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York Street Interchange

Placemaking & Active Travel Review

Annex C – Active Travel | Design Proposals & Audit (Stage 3)

October 2022

York Street Interchange

Active Travel Design Proposals and Audit

Department for Infrastructure

October 2022

Delivering a better world

Quality Information

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1. Introduction

1.1 Overview

The aspiration is to develop a coherent active travel strategy and infrastructure proposals within the York Street Interchange (YSI) study area, focused on key corridors and aligned with maximising connectivity and placemaking opportunities. There is a requirement for the active travel strategy to consider the needs of both cyclists and pedestrians, including those with mobility impairments.

This is the second of a series of active travel technical reports, following the Active Travel baseline review report. This report summarises the development and audit for a proposed step-change active travel network, reviewing proposed provision for cyclists aligned with Local Transport Note (LTN) 1/20, and pedestrians including those with mobility impairments, across the YSI study area.

Three key workstages have been completed as summarised in **Table 1** below and detailed in the subsequent sections:

Table 1 - Key Active Travel Review Workstages

Stage	Key Activities
1 - Audit existing layout (Baseline review)	• Undertake Cycle Level of Service (CLoS) + Junction Assessments (JAT) of existing cycle network against LTN 1/20. • Undertake pedestrian comfort and mobility impaired review of existing network.
2 - Proposed design amendments to YSI scheme (YSI+)	• Amend YSI proposed highway scheme design to incorporate largely segregated cycle facilities in accordance with LTN 1/20 + enhanced pedestrian facilities.
3 - Audit and cost proposed YSI+ scheme	• Repeat CLoS, JAT, pedestrian comfort and mobility impaired review of proposed YSI+ scheme. • Estimate cost of proposed Active Travel enhancements.

1.2 Study Area

Nine key corridors were identified for a Baseline Review of provision for active modes as shown and listed in **Figure 1** below. As indicated by the key, those routes coloured blue are identified within the Belfast Cycling Network (launched in June 2021), whilst the routes coloured green are potential new/additional active travel routes within the wider study area.

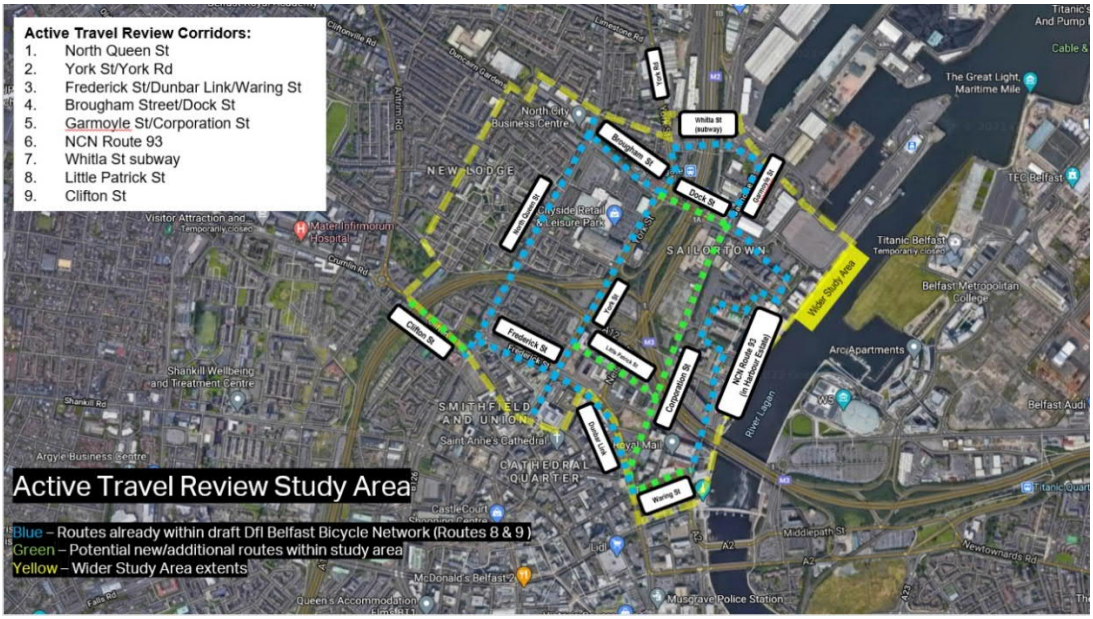


Figure 1 – Active Travel Review Corridors

1.3 Document Structure

This report is structured as follows:

- **Chapter 2** summarises the methodology adopted to undertake the active travel review of the YSI+ scheme
- **Chapters 3-11** provides a summary of the proposals and key audit findings along the nine corridors
- **Chapter 12** concludes with a summary of the key findings.

Supporting technical appendices are referenced as appropriate.

2. Methodology

2.1 Enhanced YSI Scheme Proposals

One of the core guiding principles set out in Chapter 1 of LTN 1/20 is that "*cyclists must be physically separated and protected from high volume motor traffic, both at junctions and on the stretches of road between them*." Given the high volumes of motor traffic within the YSI study area, proposed design amendments to enhance provision for cyclists and pedestrians were therefore focussed on providing physical separation on links and at junctions along each of the corridors.

The YSI+ scheme is presented in **Appendix A**. The key component elements of the proposed design amendments to the YSI scheme are summarised include:

- **3.2 km of two-way cycle track** on York Street (west side); Corporations Street (east side); Dunbar link / Great Patrick Street / Frederick Street (south side); and Clifton Street (north side)
- **1.4 km of one-way cycle track** on both sides of North Queen Street, Brougham Street and Dock Street
- **0.2 km of 'Quiet Route'** treatment on York Street (south) with restricted access for general traffic and urban realm treatment to enhance the environment for pedestrians and cyclists outside the University.
- Separation of cyclists from motor vehicles and pedestrians at **18 key junctions** across the study network ranging from improved pedestrian/cycle crossing facilities to fully segregated CYCLe OPtimised (CYCLOP) junction treatment.

2.2 Enhanced YSI Scheme Audit

The methodology adopted and detailed in Section 2 of the '*Active Travel Baseline Review - June 2021*' has again been used to undertake an audit of the proposed cycle network, with the audit based on Local Transport Note (LTN) 1/20 Cycling Level of Service (CLoS) tool and the Junction Assessment Tool (JAT), that are the prescribed mechanisms introduced to set minimum quality criteria.

In summary, only schemes with a minimum score of 70% under the CLoS with no critical fails and no red scoring turning movements under the JAT will generally be considered for funding. Where schemes are proposed for funding that do not meet these minimum criteria, local authorities will be required to justify their design choices.

A first step in the process of developing an active travel strategy for the York Street Interchange study area was to undertake a baseline CLoS and JAT of the existing provision along the identified study corridors.

Following the development of the YSI scheme active travel enhancements summarised in this report, these proposals have again been reviewed based on CLoS and JAT audit methodologies.

As within the previous baseline report, a mobility impaired specialist has been included within the project team to undertake a mobility impaired audit of each corridor, identifying any potential issues in relating to visually or mobility impaired users.

It should be noted that following a YSI client meeting in October 2021, it was agreed that some links and junctions assessed within the baselining workstage should be omitted from the study area, due to more appropriate connections being provided within the network. These include:

- Corridor 3 (Frederick Street/Dunbar Link/Waring Street) - A2 Waring Street connection.
- Corridor 6 - NCN Route 93 between Princes Dock Street and A2 Waring Street; and
- Corridor 8 - Little Patrick Street.

It was also agreed that the study area would be extended in part, with Corridor 3 proposals extending southward along A2 Victoria Street, connecting to High Street and terminating at its junction with Bridge Street.

3. Corridor 1 | North Queen Street

3.1 Proposals

Extents

Corridor 1 begins approximately 100m south of the Carrick Hill / Clifton Street junction, this short section leading up to the junction is identified as CLoS 1A. The remainder of the route covers the B126 North Queen Street, between its junction with the B88 Frederick Street and its junction with Brougham Street to the north; this section is included as CLoS 1B. The extent of the corridor is shown in **Figure 2.**

Proposals

Corridor and junction proposals along North Queen Street, from south to north, include:

- **Proposed Corridor Linear Treatment:**

  At its southern extent, cycle connections to / from Carrick Hill will be facilitated by areas of shared use footway / cycleway, whereas onward connections to / from Donegall Street will be facilitated by cycle on / off links to the carriageway.

  Between its junctions with Frederick Street and Brougham Street, narrowing of the carriageway is proposed through the removal of central hatching, in order to provide a single (3.2m) lane in either direction, with kerb segregated (0.5 – 1m segregation width) one-way cycle tracks (1.65m width) along the majority of the route.

  Cycle priority at minor arms will be maintained by providing full or partial setbacks of the cycle track.

  A short 125m section of light segregation for northbound cyclist is proposed as they pass under the Westlink Bridge. Potential to provide kerb segregation is limited in this location without significant structural works due to level difference of the western footway.

  Approximately 250m (46 bays) of on-street parking parallel to the carriageway (minimum 2.3m wide with 1m buffer strip of the cycle track) is proposed between Frederick Street and Brougham Street.

  Segregation of pedestrians and cyclists at key crossing points and bus stop bypasses will be maintained by providing interim pedestrian islands and zebra crossings of the cycle track.

- **North Queen Street / Frederick Street and Frederick Street / Clifton Street junctions** – A half CYCLOPS arrangement is proposed, connecting the proposed one-way cycle tracks of North Queen Street (N) and two-way cycle tracks of both Frederick Street and Clifton Street (E and W);

- **North Queen Street / Brougham Street junction** - Proposed as a Dutch style junction, providing an all-red stage for both cyclists and pedestrians. Onward connections to / from Duncairn Gardens (W) and North Queen Street (N) are via on-street links; whereas connections to / from Brougham Street are facilitated by segregated one-way cycle tracks.

A full suite of draft proposals along North Queen Street are provided in **Appendix A** of this report.

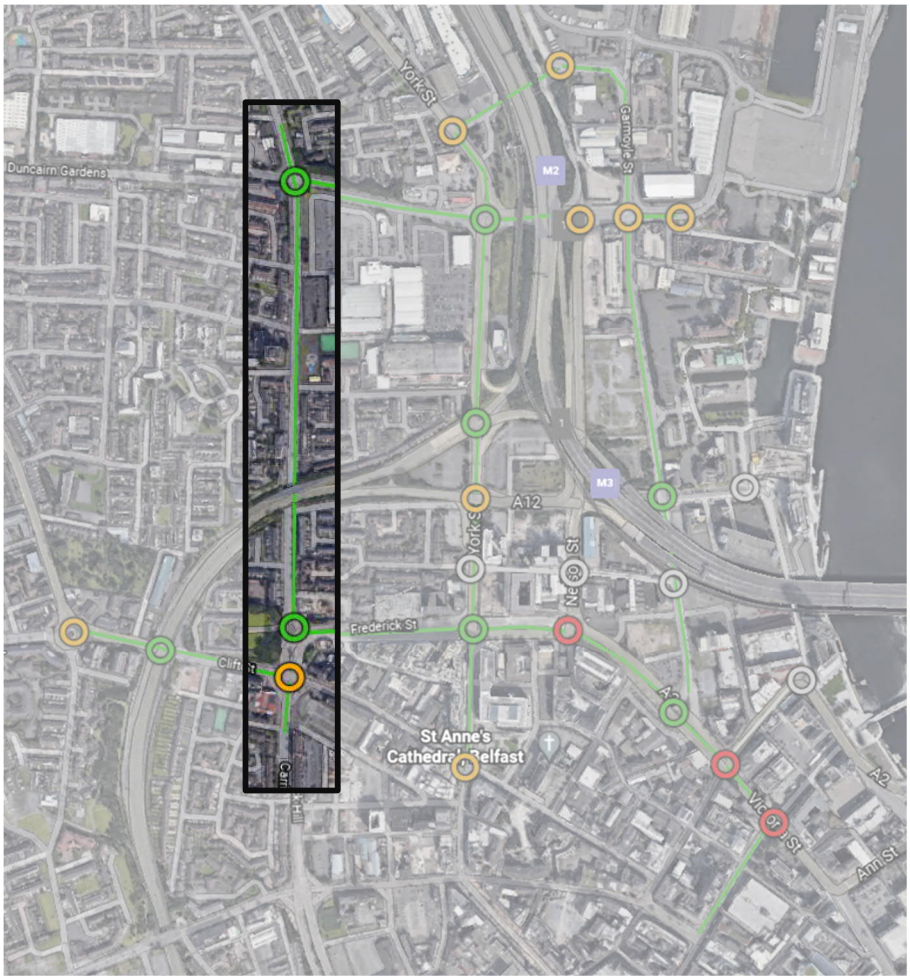


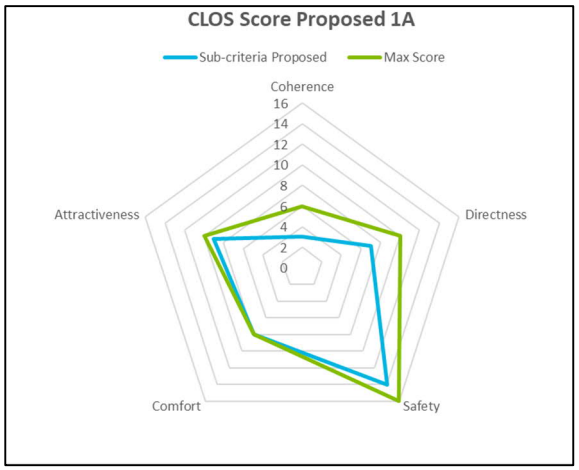
Figure 2 – Corridor 1, North Queen Street.

3.2 Cycle Level of Service Proposed Results

3.2.1 Section 1A

Section 1A covers the short 100m section of the carriageway leading to the Carrick Hill / Clifton Street junction from the southern arm. Its existing characteristics in terms of layout, traffic volume and vehicle speed are detailed in Section 3.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 1A are to provide a shared use footway / cycleway leading to the half CYCLOPs facilities at the Carrick Hill / Frederick Street junction. Section 1A has met the 70% threshold to pass the CLoS audit, scoring 82%, with no critical fails.



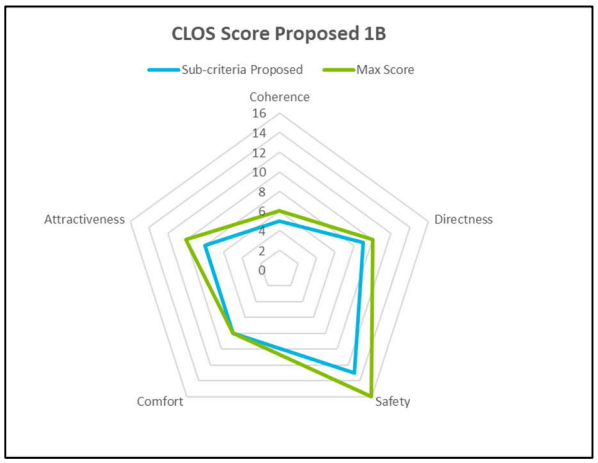
	Max possible score	50	
	Audit % score	82%	
	Pass/Fail (70% threshold)	Pass	
	Any Critical Fails? (Y/N)	No	
	Number of Critical Fails	0	
Criteria	**Max Score**	**Sub-criteria Propose**	**% score Proposed**
Coherence	6	3	50%
Directness	10	7	70%
Safety	16	**14**	88%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

3.2.2 Section 1B

Section 1B covers the B126 North Queen Street, between its junction with the B88 Frederick Street and its junction with Brougham Street to the north. Its existing characteristics in terms of layout, traffic volume and vehicle speed are detailed in Section 3.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 1B are to provide kerb segregated one-way cycle tracks (and a short section of light segregated facility northbound for a distance of 120m) on either side of the carriageway, with setback cycle priority over side roads.

Section 1B has met the 70% threshold to pass the CLoS audit, scoring 88%, with no critical fails.



	Max possible score	50	
	Audit % score	88%	
	Pass/Fail (70% threshold)	Pass	
	Any Critical Fails? (Y/N)	No	
	Number of Critical Fails	0	
Criteria	**Max Score**	**Sub-criteria Proposed**	**% score Proposed**
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**13**	81%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

3.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions included within the proposed Belfast Bicycle Network.

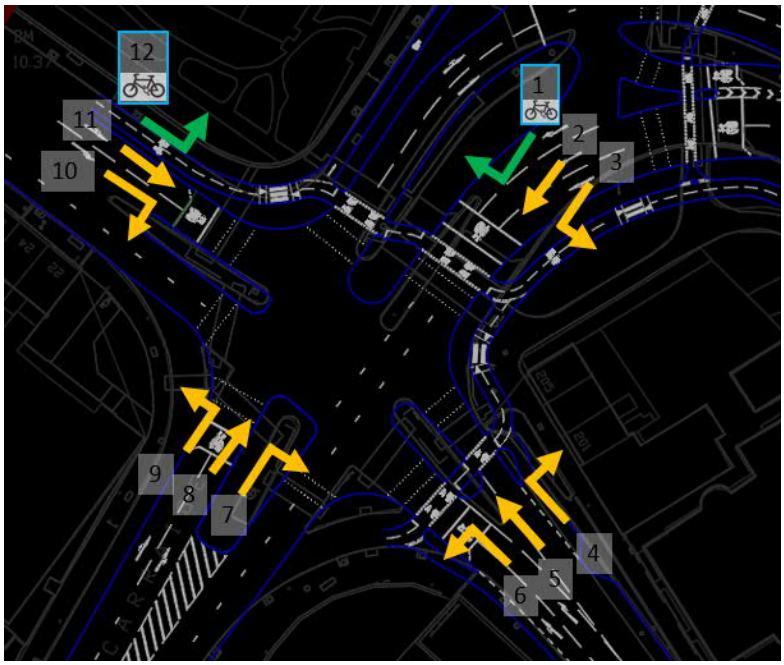
Potential cycle movements are highlighted on the following plans, which also identify the principal cycle movements that form part of the proposed Belfast Cycling Network. Three junctions have been reviewed along Corridor 1, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
1.1	B126 Carrick Hill / Clifton Street			• Movements associated with the cycle network between Frederick Street and Clifton Street score a green rating and are fully segregated from pedestrians and traffic • Other amber scoring movements are associated with onward connections to links not included within the study area. These movements at the junction connect to / from on-carriageway sections or areas of shared space that act as a termination points to the proposed network.
1.2	B88 Carrick Hill / B126 North Queen Street			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic. • All movements at this junction form part of the proposed Belfast Bicycle Network.
1.3	B126 North Queen Street / Brougham Street			• All green scoring movements, with cyclists segregated physical and in time from both pedestrians and vehicular traffic. • Movements to / from North Queen Street to Brougham Street form part of the proposed Belfast Bicycle Network at the junction. • Although other onward movements connect to / from the carriageway, these are separated in time from vehicular traffic.

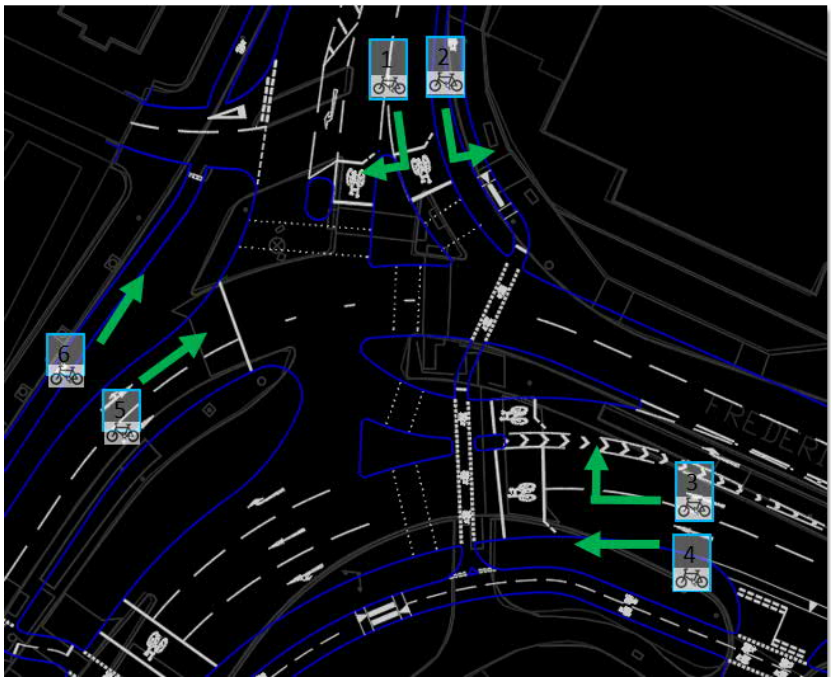
In summary, all proposed movements associated with the Belfast Bicycle Network assessed within Corridor 1 scored a green rating. A more detailed summary is provided below:

The following sections show each junction assessed within Corridor 1, with further detailed information provided in **Appendix B**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

3.3.1 Junction 1.1



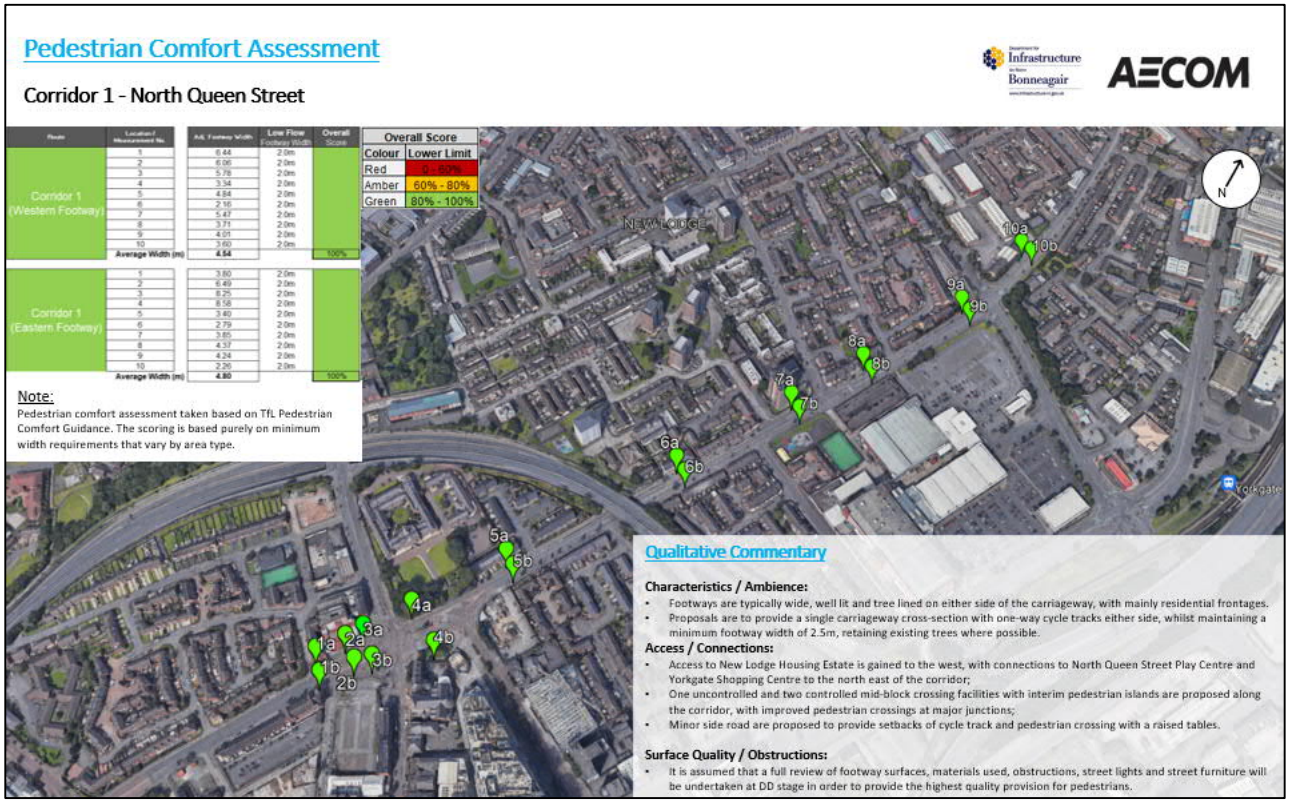
3.3.2 Junction 1.2



3.3.3 Junction 1.3

3.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 1 are shown in the figure below.



3.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

4. Corridor 2 | York Street

4.1 Overview

Extents

Corridor 2 covers York Street, from the junction with Donegall Street at its southern extent; to the Whitla Street Subway at its northern extent. Corridor 2 is shown in **Figure 3**.

Proposals:

Corridor and junction proposals along York Street, from south to north, include:

- **Proposed Corridor Linear Treatment:**

  Between its junctions with Donegall Street and Frederick Street, a reduction to a single lane in either direction to form an on-street quiet route shared with busses and taxis, giving access to Ulster University. This will in-turn provide enhanced place making and urban realm opportunities at Ulster University.

  Between Frederick Street and Dock Street, a reduction from five lanes northbound, to three lanes northbound and a single lane southbound (that forms a bus lane at its southern extent).

  A kerbed segregated two-way cycle track is proposed to run along the western footway, segregation of the cycle track will be maximised to 3m in width where possible which will form a planted aesthetic buffer. A widened pedestrian footway will then sit behind the cycle track, forming a boulevard type arrangement.

  Segregation of pedestrians and cyclists at key crossing points and bus stop bypasses will be maintained by providing interim pedestrian islands and zebra crossings of the cycle track.

- **York Street / Donegall junction -** Reduce the junction footprint, providing lead in lanes and an early release for cyclists at the junction. In addition, provide one-stage pedestrian crossings of the eastern and southern arms.
- **York Street / Frederick Street junction -** A half CYCLOPS arrangement, facilitating connections between the proposed on-street quiet route (S), two-way cycle track of York Street (N) and two-way cycle track of Great Patrick Street (E) / Frederick Street (W). The proposed signal staging aims to maximise the key pedestrian / cycle movements N / S across the western arm.
- **York Street / A12 West Link -** Segregated cycle and pedestrian crossings will be provided in order to separate movements in time from vehicular traffic.
- **York Street / Great Georges Street –** The existing connection to / from York Street is proposed to be stopped up to vehicular traffic, with Great George Street forming an on-street quiet route with vehicular access gained via North Queen Street. Great George Street's eastern extent will then form pedestrian / cycle connection, linking to the proposed two-way cycle track at York Street. The existing car park in this location is proposed to be converted into a pocket park for the local community.
- **York Street / Brougham Street** - A proposed CYCLOPS arrangement will provide connections between the proposed two-way cycle track of York Street (S), one-way cycle tracks of Brougham Street / Dock Street (E & W), onward on-street connections to / from York Street (N) and to the proposed shared use footway / cycleway at Yorkgate Railway Station.

A full suite of draft proposals along York Street are provided in **Appendix A** of this report.

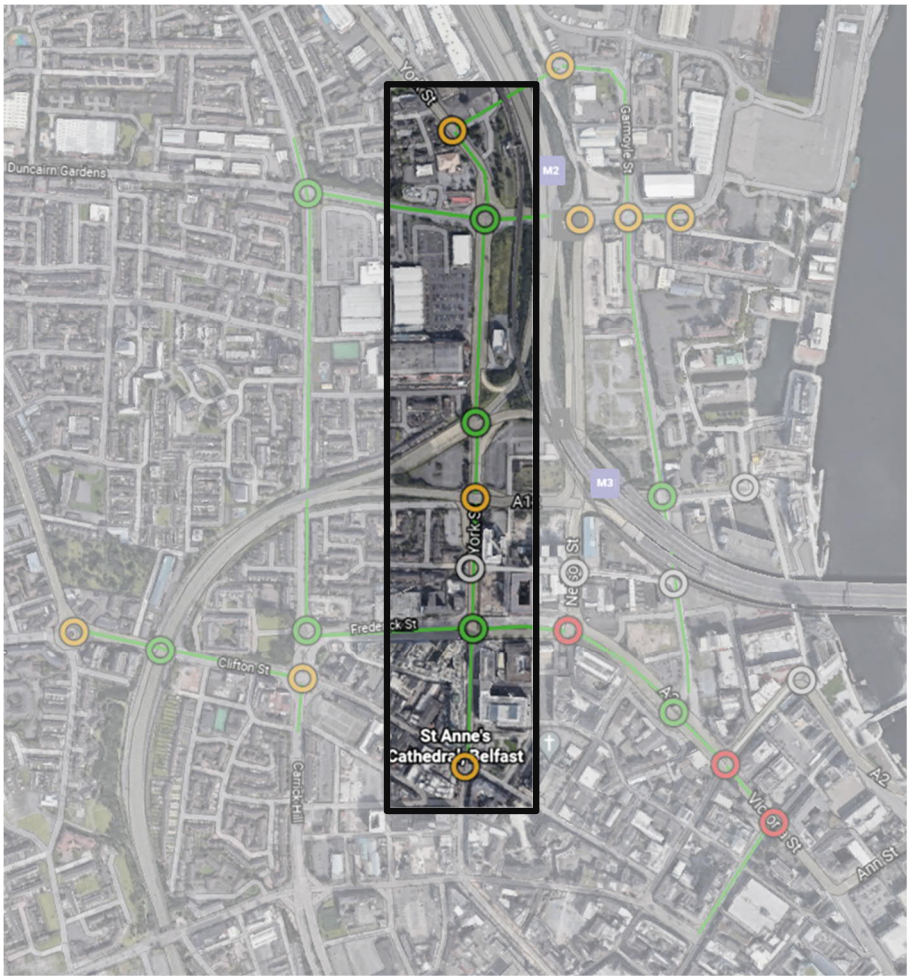


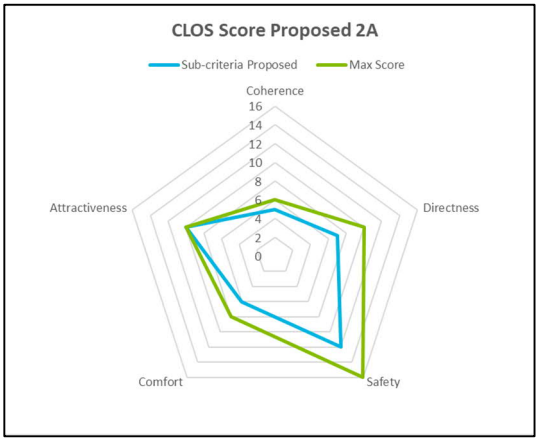
Figure 3 – Corridor 2, York Street.

4.2 Cycle Level of Service Proposed Results

4.2.1 Section 2A

Section 2A covers York Street's short 200m section of the highway between its junctions with Donegall Street and Great Patrick Street, which gives access to Ulster University. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 4.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 2A are to reduce the carriageway to a single lane in either direction, providing a shared bus / taxi / cycle lane. This will connect between the York Street / Donegall junction (where lead in lanes for cyclists and single stage pedestrian crossings will be provided) and a proposed half CYCLOPs facility at the York Street / Frederick Street junction. Section 1A has met the 70% threshold to pass the CLoS audit, scoring 80%, with no critical fails.



Max possible score	50
Audit % score	80%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

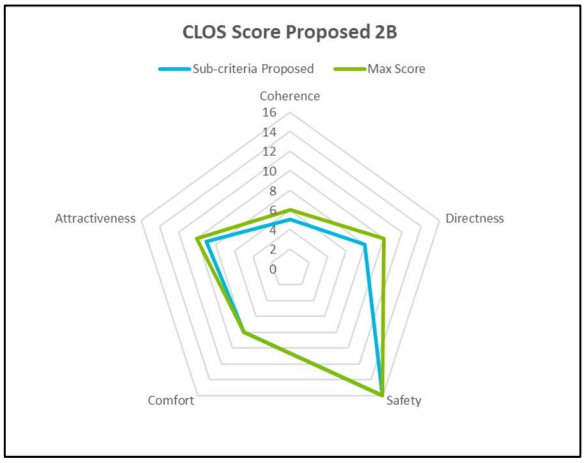
Criteria	Max Score	Sub-criteria Propose	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**12**	75%
Comfort	8	6	75%
Attractiveness	10	10	100%
	50		

4.2.2 Section 2B

Section 2B covers York Street between its junction with the B88 Frederick Street /Great Patrick Street and its junction with the A12 / Great Georges Street to the north. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 4.2.2 of the YSI Baseline Report, June-2021.

Proposals within Section 2B are to provide a kerb segregated two-way cycle track (2.5m width) running along the western footway. Segregation between the cycle track and vehicular lanes will be maximised where possible, near its junction with Great Patrick Street segregation width is approximately 0.6m; however, widens to approximately 3m at Great George Street (proposed to be stopped up to for motor vehicles).

Section 2B has met the 70% threshold to pass the CLoS audit, scoring 92%, with no critical fails.



Max possible score	50
Audit % score	92%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

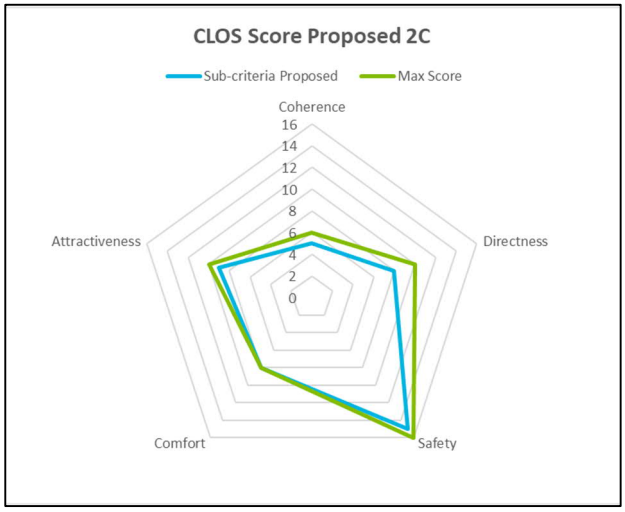
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

4.2.3 Section 2C

Section 2C covers York Street between its junction with the A12 Great Georges Street and A12 Westlink. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 4.2.3 of the YSI Baseline Report, June-2021.

Proposals within Section 2C are to provide a kerb segregated two-way cycle track (3m width) running along the western footway. Segregation between the cycle track and vehicular lanes will be maximised where possible, typically in this location segregation will be approximately 1.5m across the proposed bridge structure.

Section 2C has met the 70% threshold to pass the CLoS audit, scoring 90%, with no critical fails.



Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

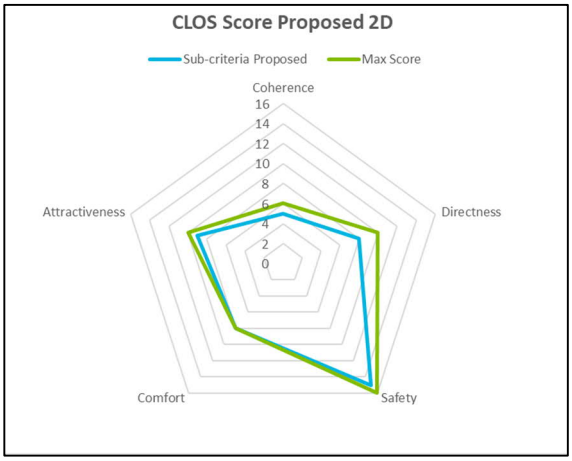
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

4.2.4 Section 2D

Section 2D covers York Street between its junction with the A12 Westlink and Brougham Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 4.2.4 of the YSI Baseline Report, June-2021.

Proposals within Section 2D are to provide a kerb segregated two-way cycle track (3m width) running along the western footway. Segregation between the cycle track and vehicular lanes will be maximised where possible, typically in this location segregation will be approximately 3m, which will allow for tree planting and shrubbery within the segregation strip.

Section 2D has met the 70% threshold to pass the CLoS audit, scoring 90%, with no critical fails.



Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

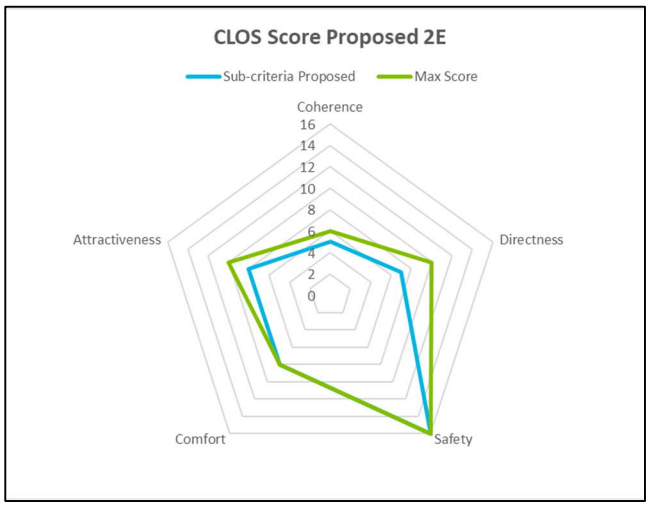
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

4.2.5 Section 2E

Section 2E covers York Street between its junction with Brougham Street and Yorkgate Station. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 4.2.5 of the B YSI Baseline Report, June-2021.

Section 2E is assumed to follow the proposed shared footway / cycleway routing within the Yorkgate Station development. It has been assumed for the purposes of this assessment that this provision will be provided and link to / from the Whitla Street subway.

Section 2E has met the 70% threshold to pass the CLoS audit, scoring 88%, with no critical fails



Max possible score	50
Audit % score	88%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

4.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions included within the proposed Belfast Bicycle Network.

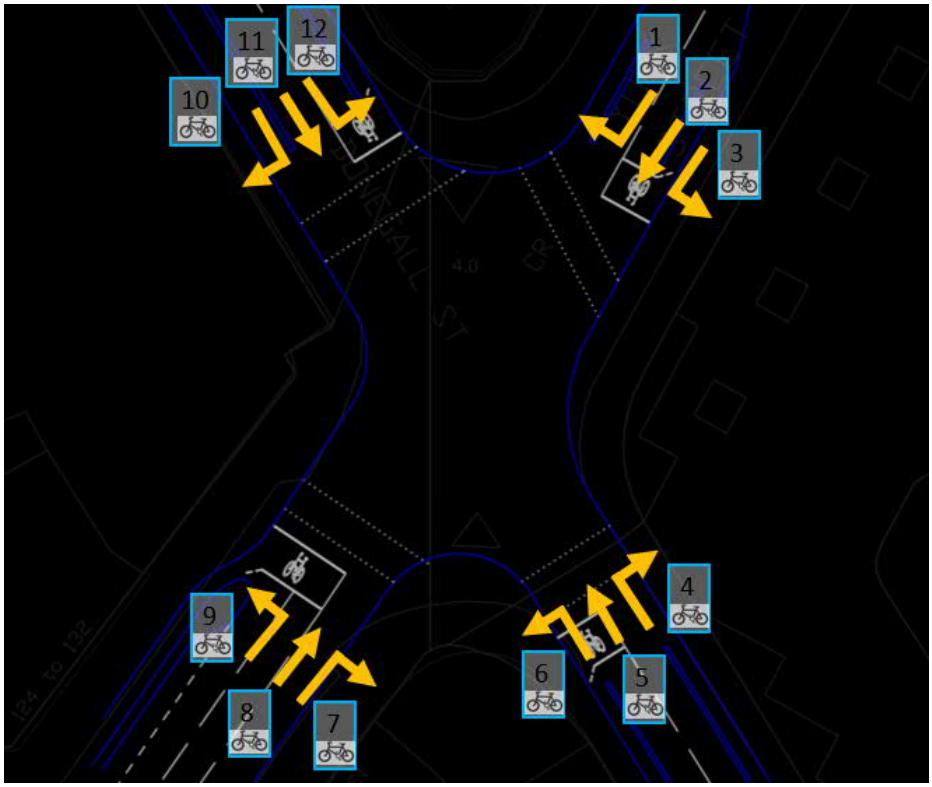
Potential cycle movements are highlighted on the following plans, which also identify the principal cycle movements that form part of the proposed Belfast Cycling Network. Six junctions have been reviewed along Corridor 2, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
2.1	York Street / Donegall Street			• Amber scoring movements are associated with onward connections to on-carriageway links not included within the study area. • The junction forms a termination point for the proposed network, with cyclists provided segregated lead in lanes and an early release to better facilitate movements.
2.2	York Street / B88 Frederick Street			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic. • All movements form part of the proposed Belfast Cycle Network.
8.1	York Street / Little Patrick Street			• Little Patrick Street is no longer included within the proposed network, with E / W cycle connections facilitated elsewhere along York Street. • Little Patrick Street is proposed to be stopped up and pedestrianised with no vehicular access.
2.3	York Street / A12 Great Georges Street			• Green scoring movements are associated with the proposed cycle network (N / S movements along York Street). • Other movements are a mixture of amber and green, with amber movements due to connections made via shared use footway / cycleway.
2.4	York Street / A12 Westlink			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic. • Banned movements are those leading to the M2 / M3 Motorway slip roads and the A12 Westlink.
2.5	A2 York Street / Brougham Street			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic through providing a CYCLOPs arrangement with an all-red cycle / pedestrian stage.
2.6	Whitla Street / Whitla Street Subway			• All amber scoring movements, with cyclists transitioning from an area of shared use footway / cycleway of Whitla Street Subway / Yorkgate Railway Station to an on-street quiet route.

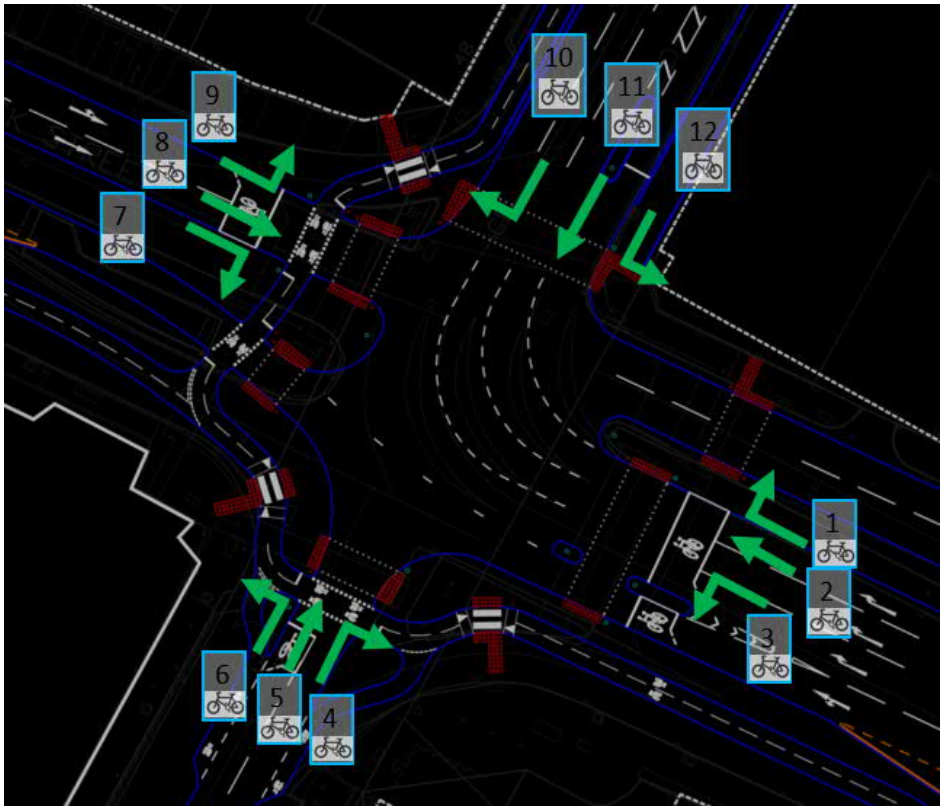
In summary, the majority of proposed movements associated with the Belfast Bicycle Network assessed within Corridor 2 scored a green rating, with two junctions at the periphery of the corridor scoring an amber rating.

The following sections show each junction assessed along Corridor 2, with further detailed information provided in **Appendix C**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

4.3.1 Junction 2.1 – York Street / Donegall Street;



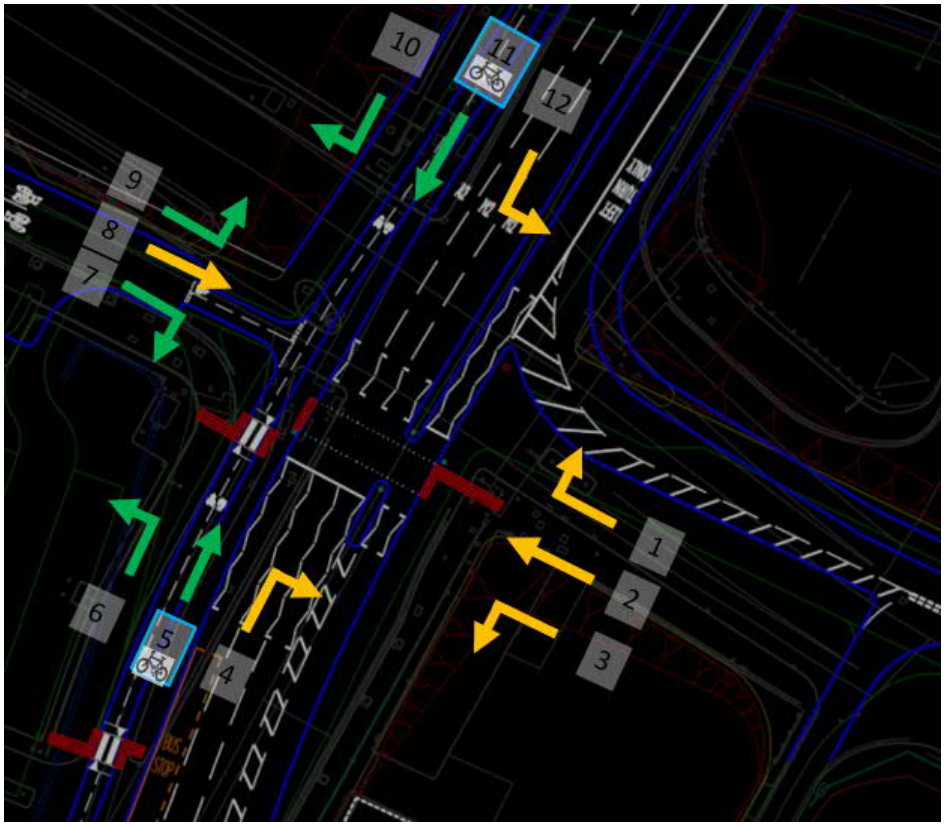
4.3.2 Junction 2.2 – York Street / B88 Frederick Street;



4.3.3 Junction 8.1 – York Street / Little Patrick Street;

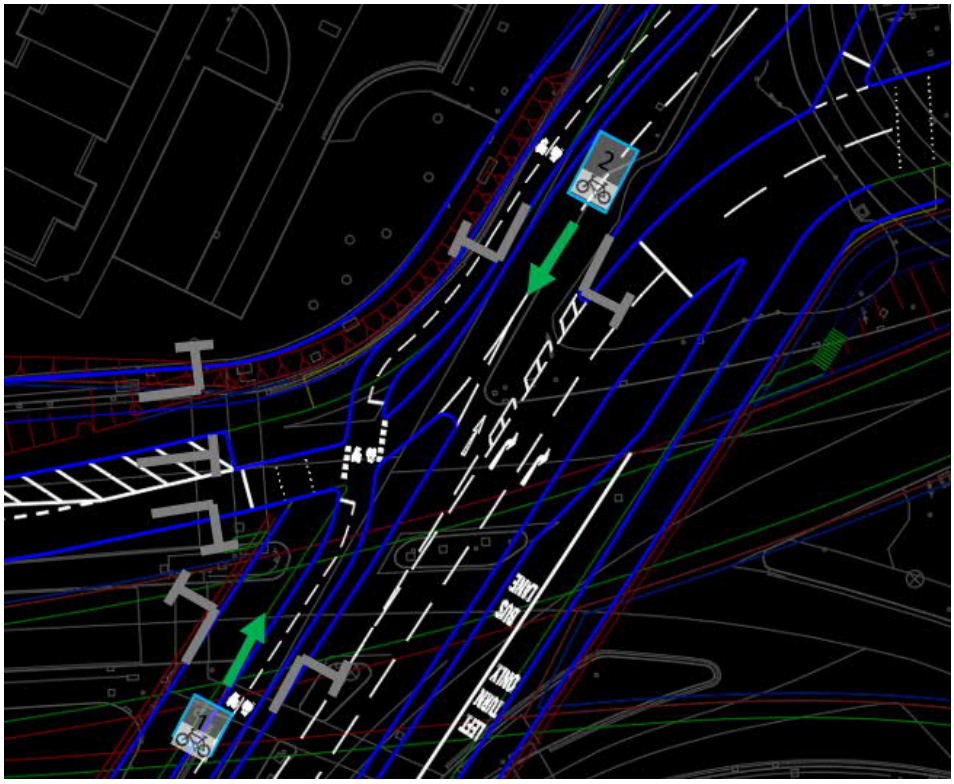
Note: Junction no longer included within proposed following the YSI client meeting in October 2021, with E / W cycle connections facilitated elsewhere along York Street.

4.3.4 Junction 2.3 – York Street / A12 Great Georges Street;



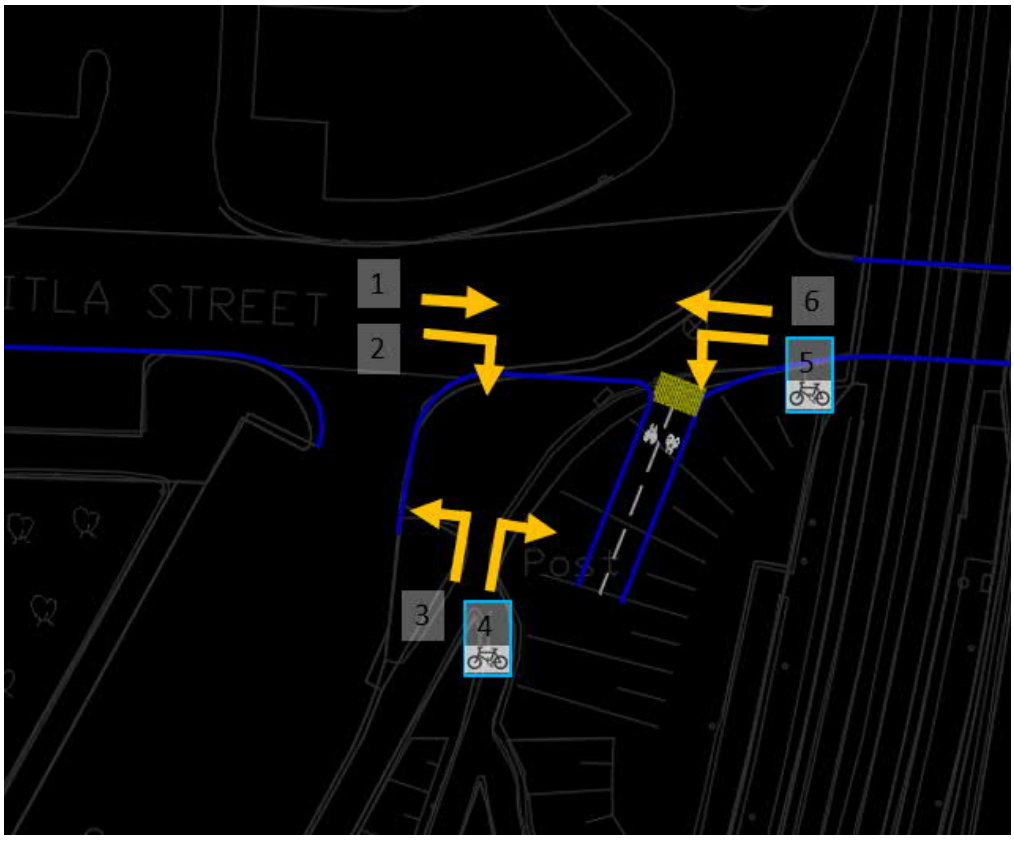
4.3.5 Junction 2.4 –York Street / A12 Westlink;

Note: Banned movements are those leading to the M2 / M3 Motorway slip roads.



4.3.6 Junction 2.5 – A2 York Street / Brougham Street;

4.3.7 Junction 2.6 – A2 York Street / Yorkgate Station.



4.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 2 are shown in the figure below.

4.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

5. Corridor 3 | Frederick Street / Dunbar Link / A2 Victoria Street / High Street

5.1 Overview

Extents

Corridor 3 covers the northern section of the 'Belfast Inner Ring', encompassing B88 Frederick Street, A2 Dunbar Link, A2 Victoria Street and High Street, between its junction with B126 North Queen Street junction at its north-western extent and the High Street / Bridge Street junction at its south-eastern extent. The corridor is shown in **Figure 4**.

Proposals:

- **Proposed Corridor Linear Treatment:**

  Proposals provide a kerb segregated two-way cycle track running adjacent to the southern footway of B88 Frederick Street / A2 Dunbar Link / A2 Victoria Street, between its junction with North Queen Street and High Street. Segregation between cycle track and vehicular lanes will typically be 1m in width along linear sections, but will be maximised to between 2.5 - 3m at proposed bus stop bypasses and junctions

  Between the York Street and High Street junctions, the proposed cycle track is located an area of existing carriageway and will be facilitated by removal of a northbound lane and narrowing of the central reserve. The cycle track and buffer will also act as a form of segregation for the southern pedestrian footway, with proposals having limited impact on existing footway widths.

  At un-signalised minor arms, such as Dunbar Street, the cycle track will be given a full or partial setback with marked priority and a raised table.

  At High Street, a parallel crossing is used to bring the cyclists back to one-way facilities that then link to / from ASL's at the Bridge Street junction, terminating the proposed network extents.

- **Frederick Street / North Queen Street and Frederick Street / Clifton Street Junctions -** Proposals are to provide a half CYCLOPS arrangement, connecting proposed two-way cycle tracks of both Frederick Street and Clifton Street (E and W) to proposed one-way cycle tracks of North Queen Street (N).

- **Frederick Street junction / York Street -** A half CYCLOPS arrangement is proposed, facilitating connections between an on-street quiet route (S), two-way cycle track of York Street (N) and two-way cycle tracks of both Great Patrick Street (E) and Frederick Street (W). This arrangement maximises green time for right turning traffic from Great Patrick Street to York Street whilst giving the primary N / S cycle and pedestrian phases of the western arm extended green time.

- **A2 Dunbar Link / Nelson Street junction –** At this location, the proposed E / W cycle route will continue via a segregated crossing of the southern arm. Proposals do not include a connection to / from Nelson Street as this does not form part of the proposed Belfast Bicycle Network.

- **A2 Dunbar Link / Corporation Street junction -** The cycle route continues, bypassing the junction in a N /S alignment alongside the western footway, whilst also connecting to the proposed two-way cycle track of Corporation Street via a segregated parallel crossing facility.

- **A2 Dunbar Link / Waring Street junctions -** The cycle route continues in a N / S alignment, bypassing the junction, with the cycle track given marked priority and partial setback across the western minor arm. Connections eastbound along Waring Street have not been facilitated, following client discussions, noting that connections to NCN Route 93 are provided for elsewhere in the proposed network at both Corporation Street and via Queens Square.

- **A2 Victoria Street / High Street junction -** The two-way cycle track connects E / W across Victoria Street via a segregated parallel crossing, linking to a shared use footway / cycleway of Queens Square. The cycle track also continues along High Street as a two-way cycle track adjacent to its northern footway. No onward connection is provided southbound along Victoria Street, this does not form part of the proposed network. Improved pedestrian crossings facilities are also proposed at the junction.

A full suite of draft proposals along Frederick Street / Dunbar Link / A2 Victoria Street / High Street are provided in **Appendix A** of this report.

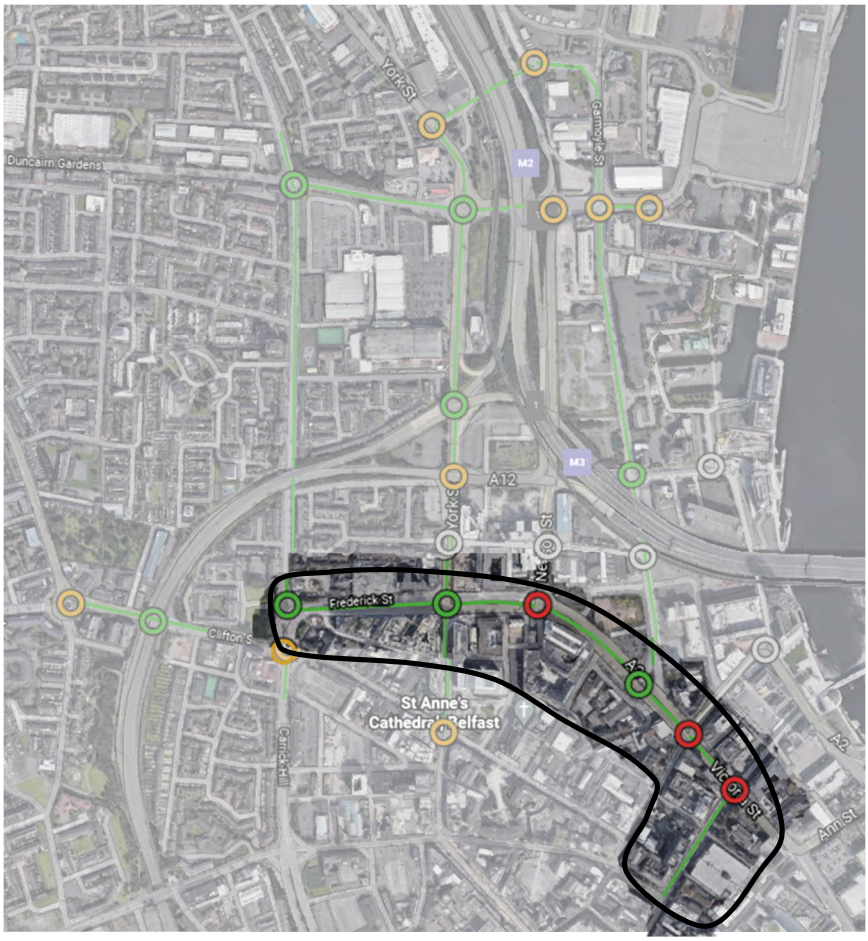


Figure 4 – Corridor 3, Frederick Street / Dunbar Link / Waring Street.

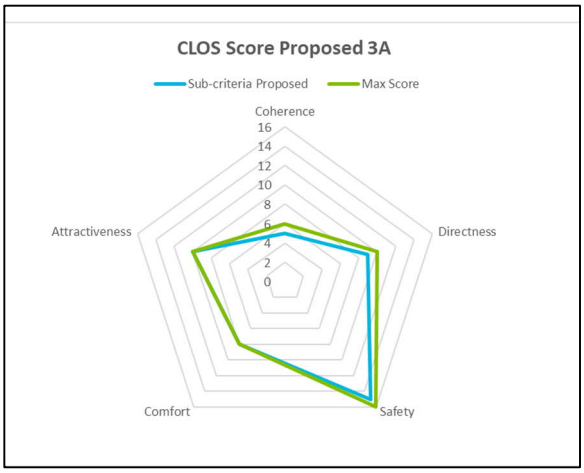
5.2 Cycle Level of Service Proposed Results

5.2.1 Section 3A

Section 3A covers the B88 Frederick Street, between North Queen Street and York Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 5.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 3A are to reduce the carriageway footprint to a single lane westbound and a dual lane eastbound. A kerb segregated 2.5m cycle track is proposed adjacent to the southern footway, with increased footway widths either side of the carriageway. A typical segregation width of 1m is proposed, which widens to 3m at pedestrian crossings and bus stop bypasses.

Section 3B has met the 70% threshold to pass the CLoS audit, scoring 94%, with no critical fails.



Max possible score	50
Audit % score	94%
Pass/Fail (70% threshold)	**Pass**
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

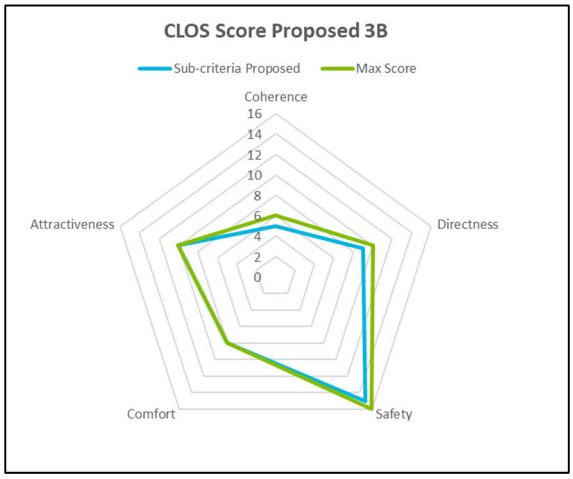
Criteria	Max Score	Sub-criteria Propose	% score Proposed
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	10	100%
	50		

5.2.2 Section 3B

Section 3B covers the A2 Great Patrick Street, between its junctions with Nelson Street and York Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 5.2.2 of the YSI Baseline Report, June-2021.

Proposals within Section 3B are to remove a vehicular lane northbound in order to provide a kerb segregated two-way cycle track (2.8m width) running adjacent to the southern footway. Segregation between the cycle track and vehicular lanes will be maximised where possible, typically 3m segregation width is proposed in this location to provide for a bus stop bypass and setback at junctions.

Section 3B has met the 70% threshold to pass the CLoS audit, scoring 94%, with no critical fails.



Max possible score	50
Audit % score	94%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

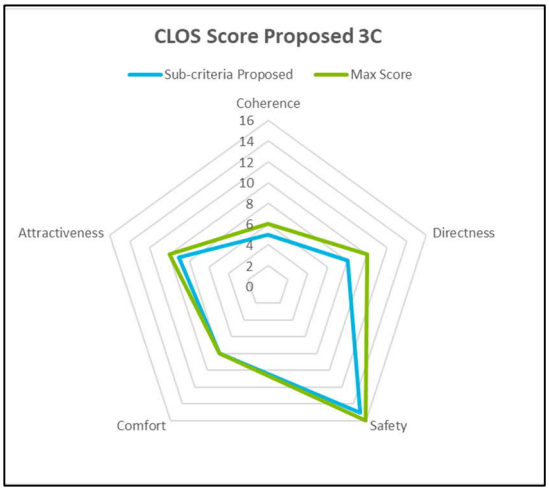
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	10	100%
	50		

5.2.3 Section 3C

Section 3C covers the A2 Dunbar Link, between its junctions with Nelson Street and Corporation Street, running in a N / S alignment. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 5.2.3 of the YSI Baseline Report, June-2021.

Proposals within Section 3C are again to remove a vehicular lane northbound to provide a kerb segregated two-way cycle track (2.8m width) running adjacent to the western footway. Typical segregation width between the cycle track and vehicular lanes will be 1m in this location.

Section 3C has met the 70% threshold to pass the CLoS audit, scoring 90%, with no critical fails.



Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

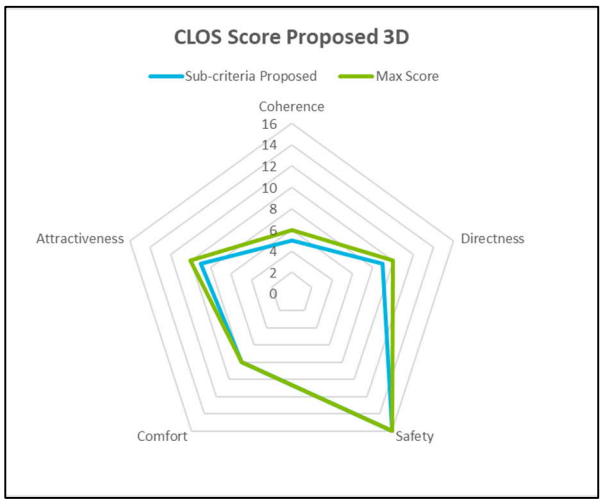
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

5.2.4 Section 3D

Section 3D covers the A2 Dunbar Link, between its junctions with Corporation Street and Waring Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 5.2.3 of the YSI Baseline Report, June-2021.

Proposals within Section 3D are to continue with removal of a northbound lane to provide a kerb segregated two-way cycle track (2.5m to 2.8m width) running adjacent to the western footway. Typical segregation width between the cycle track and vehicular lanes will be 1m in this location.

Section 3C has met the 70% threshold to pass the CLoS audit, scoring 90%, with no critical fails.



Max possible score	50
Audit % score	94%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

5.2.5 Section 3E

Section 3E covered the A2 Waring Street / Albert Square between its junctions with Victoria Street and Albert Square. As a result of client discussion and proposed alternative connections to NCN Route 93 within the network, this section is no longer included within the proposed Belfast Bicycle Network.

As a result, at the Dunbar Link / Waring Street junctions it is proposed to continue the route in a N / S alignment, bypassing the main junction, with the cycle track given marked priority and partial setback across the western minor arm. Connections eastbound to Waring Street are not facilitated, due to the removal of the NCN Route 93 from the study area and alternative connections at both Corporation Street and via Queens Square.

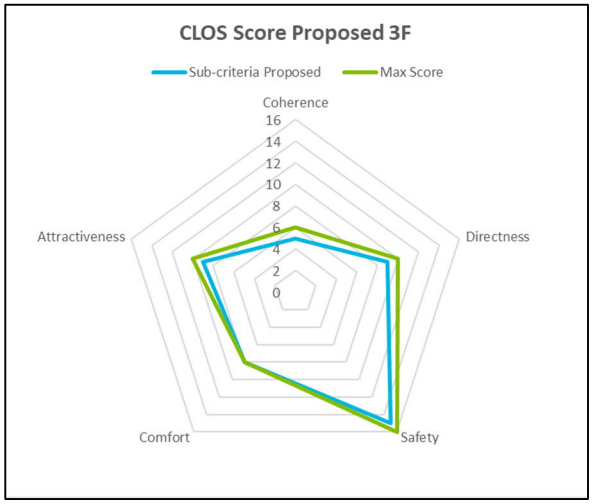
5.2.6 Section 3F

Section 3F covers the A2 Victoria Street, between its junctions with Waring Street and High Street. This section has been included during the development of the proposals to provide a suitable tie-in point to the city centre.

It is characterised by heavy motor vehicle traffic in a northbound only direction, featuring five running lanes, with three turning right to Victoria Street and two nearside lanes heading north to continue as Dunbar link. Multistage pedestrian only crossings are provided at its junctions at both Warning Street and High Street. No advisory or segregated cycle facilities are provided along this section or ASLs at the either junction.

Proposals within Section 3F include removing a vehicular lane northbound to provide a kerb segregated two-way cycle track (2.5m to 2.8m width) running adjacent to the western footway. Segregation between the cycle track and vehicular lanes will be maximised where possible, typically 1m segregation width is proposed in this location, widening to a minimum of 2m at the bus bypasses.

Section 3F existing score did not meet 70% threshold to pass the CLoS audit, scoring 42% with two critical fails. However, the proposed Section 3E has met the 70% threshold to pass the CLoS audit, scoring 92%, with no critical fails.



Max possible score	50
Audit % score	92%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

5.2.7 Section 3G

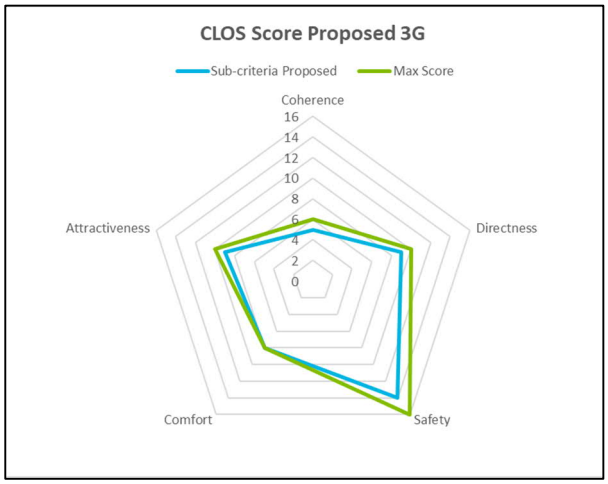
Section 3G covers High Street, between its junctions with A2 Victoria Street and Bridge Street. This section has been included through agreement with the client team.

It is characterised by moderate motor vehicle traffic, featuring a single lane in either direction, with shop frontages, on-street and taxi parking bays.

An existing advisory lead in lane is provided for eastbound cyclists towards its junction with A2 Victoria Street within the centre of the carriageway, but no ASL at the stopline. Whereas, at its junction with Bridge Street an ASL is provided but with no lead in lane.

Proposals within Section 3G are to reconfigure the carriageway and remove existing hatching / parking in order to continue the proposed two-way cycle track adjacent to the northern footway. No onward connection is provided southbound along Victoria Street at the High Street junction, as this does not form part of the proposed network. Midway along High Street, a parallel crossing is proposed to bring the cyclists back to one-way facilities, that will then link back to the carriageway at Bridge Street junction into an ASL and terminating the proposed network.

Section 3G existing score did not meet 70% threshold to pass the CLoS audit, scoring 42% with three critical fails. However, the proposed Section 3G has met the 70% threshold to pass the CLoS audit, scoring 90%, with no critical fails.



Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	9	90%
Safety	16	**14**	88%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

5.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions included within the proposed Belfast Bicycle Network.

Potential cycle movements are highlighted on the following plans, which also identify the principal cycle movements that form part of the proposed Belfast Cycling Network. Six junctions have been reviewed along Corridor 3, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
1.2	B88 Carrick Hill / B126 North Queen Street			• As per Corridor 1, Junction 1.2
2.2	York Street / B88 Frederick Street			• As per Corridor 2, Junction 2.2
3.2	A2 Great Patrick Street / Nelson Street			• Movements associated with the Belfast Cycle Network, running N / S both score a green rating and are fully segregated from pedestrians and traffic. • The junction has an overall red rating, which is associated with movements from Nelson Street. Nelson Street is not included within the proposed study area and is not promoted as a cycle connection due to high traffic volumes / speeds associated with egress from the M3 Motorway off-slip.
5.1	A1 Dunbar Link / Corporation Street			• As per Corridor 5, Junction 5.1
3.5	A2 Dunbar Link / Waring Street			• Movements associated with the Belfast Cycle Network, running N / S score a green rating and are fully segregated from pedestrians and traffic. A raised table is provided at Waring Street (W) to facilitate the movements, with cyclists given marked priority and a partial setback of the side road. • Overall, the junction scores a red rating, which is associated with movements to Waring Street (E), which are no longer included within the proposed network as per client discussions.
3.6	A2 Victoria St / High Street			• Movements associated with the Belfast Cycle Network, running between High Street and A2 Victoria Street (N) both score a green rating and are fully segregated from pedestrians and traffic. • Movements between Queens Square and High Street are scored amber to due transition on to shared footway / cycleway. Cyclists are able to connect to the existing NCN Route 93 via Queens Square. • Overall, the junction scores a red rating, which is associated with movements from Victoria Street (S), this link is not included within the proposed network and experiences high traffic volumes; as such, no facilities are provided either promote or accommodate this connection.

In summary, the majority of proposed movements associated with the Belfast Bicycle Network assessed within Corridor 3 scored a green rating, with one junction at the periphery of the corridor scoring an amber rating.

The following sections show each junction assessed along Corridor 3, with further detailed information provided in **Appendix D**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

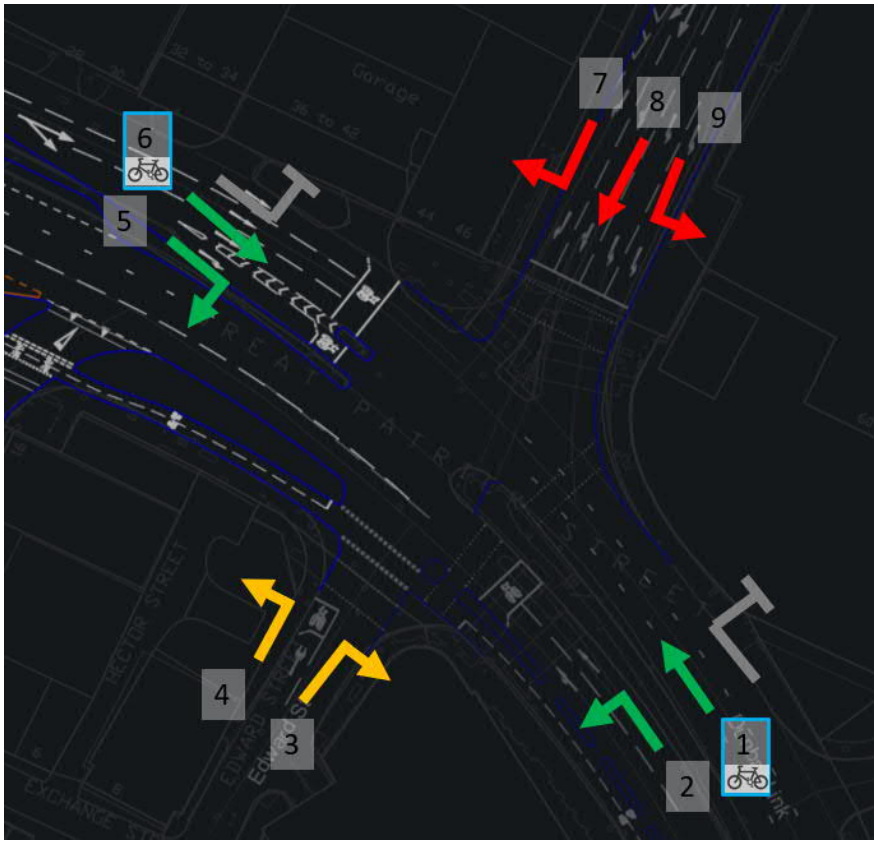
5.3.1 Junction 1.2 – B88 Carrick Hill / B126 North Queen Street

See Section 3.4.2

5.3.2 Junction 2.2 – York Street / B88 Frederick Street

See Section 4.3.2

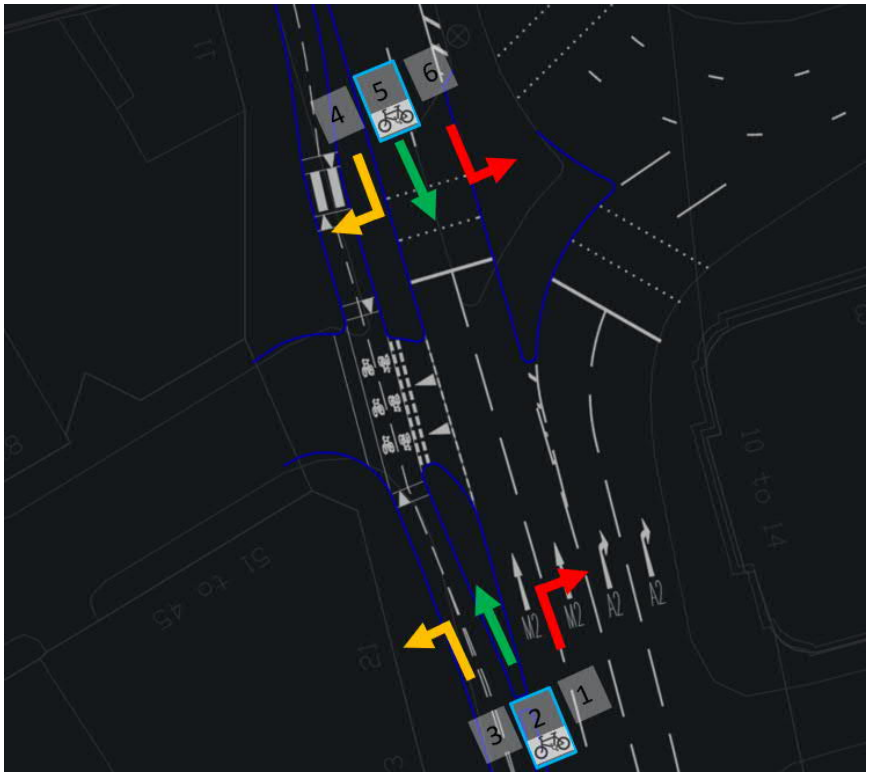
5.3.3 Junction 3.3 – Great Patrick Street / Nelson Street



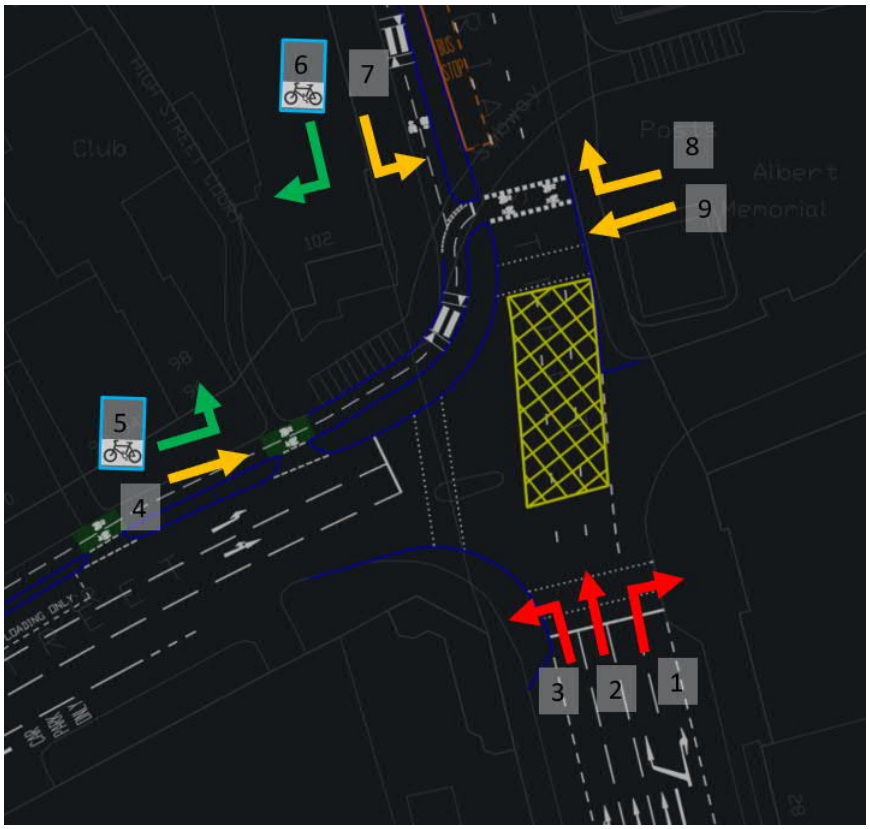
5.3.4 Junction 5.1 – A1 Dunbar Link / Corporation Street

See Section 7.3.1

5.3.5 Junction 3.5 – A2 Dunbar Link / Waring Street

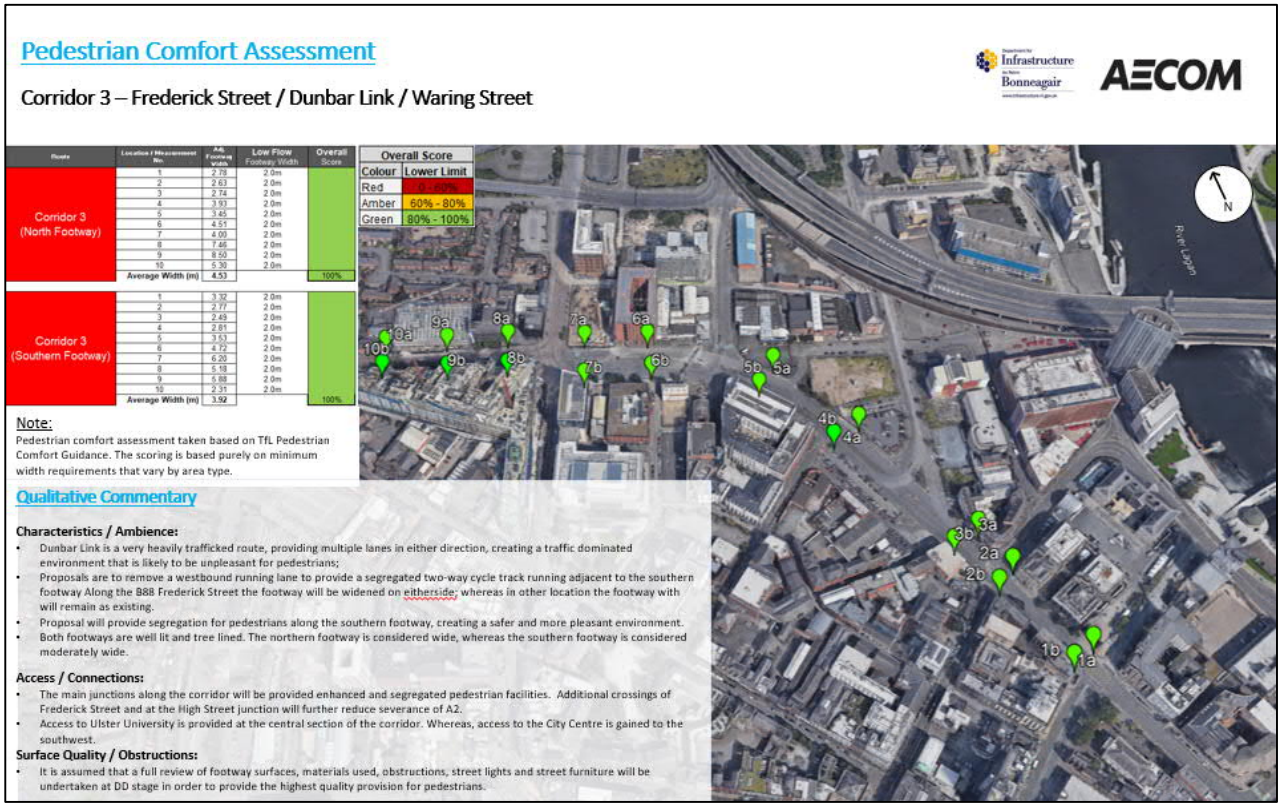


5.3.6 Junction 3.6 – A2 Victoria St / High Street



5.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 3 are shown in the figure below.



5.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

6. Corridor 4 | Brougham Street / Dock Street

6.1 Overview

Extents

Corridor 4 covers Brougham Street and Dock Street, from the junction with B126 North Queen Street at its western extent; to its junction priority junction with Princes Dock Street at its eastern extent. The corridor is shown in **Figure 5**.

Proposals:

- **Proposed Corridor Linear Treatment:**

  Between its junctions with North Queen Street and Corporation Street, narrowing of the carriageway is proposed, through the removal of central hatching and flared multi-lane approaches to junctions in order to provide with kerb segregated (0.5 – 1m segregation width) one-way cycle tracks (1.65m width) along the majority of the route, with cycle priority at minor arms maintained.

  Segregation of pedestrians and cyclists at key crossing points and bus stop bypasses will be maintained by providing interim pedestrian islands and zebra crossings of the cycle track.

  Where possible, the existing footway width will be maintained; however, as the route passes through the Dock Street underpass, the route will be requiring a reduction in the existing footway provision (maintaining 2m minimum width) and removal of a right turning lane for eastbound traffic at the Nelson Street junction. This is due to Dock Street underpass required a dual lane in either direction in order to maintain traffic flows in / out of Belfast City Centre during the AM / PM peaks.

  Proposals the Dock Street underpass are to improve surveillance, lighting provision and footway provision in order to create a safer and more welcoming pedestrian / cycle environment. A review of VRS placement will also be undertaken in order to maximise the carriageway cross-section and footway provision.

- **Brougham Street / North Queen Street** - Proposed as a Dutch style junction, providing an all-red stage for both cyclists and pedestrians. Onward connections to / from Duncairn Gardens (W) and North Queen Street (N) are via on-street links, whereas connections to / from Brougham Street are facilitated by segregated one-way cycle tracks.

- **Brougham Street** / **York Street** - A proposed CYCLOPS arrangement will provide connections between the proposed one-way cycle tracks of Brougham Street / Dock Street (E & W), two-way cycle track of York Street (S), onward on-street connections to / from York Street (N) and to the proposed shared use footway / cycleway at Yorkgate Railway Station.

- **Brougham Street** / **Nelson Street** – Proposals are to provide onward E / W connections via parallel crossing facilities on either side of the carriageway. Onward on-carriageway connections northbound to Nelson Street are not included within the study area as routing northbound is facilitated further along Dock Street at its connection to the NCN Route 93. Movements to Nelson Street (S) are not permitted as this link is proposed to connect to the M3 Motorway.

- **Dock Street / Corporation Street –** Proposals at the junction include improved segregated parallel pedestrian / cycle crossing facilities, with connections between the proposed kerb segregated one-way cycle tracks of Dock Street (W), segregated two-way cycle track of Corporation Street (S), improved two-way cycle track of NCN Route 93 along Dock Street (E) and Garmoyle Street (N). A short section of shared use footway / cycle way is proposed along the south-eastern footway; however, all other connections are full segregated.

A full suite of draft proposals along Brougham Street / Dock Street are provided in **Appendix A** of this report.

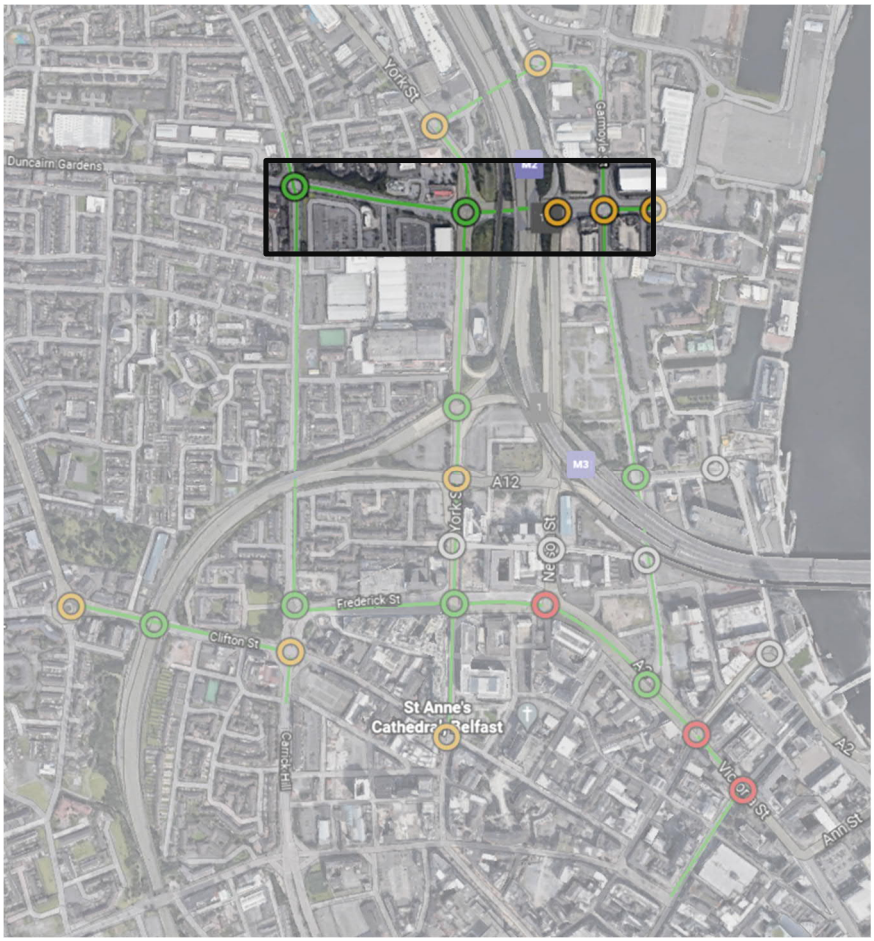


Figure 5 – Corridor 4, Brougham Street / Dock Street.

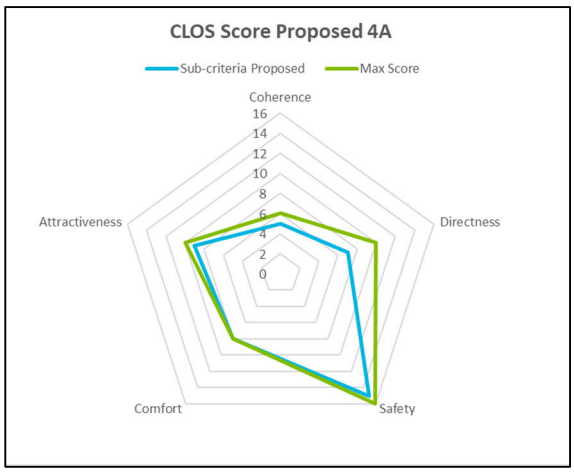
6.2 Cycle Level of Service Proposed Results

6.2.1 Section 4A

Section 4A covers Brougham Street, between its junctions with North Queen Street and York Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 6.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 4A are to reduce the carriageway footprint in order to provide kerb segregated one-way cycle tracks on either side of the carriageway (1.65m width with 0.5 kerbed segregation), whilst, where possible maintaining existing footway width provision. This will be achieved through reconfiguration of the running lanes in either direction and through removal of central hatching.

Section 4A has met the 70% threshold to pass the CLoS audit, scoring 94%, with no critical fails.



Max possible score	50
Audit % score	88%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

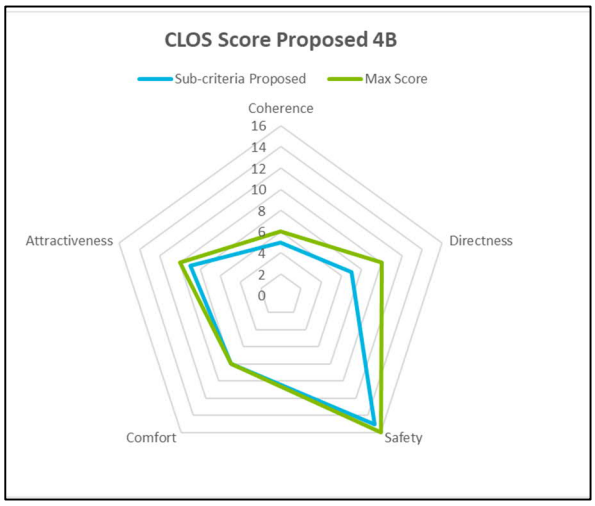
Criteria	Max Score	Sub-criteria Propose	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

6.2.2 Section 4B

Section 4B covers Dock Street, between its junctions with York Street and Nelson Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 6.2.2 of the YSI Baseline Report, June-2021.

Proposals within Section 4B are to continue kerb segregated one-way cycle track provision (1.65m with 0.5m segregation) as the route passes through the Dock Street underpass. This will be achieved through reducing the existing footway provision (maintaining 2m minimum width) and removal of a right turning lane for eastbound traffic at the Nelson Street junction.

Section 4B has met the 70% threshold to pass the CLoS audit, scoring 94%, with no critical fails.



Max possible score	50
Audit % score	88%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**15**	94%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

6.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions included within the proposed Belfast Bicycle Network.

Potential cycle movements are highlighted on the following plans, which also identify the principal cycle movements that form part of the proposed Belfast Cycling Network. Five junctions have been reviewed along Corridor 4, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
1.3	B126 North Queen Street / Brougham Street			• As per Corridor 1, Junction 1.3
2.5	A2 York Street / Brougham Street			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic through providing a CYCLOPs junction with all red ped / cycle stage.
4.3	Dock Street / Nelson Street			• Movements associated with the Belfast Bicycle Network E / W along Dock Street score a green rating and are fully segregated from pedestrians and traffic. • The amber scoring movement is associated with onward on-carriageway connection northbound to Nelson Street. Nelson Street is not included within the study area. • Routing north is facilitated further along Dock Street at its connection to the NCN Route 93.
5.3	Dock Street / Garmoyle Street			• Green scoring movements at the junction are fully segregated that do not enter sections of shared footway / cycleway. • Overall, the junction scores amber, with the majority of movements taken via shared use footway / cycleway.
6.3	Princes Dock Street / Dock Street			• Green scoring movements at the junction are associated with the fully segregated NCN Route 93 movements connecting to / from the low trafficked Princes Dock Street. • Overall, the junction scores amber, with amber ratings associated with movements taken via shared use footway / cycleway or connecting to on-street moderately trafficked routes.

In summary, all proposed movements associated with the Belfast Cycle Network assessed within Corridor 4 scored an amber rating.

The following sections show each junction assessed along Corridor 4, with further detailed information provided at **Appendix E**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

6.3.1 Junction 1.3 – B126 North Queen Street / Brougham Street

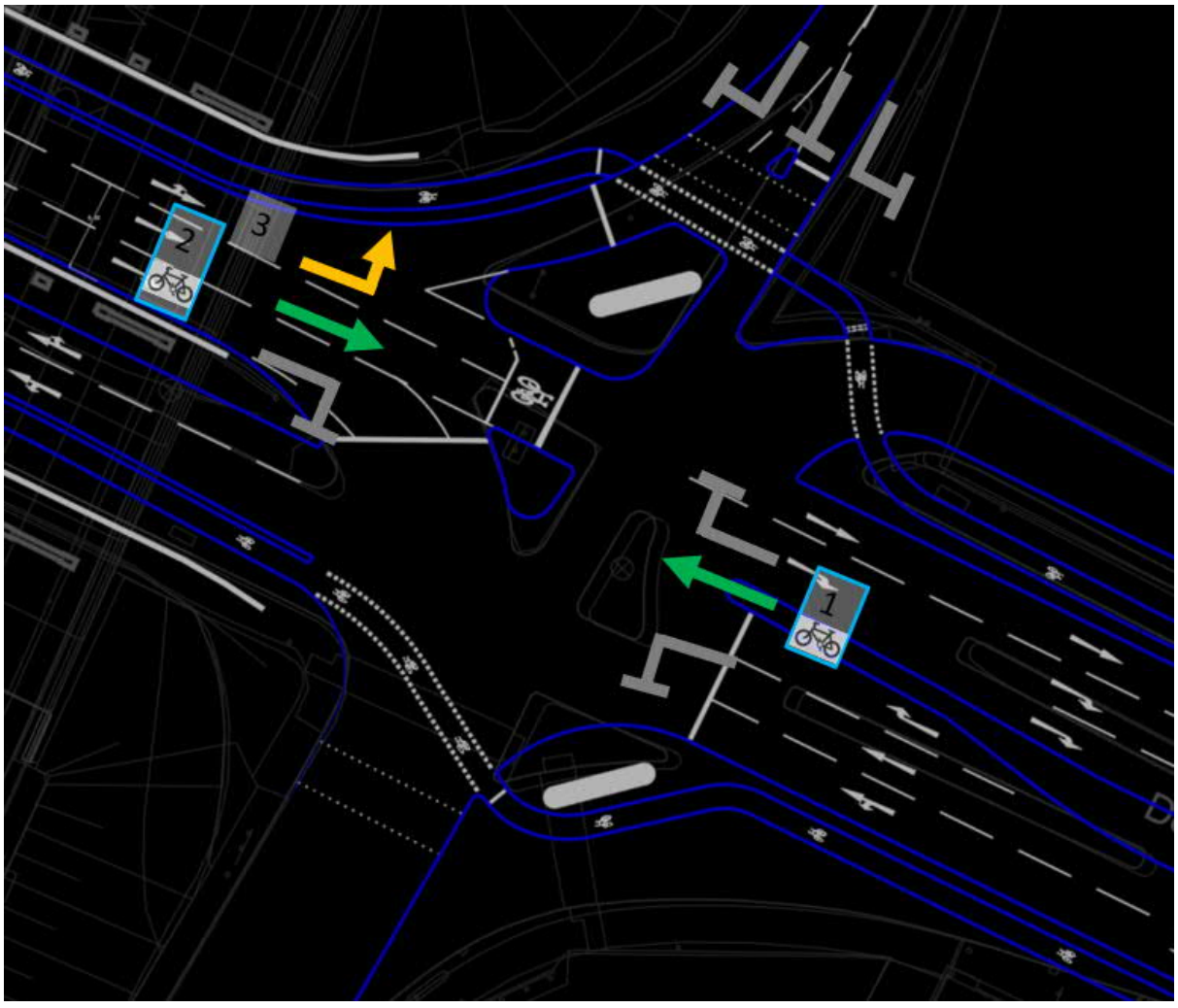
See Section 3.4.3

6.3.2 Junction 2.5 – A2 York Street / Brougham Street

See Section 4.3.6

6.3.3 Junction 4.3 –Dock Street / Nelson Street

Note: Bus lane southbound does not permit cyclists. Nelson Street SB leads to the strategic road network therefore cycle movements are not permitted.



6.3.4 Junction 5.3 – Garmoyle Street / Dock Street

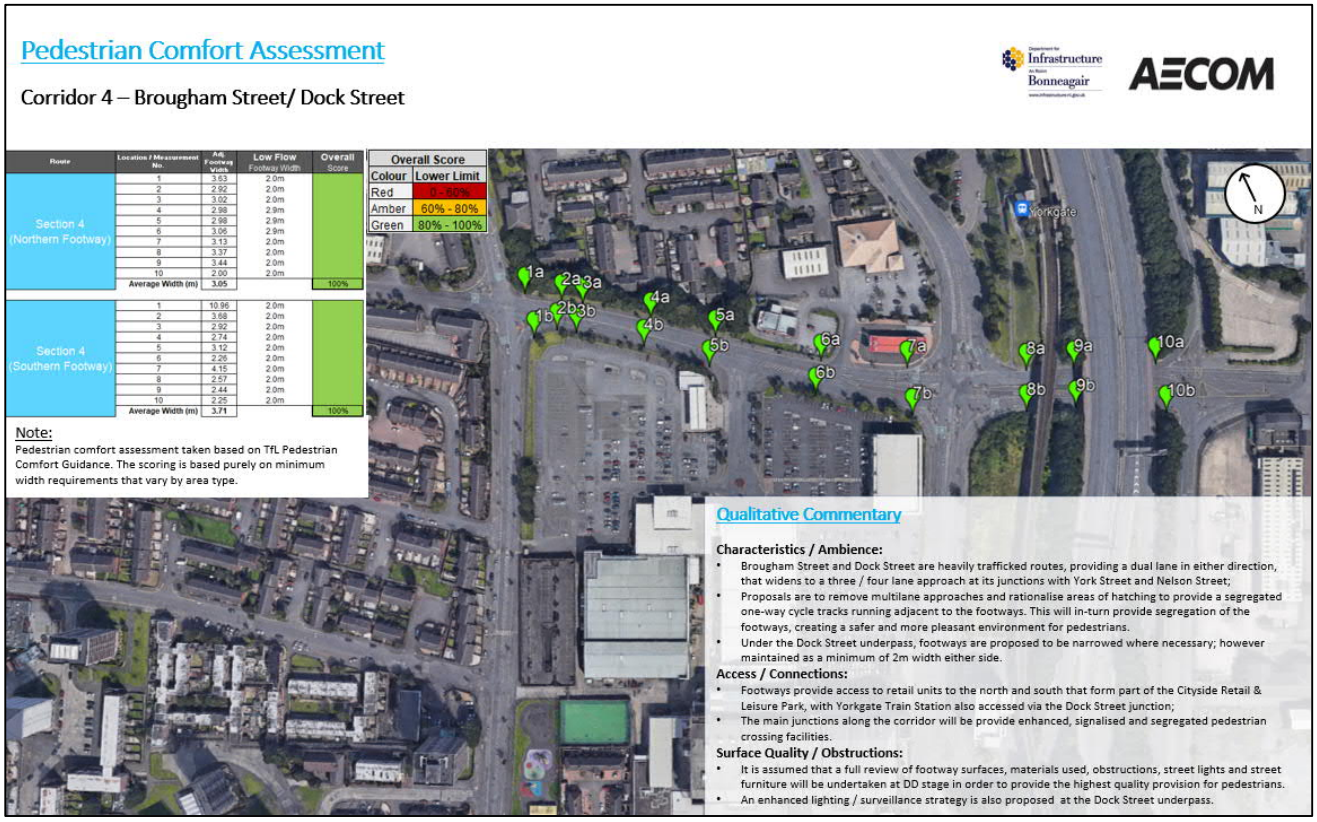
See Section 0

6.3.5 Junction 6.3 – Princes Dock Street / Dock Street

See Section 8.3.3

6.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 4 are shown in the figure below.



6.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

7. Corridor 5 | Garmoyle Street / Corporation Street

7.1 Overview

Extents

Corridor five covers Garmoyle and Corporation Street, from its junction with the A2 Dunbar Link at its southern extent; to its mid-block Toucan crossing connecting to the Whitla Street Subway. The corridor is shown in **Figure 6**.

Proposals:

- **Proposed Corridor Linear Treatment:**

  At its southern extent, the proposed cycle route connects from Corporation Street at its junction with the A2 Dunbar Link via a parallel crossing facility.

  Proposals are to provide a kerb segregated two-way cycle track running in a N / S alignment adjacent to the eastern footway of Corporation Street. A typical segregation width of 0.5m is proposed, which widens to 2.5m at proposed bus stop bypasses and at junctions. The cycle track will be facilitated through the removal of a northbound lane in this location.

  As it reaches the northern extent of Corporation Street, the proposed 2.5m cycle track continues to be located an area of existing carriageway, but facilitated through removal of a large central reserve. The cycle track and buffer will also act as a form of segregation for the pedestrian eastern footway, with the proposed facilities having limited impact on existing footway widths. The single bus lane northbound is proposed to be replaced with an all-traffic lane.

  Corridor 5 then continues in a N / S alignment from the Dock Street, following Garmoyle Street; here, a short section of shared use footway / cycle way is proposed along the south-eastern footway of the Dock Street / Corporation Street junction.

  North of Dock Street, the cycle track continues to be located adjacent to the eastern footway, with the existing NCN Route 93 shared use footway / cycleway reinstated as footway provision. Along this section a 0.5m kerbed segregation width is maintained, with proposals facilitated through removal of the SB left turn filter at the Dock Street junction.

  At its northern extent, the proposed route forms the NCN Route 93, connecting to the Whitla Street Subway via Toucan crossing facility. The cycle track is proposed to be 2.5m wide, with a segregation width of 1.5 - 3.5m facilitated through the removal of existing hatching.

- **A2 Dunbar Link / Corporation Street junction -** The cycle route connects the proposed kerb segregated cycle track of Corporation Street along the eastern footway to the kerb segregated cycle track of A2 Dunbar Link, on the southern footway, via a parallel crossing facility.

- **Corporation Street / Corporation Square –** The proposed two-way cycle track continues in a N / S alignment at the junction, with a segregated parallel crossing arrangement at the junction. Due to land boundary constraints, cyclist will stop for pedestrians crossing E or W at the junction.

  Whilst the section of NCN Route 93 between Corporation Square and Princes Dock Street is not included within the proposals, a connection to the proposed Harbour Commissioners layout along the northern footway is included within the proposals.

- **Corporation Street Junction / Dock Street –** Proposals at the junction include improved segregated parallel pedestrian / cycle crossing facilities, with connections between the proposed segregated two-way cycle track of Corporation Street (S), one-way cycle tracks of Dock Street (E) and improved two-way cycle track of NCN Route 93 along Dock Street (E) and Garmoyle Street (N). A short section of shared use footway / cycle way is proposed along the south-eastern footway; however, all other connections are fully segregated.

- **Duncrue Street / Whitla Street Subway -** Proposals at the junction include an improved alignment, with proposed parallel and Toucan crossing facilities connecting the improved NCN Route 93 of Duncrue Street to an improved shared use footway / cycleway of Whitla Street Subway (leading to Yorkgate Railway Station). The proposed arrangement results in pedestrians and cyclists not having to cross uncontrolled at Nelson Street.

A full suite of draft proposals along York Street are provided in **Appendix A** of this report.

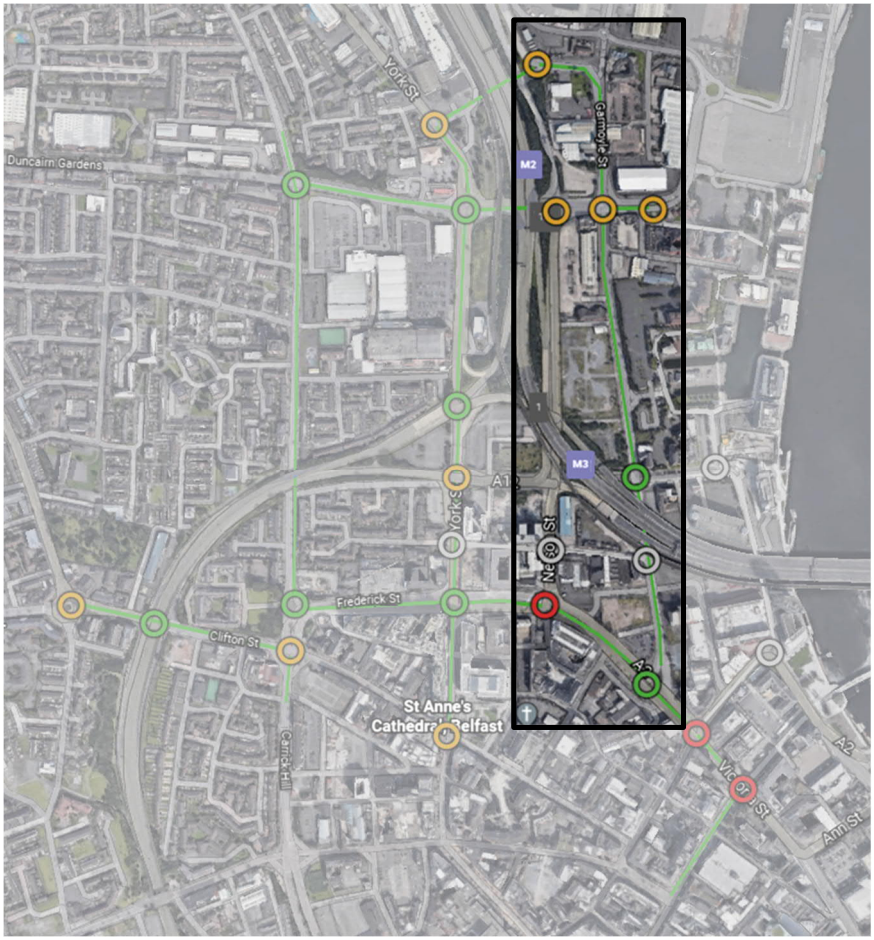


Figure 6 – Corridor 5, Garmoyle St / Corporation St

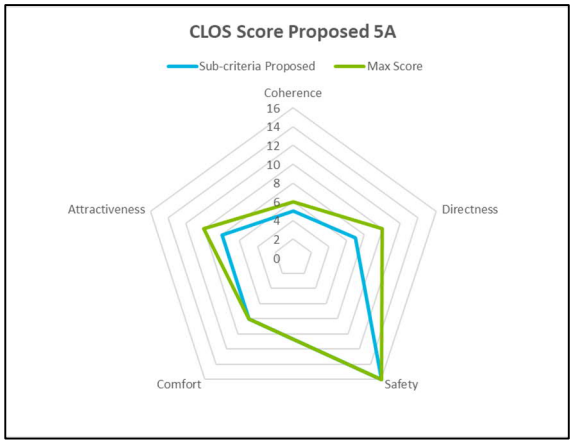
7.2 Cycle Level of Service Proposed Results

7.2.1 Section 5A

Section 5A covers Corporation Street between its junctions with the A2 Dunbar Link and Corporation Square. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 7.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 5A are to remove a vehicular lane northbound in order to provide a kerb segregated two-way cycle track (2.5m) running adjacent to the eastern footway. Segregation between the cycle track and vehicular lanes will typically be 0.5m in this location.

Section 5A has met the 70% threshold to pass the CLoS audit, scoring 88%, with no critical fails.



Max possible score	50
Audit % score	88%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

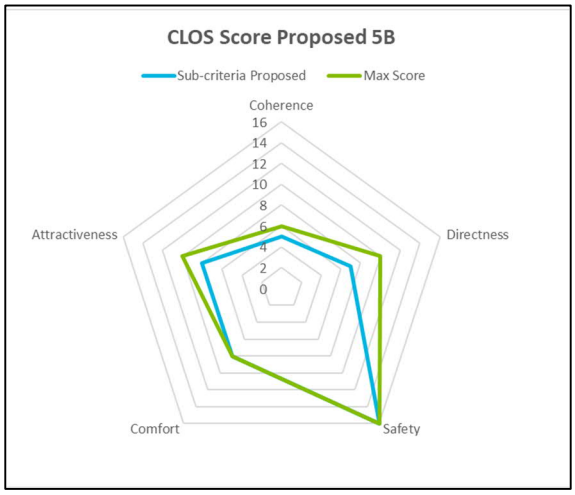
Criteria	Max Score	Sub-criteria Propose	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

7.2.2 Section 5B

Section 5B covers Corporation Street between its junctions with Corporation Square and Dock Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 7.2.2 of the YSI Baseline Report, June-2021.

Proposals within Section 5B continue a kerb segregated two-way cycle track (2.5m) running adjacent to the eastern footway, facilitated by removal of a wide central reserve. Segregation between the cycle track and vehicular lanes will typically be 0.5m in this location.

Section 5A has met the 70% threshold to pass the CLoS audit, scoring 88%, with no critical fails.



Max possible score	50
Audit % score	88%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

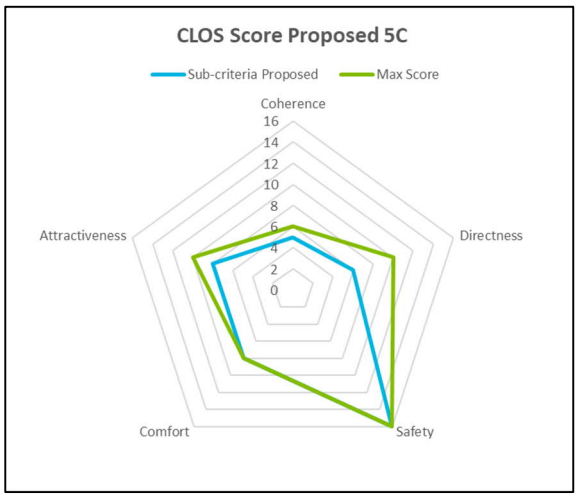
Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

7.2.3 Section 5C

Section 5C covers Garmoyle Street, between its junctions with Dock Street and its mid-block crossing towards the Whitla Street Subway. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 7.2.3 of the YSI Baseline Report, June-2021.

Proposals within Section 5C continue a kerb segregated two-way cycle track (2.5m) running adjacent to the eastern / northern footway. This section is facilitated through removal of the SB left turn filter to Dock Street at the junction and removal of hatching and left turn filter lane to Dock Street.

Section 5A has met the 70% threshold to pass the CLoS audit, scoring 86%, with no critical fails.



Max possible score	50
Audit % score	86%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	6	60%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

7.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions included within the proposed Belfast Bicycle Network.

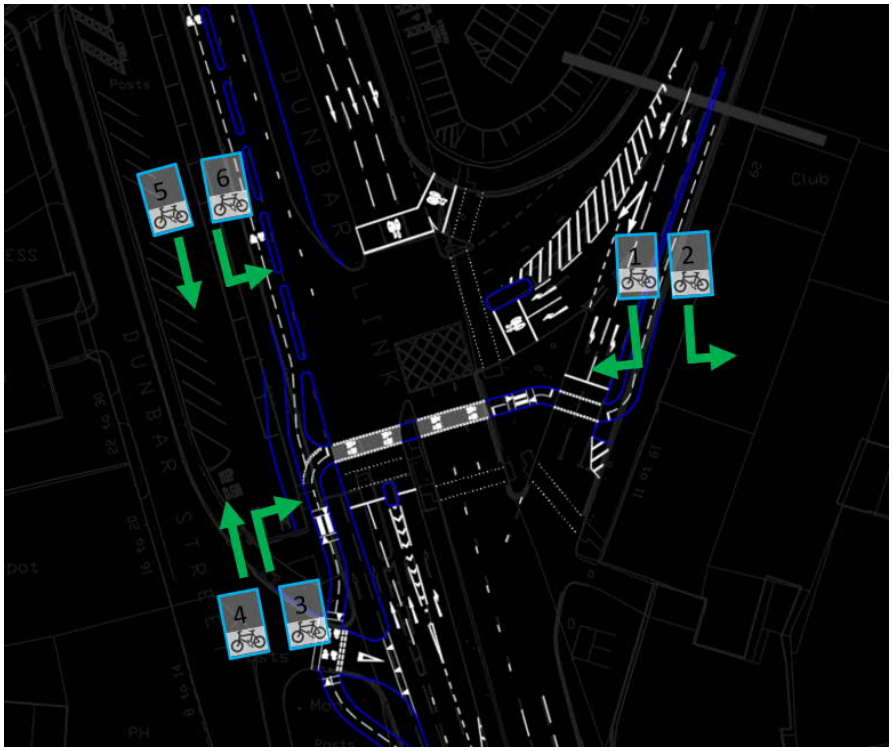
Potential cycle movements are highlighted on the following plans, which also identify the principal cycle movements that form part of the proposed Belfast Cycling Network. Four junctions have been reviewed along Corridor 5, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
5.1	A1 Dunbar Link / Corporation Street			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic through providing parallel crossing facilities at the junction.
5.2	Corporation Street / Corporation Square			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic through providing parallel crossing facilities at the junction.
8.3	Corporation Street / Little Patrick Street			• Little Patrick Street no longer included within proposed following the YSI client meeting in October 2021. • East and West connections are provided elsewhere within the network.
5.3	Garmoyle Street / Dock Street			• Green scoring movements at the junction are fully segregated that do not enter sections of shared footway / cycleway. • Overall, the junction scores amber, with the majority of movements taken via shared use footway / cycleway.
5.4	Duncrue Street / Whitla Subway			• Green scoring movements at the junction are associated with the fully segregated NCN Route 93 ahead movements that do not enter sections of shared footway / cycleway. • Overall, the junction scores amber, with the majority of movements taken via shared use footway / cycleway.

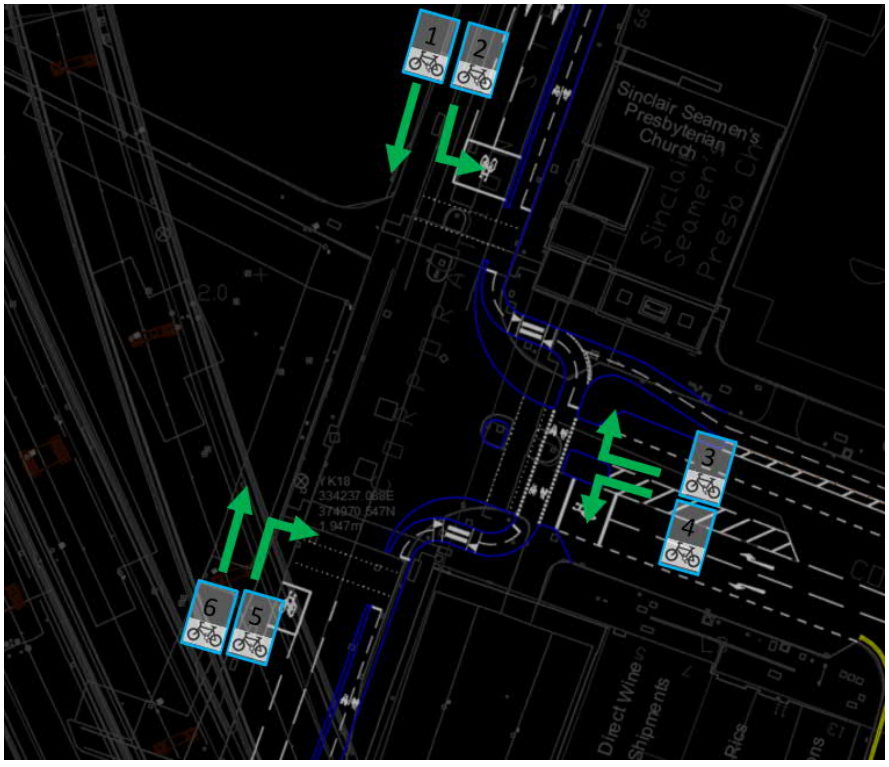
In summary, all proposed movements associated with the Belfast Cycle Network assessed within Corridor 5 scored an amber rating or above.

The following sections show each junction assessed along Corridor 5, with further detailed information provided in **Appendix F**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

7.3.1 Junction 5.1 – A1 Dunbar Link / Corporation Street



7.3.2 Junction 5.2 – Corporation Street / Corporation Square

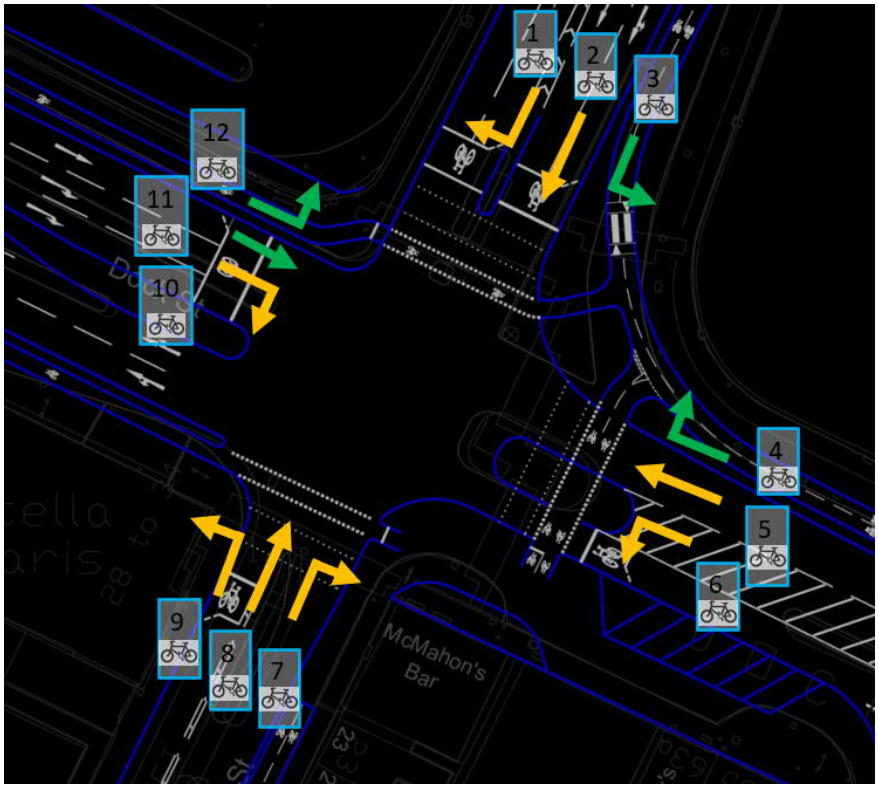


7.3.3 Junction 8.3 – Corporation Street / Little Patrick Street

See Section **Error! Reference source not found.**

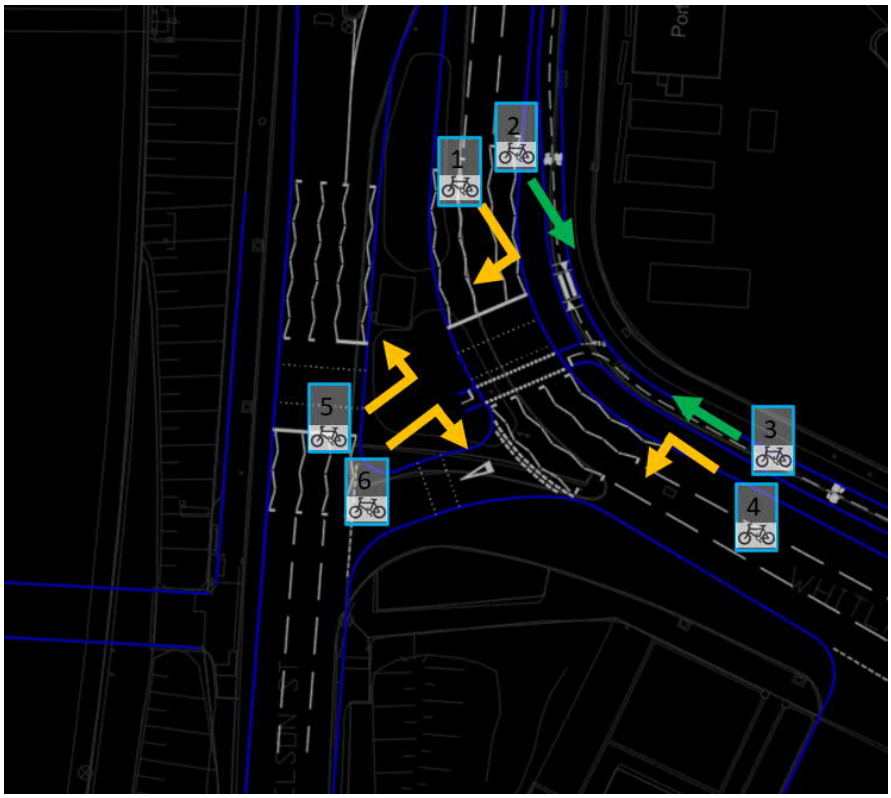
7.3.4 Junction 5.3 – Garmoyle Street / Dock Street

Note: Cycle movements 3 and 4 assumed to follow two-way cycle track to the northeast of the junction.



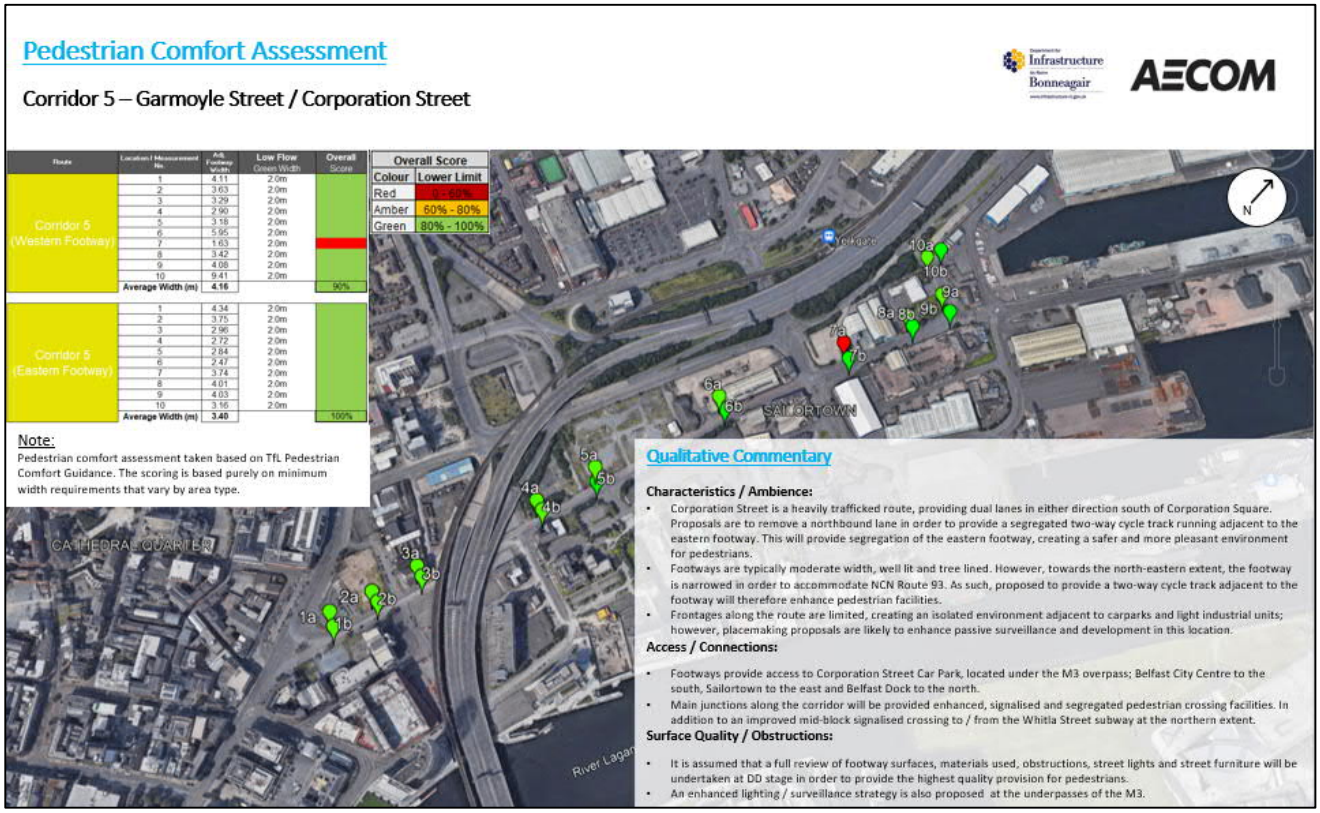
7.3.5 Junction 5.4 – Duncrue Street / Whitla Subway

Note: NB cycle movements assumed to follow cycle crossing through junction.



7.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 5 are shown in the figure below.



7.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

8. Corridor 6 | NCN Route 93

8.1 Overview

Extents

Corridor six covers NCN Route 93, between its junctions with the A2 Albert Square to the south and Garmoyle Street to the north. The extent of the corridor is shown in **Figure 6**.

Following the YSI client meeting in October 2021, it was agreed that the section of NCN Route 93 running from Waring Street and the Harbour would be omitted from the study area. As such, only the short section linking Princes Dock Street to Dock Street has been developed and assessed.

Proposed Treatment:

Proposals within Corridor 6 consistent of providing an upgraded parallel crossing facility linking Princes Dock Street existing quiet route to the proposed fully segregated two-way cycle track of Dock Street, forming an upgraded section of NCN Route 93.

This will be facilitated through stopping up of the WB left turn slip to Princes Dock Street, creating a safer environment for cyclists and pedestrians and through narrowing of Dock Street to a single lane in either direction.

Figure 7 – Corridor 6, NCN Route 93

8.2 Cycle Level of Service Proposed Results

8.2.1 Section 6A

Section 6A covers the NCN Route 93 along Donegall Quay, between its junctions with the A2 Albert Square and Clarendon Road. This section is no longer included within the proposed network following the YSI client meeting in October 2021.

8.2.2 Section 6B

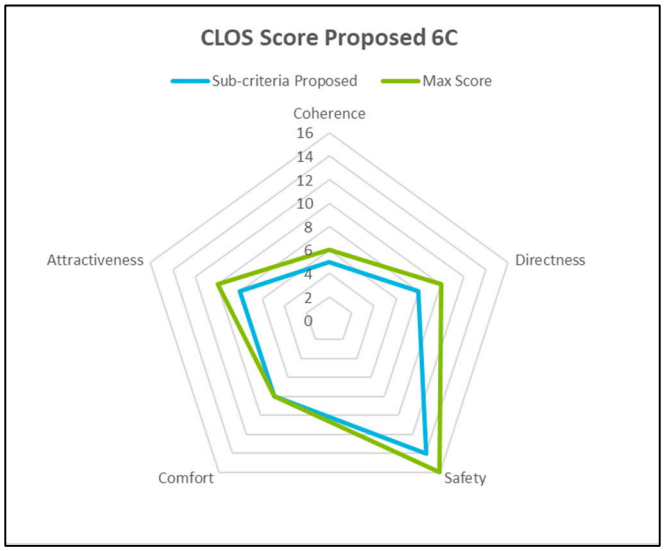
Section 6B covers the NCN Route 93 along Clarendon Road, between its junctions with Corporation Square and Dock Street. This section is no longer included within the proposed network following the YSI client meeting in October 2021.

8.2.3 Section 6C

Section 6C covers Dock Street between its junctions with Princes Dock Street and Garmoyle Street. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 8.2.3 of the Baseline Review.

Proposals within Section 6C are to provide kerb segregated two-way cycle track (2.5m) running adjacent to the northern footway, with a typical segregation width of 1m in this location. This section is facilitated through reduction from dual lanes at Dock Street to a single lane. This will also provide enhanced urban realm provision and reduced traffic impact.

Section 6A has met the 70% threshold to pass the CLoS audit, scoring 86%, with no critical fails.



Max possible score	50
Audit % score	86%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**14**	88%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

8.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions across the proposed cycle network.

Key cycle movements are highlighted on the following plans, that identify principal cycle movements that form part of the proposed Belfast Bicycle Network. One junction has been reviewed along Corridor 6, which is:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
6.1	Albert Square / Donegal Quay			• Junction no longer included within proposed assessment following the YSI client meeting, October 2021.
6.2	Donegal Quay / Clarendon Way			• Junction no longer included within proposed assessment following the YSI client meeting, October 2021.
6.2	Princes Dock Street / Dock Street			• Overall, the junction scores amber, with amber ratings associated with movements taken via shared use footway / cycleway or connecting to on-street moderately trafficked routes. • Green scoring movements at the junction are associated with the fully segregated NCN Route 93 movements connecting to / from Princes Dock Street quiet route.

In summary, proposed movements associated with the Belfast Bicycle Network assessed within Corridor 6 scored an amber rating or above. The following section shows the Princes Dock Street / Dock Street junction, with further detailed information provided in **Appendix G**.

8.3.1 Junction 6.1 – Albert Square / Donegal Quay

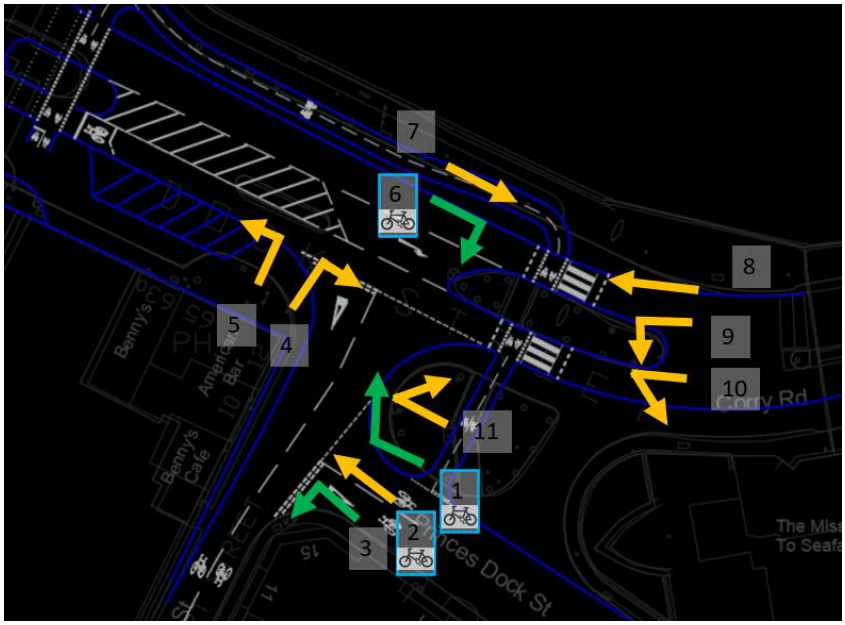
Junction no longer included within proposed following the YSI client meeting in October 2021.

8.3.2 Junction 6.2 – Donegal Quay / Clarendon Way

Junction no longer included within proposed following the YSI client meeting in October 2021.

8.3.3 Junction 6.3 – Princes Dock Street / Dock Street

Note: NB cycle movements 1,6,7 & 11 are assumed to follow cycle crossing through junction.



8.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level no longer included within proposed assessment following the YSI client meeting, October 2021.

8.5 Mobility Impaired Audit Proposed Results

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12. This section has not been included following the YSI client meeting, October 2021.

9. Corridor 7 | Whitla Street Subway

9.1 Overview

Extents

Corridor 7 covers the Whitla Street Subway and its connections between the junctions with the Whitla Street and Duncrue Street. The extent of the corridor is shown in **Figure 8**.

Proposals

The proposals adjacent to the Whitla Street Subway include the below treatments:

- Proposals within Corridor 7 are to enhance the existing subway and improve connections to / from NCN Route 93 and Yorkgate Railway Station.
- Yorkgate Railway Station proposals are to provide shared use footway / cycleway within the new development footprint; therefore, it is assumed that the Whitla Street subway connection will be provided as part of this development.
- Proposals within the subway include cutting back shrubbery entrances, improved lighting, CCTV surveillance and improved footway surface to enhance the existing connection and create a safer and more welcoming pedestrian / cycle environment.
- Realignment of Nelson Street is proposed, in order to provide a 5m wide shared footway / cycleway along the existing western footway. A parallel and Toucan crossing facility will provide the connection to the eastern footway of Whitla Street and to / from NCN Route 93.
- This provision will improve safety for pedestrians and cyclists significantly, resulting in them not having to cross uncontrolled at the Nelson Street NB right turn slip, unless accessing the southern footway.

Figure 8 – Corridor 7, Whitla Street Subway

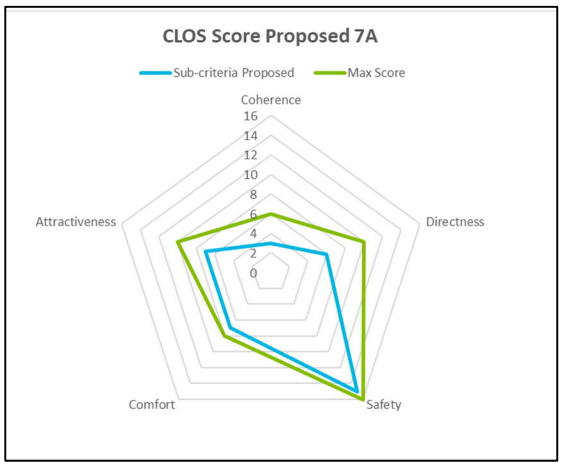
9.2 Cycle Level of Service Proposed Results

9.2.1 Section 7A

Section 7A covers the Whitla Street Subway and its connections between the junctions with the A2 Dock Street and Duncrue Street. Its existing characteristics and aesthetic are provided in the YSI Baseline Report, June-2021.

Proposals within Section 7A are that an appropriate carriageway resurfacing strategy, removal of non-cycle friendly obstructions, shrubbery removal, enhanced surveillance and improved lighting will be undertaken.

Section 7A has met the 70% threshold to pass the CLoS audit, scoring 86%, with no critical fails.



Max possible score	50
Audit % score	76%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Propose	% score Proposed
Coherence	6	3	50%
Directness	10	6	60%
Safety	16	**15**	94%
Comfort	8	7	88%
Attractiveness	10	7	70%
	50		

9.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions across the proposed cycle network.

Key cycle movements are highlighted on the following plans, that identify principal cycle movements that form part of the proposed Belfast Bicycle Network. Two junctions have been reviewed along Corridor 7, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
2.6	Whitla Street / Whitla Street Subway			• As per Corridor 2, Junction 2.6
5.4	Duncrue Street / Whitla Subway			• As per Corridor 5, Junction 5.4

In summary, all proposed movements associated with the Belfast Bicycle Network assessed within Corridor 7 scored an amber rating or above.

The following sections show each junction assessed along Corridor 7, with further detailed information provided in **Appendix G**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

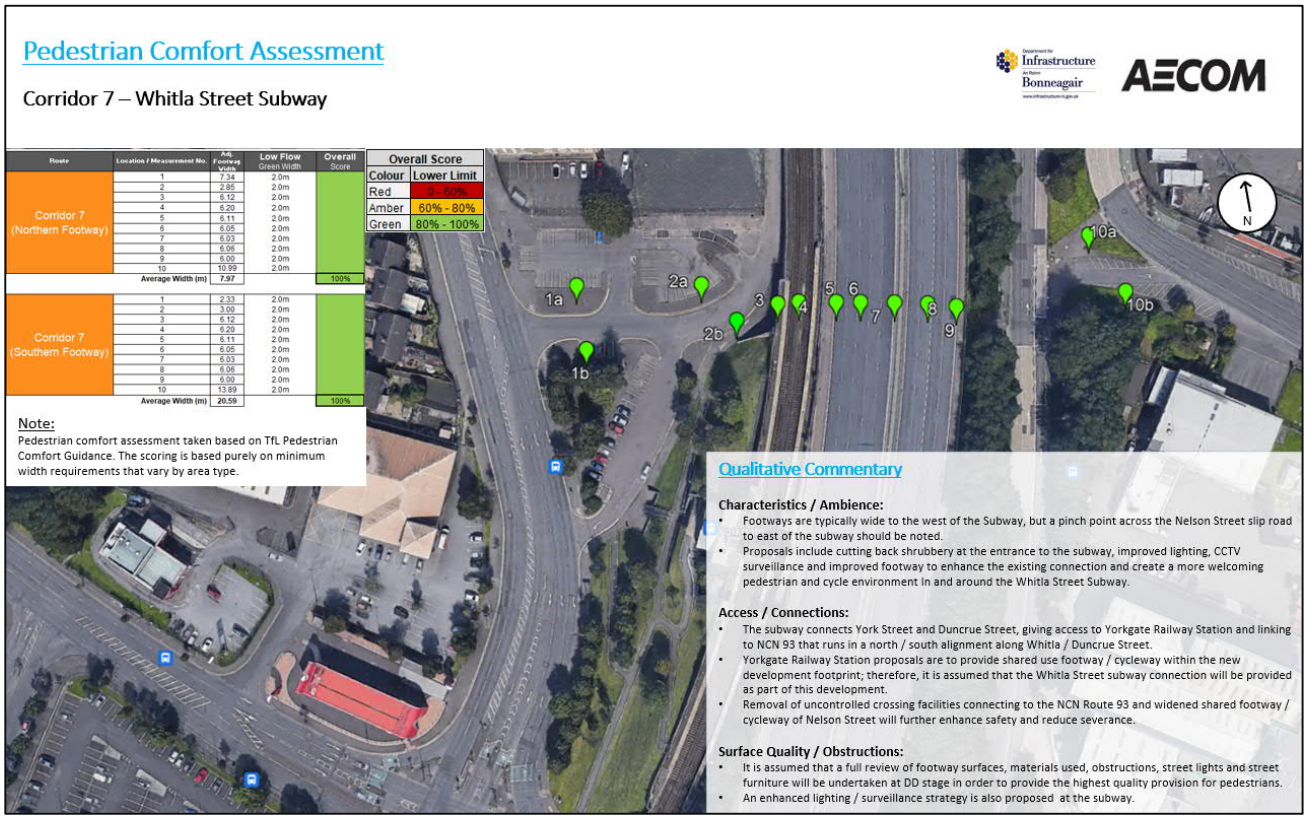
9.3.1 Junction 2.6 – A2 York Road / Whitla Street Subway

See Section 4.3.7

9.3.2 Junction 5.4 – Dubcrue Street / Whitla Subway

See Section 7.3.5

9.4 Pedestrian Comfort Levels Proposed Results



9.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12

10. Corridor 8 | Little Patrick Street

10.1 Overview

Extents

Corridor 8 covers Little Patrick Street, between its junctions with the York Street and Corporation Street. The extent of the corridor is shown in **Figure 9**.

Following the YSI client meeting in October 2021, it was agreed that Little Patrick Street be omitted from the study area, due to more appropriate alternative east / west connections provided within the network.

In addition to the above, proposals include stopping-up the western extent of Little Patrick Street to motor traffic in order to provide an enhanced public realm outside the Ulster University halls of residence.

Figure 9 – Corridor 8, Little Patrick Street

10.2 Cycle Level of Service Proposed Results

10.2.1 Section 8A

Corridor 8 covers the Little Patrick Street and its connections between its junctions with the York Street and Corporation Street. This section is no longer included within proposed network following the YSI client meeting, October 2021.

10.3 Junction Assessment Proposed Results

Junctions along Little Patrick Street are no longer included within proposed network following the YSI client meeting, October 2021.

Junction	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
.8.1	Little Patrick Street / York Street			• Junction no longer included within proposed assessment following the YSI client meeting, October 2021.
8.2	Little Patrick Street / Nelson Street			• Junction no longer included within proposed assessment following the YSI client meeting, October 2021.
8.3	Little Patrick Street / Corporation Street			• Junction no longer included within proposed assessment following the YSI client meeting, October 2021.

10.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level no longer included within proposed assessment following the YSI client meeting, October 2021.

10.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12. This section has not been included following the YSI client meeting, October 2021.

11. Corridor 9 | Clifton Street

11.1 Overview

Extents

Corridor 9 covers Clifton Street, between the 'Carlisle Circus' roundabout to the west and its signalised junction with Carrick Hill to the east. The extent of the corridor is shown in **Figure 10**.

Proposals

- **Proposed Corridor Linear Treatment:**

  Proposals are to narrow the existing carriageway, through the removal of the eastbound nearside lane, in order to provide dual 3.2m lanes in either direction, with kerb segregated (0.5 – 1m segregation width) two-way cycle track (2.5m width) adjacent to the northern footway.

  The cycle track and buffer will act as a form of segregation for the northern footway, with the proposed facilities having limited impact on existing footway widths.

  Cycle priority at the Henry Place minor arm will be maintained by providing marked priority partial setback.

  Segregation of pedestrians and cyclists at key crossing points and bus stop bypasses will be maintained by providing interim pedestrian islands and zebra crossings of the cycle track.

- **Clifton Street / Frederick Street and North Queen Street / Frederick Street and junctions** – A half CYCLOPS arrangement is proposed, connecting the proposed two-way cycle tracks of both Clifton Street (W) and Frederick Street (E) and one-way cycle tracks of North Queen Street (N). Connection to / from Carrick Hill (S) will be facilitated by areas of shared use footway / cycleway, whereas onward connections to / from Donegall Street will be facilitated by cycle on / off links to the carriageway.

- **North Queen Street / Brougham Street junction** – Proposals are to remove the existing roundabout and replace with a CYCLOPS arrangement, this will provide connections between the proposed two-way cycle track of Clifton Street (E), bus / cycle lane of Antrim Road (N) and onward on-street connections to / from Crumlin Road (W) and Denmark Street (S). The junction will operate with an all-red pedestrians / cycle stage.

A full suite of draft proposals along Clifton Street are provided in **Appendix A** of this report.

Figure 10 – Corridor 9, Clifton Street

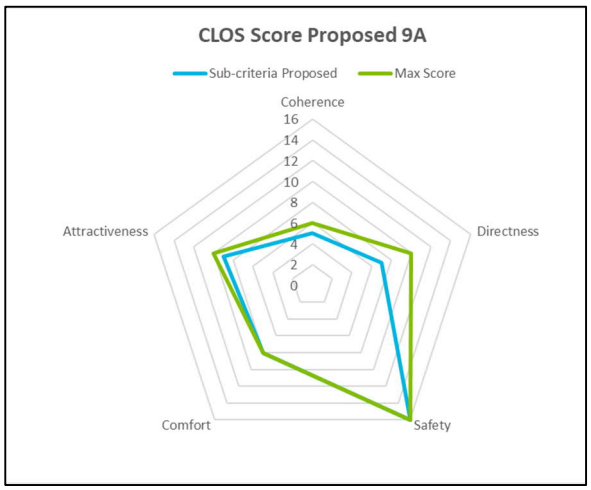
11.2 Cycle Level of Service Proposed Results

11.2.1 Section 9A

Section 9A covers Clifton Street and its connections between 'Carlisle Circus' roundabout to the west and its signalised junction with Carrick Hill to the east. Clifton Street gives access to the A12 Westlink within the centre of the route; however, this link is not permitted to cyclists. Its existing characteristics in terms of existing layout, traffic volume and vehicle speed are detailed in Section 11.2.1 of the YSI Baseline Report, June-2021.

Proposals within Section 9A are to provide kerb segregated two-way cycle track (2.5m) running adjacent to the northern footway. This section is facilitated through reduction from three to two eastbound lanes.

Section 6A has met the 70% threshold to pass the CLoS audit, scoring 86%, with no critical fails.



Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	Pass
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

11.3 Junction Assessment Proposed Results

As within the existing Baseline Review, a JAT has been undertaken for all movements at junctions across the proposed cycle network.

Key cycle movements are highlighted on the following plans, that identify principal cycle movements that form part of the proposed Belfast Bicycle Network. Three junctions have been reviewed along Corridor 7, which are:

Junction Ref	Location	Overall Junction Score	Belfast Cycle Network Score	Comments
1.1	Clifton Street / B126 Carrick Hill			• As per Corridor 1, Junction 1.1
9.2	Clifton Street / A12 Westlink			• All green scoring movements, with cyclists fully segregated from both pedestrians and vehicular traffic through providing parallel crossing facilities at the junction for E /W movements along Clifton Street. • Cycle movements to / from the A12 Westlink are prohibited
9.3	Carlisle Circus.			• Movements associated with the cycle network between Clifton Street and Antrim Road score a green rating as they link between fully segregated facilities and a low trafficked bus / cycle lane. • Other amber scoring movements are associated with onward connections to / from on carriageway links not included within the study area.

In summary, all proposed movements associated with the Belfast Bicycle Network assessed within Corridor 9 scored a green rating.

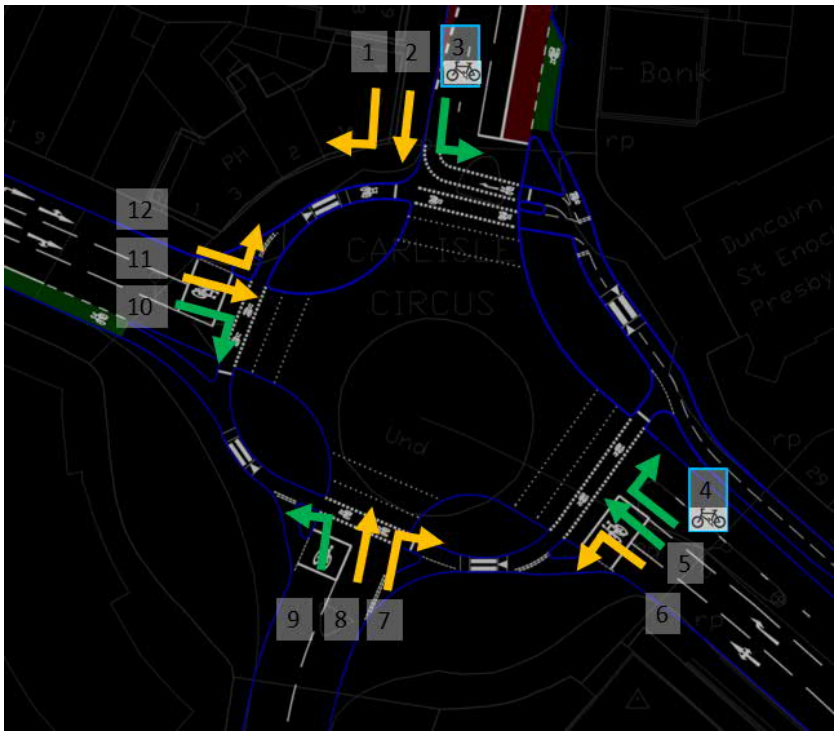
The following sections show each junction assessed along Corridor 9, with further detailed information provided in **Appendix J**. Where junctions appear in more than one corridor, the relevant section is referenced to avoid duplication of results.

11.3.1 Junction 1.1 – Clifton Street / B126 Carrick Hill

See Section 3.4.1

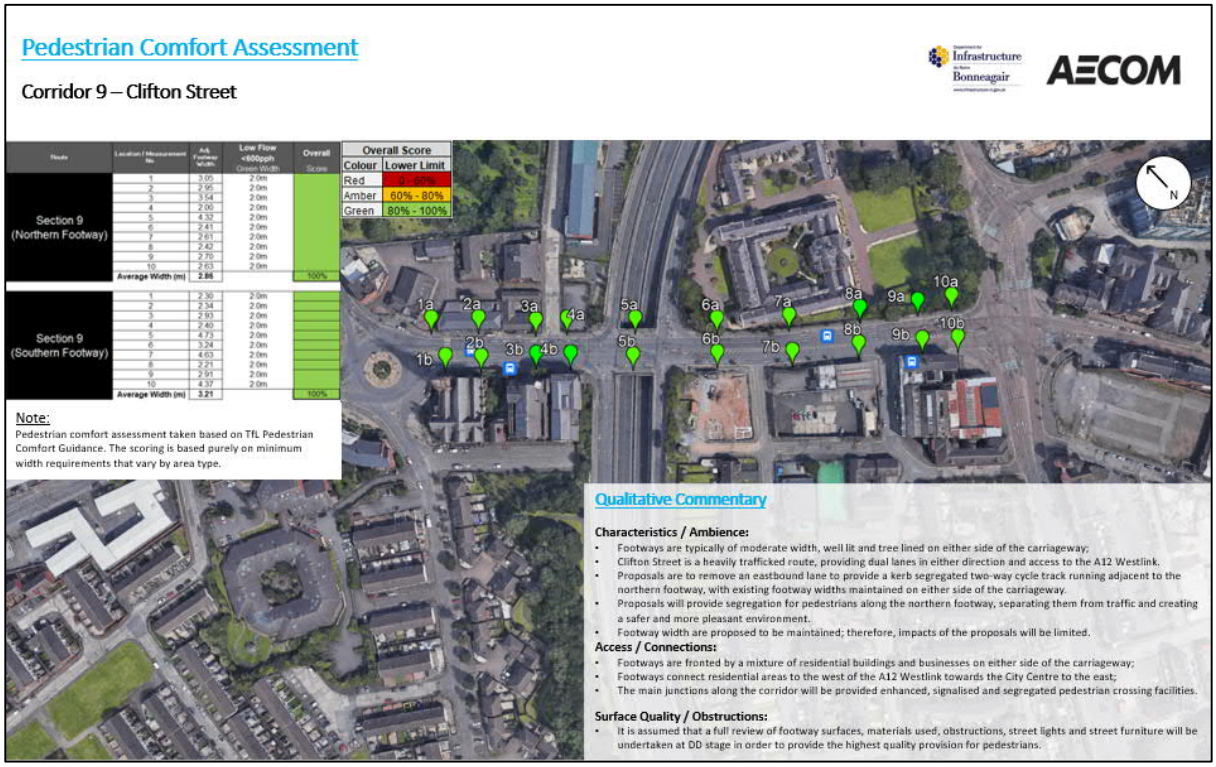
11.3.2 Junction 9.2 – Clifton Street / A12 Westlink

11.3.3 Junction 9.3 – Carlisle Circus



11.4 Pedestrian Comfort Levels Proposed Results

Results of the Pedestrian Comfort Level proposed assessment and qualitative commentary regarding the pedestrian environment for Corridor 9 are shown in the figure below.



11.5 Mobility Impaired Audit - Proposed Review

An overall Mobility Impaired Audit has been undertaken, which is highlighted at Section 12.

12. Mobility Impaired Assessment

An independent review has been undertaken by a mobility impaired specialist in relation to the proposed Belfast Bicycle Network, a summary of key themes and issues are identified below:

- The proposed pedestrian facilities are “arguably better than the current provision, for example replacing uncontrolled crossings with controlled crossings but the arrangements are more complex which may be particularly problematic for many people with vision impairments”. A such, engagement with these user groups should be undertaken to ensure they are both comfortable and familiar with proposals if / when they are development further.
- Zebra crossings to interim pedestrian islands at both junctions and bus bypasses are likely to be problematic for people with vision impairments since they rely on eye contact between the driver and the pedestrian. As such, these should be developed aligned with both the Traffic Signs Manual and The Traffic Signs Regulations and General Directions guidance, with approval necessary from DFI and Belfast City Council.
- Grade separation between pedestrians and cyclists should be reviewed at DD stage, with proposals designed to meet the latest LTN 1/20 and pedestrian design guidance.
- The need for blue-badge parking and vehicle set down/pick up points near key amenities, such as shops, university buildings and churches should be reviewed prior to the next stage of development.
- Blue-badge parking requirements within areas proposed to provide segregation strips of the cycle track and proposed bays should be reviewed at DD stage to ensure this does not prevent access to / from these bays.

13. Initial Costing Exercise

An initial high-level scheme costing exercise has been undertaken as an indication of potential construction cost of the proposed YSI+ scheme with Active Travel enhancements. A summary of this cost estimate by link type and junction scale is presented in **Figure 11** below.. At this early stage in the design process, cost estimates reflect previous scheme delivery experience and are based on an assumed £1 Million per km for link sections and varying junction costs reflecting the scale of intervention.

Total scheme costs for the proposed YSI+ Active Travel enhancements are estimated to be approximately **£19 Million**. This includes a 43% risk and ancillary cost uplift reflecting the current stage in design, but excludes Placemaking interventions. A further detailed costing exercise would be required at the next stage of design.

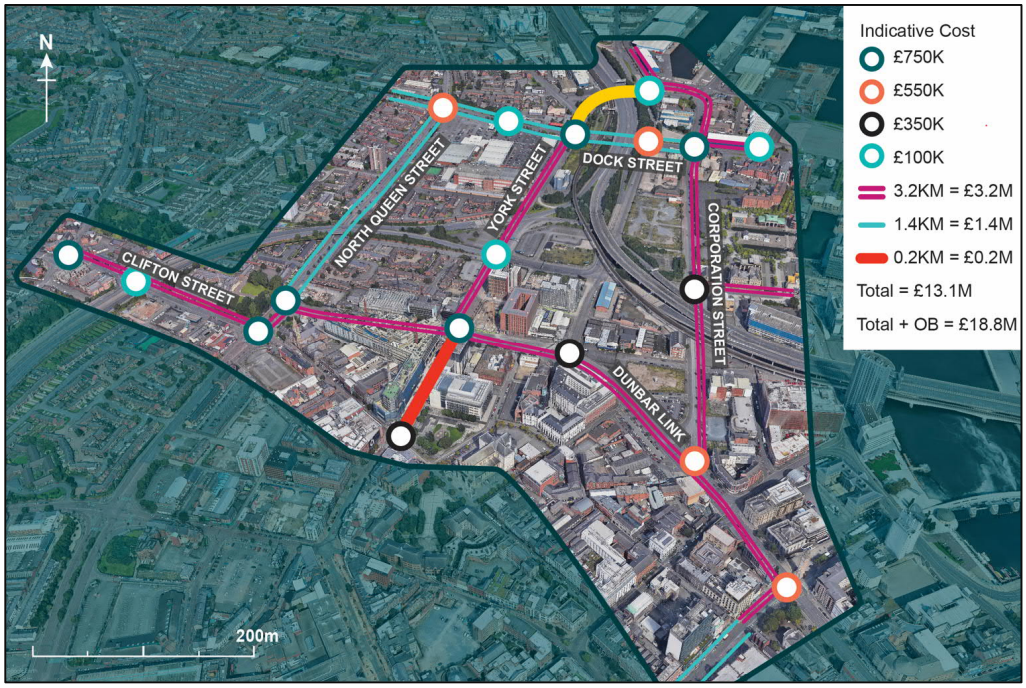


Figure 11 – YSI+ Scheme Cost Estimate

14. Visualisations

A suite of feasibility design drawings have been prepared providing further details on the proposed scheme summarised above; the drawings are included within Appendix A.

Scheme development was informed by weekly design workshops attended by both the Active Travel team and also the Placemaking team to ensure a common understanding and to ensure proposed active travel scheme detail did not diminish placemaking opportunities and vice-versa.

Three visualisations were also prepared to help communicate the proposed active travel scheme enhancements together with complementary placemaking interventions. These visualisations are provided below as **Figure 12** to **Figure 14** below.

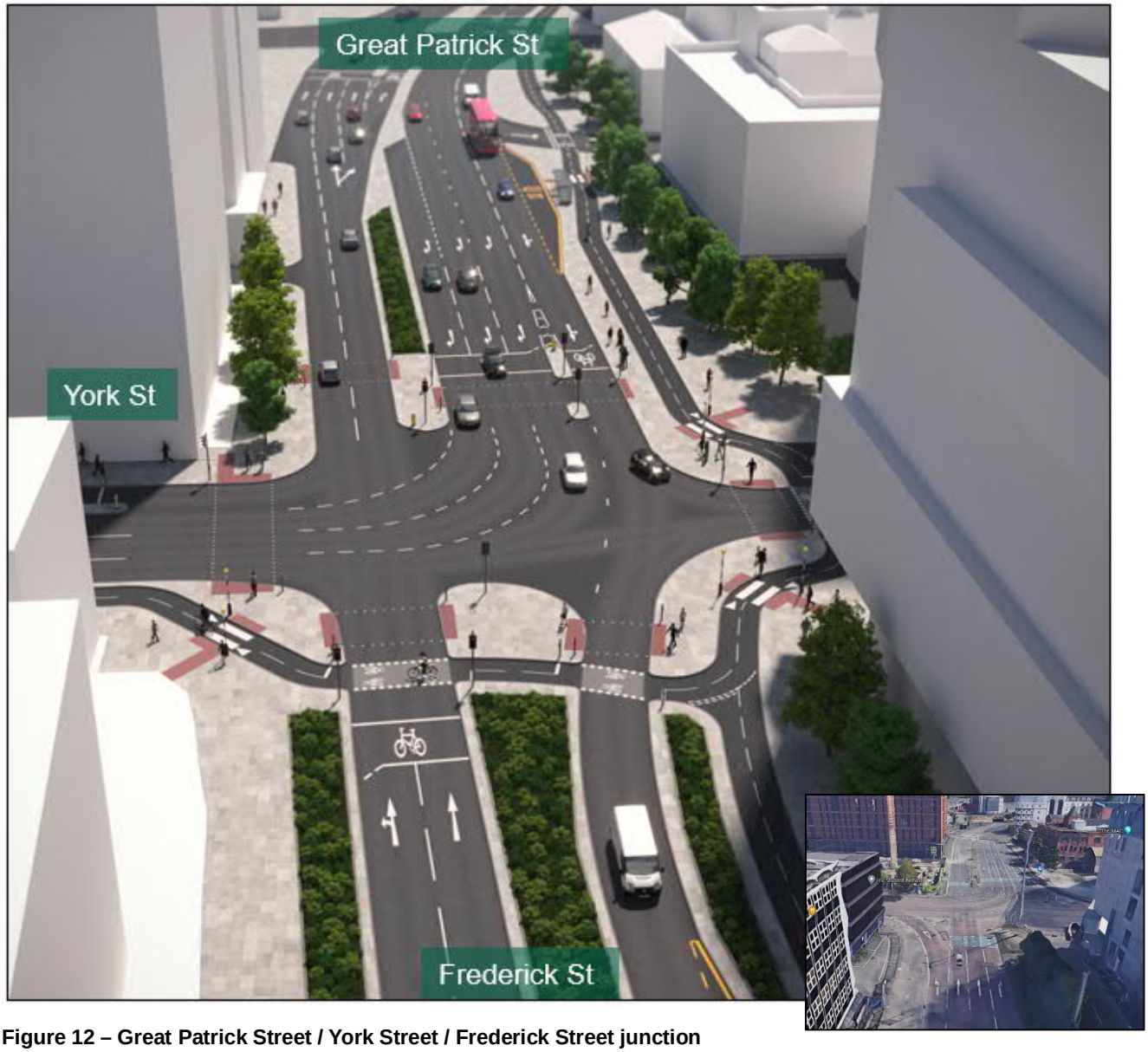


Figure 12 – Great Patrick Street / York Street / Frederick Street junction

Figure 13 – York Street looking towards Great George Street

Figure 14 – North Queen Street looking south towards Westlink Bridge

15. Summary

15.1 Cycling Summary

Design amendments have been proposed for the YSI study area to enhance provision for cyclists and pedestrians, focussed on providing physical separation for cyclists on links and at junctions along each of the corridors where there are high volumes of motor traffic. This aligns with one of the guiding principles set out in Chapter 1 of LTN 1/20 is that “cyclists must be physically separated and protected from high volume motor traffic, both at junctions and on the stretches of road between them”.

The key component elements of the proposed design amendments to the YSI scheme are summarised in **Figure 15** below and include:

- **3.2 km** of two-way cycle track on York Street (west side); Corporations Street (east side); Dunbar link / Great Patrick Street / Frederick Street (south side); and Clifton Street (north side)
- **1.4 km** of one-way cycle track on both sides of North Queen Street, Brougham Street and Dock Street
- **0.2 km** of ‘Quiet Route’ treatment on York Street (south) with restricted access for general traffic and urban realm treatment to enhance the environment for pedestrians and cyclists outside the University.
- Separation of cyclists from motor vehicles and pedestrians at 18 key junctions across the study network ranging from improved pedestrian/cycle crossing facilities to fully segregated Cycle Optimised (CYCLOP) junction treatment.

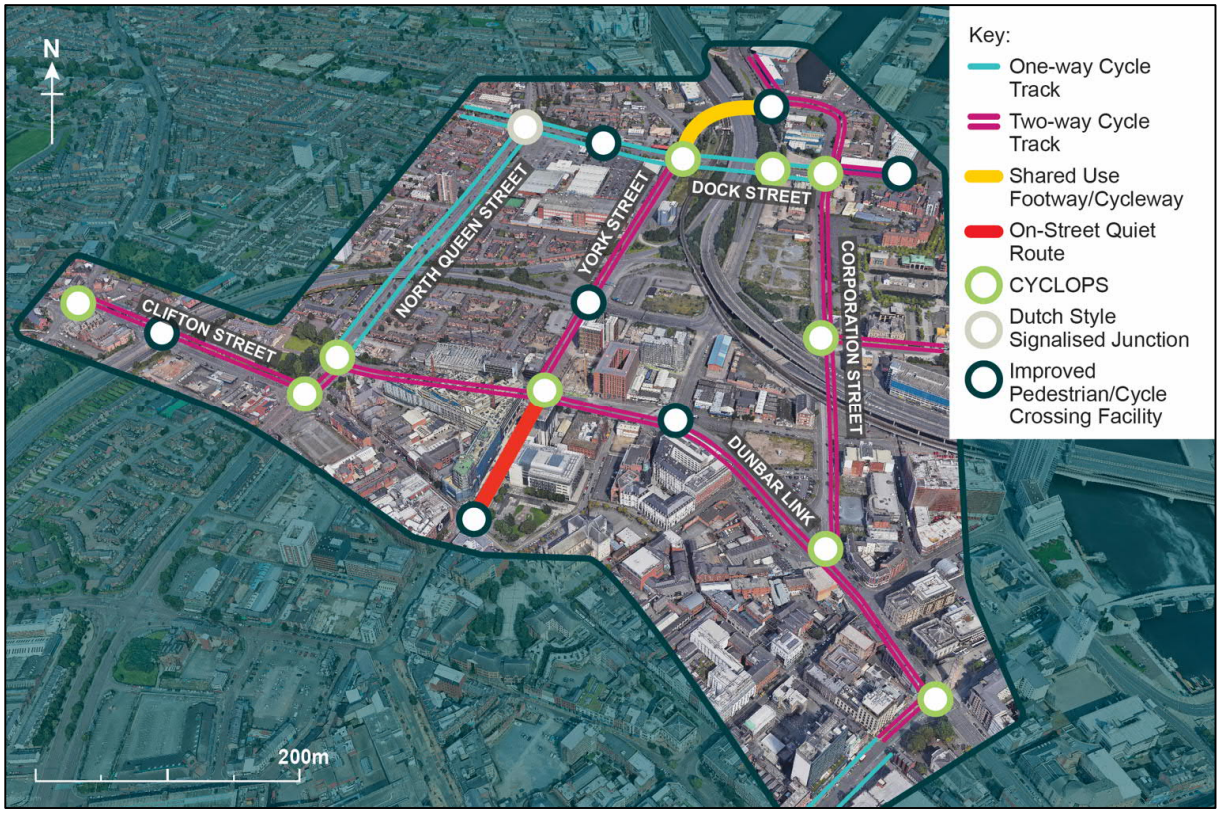


Figure 15 – Summary of proposed YSI+ scheme (with Active Travel enhancements)

Key findings of the assessment of nine study corridors by section (A-E) and by major junctions are summarised in Error! Reference source not found.. The summary below reflects the final comparable results between baseline and proposed reviews, with sections from the baseline review omitted from scope highlighted in black.

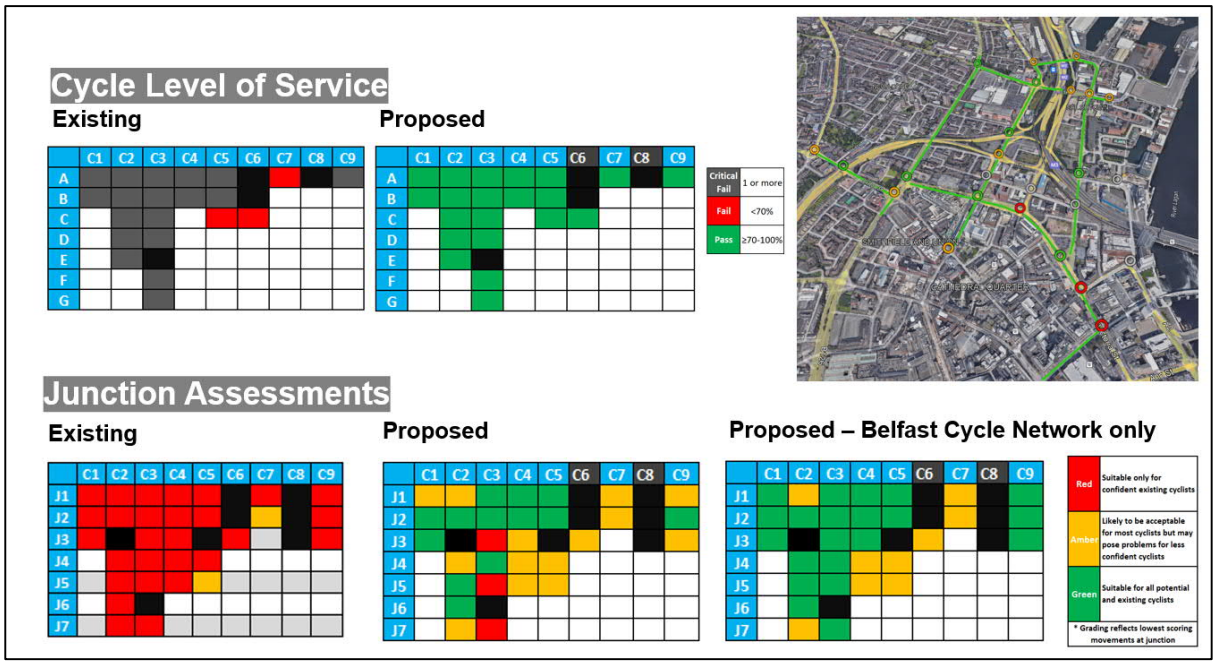


Figure 16 – Existing & Proposed YSI+ - Summary of key findings

Cycle Level of Service

All 21 link sections have been assessed using the CLoS tool across the study area. Baseline results of existing provision indicate that 18 out of the 21 link sections reviewed were classified as black / 'critical fail' due to not satisfying key safety requirements. In comparison, all proposed YSI+ scheme corridors 'passed' with CLoS scores >70% indicating a high level of provision for cyclists, satisfying the principles set out in LTN 1/20.

Junction Assessment Tool

A total of 20 junctions, acknowledging some junction locations are included twice in the Figure above where two corridors intersect, were assessed using the Junction Assessment Tool. Baseline results of existing provision indicated that 19 out of the 20 junctions reviewed classified as red whereby the lowest scoring movement at the junction was suitable only for confident existing cyclists.

In comparison, Error! Reference source not found. indicates that when focusing on **all** proposed movements at the junctions, 9 out of the 20 junctions reviewed classified as green, 8 amber and 3 red. Red scoring movements are associated with connections to adjacent links / termination points that do not form part of the proposed cycle network or are not desired connections due to very high traffic speeds or volumes.

Focusing purely on the YSI+ proposals that form the **Belfast Bicycle Network**, 15 junctions associated with the YSI+ proposals are classified as 'green' whereby the lowest scoring movement at the junction was suitable for all potential and existing cyclists. The remaining 5 junctions were classified as 'amber' meaning the YSI+ scheme interventions are likely to be acceptable for most cyclists but may pose problems for less confident cyclists. Amber scoring movements are associated with onward connections for those movements not included within the study area or to / from areas of shared footway / cycleway.

Key themes

- CLoS improves significantly with all proposed routes passing with a score above 70%. Linear links turn green due to the introduction of proposed kerb segregated cycle facilities and general improvements to safety, directness, attractiveness, comfort and coherence within the network as a whole.
- Signal staging has been reviewed at key junctions to efficiently run proposed cycle / pedestrian crossings with traffic in a way that maximises green time for all movements at the junction. Where these movements cannot be run within the same stage, to maintain coherence and directness, all red crossing stages are proposed.

- At side roads, where safe to do so cyclists and pedestrians are given marked priority as per LTN 1/20 guidance.
- Some overall junction scores remain red due to connections to adjacent links / termination points that do not form part of the cycle network; therefore, have to be undertaken on carriageway at present.
- The majority of movements score green, with others amber but no red. Amber results are associated with movements to / from areas of shared footway / cycleways or to / from connections to the carriageway beyond the perimeter of the study area.

15.2 Pedestrian Comfort Summary

A summary of the Pedestrian Comfort Assessment scores, based on effective footway width and the volume of pedestrians with a combination of flow categorisation, presence of street furniture, and area type are summarised in Error! Reference source not found..

Proposals aim to provide additional or enhanced pedestrians provision throughout the study area. Cycle tracks are typically proposed adjacent to the existing footways, facilitated through removal of nearside traffic lanes.

As such, the proposed Belfast Cycle Network has a limited impact on existing footway widths, with enhancements to existing widths along several corridors. Pedestrian provision is further enhanced at junctions, where segregated crossing facilities are provided in place of existing uncontrolled movements and all red crossing stages increase directness and coherence.

All but one of the locations were categorised green, having a sufficient footway width for expected pedestrian flows (based on predicted flows detailed in the 'York Street Pedestrian and Cyclist Volumes Report' produced by AECOM - October 2020).

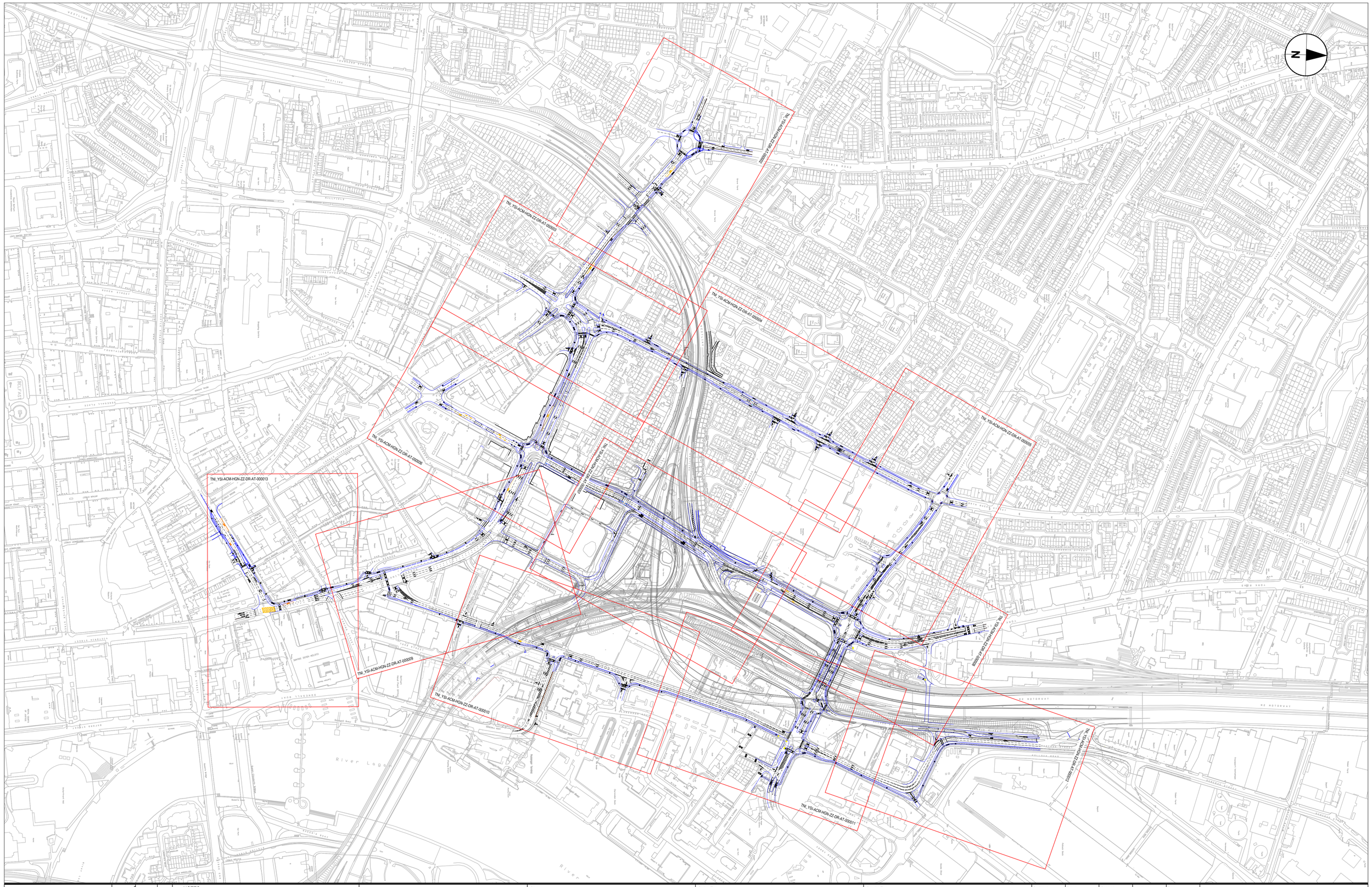
It should be noted that footway widths within Belfast City Centre typically meet width requirements. However, street furniture and other obstacles within the footway resulted in a negative pedestrian comfort score within the initial baseline assessment. As such, for the purposes of the proposed assessment, it was assumed that a full review of footway surfaces, materials used, obstructions, streetlights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.

In addition, an enhanced lighting / surveillance strategy is also proposed for underpasses and subways.

Figure 17 – YSI+ Pedestrian Comfort Assessment

APPENDICES

Appendix A – Concept Design Proposals



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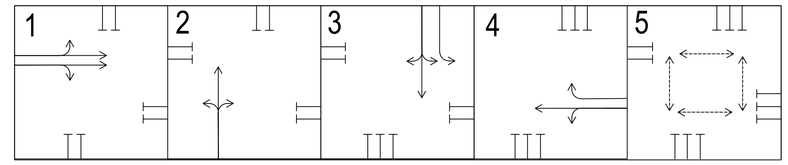
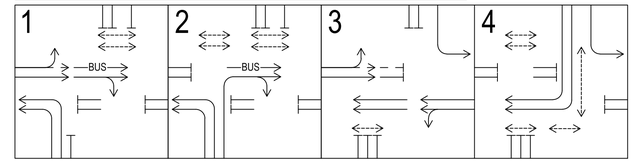
STAGING DIAGRAM - CARLISLE CIRCUS JUNCTION

OPTION TO COMBINE STAGES 2 & 3 DEPENDENT ON FLOWS



STAGING DIAGRAM - WESTLINK JUNCTION



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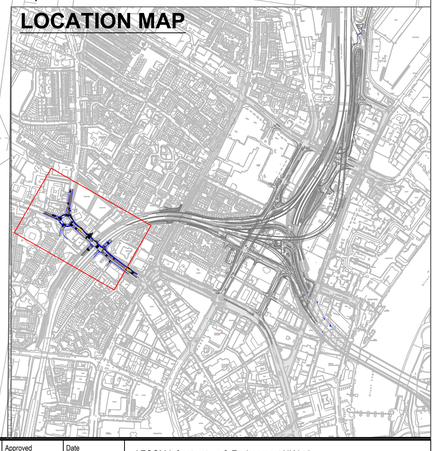

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AECOM Internal Project No. 60509045

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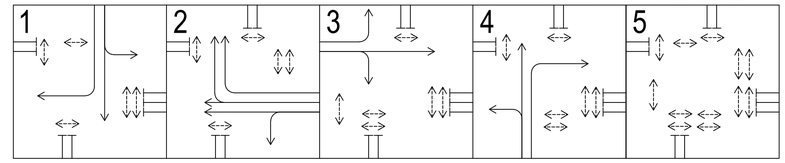
STAGING DIAGRAM - CARRICK HILL / CLIFTON STREET

OPTIONAL ALL RED STAGE



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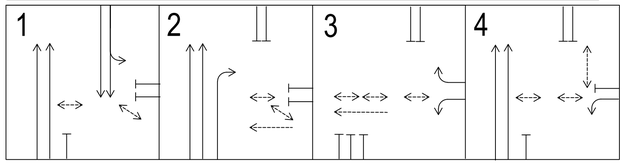

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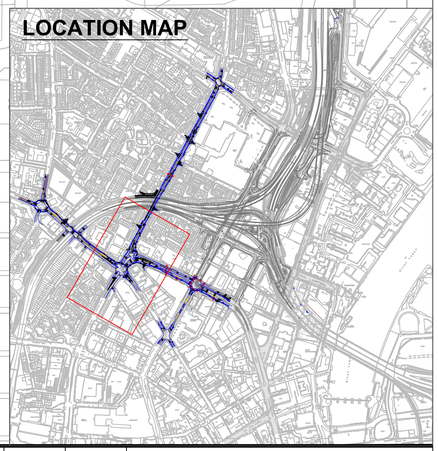

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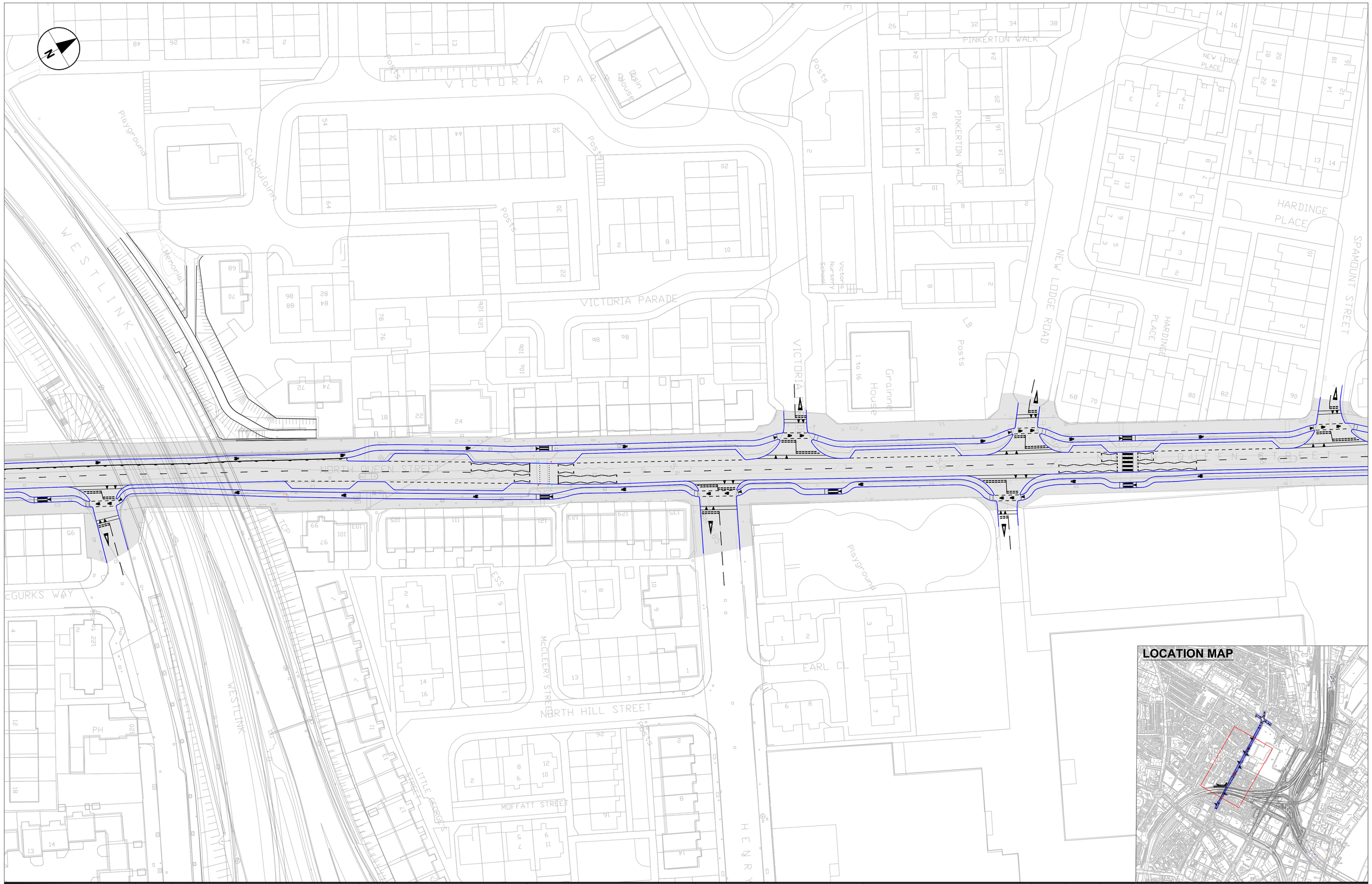

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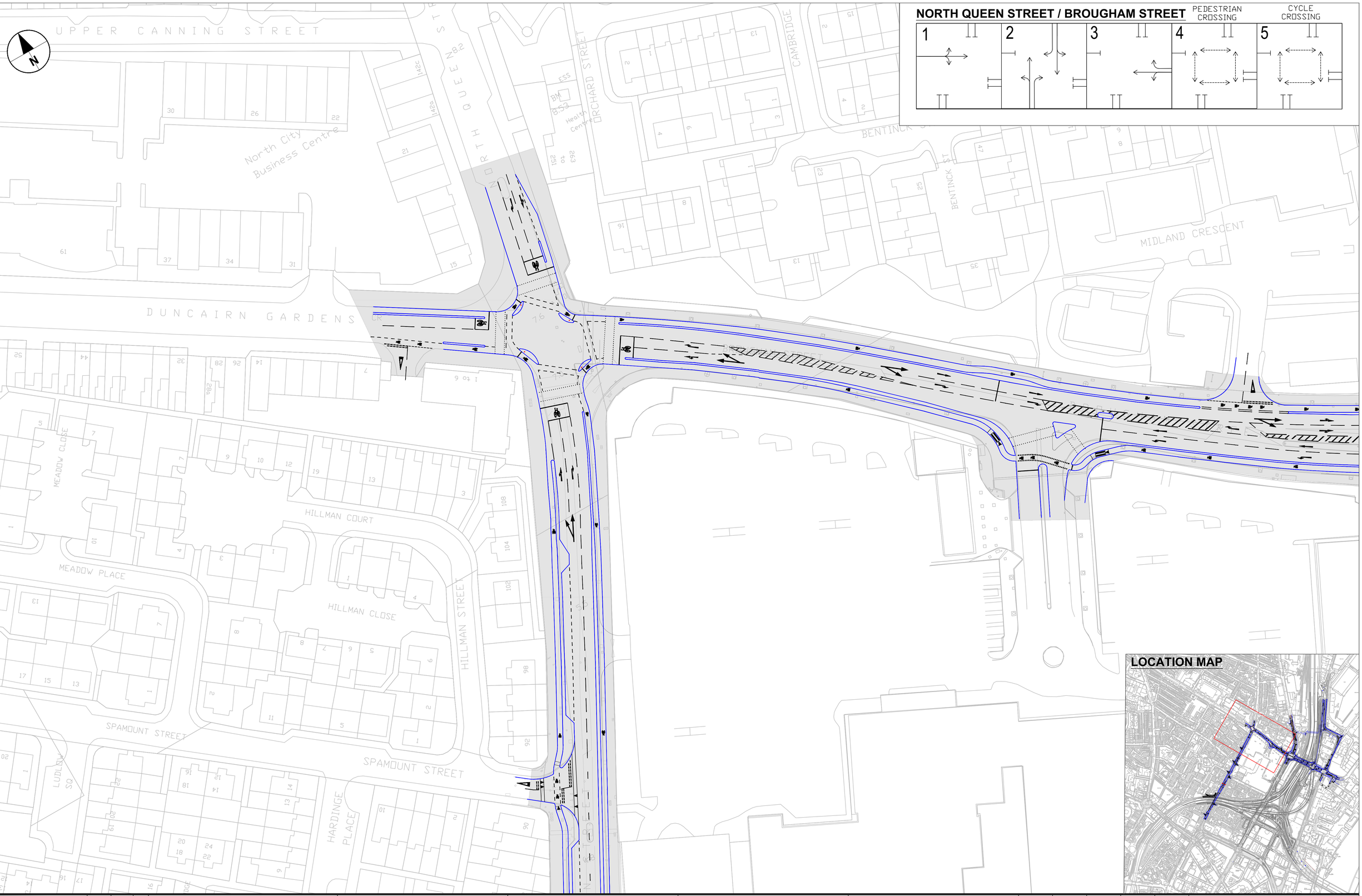
NORTH QUEEN STREET / BROUGHAM STREET



LOCATION MAP

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Purpose of issue

INFORMATION

Client

Department for Infrastructure
An Roinn Bonneagair
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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
NORTH QUEEN STREET
SHEET 5 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No. 60509045 | Suitability

Scale @ A1: 1:500 | Zone / Mileage

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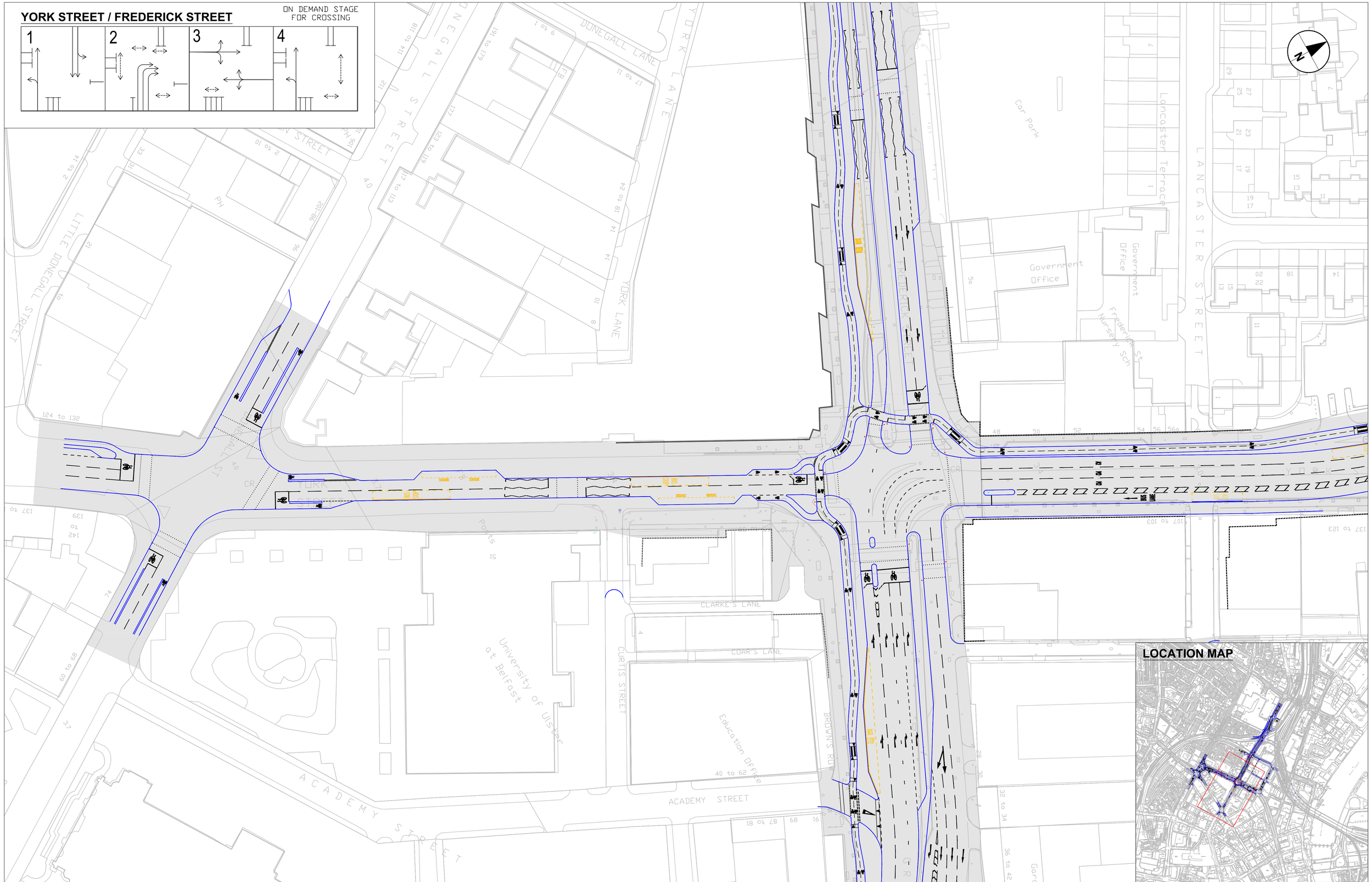
Rev: P01.2

YORK STREET / FREDERICK STREET

ON DEMAND STAGE FOR CROSSING



LOCATION MAP

NOTES

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First Issue	LO / NW	17/12/2021	P01.2

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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
YORK STREET
SHEET 6 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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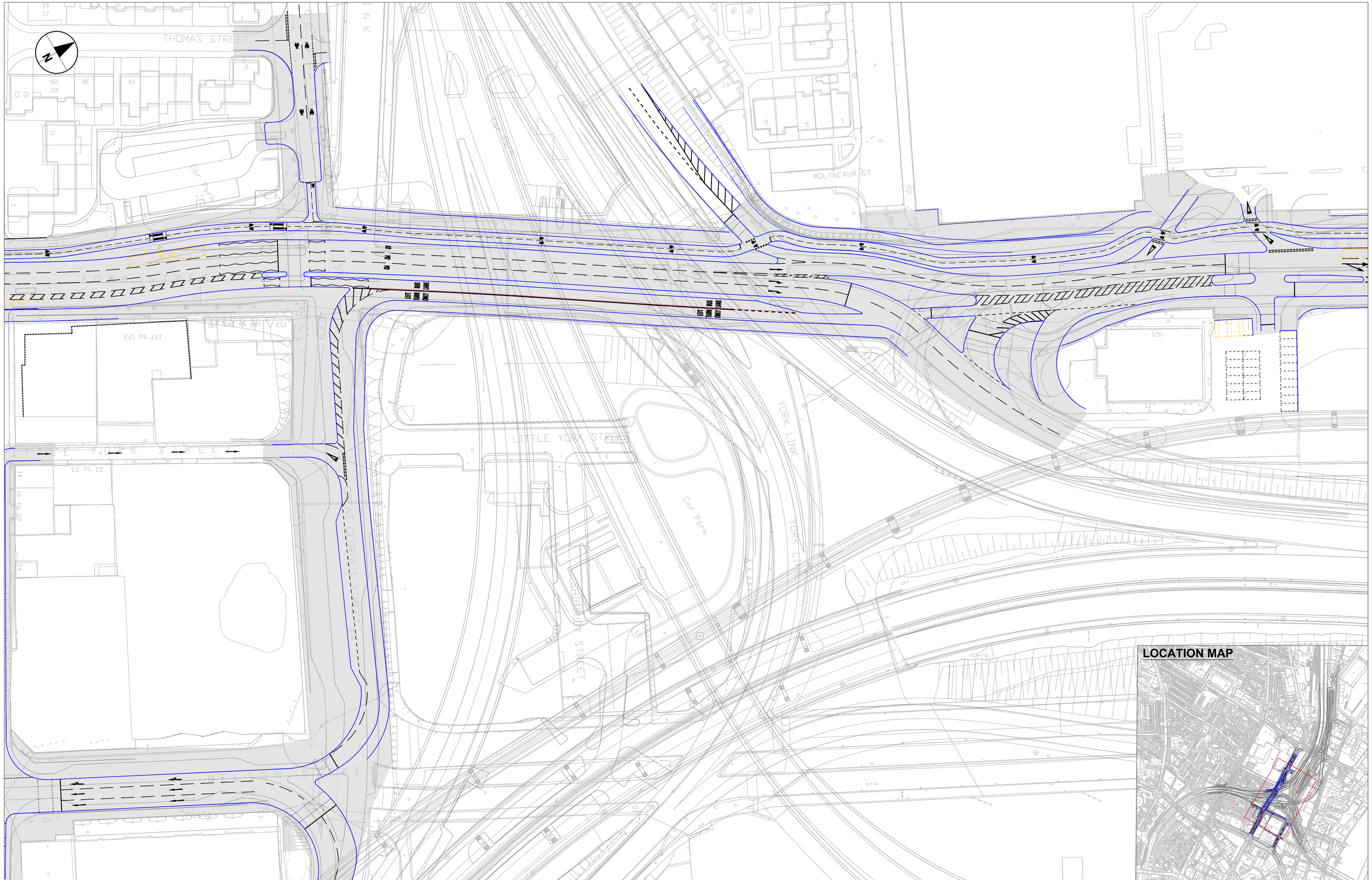
Rev: P01.2



First Issue	LO / NW	17/12/2021	P01.2
Revision Details	By / Check	Date	Suffix

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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
YORK STREET
SHEET 7 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.	Suitability
60509045	
Scale @ A1	Zone / Mileage
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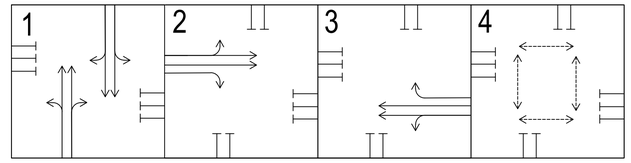
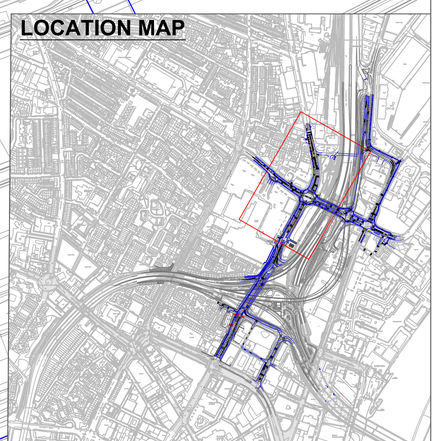
YORK STREET / DOCK STREET



LOCATION MAP



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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
YORK STREET
SHEET 8 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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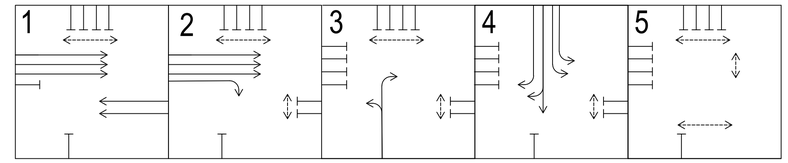
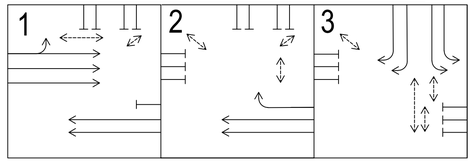
Rev: P01.2

GREAT PATRICK STREET / NELSON STREET

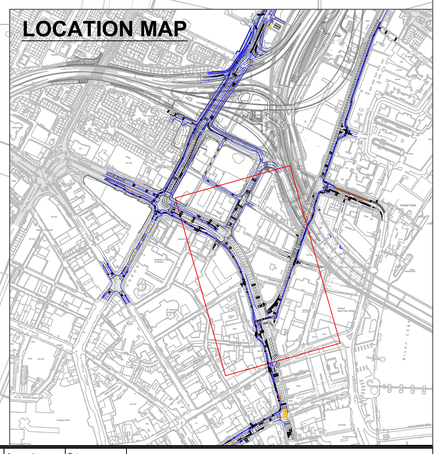
ON DEMAND STAGE FOR CROSSING



CORPORATION STREET / DUNBAR LINK



LOCATION MAP



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INFORMATION

Client

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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
COCNEPT LAYOUT
DUNBAR LINK
SHEET 9 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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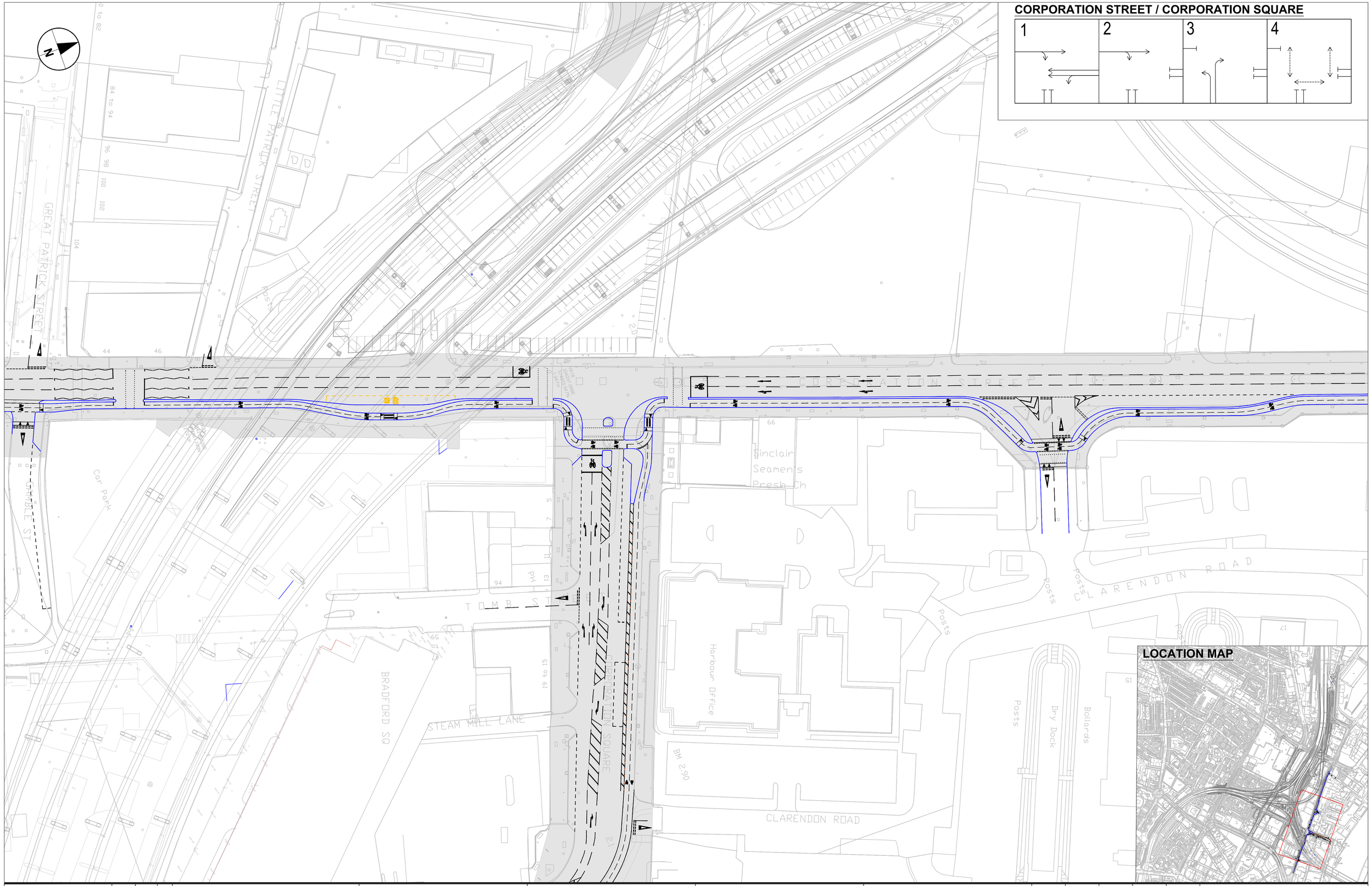
Rev: P01.2

CORPORATION STREET / CORPORATION SQUARE



LOCATION MAP

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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
CORPORATION STREET
SHEET 10 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No. 60509045 — Suitability

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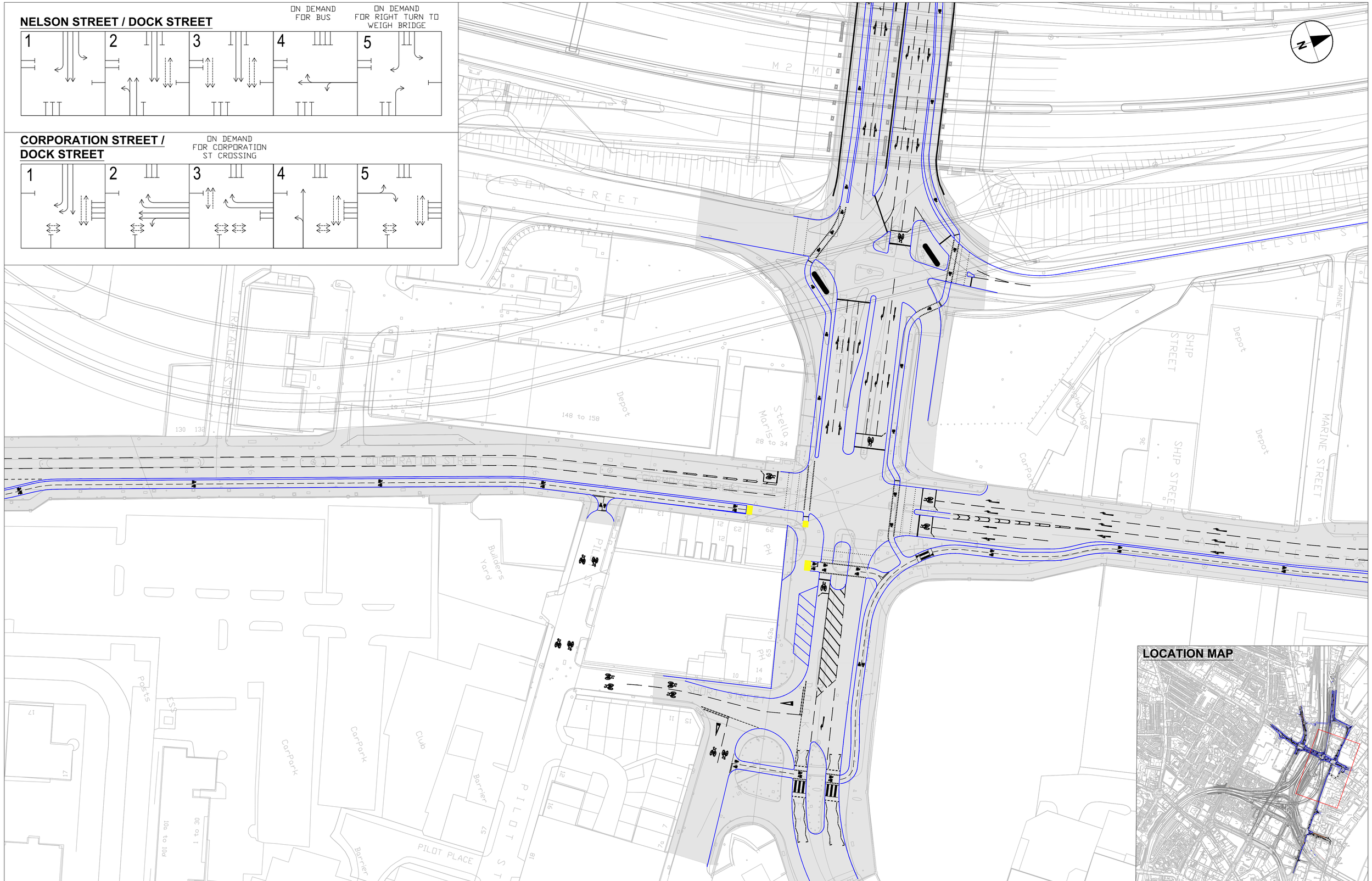
NELSON STREET / DOCK STREET

CORPORATION STREET / DOCK STREET



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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
CORPORATION STREET
SHEET 11 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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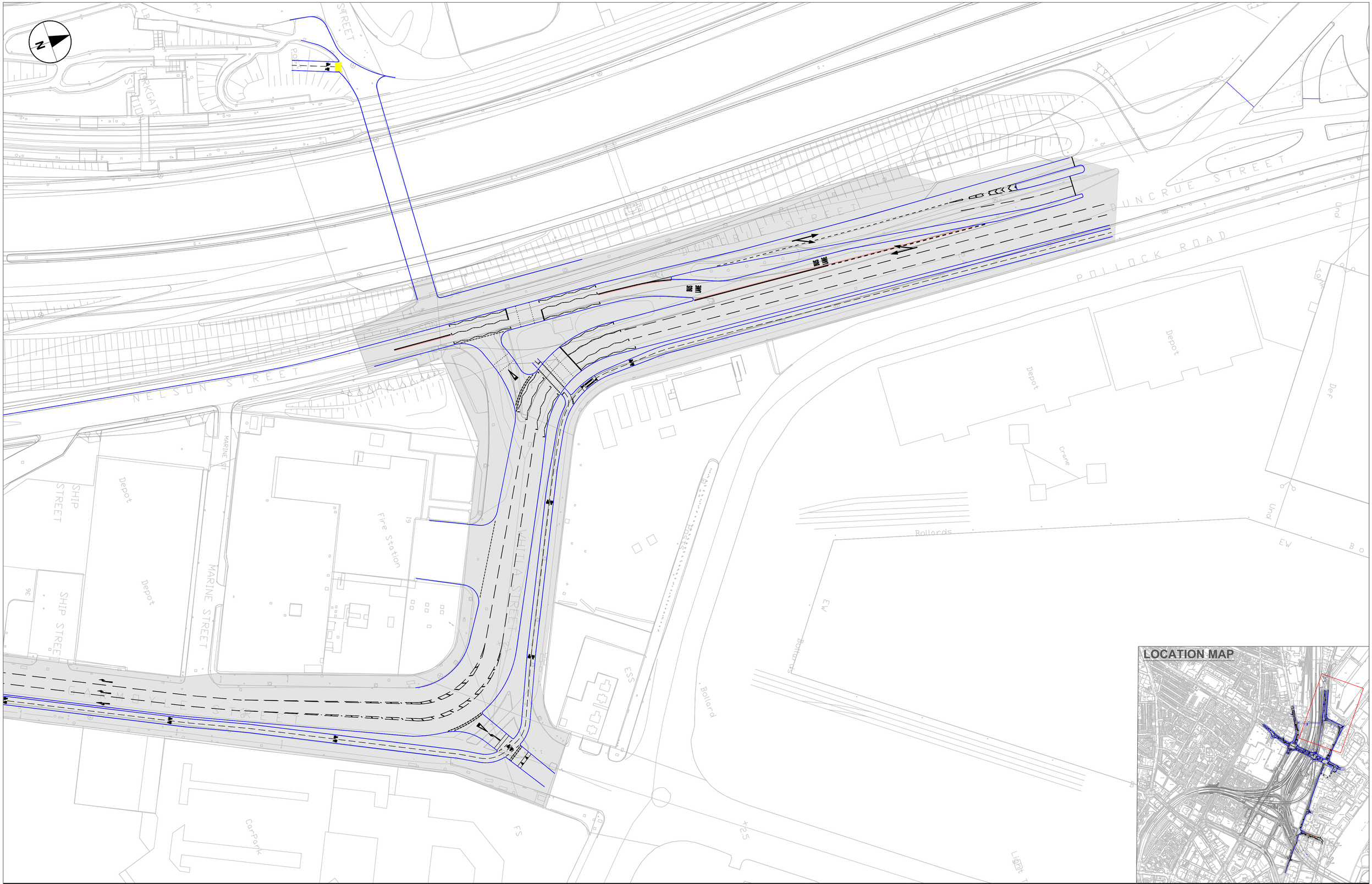

LOCATION MAP

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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
DUNCRUE STREET
SHEET 12 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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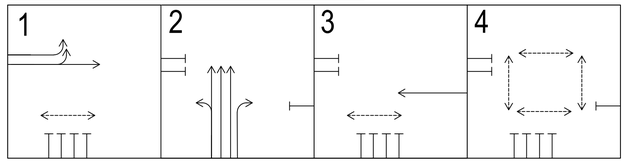
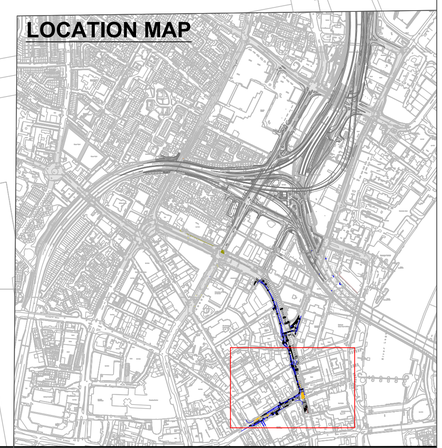
VICTORIA STREET / HIGH STREET



LOCATION MAP



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Project Title

YORK STREET INTERCHANGE

Drawing Title

ACTIVE TRAVEL REVIEW
CONCEPT LAYOUT
HIGH STREET
SHEET 13 OF 13

Designed	Drawn	Checked	Approved	Date
LO	LO	NW	NB	17/12/2021

AECOM Internal Project No.: 60509045
Suitability:
Scale @ A1: 1:500
Zone / Mileage:

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Rev: P01.2

Appendix B – Corridor 1 | North Queen Street

B.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 1 - North Queen Street	Corridor 1 - North Queen Street
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

Section	Proposed 1A	Proposed 1B

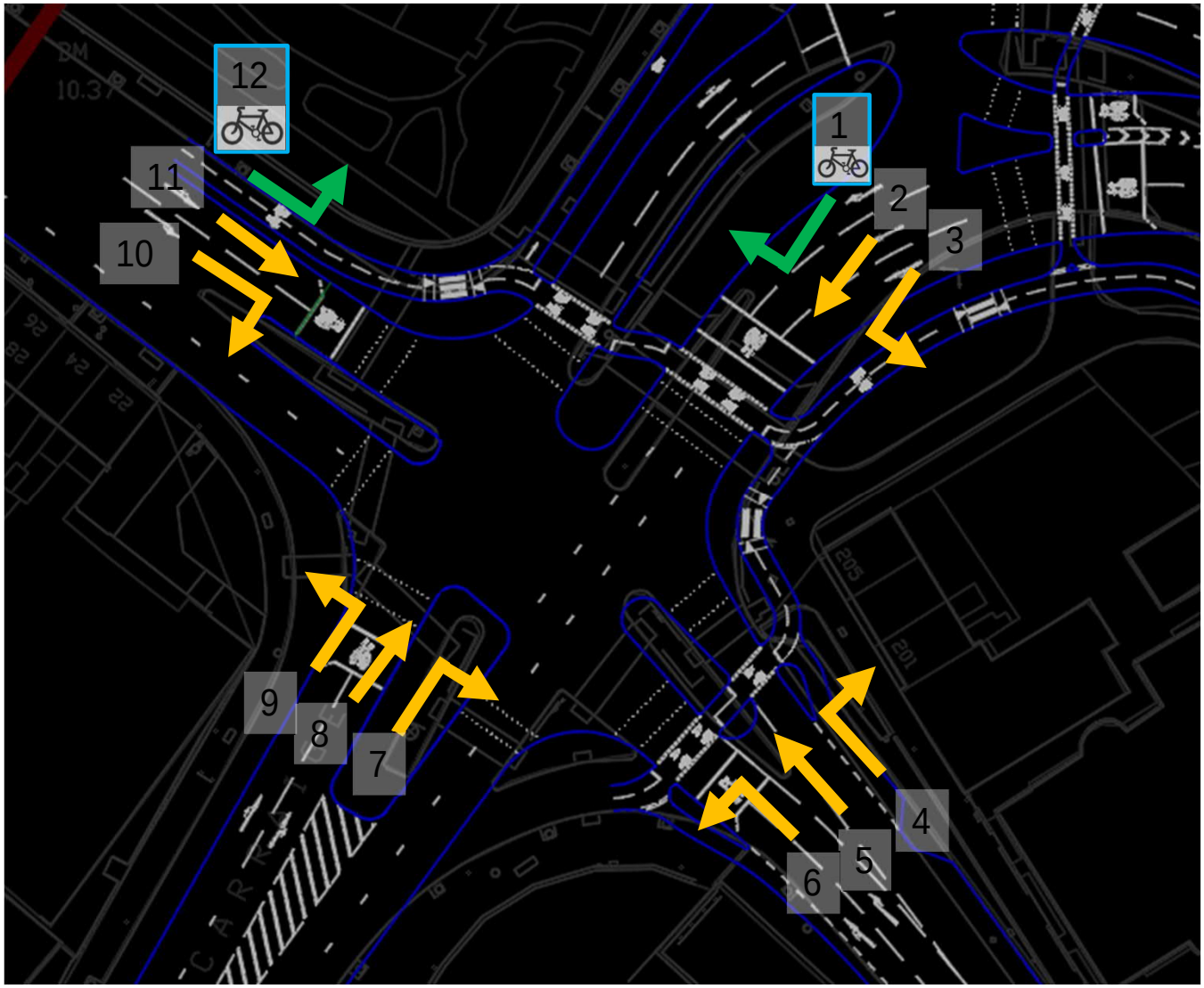
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comments	Score	Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Cyclist can use proposed dedicated cycle crossings or toucan crossings.	2	Cyclists have dedicated connections to other routes provided, with no interruption to their journey.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	1	Facilities along North Queen Street are terminated to the south on to areas of shared space. Future extensions of the route are proposed but not included within this study.	2	Cyclists are provided with a continuous route, including through the junction.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	Route contributes to a network density mesh width 250 - 1000m	1	Route contributes to a network density mesh width 250 - 1000m
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	The Carrick Hill & North Queen Street sections are both straight and direct.	2	North Queen Street is both straight and direct
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	1	Three major junctions over 893m route.	1	Three major junctions over 893m route.
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	Cyclists stop at signals and so have a similar delay to vehicles.	2	Although delay is similar at major junctions. Cyclists are able to bypass pedestrian crossing locations.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	1	Cyclists are off street and therefore are able to select appropriate speed.	2	Cyclists are off street and therefore are able to select appropriate speed.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	No change.	2	No change.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are separated from cars at junction.	2	Cyclists are separated from cars at junction.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are off street (Does not include termination points back on to carriageway at Donegall St)	2	Cyclists are off street.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Cyclists are off street.	2	Cyclists are off street.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Cyclists are off street.	2	Cyclists are off street.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	0	No change.	1	Frequents side roads treated with set backs and cyclist priority.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	Proposed new road marking strategy to be included within the design.	2	New road markings to meeting TSRGD / LTN 1/20 requirements. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	Shared use facility meeting LTN1/20 width requirements with TRO preventing vehicle parking.	1	Parking on offside of cycle lanes conflicts with cycle tracks. 1m buffer provided next to 1.65m cycle lane in these areas.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	Assumed strategy to prevent vehicle parking and avoid physical hazards - To be reviewed at the following design stage.	1	Evasion room could be enhanced further through removal of parking. However, provision designed to constraints and local requirements.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed resurfacing undertaken of the footway where required.	2	Proposed cycle tracks will be new surfacing.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Cycle track and shared use surface machine laid and in typically good condition.	2	Cycle track surface machine laid and in good condition.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended widths are maintained throughout whole route.	2	Recommended widths are maintained throughout whole route.
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	2	The route is adjacent to a busy carriageway within a city centre environment, which is not isolated.	2	The route is adjacent to a busy carriageway within a city centre environment, which is not isolated.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1		1	Reduction in pedestrian footway width. However, still remaing
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate cycle signage strategy to be undertaken at DD stage,	2	Appropriate cycle signage strategy to be undertaken at DD stage,
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Assumed cycle parking strategy to be review at the next stage of design.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	41		44	

Max possible score	50	50
Audit % score	82%	88%
Pass/Fail (70% threshold)	**Pass**	**Pass**
Any Critical Fails? (Y/N)	No	No
Number of Critical Fails	0	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed
Coherence	6	3	50%	5	83%
Directness	10	7	70%	9	90%
Safety	16	**14**	88%	**13**	81%
Comfort	8	8	100%	8	100%
Attractiveness	10	9	90%	9	90%
	50				

B.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 1 – North Queen Street

Junction 1.1: B126 Carrick Hill / Clifton St

Overall Junction Score:

Cycle Network Score:

Note – Proposed unprotected on-street connection to / from Donegal Street (South-Eastern arm), with moderate traffic flows; therefore all movements to / from scored amber. Cyclists on Carrick Hill (South-Western arm) assumed to be use shared-use footway and cross at toucan facilities therefore scored amber.

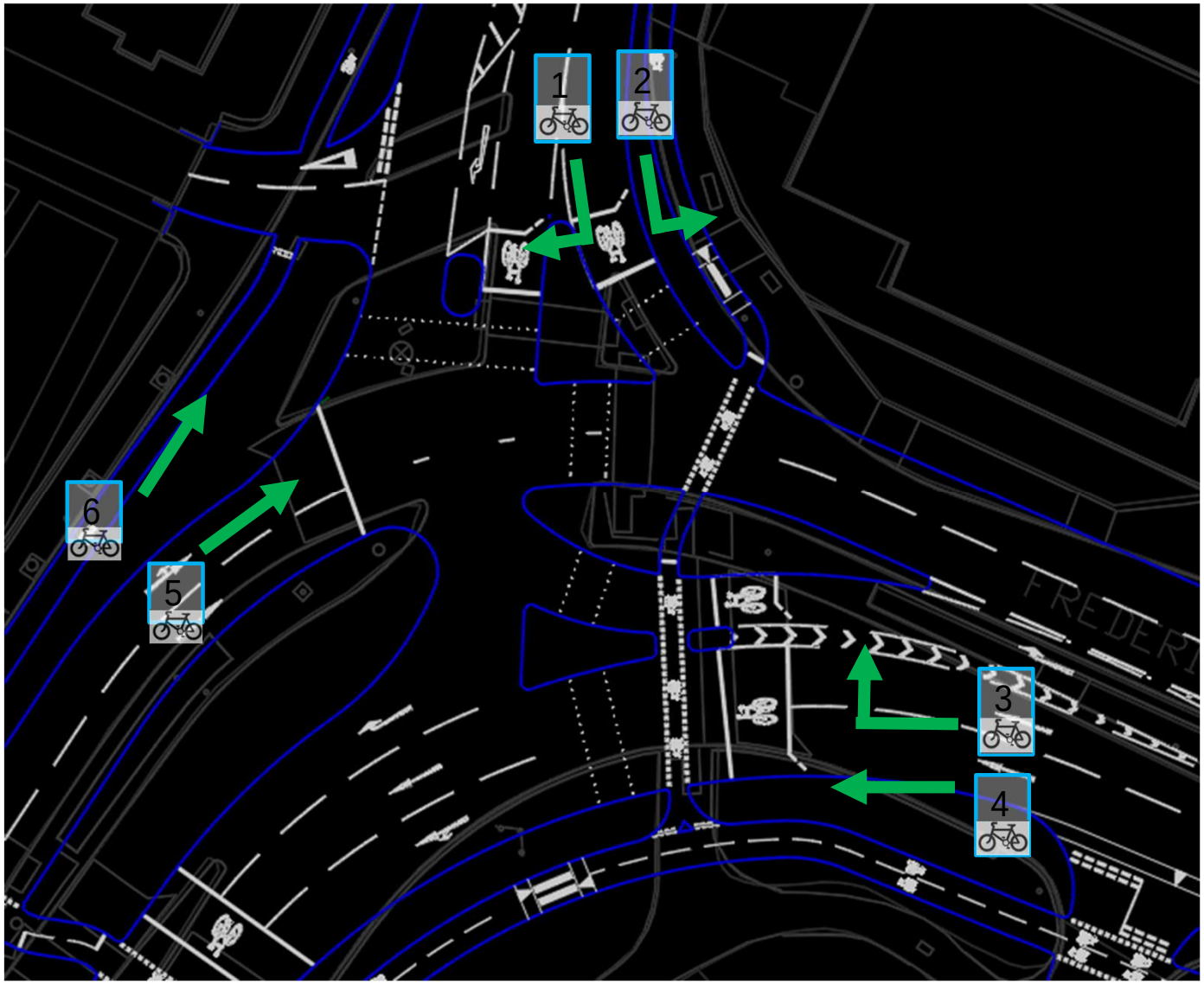
Future Belfast City Cycle Network proposals to enhance current proposals.

Cycle Strategy Route Review Junction 1.1

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	1		1	3	Cycle movement made by transiting onto section of shared use footway
3	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
4	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
5	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
6	1		1	1	Cycle movement made by transiting onto section of shared use footway
7	1		3	1	Cycle movement in potential conflict with moderate traffic flow.
8	1		2	2	Cycle movement made by transiting onto section of shared use footway
9	1		2	2	Cycle movement made by transiting onto section of shared use footway
10	1		1	4	Cycle movement made by transiting onto section of shared use footway
11	1		1	1	Cycle movement in potential conflict with moderate traffic flow.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



Department for Infrastructure
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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 1 – North Queen Street

Junction 1.2 - B88 Carrick Hill / B126 N Queen S

Overall Junction Score:

Cycle Network Score:

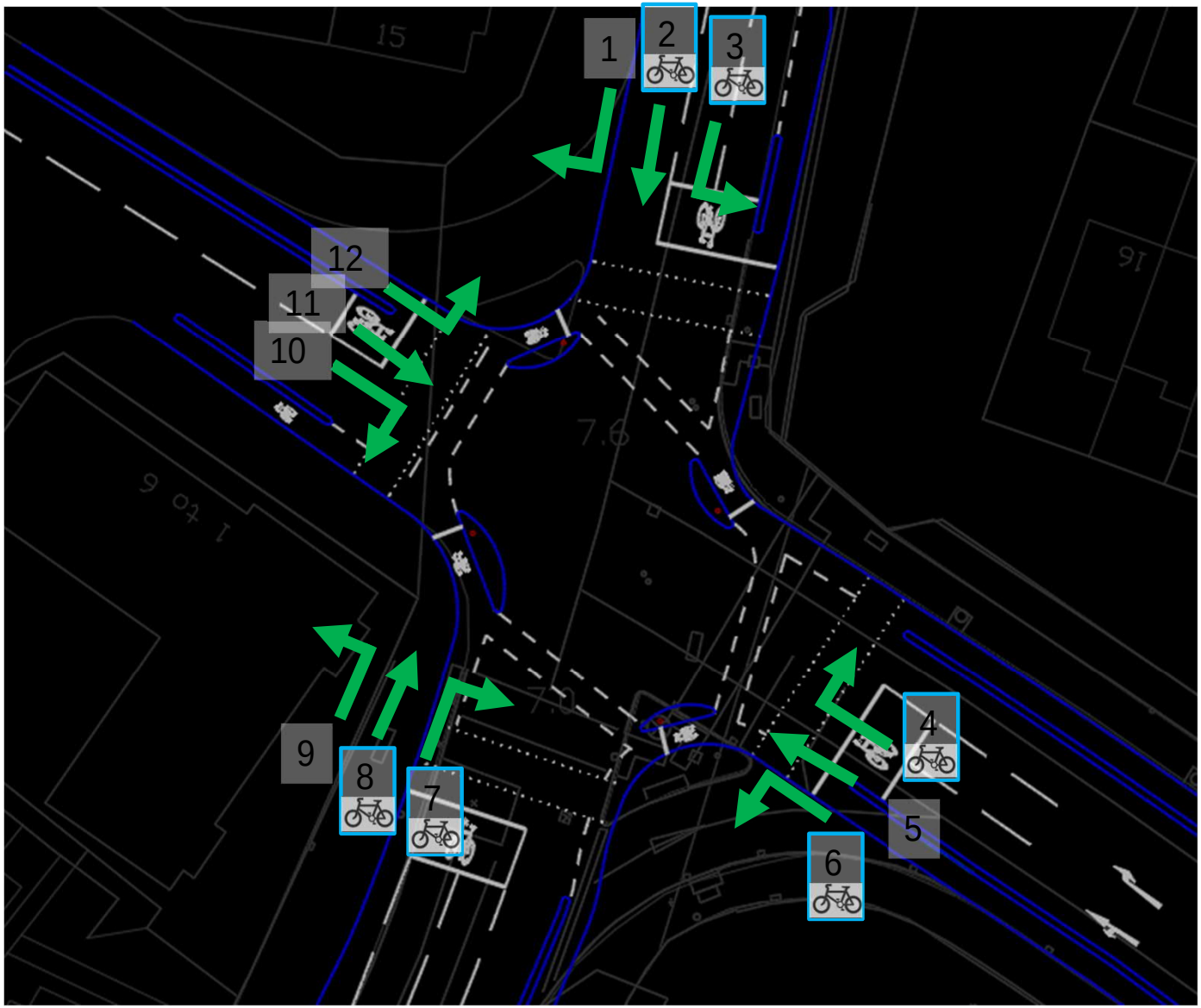
Note – Movements 3 and 5 will use the proposed two-way cycle crossing at the Carrick Hill/Clifton St Junction.

Cycle Strategy Route Review Junction 1.2

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 1 – North Queen Street

Junction 1.3 - B126 N Queen St / Brougham St

Overall Junction Score:

Cycle Network Score:

Note – Proposed right turn movements are undertaken via physically protected two-stage manoeuvre. Junction operates using all red pedestrian and cycle stages.

Cycle Strategy Route Review Junction 1.3

Movement	Score	0	1	2	Comment
1	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
8	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

B.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

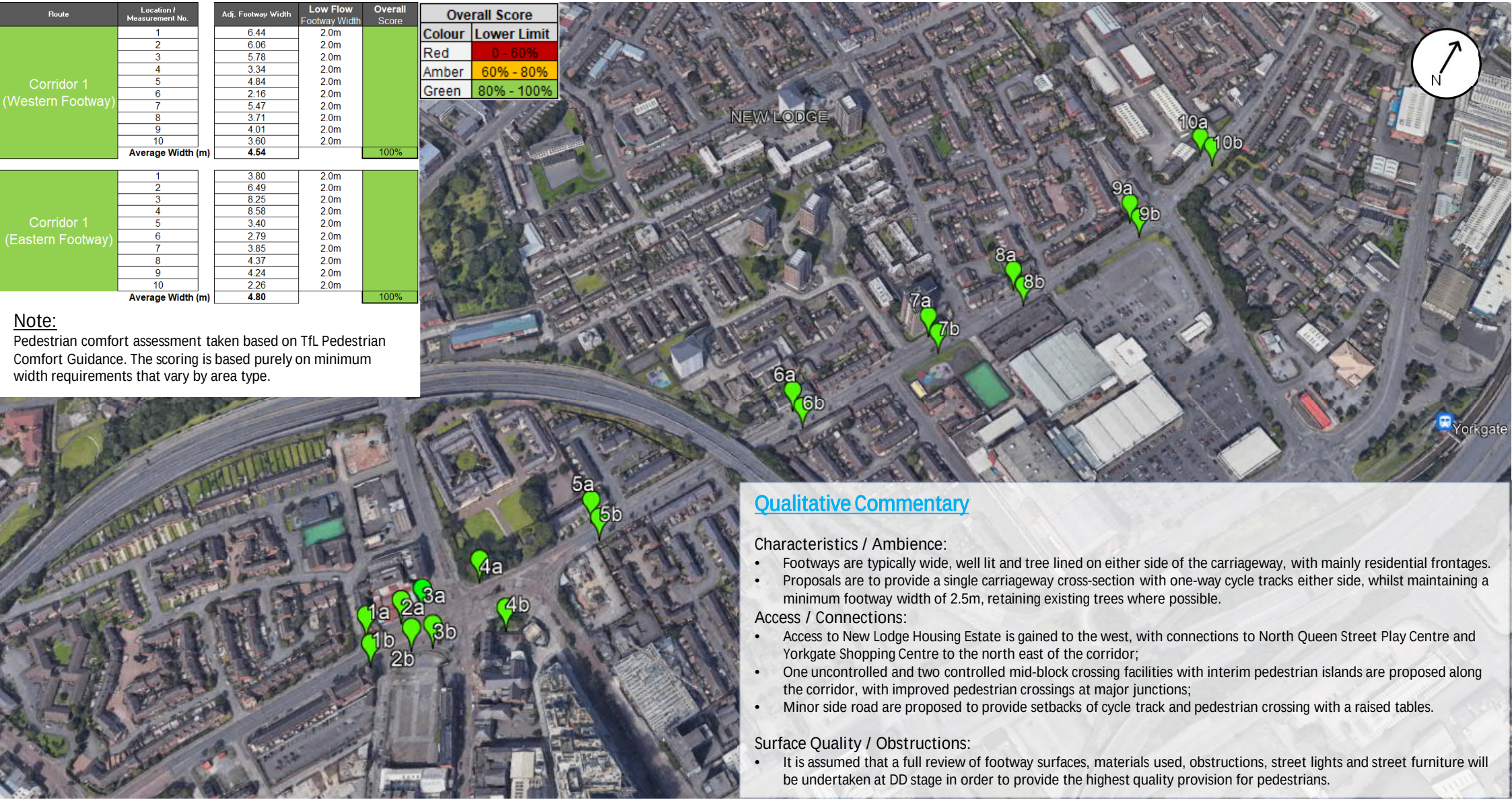
Corridor 1 - North Queen Street

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Footway Width	Overall Score
Corridor 1 (Western Footway)	1	6.44	2.0m	
	2	6.06	2.0m	
	3	5.78	2.0m	
	4	3.34	2.0m	
	5	4.84	2.0m	
	6	2.16	2.0m	
	7	5.47	2.0m	
	8	3.71	2.0m	
	9	4.01	2.0m	
	10	3.60	2.0m	
	Average Width (m)	**4.54**		100%
Corridor 1 (Eastern Footway)	1	3.80	2.0m	
	2	6.49	2.0m	
	3	8.25	2.0m	
	4	8.58	2.0m	
	5	3.40	2.0m	
	6	2.79	2.0m	
	7	3.85	2.0m	
	8	4.37	2.0m	
	9	4.24	2.0m	
	10	2.26	2.0m	
	Average Width (m)	**4.80**		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.



Qualitative Commentary

Characteristics / Ambience:

- Footways are typically wide, well lit and tree lined on either side of the carriageway, with mainly residential frontages.
- Proposals are to provide a single carriageway cross-section with one-way cycle tracks either side, whilst maintaining a minimum footway width of 2.5m, retaining existing trees where possible.

Access / Connections:

- Access to New Lodge Housing Estate is gained to the west, with connections to North Queen Street Play Centre and Yorkgate Shopping Centre to the north east of the corridor;
- One uncontrolled and two controlled mid-block crossing facilities with interim pedestrian islands are proposed along the corridor, with improved pedestrian crossings at major junctions;
- Minor side road are proposed to provide setbacks of cycle track and pedestrian crossing with a raised tables.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.

Appendix C – Corridor 2 | York Street

C.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 2 - York Street	Corridor 2 - York Street
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

AECOM

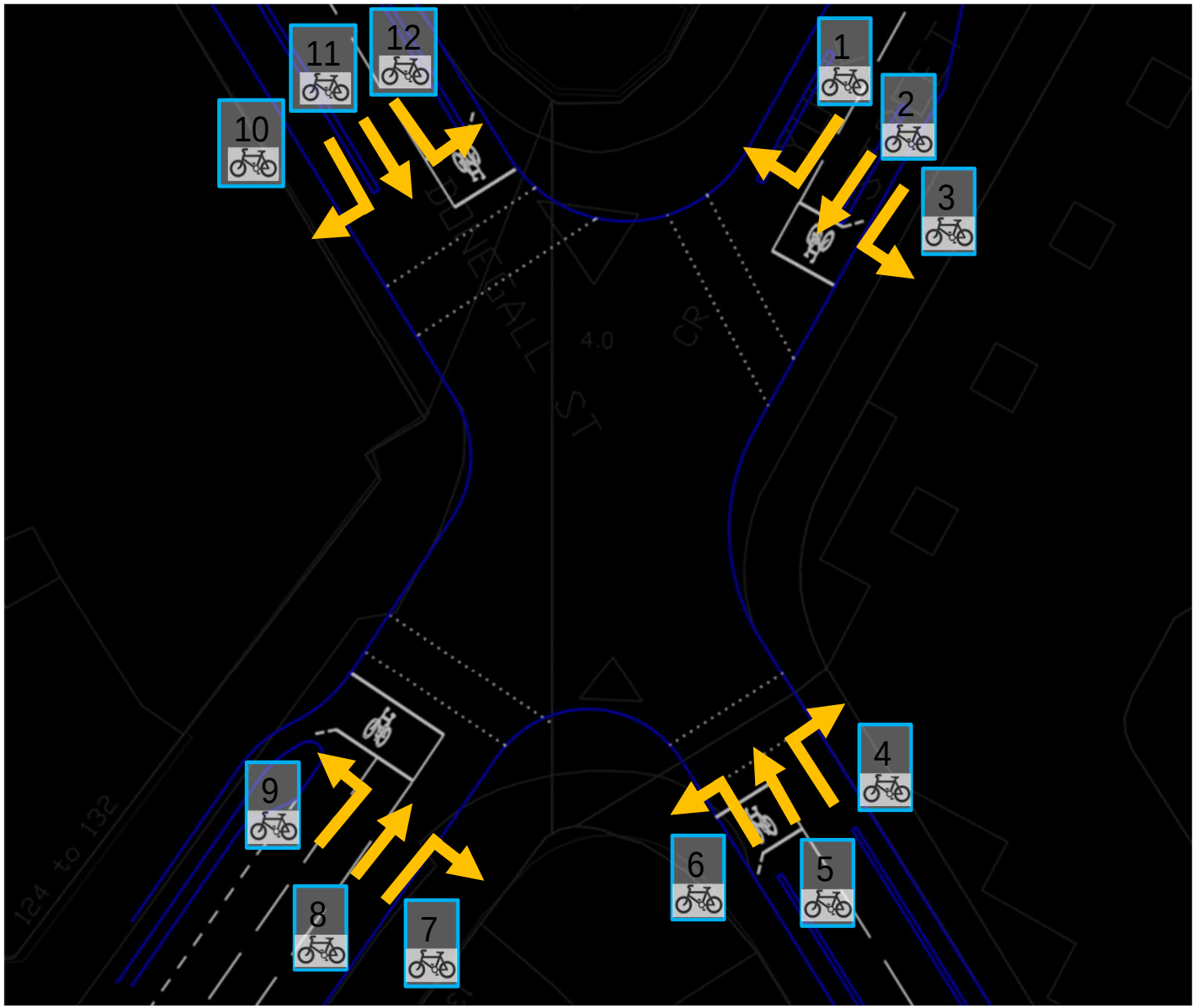
Assessed as section of shared use footway withing Yorkgate Station. Proposals assumed to be confirmed / included within Yorkgate Station proposals.

Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Proposed 2A Score	Proposed 2A Comments	Proposed 2B Score	Proposed 2B Comments	Proposed 2C Score	Proposed 2C Comments	Proposed 2D Score	Proposed 2D Comments	Proposed 2E Score	Proposed 2E Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Frederick Street.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Frederick Street.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Dock Street / Brougham Street	2	Cyclists are provided with a shared use footway and connections to / from areas of segregation allowing users to easily join/leave the route - Yorkgate Train Station.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Frederick Street.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Frederick Street.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network.	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - Dock Street / Brougham Street	2	Cyclists are provided with a continuous route in the form of a two-way cycle track and a shared use section with connections at junctions to transition to other routes within the propose network.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	York Street is both straight and direct along this section <1.2	2	York Street is both straight and direct along this section <1.2	2	York Street is both straight and direct along this section <1.2	2	York Street is both straight and direct along this section <1.2	2	A more direct route has been established for this section of the route through the provision of a shared use area which is more direct when compared to the existing cycle route.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	1	Four junctions over 987m route.	1	Four junctions over 987m route.	1	Four junctions over 987m route.	1	Four junctions over 987m route.	1	Four junctions over 987m route.
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	The majority of this section cyclists are provided with segregated two-way cycle facilities but are still required to stop at signalised junctions.	1	The majority of this section cyclists are provided with segregated two-way cycle facilities but are still required to stop at signalised junctions.	1	The majority of this section cyclists are provided with segregated two-way cycle facilities but are still required to stop at signalised junctions.	1	The majority of this section cyclists are provided with segregated two-way cycle facilities but are still required to stop at signalised junctions.	1	The majority of this section cyclists are provided with segregated two-way cycle facilities or shared use footway; however, are still required to stop at signalised junctions.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	1	Cyclists on street; therefore, are able to overtake within the adjacent running lane.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists	1	Cyclists are located on shared space; therefore, are likely to only be able to travel as fast as pedestrians and other cyclists.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	85th percentile speed = 11 mph	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists located off carriageway on an area of shared use footway.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	85th percentile speed = 11 mph	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists located off carriageway on an area of shared use footway.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Busses / taxi and cycles only route proposed. Therefore traffic assumed low <2500 AADT	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists located off carriageway on an area of shared use footway.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Measured based on Figure 4.1 in LTN 1/20 with a speed limit of 20mph and proposed motor traffic flow of approximately 2000 pcu/24 hour.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists located off carriageway on an area of shared use footway.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions , all conflicting cycle/motor traffic streams separated.	1	One side road, untreated.	2	No side roads along this section. Proposed stopping up of Great George Street provides a continuous route.	1	Westlink off-slip forming side road with principal conflicting cycle/motor traffic movements separated.	1	Side roads into Cityside Retail Park providing effective entry treatments and setback; however no continuous footway / stopping up.	2	No side roads on proposed route.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	0	No cycle lane provision; therefore, zero score.	2	Two way cycle track + buffer provides 3.0m width in this location.	2	Two way cycle track + buffer is 4.5m in this location.	2	Two way cycle track + buffer is 4.5m in this location.	2	Cyclists are away from the carriageway reducing conflict with kerb side activity.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	1	Parking alongside carriageway, which could entrap a cyclists.	2	Parking along this section proposed to be removed. Other physical hazards will be removed or reduce where possible to reduce the severity of potential collisions.	2	The proposed route is to be designed to ensure that there's no physical hazards within close proximity of the cycle track.	2	The proposed route is to be designed to ensure that there's no physical hazards within close proximity of the cycle track.	2	The proposed shared cycle route is to be designed in accordance with LTN 1/20 to ensure the route includes evasion room.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	0	Cyclists are with traffic, no segregation provided.	2	Recommended width maintained.	2	Recommended width maintained.	2	Recommended width maintained.	2	The proposed route is to be designed to meet the standards set out in LTN 1 / 20, meeting all geometric requirements for a shared use cycle corridor during the redevelopment of Yorkgate Train Station.
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	2	As per existing conditions	2	As per existing conditions	2	As per existing conditions	2	As per existing conditions	1	The route will pass through the Yorkgate Train Station which will generally be busy. Cyclists may experience the feeling of isolation after evening peak traffic time.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Proposals are to narrow the carriageway, which results in enhanced pedestrian width. Cyclists on street; therefore, do no impact to pedestrian comfort level negatively.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.	1	The shared cycle corridor will be designed to the requirements in LTN 1 / 20 to ensure pedestrian comfort level is considered during the redevelopment of Yorkgate Train Station.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	**40**		**46**		**45**		**45**		**44**	
							Max possible score	50		50		50		50		50	
							Audit % score	80%		92%		90%		90%		88%	
							Pass/Fail (70% threshold)	**Pass**		**Pass**		**Pass**		**Pass**		**Pass**	
							Any Critical Fails? (Y/N)	No		No		No		No		No	
							Number of Critical Fails	0		0		0		0		0	

Criteria	Max Score	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%	5	83%	5	83%	5	83%	5	83%
Directness	10	7	70%	8	80%	8	80%	8	80%	7	70%
Safety	16	**12**	75%	**16**	100%	**15**	94%	**15**	94%	**16**	100%
Comfort	8	6	75%	8	100%	8	100%	8	100%	8	100%
Attractiveness	10	10	100%	9	90%	9	90%	9	90%	8	80%
	50										

C.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.1 – York Street / Donegall Street

Overall Junction Score:

Cycle Network Score:

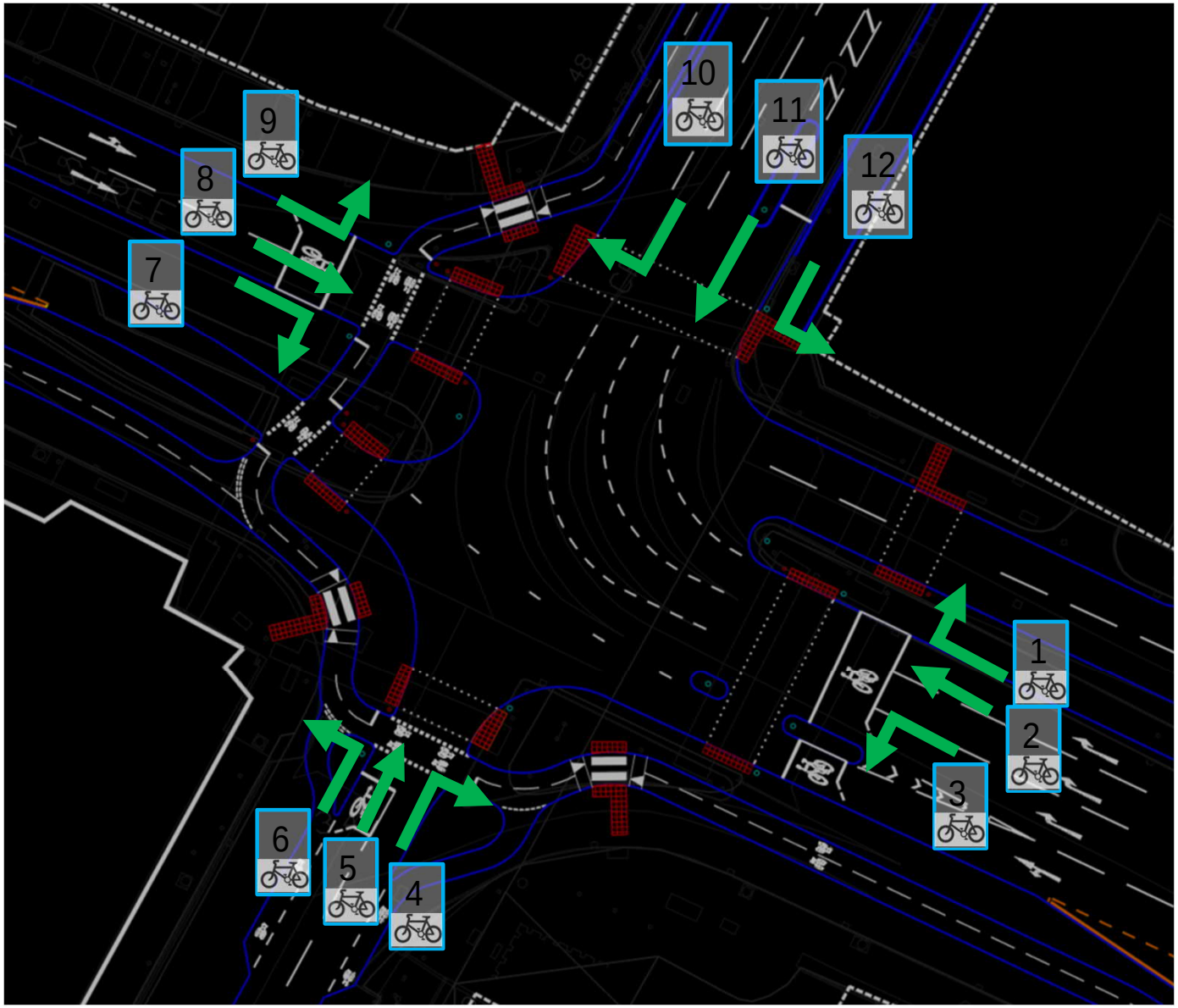
Note – Proposals are to provide cyclists are provided with an early release at junction from each approach.

Cycle Strategy Route Review Junction 2.1 - Proposed

Movement	Score	0	1	2	Comment
1	1	2	2		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
2	1	2	2		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
3	1	2	2		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
4	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
5	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
6	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
7	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
8	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
9	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
10	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
11	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.
12	1	2	1		Advance Cycle Stop lines, at least 5m deep and where the signals on the approach are on green for <30% of the cycle time.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.2 – York Street / B88 Frederick Street

Overall Junction Score:

Cycle Network Score:

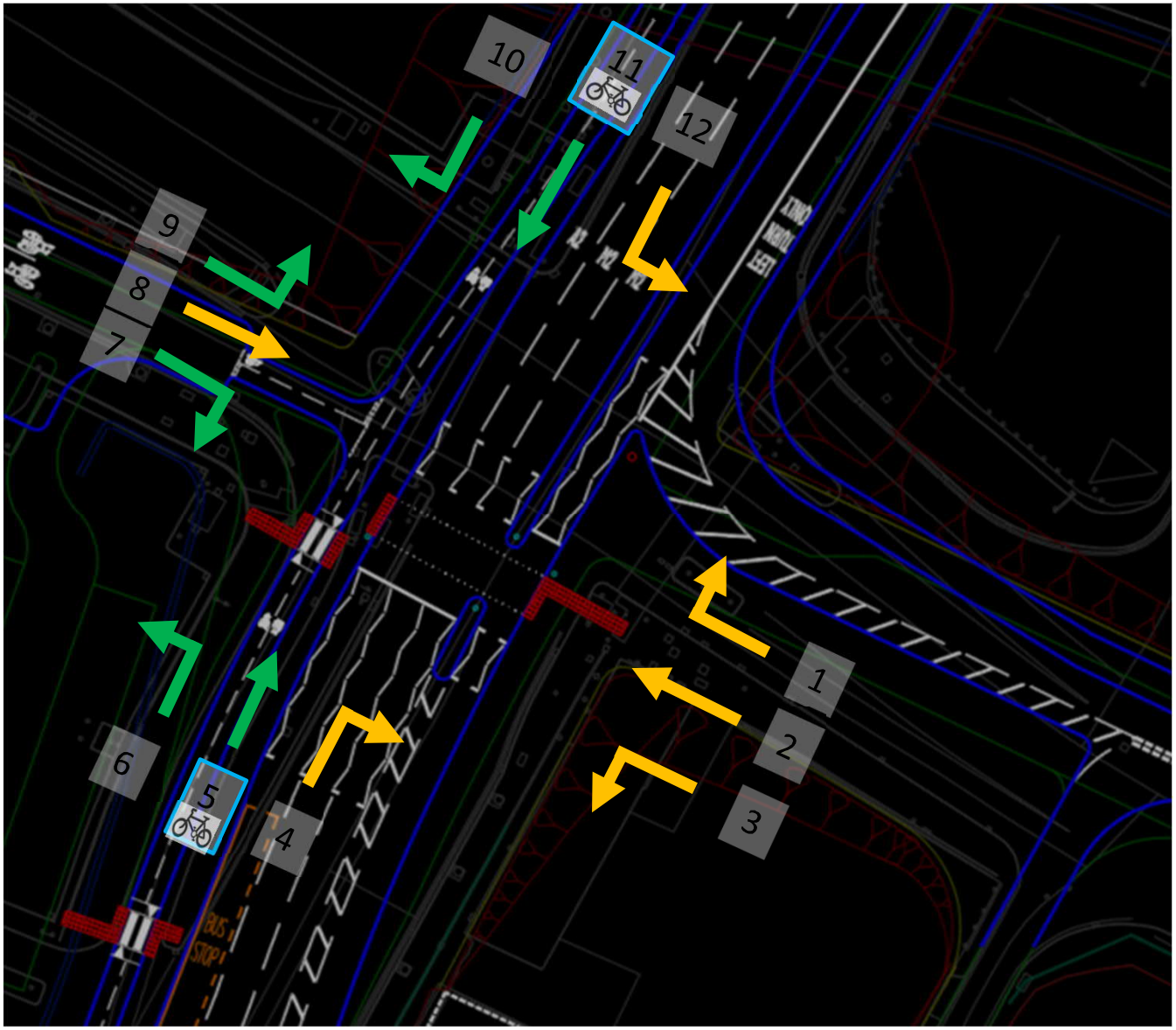
Note – Proposed on-street facility along York Street (southern arm), with traffic speeds and volume reduced through bus, taxi and access only restrictions.

Cycle Strategy Route Review Junction 2.2 - Proposed

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
4	2			5	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
5	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
6	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
7	2			5	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
8	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
12	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.3 – York St / A12 Great Georges St

Overall Junction Score:

Cycle Network Score:

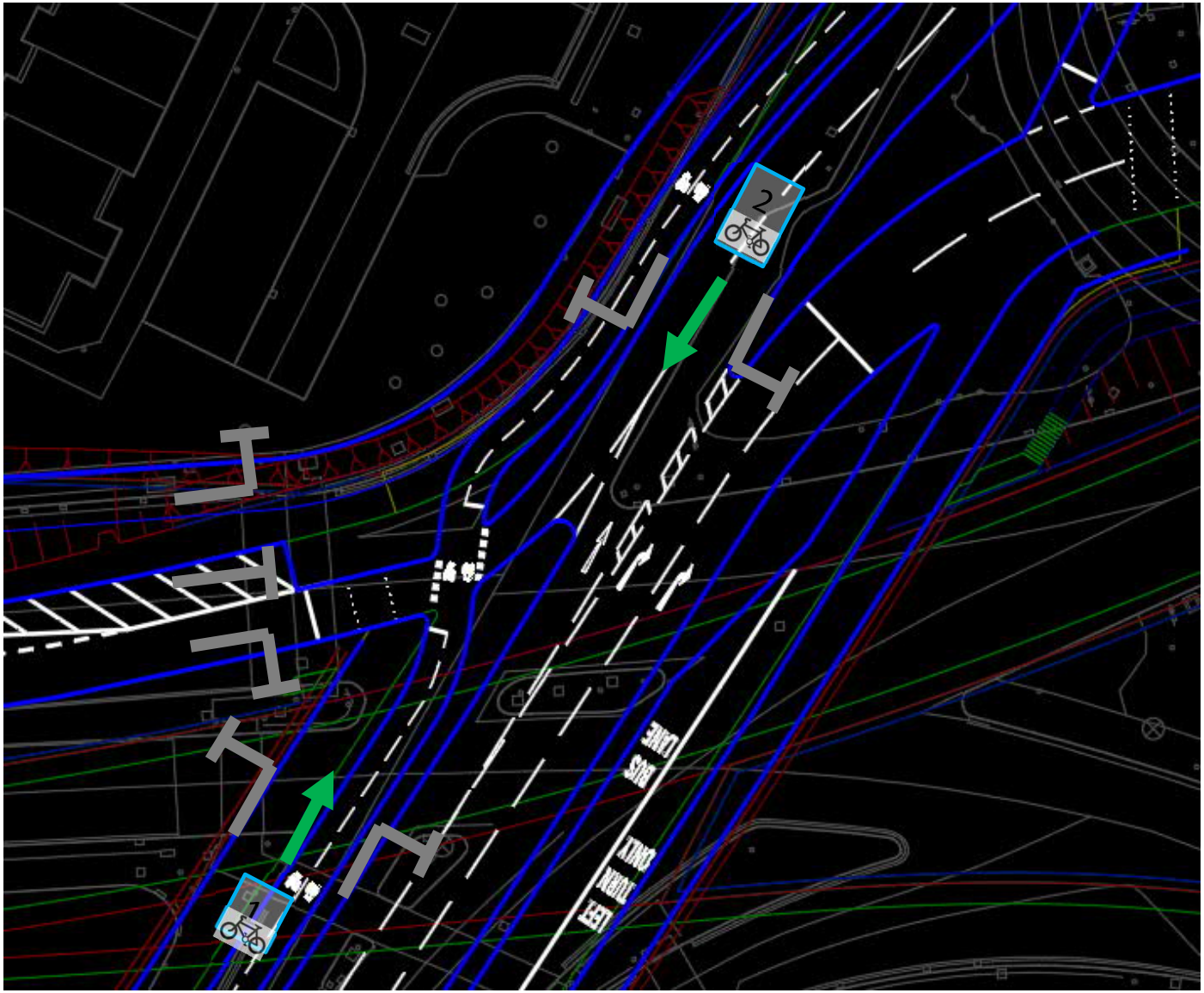
Note – Toucan crossing facility provided to accommodate E/W movements across York Street to / from shared use footway.

Cycle Strategy Route Review Junction 2.3 - Proposed

Movement	Score	0	1	2	Comment
1	1			2	Cycle movement made by transiting onto section of shared use footway
2	1			2	Cycle movement made by transiting onto section of shared use footway
3	1			2	Cycle movement made by transiting onto section of shared use footway
4	1			2	Cycle movement made by transiting onto section of shared use footway
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
7	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
8	1			2	Cycle movement made by transiting onto section of shared use footway
9	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
10	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
11	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	1			2	Cycle movement made by transiting onto section of shared use footway

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.4 –York St / A12 Westlink

Overall Junction Score:

Cycle Network Score:

Note – Movements via the A12 Westlink and do not form part of the proposed cycle network and are prohibited.

Cycle Strategy Route Review Junction 2.4 – Proposed					
Movement	Score	0	1	2	Comment
1	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.5 – A2 York St / Brougham Street

Overall Junction Score:

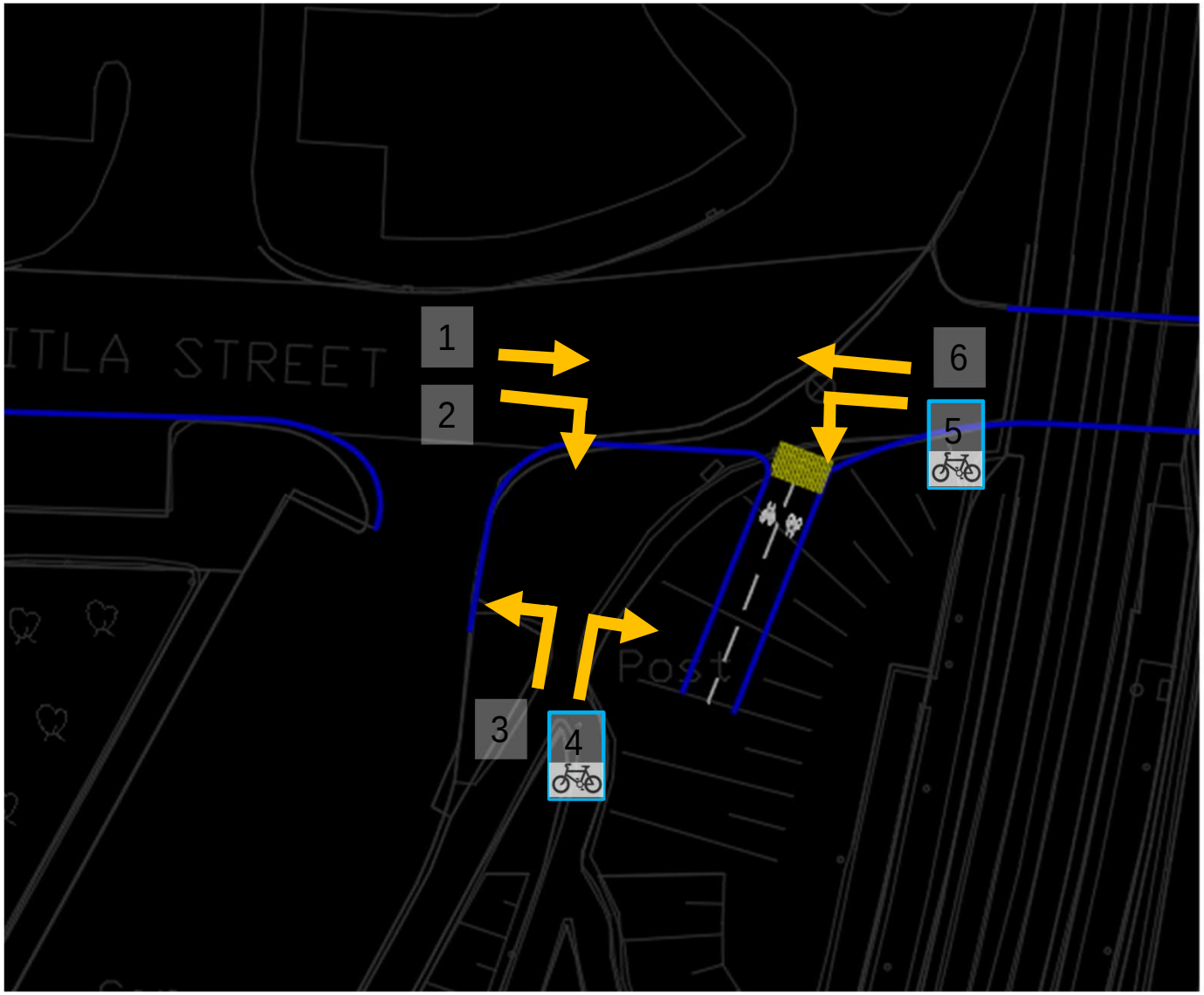
Cycle Network Score:

Cycle Strategy Route Review Junction 2.5

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
8	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



Department for Infrastructure
An Roinn Bonneagair
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AECOM

Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.6 – A2 York St / Yorkgate Station

Overall Junction Score:

Cycle Network Score:

Cycle Strategy Route Review Junction 2.6 – Proposed

Movement	Score	0	1	2	Comment
1	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
2	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
3	1		1		Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
4	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
5	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
6	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

C.3 Pedestrian Comfort Levels Proposed Results

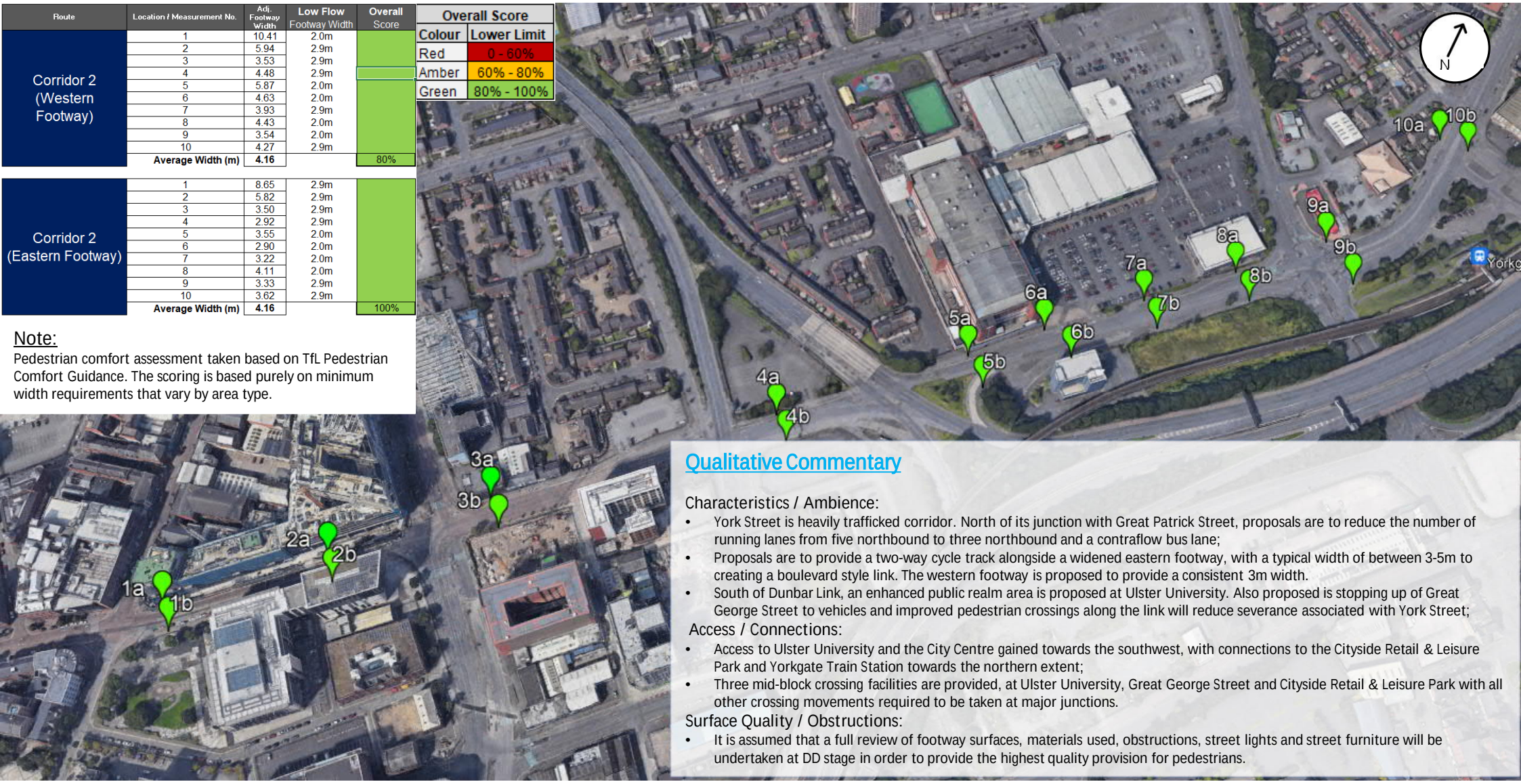
Pedestrian Comfort Assessment

Corridor 2 – York Street/ York Road

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Footway Width	Overall Score
Corridor 2 (Western Footway)	1	10.41	2.0m	
	2	5.94	2.9m	
	3	3.53	2.9m	
	4	4.48	2.9m	
	5	5.87	2.0m	
	6	4.63	2.0m	
	7	3.93	2.9m	
	8	4.43	2.0m	
	9	3.54	2.0m	
	10	4.27	2.9m	
	Average Width (m)	**4.16**		80%
Corridor 2 (Eastern Footway)	1	8.65	2.9m	
	2	5.82	2.9m	
	3	3.50	2.9m	
	4	2.92	2.9m	
	5	3.55	2.0m	
	6	2.90	2.0m	
	7	3.22	2.0m	
	8	4.11	2.0m	
	9	3.33	2.9m	
	10	3.62	2.9m	
	Average Width (m)	**4.16**		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:
Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.



Qualitative Commentary

Characteristics / Ambience:

- York Street is heavily trafficked corridor. North of its junction with Great Patrick Street, proposals are to reduce the number of running lanes from five northbound to three northbound and a contraflow bus lane;
- Proposals are to provide a two-way cycle track alongside a widened eastern footway, with a typical width of between 3-5m to creating a boulevard style link. The western footway is proposed to provide a consistent 3m width.
- South of Dunbar Link, an enhanced public realm area is proposed at Ulster University. Also proposed is stopping up of Great George Street to vehicles and improved pedestrian crossings along the link will reduce severance associated with York Street;

Access / Connections:

- Access to Ulster University and the City Centre gained towards the southwest, with connections to the Cityside Retail & Leisure Park and Yorkgate Train Station towards the northern extent;
- Three mid-block crossing facilities are provided, at Ulster University, Great George Street and Cityside Retail & Leisure Park with all other crossing movements required to be taken at major junctions.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.

Appendix D – Corridor 3 | Frederick Street / Dunbar Link / Waring Street

D.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLOS) based on DfI LfI CLOS	
Project Number	60571700
Scheme	Belfast - York Street Interchange
Location	Corridor 3 - Fredrick Street
Date	24/05/2021
Version Number	v0
Assessment By	Luke Oddy
Checked By	Joel Hawthorn

Revision	
Project Number	60571700
Scheme	Belfast - York Street Interchange
Location	Corridor 3 - Fredrick Street
Date	17/11/2021
Version Number	v0
Assessment By	Sariyah Sait
Checked By	Luke Oddy

AECOM

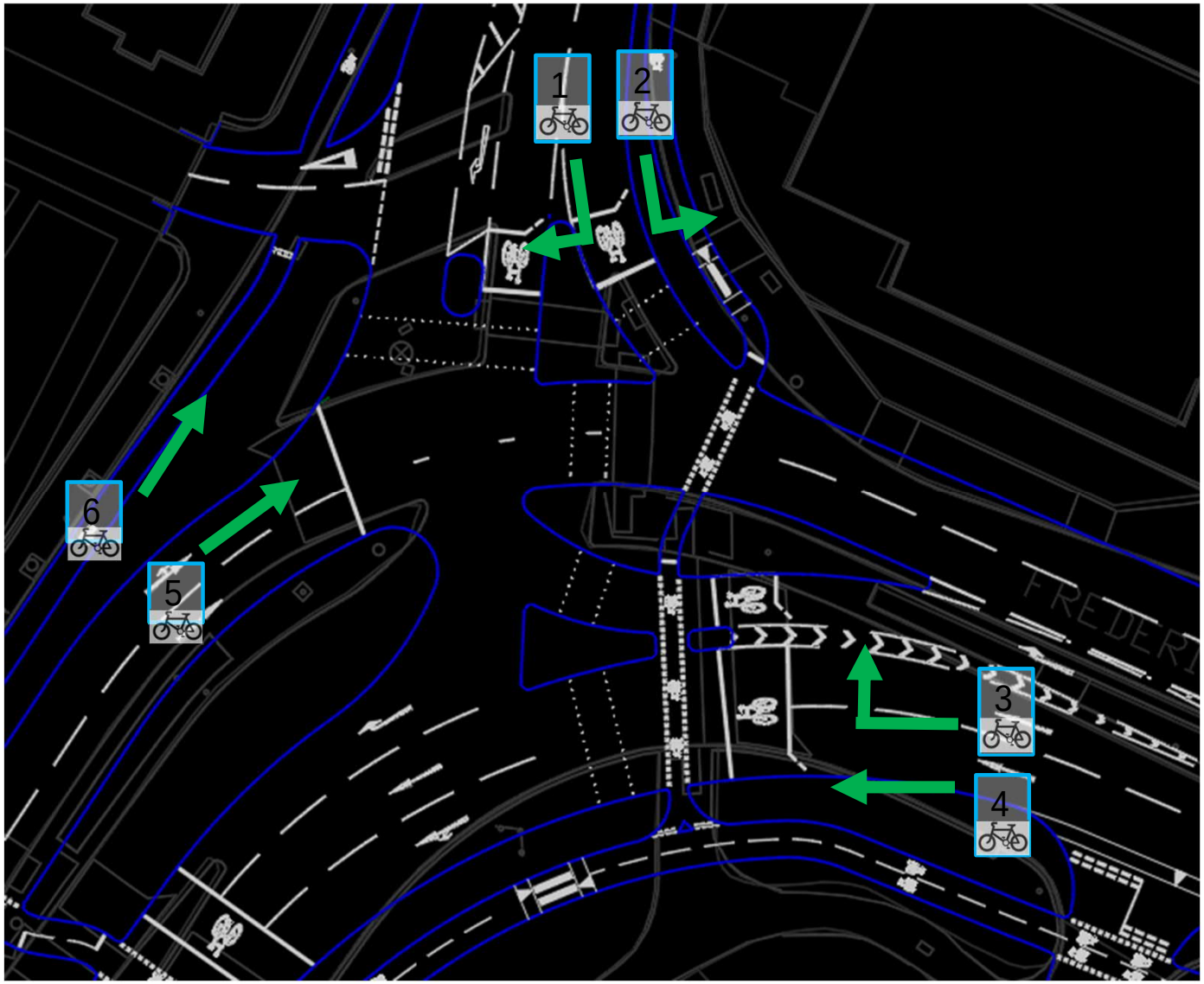
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Proposed 3A Score	Proposed 3A Comments	Proposed 3B Score	Proposed 3B Comments	Proposed 3C Score	Proposed 3C Comments	Proposed 3D Score	Proposed 3D Comments	Proposed 3E Score	Proposed 3E Comments	Existing 3F Score	Existing 3F Comments	Proposed 3F Score	Proposed 3F Comments	Existing 3G Score	Existing 3G Comments	Proposed 3G Score	Proposed 3G Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street / North Queen Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - Corporation Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - Corporation Street.			0	Five lane northbound only carriageway , dangerous for a cyclists to manoeuvre.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street.	0	Two lane carriageway either way, dangerous for a cyclists to manoeuvre	2	Cyclists are provided with a segregated two-way cycle track which splits into one way cycle tracks along either side of the carriageway. Continuity is maintained at junctions linking to adjacent routes - Big Fish.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street / North Queen Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - Corporation Street.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - Corporation Street.			0	No cycle signage currently provided.	2	Cyclists are provided with a segregated two-way cycle track, with on-ward connections junctions linking to other routes within the cycle network - York Street.	0	No cycle signage currently provided.	2	Cyclists are provided with a segregated two-way cycle track which splits into one way cycle tracks along either side of the carriageway. Continuity is maintained at junctions linking to adjacent routes - Big Fish.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.			0	No provision as yet; therefore, no contribution to wider network.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	0	No wider provision / network as yet; therefore no contribution.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	B88 Fredrick Street is both straight and direct in this location.	2	B88 Great Patrick Street is both straight and direct in this location.	2	B88 Great Patrick Street is a curved carriageway, but within <1.2 deviation factor.	2	Dunbar Link is both straight and direct in this location <1.2.			2	Victoria St is both straight and direct in this location <1.2.	2	Victoria St is both straight and direct in this location <1.2.	2	The High St is both straight and direct in this location <1.2.	2	The High St is both straight and direct in this location <1.2.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	1	Priority given at side roads, three signalised junctions at which cyclists are required to stop.	1	Priority given at side roads, three signalised junctions at which cyclists are required to stop.	1	Priority given at side roads, three signalised junctions at which cyclists are required to stop.	1	Priority given at side roads, three signalised junctions at which cyclists are required to stop.			0	Five junctions over 1km route	1	Priority given at side roads, three signalised junctions at which cyclists are required to stop.	0	Five junctions over 1km route	1	Priority given to cyclists at side roads, three signalised junctions at which cyclists are required to stop.
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	2	Cyclists are given priority at signalised junctions of Nelson Street / Corporation Street & Waring Street for N / S movements; therefore, will experience less delay in comparison to motor vehicles.	2	Cyclists are given priority at signalised junctions of Nelson Street / Corporation Street & Waring Street for N / S movements; therefore, will experience less delay in comparison to motor vehicles.	1	Cyclists are given priority at give way junction (Talbot Street) but will experience delay similar to motor vehicles at signalised junctions.	2	Cyclists are given priority at both give way junctions at Waring Street and Dunbar Street.			1	Cyclists are with traffic, therefore delay is similar to motor vehicles	2	Cyclists are given priority on give way junction at Waring Street and can also bypass junction if traveling to/from High St.	1	Cyclists are with traffic; therefore, delay is similar to motor vehicles	2	Cyclists are given priority across a total of five give way junctions on the High St on either side of the carriageway.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.			1	Multiple vehicular lanes; allowing a cyclists to overtake slow vehicles / cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.	1	Multiple vehicular lanes; allowing a cyclists to overtake slow vehicles / cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and cyclists.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.			2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.	2	Unknown, although no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through sections where cyclists are sharing the carriageway through the junction**		85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.			2	85th percentile speed = 7 mph	2	Segregated off-carriageway facilities allowing cyclists to by-pass junction. Motor traffic speed has no impact on cyclists.	2	85th percentile speed = 7 mph	2	Segregated off-carriageway facilities allowing cyclists to by-pass junction. Motor traffic speed has no impact on cyclists.
			10.Motor traffic speed on sections of shared carriageway		85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.			2	85th percentile speed = 7 mph	2	Segregated off-carriageway facilities provided. Motor traffic speed has no impact on cyclists.	2	85th percentile speed = 7 mph	2	Segregated off-carriageway facilities provided. Motor traffic speed has no impact on cyclists.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**		>10000 AADT, or >5% HGV	5000-10000 AADT and 2.5%HGV	2500-5000 and <2% HGV	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.	2	Segregated off-carriageway two way cycle facilities; therefore, no interaction with motor vehicles.			C	23024 AADT	2	Segregated off-carriageway facilities provided. Motor traffic volume has no impact on cyclists.	C	23024 AADT	2	Segregated off-carriageway facilities provided. Motor traffic volume has no impact on cyclists.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes in critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.	2	Off-carriageway facilities, no interaction with motor vehicles.			C	Measured from aerial imagery, assumed critical.	2	Segregated off-carriageway facilities provided reducing the risk of collision.	C	Measured from aerial imagery, assumed critical.	2	Segregated off-carriageway facilities provided reducing the risk of collision.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	1	Cyclist given marked priority at side road - York Lane.	1	Cyclist given marked priority at side road (Academy Street). Cyclists are provided with a segregated and signalised cycle crossing at Edward Street.	1	Cyclist given marked priority at side road.	2	Cycle track is continuous though give way (Dunbar Street and Waring Street) providing priority to cyclists.			0	One side road, untreated along the western side (Ulster St).	1	Cycle track is continuous, with marked cycle priority at give way junctions.	0	Four side roads untreated, two along each side of the carriageway.	1	Cycle track is continuous, with marked cycle priority at give way junctions.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.			1	Generally legible, slightly faded with some text provided for directions. Could be improved.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	1	Generally legible, with no text provided for directions. Could be improved.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	0	No cycle lane provision; therefore, zero score.	2	Two way cycle track + buffer is approximately 4.0m minimum.	2	Two way cycle track + buffer is approximately 4.0m minimum.	2	Two way cycle track + buffer is approximately 3.5m minimum.			0	No cycle lane provision; therefore, zero score.	2	Two way cycle track + buffer is approximately 3.5m minimum.	1	Small lead in lane towards junction northbound within dangerous offside position with no ASL at stop line.	1	Two way cycle track + buffer is approximately 3.5m minimum. One way cycle track + buffer is approximately 2.0m minimum.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	The physical hazards will be removed or reduce where possible to reduce the severity of potential collisions.	2	Parking along this section proposed to be removed. Other physical hazards will be removed or reduce where possible to reduce the severity of potential collisions.	2	Physical hazards will be removed or reduce where possible to minimise the severity of potential collisions.	2	The physical hazard of trees will be removed to reduce possible hazards to cyclists' safety. Other physical hazards will also be removed or reduce where possible to minimise the severity of potential collisions.			1	Some tree planting close to kerb edge which could entrap a cyclists.	2	The physical hazards will be removed or reduce where required to enhance cycle safety.	1	Some street furnishing such as letter box, tree planting close to kerb side. The street also provides on street parking in nearside lane, hazardous for cyclists.	2	The physical hazards will be removed or reduce where required to enhance cycle safety.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.			1	Some defects, cracks where slot cuts and surface course has been replaced. Gullies are present in near side lane.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	1	Minor defects, cracks where slot cuts and surface course has been replaced. Gullies are present in near side lane.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hard-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.			2	Carriageway surface machine laid and in typically good condition.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Carriageway surface machine laid and in typically good condition.	2	Proposed surface to be machine laid smooth and non-slip surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended width maintained.	2	Recommended width maintained.	2	Recommended width maintained.	2	Recommended width maintained.			0	Cyclists are with heavy traffic, no segregation provided.	2	Recommended width maintained.	0	Cyclists are with heavy traffic, no segregation provided.	2	Recommended width maintained.
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.			0	No existing cycle signage along the route.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	0	No existing cycle signage along the route.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.			2	Existing street lighting provided along the entire route.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Existing street lighting provided along the entire route.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	2	No change from existing route location.	2	No change from existing route location.	2	The route is along a busy carriageway within a city centre environment, which is not isolated.	2	The route is along a busy carriageway within a city centre environment, which is not isolated.			2	The route is along a busy carriageway within a city centre environment, which is not isolated.	2	The route is along a busy carriageway within a city centre environment, which is not isolated.	2	The route is along a busy carriageway within a city centre environment, which is not isolated.	2	The route is along a busy carriageway within a city centre environment, which is not isolated.
Attractiveness	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Narrowing of the carriageway and inclusion of cycle track results in enhanced pedestrian footway width.	2	Narrowing of the carriageway and inclusion of cycle track results in enhanced pedestrian footway width.	1	Cycle track proposed within existing carriageway; therefore, no impact to pedestrian comfort level.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.			1	Cyclists on street; therefore, no impact to pedestrian comfort level.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.	1	Cyclists on street; therefore, no impact to pedestrian comfort level.	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.			1	Some wayfinding and cycle signage needed.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	1	Some wayfinding and cycle signage needed.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.			0	Currently no cycle parking provided.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.	0	Currently no cycle parking provided.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.
			Audit Score					47		47		45		47				21		46		21		45	

Max possible score		50		50		50		50		50		50		50		50		50		50		50		50	
Audit % score		94%		94%		90%		94%		0%		82%		92%		82%		90%							
Pass/Fail (70% threshold)		Pass		Pass		Pass		Pass		Fail		Fail		Pass		Fail		Pass							
Any Critical Fails? (Y/N)		No		No		No		No		No		Yes		No		Yes		No							
Number of Critical Fails		0		0		0		0		0		2		0		3		0							

Criteria	Max Score	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Existing	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Existing	% score Proposed	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%	5	83%	5	83%	5	83%	0	0%	0	0%	5	83%	0	0%	5	83%
Directness	10	9	90%	9	90%	8	80%	9	90%	0	0%	6	60%	9	90%	6	60%	9	90%
Safety	16	**15**	94%	**15**	94%	**15**	94%	**16**	100%	**0**	0%	**6**	38%	**15**	94%	**6**	38%	**14**	88%
Comfort	8	8	100%	8	100%	8	100%	8	100%	0	0%	3	38%	8	100%	3	38%	8	100%
Attractiveness	10	10	100%	10	100%	9	90%	9	90%	0	0%	6	60%	9	90%	6	60%	9	90%
	50																		

D.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 1 – North Queen Street

Junction 1.2 - B88 Carrick Hill / B126 N Queen S

Overall Junction Score:

Cycle Network Score:

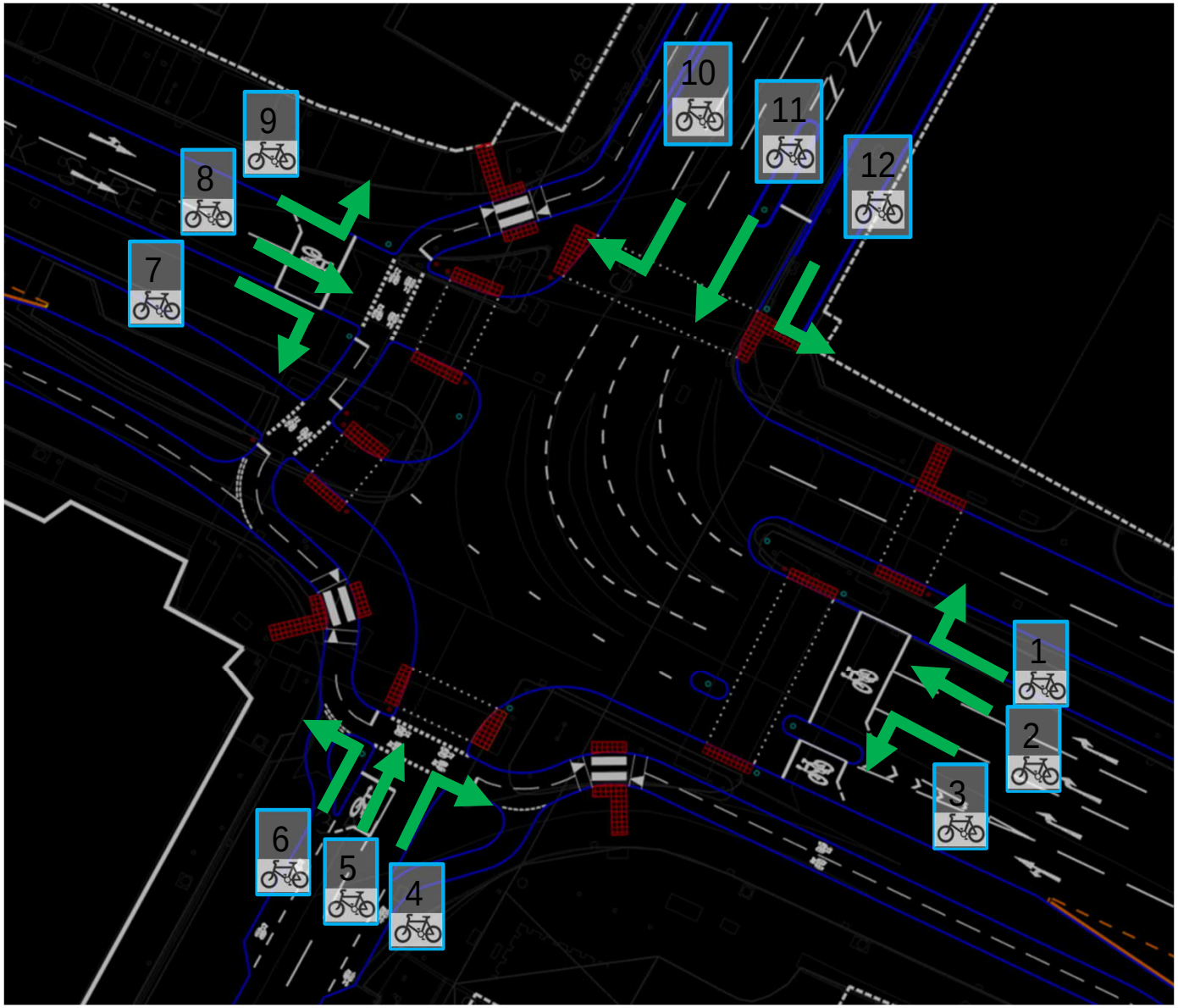
Note – Movements 3 and 5 will use the proposed two-way cycle crossing at the Carrick Hill/Clifton St Junction.

Cycle Strategy Route Review Junction 1.2

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.2 – York Street / B88 Frederick Street

Overall Junction Score:

Cycle Network Score:

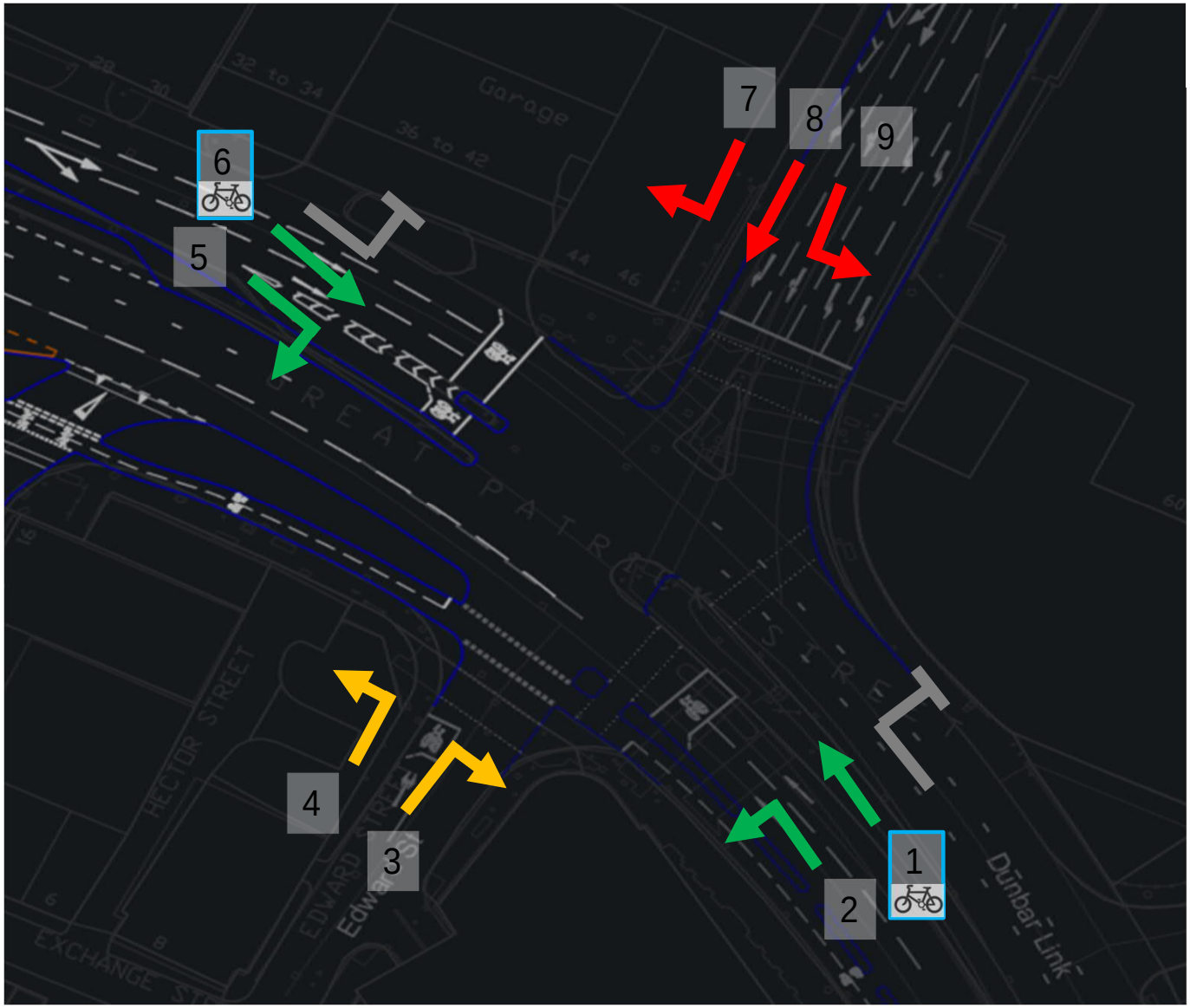
Note – Proposed on-street facility along York Street (southern arm), with traffic speeds and volume reduced through bus, taxi and access only restrictions.

Cycle Strategy Route Review Junction 2.2 - Proposed

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
4	2			5	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
5	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
6	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
7	2			5	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
8	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			4	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
12	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 3 – Fredrick St / Dunbar Link / Waring St

Junction 3.3 – Great Patrick Street / Nelson Street

Overall Junction Score:

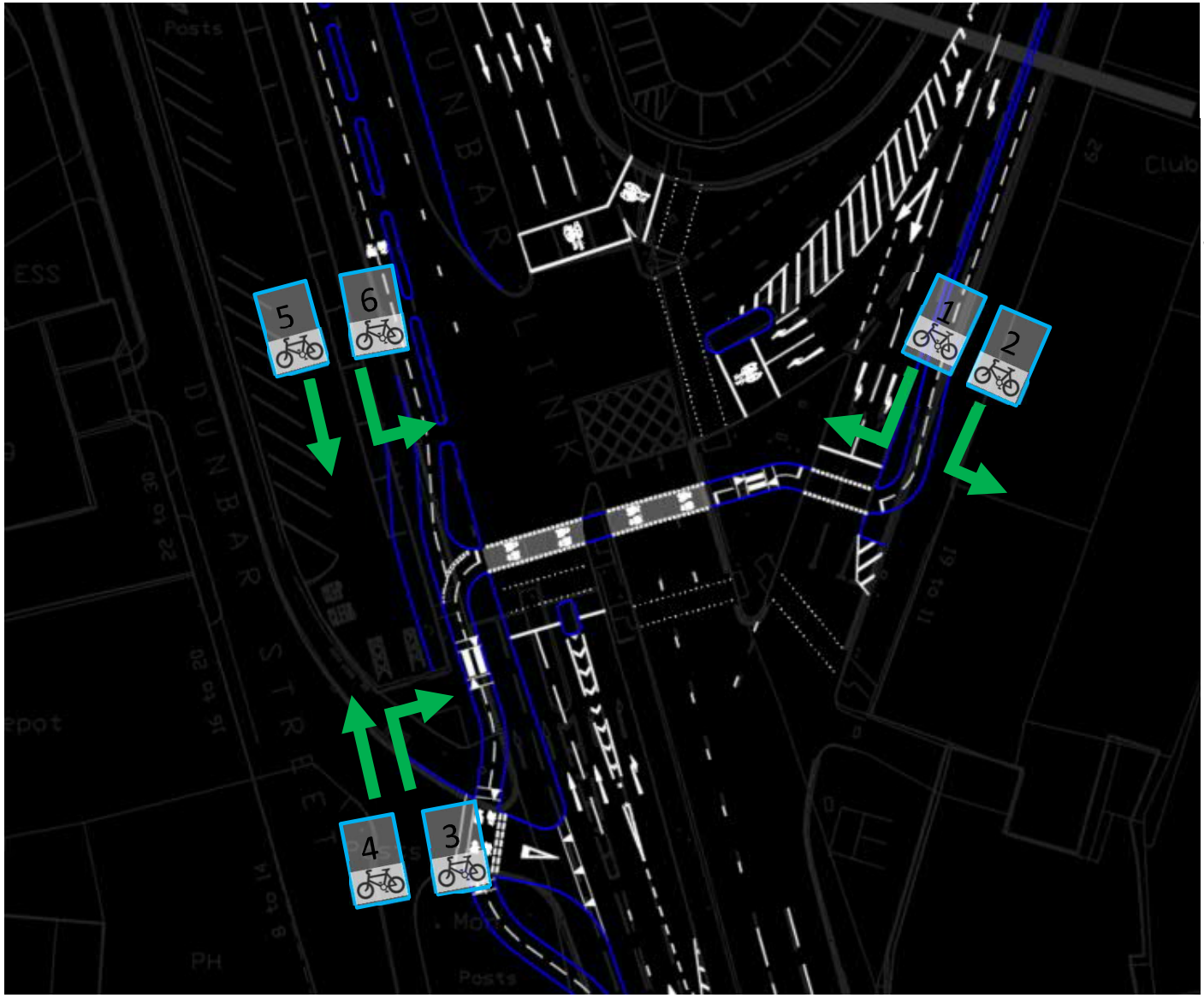
Cycle Network Score:

Cycle Strategy Route Review Junction 3.3 - Proposed

Movement	Score	0	1	2	Comment
1	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
3	1		3		Cycle movement in potential conflict with moderate traffic flow.
4	1		3		Cycle movement in potential conflict with moderate traffic flow.
5	2			3	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	0	6			Cycle movement in potential conflict with heavy motor traffic flow.
8	0	6			Cycle movement in potential conflict with heavy motor traffic flow.
9	0	6			Cycle movement in potential conflict with heavy motor traffic flow.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 3 – Fredrick St / Dunbar Link / Waring St
Junction 5.1 – A1 Dunbar Link / Corporation Street

Overall Junction Score:

Cycle Network Score:

Cycle Strategy Route Review Junction 5.1 - Proposed

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 3 – Fredrick St / Dunbar Link / Waring St

Junction 3.5 – A2 Dunbar Link / Waring Street

Overall Junction Score:

Cycle Network Score:

Note – Waring Street no longer forms part of the strategic cycle network, with movements accommodated within the proposed network via Corporation Street.

Cycle Strategy Route Review Junction 3.5 – Proposed

Movement	Score	0	1	2	Comment
1	0	6			Cycle movement in potential conflict with heavy motor traffic flow.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	1		2		Cycle movement in potential conflict with moderate traffic flow.
4	1		2		Cycle movement in potential conflict with moderate traffic flow.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 3 – Fredrick St / Dunbar Link / Waring St

Junction 3.6 – A2 Victoria St / High Street

Overall Junction Score:

Cycle Network Score:

Note – Movements 4, 7, 8 & 9 are assumed to transition using the proposed parallel crossing to / from area of shared use footway/cycleway.

Cycle Strategy Route Review Junction 3.6 - Proposed

Movement	Score	0	1	2	Comment
1	0	5			Cycle movement in potential conflict with heavy motor traffic flow.
2	0	5			Cycle movement in potential conflict with heavy motor traffic flow.
3	0	5			Cycle movement in potential conflict with heavy motor traffic flow.
4	1		1	3	Cycle movement made by transiting onto section of shared use footway
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	1		1	3	Cycle movement made by transiting onto section of shared use footway
8	1		1	3	Cycle movement made by transiting onto section of shared use footway
9	1		1	3	Cycle movement made by transiting onto section of shared use footway

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

D.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

Corridor 3 – Frederick Street / Dunbar Link / Waring Street

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Footway Width	Overall Score
Corridor 3 (North Footway)	1	2.78	2.0m	
	2	2.63	2.0m	
	3	2.74	2.0m	
	4	3.93	2.0m	
	5	3.45	2.0m	
	6	4.51	2.0m	
	7	4.00	2.0m	
	8	7.46	2.0m	
	9	8.50	2.0m	
	10	5.30	2.0m	
	Average Width (m)	4.53		100%
Corridor 3 (Southern Footway)	1	3.32	2.0m	
	2	2.77	2.0m	
	3	2.49	2.0m	
	4	2.81	2.0m	
	5	3.53	2.0m	
	6	4.72	2.0m	
	7	6.20	2.0m	
	8	5.18	2.0m	
	9	5.88	2.0m	
	10	2.31	2.0m	
	Average Width (m)	3.92		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.

Qualitative Commentary

Characteristics / Ambience:

- Dunbar Link is a very heavily trafficked route, providing multiple lanes in either direction, creating a traffic dominated environment that is likely to be unpleasant for pedestrians;
- Proposals are to remove a westbound running lane to provide a segregated two-way cycle track running adjacent to the southern footway Along the B88 Frederick Street the footway will be widened on eitherside; whereas in other location the footway with will remain as existing.
- Proposal will provide segregation for pedestrians along the southern footway, creating a safer and more pleasant environment.
- Both footways are well lit and tree lined. The northern footway is considered wide, whereas the southern footway is considered moderately wide.

Access / Connections:

- The main junctions along the corridor will be provided enhanced and segregated pedestrian facilities. Additional crossings of Frederick Street and at the High Street junction will further reduce severance of A2.
- Access to Ulster University is provided at the central section of the corridor. Whereas, access to the City Centre is gained to the southwest.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.

Appendix E – Corridor 4 | Brougham Street / Dock Street

E.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 4 - Brougham Street	Corridor 4 - Brougham Street
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

AECOM

Route Section	Proposed 4A	Proposed 4B

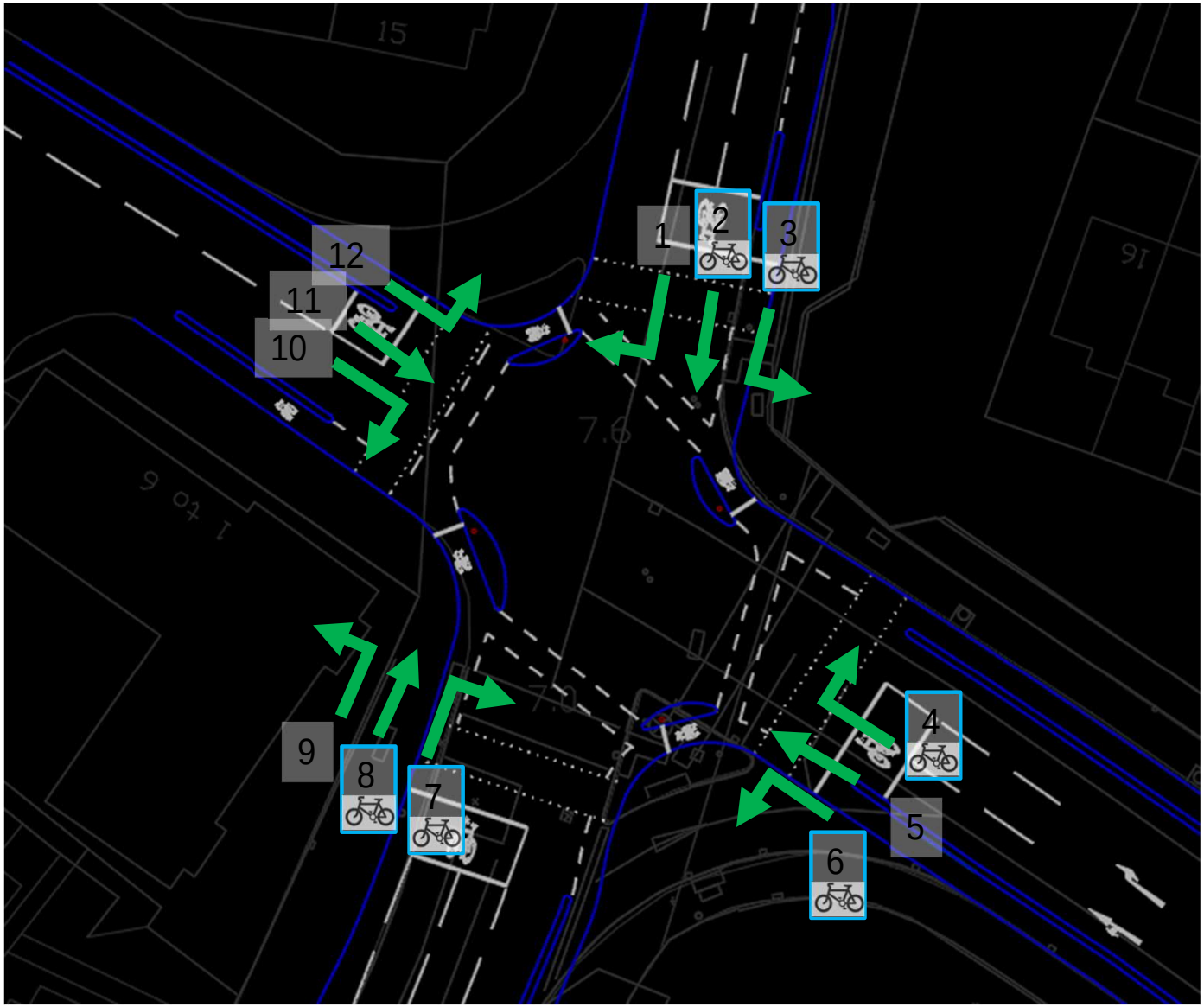
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comments	Score	Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - North Queen Street & York Street	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - York Street & Corporation Street.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - North Queen Street & York Street	2	Cyclists are provided with a segregated two-way cycle track, with links at major junctions to alternative routes within the proposed cycle network - York Street & Corporation Street.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	Brougham Street is both straight and direct.	2	Dock Street is both straight and direct.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	0	Four signalised junctions over 420m route.`	0	Four signalised junctions over 420m route.`
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	Cyclists are provided one-way cycle tracks on either side of the carriageway, but are still required to stop at the majority of signalised junctions.	1	Cyclists are provided one-way cycle tracks on either side of the carriageway, but are still required to stop at the majority of signalised junctions.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	Cyclists are provided with a one-way cycle track and can choose an appropriate speed.	2	Cyclists are provided with a one-way cycle track and can choose an appropriate speed.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, though no significant gradients observed.	2	Unknown, though no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Segregated off-carriageway facilities allowing cyclists to by-pass junction. Motor traffic speed has no impact on cyclists.	2	Segregated off-carriageway facilities allowing cyclists to by-pass junction. Motor traffic speed has no impact on cyclists.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Segregated off-carriageway facilities provided. Motor traffic speed has no impact on cyclists.	2	Segregated off-carriageway facilities provided. Motor traffic speed has no impact on cyclists.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Segregated off-carriageway facilities provided. Motor traffic volume has no impact on cyclists.	2	Segregated off-carriageway facilities provided. Motor traffic volume has no impact on cyclists.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Segregated off-carriageway facilities provided reducing the risk of collision.	2	Segregated off-carriageway facilities provided reducing the risk of collision.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	1	Effective cycle priority given at side roads to the north and south of the carriageway.	1	Cyclists not given priority at weight bridge site; however, considered infrequent not to cause a significant delay.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	One-way cycle track provided with a buffer >2m. Very limited conflict with kerbside activity.	2	One-way cycle track provided with a buffer >2m. Very limited conflict with kerbside activity.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	Physical hazards will be removed or reduce where possible to reduce the severity of potential collisions.	2	Physical hazards will be removed or reduce where possible to reduce the severity of potential collisions.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed surface to be machine laid smooth and non-slip surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended width maintained.	2	Recommended width maintained.
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	2	No change from existing route location.	1	No change from existing route location.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Cyclists on segregated cycle track; therefore, no impact to pedestrian comfort level.	2	Proposals provide a wider footway along the southern section of the carriageway.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand.
							Audit Score	44		44	

Max possible score	50	50
Audit % score	88%	88%
Pass/Fail (70% threshold)	**Pass**	**Pass**
Any Critical Fails? (Y/N)	No	No
Number of Critical Fails	0	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%	5	83%
Directness	10	7	70%	7	70%
Safety	16	**15**	94%	**15**	94%
Comfort	8	8	100%	8	100%
Attractiveness	10	9	90%	9	90%
	50				

E.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 4 – Brougham Street / Dock Street

Junction 1.3 - B126 N Queen St / Brougham St

Overall Junction Score:

Cycle Network Score:

Note – Proposed right turn movements are physically protected two-stage.

Cycle Strategy Route Review Junction 1.3

Movement	Score	0	1	2	Comment
1	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
8	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			1	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.5 – A2 York St / Brougham Street

Overall Junction Score:

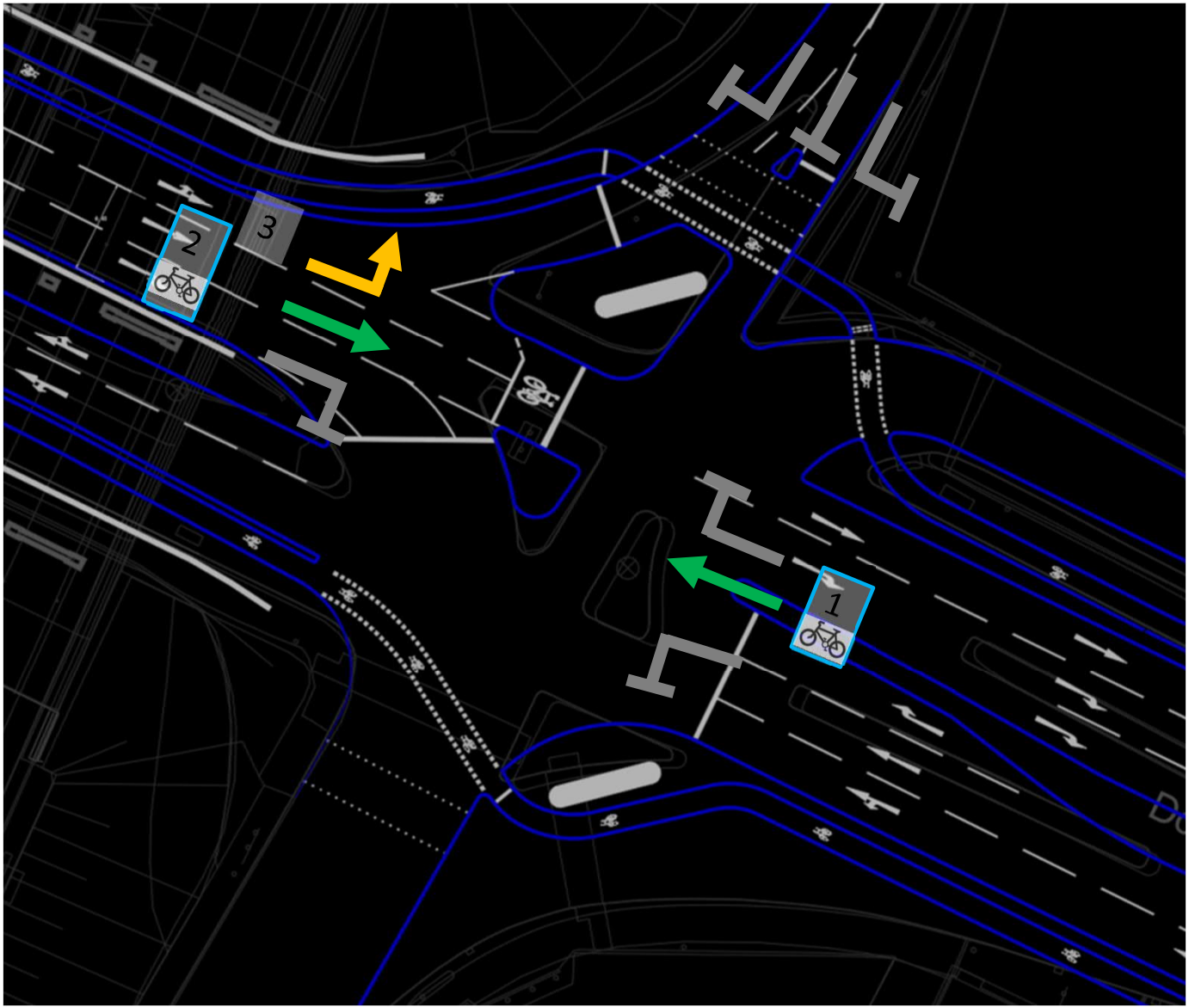
Cycle Network Score:

Cycle Strategy Route Review Junction 2.5

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
7	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
8	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
9	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
11	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 4 – Brougham Street / Dock Street
Junction 4.3 – Dock Street / Nelson Street

Overall Junction Score:

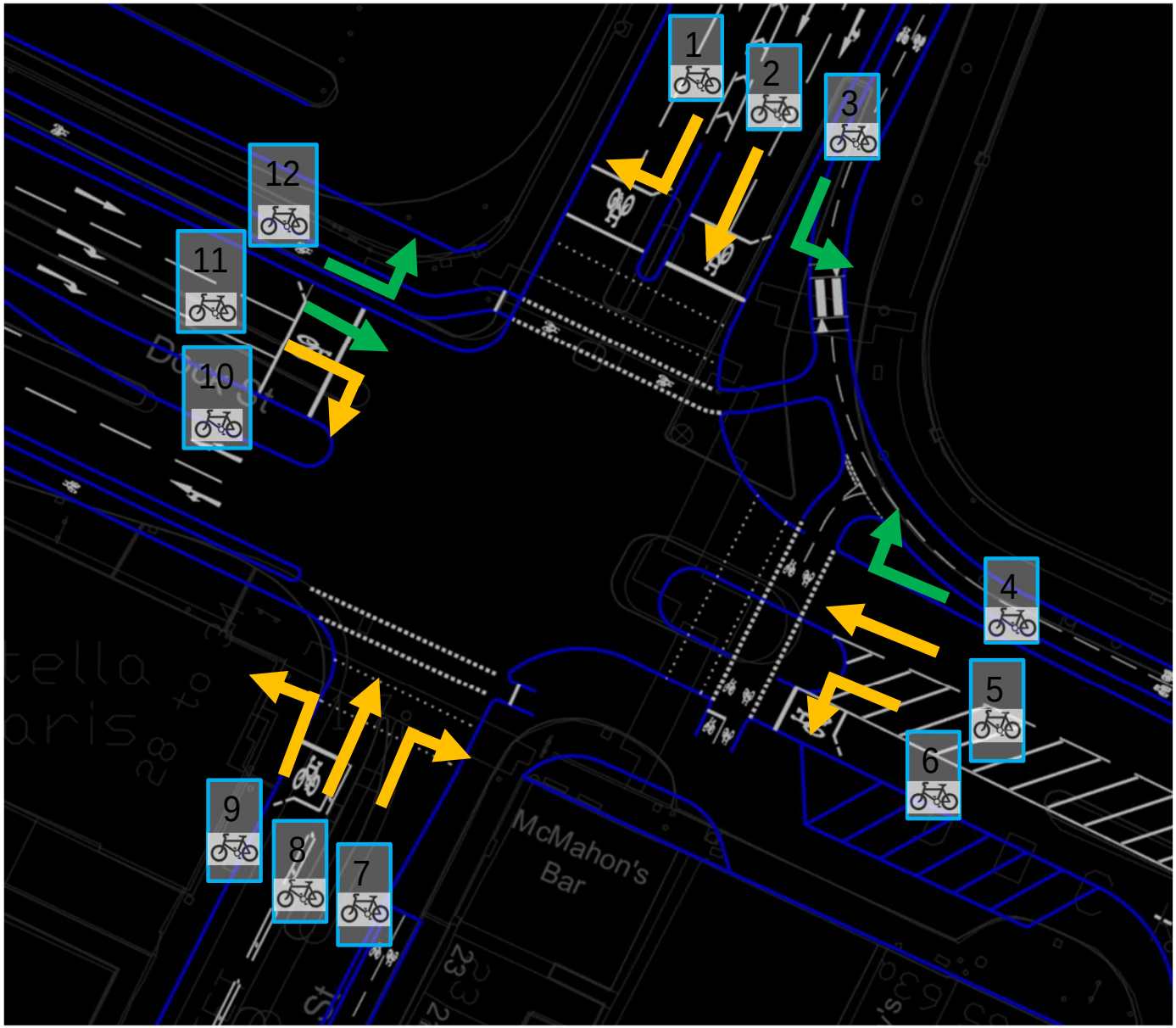
Cycle Network Score:

Note – Bus lane southbound does not permit cycle movements.
Southern arm leading to motorway; therefore, all cycle movements banned.

Cycle Strategy Route Review Junction 4.3 – Proposed					
Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	1		2	2	Cycle movement in potential conflict with moderate traffic flow.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 4 – Brougham Street / Dock Street
Junction 5.3 – Garmoyle Street / Dock Street

Overall Junction Score:

Cycle Network Score:

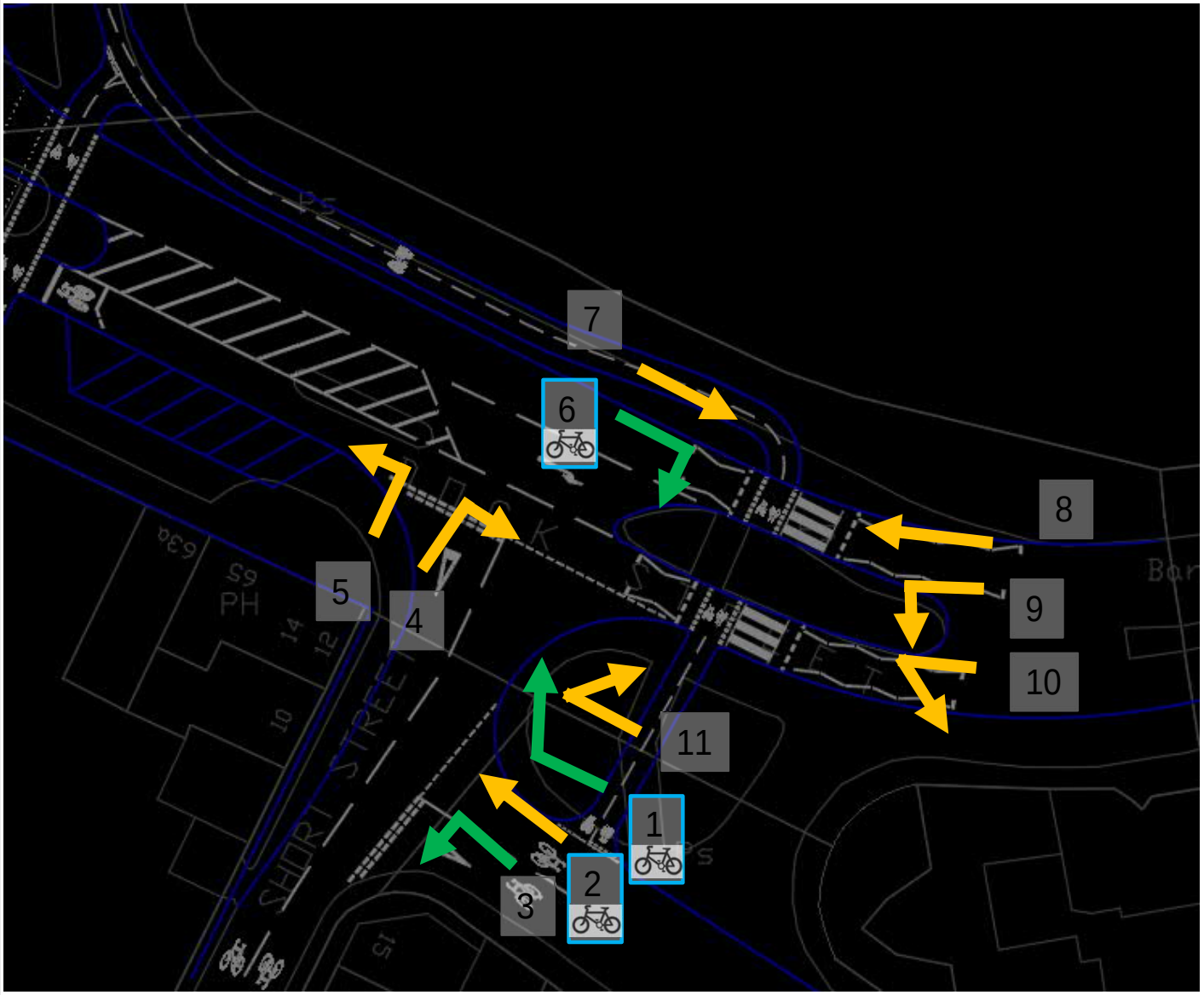
Note – Movements 1,2, 5, 6, 7, 8, 9 & 10 assumed to use shared use footway.

Cycle Strategy Route Review Junction 5.3 Proposed

Movement	Score	0	1	2	Comment
1	1		1	2	Cycle movement made by transiting onto section of shared use footway
2	1		1	1	Cycle movement made by transiting onto section of shared use footway
3	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	1		1	1	Cycle movement made by transiting onto section of shared use footway
6	1		1	1	Cycle movement made by transiting onto section of shared use footway
7	1		1	2	Cycle movement made by transiting onto section of shared use footway
8	1		1	1	Cycle movement made by transiting onto section of shared use footway
9	1		1	1	Cycle movement made by transiting onto section of shared use footway
10	1		1	2	Cycle movement made by transiting onto section of shared use footway
11	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 6 – NCN 93

Junction 6.3 – Princes Dock Street / Dock Street

Overall Junction Score:

Cycle Network Score:

Note – Movement 4, 7 and 11 assumed to be taken via parallel crossing facility. Resurfacing of carriageway assumed to be included within proposals. Movements 2 and 5 assumed to be carried out using shared footway.

Cycle Strategy Route Review Junction 6.3 - Proposed

Movement		Score	0	1	2	Comment
	1	2			2	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	2	1		1	2	Cycle movement made by transiting onto section of shared use footway
	3	2			1	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	4	1		1	1	Central refuge allowing two-stage cycle movement crossing one traffic lane at a time.
	5	1		1	1	Cycle movement made by transiting onto section of shared use footway
	6	2			2	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	7	1		2		Cycle movement in potential conflict with moderate traffic flow.
	8	1		2		Cycle movement in potential conflict with moderate traffic flow.
	9	1		2		Cycle movement in potential conflict with moderate traffic flow.
	10	1		2		Cycle movement in potential conflict with moderate traffic flow.
	11	1		2		Cycle movement in potential conflict with moderate traffic flow.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

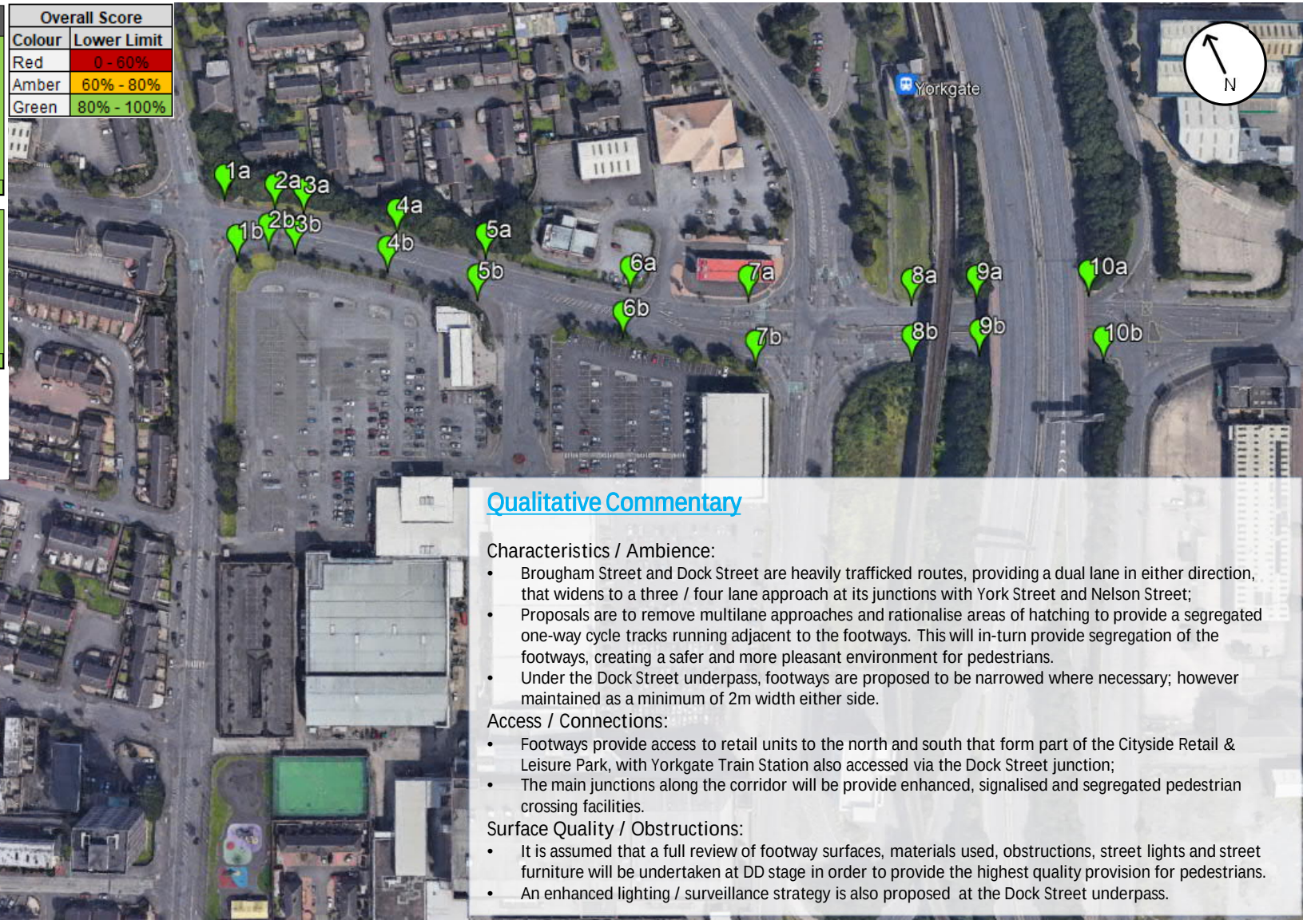
E.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

Corridor 4 – Brougham Street/ Dock Street

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Footway Width	Overall Score
Section 4 (Northern Footway)	1	3.63	2.0m	
	2	2.92	2.0m	
	3	3.02	2.0m	
	4	2.98	2.9m	
	5	2.98	2.9m	
	6	3.06	2.9m	
	7	3.13	2.0m	
	8	3.37	2.0m	
	9	3.44	2.0m	
	10	2.00	2.0m	
	Average Width (m)	**3.05**		100%
Section 4 (Southern Footway)	1	10.96	2.0m	
	2	3.68	2.0m	
	3	2.92	2.0m	
	4	2.74	2.0m	
	5	3.12	2.0m	
	6	2.26	2.0m	
	7	4.15	2.0m	
	8	2.57	2.0m	
	9	2.44	2.0m	
	10	2.25	2.0m	
	Average Width (m)	**3.71**		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%



Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.

Qualitative Commentary

Characteristics / Ambience:

- Brougham Street and Dock Street are heavily trafficked routes, providing a dual lane in either direction, that widens to a three / four lane approach at its junctions with York Street and Nelson Street;
- Proposals are to remove multilane approaches and rationalise areas of hatching to provide a segregated one-way cycle tracks running adjacent to the footways. This will in-turn provide segregation of the footways, creating a safer and more pleasant environment for pedestrians.
- Under the Dock Street underpass, footways are proposed to be narrowed where necessary; however maintained as a minimum of 2m width either side.

Access / Connections:

- Footways provide access to retail units to the north and south that form part of the Cityside Retail & Leisure Park, with Yorkgate Train Station also accessed via the Dock Street junction;
- The main junctions along the corridor will be provide enhanced, signalised and segregated pedestrian crossing facilities.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.
- An enhanced lighting / surveillance strategy is also proposed at the Dock Street underpass.

Appendix F – Corridor 5 | Garmoyle Street / Corporation Street

F.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 5 - Corporation Street	Corridor 5 - Corporation Street
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

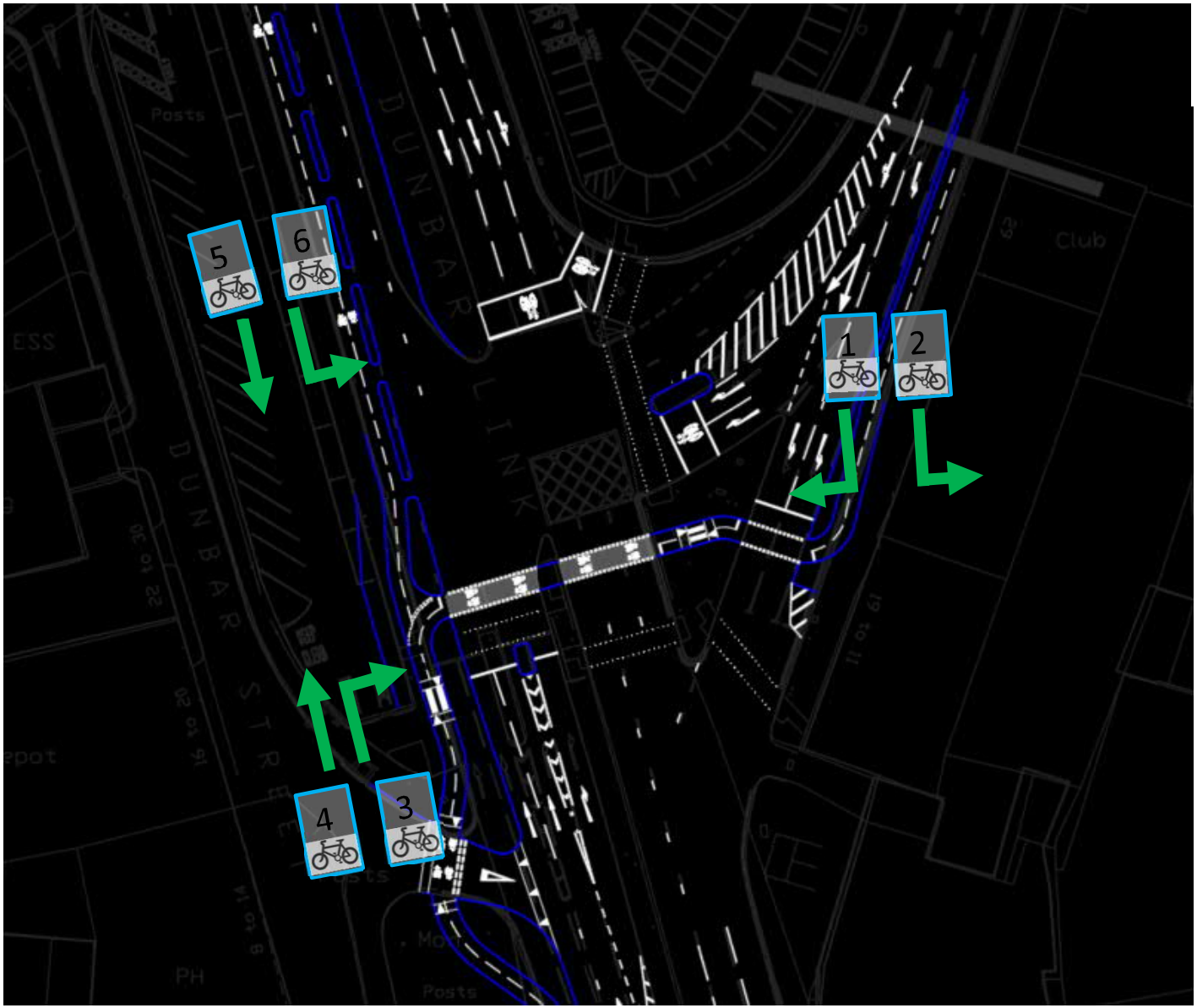
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Proposed 5A Score	Proposed 5A Comments	Proposed 5B Score	Proposed 5B Comments	Proposed 5C Score	Proposed 5C Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	Cyclists are provided with a continuous two-way cycle track, with continuity at junctions linking to other routes within the cycle network - Dunbar Link	2	Cyclists are provided with a continuous route N/S two-way along Corporation Street, linking to adjacent routes within the Belfast Cycle Network - NCN Route 93.	2	Cyclists are provided with a continuous route N/S two-way along Corporation Street, linking to adjacent routes within the Belfast Cycle Network - NCN Route 93 / Dock Street.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. ''End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	Cyclists are provided with a continuous two-way cycle track, with continuity at junctions linking to other routes within the cycle network - Dunbar Link	2	Cyclists are provided with a continuous route N/S two-way along Corporation Street, linking to adjacent routes within the Belfast Cycle Network - NCN Route 93.	2	Cyclists are provided with a continuous route N/S two-way along Corporation Street, linking to adjacent routes within the Belfast Cycle Network - NCN Route 93 / Dock Street.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	The proposed cycle route does not include any deviations, it is a straight and direct route	2	The proposed cycle route on Corporation St is both straight and direct	1	Garmoyle Street deviation factor in this location is between 1.2-1.4.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	0	Three junctions / two crossings over 1km route.`	0	Three junctions / two crossings over 1km route.`	0	Three junctions / two crossings over 1km route.`
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	Cyclists stop at signals and so have a similar delay to motor vehicles.	1	Cyclists experience delay similar to motor vehicles at junctions	1	Cyclists are given priority at giveways but will experience delay similar to motor vehicles at signalised junctions
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and other cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and other cyclists.	2	The proposed two-way cycle track allows cyclists to bypass slow moving traffic, including motor vehicles and other cyclists.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, though no significant gradients observed.	2	Unknown, though no significant gradients observed.	2	Unknown, though no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.	2	Cyclists are provided segregated two-way track and do not share the carriageway with motor vehicles - No impact.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	2	Full setback or signalised cycle crossing provided at side roads (Gamble Street) along Corporation Street.	2	Full setback or signalised cycle crossing provided at side roads along Corporation Street.	2	Cyclist given priority at Dock side road.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirements. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	Two way cycle track + buffer is approximately 3.0m minimum	2	Two way cycle track + buffer is approximately 3.0m minimum	2	Two way cycle track + buffer is approximately 3.0m minimum
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	Existing trees maintained where possible and if not a hazard to cyclists. Cyclists are provided a segregated two-way track including sufficient evasion room.	2	Existing trees maintained where possible and if not a hazard to cyclists. Cyclists are provided a segregated two-way track including sufficient evasion room.	2	Hazards near to the proposed cycle track to be removed.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed surface to be machine laid smooth and non-slip surface.	2	Proposed carriageway surface to be machine laid to achieve a smooth and level surface.	2	Proposed carriageway surface to be machine laid to achieve a smooth and level surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended width maintained	2	Recommended width maintained	2	Recommended width maintained
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	1	As previous. However, potential for score 2 through placemaking and regeneration in the future.	1	As previous. However, potential for score 2 through placemaking and regeneration in the future.	1	As previous. However, potential for score 2 through placemaking and regeneration in the future.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Cyclists within separated two-way track; therefore, no impact to pedestrian comfort level.	1	Cyclists on street; therefore, no impact to pedestrian comfort level. Shared use footway at the northern extent; however, widened sufficiently.	1	Pedestrian footway widened along the majority of Garmoyle Street due to cycle track proposals located within existing nearside southbound traffic lane. Slight narrowing of the existing footway at its northern extent; therefore, score 1 provided.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	**44**		**44**		**43**	

	Proposed 5A	Proposed 5B	Proposed 5C
Max possible score	50	50	50
Audit % score	88%	88%	86%
Pass/Fail (70% threshold)	**Pass**	**Pass**	**Pass**
Any Critical Fails? (Y/N)	No	No	No
Number of Critical Fails	0	0	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%	5	83%	5	83%
Directness	10	7	70%	7	70%	6	60%
Safety	16	**16**	100%	**16**	100%	**16**	100%
Comfort	8	8	100%	8	100%	8	100%
Attractiveness	10	8	80%	8	80%	8	80%
	50						

F.2 Junction Assessment Proposed Results



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 5 – Corporation Street

Junction 5.1 – A1 Dunbar Link / Corporation Street

Overall Junction Score:

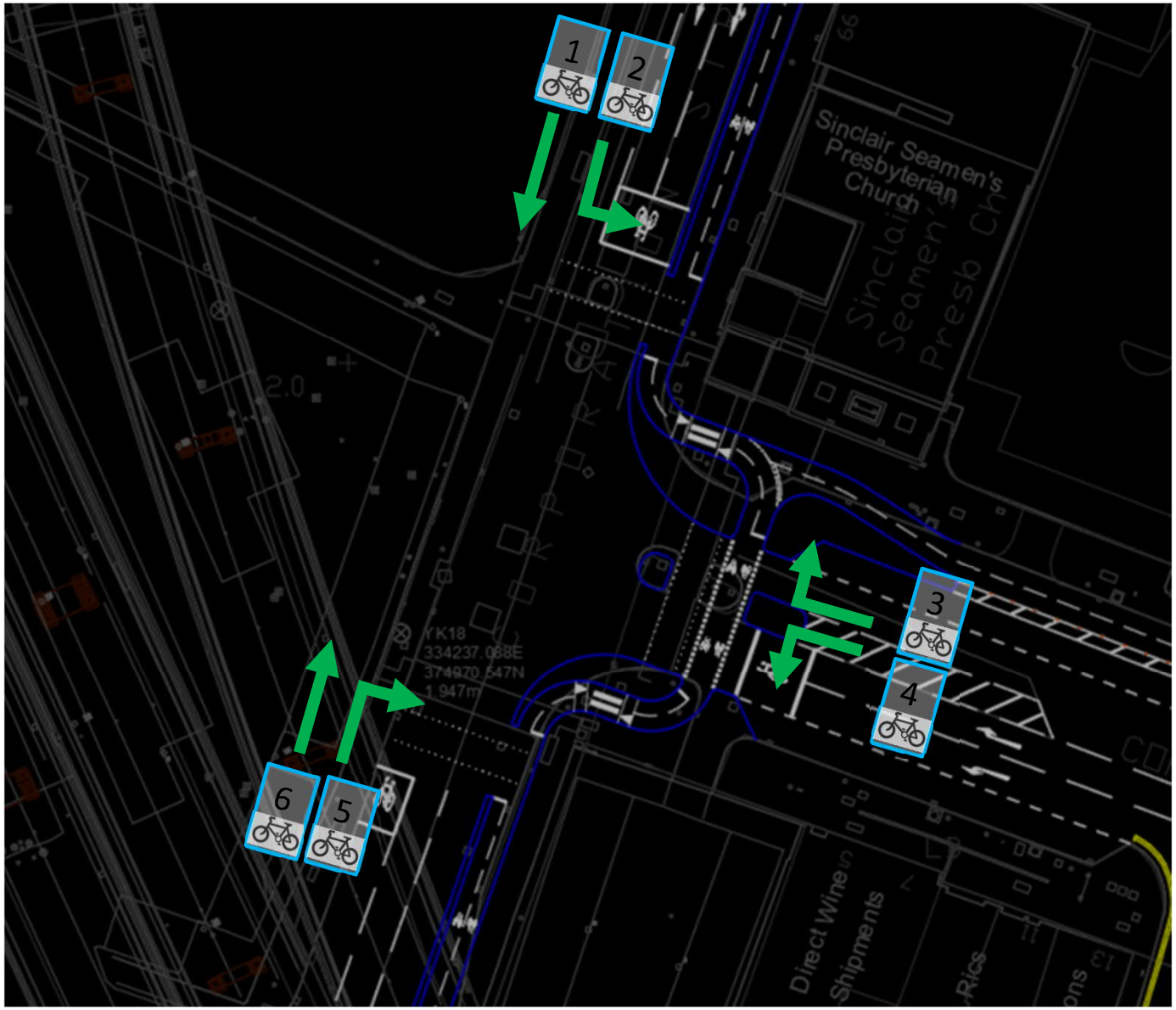
Cycle Network Score:

Cycle Strategy Route Review Junction 5.1 - Proposed

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 5 – Corporation Street

Junction 5.2 – Corporation Street / Corporation Square

Overall Junction Score:

Cycle Network Score:

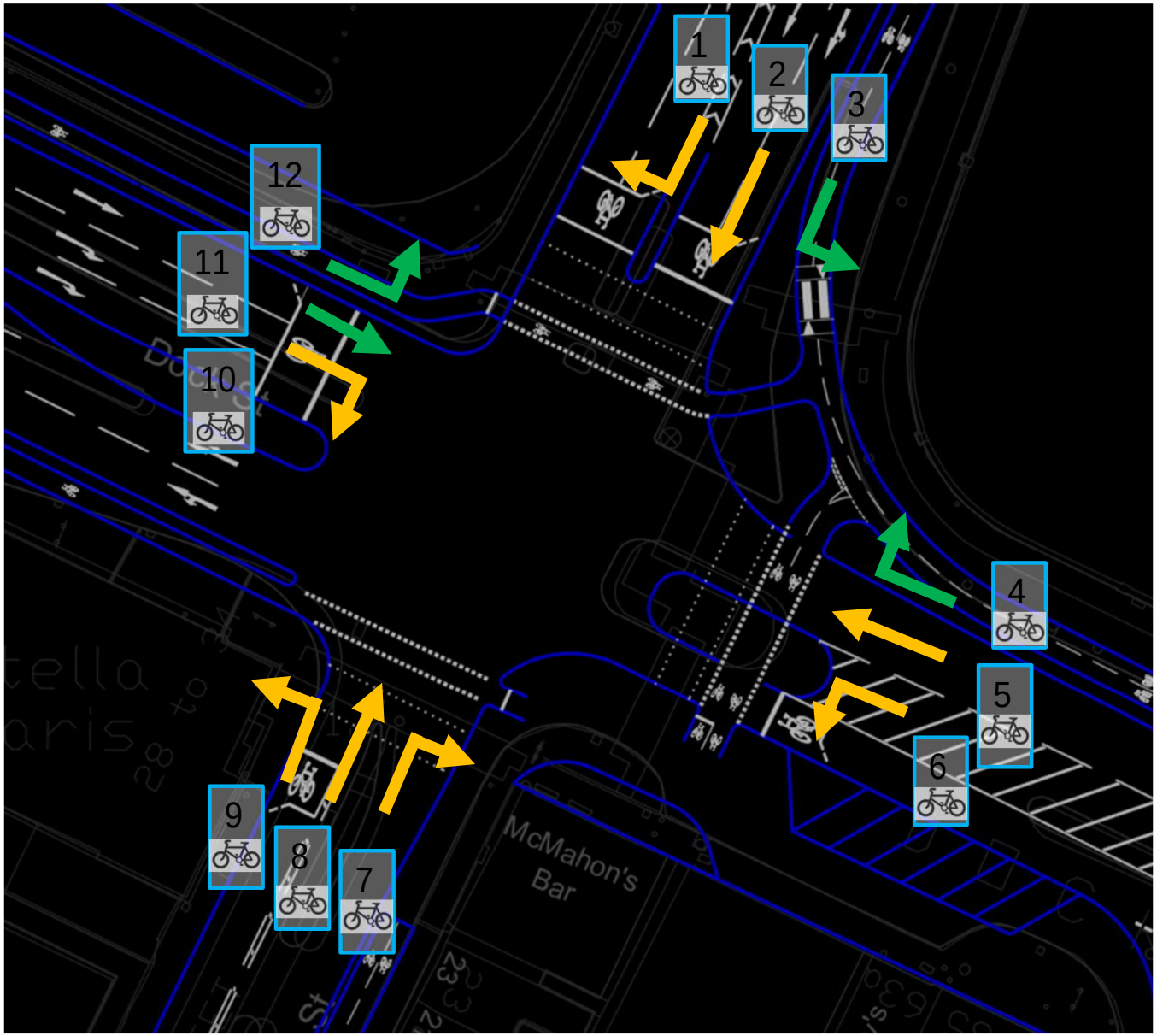
Note – Additional delay for cyclists due to stopping at pedestrian crossings of the major arm.

Cycle Strategy Route Review Junction 5.2 Proposed

Movement	Score	0	1	2	Comment
1	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 5 – Corporation Street

Junction 5.3 – Garmoyle Street / Dock Street

Overall Junction Score:

Cycle Network Score:

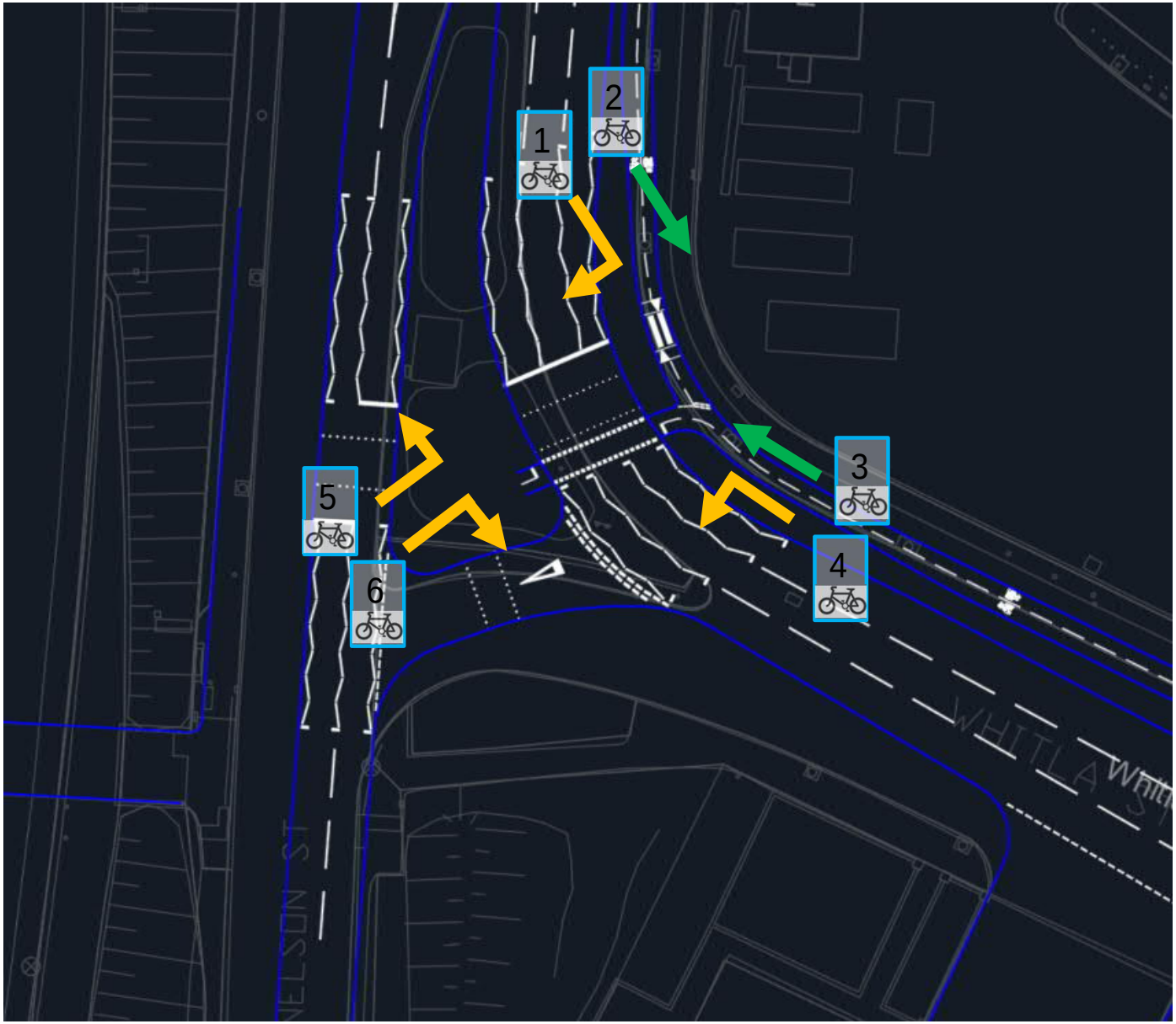
Note – Movements 1,2, 5, 6, 7, 8, 9 & 10 assumed to use shared use footway.

Cycle Strategy Route Review Junction 5.3 Proposed

Movement	Score	0	1	2	Comment
1	1		1	2	Cycle movement made by transiting onto section of shared use footway
2	1		1	1	Cycle movement made by transiting onto section of shared use footway
3	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	1		1	1	Cycle movement made by transiting onto section of shared use footway
6	1		1	1	Cycle movement made by transiting onto section of shared use footway
7	1		1	2	Cycle movement made by transiting onto section of shared use footway
8	1		1	1	Cycle movement made by transiting onto section of shared use footway
9	1		1	1	Cycle movement made by transiting onto section of shared use footway
10	1		1	2	Cycle movement made by transiting onto section of shared use footway
11	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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AECOM

Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 5 – Corporation Street
Junction 5.4 – Duncrue Street / Whitla Subway

Overall Junction Score:

Cycle Network Score:

Note – Movements 1,4,5 & 6 to cross over to / from shared use footway via toucan crossing facility.

Cycle Strategy Route Review Junction 5.4 - Proposed

Movement	Score	0	1	2	Comment
1	1		1		Cycle movement made by transiting onto section of shared use footway
2	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	1		1		Cycle movement made by transiting onto section of shared use footway
5	1		2	1	Cycle movement made by transiting onto section of shared use footway
6	1		2	1	Cycle movement made by transiting onto section of shared use footway

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

F.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

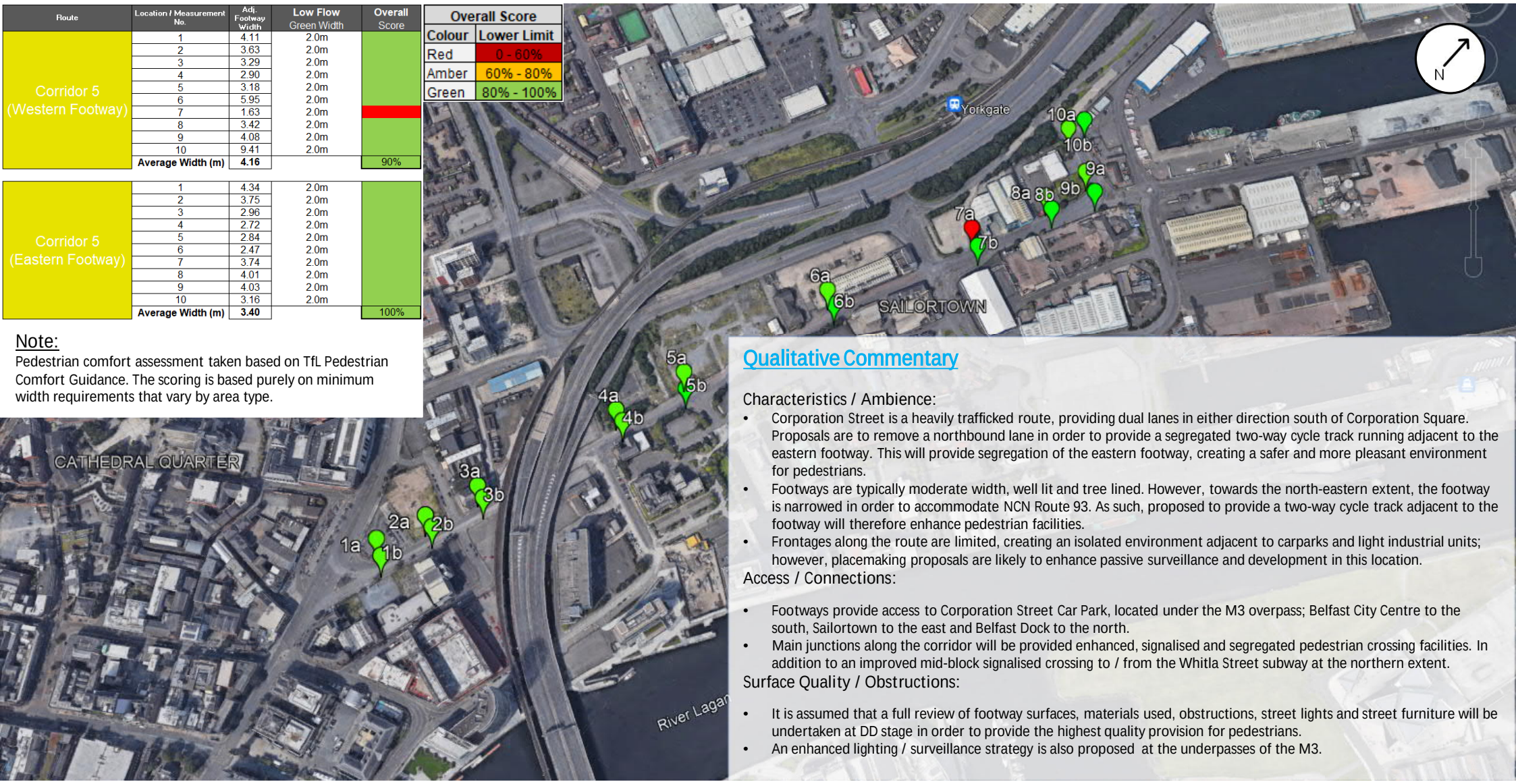
Corridor 5 – Garmoyle Street / Corporation Street

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Green Width	Overall Score
Corridor 5 (Western Footway)	1	4.11	2.0m	
	2	3.63	2.0m	
	3	3.29	2.0m	
	4	2.90	2.0m	
	5	3.18	2.0m	
	6	5.95	2.0m	
	7	1.63	2.0m	
	8	3.42	2.0m	
	9	4.08	2.0m	
	10	9.41	2.0m	
	Average Width (m)	**4.16**		90%
Corridor 5 (Eastern Footway)	1	4.34	2.0m	
	2	3.75	2.0m	
	3	2.96	2.0m	
	4	2.72	2.0m	
	5	2.84	2.0m	
	6	2.47	2.0m	
	7	3.74	2.0m	
	8	4.01	2.0m	
	9	4.03	2.0m	
	10	3.16	2.0m	
	Average Width (m)	**3.40**		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.



Qualitative Commentary

Characteristics / Ambience:

- Corporation Street is a heavily trafficked route, providing dual lanes in either direction south of Corporation Square. Proposals are to remove a northbound lane in order to provide a segregated two-way cycle track running adjacent to the eastern footway. This will provide segregation of the eastern footway, creating a safer and more pleasant environment for pedestrians.
- Footways are typically moderate width, well lit and tree lined. However, towards the north-eastern extent, the footway is narrowed in order to accommodate NCN Route 93. As such, proposed to provide a two-way cycle track adjacent to the footway will therefore enhance pedestrian facilities.
- Frontages along the route are limited, creating an isolated environment adjacent to carparks and light industrial units; however, placemaking proposals are likely to enhance passive surveillance and development in this location.

Access / Connections:

- Footways provide access to Corporation Street Car Park, located under the M3 overpass; Belfast City Centre to the south, Sailortown to the east and Belfast Dock to the north.
- Main junctions along the corridor will be provided enhanced, signalised and segregated pedestrian crossing facilities. In addition to an improved mid-block signalised crossing to / from the Whitla Street subway at the northern extent.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.
- An enhanced lighting / surveillance strategy is also proposed at the underpasses of the M3.

Appendix G – Corridor 6 | NCN Route 93

G.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 6 - NCN Route 93	Corridor 6 - NCN Route 93
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

AECOM

Proposed 6C

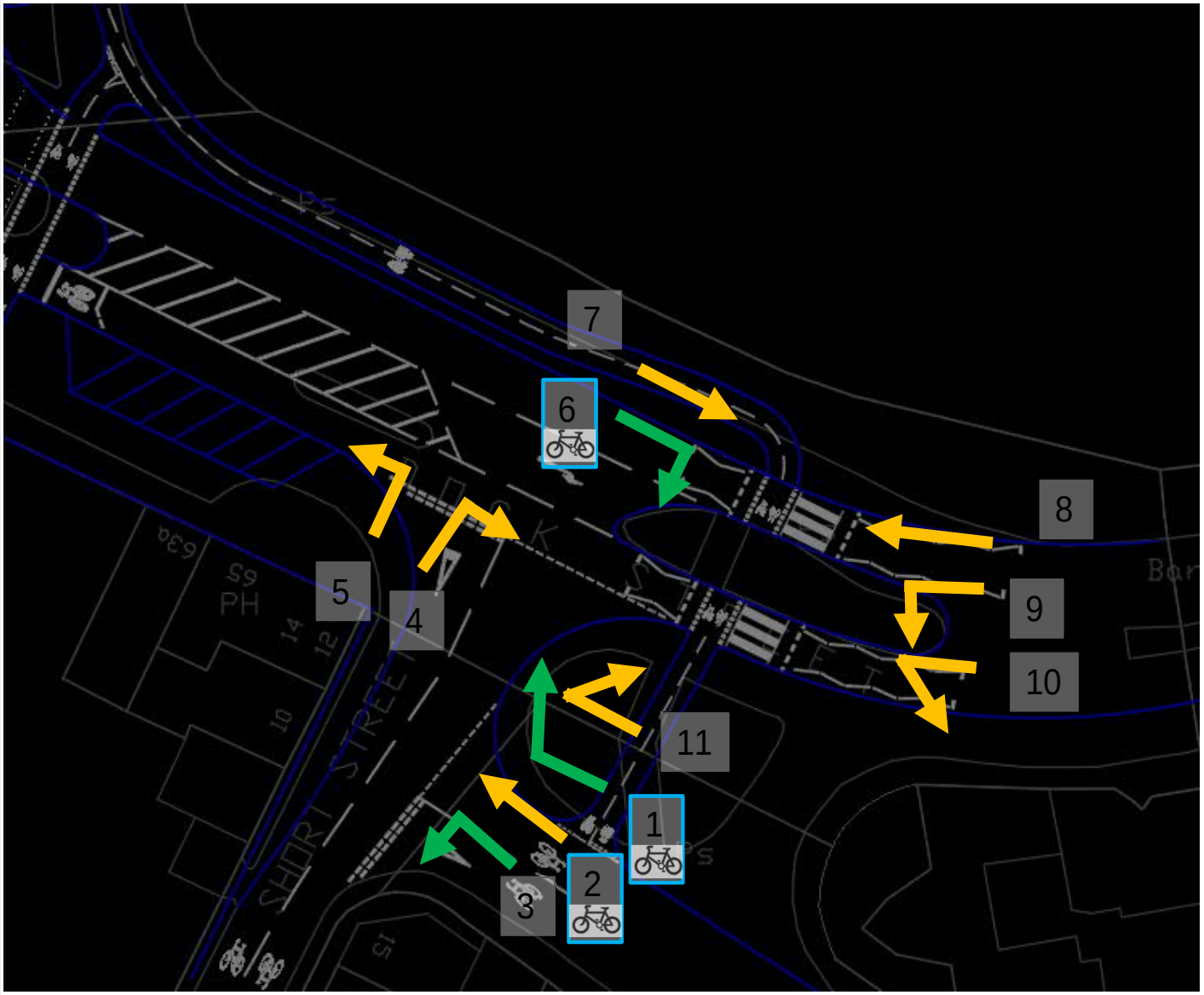
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	Cyclists provided with a two-way cycle track and dedicated parallel crossing facilities connecting to the existing NCN 93 route / Corporation St..
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	Cyclists provided with a two-way cycle track and dedicated parallel crossing facilities connecting to the existing NCN 93 route / Corporation St..
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m.
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	Dock Street is both straight and direct from its connection to Princes Dock Street
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	0	Five junctions where cyclists may be required to stop over the length of 620m (measured full length of Dock St/Brougham St).
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	2	Cyclists delay is similar at major junctions where they are included within the signal staging. However other movements bypass junctions or a given priority.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	Cyclists are provided with a 2.5m wide two-way cycle track and can choose an appropriate speed.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, though no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided with a segregated off-carriageway cycle track. Where mixing with traffic, speeds and volumes are low.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided with a segregated off-carriageway cycle track. Where mixing with traffic, speeds and volumes are low.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Cyclists are provided with a segregated off-carriageway cycle track. Where mixing with traffic, speeds and volumes are low.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Cyclists are provided with a segregated off-carriageway cycle track. Where mixing with traffic, speeds and volumes are low.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	1	Cyclists are given priority for the majority of movements. However their connection to / from Princes Dock Street / Short Street is via the carraigeway.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	1	Two-way cycle track plus buffer has a minimum width of 3.5m. However, shared use section has proposed parking running adjacent.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	Any existing lighting columns within the proposed cycle track will be relocated with a suitable distance from the cycle track.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Carriageway construction to be carried out to achieve a smooth high grip surface. Cycle track will be regularly inspected for quality and maintained.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Carriageway construction to be carried out to achieve a smooth high grip surface. Cycle track will be regularly inspected for quality and maintained.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended widths are maintained throughout the length of the route
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	1	As previous. However, potential for score 2 through placemaking and regeneration in the future.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	As previous, cyclists within separated two-way track; therefore, no impact to pedestrian comfort level.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure nonoverloaded areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	**43**	

Max possible score	50
Audit % score	86%
Pass/Fail (70% threshold)	**Pass**
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	8	80%
Safety	16	**14**	88%
Comfort	8	8	100%
Attractiveness	10	8	80%
	50		

G.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 6 – NCN 93

Junction 6.3 – Princes Dock Street / Dock Street

Overall Junction Score:

Cycle Network Score:

Note – Movement 4, 7 and 11 assumed to be taken via parallel crossing facility. Resurfacing of carriageway assumed to be included within proposals. Movements 2 and 5 assumed to be carried out using shared footway.

Cycle Strategy Route Review Junction 6.3 - Proposed

Movement		Score	0	1	2	Comment
	1	2			2	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	2	1		1	2	Cycle movement made by transiting onto section of shared use footway
	3	2			1	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	4	1		1	1	Central refuge allowing two-stage cycle movement crossing one traffic lane at a time.
	5	1		1	1	Cycle movement made by transiting onto section of shared use footway
	6	2			2	Low traffic speed and volume in mixed traffic environment (e.g. accessonly streets in a residential area).
	7	1		2		Cycle movement in potential conflict with moderate traffic flow.
	8	1		2		Cycle movement in potential conflict with moderate traffic flow.
	9	1		2		Cycle movement in potential conflict with moderate traffic flow.
	10	1		2		Cycle movement in potential conflict with moderate traffic flow.
	11	1		2		Cycle movement in potential conflict with moderate traffic flow.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

G.3 Pedestrian Comfort Levels Proposed Results

No longer in scope following the YSI client meeting, October 2021.

Appendix H – Corridor 7 | Whitla Street Subway

H.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Corridor 7 - Whitla Street Subway	Corridor 7 - Whitla Street Subway
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

Route Section	Proposed 7A

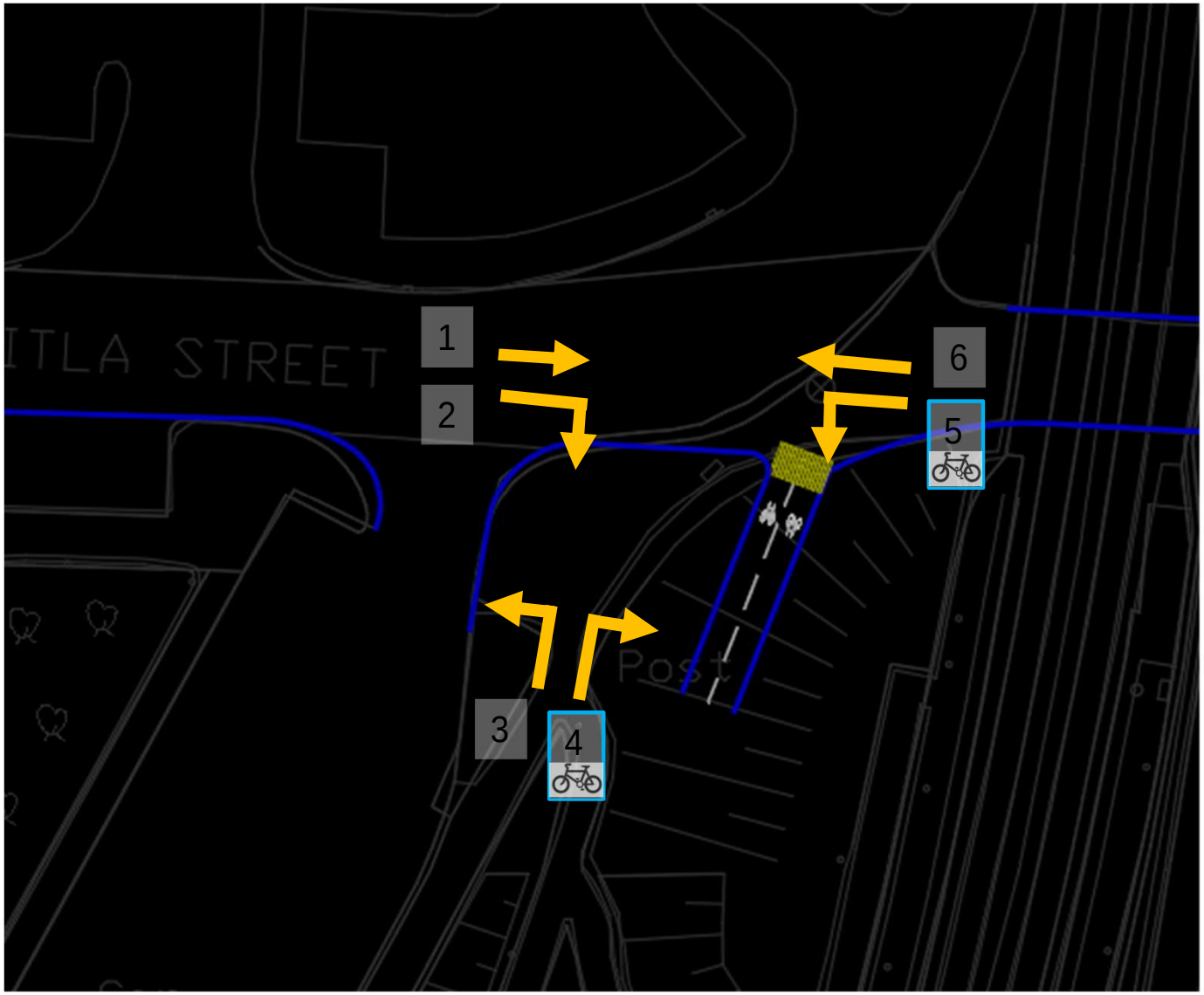
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Cyclists can connect to other sections of the network using shared use footway/cycleway running through Yorkgate Train Station and the underpass leading on to a toucan crossing connecting to NCN 93 / York Street connections.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	1	Cyclists can connect to other sections of the network using shared use footway/cycleway running through Yorkgate Train Station and the underpass leading on to a toucan crossing connecting to NCN 93 / York Street connections.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	The proposed cycle networks provide a mesh of routes across Belfast with a network density width between 250 - 1000m
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	Whitla Street Subway is both straight and direct.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	0	Three junctions over 200m route.
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	The route is a shared use and with removal of on-carriageway sections through introduction of shared footway/cycleway. Therefore, delay is reduced.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	1	The route is a shared use; therefore cyclists can travel at the same speed as pedestrians.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, though no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Access only, low speed route and shared use pedestrian / cycle underpass.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Access only, low speed route and shared use pedestrian / cycle underpass.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Access only, low speed route and shared use pedestrian / cycle underpass.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	1	Cyclist are proposed to be kept on to shared use footway/cycleway. Therefore, are segregated from motor vehicle traffic, but still interact with pedestrians.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	2	Cyclists will no longer be required to navigate Duncrue St through extension of shared space and enganced crossings / links to adjacent routes.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirement. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	Cyclists are away from the carriageway reducing kerbside conflicts.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	For more than half of the route cyclists are within a subway; therefore, are not at risk.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed route surface to be machine laid to achieve a smooth and level surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	1	Recommended width maintained
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting new lighting strategy will be undertaken to improve the underpass.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	0	Vegetation near the entrance and exit of subway to be removed, with other features blocking the entrance/exit to be reviewed to enhance passive surveilance. However, route may still appear isolated .
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Shared use route through subway impacting pedestrians, but approx. 5m wide.
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure none overlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	38	

Max possible score	50
Audit % score	76%
Pass/Fail (70% threshold)	**Pass**
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	3	50%
Directness	10	6	60%
Safety	16	**15**	94%
Comfort	8	7	88%
Attractiveness	10	7	70%
	50		

H.2 Junction Assessment Proposed Results



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 2 – York Street

Junction 2.6 – A2 York St / Yorkgate Station

Overall Junction Score:

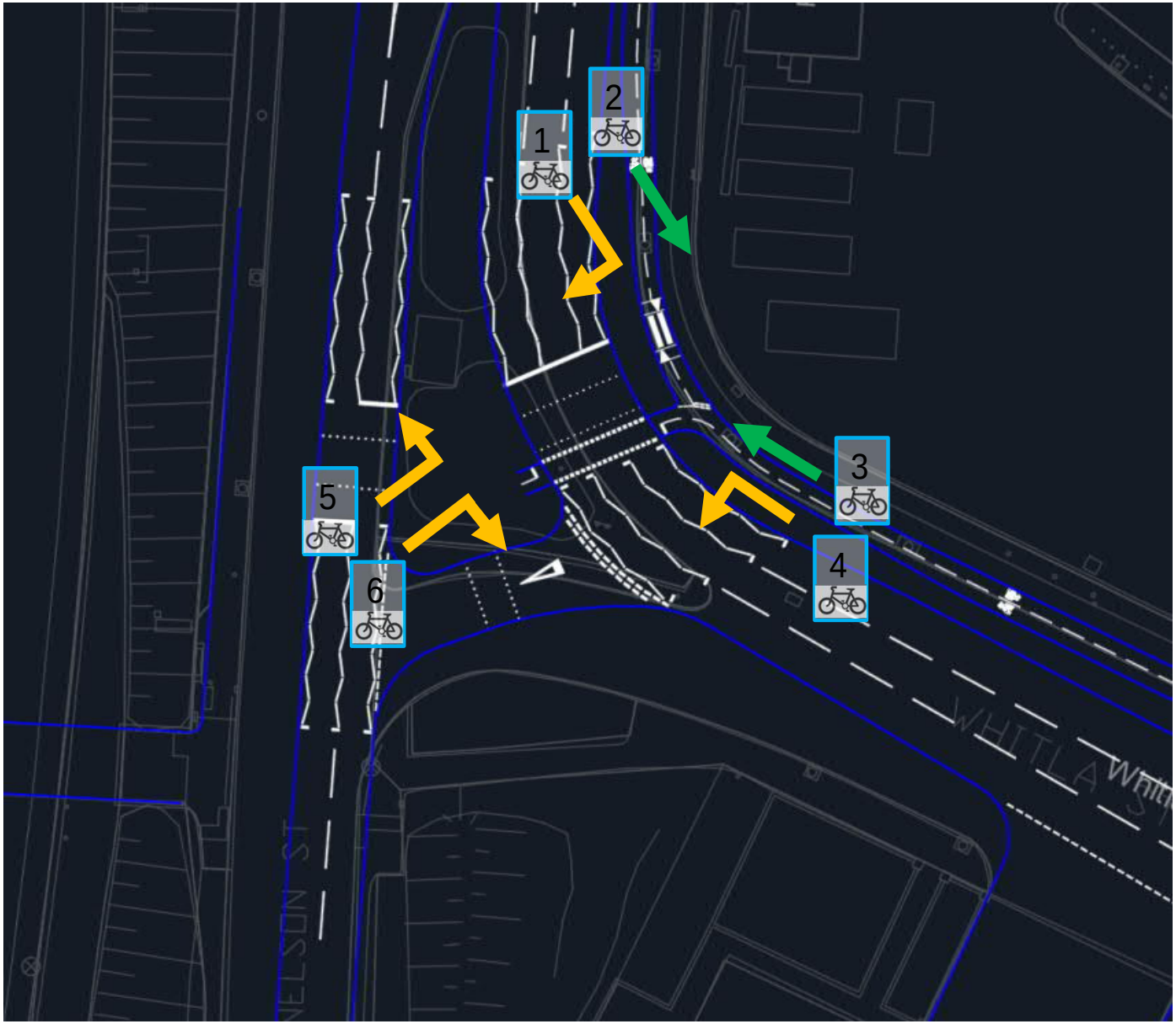
Cycle Network Score:

Cycle Strategy Route Review Junction 2.6 – Proposed

Movement	Score	0	1	2	Comment
1	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
2	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
3	1		1		Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
4	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
5	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.
6	1			2	Cycle lanes through junction meeting appropriate desirable minimum width requirements for the movement under consideration.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 5 – Corporation Street
Junction 5.4 – Duncrue Street / Whitla Subway

Overall Junction Score:

Cycle Network Score:

Note – Movements 1,4,5 & 6 to cross over to / from shared use footway via toucan crossing facility.

Cycle Strategy Route Review Junction 5.4 - Proposed

Movement	Score	0	1	2	Comment
1	1		1		Cycle movement made by transiting onto section of shared use footway
2	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	1		1		Cycle movement made by transiting onto section of shared use footway
5	1		2	1	Cycle movement made by transiting onto section of shared use footway
6	1		2	1	Cycle movement made by transiting onto section of shared use footway

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

H.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

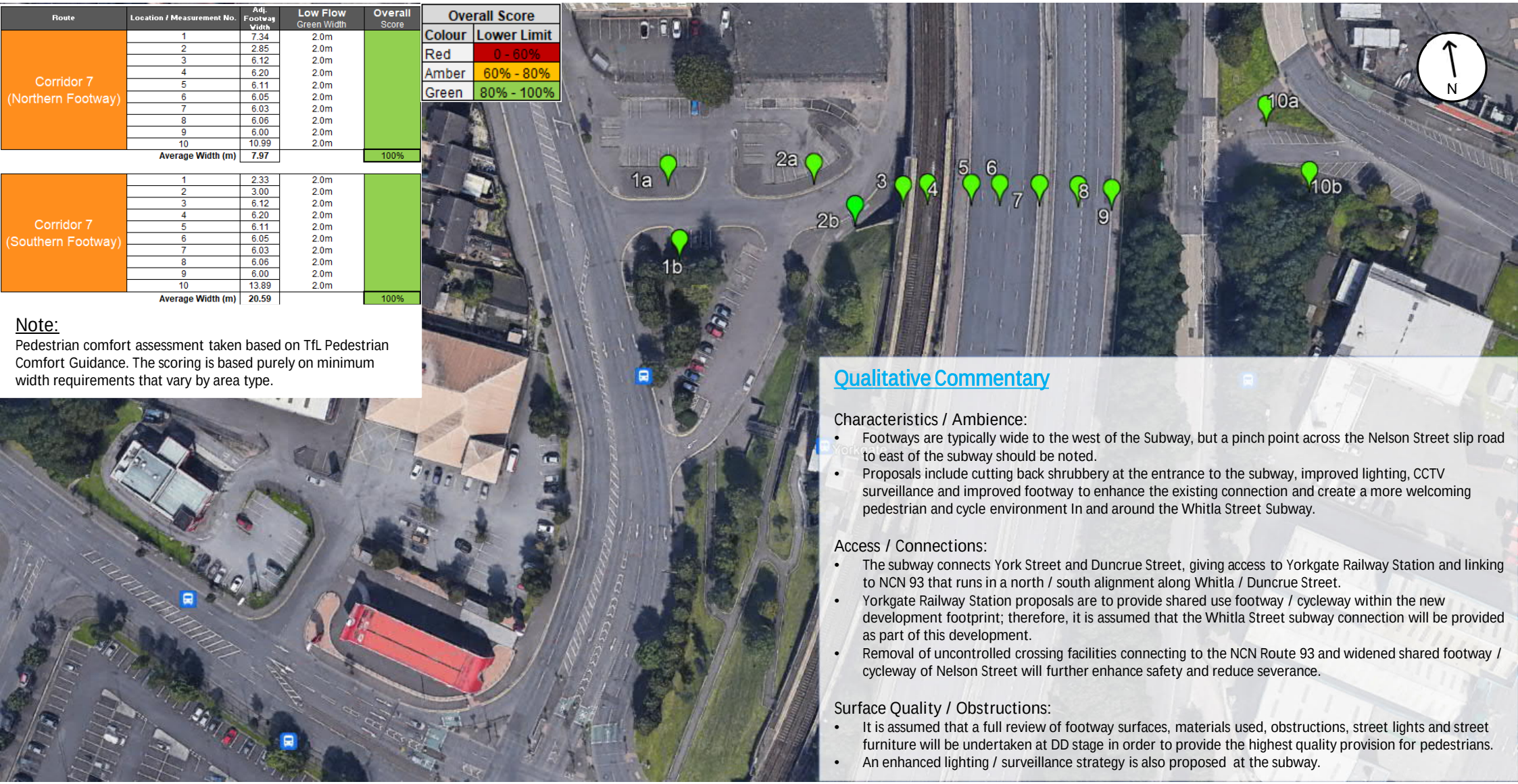
Corridor 7 – Whitla Street Subway

Route	Location / Measurement No.	Adj. Footway Width	Low Flow Green Width	Overall Score
Corridor 7 (Northern Footway)	1	7.34	2.0m	
	2	2.85	2.0m	
	3	6.12	2.0m	
	4	6.20	2.0m	
	5	6.11	2.0m	
	6	6.05	2.0m	
	7	6.03	2.0m	
	8	6.06	2.0m	
	9	6.00	2.0m	
	10	10.99	2.0m	
	Average Width (m)	7.97		100%
Corridor 7 (Southern Footway)	1	2.33	2.0m	
	2	3.00	2.0m	
	3	6.12	2.0m	
	4	6.20	2.0m	
	5	6.11	2.0m	
	6	6.05	2.0m	
	7	6.03	2.0m	
	8	6.06	2.0m	
	9	6.00	2.0m	
	10	13.89	2.0m	
	Average Width (m)	20.59		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.



Qualitative Commentary

Characteristics / Ambience:

- Footways are typically wide to the west of the Subway, but a pinch point across the Nelson Street slip road to east of the subway should be noted.
- Proposals include cutting back shrubbery at the entrance to the subway, improved lighting, CCTV surveillance and improved footway to enhance the existing connection and create a more welcoming pedestrian and cycle environment In and around the Whitla Street Subway.

Access / Connections:

- The subway connects York Street and Duncrue Street, giving access to Yorkgate Railway Station and linking to NCN 93 that runs in a north / south alignment along Whitla / Duncrue Street.
- Yorkgate Railway Station proposals are to provide shared use footway / cycleway within the new development footprint; therefore, it is assumed that the Whitla Street subway connection will be provided as part of this development.
- Removal of uncontrolled crossing facilities connecting to the NCN Route 93 and widened shared footway / cycleway of Nelson Street will further enhance safety and reduce severance.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.
- An enhanced lighting / surveillance strategy is also proposed at the subway.

Appendix I – Corridor 8 | Little Patrick Street

I.1 Cycle Level of Service Proposed Results

No longer in scope following the YSI client meeting, October 2021.

I.2 Junction Assessment Proposed Results

No longer in scope following the YSI client meeting, October 2021.

I.3 Pedestrian Comfort Levels Proposed Results

No longer in scope following the YSI client meeting, October 2021.

Appendix J – Corridor 9 | Clifton Street

J.1 Cycle Level of Service Proposed Results

Cycling Level of Service Assessment (CLoS) based on LTN 1/20		Proposed
Project Number	60571700	60571700
Scheme	Belfast - York Street Interchange	Belfast - York Street Interchange
Location	Section 9 - Clifton St	Section 9 - Clifton St
Date	24/05/2021	17/11/2021
Version Number	v0	v0
Assessment By	Luke Oddy	Sariyah Sait
Checked By	Joel Hawthorn	Luke Oddy

Route Section	Proposed 9A

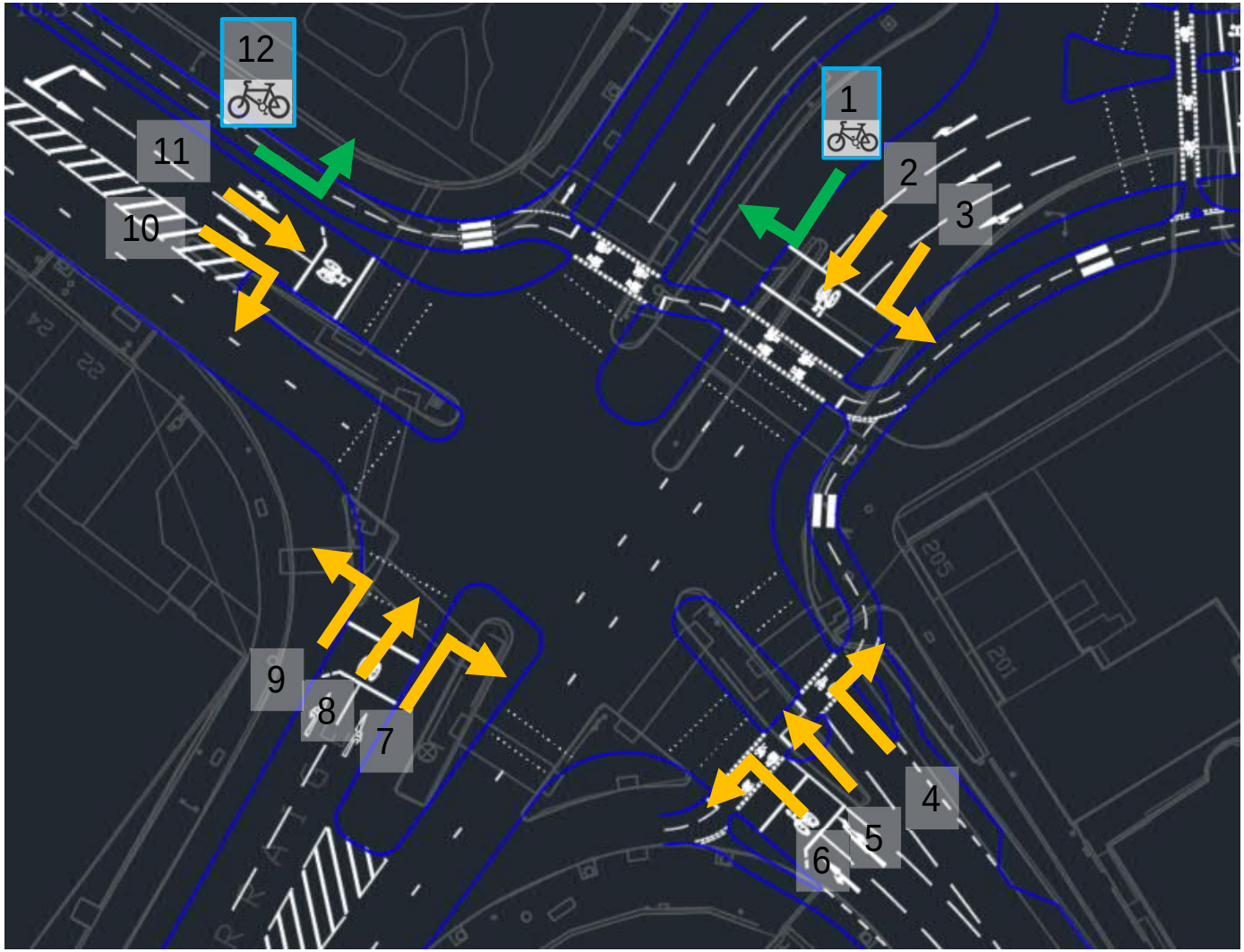
Cycling Level of Service (CLOS)

Key Requirement	Factor	Design Principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comments
Coherence	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	**1. Ability to join/leave route safely and easily** considering left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	2	A two-way cycle track allows cyclist to safely join/leave the route.
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed - cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	**2.Provision for cyclists throughout the whole length of the route**		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	2	A two -way cycle track is provided to allow cyclists to join the route via connecting junctions (North Queen St / Fredrick St junction) which have been strategically designed to provide segregated crossing facilities for cyclists.
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	**3.Density of routes based on mesh width** i.e. distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 - 1000m	Route contributes to a network density mesh width <250m	1	Route contributes to a network density mesh width 250 - 1000m.
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as the-crow-flies' distance as possible.	**4.Deviation of route** Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	Clifton Street is both straight and direct.
	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	**5.Stopping and give way frequency**		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	0	Three junctions over 325m route.
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	**6.Delay at junctions**		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (e.g. bypass at signals)	1	Cycle track is signalised at junctions, delay is similar to motor vehicles.
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	**7.Ability to maintain own speed on links**		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	Cyclists have a segregated cycle track which allows them to choose an appropriate speed to travel at.
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	**8.Gradient**		Route includes sections steeper than the gradients recommended in Figure 4.4	There are no sections of route steeper than the gradients recommended in Figure 4.4	There are no sections of route which steeper than 2%	2	Unknown, though no significant gradients observed.
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	**9.Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction**	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided with a segregated cycle track, motor traffic speed has no impact on cyclists.
			10.Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	2	Cyclists are provided with a segregated cycle track, motor traffic speed has no impact on cyclists.
	Avoid high motor traffic volumes where cyclists are sharing the carriageway.	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	**11.Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour**	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	2	Cyclists are provided with a segregated cycle track, motor traffic volume has no impact on cyclists.
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Table 6.2. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	**12.Segregation to reduce risk of collision alongside or from behind**	Cyclists sharing carriageway - nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	2	Cyclists are provided with a segregated cycle track reducing the risk of collision.
		A high proportion of collisions involving cyclists occur at junctions. Junctions there-fore need particular attention to reduce the risk of collision. Junction treatments include: - Minor/side roads : cyclist priority and/or speed reduction across side roads - Major roads : separation of cyclists from motor traffic through junctions.	**13.Conflicting movements at junctions**		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	2	Cycle track is on the northern side of the carriageway, the two untreated side roads (Trinity / Stanhope St) have no impact on cyclists. Cyclists are provided with priority at Henry Place giveway.
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	**14.Legible road markings and road layout**		Faded, old, unclear, complex road markings/unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout	2	New road markings to meeting TSRGD / LTN 1/20 requirements. Retained road markings to be remarked if required.
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	**15.Conflict with kerbside activity**	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (e.g. nearside cycle lane <2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity - e.g. less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	No conflicts with kerbside activity, cycle track + buffer is approximately 3.5m minimum.
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	**16.Evasion room and unnecessary hazards**		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	The 1.0m (min) buffer provides evasion room for cyclist.
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (e.g. from previous cycle lane)	**17.Major and minor defects**		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	Assumed appropriate carriageway resurfacing strategy and removal of none cycle friendly obstructions to be undertaken at DD Stage.
		Pavement or carriageway construction providing smooth and level surface	**18.Surface type**		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete paviours with frequent joints.	Machine laid smooth and non-slip surface - e.g. Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	Proposed carriageway surface to be machine laid to achieve a smooth and level surface.
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	**19.Desirable minimum widths according to volume of cyclists and route type** (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	2	Recommended width maintained
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	**20.Signing**		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Appropriate signage strategy to be undertaken / reviewed at detailed design stage.
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	**21.Lighting**		Most or all of route is unlit	Short and infrequent unlit/poorly lit sections	Route is lit to highway standards throughout	2	Assumed that proposed lighting will meet required highway standards and existing lighting will be maintained where possible.
			22.Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	2	The route is overlooked by heavy vehicular traffic and several frontages.
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well-used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	**23.Impact on pedestrians** Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 4.7)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	Cyclists have a segregated cycle track which indicates no interaction with pedestrians. Footway width is maintained, with slight reduction in width at junctions
	Minimise street clutter	Signing required to support scheme layout	**24.Street Clutter** Signs are informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	Appropriate signage strategy to be undertaken / reviewed at DD stage.
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on street	**25. Cycle parking** Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure nonoverlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	2	Review of appropriate cycle parking locations to be undertaken at DD stage in order to meet the expected demand..
							Audit Score	45	

Max possible score	50
Audit % score	90%
Pass/Fail (70% threshold)	**Pass**
Any Critical Fails? (Y/N)	No
Number of Critical Fails	0

Criteria	Max Score	Sub-criteria Proposed	% score Proposed
Coherence	6	5	83%
Directness	10	7	70%
Safety	16	**16**	100%
Comfort	8	8	100%
Attractiveness	10	9	90%
	50		

J.2 Junction Assessment Proposed Results



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AECOM

Project Number: 60571700

Project: Belfast - York Street Interchange

Corridor 9 – Clifton Street

Junction 1.1: B126 Carrick Hill / Clifton St

Overall Junction Score:

Cycle Network Score:

Note – Proposed unprotected on-street connection to / from Donegal Street (South-Eastern arm), with moderate traffic flows there all movements to / from scored 1. Cyclists on Carrick Hill (South-Western arm) assumed to be use shared-use footway and cross at toucan facilities therefore scored 1.

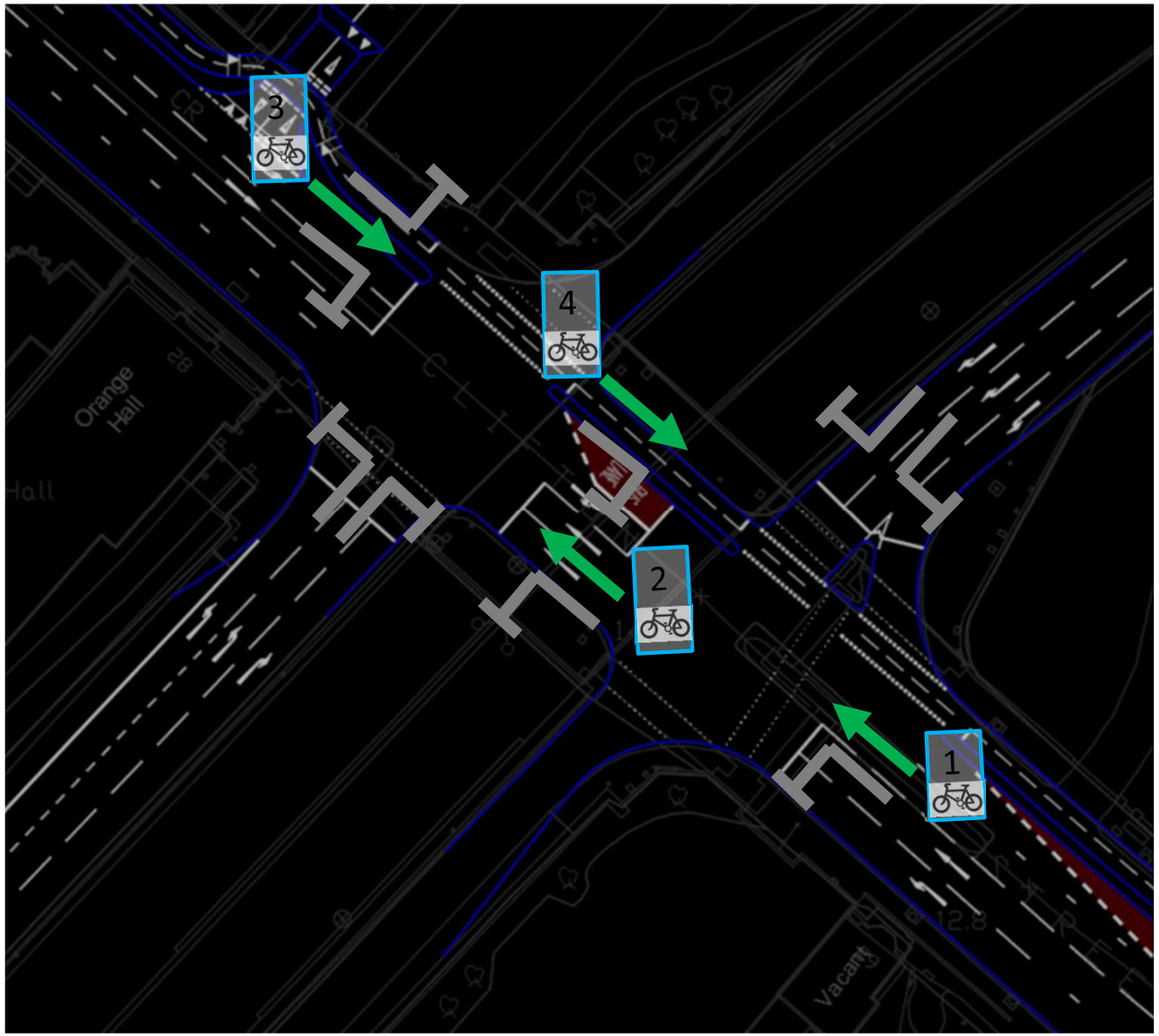
Future Belfast City Cycle Network proposals to enhance current proposals.

Cycle Strategy Route Review Junction 1.1

Movement	Score	0	1	2	Comment
1	2			4	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	1		1	3	Cycle movement made by transiting onto section of shared use footway
3	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
4	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
5	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
6	1		1	1	Cycle movement made by transiting onto section of shared use footway
7	1		3	1	Cycle movement in potential conflict with moderate traffic flow.
8	1		2	2	Cycle movement made by transiting onto section of shared use footway
9	1		2	2	Cycle movement made by transiting onto section of shared use footway
10	1		1	4	Cycle movement made by transiting onto section of shared use footway
11	1		1	1	Cycle movement in potential conflict with moderate traffic flow.
12	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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AECOM

Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 9 – Clifton Street

Junction 9.2: A12 Westlink / Clifton St

Overall Junction Score:

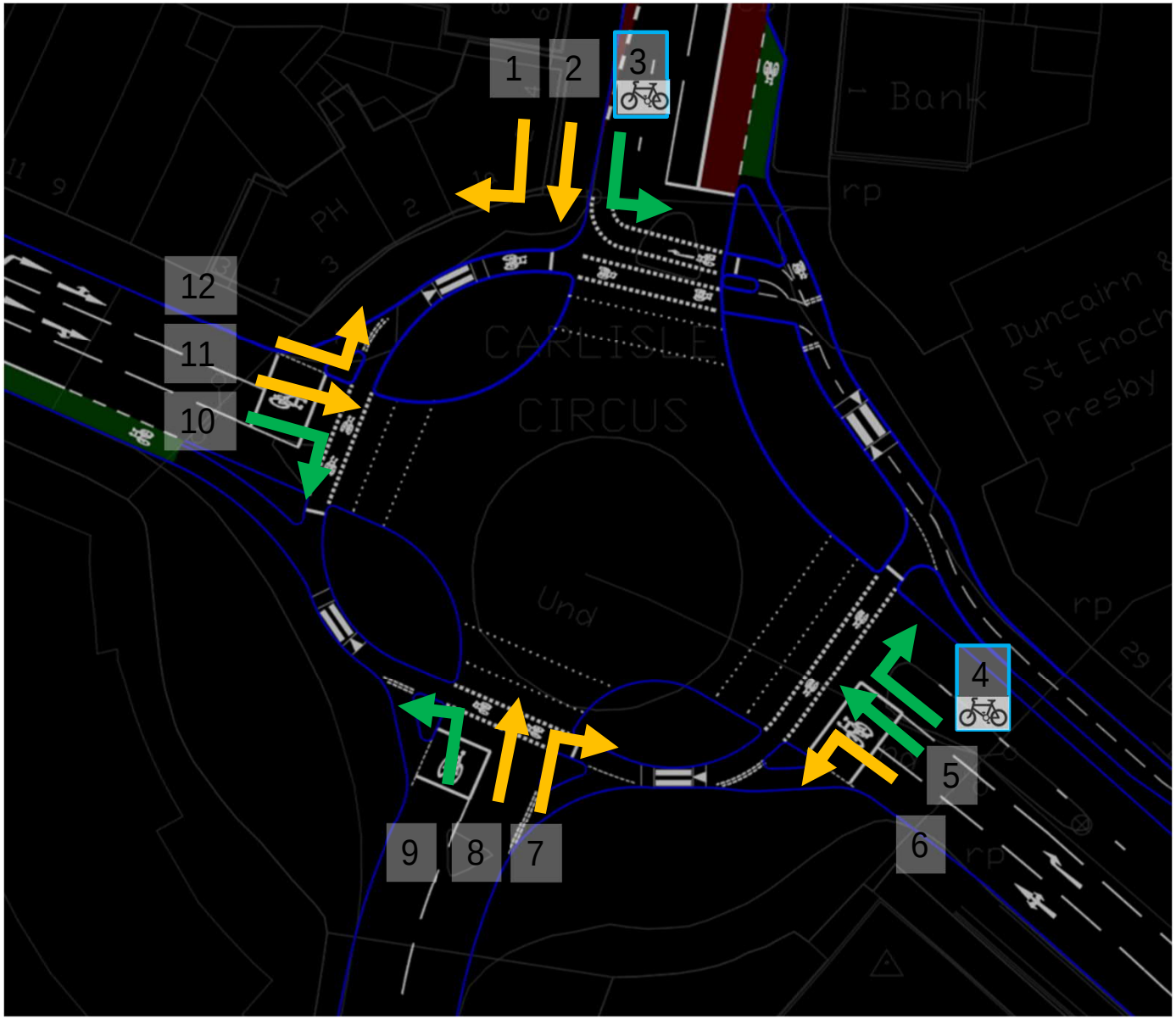
Cycle Network Score:

Cycle Strategy Route Review Junction 9.2 - Proposed

Movement	Score	0	1	2	Comment
1	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
2	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
3	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			2	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement



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AECOM

Project Number: 60571700
Project: Belfast - York Street Interchange

Corridor 9 – Clifton Street
Junction 9.3: Carlisle Circus

Overall Junction Score:

Cycle Network Score:

Cycle Strategy Route Review Junction 9.3 - Proposed

Movement	Score	0	1	2	Comment
1	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
2	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
3	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
4	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
5	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
6	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
7	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
8	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
9	2			3	Cycle movement separated physically and/or in time from motor traffic and also separated from pedestrians.
10	1		1	3	Cycle movement in potential conflict with moderate traffic flow.
11	1		1	2	Cycle movement in potential conflict with moderate traffic flow.
12	1		1	2	Cycle movement in potential conflict with moderate traffic flow.

Key

Suitable only for confident existing cyclists, and may be avoided by some experienced cyclists. Conditions are most likely to give rise to the most common collision types. Score = 0	Likely to be more acceptable to most cyclists, but may still pose problems for less confident or new cyclists. The risk of collisions has been reduced by design layout or traffic management interventions. Score= 1	Suitable for all potential and existing cyclists. The potential for collisions has been removed, or managed to a high standard of safety for cyclists. Score = 2	Movement banned or unable to be completed by cyclists within current design. Score = 0	Core Cycle Network Movement

J.3 Pedestrian Comfort Levels Proposed Results

Pedestrian Comfort Assessment

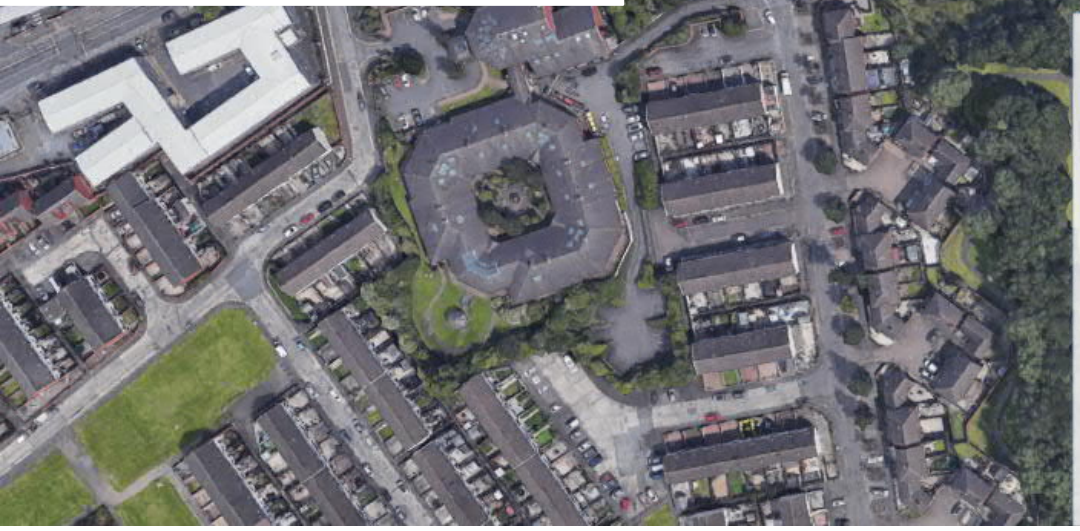
Corridor 9 – Clifton Street

Route	Location / Measurement No.	Adj. Footway Width	Low Flow <600pph Green Width	Overall Score
Section 9 (Northern Footway)	1	3.05	2.0m	
	2	2.95	2.0m	
	3	3.54	2.0m	
	4	2.00	2.0m	
	5	4.32	2.0m	
	6	2.41	2.0m	
	7	2.61	2.0m	
	8	2.42	2.0m	
	9	2.70	2.0m	
	10	2.63	2.0m	
	Average Width (m)	**2.86**		100%
Section 9 (Southern Footway)	1	2.30	2.0m	
	2	2.34	2.0m	
	3	2.93	2.0m	
	4	2.40	2.0m	
	5	4.73	2.0m	
	6	3.24	2.0m	
	7	4.63	2.0m	
	8	2.21	2.0m	
	9	2.91	2.0m	
	10	4.37	2.0m	
	Average Width (m)	**3.21**		100%

Overall Score	
Colour	Lower Limit
Red	0 - 60%
Amber	60% - 80%
Green	80% - 100%

Note:

Pedestrian comfort assessment taken based on TfL Pedestrian Comfort Guidance. The scoring is based purely on minimum width requirements that vary by area type.



Qualitative Commentary

Characteristics / Ambience:

- Footways are typically of moderate width, well lit and tree lined on either side of the carriageway;
- Clifton Street is a heavily trafficked route, providing dual lanes in either direction and access to the A12 Westlink.
- Proposals are to remove an eastbound lane to provide a kerb segregated two-way cycle track running adjacent to the northern footway, with existing footway widths maintained on either side of the carriageway.
- Proposals will provide segregation for pedestrians along the northern footway, separating them from traffic and creating a safer and more pleasant environment.
- Footway width are proposed to be maintained; therefore, impacts of the proposals will be limited.

Access / Connections:

- Footways are fronted by a mixture of residential buildings and businesses on either side of the carriageway;
- Footways connect residential areas to the west of the A12 Westlink towards the City Centre to the east;
- The main junctions along the corridor will be provided enhanced, signalised and segregated pedestrian crossing facilities.

Surface Quality / Obstructions:

- It is assumed that a full review of footway surfaces, materials used, obstructions, street lights and street furniture will be undertaken at DD stage in order to provide the highest quality provision for pedestrians.