priority junctions on Forest Road include measures to protect cyclists from motor traffic turning movements. The Fountainhall Road junction remains untreated
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	0	Road markings are worn but generally do not indicate a clear road layout	1	The continuation of the 2-way cycle track along these residential roads creates a slightly more complex design compared to the mixed traffic street layout of Option 2	2	The mixed traffic street provision creates a less complex street layout compared to the 2-way cycle track in Option 1
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2	There is some on-street parking demand along Rubislaw Den South but it unclear how much activity occurs given the residential frontages. There are P&D/ Ticket bays along Blenheim Place. There is no parking along Queen's Lane North due to the narrow width of the road	2	On-street parking will be removed from Blenheim Place and the northern side of Rubislaw Den South to implement the proposed cycle tracks	2	On-street parking will be removed from Blenheim Place to implement the proposed cycle tracks. Some parking along Rubislaw Den South will be retained as part of the cycle street proposals
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0	There are physical hazards that reduce the evasion space. They include parked cars, footway bollards/ guard railing (Fountainhall Road), boundary walls on road without footways (Albert Lane, Desswood Access Road), lighting columns (front of footway), sign posts and utility cabinets	1	The proposals will minimise the physical hazards that reduce the 'evasion space' along the link. There is no perceived difference compared to Option 2	1	The proposals will minimise the physical hazards that reduce the 'evasion space' along the link. There is no perceived difference compared to Option 1

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Cycle Level of Service Assessment
Link 11

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	0	The road surface has numerous minor and major defects along Rubislaw Den South, Queen's Lane North and Albert Lane (based on google streetview)	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface along the cycle route. Full resurfacing proposed along Rubislaw Den South, Queen's Lane North and Albert Lane	2	Proposals will repair all defects within the road carriageway and provide a smooth high grip surface along the cycle route. Full resurfacing proposed along Rubislaw Den South, Queen's Lane North and Albert Lane
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	0	Cycle route surface is machine laid but with frequent defects	2	The proposals will repair the road to provide a smooth level surface along the cycle route without defects	2	The proposals will repair the road to provide a smooth level surface along the cycle route without defects
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	1	The route uses residential roads that are wide but where the effective width is reduced by on-street parking. Other roads without parking are narrow. In all locations cyclists are comfortably able to adopt a primary riding position	2	The proposals introduce cycle tracks and mixed traffic streets using widths that comply with CbD	2	The proposals introduce cycle tracks, cycle streets and mixed traffic streets using widths that comply with CbD
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0	With no dedicated cycle route, cyclist rely on regulatory and directional signage for motor traffic	2	Regulatory signage will be provided for the cycle track and mixed traffic streets. The cycle route will be branded and include directional signage at key decision points	2	Regulatory signage will be provided for the cycle track, cycle street and mixed traffic streets. The cycle route will be branded and include directional signage at key decision points
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	0	There is standard highway lighting along the link but the provision along Queen's Lane North and Albert Lane could result in areas where levels are not sufficient. Tree coverage could do the same along Rubislaw Den South	2	The existing highway lighting should provide sufficient levels for most of cycle route but a lighting assessment should be undertaken to confirm this focusing on Rubislaw Den South, Queen's Lane North and Albert Lane. The proposal will deliver suitable lighting levels	2	The existing highway lighting should provide sufficient levels for most of cycle route but a lighting assessment should be undertaken to confirm this focusing on Rubislaw Den South, Queen's Lane North and Albert Lane. The proposal will deliver suitable lighting levels
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	0	The link includes roads where pedestrians and cyclists may have increased personal safety concerns (particularly at night) due to the lack of natural surveillance. For example along Rubislaw Den South, Queen's Lane North and Albert Lane	0	While the proposals will ensure good street lighting the route surroundings will not change. Removal of on-street parking on Rubislaw Den South will improve the visibility for pedestrians	0	While the proposals will ensure good street lighting the route surroundings will not change. Removal of on-street parking on Rubislaw Den South will improve the visibility for pedestrians
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	0	The existing provision for cyclists is on road so there is no impact on pedestrian comfort levels. The existing provision of pedestrians along the Queen's Lane North and Albert Lane is poor due to a lack of footways	0	The proposals make changes to the pedestrian provision but these are both positive/ negative. Pedestrians will need to cross the cycle track (Rubislaw Den South) while new and upgraded crossings are provided (Forest Road, Fountainhall Road) and enhancements made to all side road crossings	1	The proposals make no change to the pedestrian environment except on Rubislaw Den South where the cycle street will make it easier to cross the road
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1	The cycle route uses several residential roads where existing signage is minimal. There are greater levels of signage on Queen's Lane North to support the one-way working and no entry restriction	1	The proposed cycle route will require additional signage. A greater level of directional signage is required given the number of roads used but this should not lead to levels of signage that would be considered 'street clutter'	1	The proposed cycle route will require additional signage. A greater level of directional signage is required given the number of roads used but this should not lead to levels of signage that would be considered 'street clutter'
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	1	No cycle parking was identified along the link although there is some cycle parking located on Fountainhall Road (outside the Co-op). This provision is in a prominent position and well overlooked	2	There are opportunities to improve the cycle parking provision along Fountainhall Road to support local businesses and those visiting the church	2	There are opportunities to improve the cycle parking provision along Fountainhall Road to support local businesses and those visiting the church

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	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1	There is limited scope to increase capacity of the proposed cycle route but the proposals meet recommended widths so should be sufficient to accommodate future demand	2	The cycle street has greater opportunity to accommodate a large increase in cycle demand than the cycle tracks whose widths are constrained by the highway boundary and need to maintain a 2-way road
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	2	Albert Lane and Queen's Lane North provides access to private business car parking which could be used to increase cycle parking along the route	2	Albert Lane and Queen's Lane North provides access to private business car parking which could be used to increase cycle parking along the route

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (Rubislaw Den South Cycle	
Sub-Totals	**Cohesion** (out of 6)	1	17%	5	83%	5	83%
	Directness (out of 10)	5	50%	5	50%	5	50%
	Safety (out of 16)	6	38%	12	75%	14	88%
	Comfort (out of 8)	1	13%	8	100%	8	100%
	Activeness (out of 10)	2	20%	5	50%	6	60%
	Adaptability (out of 4)	N/A	N/A	3	75%	4	100%
Audit Score Total (out of 54)		**15**	**30%**	**38**	**70%**	**42**	**78%**

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Cycle Level of Service Assessment
Links 5 and 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0		2			
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0		2			
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0		1			
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	2	Link Length: 2,450m Crow Flies: 2,270m Deviation Factor: 7.3% Alignment: Route is along the main road. Compare DF for PRA (16.8%) and PRB (15.0%)	2	Link Length: 2,450m Crow Flies: 2,270m Deviation Factor: 7.3% Alignment: Route is along the main road. Compare DF for PRA (16.8%) and PRB (15.0%)		
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	0		2			
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0		2			
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0		2			
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1	Elevation Max: 97m Elevation Min: 43m Max Slope: 6.2% Average Slope: 2.4% West to East: Decline	1	Elevation Max: 97m Elevation Min: 43m Max Slope: 6.2% Average Slope: 2.4% West to East: Decline		

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Cycle Level of Service Assessment
Links 5 and 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X		2			
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0		2			
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	X		2			
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X		2			
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0		1.5			
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1		1.5			
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	X		2			
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0.5		2			

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 5 and 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1		2			
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1		2			
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0		2			
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0		2			
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2		2			
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	2		2			
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2		1			
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1		1			
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0		0			

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 5 and 6

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1			
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1.5			

Summary		Existing Road Layout		Proposed Road Layout (1)			
Sub-Totals	**Cohesion** (out of 6)	0	0%	5	83%	0	0%
	Directness (out of 10)	3	30%	9	90%	0	0%
	Safety (out of 16)	X	X	15	94%	0	0%
	Comfort (out of 8)	2	25%	8	100%	0	0%
	Activeness (out of 10)	7	70%	6	60%	0	0%
	Adaptability (out of 4)	N/A	N/A	2.5	63%	0	0%
Audit Score Total (out of 54)		**12**	**24%**	**46**	**84%**	**0**	**0%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8 and 9 (PR-A)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0.5		1.5		1.5	
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0		1.5		1.5	
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0		1		1	
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	0	Link Length: 2,740m Crow Flies: 2,280m Deviation Factor: 16.8% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRB (15.0%)	0	Link Length: 2,740m Crow Flies: 2,280m Deviation Factor: 16.8% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRB (15.0%)	0	Link Length: 2,740m Crow Flies: 2,280m Deviation Factor: 16.8% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRB (15.0%)
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	1.5		1.5		1.5	
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	1		1.5		1.5	
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0.5		2		2	
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.2% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDN to Fountainhall Road	0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.2% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDN to Fountainhall Road	0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.2% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDN to Fountainhall Road

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8 and 9 (PR-A)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0.5		1.5		2	
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X		2		2	
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	1		2		2	
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X		2		2	
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0		1.5		1.5	
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1		1.5		2	
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	1.5		2		2	
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0		1.5		1.5	

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8 and 9 (PR-A)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1		2		2	
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1		2		2	
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0.5		2		2	
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0		2		2	
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1.5		2		2	
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1		1		1	
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1.5		1		1.5	
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1		1		1	
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0.5		1		1	

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8 and 9 (PR-A)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1		1.5	
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1.5		1.5	

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (Rubislaw Den North - Cycle	
Sub-Totals	**Cohesion** (out of 6)	0.5	8%	4	67%	4	67%
	Directness (out of 10)	3	30%	5	50%	5	50%
	Safety (out of 16)	X	X	14	88%	15	94%
	Comfort (out of 8)	2.5	31%	8	100%	8	100%
	Activeness (out of 10)	5.5	55%	6	60%	6.5	65%
	Adaptability (out of 4)	N/A	N/A	2.5	63%	3	75%
Audit Score Total (out of 54)		**12**	**23%**	**40**	**73%**	**42**	**77%**

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8, 10 and 11 (PR-B)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network	1. Ability to join/ leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0.3		1.3		1.5	
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions	Cyclists are provided with a continuous route, including through junctions	0.0		2.0		2.0	
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m	3. Density of routes based on mesh width i.e. distances between primary and secondary routes within the network		Cycle network density is greater than 800 m between key primary and secondary routes. Cycle users must dismount or are 'abandoned' at the end of a route [p.30]	Cycle network density is 200-800 m between key primary and secondary routes. Cycle routes contribute to a network but users experience some disruption when connecting between routes, and navigation may be difficult [p.30]	Cycle network density is less than 200 m between key primary and secondary routes. Cycle routes are continuous and fully joined-up. They allow cycle users to maintain consistent speed, are well-signed and intuitive [p.30]	0.0		1.0		1.0	
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative		Cycle route is more than 20% less direct than the equivalent motor traffic journey	Cycle route is up to 20% less direct than the equivalent motor traffic journey	Cycle route is at least as direct as the equivalent motor traffic journey	1.0	Link Length: 2,670m Crow Flies: 2,270m Deviation Factor: 15.0% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRA (16.8%)	1.0	Link Length: 2,670m Crow Flies: 2,270m Deviation Factor: 15.0% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRA (16.8%)	1.0	Link Length: 2,670m Crow Flies: 2,270m Deviation Factor: 15.0% Alignment: Route is not along the main road. Compare DF for MR (7.2%) and PRA (16.8%)
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc	5. Stopping and give way frequency		At priority junctions cycle users will need to give way to motor traffic more often than motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions cycle users will need to give way to motor traffic on a similar number of occasions as motor traffic will need to give way to cycle users along a route [p.160]	At priority junctions motor traffic will need to give way to cycle users more often than cycle users will need to give way to motor traffic along a route [p.160]	1.7		1.7		1.5	
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc	6. Delay at junctions		At signalised junctions the overall delay for cycle users at the junction is greater than the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is equal to the overall delay for motor traffic [p.174]	At signalised junctions the overall delay for cycle users at the junction is less than the overall delay for motor traffic [p.174]	0.7		1.0		1.5	
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed	0.3		1.7		1.5	
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent	8. Gradient		Much of the route exceeds 3% gradient [p.60]	Some sections of route exceed 3% gradient due to local topography, but the route is designed to minimise the length of these sections [p.60]	There are no sections of route steeper than 3% gradient [p.60]	1.0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.0% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDS to Fountainhall Road	1.0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.0% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDS to Fountainhall Road	1.0	Elevation Max: 97m Elevation Min: 41m Max Slope: 7.0% Average Slope: 2.7% West to East: Level along King's Gate and Carnegie Place followed by decline along RDS to Fountainhall Road

Project: A944/ A9119 Active Travel Corridor
Client: Aberdeen City Council

Cycle Level of Service Assessment
Links 8, 10 and 11 (PR-B)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Safety	Reduce/ remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X		1.7		2.0	
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	X		2.0		2.0	
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	X		2.0		2.0	
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see LTN 1/20 (Figure 4.1) or CbD (Figure 3.2). This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	In some cases, cycle users are expected to mix with motor traffic in significantly higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	In some cases, cycle users are expected to mix with motor traffic in higher speed or volume conditions that are set out in Table 3.2 in Chapter 3	Cycle users are always protected from motor traffic when required by the conditions set in Table 3.2 in Chapter 3	X		2.0		2.0	
		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions	13. Conflicting movements at junctions		Side road junctions frequent and/ or untreated. Major junctions, conflicting cycle/ motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/ motor traffic movements separated	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/ motor traffic streams separated	0.0		1.3		1.5	
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	1.0		1.7		2.0	
	Consider and reduce risk from kerb side activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/ loading	Significant conflict with kerbside activity (e.g. nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerb side activity – e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer	No/ very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m	2.0		2.0		2.0	
	Reduce severity of collisions where they do occur	Wherever possible routes should include “evasion room” (such as grass verges)and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards	0.7		1.7		1.5	

Project: A944/ A9119 Active Travel Corridor
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Cycle Level of Service Assessment
Links 8, 10 and 11 (PR-B)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/ sunken covers/ gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1.3		2.0		2.0	
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Cycle route surface is unbound or deterioration has led to frequent defects [p.112]	Cycle route surface is hand-laid with frequent joints, or contains some defects [p.112]	Cycle route surface is machine laid and smooth, with no defects [p.112]	1.0		1.7		2.0	
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles)		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0.3		1.7		2.0	
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps	20. Signing		Route signing is poor with signs missing at key decision points	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	0.0		2.0		2.0	
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used	21. Lighting		Most of the link is infrequently lit. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently lit. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well lit. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1.3		2.0		2.0	
			22. Isolation		Most of the link is infrequently overlooked. Vegetation or other obstacles create regular breaks in visibility [p.68]	Some sections of the link are infrequently overlooked. Vegetation or other obstacles create localised breaks in visibility [p.68]	The cycle link is well overlooked. Full forward visibility is achieved and vegetation is regularly maintained [p.68]	1.0		1.0		1.0	
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	0.7		1.3		1.5	
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions	Signing for wayfinding purposes only and not causing additional obstruction	1.0		1.0		1.0	
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		Provision not secure and below the desirable minimum level of provision [p211]	Provision is secure but not overlooked and/ or only providing the desirable minimum level of provision [p211]	Provision is secure, overlooked, well-lit and exceeds the desirable minimum level of provision [p211]	0.3		0.7		1.0	

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Cycle Level of Service Assessment
Links 8, 10 and 11 (PR-B)

Stantec

	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Baseline Score	Comments	Option 1 Score	Comments	Option 2 Score	Comments
Adaptability	Cycle Routes	Cycling infrastructure should be able to evolve and improve as cycle demands change. Meeting the preceding design principles in a way that allows infrastructure to adapt to changing user needs will form a critical component of cycle networks. Trialling of potential measures using more flexible infrastructure will assist in meeting this aim	26. Cycle routes can evolve to meet future demands		*No scope to amend cycling infrastructure once installed [p.64]*	*Only some of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	*Cross section of the route has the flexibility to expand, evolve or adapt to changing demands [p.64]*	X	Not Applicable	1.0		1.5	
	Cycle Parking		27. Cycle parking can be increased to meet future demands		*Has no scope to expand, evolve or adapt to changing demands once installed [p211]*	*Has only limited flexibility to expand, evolve or adapt to changing demands [p211]*	*Has the flexibility to expand, evolve or adapt to changing demands [p211]*	X	Not Applicable	1.7		1.5	

Summary		Existing Road Layout		Proposed Road Layout (1)		Proposed Road Layout (Rubislaw Den South Cycle	
Sub-Totals	**Cohesion** (out of 6)	0.3	6%	4.3	72%	4.5	75%
	Directness (out of 10)	4.7	47%	6.3	63%	6.5	65%
	Safety (out of 16)	X	X	14.3	90%	15.0	94%
	Comfort (out of 8)	2.7	33%	7.3	92%	8.0	100%
	Activeness (out of 10)	4.3	43%	6.0	60%	6.5	65%
	Adaptability (out of 4)	N/A	N/A	2.7	67%	3.0	75%
Audit Score Total (out of 54)		**12**	**24%**	**41**	**76%**	**44**	**81%**

Appendix D: Detailed CLoS Scoring (Description)

Contents

Link 1: Brimmond Drive to Westhill Drive

Overview

Link 1 is part of Straik Road (A944) in Westhill and is located between a footpath from Brimmond Drive to the roundabout junction with Westhill Drive shown in Figure 1.

Existing Road Layout

The existing road layout can be described (west to east) as:

- Single carriageway road with 40mph speed limit
- Standard streetlighting on the northern side
- A narrow footway/ shared-use path on the southern side separated from the carriageway by a grass verge
- No formal crossing facilities at side roads
- Separate shared-use path for access to the Westhill Industrial Estate
- At the Westhill Drive roundabout the only signal controlled crossing facility is a staggered Toucan crossing on the western arm.

For the purposes of the CLoS assessment, the cycle route within the existing road layout is via the footway/ shared-use path on the southern side of Straik Road.

Proposed Road Layout

The proposed road layout for Link 1 is shown on Drawing Numbers 5501 and 5502 (Appendix B) and can be summarised as follows.

- Toucan crossing to connect the existing Brimmond Drive footpath to the new cycle track and footway
- Segregated two-way cycle track (3 metre wide) and footway (2 metre wide) on southern side of road with 1 metre wide verge
- Priority parallel crossings at junction with Enterprise Drive and entrance to the Premier Inn hotel
- Protected cycle transitions on Enterprise Drive to allow users to continue journey south
- Highway boundary constraints adjacent to the Tesco Extra store require a section of shared-use path to connect to the proposed two-way cycle track with the upgraded Toucan crossing on the Straik Road arm of the Westhill Drive junction
- Two-stage direct Toucan crossing to link shared-use paths across western arm of roundabout
- Widening of existing shared-use path to 3 metre minimum with 1 metre verge where required
- Toucan crossing on Westhill Drive arm of roundabout to connect to new segregated cycleway and footway on northern side of A944.

CLoS Scoring

A summary of the CLoS scoring for Link 1 (existing and proposed road layouts) is shown in Table 4.

Table 4: CLoS scoring - Link 1

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	1	17%	4	67%
Directness (out of 10)	5	50%	9	90%
Safety (out of 16)	13	81%	16	100%
Comfort (out of 8)	4	50%	8	100%
Attractiveness (out of 10)	5	50%	7	70%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	28	56%	47	87%

The existing shared-use path provides an adequate provision for cyclists which is reflected in the overall CLoS score of 28 (56%).

The proposed two-way cycle track on the southern side of the road and improvements to side road crossings improves the score to 48 (87%) which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 4. This indicates that if the proposals can be delivered there is little opportunity to improve the provision.

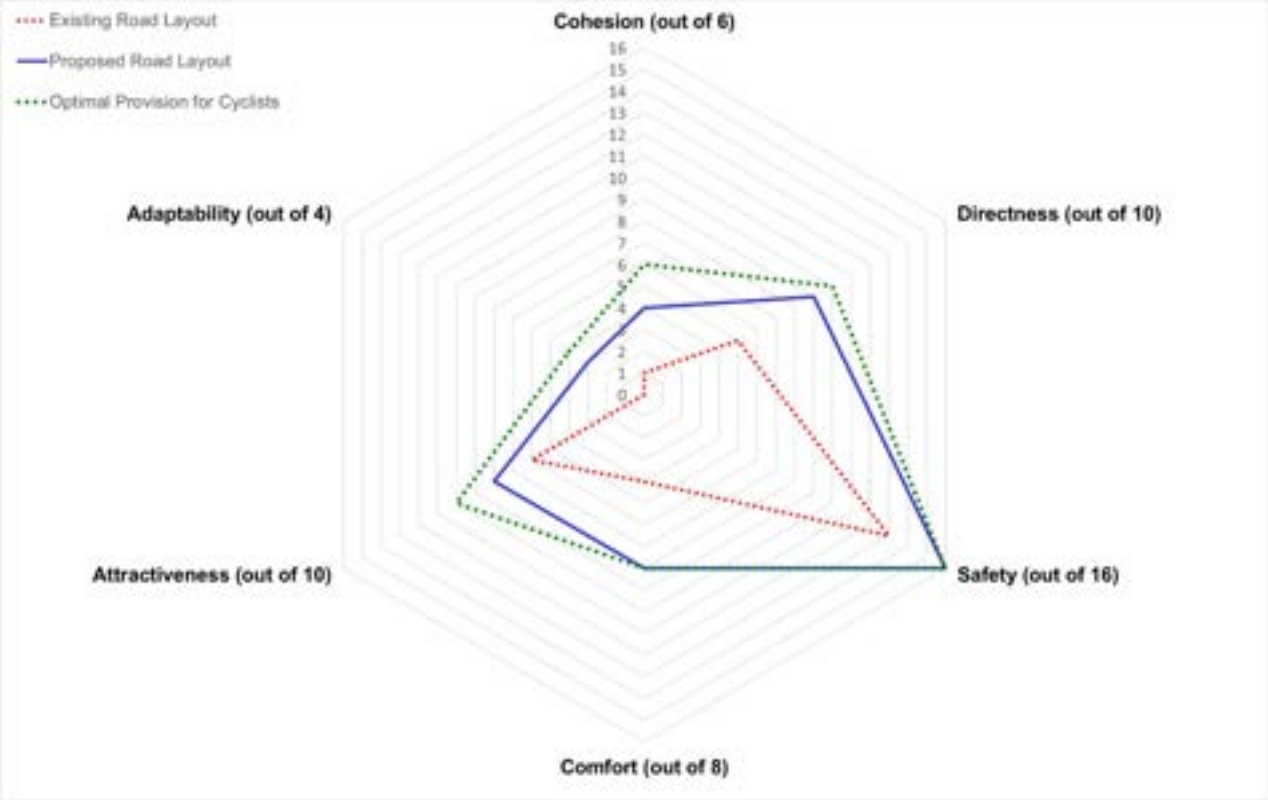

Figure 4: CLoS scoring - Link 1

Link 2: Westhill Drive to A90 AWPR roundabout

Overview

Link 2 is part of the A944 between the roundabout junctions at Westhill Drive and the A90 Aberdeen Western Peripheral Road (AWPR) as shown in Figure 1.

Existing Road Layout

The existing road layout can be described (west to east) as:

- Dual carriageway road with a 40mph speed limit
- Standard streetlighting along extent
- Shared-use path with verge separation on both sides of carriageway from Westhill Drive roundabout to A9119 junction
- The A944 j/w A9119 is signal controlled and includes a staggered signal controlled shared-use crossing on the western arm – no other crossing facilities are provided
- The A944 j/w A9119 has an ASL on the A9119 approach
- The cycle route connections between the A9119 and the A944 are poor
- There is a residential access road between the A9119 junction and Cormack Park access which has limited natural surveillance
- The layout of the Cormack Park access junction is subject to change under the Aberdeen Football Club planning application for a new stadium at Cormack Park
- Shared-use path with no verge separation on north side of the road between the Cormack Park access and A90 AWPR roundabout
- No formal crossing arrangements at side roads and accesses
- The A90 AWPR junction is a large high-speed roundabout where cyclists use the share-use path along the northern perimeter of the roundabout. This requires crossing A90 northbound entry and southbound exit slip roads (both signal controlled) and two priority junctions at Borrowstone Road and Old Borrowstone Road

For the purposes of the CLoS assessment, the cycle route within the existing road layout uses a shared-use path and the residential access road to Mayfield, Cherry Grove and Crommie Cottage residential properties to the north of the A944. At the A90 AWPR junction, pedestrians and cyclists are required to cross four roads on the northern side of the junction. Two of the four crossing are not signal controlled.

Proposed Road Layout

The proposed road layout for Link 2 is shown on Drawing Numbers 5502, 5503, 5504 and 5505 (Appendix B) and can be summarised as follows.

- Segregated two-way cycle track (3 metre wide) and footway (2 metre wide) on northern side of road with 1 metre wide verge
- A section of shared-use path (3 metre wide path with 1 metre wide verge) on the northern side of road where the Brodiach Burn bridge creates a constraint to the highway boundary
- At the A9119 junction the existing layout is retained but with improved road markings and signage for wayfinding
- At the A9119 junction the alternative cycle route option (see below) adds a controlled shared-use crossing on the residential road
- Between the A9119 junction and the Cormack Park access the route uses the residential access road as a mixed traffic street to the north of the Mayfield, Cherry Grove and Crommie Cottage properties
- An alternative route developed in response to uncertainty around the Aberdeen Football Club stadium access proposals at Cromack Park continues the two-way cycle track (3 metre wide) with 1 metre verge alongside the A944 to the south of the Mayfield, Cherry Grove and Crommie Cottage residential properties
- Narrowing of central reservation on carriageway to provide width for cycle track and requiring closing of turning gaps
- Minor accesses to be retained with dropped kerbs
- Bus lane provision on approach to A90 AWPR roundabout (to be delivered separately)

- Priority parallel crossing at access to Cairdhillock Farmhouse
- At the A90 AWPR roundabout, two signal controlled parallel crossings are proposed giving pedestrians and cyclists a more direct route through the junction via the northern verge of the central island.

It should be noted the bus lanes shown on the proposed road layouts form part of a different study. They are shown here to demonstrate how improvements to bus, cycle, walking and wheeling infrastructure would integrate to provide a coordinated improvement to travel options along this section of the A944.

CLoS Scoring

A summary of the CLoS scoring for Link 2 (existing and proposed road layouts) is shown in Table 5.

Table 5: CLoS scoring - Link 2

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	2	33%	3	50%
Directness (out of 10)	4	40%	7	70%
Safety (out of 16)	12	75%	15	94%
Comfort (out of 8)	2	25%	6	75%
Attractiveness (out of 10)	3	30%	5	50%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	23	46%	39	72%

The existing shared-use path provides an adequate provision for cyclists which is reflected in the overall CLoS score of 23 (46%). This is a lower score than Link 1 because parts of the shared-use path are narrow (at the Brodiach Burn bridge) or have no verge separation (Cormack Park to A90 AWPR junction) and part of the route is more secluded.

The proposed two-way cycle track on the northern side of the road and improvements to side road crossings improves the score to 39 (72%) which represents a high LoS as defined by CbD. Included in this is the more direct route through the A90 AWPR junction.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 5. Opportunities to improve the proposals are most achievable in those indicators that define Attractiveness and relate to providing good street lighting levels, signage and road markings particularly along the along the mixed traffic section of the route. The proposals show an alternative option which avoids the mixed traffic street section and continues the cycle track along the northern side the A944 but this has property boundary and so significant engineering constraints.

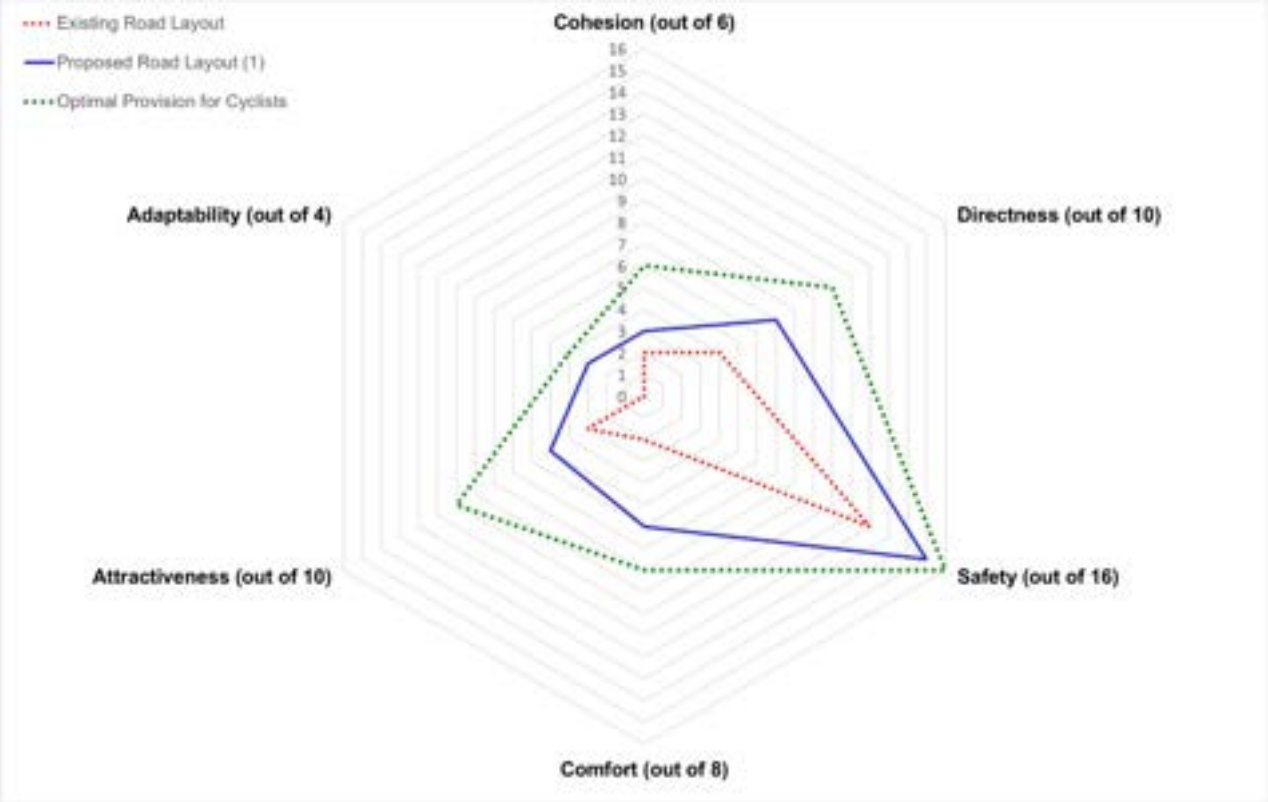

Figure 5: CLoS scores for core design principles - Link 2

Link 3 – A90 AWPR to Jessiefield roundabout

Overview

Link 3 is part of the A944 between the A90 AWPR and Jessiefield roundabouts shown in Figure 1.

Existing Road Layout

The existing road layout can be described (west to east) as:

- The A90 AWPR junction is a large high-speed roundabout where cyclists use the share-use path along the northern perimeter of the roundabout. This requires crossing A90 northbound entry and southbound exit slip roads (both signal controlled) and two priority junctions at Borrowstone Road and Old Borrowstone Road
- Dual carriageway road with 40 mph speed limit
- Shared-use path with no verge separation on north side between A90 AWPR roundabout and Kingswells Causeway
- Off-set shared-use staggered crossing of Kingswells Causeway
- Segregated cycle track and footway between Kingswells Causeway and the Fairley Road roundabout
- Off-set shared-use staggered crossing on Fairley Road
- Mixed traffic street along Old Skene Road with on-street parking and frequent side roads
- No formal crossing arrangements at side roads or vehicle accesses
- Standard streetlighting along extent.

For the purposes of the CLoS assessment, the cycle route within the existing road layout is along the shared-use path on the northern side of the A944 with shared-use crossings on Kingswells Causeway and Fairley Road. Between the Fairley Road and Jessiefield roundabout junctions the cycle route is via Old Skene Road and a shared use path.

Proposed Road Layout

The proposed road layout for Link 3 is shown on Drawing Numbers 5505, 5506, 5507, 5508 and 5509 (Appendix B) and can be summarised as follows.

- At the A90 AWPR roundabout the cycle track is aligned along the northern edge of the central island with new signal controlled parallel crossings on the circulatory lanes and which connect the cycle track to the northern side of the A944
- A90 AWPR to Kingswells Causeway - segregated two-way (3 metre wide) cycle track and footway (2 metre wide) on northern side of road with 1 metre wide verge to be provided but which requires a narrowing of the central reservation. If this is not possible then sections may need to revert to shared-use particularly adjacent to the petrol filling station and protected woodland. Give-ways may be required at the vehicle entry and exit to the petrol filling station forecourt due to property boundary constraints
- At the Kingswell Causeway junction the staggered shared-use crossing will be replaced with a separate pedestrian (staggered) and cycle (straight across) parallel crossings
- Kingswells Causeway to Fairley Road – the segregated two-way cycle track and footway will be improved through widening of both the track and footway
- At the Fairley Road junction the staggered shared-use crossing will be replaced with a separate pedestrian (staggered) and cycle (straight-across) parallel crossings
- Fairley Road to the Jessiefield roundabout – pedestrians and cyclists will use the existing route along Old Skene Road but the road layout will be designed around cycle street principles to create a safe mixed traffic route for cyclists
- An alternative route to using Old Skene Road uses a dedicated cycleway (3 metre wide) with 1 metre verge separation along the northern edge of the A944 between the Fairley Road and Jessiefield roundabouts
- Fairley Road to the Jessiefield roundabout (alternative route) - pedestrians and cyclists use Old Skene Road but with significant changes made to the road layout to make it suitable for cycling as mixed traffic street (road narrowing, rationalisation of the on-street parking)
- West of Jessefield roundabout, the existing shared-use path will join the proposed track and return to a 3 metre wide segregated two-way cycle track and 2 metre wide footway with 1 metre verge separation
- Narrowing of central reservation to provide width for track, requiring closing of turning gaps

- Minor accesses to be retained
- Additional bus priority measures on the eastbound approach to Kingswells Causeway and the east and westbound approach to the Fairley Road roundabout while the southern bypass lane for Jessefield roundabout to be repurposed as a bus lane
- Priority parallel crossing at Ardene House Vet access
- Parallel crossing on northern arm of Jessefield roundabout to be set back from give way line

Again, the bus lane provision (part of a different study) is shown to demonstrate how improvements to bus, cycle, walking and wheeling infrastructure would integrate to provide a coordinated improvement to travel options along this section of the A944.

CLoS Scoring

A summary of the CLoS scoring for Link 1 (existing and proposed road layouts) is shown in Table 6.

Table 6: CLoS scoring - Link 3

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	2	33%	4	67%
Directness (out of 10)	3	30%	6	60%
Safety (out of 16)	7	44%	15	94%
Comfort (out of 8)	2	25%	7	88%
Attractiveness (out of 10)	3	30%	5	50%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	17	34%	40	74%

The existing shared-use path provides an adequate provision for cyclists which is reflected in the overall CLoS score of 17 (34%). This is lower than Link 2 due to the share-use path being narrow and for much of its length having no verge separation. Side road and access road crossings either have no protection from turning traffic or cyclists must share staggered crossing facilities with pedestrians.

The proposed two-way cycle track and improvements to side road crossings between the A90 AWPR and Fairley Road junctions plus the cycle street proposals for Old Skene Road improves the score to 40 (74%) and which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 6. Improvements could be made to Directness and Attractiveness but there is little opportunity to increase the score for those indicators that define these design principles. For example, the route is relatively straight and the gradient fixed (Directness) while street lighting levels and signing would not improve above and beyond those already proposed (Attractiveness).

The alternative route via Old Skene Road that continues the two-way cycle track on the northern side of the road is only marginally shorter in distance and would be less Coherent given the reduced opportunity to connect to the residential areas of Kingswells. Although not considered by the CLoS assessment this option also has considerable highway engineering constraints.

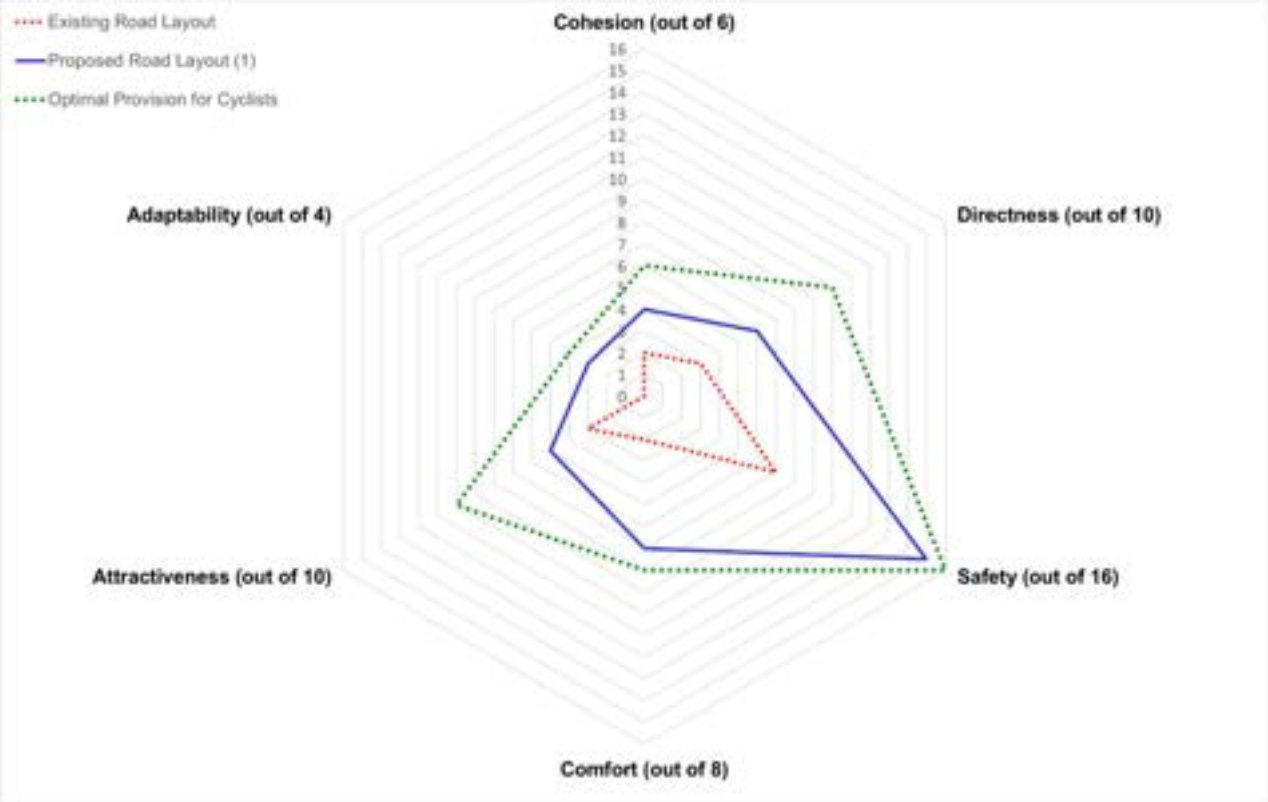

Figure 6: CLoS scoring - Link 3

Link 4 - Jessiefield roundabout to King's Gate

Figure 7: Skene Road where a two-way cycle track and separate footway is proposed on the south (left) side of the road

Overview

Link 4 includes Skene Road and part of Queen's Road (A9119) between the Jessiefield and King's Gate roundabouts shown in Figure 1.

Existing Road Layout

Within the existing road layout, the cycle route is provided by a shared-use path along the northern side of Skene Road and Queen's Road. Between the junctions with Woodend Crescent and the King's Gate roundabout the cycling provision is assumed to be on-road given the lack of signage and road markings to suggest otherwise but also the inbound bus lane permitting use by cyclists.

The existing road layout can be summarised (west to east) as:

- Narrow shared-use path with no verge separation on north side between Jessefield roundabout and Woodend Crescent junction
- On-road cycle route provision between the Woodend Crescent junction and the King's Gate roundabout with eastbound cyclists using the bus lane
- Bus lane between Provost Graham Avenue and a 45 metre set back from the King's Gate roundabout
- Single carriageway road with 40 mph speed limit between Jessiefield roundabout and Cemetery junction and 30 mph speed limit between the Cemetery junction and the King's Gate roundabout
- Shared-use crossings at the Cemetery and Groats Road signal controlled junctions but not at Provost Graham Avenue
- One Toucan crossings and two Pelican crossings
- No formal crossing arrangements at minor side roads or minor access roads

- Standard streetlighting along extent

This link is used by bus services on Routes 4, 5, 6 and 6A with those on Route 11 only using the section between Hazlehead Gardens and the King's Gate roundabout.

For the purposes of the CLoS assessment, the cycle route within the existing road layout uses the shared-use path on the northern side of Skene Road and Queen's Road until the Woodend Crescent junction where cycling is on-road (in both directions) until the King's Gate roundabout.

Proposed Road Layout

The proposed road layout for Link 4 is shown on Drawing Numbers 5510, 5512, 5513 and 5514 (Appendix B) and can be summarised as follows.

- Jessiefield roundabout to Craigden a 3 metre wide segregated two-way cycle track and 2 metre wide footway is provided on the northern side of road with minimal buffer separation and requiring a narrowing width of the road carriageway to 6.8 metres
- Section of shared-use path between Craigden and Woodend Crescent due to mature trees constraining opportunities to widen the highway boundary
- Woodend Crescent to King's Gate roundabout a 3 metre wide segregated cycle track is provided along the southern side of the residential road that runs parallel to Queen's Road – this section of road becomes one-way and allows the inbound bus lane to be retained on Queen's Road between Provost Graham Avenue and the King's Gate roundabout
- Cycle track given priority over side road traffic using continuous footways (Den Burn road, Den of Maidencraig Local Nature Reserve car park access, Queen's Den) and potentially off-set cycle tracks (Queen's Den)
- Cycle track bus stop bypasses
- Improved crossing facilities provided at the Hazlehead Cemetery Access Road, Groats Road and Provost Graham Avenue to ensure good cycle track connectivity.

CLoS Scoring

A summary of the CLoS scoring for Link 1 (existing and proposed road layouts) is shown in Table 7.

Table 7: CLoS scoring - Link 4

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	1	17%	4	67%
Directness (out of 10)	3	30%	8	80%
Safety (out of 16)	5	31%	15	94%
Comfort (out of 8)	4	50%	6	75%
Attractiveness (out of 10)	4	40%	6	60%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	17	34%	42	78%

This link has an existing provision for cyclists based on a shared-use path which is reflected in the overall CLoS score of 17 (34%). This score is relatively low because the share-use path is narrow and for much of its length, has no verge separation and is not continuous, relying on untreated and unsigned mixed traffic sections. Side and access road crossings have no protection from turning traffic with cyclists required to give-way.

The proposed two-way cycle track on the northern side of the road and improvements to side and access road crossings increases the score to 42 (78%) which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 8. The lowest CLoS scores relate to Directness and Attractiveness but there is little scope for the proposals to improve on these scores given adjacent land uses (predominantly farmland) and route topography which are fixed/ remain unchanged.

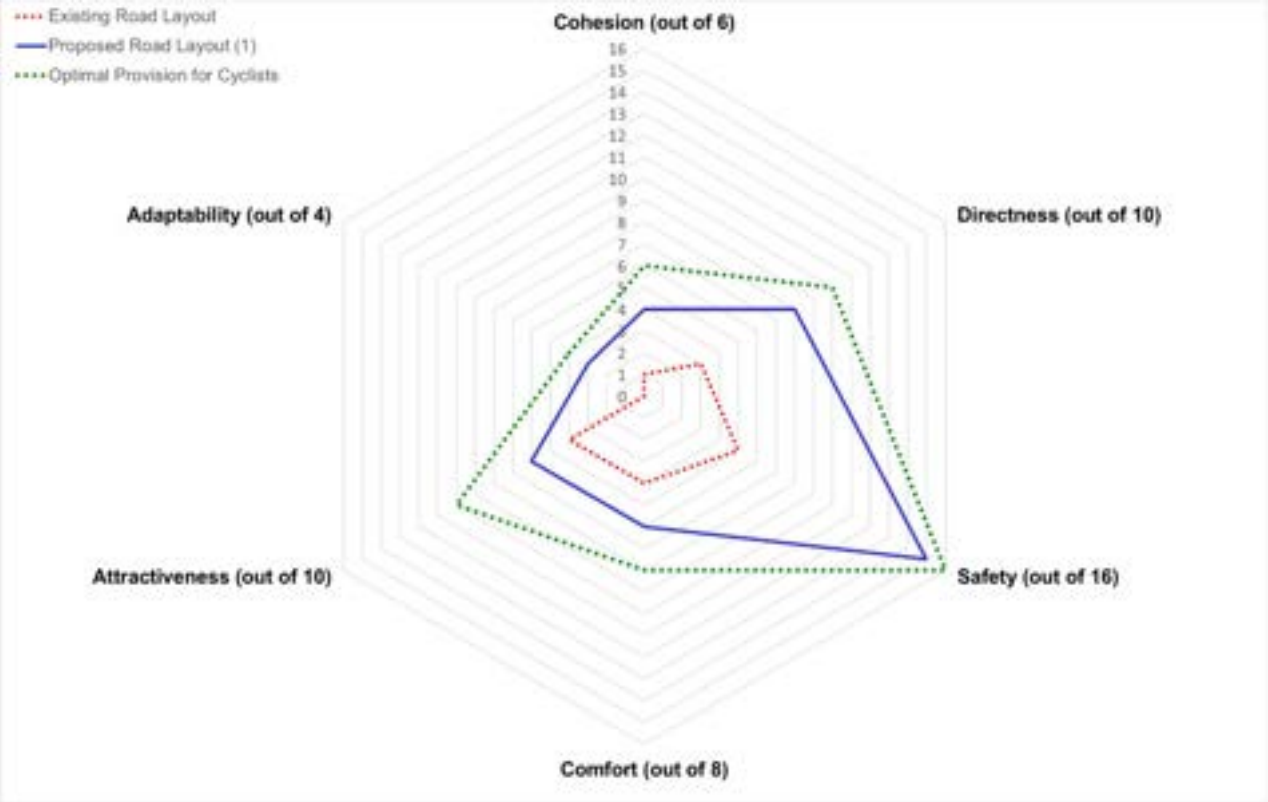

Figure 8: CLoS scoring - Link 4

Link 5 - King's Gate to Anderson Drive

Overview

Link 5 includes Queen's Road (A9119) between the King's Gate and Anderson Drive roundabouts shown in Figure 1.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- Single carriageway road with 30mph speed limit
- Standard streetlighting along extent
- Advisory cycle lanes between King's Gate and Viewfield Road
- No cycle route provision between Viewfield Road junction and Anderson Drive roundabout although inbound cyclist are permitted to use the bus lane
- Inbound bus lane (Monday-Saturday, 7.30-9.30am and 4 – 6pm) between Viewfield Road and a 40 metre set-back from the Anderson Drive roundabout
- Advance Stop Lines at the Springfield Road and Hill of Rubislaw junctions
- No signal controlled crossings for cyclists along Queen's Road or at the Anderson Drive junction
- Most side roads do not have a formal crossing provision
- Frequency vehicle cross-overs to access private driveways
- High speed and multi-lane roundabout at the Anderson Drive junction

This link is used by bus services on Routes 4, 5, 6 and 6A with those on Route 11 only using the section between Hazlehead Gardens and the King's Gate roundabout.

For the purposes of the CLoS assessment, the cycle route within the existing road layout is on-road, mixed with traffic and using the advisory cycle lanes where provided.

Proposed Road Layout

The proposed road layout for Link 5 is shown on Drawing Numbers 5514, 5515 and 5516 (Appendix B) and can be summarised as follows.

- 1.5 metre wide one-way cycle tracks with 0.2 metre buffers along both sides of the carriageway
- Traffic lane widths reduced (minimum of 3.4 metres) to accommodate cycle tracks – some localised widening may be required
- The inbound bus lane between Viewfield Road and the Anderson Drive roundabout is removed to accommodate the cycle tracks
- Anderson Drive roundabout modified to provide signal controlled parallel crossings on all arms
- All residential driveway accesses retained except for the access on the northwest corner of the Anderson Drive roundabout
- Crossings at all signal controlled junctions modified to accommodate share-use
- Bus stop by-passes using shared-use areas with dropped kerbs to exit and enter the cycle tracks
- Cycle 'early release' proposed at the Springfield Road, Hill of Rubislaw and Queen's Parade junctions
- Continuous footways across all minor side road junctions

CLoS Scoring

A summary of the CLoS scoring for Link 5 (existing and proposed road layouts) is shown in Table 8.

Table 8: CLoS scoring - Link 5

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	0	0%	5	83%
Directness (out of 10)	3	30%	9	90%
Safety (out of 16)	X	X	16	100%
Comfort (out of 8)	2	25%	8	100%

Design Principles	Existing Road Layout		Proposed Road Layout	
Attractiveness (out of 10)	7	70%	6	60%
Adaptability (out of 4)	N/A	N/A	2	50%
Total	12	24%	46	85%

This link has an existing provision for cyclists based on advisory cycle lanes which is inadequate given the speed, mix (HGV's, buses) and flow of traffic. These cycle lanes are not continuous which also leaves cyclists having no protection from motor traffic within the busiest section of the link (i.e. Viewfield Road and Anderson Drive) although an eastbound bus lane provides some protection. There is no protection from turning traffic at side roads. This results in Critical Fail scores[8] that define Safety and an overall CLoS score of 15 (30%) which suggests the existing provision is inadequate even for confident cyclists who are familiar with the route.

The continuous one-way cycle tracks on each side of the road combined with side road treatments provide cyclists a protected route along the link. Bus stop bypasses allow cyclists a safe route around stopped buses but rely on shared-use areas which increases the pedestrian collision risk although this is deemed to be small. The combined impact of these measures is to increase the CLoS score to 46 (85%) which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 9. There is a substantial improvement in Safety which goes from a Critical Fail score of 16 (100%) and Comfort which also increases to a maximum score (of 8). The only area where the proposed road layout could be improved is in Attractiveness (7 out of 10), related to reducing shared-use areas at bus stops and at the Anderson Drive junction to reduce the impact on pedestrian comfort levels. It should be noted that Attractiveness score gets worse in the proposed road layout because of the increased in shared-use areas. Highway boundary constraints however make delivering fully segregated bus stop bypasses unworkable and a signalisation of the Anderson Drive junction would come at a substantial cost.

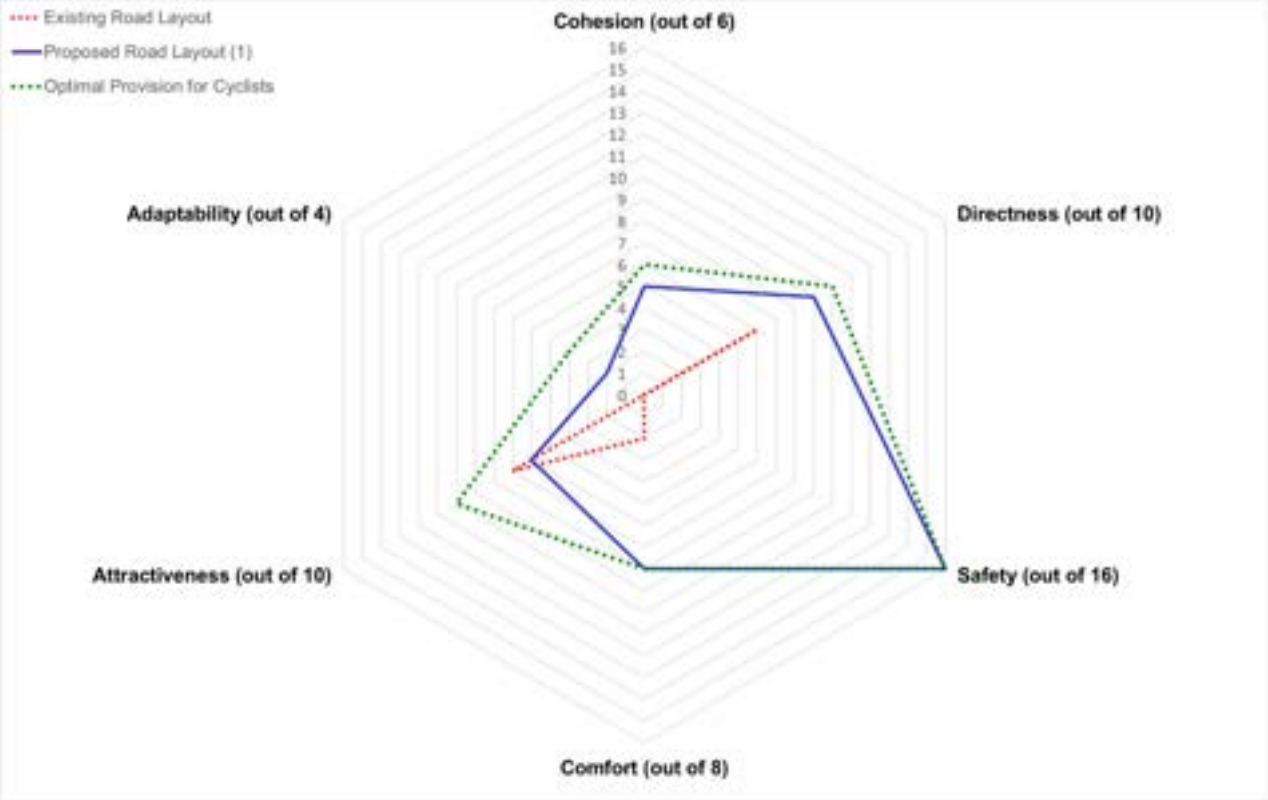

Figure 9: CLoS scoring - Link 5

[8] Safety indicators with Critical Fail scores included the speed of traffic through junctions, the volume and mix of traffic (HGV's/ buses) and lack of spaces for cyclists to pedal within these high volume/ high speed traffic flows.

Link 6 – Anderson Drive to Queen's Cross

Overview

Link 6 includes Queen's Road between the Anderson Drive and Queen's Cross roundabouts shown in Figure 1.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- Major multi-lane roundabout at Anderson Drive
- Wide single carriageway road with 30mph speed limit
- Relatively wide footways along both sides of the road
- Frequency vehicle cross-overs to access private driveways
- Streetlighting along extent
- No cycle route provision
- On-street parking restricted to bays
- Frequent bus stops
- Four Puffin and one informal (with traffic islands) crossing
- Multi-lane roundabout at Forest Road junction
- Most side roads and accesses do not have formal crossing provisions
- Major 6-arm multi-lane roundabout at Fountainhall Road junction (Queen's Cross).

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road and mixed with traffic as there are no shared-use or cycle lane provision.

Proposed Road Layout

The proposed road layout for Link 6 is shown on Drawing Numbers 5516 and 5517 (Appendix B) and can be summarised as follows.

- Cyclists negotiate the Anderson Drive roundabout using new 4 metre wide shared-use paths before transitioning to/ from the segregated one-way cycle tracks
- Upgraded and new 4 metre wide Toucan crossings on eastern and western arms of the Anderson Drive roundabout and parallel signal controlled crossings on northern and southern arms
- 1.5 - 2.0 metre wide segregated one-way cycle tracks with 0.2 – 0.5 metre buffers along both sides of the road requiring a narrowing of the road carriageway
- Continuous footways introduced at minor side road junctions
- On-street parking removed where required
- Signal controlled crossing facility to the east of Bayview Road to replace informal crossing
- Bus stop by-passes using shared-use areas with dropped kerbs to exit and enter the cycle tracks
- Forest Road roundabout to be removed and replaced with a signal controlled cross-roads including ASL's and cycle 'early release'
- At the Queen's Cross junction, a protected cycle track roundabout layout or 'Dutch style arrangement' is introduced providing a segregated route for cyclists on the perimeter of the roundabout using a combination of one-way cycle tracks and parallel Zebra crossings

CLoS Scoring

A summary of the CLoS scoring for Link 6 (existing and proposed road layouts) is shown in Table 9.

Table 9: CLoS scoring - Link 6

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	0	0%	5	83%
Directness (out of 10)	3	30%	9	90%
Safety (out of 16)	X	X	14	88%
Comfort (out of 8)	2	25%	8	100%

Design Principles	Existing Road Layout		Proposed Road Layout	
Attractiveness (out of 10)	7	70%	6	60%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	12	24%	45	83%

This link has an existing provision for cyclists is on-road and mixed with traffic which is a poor provision given the speed and flow of motor traffic. On-street parking bays create a road with a non-uniform width making it difficult for cyclists to take up a safe position within the traffic lane. Parking activity also increase the risk of collision from parking bay entry and exit maneuvers and car occupants opening doors with the path of cyclists. This results in Critical Fail scores for some indicators that define Safety[9] and an overall CLoS score of 12 (24%) which suggests the existing provisions is inadequate for confident and existing cyclists.

The continuous one-way cycle tracks on each side of the road combined with side road treatments provide cyclists a protected route. Bus stop bypasses allow cyclists a safe route around stopped buses although they rely on shared-use areas which increase the pedestrian collision risk although this is deemed to be small. The combined impact of these measures is to increase the CLoS score to 45 (83%) which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 10. There is a substantial improvement in Safety which goes from a Critical Fail score of 14 (88%) and Comfort which achieves a maximum score (of 8). The only area the proposed road layout could be improved is in Attractiveness (6 out of 10) and focused on reducing shared-use areas at bus stops or at the Anderson Drive junction to reduce the impact on pedestrian movements. It should be noted the Attractiveness score gets worse in the proposed road layout because of the increased in shared-use areas but there may be scope to change this with the introduction of cycle parking provision within the businesses, hotels and schools along this section of Queen's Road.

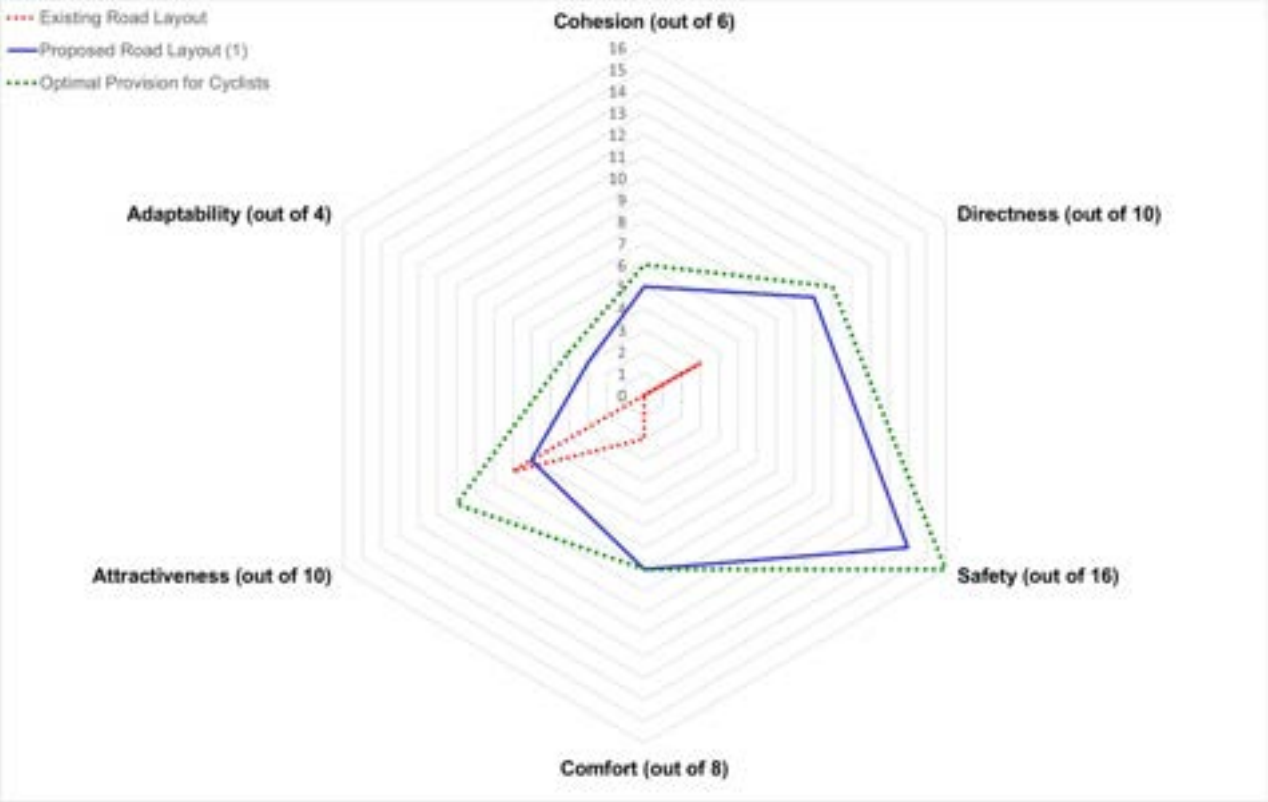

Figure 10: CLoS scoring - Link 6

[9] Safety indicators with Critical Fail scores included the speed of traffic through junctions, the volume and mix of traffic (HGV's/ buses) and lack of spaces for cyclists to pedal within these high volume/ high speed traffic flows.

Link 7 – Queen's Cross to Schoolhill

Figure 11: Carden Place where one-way cycle tracks are proposed on each side of the road

Overview

Link 7 includes Carden Place, Skene Street and part of Rosemount Viaduct and is located between the Queen's Cross roundabout and the junction of Blackfriars Street with Schoolhill shown in Figure 1.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- Wide single carriageway road with 30mph speed limit
- Relatively wide footways along both sides of the road
- Trees located at the front of the footway frequently spaced
- Frequent vehicle cross-overs to access private driveways
- Streetlighting along extent
- Four signal controlled junctions at Albert Street, Rose Street, Rosemount Viaduct and Union Terrace of which two have multi-lane approaches
- No cycle provision along section although cycle ASL's provided at the signal controlled junctions
- On-street parking restricted to bays
- No bus services operate along this link so there are no bus stops

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road and mixed with traffic.

Proposed Road Layout

The proposed road layout for Link 7 is shown on Drawing Numbers 5518, 5519 and 5520 (Appendix B) and can be summarised as follows.

- At the Queen's Cross junction, a protected cycle track roundabout layout or 'Dutch style arrangement' is introduced providing a segregated route for cyclists on the perimeter of the roundabout using a combination of one-way cycle tracks and parallel Zebra crossings
- Access from the Queen's Cross roundabout to Albyn Place is restricted for general traffic – a new bus only access road is provided between Carden Place and Albyn Place to retained existing routes for bus services
- Segregated one-way cycle lanes are provided on both sides of the road – the width of the cycle track ranges from 1.5 to 2.0 metres and the segregation buffer from 0.2 to 0.5 metres
- The cycle tracks require the narrowing of the road carriageway to 6.5 metres (approx.), removal of on-street parking on both sides of the road and some localised footway narrowing
- West of Blenheim Place junction, a parallel crossing with shared footway access will be implemented providing access to potential Parallel Routes
- Cycle 'early release' at Albert Street, Rose Street, Rosemount Viaduct and Union Terrace junctions
- Continuous footways introduced at minor side road junctions
- Rosemount Viaduct junction to be altered to improve safety for cyclists
- Taxi rank outside His Majesty's Theatre relocated.

CLoS Scoring

A summary of the CLoS scoring for Link 7 (existing and proposed road layouts) is shown in Table 10.

Table 10: CLoS scoring - Link 7

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	1	17%	5	83%
Directness (out of 10)	3	30%	7	70%
Safety (out of 16)	X	X	15	94%
Comfort (out of 8)	2	25%	8	100%
Attractiveness (out of 10)	7	70%	8	80%
Adaptability (out of 4)	N/A	N/A	1	25%
Total	13	26%	44	81%

This link has an existing provision for cyclists that is on-road and mixed with traffic which is a poor provision given the speed and flow of motor traffic along Carden Place, Skene Street and Rosemount Viaduct. On-street parking bays create a road with a non-uniform width making it difficult for cyclists to take up a safe position within the traffic lane. Parking activity also increase the risk of collision from parking bay entry and exit maneuvers and car occupants opening doors into the path of cyclists. There are frequent untreated side roads and driveway accesses with the associated vehicle turning movements increasing the collision risk for cyclists. This results in a zero score for Cohesion and Critical Fail scores for some indicators that define Safety. The overall CLoS score of 12 (24%) suggests the existing provision is inadequate even for confident cyclists.

The continuous one-way cycle tracks on each side of the road combined with side road treatments provide cyclists a protected route that increases the CLoS score to 44 (81%) and represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 12. There is a substantial improvement in Safety which goes from a Critical Fail score to 15 (80%) and Comfort which achieves a maximum score (of 8). The only area the proposed road layout could be improved is in Directness which includes indicators that measure delay at junctions. To do this the traffic signal off-set timings between junctions should be updated to give cyclists (not general traffic) a green wave through junctions.

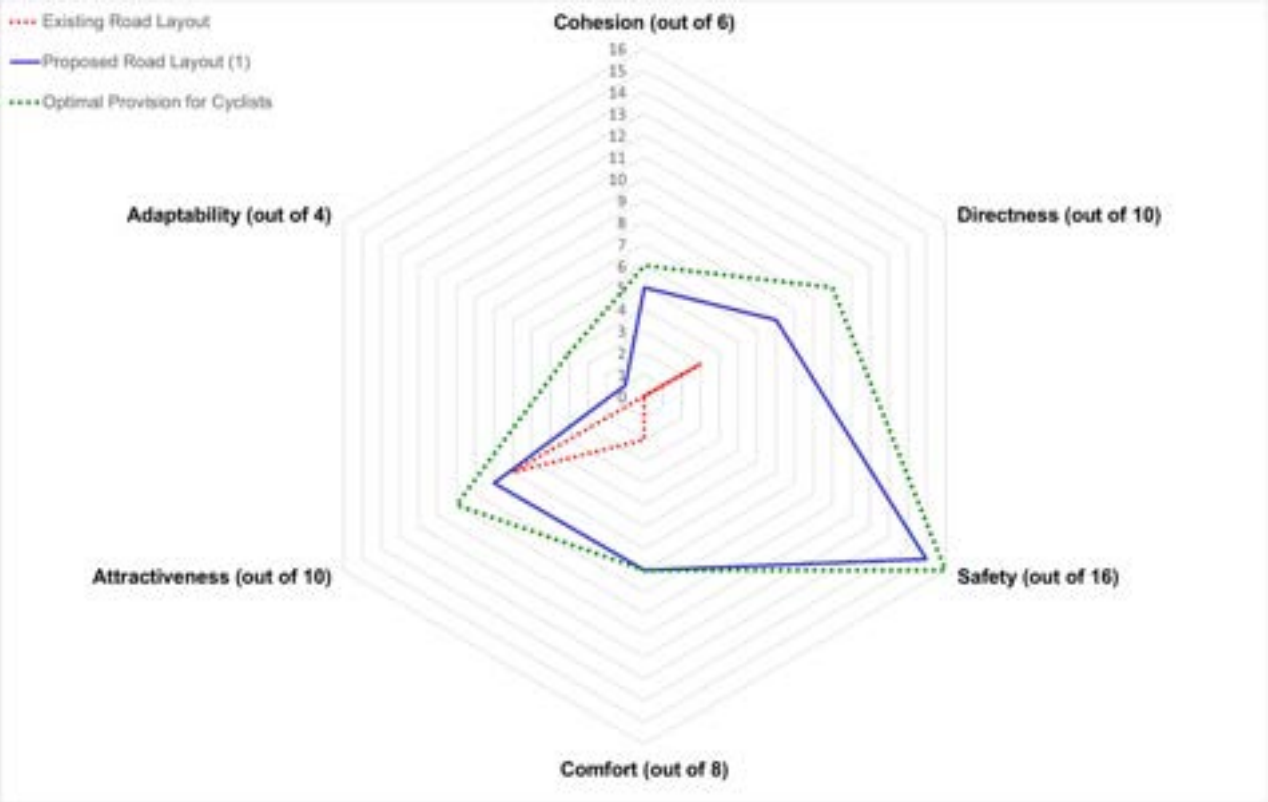

Figure 12: CLoS scoring - Link 7

Link 8 – King's Gate to Anderson Drive

Figure 13: Stronsay Drive j/w King's Gate where an upgraded shared-use crossing supports the proposed cycle track

Overview

Link 8 includes King's Gate (part), King's Cross Terrace and King's Cross Road (part) between the Queen's Road and Anderson Drive shown in Figure 2.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- Wide single carriageway road with the cycle provision within a mixed traffic environment
- Footways are off-set from the road on both sides between Queen's Road and Stronsay Drive and on the southern side between Stronsay Drive and Ord Street
- No formal crossing facilities between Queen's Road and Stronsay Drive although the Stronsay Drive junction has signal controlled crossings on two of the three arms
- Two informal crossing points (with traffic islands) are located close to the Stronsay Drive and Summerhill Road junctions
- No crossing facilities at the Summerhill Road junction
- Minor side roads and accesses have poor crossing provisions
- The Stronsay Drive junction has cycle ASL's on all three approaches
- Advisory cycle lanes between Summerhill Road and Anderson Drive junctions but with substandard widths
- There are no bus stops between Queen's Road and Summerhill Road junctions
- Streetlighting along extent
- King's Cross Terrace and King's Cross Road are residential streets with on-street parking although most properties have access to driveways

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road and mixed with traffic along King's Gate between Queen's Road and Anderson Drive. The proposed route was developed to bypass the Anderson Drive roundabout so this junction is excluded from the CLoS assessment of the existing road layout.

Proposed Road Layout

The proposed road layout for Link 8 is shown on Drawing Numbers 5521 and 5522 (Appendix B) and can be summarised as follows.

- A 3 metre wide segregated cycleway, 2 metre wide footway, and 1 metre wide verge on northern side from King's Gate roundabout to King's Gate/ King's Cross Terrace junction requiring a narrowing of the road carriageway
- Continuous footways at side road junctions along the northern side of Kings Gate to emphasis pedestrian and cycle priority over turning traffic
- Improved pedestrian crossing facilities at side road junctions along the southern side of King's Gate including tightened corner radii to reduce crossing distances and wider dropped kerbs with tractile paving
- Shared-use crossing at Stronsay Drive
- Signal controlled parallel crossing located to the west of the Summerhill Road junction providing a link between the cycle track and King's Cross Terrace
- Mixed traffic street along King's Cross Terrace defined by road markings, signage and junction treatments (traffic calming features) at each end of the road
- A 3 metre wide segregated cycle track along the southern side of King's Cross Road between King's Cross Terrace and Anderson Drive
- King's Cross Road access to Anderson Drive to be closed to accommodate new parallel signal controlled crossing on Anderson Drive
- Anderson Drive at the junctions with King's Cross Road and Carnegie Crescent realigned to accommodate a central island for the parallel signal controlled crossing
- All property accesses to be retained.

CLoS Scoring

A summary of the CLoS scoring for Link 8 (existing and proposed road layouts) is shown in Table 11.

Table 11: CLoS scoring - Link 8

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	0	0%	4	67%
Directness (out of 10)	4	40%	7	70%
Safety (out of 16)	X	X	16	100%
Comfort (out of 8)	4	50%	8	100%
Attractiveness (out of 10)	7	70%	7	70%
Adaptability (out of 4)	N/A	N/A	2	50%
Total	15	30%	44	81%

This link has an existing provision for cyclists is on-road and mixed with traffic which is a poor provision given the speed (30 mph limit) and flow of traffic along King's Gate. Side roads are wide, increasing the risk of 'left hook' collisions, the advisory cycle lanes are too narrow which increases cycling risk and there is no wider cycle route network to connect to. This results in a zero score for Cohesion and Critical Fail scores for some indicators that define Safety. The overall CLoS score of 15 (30%) indicating the existing provision is not suitable for even confident cyclists.

The continuous two-way cycle track on the northern side of the road combined with side road treatments provide cyclists a protected route that increases the CLoS score to 44 (81%) and represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 14. There is a substantial improvement in Safety which goes from a Critical Fail score to a score of 16 (100%) with Comfort also achieving a maximum score (of 8). The improved score from Cohesion is based on the potential to improve the wider cycle route network particularly with links to north, connecting to local schools and employment zones in Mastrick.

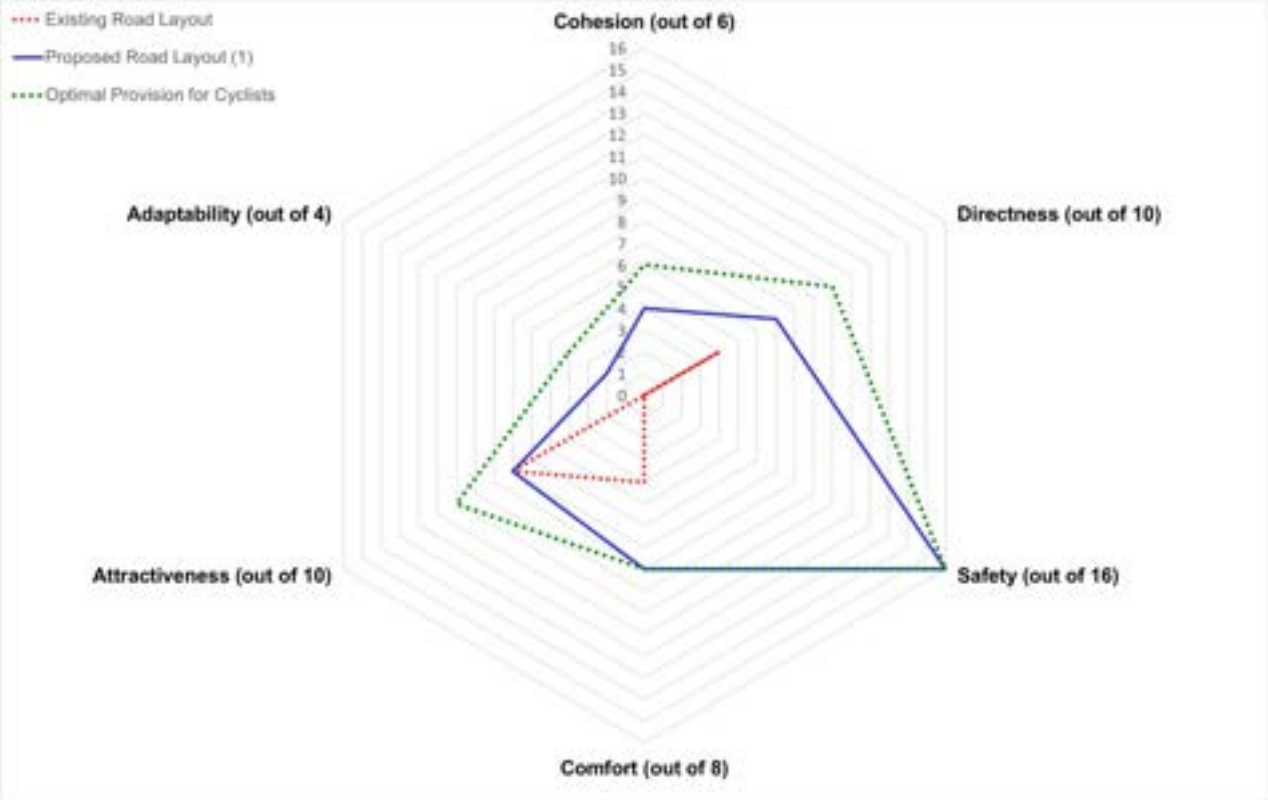

Figure 14: CLoS scoring - Link 8

Link 9 – Anderson Drive to Carden Place (via Rubislaw Den North)

Figure 15: Fountainhall Road where cycle tracks are proposed on each side of the road

Overview

Link 9 includes Carnegie Crescent, Moray Place (part), Rubislaw Den North, Forest Road (part), Desswood Lane, Fountainhall Road (part), Albert Lane (part), Blenheim Place (part) between the King's Cross Road junction with Anderson Drive and the Blenheim Place junction with Carden Place shown in Figure 2.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- On-road cycling mixed with traffic along extents
- Single carriageway residential roads except along Albert Lane which is a narrow lane with frequent vehicle accesses and no footway
- Controlled on-street parking on most roads
- Standard footway widths except along Albert Lane
- Side roads are untreated (i.e. do not include enhanced safety measures for pedestrians and cyclists)
- Bus services operate along Fountainhall Road with associated bus stops
- Section on one-way road at the southern end of Blenheim Place
- Streetlighting levels are potentially reduced by trees along Rubislaw Den North and Forest Road

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road and mixed with traffic. Although these are predominantly quite residential roads and 'Lanes' the section of Fountainhall Road is a busy street with a mixed frontage of retail, employment and community buildings.

Proposed Road Layout (Option 1 – Cycle Track and Option 2 – Cycle Street)

The proposed road layout for Link 9 is shown on Drawing Numbers 5522, 5523, 5524 and 5525 (Appendix B) but it should be noted that there are two road layout options for Moray Place and Rubislaw Den North. Drawing Number 5523-CT and 5524- CT shows the cycle route provided using a two-way cycle track on the southern side of the road (Option 1) while 5523-CS and 5524-CS show the cycle route as a mixed traffic street delivered using cycle street principles (Option 2).

- Vehicle exit from Carnegie Crescent to Anderson Drive to be closed (entry only)
- Segregated two-way cycle track (3 metre wide) and buffer to replace on-street parking along Carnegie Crescent
- Segregated two-way cycle track (3 metre wide) and buffer to replace on-street parking along Moray Place and Rubislaw Den North with (Option 1)
- Mixed traffic route using cycle street principles with some on-street parking retained along Moray Place and Rubislaw Den North (Option 2)
- Parallel crossing on Forest Road and short section of two-way cycle track on Desswood Place (Option 1)
- Zebra crossing on Forest Road with mixed traffic street on Forest Road and Desswood Place between Rubislaw Den North and Desswood Lane (Option 2)
- Signage and road markings along the Desswood Lane to support the cycle route within a mixed traffic street
- Segregated one-way cycle tracks (1.5 – 2.0 metre wide) on Fountainhall Road between Desswood Lane and Albert Lane requiring the removal of on-street parking and modification to the signal controlled crossing
- Signage, road markings and resurfacing along Albert Lane to support the cycle route within a mixed traffic street
- Segregated one-way cycle tracks (1.5 – 2.0 metre wide) on Blenheim Place requiring the removal of on-street parking – the northbound cycle track is in contra-flow
- Continuous footways at minor side road junctions and all property accesses retained with dropped kerbs.

CLoS Scoring

A summary of the CLoS scoring for Link 9 (existing and proposed road layouts) is shown in Table 12.

Table 12: CLoS scoring - Link 9

Design Principles	Existing Road Layout		Proposed Road Layout (Option 1)		Proposed Road Layout (Option 2)	
Cohesion (out of 6)	1	17%	4	67%	4	67%
Directness (out of 10)	4	40%	5	50%	5	50%
Safety (out of 16)	6	38%	12	75%	14	88%
Comfort (out of 8)	1	13%	8	100%	8	100%
Attractiveness (out of 10)	4	40%	5	50%	6	60%
Adaptability (out of 4)	N/A	N/A	3	75%	4	100%
Total	16	32%	37	69%	41	76%

This link has an existing provision for cyclists which is on-road and mixed with traffic. These streets are predominantly residential with relatively low traffic flows, suggesting the provision should be adequate for cyclists. The overall CLoS score of 16 (32%) is not much better than other mixed traffic streets with higher vehicle flows and speeds (i.e. Link 8) but this can be explained by the following:

- Link 8 has a Critical Fail score for Safety whereas Link 9 does not
- Link 9 scores poorly for Comfort given the condition of the road surfacing along Albert Lane
- Link 9 scores poorly for Attractiveness given the more secluded sections of route along Desswood Lane and Albert Lane

In Option 1 where a continuation of the two-way cycle track is used, the CLoS score increases to 37 (69%) while for Option 2 that makes greater use of cycle streets the score improves to 41 (76%). Both options provide

a high LoS as defined by CbD with the scoring suggesting the cycle street layout has a slight advantage over the cycle track. The reason for this can be explained by Figure 16 which shows the extent to which the CLoS score changes across the six core design principles with cycle street layout (Option 2) is slightly more Adaptable and Safer than the cycle track layout (Option 1). It should however be noted that both options have a mix of cycle tracks and cycle streets, so the assessment is not making a direct comparison between a cycle street and a cycle track but road layouts that have more of one than the other.

Both options have a reduced score for Attractiveness due to the limited levels of natural surveillance along Desswood Lane and Albert Lane which contribute to increased personal safety concerns particularly during the hours of darkness. The improvement in the Attractiveness score from the existing provision is due to the proposed improved lighting along these 'Lanes'.

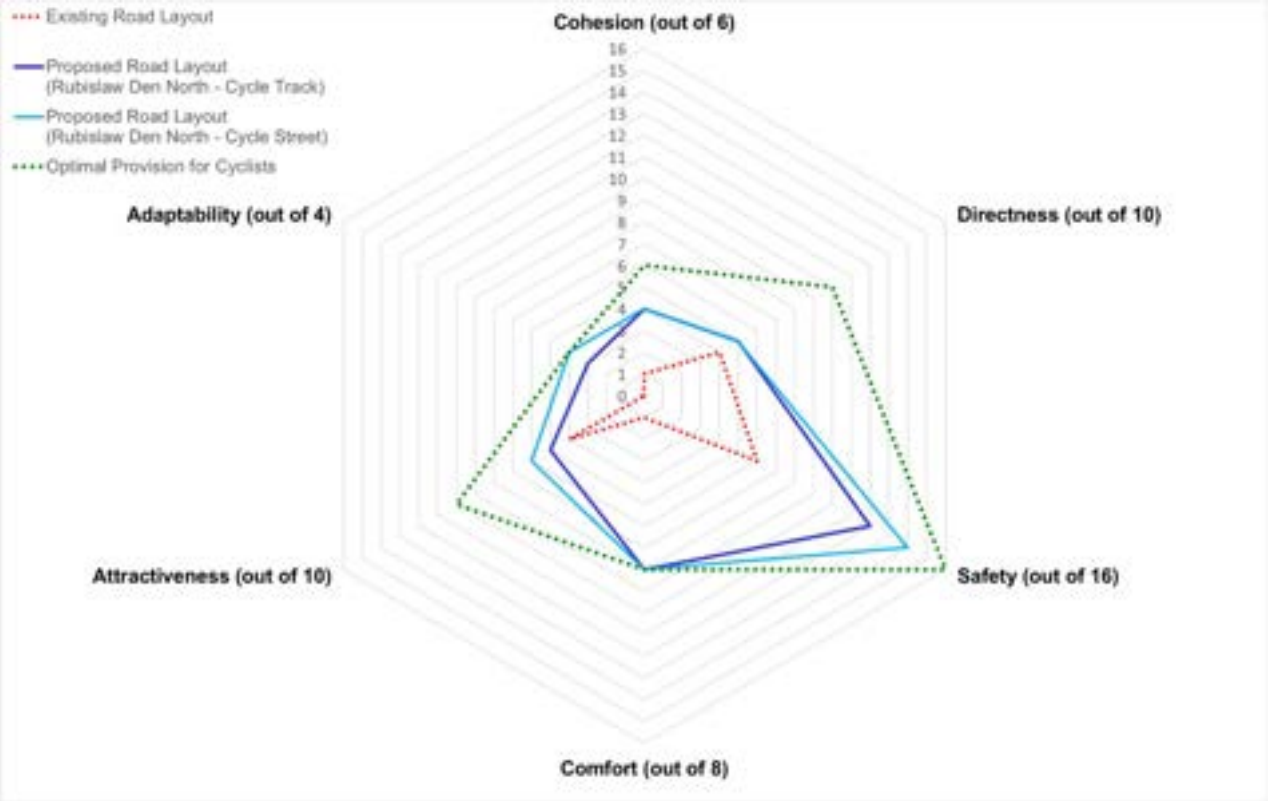

Figure 16: CLoS scoring - Link 9

Link 10 – Carnegie Crescent to Rubislaw Den South (via Anderson Drive)

Figure 17: Anderson Drive j/w King's Cross Road and Carnegie Crescent where a new signal controlled crossing is proposed

Overview

Link 10 includes part of Anderson Drive between its junctions with Carnegie Crescent and Rubislaw Den South shown in Figure 2.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- Dual carriageway road with a 40 mph speed limit and narrow central reservation
- Minimum width footways on both sides of the road with a wide verge separation that included trees
- Streetlighting along extent with lighting columns located within the verge.
- Large signal controlled junction at Hill of Rubislaw with segregated right turn from Anderson Drive
- No crossing facilities along the link which creates a severance to pedestrian movement
- The Hill of Rubislaw junction has signal controlled crossings on two of the three arms
- One northbound bus stop which is located within a layby

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road mixed with traffic although given the 40 mph speed limit any cycling along Anderson Drive is likely to be on the footways.

Proposed Road Layout

The proposed road layout for Link 10 is shown on Drawing Numbers 5526 (Appendix B) and can be summarised as follows:

- 2.5 metre wide two-way cycle track with 0.5 metre wide buffer on eastern side of Anderson Drive
- Removal of section of central reservation on Anderson Drive to realign carriageway and provide room for cycle track without impacting trees
- Priority crossing at Rubislaw Den Gardens
- Section on low trafficked on-road route at the western end of Rubislaw Den South which has a cobblestone paving surfacing

CLoS Scoring

A summary of the CLoS scoring for Link 10 (existing and proposed road layouts) is shown in Table 13.

Table 13: CLoS scoring - Link 10

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	0	0%	4	67%
Directness (out of 10)	4	40%	6	60%
Safety (out of 16)	X	X	15	94%
Comfort (out of 8)	3	38%	6	75%
Attractiveness (out of 10)	4	40%	6	60%
Adaptability (out of 4)	N/A	N/A	3	75%
Total	11	22%	40	74%

This link has an existing provision for cyclists that is on-road and mixed with traffic along a dual carriageway road with a 40 mph speed limit and high traffic flows. As such the provision is unsuitable for all cyclists. This is reflected in the overall CLoS score of 11 (22%) which includes a Critical Fail score for Safety and a zero score for Comfort and is likely to result in cyclists using the narrow footways on each side of the road.

The continuous two-way cycle track on the eastern side of the road provides cyclists with a level of protection that increases the CLoS score to 40 (74%) which represents a high LoS as defined by CbD.

The extent to which the CLoS score changes across the six core design principles is shown in Figure 18. There is a substantial improvement in Safety which goes from a Critical Fail to a score of 15 (94%). There is little scope of improving the CLoS score further given the nature of the road (busy dual carriageway), highway constraints (trees) and the need to retain the cobblestone paving at the western end of Rubislaw Den North.

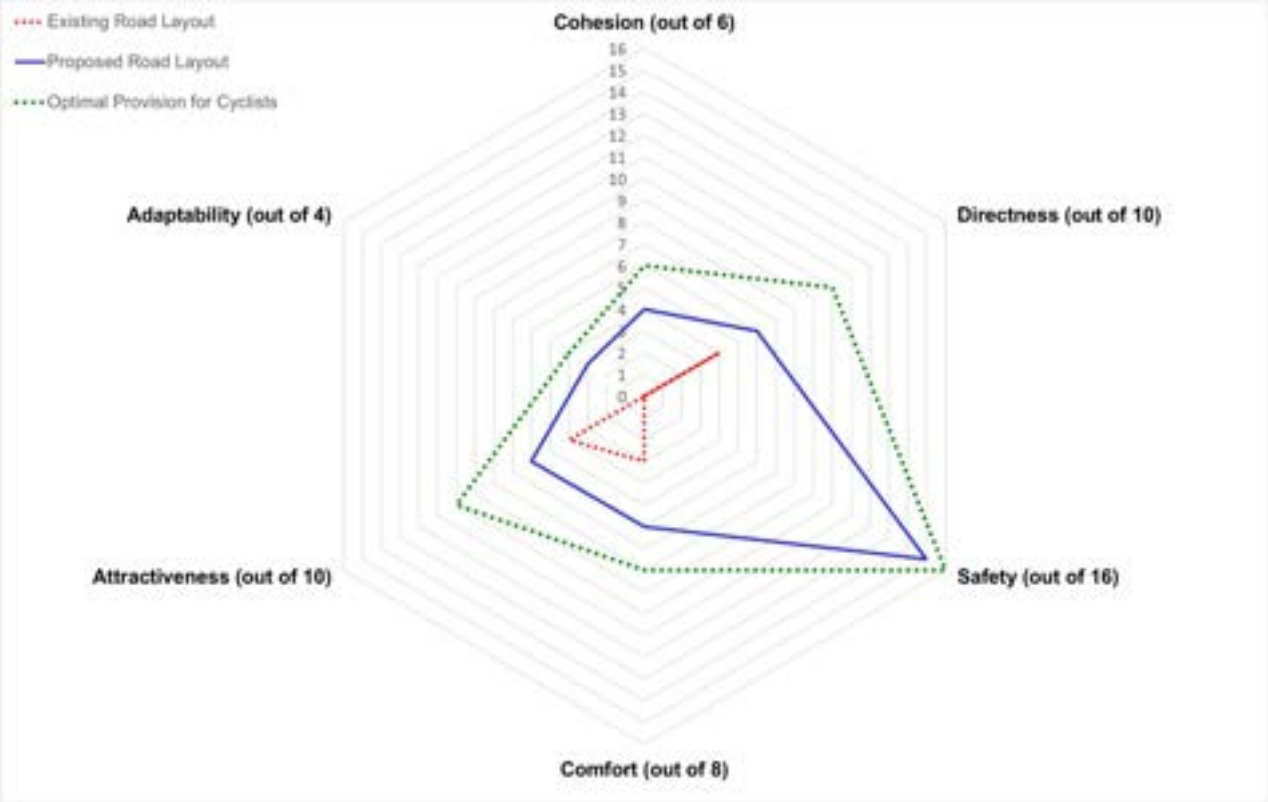

Figure 18: CLoS scoring - Link 10

Link 11 – Anderson Drive to Carden Place (via Rubislaw Den South)

Figure 19: Albert Lane which is part of Link 9 and Link 11 and a proposed mixed traffic route requiring road surfacing

Overview

Link 11 includes Rubislaw Den South, Forest Road (part), Queen's Lane North, Albert Lane (part) and Blenheim Place (part) between the Anderson Drive junction with Rubislaw Den South and the Blenheim Place junction with Carden Place shown in Figure 2.

Existing Road Layout

The existing road layout can be summarised (west to east) as:

- On-road cycling provision along extent
- The western end of Rubislaw Den South is a dead-end providing access to private driveways and has a cobblestone paved surface
- Single carriageway residential roads except along Queen's Lane North and Albert Lane which are narrow lanes with frequent vehicle accesses and no footway
- Section of one-way road at the western end of Queen's Lane North and southern end of Blenheim Place
- Controlled on-street parking on most roads
- Standard footway widths except along Queen's Lane North and Albert Lane where there no provision
- Side roads are untreated i.e. do not include enhanced safety measures for pedestrians and cyclists
- Streetlighting levels are potentially reduced by trees along Rubislaw Den South

For the purposes of the CLoS assessment the cycle route within the existing road layout is on-road and mixed with traffic.

Proposed Road Layout (Option 1 – Cycle Track and Option 2 – Cycle Street)

The proposed road layout for Link 11 is shown on Drawing Numbers 5526, 5527 and 5528 (Appendix B) but it should be noted that there are two road layout options for Rubislaw Den South. Drawing Number 5526-CT and 5527- CT shows the cycle route with a two-way cycle track on the northern side of the road (Option 1) while 5526-CS and 5527-CS shows the cycle route on-road and mixed with traffic but delivered using cycle street principles (Option 2).

- Cobblestone paved lightly trafficked section of on-road cycling at the western end of Rubislaw Den South
- Two-way cycle track (2.8 metres wide with 0.2 metre wide separation buffer) on the northern side of Rubislaw Den South requiring a narrowing of the road and removal of on-street parking (Option 1)
- Cycle street with narrow traffic lanes (2.5 metre wide), a central cobblestone paved reservation to discourage motor vehicles overtaking cyclists and off-set parking bays which will result in some loss of parking capacity (Option 2)
- Short section of 1.5 metre wide one-way cycle lane on each side of Forest Road between Rubislaw Den South and Queen's Lane North requiring a limited removal of on-street parking
- Mixed traffic street along Queen's Lane North with westbound cyclists permitted to use the one-way section
- Queen's Lane North will be resurfaced where required, street lighting improved, and signage/ road markings introduced to highlight the road as part of a strategic cycle route
- Improvements made to the Fountainhall Road junction with Queen's Lane North and Albert Lane to ensure cyclists can cross Fountainhall Road safely – consider changing give way priorities or signalising the junction
- Albert Lane will be resurfaced and measures introduced (signage/ road markings) to improve driver awareness of cyclists
- 2 metre wide one-way cycle tracks on both sides of Blenheim Place, replacing the on-street parking – the northbound cycle track will be in contra-flow
- Along the extents of the link all driveway accesses will be retained
- Along the extents of the link all side road crossings will be made fully accessible using a range measures including wider dropped kerbs, shorter and more direct cross distances or the introduction of continuous footways

CLoS Scoring

A summary of the CLoS scoring for Link 11 (existing and proposed road layouts) is shown in Table 14.

Table 14: CLoS scoring - Link 11

Design Principles	Existing Road Layout		Proposed Road Layout (Option 1)		Proposed Road Layout (Option 2)	
Cohesion (out of 6)	1	17%	5	83%	5	83%
Directness (out of 10)	5	50%	5	50%	5	50%
Safety (out of 16)	6	38%	12	75%	14	88%
Comfort (out of 8)	1	13%	8	100%	8	100%
Attractiveness (out of 10)	2	20%	5	50%	6	60%
Adaptability (out of 4)	N/A	N/A	3	75%	4	100%
Total	15	30%	38	70%	42	78%

This link has an existing on-road provision for cyclists mixed with traffic. These streets are predominantly residential with relatively low traffic flows, suggesting the provision should be adequate for cyclists. The overall CLoS score of 15 (30%) is not much better than other on-road mixed traffic streets with higher vehicle flows and speeds (i.e. Link 8) so it should be noted:

- Link 8 has a critical 'Fail' for Safety which Link 11 does not
- Link 11 scores poorly for Comfort given the condition of the road surfacing along Queen's Lane North and Albert Lane

- Link 11 scores poorly for Attractiveness given the more secluded sections of route along Queen's Lane North and Albert Lane

In Option 1 that uses a continuation of the two-way cycle track, the CLoS score increases to 38 (70%) while for Option 2 that makes greater use of cycle street layouts the score improves to 42 (78%). Both options provide a high LoS with the scoring suggesting the cycle street layout along Rubislaw Den South provides a slight advantage over the cycle track. The reason for this can be explained by Figure 20 which shows the extent to which the CLoS score changes across the six core design principles. The cycle street layout (Option 2) can be seen to be slightly more Adaptable and Safer than the cycle track layout (Option 1). It should however be noted that both options have a mix of cycle tracks and cycle streets, so the assessment is not making a direct comparison between a cycle street and a cycle track but road layouts that have more of one than the other.

Both options have a reduced score for Attractiveness due to the reduced levels of natural surveillance along Queen's Lane North and Albert Lane which increase personal safety concerns particularly during the hours of darkness. The improvement in the Attractiveness score from the existing provision is due to the proposed improved lighting along these 'Lanes'.

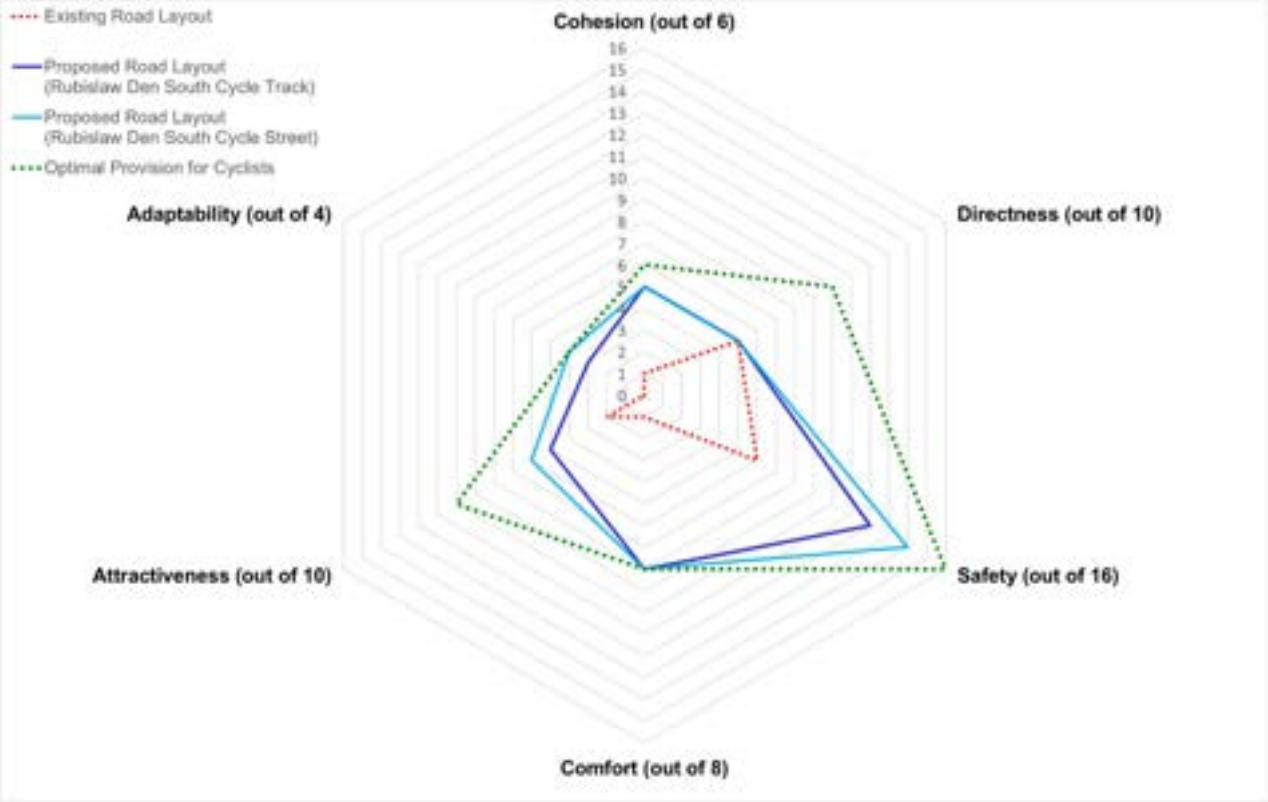

Figure 20: CLoS scoring - Link 11

Alternative Route via Queen's Road (Links 5 and 6)

Overview

This route along Queen's Road between the King's Gate and Queen's Cross roundabouts has two alternative routes (Parallel Route A and Parallel Route B). The route is defined in this CLoS assessment by combining Links 5 and 6 as shown in Figure 2.

Existing Road Layout

The existing road layout is described above for Links 5 and 6. This section of Queen's Road can be summarised as a heavily trafficked road with a 30 mph speed limit that accommodates frequent bus services and includes major junctions at King's Gate, Springfield Road, Anderson Drive, Forest Road and Queen's Cross.

Proposed Road Layout

The proposed road layout for this section of Queen's Road is described above for Links 5 and 6 and shown on Drawing Numbers 5514, 5515, 5516 and 5517 (Appendix B).

CLoS Scoring

The CLoS score for this section of Main Route has been calculated by averaging the CLoS scores across the indicators for Link 5 and Link 6[10]. A summary of these scores for the existing and proposed road layouts across the section of the Main Route is shown in Table 15.

Table 15: CLoS scoring – Main Route (Links 5 & 6)

Design Principles	Existing Road Layout		Proposed Road Layout	
Cohesion (out of 6)	0	0%	5	83%
Directness (out of 10)	3	30%	9	90%
Safety (out of 16)	X	X	15	94%
Comfort (out of 8)	2	25%	8	100%
Attractiveness (out of 10)	7	70%	6	60%
Adaptability (out of 4)	N/A	N/A	2.5	63%
Total	12	24%	46	84%

Links 5 and 6 have the same CLoS score (24 percent) reflecting the similar existing road layouts. Both links have cyclists effectively on-road and mixed with traffic as the advisory cycle lanes on Link 5 offers cyclists little protection. With cyclists mixed with heavy traffic flows and having to negotiate busy high speed junctions it is not surprising there were three Critical Fail scores for indicators that define Safety that included the speed of traffic through junctions; the volume and mix of traffic (HGV's/ buses); and lack of space for cyclists to pedal within these high volume/ high speed traffic flows. As such this section of Queen's Road is unsuitable for cyclists even confident existing users.

The proposed segregated one-way cycle tracks and major changes to junction improve the CLoS scores significantly. The extent to which the CLoS score changes across the six core design principles is shown in Figure 21 but with this overall score increasing to 84 percent the proposed road layout represents a high LoS as defined by CbD.

[10] The only exception to the average score calculation was to the Deviation Factor and Gradient indicators which were re-estimated using google earth between the start of Link 5 and end of Link 6.

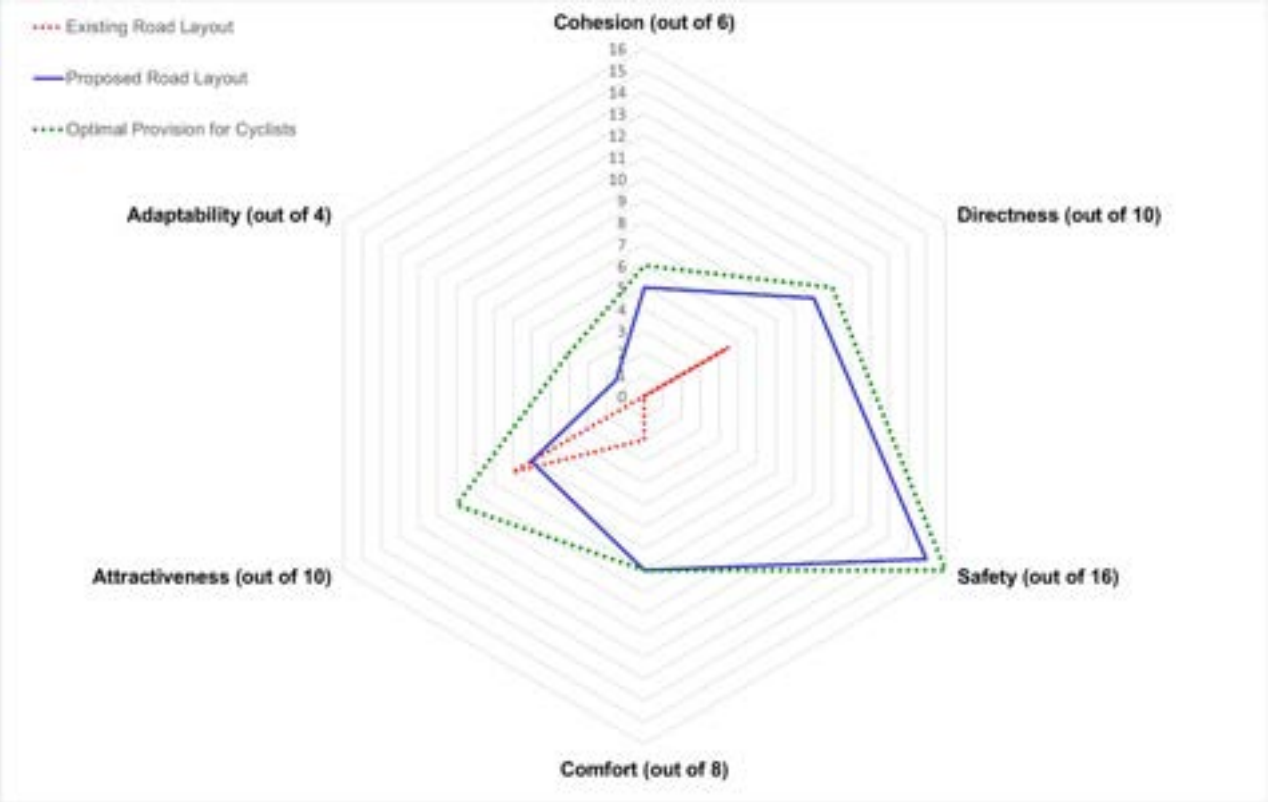

Figure 21: CLoS scoring - Main Route (Links 5 & 6)

Parallel Route A (Links 8 and 9)

Overview

This route using King's Gate and Rubislaw Den North offers and alternative route to Queen's Road between the King's Gate and Queen's Cross roundabouts. It is referred to as Parallel Route A and is defined within this CLoS assessment by combining Links 8 and 9 as shown in Figure 2.

Existing Road Layout

The existing road layout is described above in sections for Links 8 and 9. The routes uses King's Gate, Anderson Drive/ King's Cross Terrace, Carnegie Crescent, Moray Place, Rubislaw Den North, Forest Road, Desswood Place, Desswood Lane, Fountainhall Road, Albert Lane and Blenheim Place which is a combination of residential quiet streets and busier main roads.

Proposed Road Layout

The proposed road layout for the above roads is described above for the sections for Links 8 and 9 and shown on Drawing Numbers 5521, 5522, 5523, 5524 and 5525 (Appendix B). The key proposal that makes this route viable as a cycle route is the new signal controlled parallel crossing on Anderson Drive that allows cyclists and pedestrians to bypass the King's Gate/ Anderson Drive roundabout which is a major barrier to active travel.

CLoS Scoring

The CLoS score for Parallel Route A has been calculated by averaging the CLoS scores across the indicators for Links 8 and 9[11]. A summary of these scores for the existing and proposed road layouts is shown in Table 16. With a two-way cycle track (Option 1) or cycle street (Option 2) proposal for Rubislaw Den North two CLoS scores are given for the proposed road layout.

Table 16: CLoS scoring – Parallel Route A (Links 8 & 9)

Design Principles	Existing Road Layout		Proposed Road Layout (Option 1)		Proposed Road Layout (Option 2)	
Cohesion (out of 6)	0.5	8%	4	67%	4	67%
Directness (out of 10)	3	30%	5	50%	5	50%
Safety (out of 16)	X	X	14	88%	15	94%
Comfort (out of 8)	2.5	31%	8	100%	8	100%
Attractiveness (out of 10)	5.5	55%	6	60%	6.5	65%
Adaptability (out of 4)	N/A	N/A	2.5	63%	3	75%
Total	12	23%	40	73%	42	77%

The existing route requires cyclists to be on-road and mixed with traffic along the roads listed above. Most of these roads are quiet residential roads but the on-road environment along King's Gate and Fountainhall Road is much less suitable for cycling. The route between King's Gate and Carnegie Crescent currently requires cyclists to negotiate the Anderson Drive roundabout which is unsuitable for all cyclists. The combination of on-road cycling along busy 30 mph roads (King's Gate and Fountainhall Road) and junctions which are dangerous to cycle through, results in a CLoS score of 12 (23%). This indicates a low LoS as defined by CbD but with two Critical Fail scores for Safety this route for cycling cannot be recommended.

The proposed one and two - way cycle tracks, cycle streets, new crossings and junction layout changes provide a route for cyclists that has an overall CLoS score that ranges between 40 (73%) and 42 (77%) depending on whether a cycle track or cycle street is introduced on Rubislaw Den North.

Both the cycle track and cycle street provide a high LoS as defined by CbD with the scoring suggesting the cycle street layout has a slight advantage over the cycle track when considering proposals for Rubislaw Den North. The reason for this is explained in the description of the Link 9 CLoS Scoring.

[11] The only exception to the average score calculation was to the Deviation Factor and Gradient indicators which were re-estimated using google earth between the start of Link 8 and end of Link 9.

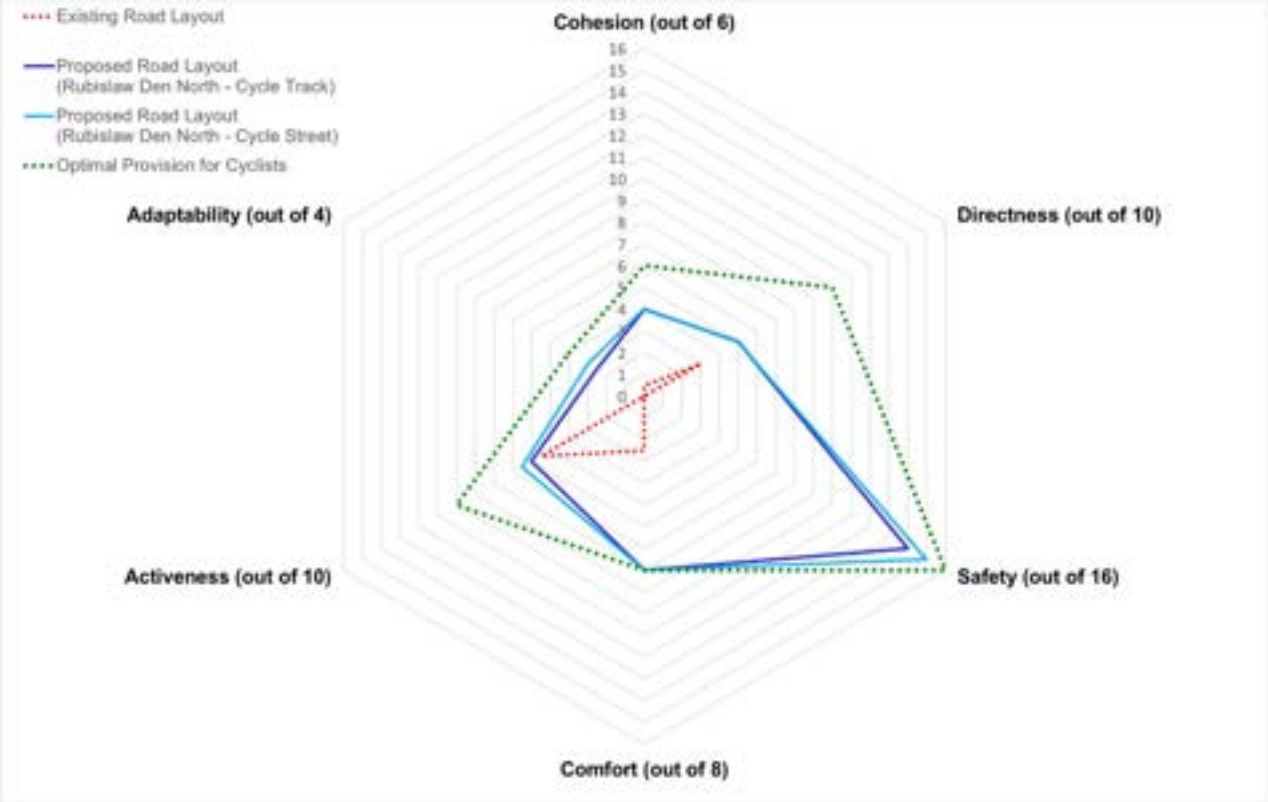

Figure 22: CLoS scoring - Parallel Route A (Links 8 & 9)

Parallel Route B (Links 8, 10 & 11)

Overview

This route using King's Gate and Rubislaw Den South offers and alternative route to Queen's Road between the King's Gate and Queen's Cross roundabouts. It is referred to as Parallel Route B and is defined within this CLoS assessment by combining Links 8, 10 and 11 as shown in Figure 2.

Existing Road Layout

The existing road layout is described above in sections for Links 8, 10 and 11. The routes uses King's Gate, King's Cross Terrace, King's Cross Road, Anderson Drive, Rubislaw Den South, Forest Road, Queen's Lane North, Albert Lane and Blenheim Place which is a combination of residential quiet streets, busier main roads and distributor roads.

Proposed Road Layout

The proposed road layout for the above roads is described above for the sections for Links 8, 10 and 11 and shown on Drawing Numbers 5521, 5522, 5526 and 5527 (Appendix B). The key proposal that makes this route viable as a cycle route is the new signal controlled parallel crossing on Anderson Drive that allows cyclists and pedestrians to bypass the King's Gate/ Anderson Drive roundabout which is a major barrier to active travel. Additionally, Anderson Drive between this crossing and Rubislaw Den South is significantly modified to accommodate a two-way cycle track.

CLoS Scoring

The CLoS score for Parallel Route A has been calculated by averaging the CLoS scores across the indicators for Links 8, 10 and 11[12]. A summary of these scores for the existing and proposed road layouts is shown in Table 17. With a two-way cycle track (Option 1) or cycle street (Option 2) proposal for Rubislaw Den North two CLoS scores are given for the proposed road layout.

Table 17: CLoS scoring – Parallel Route B (Links 8, 10 & 11)

Design Principles	Existing Road Layout		Proposed Road Layout (Option 1)		Proposed Road Layout (Option 2)	
Cohesion (out of 6)	0.3	6%	4.3	72%	4.5	75%
Directness (out of 10)	4.7	47%	6.3	63%	6.5	65%
Safety (out of 16)	X	X	14.3	90%	15.0	94%
Comfort (out of 8)	2.7	33%	7.3	92%	8.0	100%
Attractiveness (out of 10)	4.3	43%	6.0	60%	6.5	65%
Adaptability (out of 4)	N/A	N/A	2.7	67%	3.0	75%
Total	12	24%	41	76%	44	81%

The existing route requires cyclists to be on-road and mixed with traffic along the roads listed above. Most of these roads are quiet residential roads but the on-road environment along King's Gate and more importantly Anderson Drive including the Anderson Drive junction with King's Gate is unsuitable for cycling. The combination of on-road cycling along busy 30 and 40 mph roads and junctions which are dangerous to cycle through, results in a CLoS score of 12 (24%). This indicates a low LoS as defined by CbD but with three Critical Fail scores for Safety this route for cycling cannot be recommended.

The proposed two - way cycle tracks, cycle streets, new crossings and junction layout changes provide a route for cyclists that has an overall CLoS score that ranges between 41 (76%) and 44 (81%) depending on whether a cycle track or cycle street is introduced on Rubislaw Den South.

Both the cycle track and cycle street provide a high LoS as defined by CbD with the scoring suggesting the cycle street layout has a slight advantage over the cycle track when considering proposals for Rubislaw Den South. The reason for this is explained in the description of the Link 10 CLoS Scoring.

[12] The only exception to the average score calculation was to the Deviation Factor and Gradient indicators which were re-estimated using google earth between the start of Link 8 and end of Link 11.

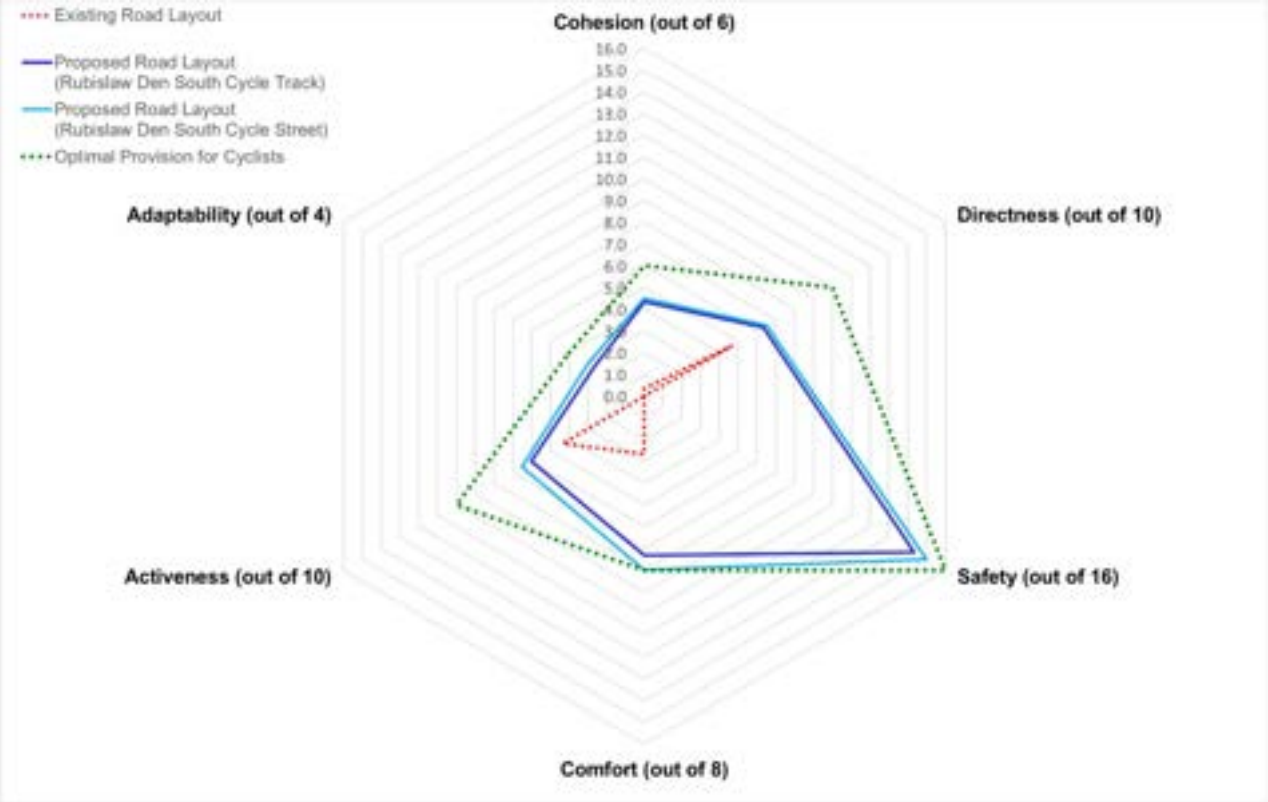

Figure 23: CLoS scoring - Parallel Route B (Links 8, 10 & 11)

Appendix E: Junction Assessment

Contents

The following qualitative assessment has been undertaken at 12 key junctions along the study corridor. It is based on four core design principles of Safety, Directness, Coherence and Attractiveness using the following indicators which are described above along with the scoring used.

- Conflicting movements – motor traffic (Safety)*
- Motor Traffic Speed Risk (Safety)*
- Delay (Directness)*
- Ability to join and leave the route (Coherence)
- Conflicting movements – pedestrians (Attractiveness)

Those indicators with an asterisk only consider the movements cyclists need to take to progress along the study corridor.

Westhill Drive j/w A944

Description

This medium-sized high-speed priority roundabout has two lane entry and exits on each of the four arms. The signal controlled crossing is a staggered shared-used facility on the western arm (Straik Road). There are informal crossings on the northern (Westhill Drive) and southern (Endeavour Drive) but no crossing provision on the eastern arm (A944). It is unclear whether these narrow footways are shared-use, but blue directional signage suggests they can be used for cycling. The proposed junction layout is shown in Drawing Number: 5502 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: From the southern footway/ shared-use path cyclists cross Straik Road using the staggered Toucan crossing and Westhill Drive at an uncontrolled crossing where pedestrians and cyclists must seek gaps in the flow of traffic to access the northern side of the A944 east of the junction
- **Proposed route for cyclists**: From the shared-use path on the southern side of Straik Road cyclists cross at an upgraded Toucan crossing (staggered route removed) to a widened shared-use path on the north-west corner of the junction. Cyclists cross Westhill Drive to access the two-way cycle track via a new Toucan crossing.

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic)*	Existing	Uncontrolled crossing of Westhill Drive with cyclists at risk of collision with traffic entering and exiting the roundabout on Westhill Drive	●	●●
	Proposed	Controlled straight-across shared-use crossing on Westhill Drive		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction are high. Cyclists are off-road but must cross Straik Road (under signal-control) and Westhill Drive (seeking gaps between traffic)	●	●●
	Proposed	Vehicle speeds on the approach, through and exit to the junction remain high. Cyclists remain off-road and needing to cross Straik Road (under signal-control) and Westhill Drive (under signal-control). Traffic speeds on Westhill Drive likely to reduce slightly with new signal controlled crossing		
Delay*	Existing	Cyclists use an off-set staggered crossing on Straik Road and must wait for gaps in traffic to cross Westhill Drive	●	●
	Proposed	The upgraded crossing on Straik Road removes the staggered route and new single stage shared-use crossing on Westhill Drive provided		
Ability to Join and Leave Route	Existing	Crossing facilities at the junctions on the Westhill Drive, A944 and Endeavour Drive are poor	●	●
	Proposed	Crossing provision on A944 and Endeavour Drive remain poor		
Conflicting Movements (pedestrians)*	Existing	Cyclists share the signal controlled staggered crossing of Straik Road and paths at the roundabout	●	●
	Proposed	No change, cyclists continue to use existing and new share-use facilities crossings and paths at the roundabout		

A9119 j/w A944

Description

This a four-armed signal controlled junction with the northern arm a minor access road associated with the Mayfield, Cherry Grove and Crommie Cottage residential properties. The only signal controlled crossing is a staggered shared-use facility on the western side of the junction. The proposed junction layout is shown in Drawing Number: 5503 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists bypass the junction by using the shared-use path and mixed traffic route via the residential access road that runs to the north of Crommie Cottage and adjacent residential properties
- **Proposed route for cyclists**: The proposals retain the existing route but with improved road markings and signage for wayfinding. The alternative option introduces a new signal controlled share-use crossing on the residential access road, but this is not the preferred option

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	Potential conflict with vehicles entering and exiting the residential access road but flows and risk of collision considered low	●●	●●
	Proposed	No change to existing provision		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction are high but cyclists are off-road and do not need to cross traffic lanes at the junction	●●	●●
	Proposed	Vehicle speeds on the approach, through and exit to the junction remain high and cyclists do not need to cross traffic lanes		
Delay*	Existing	Cyclists must give-way to traffic exiting the junction but traffic flows and therefore frequency of give-ways considered to be low	●●●	●●●
	Proposed	No change to existing provision		
Ability to Join and Leave Route	Existing	There is a signal controlled shared-use crossing on the A944 (E) arm but no crossing facilities on the A9119 approach although it does have an ASL. Cycle demand for the A9119 is likely to be low given nearby land uses	●	●
	Proposed	No change to existing provision		
Conflicting Movements (pedestrians)*	Existing	Shared-use paths and crossing widths considered adequate given the low footfall levels	●●	●●
	Proposed	No significant change to pedestrian comfort levels forecast		

A90 AWPR j/w A944 (roundabout - signal controlled)

Description

The junction is a grade-separated roundabout which is part signal controlled. There are seven exits and seven entries to the roundabout of which four of the entries are signal controlled. The proposed junction layout is shown in Drawing Numbers: 5505 and 5506 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists use an off-road route on the approach, through and exit to the junction using two signal controlled and two informal crossing facilities along a shared-use path that runs along the northern perimeter of the roundabout
- **Proposed route for cyclists**: Cyclists use an off-road route on the approach, through and exit to the junction using a two signal controlled crossing facilities to access a cycle track that runs along the northern perimeter of the roundabout island

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	Potential conflict with vehicles entering and exiting Borrowstone Road and Old Borrowstone Road particularly on the exits to the roundabout when vehicles speeds are likely to be high	●	●●
	Proposed	The new signal controlled parallel crossings on the circulatory lanes reduce the number of time cyclists have to cross traffic lanes at the junction		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction are high. Cyclists are off-road but need to cross at 4 locations (2 signal controlled and 2 informal crossing)	●●	●●
	Proposed	No change to vehicle speeds at the junction but cyclists only need to cross the road at 2 locations and both under signal control		
Delay*	Existing	Cyclist route crosses four arms to the roundabout (2 signal controlled and 2 informal crossings)	●	●●
	Proposed	New signal controlled parallel crossings on the circulatory lanes and cycle track along the northern perimeter of the roundabout island provide a more direct route through the junction for cyclists and pedestrians		
Ability to Join and Leave Route	Existing	There is limited opportunity to join or leave the route with the most likely being via Borrowstone Road and Old Borrowstone Road	●●	●●
	Proposed	No change to existing provision		
Conflicting Movements (pedestrians)*	Existing	Shared-use paths and crossing widths considered adequate given the low footfall levels	●●	●●
	Proposed	Segregated pedestrian and cycle route on the approach, through and exit to the junction. No significant change to pedestrian comfort levels forecast		

Kingswells Causeway j/w A944 (signal controlled)

Description

This is a large, signal controlled T-junction with three approach lanes on the western arm (A944), two on the northern arm (Kingswells Causeway) and four lanes on the eastern arm (A944). The only signal controlled crossing is a staggered facility on Kingswells Causeway. The proposed junction layout is shown in Drawing Number: 5507 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists use an off-road route on the approach, through and exit to the junction using a staggered shared-use signal controlled crossing on Kingswells Causeway
- **Proposed route for cyclists**: Cyclists use an off-road route on the approach, through and exit to the junction using a parallel signal controlled single stage crossing of Kingswells Causeway

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The conflicting movements when crossing Kingswells Causeway are signal controlled	●●	●●
	Proposed	The conflicting movements when crossing Kingswells Causeway remain signal controlled but cyclists are now able to cross in a single stage		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction are high. Cyclists use an off-road route to the north of the junction where the only interaction with traffic is when crossing Kingswells Causeway in two stages under signal control	●●	●●
	Proposed	Vehicle speeds on the approach, through and exit to the junction remain high. Cyclists remain off-road and cross Kingswell Causeway in a single stage under signal-control		
Delay*	Existing	Cyclists use an off-set staggered shared use signal controlled crossing of Kingswells Causeway	●	●●
	Proposed	Cyclists use an off-set parallel signal controlled crossing with traffic signal timings and cycle detection optimised to minimise the delay crossing Kingswells Causeway		
Ability to Join and Leave Route	Existing	Kingswells Causeway has shared-use paths on both sides of the road approaching the junction	●●	●●
	Proposed	No change to existing provision		
Conflicting Movements (pedestrians)*	Existing	Cyclists use a cycle track on the approach and exit to the junction and a staggered shared-use signal controlled crossing at the junction	●●	●●
	Proposed	Cyclists use a cycle track on the approach and exit to the junction and a parallel signal controlled crossing at the junction. No significant change to pedestrian comfort levels forecast		

Fairley Road j/w A944 (roundabout - signal controlled)

Description

The Fairley Road roundabout is a large high speed junction with three lane approaches on each of the four arms. The only signal controlled crossing is a staggered facility on Fairley Road. The proposed junction layout is shown in Drawing Number: 5508 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists use an off-road route (north of the A944) on the approach, through and exit to the junction using a signal controlled staggered shared-use crossing on Fairley Road
- **Proposed route for cyclists**: Cyclists use an off-road route (north of the A944) on the approach, through and exit to the junction using a signal controlled parallel single stage crossing of Fairley Road

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	Conflicting movements when crossing Fairley Road are signal controlled	●●	●●
	Proposed	Conflicting movements when crossing Fairley Road remain signal controlled but cyclists are now able to cross in a single stage		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is high, particularly on Fairley Road due to the roundabout geometry. Cyclists use an off-road route to the north of the junction where the only interaction with traffic is when crossing Fairley Road in two stages under signal-control	●●	●●
	Proposed	Vehicle speeds on the approach, through and exit to the junction remain. Cyclists remain off-road and cross Fairley Road in a single stage under signal-control		
Delay*	Existing	Cyclists use an off-set staggered shared-use signal controlled crossing of Fairley Road	●	●●
	Proposed	Cyclists use an off-set parallel signal controlled crossing with traffic signal timings and cycle detection optimised to minimise the delay crossing Fairley Road		
Ability to Join and Leave Route	Existing	There are no safe routes to join and leave the route	●	●
	Proposed	No change to existing provision		
Conflicting Movements (pedestrians)*	Existing	Pedestrians and cyclists use narrow shared-use paths and a staggered share-use crossing	●	●●
	Proposed	Pedestrians and cyclists have an enhanced shared-use path approach and exit to the junction and use a parallel crossing on Fairley Road		

A944 j/w Skene Road or 'Jessiefield roundabout' (roundabout – part signal controlled)

Description

The Jessiefield roundabout is a three-arm, part signal controlled junction with a westbound bypass lane between Skene Road and the A944. Two of the three entry lanes are signal controlled. The only signal controlled crossing is a staggered facility on northern A944 arm. The proposed junction layout is shown in Drawing Number: 5510 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists off-road route on the approach, through and exit to the junction via a shared-use staggered signal controlled crossing on the northern arm (Lang Stracht) of the roundabout
- **Proposed route for cyclists**: Cyclists use an off-road route on the approach, through and exit to the junction via a signal controlled parallel crossing on the northern arm (Lang Stracht) of the roundabout

CLoS Scoring

Anecdotal evidence from cycle campaign groups and during site visits suggest there is a compliance issue with the signal controlled crossing on the northern arm (Lang Stracht) of Jessiefield Road roundabout. Drivers have been observed running the red light which raises significant road safety risks for pedestrians and cyclists using this crossing.

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	Conflicting movements when crossing Fairley Road are signal controlled but anecdotal evidence from cycle campaign groups and site visits suggests there is a compliance issue with the signal controlled crossing on Lang Stracht with drivers observed running the red light. This raises significant road safety risks for pedestrians and cyclists	🔴	🔵🔵
	Proposed	The crossing Lang Stracht is moved away from the junction to improve driver visibility of the signal heads		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is high. This includes Lang Stracht and the approaches to the crossing	🔵	🔵
	Proposed	Vehicle speeds on the approach, through and exit to the junction remain high. While the location of the crossing is changed to improve driver visibility of the signal heads the speed of traffic approaching the crossing on Lang Stracht also unlikely to change		
Delay*	Existing	Cyclists use an off-set staggered shared-use signal controlled crossing of Lang Stracht	🔵	🔵🔵
	Proposed	Cyclists use an off-set parallel signal controlled crossing with traffic signal timings and cycle detection optimised to minimise the delay crossing Lang Stracht		
Ability to Join and Leave Route	Existing	There are no safe routes to join and leave the route. There is an off-line route away from the junction that connects Lang Stracht with Skene Road to the east of the junction	🔵	🔵
	Proposed	No change to existing provision		
Conflicting Movements (pedestrians)*	Existing	Pedestrians and cyclists use narrow shared-use paths and narrow staggered share-use crossing	🔵	🔵🔵
	Proposed	Pedestrians and cyclists have a segregated approach and exit to the junction and the crossing provides a parallel crossing on Lang Stracht		

King's Gate j/w Queen's Road (roundabout)

Description

The King's Gate roundabout is four-arm junction with two entry lanes on each approach. The roundabout is a priority junction, and all crossing facilities are uncontrolled using narrow pedestrian islands. The proposed junction layout is shown in Drawing Number: 5514 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists on-road route on the approach, through and exit to the junction
- **Proposed route for cyclists (Main Route)**: Cyclists use a shared-use area on the approach, through and exit to the junction. Crossing King's Gate and Queen's Road is provided parallel Zebra crossings
- **Proposed route for cyclists (Parallel Route)**: Cyclists use a shared-use area on the approach, through and exit to the roundabout

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The multi approach and circulatory lanes put cyclists at high risk of collision from vehicles at the roundabout	●	
	Proposed (Main)	Shared-use path and parallel Zebra crossings allow cyclists to bypass the roundabout but there is a residual risk associated with using the parallel Zebra crossings		●●
	Proposed (Parallel)	Shared-use path allows cyclists to bypass the roundabout removing all conflicting movements		●●●
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is high		
	Proposed (Main)	Geometry changes will reduce vehicle speeds on the approach, through and exit to the junction. The cycle route is off-road on shared-use paths where the only interaction with traffic is at the parallel Zebra crossings on King's Gate and Queen's Road	●	●●
	Proposed (Parallel)	Roundabout geometry changes will reduce the vehicle speeds on the approach, through and exit to the junction. The cycle route is off-road on shared-use paths removing all interactions with motor traffic		●●●
Delay*	Existing	Cyclists can bypass queues on the approach to the roundabout (via the cycle track and share-use areas) but to cross King's Gate and Queen's Road need to use the off-set parallel Zebra crossings		
	Proposed (Main)	Cyclists can bypass traffic on the approach to the roundabout (via the cycle track and share-use areas) located on the north-west perimeter of the roundabout	●●	●
	Proposed (Parallel)	The on-road provision via the roundabout makes it difficult for cyclists leave and join the route		●●
Ability to Join and Leave Route	Existing	The on-road provision via the roundabout makes it difficult for cyclists leave and join the route		
	Proposed (Main)	The shared-use paths and crossings make it easier to join and leave the roundabout from King's Gate but not Hazlehead Avenue	●	●●
	Proposed (Parallel)	There is little improvement to joining the route from Queen's Road or Hazlehead Avenue		●

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (pedestrians)*	Existing	Cyclists are on-road so no impact on pedestrian comfort levels	●●●	●
	Proposed (Main)	Pedestrians share the footway with cyclists and these shared-use areas only meet minimum standard widths. There is a nearby school. The proposals do however widen pedestrian refuge islands on all approaches to the roundabout and include parallel Zebra crossing that reduce the negative impacts of the proposals		
	Proposed (Parallel)	Pedestrians share part of the footway with cyclists and these shared-use areas (at locations) only meet minimum standard widths. There is a nearby school		●

Springfield Road j/w Queen's Road (T-junction - signal controlled)

Description

This three-armed signal controlled junction has two approach lanes on the western (Queen's Road) and southern (Springfield Road) arms. There are signal controlled crossings and ASL's on each arm of the junction. The proposed junction layout is shown in Drawing Number: 5514 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists on-road mixed with traffic on the approach, through and exit to the junction
- **Proposed route for cyclists**: Cyclists on-road at the junction but where cyclists are in cycle tracks on the approach and exit to the junction and have advisory cycle lane markings within the junction

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	Cyclists at risk from left-turn hook, heavy opposing flows (when cyclists turning right) and drivers seeking gaps when turning right. The ASL's provide cyclists some protection from conflicting movements but only when the approach is on a RED signal	●	●●
	Proposed	Cycle tracks extend up to junction stop lines and cyclists provided an 'early release' at the stop line. Advisory cycle lane markings extended through junction to raise driver awareness of cycle movements		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is considered high given the size and location of the junction and with respect to cycling that is on-road and mixed with traffic	●	●●
	Proposed	Vehicle speeds on the approach, through and exit to the junction is likely to reduce. Traffic lanes are narrowed and the space within the junction for right-turners reduced. Road markings will highlight the presence of cyclists		
Delay*	Existing	Cyclists are on-road on the approach, through and exit to the junction experiencing no significant additional delay compared to motor traffic	●●	●●
	Proposed	Cyclists can use the cycle tracks to bypass traffic queues on the approaches to the junction while cyclists given an 'early release' at stop lines. Safer but no significant change to cycle journey times expected		
Ability to Join and Leave route	Existing	Cycle access to and from Springfield Road achievable within existing method of signal control with cyclists exposed to the above conflicting movements	●	●●
	Proposed	New shared-use crossing to make cycle right turns safer		
Conflicting Movements (pedestrians)*	Existing	Cyclists are on-road so no impact on pedestrian comfort levels	●●	●●
	Proposed	Cyclists remain on-road. Shared-use crossing introduced to make turning movements safer and widened to mitigate impact on pedestrian comfort levels		

Anderson Drive j/w Queen's Road (Roundabout - priority)

Description

The Anderson Drive roundabout is a large four arm junction with three lane approaches on the western (Queen's Road) and southern (Anderson Drive) arms. The only signal controlled crossings are the southern (Anderson Drive) and eastern (Queens Road) arms and both off-set from the junction. The proposed junction layout is shown in Drawing Number: 5516 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists on-road but given the high speed/ flow traffic and vehicle movements at the junction it is expected most cyclists will use the footways
- **Proposed route for cyclists**: Cyclists on-road using cycle tracks on the approach and exit to the roundabout. Cyclists are off-road at the junction using shared-use areas and signal controlled parallel crossings on Anderson Drive

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The multi- approach and circulatory lanes put cyclists at very high risk of collision from vehicles entering and existing the roundabout	🔴	🟢🟢
	Proposed	Majority of conflicting movements removed as cyclists use an off-road provision via shared-use areas and signal controlled parallel crossings on Anderson Drive. Given the speed of traffic there remains some residual risk of conflict at the signal controlled parallel crossings		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is high	🔴	🔵🔵🔵
	Proposed	Vehicle speeds on the approach, through and exit to the junction remains high but cyclists segregated from traffic and under signal-control when crossing Anderson Drive		
Delay*	Existing	Cyclists are on-road on the approach, through and exit to the junction experiencing no significant additional delay compared to motor traffic	🟢🟢	🔵
	Proposed	Cyclists are off-road using a combination of shared-use areas and signal controlled parallel crossings to cross Anderson Drive. These crossing facilities are off-set from the junction and cyclists must cross under signal controls		
Ability to Join and Leave route	Existing	There are no suitable cycle routes along Anderson Drive	🔵	🔵
	Proposed	There remains no suitable cycle routes along Anderson Drive but the new crossing facilities provide an opportunity to develop improved links in future		
Conflicting Movements (pedestrians)*	Existing	Cyclists are on-road so no impact on pedestrian comfort levels. Given the risk to cyclists at this junction it is likely most cycling will occur on the narrow footways that surround the roundabout	🔵	🟢🟢
	Proposed	Cyclists are off-road using areas of shared-use to access the crossings on Anderson Drive. The footways have been widened to facilitate shared-use and the crossings have a parallel provision for cyclists		

Forest Road j/w Queen's Road (roundabout) or 'Forest Road roundabout'

Description

The Forest Road roundabout is a small four arm junction which has single lane approaches and off-set signal controlled crossings on all arms. The proposed junction layout is shown in Drawing Number: 5517 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists on-road on the approach, through and exit to the roundabout
- **Proposed route for cyclists**: Cyclists on-road using cycle tracks on the approach and exit to the signal controlled junction. Advisory cycle lanes provided within the junction with two-stage right turns.

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The multi- approach and circulatory lanes put cyclists at high risk of collision from vehicles entering and existing the roundabout	●	●●
	Proposed	Cycle movements through junction under signal control although still shared with motor traffic. ASL's and cycle 'early release' reduce ahead and right-turn conflicts. Two-stage right-turns proposed		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the junction is high relative to the size and location of the junction and with respect to on-road cycling mixed with traffic	●	●●
	Proposed	Replacing the roundabout with a signal controlled cross-roads and introducing cycle tracks on the approaches and exits and advisory cycle lanes through the junction is likely to reduce vehicle speeds		
Delay*	Existing	Cyclists are on-road and mixed with traffic on the approach, through and exit to the junction suggesting no additional delay when compared to motor traffic	●●	●●
	Proposed	Cyclists can use the cycle tracks to bypass traffic queues on the approaches to the junction while cyclists given an 'early release' at stop lines. Safer but no significant change to cycle journey times expected		
Ability to Join and Leave route	Existing	The on-road provision at the roundabout makes it difficult for cyclists leave/ join the route	●	●●
	Proposed	The signal controlled junction with integrated cycle tracks and lanes on all approaches		
Conflicting Movements (pedestrians)*	Existing	Cyclists on-road so no impact on pedestrian comfort levels at the junction but the risks to cyclists at the junction suggest some cycling will be on the narrow footways	●	●●●
	Proposed	Cyclists remain on-road but within a segregated provision so no impact on pedestrian comfort levels at the junction		

Queen's Road j/w Fountainhall Road, Carden Place & Albyn Place (Roundabout - priority)

Description

The Queen's Cross roundabout is a five-arm junction with two-lane entries and limit deflection for straight through traffic. There are signal controlled crossings on each arm. This roundabout poses and significant risk to cyclists given the speed and volume of traffic using it. The proposed junction layout is shown in Drawing Number: 5517 (Appendix B) and introduces a protected cycle track roundabout layout or 'Dutch style arrangement'. This provides segregated cycle tracks on the perimeter of the roundabout and parallel Zebra crossings on each arm to provide a segregated route for cyclist and pedestrians. The arrangement requires changes to the Albyn Place arm that removes general traffic entering Albyn Place from the roundabout

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists assumed to be on-road but with the risks associated with the speed and movement of traffic at the roundabout it is expected most cyclists will use the narrow footways
- **Proposed route for cyclists**: Cyclists use the protected track on the perimeter of the roundabout and parallel Zebra crossings on the roundabout arms

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The multi- approach and circulatory lanes put cyclists at very high risk of collision from vehicles entering and existing the roundabout	●	●●
	Proposed	A segregated cycle route on the perimeter of the roundabout with parallel Zebra crossings on all arms to the junctions reduces the frequency and risk of conflicting movements. There remains some potential for collision at the parallel Zebra crossings but this should reduce as drivers become more familiar with the layout and operation of the junction		
Motor Traffic Speed Risk*	Existing	Vehicle speeds on the approach, through and exit to the roundabout is high relative to the size of the junction	●	●●●
	Proposed	Vehicle speeds will be slow due to the reduced space for general traffic, the Zebra controlled crossings and tighter turning radii on the approach, through and on the exit to the roundabout		
Delay*	Existing	Cyclists are on-road and mixed with traffic on the approach, through and exit to the junction suggesting no additional delay when compared to motor traffic	●●	●●●
	Proposed	Cycle track allows cyclists to bypass traffic on the approach to the roundabout and the parallel Zebra crossings give cyclists priority over motor traffic through the junction		
Ability to Join and Leave route	Existing	The on-road provision at the roundabout makes it difficult for cyclists leave or join the route	●	●●●
	Proposed	The protected cycle track roundabout layout makes it easy for cyclists to join and leave the route		
Conflicting Movements (pedestrians)*	Existing	Cyclists are on-road but the risks to cyclists at the junction suggests most cycling will be on the narrow footways and so will have a negative impact on pedestrian comfort levels	●	●●●
	Proposed	The cycle tracks, footways and parallel Zebra crossings give cyclists and pedestrians a separate provision and so will improve pedestrian comfort levels at the junction		

Skene Street j/w Rosemount Viaduct (signal controlled)

Description

This four-arm signal controlled cross-roads has signal controlled crossings and ASL's on all arms/ approaches. The western arm (Skene Street) has a separately controlled left turn lane. The proposed junction layout is shown in Drawing Number: 5520 (Appendix B).

The existing and proposed routes for cyclists at this junction can be summarised as:

- **Existing route for cyclists**: Cyclists on-road with cyclists travelling inbound needing to turn right from Skene Street to Rosemount Viaduct and outbound cyclists turning left from Rosemount Viaduct
- **Proposed route for cyclists**: As existing but with advisory cycle lanes within the junction. Early-release and two-stage right turns provided.

CLoS Scoring

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (motor traffic) *	Existing	The inbound right turn from Skene Street is opposed by traffic in the opposite direction requiring cyclists to wait within the junction and seek gaps with traffic passing each side. The outbound left turn has a pinch point on the exit to the junction (Skene Street) created by a traffic island and requiring cyclists to maintain a primary riding position to remain safe		
	Proposed	Inbound cyclists are provided a two-stage right turn and the traffic island is removed on the Skene Street (W) eliminating the pinch point. The proposed cycle lanes on the approach, through and within the junction will raise driver perceptions of cycle movements at the junction and so help reduce conflicts		
Motor Traffic Speed Risk*	Existing	The junction is located on the edge of the city centre 20 mph zone and is signal controlled with pedestrian crossing facilities on all arms which will moderate vehicle speeds at the junction. The area of the junction is however relatively constrained so there are banned right turns on Rosemount Viaduct (in both directions) and Skene Street (E) which will increase traffic speeds along Rosemount Viaduct. Overall traffic speeds through the junction are considered moderate to high with respect to on-road cycling that is mixed with traffic		
	Proposed	The cycle lane proposals on the approach, through and on the exit to the junction narrows traffic lanes and so is likely to reduce vehicle speeds compared to existing conditions		
Delay*	Existing	Cyclists are on-road and mixed with traffic on the approach, through and exit to the junction suggesting no significant additional delay compared to motor traffic		
	Proposed	Cyclists can use the cycle tracks to bypass traffic queues on the approaches to the junctions while cyclists given an 'early release' at stop lines. Safer but no significant change to cycle journey times expected		
Ability to Join and Leave route	Existing	Cyclists are banned from making right turns from Rosemount Viaduct (in both directions) and from Skene Street (E)		
	Proposed	Two-stage right turns are introduced that allow cyclists to make all turning movements at the junction. It is proposed to retain the existing banned turns for motor traffic		

Indicator	Layout	Analysis	Score	
			Existing	Proposed
Conflicting Movements (pedestrians)*	Existing	Cyclists on-road so no impact on pedestrian comfort levels	●●	●●
	Proposed	Cyclists remain on-road and all pedestrians crossing facilities retained/ improved so no impact on pedestrian comfort levels		