Annex H

CYC Active Travel Fund Skeldergate

Revision	Revision date	Details	PREPARED	CHECKED	APPROVED
P01	14/09/2022	First Issue	Luke Oddy Senior Engineer	Neil Brownbridge Regional Director	Neil Brownbridge Regional Director

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Stage 1
Concept Option Development

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Aim & Objective

Aim

- Safety, amenity and accessibility improvements for cyclists on the route along Skeldergate, and to reduce and/or remove conflict at build-outs, to fulfil the commitment within Neil Ferris' OIC Director Decision for Local Cycling and Walking Prioritisation (7/5/20).

Objective

- Cycle Improvements - Enable cyclists to safely pass the Skeldergate build-outs without conflict over right of way and road space from other road users.

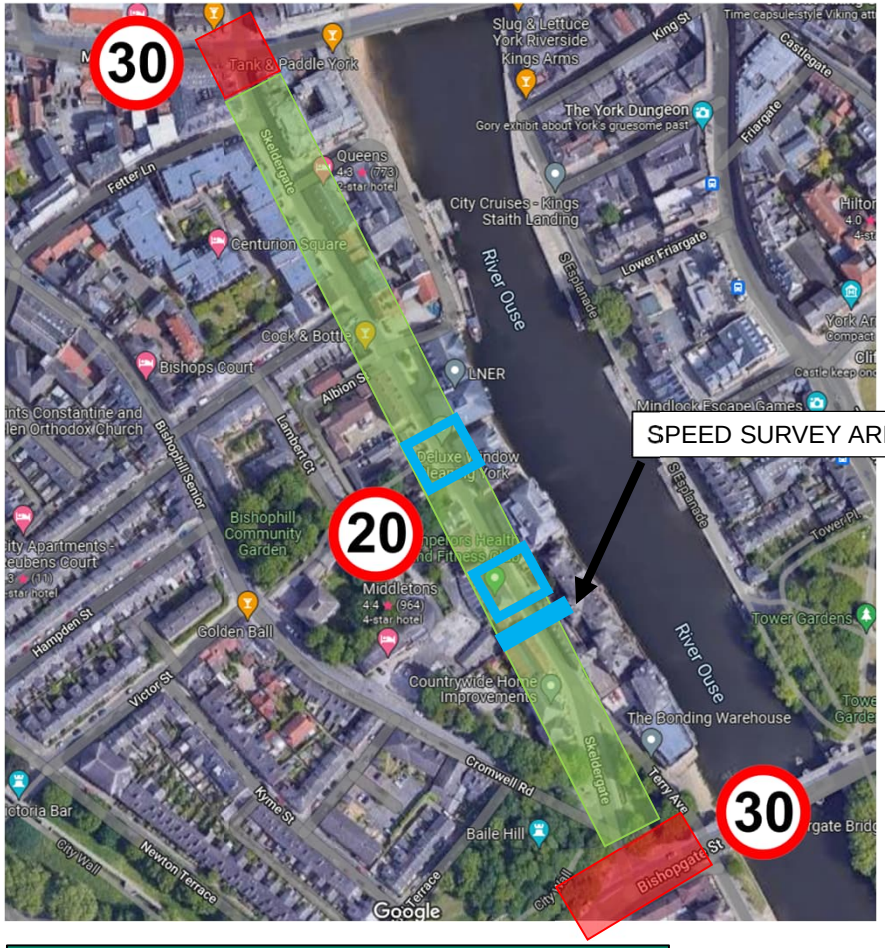
Existing Conditions

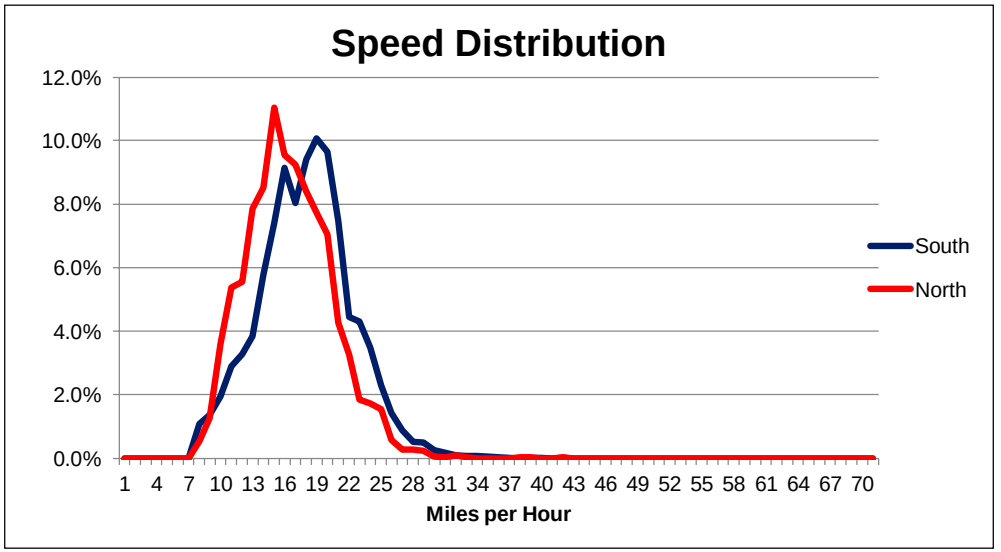
- Conflict between cyclists and vehicles at crossing buildouts;
- Perceived speed and vibration problems
- Poor carriageway surface
- Damaged footway surfacing around crossing points
- 6 - 6.2m Carriageway / 2m footways.

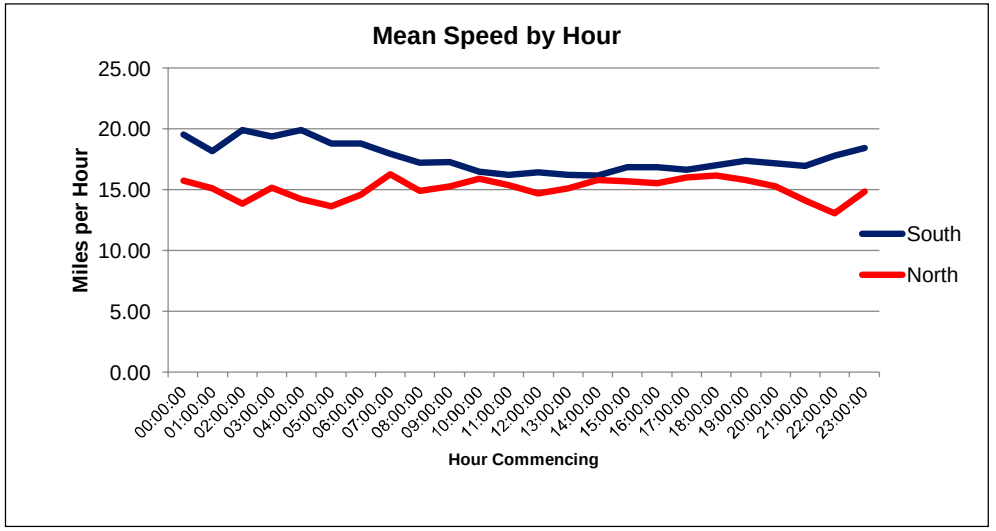
Issues with noise and vibration is a result of a number of factors: the cushions, the humps and defects throughout (inc. failing utility trenches and drainage defects). Plan to plane out and patch the old cushions and replace with new. However, dealing with the cushions alone will not address the concerns and issues being experienced.

Speed (2017 data)

- Limit 20 mph
- 85th Percentile Speeds:
  - Southbound 21 mph
  - Northbound 19 mph







Conclusion: Recorded speeds broadly in line with posted 20mph speed limit.

Traffic Volumes (2017 data)

Traffic Volume (2017)

- Weekday Average Daily Flow Southbound - 1311 vehicles
- Weekday Average Daily Flow Northbound - 389 vehicles
- Weekend Average Daily Flow Southbound - 1030 vehicles
- Weekend Average Daily Flow Northbound - 220 vehicles

Reference LTN1/20: Figure 4.1, Pg 33.

Figure 4.1: Appropriate protection from motor traffic on highways

Speed Limit[1]	Motor Traffic Flow (pcu/24 hour)[2]	Protected Space for Cycling			Cycle Lane (mandatory/ advisory)	Mixed Traffic
		Fully Kerbed Cycle Track	Stepped Cycle Track	Light Segregation		
20 mph[3]	0					
	2000					
	4000					
	6000+					
30 mph	0					
	2000					
	4000					
	6000+					
40 mph	Any					
50+ mph	Any					

Provision suitable for most people

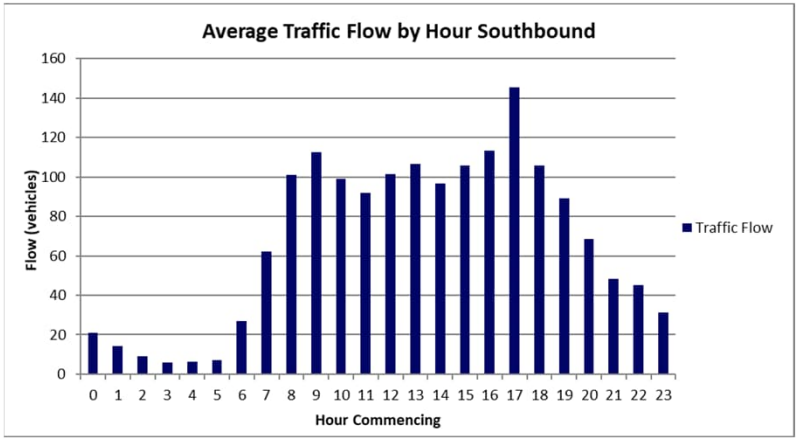
Provision not suitable for all people and will exclude some potential users and/or have safety concerns

Provision suitable for few people and will exclude most potential users and/or have safety concerns

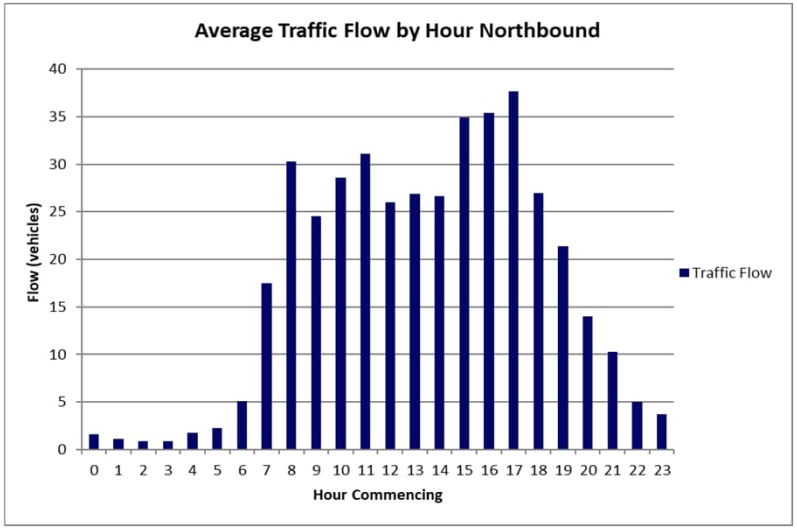
Notes:

1. If the 85th percentile speed is more than 10% above the speed limit the next highest speed limit should be applied
2. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow
3. In rural areas achieving speeds of 20mph may be difficult, and so shared routes with speeds of up to 30mph will be generally acceptable with motor vehicle flows of up to 1,000 pcu per day

Entire Survey Period



Entire Survey Period



Conclusion: Traffic flows are such that a mixed traffic environment would be considered suitable.

Option 1 – Renew Existing Buildouts

Key Features

- Introduction of vehicular give way road markings at buildouts with associated signing;
- Supplemented with introduction of 1057 cycle markings along Skeldergate.

Notes:

1. Existing layout is LTN 1/20 compliant in regards carriageway widths. Carriageway reduction to 3m would not be recommended due to bus routing and significant works required for little gain.

Main Advantages

- Low-cost option due to kerblines staying as existing;
- Introduction of markings and signing to formalise the priority arrangement should draw attention to the requirement to allow opposing traffic and cyclists to clear the buildout before advancing.

Main Disadvantages

- Leaves cyclists mixed with traffic through the buildout;
- No alteration of physical layout means cyclists may be subjected to the same issues as currently present if give way signing and markings are not adhered to by motor vehicles.

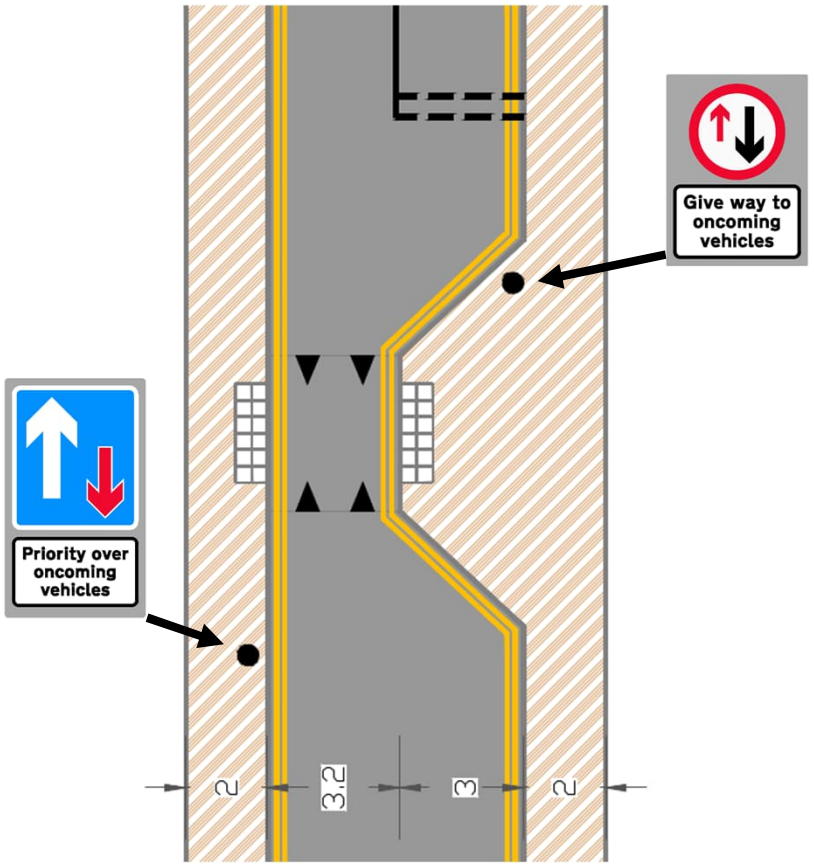
High Level Cost Estimate

A high-level cost estimate to carry out these works would be around £5,000. This is inclusive of preliminaries (30%), design & admin (15%) and a risk (40%) uplift.

An option to reinstate the damaged footway paving on the buildouts would increase the high-level cost estimate to around £15,000. This is inclusive of preliminaries (30%), design & admin (15%) and a risk (40%) uplift.

Schematic Layout:

Note: Schematic layout applies to both study area locations.



Summary

This option would improve the existing provision and formally introduce a priority system for traffic. Whilst the existing carriageway width through the buildout is already LTN 1/20 compliant, the existing issues of close passes may still occur due to no physical changes to the layout.

Option 2 –Cycle bypass at buildouts

Key Features

- Introduction of vehicular give way road markings at buildouts with associated signing;
- Supplemented with introduction of 1057 cycle markings along Skeldergate;
- 1.5m cycle bypass of give way movement at buildouts.

Notes:

1. A cycle bypass of the pinch points will remove cyclists from the narrow carriageway and provide a protected route through;
2. The width in the opposing direction for cyclists routing through the buildout can be reduced to 3m in order to ensure cyclists are located within the dominant position.

Main Advantages

- Removes cyclists in one direction from the pinch point at the buildouts;
- Reduction of the remaining carriageway to 3m, ensuring cyclists still with traffic take the primary position in the lane;
- Introduction of markings and signing to formalise the priority arrangement should draw attention to the requirement to allow opposing traffic and cyclists to clear the buildout before advancing.

Main Disadvantages

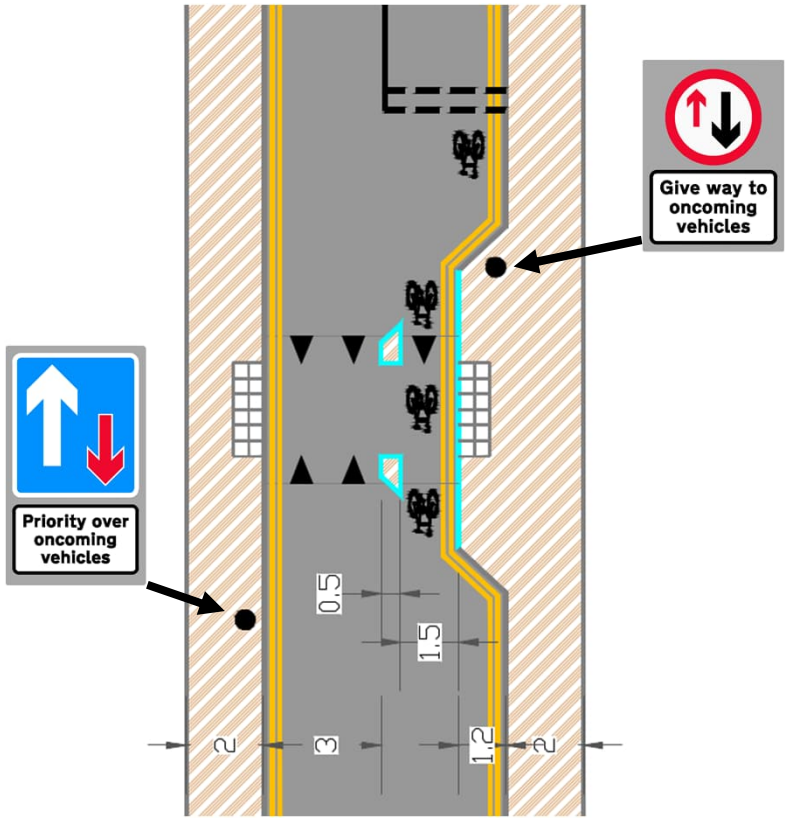
- Protection only provided for one direction of cyclists due to the width constraints along Skeldergate;
- Existing width does not allow for a standard cycle lead in lane to the bypass arrangement;
- Potential utility impact at northern most buildout (subject to statutory undertakers enquiries);
- High cost due to removal and reinstallation of kerbs.

High Level Cost Estimate

A high-level cost estimate to carry out these works would be around £35,000. This is inclusive of preliminaries (30%), design & admin (15%) and a risk (40%) uplift.

Schematic Layout:

Note: Schematic layout applies to both study area locations.



Summary

This option would provide cyclists in one direction a dedicated bypass of the buildouts, putting them in a safer position, away from any potential conflict with motor vehicles. The cyclists travelling in the opposite direction would be required to pass though the buildout narrowing. However, the proposal to reduce the carriageway width should mitigate the near pass issues due to a reduced perception of available space and cyclists adopting the primary position.

Option 3 – Reduce Buildout Extents

Key Features

- Introduction of vehicular give way road markings at buildouts with associated signing;
- Supplemented with introduction of 1057 cycle markings along Skeldergate.

Notes:

1. This would increase the carriageway width above the critical 3.9m limit set in LTN 1/20 and rely on vehicles following priority markings.
2. Option may result in more vehicles squeezing through restrictions alongside cyclists due to the width increase, but should reduce the proximity of cyclists and vehicles.

Main Advantages

- Increasing the carriageway width through the buildout should enable cyclists to adopt the secondary position in accordance with LTN 1/20, see slide 5;
- Introduction of markings and signing to formalise the priority arrangement should draw attention to the requirement to allow opposing traffic and cyclists to clear the buildout before advancing.

Main Disadvantages

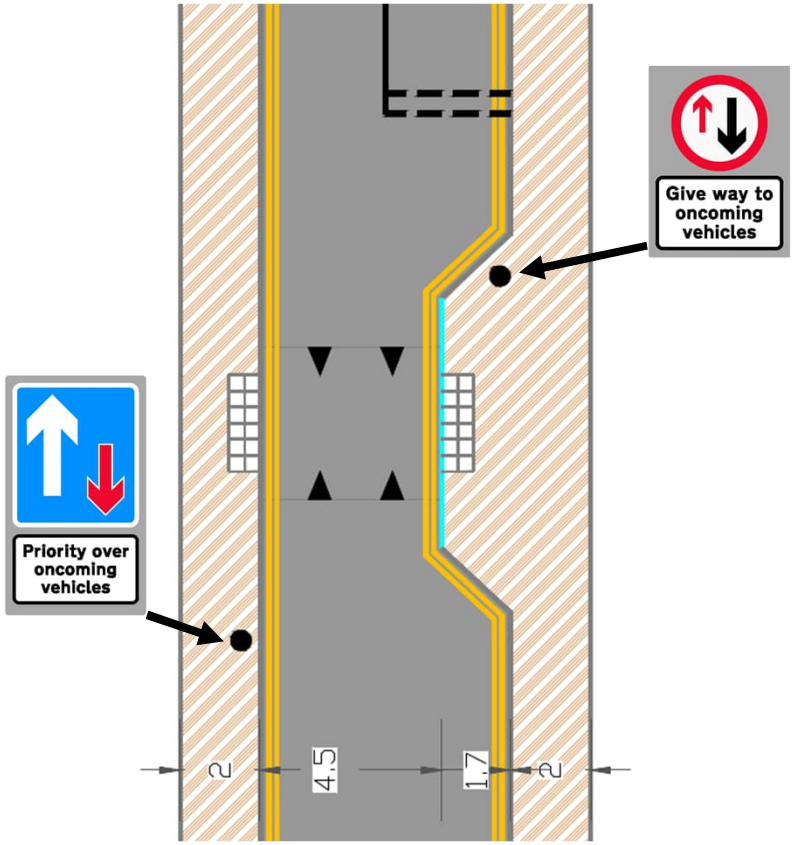
- Increasing the carriageway width above 3.9m may give the illusion to oncoming vehicles that they can squeeze through the remaining gap alongside an oncoming cyclist;
- Leaves cyclists mixed with traffic throughout;
- Higher cost than renewal of existing (Option 1) but no cost associated with installing cycle bypass (Option 2).

High Level Cost Estimate

A high-level cost estimate to carry out these works would be around £28,000. This is inclusive of preliminaries (30%), design & admin (15%) and a risk (40%) uplift.

Schematic Layout:

Note: Schematic layout applies to both study area locations.



Summary

By widening the existing carriageway in this proposal, this would potentially increase the number of opposing vehicles passing through the narrowing alongside cyclists. However, due to the increased available width and cyclists riding in the secondary position, the proximity of the passes should be lower.

Option 4 – Removal of Buildouts

Key Features

- Removal of buildouts
- Introduction of road markings - 1057 cycle markings and 'SLOW' text for vehicles
- Additional traffic calming measures (Vehicle Activated Speed Signs)

Notes:

1. This would remove the pinch points for cyclists at the existing crossing points and focus on signing and markings to control excess speeds.
2. Removal of buildout may lead to increased speeds due to visibility along Skeldergate. Speeds would need to be controlled by other measures.

Main Advantages

- Removal of buildouts will unify the carriageway width throughout, reducing pinch points and close passes;
- Easier layout for buses to navigate.

Main Disadvantages

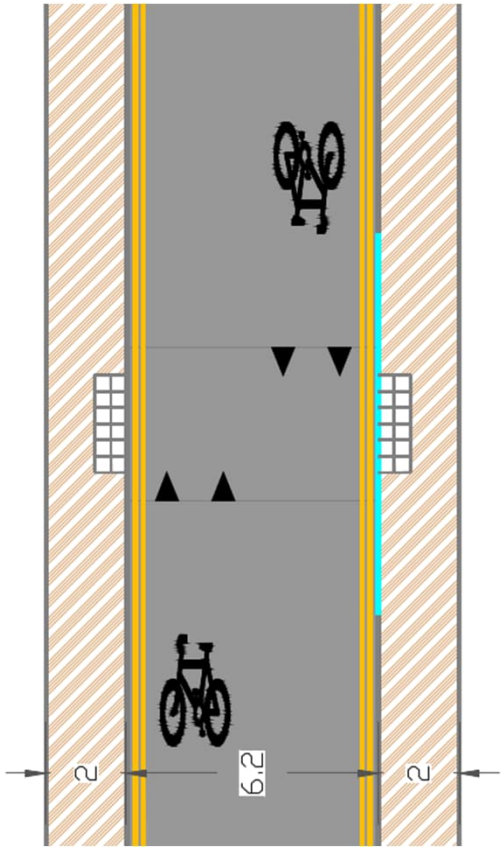
- Removing the buildout reduces the perception of traffic calming along Skeldergate albeit replaced by full carriageway width speed hump. This may result in an increase of recorded speeds;
- Increased crossing distance for pedestrians;
- Cost associated with removal of kerbs and regrading footway to carriageway level.

High Level Cost Estimate

A high-level cost estimate to carry out these works would be around £30,000. This is inclusive of preliminaries (30%), design & admin (15%) and a risk (40%) uplift but excludes cost associated with installation of additional traffic calming measures.

Schematic Layout:

Note: Schematic layout applies to both study area locations.



Summary

Total removal of the buildouts would remove the conflicts between motor vehicles and cyclists. The removal of the buildouts would potentially increase speeds along Skeldergate and would be reliant upon further traffic calming measures such as vehicle activated speed signs to control speeds.

Stage 1 Summary Table

Option	Indicative Cost *	Satisfying Key Objective *(Improved cycle safety at buildouts)*	Deliverability Rating	Summary Comments
1 – Renew Existing Buildouts	£5K	✓	Green	+ Simple and low cost to implement + New road markings and signs formalising priority - No protection for cyclists in both directions
2 – Cycle bypass at Buildouts	£35K	✓✓✓	Amber	+ Offers protection for one direction of cyclists + New road markings and signs formalising priority - Highest cost to implement - Potential issues with utilities
3 – Reduce Buildout Extents	£28K	✓	Green	+ Increased carriageway width through pinch points + New road markings and signs formalising priority - No protection for cyclists in both directions
4 – Removal of Buildouts	£30K	✓✓	Green	+ Complete removal of pinch points - No protection for cyclists in both directions

Preferred Option

Following a review of the four options presented, CYC (Beth Old) advised:

"Having looked at the options and scrutinised them against the project outline, I have come to the conclusion that only Option 2 fully meets the objective. That is: 'Enable cyclists to safely pass the Skeldergate build-outs without conflict over right of way and road space from other road users.' The key being 'without conflict', and the risk of this conflict still occurring seems to be present in all options except [Option] 2 and [Option] 4. As [Option] 4 may result in increased speed and reduced pedestrian safety, it can be ruled out, leaving Option 2."

On this basis, Option 2 was taken forward to preliminary design and assessment.

Stage 2
Preferred Scheme: Preliminary Design & Assessment

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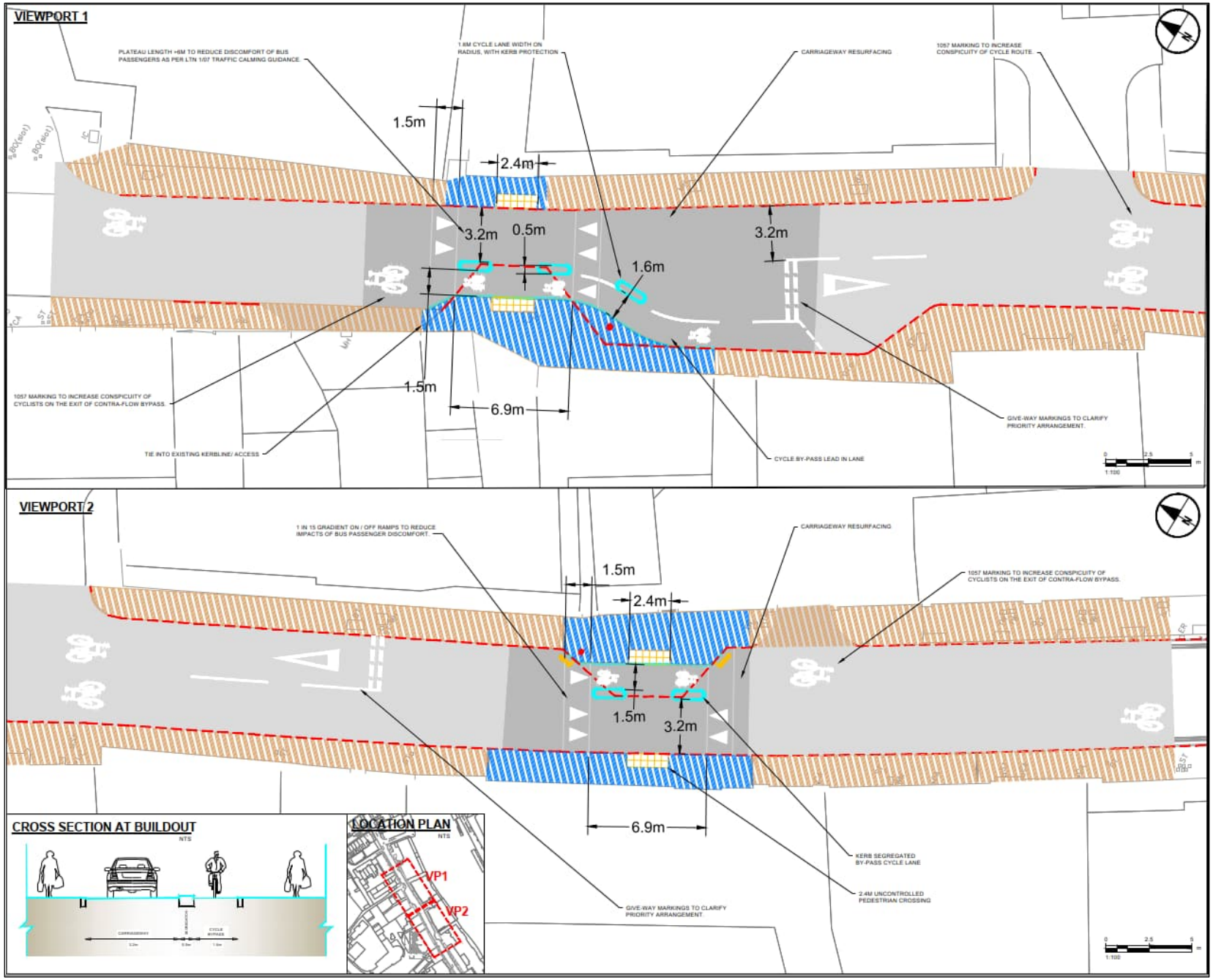
Preliminary Scheme Design



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LTN 1/20 Qualitative Assessment

Overview

Whilst LTN 1/20 does not outline an audit technique for buildouts specifically, the principles of the Cycle Level of Service have been applied to both the existing and proposed layouts to determine a red, amber or green rating. Relevant extracts from LTN 1/20 design guidance are provided in Appendix A. Of particular note are:

- Guidance at chicanes;
- Minimum acceptable lane widths; and
- Red, Amber & Green Ratings for CLOS (Cycle Level of Service) and JAT (Junction Assessment Tool).

Existing layout

The existing geometric layout of the buildouts and relatively low traffic volumes / speeds are sufficient to meet LTN 1/20 requirements for a mixed traffic environment and would be expected to score a green rating. However, the lack of clarity at the buildouts to ensure motorists are aware of the priority arrangement results in an unsafe environment for cyclists, which would reduce the buildouts to a RED rating due to safety issues.

Preferred Option

The proposed option provides cyclists in one direction a dedicated kerb segregated bypass of the buildouts that meets the minimum 1.5m width requirement. Kerb segregation of 0.5m will put cyclists in a safer riding position, away from any potential conflict with motor vehicles. The inside edge of the segregation kerb will be splayed to avoid pedal strike on the offside. The cyclists travelling in the opposing direction are still be required to pass though the buildout in the primary position within a lane that is within the prescribed width of 3.2m or below. Additional signage confirming the right of way and cycle 1057 markings within the carriageway, should reduce the risk of near pass incidents. As such, the preferred option is considered to score a GREEN rating.

Design Decision Log

Ref	Design element	Potential Hazard / Risk	Design Decision
DD-01	Carriageway Cycle Markings	Motorists unaware of presence of cyclists	To increase conspicuity of cyclists emerging from the proposed cycle bypasses, 1057 cycle markings are proposed within the carriageway and on the approaches and exits to the two buildouts.
DD-02	New give-way markings	Potential for the internal link to become blocked between the two alternate direction give-way markings (vehicles give way northbound at the northern buildout and southbound at the southern buildout)	Guidance within LTN 1/07 (relevant extracts from which are provided at Appendix A) recommends spacing between vertical traffic calming measures of at 60-70m. The proposed scheme layout retains the existing spacing between raised tables of 60m but with improved clarity regarding priorities. It is recognised that introducing this clarity in the form of give-way markings results in an internal 'stacking space' of approximately 35m. The risk of this internal link becoming blocked with both directions of motor vehicles unable to progress is considered to be low given the current (low) vehicle flows on this link together with good forward visibility. *Note:* An alternative arrangement would be to give priority in a single consistent direction at both buildouts. However, this would remove the requirement for the unopposed direction of travel to give-way, potentially encouraging higher vehicles speeds. It may also result in increased driver frustration for the direction of travel with two sets of give-way markings which may result in potential conflicts with opposing cyclists.
DD-03	Cycle segregation	A) Cycle collisions with vehicular traffic. B) Risk of pedal strike with new cycle segregation units.	A) To increase safety for cyclists travelling in the opposing direction to vehicular traffic at buildouts, the proposed layout includes kerb segregated cycle bypasses at both buildouts. A full 0.5m kerb unit is proposed to protect against the risk of vehicles 'overhanging' into the cycle lane (for example, wing mirrors). B) Cycle segregation units will be designed with a splayed internal edge to reduce the risk of pedal strike, increasing the effective width of the cycle bypass.
DD-04	Raised Plateaus	Cyclists 'jolt' as they manoeuvre the raised speed plateaus (potential comfort issue).	Detailed design to ensure ramp gradients are optimised to minimise 'jolt' to cyclists whilst also providing sufficient traffic calming benefit. *Note:* An alternative arrangement that does not provide a raised plateau was considered (see Appendix B) but rejected as CYC confirmed the removal of existing speed plateaus is currently out of scope.

Utilities Information

Northern Powergrid

Open Reach / City Fibre / Virgin / Yorkshire Water / Vodaphone / Northern Gas Network

Note:

- Utilities locations are indicative at Preliminary Design stage and are shown on drawings 60685224-ACM-2700-ZZ-DR-TR-0001 / 0002. There may be additional utilities present that are not identified these drawings.

Conclusion: There are a high number of utilities within the study area within both the carriageway and footway. As such, this increases the risk associated with any diversion / cost of required diversions. Whilst it is unlikely that proposals will require diversion of underground services, this cannot be confirmed until C3 stage.

Preliminary design cost estimate

Block Cost Estimate

Scheme	**Skeldergate**	**OPTION 1A**	
Client:	**CYC**	Preparation Date:	**Sept 2022**
Costing Base Year:	2022		
Construction Year:	2023	Inflation Adjustment Factor (IAF):	101.5%

BASE COST	Description			Section Costs	Section Costs (£ 2022 rates)	Sub Totals (£)
Preliminaries	Construction Costs			£49,977	**£50,726**	
	Traffic Signals equipment				**£0**	
	Works Contingency	5%	Sum of Works costs	£2,499	**£2,536**	
	Utilities Allowance	20%	Sum of Works costs	£9,995	**£10,145**	
	TTM	20%	Sum of Works costs	£12,494	**£12,682**	
	Sub Total:					**£76,089**
Scheme Design & Development	Design	10%	Capital costs		£7,609	
	Contract Management	2%	Capital costs		£1,522	
	Site Supervision	2%	Capital costs		£1,522	
	Sub Total:					**£10,653**
RISK						
Risk	Risk Contingency	25%	Sum of Works costs		£21,685	
	Sub Total:					**£21,685**
	Scheme Cost Estimate - Grand Total:					**£108,427**

Note:

- Risk allowance expected to reduce during detailed design stage.
- Cost increase in comparison to Concept Design stage attributable to: increases in material costs; requirement to adjust drainage; need to reinstate additional sections of cracked or altered York Stone paving and kerbs; and increased utilities allowance (20%) given the prevalence of utilities as shown in previous slide.

Residual matters to inform Detailed Design

Specifications

- Specification of kerbs
- Specification of kerb segregation islands
- Specification of footway surfacing
- Specification of traffic sign requirements
- Specification of tactile paving
- Specification of raised plateau

Data & Assessments

- C3/C4 Stats Information
- Stage 1/2 Road Safety Audit & Designers Response

Approvals

- CEC approval of proposed scheme and associated costs
- Agreement from Ward members of proposed scheme

Appendix A
Design guidance review

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LTN 1/20 Guidance Information

LTN 1/20 – Guidance at Chicanes

7.6.4 Cycle bypasses should be provided alongside horizontal measures such as chicanes or narrowings; the gap should be at least 1.5m wide to accommodate all types of cycle and to allow access by sweeping machinery. Where debris is likely to collect in the bypass at carriageway level, an alternative is to ramp up the cycle lane across the top of the buildout.

The bypass should be arranged so that cyclists re-entering the carriageway are protected and not placed in conflict with passing vehicles.

7.6.5 Vertical deflection features: Sinusoidal ramps have a smooth transition profile on both sides of the hump as shown in Figure 7.8. They are more comfortable for cyclists and should normally be used where on -carriageway cycling is anticipated.

Any difficulties in achieving the sinusoidal profile may be overcome by using preformed sections. These are particularly useful for approaches to flat-topped humps and speed tables. The profile of precast products should be checked to ensure it conforms to current regulations.

7.6.6 Flat-topped road humps can be used as pedestrian crossings (formal or otherwise). The requirements for road humps are contained in the relevant regulations.

7.6.7 A separate cycle bypass allows the hump to be avoided altogether (with 1 ,5m spacing between any kerbs). Where cyclists have no choice but to travel over humps, care should be taken to ensure that the transition from road to hump has no upstand.

7.6.8 Speed cushions are a form of road hump and are therefore subject to The Highways (Road Hump) Regulations 1999. The dimensions allow wide tracked

vehicles such as buses, ambulances and HGVs to straddle them. Cushions are not a preferred form of traffic calming on cycle routes because they constrain the ability of cyclists to choose their preferred position in the carriageway and are particularly hazardous to riders of three wheeled cycles.

7.2.9 Chicanes and pinch-points should be designed in such a way that cyclists are neither squeezed nor intimidated by motor vehicles trying to overtake. The preferred option is to provide a bypass or alternatively sufficient lane width (more than 3.9m) so that the cyclist can remain in the secondary position and be overtaken safely. Where the lane or cycle bypass is bounded by fixed objects such as full height kerbs, the additional widths given in Table 5-3 should be provided.

7.2.10 When width is insufficient for a bypass, the carriageway width is restricted to prevent overtaking. This will not be desirable over long lengths unless motor traffic volumes are also very low, as cyclists will feel intimidated by vehicles waiting to overtake. Gaps between kerbs (or kerb and solid white centre line) should be a maximum of 3.2m. As noted above, widths between 3.2m and 3.9m may encourage close overtaking by motor traffic at pinch points and should not be used

LTN 1/20 – Lane Widths on Bus Routes

Table 7-2: Minimum acceptable lane widths*

Feature	Desirable minimum	Absolute minimum	Notes
Traffic lane (cars only, speed limit 20/30mph)	3.0m	2.75m	2.5m only at offside queuing lanes where there is an adjacent flared lane
Traffic lane (bus route or >8% HGVs, or speed limit 40mph)	3.2m	3.0m	Lane widths of between 3.2m and 3.9m are not acceptable for cycling in mixed traffic.
2-way traffic lane (no centre line) between advisory cycle lanes	5.5m	4.0m	4.0m width only where AADT flow <4000 vehicles** and/or peak hour <500 vehicles with minimal HGV/Bus traffic.

* these lane widths assume traffic is free to cross the centre line, see 7.2.9 for details on critical widths at pinch points

** While centre line removal is still feasible with higher flows, the frequency at which oncoming vehicles must enter the cycle lane to pass one another can make the facility uncomfortable for cycling.

LTN 1/20 CLOS / JAT Score Rating

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

Traffic Calming Design Guidance (LTN 1/07)

Noise and Vibration

4.2.8 Research commissioned by the Department has shown that the maximum vertical acceleration from a sinusoidal hump is slightly greater than that from a round-topped hump of the same length, which may cause slightly increased discomfort to vehicle occupants (Kennedy et al., 2004). Flat-top humps with 1 metre length sinusoidal ramps gave lower levels of noise and vibration compared to flat-top humps with straight ramps. Discomfort, noise and vibration are discussed in greater detail in Section 4.5. Local authorities will also need to consider any additional cost in achieving a true sinusoidal profile, possibly including the need for additional construction site monitoring.

Hump Spacing

4.2.6 A maximum spacing of 150 metres is normally recommended for round-top and flat-top road humps and raised junctions (when used in a series), but at this spacing (closer for 50 mm high humps) there may be more braking and acceleration than if the spacing is below 100 metres. Hump spacing of 150 metres is not suitable for 20 mph zones where a spacing of 60–70 metres will be required.

Buses

2.5.4 For flat-top humps (Fig. 2.1), the shallower the gradient of the on/off ramps, the lower the speed reduction. Trials by local authorities indicate that gradients of about 1:15 were noticeably more comfortable than gradients of 1:10, but little further gain was obtained with gradients of 1:15 and 1:20. This suggests that 1:15 would be a suitable compromise to obtain reasonable speed reduction without excessive discomfort (TAL 02/96). TfL recommends an off gradient of 1:20 (TfL 2005). The length of plateau between the on and off ramps may also affect driver and passenger discomfort. However, the relationship between plateau length and passenger discomfort is less well documented, the results are not so consistent and may depend on the bus type and suspension of the vehicle. Most bus companies prefer a plateau length of at least 6 metres, which can accommodate the wheel base of most buses in the UK. TfL recommends a 12.5 metre length for articulated buses and buses greater than 15 metres in length (TfL 2005).

Cyclists

2.7.30 Test track trials of different profile humps, all 75 mm high, indicated that the 3.7 metre long sinusoidal hump was the most comfortable for cyclists. However, the difference in discomfort between the sinusoidal and round-top humps was not large, and local authorities would need to consider the cost effectiveness of achieving the sinusoidal profile (TAL 09/98). The 8 metre long flat-top hump with 1:13 straight on/off ramp gradients was the least comfortable (for cyclists) of all the humps tested. Some cyclists complained about the double jolt they felt crossing the hump (Sayer et al., 1999).

2.7.31 The results of the trials indicate that the use of flat-top humps with straight ramps should be kept to a minimum on routes used by substantial numbers of cyclists (i.e. only in conjunction with pedestrian crossing facilities or at side road entry treatments). It may be preferable at these locations to use 'S' humps.

2.7.32 Cyclists will normally be expected to use the shallower outer profiles of the 'H' and 'S' humps (see Chapter 4). However, care is needed with the 'H' hump to ensure that any drainage gully located near the foot of this ramp is placed and constructed so that it does not interfere with the smooth passage of cyclists (see paragraph 4.2.8)

S-Humps

The 'S' hump (Fig. 4.10) was designed by Fife Council (1996) in Scotland, using a similar principle to the 'H' hump described above. The 'S' hump dimensions used by Fife are given in Figure 4.11. This shows that the minimum gradient for the outer ramps are 1 in 33 and the maximum inner ramp gradients are 1 in 8, with an overall height of 75 mm and a plateau length of 7 metres. Vehicles with a narrow track have to use the steeper part of the hump, whereas those with a wider track are able to use the less severe outer ramps. This benefits large buses and fire appliances but may not be as effective for small ambulances or minibuses with narrower tracks. The 'S' hump could be used in a speed cushion scheme, where raised junctions or pedestrian crossings are required. A spacing of 100 metres was found to be acceptable for the 'S' road humps in Fife (TAL 09/98, Webster & Layfield, 1998). The speed differential between buses and cars was similar to the 'H' hump.

Appendix B
Preliminary design variant – no raised table

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Design variant of preferred option – No Raised Plateaus

Key Features

- Introduction of vehicular give way road markings at buildouts with associated signing;
- Supplemented with introduction of 1057 cycle markings along Skeldergate;
- 1.5m cycle bypass of giveaway movement at buildouts.

Notes:

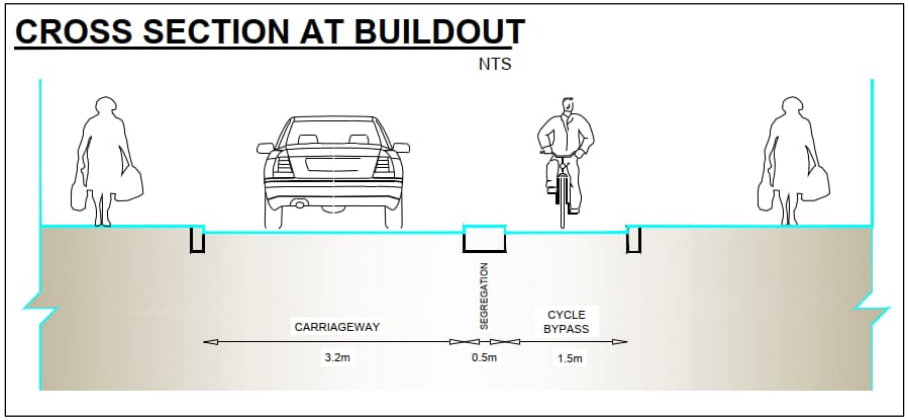
1. A cycle bypass of the pinch points will remove cyclists from the narrow carriageway and provide a protected route through;
2. The width in the opposing direction for cyclists routing through the buildout will be maintained at 3.2m in order to ensure cyclists are located within the primary position and provide sufficient width for Buses / HGV's.

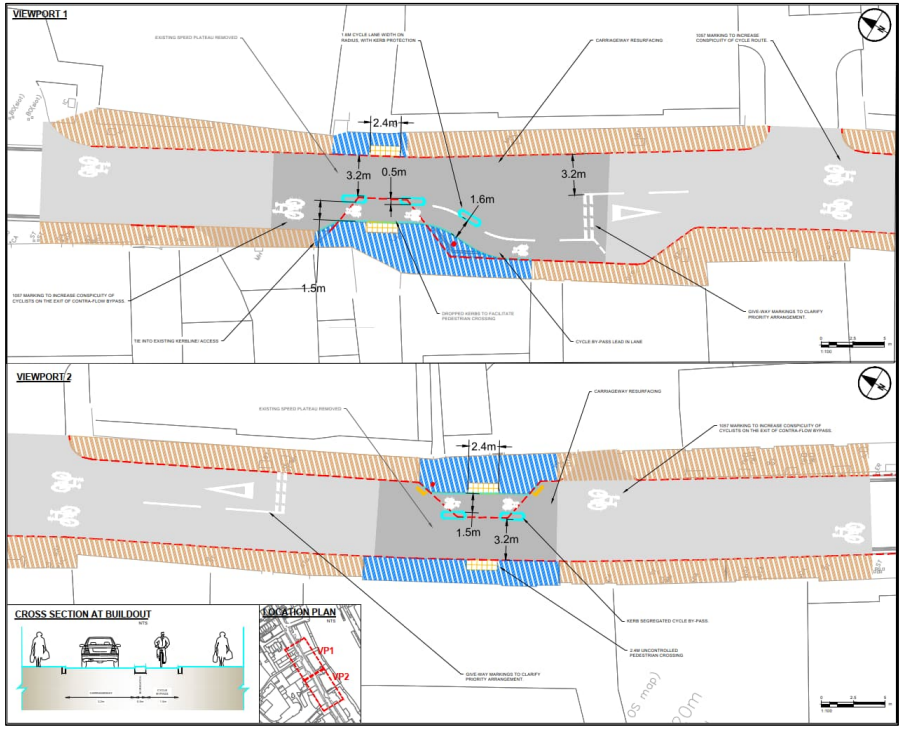
Main Advantages

- Removes cyclists in one direction from the pinch point at the buildouts;
- Ensures eastbound cyclists still with traffic take the primary position;
- Introduction of markings and signing to formalise the priority arrangement enforces the requirement to allow opposing traffic / cyclists to clear the buildout before advancing.
- Removes safety, noise, discomfort and vibration issues relating to speed plateaus.

Main Disadvantages

- Protection only provided for one direction of cyclists due to the width constraints along Skeldergate;
- Existing width does not allow for a standard cycle lead in lane to the bypass arrangement;
- Potential utility impacts, particularly at northern most buildout (subject to C3 statutory undertakers enquiries);
- Issues relating to speed potentially increased in comparison to Option 1A, potential for these to be negated by speed camera / speed messaging.





Note: CYC CONFIRMED THIS VARIANT OPTION IS NOT TO BE PROGRESSED

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