



Dundee Western Gateway Active Travel Feasibility Study

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Dundee City Council



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1. Study Context

1.1 Introduction

In May 2021, Jacobs was appointed by Dundee City Council (DCC) to undertake a feasibility study of new and improved active travel routes for the Western Gateway area of Dundee. The study identifies options for improved infrastructure that will facilitate walking, wheeling, and cycling for everyday journeys by local people. In addition to routes and connections, recommendations have been made for signage, cycle parking and other complementary measures.

This report presents the findings of our work, which has identified and appraised a range of route options and interventions, identified key risks and constraints to implementation, and provided high-level capital cost estimates construction of the proposed route improvements.

The study has been informed by our own desktop research and site visit and has been complemented by early engagement with stakeholders and members of the local communities.

Following this introduction, this report is structured as follows:

- Section 2: background and existing situation;
- Section 3: overview of approach to assessing options;
- Section 4: options for proposed route improvements;
- Section 5: estimates of capital construction costs;
- Section 6: recommendations for wayfinding, cycle parking and complementary measures;
- Section 7: summary and recommended next steps;
- Appendix A: appraisal tables for each option considered;
- Appendix B: high-level design drawings for each of the route options recommended for further consideration.

1.2 About Western Gateway

The Western Gateway development area is located on the western edge of Dundee, just north of the A90 Kingsway. There has been a long-standing vision for strategic housing growth in this location, with the aspiration to create a village environment with a range of housing, community facilities and amenities.

Over 700 homes and a village centre have already been approved (with over 1,000 homes to be in place once the development is complete), and the village centre will include a cafe, nursery, village hall, retail, and office use, as well as open and recreational spaces. Landscaped footpath links are to be provided to enable access to community facilities and larger amenity spaces. There are also proposals for primary school provision to be provided within the area, to be completed by 2025.

Due to the scale of the development, there is a commitment to upgrade the A90 Swallow Roundabout junction to a signalised junction, with pedestrian crossing points to allow access across the dual carriageway and a pedestrian/cycle path connecting to the existing route along Dykes of Gray Road.

1.3 Scope of study

The study area for this commission broadly follows the boundary of the Western Gateway Development Framework area¹. The core study area is shown in Figure 1-1, which also provides detail of existing route connections, both within Western Gateway, and also where routes connect to the wider active travel network in the vicinity of the development area.

The study has focused on identifying route improvements within this defined boundary, including connections to and across the A90 Kingsway (to provide onward connections to the rest of Dundee). Options for improvement to the south of the Kingsway are out with the scope of this commission; however, work by DCC is ongoing to define improved networks for active travel across Dundee as part of its Cycling Strategy² and complementary work³, and therefore connectivity between local routes and the wider city area will be considered as work progresses.

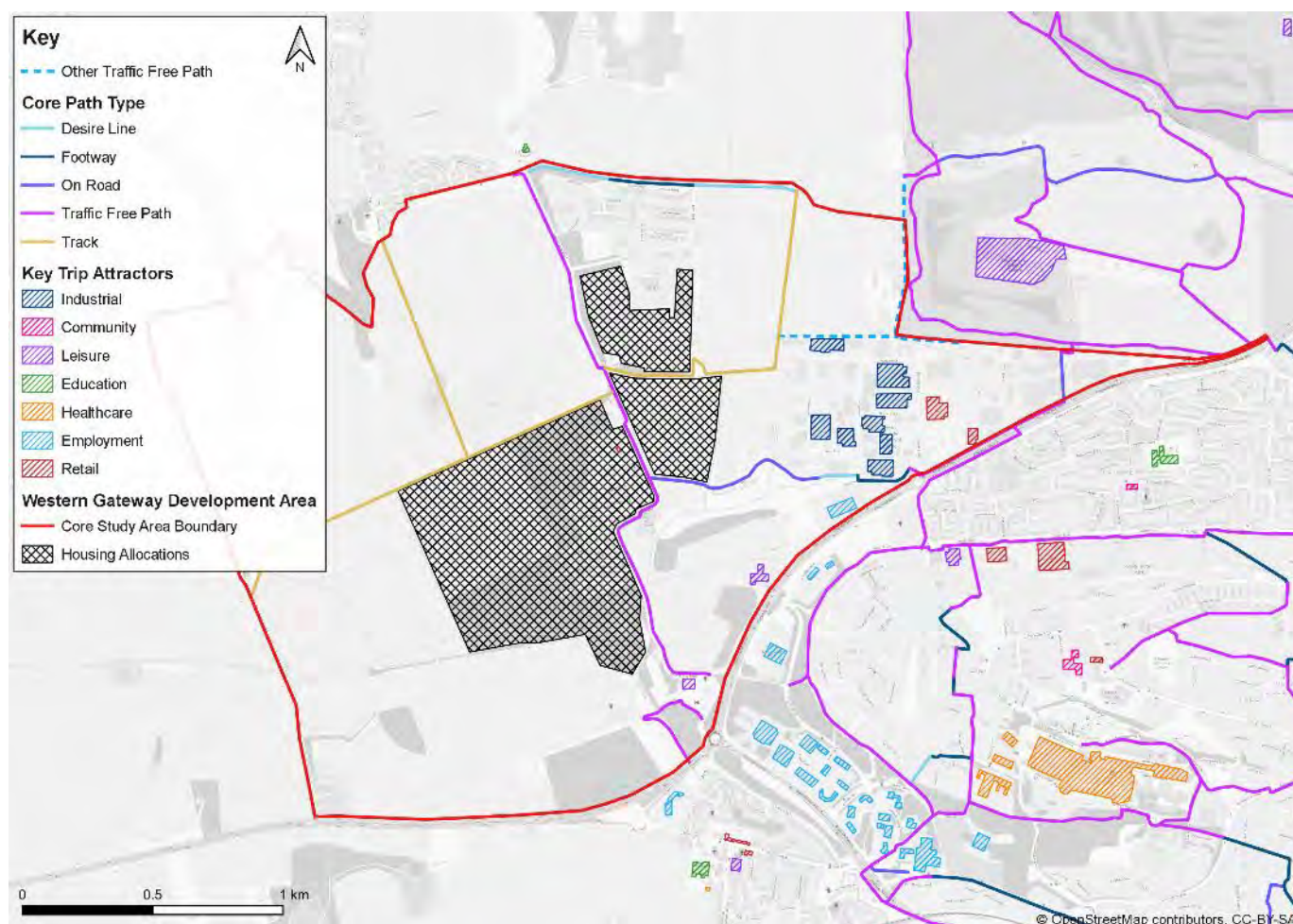


Figure 1-1 - Feasibility study area

¹ <https://www.dundee.gov.uk/service-area/city-development/local-development-plan/western-gateway-development>

² https://www.dundee.gov.uk/sites/default/files/publications/dundee_cycle_strategy_2019.pdf

³ https://www.dundee.gov.uk/sites/default/files/publications/benefits_of_active_travel_in_dundee_final.pdf

1.4 Summary of problems and opportunities

Section 2 of this report (Background and Existing Situation)) provides more detail on the current problems and opportunities to encouraging greater uptake of active travel in Western Gateway. To set the scene and provide initial context, a summary of the key problems and opportunities are outlined below.

Table 1-1: Problem Themes

Problem Theme	Description
Poor Accessibility / Connectivity	Limited permeability for all users due to restricted path widths, rough ground, limited crossing provision, etc
	Few local amenities within the Western Gateway area and significant segregation of the area from the rest of Dundee caused by busy roads and lengthy distances
	Limited route options to local amenities in wider area, particularly west to east connections
	Discontinuous provision and linkages in places
	Lack of formal crossings at Swallow Roundabout
Limited and Constrained Infrastructure	Existing formalised routes are not to current design standards (e.g. narrow shared use path on Dykes of Gray Road)
	Poor surface conditions of informal paths (e.g. overgrown vegetation, uneven surfaces, drainage issues, etc)
	Limited or no signage; lack of lighting
Real and Perceived Safety	Anecdotal evidence (received through engagement feedback) of vehicles not observing speed limits
	Lack of lighting and signage exacerbates real and perceived unsafe environment for pedestrians and cyclists

Table 1-2: Opportunity Themes

Opportunity Theme	Description
Improved Accessibility / Connectivity	Evidence of well-used informal routes and desire lines
Planned Residential/Other Development	Opportunities to tie improvements in with ongoing/planned residential developments
	Potential to secure developer contributions towards cost of upgrades
	Planned Swallow Roundabout upgrade will provide key crossing of the Kingsway
	Plans for primary school provision at Western Gateway by 2025 will enable local active travel journeys by young people and their families to school

Opportunity Theme	Description
Route Development	Several potential route improvement options possible for connecting people to wider services/amenities
	Availability of physical space creates opportunities for high-quality segregated routes
	Proposals for local amenities within Western Gateway offer opportunities for residents to make local journeys by active travel modes

1.5 Study Objectives

With the above context and issues in mind, the study objectives were defined and agreed with the client team at inception; that options for improvement must seek to provide high quality, attractive routes for people walking, wheeling, and cycling:

- Within and between existing and proposed Western Gateway development sites;
- To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network;
- To community facilities, schools, employment, and retail; and
- To local active leisure/recreation opportunities.

Route options have been appraised against the above objectives, as well as a range of other criteria, as detailed in section 3.

2. Background and Existing Situation

2.1 Summary of key issues

Dykes of Gray village is the core area within the Western Gateway development; connected directly to Liff in Angus and to Kingsway West (A90) by Dykes of Gray Road. This study has identified five key routes (A to E) to help facilitate the optioneering exercise, Figure 2.1. This section presents an overview of existing conditions for active travel in the area, focussing on these five key routes; information has been gathered from various sources including desktop review, site visit and early engagement with stakeholders and local community representatives.

2.2 Route Corridor Assessment

Five key routes within the study have been identified for assessment. These are:

- Route A – Liff (Church Road) to A90 Kingsway (Swallow Roundabout);
- Route B – Denhead of Gray to Myrekirk Junction/Myrekirk Road;
- Route C – Dykes of Gray Road to Liff Road;
- Route D – Liff to Camperdown Park;
- Route E – Liff Road to A90 Kingsway.



Figure 2-1 – Dundee Western Gateway Key Routes

2.2.1 Route A – Liff (Church Road) to A90 Kingsway (Swallow Roundabout)

This route is the key connection for existing and proposed developments, providing links to Liff to the north, to Dundee and Invergowrie to the south. A recently constructed path alternates between the east and west side of Dykes of Gray Road, with uncontrolled crossing points in place. The path runs from Church Road in Liff to approximately 250m north of Swallow Roundabout. The speed limit of the road has recently been reduced from 60mph to 40mph, however high traffic speeds were observed at the time of the site visit, and anecdotal feedback from engagement with community representatives reinforced this. Red carriageway surfacing has recently been installed in an attempt to combat high speeds.

There is an existing crossing point on Church Road which connects the shared use path to Liff Primary School and provides access to Liff and beyond for residents of Springfield housing development. This crossing point links Dundee City Council to Angus Council area. Liff Primary School is a key trip attractor for surrounding developments, with some children from the Dundee attending the school on placing requests. The Spar at Dykes of Gray is also a trip attractor for those living in Liff and in existing and proposed developments in-between.

Whilst Dykes of Gray is a busy area for pedestrians and despite these key services, there is little in the way of dedicated infrastructure, signage or lighting for walkers, wheelers, and cyclists to move around the area safely or comfortably. There are no controlled crossings, poor provision of uncontrolled crossings and no tactile paving, limiting accessibility for disabled people.

There is also an existing unsurfaced path connecting Dykes of Gray Road with Benvie and Liff which currently has overgrown vegetation obstructing the path. The surface of the path is not well maintained and there is no lighting in place for the entirety of the route.

To the southern end of Dykes of Gray Road, there is no formal connection to Swallow Roundabout. There are desire lines along the verges on either side of Dykes of Gray Road towards Swallow Roundabout, as can be seen in Figure 2-2. To cross the Kingsway, the current signed route is via the Landmark Hotel grounds, then following the Invergowrie Burn to an underpass, under the A90, to Mill Road in Invergowrie. The existing route is not surfaced (Figure 2-23) and is prone to flooding. There is currently no lighting and the route is not direct.

There are no formal pedestrian/cyclist crossing points of the Kingsway at Swallow Roundabout, but these are included in the planned upgrade of the junction. There is a desire line just to the north of the roundabout where people choose to cross the Kingsway.




Figure 2-2 – Liff (Church Road) to A90 Kingsway (Swallow Roundabout)

Table 2-1: Route A Problems and Opportunities

Problems	Opportunities
<ul style="list-style-type: none"> • Existing path next to Dykes of Gray Road is narrow and does not cover the full route • Requirement to cross Dykes of Gray Road at several points • No provision for pedestrians or cyclists towards or crossing the A90 Kingsway • Requirement to walk next to the carriageway to access Swallow Roundabout • Crossing required to get to signed route and underpass • Existing paths are not lit • Lack of signage • Land ownership constraints 	<ul style="list-style-type: none"> • Space to widen existing Dykes of Gray Road path • Space to extend Dykes of Gray Road path towards Swallow Roundabout • Opportunity to provide controlled crossings of Dykes of Gray Road • Opportunity to incorporate crossing into planned signalisation of the roundabout

Site Visit – Existing conditions

		
<p>Figure 2-3 - Path northbound on Dykes of Gray Road</p>	<p>Figure 2-4 - Good internal network of paths within development</p>	<p>Figure 2-5 – Denhead of Gray/Dykes of Gray Road junction</p>



		
<p>Figure 2-6 – Crossing from east to west of Dykes of Gray Road</p>	<p>Figure 2-7 – Path northbound on west side of Dykes of Gray Road</p>	<p>Figure 2-8 – Track from Dykes of Gray Road to Benvie</p>

<p>Figure 2-9 – Crossing of Church Road in Liff</p>	<p>Figure 2-10 – Denhead of Gray/Dykes of Gray Road junction</p>	<p>Figure 2-11 – Path on east side of Dykes of Gray Road</p>

<p>Figure 2-12 – No path towards Swallow Roundabout from end of shared use path</p>	<p>Figure 2-13 – Former road towards Kingsway from Dykes of Gray Road</p>	<p>Figure 2-14 – Desire lines on south side of Dykes of Gray Road towards Swallow Roundabout</p>

<p>Figure 2-15 – Desire lines on north side of Dykes of Gray Road towards Swallow Roundabout</p>	<p>Figure 2-16 – Junction between Dykes of Gray Road and Landmark Hotel</p>	<p>Figure 2-17 – Signed route through Landmark Hotel grounds</p>

<p>Figure 2-18 – Signed route to Invergowrie via Landmark Hotel</p>	<p>Figure 2-19 – Reasonable path surface within grounds of Landmark Hotel</p>	<p>Figure 2-20 – Poor path surface out with the Landmark Hotel grounds</p>

		
<p>Figure 2-21 – Route signage</p>	<p>Figure 2-22 – Poor surface quality by Invergowrie Burn</p>	<p>Figure 2-23 – Path via underpass is liable to flooding</p>

	
<p>Figure 2-24 – Shared use path as it enters Invergowrie</p>	<p>Figure 2-25 – Connection to Mill Road in Invergowrie</p>

2.2.2 Route B – Denhead of Gray to Myrekirk Junction/Myrekirk Road

Connecting existing and proposed developments to West Gourdie Industrial Estate is seen as a priority route; providing opportunity to access employment and retail opportunities (which includes Asda and Aldi supermarkets). At present there is no formal path connecting Denhead of Gray to Fulton Road/Nobel Road. The current informal route for pedestrians and cyclists is on-road via Denhead of Gray then a poorly surfaced, informal path from Denhead of Gray to Nobel Road, where cyclists join the carriageway at Fulton Road and a footway is provided for pedestrians.

There is no provision for cyclists from Fulton Road to the trip attractors within the industrial estates. The images below show the condition of the current path from Fulton Road to the east end of Denhead of Gray. Some sections are surfaced but of limited width and some sections are steep, narrow, and muddy. Figure 2-30 shows the steep section of path heading eastbound towards the industrial estate. A shallower gradient would be required to increase the accessibility and comfort for users of all abilities. There are key crossing points of the Kingsway on both the east and west arms of the Myrekirk Junction.

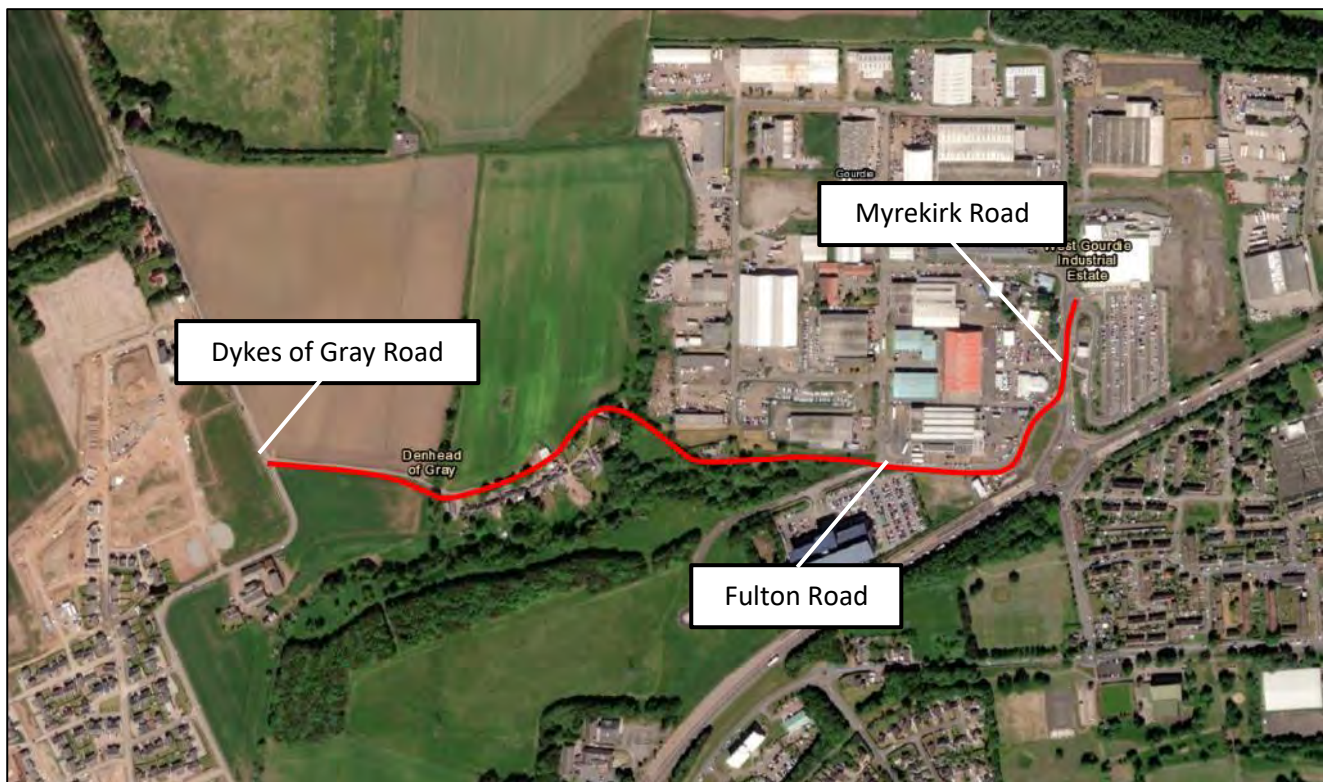





Figure 2-26 – Denhead of Gray to Myrekirk Road (Asda)

Table 2-2: Route A Problems and Opportunities

Problems	Opportunities
<ul style="list-style-type: none"> • Steep slope and lack of surfacing at section to west of Nobel Road • Lack of lighting • Lack of signage • Pedestrians and cyclists currently required to use the road (Denhead of Gray) for western half of the route • Land ownership 	<ul style="list-style-type: none"> • Space available for widening of existing section from Denhead of Gray to Nobel Road • Space available to create shared use path on north side of Denhead of Gray

Site Visit – Existing Conditions

		
<p>Figure 2-27 – Surfaced path from Nobel Road westbound</p>	<p>Figure 2-28 – Unsurfaced path westbound towards Denhead of Gray</p>	<p>Figure 2-29 – Steep, unsurfaced path westbound towards Denhead of Gray</p>

		
<p>Figure 2-30 – Steep unsurfaced path eastbound from Denhead of Gray</p>	<p>Figure 2-31 – Pedestrians and cyclists use road on Denhead of Gray</p>	<p>Figure 2-32 – Pedestrians and cyclists use road on Denhead of Gray</p>

2.2.3 Route C – Dykes of Gray to Liff Road

An alternative (or additional) route linking the developments to West Gourdie Industrial Estate is via Liff Road, to the west of its junction with Myrekirk Road. This follows the northern perimeter of the industrial estate before continuing west towards the proposed developments and onwards to Dykes of Gray Road.

The potential route would route through land currently owned by Forestry and Land Scotland. Poor drainage was noted on site, as can be seen in Figure 2-38. The route is also steep, particularly towards a potential connection to Whitelawston Cottages. Figure 2-34 shows the existing informal path where it connects with Liff Road, where there is currently no provision for pedestrians or cyclists. This route could become a circular route in conjunction with the proposed route on Denhead of Gray (Route B).



Figure 2-33 – Dykes of Gray Road to Liff Road

Table 2-3: Route A Problems and Opportunities

Problems	Opportunities
<ul style="list-style-type: none"> • Steep gradient and lack of surfacing along entire section • Lack of lighting • Lack of signage • Poor drainage • Land ownership 	<ul style="list-style-type: none"> • Space available for developing a suitable path • Opportunity to reduce gradient of path

<p>Figure 2-34 – Path access looking east towards Liff Road</p>	<p>Figure 2-35 – Path access looking north, narrow footway on east side</p>	<p>Figure 2-36 – unsurfaced path looking west from Liff Road</p>

<p>Figure 2-37 – Poor drainage looking south</p>	<p>Figure 2-38 – Poor drainage looking north</p>	<p>Figure 2-39 – Looking south towards the development</p>

2.2.4 Route D – Liff to Camperdown Park

There is currently no complete path connecting Liff to Camperdown Park, with only a partial, poorly surfaced path running along the north of the development, from Liff to the east (see Figure 2-45). Pedestrians were noted to be using the road, where there are blind bends and limited carriageway widths. There are desire lines in the fields (owned by Forestry and Land Scotland) on the south side of the road (see Figure 2-41) which link Liff with Camperdown Park and an existing informal track to the south. An existing narrow footway extends from Liff Road towards Camperdown Park (see Figure 2-35). There is potential for this route to link with an existing track (see Figure 2-43) to the south, which could connect with a potential path on Route C.

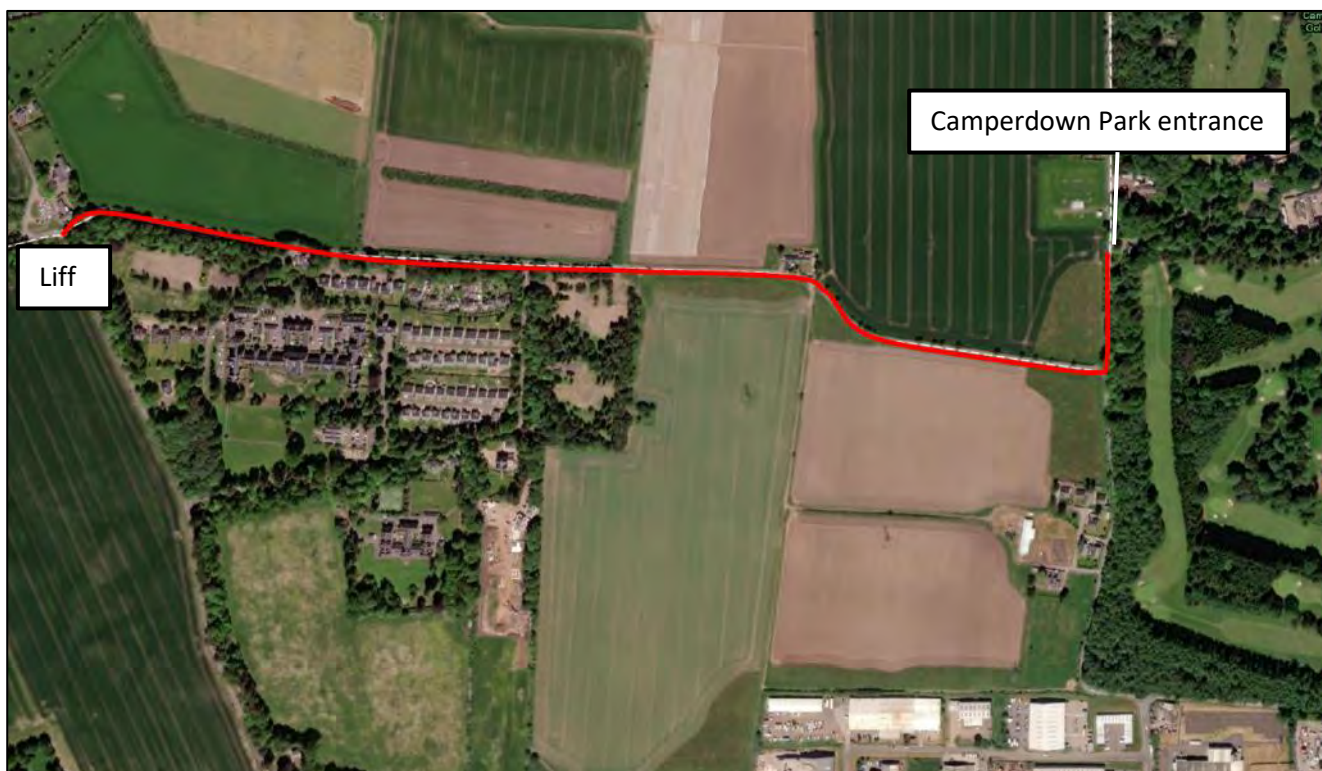





Figure 2-40 - Liff to Camperdown Park

Table 2-4: Route A Problems and Opportunities

Problems	Opportunities
<ul style="list-style-type: none"> • Unsurfaced path • Land ownership • Path not lit • Lack of crossing points • Limited visibility in places 	<ul style="list-style-type: none"> • Land available for developing a suitable path

		
<p>Figure 2-41 – Desire lines looking west towards Liff</p>	<p>Figure 2-42 – Desire lines looking west towards Liff</p>	<p>Figure 2-43 – Track looking south towards development site</p>

		
<p>Figure 2-44 – Connection to existing informal path in Liff</p>	<p>Figure 2-45 – Existing informal path on north side of Liff development, looking east.</p>	<p>Figure 2-46 – Existing informal path on north side of Liff development, looking east.</p>

2.2.5 Route E – Liff Road to A90 Kingsway

Liff Road runs along the south side of Camperdown Park, connecting Liff and areas to the north, to the A90 Kingsway and West Gourdie Industrial estate. There is a footway on the south side of Liff Road between Myrekirk Road and the Kingsway where it crosses to the north side, via an uncontrolled crossing. To the west of Myrekirk Road, there is limited provision for pedestrians on Liff Road. Figure 2-48 and Figure 2-49 show the narrow footway on the north/east side of Liff Road. There is potential to connect to an informal path through fields (Route c) which could connect Liff Road to the existing and proposed Western Gateway developments. The Green Circular cycle route runs north/south through Camperdown Park, crossing Liff Road just to the east of Whittle Place. It was noted that improvements are currently being made to the Camperdown Park internal path network. There is a key crossing point of the Kingsway just to the east of Liff Road, where it meets the Kingsway.



Figure 2-47 - Liff Road to A90 Kingsway

Table 2-5: Route A Problems and Opportunities

Problems	Opportunities
<ul style="list-style-type: none"> • Narrow footway • Width constraints • Land ownership • Lack of lighting • Lack of crossing points 	<ul style="list-style-type: none"> • Land available for developing a suitable path • Opportunity to connect to Camperdown Park path network and Green Circular cycle route • Opportunity to connect to potential path to existing and proposed developments

Site Visit – Existing conditions

		
<p>Figure 2-48 – Narrow footway on west side of Liff Road</p>	<p>Figure 2-49 – Liff Road looking east</p>	<p>Figure 2-50 – South side of Liff Road</p>

2.3 Stage 1 Stakeholder and Community Engagement

Engagement for this commission has comprised of two key stages; the first stage of engagement with stakeholders and community representatives was undertaken at the same time as desktop research and site visit, to gather views on current location-specific problems and opportunities to inform development of options, and secondly to gather feedback on the proposed route options, as detailed later in this report.

During late May/early June 2021, two separate Microsoft Teams workshop sessions were undertaken with a range of public sector representatives, and separately with members of local community organisations and active travel interest groups. A summary of the activities and key feedback is provided below.

2.3.1 Issues and opportunities workshop with public sector stakeholders

Date of session: 26th May 2021, 10.30 – 12.00

Attendee name and organisation:

- James Mullen, Dundee City Council;
- Alistair Hilton, Dundee City Council;
- John Whyman, Dundee City Council;
- Mike Giblin, Dundee City Council;
- Marianne Scott, Cycling Scotland;
- Neil Quinney, Sustrans, Perth and Kinross Council;
- Paul Downie, Sustrans, Angus Council;
- John McDonald, Transport Scotland;
- Jason Gillespie, SYSTRA/Transport Scotland.

Others who were invited but did not attend:

- Michael Sandeman, Dundee City Council;
- Mike Welsh, Dundee City Council;
- Haytham Abubaker, Dundee City Council;
- Paul Clark, Angus Council;
- Dave Stubbs, Perth, and Kinross Council;
- Jane Pritchard, Perth, and Kinross Council;
- Merry Smith, Tactran.

2.3.2 Issues and opportunities workshop with community and interest groups

Date of session: 2nd June 2021, 18.00 – 20.00

Name of organisation attending:

- Western Gateway Community Group (four representatives);
- West Green Park Residents & Proprietors Association (one representative);
- Dundee Cycling Forum (one representative);
- Dundee Biking, Riding & Walking Forum (one representative).

Organisations that were invited but did not attend:

- Muirhead, Liff & Birkhill Community Council;
- Invergowrie & Kingoodie Community Council.

2.3.3 Summary of engagement feedback

A summary of key location-specific issues regarding existing provision arising from both sessions is provided below:

- Dykes of Gray Road below standard for walking and cycling (poor lighting, fast-moving motor traffic, a criss-cross of pedestrian footway and carriageway and conflicts in users from pedestrians, cyclists, and horse riders);
- Crossing into the Landmark Hotel to join the Invergowrie path network is very difficult, especially with children, due to poor visibility;
- People frequently walk on the road along 'U328 Gourdie Brae Branch to C11 Junction' road between Whitelawston Cottages and Gourdie Brae;
- Path north-west of the Swallow Hotel is not suitable for bikes;
- No crossing points at Swallow Roundabout;
- Muddy path at Denhead of Gray;
- Very muddy path running from Dykes of Gray Road to West Gourdie Industrial Estate;
- At Myrekirk Roundabout (signalised junction) buttons do not always work and crossing time is long with unnecessary waits;
- Several trip hazards on the path between Dykes of Gray Road and Invergowrie Burn;
- Camperdown Park is a great asset but very difficult to access from the west, on foot or by bike. Several paths could be potential routes but need maintenance or upgrading;
- No path access to pub/hotel/restaurant (Gourdie Croft);

- Good public transport links from Asda superstore; potential for a mobility hub.

The online whiteboard tool Mural was used to capture views in both sessions, in addition to notes taken during the discussion. Furthermore, the (now closed) Dundee Commonplace map was also used to review any comments relating to the Western Gateway area: <https://dundeespacesforpeople.commonplace.is/comments>.

3. Option Assessment Methodology

3.1 Overview of approach

This section provides detail on how route options have been appraised against a broad range of criteria. Given the scale of this commission, our approach to appraisal has been to undertake:

- Appraisal against Study Objectives: An initial, high level qualitative assessment of each route and the interventions on it against each of the agreed study objectives detailed in section 1.5, considering the relative size and scale of the likely impacts;
- Appraisal against Sustrans’ Places for Everyone and Transport Scotland’s recently updated Cycling by Design guidance; see section 3.3 below;
- Appraisal of implementability: An initial, high level assessment of each route and the interventions on it, following the principles of STAG implementability criteria:
 - Feasibility: A preliminary assessment of the feasibility of construction or implementation of an option and the status of its technology as well as any cost, timescale or deliverability risks associated with the construction;
 - Affordability: The scale of the financing burden on the promoting authority and other possible funding organisations and the risks associated with these;
 - Public Acceptability: The likely public response to implementation of the option (gauged using feedback received from stakeholder and community engagement, and our own professional judgement).
- Identification of significant risks and constraints: A high level assessment of anticipated issues, including include land ownership, topography/gradients, physical space, flooding/drainage issues, etc;
- High level review of environmental constraints, using published datasets (reviewed for issues including air quality, heritage, noise & vibration, habitats and biodiversity, agriculture and soils, landscape & visual amenity, water, drainage and flood defence, water quality, and geology).

3.2 Assessment scale

Each of the route options and accompanying interventions have been assessed against the study objectives and design guidance using a seven-point scale that considers the relative size and scale of the likely impacts, in qualitative terms. Individual scores have then been averaged and assigned a Red-Amber-Green (RAG) rating as shown in Table 3-1. For feasibility, cost and public acceptability ratings, a three point “tick” scoring system has been used, as outlined in Table 3-2.

Table 3-1: Seven-point scoring scale

Contribution towards objectives/criteria	Score given
Major benefit	+3
Moderate benefit	+2
Minor benefit	+1
Neutral	0
Minor cost or negative impact	-1
Moderate cost or negative impact	-2
Moderate cost or negative impact	-3

Table 3-2: Feasibility/Cost/Public Acceptability scoring

Feasibility/Cost/Public Acceptability Rating	Score given
Good	✓✓✓
Average	✓✓
Poor	✓

Full details of each of the options that have been appraised are provided in Section 4, with a summary table that presents the average score for each option against the above criteria, a commentary on the option’s performance or impact and a recommendation as to whether the option should be taken forward for further assessment or sifted out, along with the rationale behind the recommendation. Full details of the appraisal are contained in Appendix A.

3.3 Sustrans’ Places for Everyone

As referenced above, options have been assessed against Places for Everyone (PfE) design principles. Sustrans have created these to guide the development of projects which would be seeking funding from the PfE programme. Each of the route options has been assessed against the following principles⁴, which are to:

- Develop ideas collaboratively and in partnership with communities;
- Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old;
- Design places that provide enjoyment, comfort, and protection;
- Ensure access for all and equality of opportunity in public space;
- Ensure all proposals are developed in a way that is context-specific and evidence-led; and
- Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling, and wheeling over private motor vehicles.

3.4 Transport Scotland Cycling by Design

Where provision for cyclists is being considered, Cycling by Design principles⁵ have been used to assess the options against the following core criteria:

- **Attractiveness** – Design should complement and enhance its environment in such a way that cycling is attractive;
- **Coherence** – Design should be continuous and consistent from origin to destination;
- **Comfort** – Design should meet surface width, quality and gradient standards and be convenient by avoiding complex manoeuvres;
- **Directness** – Design should be as direct as possible and minimise detours and delays. The impact of junctions and crossings on journey times should be considered;

⁴ <https://www.sustrans.org.uk/our-blog/projects/2019/scotland/places-for-everyone>

⁵ Jacobs has undertaken the update to Cycling by Design on behalf of Transport Scotland; updated guidance was published in September 2021 <https://www.transport.gov.scot/media/50323/cycling-by-design-update-2019-final-document-15-september-2021-1.pdf>

- **Safety** – Design should minimise the potential for actual and perceived risk of accidents for all users;
- **Adaptability** – Design should consider the potential for future expansion and cater for an anticipated rise in the number of people cycling.

Furthermore, options have been assessed against two additional criteria:

- **Accessibility** – Design should comply with the Equality Act 2010 and cater for all types of cycle;
- **Deliverability** – Constraints and objections should be overcome in delivery timeframe.

4. Options for Route Improvements

This section outlines the interventions proposed, based on the route assessments undertaken in Section 2.2. Detailed descriptions of the options are included. A summary of the option assessment is presented and recommendations on whether or not to retain for further consideration. Examples of the different types of interventions are also presented.

Table 4-1 at the end of this section presents the outcomes of the scoring for all options; the full appraisal scoring is then contained in Appendix A.

4.1 Route A: Liff (Church Road) to A90 Kingsway (Swallow Roundabout)

Intervention A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout)

Description:

A bi-directional, 3-metre-wide segregated cycleway alongside a 2-metre-wide path for pedestrians, separated by a 0.5m wide segregation from the Church Road intersection in Liff, to the A90 Swallow Roundabout. The proposed segregated path would run parallel to Dykes of Gray Road and connect the existing and proposed developments with Liff, Dundee and the west.

As there are plans for further housing developments within the area, there will be a further increase the pedestrian traffic along this route. Dykes of Gray Road will likely be the main route to Liff, Dundee and beyond, therefore there will be a need to provide controlled crossings and measures to highlight the crossing point to drivers, such as signage and road markings, to improve safety for all users.

To ensure suitable warning for people with visual impairments and make the route more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing points, in line with 'Roads for All' guidance. The speed limit on Dykes of Gray Road has recently been lowered from 60mph to 40mph outside of the built-up areas. A reduction in speed limit from 40mph in built up areas would also be essential.

Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night. A drawing of Option A1a segregated pathway can be found in Appendix B. The interventions proposed in Figure 4-1 along Dykes of Gray Road from Liff to the A90 Kingsway West are:

- Controlled crossing of Church Road;
- Controlled crossing of Dykes of Gray Road to link development site;
- Segregated pathway on west side of Dykes of Gray Road;
- Controlled crossing of Dykes of Gray Road to link future development site (the path changes from the west side of the road to east side due to the lack of space available, path continues on east side to Kingsway);
- Segregated pathway on east side of Dykes of Gray Road;
- Controlled crossing of Dykes of Gray Road to Spare and local facilities;
- Controlled crossing of Dykes of Gray Road to link to Nethergray Entry;
- Provision of lighting for the entirety of the route;
- Connect to planned controlled crossing of the Kingsway.

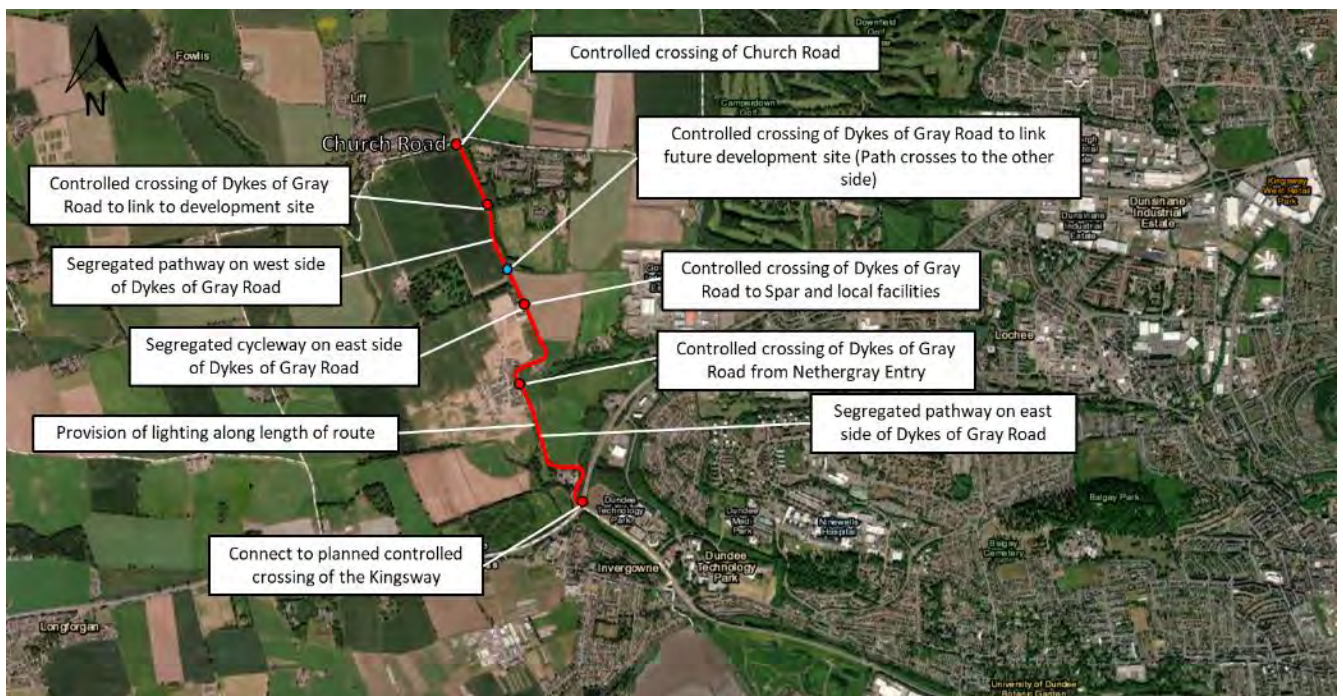


Figure 4-1 - Option A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout), Two-Way Segregated Pathway

As an alternative to a two-way segregated pathway, a shared use path following the same route as the proposed segregated pathway can be implemented, with the widening of the existing path where necessary. The path would be widened to 2-3m based on Cycling by Design standards. However, this would be subject to detailed design guidance.

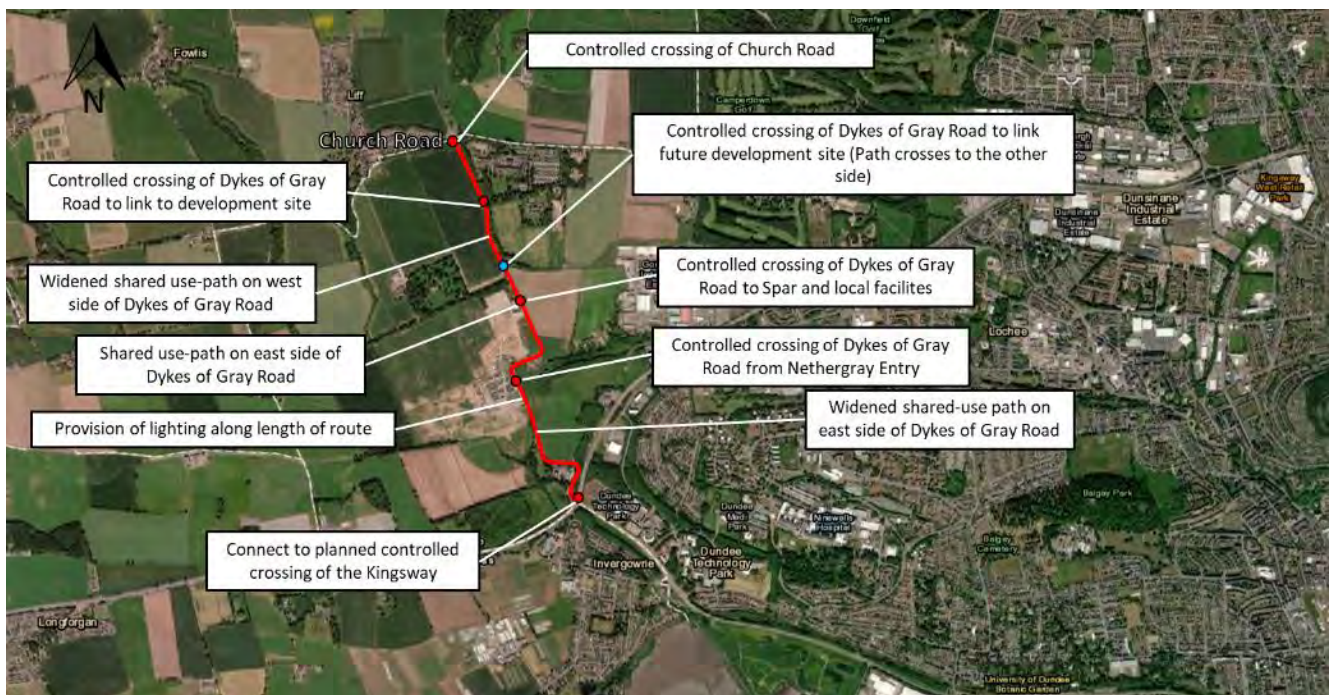


Figure 4-2 - Option A1a (alt): Liff (Church Road) to A90 Kingsway (Swallow Roundabout), Widened Shared-Use Path (Alternative to Two-Way Segregated Pathway)

Option Assessment:

The segregated pathway has scored higher in the Objectives rating, PfE Design Principles rating and Cycling by Design rating as it provides a safer and much more desirable option by segregating the pedestrians and cyclists.

The shared-use path is a less costly alternative to the segregated pathway, however, based on best practice and feedback from public engagement, the segregated pathway is the desired option. Land ownership is a constraint for both options and if the segregated pathway is proven to be undeliverable then a widened shared-use path would be the alternative.

Recommendation: It is recommended that if sufficient space is available adjacent to Dykes of Gray Road, the segregated pathway should be taken forward as a viable option and prioritised over the shared-use path, as this enables pedestrians and cyclists to be separated. This is based on the latest emerging guidance for Scotland, which recommends pedestrians and cyclists to be segregated from one another. However, there will be many challenges such as land ownership and it is assumed that the shared-use path would cost less than the fully segregated option, this is subject to detailed design and costings.

Option A1b: Dykes of Gray Road South to existing path to Green Circular

Description:

A shared-use path connecting Dykes of Gray Road to the Green Circular, crossing the Kingsway via a new bridge and Explorer Road via a new controlled crossing. The path would connect the developments to a key cycle route, allowing for onward access to the east and north. This path should be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance. The path would follow the route of a disused road, from Dykes of Gray Road to the Kingsway.

A new grade separated crossing of the Kingsway would be required, as a standalone controlled crossing at this point on the Kingsway was deemed inappropriate due to traffic levels. A walking and cycling bridge would be the preferred type of crossing here in order to ensure safety and comfort.

To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing point, at Explorer Road, in line with 'Roads for All' guidance. Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night. The interventions proposed in Figure 4-3 from Dykes of Gray Road to the Green Circular are:

- Connection to existing path to north;
- Shared-use path;
- Pedestrian/cycle bridge;
- Controlled crossing;
- Connection to Green Circular.

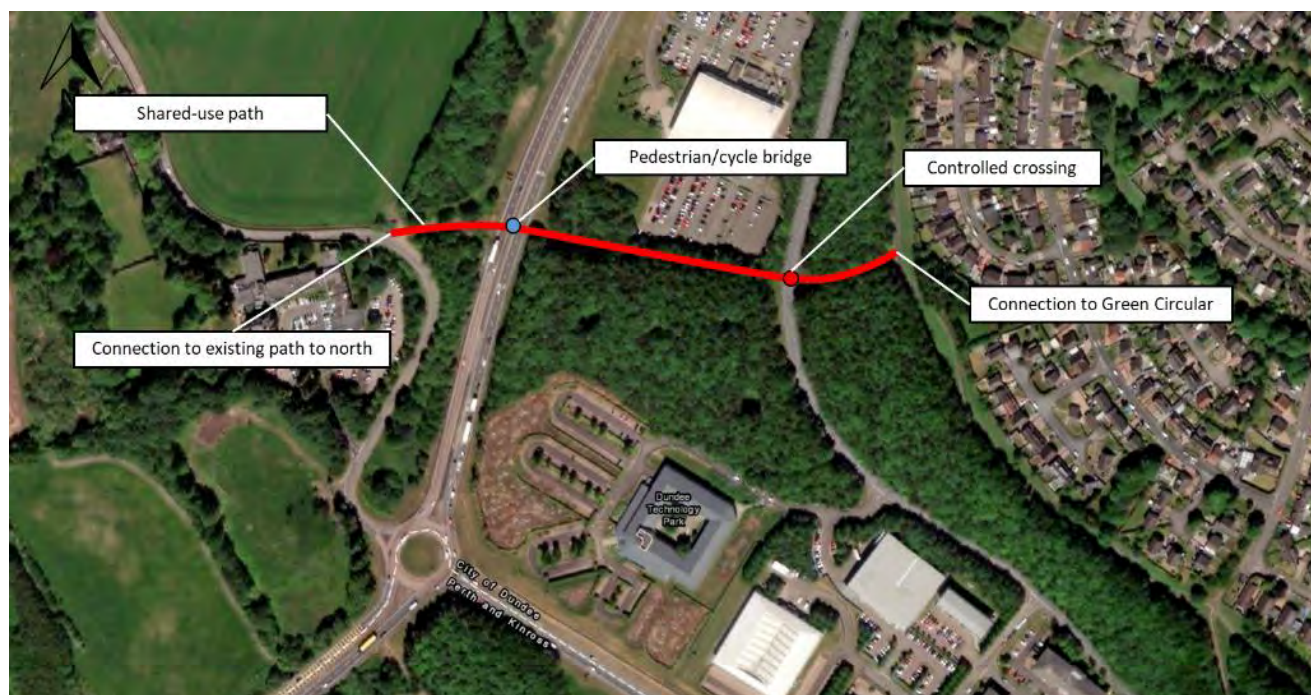


Figure 4-3 - Option A1b: Dykes of Gray Road South to existing path to Green Circular.

Option Assessment:

The pathway has scored low in Objectives and Cycling by Design rating as it does not provide a direct connection to the proposed Western Gateway development sites and would be not adaptable for future developments.

Additionally, the bridge is an expensive intervention and will not provide much benefit to the current infrastructure since an at-grade crossing is already being brought forward at Swallow Roundabout.

Recommendation: It is recommended that this intervention is not taken forward due to the significant costs involved. A signalised crossing is being proposed as part of the proposed Swallow Roundabout upgrades, which would provide a more financially viable crossing point of the Kingsway. An additional grade separated crossing would therefore not be considered good value for money.

Intervention A1c: Dykes of Gray Road South to Mill Road Shared-Use Path

Description:

A shared-use path from the southern end of the existing shared-use path on Dykes of Gray Road, to Mill Road in Invergowrie, via the existing signed route through the Landmark Hotel grounds. This path should be suitable for walkers, wheelers, and cyclists, indicatively 2-3 m (Cycling by Design standards) but subject to detailed design guidance. Additionally, the existing sections of the route will require resurfacing and clearance of overgrown vegetation.

To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing point on Dykes of Gray Road, in line with 'Roads for All' guidance. Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night.

The interventions proposed in Figure 4-4 from Dykes of Gray Road to Mill Road are:

- Connection to existing path to north;

- Shared-use path on east side of Dykes of Gray Road;
- Controlled crossing of Dykes of Gray Road;
- Re-surfacing and widening of existing signed path;
- Provision of lighting and improved signage along length of the route;
- Existing underpass improvements such as lighting, paint, and artwork, and making accessible for a range of cycle types;
- Connection to Mill Road.

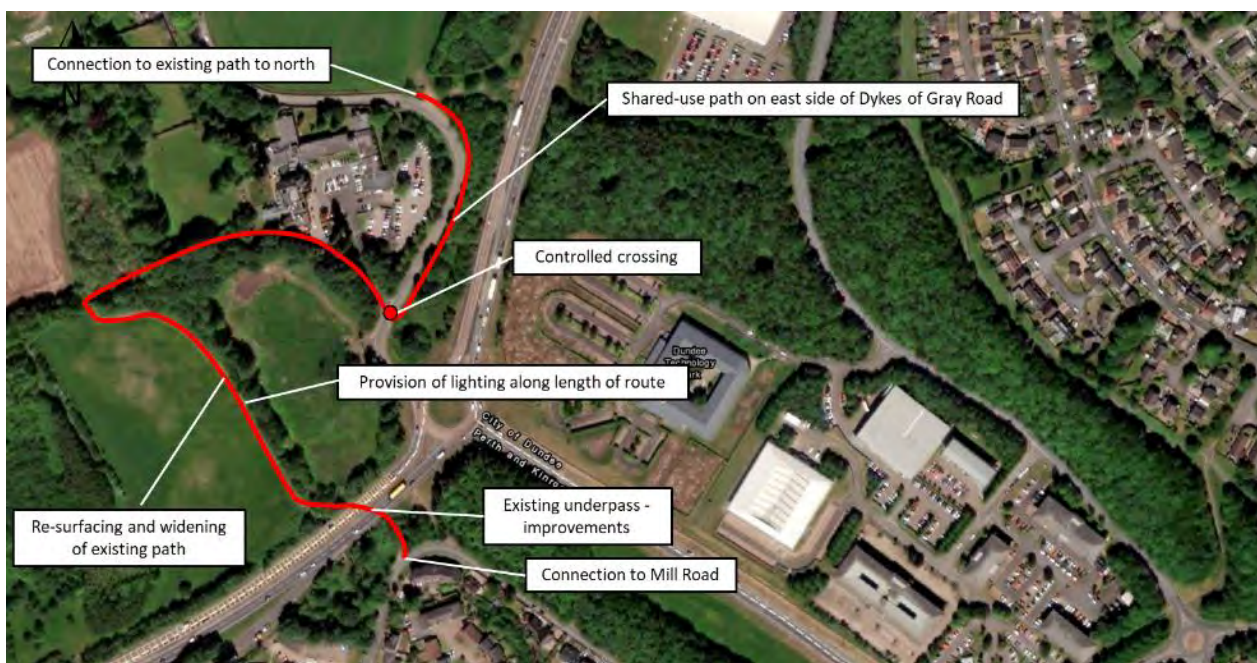


Figure 4-4 - Option A1c: Dykes of Gray Road South to Mill Road Shared-Use Path

Option Assessment:

The pathway has scored low in Objectives rating, PfE Design Principles rating and Cycling by Design rating as it does not provide a direct connection to the proposed Western Gateway development sites, it is also not suitable for unaccompanied 12-year-olds due to the path passing through a rural, undeveloped area and underpass which is prone to flooding.

Furthermore, the path does not provide a direct route across the Kingsway compared to the forthcoming at-grade crossing of the Swallow Roundabout and feedback from the public engagement found this to be one of the least desired interventions.

Recommendation:

It is recommended that this intervention is not be taken forward as a viable option. Various concerns were raised by the public in regard to the safety of this route in evenings and during adverse weather conditions. The underpass and its surrounding areas are prone to flooding. The plans for an at-grade signalised crossing at Swallow Roundabout would provide a more attractive alternative to routing via the underpass.

Intervention A1d: South of Development Site to Mill Road Shared-Use Path

Description:

A new shared-use path from the south of the development site, joining the existing sighted route to Invergowrie via the A90 underpass, to Mill Road. This path should be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance. Additionally, the existing sections of the route will require resurfacing and clearance of overgrown vegetation.

Additionally, improved signage to promote the path as 'Walking and Cycling Friendly', along with the provision lighting is proposed, to ensure safety and allow for the path to be utilised at all times. The interventions proposed in Figure 4-5 from Dykes of Gray Road to Mill Road are:

- Shared-use path connects to path network to south of development;
- Re-surfacing and widening of existing path;
- Provision of lighting along length of route;
- Existing underpass improvements such as lighting, paint, and artwork, and making accessible for all cycle types;
- Connection to Mill Road.



Figure 4-5 - Option A1d: South of Development Site to Mill Road Shared-Use Path

Option Assessment:

The pathway has scored low in Objectives rating, PfE Design Principles rating and Cycling by Design rating as it does not provide a direct connection to the proposed Western Gateway development sites, it is also not suitable for unaccompanied 12-year-olds due to the path passing through a rural, undeveloped area and underpass which is prone to flooding. Furthermore, feedback from the public engagement found this to be one of the least desired interventions.

Recommendation:

It is recommended that this intervention is not taken forward as a viable option. Various concerns were raised by the public in regard to the safety of this route in evenings and during adverse weather conditions. The underpass and its surrounding areas are prone to flooding. The plans for an at-grade signalised crossing at the Swallow Roundabout would provide a more attractive alternative to routing via the underpass.

Intervention A2: Dykes of Gray Road to Benvie/Liff Path Improvements

Description:

Surface improvements to the existing off-road path from Dykes of Gray Road to Benvie and Liff. This path may be suitable for walkers, wheelers, and cyclists, presumably 2-3m (Cycling by Design standards) but subject to further site investigation. Additionally, the route will require improved signage to formalise the path.

This would create a connection with Benvie and Liff from the newly developed Springfield housing development. The interventions proposed in Figure 4-6 adjacent to Dykes of Gray Road are:

- Connection to Church Road;
- Surface improvements to existing off-road path – full road specification needed given vehicular use;
- Clearing of vegetation;
- Connection to Benvie and route to south.

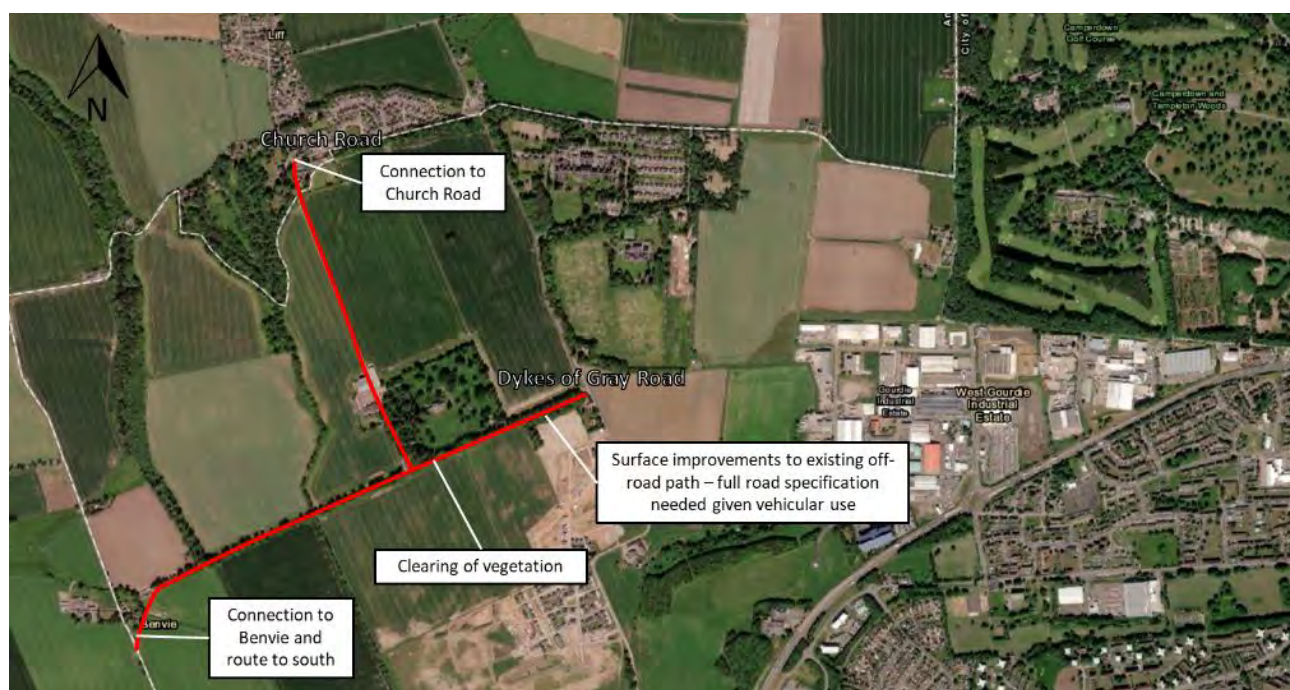


Figure 4-6 - Option A2: Dykes of Gray Road to Benvie/Liff Path Improvements

Option Assessment:

The pathway has scored low in Objectives rating, PfE Design Principles rating and Cycling by Design rating as it does not provide a direct connection to the proposed Western Gateway development sites or the Green Circular including across the Kingsway. It is also not suitable for unaccompanied 12-year-olds due to the path passing through a rural, undeveloped area.

Furthermore, the path does not provide any access to local facilities and during the public engagement, it was found to be one of the least attractive interventions as it does not provide much benefit to local active travel infrastructure and is already used as recreational walking and cycling route.

Recommendation:

It is recommended that this intervention is not be taken forward as a viable option, as it offers little benefit in terms of connectivity. More attractive alternatives are in place to connect the developments with Liff. Due to the size and nature of Benvie, it is not considered a key trip attractor for the existing and proposed developments.

4.2 Route B – Denhead of Gray to Myrekirk Junction/Myrekirk Road

Interventions B1a/ B1b/ B1c: Denhead of Gray to Myrekirk Junction Shared-Use Path

Description:

Shared-use path from Dykes of Gray Road to Myrekirk Road/Myrekirk Junction, connecting the existing and proposed developments to local facilities such as Asda and Aldi in West Gourdie Industrial Estate and beyond. A new shared-use path on the north side of Denhead of Gray for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance.

To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing point on Fulton Road and Dykes of Gray Road, in line with 'Roads for All' guidance. Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night.

The three interventions differ in how Denhead of Gray connects to Fulton Road; B1a follows the existing unsurfaced path which has a steeper gradient and connects with Nobel Road via a proposed shared use path to be constructed by Dundee City Council whereas B1b is similar to B1a but follows a shallower gradient and does not connect to the proposed section. B1c follows a shallower gradient just to the south of the existing informal path and connects to Fulton Road via the existing footbridge over the Lochee Burn.

The interventions proposed in B1a, Figure 4-7 from Denhead of Gray to Myrekirk Road/Junction are:

- Crossing point at Dykes of Gray Road;
- Connections to existing path to north and to south;
- Shared-use path on north side of Denhead of Gray;
- Provision of lighting along the route;
- Shared-use path on route of existing path (steep gradient);
- Controlled crossing of Fulton Road;
- Shared use path on south side of Fulton Road;
- Connection to existing crossing point at Myrekirk Junction;
- Shared-use path on east side of Myrekirk Road.

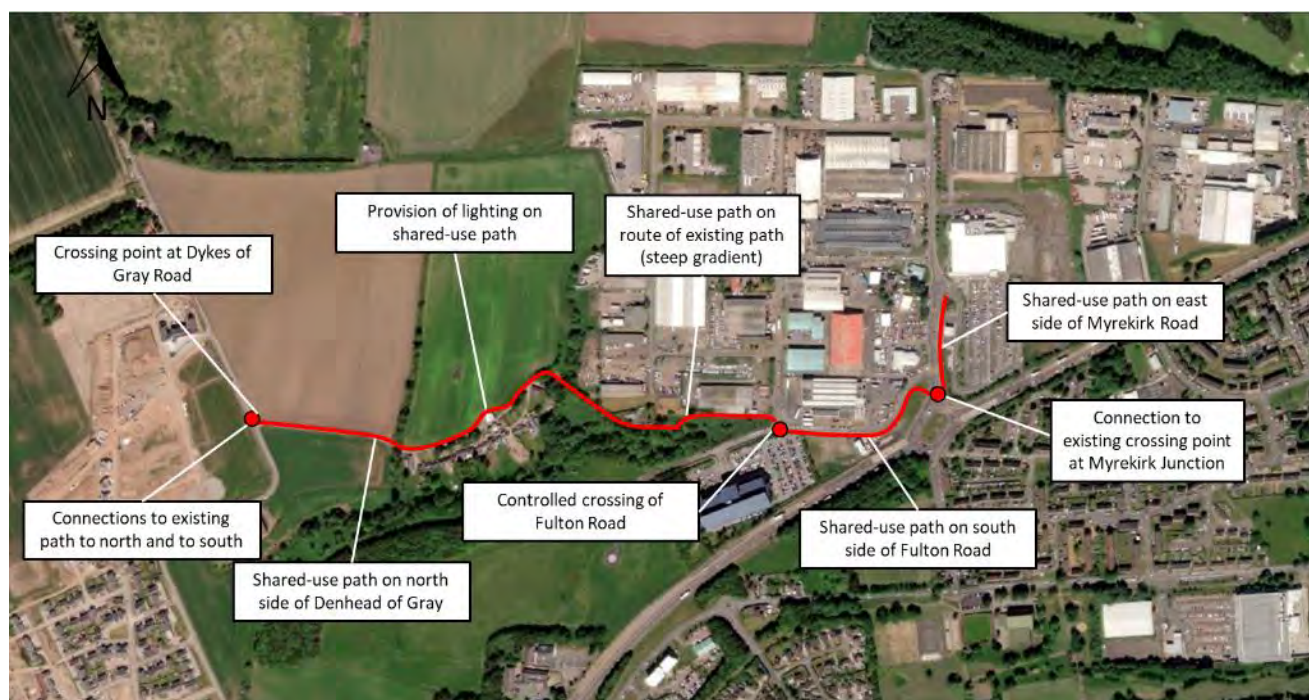


Figure 4-7 - Option B1a: Denhead of Gray to Myrekirk Junction On-Line Shared-Use Path

B1b is an alternative option to B1a, with a shallower gradient on the section connecting Denhead of Gray to Nobel Road as shown in Figure 4-8.

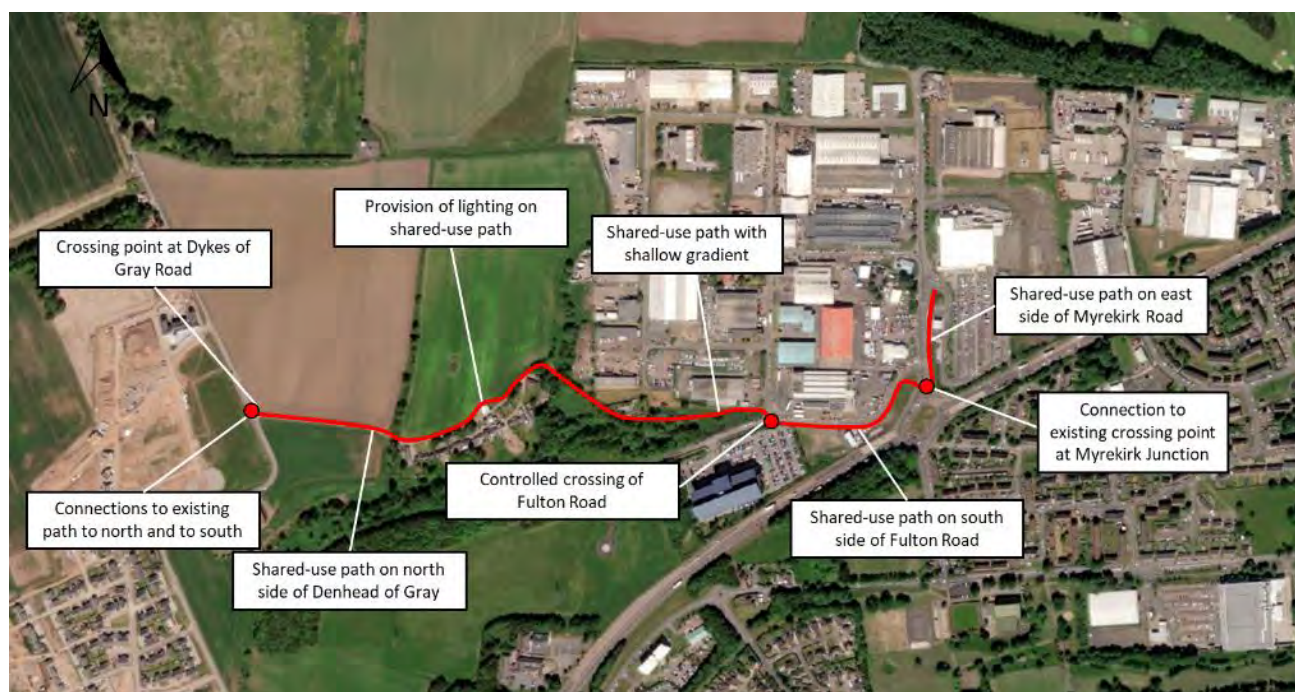


Figure 4-8 - Option B1b: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path (Reduced incline from Denhead of Gray to Nobel Road)

B1c is an alternative to B1a and B1b; following an alternative alignment from Denhead of Gray, which has a shallower gradient, and connects to Fulton Road via the pedestrian footbridge over the Lochee Burn. The interventions proposed in Figure 4-9 from Denhead of Gray to Myrekirk Road/Junction are:

- Crossing point at Dykes of Gray Road;

- Connections to existing path to north and to south;
- Shared-use path on north side of Denhead of Gray;
- Provision of lighting along the route;
- Shared-use path with shallow gradient;
- Controlled crossing of Fulton Road;
- Shared use path on south side of Fulton Road;
- Connection to existing crossing point at Myrekirk Junction;
- Shared-use path on east side of Myrekirk Road.

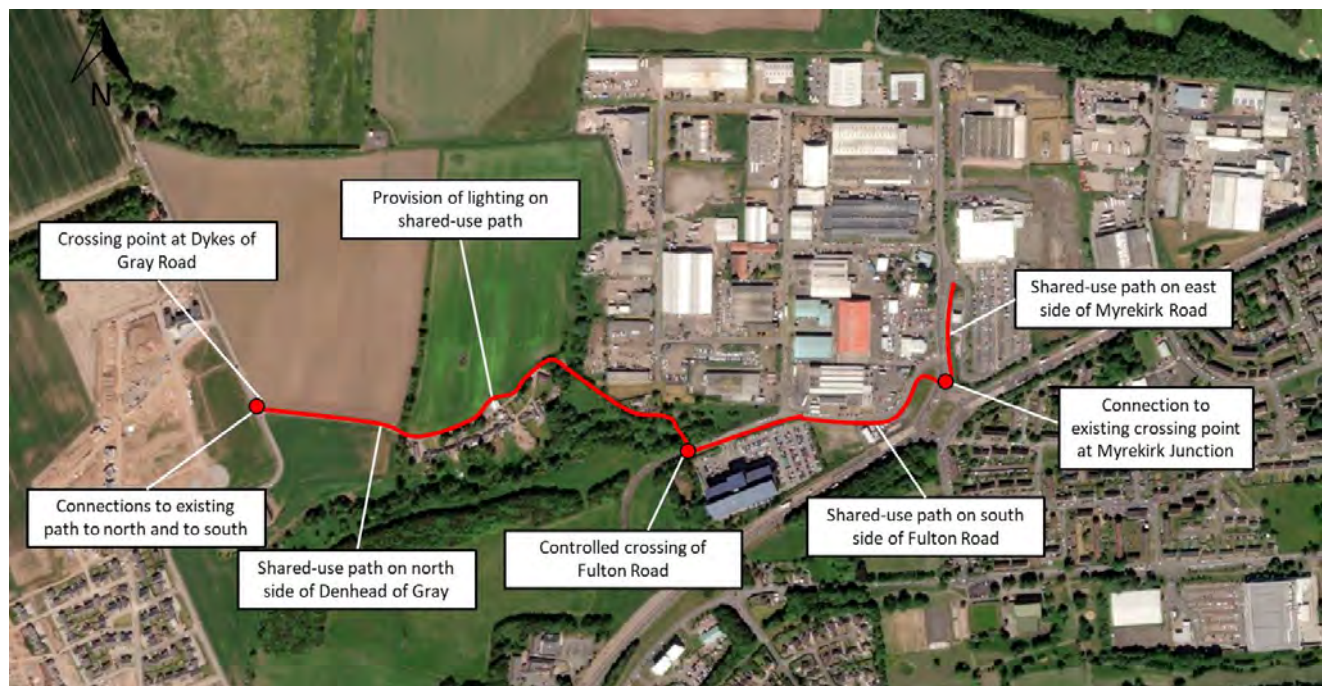


Figure 4-9 - Option B1c: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path (connection to Fulton Road)

Option Assessment:

All three options have scored high in the objectives ratings but were not able to achieve a score of 3 since they do not provide a direct route to the Green Circular hence the rest of the city's active travel network.

Option B1a scored low in the PfE Design Principles and Cycling by Design rating as it recommends a section of the route to be implemented on a steep gradient. Option B1b avoids the steep gradient, whereas B1c requires a structural analysis of the pedestrian bridge with potential structural works to be carried out that can be costly.

A drawing of Option B1a shared-use path can be found in Appendix B.

Recommendation:

Despite the comment about scoring above, Route B1a is recommended to be taken forward as a viable option, as part of the route is already proposed to be implemented by Dundee City Council and therefore route improvements should align with this section.

It is recommended that Intervention B1b is not taken forward as viable option as it does not currently align with the Dundee City Council proposed section, however further consideration should be given to gradient in any route improvements. B1c should also not be taken forward as a viable option as structural constraints may prevent the route from being implemented.

4.3 Route C: Dykes of Gray Road to Liff Road

Interventions C1a/ C1b: Dykes of Gray Road to Liff Road Shared-Use Path

Description:

A shared-use path from Dykes of Gray Road to Liff Road, connecting the existing and proposed developments to West Gourdie Industrial Estate. A new shared-use path for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance.

To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing point on Dykes of Gray Road, in line with 'Roads for All' guidance. Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night.

C1b differs to C1a in that it follows a shallower gradient for the middle section, as opposed to following the existing informal path which has a steep gradient. The interventions proposed in C1a, Figure 4-10, from Dykes of Gray to Liff Road Junction are:

- Crossing to connect to existing path to north and south;
- Shared-Use path following existing informal path (steep gradient);
- Connection to Liff Road and Myrekirk Road.



Figure 4-10 – Option C1a: Dykes of Gray to Liff Road Shared-use Path On-Line

An alternative to option C1a is C1b, which follows the same route but with a shallower gradient at the west of the industrial estate as shown in Figure 4-11. A drawing of Option C1b can be found in Appendix B.

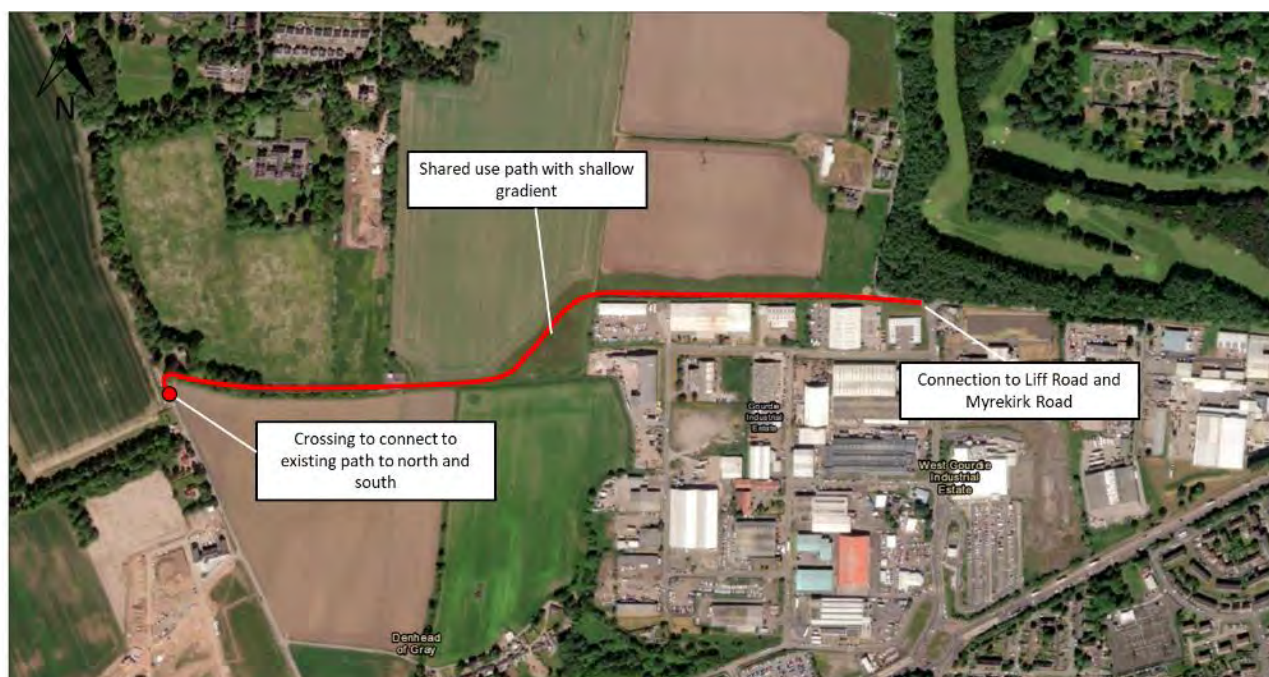


Figure 4-11 - Option C1b: Dykes of Gray Road to Liff Road Shared-Use Path Off-Line

Option Assessment:

Both options have scored a 2 in the Objective rating as they do not provide a direct connection to the Green Circular, hence the city's wider active travel network but do create a connection for users to access local facilities for education, employment and leisure. Option C1a has scored low in the PfE Design Principles and Cycling by Design ratings as it recommends for a section of the route to be on a steep gradient, whereas C1b avoids the steep gradient hence has scored higher across the different criteria.

Recommendation:

It is recommended that Option C1b is taken forward as viable option due to the shallower gradient compared to C1a.

4.4 Route D: Liff to Camperdown Park

Intervention D1a/ D1b: Liff to Camperdown Park Shared-Use Path

Description:

Shared-use path alongside the 'U328 Gourdie Brae Branch to C11 Junction' road, on the south side within the woodlands area till Camperdown Park, using the existing path through the woodlands area for part of the route and establishing a new path for the rest. The path crosses over to the north side towards the end of the unclassified road and uses the existing path within the farmland until it reaches the entrance of Camperdown Park. The shared-use path must be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance

To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving and dropped kerbs should be installed at the controlled crossing point on 'U328 Gourdie Brae Branch to C11 Junction' road and at the entrance to Camperdown Park, in line with 'Roads for All' guidance. Signage could be provided to promote the road as 'Walking and Cycling Friendly', as well as the provision of improved lighting, to ensure safety of users at all times, particularly at night.

D1a and D1b differ in that D1a follows the south of the existing road, to its junction with 'U328 Gourdie Brae Branch to C11 Junction' road, before crossing to the north side and onwards to Camperdown Park. Option D1b crosses the existing road approximately 430m west of the junction with 'U328 Gourdie Brae Branch to C11 Junction' road and routes along the north side of the route for this section towards Camperdown Park.

A drawing of Option D1a shared-use path can be found in Appendix B. The interventions proposed in D1a, Figure 4-12 from 'U328 Gourdie Brae Branch to C11 Junction' road to Camperdown Park are:

- Controlled crossing to east of Church Road;
- Shared-Use path on south side of 'U328 Gourdie Brae Branch to C11 Junction' road;
- Controlled crossing (path crosses to the other side);
- Controlled crossing at Camperdown Park entrance.

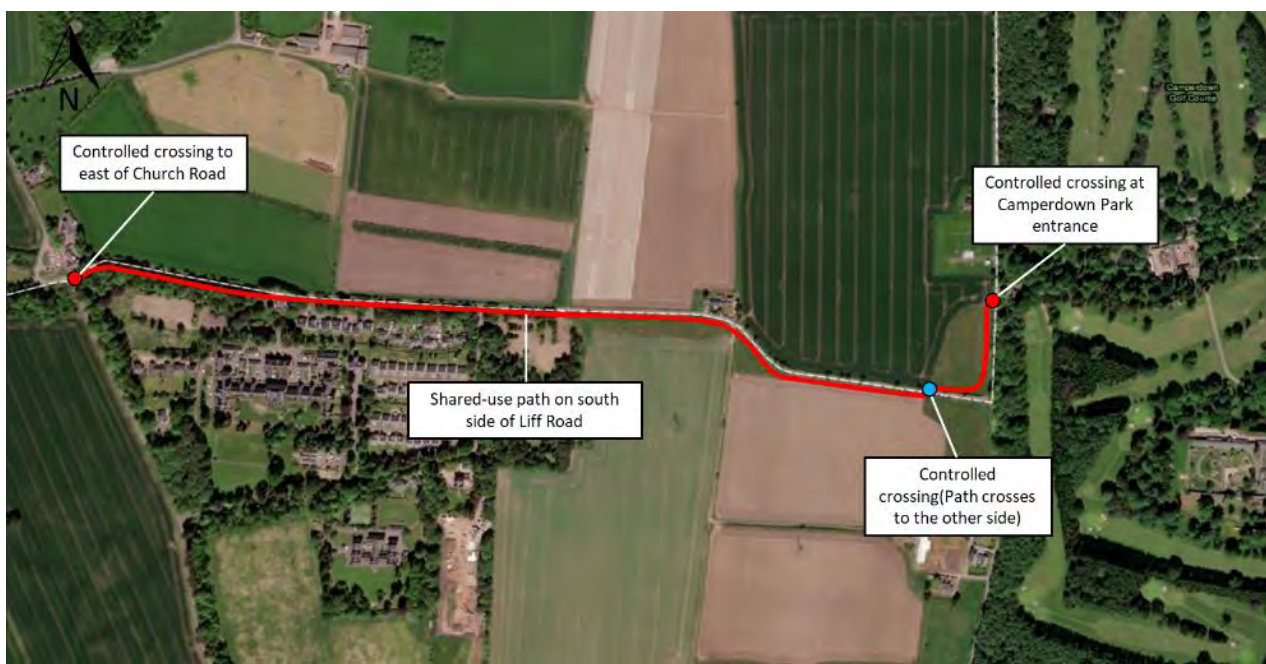


Figure 4-12 - Option D1a: Liff to Camperdown Park Shared-Use Path South Side

An alternative to D1a is D1b, which has a crossing point further east towards Gourdie Brae than D1a but proposes all other aspects of the route similarly, as shown in Figure 4-13.

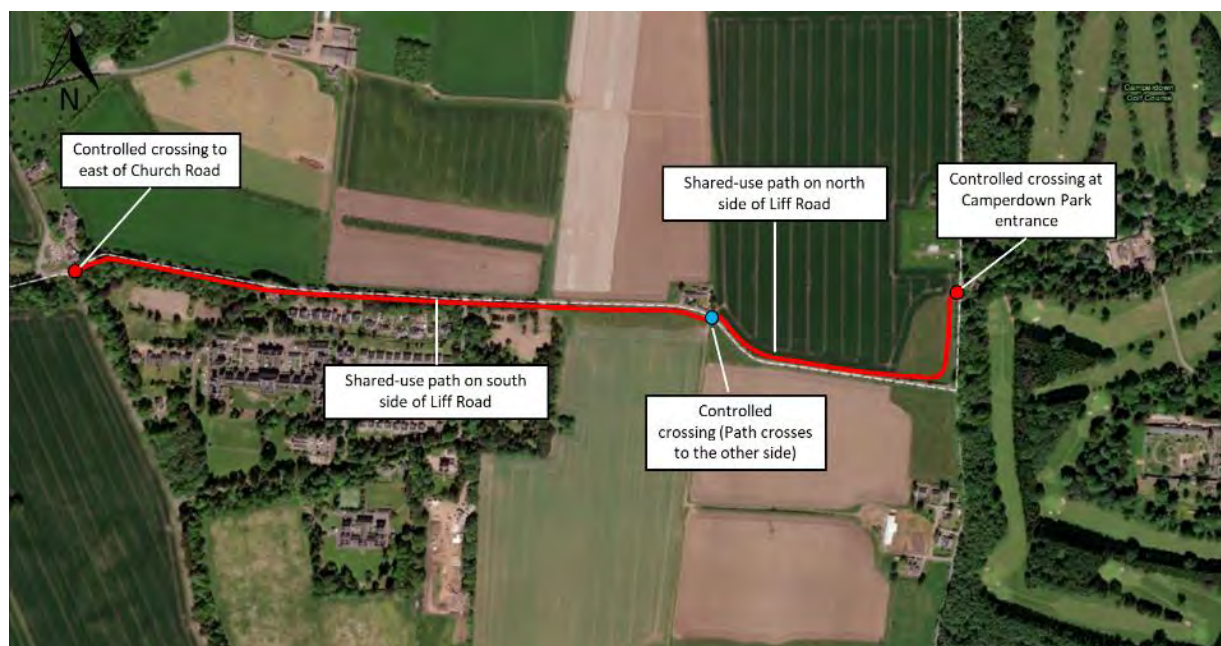


Figure 4-13 - Option D1b: Liff to Camperdown Park Shared-Use Path North Side

Option Assessment:

Option D1a has scored higher in the option assessment as it recommends safer crossing points and aligns well with Option E1a.

As a route option, it has scored low in the objective rating as it does not provide a direct connection to any other facility apart from Camperdown Park, but has scored slightly higher in the PfE Design Principles and Cycling by Design rating; it provides an off-road pathway but was not able to achieve a score of 3 since it is not a segregated pathway. The latest emerging guidance for Scotland recommends a segregated pathway to be preferred where feasible.

Recommendation:

It is recommended that option D1a is to be taken forward as a viable option as it proposes the crossing at a safer location compared to in D1b, where there is poorer visibility. The section of the route to the north of the existing development will need to be analysed further at a detailed design stage as it is understood there are several trees that have a Tree Preservation Order in place.

4.5 Route E: Liff Road to A90 Kingsway

Intervention E1a: Liff Road A90 Kingsway

Description:

A bi-directional, 3-metre-wide segregated cycleway alongside a 2-metre-wide path for pedestrians, separated by a 0.5m wide segregation from Camperdown Park entrance to the A90 Kingsway. The path would route through farmland to the west of Liff Road, before running on the west and then south side of Liff Road, towards the Kingsway.

There are a number of proposed controlled crossings on Liff Road and at the entrances to Camperdown Park. The route allows users to connect with Dykes of Gray Road through option C1a and C1b, the Green Circular and the A90 Kingsway. To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving at the controlled crossings on Liff Road and the entrance of Camperdown Park in line with 'Roads for All'.

Dropped kerbs on both sides of the crossings or raised tables can be implemented for ease of access. Additional measures can be implemented to highlight the crossing point to drivers such as signage and road markings, to improve safety for all users. Improved signage to promote the route as 'Walking and Cycling Friendly'.

A drawing of Option E1a segregated pathway can be found in Appendix B. The interventions proposed from the Camperdown Park western entrance to the A90 Kingsway, via Liff Road are shown in



Figure 4-14, these include:

- Connection to Camperdown Park entrance western entrance;
- Controlled crossing at Camperdown Park western entrance;
- Route through Forestry and Land Scotland land avoiding narrow section of Liff Road;
- Controlled crossing at 'U328 Gourdie Brae Branch to C11 Junction' road;
- Connection to existing/proposed path to Dykes of Gray Road;
- Segregated cycleway on south side of Liff Road;
- Connection to Kingsway underpass and recent path improvements in Camperdown Park;
- Controlled crossings to connect to Green Circular and existing path network;
- Improvements to underpass including lighting and artwork, and to make accessible for all cycle types.

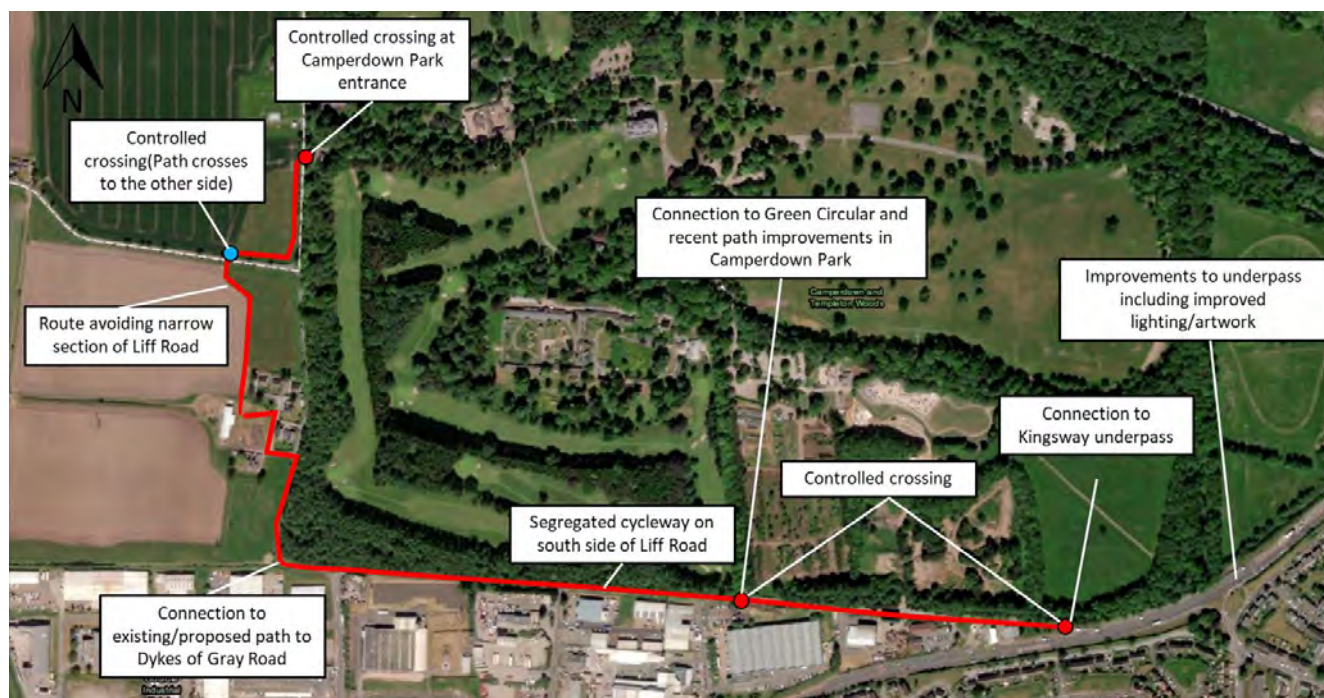


Figure 4-14 - Option E1a: Liff Road to A90 Kingsway, Segregated Pathway

An alternative to E1a (segregated cycleway) is a widened shared-use path, following the same route. The interventions proposed from the Camperdown Park western entrance to the A90 Kingsway, via Liff Road are shown in

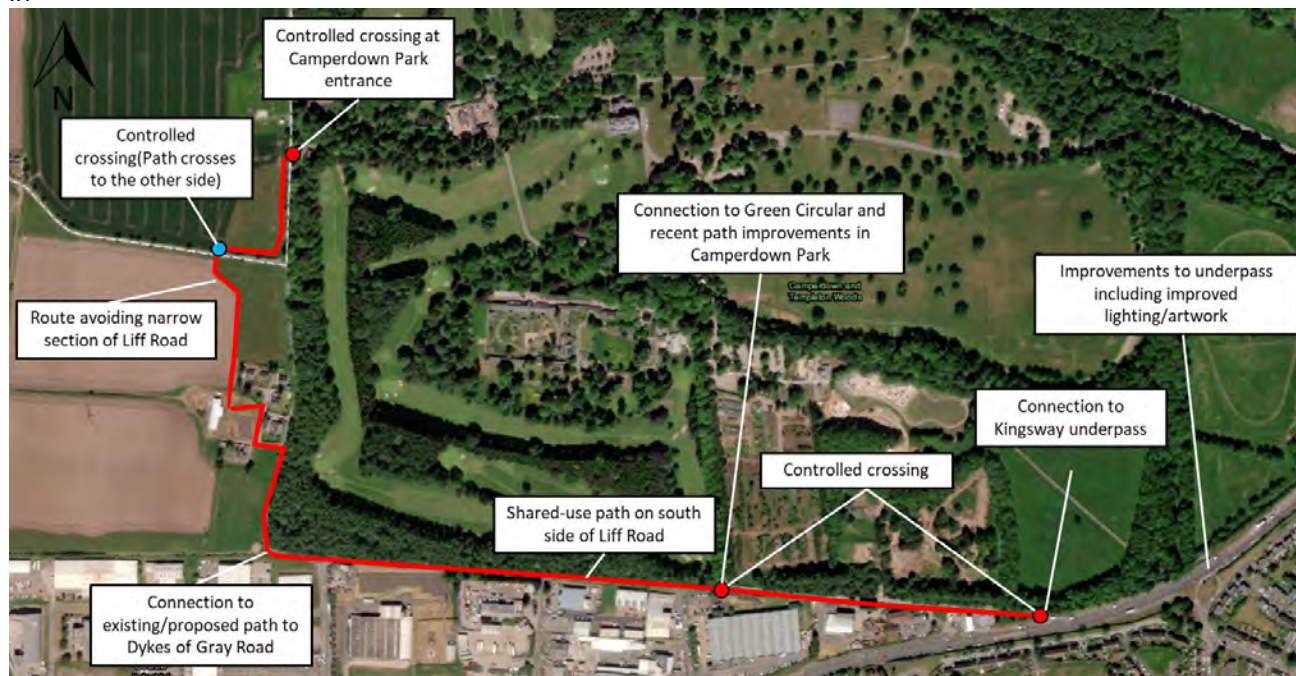


Figure 4-15.

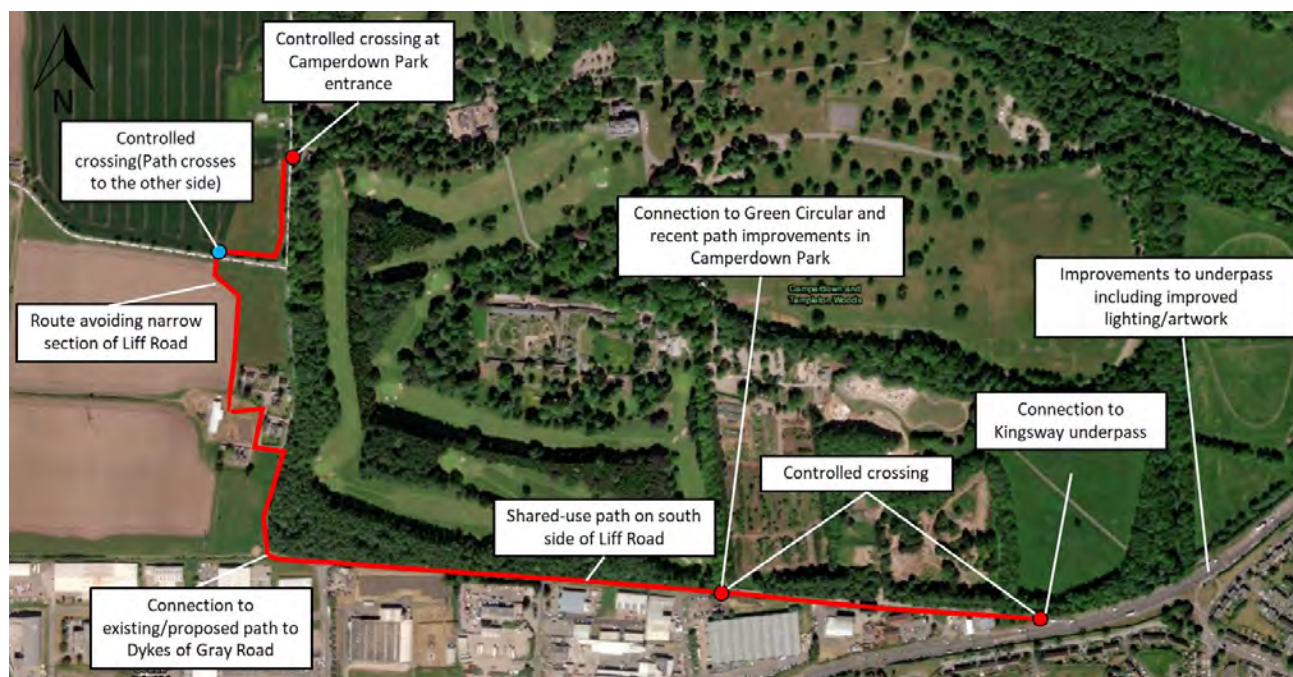


Figure 4-15 - Option E1a: Liff Road to A90 Kingsway, Widened Shared-Use Path

Option Assessment:

Both options have scored high on the Objectives ratings but were not able to receive a score of 3 as they are not within proposed or existing Western Gateway developments sites.

Option E1a Segregated pathway has scored higher in the PfE Design Principles and Cycling by Design rating as it is recommended in the latest emerging guidance for Scotland to provide a segregated pathway where possible. The cost of a segregated pathway is higher, but it provides a safer alternative to the shared-use path and allows users to feel comfortable and secure.

Recommendation:

It is recommended that Option E1a Segregated Pathway is taken forward for further consideration as it allows pedestrians and cyclists to be separated which is a safer and more desirable option to compared to shared use. Challenges with width constraints, particularly on Liff Road will need to be considered and if the segregated pathway is not deliverable then a shared-use path should be considered.

Intervention E1b: Liff Road to A90 Kingsway, Shared-Use path - Alternative Route

Description:

Shared-use path from Liff Road to the A90 Kingsway. This option provides an alternative alignment for avoiding the constrained section of Liff Road (north/south). The proposed path would follow an existing, informal track within an area of land owned by Forestry and Land Scotland. The shared-use path must be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance.

There are a number of proposed controlled crossings on Liff Road, and the route allows users to connect with Dykes of Gray Road, the Green Circular and the A90 Kingsway. To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving at the controlled crossings on Liff Road in line with 'Roads for All' and dropped kerbs and raised tables should be implemented on both sides of the crossings. Additional measures are proposed to highlight the crossing point to drivers such as signage and road markings, to improve safety at crossing points, for all users. The addition of signage is also proposed, to promote the route as 'Walking and Cycling Friendly'.

A drawing of Option E1b shared use path can be found in Appendix B. The interventions proposed for Option E1b can be seen in

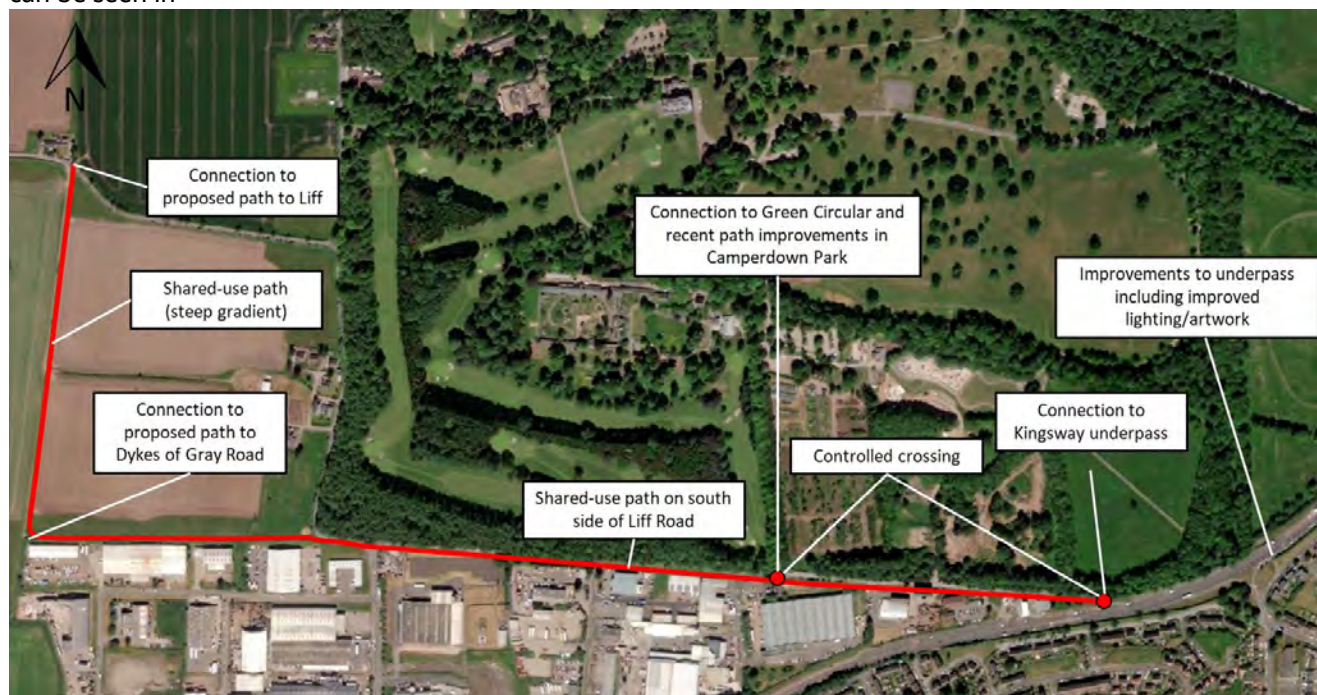


Figure 4-16 and include:

- Connection to proposed path to Liff;
- Shared-use path (steep gradient);
- Connection to proposed path to Dykes of Gray Road;
- Shared-use path on south side of Liff Road;
- Connection to Kingsway underpass and recent path improvements in Camperdown Park;
- Controlled crossings to connect to Green Circular and existing path network;
- Connection to Kingsway underpass;

- Improvements to underpass including improved lighting/artwork and to make accessible for all cycle types.

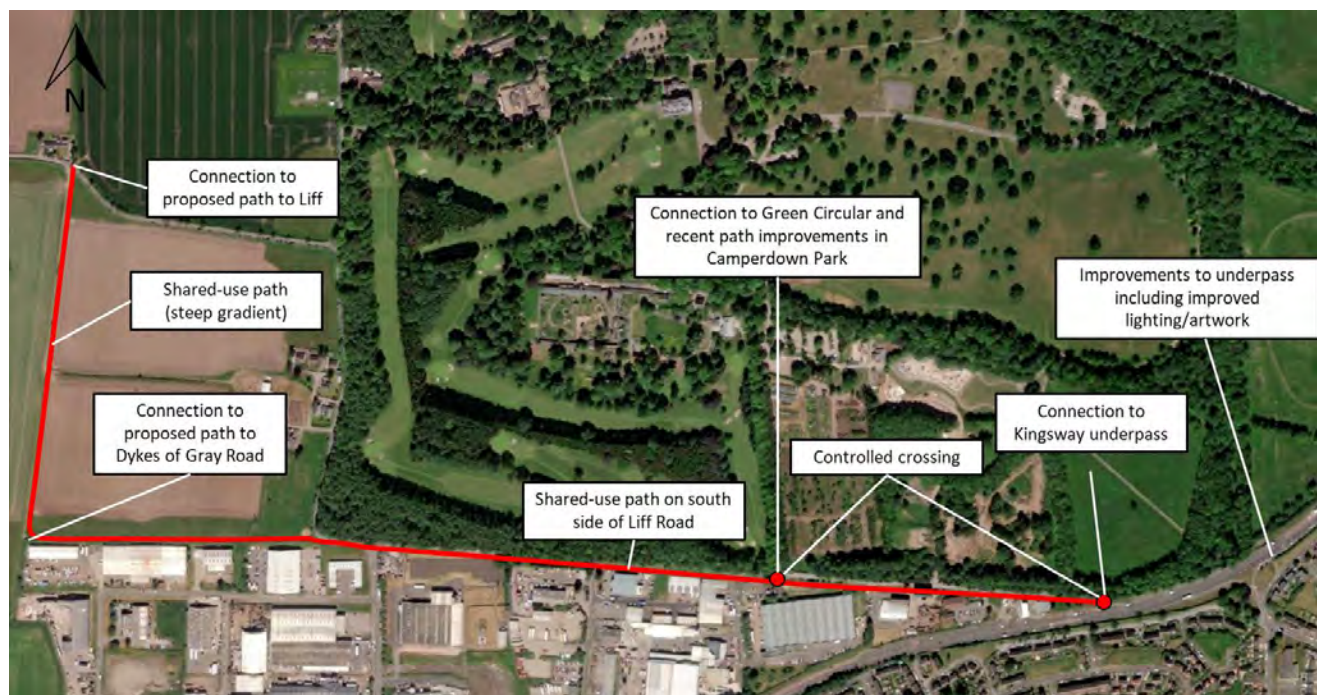


Figure 4-16 - Option E1b: Liff Road to A90 Kingsway, Shared-Use Path- Alternative Route

Option Assessment:

The intervention has scored highly overall throughout the different criteria but has not been able to achieve a score of 3 for any of the ratings as it is not within the proposed or existing Western Gateway developments sites and it does not provide a direct connection to any employment or retail facilities. Additionally, the land ownership constrains, water run-off due to the steep gradient has lowered its feasibility and deliverability rating.

Recommendation:

It is recommended that this intervention is taken forward as a viable option if E1a is undeliverable.

Intervention E1c: Liff Road to Kingsway Alternative Route Improved Shared-Use Path (via Camperdown Park)

Description:

A shared-use path from the Liff Road western entrance of Camperdown Park to the A90 Kingsway, the path follows the route of an existing informal path within the woodlands, around the west and south of Camperdown Park before connecting with the Green Circular. The path then continues on the south side of Liff Road to the A90 Kingsway. The shared-use path would be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance.

There are two controlled crossings proposed on Liff Road, where the path connects with the Green Circular and the Kingsway. To ensure suitable warning for people with visual impairments and to make the route more accessible, a combination of tactile blister style paving, raised tables and dropped kerbs are proposed at the controlled crossings on Liff Road, in line with 'Roads for All'. Additional measures can be implemented to highlight the crossing point to drivers such as signage, road markings, to improve safety for all users. Improved signage is proposed to promote the road as 'Walking and Cycling Friendly'. The interventions proposed in Option E1c are shown in



Figure 4-17 and include:

- Connection to existing/proposed routes;
- Improved shared-use path on route of existing informal path;
- Connection Kingsway underpass and recent path improvements in Camperdown Park;
- Controlled crossings to connect to Green Circular and existing path network;
- Improvements to underpass including improved lighting/artwork and to make accessible for all cycle types.



Figure 4-17 – Option E1c: Liff Road to A90 Kingsway Alternative Route, Improved Shared-Use Path Camperdown Park

Option Assessment:

The intervention has scored poorly across the different criteria as it does not meet the objectives of providing a path within the proposed or existing Western Gateway development sites and is outside the boundary of the core study area. It also proposed the path follow an existing off-road, woodland footway which was not a desirable option emerging during public engagement, particularly for independent walking wheeling or cycling of an unaccompanied 12-year-old.

Recommendation:

It is recommended that this option is not taken forward for further consideration as it has not been supported as one of the desired routes in the public engagement. The path passes through a woodlands area which was not been deemed an attractive option, especially at night.

Intervention E1d: Liff Road to A90 Kingsway Alternative Route

Description:

A shared-use path from the Liff Road western entrance of Camperdown Park to the A90 Kingsway, the proposed route utilises an existing path within Camperdown Park. The shared-use path would be suitable for walkers, wheelers, and cyclists, indicatively 2-3m (Cycling by Design standards) but subject to detailed design guidance.

Additionally, improved signage to promote the road as 'Walking and Cycling Friendly' is proposed. The interventions proposed in Option E1d can be seen in Figure 4-18 and include:

- Connection to proposed route to Liff;
- Improved shared-use path within Camperdown Park;
- Connection to existing path to east and underpass;
- Improvements to underpass including improved lighting/artwork and to make accessible for all cycle types.



Figure 4-18 - Option E1d: Liff Road to A90 Kingsway Alternative Route, Improved Shared-Use Path Camperdown Park

Option Assessment:

The intervention has scored poorly across the different criteria as it does not meet the objectives of providing a path within the proposed or existing Western Gateway developments sites and is outside of the core study area. It has also proposed for a section of the route to follow an existing off-road, woodland footway which was not a desirable option during public engagement, particularly for independent walking wheeling or cycling of an unaccompanied 12-year-old.

Recommendation:

It is recommended that this option not taken forward for further consideration, as it is not seen as a priority route for the Western Gateway developments and did not receive adequate support at public engagement. The path passes through woodlands which was not deemed an attractive option, especially for children and at night.

Intervention E1e: Liff Road to Myrekirk Junction, Two-Way Segregated Cycleway

Description:

A two-way segregated cycleway from Liff Road to Myrekirk Junction. The proposed route will allow users to connect with the West Gourdie Industrial Estate, Green Circular and Camperdown Park. Controlled crossings have been proposed at the Green Circular connection on Liff Road. To ensure suitable warning for people with visual impairments and make the area more accessible, tactile blister style paving, dropped kerbs and raised tables are being proposed at the controlled crossing in line with 'Roads for All'. Additional measures can be implemented to highlight the crossing point to drivers such as signage and road markings, to improve safety for all users. Improved signage is also proposed to promote the road as 'Walking and Cycling Friendly'.

The interventions proposed for Option E1e are shown in Figure 4-19 and include:

- Connection to Myrekirk Junction;
- Segregated cycleway on north side of Kingsway;

- Improvements to underpass including improved lighting/artwork and to make accessible for all cycle types;
- Improvements to narrow shared-use section including lighting and cutting back vegetation;
- Segregated cycleway on east side of Whittle Place;
- Controlled crossing to Green Circular and Camperdown Park.



Figure 4-19 - Option E1e: Liff Road to Myrekirk Junction, Two-Way Segregated Cycleway

An alternative to E1e Segregated Cycleway is a widened shared-use path, as shown in Figure 4-20. A drawing of Option E1e shared use path can be found in Appendix B.



Figure 4-20 - Option E1e: Liff Road to Myrekirk Junction, Widened Shared-Use Path (Alternative to Two-Way Segregated Cycleway)

Option Assessment:

The intervention has scored low in the objectives rating as it does not meet the objectives of providing a path within the proposed or existing Western Gateway developments sites. The segregated pathway has scored higher in the PfE Design Principles rating as it a safer alternative to a shared-use path which create a comfortable and secure network for users, however, it has scored lower in the Cycling by Design rating compared to shared-use path due to the lack of space available on the narrow section of the route, making this an undeliverable option.

Recommendation:

It is recommended that Option E1e (shared-use path) is taken forward for further consideration option as a segregated cycleway is not deliverable due to the narrow section on Whittle Place. The proposed path offers a connection to local facilities and interlinks users to other proposed paths feeding into Myrekirk Junction.

Table 4-1: Route scoring outcomes

Option	Contribution to objectives rating	PfE Design Principles rating	Cycling by Design rating	Feasibility/deliverability rating	Cost rating	Public acceptability rating	Significant risks/issues	Recommendation
Option A1a: Liff (Church Road) to A90 Segregated Cycleway	2.75	2.67	2.38	✓ ✓	✓	✓ ✓ ✓	Land ownership	Retain for further consideration
Option A1a: Liff (Church Road) to A90 Widened Shared-Use Path	2.75	2.17	1.75	✓ ✓	✓ ✓	✓ ✓	Land ownership	Retain for further consideration if segregated cycleway is proven to be undeliverable
Option A1b: Dykes of Gray at south of existing path to Green Circular	1.50	2.00	1.63	✓	✓	✓ ✓ ✓	Cost	Do not retain for further consideration
Option A1c: Dykes of Gray Road to Mill Road Shared-Use Path	1.50	1.33	-0.13	✓ ✓	✓ ✓	✓	Land ownership/flooding	Do not retain for further consideration
Option A1d: South of Development Site to Mill Road Shared-Use Path	1.50	1.33	0.38	✓ ✓	✓	✓	Land ownership/flooding	Do not retain for further consideration
Option A2: Dykes of Gray Road to Benvie/Liff Path Improvements	0.50	1.67	1.25	✓ ✓	✓ ✓	✓	Land ownership	Do not retain for further consideration

Option B1a: Denhead of Gray to Myrekirk Junction On-Line Shared-Use Path	2.75	2.33	1.88	✓ ✓	✓ ✓	✓ ✓ ✓	Land ownership/gradient	Retain for further consideration
Option B1b: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path	2.75	2.33	1.88	✓ ✓	✓ ✓	✓ ✓ ✓	Land ownership	Do not retain for further consideration
Option B1c: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path	2.75	2.33	1.63	✓ ✓	✓	✓ ✓ ✓	Land ownership/cost	Do not retain for further consideration
Option C1a: Dykes of Gray to Liff Road Shared-Use Path On-Line	2.00	1.50	1.75	✓ ✓	✓ ✓	✓ ✓	Land ownership/Gradient	Do not retain for further consideration
Option C1b: Dykes of Gray to Liff Road Shared-Use Path Off-Line	2.00	2.00	2.13	✓ ✓	✓	✓ ✓	Land ownership/Gradient/Loss of agricultural land	Retain for further consideration
Option D1a: Liff Road to Camperdown Park Shared-Use Path South Side	1.75	2.00	2.13	✓ ✓	✓ ✓	✓ ✓	Land ownership/crossing points/Tree Preservation Orders	Retain for further consideration

Option D1b: Liff Road to Camperdown Park Shared-Use Path North Side	1.75	1.83	1.75	✓ ✓	✓ ✓	✓ ✓	Land ownership/crossing points	Do not retain for further consideration
Option E1a: Liff Road to A90 Kingsway Segregated Two-Way Cycleway	2.25	2.67	0.50	✓	✓	✓ ✓	Land ownership/Gradient/Constrained space for path widening	Retain for further consideration
Option E1a: Liff Road to A90 Kingsway Shared-Use Path	2.25	2.17	0.13	✓	✓ ✓	✓ ✓	Land ownership/Gradient/Constrained space for path widening	Do not retain for further consideration
Option E1b: Liff Road to A90 Kingsway Alternative Route	2.50	2.33	2.00	✓	✓ ✓	✓ ✓	Land ownership/Gradient/Drainage/Constrained space for path widening	Retain for further consideration if option E1a is proven to be undeliverable

Option E1c: Liff Road to A90 Kingsway Alternative Route Shared-Use Path Camperdown Park	1.50	2.17	0.25	✓	✓ ✓	✓	Gradient	Do not retain for further consideration
Option E1d: Liff Road to A90 Kingsway Alternative Route - Improved Shared-Use Path Camperdown Park	1.50	2.17	0.25	✓ ✓	✓ ✓	✓	Lack of Space/Land ownership	Do not retain for further consideration
Option E1e: Liff Road to Myrekirk Junction - Two-Way Segregated Cycleway	1.00	2.17	-0.50	✓	✓	✓ ✓	Lack of Space/Land ownership	Do not retain for further consideration
Option E1e: Liff Road to Myrekirk Junction - Widened Shared-Use Path	1.00	1.83	1.00	✓ ✓	✓ ✓	✓ ✓	Lack of Space/Land ownership	Retain for further consideration if segregated route undeliverable

4.6 Stage 2 stakeholder and community engagement

In early July 2021, the above emerging route options and our recommendations were presented via a Teams Live session to which stakeholders, community representatives and members of the public were invited. The representatives that we had approached or engaged with during the first stage of engagement were asked to circulate the invitation to the session amongst their networks and we provided a briefing pack to give individuals the opportunity to review the options in more detail, especially if unable to attend the Teams Live session. Individuals were also able to email their comments directly to the project email address.

4.6.1 Summary of engagement feedback

We received many constructive comments on the emerging options, and overall good support for the proposals presented. A summary of the key feedback received from the Teams Live session and via email is provided below:

- Request for crossing points at Nethergray Gait and Nethergray Entry;
- The segregated path along Dykes of Gray Road should be built with generous space for cyclists and pedestrians, as this will most likely become the main link between the communities and the proposed facilities;
- Dykes of Gray Road is relatively steep; mixing fast moving cyclists with pedestrians might not be safe;
- The underpass through to Invergowrie is not a safe option in the evenings, winter months or poor weather. The path is secluded, prone to flooding, there is a lack of lighting and it is not to the appropriate standard. Pedestrian crossing points provided as part of the Swallow junction upgrade will create a more direct route;
- The path through Denhead of Gray is a key route for the Western Gateway community. With the provision of lighting, crossing points and suitable gradients, this will be a useful route. However, there were concerns that street lighting along the path could detract from its rural setting;
- The proposed path from Dykes of Gray Road to Liff Road provides a safe route. The wall surrounding Camperdown Park is listed, however an opening into Camperdown Park at the corner of the bend on Liff Road would provide direct access. The wall is also in a state of disrepair;
- The routes through Camperdown Park do not seem safe during winter months.

4.7 Other stakeholders engaged

In addition to the above sessions, we made direct email contact with local groups representing disabled people in Dundee (Dundee Access Group, North East Sensory Services and Guide Dogs Association) to invite them to participate in the project by providing their views, either directly to us or through the online discussion sessions.

We did not receive any specific feedback on accessibility for disabled people during the course of the study, and therefore recommend that further work is undertaken during subsequent project stages to engage these groups on design details.

4.8 Land ownership

A high-level review of land ownership has been undertaken to identify with whom future discussions may be required regarding potential land-take to construct new routes. It is recommended that at the next stage of work, that DCC confirms details of landowners and engages in discussion with them regarding their views on the potential options.

4.9 Intervention types

This section provides more detail on the types of interventions proposed above, with photographic examples illustrating how the interventions may look, based on the latest emerging guidance for Scotland.

4.9.1 Segregated Cycleway

A segregated cycleway is preferred over a shared-use path as recommended in the latest emerging guidance for Scotland and separates the cyclists and pedestrians from one another. Figure 4-21 below is a bi-directional, 3-metre-wide segregated cycleway alongside a 2-metre-wide path for pedestrians, separated by a 0.5m wide segregation.



Figure 4-21 - Path separated using grass delineation strip⁶

4.9.2 Shared-Use Path

A shared-use path allows pedestrian and cyclists to share the route and it is generally recommended for it to be at least 3 metres wide. Figure 4-22 below is an example of a 3-metre-wide shared use path in a rural setting.

⁶ <https://www.sustrans.org.uk/for-professionals/infrastructure/sustrans-traffic-free-routes-and-greenways-design-guide/sustrans-traffic-free-routes-and-greenways-design-guide-contents/2019-design-guidance/part-1-general-principles/4-sharing-of-paths/>



Figure 4-22 - Example of Shared-Use Pathway⁷

4.9.3 Controlled Crossings

The latest emerging guidance for Scotland sets out the conditions that controlled crossings should be installed.

Signal-controlled crossings are generally suitable in urban areas where user volume is relatively high. Signal-controlled crossings are generally only used to address the crossing of a road. They have a relatively higher installation and maintenance cost than uncontrolled or other controlled crossings. Where interactions arise between cycle users and pedestrians without adjacent motor traffic, these can be adequately controlled without traffic signals.

Signal-controlled crossings incorporating cycle facilities may include:

- Where pedestrians cross a road and an adjacent cycle facility (Puffin Crossing);
- Where cycle users (often with pedestrians) cross a road (Toucan Crossing)

Several features of a signal-controlled crossing will apply regardless of the specific layout. Suitable crossing facilities, including dropped kerbs and tactile paving are required. Facilities to emphasise the crossing and to slow drivers, such as speed tables, may also be incorporated.

Guidance on tactile paving and dropped kerbs is contained in “Guidance on the use of Tactile Paving Surfaces” and in “Roads for All: Good Practice Guide for Roads” respectively. Figure 4-23 and Figure 4-24 shows an example of a Toucan Crossing.

⁷ <https://www.alamoareampo.org/Bike-Ped/>



Figure 4-23 - Example of a controlled crossing⁸



Figure 4-24 - Example of a controlled crossing⁹

4.9.4 Uncontrolled Crossing

An uncontrolled crossing can be implemented in rural or urban settings with a low number of vehicles on the road and a low-speed limit. Features of an uncontrolled crossing may include:

- Traffic signs and road markings to advise and regulate the movement of users;

⁸ <https://www.cheshire-live.co.uk/news/local-news/council-upgrades-crossing-sealand-road-6696914>

⁹ <https://www.cheshire-live.co.uk/news/local-news/council-upgrades-crossing-sealand-road-6696914>

- Physical infrastructure to accommodate users crossing, e.g. dropped kerbs and tactile paving. Guidance on tactile paving and dropped kerbs is contained in Guidance on the use of Tactile Paving Surfaces and in Roads for All: Good Practice Guide for Roads respectively.



Figure 4-25 - Example of uncontrolled crossing¹⁰

4.9.5 Lighting

Cycling by Design (September 2021)¹¹ specifies when the lighting of cycle routes is appropriate. Cycle routes which run on or adjacent to the carriageway will often benefit sufficiently from carriageway lighting. Off-carriageway routes may require separate lighting provision. Cycle routes which run adjacent to an unlit carriageway should not be lit as this can cause difficulties for drivers.

The assessment of whether lighting provision is required should be based on local factors. In an urban development it is recommended that, where appropriate and feasible, routes should be lit, particularly at crossing points. It may be necessary to consult local residents to assess requirements.

It is not normally necessary to provide lighting for cycle routes in rural areas unless there are specific requirements. These may include:

- High flows of non-motorised users (NMUs), particularly on adjacent and shared use routes;
- Routes with specific dangers such as intersections with rights of way or on routes that do not meet the required geometric standards;
- Identified school or commuter routes; and
- Routes through any underpass (subject to environmental impact).

Guidance on the lighting of cycling infrastructure is provided in the Institution of Lighting Professionals, Professional Lighting Guide 23: Lighting for Cycling Infrastructure¹². For the purpose of this study, using a high-level approach, lighting can be categorised into 3 groups: buried street lighting, low level lamps and standard

¹⁰ <https://www.geograph.org.uk/photo/5781028>

¹¹ <https://www.transport.gov.scot/media/50323/cycling-by-design-update-2019-final-document-15-september-2021-1.pdf>

¹² <https://theilp.org.uk/publication/plg23-lighting-for-cycling-infrastructure/>

street lighting. An example of each of these groups can be seen below and based on the rural or urban settings of the route, appropriate lighting can be implemented.



Figure 4-26 - An example of Street Lighting at footway level¹³

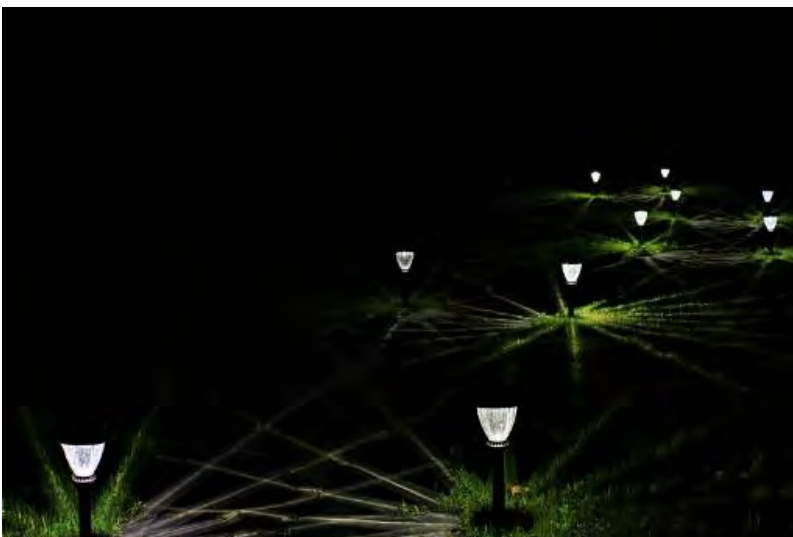


Figure 4-27 - Example of Sensitive Low-Level Path Lighting¹⁴

¹³ <https://shop.signbox.co.uk/30/541/solar-eye-solar-powered-pathway-delineation-light>

¹⁴ https://www.flickr.com/photos/caitees_photography/4710378665



Figure 4-28 - An example of Typical Street Lighting¹⁵

4.9.6 Signage and Wayfinding

Signing and wayfinding is part of the Sustrans' "Traffic-Free Routes and Greenways Design Guide". It covers the importance of treating signing as an integral part of the design process, signage consistency, legibility and maintenance and the need for designers to be sensitive to the environment.

Key principles

- Signing and wayfinding is an important element of traffic-free routes and should be treated as an integral part of the design process;
- Signing should be consistent and legible throughout a route or network. It must present the correct information to users;
- Signing and wayfinding features need maintaining;
- Signing, wayfinding and street furniture can all serve to create clutter. It is important to consolidate and rationalise signing along routes where possible;
- The approach to introducing these features needs to be sensitive to the environment.

The Traffic Signs Regulations and General Directions 2016 (TSRGD)¹⁶ apply to all signs positioned within the public highway. The regulations ensure that signs are consistent, legible and provide a clear message to road users.

¹⁵ <https://www.tridonic.com/com/en/news-2019-smart-and-adaptive-lighting-for-darmstadt.asp>

¹⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916837/TSRGD_2016_circular_document.pdf



Figure 4-29 - Wayfinding Example, Glasgow¹⁷

¹⁷ <http://appliedwayfinding.com/wp-content/uploads/2015/01/glasgow-city-council3.jpg>

5. Cost Estimates

5.1 Cost Assumptions

To develop initial cost estimates at this early stage, we have made the following design assumptions:

- A per kilometre rate based on previous experience from similar projects delivered was applied covering the main civil engineering activities during the construction phase;
- At this stage that simple drainage improvements can be made to connect into existing system. Further design work on drainage solutions will be required for the length of the route during detailed design stages;
- That no utility protection or diversion works are considered at this stage and will be further reviewed in the detailed design stages;
- No allowance is made for accommodation works to cater for landowners and other affected stakeholders during the construction works;
- No allowance is made for further designer services fees for the following design development stages; \n allowance is made for traffic management costs during construction, but this would have to be worked up in more detail for each option as the design develops;
- Preliminaries are assumed at 25% and site supervision is assumed at 5%; optimism bias is assumed at 44% ('standard' civil engineering projects). A scheme specific optimism bias calculation will be required as the scheme is developed further; No allowance is made for any risk or inflation to the final cost estimates, but this will be revisited as cost estimates are refined during future design stages;
- Lighting has been excluded from the initial route cost estimates and should be further specified during detailed design, but an average per kilometre indicative cost has been provided separately;
- Any paint and artwork required for underpass improvements has been excluded in the initial route cost estimates and should be considered during the detailed design in conjunction with stakeholder and community engagement;
- Without knowledge of specific requirements at this early stage, each of these assumptions will have to be refined as the project progresses.

5.2 Capital construction cost estimates

For the proposed interventions recommended to be taken forward in section 4, estimated construction costs have been developed and are summarised in Table 5-1 below. The costs are presented as a Low-High range and are indicative due to the uncertainty and high-level nature at this early optioneering stage. Therefore, they are subject to change as more information becomes available and the concept/detailed design stages develop. They do not allow for additional allowances that are unknown at this stage, which could include land costs, utility protection costs, detailed design costs, traffic management and other mobilisation works.

The cost estimates have generally been developed using a top-down approach, based on works of a similar nature from other projects costed by the project team. Where required, a bottom-up approach has been adopted using data gathered from the site visit and desktop study and costed using SPON's Civil Engineering and Highways Works Price Book (2020).

Route	Low-Cost Range (£)	High-Cost Range (£)
A1a - Segregated	£ 2.1m	£ 2.5m
A1a - Shared	£ 1.6m	£ 2.0m
B1a	£ 0.5m	£ 0.9m
C1b	£ 0.5m	£ 0.9m
D1a	£ 0.8m	£ 1.2m
E1a - Segregated	£ 1.4m	£ 1.8m
E1a - Shared	£ 1.0m	£ 1.4m
E1b	£ 0.9m	£ 1.3m
E1e	£ 0.2m	£ 0.6m

Table 5-1: Indicative capital construction cost estimates

5.3 Lighting Costs

Lighting has been excluded from the above estimated costs as it is uncertain the type of lighting needed; a lighting engineer would be required to carry out a detailed review at the design development stage. In Table 5-2 below, high level estimated costs per kilometre have been provided for buried street lightings, low level street lightings and standard street lightings.

Additionally, an estimated cost of flood lights has been provided for underpass improvements, but it has not taken into account any unknown constraints such as structural limitations, new power connections, durability of the flood lights during adverse weather conditions. The estimated price has recommended a standard flood light which would suffice if there are no constraints to the installation.

Lighting Interventions (per km)	Low-Cost Range (£)	High-Cost Range (£)
Buried Street Lighting (1 metre apart)	£ 0.17m	£ 0.42m
Low Level Lighting (1 - 4 metres height, 1.5 metres apart)	£ 0.70m	£ 1.00m
Standard Street Lighting (8 - 10 metres height, 40 metres apart)	£ 0.13m	£ 0.21m
Flood Lights	£ 200 (per unit)	£ 1,000 (per unit)

Table 5-2 – Indicative lighting costs

5.4 Potential funding sources

DCC may be able to draw on the following sources of funding for delivery of the capital works associated with the construction of new routes:

- Sustrans' Places for Everyone Fund (or equivalent future funds): as set out in the option appraisal, several of the emerging preferred options are likely to be suitable for potential Sustrans funding due to protected cycling infrastructure. Although there remains uncertainty surrounding the extent of the current PfE fund, avenues of potential funding from Sustrans should be explored;
- Scottish Government active travel funding: investment in active travel at a national level have increased significantly in recent years. Although most of this is directed towards PfE currently, there may be opportunities over the course of the development of this project to explore alternative funding from Transport Scotland;

- UK Government Levelling Up fund: there may be opportunity for a share of any emerging funds from this source (or future applications to the fund);
- DCC active travel capital funding;
- Developer contributions: contributions to the cost of delivering improvements may be sought from nearby developments. Upon agreement of preferred options and commencement of Concept Design work, the level of potential contribution to the overall cost estimate from developments in this area can be established.

6. Recommendations for Wayfinding, Cycle Parking and Complementary Measures

6.1 Recommendations for wayfinding

The proposed interventions in this study have highlighted many key routes for walking, wheeling, and cycling. An important element of any new route is signage and wayfinding, as highlighted in Section 4.9.6 above. A high-level review of potential key locations that would benefit from signage along each route are highlighted below.

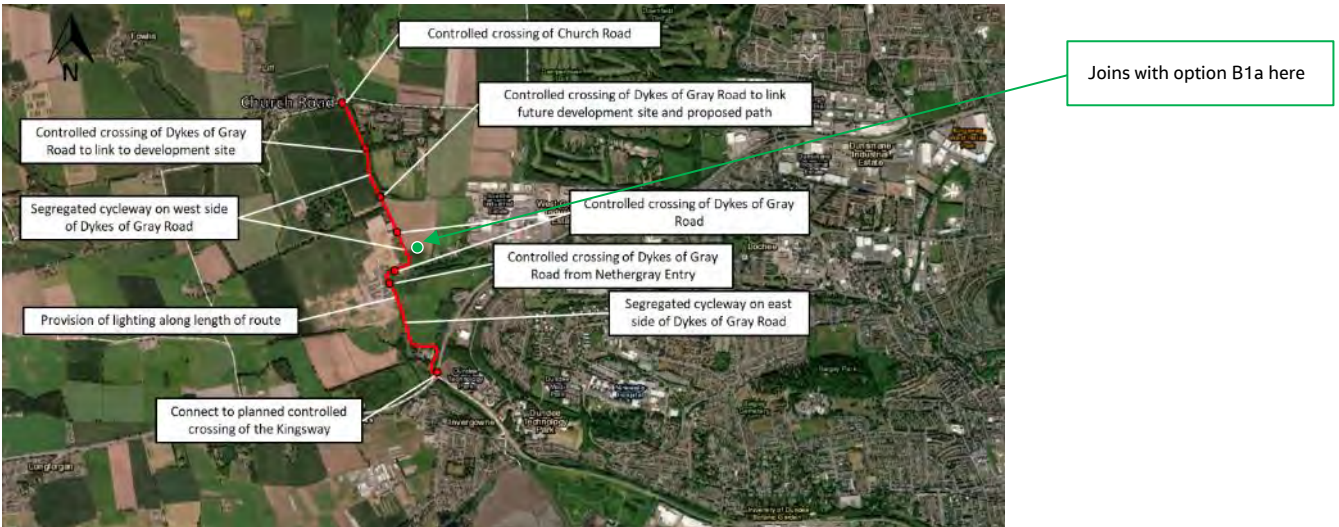


Figure 6-1 - Option A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout)

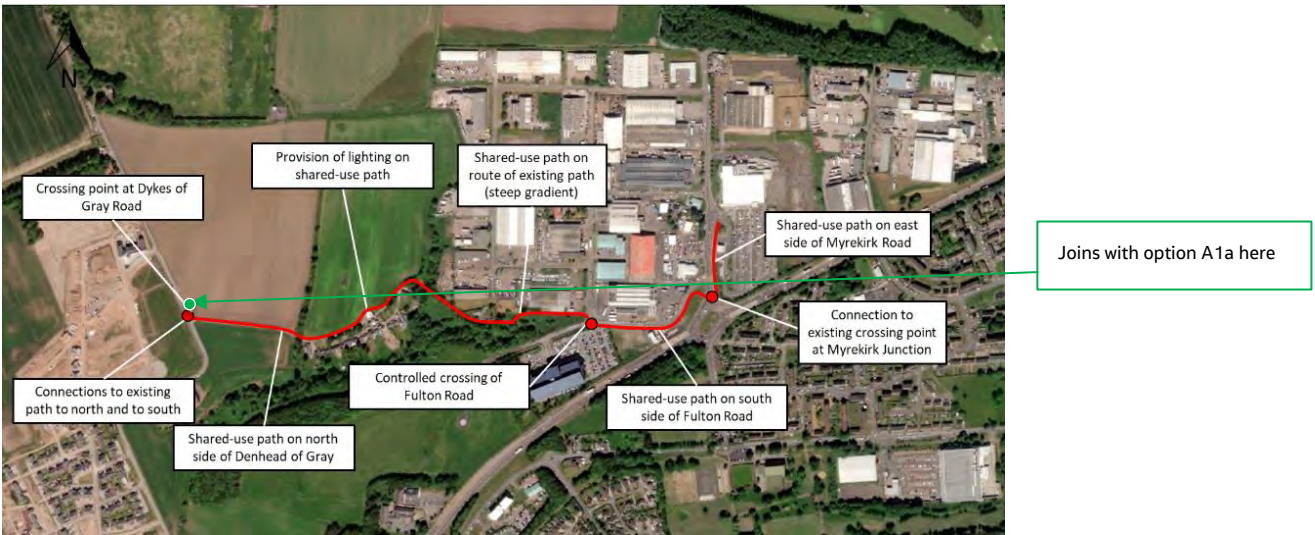


Figure 6-2 Option B1a: Denhead of Gray to Myrekirk Junction On-Line Shared-Use Path

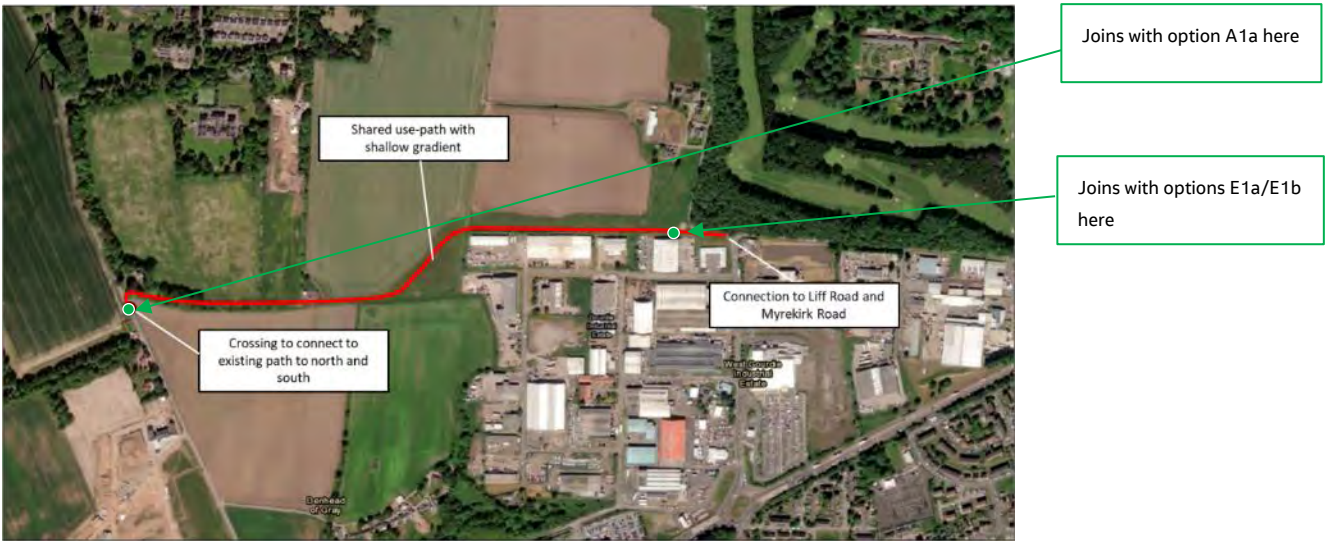


Figure 6-3 - Option C1b: Dykes of Gray to Liff Road Shared-Use path Off-Line

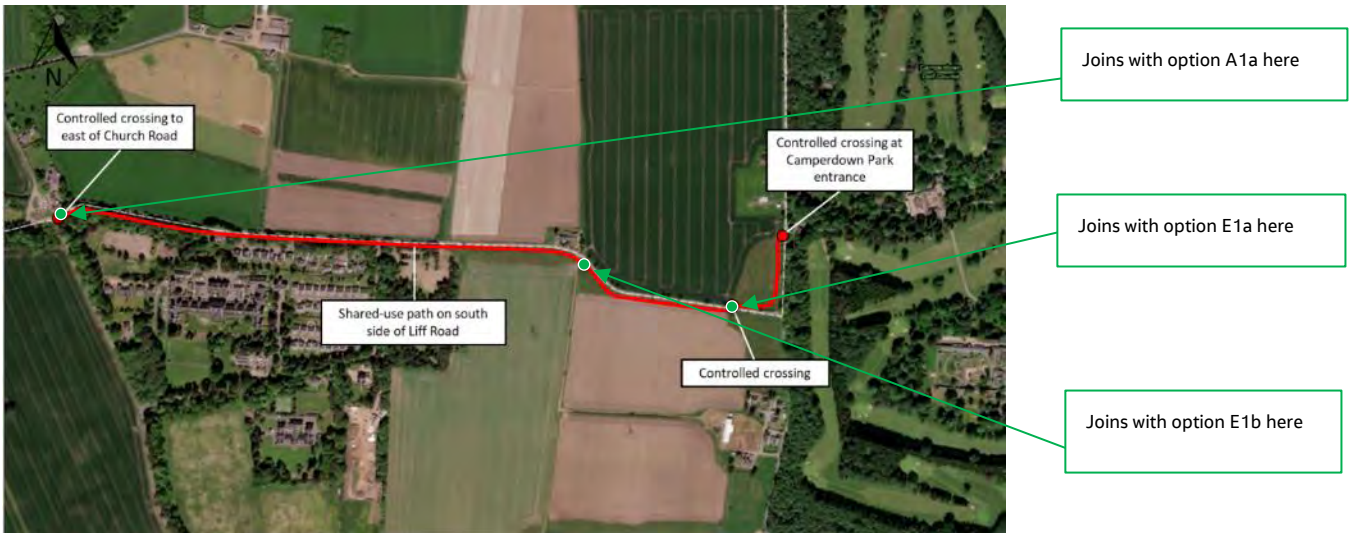


Figure 6-4 - Option D1a - Liff Road to Camperdown Park Shared-Use Path South Side

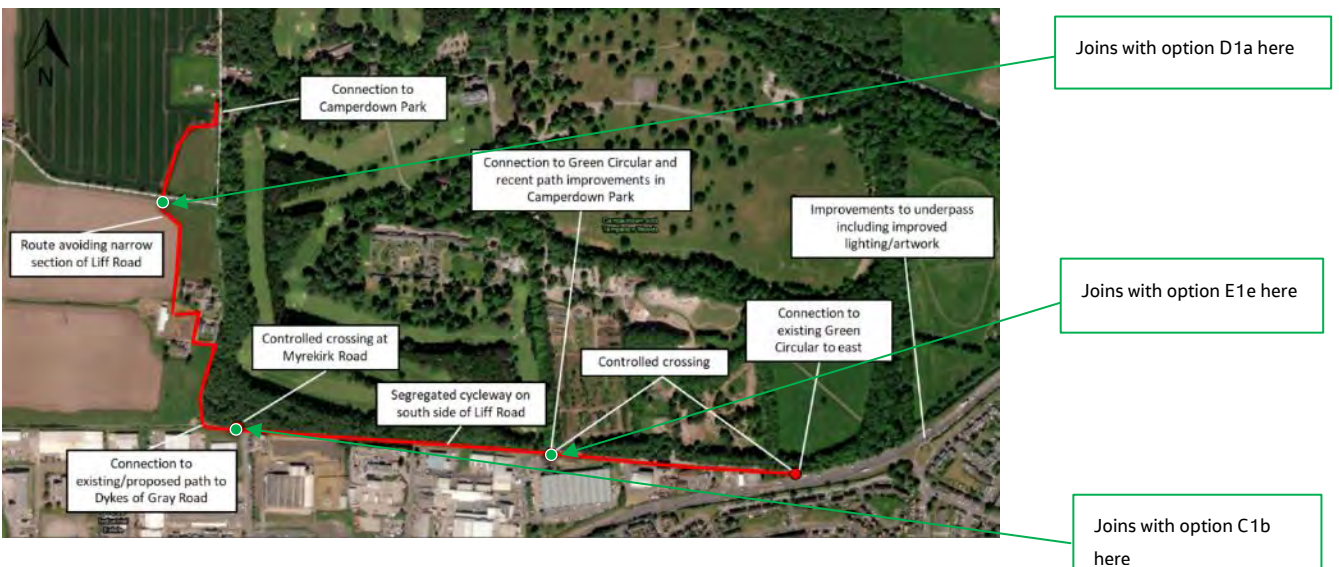


Figure 6-5 - Option E1a - Liff Road to A90 Kingsway (Segregated Two-Way Cycleway)

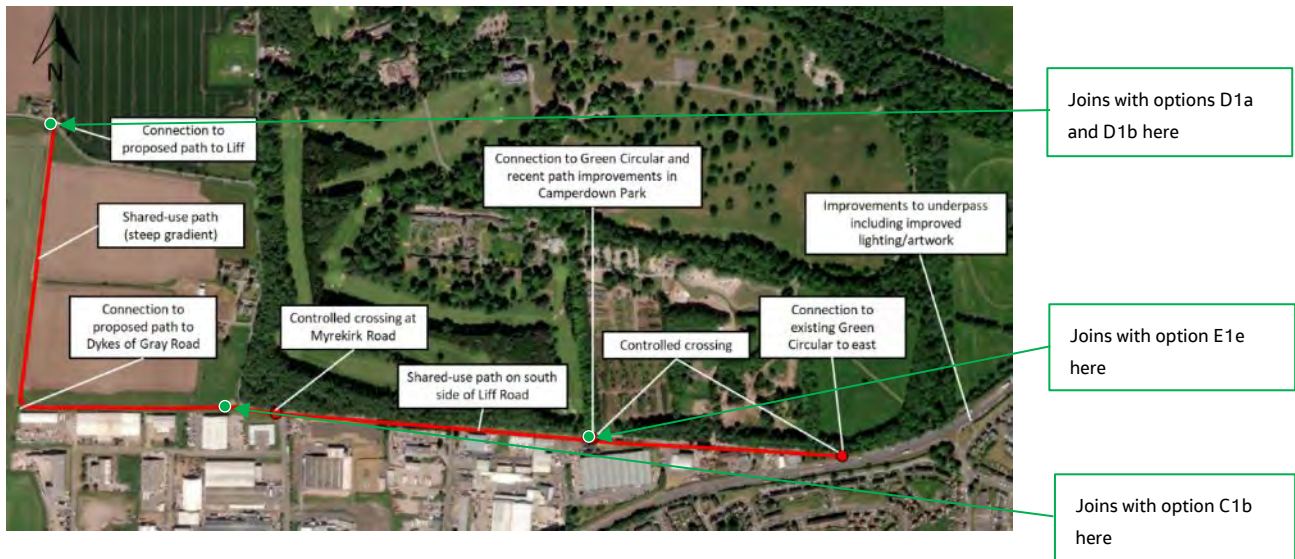


Figure 6-6 - Option E1b: Liff Road to A90 Kingsway, Shared-Use Path - Alternative Route



Figure 6-7 - Option E1e: Liff Road to Myrekirk Junction, Widened Shared-Use Path (Alternative to Two-Way Segregated Cycleway)

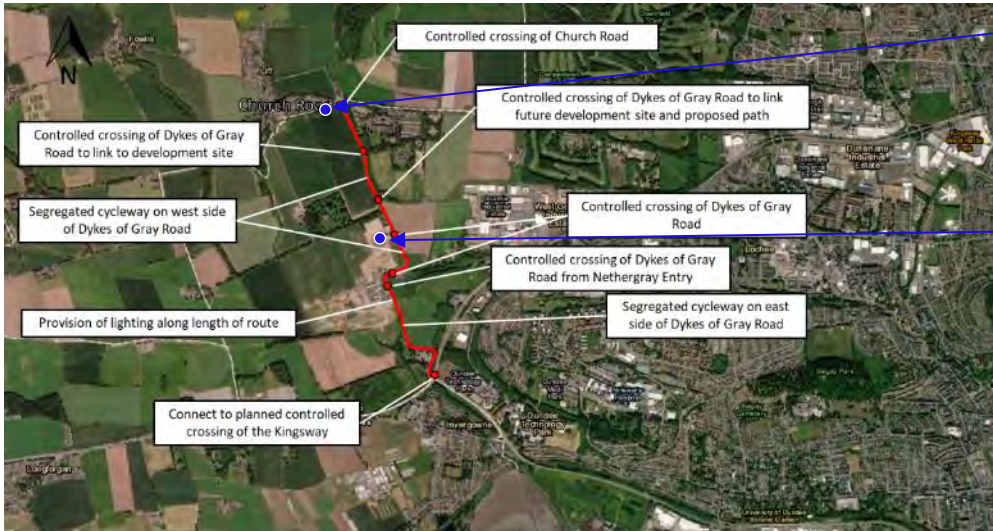
6.2 Recommendations for cycle parking

The proposed interventions in this study have highlighted several key routes for cycling. This study has identified where the installation of cycle parking facilities would be beneficial, to give cyclists confidence that they can securely store their cycle at their destination.

The specification of cycle parking units would need to be defined at a detailed design stage; they would require to be well-sited, secure, covered, of sufficient capacity for the specific destination, and be able to accommodate a range of cycle types. Note that we have not made any recommendations for new or improved cycle parking on employment or retail premises which are privately owned.

We are aware that Dundee’s Ride-On e-bike hire scheme operates in several parts of the city. There may be potential for scheme expansion to Western Gateway in the future, although it should be noted that for bike hire

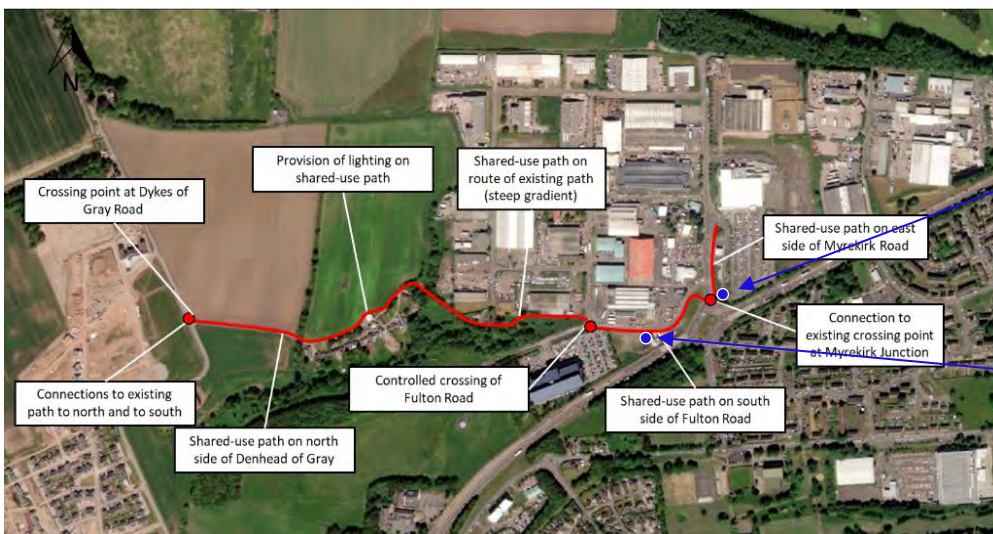
operating efficiency is greater in areas of higher population density (greater than 4,000 people per square km is a reasonable threshold¹⁸), therefore consideration of appropriate location is important.



There is a bus stop here with services to Dundee City Centre and Ninewells; cycle parking here would be beneficial to enable interchange

There is currently a retail unit here and the proposed village core is to be located here; cycle parking would be beneficial if not already provided for in the masterplan

Figure 6-8 - Option A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout)



Cycle parking near the Asda store would allow people to park their bikes and use onward public transport (good public transport links on Myrekirk Road), or access retail/employment

One retail unit and one hospitality unit located here; cycle parking would be beneficial in this area

Figure 6-9 - Option B1a: Denhead of Gray to Myrekirk Junction On-Line Shared-Use Path

¹⁸ <https://como.org.uk/wp-content/uploads/2018/06/Bike-Share-Procurement-Guidance-HI-RES.compressed.pdf>

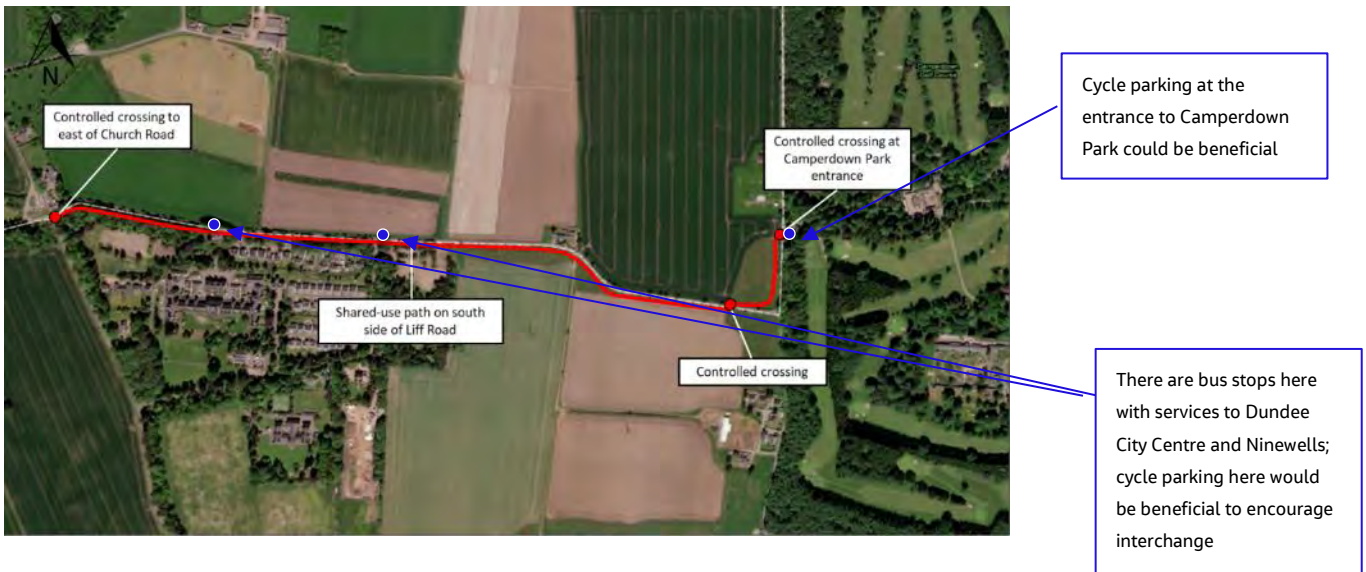


Figure 6-10 - Option D1a: Liff Road to Camperdown Park Shared-Use Path South Side

6.3 Recommendations for complementary measures

Improving infrastructure is necessary, but insufficient on its own, to encourage more people to walk, wheel and cycle.

“Increasing rates of active travel use relies on the right balance of investment to be made in:

- *The right infrastructure;*
- *The right information;*
- *The right enablers of change (access to bikes, cycle training, led walks, etc.); and*
- *The right attitudes, so that more people perceive active travel options as attractive and relevant to their journey choices or leisure time activities”¹⁹.*

Behaviour change interventions are likely to be particularly cost-effective if:

- They accompany the introduction of new or improved infrastructure;
- Are focussed on people that are undergoing life events which affect travel choices (e.g. moving house, children changing school, etc);
- Where the alternative travel option being suggested is credible (e.g. active journeys that are short enough for people to realistically achieve).

Should route improvements commence to construction, it is recommended that behaviour change measures are considered alongside investment in infrastructure. Any work should focus on those individuals who would benefit most from route improvements. Complementary measures could include as an example:

- **Information:**
 - Update the Dundee Cycle Map with Western Gateway routes and widely disseminate printed and online versions to local residents, employers, community facilities, etc;

¹⁹ Adapted from Review of Active Travel Policy Implementation. Transport Scotland, 2016 <https://www.transport.gov.scot/media/10302/tp-active-travel-policy-implementation-review-october-2016.pdf>

- Undertake a campaign that seeks to ensure that an improved level of awareness and respect exists between all types of path users;
- **Enabling change:**
 - Help more people to access good value bikes to loan or purchase, in partnership with Dundee's Active Travel Hub;
 - Investigate potential for the Ride On e-bike hire scheme to expand out to Western Gateway (see note above);
- **Encouraging change:**
 - Ongoing promotional campaign work and better information to ensure that local people know of the opportunities for active travel, of the benefits of walking and cycling more often;
 - Encouragement to cycle and walk more, through community events and activities.

7. Conclusions and Recommendations

7.1 Conclusions

The findings of this study suggest that there are several options for improving active travel connectivity within and from the Western Gateway area which merit further detailed development and assessment.

It should be noted that the methodology used for this commission is not designed to recommend a preferred option. In reality, it provides a multi-criteria assessment framework to assess the relative performance of the various options and interventions, enabling DCC to make an informed choice on the future development of active travel improvements for Western Gateway.

The appraisal described in this report has shown that there are a number of potential interventions which could fulfil the study objectives. The ultimate aim should be to develop a cohesive network of active travel routes within and from Western Gateway, linked to the wider active travel network in Dundee and developed in line with proposals being considered as part of ongoing work by DCC through its Cycling Strategy and related work.

It is recommended that further work is undertaken to develop these proposed interventions to an appropriate level of design to allow for a further assessment of their deliverability, including technical feasibility. This would also enable further quantification of their likely impacts, both positive and negative.

There is a considerable level of community and stakeholder interest in active travel improvements in the area. To ensure stakeholders are fully informed of developments; it is recommended that further community engagement is undertaken as the proposals are refined. This is especially relevant for representatives of disabled people, who we attempted contact with during this commission, but who did not provide their views at this stage.

Furthermore, engagement with landowners should be undertaken to understand their views on route options, where land take may be required, and whether developer contributions towards infrastructure costs may be possible.

7.2 Recommended Next Steps

The following next steps are recommended for subsequent stages of work to improve active travel for the Western Gateway:

- DCC should review the emerging findings from this stage of work and undertake a gateway review to determine if the recommended emerging preferred options are to be taken forward to Stage 2 Concept Design;
- Early engagement with affected stakeholders and local community representatives should be undertaken (including landowners), guided by a stakeholder and community engagement plan;
- Construction cost estimates should be further reviewed and developed as design work commences.

Appendix A Route Appraisal Tables

Intervention A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout) – Two-way segregated pathway

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	3	Connects with Liff Primary school
To local active leisure/recreation opportunities	3	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	3	Off-Road facility
Design places that provide enjoyment, comfort and protection	3	Off-Road facility
Ensure access for all and equality of opportunity in public space	3	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling, and wheeling over private motor vehicles	1	

Criteria	Score	Description
Attractiveness	3	
Coherence	2	Connects to Liff
Directness	2	

Safety	3	Off-Road but no lighting present
Comfort	3	
Adaptability	2	Space available for future adjustments
Deliverability	2	
Accessibility	2	Easy to access from the housing development

Intervention A 1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout) – Shared-use path

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	
To the Green Circular, including across the Kingsway, and hence the rest of the city’s active travel network	2	
To community facilities, schools, employment and retail	3	Connects with Liff Primary school
To local active leisure/recreation opportunities	3	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling, and wheeling over private motor vehicles	1	

Criteria	Score	Description
Attractiveness	-1	
Coherence	2	Connects to Liff
Directness	2	
Safety	3	Off-Road but no lighting present
Comfort	2	
Adaptability	2	Space available for future adjustments
Deliverability	2	
Accessibility	2	Easy to access from the housing development

Option A1b: Dykes of Gray Road South to existing path to Green Circular

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	0	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility

Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	3	
Coherence	3	Connects to Liff
Directness	3	
Safety	3	Off-Road, no lighting or signage
Comfort	3	
Adaptability	0	Space available for future adjustments
Deliverability	-3	
Accessibility	1	Easy to access from the housing development

Intervention A1c: Dykes of Gray Road South to Mill Road Shared-Use Path

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	0	
To the Green Circular, including across the Kingsway, and hence the rest of the city’s active travel network	2	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	0	Off-Road facility
Design places that provide enjoyment, comfort and protection	0	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	-3	
Coherence	0	Connects to Liff
Directness	-3	
Safety	2	Off-Road, no lighting or signage
Comfort	0	
Adaptability	1	Space available for future adjustments
Deliverability	1	
Accessibility	1	Easy to access from the housing development

Intervention A1d: South of Development Site to Mill Road Shared-Use Path

Objectives	Score	Description

Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	0	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	0	Off-Road facility
Design places that provide enjoyment, comfort and protection	0	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	-3	
Coherence	0	Connects to Liff
Directness	-2	
Safety	2	Off-Road, no lighting or signage
Comfort	0	
Adaptability	2	Space available for future adjustments

Deliverability	2	
Accessibility	2	Easy to access from the housing development

Intervention A2: Dykes of Gray Road to Benvie/Liff Path Improvements

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	0	
To the Green Circular, including across the Kingsway, and hence the rest of the city’s active travel network	0	Does not connect Directly to the green circular
To community facilities, schools, employment and retail	1	
To local active leisure/recreation opportunities	1	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	0	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	0	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	-3	
Coherence	0	Connects to Liff

Directness	2	
Safety	3	Off-Road, no lighting or signage
Comfort	2	
Adaptability	2	Space available for future adjustments
Deliverability	2	
Accessibility	2	Easy to access from the housing development

Intervention B1a: Denhead of Gray to Myrekirk Junction On-Line Shared-Use Path

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	Does not connect directly to the Green Circular but connects to Myrekirk Roundabout controlled crossing which is near the green circular
To community facilities, schools, employment and retail	3	
To local active leisure/recreation opportunities	3	Indirectly connects to local facilities.

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit

Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	
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Criteria	Score	Description
Attractiveness	1	
Coherence	2	Connects to Liff
Directness	2	
Safety	2	Off-Road, lack of lighting
Comfort	1	
Adaptability	2	Space available for future adjustments
Deliverability	3	Proposed path by DCC will support this route
Accessibility	2	Easy to access from the housing development

Intervention B1b: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path

(Reduced incline from Denhead of Gray to Nobel Road)

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	Does not connect directly to the Green Circular but connects to Myrekirk Roundabout controlled crossing which is near the green circular
To community facilities, schools, employment and retail	3	
To local active leisure/recreation opportunities	3	Indirectly connects to local facilities.

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	

Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	1	
Coherence	2	Connects to Liff
Directness	2	
Safety	2	Off-Road, lack of lighting
Comfort	1	
Adaptability	2	Space available for future adjustments
Deliverability	3	Land owned by Lotus group
Accessibility	2	Easy to access from the housing development

Intervention B1c: Denhead of Gray to Myrekirk Junction Off-Line Shared-Use Path (connection to Fulton Road)

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	
To the Green Circular, including across the Kingsway, and hence the rest of the city’s active travel network	2	Does not connect directly to the Green Circular but connects to Myrekirk Roundabout controlled crossing which is near the green circular

To community facilities, schools, employment and retail	3	
To local active leisure/recreation opportunities	3	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	
Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Data gathered on site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	2	
Coherence	2	Continues on from Route A
Directness	2	
Safety	2	Off-Road
Comfort	2	
Adaptability	1	
Deliverability	0	
Accessibility	2	

Intervention C1a: Dykes of Gray Road to Liff Road Shared-Use Path On-Line

Objectives	Score	Description
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Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	Connecting the existing route with local facilities
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	1	Does not connect directly with Green Circular
To community facilities, schools, employment and retail	2	Connecting the existing path with the local facilities
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	1	Off-Road facility
Design places that provide enjoyment, comfort and protection	1	Off-Road facility
Ensure access for all and equality of opportunity in public space	1	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	1	Connects the housing development to Asda and local facilities
Coherence	2	
Directness	2	
Safety	2	Safer to access local facilities via a dedicated route, lack of lighting
Comfort	1	
Adaptability	2	

Deliverability	2	
Accessibility	2	

Intervention C1b: Dykes of Gray to Liff Road Shared-Use Path Off-Line

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	3	Connecting the existing route with local facilities
To the Green Circular, including across the Kingsway, and hence the rest of the city’s active travel network	1	Does not connect directly with Green Circular
To community facilities, schools, employment and retail	2	Connecting the existing path with the local facilities
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	2	Connects the housing development to Asda and local facilities
Coherence	2	

Directness	2	
Safety	3	Safer to access local facilities via a dedicated route, lack of lighting
Comfort	2	
Adaptability	2	
Deliverability	2	
Accessibility	2	

Intervention D1a: Dykes of Gray to Liff Road Shared Use Path On-Line

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	1	Connects to the Green Circular in Camperdown Park and improves the route from the Whitelawson Cottages and the West Green Park housing to Liff Primary
To local active leisure/recreation opportunities	3	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit

Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	
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Criteria	Score	Description
Attractiveness	2	
Coherence	2	Connects to Liff
Directness	2	
Safety	3	Off-Road
Comfort	3	
Adaptability	2	Space available for future adjustments
Deliverability	2	
Accessibility	1	Easy to access from the housing development

Intervention D1b: Liff Road to Camperdown park Shared-Use Path North Side

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	1	Connects to the Green Circular in Camperdown Park and improves the route from the Whitelawson Cottages and the West Green Park housing to Liff Primary
To local active leisure/recreation opportunities	3	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	

Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	1	Off-Road facility
Design places that provide enjoyment, comfort and protection	2	Off-Road facility
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	0	

Criteria	Score	Description
Attractiveness	0	
Coherence	2	Connects to Liff
Directness	2	
Safety	2	Off-Road
Comfort	2	
Adaptability	2	Space available for future adjustments
Deliverability	2	
Accessibility	2	Easy to access from the housing development

Intervention E1a: Liff Road A90 Kingsway, Segregated Pathway

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	3	
To community facilities, schools, employment and retail	2	

To local active leisure/recreation opportunities	3	Direct connection with Camperdown
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PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	3	
Design places that provide enjoyment, comfort and protection	3	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	1	
Coherence	1	Connects to Camperdown
Directness	-1	
Safety	2	Off-Road, no lighting or signage
Comfort	2	
Adaptability	1	Space available for future adjustments
Deliverability	-1	
Accessibility	-1	Access from the housing development but relies on intervention B1/C1 to be implemented

Intervention E1a: Liff Road A90 Kingsway, Shared-Use Path

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		

Within and between existing and proposed Western Gateway development sites	1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	3	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	3	Direct connection with Camperdown

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	
Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	-1	
Coherence	1	Connects to Camperdown
Directness	-1	
Safety	2	Off-Road, no lighting or signage
Comfort	1	
Adaptability	1	Space available for future adjustments
Deliverability	-1	

Accessibility	-1	Access from the housing development but relies on intervention B1/C1 to be implemented
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Intervention E1b: Liff Road to A90 Kingsway Alternative Route, Shared-Use Path or Two-Way Segregated Cycleway on Liff Road

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	2	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	3	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	3	Direct connection with Camperdown

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	
Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	3	
Coherence	3	Connects to Camperdown

Directness	2	
Safety	3	Off-Road, no lighting or signage
Comfort	2	
Adaptability	2	Space available for future adjustments
Deliverability	1	
Accessibility	0	Access from the housing development but relies on intervention B1/C1 to be implemented

Intervention E1c: Liff Road to Kingsway Alternative Route Improved Shared-Use Path Camperdown Park

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	-1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	3	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	1	
Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit

Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	
---	---	--

Criteria	Score	Description
Attractiveness	-3	
Coherence	1	Connects to Camperdown
Directness	1	
Safety	2	Off-Road, no lighting or signage
Comfort	1	
Adaptability	0	Space available for future adjustments
Deliverability	1	
Accessibility	-1	Access from the housing development but relies on intervention B1/C1 to be implemented

Intervention E1d: Liff Road to A90 Kingsway Alternative Route

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	-1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	3	
To community facilities, schools, employment and retail	2	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	1	

Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	-3	
Coherence	1	Connects to Camperdown
Directness	1	
Safety	2	Off-Road, no lighting or signage
Comfort	1	
Adaptability	0	Space available for future adjustments
Deliverability	1	
Accessibility	-1	Access from the housing development but relies on intervention B1/C1 to be implemented

Intervention E1e: Liff Road to Myrekirk Junction, Two-Way Segregated Cycleway

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	-1	
To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	1	
To local active leisure/recreation opportunities	2	

PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	2	
Design places that provide enjoyment, comfort and protection	2	
Ensure access for all and equality of opportunity in public space	2	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	1	

Criteria	Score	Description
Attractiveness	-3	
Coherence	1	
Directness	1	
Safety	2	
Comfort	2	
Adaptability	-1	
Deliverability	-3	
Accessibility	-3	

Intervention E1e: Liff Road to Myrekirk Junction, Widened Shared-Use Path

Objectives	Score	Description
Provide high quality, attractive routes for people walking, wheeling and cycling:		
Within and between existing and proposed Western Gateway development sites	-1	

To the Green Circular, including across the Kingsway, and hence the rest of the city's active travel network	2	
To community facilities, schools, employment and retail	1	
To local active leisure/recreation opportunities	2	

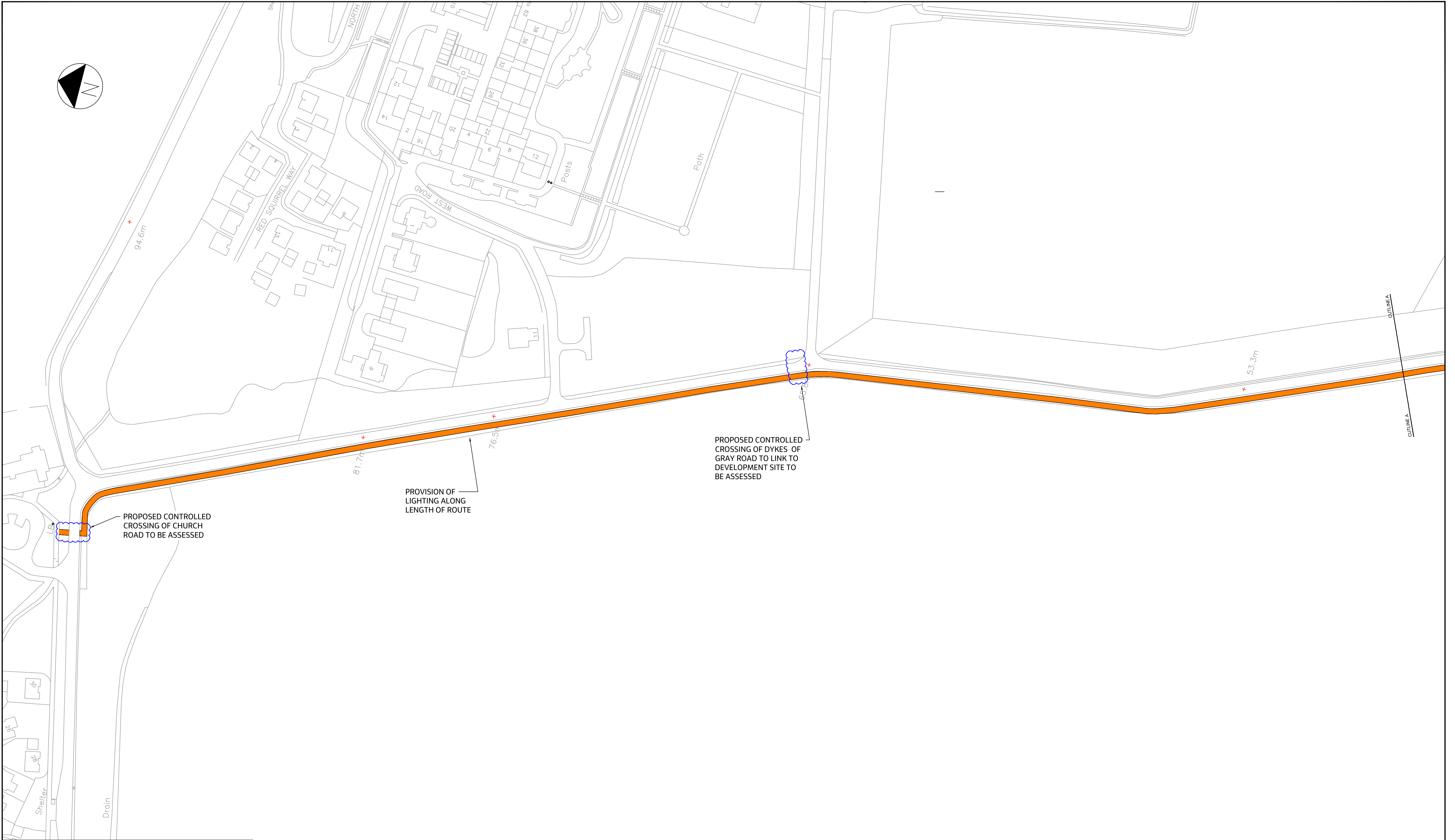
PfE Design Principle	Score	Description
Develop ideas collaboratively and in partnership with communities	3	
Facilitate independent walking, cycling, and wheeling for everyone, including an unaccompanied 12-year-old	1	
Design places that provide enjoyment, comfort and protection	1	
Ensure access for all and equality of opportunity in public space	1	
Ensure all proposals are developed in a way that is context-specific and evidence-led	3	Evidence gathered during site visit
Reallocate road space, and restrict motor traffic permeability to prioritise people walking, cycling and wheeling over private motor vehicles	2	

Criteria	Score	Description
Attractiveness	1	
Coherence	1	
Directness	1	
Safety	1	
Comfort	1	
Adaptability	2	
Deliverability	1	
Accessibility	0	

Appendix B Route Option Design Drawings

Note: Drawings for Routes A1a, B1a, C1b, D1a, E1a, E1b and E1e have been attached to this report.




Option A1a: Liff (Church Road) to A90 Kingsway (Swallow Roundabout),
Two-Way Segregated Pathway



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KEY

PROPOSED SEGREGATED CYCLEWAY/ SHARED-USE PATH	
EXISTING SHARED-USE PATH	
PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)	

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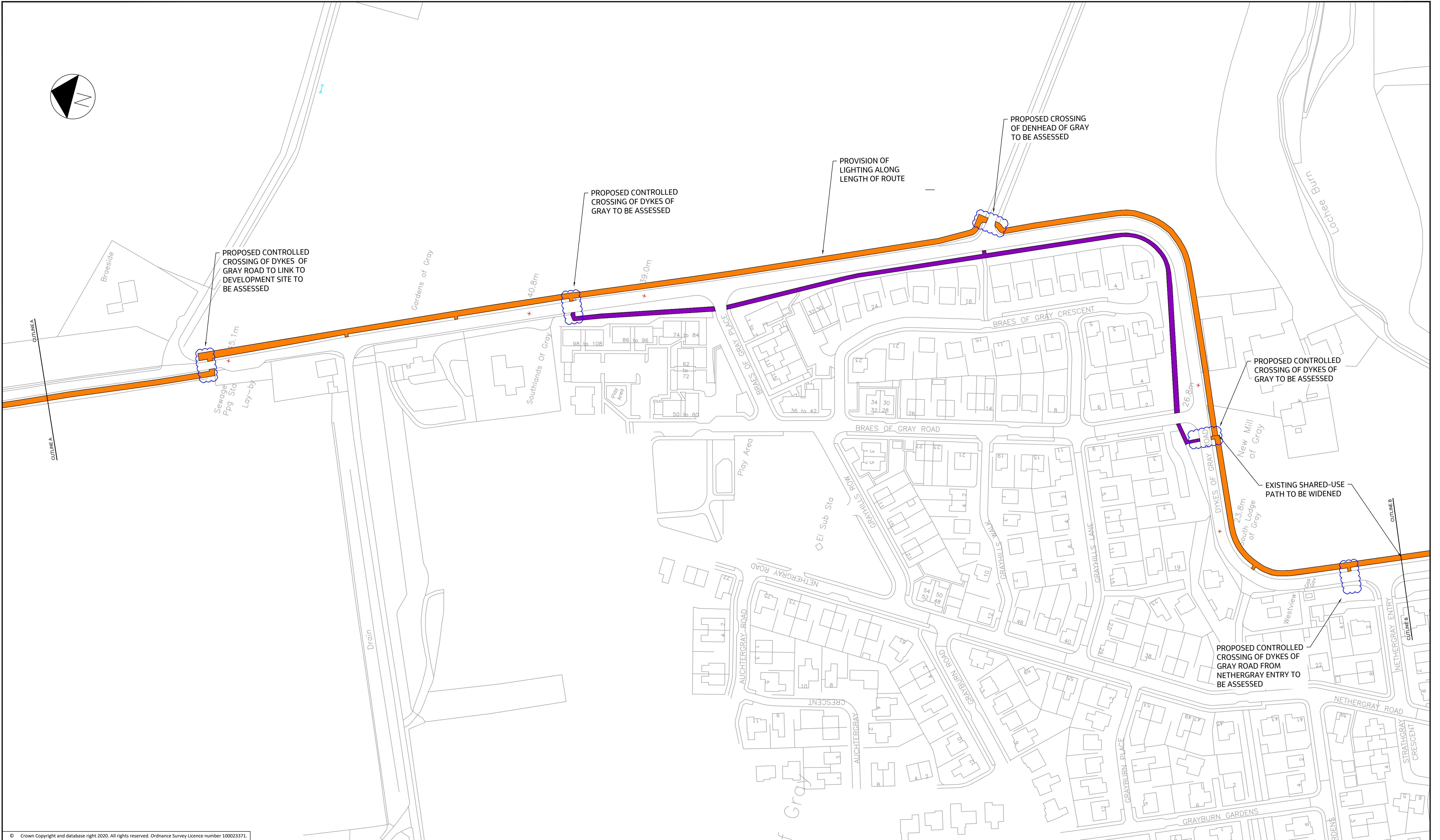
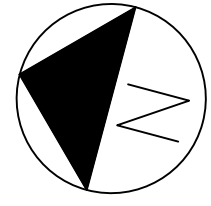
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SEGREGATED CYCLEWAY /
WIDENED SHARED- USE PATH
SHEET 1

Drawing status: **FOR INFORMATION**

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EXISTING SHARED-USE PATH	
PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)	

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OPTION A1a

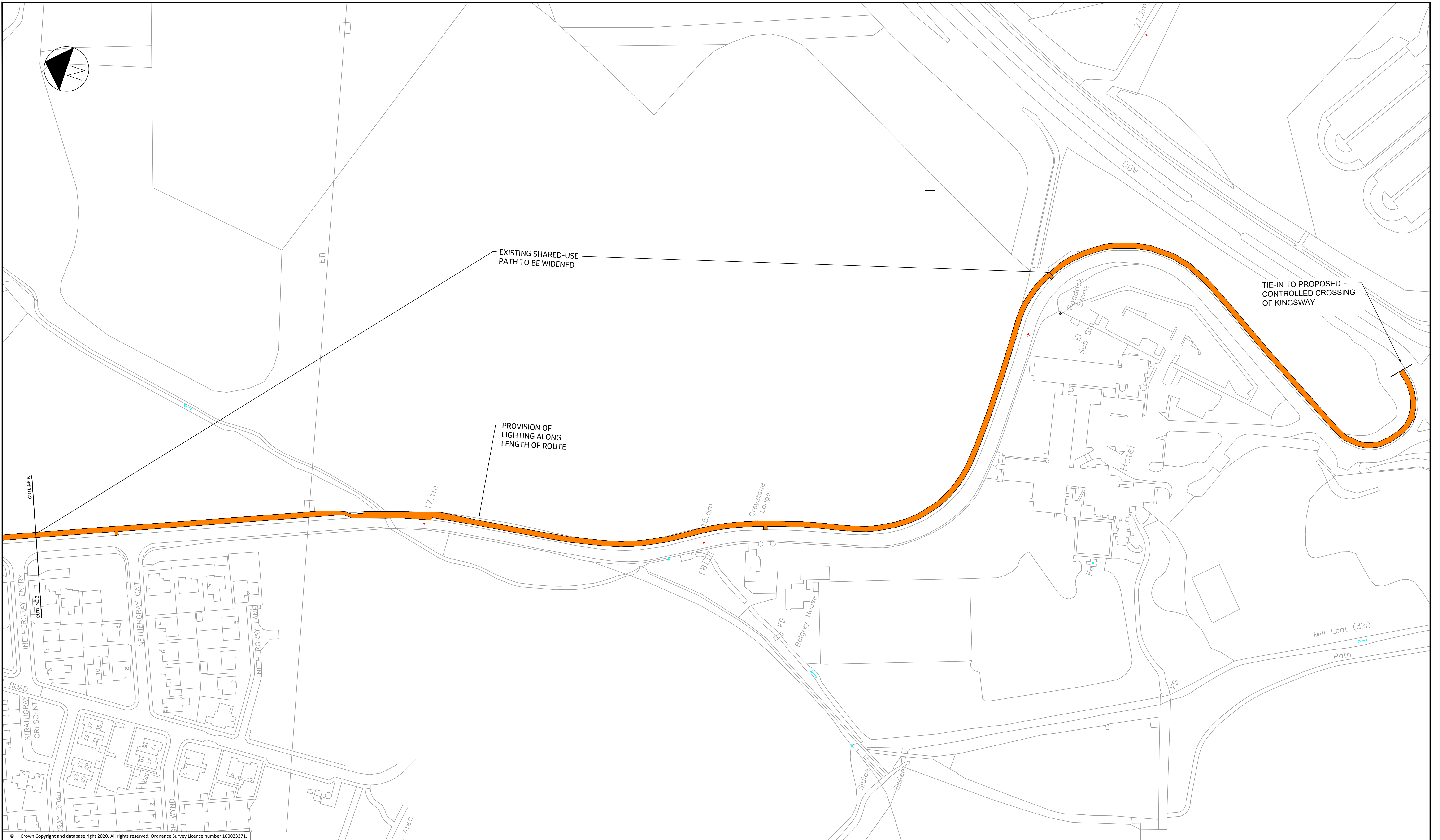
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WIDENED SHARED- USE PATH
SHEET 2**

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Client no.		0
Drawing number	B2340228-SK-A1a-0002	

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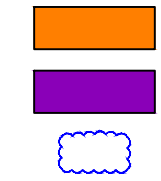
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 - EXISTING SHARED-USE PATH
 - PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)



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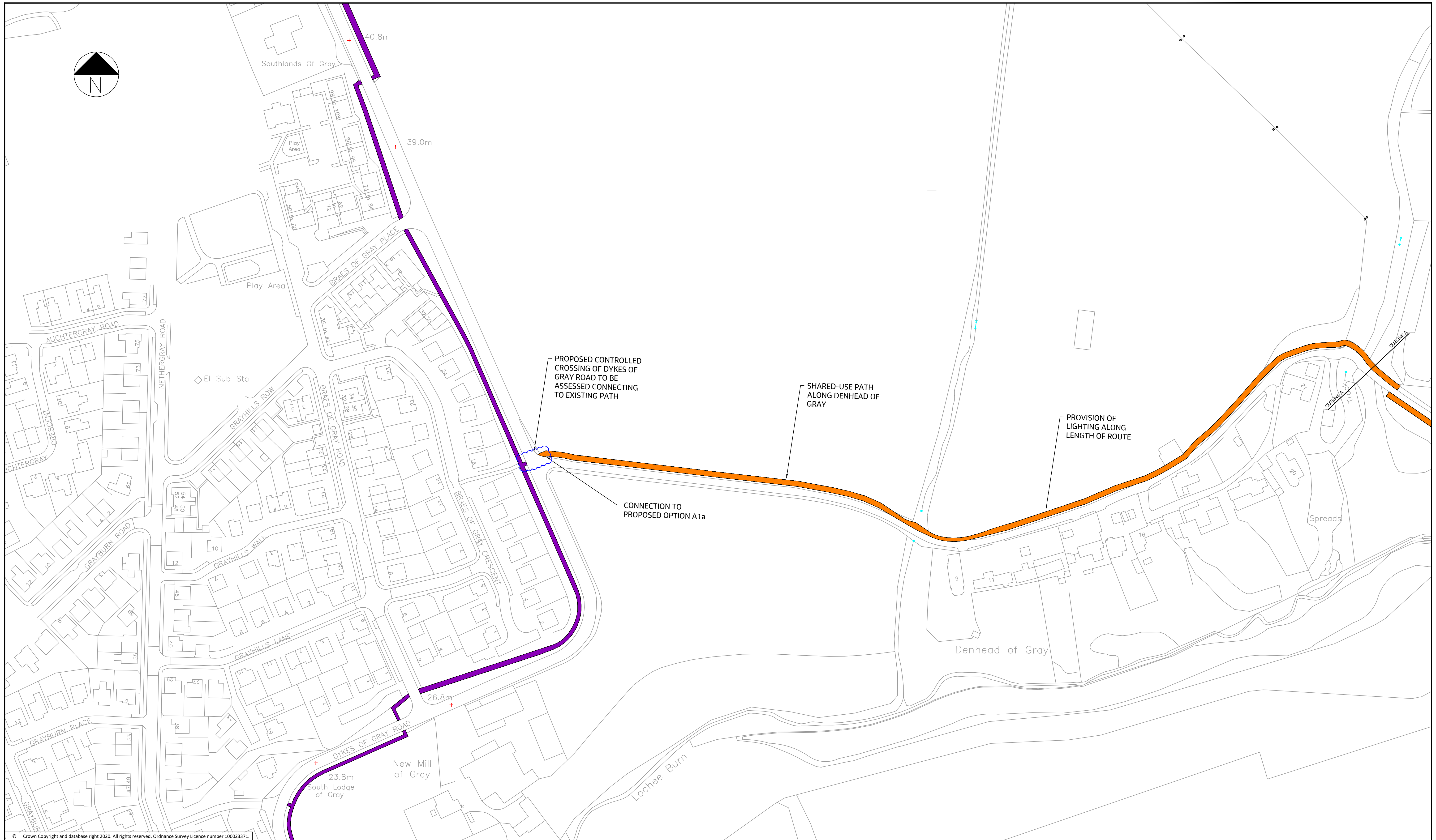
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LIFF TO A90 KINGSWAY
SEGREGATED CYCLEWAY /
WIDENED SHARED- USE PATH
SHEET 3

Drawing status
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Option B1a: Denhead of Gray to Myrekirk Junction On-Line Shared Use Path



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KEY

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EXISTING SHARED-USE PATH	
PROPOSED SHARED-USE PATH TO BE CONSTRUCTED BY DCC	
PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)	

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OPTION B1a

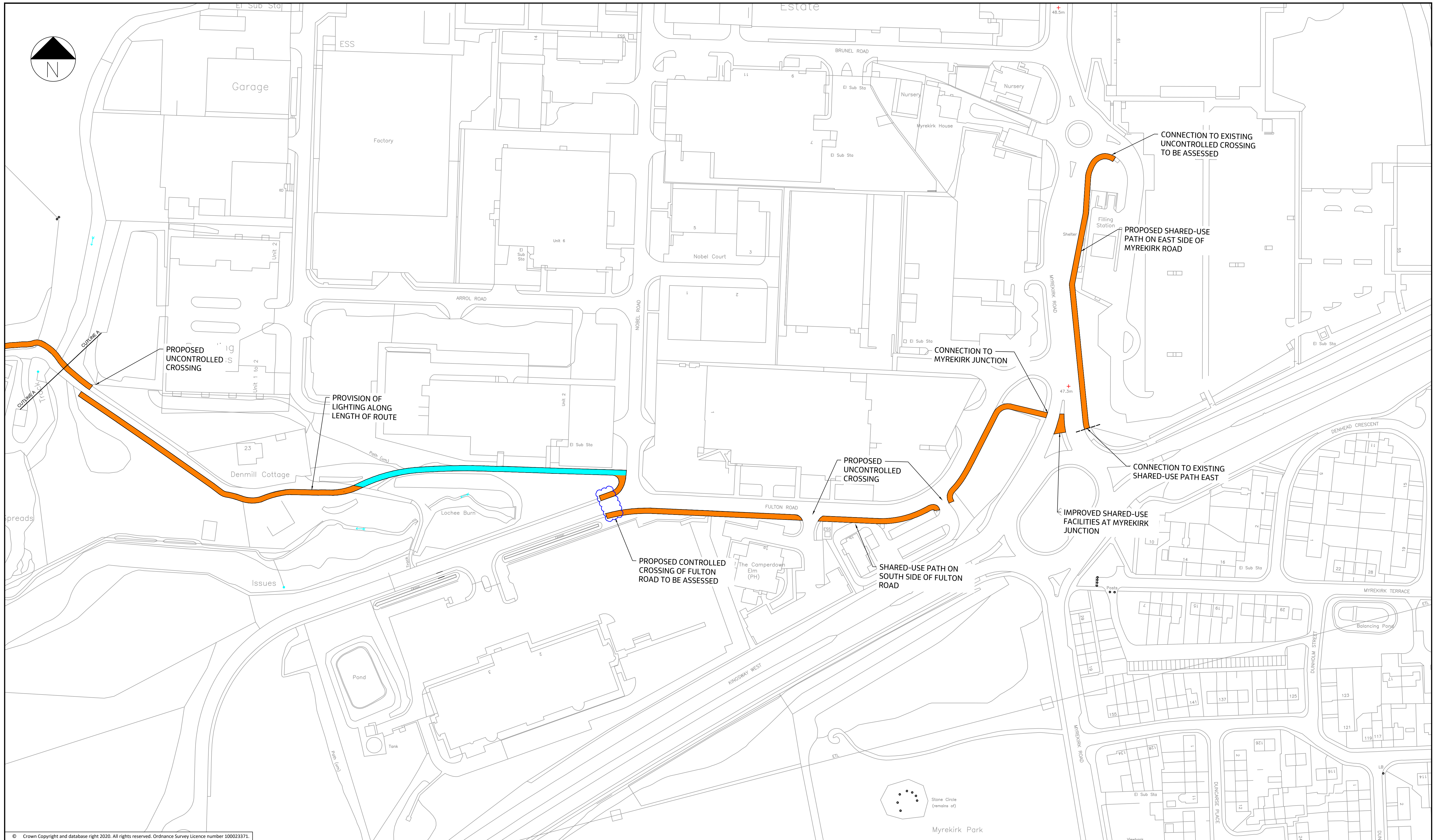
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MYREKIRK JUNCTION
SAHRED-USE PATH
SHEET 1**

Drawing status
FOR INFORMATION

Scale
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DO NOT SCALE

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Rev
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KEY

PROPOSED SHARED-USE PATH	
EXISTING SHARED-USE PATH	
PROPOSED SHARED-USE PATH TO BE CONSTRUCTED BY DCC	
PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)	

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OPTION B1a

Drawing title
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 MYREKIRK JUNCTION
 SHARED-USE PATH
 SHEET 2**

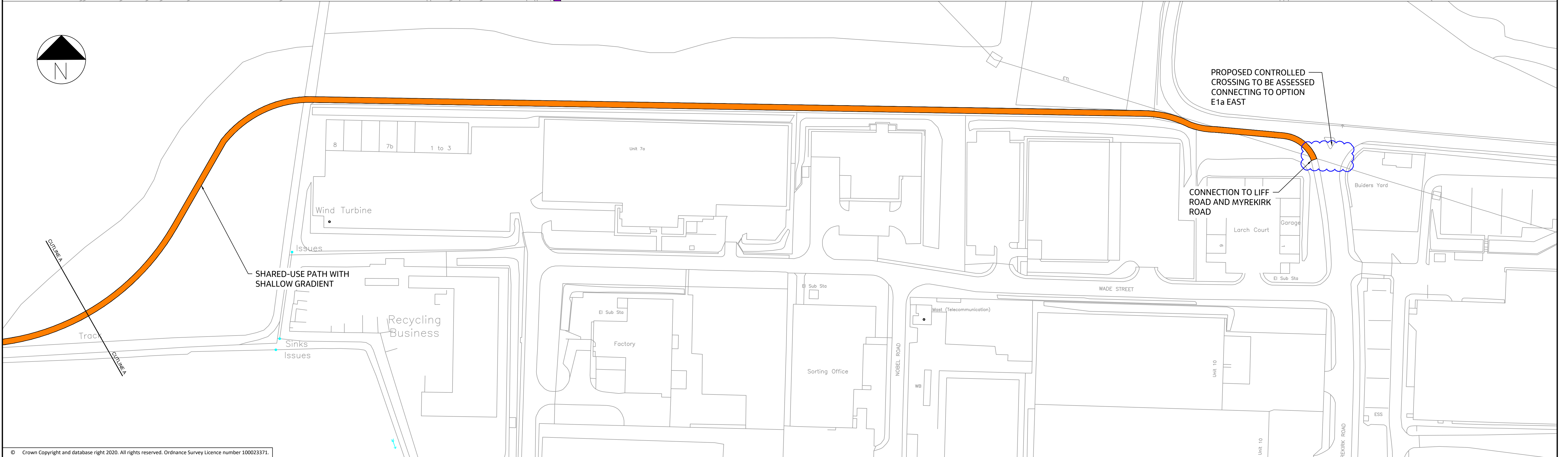
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Option C1b: Dykes of Gray to Liff Road Shared-use Path Off-Line



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KEY

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ACTIVE TRAVEL CONNECTIONS

OPTION C1b

Drawing title: **DYKES OF GRAY TO LIFF ROAD SHARED- USE PATH**

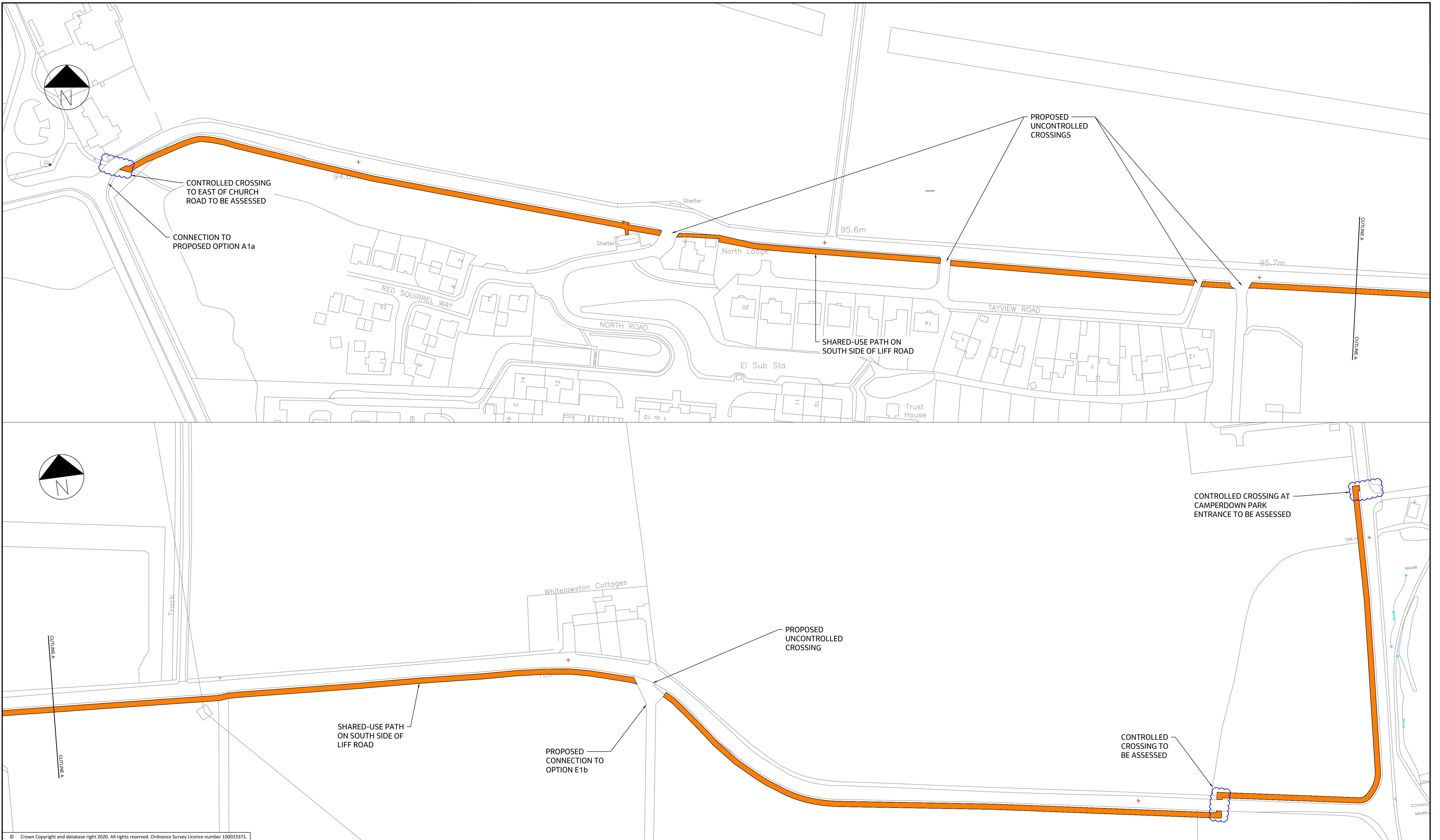
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Option D1a: Liff to Camperdown Park Shared-Use Path South Side



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KEY

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PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)	

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Drawing title
**LIFF ROAD TO
 CAMPERDOWN PARK
 SHARED- USE PATH**

Drawing status
FOR INFORMATION

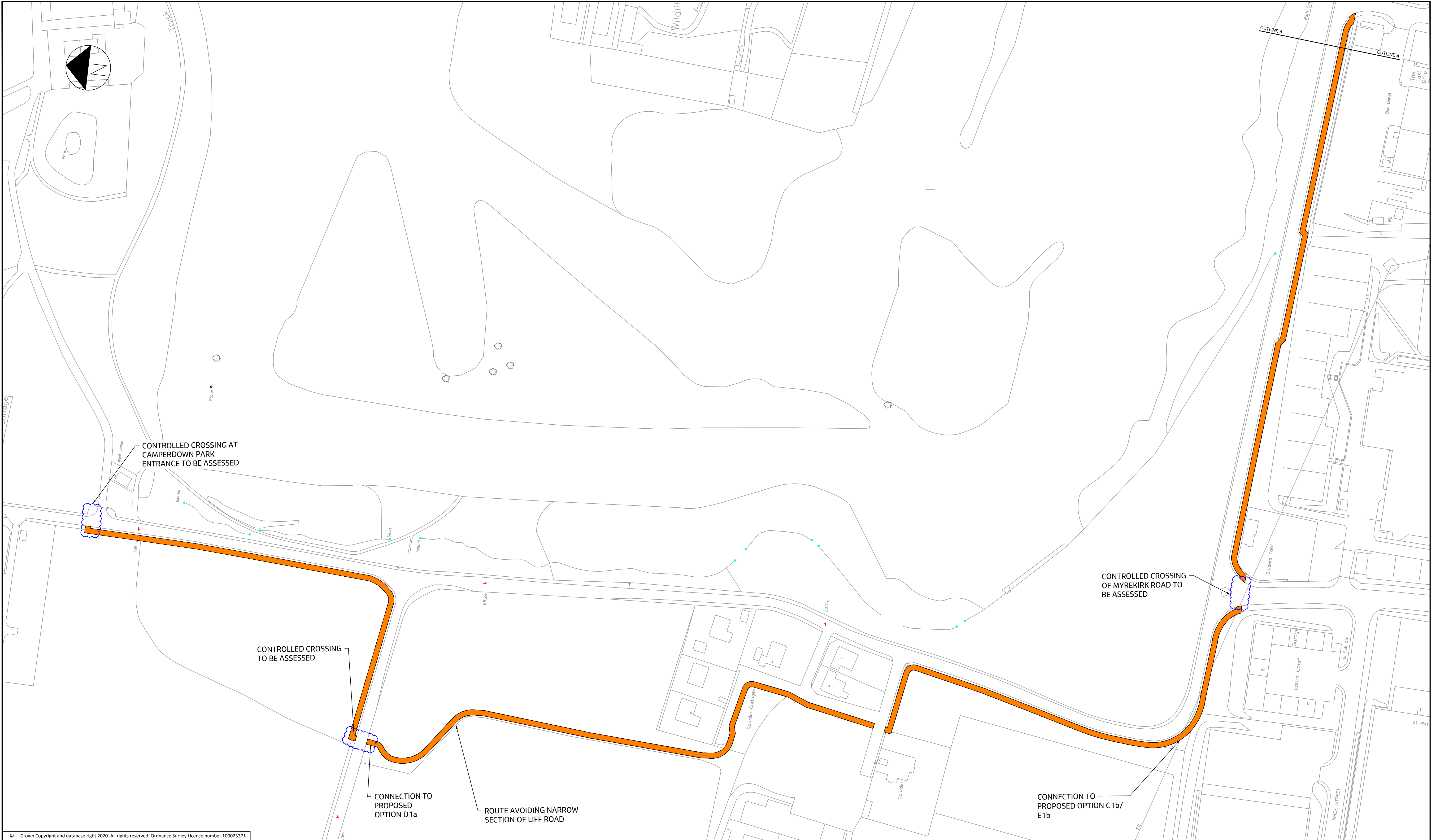
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Option E1a: Liff Road to A90 Kingsway, Segregated Pathway



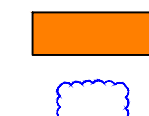
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OPTION E1a

**LIFF ROAD TO A90 KINGSWAY
 SEGREGATED CYCLEWAY/
 SHARED-USE PATH
 SHEET 1**

Drawing status: FOR INFORMATION

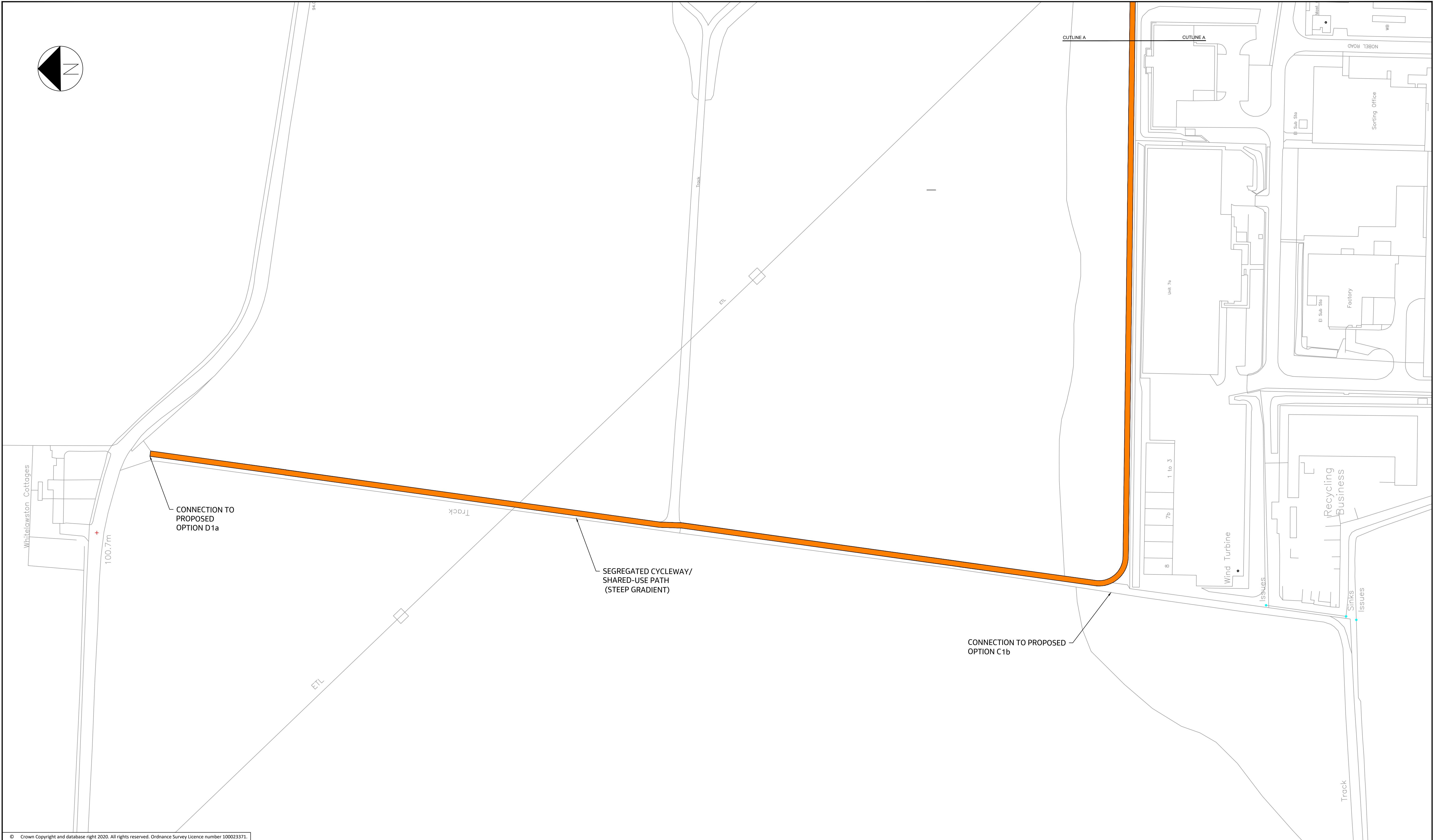
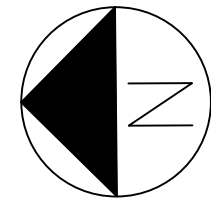
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Option E1b: Liff Road to A90 Kingsway, Shared-Use Path- Alternative Route



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OPTION E1b

Drawing title
LIFF ROAD TO A90 KINGSWAY
SEGREGATED CYCLEWAY/
SHARED-USE PATH
SHEET 1

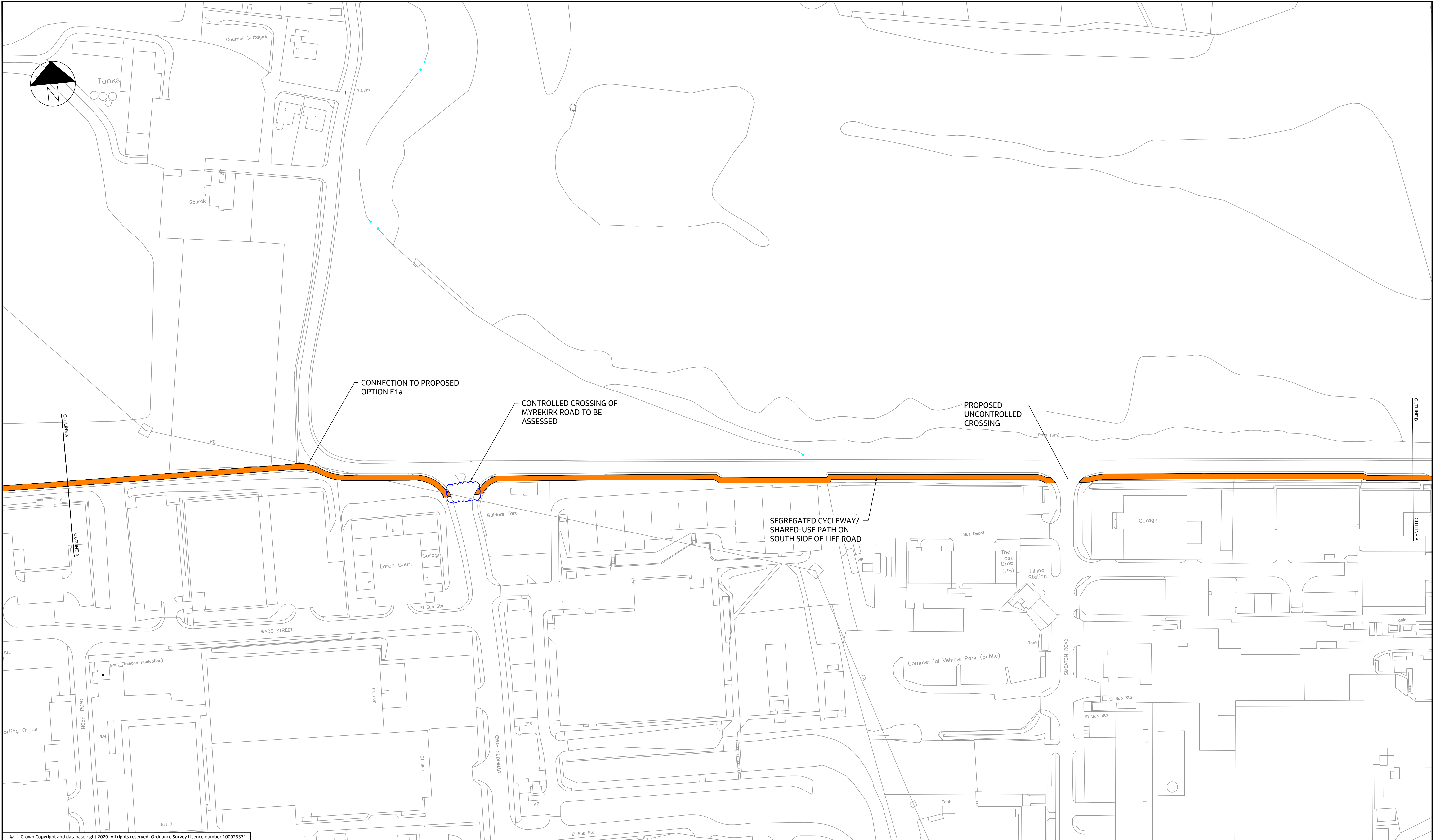
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 4. EXISTING CARRIAGEWAY WIDTHS, KERB LINES AND CROSSING LOCATIONS ARE INDICATIVE AND WILL BE CONFIRMED PRIOR TO COMMENCING CONSTRUCTION WORKS.

KEY

PROPOSED SEGREGATED CYCLEWAY/ SHARED-USE PATH 

PROPOSED CONTROLLED CROSSING (TO BE ASSESSED) 

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Project: **DUNDEE WESTERN GATEWAY**
ACTIVE TRAVEL CONNECTIONS

OPTION E1b

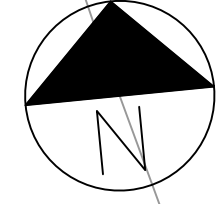
Drawing title: **LIFF ROAD TO A90 KINGSWAY**
SEGREGATED CYCLEWAY/
SHARED-USE PATH
SHEET 2

Drawing status: **FOR INFORMATION**

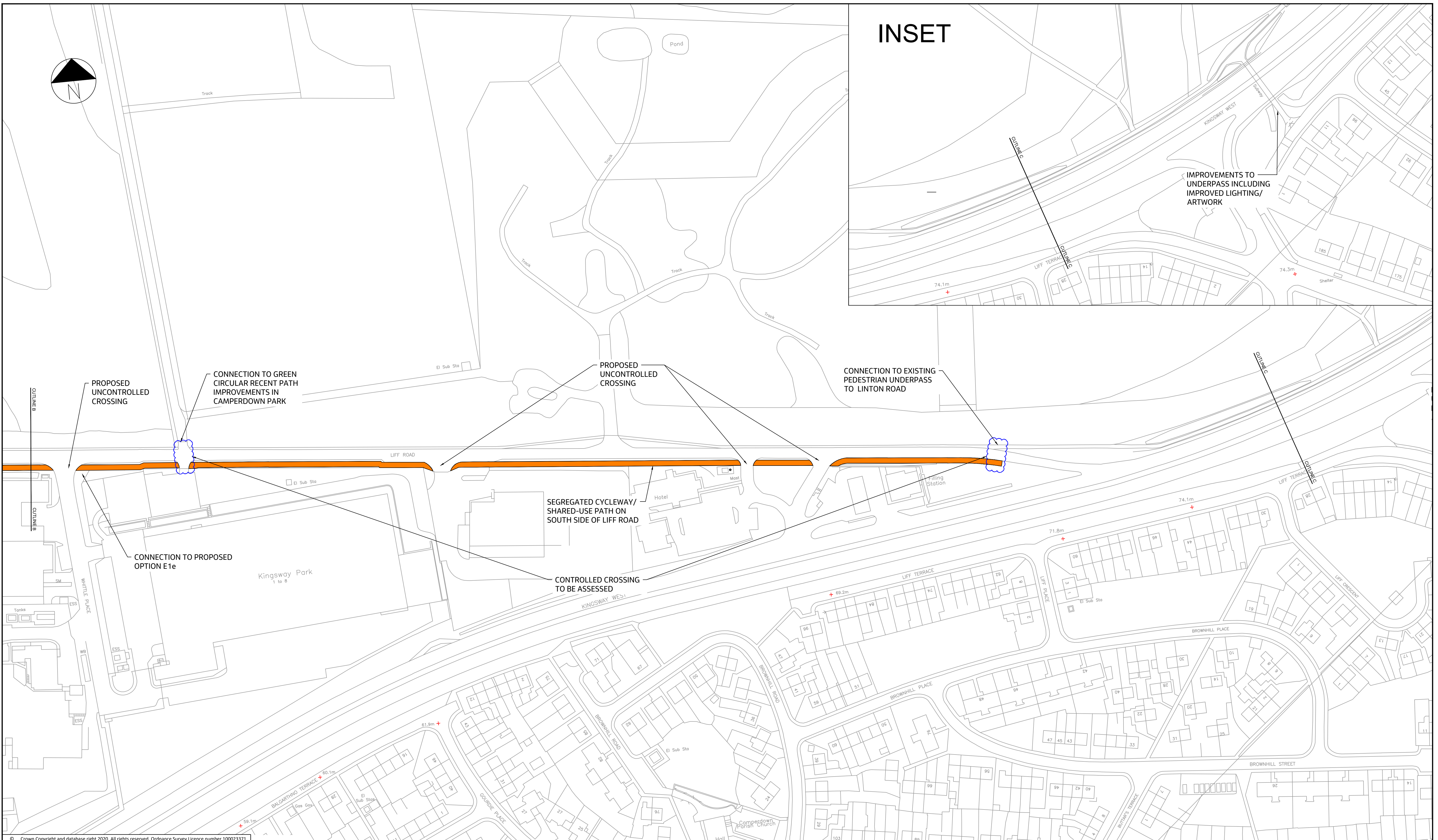
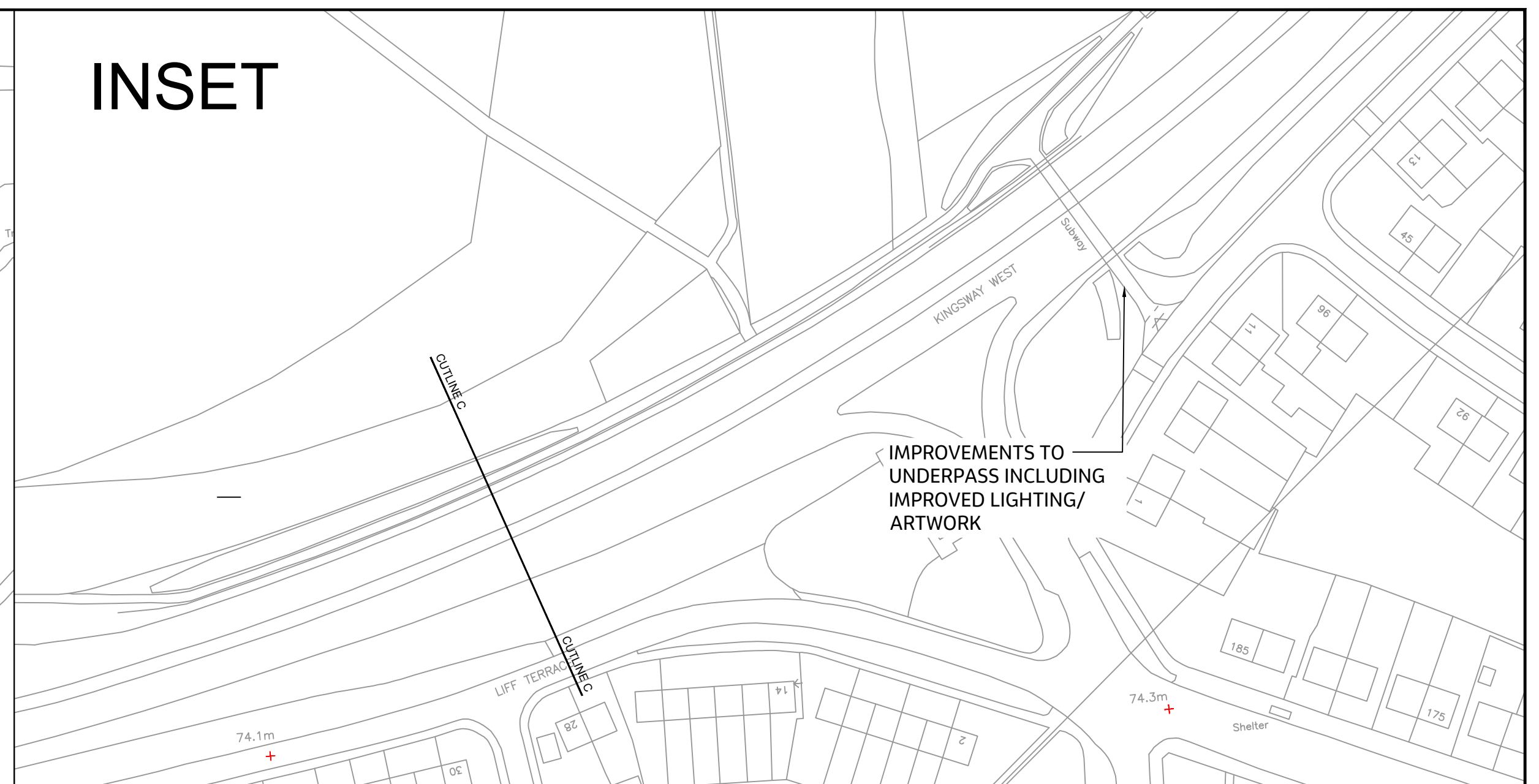
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Jacobs No.		Rev
Client no.		0
Drawing number	B2340228-SK-E1b-0002	

Rev	Rev. Date	Purpose of revision	Des'd	Check'd	Rev'd	Appr'd
0	27/08/2021	FOR INFORMATION	DC	IW	KV	CMcD

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INSET



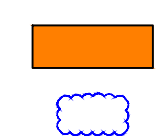
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KEY

- PROPOSED SEGREGATED CYCLEWAY/ SHARED-USE PATH
- PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)



Rev	Rev. Date	Purpose of revision	Des'd	Check'd	Rev'd	Apprv'd
1	13/09/2021	FOR INFORMATION	DC	IW	KV	CMcD
0	27/08/2021	FOR INFORMATION	DC	IW	KV	CMcD

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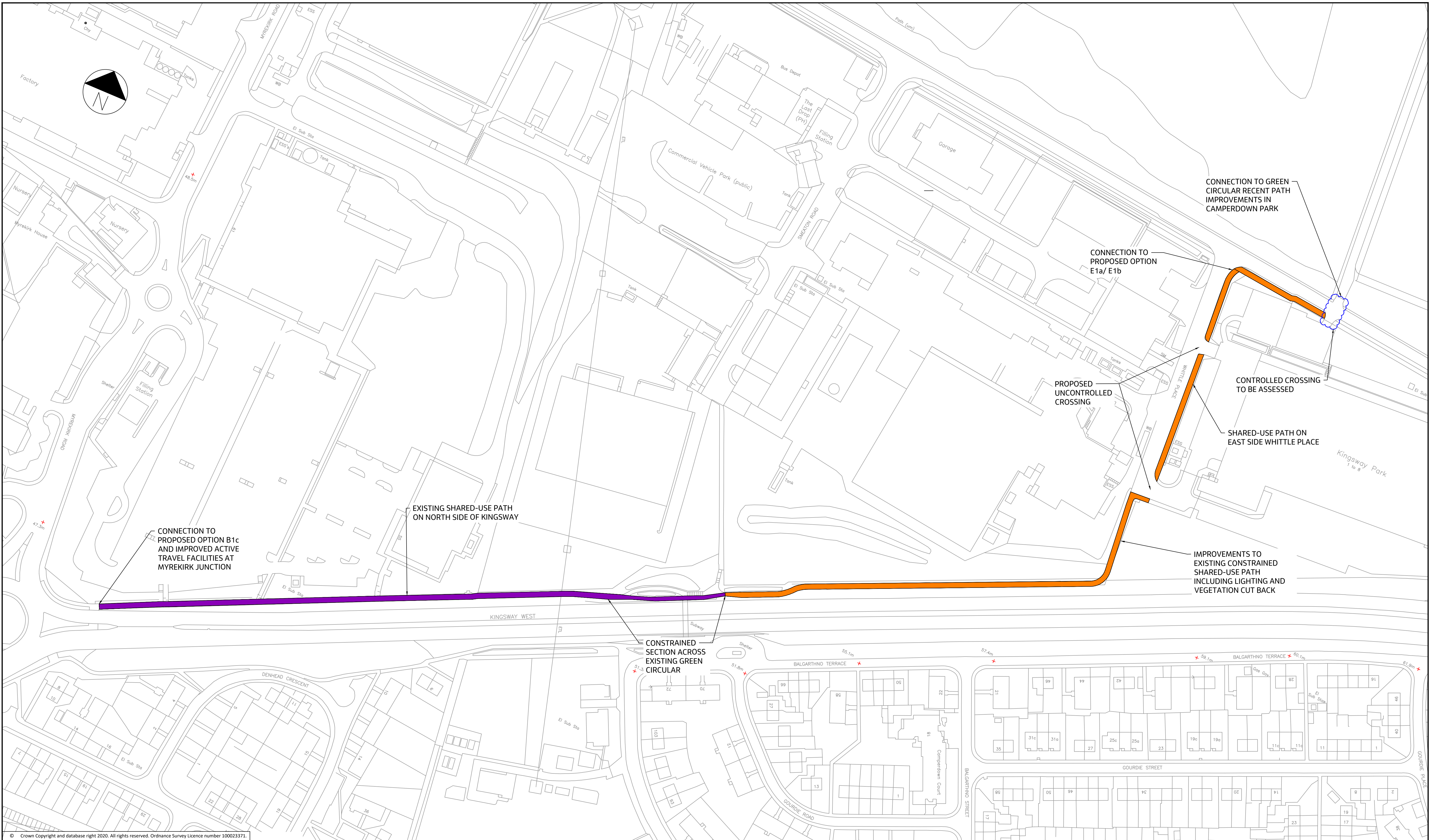
OPTION E1b

Drawing title: **LIFF ROAD TO A90 KINGSWAY
SEGREGATED CYCLEWAY/
SHARED-USE PATH
SHEET 3**

Drawing status: **FOR INFORMATION**

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.		Rev
Client no.		1
Drawing number	B2340228-SK-E1b-0003	

**Option E1e: Liff Road to Myrekirk Junction, Widened Shared-Use Path
(Alternative to Two-Way Segregated Cycleway)**



CONNECTION TO PROPOSED OPTION B1c AND IMPROVED ACTIVE TRAVEL FACILITIES AT MYREKIRK JUNCTION

EXISTING SHARED-USE PATH ON NORTH SIDE OF KINGSWAY

CONSTRAINED SECTION ACROSS EXISTING GREEN CIRCULAR

PROPOSED UNCONTROLLED CROSSING

CONNECTION TO PROPOSED OPTION E1a/ E1b

CONNECTION TO GREEN CIRCULAR RECENT PATH IMPROVEMENTS IN CAMPERDOWN PARK

CONTROLLED CROSSING TO BE ASSESSED

SHARED-USE PATH ON EAST SIDE WHITTLE PLACE

IMPROVEMENTS TO EXISTING CONSTRAINED SHARED-USE PATH INCLUDING LIGHTING AND VEGETATION CUT BACK

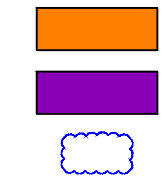
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KEY

- PROPOSED SHARED-USE PATH
- EXISTING SHARED-USE PATH
- PROPOSED CONTROLLED CROSSING (TO BE ASSESSED)



1	13/09/2021	FOR INFORMATION	DC	IW	KV	CMcD
0	27/08/2021	FOR INFORMATION	DC	IW	KV	CMcD
Rev	Rev. Date	Purpose of revision	Des'd	Check'd	Rev'd	App'vd

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OPTION E1e

Drawing title: **LIFF ROAD TO MYREKIRK JUNCTION WIDENED SHARED-USE PATH**

Drawing status: **FOR INFORMATION**

Scale	1:1000 @ A1	DO NOT SCALE
Jacobs No.		Rev
Client no.		1
Drawing number	B2340228-SK-E1e-0001	