Road Safety Audit Response

RSA File Ref	

PROJECT DETAILS

Report Title	Include RSA stage

PREPARED BY

Name		Date	15/08/2025
Position	Senior Associate Engineer		
Organisation	Stantec		
Signed			

APPROVED BY

Name		Date	15/08/2025
Position	Senior Associate Transport Planner		
Organisation	Stantec		
Signed			

INTRODUCTION

This RSA reviews alterations and additions to active travel infrastructure proposed as part of the Greenbank to Meadows Cycle Route. The scheme is situated between the Greenbank and Greenhill areas to the south of Edinburgh City Centre and spans predominately residential carriageways.

RSA DECISION LOG

RSA Problem		RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
Number of problem from RSA REPORT	*Insert problem from RSA REPORT*	*Insert recommendation from RSA report*	*Insert design organisation's response*	*Insert Overseeing Organisation's response*	*Insert design and Overseeing Organisation's agreed action*
3.1	Debris and loose material were observed along carriageway edges and around gullies at several locations across the extents of the proposed cycle lanes. Detritus material may reduce tyre grip and unsteady a cyclist, increasing the risk of cyclists suffering injury from falls. This risk is exacerbated due to the potential for higher cycle speeds on sections with steep gradients such as Braid Avenue. Furthermore, the debris may block gullies and impede drainage. This could result in water pooling on the cycleway potentially giving rise to cyclist injury from slips and falls, particularly during cold periods when water can form ice	It is recommended that debris and loose material is removed, and that the cycleway is regularly maintained.	To be actioned as part of the local authorities regular maintenance programme	As with any part of the carriageway, any debris and loose material buildup will be addressed through CEC's programme of regular maintenance.	Include sweeping/debris removal within regular maintenance programme.
3.2	Older style iron gullies were observed at several locations across the extents of the proposed cycle lanes; some of which have sunken below surface levels. Gullies, particularly those pictured with large metal grates, within cycle lanes may result in the unsteadying of cyclists leading to falls. Those sunk below carriageway surface may also destabilise a cyclist contributing to injury. This risk is exacerbated due to the potential for higher cycle speeds on sections with steep gradients such as Braid Avenue	It is recommended cycle friendly gulley frames are provided and that sunken gullies are reset flush with cycleway surface.	It is recommended that an on site review is undertaken of each of the gully locations prior to construction to idetify any sunken gullys and determine whether remedial works are required. Should gully upgrades be deemed necessary it is recommended that cycle friendly gully frames are provided where necessary.	Agreed, gullies can be examined prior to works to determine if remedial action is required.	Gullies to be examined prior to works and remedial action taken if required.
3.3	Parking bays are proposed adjacent to cycle lanes at various locations throughout the scheme extents. At these locations a 0.535m 'buffer' is proposed consisting of an 150mm road marking, 235mm kerb defender and 150mm cycle lane marking. Whilst it is acknowledged a response has been provided to the potential risk of trips and falls when accessing and aggressing the bays (RSA Stage 1 Problem Ref 3.6) it is also anticipated that the parking bay proposals may present the following risks: ▪ people will be required to load / unload from the cycle lane, potentially causing obstructions which may contribute to risk of pedestrian and cycle collisions; and ▪ cyclists may be injured by striking vehicle doors opening into the cycle lane, particularly as vehicles are likely to park within the road marking extents, close to the defender kerbs. A 0.5m buffer would therefore not be achieved.	It is recommended that sufficient buffer width is provided between parking bays and cycleways and /or an alternative parking or cycle facility arrangement is provided.	The carriageway widths have already been reduced to the minimum standards based on ESDG, including the provision of floating parking. Similar minimum buffer widths are present in several Traveling Safety schemes across Edinburgh, which have been monitored and reviewed over the past three years without any issues being identified for this type of location.	Widths are as per minimum standards, and practical experience of similar installations has been that these issues are not prevalent.	No changes proposed.

3.4	Whilst it is acknowledged a response has been provided to the potential risk due to narrow cycle lanes and proximity to kerb lines (RSA Stage 1 Problem Ref 3.2), there is a potential risk that due to the provision of double yellow lines within the narrow bi-directional cycle lane: ▪ cyclists may ride longitudinally along the makings which may reduce tyre grip, particularly in wet conditions, increasing the risk of destabilisation, or ▪ cyclists may ride centrally within the cycle lane to avoid the markings increasing the risk of side swipe or head on collisions with oncoming cyclists.	It is recommended that sufficient cycle lane width is provided. This may include but is not limited to an alternative cross section and road markings with suitable skid resistance.	The cycleway width meets ESDG required minimums and there is insufficient carriageway width to increase this. The provision of yellow lines within the cycle lane is necessary to ensure waiting restrictions are clear and can be enforced. It is recommended that all road markings applied within the cycle lane, including yellow lines, are specified with appropriate materials to provide skid resistance, suitable for cycle infrastructure.	The constraints of the site and the relevant guidance dictate the dimensions of the cycle lanes. Markings can be made safer through material choice.	Specification of road markings to provide appropriate skid resistance.
3.5	At the western scheme extents, the proposed two-way cycle lanes will transition to and from an existing shared use area at footway level (Green arrow). However, the current flush kerb extents (shown in red above) and cycle road marking do not align with the proposed cycle lanes, directing cyclists into the primary position within the carriageway (Blue arrow). There is a risk that cyclists transitioning between the two facilities may become unsteadied when making sharp manoeuvres or when crossing the drop kerb at an acute angle which may lead to falls and an increased the risk of injury. Furthermore, as pictured above, the extents of the dropped kerb are unclear on approach to the proposed two-way cycle lanes. There is a risk that during periods of inclement weather such as snow fall or leaf litter accumulation may further obscure the dropped kerb extents. It is anticipated cyclists will proceed directly between the cycle lanes and shared area, at risk of colliding with full height kerbs. This may contribute to injury from falls.	It is recommended that the existing flush kerb and/or markings are altered to better direct cyclists between the proposed cycle facility and the shared use pat	The dropped kerb provides acceptable width for cyclists to access the footway although it is agreed that the alignment could be improved. It is recommended that an additional defender kerb is introduced on the carriageway to enable cyclists to fully utilise the entire width of the dropped kerb.	Additional defender can be installed to improve transition between the two.	Additional defender to be installed.
3.6	The proposals include a bidirectional cycle lane on the northern side of Hermitage Drive. Drivers crossing the cycle lane may not be aware that it facilitates two-way cycling and may therefore not look for cyclists travelling in both directions along the proposed cycle lane. This may contribute to side impact collisions between cyclists (particularly westbound cyclists) and motorists crossing the lane. This risk is heightened by the inconsistency in cycling infrastructure in the surrounding area, where facilities alternate between uni-directional and bi-directional layouts.	It is recommended that cycle markings and/or signage are provided, positioned in the view of drivers approaching the junction, to inform drivers of the potential for two-way cycle movements.	It is recommended that additional cycle markings are applied across all side road junctions on Hermitage Drive. These will be strategically positioned to ensure approaching drivers are adequately informed of the bidirectional nature of the cycle lane. This approach aligns with best practice guidance and will enhance awareness, reduce the risk of conflict and improve safety for cyclists and motorists.	Agreed, additional markings would enhance the awareness of the presence of bidirectional cyclist movements at junctions.	Additional markings to be installed.
3.7	Parking bays are proposed adjacent to side road junctions at the locations noted above. When occupied, visibility to/from the junction may be obstructed which may contribute to side impact type collisions as vehicles emerge from side roads. The risk is exacerbated on Braid Avenue as parking bays have been relocated further into the carriageway from the existing kerbline to accommodate the proposed cycle lane, reducing visibility further.	It is recommended that parking bays extents are amended to provide suitable intervisibility at junctions.	The placement of parking bays has been planned to balance visibility, parking capacity, and new cycling infrastructure. Visibility for vehicles emerging from side roads remains unchanged from the current situation. Kerbside parking is a common feature in the area and drivers are accustomed to exercising caution in such environments. It is recommended that parking demand be monitored during the trial to determine if parking provision can be reduced to improve visibility.	The location of parking is in line with the current context and is a compromise between different competing factors. Monitoring could be commissioned to see if provision can be reduced.	No changes proposed.
3.8	The eastern and western footways on Braid Avenue are lined with mature trees within proximity to the proposed uni-directional cycle lanes. Dense tree canopies and branches hang over the proposed cycle lanes and some trees are growing at an angle, protruding into the proposed lanes. There is a risk that cyclists may collide with branches and vegetation increasing the risk of injury. The likelihood of vegetation strikes is exacerbated during the hours of darkness when conspicuity of the vegetation observed may be reduced. Additionally, cyclists may make sudden manoeuvres to avoid obstructions, increasing the risk of falls. This risk may be exacerbated on the northbound lane where cyclists may gain higher speeds due to the downhill gradient.	It is recommended that the effective width of the cycle lanes is unobstructed, this may include but is not limited to the removal of trees and vegetation. If this is not possible it is recommended that an alternative north/ south route is investigated.	The existing trees adjacent to the proposed cycle lane on Braid Avenue have been retained as a valuable element of the local streetscape, contributing to visual amenity, biodiversity, and the character of the area. It is recommended that street trees be maintained as part of the regular maintenance programme and trimmed to provide adequate headroom for cyclists as per Cycling by Design.	Trees play a valuable role in the local environment and historic character of the neighbourhood, and the issues of visibility and removing obstacles can be largely addressed through regular maintenance.	Include vegetation within regular maintenance programme.
3.9	During the site visit it was observed that Braid Avenue has a steep gradient. When travelling uphill cyclists require greater lateral movement than when cycling on flat or downhill profiles. The current layout proposes a 1.5m uphill cycle lane width. There is a risk that due to the required lateral width of a moving cyclist, cyclists may side swipe each other or collide with vegetation or kerbed defenders at the lane extents, contributing to the likelihood of falls and/ or injury.	It is recommended that the southbound cycle lane width is increased to allow for greater lateral movement for cyclists travelling uphill.	The proposed 1.5m width for the southbound uphill cycle lane on Braid Avenue meets the standards set out in ESDG and has been determined based on the available carriageway width. It is recommended that regular maintenance of kerb defenders and vegetation is carried out to prevent the effective width of the cycle lane being compromised.	The cycle lane dimensions confirm with design standards and the constraints of the site. Regular maintenance can safeguard the usable width.	Include sweeping/debris/ vegetation removal within regular maintenance programme.

3.10.	Formalised parking facilities are proposed along Braid Avenue in close proximity to existing accesses. When the parking bays are occupied, it is anticipated that: ▪ parked vehicles may obstruct visibility between drivers exiting the accesses to vehicles on the mainline, increasing the likelihood of side impact collisions (blue arrows above); and ▪ parked vehicles may obstruct visibility of cyclists travelling along the cycle way from drivers tuning into accesses (particularly where long lengths of parking bays are proposed) which may contribute to collisions between vehicles and cyclists (red arrows above).	It is recommended that parking bay extents are amended to allow sufficient intervisibility between road users.	The accesses in question serve a limited number of properties with low vehicle movements, resulting in low risk of conflict. In addition, the narrow carriagway width will encourage lower vehicle speeds along Braid Avenue, further reducing risk. Given these factors and the contraints of limited street space, no amendments to the parking bay extents are required at this time. It is recommended that parking demand be monitored during the trial to determine if parking can be reduced to improve visibility.	The number of vehicle movements as described will be low, and vehicles will be travelling at low speeds, resulting in a low probability of such collisions occuring. Monitoring could be commissioned to see if provision can be reduced.	No changes proposed.
3.11	The proposed carriageway width on Braid Avenue, which varies between 4.7- 5.5m, may not provide sufficient space for two vehicles to pass simultaneously. Gaps in the formalised bays are provided, lengths of which vary. At some locations, the proposed gap length may not provide sufficient manoeuvring room between bays for two vehicles to pass. This arrangement increases the risk of: ▪ vehicles attempting to pass each other where there is insufficient width to do so, increasing the risk of side swipe collisions ▪ requirement for vehicles to reverse over extended distances, increasing the risk of reversing related collisions and driver frustration. These risks are exacerbated during peak times when higher vehicles volumes can be expected and where longer length parking bays are proposed with fewer gaps for vehicles to pass.	It is recommended that simultaneous vehicle movements are better accommodated. This may include but is not limited to, altering lane widths to allow two-way passing or altering parking bay extents to provide sufficient and regular gaps in parking to enable vehicles to pass.	The proposed widths have been designed to create a low-speed environment that prioritises safety and meet ESDG required minimums. There is insufficient width available to enable increased widths of cycle lane within this corridor. The proposed widths are consistent with ESDG for streets with low traffic volumes and are sufficient to allow two vehicles to pass with appropriate driver caution, or to negotiate priority informally when necessary. The layout, including the placement and spacing of formalised parking bays and passing gaps, has been informed by swept path analysis and site-specific constraints. The gaps in parking are spaced to allow vehicles to pass safely without requiring excessive reversing manoeuvres. As such, subject to further monitoring during the trial, we consider the current design appropriate and do not propose any amendments to carriageway widths or parking bay extents.	The lane widths and parking bays have been based on the relevant design guidance and the nature and constraints of the site and its typical vehicle movements and volumes. Monitoring may identify areas where further modification is suitable.	No changes proposed.
3.12	Intervisibility between southbound drivers on Braid Avenue and pedestrians crossing from east to west is reduced by an existing tree immediately adjacent to the crossing. Reduced intervisibility between users increases the risk of collisions between vehicles and pedestrians, as pedestrians may inadvertently enter into the path of a vehicle to cross.	It is recommended that the tree is removed to provide sufficient intervisibility between road users.	The existing tree has been retained as a valuable element of the local streetscape and the crossing has been designed in line with national guidance for low-speed residential streets. While it is acknowledged that the tree introduces a degree of constraint to intervisibility, the crossing location has been selected to align with pedestrian desire lines and designed to encourage cautious driver behaviour, supported by the reduced carriageway width and traffic-calming layout. Forward visibility for southbound drivers remains adequate, and pedestrians are provided with clear views of oncoming traffic before stepping into the carriageway. We consider the retention of the tree compatible with safe crossing provision and do not propose its removal; however, it is recommended that the tree be maintained as part of the regular maintenance programme.	Trees play a valuable role in the local environment and historic character of the neighbourhood, and the issues of visibility and removing obstacles can be largely addressed through regular maintenance.	Include vegetation removal within regular maintenance programme.
3.13	It is noted that red surfacing has been proposed where cycle lanes cross the side road junction. However, due to lack of signage and markings, drivers may not anticipate cyclists travelling so close to the give way line. This may contribute to side impact collisions with cyclists.	It is recommended that appropriate signage and/or road markings are incorporated into the proposals to increase drivers' awareness of potential cyclists.	It is recommended that additional cycle markings are applied across all side road junctions on Hermitage Drive. These will be strategically positioned to ensure approaching drivers are adequately informed of the bidirectional nature of the cycle lane. This approach aligns with best practice guidance and will enhance awareness, reduce the risk of conflict and improve safety for cyclists and motorists.	Agreed, additional markings would enhance the awareness of the presence of cyclist movements at junctions.	Additional markings to be installed.
3.14	Marked parking bays are proposed on the south side of Braid Avenue opposite Corrennie Drive. If occupied the bay may restrict cyclists manoeuvring from Corrennie Drive to the northbound cycle lane on Braid Avenue. This may increase the risk of cyclists having to make sharp manoeuvres to access the cycle lane, increasing the risk of falls or collisions with parked vehicles. Parked cars may also restrict visibility from northbound cyclists on the cycle lane to cyclists joining the lane where they may not be expected to, which may contribute to collisions between cyclists.	It is recommended that access to the cycle lanes is facilitated at side road junctions. This may involve but is not limited the removal of the parking bay proposed opposite Corrennie Drive.	We note the comment regarding the marked parking bays opposite Corrennie Drive and the potential impact on cyclist manoeuvring. However, it should be clarified that cyclists travelling northbound on Corrennie Drive do not need to cross Braid Avenue at this location, as the northbound cycle lane on Braid Avenue continues uninterrupted past the junction. Therefore, the concern about cyclists making sharp manoeuvres to access the cycle lane from Corrennie Drive does not apply in this context. Visibility between cyclists on the cycle lane and those joining from Corrennie Drive is not impeded by the proposed parking bays, as cyclists remain separated by the carriageway layout. However, we assume the audit comment relates to cyclists travelling from Corrennie Drive and travelling south on Braid Avenue. The routing through the estate has been agreed with stakeholders including residents and it is unlikely that cyclists will travel between Corrennie Drive and Braid Avenue southbound due to the gradients along this section of the route.	This parking bay will not impede movement to/from Corrennie Drive to/from Braid Avenue in either direction. In particular, a large break in the segregation will enable cyclist travelling southbound from Corrennie Drive to access the southbound cycle lane on the east side of Braid Avenue.	No changes proposed.

3.15	Marked parking bays are proposed on the south side of Braid Avenue opposite Corrennie Drive. As shown on the provided swept path drawing, large vehicles making the manoeuvre from Corrennie Drive to Braid Avenue will encroach into the parking bays which may result in side impact or nose to tail type collisions between manoeuvring and parked vehicles. Furthermore, drivers may undertake reversing manoeuvres to avoid collisions with parked vehicles at risk of reversing into the path of pedestrians, cyclists or ensuing vehicles.	It is recommended that the layout is amended to remove the conflict between parked and manoeuvring vehicles. This may involve but is not limited to amendment of parking bay location/ extents and/or alterations to the defender kerb layout.	Swept path has been rechecked allowing vehicles to use both sides of the carriageway on Corrennie drive, which is acceptable for large vehicles on residential streets. This removes the conflict with the parking bay on Braid Avenue.	Plotted potential maneuvres for large vehicles are appropiate for the street in question.	No changes proposed.
3.16	During the site visit it was observed that a gully will be located in the proposed pedestrian crossing of Braid Avenue. This increases the risk of pedestrian slips and falls which could result in injury. There is also potential for footwear, such as high heels to be caught in the open grating, which may also give rise to injury from falls	It is recommended that the gully is relocated, or the crossing be relocated out with the gully location.	The gully is located at a low point in the carriageway so it is not possible to relocate it without significant resurfacing. The crossing has been located at this position as it matches pedestrian desire lines and avoids driveways and other street furniture including trees.	Relocation of the gully would be a dispropriatiate response as it would entail significant additional civils works and relocation of the crossing would be to a less desirable/more compromised location than that proposed.	No changes proposed.
3.17	Marked parking bays are located immediately adjacent to the proposed pedestrian crossing of Braid Avenue. Visibility between pedestrians crossing from the east and motorists travelling north on Braid Avenue may be restricted if the bays are occupied, increasing the risk of collisions between pedestrians and vehicles. The risk may be exacerbated due to the downhill gradient which increases the potential for higher vehicle speeds.	It is recommended that the parking layout is amended to provide sufficient intervisibility between pedestrians and motorists at the crossing	The placement of parking bays has been planned to balance visibility, parking capacity, and new cycling infrastructure. Kerbside parking is a common feature in the area and drivers are accustomed to exercising caution in such environments. It is recommended that parking demand be monitored during the trial to determine if parking provision can be reduced to improve visibility.	The location of parking is in line with the current context and is a compromise between different competing factors. Monitoring could be commissioned to see if provision can be reduced.	No changes proposed.
3.18	Defender kerbs are proposed to form chicanes on Braid Road, with signage to be mounted on temporary concrete blocks within. This configuration may result in increased injury severity, if a vehicle strikes a defender kerb and subsequently collides with a concrete block, particularly for example a rider of a powered two-wheeler.	It is recommended that an alternative method which is less likely to contribute to driver/ rider injury is used to mount temporary signs situated within the chicanes.	The use of defender kerbs and temporary concrete blocks has been selected as an effective, low-maintenance solution to deliver traffic calming while maintaining flexibility during the trial. The layout promotes reduced vehicle speeds and improved safety for vulnerable road users. While it is acknowledged that a collision with street furniture may result in increased injury severity, this risk is mitigated by the overall reduction in approach speeds created by the chicanes and visual narrowing. Defender kerbs are highly visible and have been used in similar contexts without significant safety issues. The temporary signage mounting approach is a widely accepted solution for interim layouts. The design provides a proportional response to reduce traffic speeds and enhance road safety; we do not propose to amend the proposed arrangement.	The proposed use of signage mounted on concrete blocks and surrounded by defenders has been used for other projects and is a valid choice given the low design speed, the expected volume of traffic in the locations in question, and the inherent high visibility of these installations.	No changes proposed.
3.19	Overhanging vegetation was observed where the proposed cycle direction signs on Comiston Road and Whitehouse Loan are to be mounted, most likely obstructing them from road user view. Without advanced warning of the cycle route's continuation which enables cyclists to position themselves appropriately for upcoming turning manoeuvres, there is a risk of cyclists making late or sudden manoeuvres. This may contribute to falls or collisions with other road users.	It is recommended that vegetation is cut back to provide suitable visibility to signs.	To be actioned as part of the local authorities regular maintenance programme	Trees play a valuable role in the local environment and historic character of the neighbourhood, and the issues of visibility and removing obstacles can be largely addressed through regular maintenance.	Include vegetation within regular maintenance programme.
3.20.	Kerbed islands are proposed on Midmar Drive. In the absence of vertical features to highlight the presence of the islands there is an increased risk of vehicles striking the kerb, which could lead to loss-of-control collisions or secondary incidents if tyres are damaged during a kerb strike. This may be exacerbated due to road markings on approach aligning with the kerb. This risk is heightened during adverse weather where snow accumulation or leaf litter may obscure the kerb lines within the carriageway and due to the requirement for vehicles to drive within the central hatched -in line with the islands- when passing parked vehicles	It is recommended that vertical features, such as reflective bollards, are provided to clearly highlight the kerbed islands within the carriageway. It is also recommended that proposed road markings guide drivers beyond the kerb extents	It is recommended that reflective bollards in NAL sockets be added to the islands to increase visbility to the island for drivers.	Agreed, island visbility can be increased through inclusion of reflective bollards.	Reflective bollards to be installed on the islands.

DESIGN ORGANISATION STATEMENT			
On behalf of the design organisation I certify that: **1) the RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the Overseeing Organisation.**			
Name		**Date**	14/10/2025
Position	Senior Associate Engineer		
Organisation	Stantec		

Signed			

OVERSEEING ORGANISATION STATEMENT

On behalf of the Overseeing Organisation I certify that:

1) the RSA actions identified in response to the road safety audit problems in the road safety audit have been discussed and agreed with the design organisation; and

2) the agreed RSA actions will be progressed.

Name		Date	20.08.25
Position	Transport Officer		
Organisation	The City of Edinburgh Council		
Signed			