

Gruggies Burn Flood Alleviation Scheme

Highways and Core Path Matters

March 2024



Balfour Beatty



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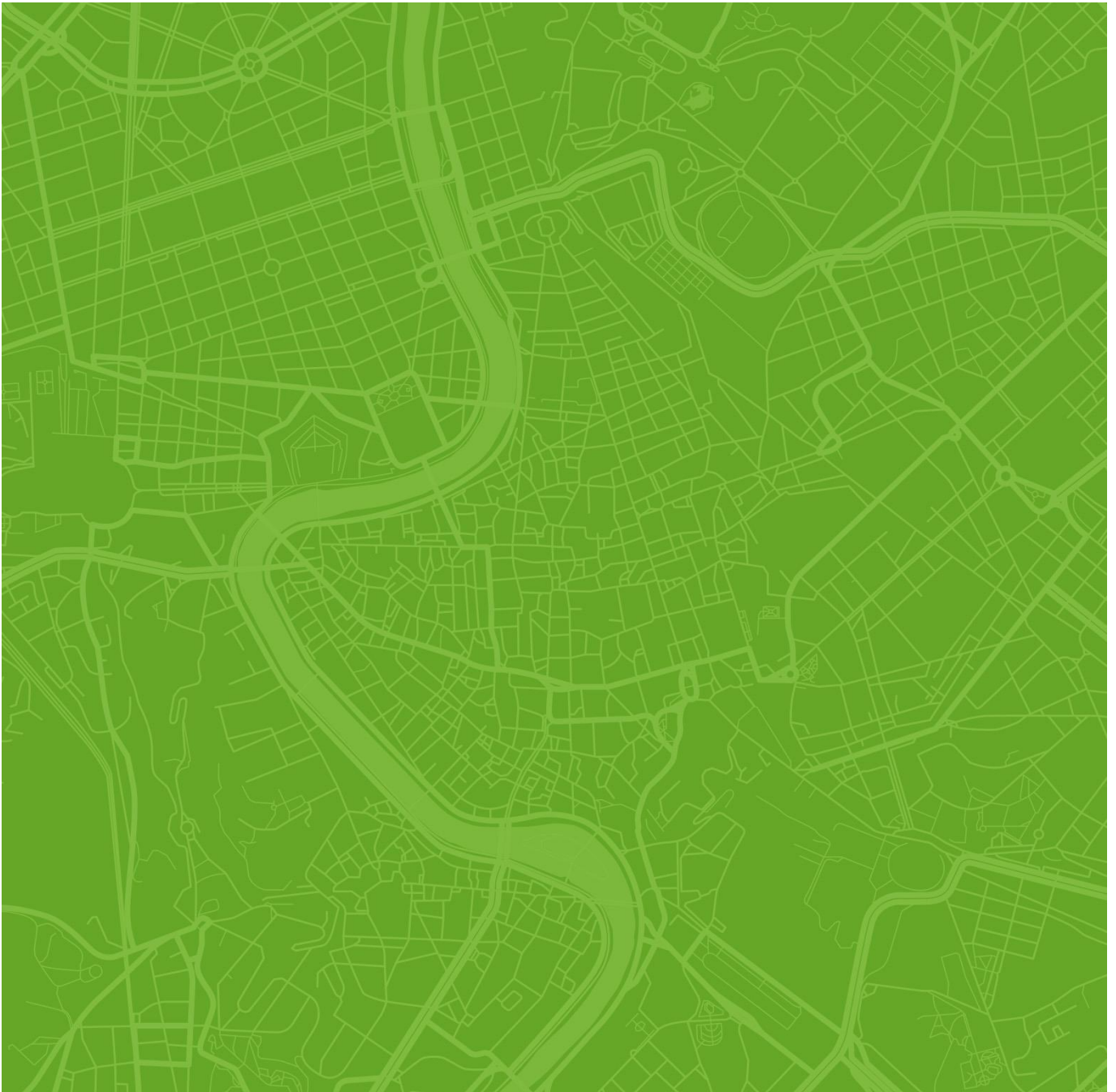
West Dunbartonshire Council

Gruggies Burn Flood Alleviation Scheme Highways and Core Paths Matters

Final report

Prepared by LUC

March 2024



West Dunbartonshire Council

Gruggies Burn Flood Alleviation Scheme
 Highways and Core Paths Matters

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Chapter 1

Introduction

Introduction

1.1 LUC's Transport and Movement Team have been asked to provide technical advice in relation to EIA screening opinion comments received in relation to active travel and core paths and will form part of the Gruggies Flood Alleviation Scheme (the Scheme) notification. It has been established that an EIA is not required for the Scheme, although some potential impacts require consideration.

1.2 It is anticipated that this Technical Note will satisfy the requirements for consideration of the potential impacts of the scheme on active travel and the core path network.

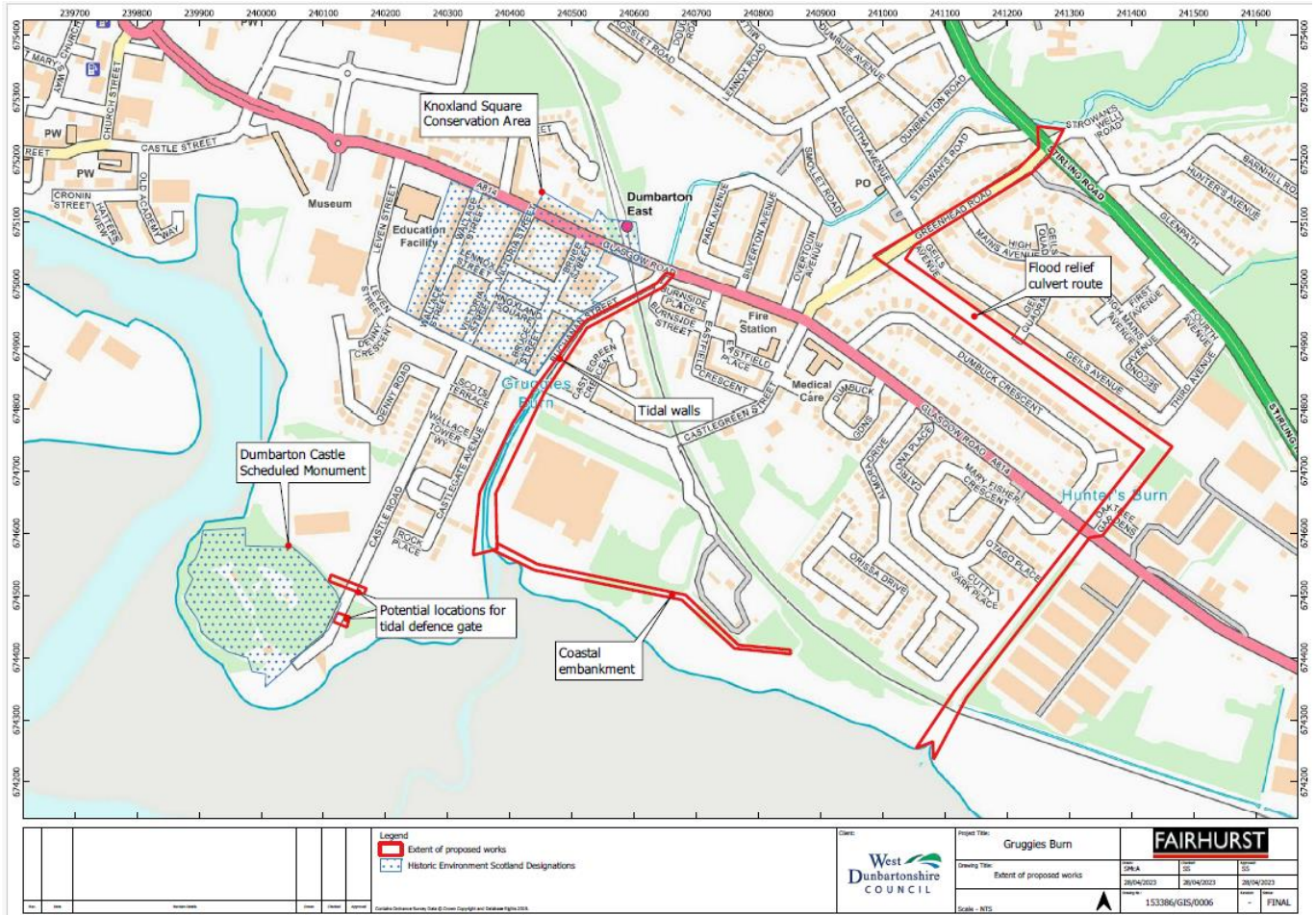
The Proposed Scheme

1.3 There is a significant risk of fluvial and tidal flooding in the town of Dumbarton, West Dunbartonshire. To mitigate this risk, West Dunbartonshire Council is developing the Scheme which consists of:

- A flow diversion weir;
- A culvert inlet;
- A flow diversion culvert;
- A culvert outfall;
- Flood walls;
- Tidal embankments; and
- A tidal floodgate.

1.4 The diversion culvert would convey excess flows from the watercourse north of the A82 to the open tidal River Clyde, thereby reducing potential flows in the Burn. It is anticipated that the diversion culvert would be constructed using horizontal directional drilling (HDD) or phased open cut methods under or across the A82. In all other areas the diversion culvert will be constructed using open cut methods. The tidal embankment, flood walls and tidal floodgate are intended to protect against tidal inundation from the River Clyde. The tidal embankments will likely be a reinforced earth bund structure, subject to design. The flood walls are likely to be reinforced concrete, or sheet piled with masonry or concrete facing along the banks of The Burn from the River Clyde to Glasgow Road. Figure 1.1 shows the proposed scheme extents.

Figure 1.1: Proposed Scheme Extents



Screening Opinion Comments

1.5 The comments received in relation to the core path network are as follows:

“The core path network will be impacted upon and this will require to be managed with suitable core path diversions as required and this includes the cycle path. The proposal will impact upon the A82 Trunk Road and this will require to be carefully managed in consultation with Transport Scotland. The impact upon local roads together with managing residents access during the works will also be key.”

Chapter 2

Core Paths Matters

Impacts of the Scheme on the Core Path Network

2.1 The Core Paths identified as being potentially impacted by the Scheme are 59, 61, 62, 63, 64, 65, 66, and 67.

- Core Path 59 provides a traffic free east-west link through east Dumbarton and it is the section south of Geils Avenue and north of Dumbuck Crescent that will be impacted. This link also forms part of the Sustrans National Cycle Route 7. Core Path 59 may be inaccessible during the construction of the flow diversion culvert where it passes adjacent to that route.
- Core paths 61 and 62 follow the eastern bank of the burn between Glasgow Road and the River Clyde, ending at the eastern landing of a footbridge which crosses the burn. Core Paths 61 and 62 are likely to be inaccessible during the period of construction of the flood walls on the banks of the burn.
- To the west of the footbridge Core Path 64 provides a link along the shoreline to Dumbarton Castle and Dumbarton Rock Bowling Club. Core Path 64 and the footbridge over the burn are likely to be impacted by the construction of the flood walls and tidal embankments which will be required to tie-in to each other in the vicinity of the eastern landing of the footbridge.
- To the east of the footbridge Core Paths 63 and 66 provide a link along the shoreline to Core Path 67. Core Paths 63 and 66 are likely to be inaccessible during the construction of the tidal embankment.
- Core Path 65 provides a link north from 63 and 66 to Castlegreen Road. Core Path 65 will provide no access to the shoreline during the construction of the tidal embankment.
- Core Path 67 provides a link north from the shoreline to Glasgow Road. Core Path 67 is likely to be inaccessible during the construction of the flow diversion culvert where it passes beneath that route.

2.2 Figure 2.1 shows the Core Path Network.

Figure 2.1: Core Path Network



Site Visit

2.3 LUC undertook a site visit to the area which coincided with the AM peak (0730-0900) and again during the school PM peak (1445-1630). The visit involved moving around the area from the A82 southwards and exploring the residential roads and off road segregated pathways. During the day of the site visit the weather was clear with no rain and no reason to inhibit use of active travel modes or to lead to an increase in vehicle usage such as high winds or storms forecast.

2.4 On the site visit it was noted that the A82 was busy in both directions with no evidence of tidal traffic movements. The pedestrian crossing points in the vicinity of Gruggies Burn were lightly used but there was evidence of pupil activity and also of leisure activities such as dog walkers. Throughout the residential areas pedestrian footfall was low with the exception of the local shop on Greenhead Road which had a higher number of associated pedestrian movements. There was evidence of pedestrian activity along Castlegreen Street and other residential side roads such as Bruce Street associated primary school movements. The core paths in the area had a higher volume of pedestrian movements but these were again considered to be low. Overall pedestrian activity was low on residential streets but of sufficient numbers to require mitigation of any impacted core paths.

2.5 During both visits there was little to no evidence of cycling/wheeling being a common activity.

2.6 Overall the conditions of the residential roads e.g. Castlegreen Street was of good quality with adjacent footways often having formal crossing points and in the new residential area surrounding the football stadium the footways were wide and often continuous over side roads providing a safe environment for alternative routes. In general traffic volumes and speeds were low and conducive to on road cycling.

Identification of Diversion Routes and Mitigation

2.7 In order to mitigate the impact of the Scheme construction on the core paths network, where possible, suitable diversion routes have been identified. These diversion routes will be signposted when construction activities render a section of the network inaccessible. It is considered that where the proposed diversion route is along quiet roads, signposting of the route and signage making motorists aware of the presence of cyclists will be sufficient for the diversion route. Where diversion routes are proposed to use busier roads, appropriate measures will be required to maintain cyclist safety.

2.8 Figure 2.2 shows the identified indicative diversion routes.

Figure 2.2: Proposed Diversion Routes

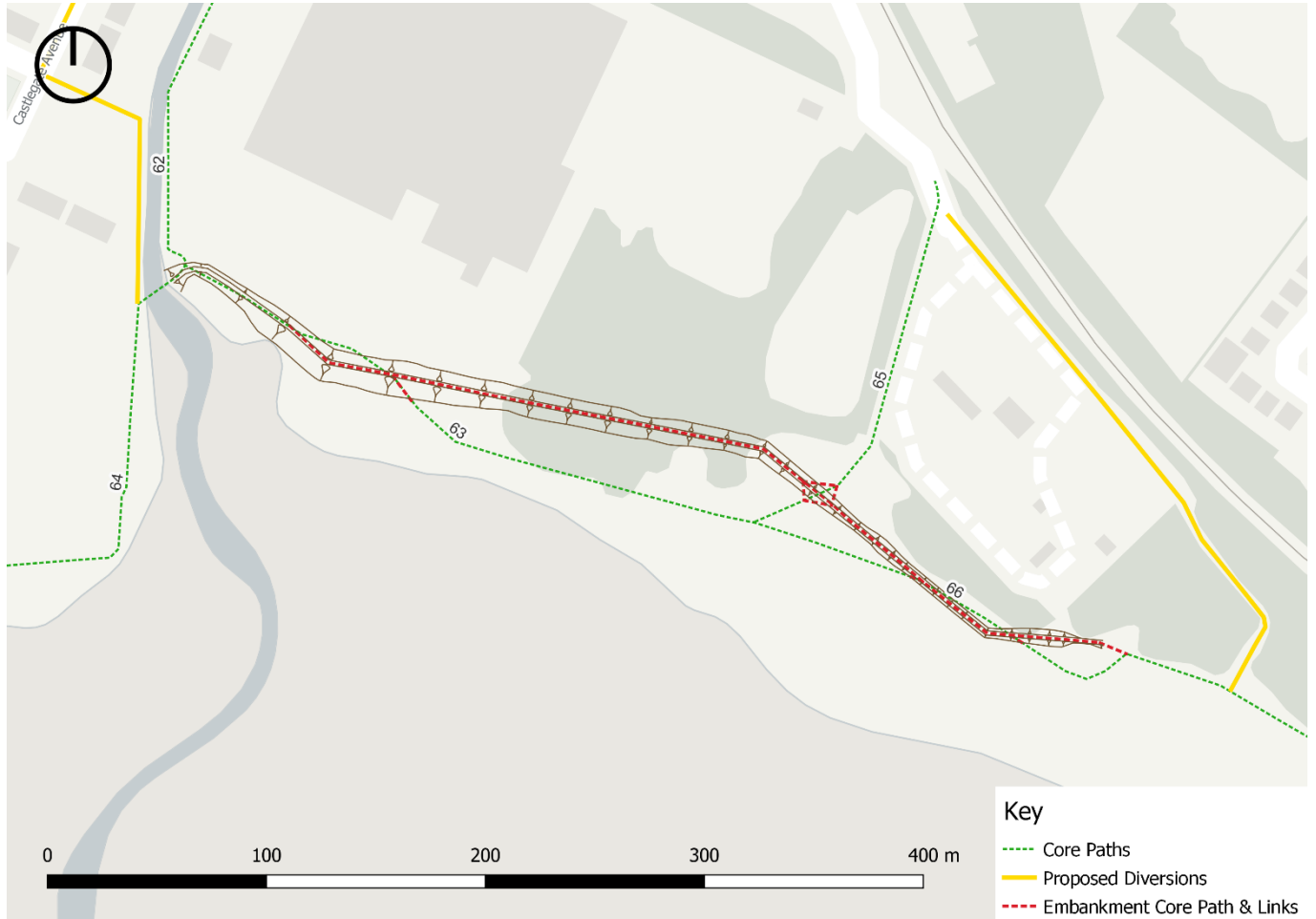


2.9 Core Path 59 will require closure during the construction of the diversion culvert in this location. Therefore it is proposed to divert the core path along Geils Avenue during this period. This proposed diversion will need to be considered in greater detail as designs for the culvert come forward as access along Greenhead Road and to Geils Avenue may also be impacted. In this case alternative routes, such as along Glasgow Road A814 may need to be considered.

2.10 It is proposed that during construction of the flood wall, Core Paths 61 and 62 are diverted along Buchanan Street, Castlegreen Street and Castlegate Avenue. This diversion will tie into Core Path 64 at the western landing point of the existing footbridge over the burn. It is considered that this will be a signage only diversion.

2.11 An appropriate diversion route for Core Paths 63 and 66 has not been identified and it is therefore considered that these will necessitate temporary closure during the construction of the tidal embankment. It is proposed that the existing core path will be realigned along the crest of the tidal embankment with appropriate tie-ins to the existing path's surface and connections provided to adjoining paths as shown in Figure 2.3 below.

Figure 2.3: Proposed Realignment of Core Paths 63 and 66



2.12 Whilst Core Path 65 itself will not require a closure as part of these works, it will be necessary to highlight alternative access to Core Path 66 and the shoreline. Signage will therefore be provided to direct users along an existing path which follows alongside the railway. Removal of an existing gate which forms a barrier for cyclists will be required.

2.13 No suitable diversion route for Core Path 67 has been identified. This path will therefore need to be closed if it is not possible to provide a safe route adjacent to the works during construction of the culvert in this location.

2.14 A drawing (no. 12449-LUC-XX-XX-DR-TP-0001) has been prepared to summarise the proposed diversions and mitigations, and is provided in Appendix A of this note.

Opportunities

2.15 There are opportunities to improve the existing core path network as part of the Scheme works as follows:

- Provide an upgraded surface to Core Paths 61 and 62 when they are reinstated.
- The existing footbridge over the burn is in poor condition and there may be opportunity to provide a replacement as part of the works.
- Permanent removal of the gate on the alternative route to Core Path 65.

Chapter 3

Highways Matters

Impact of the Scheme on Highways Network

3.1 It is considered that construction of the flow diversion culvert will have an impact on highways in the local area where it crosses or passes beneath them including the A82, which is a trunk road, Greenhead Road and A814 Glasgow Road. Some minor roads may also need to be closed at their junctions with Greenhead Road including High Mains Avenue and Geils Avenue.

A82 Stirling Road

3.2 At the proposed culvert inlet location, the A82 is a 2+2 lane dual carriageway, forming a priority crossroads with Greenhead Road and Strowan's Well Road. The proposed diversion culvert will cross beneath the junction of the A82, with the inlet located between the western arm of A82 Stirling Road and Strowan's Well Road and the culvert being routed beneath Greenhead Road.

3.3 As detailed plans of the proposed culvert crossing of the A82 will be developed post-notification it is assumed that with HDD or phased open cut methods it will be possible to construct the culvert under temporary traffic management, with temporary signals. This will necessitate the temporary take up of the central reservations, to be reinstated once works are completed. Access to properties on Strowan's Well Road will be maintained via Barnhill Road.

3.4 It is anticipated that the culvert will be progressed in a north to south direction. Whilst the works are undertaken in the eastbound carriageway, there will be two way running on the westbound carriageway. Once the works cross to the westbound carriageway the traffic management will be rearranged to allow two way running on the eastbound carriageway.

3.5 During the latter period, access to Greenhead Road will not be possible from the A82, therefore signage for an appropriate diversion will be provided.

3.6 In the event that traffic management is not sufficient for the construction of the culvert under the A82 a diversion route has been proposed with through-traffic diverted along the B830 and A814 Glasgow Road. Local traffic will be diverted along Dunbritton Road, Alcutha Avenue, Greenhead Road and A814 Glasgow Road.

Greenhead Road

3.7 It is assumed that the diversion culvert will be installed beneath Greenhead Road in sections with one lane closed and traffic managed with temporary signals to maintain access to properties as far as practicable. Where the works may require a closure of the access to High Mains Avenue or Geils Avenue an alternative route will be signposted. Access to High Mains Avenue will be via Geils Avenue and Geils Quadrant. Access to Geils Avenue will be via High Mains Avenue and Geils Quadrant.

3.8 In the event that a full road closure is required for each section, it is considered that advance signage of the road closure with an instruction for motorists to find an alternative route will be sufficient.

A814 Glasgow Road

3.9 Where the diversion culvert is proposed to cross beneath the A814 Glasgow Road, traffic will be managed with temporary traffic lights. Access will need to be maintained to properties on Oaktree Gardens and the Dumbuck Bowling Club. If a full closure is required a diversion route will be signposted advising motorists to use Greenhead Road and the A82.

Chapter 4

Consultation

Introduction

4.1 LUC have consulted with the highways authorities relevant to the Scheme, namely West Dunbartonshire council and Transport Scotland.

West Dunbartonshire Council

4.2 LUC have consulted WDC regarding the core paths and highways mitigation proposals. The relevant officer has had sight of the proposals and is agreeable to them in principle. The officer noted that as a contractor's method of works is not yet available it is possible that the proposed diversions and mitigation may need to be amended as the project progresses. The officer also noted that the council have previous experience of road closures being in place on Greenhead Road for extended periods of time.

Transport Scotland

4.3 Transport Scotland have been consulted on appropriate traffic management during the construction of the proposed culvert beneath the A82 Stirling Road at its junction with Greenhead Road. TS have indicate that traffic management consisting of two way running on a single carriageway is acceptable in principle. TS advised that the A82's efficient function is important to local residents and users from further afield and that therefore as much notice as possible for traffic management will be required with working outside of June to August being preferable. TS advised that as the scheme progresses to detailed design a full Traffic Management and Impact Assessment with appropriate modelling will be required with the potential requirement for transport minister's approval.

Chapter 5

Core Paths Design Advice

Introduction

5.1 Core Paths play a vital role in promoting outdoor recreation, health and wellbeing and are accessible to pedestrians, cyclists and equestrians. It is considered that for the typical Core Path users in Dumbarton, the provision of routes to the standards set out in Cycling by Design is appropriate for walkers and wheelers. It is considered that the usage levels of the existing routes are acceptable for shared use, although interaction between pedestrians and cyclists must be carefully considered and the priority of pedestrian movement within the sustainable travel hierarchy maintained.

Upgrading Existing Facilities

5.2 The Scheme may present opportunities to upgrade existing core paths. Where these opportunities arise an assessment will be required to ensure that the existing infrastructure is suitable for use and to determine what construction works are required to upgrade the facility. Issues to consider include:

- Interaction with other pedestrian facilities;
- Review of any actual or perceived safety risk resulting from the upgraded routes;
- Future infrastructure maintenance responsibility, including cycle track pavement, structures, signage, fencing and lighting;
- Existing physical constraints to providing a compliant facility, such as existing overbridges or width restrictions; and,
- Planning and consultation requirements with those authorities responsible for the existing infrastructure.

Access Control

5.3 Access control measures such as barriers and gates may exclude some disabled people and riders of non-standard bicycles from using the facilities. They may also require cyclists to dismount to navigate them making the facilities less attractive to use. Therefore there should be a presumption against installing access control measures unless it can be demonstrated that there is a significant and persistent safety or personal security concern raised by unwanted access, such as by motor vehicles. Similarly existing access controls should be removed where possible as part of an upgrade to existing facilities.

5.4 Where access controls are being considered as a means of controlling speed, such as on an approach to an interaction point, it is preferable to adjust the horizontal alignment where possible. Where access controls must be provided, spacing of 1.5m should be provided to allow all types of cycle to pass unrestricted.

Geometry

5.5 The requirements for cycling link geometry relating to stopping distances, and horizontal and vertical alignments are set out in the Table 5.1 below. It is considered that 20kph is an appropriate design speed for core paths in Dumbarton.

Table 5.1: Cycling Link Geometry Requirements

Design Criteria	Local Access (20kph design speed)	Commuter Link (30kph design speed)	High Speed Link (40kph design speed)
Dynamic Sight Distance – desirable minimum	44m	67m	89m
Stopping Sight Distance – desirable minimum	17m	31m	47m

Design Criteria	Local Access (20kph design speed)	Commuter Link (30kph design speed)	High Speed Link (40kph design speed)
Horizontal Radius – desirable minimum	14m	32m	57m
Vertical Crest Curvature (K) – desirable minimum	6	6	14
Vertical Sag Curvature (K) – desirable minimum	5	5	5
Gradient – desirable maximum	3%	3%	3%

Source: Cycling by Design

5.6 For cycle tracks which are to be shared with pedestrians the desirable minimum width is 4m. The absolute minimum width is 2.5m. Where link gradients are greater than 3%, 0.25m should be added to the track width to account for increased lateral movement at slower cycling speeds.

5.7 It is necessary to allow sufficient clearance between the route and fixed objects or adjacent infrastructure. Greater proximity to fixed objects and features reduces the effective width of the route as users seek to avoid them. The clearance should be provided in accordance with Table 5.2 below.

Table 5.2: Clearance to objects and other features

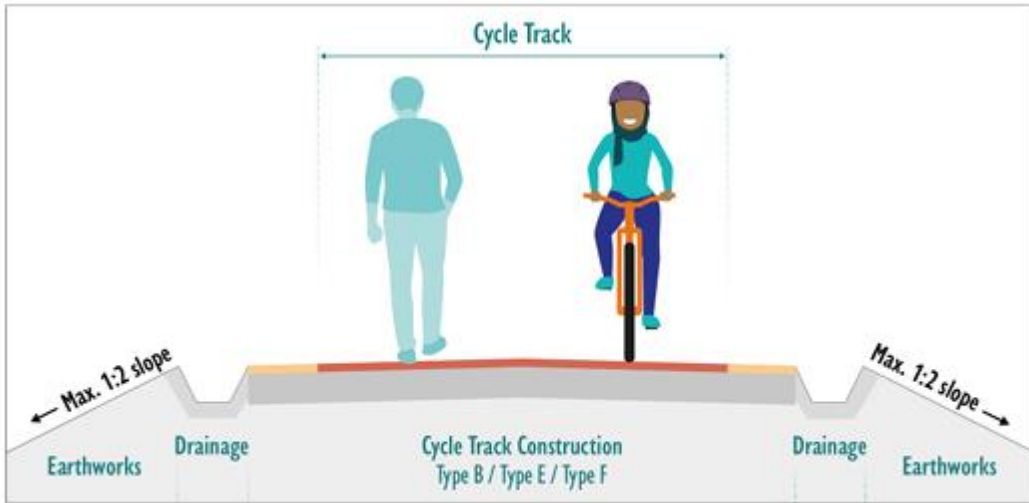
Features	Minimum Clearance
Vertical feature between 60mm and 150mm	0.2m
Vertical feature between 150mm and 600mm	0.2m
Vertical feature higher than 6000mm	0.5m
Ditch or slope	0.5m
Canal or other watercourse	1.2m
Equestrian route	1.2m

Source: Cycling by Design

Cross Section and Construction

5.8 A typical cross section for a shared pedestrian and cyclist route is shown in Figure 5.1 below.

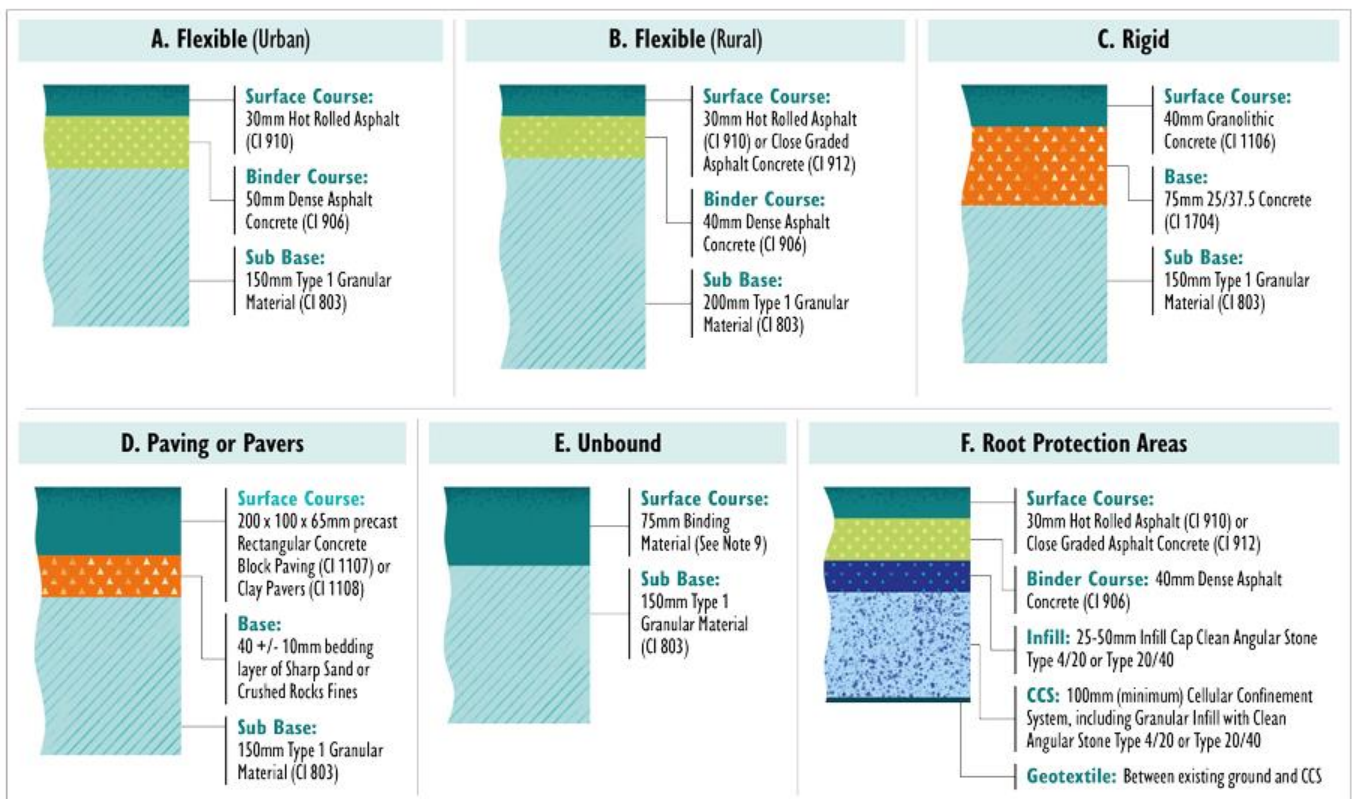
Figure 5.1: Typical Shared Use Cross Section



Source: Cycling by Design

5.9 It is considered that a range of surface construction types will be required for the core paths in Dumbarton. The pavement buildups for each surface type are presented in Figure 5.2 below.

Figure 5.2: Cycle Track Pavement Build Up



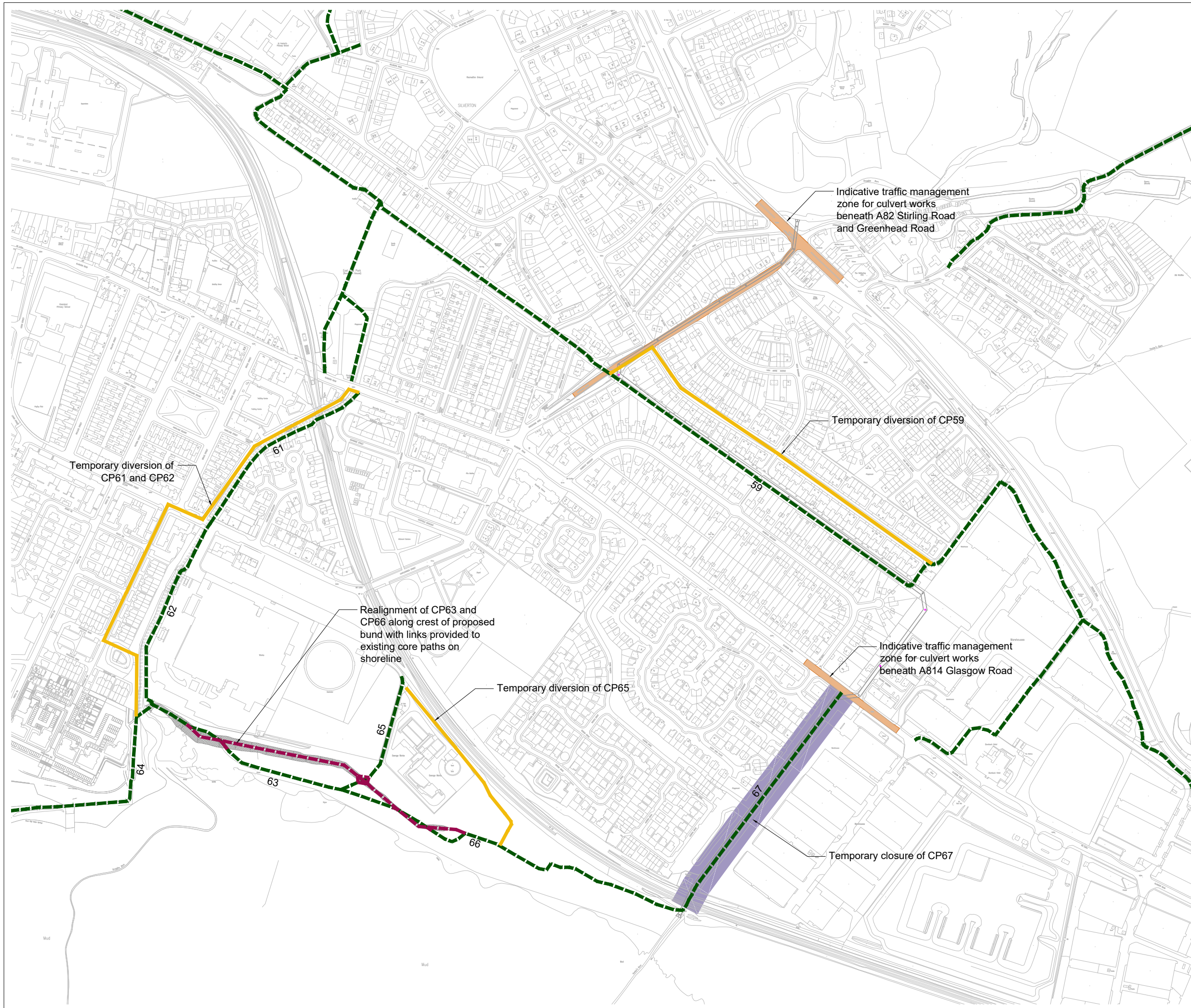
Source: Cycling by Design

Chapter 6

Summary and Conclusion

- 6.1** LUC have produced this technical note to provide advice on the core paths and highways matters raised in the EIA screening opinion of the Scheme. No environmental statement is required, although there must be consideration of the scheme's impact on core paths and highways in Dumbarton.
- 6.2** This note has identified where the Scheme may have an adverse impact on the core paths and highways networks and set out proposals for mitigatory measures such as temporary diversions, route realignment, and traffic management.
- 6.3** LUC have consulted with the relevant authorities for the trunk road (Transport Scotland) and the paths and highways within Dumbarton (WDC). Through this consultation it has been established that the proposals that have been set out above are agreeable in principle and should be worked up in greater detail as the scheme progresses.
- 6.4** LUC have also provided high level design advice for the Core Path network based on the guidance in *Cycling by Design*. It is considered that the guidance provided will be suitable for typical core path users in Dumbarton.
- 6.5** To conclude, this note has set out that the impact of the Scheme on the core paths and highways has been considered to the satisfaction of the EIA screening opinion comments on these matters.

Appendix A
Mitigation Summary Plan



Indicative traffic management zone for culvert works beneath A82 Stirling Road and Greenhead Road

Temporary diversion of CP59

Temporary diversion of CP61 and CP62

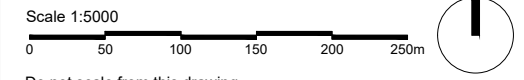
Realignment of CP63 and CP66 along crest of proposed bund with links provided to existing core paths on shoreline

Temporary diversion of CP65

Indicative traffic management zone for culvert works beneath A814 Glasgow Road

Temporary closure of CP67

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Project
Gruggies Burn Flood Alleviation Scheme

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12449	1:5000	S0 - WIP

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Core Paths and Highways Impacts Mitigation Measures

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