Road Safety Matters

Road Safety Audit

Stage 1

For

WESTGATE VISION AREA

PUBLIC REALM/URBAN REGENERATION SCHEME

WESTGATE, DROGHEDA, CO LOUTH

Date: December 2023

Report produced for: Louth County Council

Report produced by: Road Safety Matters Ltd

Reference: RSM/MOB/081222/WESTGATE RSA1

Road Safety Matters Ltd
Urlingford Rd, Johnstown
Kilkenny, Ireland E41 W721
Tel +353 (0)56 883 8428
mobrien@roadsafetymatters.net
www.roadsafetymatters.net

Company Registration No 657952 VAT No IE 3649269UH

DOCUMENT CONTROL SHEET

Client	Louth County Council
Project Title	Westgate Vision Area Regeneration Scheme, Drogheda, Co Louth
Document Title	Stage 1 Road Safety Audit
Document Ref.	RSM/MOB/081222/WESTGATE RSA1
Status	FINAL

Record of Issue

Rev	Originator	Team Member	Date	Distribution
DRAFT 1	M O' B	AJS	16/5//23	Ken Hegarty, Hegsons Design Consultancy Limited Paul McMonagle, Turley
FINAL	M O' B	AJS	7/12/23	Ken Hegarty, Hegsons Design Consultancy Limited Paul McMonagle, Turley

BACKGROUND INFORMATION

The report which follows is the Road Safety Audit (RSA) - Stage 1, for the proposed improvements to the Westgate Area of Drogheda, Co Louth, based on the information supplied to the RSA Team as detailed below. The scheme is an urban realm and streetscape scheme designed to enhance multimodal accessibility within the Westgate Vision Area. The proposals will involve Kerb realignment, new pedestrian and cycling facilities, new public lighting, feature paving, and street furniture, landscaping, reconfigured parking areas and controlled and uncontrolled pedestrian and cycling crossing treatments, along with all associated ancillary works.

Table 1: Information Supplied

Item		Supplied	Comment
A	Plans / Drawings	Y	SEE DOCUMENT ISSUE REGISTER APPENDIX C
			LOUB3004_Combined Site Plan_RevF.PDF
			HDC1257-001-Engineering Layout.pdf
B	Traffic Volume Information	N	
C	Speed Count Data	N	
D	Collision Data	Y	
E	Departures from Standards	N	
F	Audit Brief	Y	RSA 1 – Preliminary Design Audit
G	Other Data / Documents	N	

TABLE OF CONTENTS

1. INTRODUCTION

1.1 This report results from a Stage 1 Road Safety Audit (RSA) and Disability Audit for the Urban Realm and Streetscape proposals for the Westgate Area in Drogheda, Co Louth, undertaken at the request of Turley Associates on behalf of Louth County Council. This Audit examines the road safety implications associated with the construction of a new Public Plaza and Public Realm Works on the streets listed below, which are at the location shown in figure 1 and within the area highlighted in the red line boundary in figure 2.

- R132 St George Square
- R900 Narrow West Street
- R900 Fair Street
- Father Connolly Way
- Dominic Street
- St Patrickswell Lane
- Old Abbey Lane
- Scholes Lane

The works include controlled and uncontrolled pedestrian crossing points, kerb buildouts, new paving, landscaping, new street furniture and all associated ancillary works, including car parking reconfiguration. The extent of the site proposals have been shown in proposals indicated on figure 3.

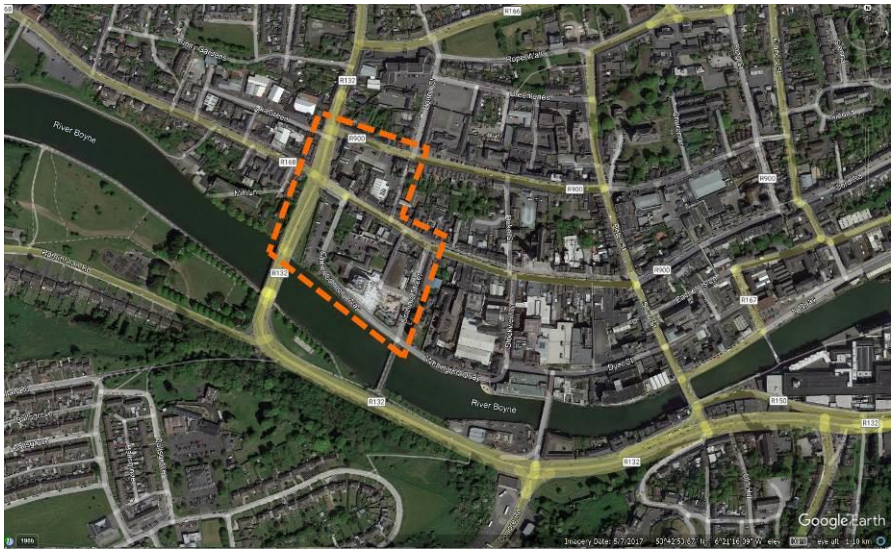


Figure 1: Site Location Plan

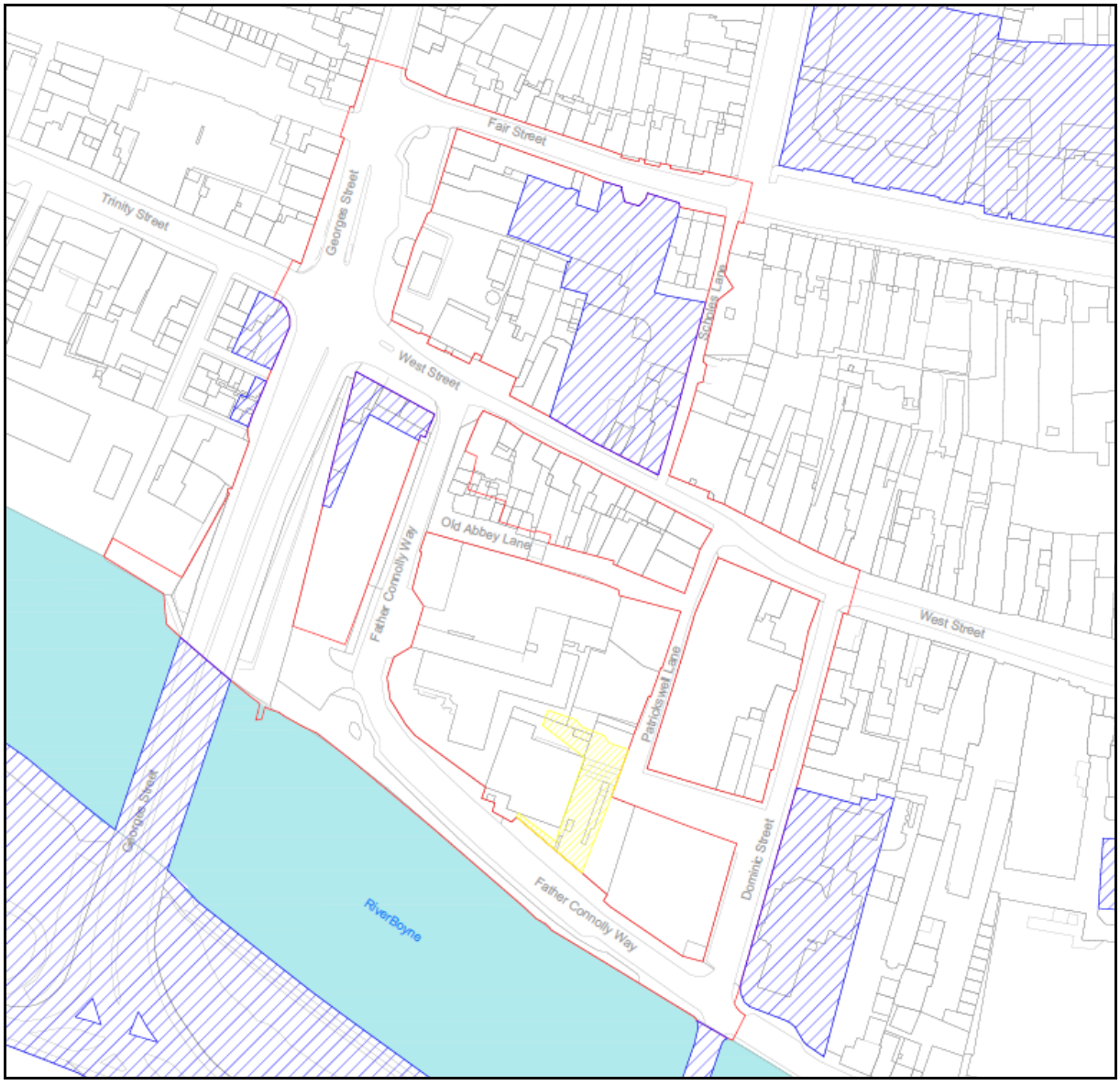


Figure 2: Site Red Line Boundary

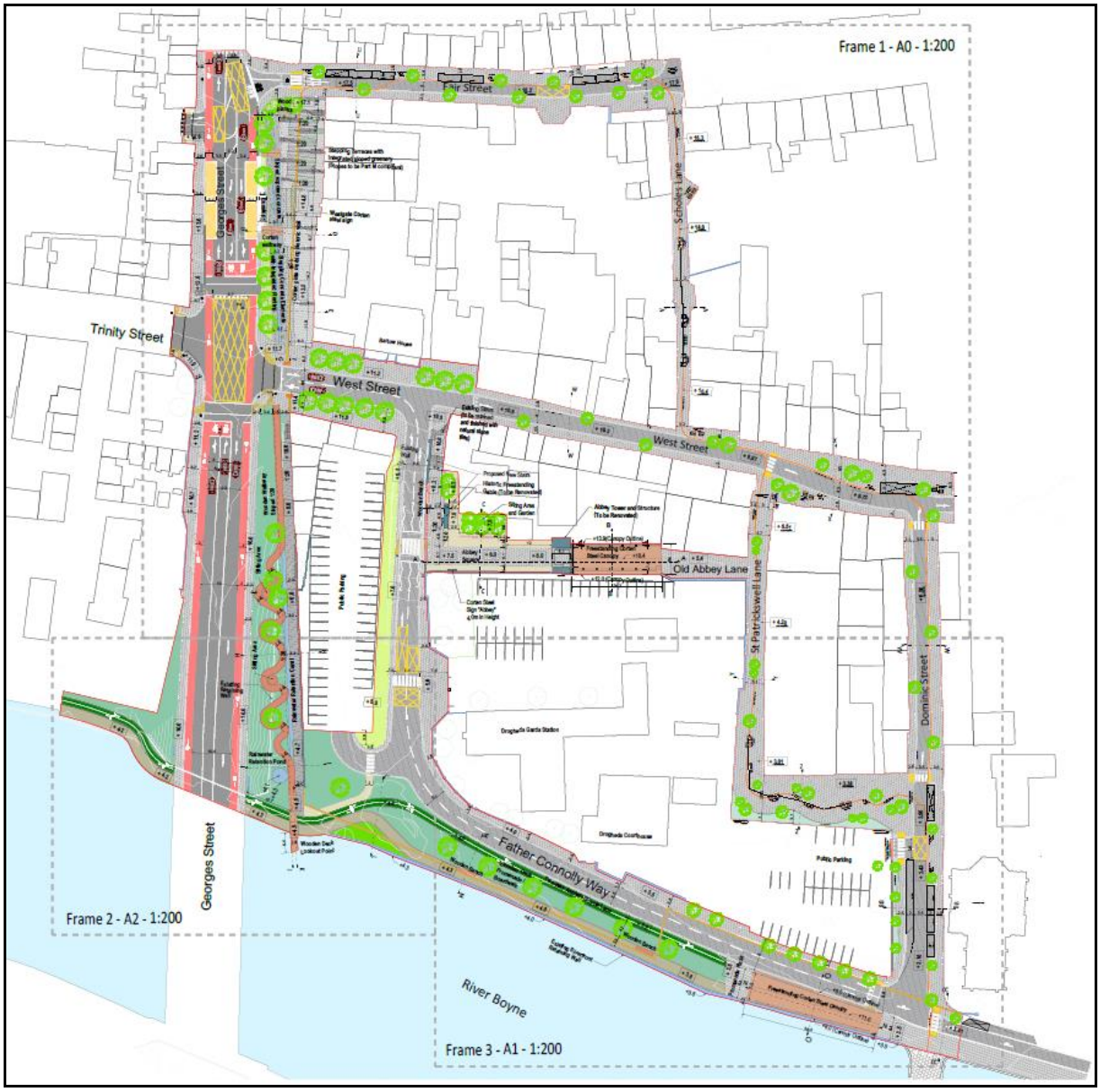


Figure 3: Internal Site Proposals

1.2 The RSA was carried out during May 2023 and included a site visit by the Audit Team on Thursday 8th December 2022 during daylight hours. The weather at the time of the site visit was fine and dry, and the surface of the road was predominantly dry. Traffic conditions were moderate, and the posted speed limit at the site was 50 km/hr. Vulnerable Road User (VRU – including pedestrians and cyclists) activity was relatively low at the time of the site visit on most of the links throughout the site, however a moderate level of pedestrian activity was noted at some locations within the site.

1.3 The Audit Team Membership was as follows;

Team Leader:	Miriam O'Brien – BE(Civil) FIHE MIEI MCIHT SoRSA CoC
Team Member:	Anthony Sumner – HNC Civil Eng, AEng, MIEI, MCIHT

1.4 The Audit took place at the offices of Road Safety Matters Ltd following the site visit by the Audit Team. The Audit was undertaken in accordance with the Design Team's Audit Brief, and comprised an examination of the drawings provided by the Design Team, as listed in Background Information, Table 1.

1.5 The terms of reference of the Road Safety Audit are as described in TII GE-STY-01024 December 2017 and the Design Manual for Urban Roads and Streets (DMURS). The team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

1.6 Section 2 of this report contains issues raised by the current Stage 2 Road Safety Audit, together with recommendations to be considered. Section 3 contains the Auditor Team Statement. Most issues raised in Section 2 can be cross-referenced with the scheme drawings (**Appendix C)** and photographs taken on the site visit (**Appendix B**) along with labelled Figures and Photos within the body of the report where necessary.

2. ISSUES RAISED BY THE STAGE 2 ROAD SAFETY AUDIT

2.1 GENERAL

2.1.1 The designers have not advised of any departures from standard.

2.1.2 There was no information provided relating to long sections for any of the examined streets.

2.1.3 There was no 85th percentile speed survey data provided for any of the streets within the site.

2.1.4 Observation – Collision History at Site

No information was provided on any existing collision statistics throughout the scheme area. A review of the Road Safety Authority (RSA) online collision database was not possible at the time of writing of this report, to determine the extent of existing available collision records in the Westgate area, which is located within an urban zone where risks for VRUs are typically higher. A number of existing risks were noted on the current layout, which have not been fully addressed on the proposed design layout, as detailed further in this Stage 1 RSA report, and may present ongoing risks to road users.

Recommendations

The final layout through the site should take into account any existing risks and collision evidence for the extent of the scheme area at detailed design stage, to include a review of all existing Local Authority / Gardaí collision records on the network, including any damage only collisions, with provision for any necessary remediation to reduce identified risks and ensure that a safe layout has been provided for all road users in the locality, particularly VRUs.

2.1.5 Problem – Traffic Volumes and Emergency Access Generally

There was no information provided on existing traffic volumes at the site, including the proportion of vehicles turning to and from multiple access points and junctions, and including anticipated traffic volumes for any permitted developments in the area where vehicular access to parking or access on foot or by bicycle will be required, e.g. the proposed pedestrian link under the Bridge of Peace to access proposed apartments off Mill Lane.

Elsewhere existing vehicular access is likely to be restricted by the design proposals at a number of locations in the scheme area, including the rear of a significant number of properties, locations where there are existing dropped kerbs, and the rear of the courthouse on St Patrickswell Lane. The provision for safe unobstructed emergency vehicle access to a number of areas of the site is unclear due to proposals for street furniture inclusive of landscaping and street furniture.

Figure 3: Existing Parking and Vehicular Access to Courthouse on St Patrickswell Lane

Figure 4: Existing Congestion and blocked Junction on George's St

Recommendations

1. The detailed design for the site should take into account all anticipated traffic on the roads through the scheme area, incuding additional traffic which may arise and which may require new or amended access for any committed developments in the locality.

2. The final layout for the scheme should take into account existing and anticipated turning movements at all junctions at the site, and the junction layout, form and rights of way at each conflict point should be clear and unambiguous for all road users.

3. The extent of any queues arising at junctions throughout the site should be assessed at peak times, to demonstrate that the junction layouts will safely accommodate all anticipated traffic volumes and will not impact on the safe and independent operation of the nearby junctions and intersection points.

4. Provision should be made for reinstatement of yellow box markings and suitable dropped kerbs at all locations where vehicular access is required, and clear visibility and intervisibility should be provided at all potential conflict points throughout the site, including at tie-ins.

5. Clear visibility should be provided to the rear of all anticipated queues at junctions and controlled VRU crossing points to minimise the risk of rear shunt collision.

6. Provision should be made for unobstructed emergency vehicle access to all relevant areas of the site and to all areas where private parking is currently provided, with provision for dropped kerbs where relevant. Provision should also be made for reinstatement of yellow box markings at locations where unobstructed vehicular access is required.

7. The final layout for the Westgate Scheme area should be subject to suitable worst case scenario swept path analysis for the largest anticipated vehicle sizes.

8. The cross-section widths throughout the site and at scheme tie-ins must be sufficient to cater safely for all anticipated traffic movements at all times, with a minimum clearance of 600mm to be provided between solid continuous boundaries/walls and the edge of running lanes, and with sufficient safe segregation to be provided on routes where pedestrian access is to be provided, with any sections where pedestrians cannot safely pass to be clearly signed.

2.1.6 Problem – Site Clearance Generally

The provision for reinstatement or removal of a number of existing features on the site has not been included on design drawings, including existing kerbs, redundant road markings, parking metres, parking signs, redundant or relocated road signs, bollards and chamber covers where levels will be affected. A large existing sculpture adjacent to the Bridge of Peace has not been shown on the proposed design plans. And an existing footway is being removed from a desire line at this location, as shown in figures 5 and 9.

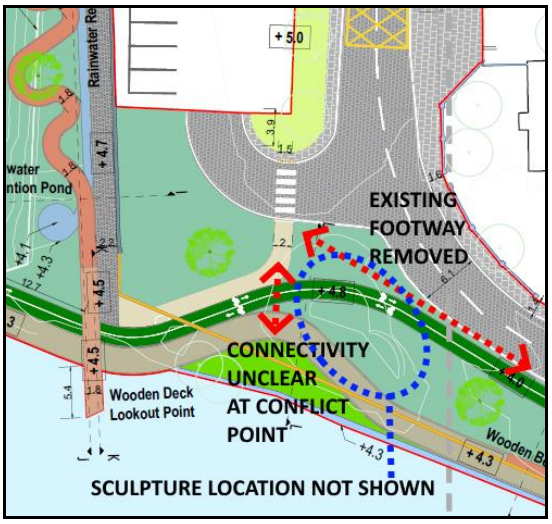


Figure 5: Existing Sculpture, hedges and footway to be removed To construct cyclepath and Riverside Footway

Figure 6: Existing Sculpture, hedges and footway to be removed

Figure 7: Utility Poles obstructing narrow Footways with no clearance to carriageways

Figure 8: Walls to be removed from River Bank and other areas of site

Recommendations

1. Detailed design should include details of all site clearance proposals, taking into account issues raised in this Stage 1 RSA report, to include all street furniture where relevant, including the sculpture opposite the Garda Station on Father Connolly Way. All retained or relocated features should be placed in a location which does not obstruct or cause a hazard to road users.

2. The final location of all street furniture should not obstruct VRUs, with a minimum offset of 450mm to be provided between all street furniture and the carriageway edges, to minimise the risk of being struck by passing vehicles.

3. Detailed design and site clearance should include details of treatment of all utilities, including poles, cabinets and chamber covers, with final locations to minimise risks to road users, particularly VRUs.

2.1.7 Problem - Parking Demands Generally

The cumulative parking demands for the Westgate area are unknown. Existing parking bays are being removed from a significant number of locations throughout the site, e.g. along the southern boundary of Father Connolly Way, and to the south of the junction of George's Street and Fair Street, and the provision for replacement parking elsewhere within the area has not been shown on the proposed layout plans. New parking bays are shown at some locations, however the provision for replacement of parking meters on narrow footways adjacent to some of these proposed parking bays has not been shown. Obstructions on narrow footway may prevent safe movement for pedestrians, particularly those who are mobility impaired, and may force pedestrians to step out into the carriageway into the path of oncoming vehicles.

A number of the proposed parking bay dimensions are also narrow, including disabled parking bays. Insufficiently wide parking bays are unlikely to cater safely for parking demands for larger cars and vehicles. The risks to cyclists travelling on narrow cross sections adjacent to parallel bays is also increased where bays are too narrow, with a higher likelihood of obstruction arising for cyclists due to car doors opening onto the carriageway. Elsewhere proposed loading bays are

also too narrow, which will present difficulties for larger vehicles loading and unloading in a confined space, with increased risk of obstruction for passing and turning vehicles. The proposed design does not include for signage adjacent to loading bays, or disabled parking bays, where further obstructions and potential overhead hazards may arise. Motorists may misinterpret the function of the area where there is no clearly defined markings or signage, and vehicles may park on footways, or partially block footways, where there is no provision for clearly defined kerbs or where flush kerbs are proposed, which would block access for pedestrians and those who are mobility impaired, potentially forcing them out onto the carriageway into the path of oncoming vehicles. Poorly defined areas without visual distinction, standard kerbs or tactile guidance in shared space areas also present difficulties for those with visual impairment, particularly in spaces where electric vehicles will be used, which have lower audible levels. The site proposals do not include for blue coloured surfacing on disabled parking bays to further highlight the function of the space. Elsewhere parked vehicles will obstruct visibility to and from oncoming vehicles, leading to an increased risk of right-angled collisions and pulling out type incidents, as detailed further in section 2.2 of this Stage 1 RSA report.

Figure 9: Parking bays, metres and existing footway to be removed on Father Connolly Way

Figure 10: Parking Bays, signs and metres to be removed from St Patrickswell Lane

Figure 11: Existing Parking to be removed at location of proposed corten plate, walkway and stepping terraces, south of Fair Street

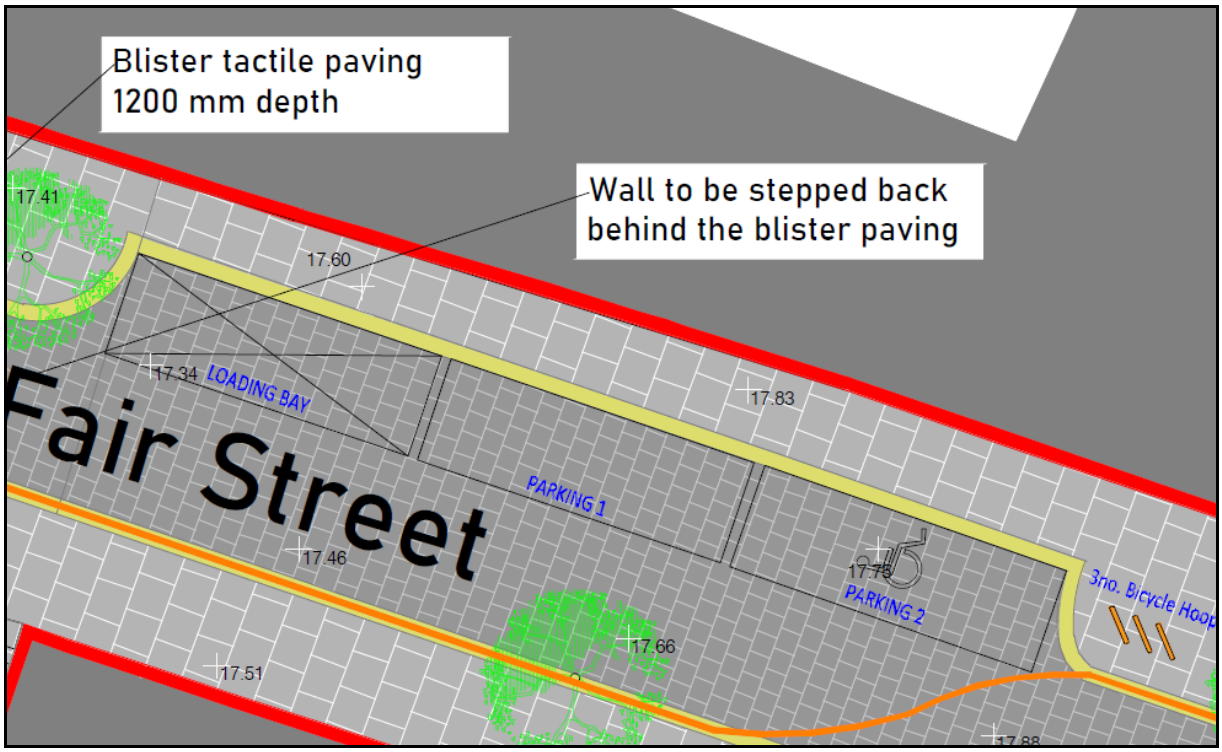


Figure 12: Proposed Narrow loading bay on Fair Street

Figure 13: Narrow footway on Dominic Street where parking is being removed from eastern side. Note: No provision for replacement double yellow lines on any links

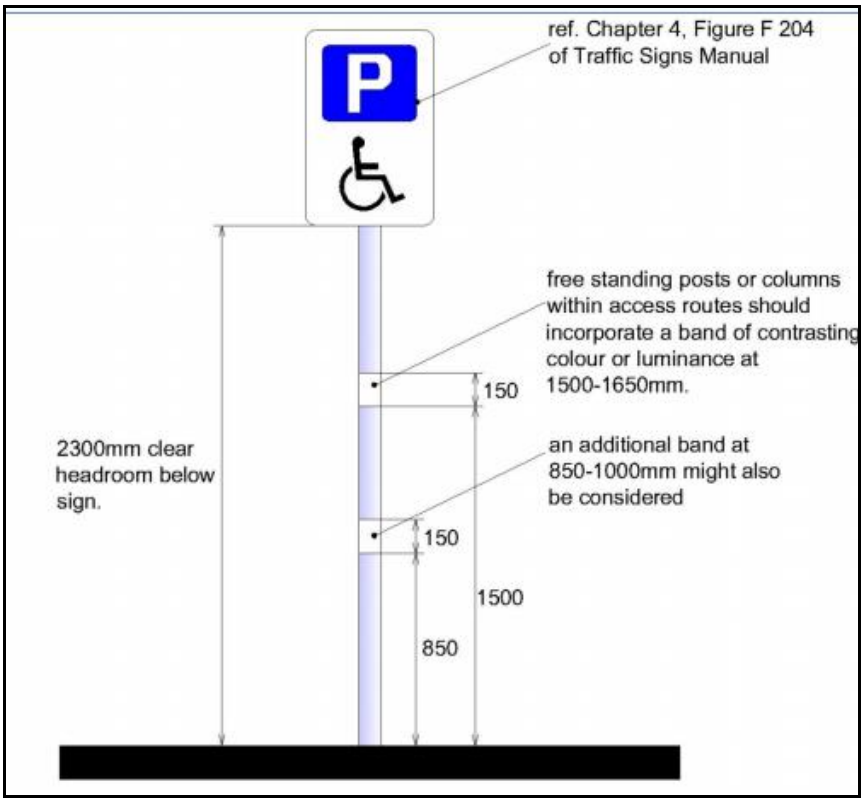


Figure 14: Standard Requirements for Signage on Disabled Bays

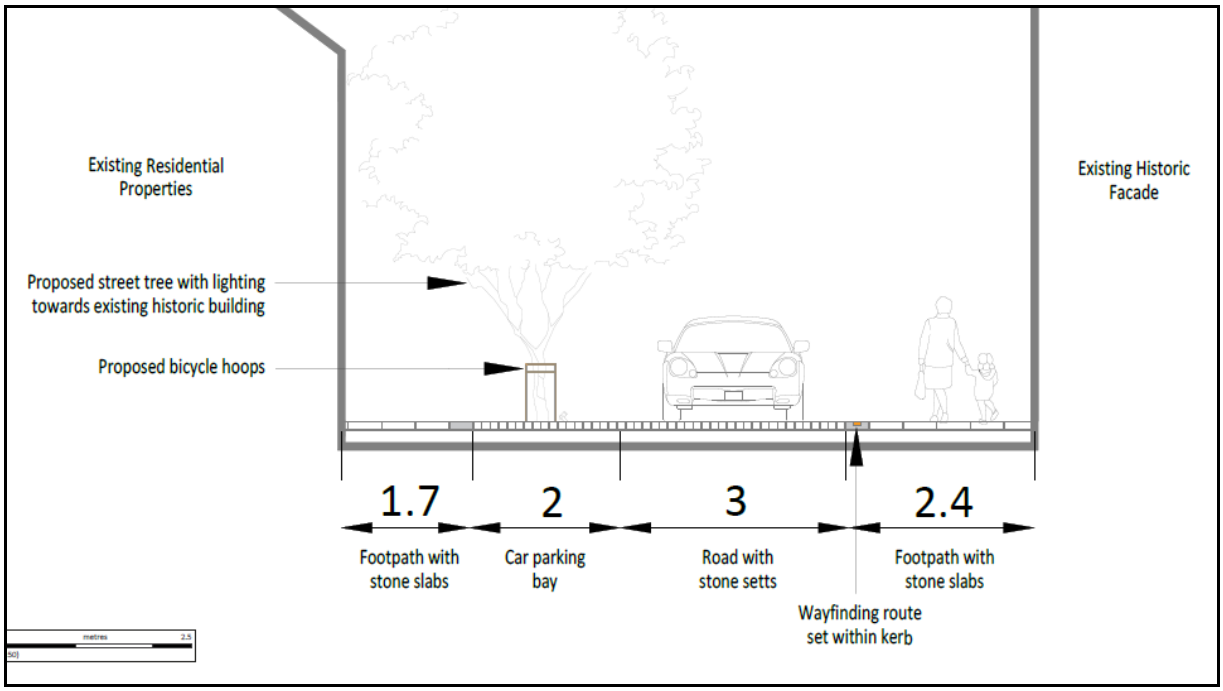


Figure 15: Narrow Parking Bay Width
(Section U-U Fair Street)

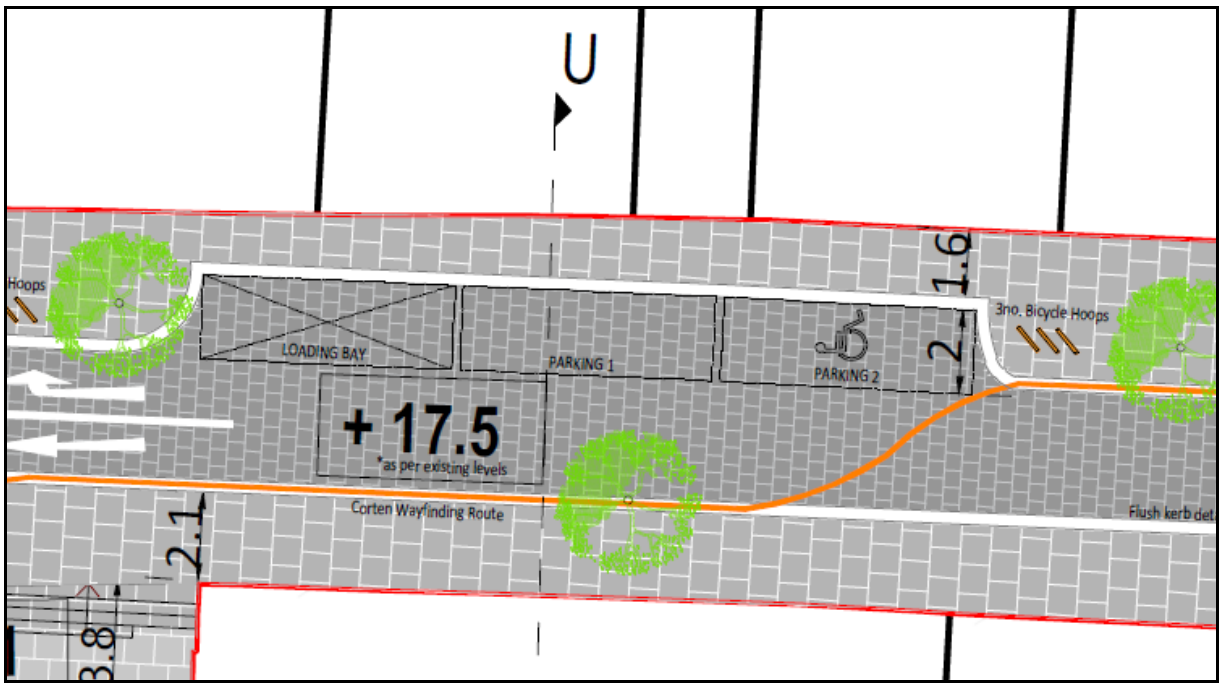


Figure 16: Narrow proposed disabled bay on Fair Street with narrow footway adjacent

Figure 17: Narrow proposed parking bays on Fair Street with narrow footway adjacent

Recommendations

1. Cumulative parking demands should be assessed for each section of the site to ensure supply caters for anticipated demand, including demands for parking in adjacent sections of the site which are outside the red line boundary.

2. Suitable parking restrictions should be provided at all locations where parked vehicles may obstruct safe vehicular or pedestrian movements or may obstruct visibility and intervisibility, to include provision for yellow box markings and double yellow lines where necessary, particularly on approaches to junctions and busy access points where parked vehicles may present visibility splay obstructions.

3. Public Pay and Display parking and associated metres should be included within the general pay and display street parking system, to include the locations of any required parking meters. Parking metres, and all other street furniture throughout the site must be located in positions which do not obstruct movements for VRUs, particularly disabled users, and those with buggies and wheelchairs. Private car parking spaces should also be clearly signed and lined.

4. Provision should be made to accommodate safe alighting and movement adjacent to parking spaces for those who are sensory impaired or mobility impaired, including those in wheelchairs. All disabled parking spaces should be configured in line with standard requirements, to include coloured surfacing, suitable signage and symbology, and sufficient widths on footways adjacent to ensure passengers can alight, wait and circulate safely away from areas where vehicles will be passing and where the risk of conflict is higher. Signs must not obstruct VRU movement, and all final sign locations throughout the site must be sited with the edge of sign faces provided at a minimum 450mm from the kerb edges, at a suitable mounting height.

5. All parking bay dimensions should be sufficiently wide to cater for the most frequent vehicle types (e.g. SUVs) and wider where necessary on routes with limited cross section, with the minimum advisable widths for parallel bays being 4.8 x 2.4m, and wider where the adjacent carriageway cross section is reduced and where cyclists may be travelling on a shared

space, with a buffer zone of 1m ideally provided adjacent to parallel parking bays where the adjacent traffic lane is shared by motorised vehicles and cyclists. The dimensions of all proposed parking bays and loading bays should also comply with the requirements of the Louth County Development Plan standards 2021-2027[1].

6. All loading bays should be standardised widths, typically minimum 3m, to cater for larger vehicle sizes turning in and out of the bays, and should not be located in close proximity to junctions where a vehicle stopped or parked to load or unload may restrict turning movements for larger vehicles.

7. A continuous unobstructed footway width of 2m should ideally be provided to the rear of all parking spaces throughout the site to prevent the need for pedestrians, particularly the mobility or visually impaired, to have to walk within traffic aisles adjacent, in potential conflict with circulating, turning and reversing vehicles.

2.1.8 Problem – Vehicle Speeds and Speed Limits

There was no 85th percentile speed survey information supplied to the Audit Team. The current posted speed limit for the Westgate area is 50 km/hr and there is no provision in the design drawings for reduced speed in areas where a high proportion of circulating VRUs should be anticipated in the urban zone, where the principals of the Design Manual for Urban Roads and Streets (DMURS) are applicable. A 50 km/hr speed limit would be inappropriately high for a site of this nature. It was noted that observed speeds on Father Connolly Way appeared relatively high. There is no provision for traffic calming on the long section of this link, aside from the raised table at the intersection with Dominic Street. VRU volumes and demands to cross the carriageway at this location may be higher in summertime, with additional desire lines to cross the carriageway to access the River likely, particularly as the existing footway along the southern boundary of the link is being removed, as outlined previously.

[1] Refer to Section 16 of the DoEHLG/DoT/DTO Traffic Management Guidelines and to the Metric Handbook Planning and Design Data (3rd Edition) and to the Design Manual of Roads and Streets DMURS (as amended).

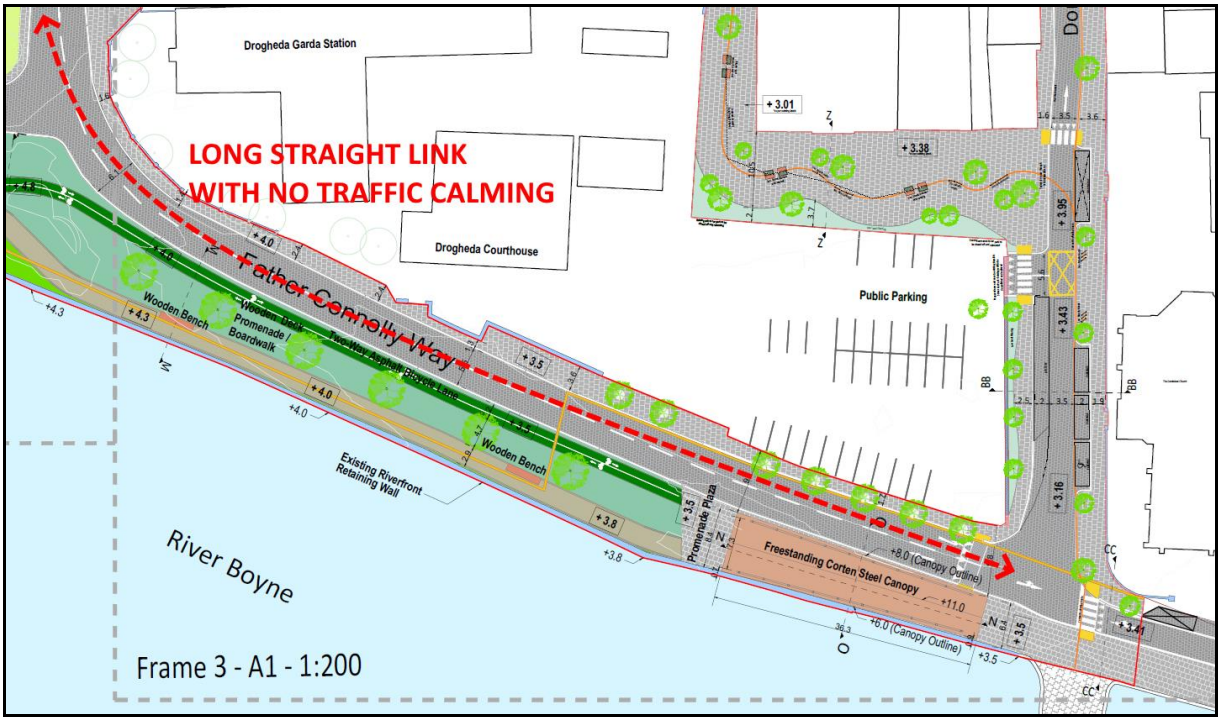


Figure 18: High observed speeds on long straight section of Father Connolly way

Recommendations

1. Existing and anticipated speeds should be considered on all links through the Westgate area, and areas where increased VRU demands to cross are likely to arise as a direct result of the site proposals, with provision for suitable traffic calming on long straight links and where vehicle speeds may be high or intervisibility compromised. Design should include post construction speed monitoring with additional remediation as necessary.

2. Low speeds should be encouraged throughout the site, where VRUs should have greater priority in accordance with the principles of DMURS[2], with provision for vertical deflection where possible on all points where likely VRU desire lines will arise, and where relatively high

[2] DMURS - Design Manual for Urban Roads and Streets, seeks to reallocate roadspace for the benefit of VRUs and the prioritisation of VRU movements. Studies have shown that at an impact speed of 45-50 km/hr a pedestrian will have an estimated 27% chance of survival. At an impact speed of 60 km/hr or more the chance of survival is less than 1%. A reduction of 10 km/hr in travel speed reduces collision risk by 21% and fatality rates by 50%. Signing alone is unlikely to change driver behaviours, and some physical measures are usually necessary.

volumes of pedestrians will be expected to cross the path of vehicles, particularly at locations where intervisibility may be compromised by parking or building lines

3. Clear lower speed limit signs, slow zone or bespoke VRU priority signage or entry treatment to the Westgate area should be posted on all entries to the site / urban area, to ensure VRU movements are prioritised in a low speed environment and motorists adapt driving behaviour accordingly.

2.1.9 Problem – Drainage Generally

A number of existing drains are blocked and likely to be ineffective in wet conditions. Elsewhere, proposals for new drainage along the new kerblines are unclear, and no provision has been made for relocation of gullies displaced by scheme proposals, e.g. at kerb removals or buildouts. Gradients and crossfalls have not been shown on proposed surfaces to determine drainage paths, and gullies will be located in pedestrian circulation areas on the new layout, where they may present a hazard to pedestrians, including those who are mobility impaired, with walking aids, canes or heels.

Figure 19: Existing Blocked Gully on Father Connolly Way

Figure 20: Gully within pedestrian zone on Abbey Square/Old Abbey Lane

Figure 21: Existing Drains creating slippy conditions on St Patrickswell Lane

Gully adjacent will be located in centre of new pedestrian ciculation area

Figure 22: Gully in desire line at pedestrian crossing on George's Street

Recommendations

1. The new layout will need to be adequately drained throughout the site to prevent ponding and excess surface water, which can present a hazard for all road users. Provision should be made for suitable drainage adjacent to all new kerblines or level differences throughout the site, including at scheme tie-ins.

2. Detailed design should include a review of all existing drainage provision throughout the site, with existing blocked gullies to be cleared and maintained, and all gullies to be located outside pedestrian desire lines, including at crossing points.

3. All gullies should be kept out of the desire line for VRUs, with finished levels to be flush with the surrounding surfaces.

4. Final crossfalls on all surfaces should ensure there is no risk of standing water on the footways, or varying crossfalls over short sections, which might present difficulties for mobility impaired pedestrians.

2.1.10 Problem – Proposed Crossfalls and Gradients

There were no long sections or cross sections provided for the extent of the site to indicate gradients and crossfalls on surfaces, and finished levels within the site are not clear at some locations. Insufficient crossfalls on footways and pedestrian circulation areas can lead to increased surface water accumulation, and an increased risk of slippy surfaces and slipping in wet and icy conditions, whilst insufficient long and crossfall gradients on the vehicular circulation areas can lead to ponding and increased skidding risks in wet and icy conditions.

The site proposals appear to include for significant level changes over relatively short distances, particularly adjacent to steps and where sections of existing retaining wall are being removed, e.g. Father Connolly Way, and the treatment of level differences is unclear. Significant gradients or varying crossfalls can also make it difficult for disabled, elderly or encumbered pedestrians to walk. Falls alternating between different directions will impact on drainage paths and may result in standing water in the transition between alternating crossfalls.

Recommendations

1. Detailed design should include long sections on all links through the Westgate Area to show gradients and vertical design. Cross sections and pavement design should include suitable crossfalls and longitudinal gradients on all surfaces to ensure there is no risk of standing water on the footways, or varying crossfalls over a short sections, which might present difficulties for mobility impaired pedestrians.

2. The footway wearing course or paver surface must not become slippery and difficult for pedestrians to walk on when wet, and gradients in VRU circulation areas should not exceed 5%, or 3% on new cycling infrastructure.

3. Any ramps throughout the site should be designed in accordance with the requirements of Government Technical Guidance Document M, Access and Use (2010), as detailed further in section 2.3 of this Stage 1 RSA report.

2.1.11 Problem – Proposed Pavement Surfaces, Design & Colours

The preliminary design plans show provision for different pavement types, which may lead to differential settlement between differing pavement types subject to vehicular loading, increasing the risk of trip hazards and ponding. Damaged, uneven or inappropriately smooth paving surfaces may also create difficulty for wheelchair/push chair users. Examples of paving leading to settlement and hazards due to vehicular loading at present on the site have been shown in figure 23.

Natural stone setts with similar paving colours have been used in pedestrian and vehicular circulation areas which can create difficulties for visually impaired pedestrians in being able to distinguish between the functions of different areas, leading to misinterpretation of the layout and an increased risk of pedestrian/vehicular conflict. This risk is higher in areas where substandard width footways are provided, or in shared surface areas and areas which do not have level differences or a clear distinction between the carriageway surface and the VRU zones, where traditional full height kerbs delineating footways are absent, or where there is no provision for separation distance presented by traditional verges between carriageways and VRU circulation areas. The contrast between similar paving colours in adjacent areas can fade dramatically in wet and dark conditions. There is also no clear provision for contrasting paving colours adjacent to street furniture, as per standard practice, to highlight the presence of the hazards to visually impaired pedestrians.

Figure 23: Pavement Damage at Transition between surface types

There were no details provided for treatment of joints between different surface types, and there is no provision for anti-skid surfacing on approaches to any of the controlled crossing points, which are areas which will be subject to high stress and frequent braking action, particularly where there is a likelihood of higher approach speeds, such as on the southbound approach to signals on Georges Street, at the intersection with Fair Street, which is on a downhill gradient, which increases stopping sight distance, and where existing high friction surfacing has been provided, as shown in figure 24. Insufficient skid resistance on approaches to controlled crossing points will result in an increased risk of overshooting the stop line, failure to stop, red light running and potential collision with VRUs.

Figure 24: Existing Anti-skid surfacing on approach to existing traffic signals

Recommendations

1. Surface and paving colours should have a clear visual distinction between areas to be trafficked by vehicles, including parking, and areas to be used by VRUs, supplemented with suitable tactile delineation along the edges of pedestrian zones provided at the same level as

the carriageway, where the risk of vehicular encroachment is higher, to further alert visually impaired pedestrians to the potential for conflict.

2. Clear linear tactile delineation should also be provided on shared areas where insufficient space has been provided for VRUs at pinch points and conflict locations to minimise the risk of conflict between visually impaired pedestrians and motorised traffic, and any proposed EV parking spaces and associated street furniture should be located in areas where there are safe segregated pedestrian zones.

3. Joints between different paving types should be suitably treated to reduce differential settlement, trip hazards and ponding risks.

4. A distinctive high contrasting surface colour should be provided around obstacles and street furniture within pedestrian circulation areas. Additional clearance requirements and visual aids should be provided where necessary in accordance with recommendations shown in figure 25.

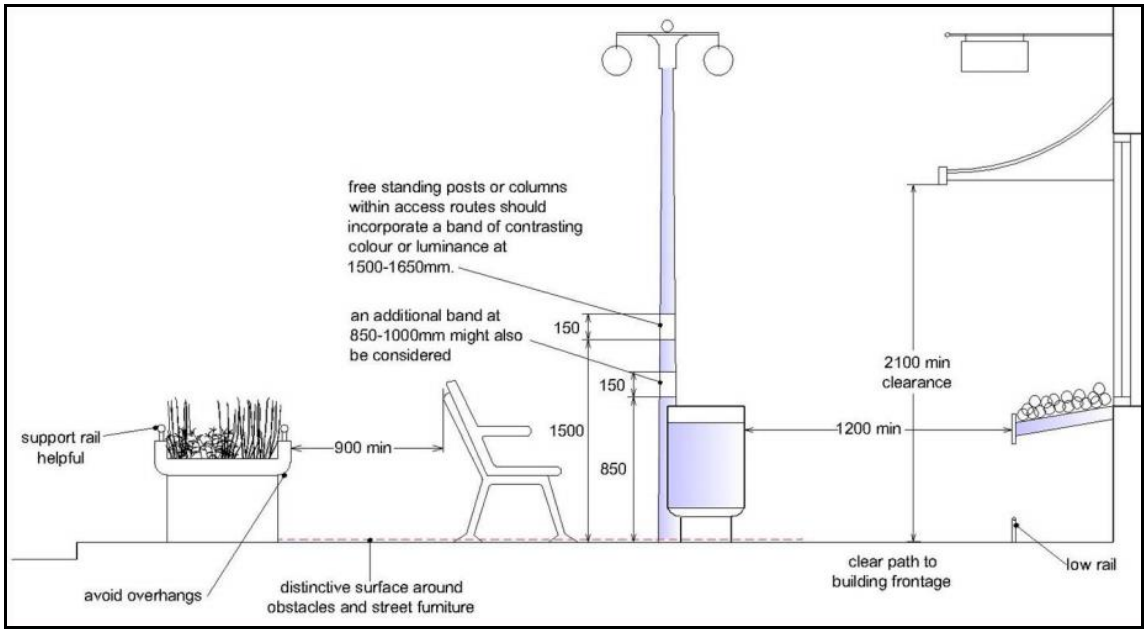


Figure 25: Recommendations for street furniture placement and visual enhancement

5. The surface of all pedestrian circulation areas should be slip resistant, especially when wet, in accordance with Guidance on slip resistance given in BS 8300:2009 Annex E. The areas

of VRU circulation throughout the site should be smooth and free of debris and trip hazards exceeding 6mm in height.

6. Suitable high friction surfacing should be provided in accordance with DN-GEO-03084 and DN-PAV-03023 for a minimum length of 50m in advance of each signal-controlled crossing point within the 50 km/hr speed limit, ideally with contrasting colouring to highlight the presence of the crossings. If approach 85th percentile speeds are greater than 50 km/hr then a longer length should be provided.

7. The condition of all roads and paved areas at should be examined at scheme tie-ins, and poor surface condition should be addressed. All surfaces throughout the site and at tie-ins should be free from trip and slip hazards.

2.1.12 Problem - Landscaping Generally

Proposed landscaping and trees were noted at locations where they may compromise safe traffic movement throughout the site for all vehicle sizes, and where they may obstruct visibility splays and intervisibility between pedestrians and approaching motorists. Landscaping has also been provided immediately adjacent to or within vehicle circulation areas, where there is a greater risk of being struck by passing and turning vehicles. Trees and landscaping located adjacent to pedestrian routes can create hazards due to falling leaves and slippy conditions, with tree roots potentially also damaging pavements over time, and potentially presenting trip hazards. Tree canopies can also reduce the effectiveness of street lighting, which may lead to an increase in collision risks during the hours of darkness, and reduce conspicuity of VRUs. Vegetation on the nearside of West Street may also obstruct clear visibility of the primary signal head aspect on the nearside, and likewise on the Georges St southbound approach to the signals at the junction, as highlighted in figure 26.

Figure 26: Landscaping on approaches to Traffic Signals

Landscaping is also shown on narrow sections of footway where they will obstruct pedestrian movement, with an example of where this is occurring shown in figure 27. Elsewhere, proposed landscaping will preclude vehicular access e.g. the western side of Barlow House, as highlighted in figures 28 and 29. Landscaping is also proposed at locations where it may present obstructions in visibility splays to the left and/or right of access points and junctions, e.g. the access to the car park on Fair Street, as shown in figure 30. Obstructions in visibility splays can increase the risk of pulling out type incidents and rright angled collisions.

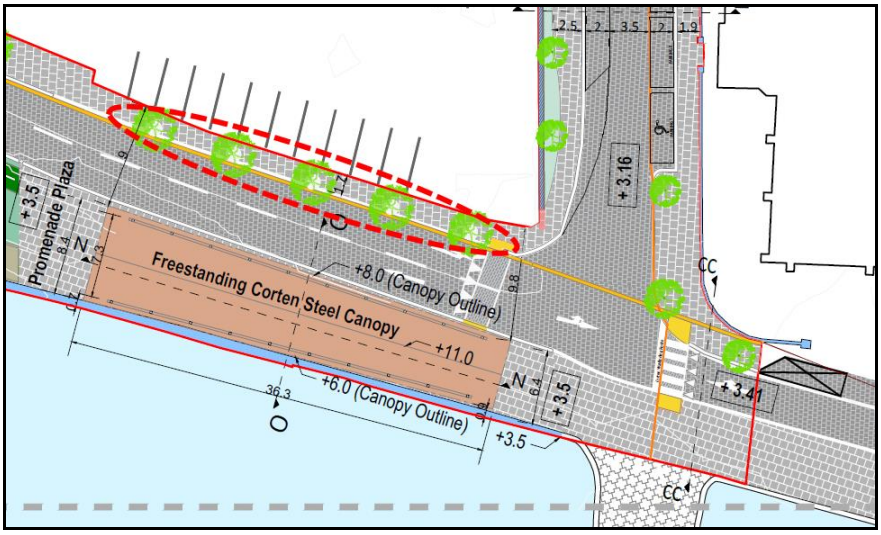


Figure 27: Proposed landscaping obstructing narrow footway

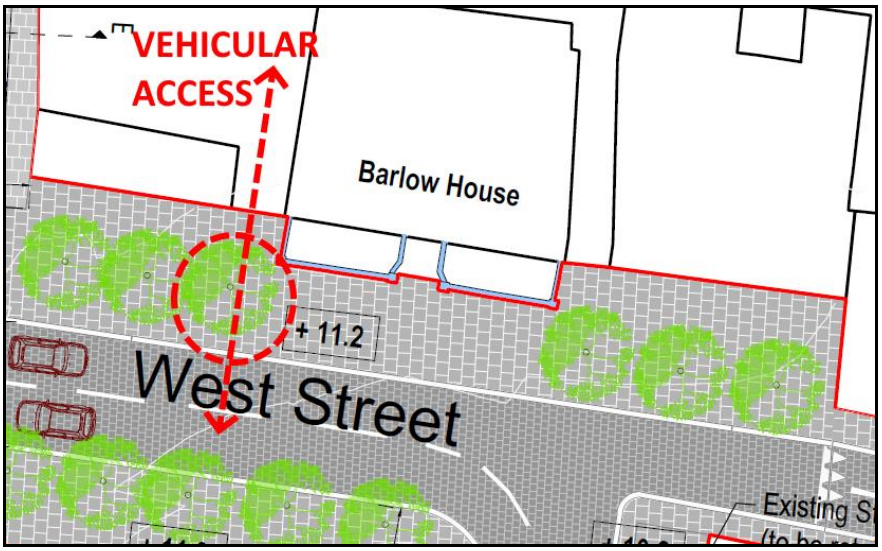


Figure 28: Proposed landscaping precluding vehicular access

Figure 29: Existing vehicular access to rear of Barlow House

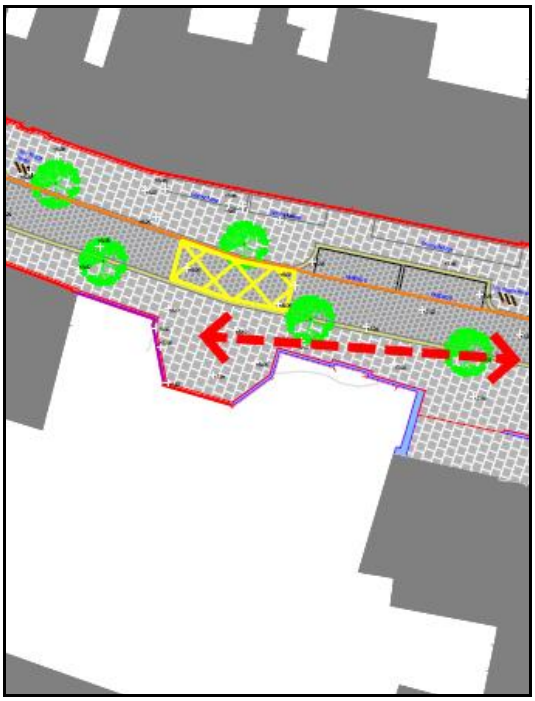


Figure 30: Landscaping in Visibility Splay to right at Fair St Car Park (one-way operation westbound)

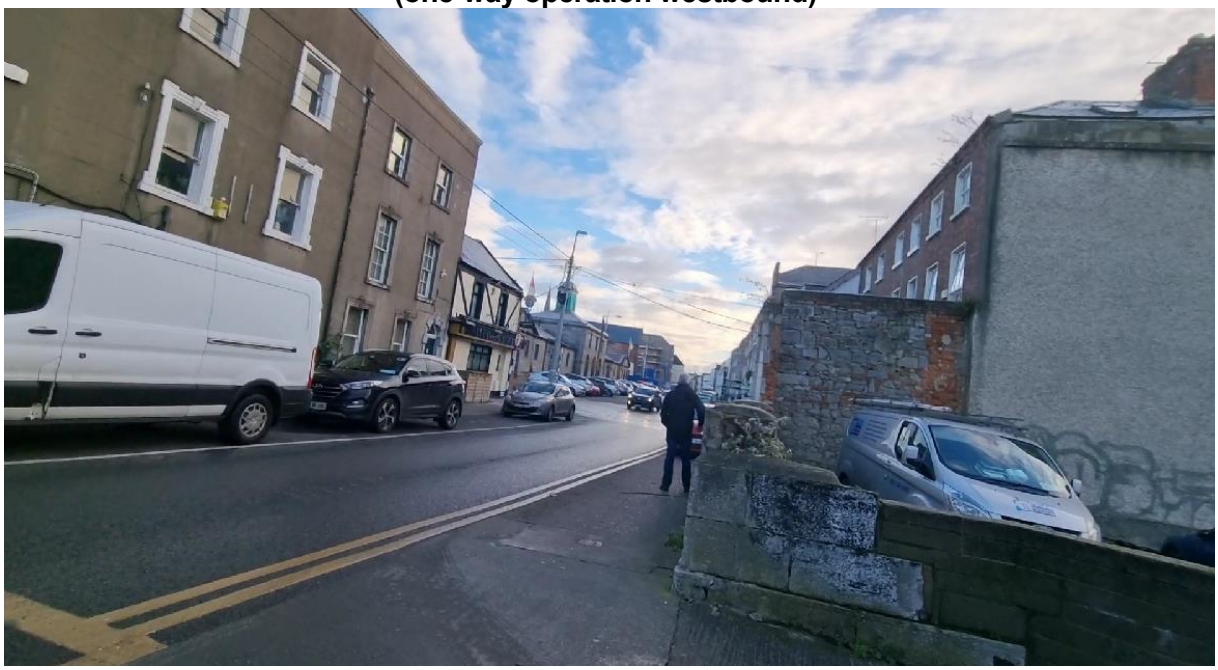


Figure 31: Existing Visibility to right from Fair St Car Park

Landscaping has also been shown in the centre of pedestrian circulation area where tree pits may present hazards for some road users with walking aids, canes or heels, with sharp edges also shown on planters which are projecting into pedestrian circulating areas. Low overhanging

branches and vegetation in pedestrian ciculation areas may also present overhead hazards to passing pedestrians and cyclists, including at eye height. Landscaping has also been shown at locations on the approaches to a number of the proposed pedestrian crossing points, where intervisibility will be obstructed, leading to an increased risk of pedestrian/vehicular conflict.

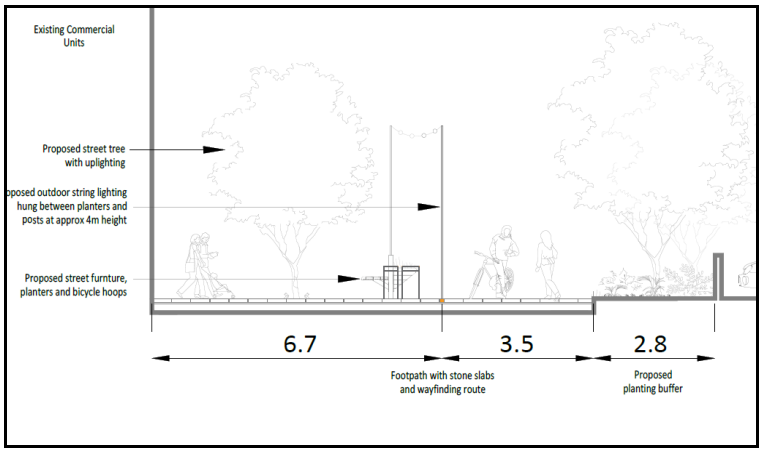
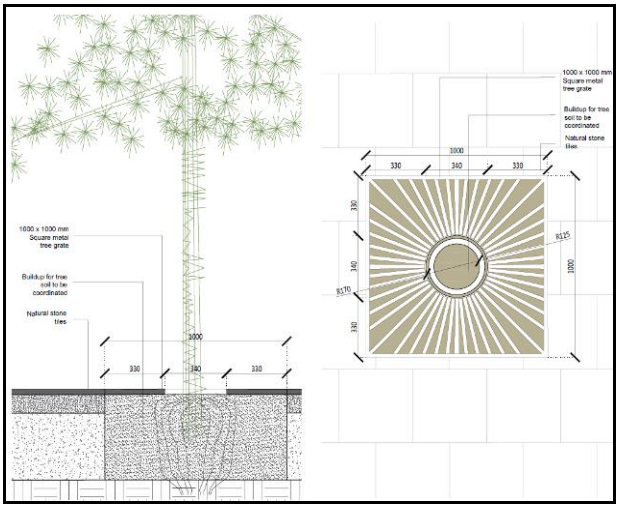


Figure 32: Proposed Landscaping within Southern section of St Patrickswell Lane



Figures 33 & 34: Tree Pit Proposals

Figure 35: Planting located too close to carriageway edge

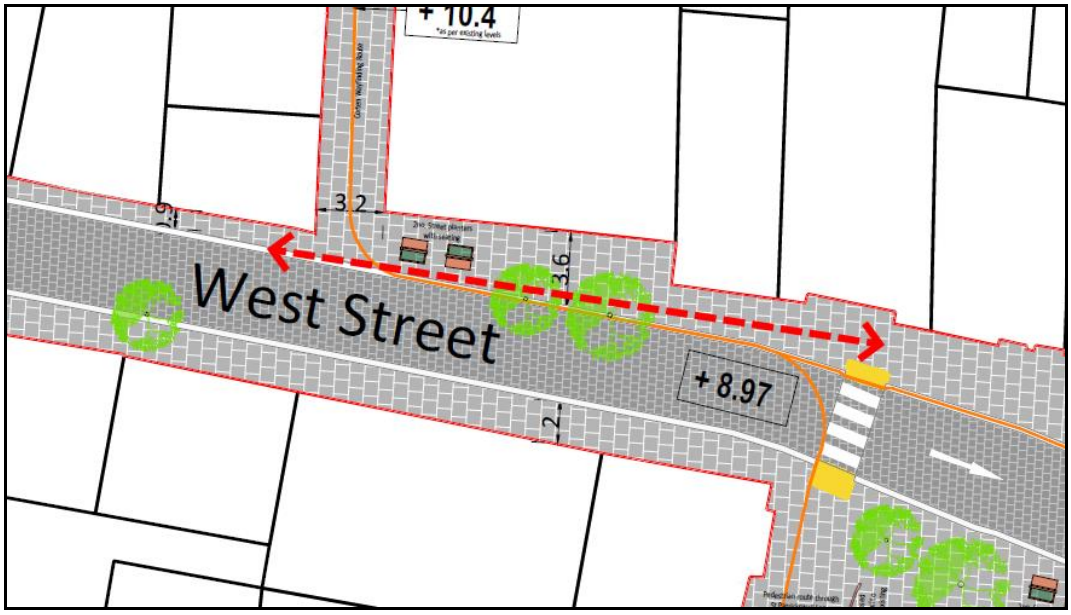


Figure 36: Trees obstructing pedestrian intervisibility at crossing

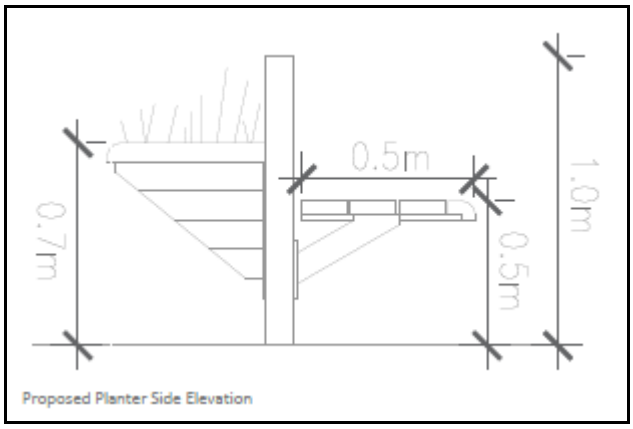


Figure 37: Proposed Planters with sharp edges projecting into pedestrian circulation areas

Recommendations

1. All landscaping, boundaries and fencing to be located outside visibility splays and sightlines, and maintained at heights below 1.05m wherever possible, and landscaping should not interfere with driver visibility of signal head aspects, with both primary and secondary signal head aspects at all signalised junctions and crossing points to be clear and unobstructed at all times.

2. Safe one-way or two-way traffic movements should not be compromised by landscaping location, and all landscaping should be located at a sufficient offset from the carriageway edges, in accordance with standard requirements.

3. Visibility splays should be clear and unobstructed at all times in accordance with traffic speeds, with clear unobstructed visibility to be provided to and from pedestrians potentially waiting to cross at all uncontrolled crossing points throughout the scheme from a point 2m back from the kerbline.

4. All areas of VRU circulation throughout the site should be free of obstruction and hazards arising from landscaping proposals, and landscaping should not compromise intervisibility at any potential conflict points with vehicles. The edges of all street furniture should be rounded, and should not present a sharp hazard to passing VRUs.

5. Landscaping growth should be monitored on an ongoing basis, with provision for cutting back branches and overhanging foliage to maintain visibility and ensure a clear vertical overhead clearance has been provided in VRU circulation areas (2.4m minimum for cyclists, can be reduced to 2.1m for pedestrians).

6. Suitable measures should be provided to warn users of the presence of trees, furniture and potential hazards at the base of trees.

7. The specification for all tree pits throughout the scheme should be pedestrian/cyclist friendly. Slots in gratings for landscaping features (and drainage) should not be more than 13mm wide and set at right angles to the dominant line of travel. All potential hazards for mobility impaired pedestrians should also be removed, including those with canes, or for wheels on wheelchairs/buggies, as well as for pedestrians with heels.

8. Dense tree foliage should be kept away from street lighting sources to ensure lighting is not compromised.

9. All pedestrian circulation areas should be kept free of leaves and debris which may present slip hazards.

2.1.13 Problem - Boundary Treatment and Fencing

There were no details provided for proposed boundary treatment or fencing and guardrails at a number of locations, including adjacent to the river where the new footway proposals will bring pedestrians immediately adjacent to the exposed water hazards, where there is no provision for fencing. There is no fencing shown adjacent to the elevated walkways where there is a significant risk of falling from a height. Existing boundary treatment is limiting sightlines and forward visibility at a number of locations, for both motorists and pedestrians who may wish to cross on desire lines, with examples shown in figures 38 and 39.

Figure 38: Nearside boundary Treatment reducing SSD[3] on Father Connolly Way

Figure 39: Boundary Treatment reducing intervisibility for pedesrians wishing to cross on desire line to/from car park on Father Connolly Way

[3] SSD = Stopping Sight Distance – the length of roadway that should be visible ahead, equivalent to the distance which a vehicle needs to come safely to a stop in the event of a hazard in the carriageway, equalling the sum of the braking distance and the distance traversed during the brake reaction time.

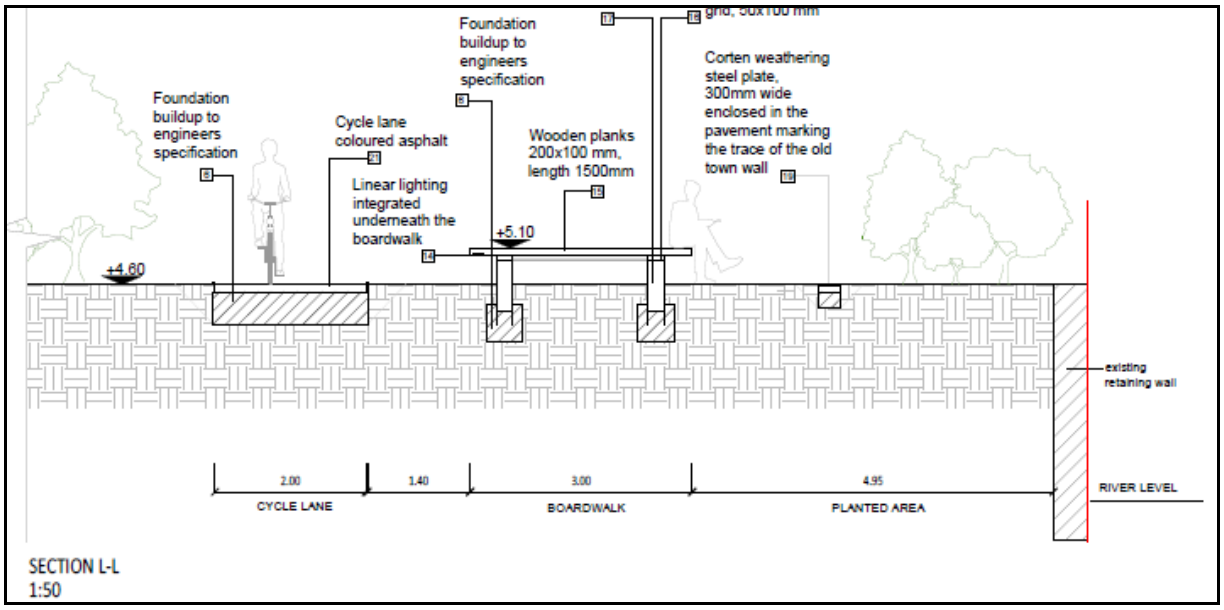


Figure 40: No fencing on elevated Boardwalk

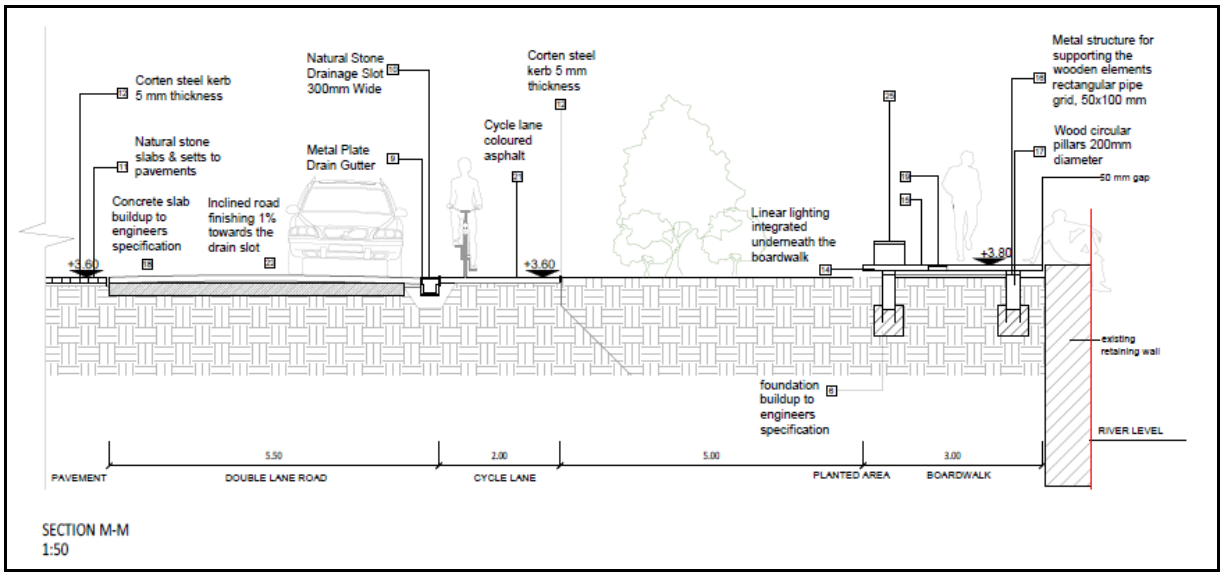


Figure 41: No Guardrail adjacent to River

Recommendations

1. Details of fencing, boundary treatment and guardrail throughout the site should be provided at Stage 2 detailed design, particularly any areas adjacent to level differences where there is a risk of falling from a height.

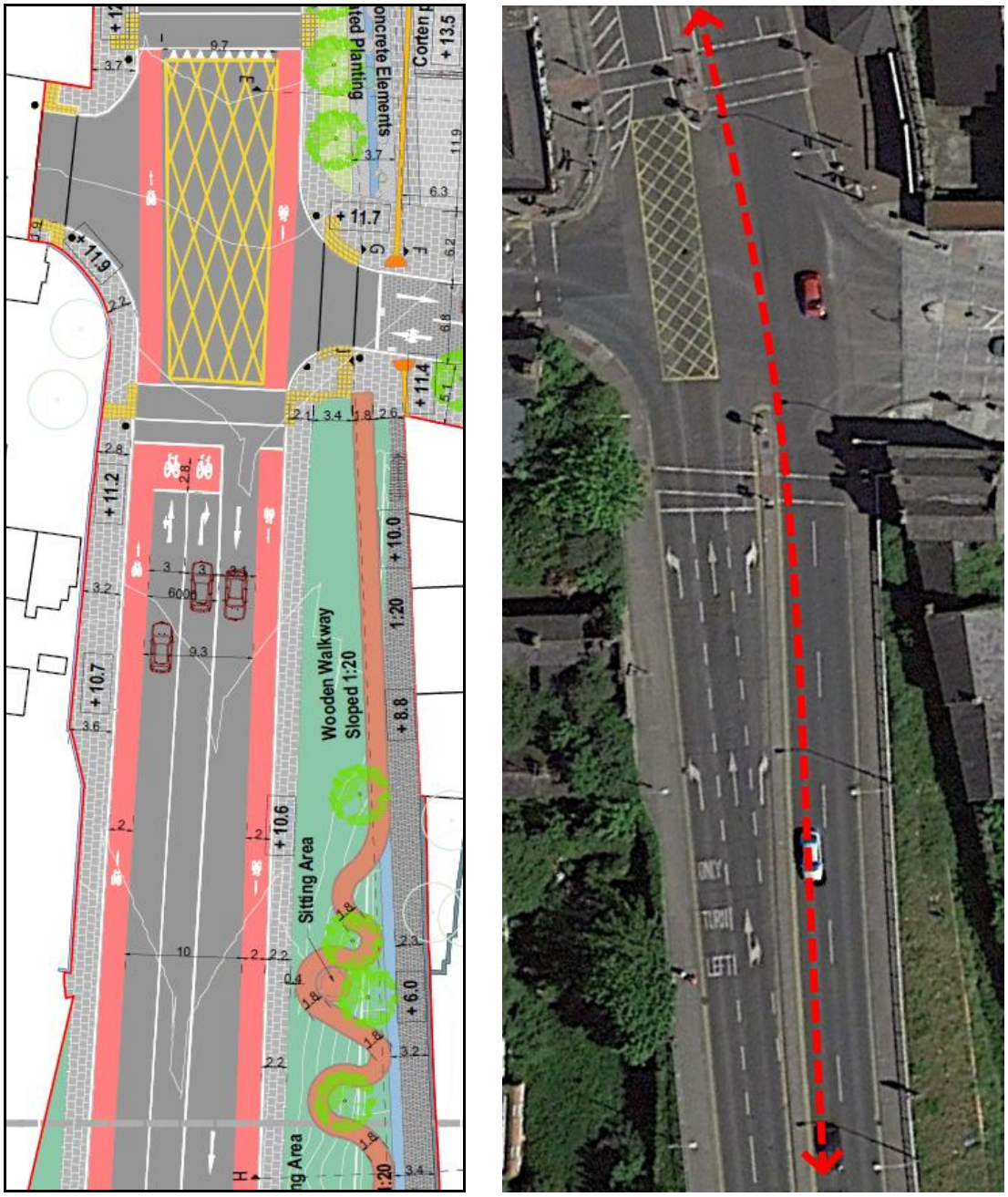
2. The final height and treatment of all walls, barriers and balustrades throughout the scheme area should ensure that the risk of pedestrians mounting or traversing the wall or barrier and falling from a height, particularly adjacent to exposed water hazards, has been minimised, with provision for additional guarding height where necessary on low barriers or walls to protect users from the risk of falling.

3. Fencing and boundary treatment, including hedging, should be provided at a suitable height below driver eye height of 1.05m, and should not interfere with visibility at junctions and access points, or intervisibility at potential points of conflict between pedestrians and motorists

2.2 JUNCTION LAYOUT AND ALIGNMENT

2.2.1 Problem – Dual Carriageway Reconfiguration as Single Carriageway

The design proposals will remove the central reservation on George's Street which will alter the cross section of the link from dual carriageway to single carriageway. The reclassification of the link from dual to single carriageway is likely to significantly reduce the capacity and level of service of the R132 Regional Road, which may result in a significant increase in queues at peak times, and potential for increased rear shunt collision risks. Single carriageway roads typically also have higher collision rates due to the potential for head on collisions with traffic in the opposing stream, due to lack of segregation, and the increased risk of inappropriate overtaking manoeuvres, and resultant head on collision risks. The removal of the central reservation will also remove the refuge area at the pedestrian crossing point on the southern arm of the junction with Trinity Street, and will increase the crossing distance for pedestrians, with no provision for refuge for older or mobility impaired pedestrians, resulting in vulnerable road users being at greater risk of conflict with passing and turning traffic at the junction.



Figures 42 & 43: Dual Carriageway (LHS) configured as single carriageway

Recommendations

1. The reclassification of the link from dual to single carriageway should be accompanied by suitable risk assessment to include colliison investigation in respect of existing collision history on Georges Street, current two-way AADT flows on the Peace Bridge and further

upstream on the link, to the south of the River Boyne. The standard DN-GEO-03031 typically applies for single carriageway Urban Relief Roads, which has a desirable minimum SSD of 90m for a 60 km/hr design speed.

2. Provision should be made for pedestrian refuge of a suitable width where crossing distances exceed 10m, and where multiple streams of opposing traffic flow are being traversed. The refuge width should be increased where provision has been made for crossing for cyclists, i.e. toucan crossings.

3. Where pedestrians are crossing opposing sides of a carriageway on two seperate red and green phases, provision should be made for a standardised sheep pen arrangement to prevent pedestrians walking into the opposing traffic stream which should be configured to allow pedestrians to face towards oncoming traffic in the central reservation.

2.2.2 Problem – Visibility at Junctions

Visibility at a number of locations is compromised by building lines to the left and right of the junctions, and the design will include provision for new crossings which will further set back the stop lines at the junctions, and will impact on the junction intervisibility zone. The provision for advanced cycle stop lines at the signalised crossroads of George's Street and West Street will also result in obstructions within the junction intervisibility zone, which is a departure from standard on a signalised junction, and can increase the risk of conflict for all road users particularly VRUs, as signal control tends to give a false sense of security to vulnerable road users, particularly the visually and mobility impaired, so any restrictions on SSD or inappropriate vehicular approach speeds for local conditions will increase the risk of vehicular and VRU conflict, and the risk of right-angled and crossover collisions at the junction.

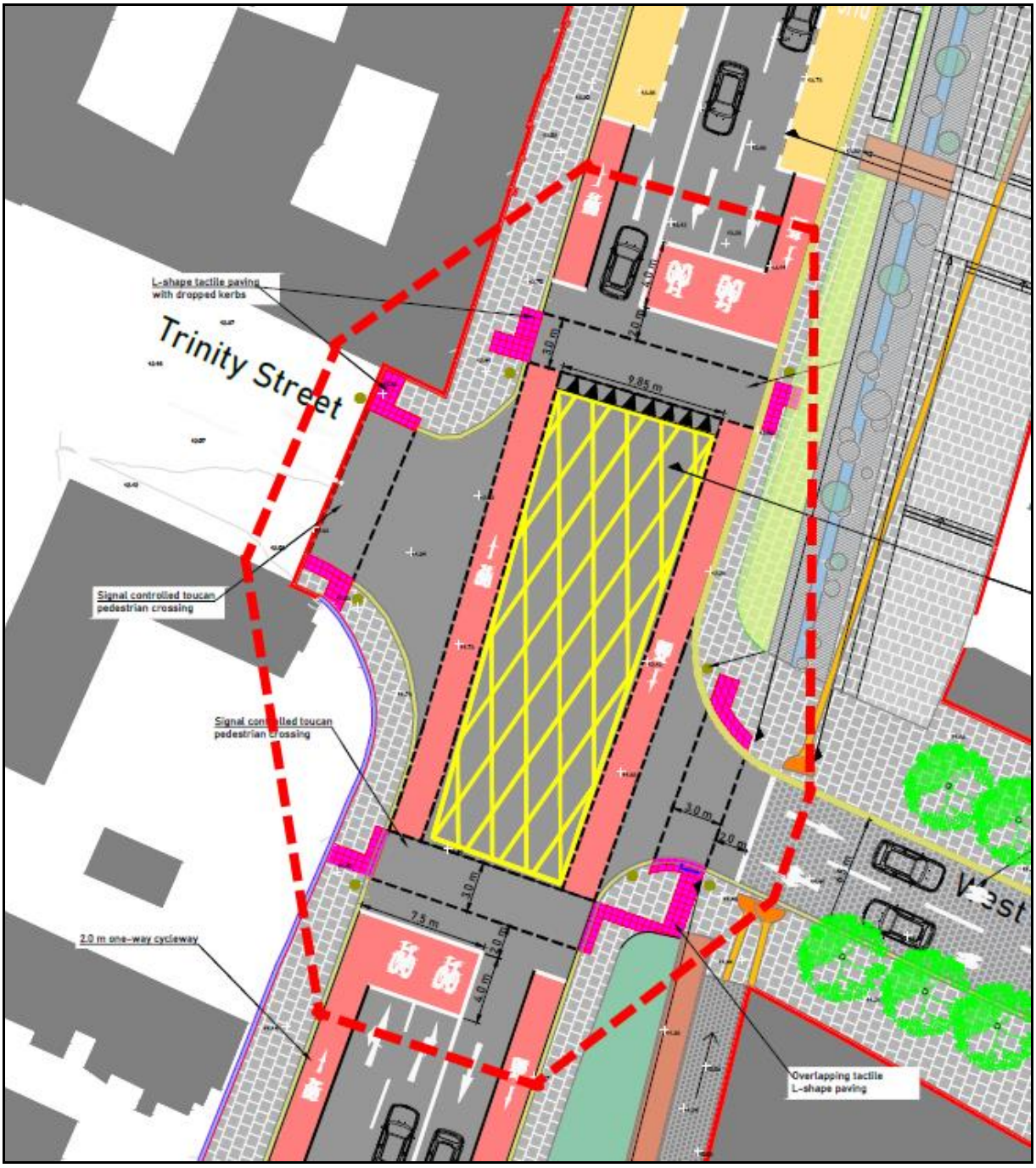


Figure 44: Approximate Junction Intervisibility Zone

Recommendations

1. Visibility at all junctions and intersection points throughout the scheme area should be clear and unobstructed at all times in accordance with traffic speeds, with all potential

visibility splay obstructions to be removed, including parking bays, landscaping, boundary treatment, street and street furniture. Where obstructions arise due to building lines, provision should be made for suitable traffic calming and speed control measure son approaches to the junction to ensure vehicles cannot approach at speed, with provision made for speed detection loops where necessary.

2. The junction layout at signal-controlled intersections should be reviewed to ensure that an appropriate intervisibility zone can be provided, with a distance of 2.5m back from all stop lines on each arm to be visible to vehicles waiting at all other stop lines throughout the junction in accordance with Industry standards for signalised intersections, e.g. DN-GEO-03044. Where intervisibility cannot be achieved, a suitable departure from standard should be applied to the proposed design layout, with provision for suitable mitigation to reduce risks arising, and ongoing monitoring to proactively address any significant change in collision rates, particularly those involving VRUs. Intervisibility between motorists and VRUs attempting to cross at any of the signal-controlled crossing points should be clear and unobstructed at all times.

2.2.3 Problem – Signalised Junction Design Generally

The design of the signalised intersections on George's Street will result in a significant impact on the existing staging sequence and phasing, particularly as the central reservations will be removed from the northern and southern arms of the intersection of George's St / West St / Trinity St, which will impact on the duration and sequence of pedestrian phases.

There were no staging digrams provided with the preliminary design proposals, and no details of any signal timings, or location of secondary signal heads/poles where relevant. Indicative locations have been shown for primary signal heads, however they are located on the offside on the crossing point, rather than the nearside. It was noted that a number of the existing signal head poles are obstructing footways and restricting VRU accessibility. The location of stop lines in advance of signals is also not clear. Stop lines located too close to signals and pedestrian crossing points increases the risk of overshooting the stop line on a

red signal and colliding with a pedestrian on the crossing, and also increases the risk of red light running and crossover colliisons.

There were no details provided on the length of phases or staging sequence, to determine if VRUs, including older pedestrians, will have sufficient time to cross the carriageway, particularly on George's Street, which is vehicle dominated, or to determine any potential delays for pedestrians to wait when wishing to cross consecutive phases on different arms, which canlead to impatience and crossing against traffic. There is no provision for replacement of existing tactile mapping and Push Button Units (PBUs), which are currently configured for dual carriageway operation and lane sequences, and do not include for the proposed cycle lanes on each side of the cross section on George's Street.

Figure 45: Signal head poles obstructing footway on Trinity Street

Figure 46: Existing Tactile Mapping on Eastern side of signalised crossroads

Figure 47: Existing Tactile Mapping on southwestern side of signalised crossroads

Figure 48: Existing Tactile Mapping on northeastern side of signalised crossroads

Recommendations

1. Detailed design should include details of all proposed signal stages, phasing and timing, with priority to be given to VRU movments, in line with the recommednations of DMURS in respect of VRU priority in an urban environment.

2. Pedestrians should not need to wait to travel on consectutive arms across multiple streams of traffic, and all green phases for pedestrians should enable suffiicent time to cross the carriageway safely, including the cycle lanes, and particularly where the provision for refuge between opposing flows has been removed.

3. Detailed design should include provision for suitably sited primary and secondary signal head poles and aspects, with visibility of red and green signals to be clear and unobstructed on all approaches, with design to be accompanied by suitably placed speed detection loops where necessary, to include early cut off to reduce the risk of pedestrian/vehicular conflict and red light running. Signal poles should not obstruct VRU routes, and signal heads must be placed at a sufficinat offset from the carriageway

edges (minimum 450mm) to minimise the risk of being struck by passing and turning vehicles, including wide mirrors on HGVs.

4. All stop lines at signals should be placed a minimum advisable 2.5m in advance of VRU crossing points, and crossing widths should be increased with provision for toucan crossing facilities at any location where inexperienced cyclists are expected, who may not wish to cross at the junction using the advanced cycle stop lines provided.

5. Detailed design should include provision for suitable PBUs and tactile mapping to reflect the new lauyout, with audible and tactile signals for the benefit of sensory impaired pedestrians.

2.2.4 Problem – Geometry Generally

There was no swept path analysis provided to demonstrate that the swept paths and turning movements of all anticipated vehicle sizes can be accommodated within the proposed layout at all junctions and links throughout the Westgate area with adequate margins of safety, including service, delivery and emergency vehicle access, including at the Garda Station.

In areas where there is no traditional kerbline, a significant number of items of street furniture will be located in very close proximity to the edge of running lane, which presents an increased risk that the hazard will be struck. An example is shown in figure 51. The tree shown presents a wide canopy which will be struck by high sided vehicles (LGVs/HGVs) attempting to pass at this location.

The proposed design includes significant kerb buildouts at some locations, including where sharp kerb edges are shown, which can preclude turning and cause tyre blow out. Elsewhere the kerb hazards have been removed, however turning and passing vehicles are more likely to encroach into the VRU zones at these locations, particularly where space is confined, presenting increased risk of conflict with VRUs, particularly those who are visually and mobility impaired.

The proportion of larger vehicles using the study area is unknown, however it was noted that a number of the lanes at the reconfigured signalised junctions will be narrow, and the cross section is also relatively narrow on most links to the east of George's Street. Narrower lanes increase the risks for two wheeled vehicles (cyclists and motorcyclists) travelling alongside larger vehicles in particular, and increase the risk of rear shunt collision. Larger vehicles parked within proposed parallel parking spaces are likely to protrude into the carriageway adjacent, particularly on narrow parking bays, further restricting movement on the links.

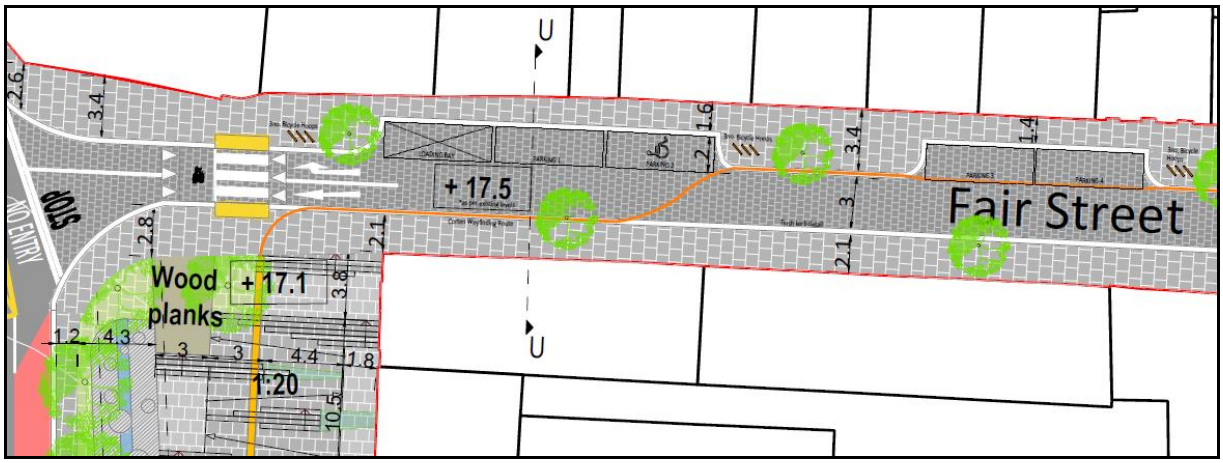


Figure 49: Narrow lanes on Fair Street

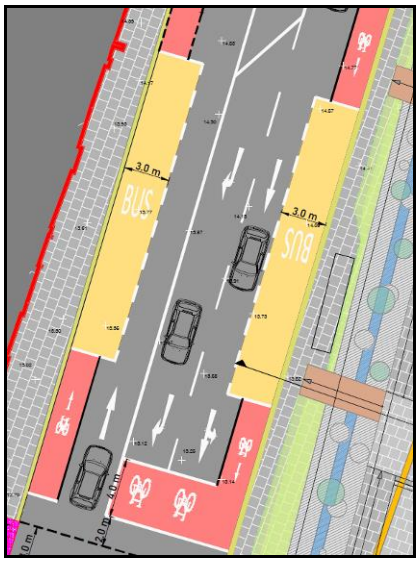


Figure 50: Narrow Lanes on George's Street with No space for vehicles to pass stopped buses safely

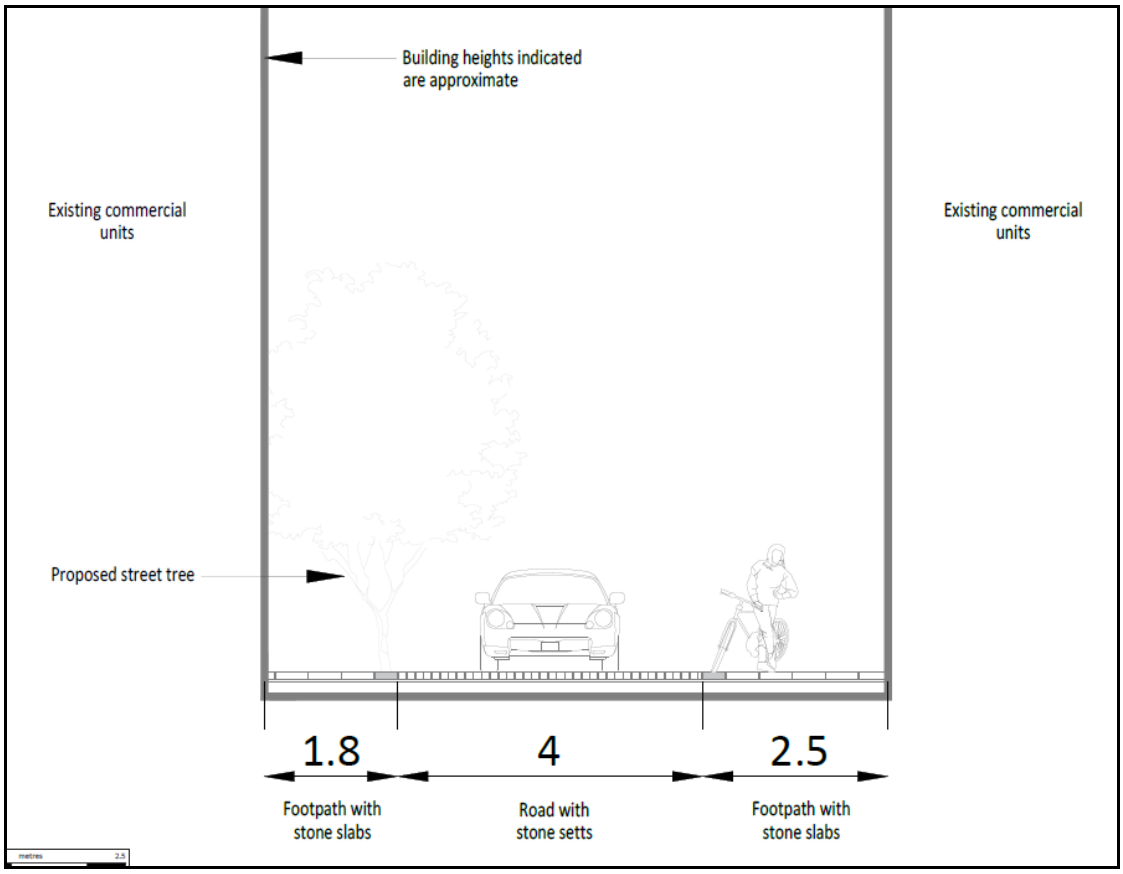


Figure 51: Tree located with no clearance to traffic lane adjacent On narrow footway (Section W-W, West Street)

Recommendations

1. Swept path analysis should be completed for all possible vehicle movements throughout the site including turns to and from all private access points and junctions along the route where kerb lines have been amended, to demonstrate that the swept paths and turning movements of all anticipated vehicles, inclusive of delivery and emergency vehicles, can be safely accommodated within the proposed layout with adequate margins of safety and with sufficient offset to all adjacent hazards, and without encroachment into adjacent VRU zones.

2. Turning or passing vehicles should not encroach over the carriageway centrelines into the path of oncoming traffic, which would lead to a side swipe or head on collision risk, and vehicles should not encroach into adjacent VRU zones. Vehicles waiting to turn out of junctions must not restrict entry for opposing vehicles turning in.

3. The width of all trafficked lanes should be sufficient to accommodate all road users safely in an urban environment, including cyclists. Narrow lanes should be avoided on locations where cyclists may be forced to share road space with traffic due to insufficient widths on adjacent footways, and adjacent to any parallel parking spaces where vehicle doors opening out onto the carriageway will present a hazard.

4. The cross section on George's Street should be examined to ensure the operation of the Bus Stops and Bus stop configuration does not increase risks for any other road suers, including passing traffic, motorcyclists and cyclists, and the width of all traffic lanes should accommodate all road users safely in an urban environment.

5. The final design layout should include sufficient offset to all street furniture from vehicular swept paths, particularly where there is no clearly defined kerb line, including bollards, bins, signs and landscaping with a minimum clearance of 450mm to be increased to 600mm for solid continuous hazards adjacent to the carriageway, including walls and gate pillars.

6. Where any gates are provided to private access points throughout the scheme area, clarification should be provided on all gate operation, and gates must not obstruct movements for pedestrians or vehicles, or present hazards to passing vehicles, with allowances made where relevant for suitable setback from the main carriageway to facilitate safe waiting without blocking through traffic.

2.2.5 Problem – Ambiguous Rights of Way

Visibility at a number of internal junctions may be compromised by building lines as outlined previously, and the risk of conflict at these locations may be increased by the lack of clear guidance on rights of way at some conflict points. Multiple conflicting turning movements will occur at some locations where rights of way not clear on the proposed layout, including at locations where conflict points are clearly lined and signed on the existing layout, but where the proposed design appears to have removed relevant road markings and signage, with an example shown in figure 56. The rights of way at some junction tie-ins have also not been shown, with an example shown in figure 57, which is the junction opposite Scholes Lane. Proposals for parking and landscaping at this location are likely to obstruct visibility to the right, although risks arising

should be minimal, provided traffic circulation is maintained as one-way westbound operation only on this link.

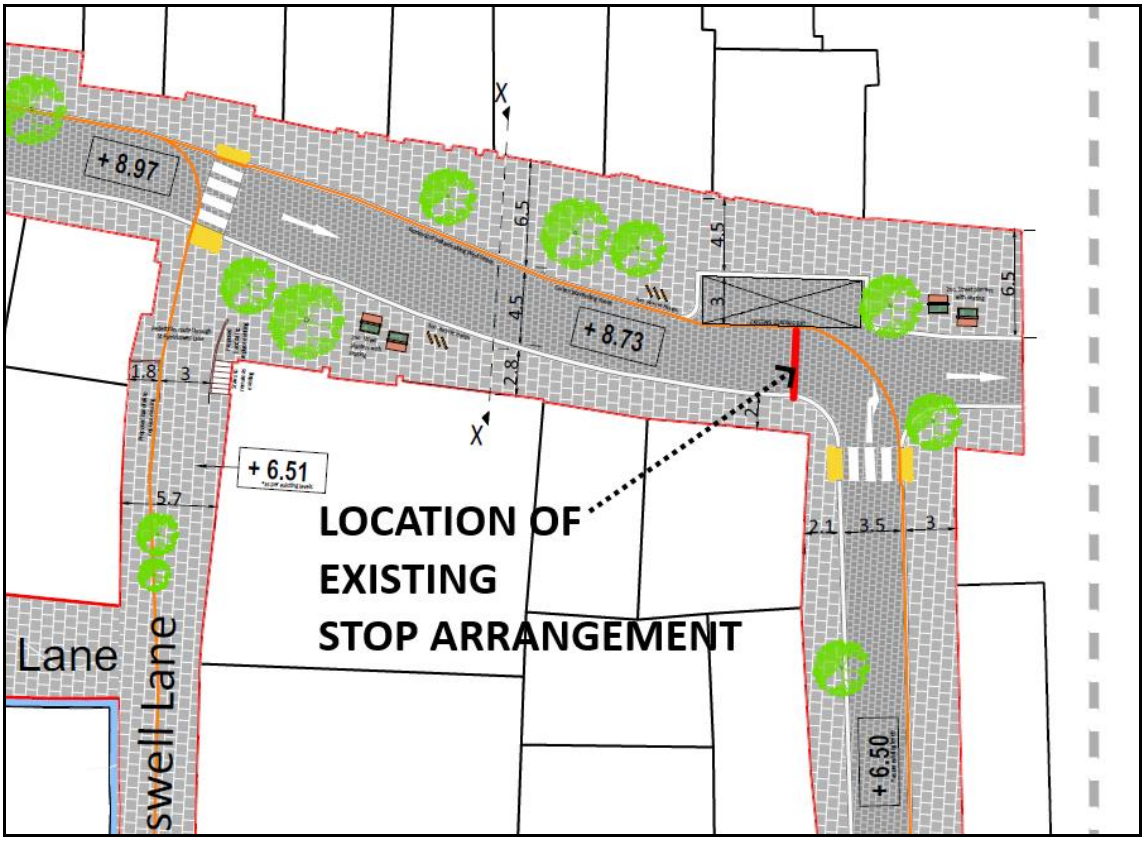


Figure 56: Clear current provision on rights of way and priority to be removed (i.e. existing stop sign and line)

Figures 57 & 58: Rights of way and details not shown at tie-in to junction opposite Scholes Lane

Figure 59: Existing Layout at junction opposite Scholes Lane

Figure 60: Existing Visibility to the right from junction opposite Scholes Lane

Figure 61: Existing Visibility to the right from junction opposite Scholes Lane currently obstructed by vehicles parked within perpendicular parking bays adjacent

Recommendations

1. Visibility should be clear and unobstructed at all times in accordance with traffic speeds. Any locations where visibility could be compromised by building lines should be clearly signed and lined to warn road users of the potential for conflict.

2. Clarification should be provided on the proposed form of control at each junction and internal intersection point, and the priority and rights of way, as well as permissible direction of circulation should be clear and unambiguous to all road users throughout the scheme area, with provision for suitable road markings and signage in accordance with the requirements of the Traffic Signs Manual, including no entry signs, turn right only signs and turn left only signs where relevant.

2.2.6 Problem – Bus Stop Configuration and Locations

Visibility from the junctions to the North of the Bus Stops on George's Street will be compromised by building lines, as outlined previously, and will be further reduced by the location of the reconfigured bus bays, as indicated on figure 62 (note visibility splays on all diagrams are approximate only).

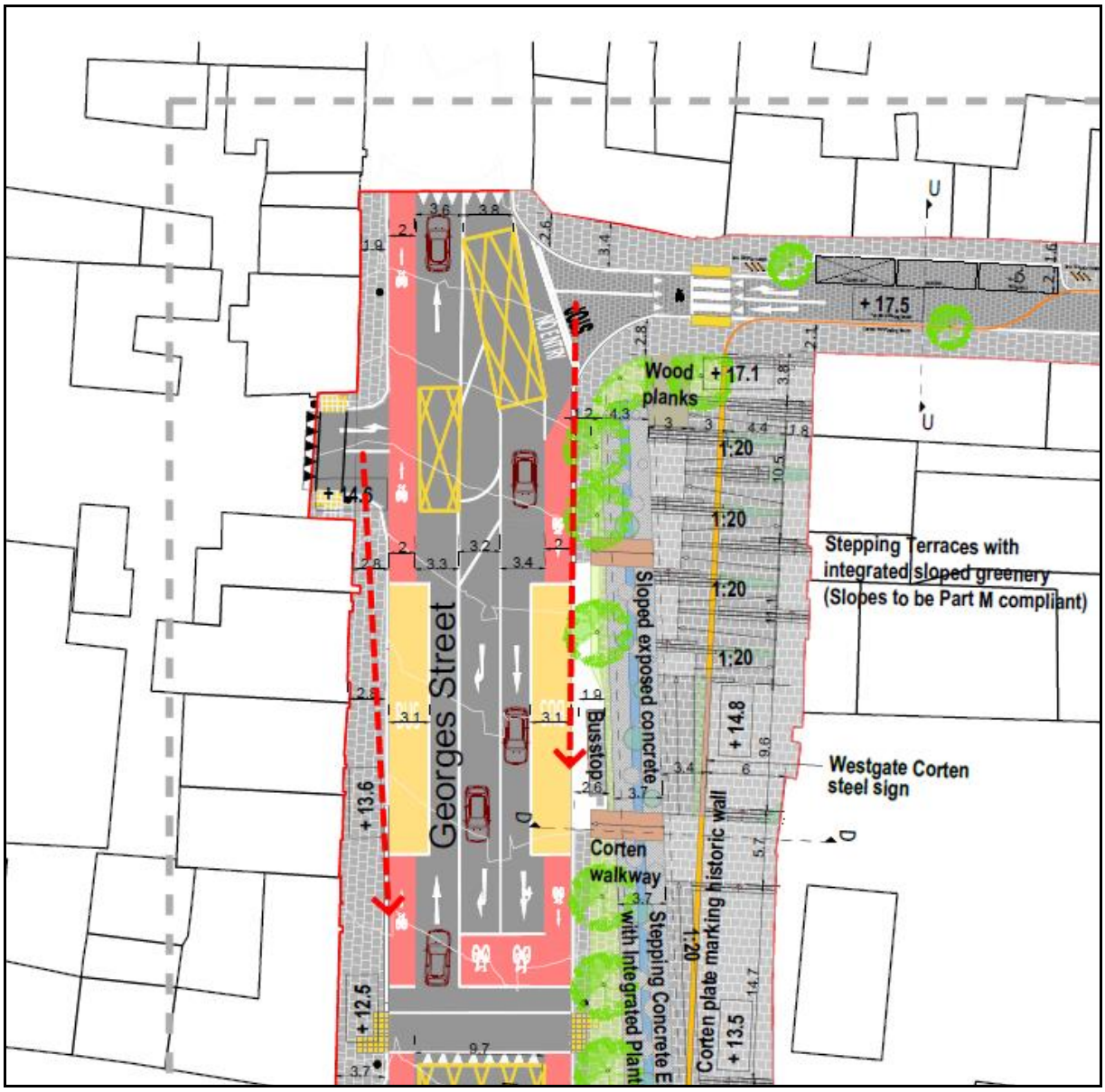


Figure 62: Bus Stops obstructing visibility splays from junctions

The provision for replacement of an existing bus stop on Father Connolly Way is not known, although a new bus stop will be provided on Dominic Street. Visibility to the right from the relocated egress point from the surface car park on Dominic Street will be restricted due to the location of the proposed bus bay, which has a narrow width. Buses will not have sufficient space to stop and wait safely in the carriageway without obstructing the path of passing vehicles, and buses or any other vehicles stopped at this location will obstruct clear visibility towards oncoming vehicles. Obstructions in visibility splays and poor channelisation can lead to an increased risk of pulling out type incidents and right-angled collisions, as well as rear shunt risks due to sudden breaking with vehicles slowing to turn in as well as slow moving vehicles turning out.

It is also unclear if there is sufficient space for the bus stop and any associated seating, shelter and dwell area at this location without obstructing space for passing pedestrians, particularly those who are mobility impaired, and there is no provision for Kassel kerbs to facilitate boarding and alighting by mobility impaired pedestrians. The kerb design at this location also presents poor channelisation and there are very sharp kerb radii both at the car park access/egress point and at the intersection of Father Connolly way and Dominic Street to the south. It was also noted that there is no continuity of pedestrian facilities into the car park at this location, and pedestrians wishing to access the car park will need to step into the carriageway on a narrow access point, due to the location of the wall.

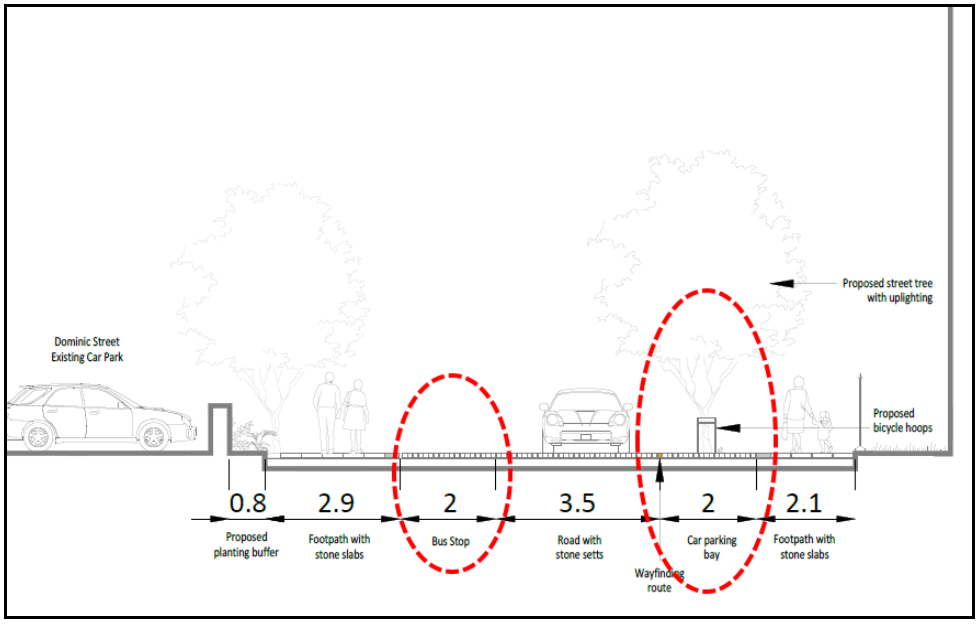


Figure 63: Narrow Bus stop and parking bays on Dominic Street

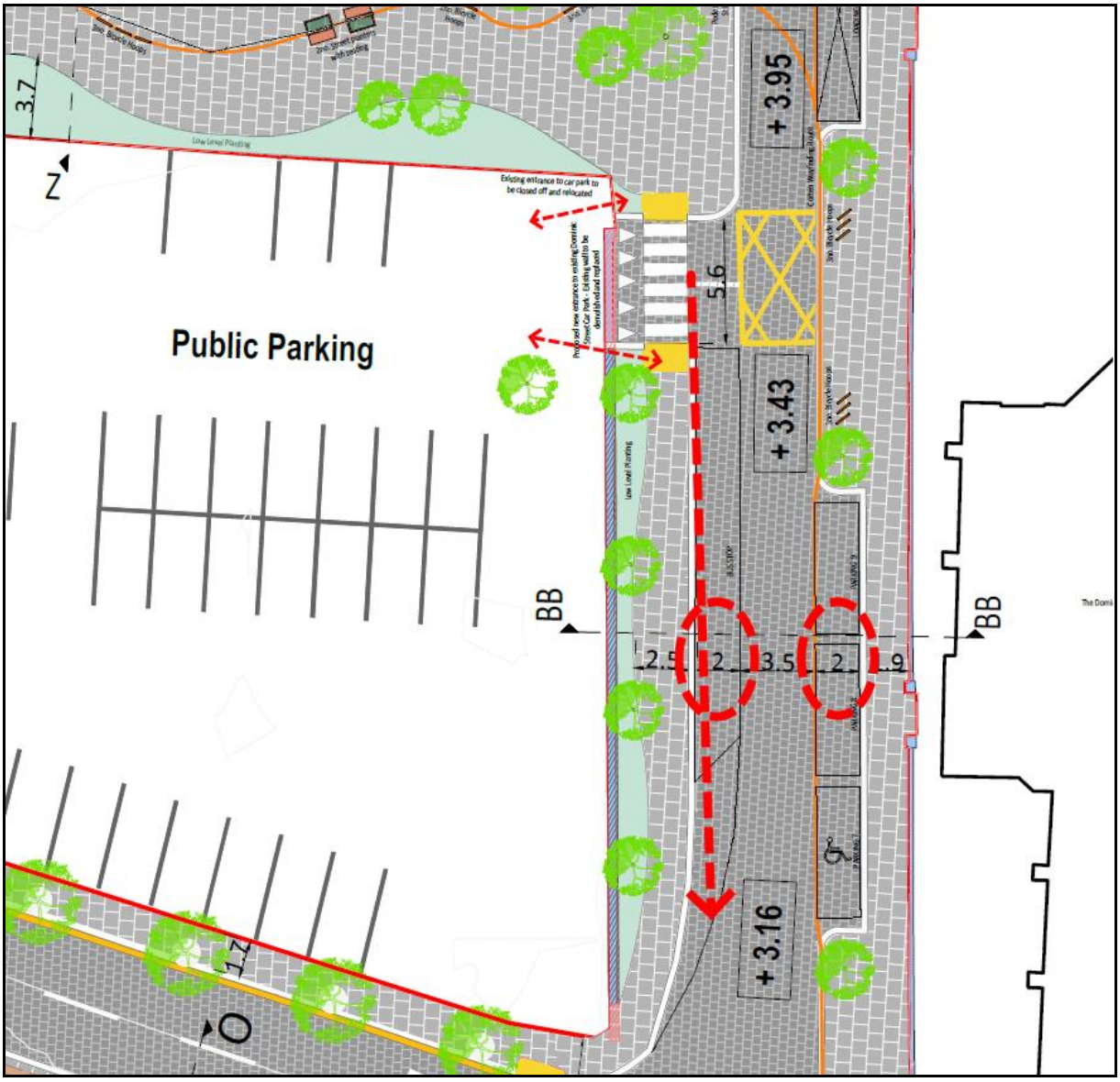


Figure 64: Poor channelisation, Narrow Bus stop and reduced visibility at car park egress

Recommendations

1. Visibility splays should be clear and unobstructed at all times in accordance with traffic speeds from all junctions and busy access/egress points .

2. Parking and bus stops should be relocated outside visibility splays to enhance junction conspicuity and reduce collision risk and suitable traffic calming measures should be considered on approaches to any locations where visibility may be compromised, to reduce

vehicle speeds and associsted risks. Bus stops should be inset within the kerb where there is a risk that veisibility could be compromised on a regular basis (i.e. depending on bus frequency).

3. All bus stops should be suitably configured in line with standard practice, to include for suitable road markings and accessibility by mobility imoaired pedestrians, and for suitable shelter and seating areas whre relevant. All bus bay widths and lengths should safely accommodate safe waiting for the largest anticipaited bus sizes, to ensure the buses can stop and wait safely without obstructing the movement of vehicles and other road users.

4. The waiting area at all bus stops should be suffiicently wide to cater for all passenger demands, without waiitng passengers obstructing movments for other pedestrians passing through on the footway.

2.3 NON-MOTORISED USER PROVISION

2.3.1 Problem – Cyclist facilities

There was no information provided on anticipated cyclist volumes and desire lines, and there was a low level of cycling activity noted at the time of the site visit, however the preliminary design layout for the Westgate area will provide new cycling infrastructure through the provision of new on street cycle lanes on both sides of George's Street, Advanced Cycle Stop Lines at the signalised crossroads, and a new two-way cycle track parallel to the River Boyne on the southern side of Father Connolly Way

A number of potential safety issues were noted on the preliminary design layout, which should be considered as the design progresses, some of which have been summarised below:

- There was no long section provided to show gradients on the new cycling routes, including the new route underneath the Peace Bridge, where the clearance to the overhead hazard is unknown.

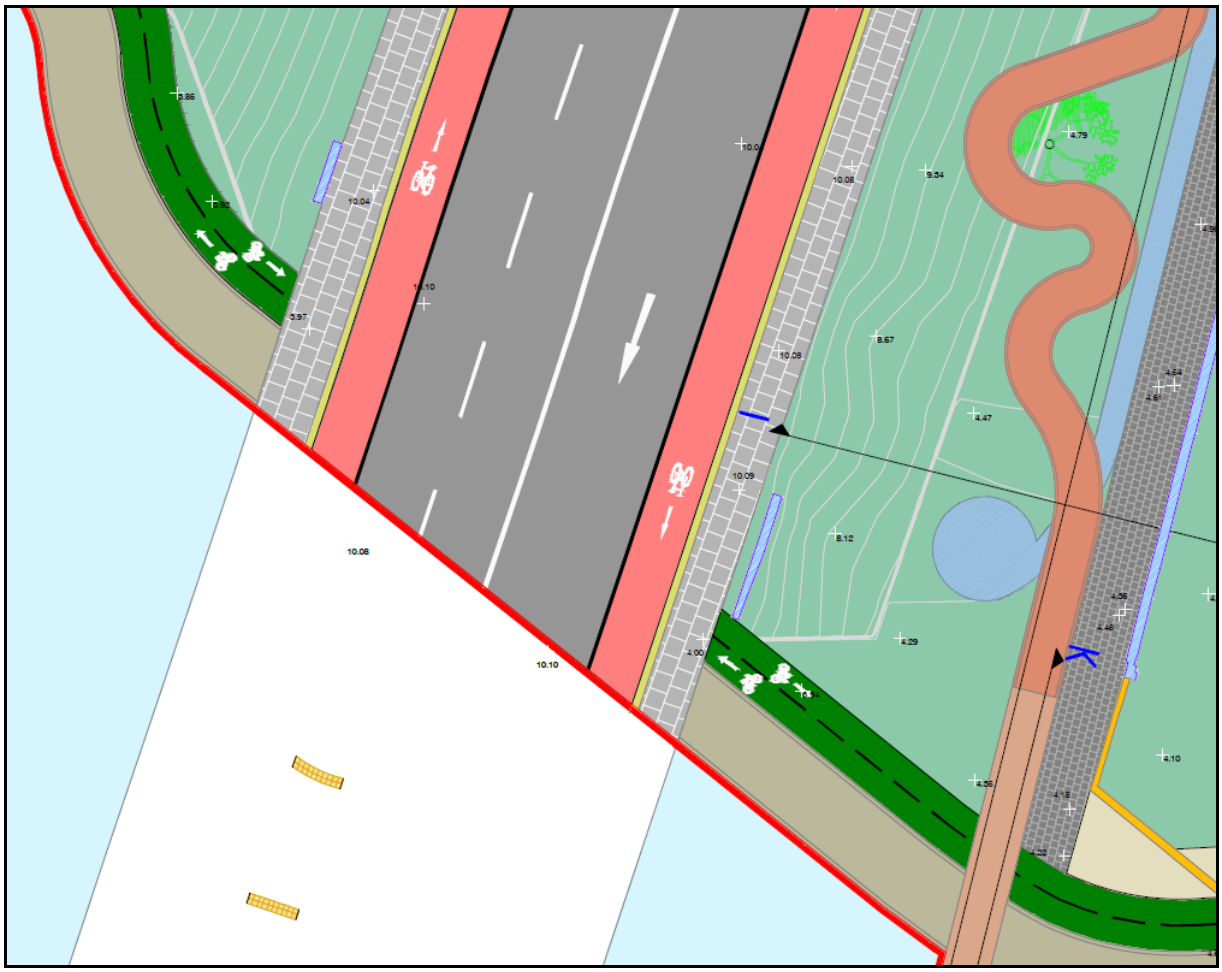


Figure 65: Cycling Route to continue Underneath Peace Bridge
(Note: No gradients or long sections provided)

- There is also no overhead clearance provided adjacent to the proposed elevated walkway shown in figure 58, where cyclists using this space may be att risk of striking their head on the overhead hazard, which include sharp edges.

-

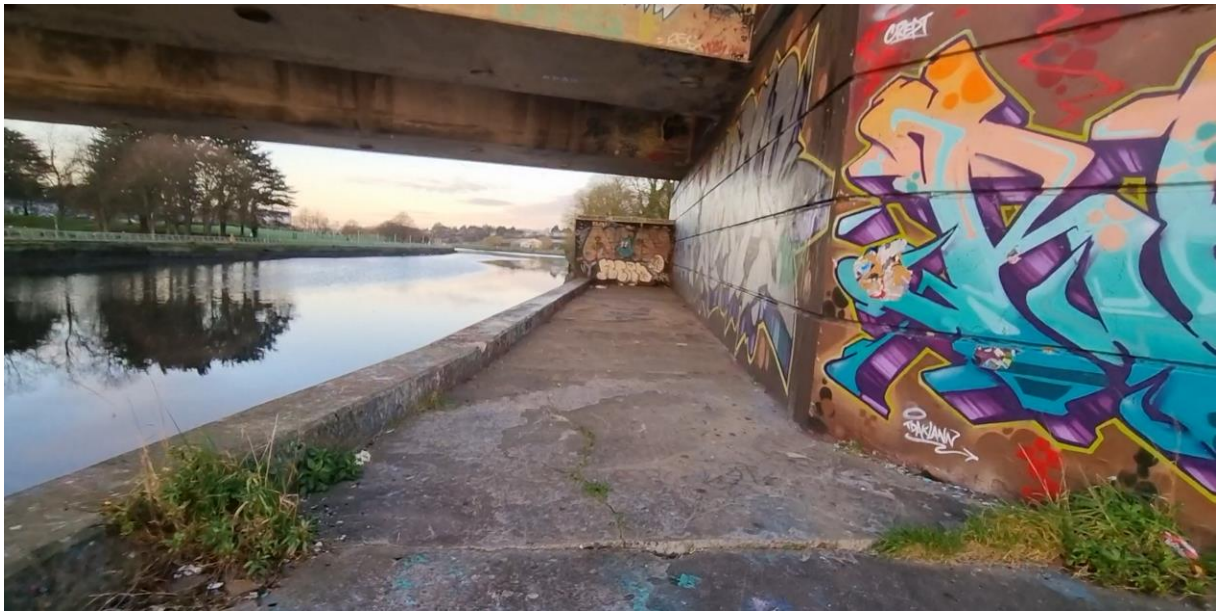


Figure 66: Cycling Route to continue Underneath Peace Bridge

Figure 67: Cycling Route to continue Underneath Peace Bridge

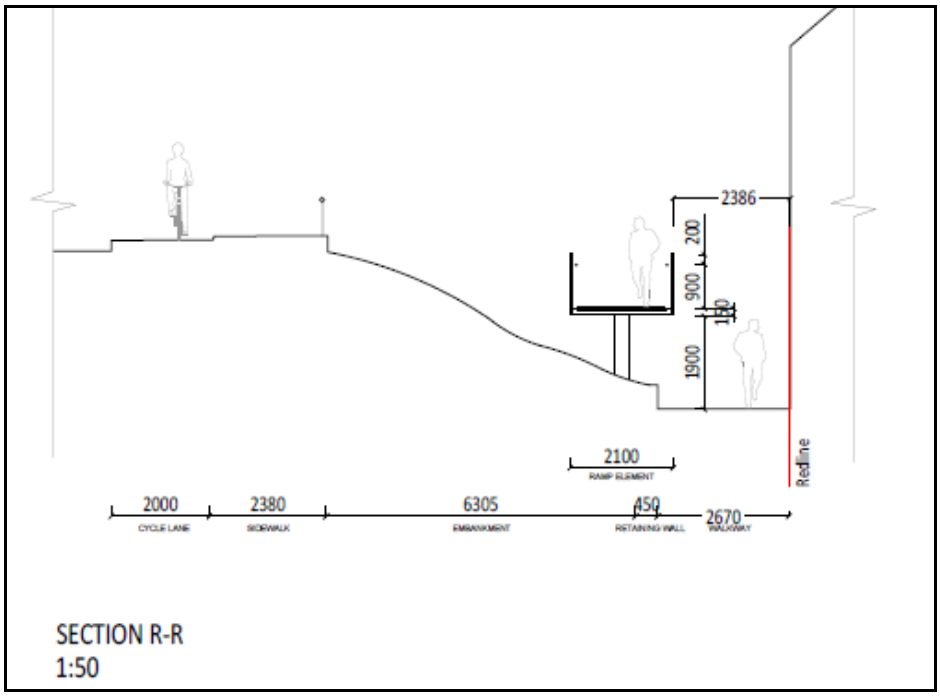


Figure 68: No overhead clearance adjacent to walkway

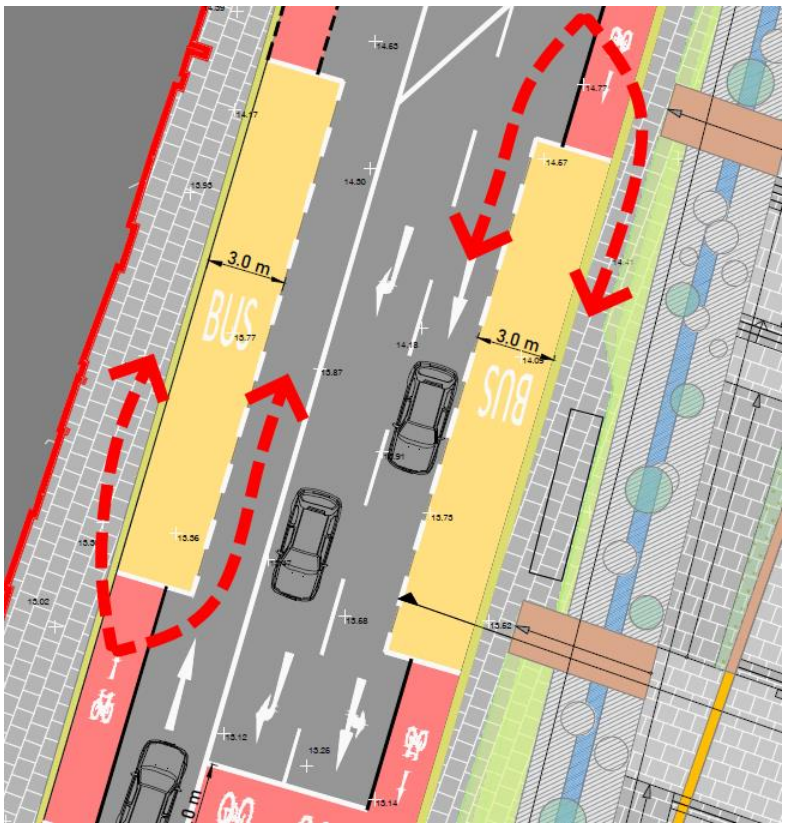


Figure 69: Discontinuous Cycle Lanes

- There is no provision for safe continuity of the proposed cycling facilities through the bus stop area on both sides of George's Street, cyclists will be vulnerable at this location, and will need to enter the carriageway on a very narrow lane, presenting significantly increased risks of conflict with passing traffic, or alternatively pedestrians will need to mount the kerbs in potential conflict with pedestrians and passengers on the footway adjacent, including on the eastern side of the cross section, where the footway is narrow

- There is no provision for transition kerbs to facilitate transfer between on and off-road cycling facilities.

- The signalised crossing points have been configured for pedestrian use only, with no provision for toucan aspects or PBUs, and insufficient width for shared use.

- The proposed two-way asphalt bicycle lane width along the Riverside on Father Connolly Way is too narrow for two-way use.

- The proposed two way cycle track intersects with the proposed walkway, wth no provision for yield signs, dynamic visibility, or ladder and tramline tactile paving.

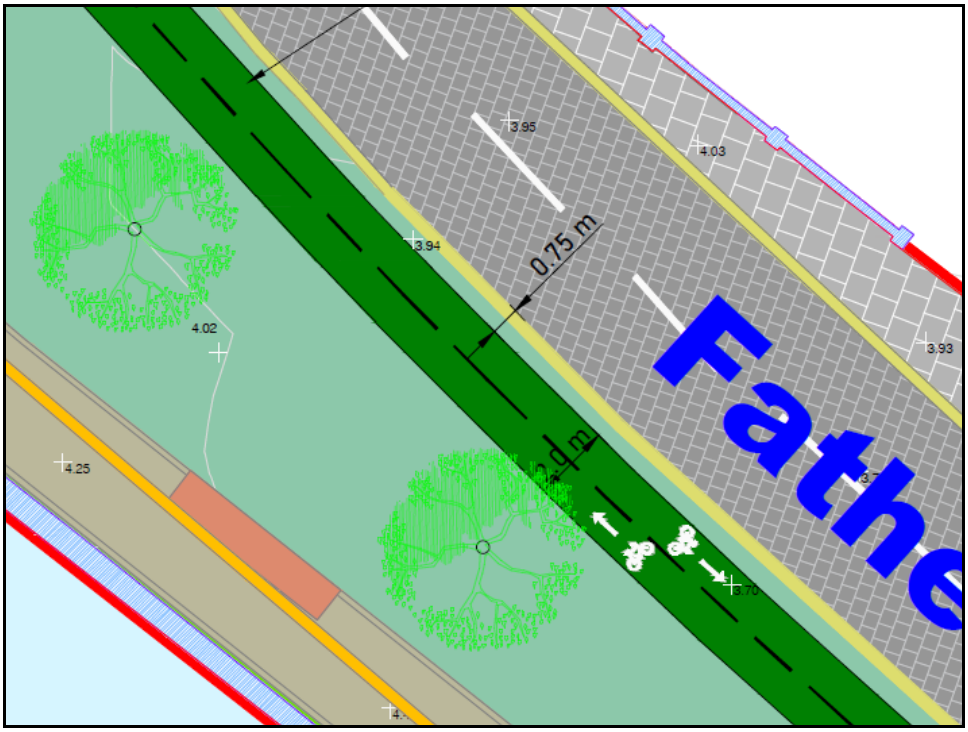


Figure 70: Narrow two-way cycle track on Father Connolly Way

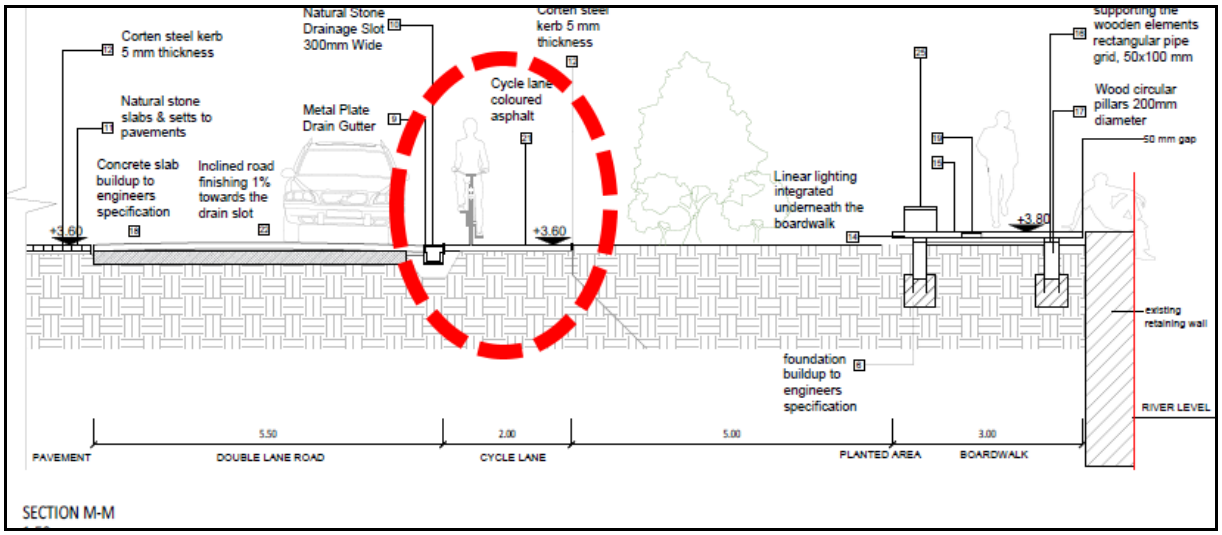


Figure 71: Narrow two-way cycle track on Father Connolly Way

- A number of bicycle parking spaces have been provided within the site, however the provision for wayfinding and safe unobstructed access to and from these spaces is not clear from the design proposals, as many of the spaces are located adjacent to narrow footways, where there is insufficient space for cyclists to walk alongside pedestrians, and no provision for suitable kerb transitions/dropped kerbs to facilitate transfer from off road to on road facilities.

- There is no provision for RUS shared VRU surface signage, or tactile paving at potential conflict points between pedestrians and cyclists, and the provision for cyclists to cross footways is not clear, where facilities intersect at right angles and where conflicts will arise between pedestrians and cyclists.

- There is no provision on the design for a verge or separation distance between the VRU facilities and the carriageways adjacent. When cycle/pedestrian facilities follow parallel to the route of a road, a separation distance should be provided between the road and the cycle track through the provision of a grassed verge. A minimum grassed verge width of 1m is usually required to improve safety for VRUs.

- The proposed wooden walkway slope is too steep for cyclist access, and vegetation adjacent is likely to lead to slippy conditions due to fallen leaves etc. The bends on this facility are too sharp, and will be too narrow for shared use with cyclists and pedestrians.

There is no scope for cyclists to use the facility adjacent due to the presence of steps, as highlighted in figure 72.

Figure 72: Narrow 1.8m wide wooden walkway not suitable for cyclists

Recommendations

1. Likely cyclist volumes and desire lines should be considered in provision of safe continuous cycling facilities, with sufficient width to be provided to minimise the potential for conflict between cyclists and motorists, and between cyclists and pedestrians.

2. All cycling facilities should have a design speed of 30 km/h and suitable intervisibility should be provided at all intersection points, with a reduced design speed of 10 km/h acceptable (over short distances) on approaches to junctions.

3. A width of 3 metres is the preferred two-way minimum width on a cycling route which is not shared with pedestrians, but only where the route is not bounded by vertical features. Where a significant amount of two-way cycling is expected, additional width should be provided, depending on anticipated user flows. Additional width should also be provided for spaces which are to be shared with pedestrians on the same level.

4. If vertical objects such as a wall, a fence or items of street furniture such as lighting columns are located immediately adjacent to a cycle facility, the effective width of the cycle facility will be reduced. A minimum lateral clearance of 0.5m shall be provided to vertical objects where they are located adjacent to cycle facilities.

5. Shared facilities next to vehicular traffic should have a recommended combined width of 4m with the absolute minimum combined width of 3m acceptable in locations which cater for just one-way direction of travel for cyclists.

6. Detailed design should include details of proposed gradients and widths on all new cycling facilities, with sufficient overhead clearance to be provided to signs and bridge abutments, and any other overhead hazards. Headroom standards to be provided in accordance with DN-GEO-03040. The desirable minimum headroom along cycle facilities is 2.7 metres, however over short distances a reduced head height of 2.4 metres is acceptable.

7. Clear wayfinding should be provided for all cyclists throughout the site, to and from bicycle parking stands, to include sufficiently wide carriageways to enable safe shared use,

particularly adjacent to parallel parking bays, where an additional buffer zone of 1m is recommended to minimise risks arising for car doors opening.

8. The width of all crossings to be shared by both pedestrians and cyclists to be a minimum 4m wide, including informal crossings, and controlled pedestrian crossing facilities should be configured as toucan crossings to accommodate cyclists, where volumes dictate.

9. The minimum required 3m wide shared VRU route width should be increased where the shared surface is bound on one or both sides by a solid continuous hazard such as a wall or fence, and where significant demands for two-way cyclist movement are expected to arise.

10. Provision should be made for suitable dropped kerbs and transition kerbs to facilitate transfer between on and off-road facilities. Cyclists should be able to access parking areas within the site safely without having to negotiate excessive kerb heights or travel on narrow footways adjacent to pedestrians.

11. Provision should be made for suitable signage on VRU areas, particularly on shared spaces between pedestrians and cyclists (typically signed with RUS signage in accordance with the requirements of the Traffic Signs Manual), to include appropriate signage at the start and end of all cyclist facilities.

12. Large Chamber covers and gullies should be kept out of cyclist desire lines and the surface of all routes to be used by cyclists should be a suitable gradient (desirable minimum gradient of 3%) and should be suitably drained to ensure to surfaces do not become slippery when wet.

2.3.2 Problem - Proposed Crossing Location and Layout on Fair Street

A standalone signalised pedestrian crossing is proposed on Fair Street in close proximity to the intersection with Georges Street, however the layout of the crossing is ambiguous, with zebra markings shown on one plan and a signal controlled crossing shown on another, as shown in figures 73 and 74. Ambiguous layouts, which do not conform to standard layouts can increase the risk of misinterpretation regarding rights of way and priority, leading to an increased risk of pedestrian/vehicular conflict. It is unclear if this crossing point is to be integrated into the

signalised operation of this junction, as the three other arms on the junction will operate with signal control.

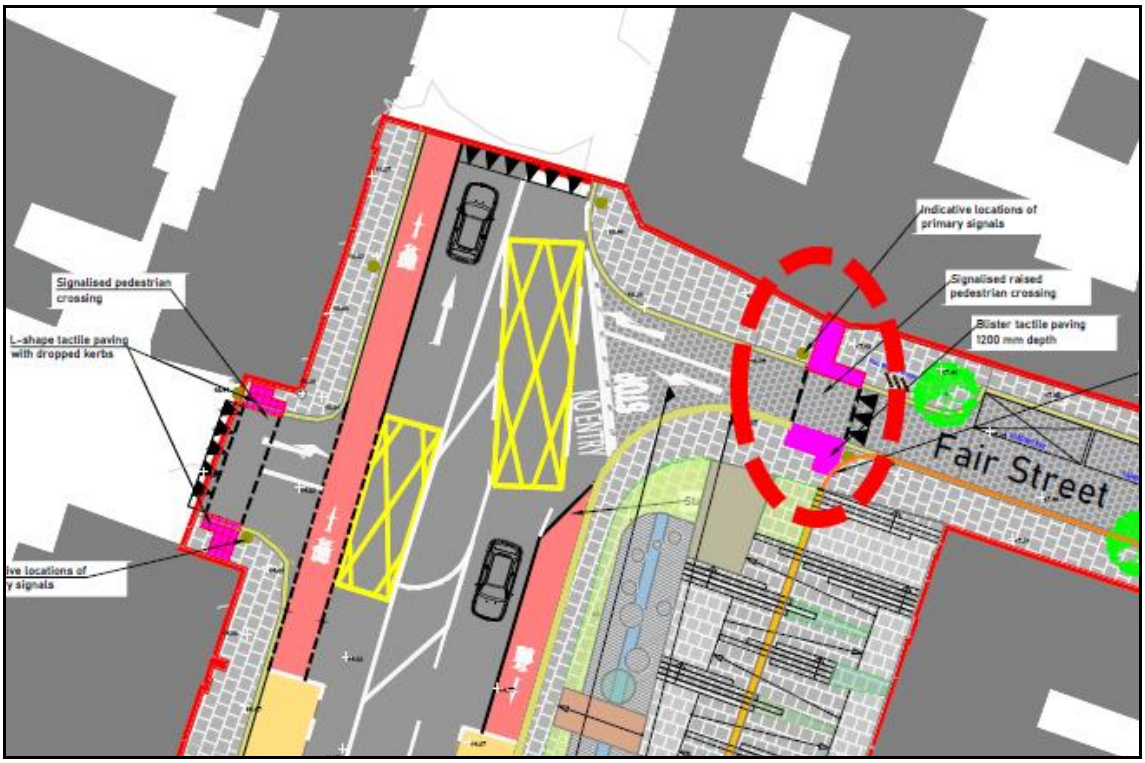


Figure 73: Crossing configured as signalised raised crossing

Figure 74: Crossing configured as raised Zebra Crossing

Recommendations

1. Standalone signalised pedestrian crossings should not be located closer than 20m from a nearby junction. Where this is unavoidable, the crossing should be integrated into the signal operations and staging for the entire junction, and linked to nearby signals also through a suitable UTC system.

2. Crossings which are configured as zebra crossings can be located up to 5m away from a junction, however layout should include Belisha Beacons and associated road markings in line with standard design to minimise the risk of misinterpretation regarding rights of way and priority.

3. The layout of the crossing point should conform to a standard layout as either controlled signalised or zebra crossing, with red L-shaped tactile paving to accompany a controlled crossing, or an uncontrolled crossing with buff tactile paving.

2.3.3 Problem – Permeability and Accessibility for Mobility Impaired Pedestrians/VRUs

Proposed footway widths are substandard on a number of streets throughout the Westgate Scheme area, which may present potential difficulties for disabled pedestrians/road users in accessing or traversing the site in these areas, without potential conflict with circulating and turning traffic. Steps are also precluding safe accessibility for all road users at some locations, with inconsistent provision for suitable warning surfaces at the top and bottom, to highlight the presence of the hazard to visually impaired pedestrians.

Some areas of site are poorly defined in terms of pedestrian segregation and clear and safe wayfinding, particularly for disabled road users, who will need to share space with motorised traffic to traverse these sections of the site. A number of potential safety issues were also noted at intersections and scheme tie-ins, inclusive of no footways, abruptly terminating footways, narrow footways, poor surface condition and trip hazards, and insufficient clearance to solid continuous walls was also noted, which can lead to a risk of crushing where pedestrians, including those with wheelchairs or a buggy, may have insufficient space to travel between the walls and the traffic lanes. This risk also arises for two-wheeled vehicles at these locations.

Figure 75: Narrow existing steps, No tactile at top and bottom

Figure 76: Narrow steps, with conduroy tactile at top and bottom
With no contrasting colour to surrouding paving

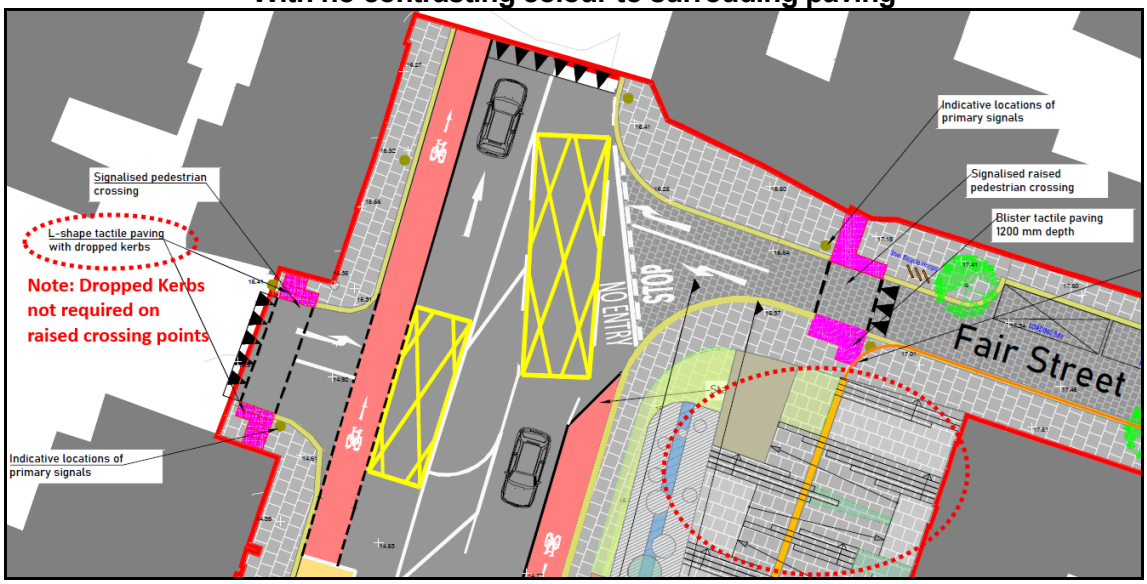


Figure 77: Proposed Steps to south of Fair Street
Note: trip hazards arising where dropped kerbs are provided at raised crossing points

Provision has been made for visually and mobility impaired pedestrians through proposals for blister tactile paving at a number of formal and informal crossing points throughout the scheme to alert visually impaired pedestrians to the presence of the crossings and the potential for conflict with traffic, however provision is inconsistent in respect of colours and configuration, and the width of a number of the crossings and associated dropped kerbs is narrow, and may not safely

accommodate wheelchair users, or those with buggies, including double buggies. Tactile paving and the extent of dropped kerbing does not line up correctly for the full width of all crossings, and the stem of all L-shaped tactile at the signalised junctions does not extend to the rear of all adjacent footways. The preliminary design layout also includes provision for tactile paving with dropped kerbs, however the surfaces are raised on junction tables/plateaues at some locations where dropped kerbs have been indicated, which will ppresent a trip hazard on pedestrian desire lines.

There is no provision for corduroy tactile paving at the top and bottom of a number of existing and proposed steps throughout the site. Existing steps are narrow and do not conform to standard in respect of width and handrails, as shown previously in figures 75 and 76. Elsewhere, single steps were noted at a number of locations, including at access points to/from premises adjacent where the steps are projecting out onto the adjacent footway and causing a potential trip hazard, with an example of where this is occurring shown in figures 80 and 81.

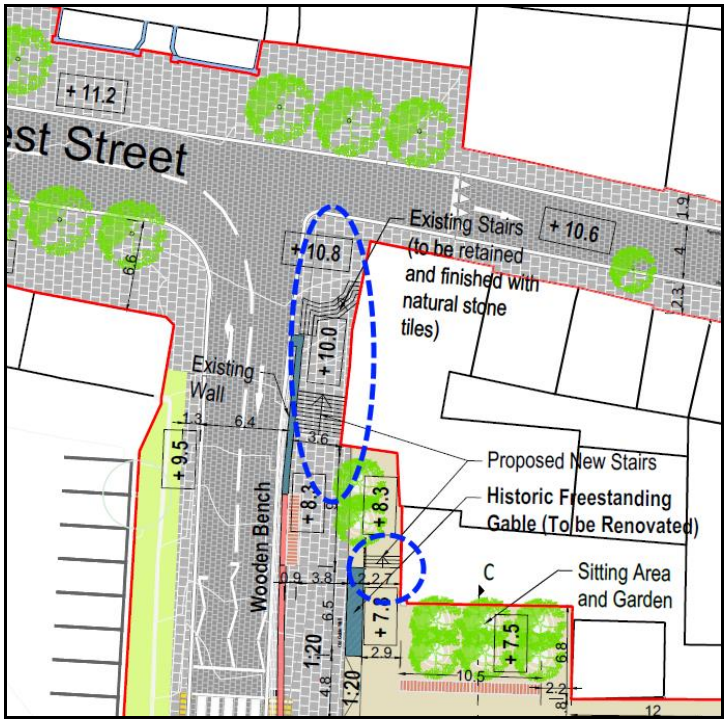


Figure 78: New Steps Proposed & Retaining wall to be removed

Figure 79: Existing non compliant steps and handrails

Figure 80: Steps presenting trip hazards in footways

Figure 81: Steps presenting trip hazards in footway and obstructing footway width

- Existing dropped kerbs and tactile paving is being removed from the junction mouth at the intersection of West Street and Father Connolly Way, where a significant desire line to cross was noted at the time of the site visit. There is no provision in the design drawings for accessibility on the observed desire line to cross the mouth of the junction, as at present. It was noted that the existing tactile paving is poorly aligned, and bringing visually impaired pedestrians out into the centre of the carriageway at this location, as shown in figure 82.

Figure 82: Existing informal crossing point across mount of junction with Father Connolly Way/West Street to be removed. Note Tactile is incorrectly aligned at present

Recommendations

1. All tactile paving throughout the scheme should be provided in accordance with 'Guidance on the use of Tactile Paving Surfaces'.

2. All tactile paving should extend across the full width of each crossing with appropriate dropped kerbs to be provided to each side, to be flush with the surrounding surface or have a maximum upstand of 6mm, with suitable transition kerbs to each side.

3. The width of all crossing points should ensure that all likely demands for crossing can be accommodated, including two-way movements for mobility impaired pedestrians as necessary.

4. All tactile paving should line directly up with tactile paving and dropped kerbs on the opposite side of the crossing, and should be the same width, to ensure visually impaired pedestrians are not directed to cross at a location where insufficient dropped kerbs may present a trip hazard.

5. All inspection covers should be located away from tactiles or alternatively the covers should be inlaid with blister surface to provide continuity for the tactile paving layout and to minimise slip hazards.

6. Appropriate corduroy warning paving should be provided at all level changes and at the top and bottom of steps throughout the site, at a suitable offset from the hazard, to alert visually and mobility impaired pedestrians to the presence of the hazard.

7. The corduroy surfaces should extend across the full width of all steps at both the top and bottom of the flight, and ideally extended to a point 400mm beyond the end of the hazard where pedestrians may be approaching steps at an angle.

8. The tactiles should be installed at a standardised offset of 400mm, to assist visually impaired people in adjusting their walking speed.

9. Contrasting colours for leading step edges and warning paving colours should also be provided to further inform visually impaired users of the presence of the hazard(s). The rise of each step should be between 150 mm and 180 mm.

10. All step nosings should incorporate a permanently contrasting continuous material on the tread. The material should be between 50 mm and 65 mm wide on the tread and should contrast visually with the remainder of the tread.

11. Projecting features which may present hazards should be avoided to reduce the risks to people with vision impairment, including single steps and steps protruding into footway areas. However, if they are unavoidable, hazard protection should be provided if objects project more than 100 mm into an access route and their lower front edge is more than 300 mm above the ground.

12. A window or door in general use should not open out onto access routes, within a height of 2100 mm above floor or ground level. Where such hazards are unavoidable, the area should be protected by guarding, planting or other suitable barrier incorporating low level cane detection.

13. The finished levels of all surfaces should be examined to ensure safe access to buildings has been provided where necessary. Single steps should not be provided anywhere throughout the scheme areas, and should be substituted by ramped access with suitable gradients. Ramps should not protrude into pedestrian circulation areas where they may present a trip hazard.

14. The layout should ensure there are safe access routes and measures to improve amenity and safety for mobility or sensory impaired pedestrians throughout the extent of the Westgate Scheme area, inclusive of terms of reference of the National Disability Authority Guidelines, the Disability Act 2005 and the Building Regulations 2014.

15. The width and layout of all footways and ramps should ensure safe accessibility can be provided for all road users, including the mobility and visually impaired, and all completed works on footways and VRU desire lines throughout the site should ensure that safe access can be accommodated for mobility and visually impaired pedestrians, with accessibility to be provided in accordance with the requirements of Government Technical Guidance Document M, Access and Use (2010).

16. Detailed design should include information on proposed gradients and crossfalls on all routes to be traversed by pedestrians, including the mobility impaired, as well as finished levels at the top and bottom of steps and cross sections to indicate kerb heights at regular chainages on the new streets, with dropped kerbs to be flush with the surrounding carriageway on pedestrian desire lines, or have a maximum kerb upstand of 6mm.

17. All surfaces and any ramps throughout the scheme should have a maximum gradient of 1:20 (preferable) or 1:12 (absolute maximum over short distances only) at all locations. An alternative means of access for wheelchair users must be provided in all locations where steps have been provided, or where ramp gradients of 1:20 or greater are provided, with a total ramp rise greater than 2m.

18. Appropriate dwell/landing areas should be provided where lengths of gradient require it. Individual sloped sections should not be greater than 9m (@ slope of 1 in 20). Steeper slopes require shorter lengths, with minimum landing lengths of 1m.

19. The background against which the handrails are seen should contrast visually without being highly reflective. A level landing of at least 1800 mm long x 1800 mm wide and clear of any obstructions should also be provided at the top and bottom of all ramps. Intermediate landings can be 1500mm, however Intermediate landings should be at least 1800 mm wide and 1800 mm long to act as passing places when it is not possible for a wheelchair user to see from one end of the ramp to the other.

20. All cross falls should be reviewed at detailed design stage to ensure there is no risk of standing water on the ramps or footways, or varying crossfalls over a short section which might present difficulties for mobility impaired pedestrians, with drainage paths and potential for ponding to be monitored to ensure footway surfaces do not become slippery and difficult for pedestrians to walk on when wet.

2.3.4 Problem – Pedestrian Facilities Generally

There was no information provided to the Audit Team on anticipated pedestrian demands and desire lines throughout the scheme area, and there was a moderate level of pedestrian activity noted at the time of the site visit. Exisitng pedestrian facilities are substandard in respect of width, layout and continuity within an urban environment, and the proposed design does not adequately address all substandard issues.

A number of potential safety issues were noted on the preliminary design layout, which should be considered as the design progresses, some of which have been summarised below, with photos where necessary to illustrate the issues raised:

- The provision for continuity of a number of pedestrian routes is not clear at some locations, particularly at tie-ins, and pedestrians may inadvertently walk out into the path of vehicles on desire lines where the layout and priority are ambiguous, and intervisibility may be restricted by building lines and other street furniture, landscaping and parking.

- Intervisibility at a number of pedestrian crossing locations will be compromised by the location of landscaping and parking bays adjacent, with an example of where this occurs shown in figure 83.

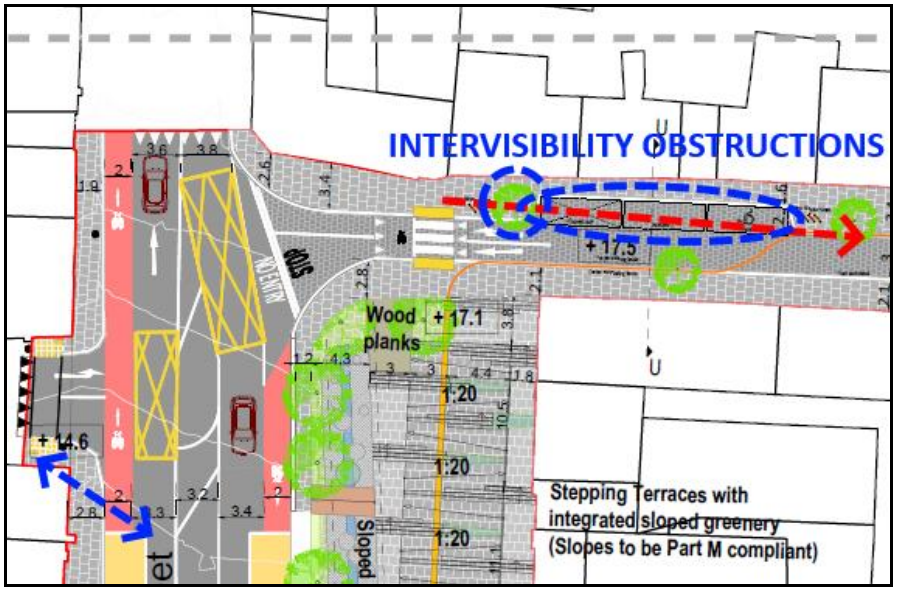


Figure 83: Intervisibility compromised by parking bays, landscaping and building lines

- Existing intervisibility at controlled crossing points is poor at a number of locations, including at a number of the signalised crossing points at the crossroads intersection of Trinity Street/West Street/Georges Street, as shown in the photos in figures 84 and 85. Intervisibility will be further reduced to and from all existing crossing points at this location due to the set back of stop lines and impact on the intervisibility zone, as outlined previously in section 2.2 of this Stage 1 RSA report. Insufficient intervisibility increases the risk of pedestrian/vehicular conflict.

- Intervisibility is also compromised at a number of junction mouths and access points where building lines obstruct the sightlines.

Figure 84: Limited intervisibility to/from right at Crossing on Trinity Street

Figure 85: Reduced Intervisibility to left from 2m back from kerbline at crossing on Georges Street

- The provision for treatment of significant level difference to the rear of the new crossing point on Father Connolly Way is unclear, as there are significant level differences to each side of the retaining wall at present, as shown in figure 86, and a significant section of the retaining wall is being removed, which may present a risk of falling from a height in the absence of suitable fencing.

- The provision for safe connectivity between Abbey Square and the new zebra crossing on Father Connolly Way is unclear, and the existing longitudinal vertical grdient on this link appears steep. New crossings should not be provided on gradients exceeding 5% due to the potential for reduced stopping distance in wet and icy conditions, and the potential for higher speeds on the downhill approach.

- Intervisibility to/from the south from the eastern side of the crossing is also likely to be obstructed by current boundary treatment/wall to the south, as highlighted in figure 88.

Figure 86: View southwards showing level differences at retaining wall

Figure 87: Eastern side of retaining wall on Old Abbey Lane

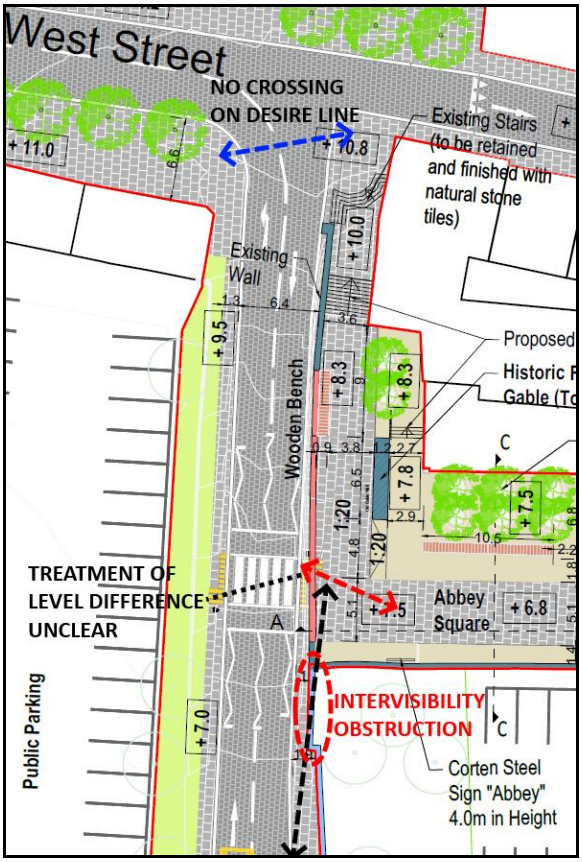


Figure 88: Reduced intervisibility to/from left at crossing

Recommendations

1. Pedestrian movements should be prioritised throughout the site and supplemented with provision for reduced speed limit signage, slow zone signage or bespoke pedestrian priority signs where necessary to reinforce the message to motorists.

2. The design should cater for the most dominant VRU desire lines throughout the area, and ensure the proposed layout prioritises movements of VRUs over and above the movement of traffic within the urban area, with inclusion for additional vertical deflection where necessary to encourage low vehicle speeds and promote VRU priority. All pedestrian crossing points should ideally be raised, to further prioritise VRU movements

3. There should be no new hazards placed within the intervisibility splays on approaches to any crossings, controlled or uncontrolled, including guardrails, landscaping, parking, utility poles and cabinets, seating, bicycle parking and boundaries. Intervisibility between motorists and VRUs should be clear and unobstructed at all times in accordance with traffic speeds, with parking bays, vegetation and street furniture to be removed from locations where clear intervisibility is will be reduced. All guardrails to be used should be high visibility specification.

4. Where intervisibility at a proposed crossing is compromised by the proximity of a building provision should be made for suitable warning signage and trafifc calming measures, to ensure motorists can not approach or turn towards crossings at speed., with provision for suitable anti-skid or high friction surfacing for a minimum recommended distance of 50m in advance of controlled crossing points.

5. The treatment of the level differences between Father Connolly Way and Abbey Square should be clarified, with suitable gradients (maximum 5%) to be provided on the desire line between the crossing and the Old Abbey, and with no sudden change in gradients at the tie in on Abbey Lane to the north. New crossings should not be provided on roads with gradients exceeding 5%.

6. Pedestrian accessibility, and safe accessibility for disabled road users, including those who are mobility impaired with wheelchairs, buggies and walking aids, or those who are sensory impaired, should be provided in accordance with the requirement of Government Technical

Guidance Document M, Access and Use (2010), the Local Government Management Services Board (LGMSB) Guidelines entitled “Good Practice Guidelines on Access of Streetscapes” and the Irish Wheelchair Association best Practice Guidelines.

2.3.5 Problem – Narrow and Abruptly Terminating Footways

Footways are narrow with substandard widths at a number of locations throughout the site, and there is insufficient space for disabled or mobility impaired road users to pass safely at some locations throughout the site due to the location of street furniture, which may force pedestrians out into the path of oncoming vehicles. Narrow footways and VRU routes are contrary to the aspirations of DMURS which advocates the reallocation of space on the cross section for the benefit of VRUs. Mobility and visually impaired pedestrians in particular may be more vulnerable on narrower footways with potential obstructions from street furniture and where no separation distance has been provided, and where there is no longitudinal tactile guidance.

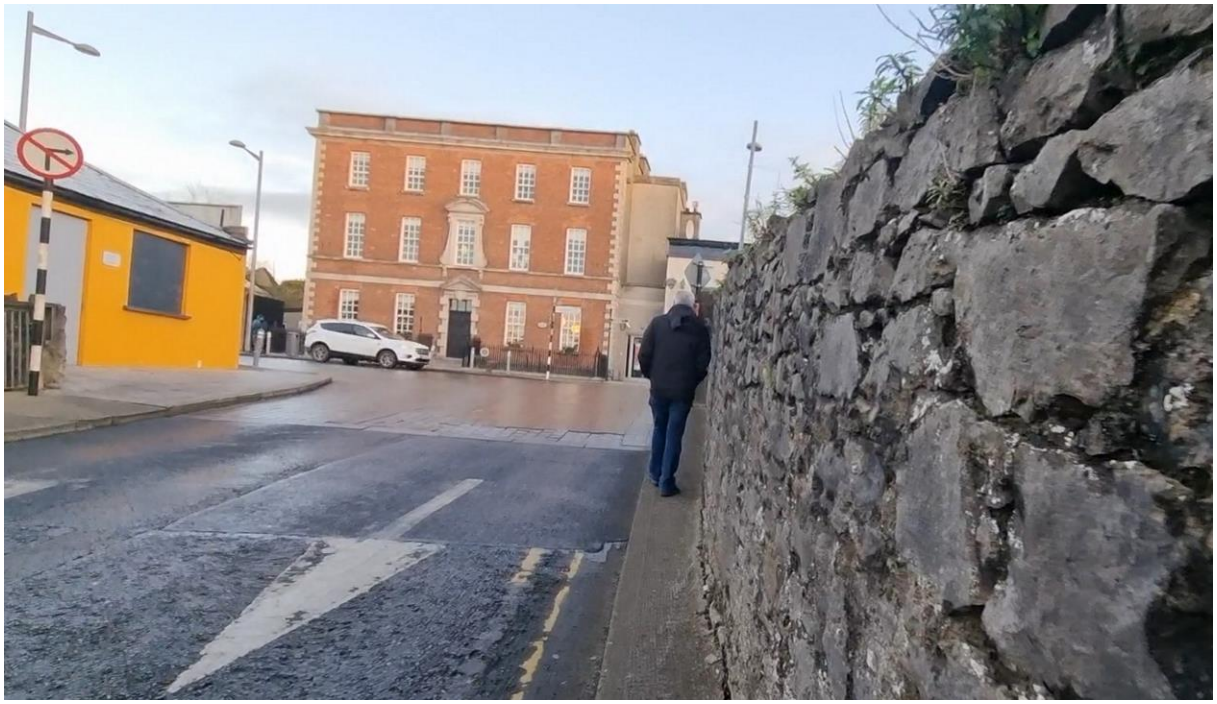


Figure 89: Very Narrow section of footway retained on Father Connolly Way

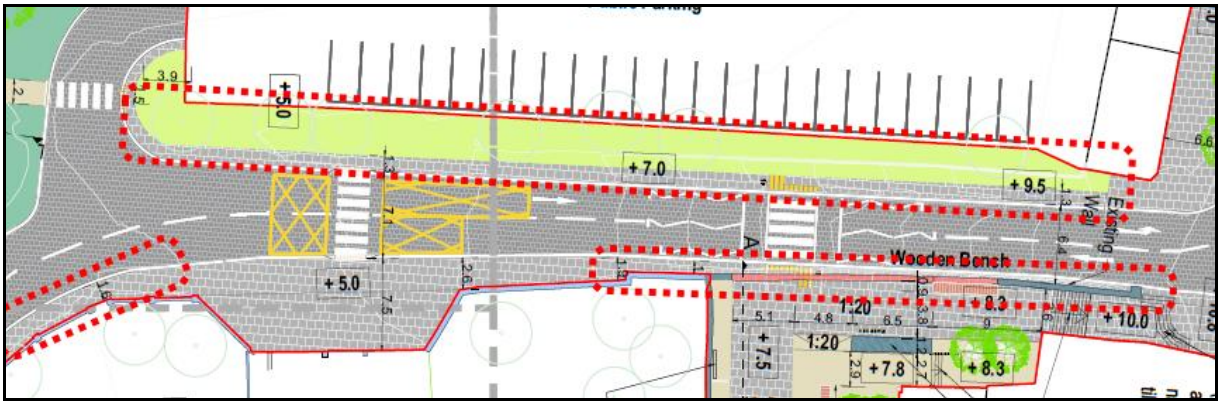


Figure 90: Very Narrow footways on Father Connolly Way

Figure 91: Narrow footway to rear of parking bays on Fair Street

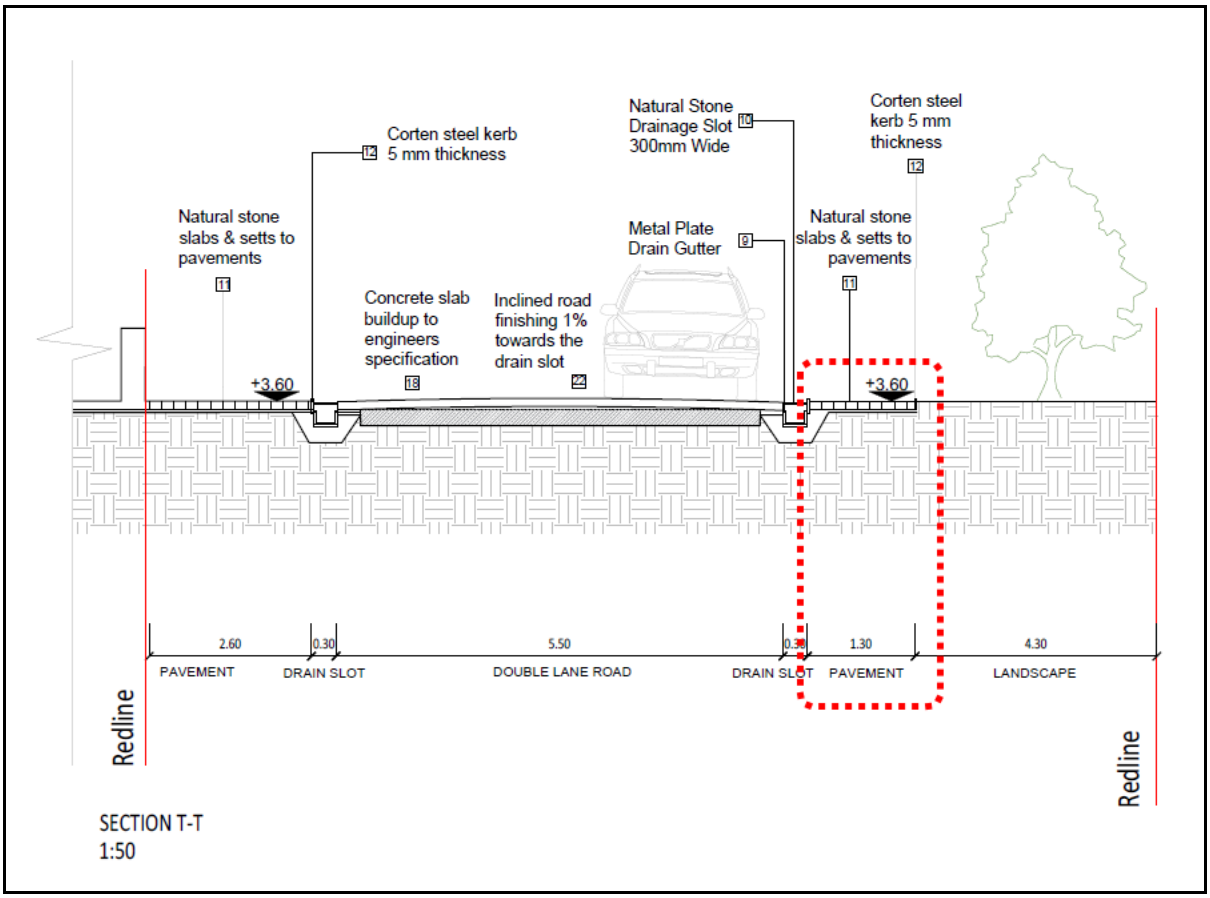


Figure 92: Narrow proposed footway on Riverside

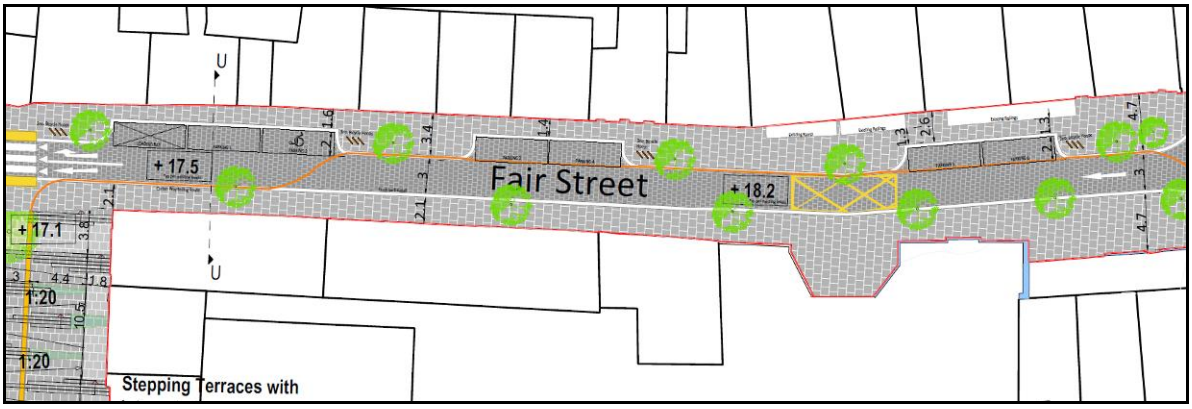


Figure 93: Narrow footways on Fair Street

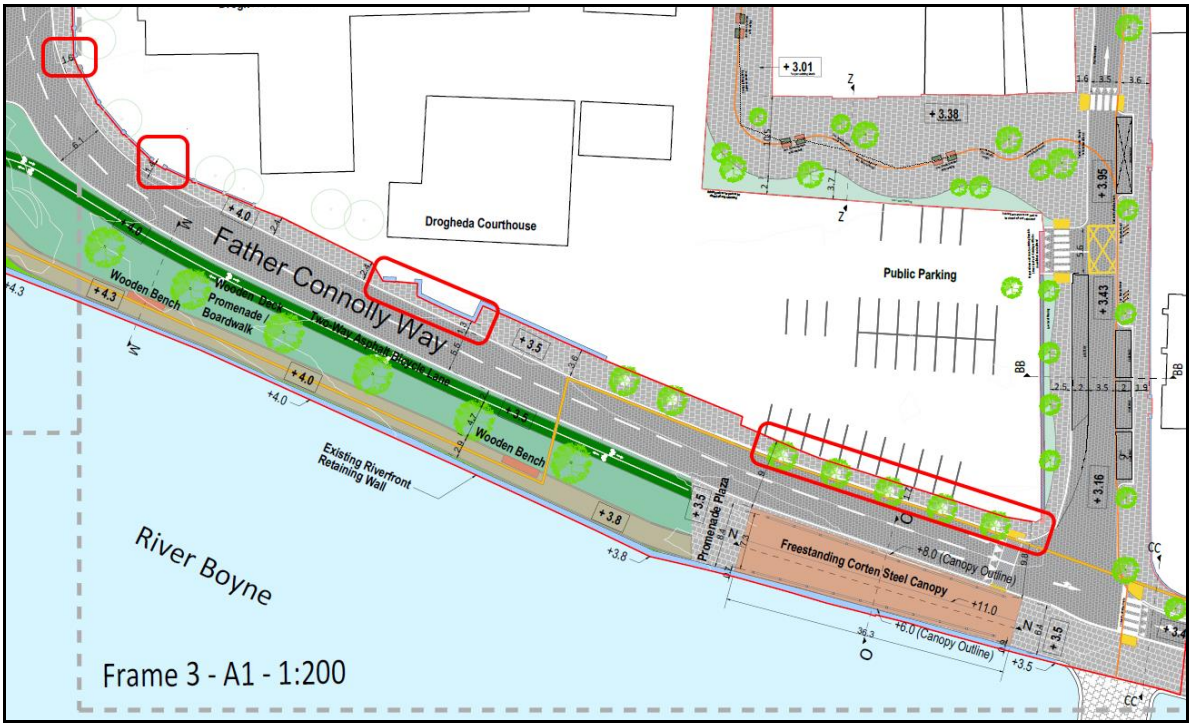


Figure 94: Narrow footways on Father Connolly Way

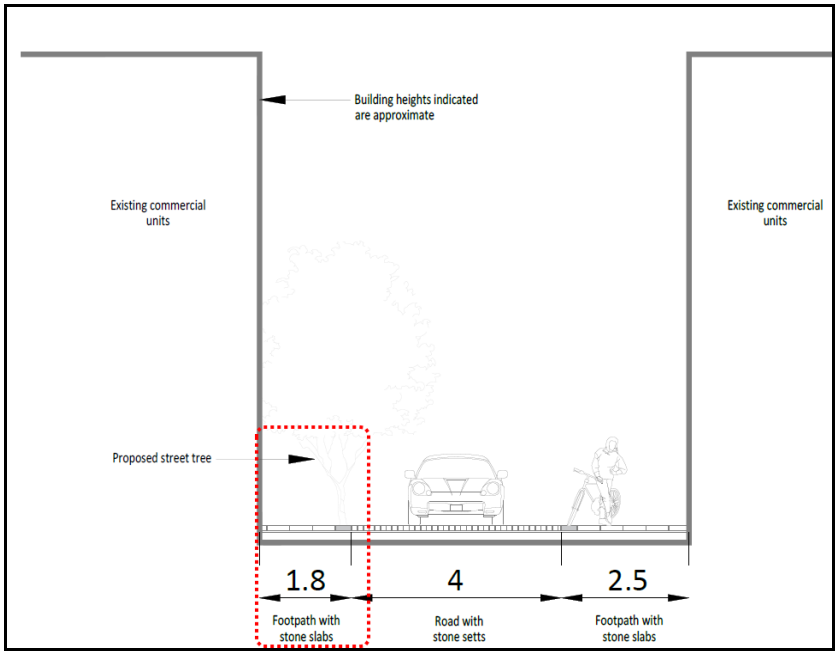


Figure 95: Narrow footways on West Street (Section W-W West Street)

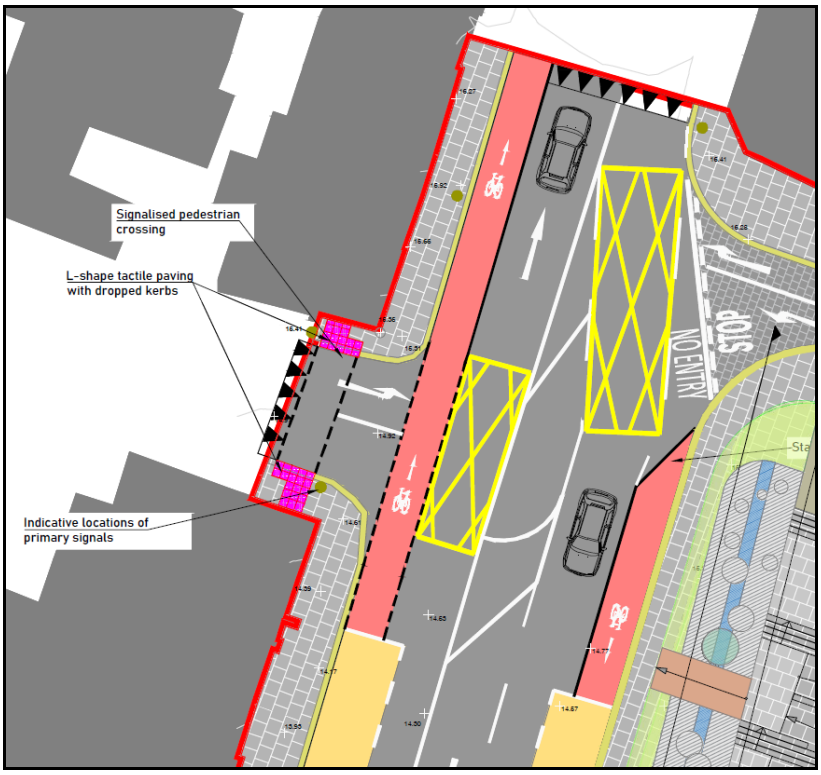


Figure 96: Narrow abruptly terminating footways on Fair Green Where Signal poles will block footways

Figure 97: No footway at tie in on Fair Green

Figure 98: Pedestrians forced to walk in carriageway on Fair Green where additional obstructions arise

Figure 99: Footway terminates abruptly at scheme ti-in on Fair Green

Recommendations

1. All proposed pedestrian routes should be continuous and should not terminate abruptly or force pedestrians out into the carriageway, including at scheme tie-ins. New urban relam improvements can change VRU behaviour and provide a false sense of security, and pedestrians may not be alerted to the sudden change in standards and infrastructure proviison.

2. All likely pedestrian demands and desire lines should be examined throughout the site, with all footways to be clear and unobstructed at all times, with potential obstructions removed or relocated as appropriate, with due regard for the placement of refuse and signage for commercial premises, which were noted blocking footways at a significant number of locations throughout the site.

3. A recommended clear and unobstructed footway width of 2m should be provided to allow two wheelchair users or road users with buggies to safely pass each other going in opposite directions. Where this pathway width is not possible, the approach route should have a clear and unobstructed minimum width of 1.8m, with passing places provided at intervals for wheelchair users, and an absolute minimum unobstructed width of 1.2m at isolated locations only, e.g. adjacent to a lighting column or road sign.

4. A minimum unobstructed continuous footway width of 2m should be increased to 3m on any surfaces to be shared with cyclists, to be widened further to cater for two-way cycling flow.

5. An absolute minimum footway width of 1.2m is acceptable at isolated locations only, however sufficiently greater width should be provided wherever possible to provide a greater degree of protection to pedestrians within the urban zone, and to facilitate accessibility for the mobility impaired.

6. All street furniture, including lighting columns, should be located to the back of footway where possible, in a location which does not obstruct the movement of VRUs, and at a sufficient offset from the carriageway edge to minimise the risk of vehicle strike.

7. Sufficient space should be provided between any bollards, signage and lighting columns throughout the scheme area to ensure accessibility is not restricted for mobility impaired pedestrians, including those in wheelchairs and with double buggies.

8. Any bollards used throughout the scheme area should be sufficiently spaced to ensure VRU movements are not restricted, particularly for mobility impaired pedestrians. Bollards should not be black, and should include reflective strips to ensure they are clearly visible to all road users during the hours of darkness, and are located at a sufficient offset from the carriageway edges, to minimise the risk of being struck by passing vehicles.

2.3.6 Problem – Intervisibility and layout at Pedestrian Crossings on Father Connolly Way

There is inconsistent treatment of crossing points in close proximity on Father Connolly Way, which is likely to lead to confusion and misinterpretation regarding rights of way and priority, with one of the crossings configured as a controlled zebra crossing, and the other crossings configured as informal uncontrolled crossing points, however zebra markings have been provided on the carriageway, which are typically associated with a controlled crossing point. Intervisibility issues are also likely to arise on the eastern side of the more northerly crossing point due to walls to the north and south. Footways are also substandard width on both sides of the carriageway at this location, and there is no provision for improved widths on the proposed design layout.

The crossings at the intersection with Dominic Street, which are shown in figure 101, are also configured inconsistently, with the crossing on the eastern side partially located on a radius kerb, which is not recommended. Visibility to the left from the northern side of this crossing, immediately south of the church, will also be obstructed by the location of the landscaping and loading bay adjacent, with a risk that pedestrians wishing to cross towards the River Boyne Bridge may not be clearly seen on the westbound approach, resulting in an increased risk of pedestrian/vehicular conflict. Similar risks will arise on the eastbound approach to the easterly crossing, due to the location of proposed landscaping and the location of canopy supports on the southern side.

It was considered that significant desire lines will arise to cross the carriageway at this location to access the surface car park, however visibility issues may arise on the desire line, due to the removal of an existing footway, existing curvature at the south of the link and boundary treatment. The proposals for pedestrian links to and from the car park area have not been shown.

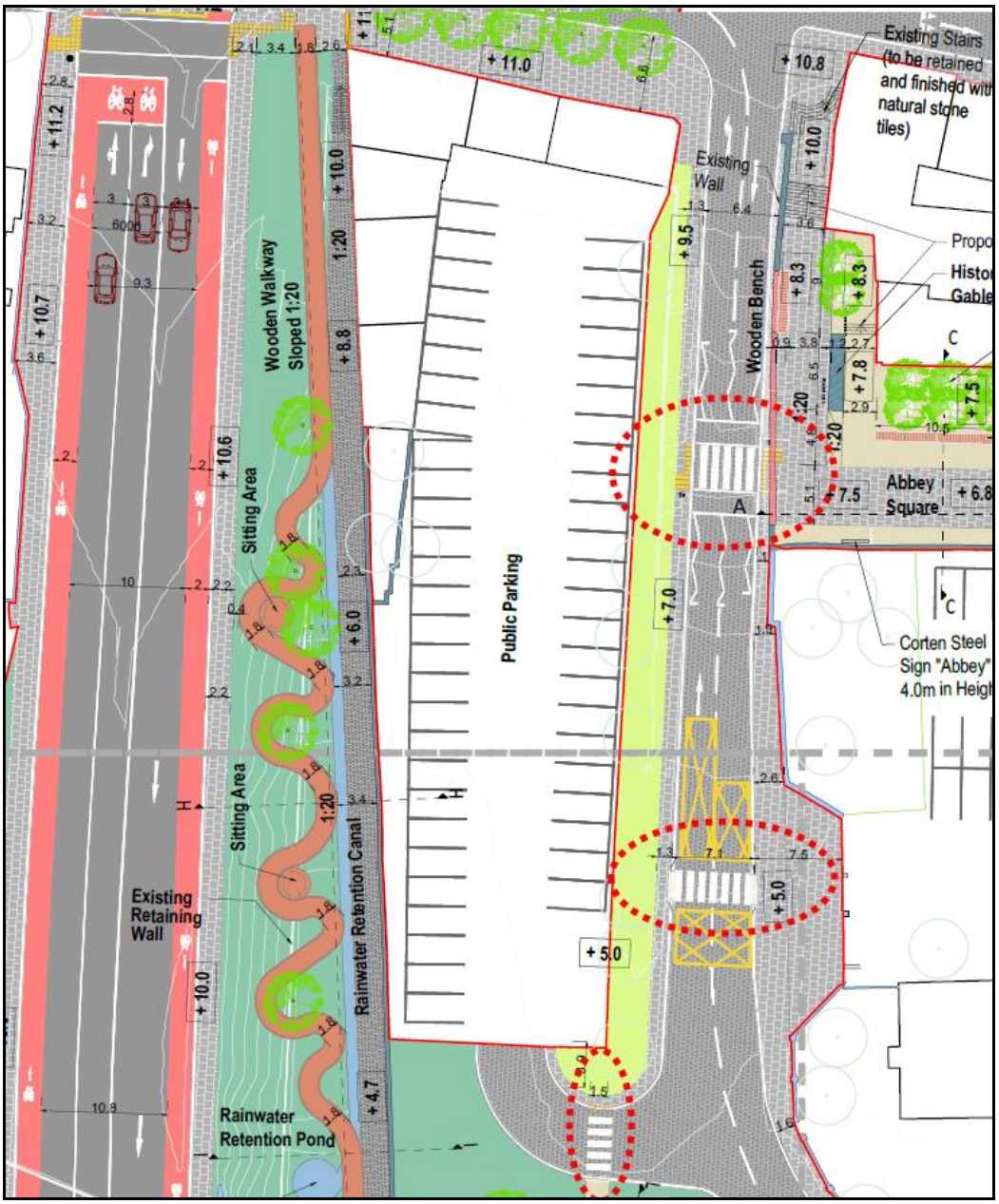


Figure 100: Inconsistent Crossing facilities and very narrow footways On Father Connolly Way

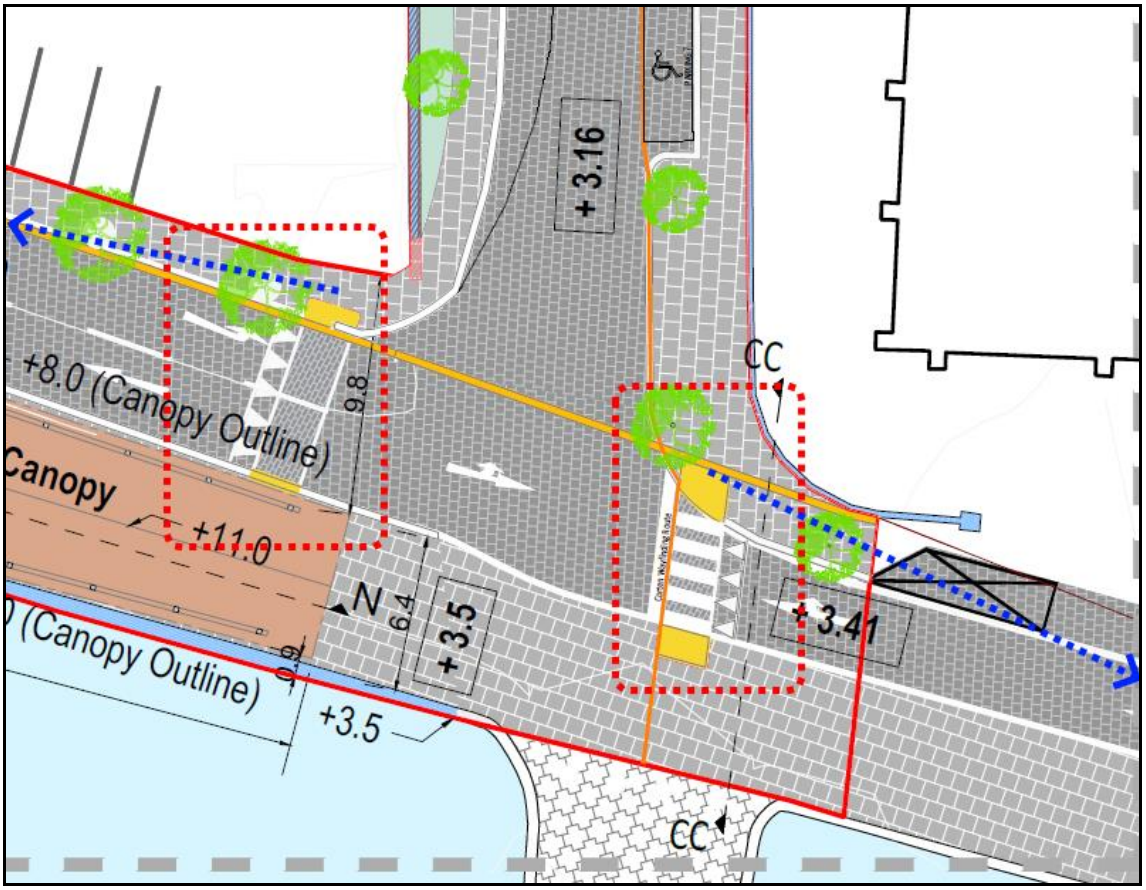


Figure 101: Inconsistent Crossing Treatment with iIntervisibility obstructions

Figure 102: Existing pedestrian link to/from car park to Father Connolly way

Figure 103: Significant level difference between Car Park and Father Connolly Way

Recommendations

1. Crossings should conform to standard layout as a controlled or uncontrolled crossing point to prevent misinterpretation regarding the rights of way and priority, and zebra markings on the carriageway should be accompanied by suitable road markings, Belisha Beacons, and L-shaped red tactile paving on each side.

2. Crossings and junctions in close proximity should be configured in a consistent manner to encourage a self-explaining layout, and to minimise the risk of misinterpretation.

3. Pedestrians should be clearly visible from a point 2m back from the kerb line on both sides of all crossing points throughout the scheme area, booth controlled and uncontrolled, and all obstructions should be removed, including walls, parking and loading bays, vegetation and landscaping, signs, columns and boundaries.

4. Detailed design should show safe routes to and from the car parking area to the west of Father Connolly way.

5. All controlled VRU crossing facilities should ideally be accompanied by provision for suitable traffic calming measures to reduce vehicle speeds and reverse the road hierarchy.

6. The crossing configuration and layouts throughout the Westgate scheme area should be ascertained with reference to the requirements of DN-GEO-03084 July 2021, with provision for controlled crossing facilities subject to a PV Squared analysis.

2.3.7 Problem – Layout and Wide crossing distances on George's Street

The new layout on George's Street will remove existing pedestrian refuge islands, as outlined previously. Pedestrians will be crossing multiple lanes and the existing sheep pen arrangement will be removed from the northern arm of the signalised crossroads with Trinity Street/West Street. Sensory impaired road users rely on controlled crossings with short crossing distances, and with audible, tactile and visual signals, and will be more vulnerable crossing on the wide crossing points, particularly where intervisibility is compromised.

The location of existing utility boxes at the junction are also obstructing clear intervisibility at one of the crossing points, particularly of small children, and there is no provision in the design for removal or relocation of these obstructions. The layout and configuration are likey to require addiitonal primary and secondary signal heads in the centre of the carriageway, and the opportunity for safe siting of these signals has been removed through removal of the refuge areas. Provision for replacement of the existing signal heads on the islands has not been shown on site clearance drawings or notes, andd a significant nuber of the poles are likely to obstruct footways on the new layout, some of which are already substandard width.

The proposed layout at the signalised crossroads is presented in figure 105, and shows removal of central refuge areas, new signal poles located too close to carriageway edges, insuffiicent number and location of primary and secondary signal heads, insufficient space on some footways for some of the signal head poles, incorrect tactile layout and colour, wide crossing distances, poor intervisibility and substandard intervisibility zone, with no departures from standard received for the proposed design.

Figure 104: Existing Sheep Pen Arrangement and narrow crossing

Figure 105: Proposed Layout at Junction of George's St / West St

Figure 106: Visibility to right compriomised by utility cabinet location

Poor intervisibility may also arise at a number of the other pedestrian crossing points at the junction, due to the location of bus stops, landscaping, building lines and boundaries, which will increase the risk of pedestrian/vehicular conflict. Figure 107 shows where intervisibility will be significantly reduced due to the relocation of the existing inset bus stop to the main carriageway on Georges Street. A bus stopped at this location will obstruct clear intervisibility to and from a pedestrian waiting or attempting to cross from this side of the crossing.

Figure 107: Visibility to right showing location of inset bus stop where visibility will be further reduced by bus stop relation

Figure 108: Poor Visibility to right from crossing

Figure 109: Crossing on Trinity Street is currently too narrow

Figure 110: Reduced visibility to left from existing crossing

Recommendations

1. The layout at the signalised junction should be configured to ensure pedestrian priority and safety is prioritised, taking into account all issues raised in this Stage 1 RSA report, to include sufficient green time for all pedestrians to cross, and upgrading of the crossings to toucans where necessary. Any deviation from standard layout for signalised junctions should be accompanied by the relevant departure from standard.

2. All crossing distances for VRUs should be minimised to less than 10m throughout the site, with crossings to be placed as close as possible to existing and likely future desire lines on the shortest possible direct route to minimise journey times and maximise usage.

3. All controlled crossing distances should be a minimum 2.4m wide to be increased to 4m where the crossing is configured as a toucan.

4. Intervisibility between motorists and VRUs attempting to cross at any of the crossings should be clear and unobstructed at all times in accordance with traffic speeds, and VRUs should

have good visibility of approaching vehicles from an x distance of 2m back from the edge of the road on each side of all controlled and uncontrolled crossings and identified desire lines to cross the carriageway throughout the scheme area.

5. Detailed design should include proposals for signal staging and timings and accompanying primary and secondary signal head placement. Sufficient clearance should be provided to passing traffic from signal heads and poles, and poles should not obstruct VRU movements on footways.

2.3.8 Problem – Kerb Proposals and Accessibility Generally in VRU Areas

Pedestrian desire lines and footway continuity are unclear at some locations internally within the site and at scheme tie-ins, and there are no clear boundaries or segregation between VRUs and motorised traffic at some locations, as outlined previously, resulting in an increased risk of vehicular encroachment into VRU zones. Kerb heights are also unclear at some locations where high kerb upstands may create trip hazards to VRUs.

Paving colours may also be similar in adjoining sections, and there is no clear visual distinction between carriageways and footways at the same level, which increases risks to disabled road users, particularly those with visual impairment in shared surface areas where vehicles and pedestrians are circulating at the same level, with no provision for delineation of VRU routes. Linear Tactile Paving has not been provided to assist visually impaired pedestrians at some of the potential points of conflict, to delineate vehicular routes. This layout also presents an increased risk that vehicles will park on pedestrian circulation areas or that passing or turning vehicles will strike roadside hazards.

There is no provision for pedestrian accessibility on all desire lines throughout the site, with an example shown in figure 112. Pedestrians wishing to travel to and from Old Abbey Lane or West Street and the Dominic Street Car Park will need to travel on a longer distance in conflict with vehicles turning to and from the relocated car park entrance, where there is no provision for segregated access for VRUs, particularly those who are mobility impaired.

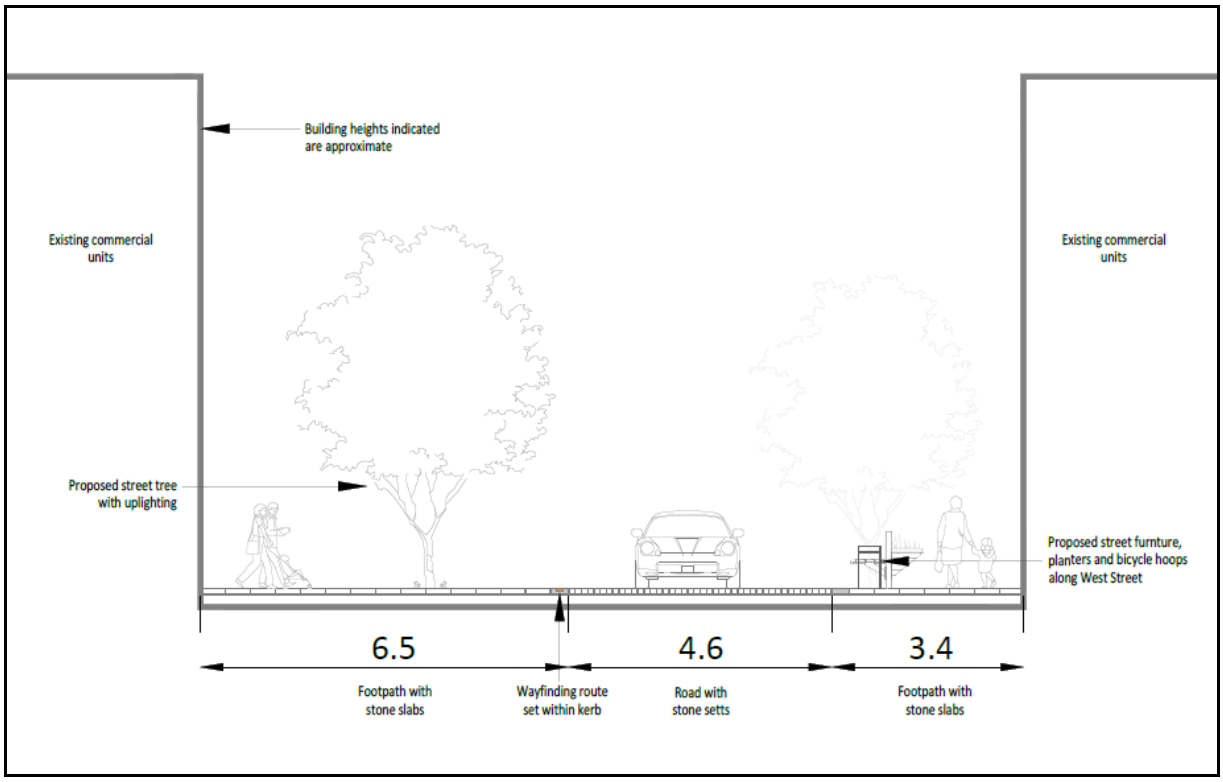


Figure 111: Cross Section showing no crossfall, clearance to hazards or linear tactile delineation

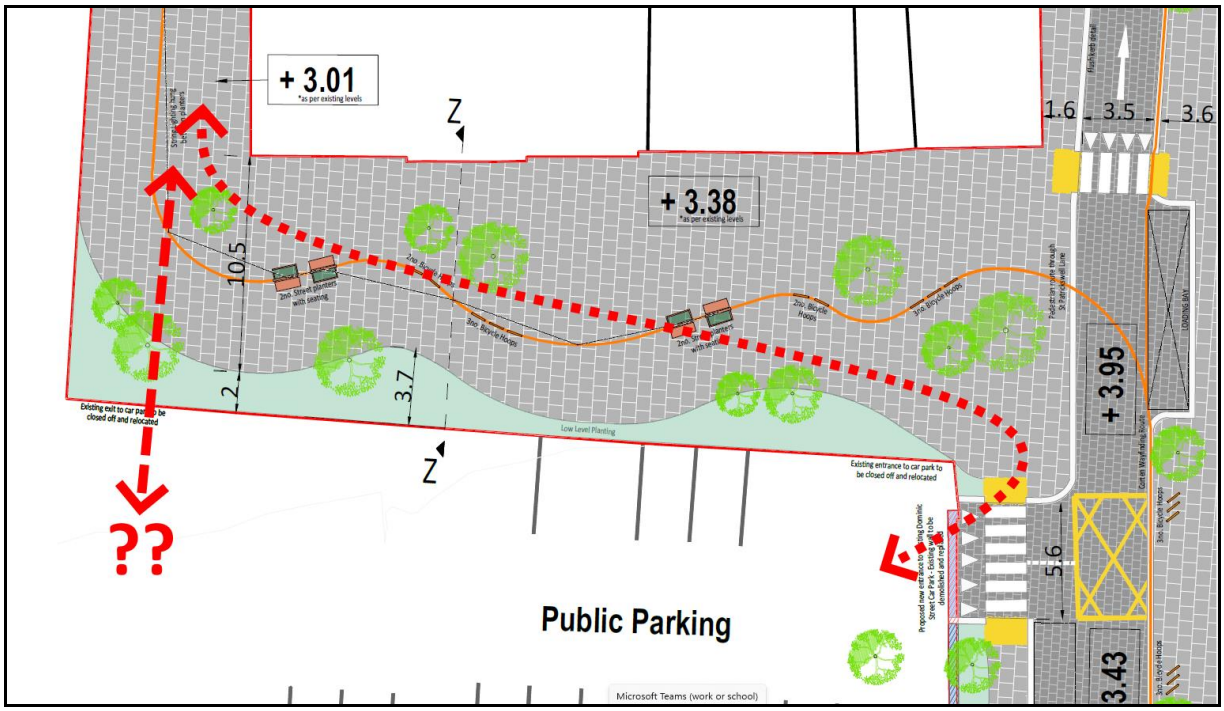


Figure 112: Long Pedestrian Routing to/from car park

The provision for boundary treatment and connectivity at the southern end of the Dominic Street car park have also not been shown. Figures 113 and 114 currently sho connectivity to and from theis area. Figure 115 also shows barriers for general VRU accessibility to and from the surface car park to the west of Father Connolly Way, adjacent to the Bridge of Peace, where connectivity issues have already been highlighted in section 2.3.6 of this Stage 1 RSA report, and where pedestrians may be forced to walk within the carriageway to avoid obstructions.

Figure 113: Current pedestrian connectivity to/from south of Dominic Street Car park

Figure 114: Current pedestrian connectivity to/from south of Dominic Street Car park

Figure 115: Obstructions precluding Safe Pedestrian Access to/from Car Park on Father Connolly Way

Recommendations

1. The provision for kerbing throughout the scheme area should be reviewed to ensure there are no hazards presented within VRU desire lines. The surface condition should also be reviewed on all existing footways to be retained throughout the scheme area, with repair and remediation, and with all potential trip hazards to be removed where necessary.

2. Pedestrians should not be brought out into the path of traffic without warning, particularly in areas where vehicles may be reversing or turning.

3. A continuous unobstructed footway width of 2m should ideally be provided to the rear of all parking spaces in surface car parks to prevent the need for pedestrians, particularly the mobility or visually impaired, to have to walk within the traffic aisles in potential conflict with circulating, turning and reversing vehicles.

4. Safe pedestrian connectivity should be provided to and from car parking areas on the most direct desire lines, and ideally away from the access points where vehicles are turnign and waiting.

5. Clear visual distinction should be provided between areas of different function throughout the scheme, with provision for suitable linear tactile delineation in shared surface arreas, for the benefit of visually impaired pedestrians.

1. The central island should be a minimum of 3.5m wide, however it is possible to reduce the width of the central island to 2.5m for low anticipated cycling volumes, with an absolute minimum 1.2m for low pedestrian volumes and negligible cyclist use and demand for access by mobility impaired pedestrians.

2. Where islands include tactile blister paving then they should be a minimum of 1.8m in width so that they can safely accommodate a waiting pedestrian with a buggy.

2.4 ROAD SIGNS, MARKINGS AND LIGHTING

2.4.1 Problem – Lighting

There were no details provided for proposed lighting throughout the Westgate scheme area. The new layout will need to be adequately lit to minimise the risk of collisions occurring during the hours of darkness, particularly in areas where VRUs will be circulating and at crossing points, to ensure VRUs on or waiting to cross at the crossing points are conspicuous in all lighting conditions.

It was noted that a significant number of existing utility poles/lighting columns are located in positions which obstruct footways, and in many cases are located too close to or immediately adjacent to the carriageway edges, presenting a risk that they will be struck by passing, turning or parking vehicles. This risk will be increased in all areas where footways are to be provided at the same level as the carriageway adjacent, as the removal of traditional kerbs further exposes all street furniture to the swept paths of turning and passing vehicles, and increases the risk of vehicle strike.

Recommendations

1. Lighting design should be completed at detailed design stage, taking into account all issues raised in this Stage 1 RSA report, to reduce the risk of collisions occurring during the hours of darkness, and to increase conspicuity of potential hazards for VRUs.

2. A review of all lighting proposals is recommended to ensure that all new lighting columns will be sufficiently setback from the carriageway edges to minimise the risk of being struck by passing vehicles, and in a location which does not obstruct the footway widths to less than absolute minimum advisable width of 1.2m at isolated locations.

3. The base of columns located within shared space areas should be suitably protected to minimise the risk of being struck by passing, turning and reversing vehicles.

2.4.2 Problem – Signing and Lining Generally

There was no signing and lining schedule provided to confirm proposals for signs and road markings, including details, sign sizes, text heights and mounting heights. The following observations were made on general signing and lining issues which should be taken into consideration at detailed design stage:

- There is no provison for reduced speed limit signage, slow zone signage or pedestrian priority signage on entry to the town centre area/ Westgate scheme area.

- A number of existing signs are located too close to the carriageway edges, where there is a risk they will be struck by passing or turning vehicles. A number of proposed signs also appear to be located too close to carriageway edges.

- There is no provision for warning and regulatory signage on the approaches to the junctions, e.g. T-Junction ahead, signals ahead etc, and no provision for warning signs on approaches to raised crossings/ramps.

- There is no provision for removal and replacement of existing road markings (left turn only in Lane 1 and straight ahead in lane 2) for road users travelling northbound on George's St (R132) across the Bridge of Peace over the River Boyne, where the new layout will require reconfiguration of edge of lane delineation, arrow markings, and destination markings further upstream, as well as suitable tie ins to the central reservation which is to be removed within the scheme extents.

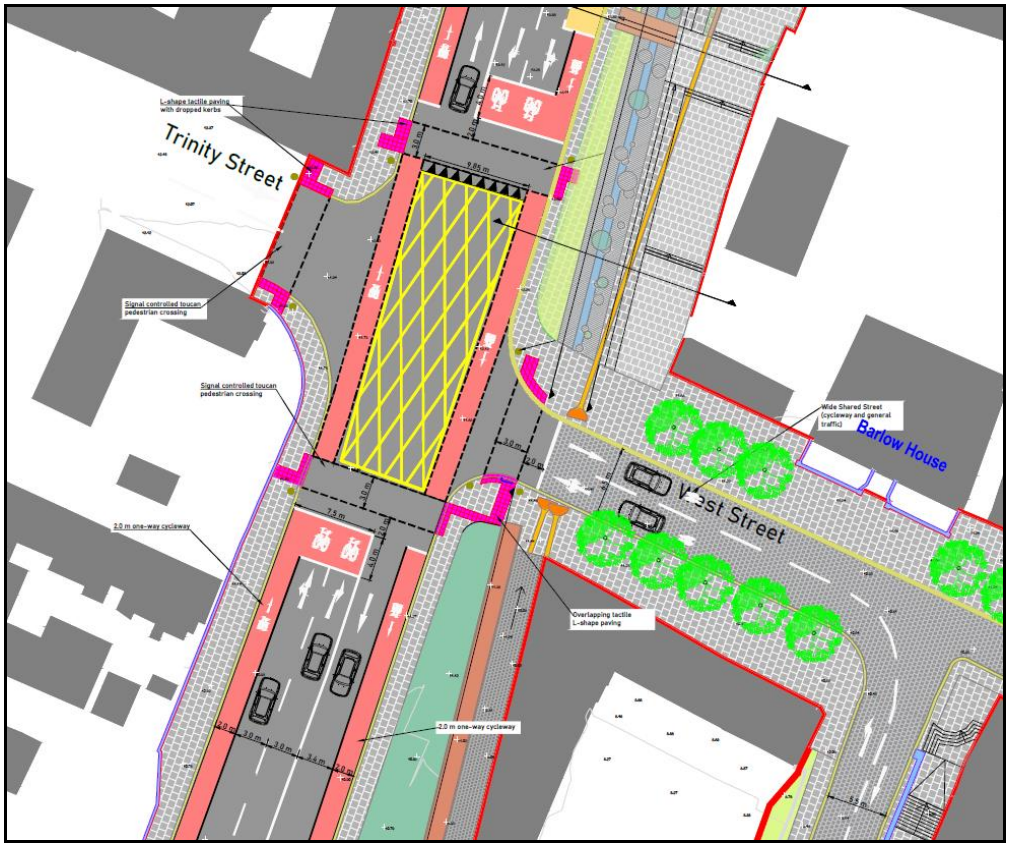


Figure 116: New Lane arrow markings at signalised crossroads

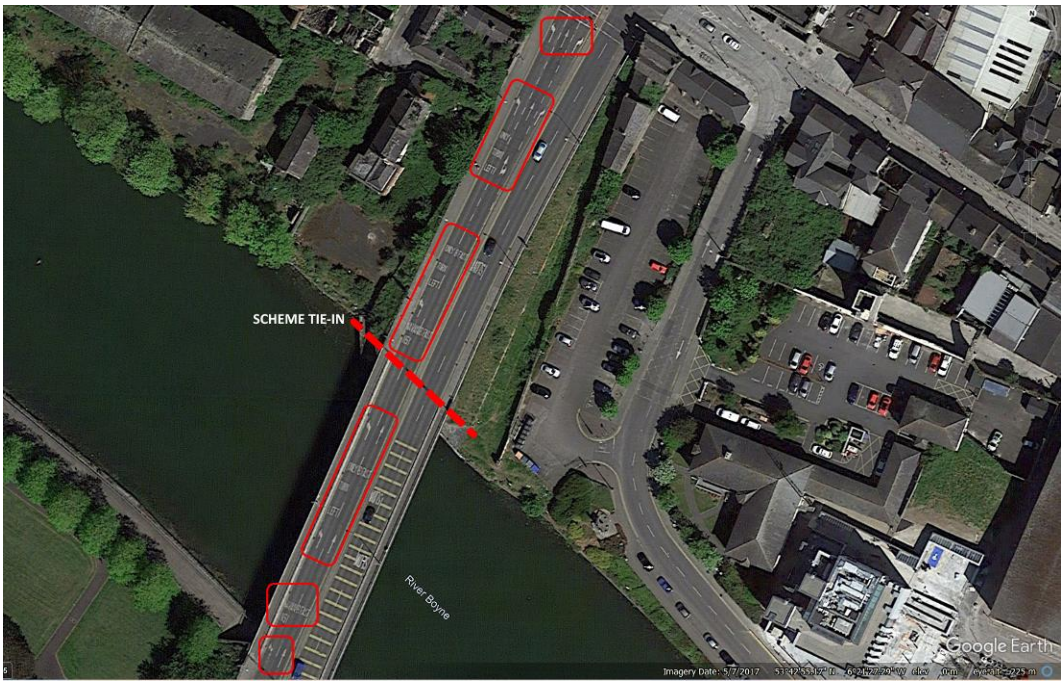


Figure 117: Misleading road markings to south of Scheme Tie-in at Peace Bridge

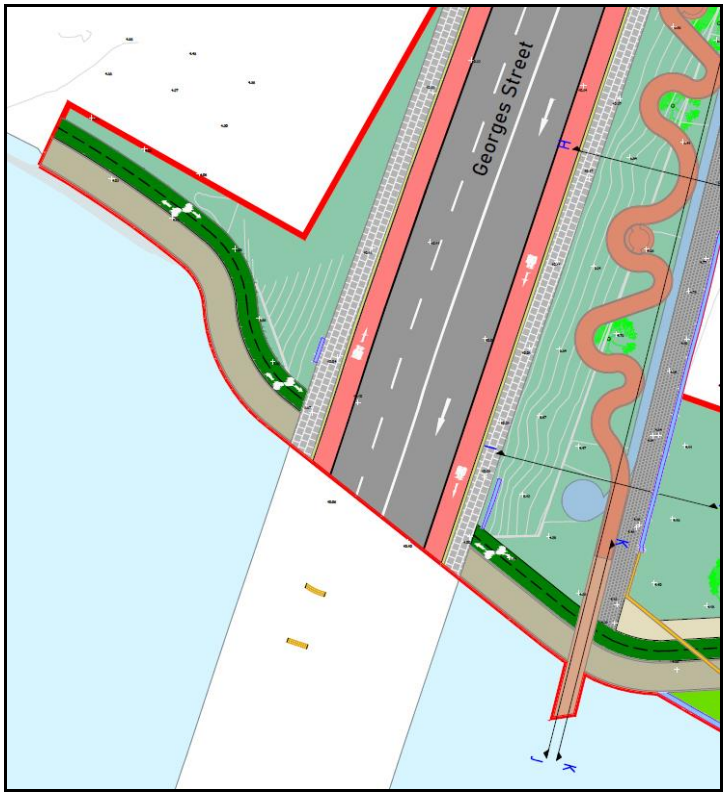


Figure 118: No Details shown for scheme Tie-in at Bridge

Figure 119: Old Road Markings to be Removed

Figure 120: Old Road Markings to be Removed

Figure 121: Existing Map Sign to be Replaced to reflect new layout
Note: Sign too close to carriageway edge has been struck

Figure 122: Redundant Road Markings

- Arrows and road signs on Father Connolly way are directing motorists the wrong way down a one-way westbound street (Wellington Quay), as shown in figure 123.

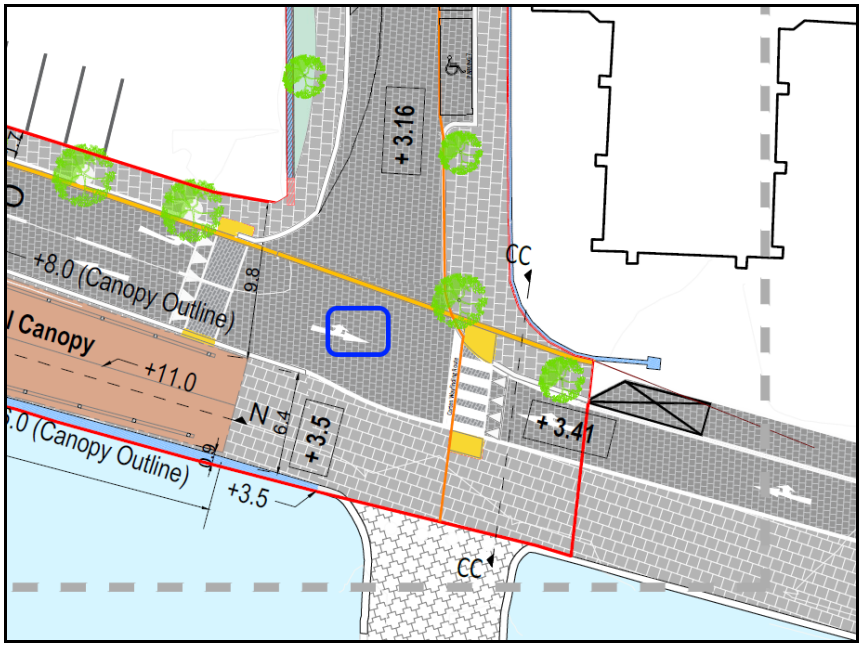


Figure 123: Reduced Intervisibility to right from 2m back from kerbline at crossing

- There is no clear provision for right turners at the north of Father Connolly Way (see existing misleading signs/markings) and proposed road marking. The misleading sign on Father Connolly Way, does not relate to the jucntion ahead with the R900 (West Street).

- Elsewhere, there is no provision for reinstatement of existing signage on the design plans.

Figure 124: Reduced Intervisibility to right from 2m back from kerbline at crossing

Figure 125: Exisitng Misleading Sign

Figure 126: Misleading sign

Figure 127: No provision for replacement of existing signs

Figure 128:: No provision for replacement of existing signs

- There is no provision on the design layout for reinstatement of existing yellow box markings and double yellow lines at a number of locations throughout the scheme area following completion of the kerb buildouts, parking bay reconfiguration and urban realm improvements, to ensure vehicles do not stop, park or block through traffic or VRU intervisibility at junctions.

Figure 129: Existing Double Yellow Lines on Dominic Street

Figure 130: Exisitng Double Yellow Lines and Yellow Box Markings/No Parkimgs signs

- Dashed lines are shown at pedestrian crossing points at the signalised junction of West Street/Trinity Street rather than solid continuous pedestrian crossing lines. Stop lines are also located too close to the crossing points at a number of locations.

- There is no provision for replacement of any existing parking signage & parking metres to differentiate areas of public and private parking throughout the site, or clarify any parking restrictions/hours.

- There is no provision for No entry signs at a number of locations where operation is one-way, e.g. at entrance to Wellington Quay

- no left turn signs/no right turn signs/no yield or stop arrangements shown and form of control and priority is unclear at a number of junctions

- There is no provision for standardised signage on VRU routes, including warning signage where necessary to alert motorists to the potential presence of pedestrians or cyclists within the carriageway ahead, including on narrow cross sections where there is insufficient space off road for shared cyclist/pedestrian usage.

- There is no provision for removal of existing road markings which will become redundant, or for replacement/reinstatement of a number of markings which are being removed by the proposed design.

- The proposed location of all signs is not clear, however a number of signs appear to be located too close to the carriageway edge, where there is a risk they will be struck by passing or turning vehicles.

- There is no provision for warning signage on the approaches to the raised crossing points/ramps on the raised surfaces, although dragons teeth markings have been provided to highlight the presence of the hazard during the hours of darkness.

Figure 131: Existing Double Yellow Markings on Father Connolly Way

Figure 132: Double Yellow Markings to be replaced

- Existing give-way / yield markings and no entry markings are being removed from St Patrickswell Lane, and there is no provision to prevent vehicle access or turning onto St Patrickswell Lane. Vehicles may attempt to turn in error, and there is no provision for a turning circle on the link. The photo in figure 133 shows poor visibility to the left from this location at present, with visibility compromised by both building line and proposed landscaping.

Figure 133 : Limited Visibility to Left

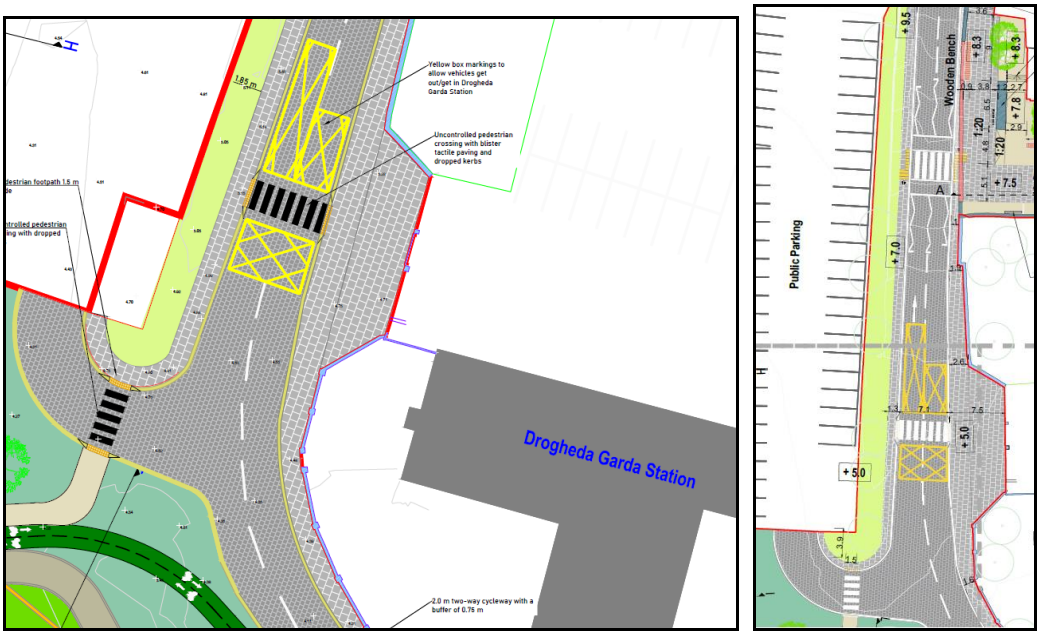
Figure 134: Existing Signs and layout on St Patrickswell Lane / West Street

Figure 135: Exisitng Signs Not Shown on Plans

Figure 136: No provision for no right turn signs out of new car park access/egress on Dominic St

- Zebra road markings have been provided at a number of the informal uncontrolled pedestrian crossing points, however there is no provision for standard road markings, Belisha Beacons or L shaped red tactile paving. Zebra road markings are typically only used at controlled pedestrian crossing points and accompanied by these standard design measures. An ambiguous layout which does not confirm to standard layout may result in misinterpretation

and ambiguity regarding rights of way, leading to an increased risk of vehicular/pedestrian conflict.



Figures 136 & 137: Zebra markings shown with inconsistent layouts for crossings in close proximity

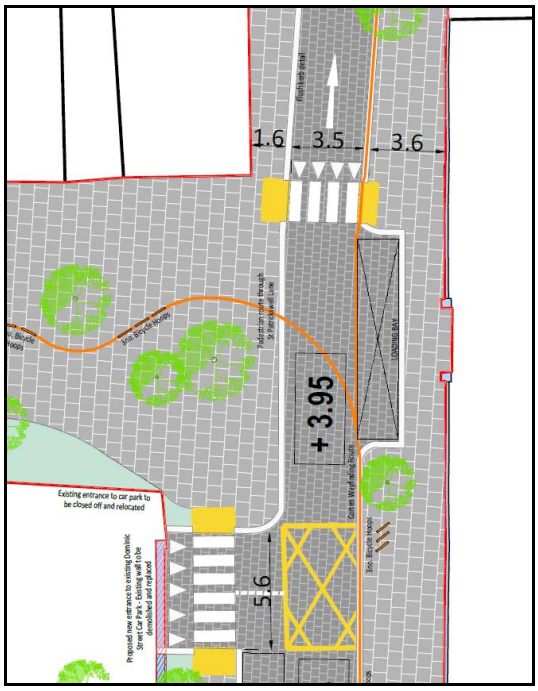


Figure 138: Ambiguous Layouts and Reduced Intervisibility to left from 2m back from kerbline at northernmost crossing due to loading bay location

- There is no guidance to denote rights of way and priority for vehicles turning from both directions on Father Connolly Way/Wellington Quay

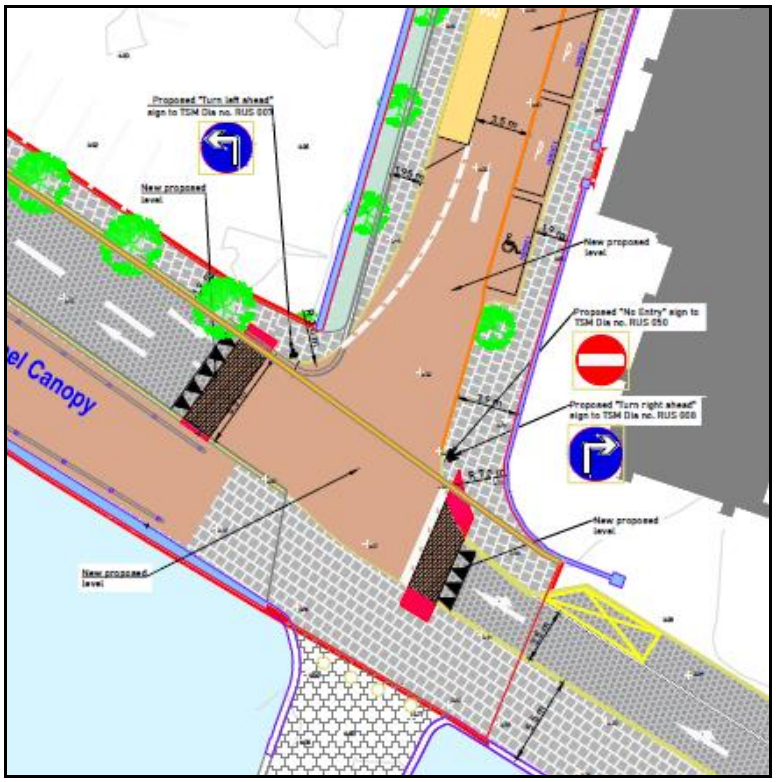


Figure 139: Ambiguous Layout at Junction

Figure 140: existing Stop Line & Sign removed at Intersection of Father Connolly way/Dominic Street?

Figure 141: Existing Stop Markings removed on western arm of intersection of Dominic street/ West Street

Figure 142: Visibility to Right from stop line on West Street

Figure 143: Existing Pedestrian Warning Signs used where intervisibility is poor

Figure 144: Design Plans do not show provision for yellow box markings Or vehicular access at Courthouse

Figure 145: No Clearance to Existing Street Furniture on West Street

Recommendations

1. A review of all existing signs and road marking provision is recommended at detailed design stage, in conjunction with proposed signs and road markings, to take into account the issues raised in this Stage 1 RSA report.

2. Provision should be made for suitably placed reduced speed limit signage on entry to the site from all directions, at a location which does not compromise VRU or vehicular movement. This signage should be supplemented by clear guidance to motorists on the need for pedestrian and cyclist priority and movement throughout the area.

3. Text heights on all signage throughout the site should be suitable for prevailing conditions and speeds to ensure the message is clearly visible to all road users.

4. Provision should be made for reinstatement of the yellow box markings, double yellow lines and parking restrictions where necessary throughout the site adjacent to new kerb lines to ensure vehicles do not park in locations which may restrict visibility or turning movements at the junctions.

5. All parking bays should be clearly lined and signed, including disabled parking bays, as per previous recommendations in this Stage 1 RSA report.

6. All road markings and signage should have high reflectivity specification to ensure clear legibility during the hours of darkness.#

7. Clear signage and wayfinding signs should be provided to direct motorists to the relevant sections of off-street parking within the site, and to direct cyclists to bicycle parking areas. Clear signage and wayfinding signs should be provided to direct motorists to the relevant sections of pay & display on-street parking within the site. Ideally, information should also be provided on car park occupancy levels, to prevent unnecessary circulation of vehicles within the Westgate area where relatively high proportions of circulating VRUs should be anticipated.

8. All signs should be mounted at a suitable height, ideally on passively safe poles, at a sufficient offset from the carriageway edges to avoid being struck by passing vehicles. The lowest edge of all signs should be set at a height of 2.1m or higher over footways and at 2.4m or higher over areas which may be used by cyclists.

9. Suitable warning signage and / or RUS signs and road markings symbology should be provided on VRU facilities in accordance with the requirements of the Traffic Signs Manual to assist VRUs with wayfinding, and to provide warning and guidance regarding the potential for conflict with pedestrians/cyclists ahead

10. Redundant road markings and signs should be removed where necessary to prevent driver confusion and misinterpretation of the new layout.

11. Provision should also be made for turning circles and safe unobstructed emergency vehicle access where necessary within the adjacent sites where previous through routes were possible and are now terminated (e.g. to/from Courthouse from St Patrickswell Lane, which will be pedestrianised with no apparent provision for vehicular access on the preliminary design plans.

12. The permissible direction of circulation should be clear on all links and approaches to all junctions, and all areas where vehicles are not permitted to enter should also be clearly signed.

13. Clear and unambiguous lining and signing should be provided at all conflict points at junctions and access points to indicate the form of control and priority movements, in accordance with the requirements of the Traffic Signs Manual to include TSM warning signs, stop lines and signs, arrow markings and no left/right turn signs where traffic circulation is one-way only, and warning signs for pedestrian crossings which are raised or where intervisibility is reduced.

14. Warning signs should be provided on all approaches to all junctions and hazards in accordance with the requirements of the traffic signs manual, at a suitable, safe location in advance of the hazard and correctly orientated towards traffic.

15. Except on roads with a 30km/h speed limit, lengths of road with road humps should be provided with Road Hump warning signs, W 130, on approaches from each direction, supplemented by M112 Traffic Calming Triangle to highlight the presence of the hazard in dark conditions.

16. All signs to be placed in clear view of motorists with sign faces to be mounted at a sufficient offset from the carriageway edge (minimum 450mm) in a location which does not obstruct the footway or compromise clear forward visibility towards any other relevant signage. All other street furniture such as bollards, litter bins and timber benches should also be located at a sufficient set back from the carriageway edges.

17. All pedestrian/cyclists crossings should conform to standard layout to prevent misinterpretation and ambiguity regarding rights of way and priority.

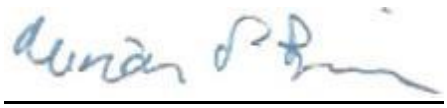
18. Suitable warning signage should be provided on the approaches to all pedestrian crossing points or locations where desire lines arise, including across all junction mouths, where visibility may be compromised by parked cars or any other obstruction, including landscaping and building lines.

19. All signs to be placed in clear view of motorists with the edges of sign faces to be mounted at a sufficient offset from the carriageway edge (minimum 450mm) to avoid being struck by passing vehicles, and placed in a location which does not obstruct the footway or compromise clear forward visibility towards any other relevant signage, with cranked poles to be used where necessary.

20. All sign locations and mounting heights throughout the scheme area should ensure signs can be clearly seen by approaching motorists, and do not obstruct visibility towards any other relevant signage or impact on visibility.

3.0 AUDIT TEAM STATEMENT

We certify that we have visited the site and examined the drawings and information supplied. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems identified have been noted within the report, together with suggestions for improvements which are recommended to be studied for implementation. No one on the Audit Team has been otherwise involved with the design of the measures audited. This audit has been carried out in accordance with TII GE-STY-01024 December 2017.

Signed:  Date: 7/12/23

MIRIAM O'BRIEN

Signed:  Date: 7/12/23

ANTHONY SUMNER

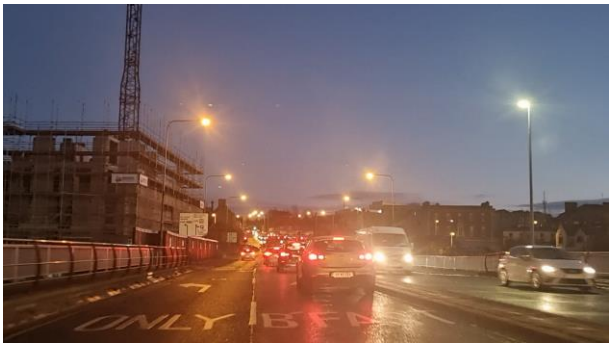
APPENDIX A – ROAD SAFETY AUDIT BRIEF CHECKLIST

Have the following been included in the audit brief?: (*if 'No', reasons should be given below)*

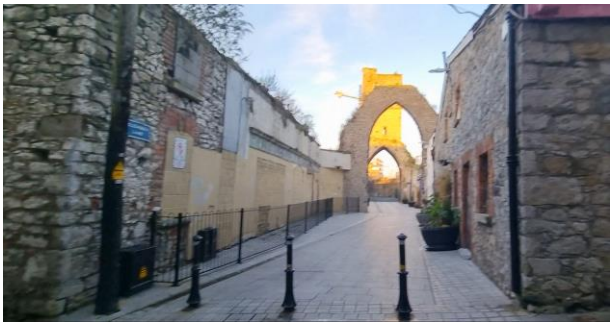
	Yes	No
1. The Design Brief	☑	☐
2. Departures from Standard	☐	☑
3. Scheme Drawings	☑	☐
4. Scheme Details (e.g. signs schedules, traffic signal staging)	☐	☑
5. Collision data for existing roads affected by scheme	☐	☑
6. Traffic surveys	☐	☑
7. Previous Road Safety Audit Reports and Designer Responses/Feedback Form	☐	☑
8. Previous Exception Reports	☐	☑
9. Start date for construction and expected opening date	☐	☑
10. Any elements to be excluded from audit	☐	☑

Any other information? ☐ ☑

APPENDIX B – SITE PHOTOGRAPHS

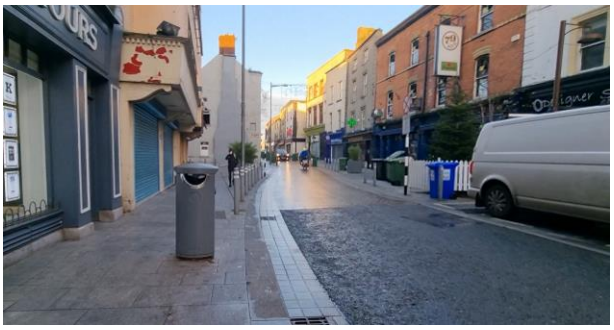



brú digital hub
connect · work · create




WOOD
FLOORING

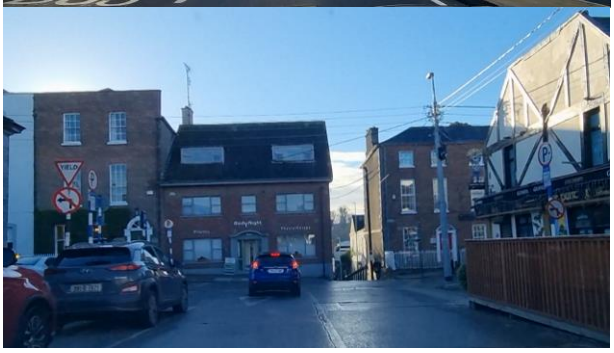

TAKE AWAY




SUPERPHARM


MarketPlace


Local Star



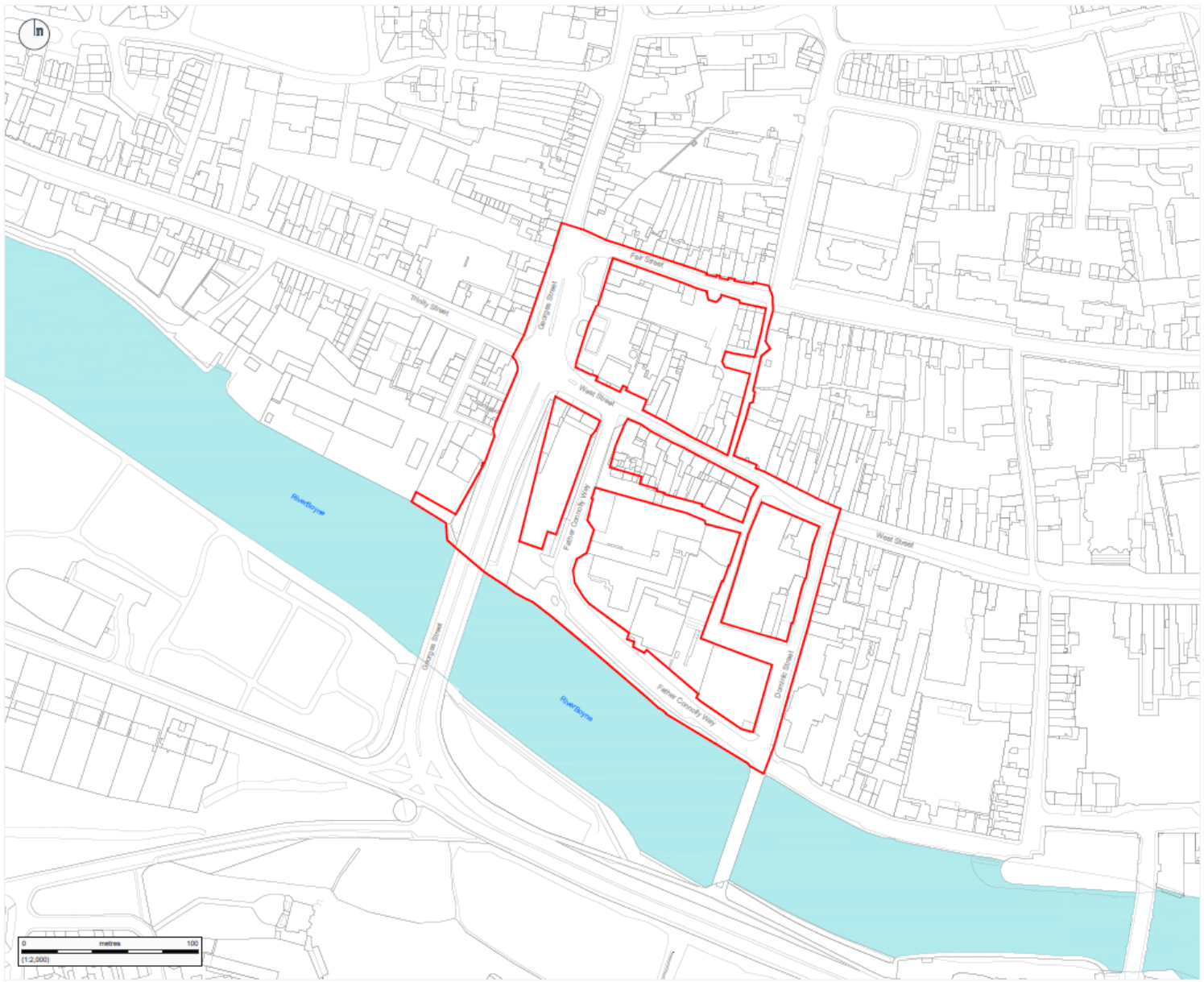
APPENDIX C – SCHEME DRAWINGS

List of drawings provided below. See also Drawing Register Circulated – Note drawings with red strikethrough were not provided for Audit:

- HDC1257-001 - Engineering Layout
- 100_ARC_ARW_1_Drawing List
- 101_ARC_ARW_1_Site Location plan
- 102_ARC_ARW_1_Existing plan
- 108_ARC_ARW_1_Riverside Pavillion
- 109_ARC_ARW_1_Existing - Abbey
- 110_ARC_ARW_1_Proposed Abbey
- 111_ARC_ARW_1_Abbey Gable
- 112_ARC_ARW_1_Section C-C - Abbey
- 115_ARC_ARW_1_Sections P-P D-D E-E - 100
- 116_ARC_ARW_1_Sections R-R H-H I-I - 100
- 117_ARC_ARW_1_Sections K-K, L-L
- 118_ARC_ARW_1_Sections M-M, S-S - Riverside
- 119_ARC_ARW_1_Section T-T - Riverside
- 120_ARC_ARW_1_Demolition Plan - Wall Along Father Connolly Way
- 121_ARC_ARW_1_Existing Toilet Block Demolition
- 122_ARC_ARW_1_Typical Stairs
- 123_ARC_ARW_1_Seating Bench
- 124_ARC_ARW_1_Historic Gate Detail
- 125_ARC_ARW_1_Tree Grating
- 126_ARC_ARW_1_Details-Westgate Corten steel sign - 20
- 127_ARC_ARW_1_Abbey Corten steel sign details
- 20230210_0291_ARC_ARW_1_01_Site Location Plan.dwg
- LOUB3004_Combined Site Plan_Rev F
- LOUB3004_Demolition Plan_Dominic Street
- LOUB3004_Detail_Bicycle Hoop
- LOUB3004_Detail_Street Planter
- LOUB3004_Detail_Street Tree
- LOUB3004_Proposed Wall_Dominic Street
- LOUB3004_Section AA_Dominic Street
- LOUB3004_Section BB_Dominic Street
- LOUB3004_Section CC_Wellington Quay
- LOUB3004_Section U_Fair Street
- LOUB3004_Section V_Scholes Lane
- LOUB3004_Section W_West Street
- LOUB3004_Section X_West Street
- LOUB3004_Section Y_St Patrickswell Lane
- LOUB3004_Section Z_St Patrickswell Lane

m	Sheet Name	Scale	Issue Date	Rev. Nr.	Rev. Description
LOUX3001-P-000-100-A	Drawing List	n/a	10.02.2023	1	Planning Drawings
LOUX3001-P-000-101-A	Site Location Plan	1:1000	10.02.2023	1	Planning Drawings
LOUX3001-P-000-102-A	Existing Site Plan	1:500	10.02.2023	1	Planning Drawings
LOUX3001-P-000-103-A	Proposed Site Plan	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-104-A	GA Plan - Frame 01	1:200	10.02.2023	1	Planning Drawings
LOUX3001-P-000-105-A	GA Plan - Frame 02	1:200	10.02.2023	1	Planning Drawings
LOUX3001-P-000-106-A	GA Plan - Frame 03	1:200	10.02.2023	1	Planning Drawings
LOUX3001-P-000-107-A	GA Plan - Abbey Square and Community Space	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-108-A	GA Plan - Riverside Pavilion	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-109-A	Existing Plan, Section and Elevations - Abbey	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-110-A	Proposed Plan, Sections A & B and Elevations - Abbey	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-111-A	Proposed Plan, Sections and Elevations - Abbey Gable	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-112-A	Section C - Abbey	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-113-A	Section A-A - Long Section Abbey - George's Street	1:100	TBC	1	Planning Drawings
LOUX3001-P-000-114-A	Sections H-H, I-I and J-J - George's Street - Medieval Wall	1:100	TBC	1	Planning Drawings
LOUX3001-P-000-115-A	Sections P-P, D-D and E-E - George's Square	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-116-A	Sections R-R. H-H and I-I - Medieval Wall	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-117-A	Sections K-K and L-L - Riverside	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-118-A	Sections M-M and S-S - Riverside	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-119-A	Section T-T	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-120-A	Demolition Plan - Wall Along Father - Connolly Way	1:100	10.02.2023	1	Planning Drawings
LOUX3001-P-000-121-A	Existing Toilet Block at Georges Square Demolition Drawings	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-122-A	Typical stairs	1:10	10.02.2023	1	Planning Drawings
LOUX3001-P-000-123-A	Seating bench	1:20	10.02.2023	1	Planning Drawings
LOUX3001-P-000-124-A	Historic Gate details	1:50	10.02.2023	1	Planning Drawings
LOUX3001-P-000-125-A	Tree Grating details	1:10	10.02.2023	1	Planning Drawings
LOUX3001-P-000-126-A	Westgate Corten Steel Sign details	1:30	10.02.2023	1	Planning Drawings
LOUX3001-P-000-127-A	Abbey Corten Steel Sign details	1:20	10.02.2023	1	Planning Drawings
LOUX3001-P-000-128-A	Boundary Treatment	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-129-A	Proposed Paving	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-130-A	Medieval Wall Corten Steel Insert	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-131-A	Stepping Circular Concrete Elements	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-132-A	Wooden Planks - George's Square	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-133-A	Corten Walkway - George's Square	1:10	TBC	1	Planning Drawings
LOUX3001-P-000-134-A	Boardwalk - Riverside	1:10	TBC	1	Planning Drawings

RSM Road Safety Matters



KEY

Redline Boundary

Total Area - 1.87ha

CLIENT
Louth County Council

PROJECT
Westgate
Drogheda

DRAWING
Redline Plan

PROJECT NUMBER
LOUB3004

DRAWING NUMBER
1001

CHECKED BY
AW

REVISION
E

STATUS
Draft

DATE
April 2022

SCALE
1:2,000 @ A3

Turley


Frame 1 - A0 - 1:200
Trinity Street
West Street
Old Abbey Lane
St Patrickswell Lane
Dominic Street
Georges Street
Father Connolly Way
River Boyne
Frame 2 - A2 - 1:200
Frame 3 - A1 - 1:200
Turley

Westgate Vision Area

Road Safety Audit Feedback Form

Scheme: Westgate Regeneration Scheme & Public Realm Works, Westgate, Drogheda, Co Louth

Route No. N/A

Audit Stage: 1

Date Audit Completed: December 2023

To Be Completed By Designer				To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	**Problem accepted (yes/no)**	**Recommended measure accepted (yes/no)**	**Describe Alternative Measure(s). Give Reasons for not accepting Recommended Measure. Only Complete if recommended measure is not accepted**	**Alternative measures or reasons accepted by auditors (yes/no)**
2.1.4	Y	Y		
2.1.5	Y	Y		
2.1.6	Y	Y		
2.1.7	Y	Y		
2.1.8	Y	Y		
2.1.9	Y	Y		
2.1.10	Y	Y		
2.1.11	Y	Y		

Road Safety Matters Ltd
Urlingford Rd, Johnstown
Kilkenny, Ireland E41 W721
Tel +353 (0)56 883 8428
mobrien@roadsafetymatters.net
www.roadsafetymatters.net

2.1.12	Y	Y		
2.1.13	Y	Y		
2.2.1	Y	Y	Proposed Part 8 Planning Application for the Active Travel Schemes along the R132 has determined the lane configuration & design of the area. To be reviewed follow the conclusion of the Part 8 Planning process for the Active Travel Schemes	
2.2.2	Y	Y	Visibility has been improved where possible based on the existing/ historic building lines.	
2.2.3	Y	Y	Detailed Area wide modelling is to be undertaken at part of the Active Travel Schemes in Drogheda. The junction configuration & details design will be integrated into the wide traffic management plan for the town once complete.	
2.2.4	Y	Y		
2.2.5	Y	Y		
2.2.6	Y	Y	Proposed Part 8 Planning Application for the Active Travel Schemes along the R132 has determined the lane configuration & design of the area. To be reviewed follow the conclusion of the Part 8 Planning process for the Active Travel Schemes	
2.3.1	Y	N	Limited space and proposed Part 8 Planning Application for the Active Travel Schemes in the town has influenced the design. To be reviewed following the conclusion of the Part 8 Planning process for the Active Travel Schemes & prior to construction / subject to further safety audits.	Yes[4]
2.3.2	Y	Y		
2.3.3	Y	Y		
2.3.4	Y	Y		
2.3.5	Y	Y	Facilities have been improved where possible based on the existing/	

[4] Note: as issues raised relate to Cyclability and Cyclist Safety – the scheme safety requirements for this road user should be subject to further Detailed Design and Audit in accordance with the National Transport Authority Cycle Design Manual 2023 (NTA CDM 23), taking into account recommendations in this Stage 1 RSA report, with appropriate departures obtained where Active Travel and CDM design standards cannot be achieved

			historic building lines.	
2.3.6	Y	Y		
2.3.7	Y	Y	Proposed Part 8 Planning Application for the Active Travel Schemes along the R132 has determined the lane configuration and space available. To be reviewed follow the conclusion of the Part 8 Planning process for the Active Travel Schemes	
2.3.8	Y	Y		
2.4.1	Y	Y		
2.4.2	Y	Y	To be addressed prior to construction	

Signed: Paul Mc Monagle Project Lead Date 14/12/23

Signed Project Lead Date 11/12/23

Signed: Aideen Moriarty. Client Date Dec 14th 2023

for & on behalf of L.C.C.