Appendix A –
Rationale for Table 2 Option Sifting

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Table 2 - To progress to further development, appraisal, design and OBC		SIFT or RETAIN	Design Comments
AT24	Improve active travel connectivity between the A947 study area and Aberdeen Airport/Heliport	RETAIN	:- Access to Heliport improved by committed works on Farburn Terrace. :- Improvements on Market St. add benefit in terms of directness for wider area. Supporting AT26. :- Works could include: - Cycle signage + markings added along route - Modal filter installed at Western end to replace old metal gate - TRO to adjust speed limit to 20mph if not already changed from 30mph when access restrictions introduced.
AT26	Improve active travel connectivity between the A947 study area and TECA	RETAIN	:- Improving connection with existing shared use facilities along Wellheads Drive would support a coherent AT route/network. :- Improved wayfinding throughout would add benefits. :- Improvements on Market St. add benefit in terms of directness for wider area. Supporting AT24. :- Works could include: - Cycle signage + markings added along route - Modal filter installed at Western end to replace old metal gate - TRO to adjust speed limit to 20mph if not already changed from 30mph when access restrictions introduced. :- Existing path network south of TECA could be upgraded to bound surface to offer higher level of service for users.
AT27	Improve active travel connectivity between the A947 study area and Kirkhill Industrial Estate	SIFT	:- Propose to sift AT27 as promotes similar outcomes to AT24, AT26 and AT58 which are more targeted and specific.
AT31	Improve active travel links between the Riverside Path and housing within Dyce	RETAIN	:- AT14 and AT60 from Table 1 provide improved connection with Riverside Path network. :- AT14 provides formal pedestrian crossing to the north on Riverview Drive and connects to the Riverside Path via existing footways. :- AT60 provides a missing link in the existing shared-use path to complete access to the Riverside Path. This would facilitate access for residents on the south side of Riverview Drive and remove the need for multiple road crossings. :- Further consideration of desire lines will inform addition of further priority crossings over Riverview Drive. Worn surface close to Dyce Academy, approximately 280m south of the established Riverside Path access is a potential location that would merit further review. AT31 to be retained to specifically review and develop improved connections in the area between AT14 and AT60.
AT33	Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road	RETAIN	:- Introduction of a one-way system on Station Road and adjacent streets would help improve attractiveness of active travel and support quiet route measures and the delivery of O2. :- Existing corridor width is 7.5m. A contra-flow cycle lane could potentially be adopted for improved cycling accessibility but would require existing sub-standard footways to be retained at existing width (approx 1.25m) and removal of existing on-road parking.
AT35	Implement quiet route measures on the local road network to the west of the A947 via Bankhead Road, Wellheads Drive and Farburn Terrace to Dyce Rail Station	RETAIN	:- Farburn Terrace improvements already captured under separate committed project. :- Wellheads Drive is too wide to be considered for quiet route measures (CbD 3.8.3) :- Opportunities for implementation of quiet route measures on Bankhead Road to be investigated further. : -There would be merit in redefining option as quiet route may also not be the most appropriate measure for Bankhead Road - would need to establish traffic conditions to inform suitability. "Implement active travel improvements on the local road network to the west of A947 via Bankhead Road and Wellheads Drive" may be more appropriate but would require additional optioneering. Client group to consider.
AT41	Improve active travel access to the retail park at the Bucksburn Roundabout	RETAIN	Access from Bankhead Road considered to connect with wider active travel infrastructure as no improvements proposed on the A947 between Bucksburn Roundabout and the Old Meldrum Road junction. Opportunity to introduce accessible ramp where existing stair only access is located however technical and deliverability challenges noted: :- Approx 5m level difference therefore 100m+ ramp required. :- Proximity to overbridge wingwalls would raise constructability challenges :- Risk that users would be approaching Bankhead Road on a lengthy downhill gradient and visibility would be obscured by the overbridge abutment. :- Significant deliverability challenges noted therefore connection from Bankhead Road not proposed to be taken forward for further development and evaluation. _____ Update: Following installation of new Toucan Crossing on A947, north of Old Meldrum Road junction, there is a new opportunity to consider creation of an active travel link to the retail park along the A947. :- On the assumption the A947 dual traffic lanes are to be retained, the existing northbound footway could be upgraded to a shared use facility between the A947 crossing and the retail park. :- Existing footway width varies between 1.8-3m with available verge space at rear although widening would require relocation of lighting columns, signal posts and removal of some vegetation. :- A947 carriageway width reduction to one lane would facilitate a segregated two-way cycle track to at least desirable minimum width with buffer to meet the new crossing facility. Wider connectivity north of the crossing should be captured as part of AT48.
AT42	Review access to the Formartine and Buchan Way from within Dyce	SIFT	:- 5 primary points of access identified between Dyce Station and B977 :- Improvement in access facilitated to F&B Way facilitated by multiple other Table 1 and 2 options - AT68 promotes general wayfinding improvement - AT13 & AT58 promote shared use paths and crossings which connect with existing access to the F&B way - AT32 improves access from Pitmedden Drive :- Propose to sift as promotes similar outcomes to above mentioned options which are more targeted and specific.
AT43	Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)	RETAIN	:- AT28 from Table 4 (Quick Wins) provides direct access from the A947 onto existing path connecting to B977. :- Existing path could be brought up to a desirable minimum width and bound surface :- A new crossing of the A947 would improve access to bus stops and connect with AT59 to accommodate transition between NB and SB movements on A947. :- Old A947 pre-AWPR is suitable for consideration of quiet route measures.
AT47	Implement with-flow segregated cycleway on the A947 between AWPR Junction and A947/A96 Junction	SIFT	:- Variability of conditions and number of fixed physical constraints along route mean that there is not a 'one size fits all' solution. :- Section specific options which broadly cover extent of route are available across Tables 1-4 and are considered more deliverable when considered individually.

AT48	Implement two-way segregated cycleway on the A947 between AWPR Junction and A947/A96 Junction	RETAIN	:- Variability of conditions and number of fixed physical constraints along route mean that there is not a 'one size fits all' solution. :- Section specific options which broadly cover extent of route are available across Tables 1-4 and are considered more deliverable when considered individually. :- Reconsider the wording of this option to incorporate 'evaluation of highest practicable level of service' such as shared use where constraints present significant deliverability risk to segregation: :-it should be retained as a standalone option to capture sections not considered under other targetted options and to promote an overall coherent and connected network. :- improvements taken forward as part of this option include: Bucksburn Roundabout to Old Meldrum Road :- No existing facility :- connection to A96 segregated route evaluated as part of Old Meldrum Road (AT51/52) :- connection to Bucksburn Retail Park evaluated as part of AT41 :- segregation on this link would require A947 to be downgraded to single carriageway. Old Meldrum Road to Stoneywood Brae :- Existing Shared-Use path typically compliant with absolute minimum standard and constrained by road corridor, embankment and overbridges. Reducing VRS set back to 0.6m on southbound approach to Old Meldrum Road junction would support consistent shared-use width throughout. :- Segregation or desirable minimum shared-use on this link would require A947 to be downgraded to single carriageway. Stoneywood Brae to Beech Manor :- Availible verge space to provide segregation to desirable minimum standard using existing verge space with reallocation of lighting columns.
AT51	Implement with-flow segregated cycleway on Old Meldrum Road	RETAIN	:- Existing corridor width varies between 14-16m with on-street parking throughout. :- Insufficient width to provide with-flow segregation to desirable minimum width on Old Meldrum Road. Absolute minimum widths could be achieved but only with a significant reduction in existing on-street parking provision. :- Option to be retained for further consideration based on benefits of with-flow at junctions.
AT52	Implement two-way segregated cycleway on Old Meldrum Road	RETAIN	:- Existing corridor width varies between 14-16m with on-street parking throughout. :- Two-way segregation to desirable minimum width could be achieved with a significant reduction in existing on-street parking provision. :- Two-way segregation consistent with wider proposals on connecting A96 corridor.
AT55	Implement with-flow segregated cycleway on Gilbert Road	SIFT	:- Existing corridor width 10-11m with on-street residential parking and fixed private boundaries on both sides. :- Not feasible to achieve CbD absolute minimum with-flow segregation along route without removal of parking. :- Low moving traffic volumes and speeds would suggest mixed traffic street measures could be more effective here.
AT56	Implement two-way segregated cycleway on Gilbert Road	SIFT	:- Existing corridor width 10-11m with on-street residential parking and fixed private boundaries on both sides. :- Not feasible to achieve CbD absolute minimum two-way segregation along route without removal of parking. :- Low moving traffic volumes and speeds would suggest mixed traffic street measures could be more effective here.
AT58	Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport	RETAIN	:- Approx 2.5km of new shared-use path would connect existing shared-use path network through Kirkhill Industrial Estate with F&B Way and proposed infrastructure connecting to Dyce. :- Constraint at rail overbridge would require route to cross Dyce Drive at 2no. locations. Provision of priority crossing for active travel users would require the existing posted speed limit on Dyce Drive (de-restricted) to be reduced to at least 50mph (and lower if non-signalised crossing considered).
AT61	Implement shared use path on Victoria Street	RETAIN	:- Variable cross-sectional width along length of Victoria Street, approximately 12m wide in places. :- On-street parking for a number of residential and commercial properties. :- Higher risk of conflict between users therefore shared use not considered appropriate on primary residential and commercial section of Victoria Street. :- Mixed traffic street measures considered to be potentially more appropriate in association with O16, O25 and O26 however HGV use on part of the link could limit attractiveness. :- Promotion of a reduced 20mph speed limit would help minimise cross-section width and increase attractiveness of active travel. :- Propose to update option wording to allow evaluation of wide range of options for Victoria Street - "Implement package of active travel measures on Victoria Street" and split into 3 sections for evaluation: 1. Victoria St/Riverview Dr South roundabout to Farburn Terrace 2. Farburn Terrace to Pitmedden Road 3. Pitmedden Road to Victoria St/Riverview Dr North (HGV access recognised for Pitmedden Road industrial estate) Section 1 Adequate verge space on Eastern side to develop segregated connection. Existing advisory lanes could be reallocated to support development too. Section 2 Limited scope to widen existing footways or reduce carriageway width. Propose to reduce speed limit to 20mph and introduce variety of measures to formalise this section as a mixed traffic street Section 3 Option 1 Reduction of speed limit to 20mph, carriageway narrowing to 6m and removal of on street parking would create opportunity for segregated cycleway along this section with minimal impact on 3rd party land. Absolute minimum width footway + Desirable minimum cycletrack Section 3 Option 2 Reduction of speed limit to 20mph and removal of on street parking would create opportunity to widen and reclassify existing footways on Eastern side to shared use desirable minimum width with localised narrowing to absolute minimum width. Section 3 Option 3 Reduction of speed limit to 20mph and introduction of a variety of measures to formalise this section as a mixed traffic street. Reduction in HGV movements desirable to improve attractiveness of route.
AT64	Implement shared use path on Old Meldrum Road	SIFT	:- Existing corridor width varies between 14-16m with on-street parking throughout. :- A shared-use path could feasibly be provided to desirable minimum requirements with moderate reduction in existing on-street parking provision. :- However, segregated facilities along Old Meldrum Road offer a higher LoS to cyclists and therefore will be retained over SU option.
AT65	Implement streetscape improvements and widened pavements along Mugiemoss Road	RETAIN	:- Primary route now through Mill Drive which also incorporates a shared-use path facility. :- Constrained width of Mugiemoss Road and assumed continued operation as a bus route limit viability of footway widening. :- Quiet route/mixed traffic street measures could be considered to remove modal conflict on footways.

AT66	Implement shared use path on Gilbert Road	SIFT	:- Existing corridor width 10-11m with on-street residential parking and fixed private boundaries on both sides. :- Not feasible to achieve CbD absolute minimum shared-use without removal of parking on one side. :- Low moving traffic volumes and speeds would suggest mixed traffic street measures could be more effective here.
PT2	Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor	RETAIN	:- To be taken forward for further analysis. Lower cost intervention that could deliver wide benefit.
PT9	Improve public transport connectivity between the A947 study area and Aberdeen Airport/Heliport	SIFT	:- Following PT specific engagement with the client group including Nestrans, it was agreed that standalone public transport options could be sifted. The Roads Hierarchy places greater emphasis on active travel and by delivering traffic calming and active travel improvements as captured under retained Table 1 and 2 options, benefits in terms of public transport attractiveness and journey time reliability will be realised. It is also noted that public transport improvements are reliant on commitment and buy-in from private operators.
PT10	Improve public transport connectivity between the A947 study area and Craibstone Park & Ride	SIFT	:- Following PT specific engagement with the client group including Nestrans, it was agreed that standalone public transport options could be sifted. The Roads Hierarchy places greater emphasis on active travel and by delivering traffic calming and active travel improvements as captured under retained Table 1 and 2 options, benefits in terms of public transport attractiveness and journey time reliability will be realised. It is also noted that public transport improvements are reliant on commitment and buy-in from private operators.
PT11	Improve public transport connectivity between the A947 study area and TECA	SIFT	:- Following PT specific engagement with the client group including Nestrans, it was agreed that standalone public transport options could be sifted. The Roads Hierarchy places greater emphasis on active travel and by delivering traffic calming and active travel improvements as captured under retained Table 1 and 2 options, benefits in terms of public transport attractiveness and journey time reliability will be realised. It is also noted that public transport improvements are reliant on commitment and buy-in from private operators.
PT12	Improve public transport connectivity between the A947 study area and Kirkhill Industrial Estate	SIFT	:- Following PT specific engagement with the client group including Nestrans, it was agreed that standalone public transport options could be sifted. The Roads Hierarchy places greater emphasis on active travel and by delivering traffic calming and active travel improvements as captured under retained Table 1 and 2 options, benefits in terms of public transport attractiveness and journey time reliability will be realised. It is also noted that public transport improvements are reliant on commitment and buy-in from private operators.
O2	Review the layout of the Victoria Street/Skene Place Junction	RETAIN	:- Review of junction layout to be considered alongside AT33 :- Introduction of a one-way system on Station Road and adjacent streets would help improve attractiveness of active travel and support quiet route measures. :- Initial swept path analysis with a DB32 fire appliance has been undertaken with potential constraint turning into Skene Place if one-way network adopted.
O3	Review the layout of the Riverview Drive/Balloch Way Junction	RETAIN	:- Reduction in kerb radii proposed to reduce traffic speed turning into the side road. :- Swept path analysis undertaken based on OS data suggests no encroachment into opposing lane but would require survey data to confirm.
O4	Review the layout of the Riverview Drive/Todlaw Walk Junction	RETAIN	:- Reduction in kerb radii proposed to reduce traffic speed turning into the side road. :- Swept path analysis undertaken based on OS data suggests no encroachment into opposing lane but would require survey data to confirm.
O5	Review the layout of the Riverview Drive/Netherview Avenue Junction	RETAIN	:- Reduction in kerb radii proposed to reduce traffic speed turning into the side road. :- Swept path analysis undertaken based on OS data suggests no encroachment into opposing lane but would require survey data to confirm.
O7	Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer	RETAIN	:- Public consultation identified frequency of illegal manoeuvres from Stoneywood Road onto A947 at junction. :- Options to improve junction operation include: - increasing splitter island kerb radius and/or introducing a taper entry to inhibit right turn and straight through movement at junction. - Replace hatch marking with physical island adjacent to right turn filter lane on A947 (similar to Stoneywood Brae Junction) - Revise junction layout to accommodate desired movements with possible signalised interchange or roundabout.
O8	Review the layout of the A947/Stoneywood Brae Junction	RETAIN	:- Assessment of existing layout to be undertaken. Initial review identified taper for change in carriageway width is not to standard. :- To be retained and considered further as part of wider improvements on A947 corridor.
O10	Review layout of the A947/McDonalds access road junction	RETAIN	:- Swept path analysis to be undertaken. Proximity of at-grade pedestrian crossing and left turn onto the A947 to be evaluated and visibility to be assessed.
O16	Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce	RETAIN	:- Area wide analysis and consultation required :- Deliverability and benefits will be subject to appraisal of a number of specific options from Tables 1 to 4
O25	Implement access only restrictions for general traffic on Victoria Street	RETAIN	:- Area wide modelling and consultation required :- Reprioritisation of A947 route along Riverview Drive supports measure :- Potential deliverability challenge with restriction of access to local businesses and services therefore clear benefits to be established ahead of consultation on this option.
O26	Implement one-way restrictions for general traffic on Victoria Street	RETAIN	:- Area wide modelling and consultation required :- Modelling will provide information to inform one-way direction based on current and future traffic flows along Victoria Street :- Reprioritisation of A947 route along Riverview Drive supports measure :- Potential deliverability challenge with restriction of access to local businesses and services therefore clear benefits to be established ahead of consultation on this option.

AT62	Widen the shared use path on the east side of the A947 between the A96 and Beech Manor	N/A - sifted at previous stage	:-Option was sifted at previous project stage on the basis that segregated facilities should be promoted as part of the study rather than shared use. Assessment of technical viability was founded on agreed assumption that the A947 dual traffic lanes were to be retained and recognised limitations in terms of available width to improve existing absolute minimum shared use paths to provide segregation or desirable minimum shared use with buffer. North of Bucksburn Roundabout, the corridor is constrained on embankment and across overbridges. Revisited as part of discussion on end-to-end active travel provision along A947 (AT48).

Table 2 - Proposed Revision to Option Definition		SIFT or RETAIN	Design Comments
AT35a	Implement active travel improvements on the local road network to the west of A947 via Bankhead Road and Wellheads Drive	RETAIN	:- Farburn Terrace improvements already captured under separate committed project. :- Wellheads Drive is too wide to be considered for quiet route measures (CbD 3.8.3) :- Opportunities for implementation of quiet route measures on Bankhead Road to be investigated further.

AT48a	Implement active travel improvements to support highest practicable level of service on the A947 between AWPR Junction and A947/A96 Junction	RETAIN	:- Variability of conditions and number of fixed physical constraints along route mean that there is not a 'one size fits all' solution. :- Section specific options which broadly cover extent of route are available across Tables 1-4 and are considered more deliverable when considered individually. :-it should be retained as a standalone option to capture sections not considered under other targeted options and to promote an overall coherent and connected network. :- improvements taken forward as part of this option include: Bucksburn Roundabout to Old Meldrum Road :- No existing facility :- connection to A96 segregated route evaluated as part of Old Meldrum Road (AT51/52) :- connection to Bucksburn Retail Park evaluated as part of AT41 :- segregation on this link would require A947 to be downgraded to single carriageway. Old Meldrum Road to Stoneywood Brae :- Existing Shared-Use path typically compliant with absolute minimum standard and constrained by road corridor, embankment and overbridges. Reducing VRS set back to 0.6m on southbound approach to Old Meldrum Road junction would support consistent shared-use width throughout. :- Segregation or desirable minimum shared-use on this link would require A947 to be downgraded to single carriageway. Stoneywood Brae to Beech Manor :- Availible verge space to provide segregation to desirable minimum standard using existing verge space with reallocation of lighting columns.
AT61a	Implement package of active travel measures on Victoria Street	RETAIN	:- Variable cross-sectional width along length of Victoria Street, approximately 12m wide in places. :- On-street parking for a number of residential and commercial properties. :- Higher risk of conflict between users therefore shared use not considered appropriate on primary residential and commercial section of Victoria Street. :- Mixed traffic street measures considered to be potentially more appropriate in association with O16, O25 and O26 however HGV use on part of the link could limit attractiveness. :- Promotion of a reduced 20mph speed limit would help minimise cross-section width and increase attractiveness of active travel. :- Propose to consider in 3 sections for evaluation: 1. Victoria St/Riverview Dr South roundabout to Farburn Terrace 2. Farburn Terrace to Pitmedden Road 3. Pitmedden Road to Victoria St/Riverview Dr North (HGV access recognised for Pitmedden Road industrial estate) Section 1 Adequate verge space on Eastern side to develop segregated connection. Existing advisory lanes could be reallocated to support development too. Section 2 Limited scope to widen existing footways or reduce carriageway width. Propose to reduce speed limit to 20mph and introduce variety of measures to formalise this section as a mixed traffic street Section 3 Option 1 Reduction of speed limit to 20mph, carriageway narrowing to 6m and removal of on street parking would create opportunity for segregated cycleway along this section with minimal impact on 3rd party land. Absolute minimum width footway + Desirable minimum cycletrack Section 3 Option 2 Reduction of speed limit to 20mph and removal of on street parking would create opportunity to widen and reclassify existing footways on Eastern side to shared use desirable minimum width with localised narrowing to absolute minimum width. Section 3 Option 3 Reduction of speed limit to 20mph and introduction of a variety of measures to formalise this section as a mixed traffic street. Reduction in HGV movements desirable to improve attractiveness of route.

Appendix B –
Table 1 Design Technical Note

Delivering a better world

Project:	**A947 Multi-Modal Corridor Study: Detailed Appraisal & OBC**		
Subject:	**Technical Note - Table 1 Design Overview**		
Prepared by:	**Jack McKenna**	Date:	**05/01/2024**
Checked by:	**Steven Smith**	Date:	**10/01/2024**
Verified by:	**Joanne Melarkey**	Date:	**17/01/2024**
Approved by:	**Andrew Robb**	Date:	**19/01/2024 (Draft)** **11/03/2024 (Final following client comment)**

Introduction

This Technical Note details the Option Development undertaken as part of the Detailed Appraisal and Outline Business Case (OBC) stage of the A947 Multi-Modal Corridor Study. This Option Development exercise focuses on the 'Table 1' options specified by Aberdeen City Council (ACC) at the inception stage of the study, as summarised in Table 1 below.

Table 1 – 'Table 1' Options for Detailed Design and OBC

Option	Description
AT4	Implement measures to give active travel users priority over Burnside Drive when using the shared use path on Riverview Drive
AT8	Reconfigure the Auchmill Road/Oldmeldrum Road junction to improve connections for pedestrians and cyclists
AT13	Provide a formal pedestrian crossing point to the north of the A947/Riverview Drive Roundabout to facilitate movements to the Formartine and Buchan Way
AT14	Provide a formal pedestrian crossing point to the east of the A947/Riverview Drive Roundabout
AT16	Implement formal pedestrian crossing facilities on the arms of the Riverview Drive/Stoneywood Road Roundabout
AT17	Implement signalised crossing facility on Victoria Street adjacent to Tesco
AT19	Implement pedestrian crossing facilities at the Oldmeldrum Road/Mugiemoss Road Junction
AT20	Conduct a footway review throughout the study area, identifying gaps in provision and considering the width and surfacing of existing footways
AT30	Provide direct active travel link between Dyce Drive and Riverview Drive
AT32	Implement footways on the south side of the carriageway on Pitmedden Road
AT59	Widen the shared use path on the east side of the A947 to the north of Riverview Drive
AT60	Provide continuous footways on Riverview Drive for the duration of the route
AT68	Conduct a review of wayfinding signage throughout the study area
O11	Undertake a review of parking arrangements on Victoria Street
O15	Introduce placemaking and gateway features on Victoria Street

General arrangement (GA) layouts for the design-orientated options are available in Appendix A and the basis of design, key design details and recognised risks and unknowns are discussed within the main body of this Technical Note.

Design Guidance Overview

Cycling by Design provides guidance for permanent active travel infrastructure design in Scotland and has been considered and referenced throughout this Technical Note. The guidance defines 'desirable minimum' and 'absolute minimum' widths for various forms of active travel facility. 'Desirable minimum' widths should be considered as the minimum requirement and reductions below this level should only be applied where specific constraints are identified, such that it cannot be reasonably achieved. In such cases, limited reductions are permissible, but the highest achievable

standard should be maintained. 'Absolute minimum' widths represent the scope of permissible reduction to the requirement. Where elements of the design are subject to statutory obligations, these must be adhered to.

The Cycling by Design footway and cycle track width requirements for different cycle track types are outlined in the table below.

Table 2 – Cycling by Design Track Width Requirements

Cycle Track Types		Footway Width	Cycle track width *One-way, less than 300 cycles per hour peak*	Cycle track width *Two-way, less than 300 cycles per hour peak*
Remote Cycle Tracks Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Remote Cycle Tracks Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m
Cycle Tracks adjacent to carriageway Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Cycle Tracks adjacent to carriageway Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m

In addition to the direct width of the usable facility, consideration of the minimum buffer width for a facility adjacent to a carriageway is also required and is defined by the posted road speed limit. Table 3 is also taken from Cycling by Design and outlines these minimum requirements.

Table 3 – Minimum Buffer Widths

Speed Limit	Minimum Buffer Width
30mph	0.5m
40mph	1.00m
50mph	2.00m (including any hard strip)
60mph	2.50m (including any hard strip)
70mph	3.50m (including any hard strip)

The Design Manual for Roads and Bridges (DMRB) has also been referenced in this Technical Note. The DMRB provides design guidance for the development of the trunk road network in the UK. Where no standard specific to the local road network is available, the DMRB becomes the primary point of reference and the requirements set out within the standards were considered to evaluate road layout interventions and opportunities in accordance with several of the Table 1 options.

Table 1 Option Development

AT4 – Implement measures to give active travel users priority over Burnside Drive when using the shared use path on Riverview Drive

Riverview Drive is a standard single carriageway road with a 40mph posted speed limit. Burnside Drive provides direct access to a residential estate and is signed as the access to Farburn Industrial Estate which is located south of the residential area. A primary access to Farburn Industrial Estate is provided by the Wellheads Road priority junction, 430m to the west along Riverview Drive however this is not promoted by directional signage.

Access to Burnside Drive is currently provided off an extended straight on Riverview Drive by an at-grade priority junction with unobstructed visibility and 10m junction corner radii. A shared use path, forming part of NCN Route 1, runs adjacent to Riverview Drive, crossing the Burnside Drive junction bell mouth at an uncontrolled dropped kerb crossing.

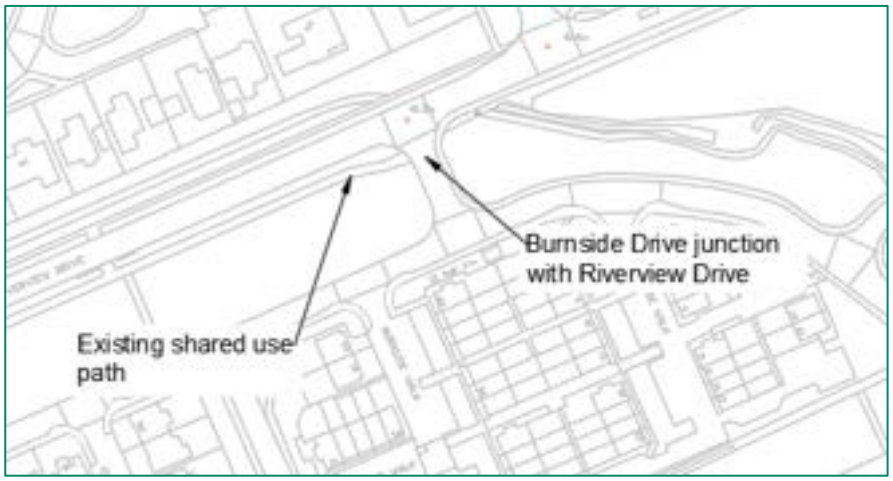


Figure 1 - Existing Arrangement

In line with changes to the Highway Code from January 2022, walking and wheeling users crossing Burnside Drive and continuing straight on the shared use path have priority over vehicles turning into Burnside Drive. To provide priority over vehicles turning out of Burnside Drive and improve attractiveness and safety for users, a controlled 'bend-out' crossing is being developed as part of this option. Cycling by Design promotes this as the appropriate arrangement due to the 40mph speed limit of Riverview Drive.

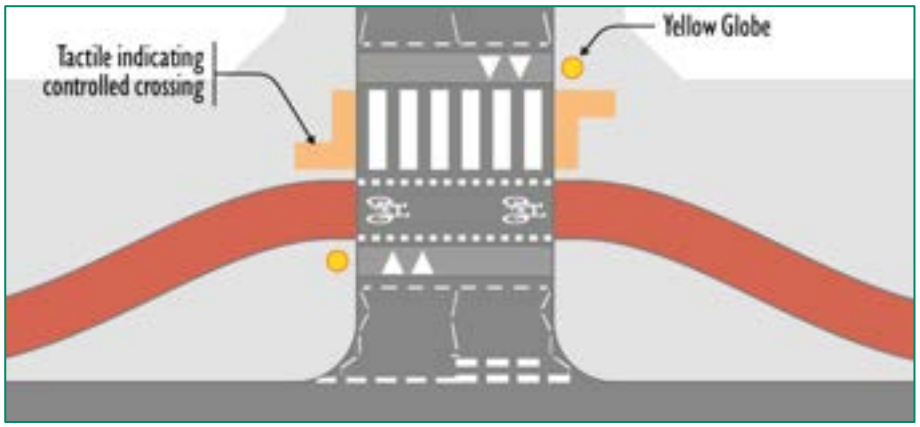


Figure 2 - Priority at side road 'bend-out' layout (Source: Cycling by Design)

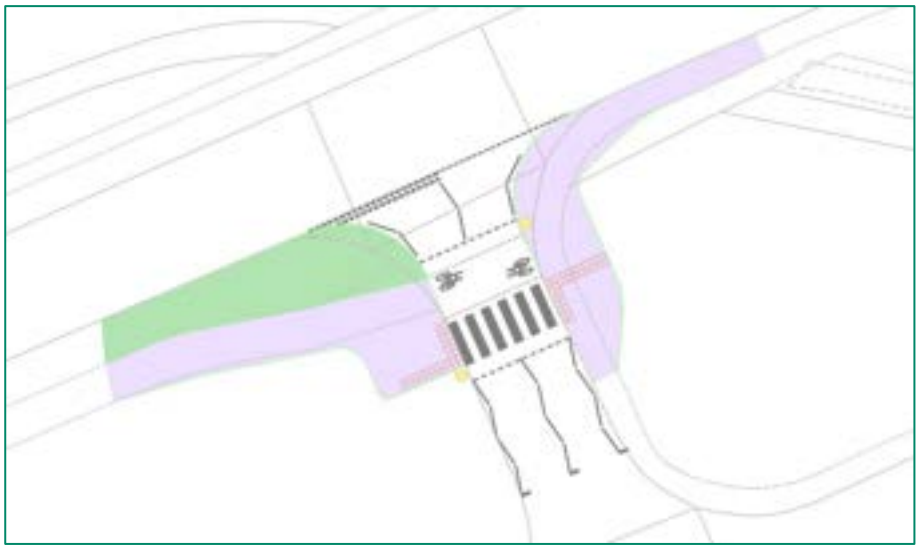


Figure 3 - Proposed active travel priority crossing layout on Burnside Drive

Key design features

- Crossing location set-back 5m, similar to existing, from the junction edge line to accommodate storage of a vehicle off the main road and without obstruction to crossing whilst also avoiding excessive detours for active travel users.
- Shared use path realigned locally and widened on approach to crossing using existing verge space and without disturbing existing vegetation.
- Parallel crossing arrangement to clearly define user space and avoid conflict between user groups on the crossing.
- Directional signage for Farburn Industrial Estate relocated to promote Wellheads Road as primary access route.
- Junction corner radii reduced from 10m to 6m to limit vehicle speeds, enabled by redirection of HGVs away from Burnside Drive to access the industrial estate at Wellheads Road.
- Dropped kerb crossing rather than raised table as recognised to be more distinguishable by visually impaired user groups; enables existing drainage runoff flow paths to be retained and simplifies future maintenance by ACC.

Risks and Unknowns

The Far Burn is culverted below Riverview Drive, crossing diagonally from the east of the Burnside Drive junction. This limits opportunity to realign the shared use facilities on the eastern approach to the Burnside Drive crossing. Further information on the surfacing depth on top of the culvert will be required to inform detailed development of the tie-in following junction improvements.

Utility chambers are observed in the eastern footway and western verge. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered to be low. C2 preliminary inquiries will be undertaken to establish apparatus in the study area to inform the detailed design impact.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT4 is £221,000 including optimism bias at 44%.

AT8 – Reconfigure the Auchmill Road/Old Meldrum Road junction to improve connections for pedestrians and cyclists.

The A96 Auchmill Road is an urban dual carriageway with a 30mph posted speed limit. Old Meldrum Road meets Auchmill Road at a priority junction with a restricted eastbound only merge. Central reserve widening on Auchmill Road accommodates a right-turning lane for westbound vehicles and a diverge taper with give-way prevents conflict with eastbound vehicles turning onto Old Meldrum Road.

The Old Meldrum Road junction is approximately 40m wide and pedestrian access across the junction is accommodated in multiple uncontrolled stages with dropped kerbs and pedestrian refuge areas on the splitter islands.

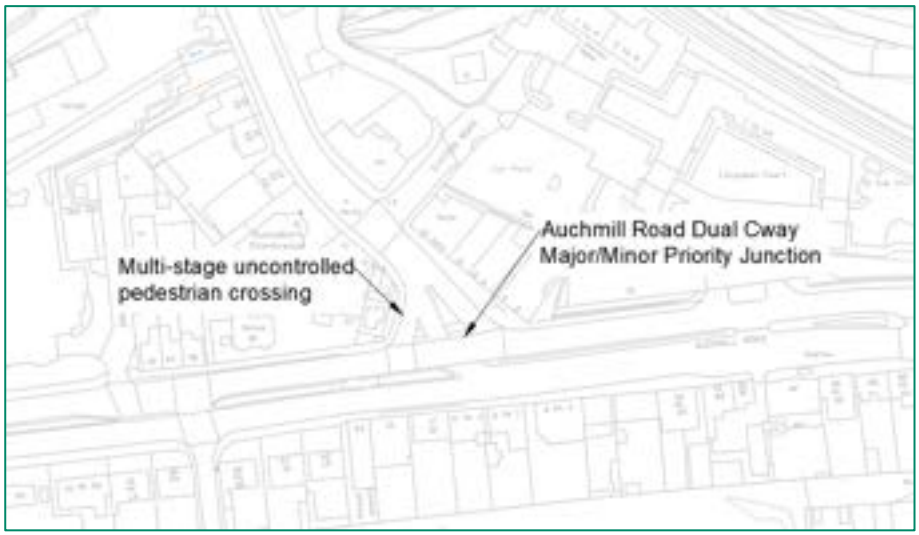


Figure 2 Existing Arrangement

The A96 Multi-Modal Corridor Study, being progressed separately by ACC, is promoting a bi-directional segregated cycleway in the westbound channel of Auchmill Road alongside bus improvements. Reconfiguration of the Auchmill Road central reserve and removal of the right turn into Old Meldrum Road are proposed to facilitate these improvements.

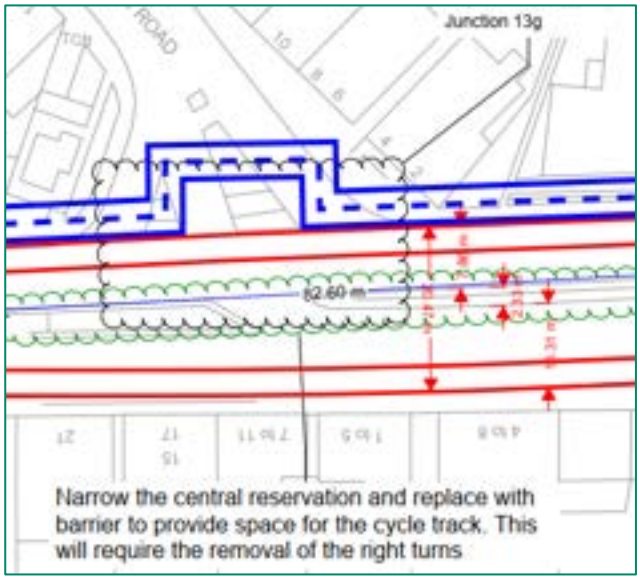


Figure 3 - Outline concept design developed as part of A96 Multi-Modal Corridor Study (Source: Stantec)

The proposed interventions on the A96 Auchmill Road create opportunity for reconfiguration of the Old Meldrum Road junction to improve pedestrian and cycle user accessibility.

Figure 4 - Proposed A96 Auchmill Road/Old Meldrum Road Layout

Key design features

- Give-way entry and exit moved south into existing Auchmill Road carriageway, indicatively representing proposed reconfiguration proposed by parallel corridor study.
- Localised realignment of Old Meldrum Road for a more perpendicular approach, reducing footprint of the road carriageway and length of crossing with significant redistribution of space (>300m^2) for pedestrian and cycle users or for placemaking improvements.
- Scope to also utilise redistributed space to integrate bi-directional cycleway on Auchmill Road with with-flow or bi-directional facilities being appraised on Old Meldrum Road (AT51 & AT52 from Table 2).
- Junction corner radii reduced to 6m on exit and 10m on entry to major road to limit vehicle speeds whilst also accommodating access and egress swept path from a bus and fire appliance.
- Bend-out crossing feasible due to major road having speed limit less than 40mph, providing pedestrian and cycle users with controlled priority.
- Crossing location set-back 10m from the junction edge line to accommodate storage of a bus at the give-way onto Auchmill Road whilst maintaining a relatively direct path for active travel users.
- Dropped kerb crossing rather than raised table as recognised to be more distinguishable by visually impaired user groups; enables existing drainage runoff flow paths to be retained and simplifies future maintenance by ACC.

Risks and Unknowns

Utility chambers are observed throughout the existing junction. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered to be low. C2 preliminary inquiries will be undertaken to establish apparatus in the study area to inform design impact.

The proposed layout assumes the bi-directional cycleway is developed out from the existing Auchmill Road channel line with traffic lanes redeveloped using the existing central reservation as suggested by the outline concept designs. It is also assumed that improvements on the A96 corridor will be delivered on a parallel timeline to the Old Meldrum Road junction improvements and the layout represents a permanent case. Going forward, it has been agreed that the Auchmill Road/Old Meldrum Road junction improvements will be progressed and consulted on as part of the A96 design with the A947 study proposals for Old Meldrum Road tying-in to what emerges from the A96 appraisal.

AT13 – Provide a formal pedestrian crossing point to the North of the A947/Riverview Drive roundabout to facilitate movements to the Formartine and Buchan Way

North of the A947/Riverview Drive Roundabout, the A947 is a single carriageway road with 40mph posted speed limit and localised widening for a ghost island at the Dyce Drive junction. Dyce Drive also comprises a single carriageway cross-section with 40mph posted speed limit on the immediate approach to and exit from the A947 junction. West of the Formartine and Buchan (F&B) Way overbridge, Dyce Drive has a de-restricted speed limit and rural character.

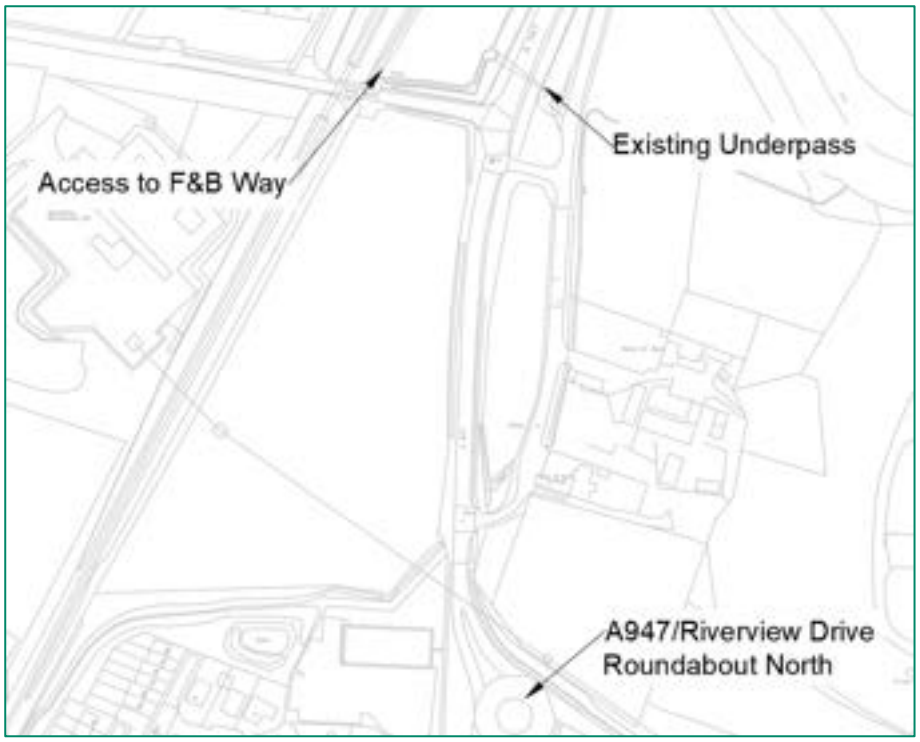


Figure 5 - Location Plan

National Cycle Network (NCN) Route 1 waymarks the existing connectivity between the Riverview Drive Roundabout and the F&B Way with a combination of shared use paths and quiet on-road facilities. A narrow footway extends the length of the A947 verge and provides an alternative to the on-road quiet route section for pedestrian users. It is understood that agreement is in place for the development of the section of the F&B Way south of Dyce Drive to extend NCN Route 1 to Dyce Railway Station[1].

[1] (Public Pack)Agenda Document for North East of Scotland Transport Partnership, 06/12/2023 14:00 (nestrans.org.uk)

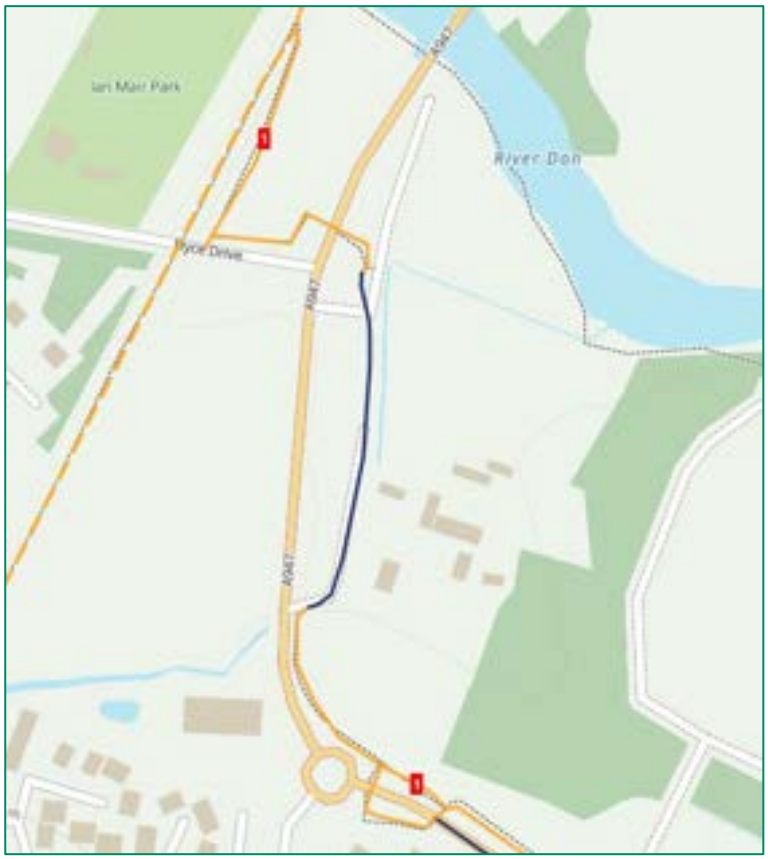


Figure 6 - NCN Route 1 Map (Source: Sustrans.org.uk)

The crossing of the A947 is currently accommodated by an underpass north of the Dyce Drive junction. The underpass is approximately 33m long with 2.1m headroom and a 2m path cross section. Existing low level lighting was not observed to be operational and the approach geometry and overgrown vegetation limit visibility for users making it unattractive in terms of personal security. The limited headroom also presents a low level of service for cycle users who are instructed to dismount when travelling through.

Figure 7 - Existing conditions at A947 underpass

Cycling by Design recommends a desirable minimum 2.7m and absolute minimum 2.2m headroom for underbridges of length greater than 23m. Minimising concerns over personal safety is noted as being essential and it is recommended that this is achieved by optimising through-visibility and natural light; maximising headroom; minimising the length; and minimising the perception of an enclosed space.

Consideration has been given to the possible options for improving the existing connection or providing a new formal crossing of the A947 north of the Riverview Drive roundabout to facilitate access to the F&B Way. The outline options are sketched in Figure 10 and summarised in Table 1.

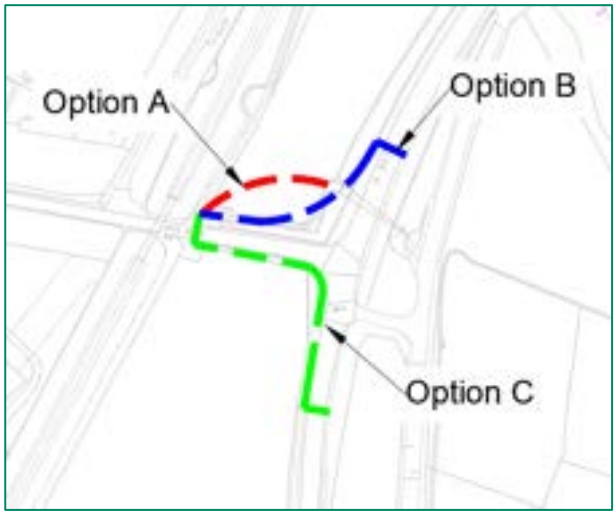


Figure 8 - Outline Improvement Options to facilitate F&B Way access

Table 4 - Access Improvement Options Overview

Option	Overview	Benefits/Opportunities	Limitations/Constraints
A	Retain and enhance existing underpass: • improve approach geometry on west side • clear vegetation on approaches • Recommission and enhance lighting to improve attractiveness	• Grade separation so no interface with vehicles at crossing	• No scope to improve approach geometry on east side of underpass • Severance of third party land on west side • Whole life cost of lighting operation and maintenance • Fundamental limitations with existing headroom and cross section width, taking cognisance of current guidance
B	Stop-up underpass and re-grade western approach for an at-grade crossing of the A947 north of Dyce Drive, connecting with improved shared use path on east side of A947 (AT59)	• Single at-grade crossing of main route with good visibility • Wider A947 cross section to the north would allow for accommodation of a refuge island and make for more accessible crossing. • Integrates with improvements promoted in east A947 verge as part of AT59	• Less direct than Option C for users travelling to/from northern Dyce. • Third party land impact anticipated but severance minimised.
C	At-grade crossings of Dyce Drive and A947 south of Dyce Drive, connecting with improved shared use path on east side of A947 (AT59).	• Most direct option for users travelling to/from northern Dyce. • Would allow for existing underpass to be retained as an alternative traffic-free route.	• Increased interface with traffic due to 2no. at-grade crossings • Insufficient space to accommodate refuge islands at crossings. • Visibility at Dyce Drive crossing anticipated to be constrained by F&B Way bridge abutment • Greater third party land impact than Option B

From the high-level comparative analysis of the outline options, Option B was recognised to present a generally attractive solution with fewer deliverability constraints than Option C and was therefore progressed in a concept design.

Figure 9 - Proposed Formal Crossing Arrangement to Facilitate Access to F&B Way

Key design features

- 80m long shared use path at a desirable maximum 5% longitudinal gradient, assuming an approximate level difference of 4m between the F&B Way and the A947.
- 2.5m refuge island to accommodate all forms of cycle vehicle, permitted due to speed limit not exceeding 40mph.
- Crossing integrates with shared use improvements on east side of A947 as promoted as part of Option AT59.
- Ghost island junction markings adapted to incorporate crossing but impact on existing junction operation minimised.

Additional Opportunities

- Existing underpass could be refurbished to continue to provide a safe grade-separated alternative route for users. Vegetation removal on approach and recommissioning of lighting through underpass would improve attractiveness of existing facility. However, fixed constraints in terms of the length, cross section and headroom through the underpass would continue to be the primary limiting factors in terms of attractiveness for users.

Risks and Unknowns

- Adjacent third-party land ownership to be confirmed; to inform subsequent consultation process.
- Due to the earthworks associated with formation of the ramp, a desk-based analysis of ground conditions would be recommended to inform identification of constructability and deliverability risks. It is assumed that existing ground conditions are acceptable.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT13 is £278,000 including optimism bias at 44%.

AT14 – Provide a formal pedestrian crossing point to the east of the A947/Riverview Drive Roundabout

There are two existing uncontrolled crossings to the east of the A947/Riverview Drive north roundabout. A staggered crossing utilising the splitter island as a pedestrian refuge is located immediately adjacent to the roundabout on the eastern arm. The second crossing is offset 50m to the east of the roundabout and provides an uncontrolled continuous 10.8m crossing across both north and southbound traffic lanes.

In the vicinity of the existing crossing locations, Riverview Drive has a wide overall cross section comprising a single carriageway layout with advisory with-flow cycle lanes in both channels. The crossing adjacent to the roundabout is signed as part of National Cycle Network Route 1 with cycle users in the northbound advisory cycle lane diverging from the road carriageway at the offset crossing before continuing towards the staggered roundabout crossing on a short section of shared use footway.

A 40mph speed limit applies on Riverview Drive transitioning to 30mph on the immediate approach to the roundabout. The straight horizontal geometry and wide cross section of the route provides good visibility for vehicles and it is assumed that the 85th percentile speed on this section of the route is close to the posted speed.

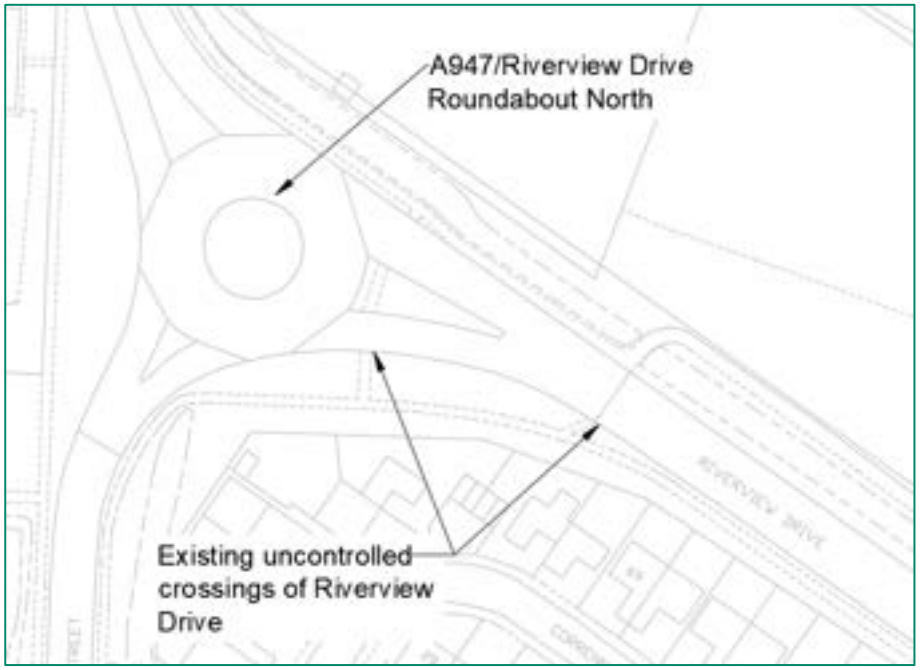


Figure 10 - Existing Layout of A947/Riverview Drive Roundabout North

Aberdeen City Council guidance states that following initial desktop study, an on-site survey and modified PV2 assessment is required to determine whether a pedestrian crossing is justified at a given location. In the absence of detailed pedestrian and vehicle count data, it has been assumed that a controlled crossing would be justified at this location. This is based on the anticipated future increase in crossing demand following area wide connectivity improvements proposed as part of this study and the increased demand driven by a committed residential development in the existing greenfield site north of Riverview Drive.

Parallel crossings are generally not recommended where the 85th percentile speed exceeds 35mph. Although vehicles will be slowing on approach to the roundabout, southbound vehicles exiting the roundabout will be accelerating up to 40mph speed limit. A signal-controlled cycle crossing such as a Toucan crossing can be adopted for 85th percentile speeds up to 50mph therefore represents a more appropriate arrangement on Riverview Drive.

Figure 11 - Proposed Formal Crossing Layout on Riverview Drive

Key design features

- Signalised shared crossing to accommodate pedestrian and cycle users on a demand driven basis.
- New crossing sited 60m from roundabout entry give-way to best integrate non-motorised user movements from all directions and minimise influence on roundabout operation.
- Existing uncontrolled crossings removed and signage relocated to designate the new crossing as part of NCN Route 1.
- Shared use path widened to 2.5m with 1m buffer on the north side for continuity with proposals for the A947 north (as part of Option AT59), and to provide greater clearance from manoeuvring vehicles on adjacent roundabout.
- Existing on-carriageway advisory lane on Riverview Drive reallocated to shared use path/buffer to minimise earthworks and third party land intrusion on north side and to reduce crossing length to 7.3m.
- Segregated transition to/from existing advisory lanes on Riverview Drive south-east of the crossing.
- Improvements to existing shared use path to the south-west of the crossing to be considered as part of Victoria Street improvements (Table 2, Option AT61a).

Risks and Unknowns

- Further assessment of projected user demand would be required and a PV2 assessment undertaken to confirm justification for development of formal crossing facilities at this location in line with guidance provided by the Department for Transport.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT14 is £272,000 including optimism bias at 44%.

AT16 – Implement formal pedestrian crossing facilities on the arms of the Riverview Drive/Stoneywood Road Roundabout

The Riverview Drive/Stoneywood Road Roundabout is a three-arm roundabout linking the A947 Stoneywood Road to the south, the A947 Riverview Drive to the east and Victoria Street to the north. There are existing uncontrolled staggered crossings immediately adjacent to the roundabout entry/exit on each arm however dropped kerbs are not present at the

crossing on the Victoria Street arm.

The connecting section of Stoneywood Road has a 30mph posted speed limit and comprises two lanes northbound on approach to the Riverview Drive roundabout and a single lane southbound. On-road advisory cycle lanes and roadside footways are present in both directions. A bus stop with layby is located on Stoneywood Road at the southbound exit from the roundabout.

The connecting section of Victoria Street also has a 30mph posted speed limit and comprises a single carriageway layout with on-road advisory cycle lanes and footways on each side. A bus stop with layby is located on Victoria Street at the northbound exit from the Riverview Drive roundabout. The gatehouse property boundary and railway boundary are located at the rear of the northbound footway. The car park for the hotel to the east is located in a cutting with approximate 2m level difference adjacent to the southbound roundabout entry.

Riverview Drive has a 40mph posted speed limit and comprises a single carriageway layout with footways on each side. A short section of segregated cycleway, part of NCN Route 1, is offset in the southern verge and extends to Wellheads Road from which point it becomes a shared use facility and continues along Riverview Drive to the east.

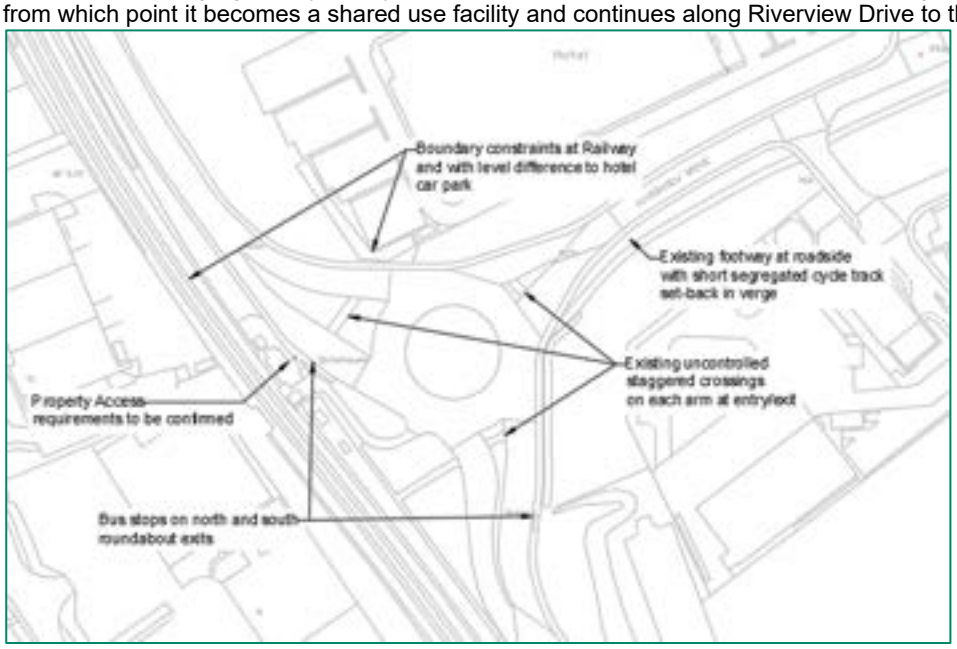


Figure 12 - Riverview Drive/Stoneywood Road Roundabout – Existing Layout

Spatial constraints from boundary features inhibit the scope to provide segregated facilities on the perimeter of the roundabout. A shared use path of at least absolute minimum width of 2.5m in accordance with Cycling by Design guidance can be provided throughout and offers a coherent environment for active travel users navigating the roundabout. This is also consistent with the existing facilities in the proximity on Riverview Drive and Farburn Terrace. A 0.5 to 1m buffer between the road carriageway and shared use path can be accommodated relative to the 30mph or 40mph posted speed limits respectively, in accordance with requirements of Cycling by Design guidance.

Improvement of the existing crossing facilities to formalise and make these more attractive and accessible for all users is required. Aberdeen City Council guidance states that following initial desktop study, an on-site survey and modified PV2 assessment is required to determine whether a pedestrian crossing is justified at a given location. In the absence of detailed pedestrian and vehicle count data, it has been assumed that a controlled crossing would be justified at this location. This is based on the anticipated future increase in crossing demand following area wide connectivity improvements proposed as part of this study.

Cycling by Design recommends that parallel crossings should not be installed on roads with an 85th percentile speed of 35mph or above without additional speed reduction measures. The 40mph posted speed limit of Riverview Drive is more appropriately suited to a signal-controlled crossing arrangement.

Separate crossing facilities can provide a better level of service for users by reducing potential for conflict between competing modes while crossing, however, the integration with the proposed shared use path network on approach to the crossings would promote simpler interpretation and navigation of a shared space throughout. It is proposed that Toucan crossings are therefore adopted on each arm as a coherent solution to cater for all movements.

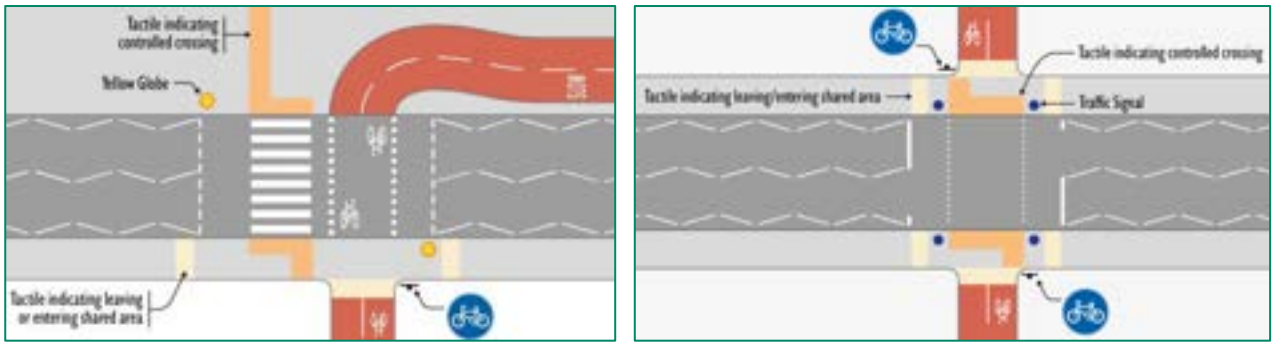


Figure 13 - Indicative Parallel and Toucan Crossing Layouts (Source: Cycling by Design)

The DMRB, volume CD 116, recommends that crossings should not be sited between 20m and 60m from the give-way line at roundabout entries. Formal replacement of the existing crossings at the roundabout and within the permissible 20m of the give-way line would result in an overall greater crossing length for users and impact the existing bus stops located on the Victoria Street and Stoneywood Road arms of the roundabout.

Key trip generators and attractors are not located in the immediate vicinity of the roundabout therefore it is recognised that crossings offset 60m from the give-way line would still offer a direct connection for users, minimise the crossing length and enable single stage crossings to be provided. Consistent and clear wayfinding signage on approach to the crossings would inform user journeys ahead of reaching the roundabout to support users in taking the most direct route towards their intended destination.

Figure 14 - Proposed Formal Crossing Facilities and Connections at the Riverview Drive/Stoneywood Road Roundabout

Key design features

- Signalised and single stage toucan crossings on each arm, set-back 60m from roundabout entries and 6m wide to minimise user conflict when crossing in the shared space.
- Existing crossings and private access off roundabout stopped-up/removed.
- A network of shared use paths at least 2.5m wide and expanding to the desirable minimum 4m wide where space allows. Buffer strips provided where routes are adjacent to road carriageway.
- Minor reduction in entry width for Victoria Street entry to accommodate absolute minimum shared use path and required buffer with minimal earthworks and minimal impact on third party hotel car park.
- Existing section of segregated footway and cycleway on Riverview Drive upgraded and resurfaced to better differentiate for intended user groups.

Risks and Unknowns

- Access requirements for gatehouse property immediately west of the roundabout to be confirmed. Design currently assumes that vehicular access would be formally stopped up to facilitate a continuous shared active travel route to connecting north to south.
- Street lighting is currently present at back of existing footways. It is anticipated that relocation of some lighting columns will be required where footways are widened into the verge to achieve standard for shared use.
- Widening into potential third party land required to develop a bus stop bypass arrangement at the bus stop with shelter on the southern roundabout exit onto Stoneywood Road. Established vegetation will also require to be cleared to facilitate the layout for improved accessibility.
- The southbound visibility to the signals at the proposed crossing on Stoneywood Road will also potentially be obstructed by existing vegetation – this provides further rationale for localised clearance subject to consideration by the relevant team within ACC.
- Connecting facilities north of the crossing on Victoria Street and south of the crossing on Stoneywood Road subject to change based on design development of Table 2 options.
- Localised third party land impact at hotel on north side of Riverview Drive (required to accommodate widening for shared use facility on approach to proposed crossing). Engagement with landowner will be required.
- Further assessment of projected user demand would be required and a PV2 assessment undertaken to confirm justification for development of formal crossing facilities at these locations in line with guidance provided by the Department for Transport.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT16 is £1,149,000 including optimism bias at 44%.

AT17 – Implement signalised crossing facility on Victoria Street adjacent to Tesco

Victoria Street comprises a typical urban single carriageway layout with posted speed limit of 30mph, designated on street parking bays throughout and a high number of residential and commercial frontages.

An existing controlled zebra crossing of approximate 7.3m length exists adjacent to the Tesco store. The crossing is located on an extended straight section of the corridor with good visibility. A minor junction with access to parking for Tesco is located south-west of the crossing and a loading bay is located north-west. A residential vehicular access with dropped kerb onto Victoria Street is located immediately south-east of the crossing.

Where the 85th percentile speed of vehicles is between 20mph and 35mph, Cycling by Design advises that a controlled zebra crossing offers a 'medium level of service' and may not be suitable for some users. Transport Scotland's inclusive design guidance, Roads for All, also notes that zebra crossings are not inclusive for visually impaired users.

It is proposed that the existing zebra crossing is replaced by a signal controlled puffin crossing at its existing location to provide a direct and accessible improvement on the existing desire line. Refresh of existing lining and tactile paving would be required as part of the upgrade. Cycling by Design recognises that signal controlled crossings offer a 'high level of service' and are suitable for most users.

Figure 15 - New puffin crossing on Victoria Street

Risks and Unknowns

- Existing 'Belisha Beacons' for the zebra crossing are mounted on lighting columns. It is anticipated that 2no. lighting columns will require relocation to accommodate the new signals.
- It is assumed that the south-east signal post can be accommodated without impacting access to property immediately south-east of the crossing.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT17 is £198,000 including optimism bias at 44%.

AT19 – Implement pedestrian crossing facilities at the Old Meldrum Road/Mugiemoss Road junction

Formal pedestrian crossing facilities have been developed at the Old Meldrum Road/Mugiemoss Road junction as part of the redevelopment of Old Meldrum Road. It is therefore concluded that this option should be sifted from further appraisal as part of this study.

Figure 168 - New pedestrian crossing facility at the Old Meldrum Road/Mugiemoss Road Junction

AT20 – Conduct a footway review throughout the study area, identifying gaps in provision and considering the width and surfacing of existing footways

A footway review throughout the study area was undertaken in November 2023. A summary of the findings is included in Appendix B of this Technical Note. The note focuses on gaps in provision for footways at key locations across Dyce identified through a detailed footway assessment throughout the study area. Within the note, recommendations are made for improvement based on condition, surface type and width.

AT30 – Provide direct active travel link between Dyce Drive and Riverview Drive

Option AT13 outlines the existing active travel connectivity between Riverview Drive and the F&B Way off Dyce Drive. Shared use improvements are proposed between the Riverside Path access off Riverview Drive and a new at-grade formal crossing north of the A947/Dyce Drive junction. It is considered that the improvements proposed as part of AT13, AT14 and AT59 support fulfilment of this option and that no further option specific interventions would be required. Therefore, the AT30 option should be sifted from further design and appraisal as part of this study.

AT32 – Implement footways on the south side of the carriageway on Pitmedden Road

Pitmedden Road is a single carriageway link road with a posted speed limit of 40mph. It serves residential and recreational accesses at its southern end close to the junction with Victoria Street. North of the Pitmedden Drive access, the route primarily serves a number of industrial sites. An existing 2m wide footway is present in the southern verge between Victoria Street and the Dyce Scout Hut access. North of this, the verge comprises grass with third party boundary fencing offset approximately 3m from the edge of the road carriageway. The existing footway provision extends further on the north side, terminating at the Kirkton Drive access.

Approximately 400m north of the Victoria Street junction on Pitmedden Road, an unbound track in the southern verge provides connection onto the F&B Way. Footway improvements are proposed to extend the existing footway provision in the south verge and provide an improved, accessible pedestrian connection onto the F&B Way. Due to the higher concentration of industrial vehicle accesses within the south verge beyond the F&B Way connection, it is considered that the existing footway on the north side of the carriageway offers a reduced likelihood of vehicle conflict and provides an appropriate level of connectivity without further intervention in the south verge.

Figure 179 - Existing Layout

Figure 20 - Existing grass verge on south side of Pitmedden Road and access onto F&B Way

Figure 181 – Proposed extent of new footways on Pitmedden Road to tie-in with F&B Way

Key design features

- Formation of 2m bound footway in existing grass verge to connect the existing footway with F&B Way access.
- Access onto F&B Way formalised on the primary desire line with opportunity to improve landscaping.
- Tactile paving introduced at uncontrolled access crossing locations and at interface with shared use F&B Way in line with inclusive design guidance.

Risks and Unknowns

- Street lighting is currently present in the verge. It is anticipated that localised relocation of some lighting columns will be required to locate at the rear of the footway if not currently set-back 2m from the edge of the road carriageway.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT32 is £119,000 including optimism bias at 44%.

AT59 – Widen the shared use path on the East side of the A947 to the North of Riverview Drive

The A947 north of Riverview Drive is a 40mph single carriageway with a shared use path of variable width between 0.7m and 1.7m in the eastern verge between Riverview Drive Roundabout and the B977 junction. The path is of bound formation between Riverview Drive Roundabout and Parkhill Bridge and then becomes unbound north of the bridge.

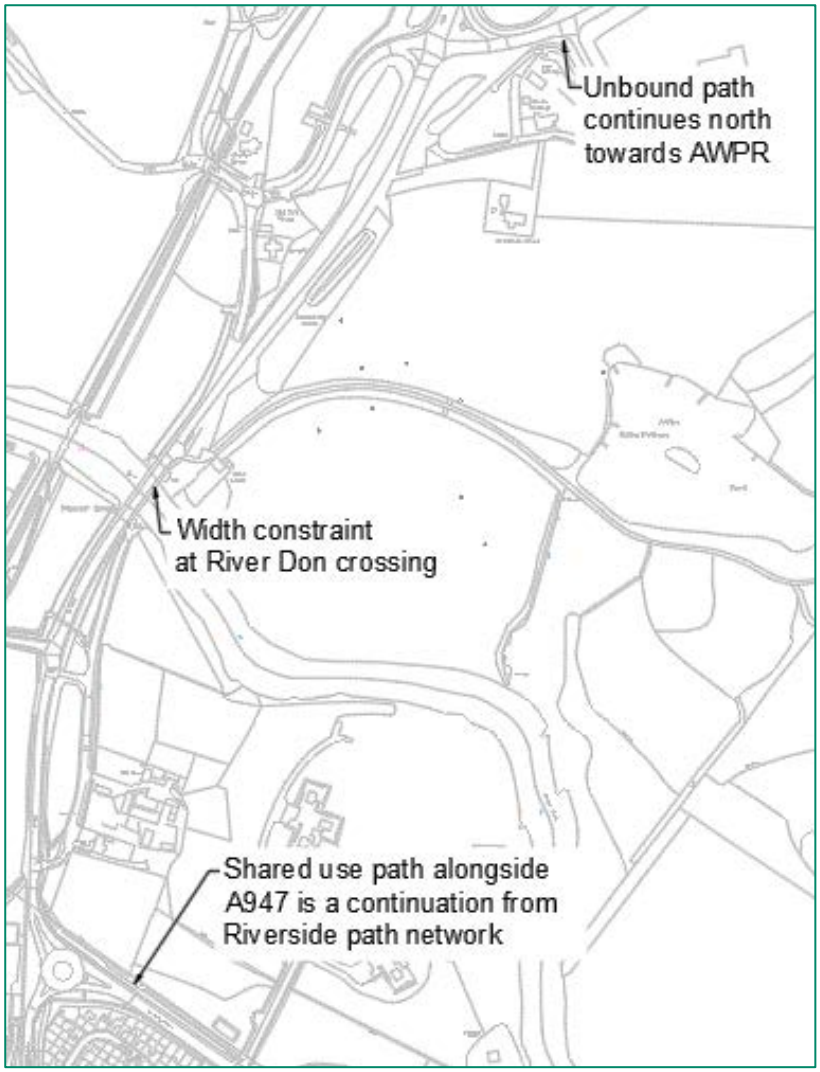


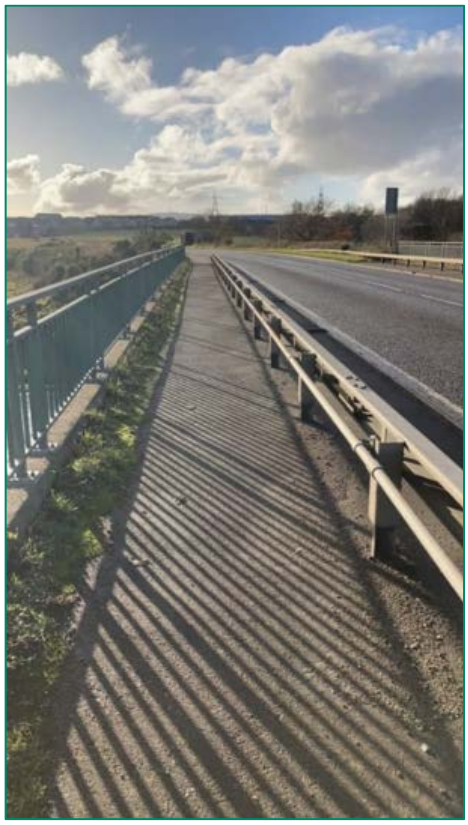
Figure 192 - Extents of existing shared use path on A947

The existing path does not meet the 4m desirable minimum or 2.5m absolute minimum width parameters for a shared use facility as outlined in Cycling by Design. The guidance also recommends a minimum 1.0m buffer between road and cycleway, based on a 40mph posted speed limit.

There is sufficient nominally flat verge space along the majority of this corridor to implement widening to achieve desirable minimum standards without impact on third party land. However, localised constraints exist over two sections.

Between Riverview Drive and the Dyce gateway sign south of Dyce Drive, the verge narrows to approximately 3.5m and existing path to 1m due to the close proximity and level difference of adjacent third party land. The adjacent land transitions from being in cutting to embankment which limits the effective width for low impact intervention. Widening to achieve desirable minimum would require land agreement and earthworks with associated increased footprint and costs. It is considered proportionate to promote a short section which meets the absolute minimum width requirement of 2.5m based on the more rural setting and associated lower probability of conflict between users in this part of the study area.

A fixed verge width of 3m exists on the Parkhill Bridge over the River Don. This is further constrained by the presence of a vehicle restraint system (VRS), set-back 1.2m from the carriageway edge, which reduces the usable shared use path space to approximately 1.8m.



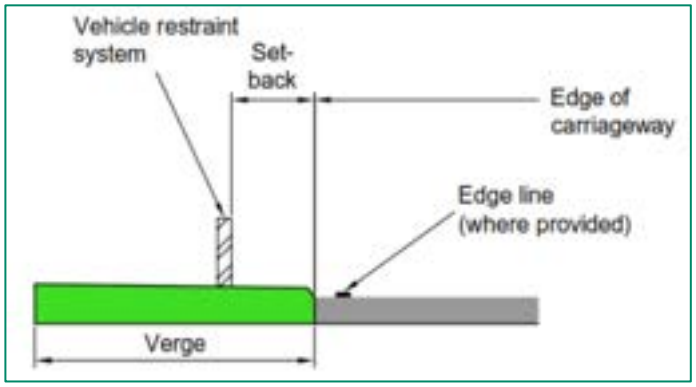


Figure 203 - Existing VRS set-back on Parkhill Bridge and diagram illustrating VRS set-back measurement (Source: DMRB CD 127)

DMRB CD 127 defines the 1.2m requirement for set-back of a VRS in a verge. Where the speed limit is less than 50mph, the standards permit relaxation of the set-back to 0.6m. It is proposed that this intervention is taken to release space in the existing verge for use as part of an improved shared use path. It is recognised that the approximate 2.4m shared use path achievable by this intervention is short of the absolute minimum width defined in the guidance however this is recognised as a proportionate and reasonably practicable solution to overcome the localised constraint.

Figure 214 - Proposed extent of shared use path widening on A947 north of Riverview Drive

Key design features

- Widening of existing shared use path on east side of A947 to a desirable minimum 4m width with localised sections at 2.4m due to specific constraints such as the VRS on Parkhill Bridge. Minimum 1m buffer strips provided throughout in line with 40mph speed limit. Proposed improvements to extend for 600m on existing path alignment from Riverview Drive roundabout to the northern bus stop and crossing which connects with the former A947 carriageway and B977.

- Tactile paving introduced at uncontrolled minor access crossing locations and at interface with options AT13 (Provide a formal pedestrian crossing point to the north of the A947/Riverview Drive Roundabout to facilitate movements to the Formartine and Buchan Way) and AT43 (Implement active travel connection between the A947 and the B977, utilising a section of the old A947).
- Minor adjustment to existing access corner radii to reduce to 10m and limit vehicle turning speeds.
- Existing road signage to be relocated within verge to accommodate shared use path widening.

Risks and Unknowns

- Adjacent third party land ownership to be confirmed; to inform subsequent consultation process.
- Where minor earthworks are required, a desk-based analysis of ground conditions would be recommended to inform constructability risks and suitability of material for reuse.
- Street lighting is currently present in front of or within the existing shared use path on the approach to Riverview Drive roundabout. It is anticipated that localised relocation of some lighting columns will be required to facilitate the proposed improvements.
- Utility chambers are observed throughout the existing footway and verge. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered to be low. C2 preliminary inquiries will be undertaken to establish apparatus in the study area to inform design impact.
- As-built design information for the River Don overbridge will be required to confirm the viability of relocating VRS to reduce set-back. Depth to the bridge deck, position of existing service ducts and arrangements for on-bridge drainage will inform safety barrier foundation design.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT59 is £502,000 including optimism bias at 44%.

AT60 – Provide continuous footways on Riverview Drive for the duration of the route

Riverview Drive is a standard single carriageway road with a 40mph posted speed limit. A footway is provided along the entirety of its length in the northbound verge. An existing shared use path in the southbound verge extends from the southern roundabout to a point 65m east of the Overton Circle Junction and then from the northern Riverside Path access point to the northern roundabout. Advisory on-road cycle lanes extend along the majority of Riverview Drive from the end of the southern section of shared use path to the northern roundabout. The Riverside Path provides an alternative traffic-free shared use connection between North and South. Both the advisory lanes and Riverside Path are designated as part of National Cycle Network Route 1.

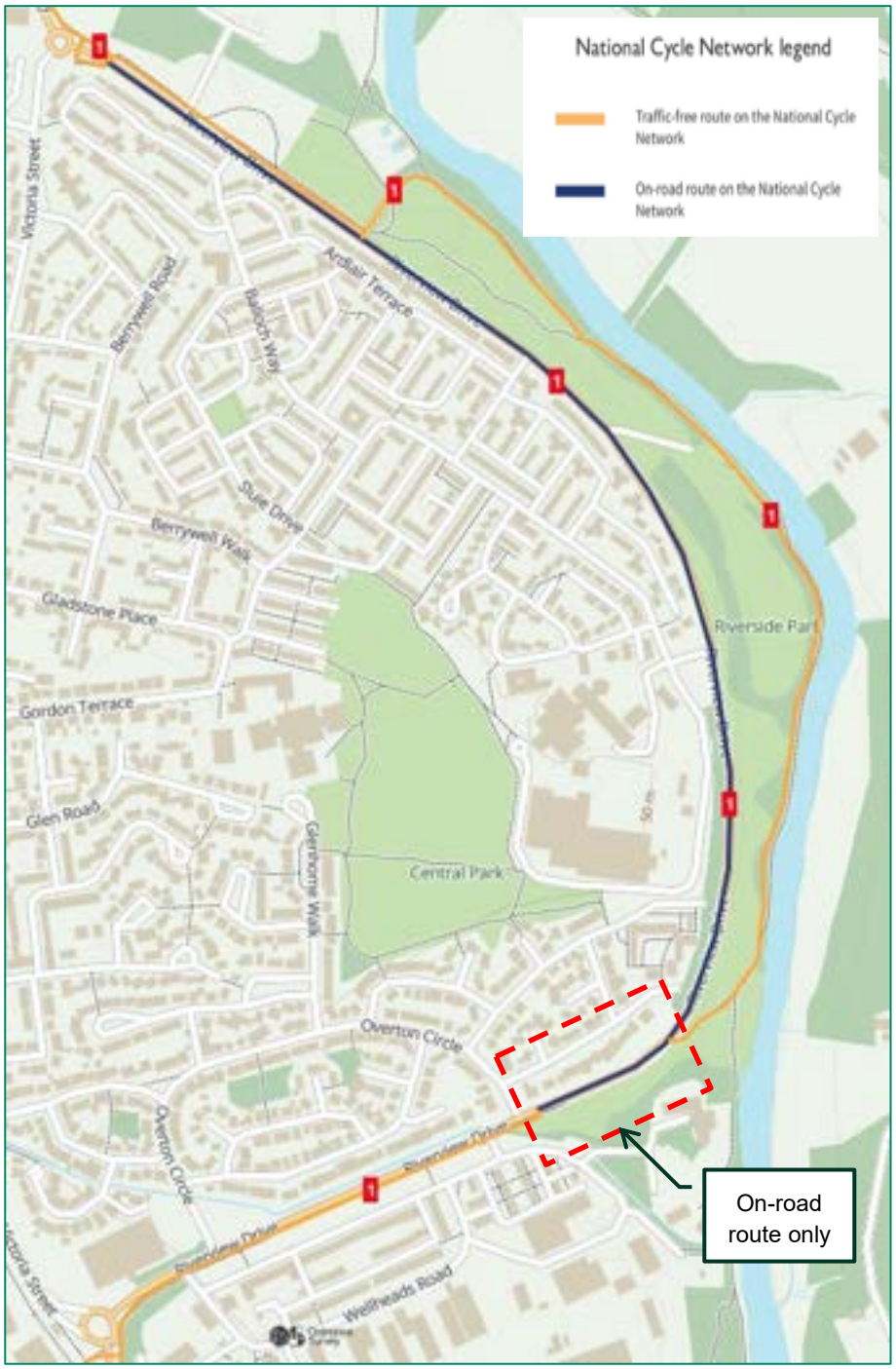


Figure 225 - NCN Route 1 Map (Source: Sustrans.org.uk)

A number of residential at-grade priority junctions take access off the northbound side of the road carriageway. In line with changes to the Highway Code, walking and wheeling users crossing the minor access roads and continuing straight on the footway have priority over vehicles turning into the minor road. A continuous footway arrangement as illustrated in Figure 26 would further improve attractiveness and demonstrate active travel user priority; however Cycling by Design guidance states that the layout should only be used in locations where the main road and side road have a speed limit of 30 mph or less. Therefore this approach is not appropriate on Riverview Drive (which has a posted speed limit of 40 mph).

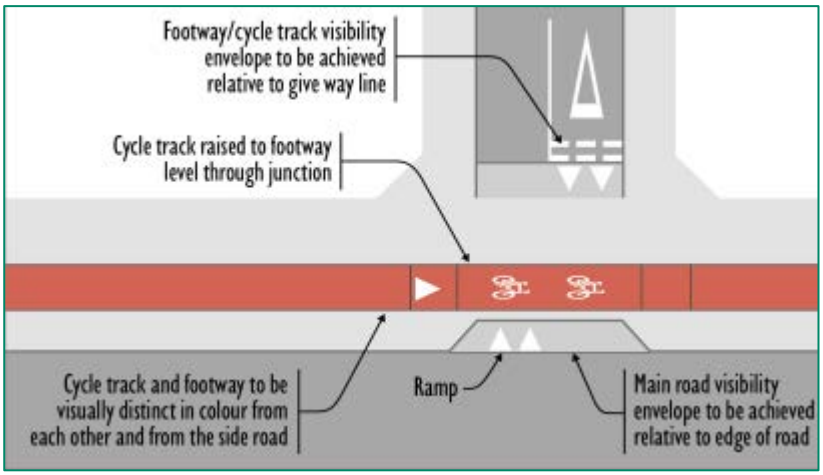


Figure 236 - Continuous Footway Arrangement (Source: Cycling by Design)

There is however opportunity to improve connectivity and accessibility along Riverview Drive by addressing the missing traffic free link on NCN Route 1 in the southbound verge between the existing shared use path, and the Riverside Path access. A section of new shared use path, 4m wide in the existing road verge would provide a continuous connection without need for users to cross Riverview Drive. As part of the improvements, the existing uncontrolled crossing connecting the Riverside Path with the footway in the northbound verge would be formalised with tactile paving.

Figure 247 Proposed works to address missing link and extend continuous off-road shared use facility to meet Riverside Path

Continuation of the shared use path in the Riverview Drive southbound verge beyond the Riverside Path access is inhibited by the narrowing of the road corridor and the existing placement of VRS on the outside of the extended bend, protecting against errant vehicle encroachment into the park and towards the river. Light segregation could be implemented to improve the existing on-road advisory cycle lanes. Light segregation offers greater protection than painted cycle lanes and can be considered as an additional measure due to it not being reasonably practical to provide a more formal kerb segregation. It is proposed that light segregation can be achieved with vertical features such as bollards or Wand Orcas to improve visibility and recognition for all users.

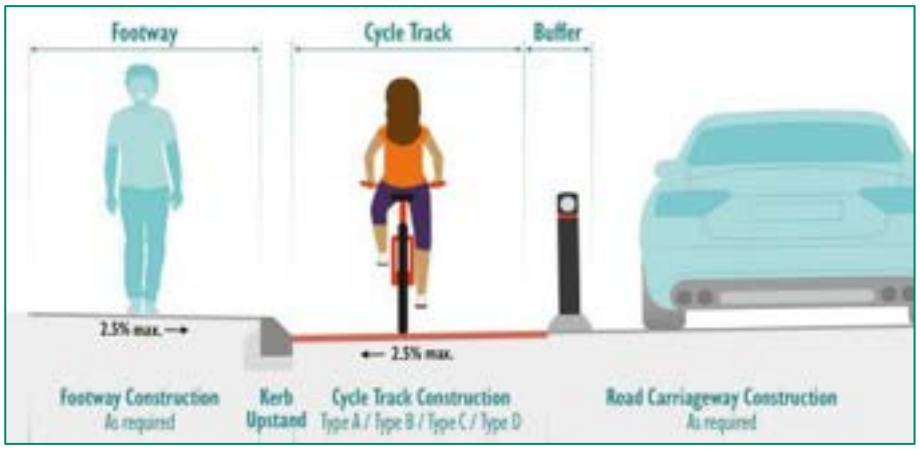


Figure 258 - Proposed light segregation on existing Riverview Drive advisory cycle lanes (Source: Cycling by Design)

Key design features

- 160m of new shared use path to address the missing traffic-free link in the southbound verge of Riverview Drive. Desirable minimum 4m wide shared use path proposed with 1m buffer strip in line with 40mph speed limit.
- Improved uncontrolled crossing of Riverview Drive with consistent width on each side and tactile paving in line with inclusive design requirements.
- Introduction of Wand Orcas or similar to provide a highly visible and robust form of light segregation for cycle users continuing on the on-road facility.

Risks and Unknowns

- Street lighting is currently present within the existing verge. It is anticipated that localised relocation of 4no. lighting columns will be required to facilitate the proposed improvements.
- Provision of a shared use path to desirable minimum dimension will result in minor encroachment beyond the existing road boundary fence. ACC land ownership extent is to be confirmed through engagement. It is assumed that this land is owned by ACC as part of the Riverside Park and therefore no third party land agreements would be required. This land offers an alternative routing opportunity if moving the existing lighting columns located along the verge presents a significant risk to cost or delivery.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT60 is £182,000 including optimism bias at 44%.

AT68 – Conduct a review of wayfinding signage throughout the study area

A review of wayfinding signage throughout the study area was undertaken in November 2023. A summary of the findings is included in Appendix C of this Technical Note.

O11 – Undertake a review of parking arrangements on Victoria Street

A review of parking arrangements on Victoria Street was undertaken in November 2023. A summary of the findings is included in Appendix D of this Technical Note.

O15 – Introduce placemaking and gateway features on Victoria Street

The opportunities for introduction of placemaking and gateway features on Victoria Street are intrinsically linked to the comparative design options being progressed through design as part of Table 2. The holistic review of the Table 2 options will to inform the appropriate locations and types of placemaking and gateway features which can be introduced. The following options from Table 2 have a direct impact on the opportunities for placemaking and gateway features on Victoria Street:

- AT33 – Provide improved active travel links between Dyce Rail Station, the A947 and the eastern section of Dyce, particularly along Station Road
- AT61 – Implement a shared use path on Victoria Street
- O2 – Review the layout of Victoria Street/Skene Place junction
- O25 – Implement access only restrictions for general traffic on Victoria Street
- O26 – Implement one-way restrictions for general traffic on Victoria Street

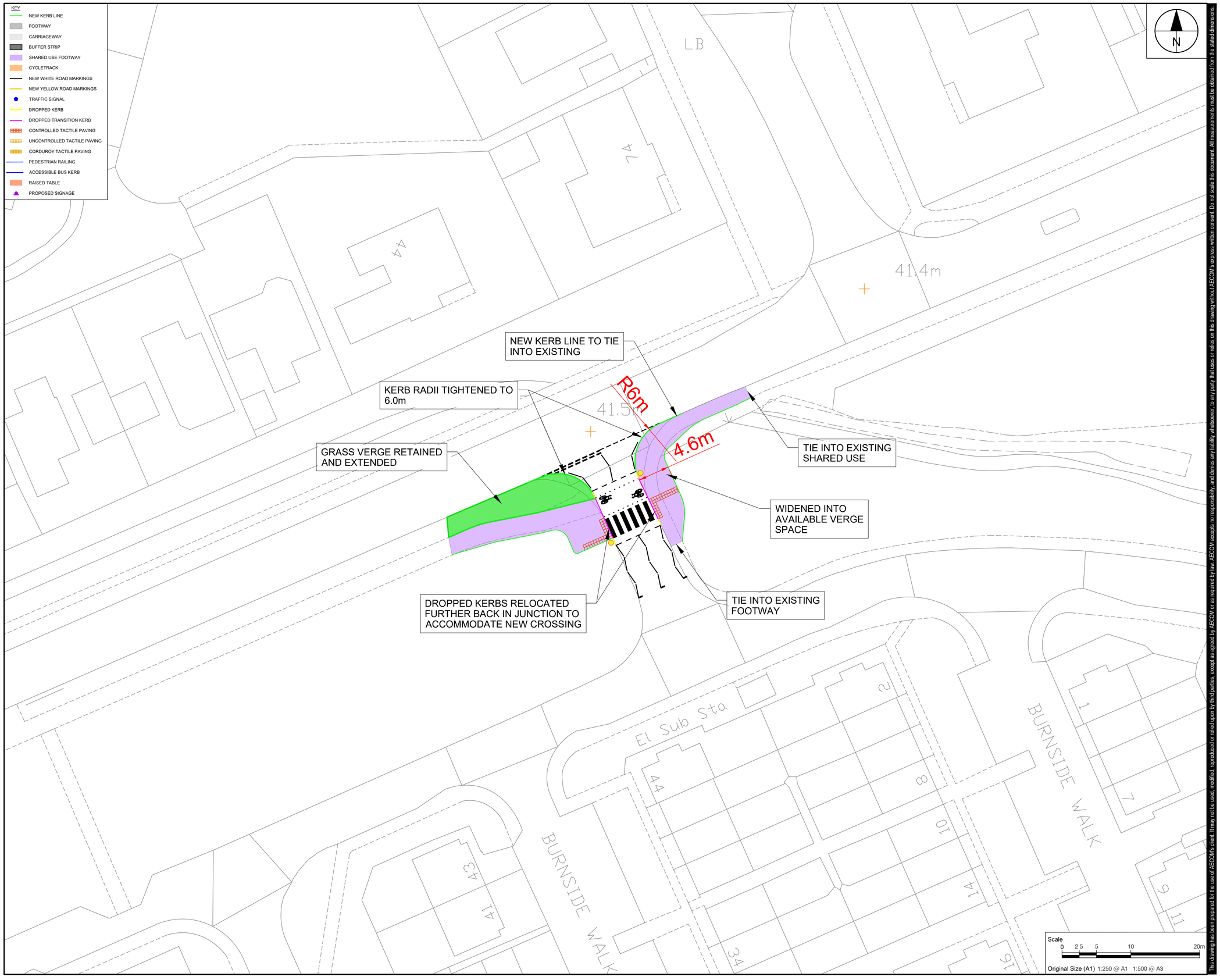
Appendix A – Design General Arrangement Layouts

ISO A1 594mm x 841mm

Project Management Initials: Designer: JM Checked: SS Approved: PL

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE



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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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SHEET TITLE

A947 Table 1 Detailed Design
AT4 General Arrangement
Sheet 1 of 8

SHEET NUMBER

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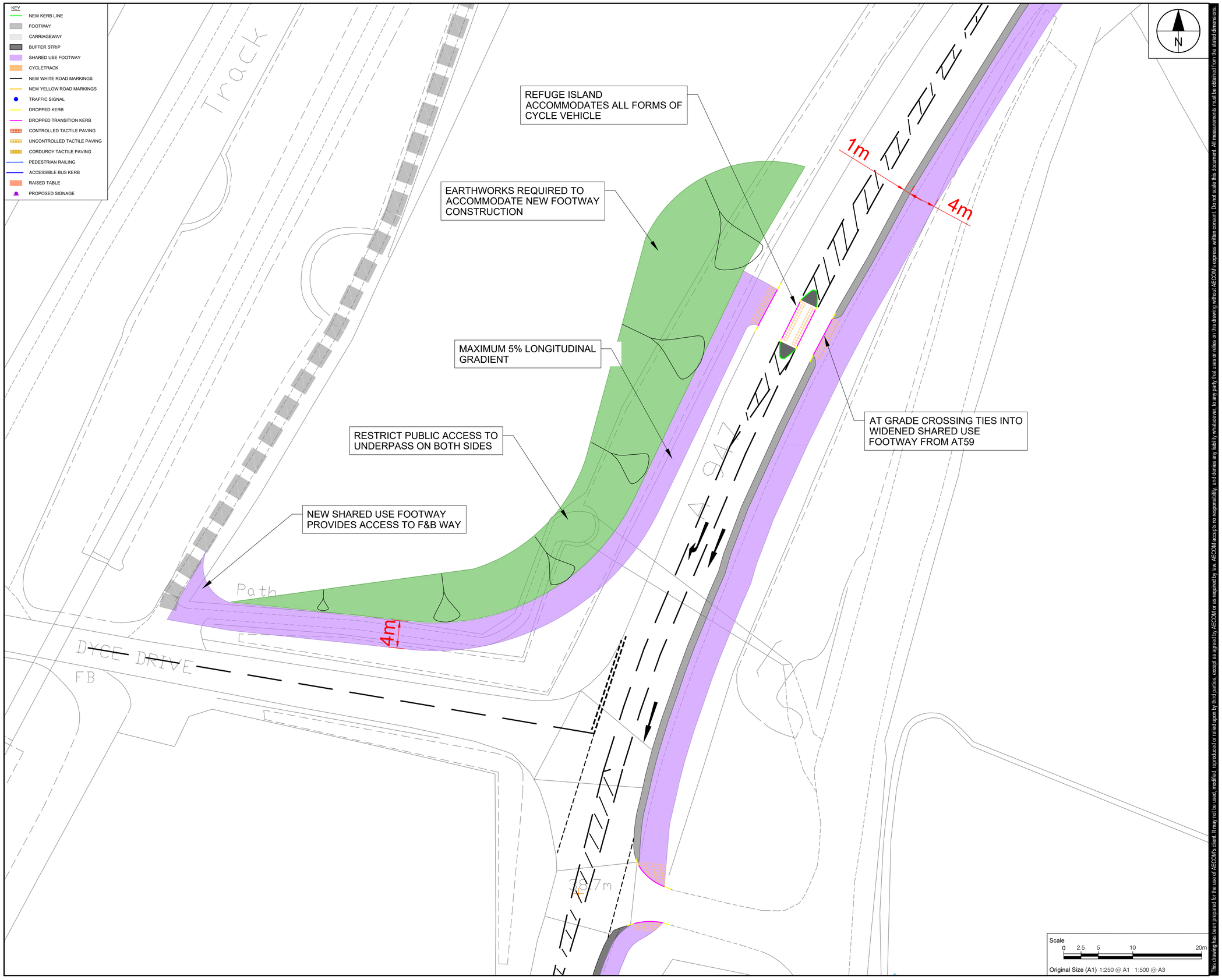

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Checked: SS
Designer: JM
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A947 Table 1 Detailed Design
AT13+30 General Arrangement
Sheet 2 of 8

SHEET NUMBER

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A947 Table 1 Detailed Design
AT14 General Arrangement
Sheet 3 of 8

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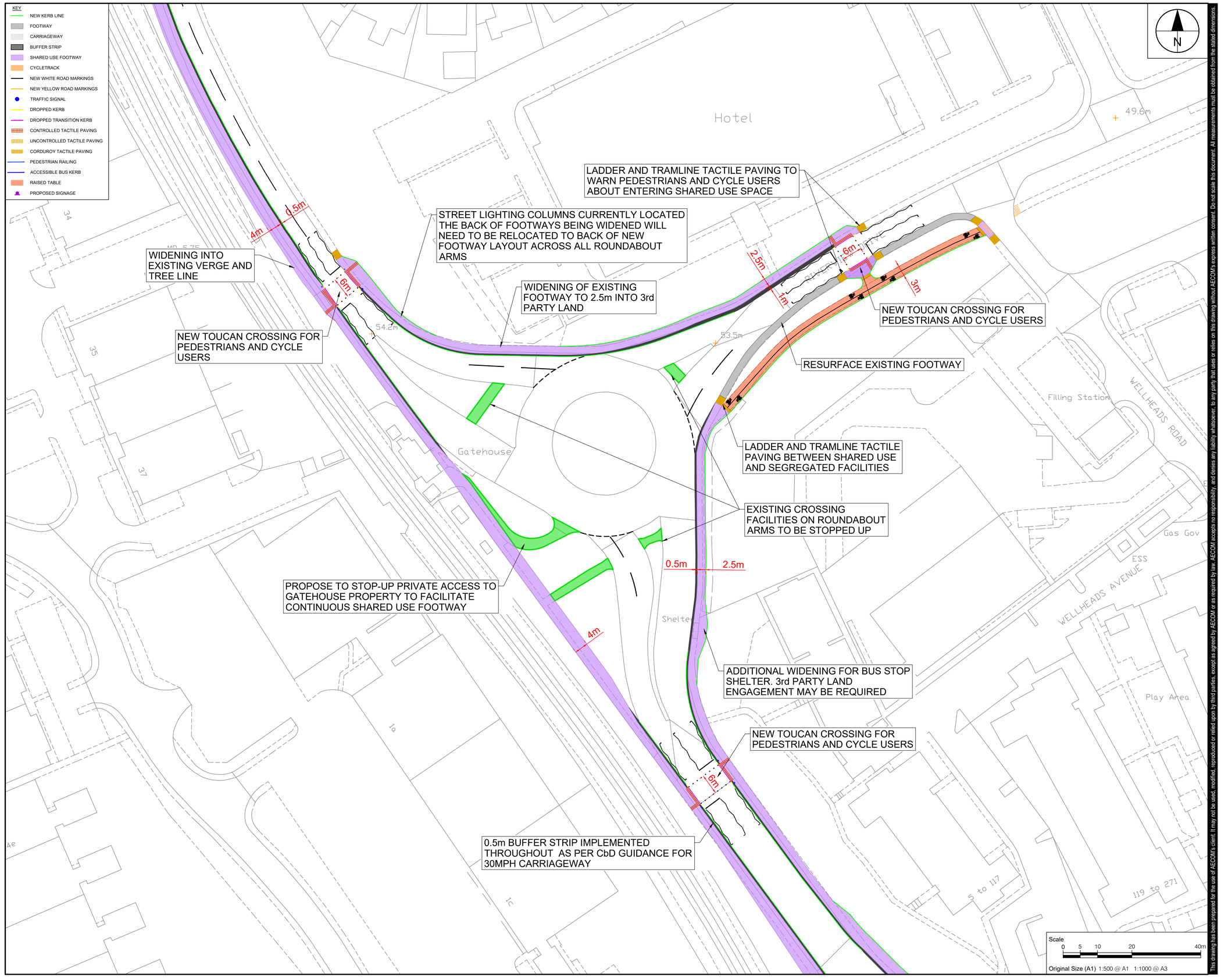

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Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

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60709527

SHEET TITLE

A947 Table 1 Detailed Design
AT16 Option 2 General Arrangement
Sheet 4 of 8

SHEET NUMBER

60709527-SHT-30-C-T1-0704

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

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- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
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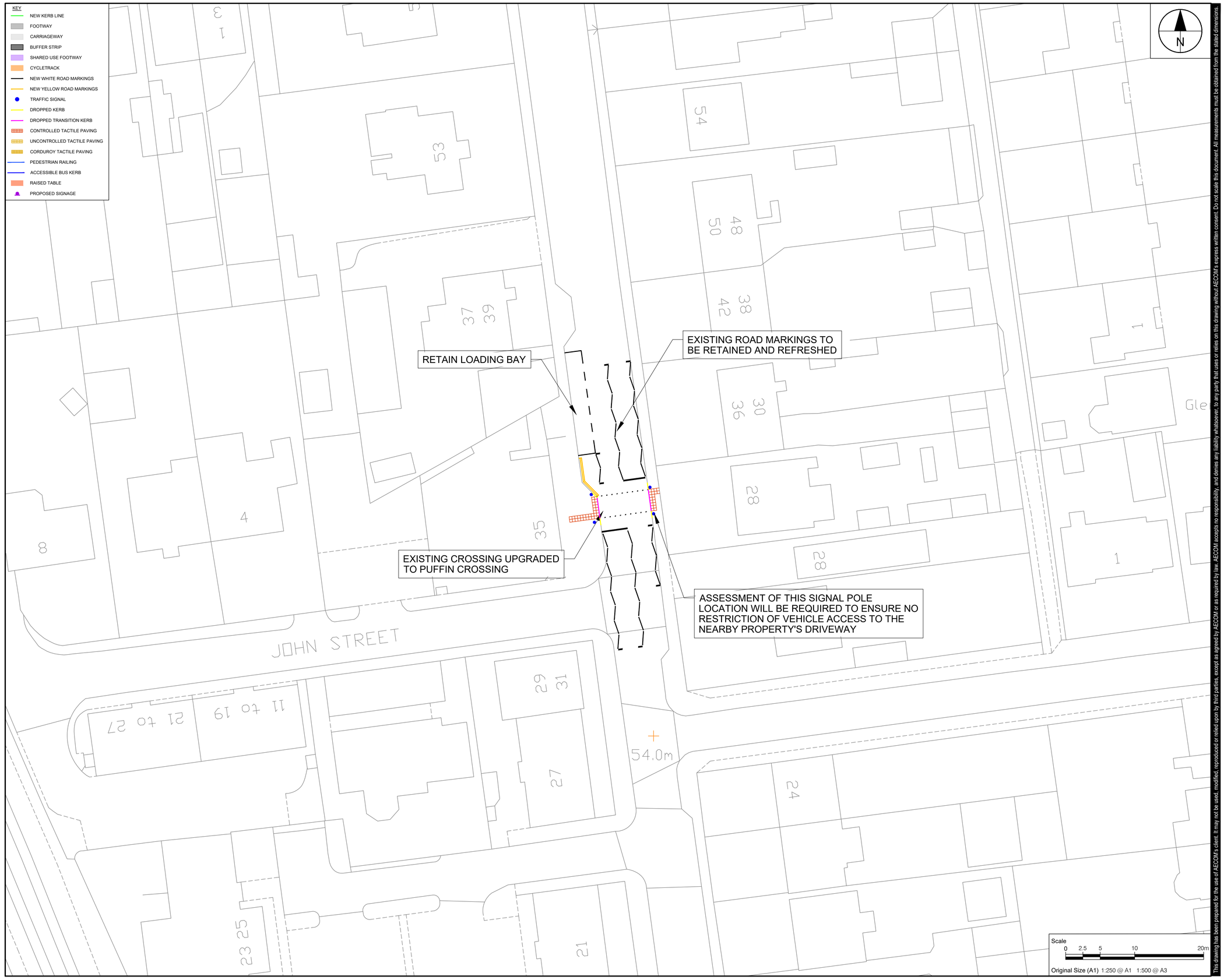
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE



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AT17 General Arrangement
Sheet 5 of 8

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Project Management Initials: Designer: JM Checked: SS Approved: PL ISO A1 594mm x 841mm

EXTEND EXISTING VEGETATION TO RESTRICT VEHICLE PARKING

NEW TACTILE PAVING AND DROPPED KERB CROSSING INTRODUCED

3m

CUT BACK AND MAINTAIN EXISTING OVERGROWN VEGETATION

2.6m

LADDER TACTILE PAVING FOR PEDESTRIANS JOINING F&B WAY

NEW FOOTWAY CONSTRUCTION ALONG AVAILABLE VERGE SPACE

EXISTING LIGHTING COLUMNS ALONG PITMEDDEN ROAD WILL BE RELOCATED TO BACK OF NEW FOOTWAY

2.3m

NEW 2m FOOTWAY CONSTRUCTION IN AVAILABLE VERGE SPACE AT DYCE SCOUT HUT

Waste
osal
Centre

LBs

N

KEY
- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
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- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

Scale
0 2.5 5 10 20m
Original Size (A1) 1:250 @ A1 1:500 @ A3

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AT17 General Arrangement
Sheet 6 of 8

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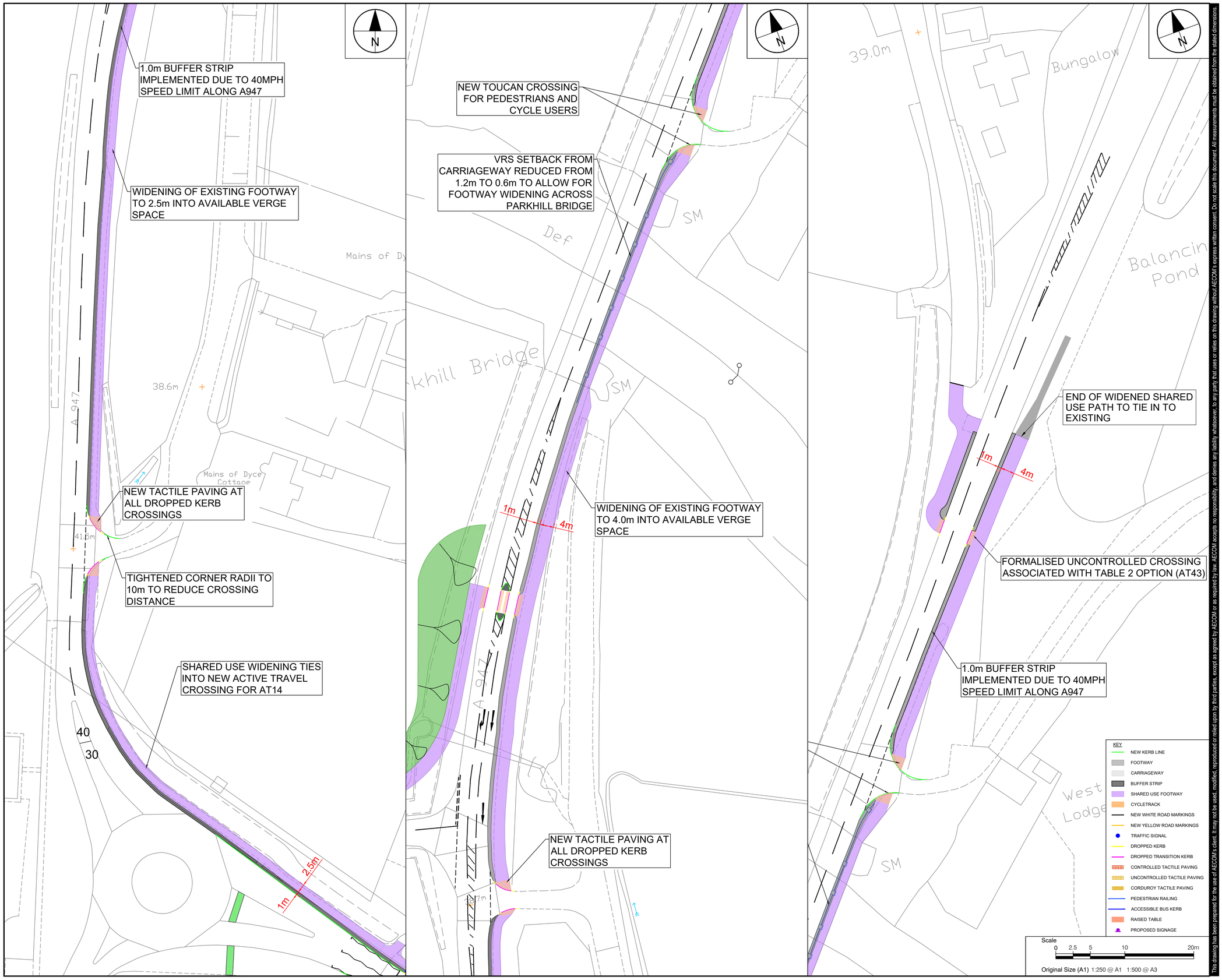

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A947 Table 1 Detailed Design
AT59 General Arrangement
Sheet 7 of 8

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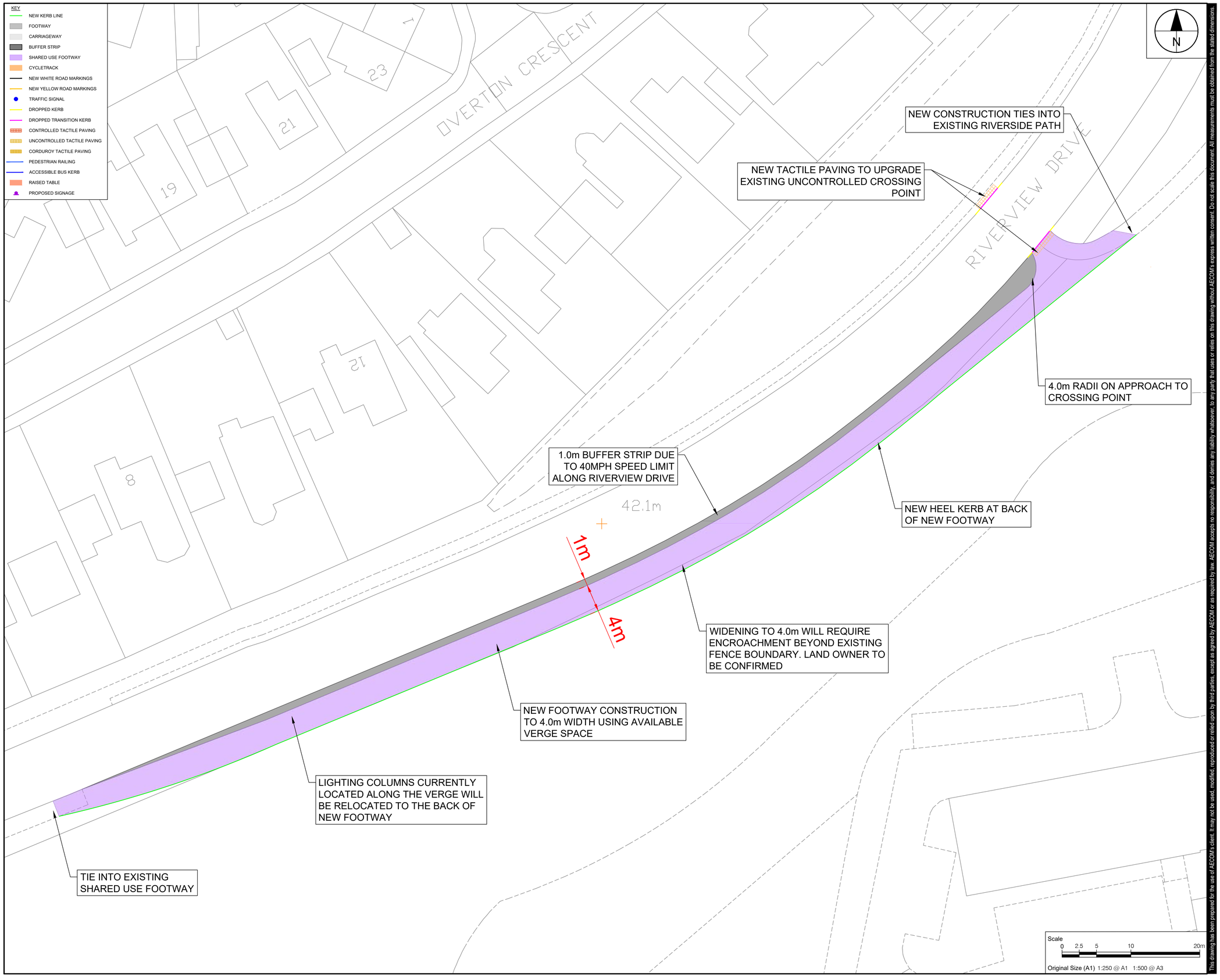

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60709527

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A947 Table 1 Detailed Design
AT60 General Arrangement
Sheet 8 of 8

SHEET NUMBER

60709527-SHT-30-C-T1-0708

Appendix B – Existing Footway Review

Project:	**A947 Multi-Modal Corridor Study: Detailed Appraisal & OBC**		
Subject:	**Existing Footway Review**		
Prepared by:	**Jack McKenna**	Date:	**11/12/2023**
Checked by:	**Steven Smith**	Date:	**10/01/2024**
Verified by:	**Joanne Melarkey**	Date:	**17/01/2024**
Approved by:	**Andrew Robb**	Date:	**19/01/2024**

Existing Footway Review

Introduction

AECOM staff carried out a site visit to the study area in November 2023.The purpose of the visit was to conduct a site walkover and capture data on the existing signage and footway network along the A947 to inform a detailed review of each.

ArcGIS Survey123 was utilised on site to gather and collect data throughout the day. The software is a form-based data collection tool which can be used to gather information on site and then analysed off-site through a variety of tools and interfaces. AECOM's GIS team created a smart form survey which was accessible from a mobile device and used the device's GPS to record the location of each entry. The data and photos collected on site were then automatically transferred from the offline application into a GIS web map for further review and analysis.

To ensure an efficient walkover, each location visited within the study area was predetermined based on the street's assumed high footfall or planned works as part of the active travel improvement options detailed within Tables 1 and 2. For the larger stretches of footways along the A947 corridor, multiple entries were used to achieve an averaged evaluation. For example, along Riverview Drive, 11 entries were captured along its length on both sides of the carriageway. Each footway's width was assessed manually using a tape measure with the measurement being taking between the front of a heel kerb or equivalent and the back of the roadside kerb.

Review Criteria

The footway review was split into two objectives; 1) to identify any gaps in provision within the study area and; 2) to consider and evaluate the width and condition of the existing footway network. These footway review objectives were reflected through the categories and questions which were set out in the mobile survey for use on-site.

The six categories of questions within the survey were:

- Site Information;
- Footway Information;
- Verge Information;
- Existing Barriers;
- Gaps in Provision; and
- Other.

Questions were then included within the categories in various forms such as multiple choice and scoring between 1-5 (ranging from very poor to very good). Figure 1 provides an example of the questions which were included for a selection of the above categories.

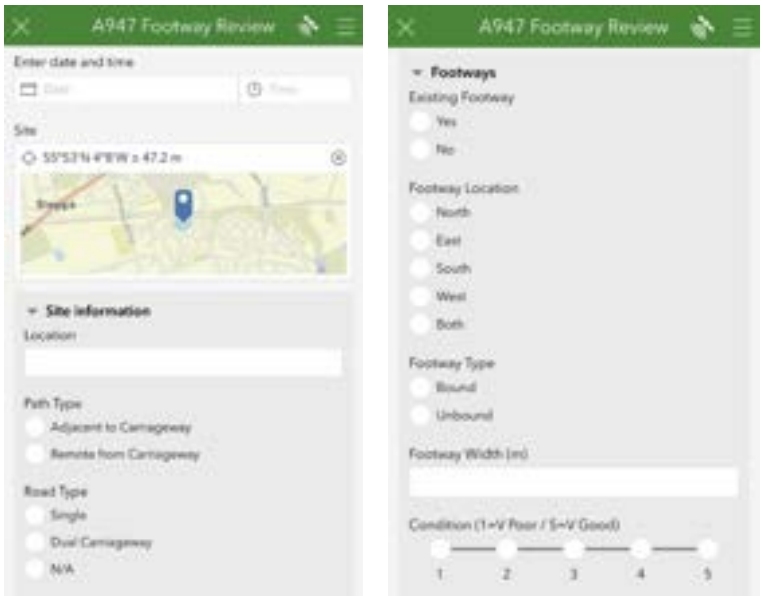


Figure 1 - ArcGIS Survey123 example

Gaps in Provision

Various gaps in provision were identified within the study area during the site walkover. Examples of the issues identified were poor footway surface makeup, lack of lighting and evidence of pedestrian desire lines which are not currently being accommodated. This section of the Technical Note will highlight a selection of the areas identified; the full list of areas identified is summarised in Table 1 at the end of this note.

Figure 2 shows the current access point to the Formartine and Buchan (F&B) Way from Pitmedden Road. The poor characteristics of this path include a steep gradient, narrow width, and overgrown vegetation. Proposed works as part of Option AT32 from Table 1 focus on extending the existing footway into the available verge space on the south side of Pitmedden Road. These works would provide a link for users to the F&B Way from Victoria Street via this access point. It is anticipated that as a result of Option AT32, pedestrian footfall would increase. To ensure there is no missing pedestrian link between the new footway along Pitmedden Road and the F&B Way, it is recommended that improvements to the existing path are included under Option AT32. This path scored a 1 out of 5 (very poor) for its current condition due to the uneven surface, 1m width and presence of overgrown vegetation. Proposed works would include widening to 3m, resurfacing to produce a smooth surface and introducing a regular maintenance plan to avoid the risk of vegetation overgrowth.

Figure 2 - Existing path to F&B Way

An assessment along the north of Riverview Drive identified an existing pedestrian desire line which is not currently accommodated by safe crossing facilities or a bound path surface. To the east of the Todlaw Walk junction, a worn section of the grass verge was observed where there is a gap in the existing fencing, shown in Figure 3.

Figure 3 - Worn surface between Todlaw Walk and Riverside Path

The amount of wear demonstrates that this route is currently being taken by local residents to enter and exit the Riverside Path on foot. There was also evidence of bike tyre marks in the ground showing that cyclists are also utilising this area. Scope for improvement will be investigated as part of Option AT31 from Table 2 which aims to provide active travel links between local housing in Dyce and the Riverside Path. The works required to formalise this link would include implementing dropped kerbs and tactile paving, the improvement of the existing pedestrian refuge island and approximately 50m of new bound surfacing, connecting to the Riverside Path.

An existing shared use footway is located on the north and west side of Wellheads Drive, between the Dyce Drive junction and Aberdeen Airport Fire Station. Despite the footway not meeting Cycling by Design's (CbD) absolute minimum width requirements for a shared use path, the inclusion of an adequate width buffer and the overall condition of the footway surface led to a scoring of 4 out of 5 during the review. However, at the end point of the shared use path, the road markings were found to be significantly faded, as outlined in Figure 4. On approach to the fire station, the possibility of an active travel user missing the give-way markings presents a safety risk due to the potential for a dangerous interaction with exiting vehicles.

Figure 4 - Faded cycle markings on Wellheads Drive footway

Refreshing the existing road markings is recommended to improve the safety of active travel users who use the shared use path.

Footway Width and Condition Assessment

All key footways throughout the study area were evaluated through a data collection and scoring process using the previously described smart form survey. Data based on characteristics such as the width, type and adjacent road's speed limit was collected and considered when scoring footway condition. Key findings are presented below, with all footway data entries summarised in Table 2 at the end of this note.

Multiple locations within the study area scored 5 out of 5 for their overall condition. These were typically footways which had been recently constructed or resurfaced. For example, the newly constructed Mill Drive shared use footway has a smooth surface with minimal wear and its width is compliant with the minimum standards set out by Cycling by Design.

Figure 5 - Shared use footway adjacent to Mill Drive

The primary reason for the low scoring footways in this review was the condition of the surface layer. Unlike that of the Mill Drive footway shown above, these footways have an unbound surface which can make it difficult to walk on for some users.

Figure 6 - Example of poor footway condition on Old Meldrum Road

It is recommended that any footways which were scored either a “1” or “2” out of 5 are reviewed and proposed for future resurfacing by Aberdeen City Council (ACC). Some of these are included in active travel improvement works through Tables 1 and 2. Those that are not currently captured within the proposed scope of options being developed as part of this study are summarised below:

Table 0.1 - Low scoring footways not captured under existing design options

Location	Footway Condition Score
Wellheads Way	2
Market Street	2
Greenburn Road	2

Various localised narrowing locations on footways along the A947 were identified and captured under this review. Such narrowing was mainly caused by the introduction of a lighting column in the footway; Figure 7 provides an example from Victoria Street.

Figure 7 - Localised footway narrowing on Victoria Street

The footway width between the lighting column and the property was measured as 1.0m, an insufficient width for two pedestrians to pass one another. This introduces a safety risk of a pedestrian stepping into the carriageway into oncoming traffic. It is understood that this may be the only appropriate location for the lighting column and the required cabling due to the property boundary but has still been captured under this review to highlight the potential risk present to pedestrian safety.

Table 0.1 - Summary of Existing Gaps in Provision

Location	Identified Gap in Provision	Reasoning
A947 Oldmeldrum Road (North of Dyce)	Y	Scope to improve conditions at bus stops Realignment of crossings North of Parkhill Bridge to tie them together DMRB allows for reposition of the VRS on Parkhill Bridge closer to the carriageway to reallocate space on footway Shared use path footway to south below CbD minimum requirements
Riverside Path	Y	Introduction of lighting along the path would make it more accessible and safer (subject to the appropriate environmental assessment)
Riverview Drive	Y	Existing pedestrian desire line not accommodated by a formal footpath at Todlaw Walk junction Available verge space to widen existing shared use footway outside Overton Circle
Pitmedden Road	Y	Footway ends on west side of carriageway at Dyce Scout Hut. Available verge space to extend footway further north to tie in with F&B Way
Wellheads Drive	Y	Existing cycle warning markings need refreshed
TECA paths	Y	Potential to upgrade to a bound surface to improve accessibility
Millhill Brae underpass	Y	Introduction of lighting to improve user safety
Old Meldrum Road	Y	Footway condition on west side deteriorated

Table 2 - Footway Assessment Summary

Location	Surface Type	Footway Width (m)	Condition (1 – 5)	Existing Verge	Speed Limit (mph)	Existing Buffer	Buffer Width (m)	Illuminated
A947 Oldmeldrum Road (Towards B977 Junction)	Unbound	1.0	1	Yes	40	Yes	1.5	No
A947 Oldmeldrum Road (between Dyce Drive and north of Parkhill Bridge)	Bound	1.7	4	Yes	40	No	-	No
A947 Oldmeldrum Road (between Riverview Drive Roundabout and Dyce Drive)	Bound	0.7 - 1.3	2	Yes	40	Yes	1.5	Yes
North Victoria Street	Bound	1.0 - 1.8	3	No	30	No	-	Yes
Central Victoria Street	Bound	1.5	3	No	30	No	-	Yes
Gordon Terrace	Bound	1.5 - 1.8	3	No	20	No	-	Yes
Station Road	Bound	1.2	3	No	20	No	-	Yes
Skene Place	Bound	1.4	2	No	20	No	-	Yes
Merrivale	Bound	1.4	4	No	20	No	-	Yes
South Victoria Street	Bound	1.5	3	Yes	30	No	-	Yes
Farburn Terrace	Bound	1.5	3	Yes	30	No	-	Yes
Wellheads Drive	Bound	2.2	4	Yes	40	Yes	0.5	Yes
Wellheads Crescent	Bound	1.9	3	Yes	30	No	-	Yes
Wellheads Way	Bound	2.0	2	Yes	30	No	-	Yes

Location	Surface Type	Footway Width (m)	Condition (1 – 5)	Existing Verge	Speed Limit (mph)	Existing Buffer	Buffer Width (m)	Illuminated
Wellheads Place	Bound	2.0	3	Yes	30	No	-	Yes
North Riverview Drive	Bound	1.8	3	Yes	40	Yes	1	Yes
South Riverview Drive	Bound	1.8 - 2.5	4	Yes	40	Yes	2 - 2.5	Yes
Riverside Path	Bound	2.5	4	Yes	-	No	-	No
Market Street	Bound	0.9 - 1.5	2	No	20	No	-	Yes
North Stoneywood Road	Bound	1.5 - 2.0	3	Yes	30	No	-	Yes
Central Stoneywood Road	Bound	3	4	Yes	30	No	-	Yes
South Stoneywood Road	Bound	2 – 2.80	3	Yes	40	Yes	0.9	Yes
Bankhead Road	Bound	1.3 – 1.5	2	No	20	No	-	Yes
Millhill Brae	Bound	3	2	No	20	No	-	Yes
Greenburn Road	Bound	1.4	2	No	20	No	-	Yes
TECA Paths	Bound	2.9	5	Yes	-	No	-	Yes
TECA Paths	Unbound	1.9	3	Yes	-	No	-	No
Mill Drive	Bound	1.8 - 2.9	5	Yes	20	No	-	Yes
Old Meldrum Road	Bound	2.1 – 2.9	2	No	20	No	-	Yes
Mugiemoss Road	Bound	1.3 – 2	3	No	20	No	-	Yes

Appendix C – Existing Wayfinding Signage Review

Project:	**A947 Multi-Modal Corridor Study: Detailed Appraisal & OBC**		
Subject:	**A947 Wayfinding Signage Review**		
Prepared by:	**Jack McKenna**	Date:	**11/12/2023**
Checked by:	**Steven Smith**	Date:	**10/01/2024**
Verified by:	**Joanne Melarkey**	Date:	**17/01/2024**
Approved by:	**Andrew Robb**	Date:	**19/01/2024**

A947 Wayfinding Signage Review

Introduction

AECOM staff carried out a site visit to the study area in November 2023.The purpose of the visit was to conduct a site walkover and capture data on the existing wayfinding signage and footway network along the A947 to inform a detailed review of each.

ArcGIS Survey123 was utilised on site to gather and collect data throughout the day. The software is a form-based data collection tool which can be used to gather information on site and then analysed off-site through a variety of tools and interfaces. AECOM's GIS team created a smart form survey which was accessible from a mobile device and used the device's GPS to record the location of each entry. The data and photos collected on site were then automatically transferred from the offline application into a GIS web map for further review and analysis.

The signage review was limited to wayfinding signage for the Formartine and Buchan (F&B) Way, National Cycle Network (NCN) and other local pedestrian trip attractors as vehicle traffic signage was considered out of the scope of works for this project. The walkover was expanded beyond the A947 corridor to ensure all relevant signage was covered and the NCN route within the study area was followed.

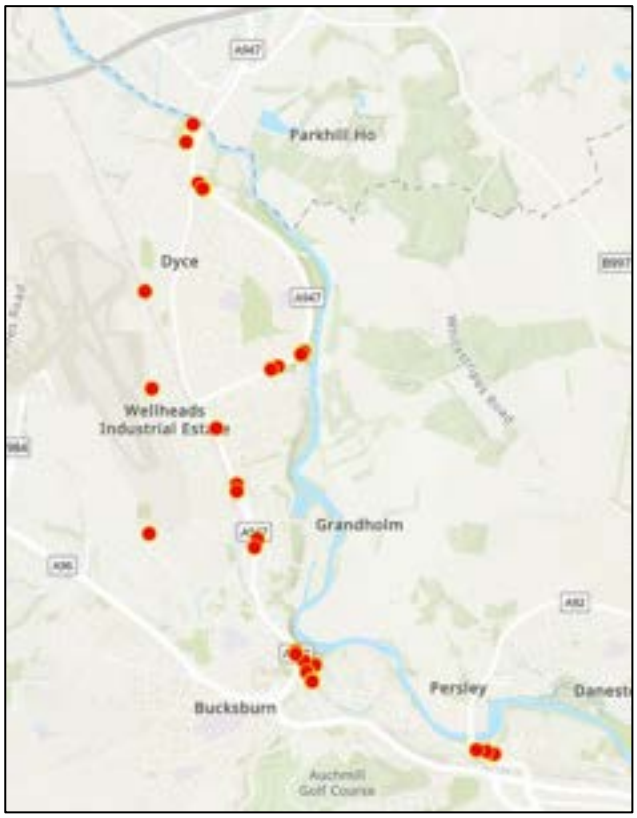


Figure 1 - Map of signage review data entries (Source: ArcGIS)

Review Criteria

Assessment of the signage network throughout the A947 study area was focused on two components; 1) each physical sign and its positioning within the network relative to the intended final destination and; 2) other nearby signs. Details of each sign were captured using the smart form survey throughout the walkover. The questions selected for the survey focused on identifying three key points from each sign: the site information; sign and pole condition; and the sign's coherence and orientation relative to the network. Figure 2 shows a screenshot of the survey and the questions which were used.

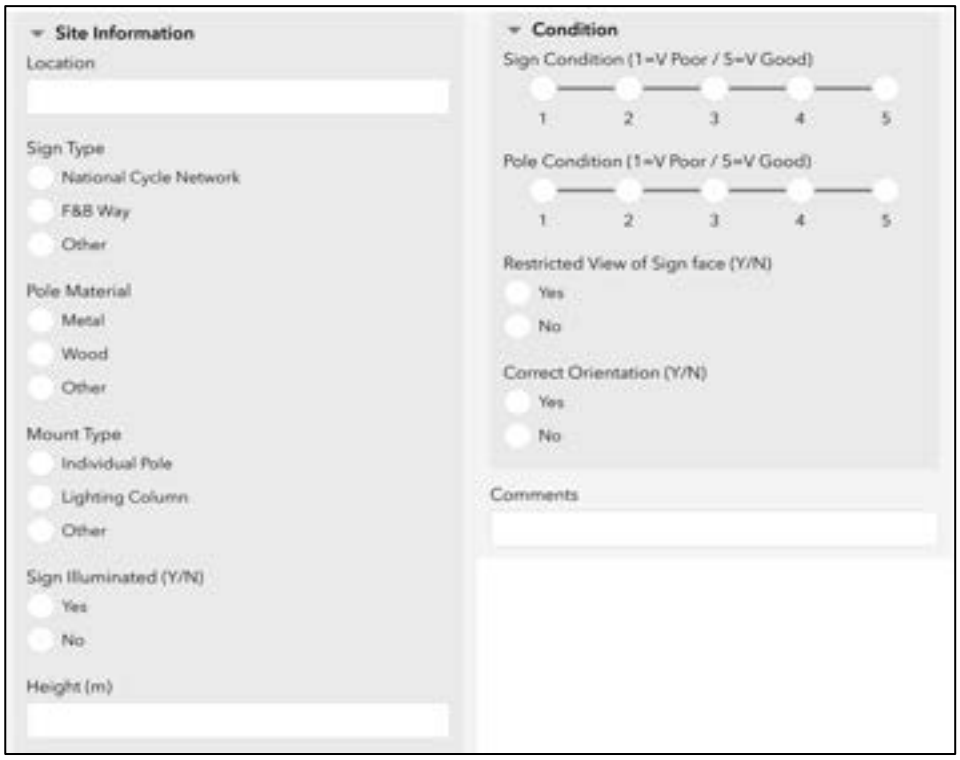


Figure 2 - ArcGIS Survey123 Criteria

Signage Review Findings

Throughout the site walkover, a total of 32 signs were assessed as part of the A947 signage network review. The condition of each sign face and signpost were evaluated on a scale between 1 and 5, with 1 being very poor condition and 5 being very good condition. Figure 3 illustrates the findings of the sign face and post review.

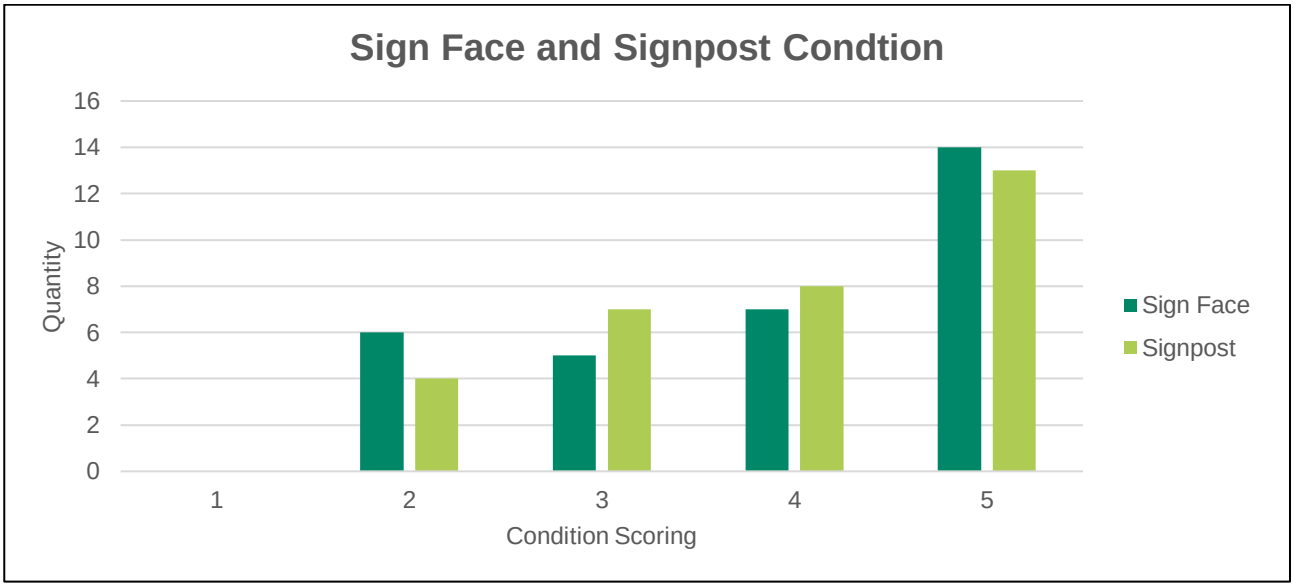


Figure 3 - Sign face and post condition graph

This graph indicates that the majority of sign faces and posts within the study area are in very good condition. These scores were awarded due to the minimal wear and damage observed, likely due to signs being installed in recent years by the Council. The surrounding trees and vegetation at these locations was also well

maintained to ensure there was no restricted view of the sign faces which would impact their legibility to active travel users.

An example of a sign face which received a poor score during the review is shown in Figure 4. This sign is located on a shared use path adjacent to Stoneywood Road.

Figure 4 - Poor condition sign face example

As shown in the above image, the NCN Route 1 sign face's legibility is impacted by the presence of moss leading to a poor score for condition during the review. This form of degradation in sign faces across the study area was common where located next to a woodland area or other forms of vegetation. Impacted signs could be more regularly maintained to reduce their legibility risk for users. Other low scoring sign faces showed signs of damage through dents and bends, however, there were no instances of damage impacting sign readability for users.

Damage was the primary cause of the low scoring of signpost condition which was outlined in Figure 3. Figure 5 demonstrates a sign which is no longer fully connected to its post due to damage. The damage to the wooden fencepost on which the sign is mounted impacts the connection to the sign face which in future may lead to the sign breaking off entirely.

Figure 5 - Damaged wooden sign mounting post

The orientation of wayfinding signage was also monitored during the site walkover to ensure each sign was directing active travel users in the correct direction. This was included in the survey as it is common for road and traffic signs to be vandalised and turned to face an incorrect direction. From the 32 signs captured in this review, only two signs were identified to have the incorrect orientation. These were only slight variations to the intended orientation and had no significant impact on their legibility for users but were highlighted as they could face the oncoming lane more directly.

While walking the majority of the NCN route within the study area, a coherent network was observed through the use of wayfinding signage in an effective manner along the route. As the data map indicates in Figure 1, the pattern of signage follows NCN Route 1 correctly with reasonable gapping in between. This gapping ensures that cyclists can follow the intended route while avoiding street clutter along the route corridor. The other wayfinding signage for trip attractors such as the F&B Way and Riverside Path are located more locally to the intended destination. The most effective location for these signs is near all access points nearby, providing clear and direct instructions for users.

Table 1 - Signage Review Summary Table

Location	Sign Type	Post Material	Illuminated?	Height (m)	Sign Condition	Pole Condition	Restricted View of Sign Face?	Correct Orientation?
F&B Way Path	F&B Way	Metal	No	2.0	4	5	No	Yes
F&B Way Access Point	Other	Metal	No	2.0	4	3	Yes	Yes
Old Meldrum Road Underpass	NCN	Wood	No	1.0	2	2	No	Yes
Riverview Drive	NCN	Metal	No	1.8	4	5	No	Yes
Riverview Drive	NCN	Metal	No	2.2	5	3	No	Yes
Riverview Drive	NCN	Metal	No	1.8	4	2	No	Yes
Riverside Path	Other	Wood	No	2.0	4	2	No	Yes
Riverside Path	Other	Wood	No	2.2	3	3	No	Yes
Riverview Drive	NCN	Metal	No	2.2	5	5	No	Yes
Riverview Drive	NCN	Metal	No	2.0	5	5	No	Yes
Dyce Station	F&B Way	Metal	Yes	2.8	2	2	No	Yes
Wellheads Drive	NCN	Metal	Yes	2.0	5	5	No	Yes

Location	Sign Type	Post Material	Illuminated?	Height (m)	Sign Condition	Pole Condition	Restricted View of Sign Face?	Correct Orientation?
Wellheads Drive	Other	Metal	Yes	2.8	5	5	No	Yes
Stoneywood Road	NCN	Metal	Yes	2.0	5	5	No	No
Stoneywood Road	NCN	Metal	No	2.2	4	3	No	No
Stoneywood Road	NCN	Metal	Yes	2.5	3	4	No	Yes
Stoneywood Road	NCN	Metal	No	2.0	3	4	No	Yes
Stoneywood Road	NCN	Metal	No	2.5	5	5	No	Yes
Stoneywood Road	NCN	Metal	No	2.3	2	4	No	Yes
Stoneywood Road	NCN	Metal	No	2.0	2	4	No	Yes
Stoneywood Road	NCN	Metal	Yes	2.0	3	4	No	Yes
Stoneywood Road	F&B Way	Wood	No	2.1	2	3	No	Yes
Mill Drive	NCN	Metal	No	2.3	5	5	No	Yes
Bankhead Road	NCN	Metal	No	2.0	5	5	No	Yes
Old Meldrum Road	NCN	Metal	No	2.0	5	5	No	Yes
Old Meldrum Road	NCN	Metal	No	2.0	5	5	No	Yes

Location	Sign Type	Post Material	Illuminated?	Height (m)	Sign Condition	Pole Condition	Restricted View of Sign Face?	Correct Orientation?
Old Meldrum Road	F&B Way	Metal	No	2.3	5	3	No	Yes
Mugiemoss Road	NCN	Metal	No	2.5	2	4	No	Yes
Persley Walled Garden	NCN	Metal	No	2.0	4	4	Yes	Yes
Persley Walled Garden	NCN	Metal	No	2.8	5	4	No	Yes
Persley Walled Garden	Other	Wood	No	2.2	3	3	No	Yes
Persley Walled Garden	NCN	Metal	No	2.0	5	5	No	Yes

Appendix D – Review of Existing Parking Arrangements on Victoria Street

Project:	**A947 Multi-Modal Corridor Study: Detailed Appraisal & OBC**		
Subject:	**Review of Existing Parking Arrangements on Victoria Street**		
Prepared by:	**Jack McKenna**	Date:	**05/01/2024**
Checked by:	**Steven Smith**	Date:	**10/01/2024**
Verified by:	**Joanne Melarkey**	Date:	**17/01/2024**
Approved by:	**Andrew Robb**	Date:	**19/01/2024**

Review of Existing Parking Arrangements on Victoria Street

Introduction

This Technical Note will investigate the current parking arrangements along Victoria Street, a primary urban street which runs through the centre of Dyce within the A947 study area. Victoria Street contains a mix of residential and commercial properties along its boundary which attracts a large volume of traffic and footfall on a daily basis. Victoria Street is a single carriageway route with a varying corridor width along its length. It is bordered by pedestrian footways and properties throughout. The route was reclassified following the revision of ACC's Roads Hierarchy, with the route no longer forming part of the A947 itself; the priority route is now via Riverview Drive.

The review of the current parking arrangements will focus on the current capacity for on-street and off-street parking, locations of businesses relative to parking and the existing areas along Victoria Street which have parking restrictions. For the purpose of this Technical Note, Victoria Street will be split into three sections based on the property type bordering each section. The following sections have been identified:

- North – Riverview Drive roundabout to Pitmedden Road
- Central – Pitmedden Road to Farburn Terrace
- South - Farburn Terrace to Riverview Drive roundabout

Capacity Review

This section of the Technical Note will focus on the existing parking capacity for vehicles throughout Victoria Street. The capacity of on-street parking along Victoria Street was measured through a desk study using online OS mapping. Sections across residential driveways and existing parking restrictions were excluded when measuring the existing capacity.

The northern area of Victoria Street is primarily bordered by residential properties with a small number of businesses also in this area, each of which provides customers with suitable off-street parking arrangements. During a site walkover, it was observed that a large number of the residential properties in this area have access to a single or multi-car driveway with the others requiring to use on-street parking outside or near their property. There is approximately 220m of available on-street parking on the west side of the Victoria Street corridor and 240m to the east. This provides approximately 36 and 40 spaces respectively for vehicles to utilise on-street parking in the northern section of Victoria Street.

The central area of Victoria Street contains the majority of its commercial properties along with Dyce Railway Station. These trip attractors create a higher vehicle parking demand. A lot of these non-residential properties come with adequate off-street parking areas for their customers, however, there are a number which do not have dedicated parking, and patrons need to use on-street parking along Victoria Street or an adjacent residential street. A previous study undertaken on behalf of Nestrans identified limited parking availability at the Railway Station during peak times due to the volume of park and ride passengers. This was recognised to result in on-street parking overflow into the nearby residential street network.

Within the central section of Victoria Street, the western side of the carriageway has available space for approximately 190m of parking and the eastern side has accommodation for approximately 100m. This provides 31 and 16 spaces respectively for a typical 6m length parallel bay. The availability of on-street parking in this section is impacted by the build outs and parking restrictions which are located at crossing points throughout. The build outs narrow the carriageway to reduce the effective crossing width for pedestrians.

The southern extents of Victoria Street sit between the Farburn Terrace junction and the Riverview Drive roundabout. The corridor here is bordered by greenspace and connects Victoria Street with areas south such as Stoneywood and Bucksburn using the A947. The carriageway is narrowed due to the presence of advisory cycle lanes which restricts parking along this section as a result.

Existing Parking Restrictions

The northern section of Victoria Street has minimal existing double yellow line parking restrictions. Those primarily located at the corner of junctions to adjacent side streets are deployed to ensure clear visibility for vehicles waiting to exit these junctions. Other parking restrictions are in place as part of the two controlled crossing points near the south Riverview Drive roundabout and outside Dyce Parish Church.

As a result of the physical buildouts present in the centre of Victoria Street and the resulting carriageway narrowing, there is an increase in the number of parking restrictions which are required in this area. These restrictions impact the volume of on-street parking available for local residents and customers of the local businesses.

Appendix E – Outline Cost Estimates

Table 5 – Summary of Outline Cost Estimates

Option	Estimated Construction Cost
AT4 - Implement measures to give active travel users priority over Burnside Drive when using the shared use path on Riverview Drive	**£221,000**
AT13 - Provide a formal pedestrian crossing point to the north of the A947/Riverview Drive Roundabout to facilitate movements to the Formartine and Buchan Way	**£278,000**
AT14 - Provide a formal pedestrian crossing point to the east of the A947/Riverview Drive Roundabout	**£272,000**
AT16 - Implement formal pedestrian crossing facilities on the arms of the Riverview Drive/Stoneywood Road Roundabout	**£1,149,000**
AT17 - Implement signalised crossing facility on Victoria Street adjacent to Tesco	**£198,000**
AT32 - Implement footways on the south side of the carriageway on Pitmedden Road	**£119,000**
AT59 - Widen the shared use path on the east side of the A947 to the north of Riverview Drive	**£502,000**
AT60 - Provide continuous footways on Riverview Drive for the duration of the route	**£182,000**

Appendix C –
Table 2 Preliminary Design Option Development Technical Note

Delivering a better world

Project:	**60709527 – A947 Detailed Appraisal & OBC**		
Subject:	**Table 2 Preliminary Option Development Technical Note**		
Prepared by:	**Jack McKenna, Engineer**	Date:	**16/10/2023**
Checked by:	**Steven Smith, Principal Engineer**	Date:	**09/11/2023**
Verified by:	**Joanne Melarkey, Regional Director (Project Director)**	Date:	**17/11/2023**
Approved by:	**Andrew Robb, Associate Director (Project Manager)**	Date:	**08/12/2023**

Introduction

This Technical Note details the Preliminary Option Development exercise undertaken as part of the Detailed Appraisal and Outline Business Case (OBC) stage of the A947 Multi-Modal Corridor Study.

This Preliminary Option Development exercise focuses on 'Table 2' options specified by Aberdeen City Council (ACC) considering specific aspects of deliverability for each of the options, to assess whether they should be subsequently considered as part of a detailed STAG-based appraisal.

Table 1 – 'Table 2' Options for Development, Detailed Appraisal, Detailed Design and OBC

Option	Description
AT24	Improve active travel connectivity between the A947 study area and Aberdeen Airport/Heliport
AT26	Improve active travel connectivity between the A947 study area and TECA
AT27	Improve active travel connectivity between the A947 study area and Kirkhill Industrial Estate
AT31	Improve active travel links between the Riverside Path and housing within Dyce
AT33	Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road
AT35a	Implement improvements to develop a mixed-traffic street (which allows for safe, on-road cycling) on the local road network to the west of the A947, incorporating Bankhead Road, Greenburn Road and Millhill Brae
AT41a/b	Improve active travel access to the retail park at the Bucksburn Roundabout
AT42	Review access to the Formartine and Buchan Way from within Dyce
AT43	Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)
AT47	Implement with-flow segregated cycleway on the A947 between AWPR Junction and A947/A96 Junction
AT48a	Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North
AT51	Implement with-flow segregated cycleway on Old Meldrum Road
AT52	Implement two-way segregated cycleway on Old Meldrum Road
AT55	Implement with-flow segregated cycleway on Gilbert Road
AT56	Implement two-way segregated cycleway on Gilbert Road

Option	Description
AT58	Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport
AT61a	Implement package of active travel measures on Victoria Street
AT62	Widen the shared use path on the east side of the A947 between the A96 and Beech Manor
AT64	Implement shared use path on Old Meldrum Road
AT65	Implement streetscape improvements and widened pavements along Mugiemoss Road
AT66	Implement shared use path on Gilbert Road
PT2	Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor
PT9	Improve public transport connectivity between the A947 study area and Aberdeen Airport/Heliport
PT10	Improve public transport connectivity between the A947 study area and Craibstone Park & Ride
PT11	Improve public transport connectivity between the A947 study area and TECA
PT12	Improve public transport connectivity between the A947 study area and Kirkhill Industrial Estate
O2	Review the layout of the Victoria Street/Skene Place Junction
O3	Review the layout of the Riverview Drive/Balloch Way Junction
O4	Review the layout of the Riverview Drive/Todlaw Walk Junction
O5	Review the layout of the Riverview Drive/Netherview Avenue Junction
O7	Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer
O8	Review the layout of the A947/Stoneywood Brae Junction
O10	Review layout of the A947/McDonalds access road junction
O16	Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce
O25	Implement access only restrictions for general traffic on Victoria Street
O26	Implement one-way restrictions for general traffic on Victoria Street

Options assigned to ‘Table 1’ by ACC at the outset of the commission have been expedited to OBC stage, however, by nature of the scope of the options in Table 2, this interim Preliminary Option Development exercise has been necessary to ensure there is adequate rationale for progressing this group of options further in the appraisal and design processes. Following this appraisal exercise, the strongest performing options will move forward to the OBC stage.

This Preliminary Option Development exercise has sought to establish if there are any deliverability barriers taking into account the design requirements and existing conditions. It has also sought to identify conflicting proposals or solutions which are dependent on each other.

Design Guidance Overview

Cycling by Design provides guidance for permanent active travel infrastructure design in Scotland and has been considered and referenced throughout this Technical Note. The guidance defines ‘desirable minimum’ and ‘absolute minimum’ widths for various forms of active travel facility. ‘Desirable minimum’ widths should be considered as the minimum requirement and reductions below this level should only be applied where specific constraints are identified, such that it cannot be reasonably achieved. In such cases, limited reductions are permissible, but the highest achievable standard should be maintained. ‘Absolute minimum’ widths represent the scope of permissible reduction to the requirement. Where elements of the design are subject to statutory obligations, these must be adhered to.

The Cycling by Design footway and cycle track width requirements for different cycle track types are outlined in the table below.

Table 2 - Cycling by Design Track Width Requirements

Cycle Track Types		**Footway Width**	**Cycle track width** *One-way, less than 300 cycles per hour peak*	**Cycle track width** *Two-way, less than 300 cycles per hour peak*
Remote Cycle Tracks Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Remote Cycle Tracks Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m
Cycle Tracks adjacent to carriageway Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Cycle Tracks adjacent to carriageway Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m

In addition to the direct width of the usable facility, consideration of the minimum buffer width for a facility adjacent to a carriageway is also required and is defined by the posted road speed limit. Table 3 is also taken from Cycling by Design and outlines these minimum requirements.

Table **3** - Minimum Buffer Widths

Speed Limit	**Minimum Buffer Width**
30mph	0.5m
40mph	1.00m
50mph	2.00m (including any hard strip)
60mph	2.50m (including any hard strip)
70mph	3.50m (including any hard strip)

The Design Manual for Roads and Bridges (DMRB) has also been referenced in this Technical Note. The DMRB provides design guidance for the development of the trunk road network in the UK. Where no standard specific to the local road network is available, the DMRB becomes the primary point of reference and the requirements set out within the standards were considered to evaluate road layout interventions and opportunities in accordance with several of the Table 2 options.

A947 Study – Table 2 Option Development

This section sets out the preliminary option development work undertaken to support the assessment of the options. Each option section has a summary rationale to confirm:

- Retain – Option progresses to detailed appraisal; or
- Sift – Option is no longer under consideration in the scope of the A947 Detailed Appraisal & OBC study.

AT24 – Improve active travel connectivity between the A947 study area and Aberdeen Airport/Heliport

This option considered the two primary connection points between the A947 and Aberdeen Airport/Heliport as being Farburn Terrace and Market Street.

As part of ACC's Active Travel Action Plan, Farburn Terrace and its roundabout with Wellheads Drive have been identified as a missing link between the existing shared use cycleways on Wellheads Drive and Dyce Rail Station. ACC secured funding from Sustrans and Nestrans to develop a detailed design for shared use cycleways along Wellheads Drive, around the existing roundabout and along Farburn Terrace to Victoria Street. As these are committed improvements from ACC, the works on Farburn Terrace will no longer be included in the scope of Option AT24.

Market Street is a residential street with a barrier to the west restricting vehicle access to/from Wellheads Drive. Active travel improvements would add benefit in terms of directness between the southern extents of the A947 and Aberdeen Airport and Heliport. Based on anticipated traffic volumes and speeds on Market Street, adoption as a mixed traffic street is considered to provide a high level of service to users. Proposed works would include the implementation of new cycle signage and road markings and replacement of the existing barrier at the western end with a modal filter restricting vehicle access but permitting active travel permeability. The improvements to Market Street present limited risk in terms of complexity and deliverability therefore it is recommended that this option is now taken forward as a 'Quick Win' and moved to Table 4 for delivery by ACC as part of that workstream.

AT24 Recommendation:	Move to Table 4 for delivery as a Quick Win

AT26 – Improve active travel connectivity between the A947 study area and TECA

There are currently multiple links from The Event Complex Aberdeen (TECA) to the study area through an existing core path network to the north, east, south and west. The current condition of this network is mixed with a combination of bound and unbound surfacing. Based on Cycling by Design's core design principle of Comfort, an unbound surface provides a low level of service to its users.

Proposed works as part of this option include upgrading the existing path surface to the south and west of TECA to a bound surface and improving wayfinding signage for users.

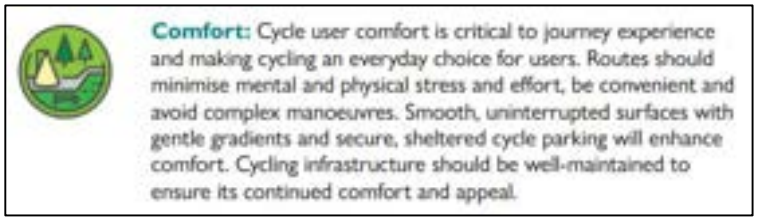


Figure 1 - Cycling by Design's Definition of Comfort (Cycling by Design, 2021)

A combination of options AT24 and AT26 along with the existing shared use facilities along Wellheads Drive creates a coherent active travel network between the A947 and key trip attractors to the west, Aberdeen International Airport and TECA.

AT26 Recommendation:	Retain

AT27 – Improve active travel connectivity between the A947 study area and Kirkhill Industrial Estate

There are various active travel solutions to improve connectivity between the A947 and Kirkhill Industrial Estate. These can be delivered in a more targeted way as part of options AT24, AT26 and AT58[1]. As a result, AT27 will be sifted out moving into the detailed appraisal stage.

AT27 Recommendation:	Sift

AT31 – Improve active travel links between the Riverside Path and housing within Dyce

The Riverside Path runs along the River Don and connects into the southbound verge of Riverview Drive at two established locations, east of Overton Circle and east of Balloch Way. The current connection between the Riverside Path and housing in Dyce is through informal dropped kerb crossings on Riverview Drive which do not meet desirable accessibility requirements. Connection improvements with the Riverside Path network are covered by Table 1 options AT14[2] and AT60[3].

Assessment of pedestrian desire lines has been carried out to determine appropriate crossing locations to improve connections between the Riverside Path and nearby housing areas. A worn section of verge was identified south of the Todlaw Walk junction, approximately 280m south of the established Riverside Path entrance.

Figure 2 – Evidence of Pedestrian Desire Line South of Todlaw Walk (Site Walkover Photo)

[1] **AT58 -** Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport.
[2] **AT14 -** Provide a formal pedestrian crossing point to the east of the A947/Riverview Drive Roundabout.
[3] **AT60 -** Provide continuous footways on Riverview Drive for the duration of the route.

Proposed works to formalise this connection point would include 40m of a new bound surface, dropped kerbs and tactile paving. AT31 will be retained to specifically review and develop improved connections in the area between AT14 and AT60 from Table 1.

AT31 Recommendation:	Retain

AT33 – Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road

Station Road is the main link between Dyce Rail Station and Victoria Street. The corridor consists of a 5.5m carriageway with 1.5m footways each side and parking restrictions at various locations throughout. Due to low traffic volumes and speeds along Station Road, the introduction of one-way side roads is being proposed as part of the associated Option O2[4].

The introduction of a one-way system on Station Road and adjacent streets would allow opportunity for the adoption of contra-flow cycle lanes. However, the narrow corridor width would require the retention of the existing narrow footways and removal of the existing on-road parking. This option is proposed to be retained in conjunction with Option O2.

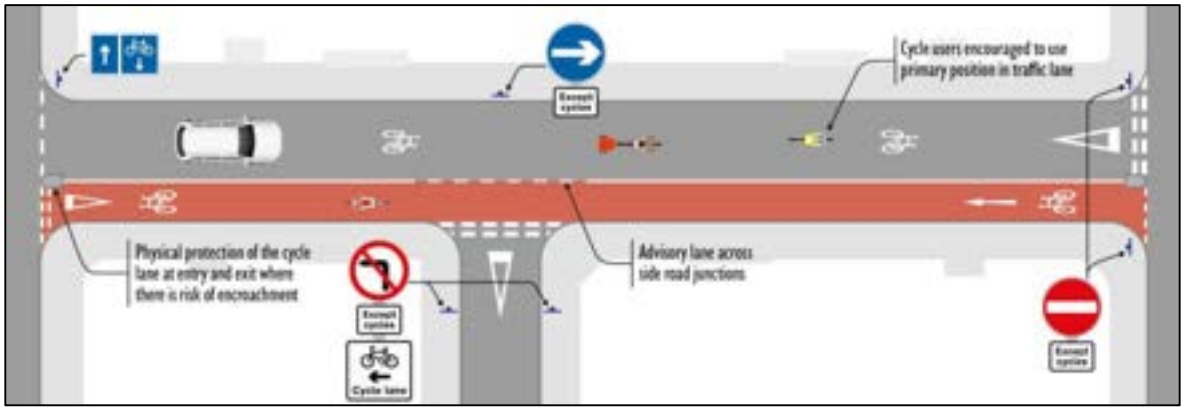


Figure 3 - Contra-flow Cycle Lane Example Arrangement (Cycling by Design, 2021)

AT33 Recommendation:	Retain

AT35a – Implement improvements to develop a mixed-traffic street (which allows for safe, on-road cycling) on the local road network to the west of the A947, incorporating Bankhead Road, Greenburn Road and Millhill Brae

Following a review of Option AT35, the wording of the option was redefined to broaden the scope from focusing on quiet route measures to active travel improvements. The option reference has now been updated to AT35a to reflect this change[5]. Since this revision was approved by the client group, the option definition has been further expanded to identify the importance of Farburn Terrace in the context of active travel improvements to the west of the A947 corridor.

Bankhead Road, Wellheads Drive and Farburn Terrace have been identified as western boundary streets to the proposed Low Traffic Neighbourhood (LTN) and have various options which focus on active travel improvements within this study. An assessment of these roads was caried out to understand their suitability for active travel improvements.

Millhill Brae and Greenburn Road have been identified as the key connecting roads to Bankhead Road for active travel users. There is an underpass at the end of Millhill Brae which provides users with access to the east of the A947. A variety of quiet route measures are considered suitable for Millhill Brae and will be explored in the detailed design stage to improve conditions for active travel

[4] **O2 -** Review the layout of Victoria Street/Skene Place junction.
[5] Original **AT35** wording *"Implement quiet route measures on the local road network to the west of the A947 via Bankhead Road, Wellheads Drive and Farburn Terrace to Dyce Rail Station".*

users. Greenburn Road is a residential street that also acts as one of the main access points for pedestrians to Stoneywood School. The introduction of quiet route measures would support improved access to the school for pupils, parents and other pedestrians daily.

Wellheads Crescent, Wellheads Way and Wellheads Place were identified as options to control vehicle movements and create new active travel opportunities for users traveling to and from the various business premises within Wellheads Industrial Estate. However, traffic lanes in this area often exceed 3.5m to accommodate HGVs. Cycling by Design Section 3.8.3 states that on streets where cycle users mix with motor traffic, lane widths should be designed between 2.8m – 3.2m to allow cycle users to safely adopt the primary riding position. The carriageway widths for roads connecting with Wellheads Drive are therefore too wide to accommodate the introduction of quiet route measures without impact on continued industrial access. Market Street is also considered as a connecting road to Wellheads Drive; and implementation of quiet route measures is already being progressed under Option AT24.

Farburn Terrace was previously identified as a suitable boundary street for a proposed Low Traffic Neighbourhood (LTN), however, with existing committed works being progressed separately by ACC, introduction of any new active travel measures on Farburn Terrace will not be considered further as part of this study.

AT35a Recommendation:	Redefine and retain

AT41a/b – Improve active travel access to the retail park at the Bucksburn Roundabout

An initial review of this option identified the stair access from Bankhead Road as the most appropriate connection between the A947 and the retail park for active travel users. An opportunity was identified to replace the stairs with an accessible ramp, facilitating the movement of active travel users to and from the retail park. Various technical and deliverability challenges were identified with this option upon further review. Due to the approximate 5m level difference between the footway on Bankhead Road and the A947 carriageway level, to meet Cycling by Design gradient requirements, a ramp in excess of 100m would be necessary to achieve a suitable gradient. Furthermore, the close proximity to the A947 overbridge wingwalls raised concerns of constructability challenges. Finally, the overbridge walls could have obscured visibility to oncoming traffic along Bankhead Road, increasing hazard to cycle users on a downhill approach to Bankhead Road.

Following the recent installation of a new Toucan crossing on the A947, North of the Old Meldrum Road junction, there is a new opportunity to create an active travel link to the retail park along the A947 corridor. The A947 widens to a dual carriageway in this area which presents two different opportunities for the new active travel link. Reduction of the northbound carriageway to one lane would facilitate a segregated two-way cycleway between the retail park and the new crossing facility on the A947 in accordance with Cycling by Design's desirable minimum width. Should the dual traffic lanes be retained, the existing footway west of the A947 could be upgraded to a shared use facility between the A947 crossing and the retail park at Bucksburn Roundabout. The existing footway varies in width between 1.8-3m with available verge space at the rear. Widening of this footway to at least the absolute minimum width would require the reallocation of lighting columns, signal posts and the removal of vegetation. AT41a/b will be retained to allow further design work on the proposed active travel link to be carried out. Connectivity north of the new crossing and the Old Meldrum Road junction is captured more broadly as part of the associated Option AT48a[6].

Option AT41a assumes the existing dual carriageway layout is retained and the existing northbound footway is upgraded to a shared use facility between the A947 crossing and the retail park. Option AT41b would involve A947 carriageway width reduction to one lane to facilitate a segregated two-way cycleway.

AT41a/b Recommendation:	Retain

[6] **AT48a -** Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North.

AT42 – Review access to the Formartine and Buchan Way from within Dyce

Five primary points of access to the Formartine and Buchan (F&B) Way were identified between Dyce Rail Station and the B977 in a review of the study area. Improvement in access onto the F&B Way is captured by other options that are already being carried forward to detailed appraisal. Option AT68 focuses on improving wayfinding signage throughout the study area including promoting access to the F&B Way. Options AT13 and AT58 promote the introduction of shared use paths and crossings which will connect to existing access points to the F&B Way. Option AT32 will improve access to the F&B Way by formalising pedestrian movements on the south side of Pitmedden Road to the F&B Way.

It is therefore proposed that AT42 is sifted out as it promotes similar outcomes to the options outlined above. Review of access to the F&B Way will therefore form part of the consideration of other more targeted options.

AT42 Recommendation:	Sift

AT43 – Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)

A section of the former A947 was repurposed for local access only when the primary route was diverted to align with new infrastructure as part of the AWPR project. There is an existing path which connects the northbound bus stop on Oldmeldrum Road and the section of old A947 carriageway with dropped kerbs for pedestrians wishing to cross perpendicularly.

Option AT28 aims to facilitate the movement of cyclists travelling northbound by implementing additional dropped kerbs to improve integration with the A947 and the existing strip of path for cyclists. This was identified as a quick-win and will be delivered by ACC.

Figure 4 - Existing A947/B977 Connection Conditions (Site Walkover Photo)

The proposals for Option AT43 focus on improvements to the existing path between the old and new A947 which is approximately 1.5m wide and comprises an unbound surface. There is adequate verge space here to widen the path to Cycling by Design's desirable minimum width of 4m and upgrade to a bound surface, offering a higher level of service in comparison to the existing conditions. A proposed new crossing at this location will also be explored at the next design stage, aiming to improve access between the northbound and southbound bus stops as well as the widened shared use path being progressed under Option AT58.

AT43 Recommendation:	Retain

AT47 – Implement with-flow segregated cycleway on the A947 between AWPR Junction and A947/A96 Junction

A review of corridor widths along the full length of the route recognised that implementation of continuous with-flow segregated cycleways on the A947 between the AWPR and A947/A96 junction is not feasible due to several fixed constraints at overbridges, property boundaries and junctions. The section specific options previously outlined in Tables 1-4 (of the original ACC Invitation To Tender) are considered more deliverable when considered individually. As a result of the deliverability challenges outlined, Option AT47 will be sifted out on this basis.

AT47 Recommendation:	Sift

AT48a – Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North

In order to capture sections along the A947 which are not considered under other targeted active travel options and to promote an overall coherent and connected network, AT48 has been reworded to incorporate the evaluation of solutions which offer a high level of service between the Bucksburn Roundabout and Riverview Drive Roundabout North, through the implementation of new shared use and segregated cycleway facilities. This would enable active travel improvements along the entirety of Riverview Drive. The option reference has now been updated to AT48a to reflect this change.

A mapping exercise was carried out to review any existing and proposed active travel facilities along the A947 corridor between the AWPR junction and the A947/A96 junction. The overview map created is shown in Appendix A. The was developed to understand the cumulative extents of the proposed active travel links and to identify any gaps in provision and potential missing links. Subsequently, improvements in the following sections will be taken forward: Bucksburn Roundabout to Old Meldrum Road, Old Meldrum Road to Stoneywood Brae and Stoneywood Brae to Beech Manor, with this option then extending as far as Riverview Drive Roundabout North.

AT48a Recommendation:	Redefine and retain

AT51 – Implement with-flow segregated cycleway on Old Meldrum Road

Works are currently ongoing north of the Bankhead Road Junction on Old Meldrum Road. As part of the Barratt Homes development, the Mill Drive carriageway has been realigned and is now the priority route for vehicles coming off the A947. A short new section of carriageway is currently under construction which will connect Old Meldrum Road to Mill Drive. Figure 5 shows a photo captured by AECOM staff during a recent visit to the area with an aim to better understand the new road layout north of Old Meldrum Road.

Figure 5 - New Layout North of Old Meldrum Road (Site Walkover Photo)

Assessment of the Old Meldrum Road corridor width was carried out to understand its suitability for with-flow segregation. It was measured to vary between 14-16m with multiple sections of on-street parking. This width is insufficient to accommodate with-flow segregation to Cycling by Design's desirable minimum specification. However, absolute minimum widths could be achieved when accompanied with a reduction in existing on-street parking provision. Option AT51 will be retained for further consideration and design due to the benefits of with-flow segregation at junctions – a prominent feature along both sides of the Old Meldrum Road corridor.

AT51 Recommendation:	Retain

AT52 – Implement two-way segregated cycleway on Old Meldrum Road

A two-way segregated cycleway demands less road space than a with-flow alternative. As a result, a desirable minimum width layout could be achieved along Old Meldrum Road. This would still require a reduction in the existing on-street parking provision, like that of the with-flow option. A two-way segregated cycleway would also offer continuity in association with a similar facility which is proposed on the A96 to the south along Auchmill Road. The interface with junctions and impact on on-street parking will inform the comparative appraisal between AT51 and AT52 through the appraisal and detailed design stage.

AT52 Recommendation:	Retain

Furthermore, the A96 Multi-Modal Corridor Study, being progressed separately by ACC, is promoting a bi-directional segregated cycleway in the westbound channel of Auchmill Road alongside bus improvements. Reconfiguration of the Auchmill Road central reserve and removal of the right turn into Old Meldrum Road are proposed to facilitate these improvements. This is detailed further in the Table 1 Design Technical Note (forming Appendix B of the Detailed Appraisal Report).

AT55 – Implement with-flow segregated cycleway on Gilbert Road

Gilbert Road is a residential street which connects Old Meldrum Road and the A96. On-street parking is prevalent throughout due to several properties having no off-street alternatives. Gilbert Road has an existing corridor width of approximately 10-11m with fixed property boundaries on both sides. Cycling by Design outlines an absolute minimum cycleway width of 1.5m with 1.5m wide footways. Implementation of a with-flow segregated cycleway is therefore not feasible on Gilbert Road due to the width being unable to support absolute minimum pedestrian and cycle facilities without reduction in road width below 6m or acquisition of third-party land. Option AT55 is sifted out on this basis.

AT55 Recommendation:	Sift

AT56 – Implement two-way segregated cycleway on Gilbert Road

A similar assessment of Gilbert Road's corridor width against Cycling by Design standards was carried out for Option AT56. An absolute minimum two-way segregated cycleway requires a 2m width with a 1.5m footway. There is inadequate space available to achieve two-way segregation without impact on the existing road corridor width or requirement for third-party land acquisition. As a result, Option AT56 will also be sifted from further consideration.

AT56 Recommendation:	Sift

AT58 – Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport

This route spans along Dyce Drive between the F&B Way overbridge and the existing shared use path network located to the north of Kirkhill Industrial Estate with an approximate length of 2.5km. Multiple constraints exist within the proposed extent of this route. There is minimal to no verge space adjacent to the carriageway along the eastern part of the link; as a result, third party land acquisition will be required. In the western section between Pitmedden and Kirkhill Industrial Estates, the route will have to cross Dyce Drive at two locations to align with the wide verge of the railway overbridge. To accommodate priority crossings for pedestrians, the speed limit on Dyce Drive would require reduction to at least 50mph. It is proposed that this option is progressed to the next stage to develop an optimal route along Dyce Drive while also ensuring the safety of active travel users.

AT58 Recommendation:	Retain

AT61a – Implement package of active travel measures on Victoria Street

Victoria Street has been assessed to have a variable cross-sectional width along its length, with the most common width approximately 12m. As the urban centre of Dyce, implementation of a shared use path would bring a higher risk of conflict between users. Therefore, shared use is not considered appropriate on the primary residential and commercial section of Victoria Street. As a result of the recent reprioritisation of the A947 along Riverview Drive as part of the Roads Hierarchy revision, it is anticipated that there will be reduced traffic levels along Victoria Street with route reclassification. Despite the implementation of a shared use path being discounted, it is important to continue developing other active travel measures along Victoria Street to improve accessibility and active travel opportunities in the 'heart' of Dyce. AT61 has been reworded[7] to capture a broader range of options for active travel improvements along Victoria Street. The option reference has now been updated to AT61a to reflect this change and the option has been considered in three sections: 1) Victoria Street/Riverview Drive South Roundabout to Farburn Terrace; 2) Farburn Terrace to Pitmedden Road; and 3) Pitmedden Road to Victoria Street/Riverview Drive North Roundabout. In Section 1, there is adequate space on the eastern side to develop a segregated cycleway connection

[7] Original **AT61** wording *"Implement shared use path on Victoria Street".*

by reallocating the existing advisory cycle lanes and utilising the existing verge space. In Section 2, there is limited scope to widen the existing footways or reduce the carriageway width due to bordering property boundaries. A reduction of the speed limit to 20mph and introduction of various measures would allow this section to be formalised as a mixed traffic street. Section 3 has three sub-improvement options, with varying volumes of works required. Option 3a involves the reduction of the road carriageway width to 6m, removal of on-street parking and speed limit reduction to 20mph. Option 3b – reduction of speed limit to 20mph and removal of on street parking would create opportunity to widen and reclassify existing footways on Eastern side to shared use desirable minimum width, with local sections of absolute minimum shared use width due to corridor constraints. Option 3c would continue the measures introduced as part of Option 3b with a reduced speed limit to formalise Section 3 as a mixed traffic street.

Further design work and appraisal will be carried out on this package of options to understand their feasibility and impact on road and active travel users along Victoria Street.

AT61a Recommendation:	Redefine and Retain

AT62 – Widen the shared use path on the East side of the A947 between the A96 and Beech Manor

This option was sifted out at the previous project stage on the basis that segregated facilities should be promoted as part of the study rather than shared use. An assessment of technical viability was founded on the agreed assumption that the A947 dual traffic lanes were to be retained, limiting the available width at this section. Further discussions with the client group have presented a desire for further consideration of space reallocation for active travel measures on this section of the A947 corridor. This would assist in delivering end-to-end active travel provisions along the A947 and will be revisited as part of Option AT48.

AT62 Recommendation:	Sifted as part of previous phase – consider residual improvements as part of AT48 option development

AT64 – Implement shared use path on Old Meldrum Road

Old Meldrum Road has a variable corridor width of 14-16m along the length of the route. The implementation of a shared use path and buffer strip to absolute minimum width requirements is considered feasible but the introduction of additional parking restrictions along Old Meldrum Road would be required. Despite having adequate corridor width to implement this option, it will not be progressed as two-way segregation is also feasible, Option AT52 outlined previously. A segregated cycleway is considered to offer a higher level of service to cyclists and will therefore be retained over the shared use alternative on Old Meldrum Road.

AT64 Recommendation:	Sift

AT65 – Implement streetscape improvements and widened pavements along Mugiemoss Road

Recent residential development along Mill Drive has resulted in realignment of the carriageway in this area. When exiting the A947 to the north west, vehicles are now taken towards Mill Drive with a small connector road available for journeys down Old Meldrum Road. The connector road is still under construction; however, it is anticipated that the change to the primary route in this area will reduce traffic volumes along the western extents of Mugiemoss Road. As part of the new carriageway construction along Mill Drive, a 2.5m shared use footway was incorporated in the development which ties in with the existing active travel infrastructure along Old Meldrum Road and the A947.

At Mugiemoss Road, between the Old Meldrum Road and Mill Drive junctions, the narrow 6m road corridor offers limited scope for footway widening. Due to the anticipated reduction in traffic volumes and the existing 20mph speed limit in this area, the introduction of quiet route and mixed street measures could be considered to protect active travel users and remove existing modal conflict on the footways along Mugiemoss Road.

Beyond the Mill Drive junction, the road corridor widens to 7.5m which provides opportunity to reallocate space from the road carriageway and widen the existing north footway to Cycling by Design's absolute minimum width for shared use. Due to the ongoing active travel improvements along Mill Drive and the potential to widen Mugiemoss Road footways to the east, Option AT65 will be retained to allow further design and appraisal.

AT65 Recommendation:	Retain

AT66 – Implement shared use path on Gilbert Road

Similar constraints are present when exploring the implementation of a shared use path on Gilbert Road as with implementing segregated cycle infrastructure. Due to the narrow corridor width of 10-11m and the requirement for on-street parking throughout, delivering an adequate shared use path to Cycling by Design standards is not considered feasible without impacting the existing road corridor width or requiring third party land. Therefore, Option AT66 will be sifted out at this stage of the study.

AT66 Recommendation:	Sift

PT2 – Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor

This option seeks to investigate the timings of existing traffic signals along the A947 corridor and consider the introduction of adaptive traffic signals to improve traffic flow through the junctions for all users and therefore deliver a positive impact on journey times. This option will be taken forward for further assessment.

PT2 Recommendation:	Retain

PT9 – Improve public transport connectivity between the A947 study area and Aberdeen Airport/Heliport

PT10 – Improve public transport connectivity between the A947 study area and Craibstone Park & Ride

PT11 – Improve public transport connectivity between the A947 study area and TECA

PT12 – Improve public transport connectivity between the A947 study area and Kirkhill Industrial Estate

Following targeted engagement with the ACC client team, and Nestrans, it was agreed that the standalone public transport options would be sifted out at this stage of the study. The Roads Hierarchy places greater emphasis on active travel and by delivering traffic calming and active travel improvements under the Table 1 and Table 2 options, benefits in terms of public transport attractiveness and journey time reliability will also be realised. It is also noted that public transport improvements are reliant on commitment and buy-in from private operators. Existing initiatives such as the Airport 'Hoppa' service, which has been extended to TECA[8], will deliver some of the scope of these options as they were originally conceptualised at the Preliminary Appraisal stage.

Option PT2 (described above) will also have some benefit for public transport operations on the study corridor.

PT9/PT10/PT11/PT12 Recommendation:	Sift

O2 – Review the layout of the Victoria Street/Skene Place Junction

Option AT33 explores the improvement of active travel links between Dyce Rail Station and the A947 through the adoption of LTN measures along Station Road and its side roads. Skene Place is linked to Station Road by Merrivale. Option O2 aims to simplify traffic movements to and from Victoria Street by introducing a one-way system using Station Road, Merrivale and Skene Place, as shown in Figure 6 below.

Figure 6 - Proposed One-Way System (OS Base Map)

West of Merrivale, Station Road and Skene Place would remain with bi-directional flow due to there being no alternative through link available. Initial swept path analysis was carried out using OS mapping to gauge the feasibility of emergency vehicles turning throughout the one-way system. No major issues were identified in this high-level review, supporting the retention of this option for further appraisal.

O2 Recommendation:	Retain

[8] Airport 'Hoppa' service extended to P&J Live (agcc.co.uk)

O3 & O4 – Review the layout of the Riverview Drive/Balloch Way Junction / Review the layout of the Riverview Drive/Todlaw Walk Junction

A reduction in kerb radii to 6m and a narrowing of the existing junction is proposed to reduce traffic speeds turning into Balloch Way (Figure 7) and Todlaw Walk (Figure 8) from Riverview Drive. Initial swept path analysis against the OS mapping base for an emergency vehicle suggests no encroachment into the opposing lane on entry and exit manoeuvres. It is proposed that these options are retained and further analysis conducted to verify the feasibility of changes to junction arrangements.

Figure 7 - Proposed improvements to the Riverview Drive/Balloch Way Junction (OS Base Map)

Figure 8 - Proposed improvements to the Riverview Drive/Todlaw Walk Junction (OS Base Map)

O3 & O4 Recommendation:	Retain

O5 – Review the layout of the Riverview Drive/Netherview Avenue Junction

A reduction in kerb radii to 10m and a narrowing of the existing junction is proposed to reduce traffic speeds turning into Netherview Avenue from Riverview Drive. Initial swept path analysis against the OS mapping base for a rigid industrial vehicle suggests no encroachment into the opposing lane on entry and exit manoeuvres. It is proposed that this option is retained, and further analysis conducted to verify the feasibility of changes to junction arrangement.

Figure 9 - Proposed improvement to the Riverview Drive/Netherview Avenue junction (OS Base Map)

O7 – Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer

Early public consultation identified a high frequency of illegal turning manoeuvres occurring from vehicles continuing straight though the 'left only' exit from Stoneywood Road to the Co-op and Marks and Spencer's retail access at Beech Manor. The following minor interventions to improve the current conditions at this junction are considered feasible.

Increasing the existing splitter island radius at the Stoneywood Road junction in conjunction with the introduction of a tapered merge would further guide vehicles north the on A947. The altered kerb line has been indicatively sketched, as shown in Figure 10.

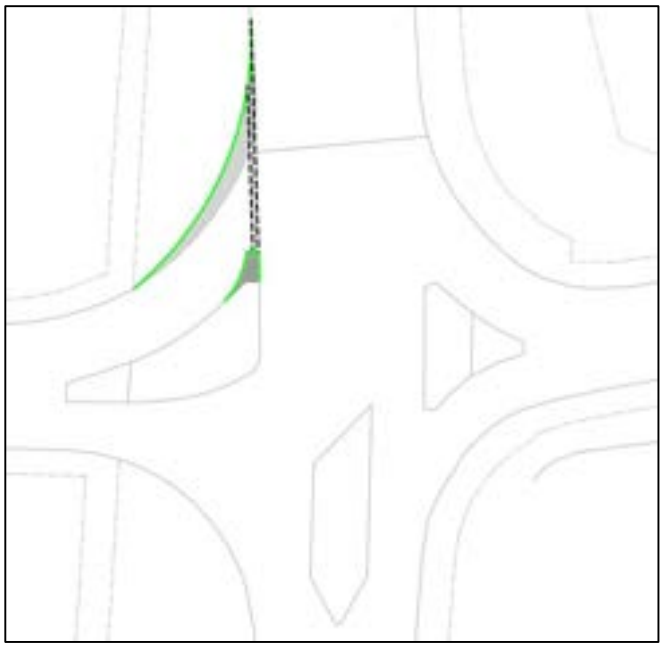


Figure 10 - Indicative kerb adjustments to the A947/Stoneywood Road junction (OS Base Map)

The introduction of a physical island to replace the existing hatch road markings adjacent to the right turn filter lane on the A947 would physically preclude the straight through manoeuvre and present an arrangement consistent with the adjacent Stoneywood Brae junction. This is indicatively shown in Figure 11.

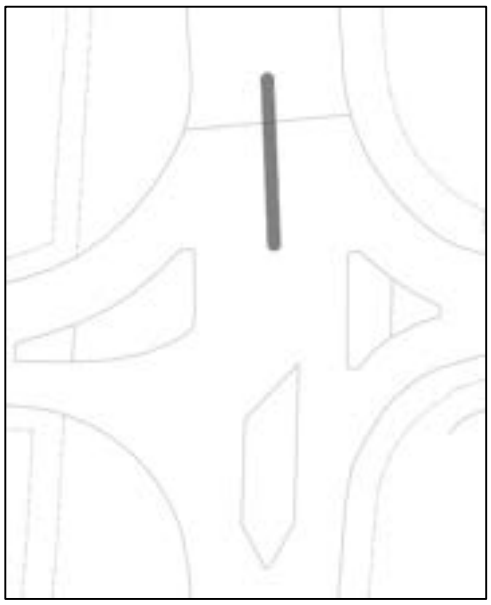


Figure 11 - Indicative location for new road island on A947 (OS Base Map)

Option O7 will be retained and progressed to establish which of the above interventions is most appropriate at the Stoneywood Road junction.

O7 Recommendation:	Retain

O8 – Review the layout of the A947/Stoneywood Brae Junction

Stakeholder consultation raised concerns about vehicle acceleration through the A947/Stoneywood Brae junction as the carriageway transitions from single to dual carriageway, creating a safety risk for on-road cycle users.

An initial review of this junction identified that the existing taper for change in carriageway width is not to the standard set out in DMRB CD 127 Cross Sections and Headroom[9]. The DMRB is the primary referenced standard in this case due to the nature of the road corridor and absence of other overriding guidance specific to the taper length in a local road context. The speed limit on the A947 is 40mph, therefore, a minimum taper ratio of 1:35 is required for implementation of the change in carriageway width. Option O8 is to be retained and proposed alterations to the junction to meet the minimum taper ratio will be developed at the next stage.

O8 Recommendation:	Retain

O10 – Review layout of the A947/McDonalds access road junction

The existing junction radii meets DMRB CD 123 Geometric Design of at-grade Priority and Signal-Controlled Junctions[10] minimum requirements, however there is potential to narrow or reposition the junction to further protect pedestrians using an at-grade crossing north of the access road. The nature of the junction as a primary commercial access adjacent to the trunk road network (A96) promotes the DMRB as the primary reference document. Option O10 will be retained to allow swept path analysis to be conducted of the junction, helping to confirm potential layout improvements.

O10 Recommendation:	Retain

[9] https://www.standardsforhighways.co.uk/search/10442706-b592-42c8-85f8-2a0c779a8e37

[10] https://www.standardsforhighways.co.uk/search/962a81c1-abda-4424-96c9-fe4c2287308c

O16 – Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce.

Further assessment of the project area is required along with engagement with the local community to ensure implemented works best meet their needs within a 20-minute neighbourhood environment. Deliverability and benefits of any additional works would be subject to appraisal in line with various options defined in Tables 1 to 4 of the ACC study brief. This option will be retained for holistic development in conjunction with the other options being delivered.

O16 Recommendation:	Retain

O25 – Implement access only restrictions for general traffic on Victoria Street

Reprioritisation of the A947 along Riverview Drive supports consideration of the implementation of access only restrictions for general traffic on Victoria Street. Further assessment is required to better understand the impacts this would have on residents, local businesses, and key transport service providers. The feasibility of this option will be assessed through various forms of consultation with these stakeholders. There are several deliverability challenges that need to be considered with this option. These include impeded access to key trip attractors in Dyce, Pitmedden and Kirkhill Industrial Estates, Aberdeen International Airport/Heliport, Dyce Rail Station and Dyce Primary School. Option O25 would be most beneficial if rolled out alongside various other active travel improvements. This option will be retained for further holistic consideration and design.

O25 Recommendation:	Retain

O26 – Implement one-way restrictions for general traffic on Victoria Street

Reprioritisation of the A947 along Riverview Drive supports consideration of the implementation of one-way restrictions for general traffic on Victoria Street. Option O26 has similar benefits and constraints as Option O25 with both requiring significant consultation with various stakeholders. Victoria Street is located between two roundabouts to the north and south. Traffic flow analysis would be required to determine the preferred direction of one-way restrictions based on capacity for entering/exiting. Assessment of benefits and feasibility will continue in the next stage of this study, with this option to be retained for further assessment.

O26 Recommendation:	Retain

Summary

Option	Description	Recommendation	Reason for Sifting
AT24	Improve active travel connectivity between the A947 study area and Aberdeen Airport/Heliport	**Move to Table 4 for delivery as a 'Quick Win'**	Well defined remaining measures support progression as a quick win without need for further appraisal.
AT26	Improve active travel connectivity between the A947 study area and TECA	**Retain**	
AT27	Improve active travel connectivity between the A947 study area and Kirkhill Industrial Estate	**Sift**	Delivered in more targeted ways by other options.
AT31	Improve active travel links between the Riverside Path and housing within Dyce	**Retain**	
AT33	Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road	**Retain**	
AT35a	Implement improvements to develop a mixed-traffic street (which allows for safe, on-road cycling) on the local road network to the west of the A947, incorporating Bankhead Road, Greenburn Road and Millhill Brae	**Retain**	
AT41a/b	Improve active travel access to the retail park at the Bucksburn Roundabout	**Retain**	
AT42	Review access to the Formartine and Buchan Way from within Dyce	**Sift**	Delivered in more targeted ways by other options.
AT43	Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)	**Retain**	
AT47	Implement with-flow segregated cycleway on the A947 between AWPR Junction and A947/A96 Junction	**Sift**	Not feasible due to several fixed constraints.
AT48a	Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North	**Retain**	
AT51	Implement with-flow segregated cycleway on Old Meldrum Road	**Retain**	
AT52	Implement two-way segregated cycleway on Old Meldrum Road	**Retain**	
AT55	Implement with-flow segregated cycleway on Gilbert Road	**Sift**	

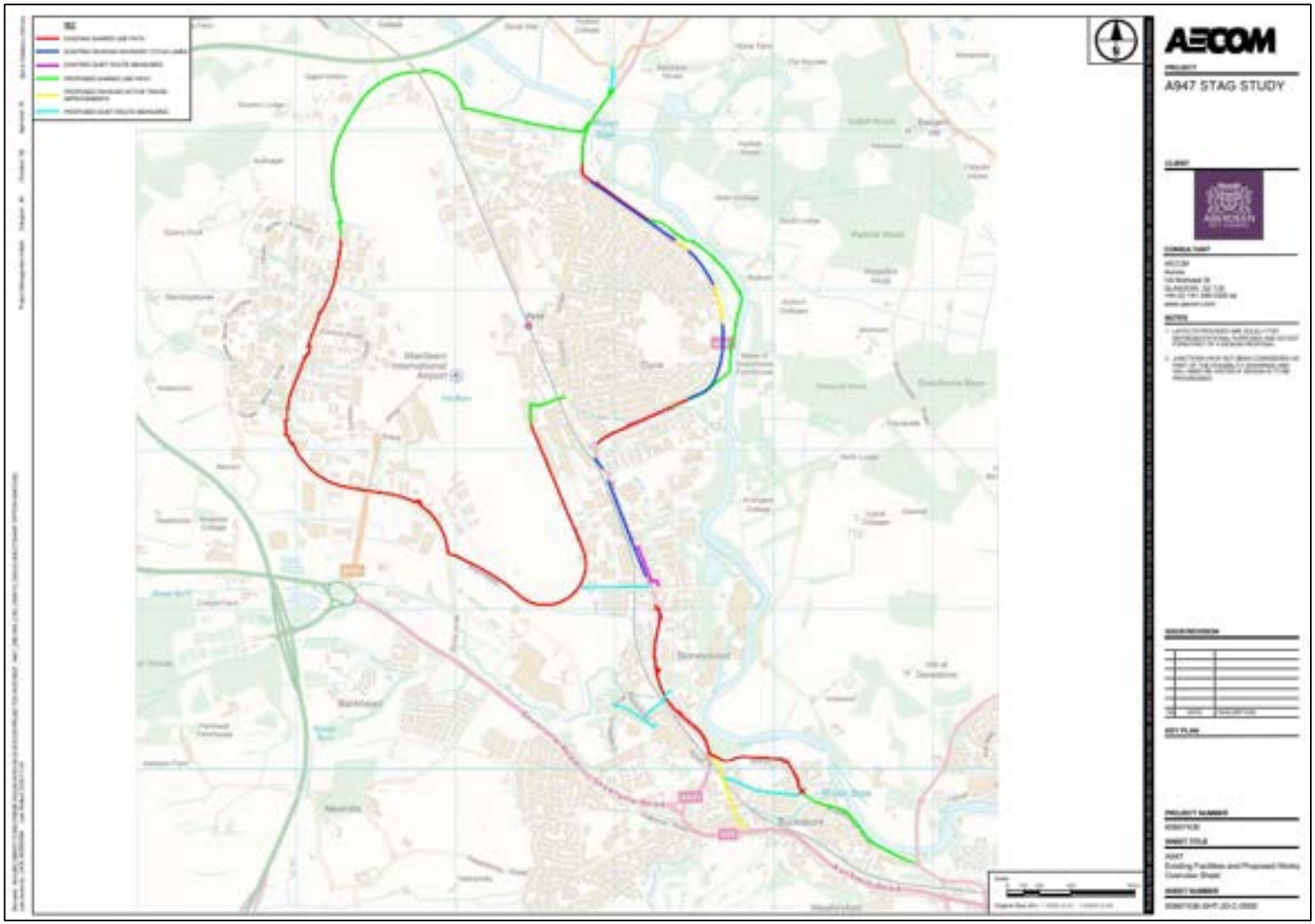
AT56	Implement two-way segregated cycleway on Gilbert Road	**Sift**	Existing corridor width unable to support absolute minimum segregated pedestrian and cycle facilities without reduction in road width below 6m or acquisition of third-party land.
AT58	Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport	**Retain**	
AT61a	Implement package of active travel measures on Victoria Street	**Retain**	
AT62	Widen the shared use path on the east side of the A947 between the A96 and Beech Manor	**Sift**	Part of previous phase – consider residual improvements as part of AT48 option development.
AT64	Implement shared use path on Old Meldrum Road	**Sift**	Two-way segregation being taken forward instead.
AT65	Implement streetscape improvements and widened pavements along Mugiemoss Road	**Retain**	
AT66	Implement shared use path on Gilbert Road	**Sift**	Existing corridor width unable to support absolute minimum shared use facilities without reduction in road width below 6m or acquisition of third-party land.
PT2	Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor	**Retain**	
PT9	Improve public transport connectivity between the A947 study area and Aberdeen Airport/Heliport	**Sift**	Active travel improvements will have knock on benefits to public transport attractiveness.
PT10	Improve public transport connectivity between the A947 study area and Craibstone Park & Ride	**Sift**	
PT11	Improve public transport connectivity between the A947 study area and TECA	**Sift**	
PT12	Improve public transport connectivity between the A947 study area and Kirkhill Industrial Estate	**Sift**	
O2	Review the layout of the Victoria Street/Skene Place Junction	**Retain**	
O3	Review the layout of the Riverview Drive/Balloch Way Junction	**Retain**	
O4	Review the layout of the Riverview Drive/Todlaw Walk Junction	**Retain**	
O5	Review the layout of the Riverview Drive/Netherview Avenue Junction	**Retain**	

O7	Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer	**Retain**
O8	Review the layout of the A947/Stoneywood Brae Junction	**Retain**
O10	Review layout of the A947/McDonalds access road junction	**Retain**
O16	Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce	**Retain**
O25	Implement access only restrictions for general traffic on Victoria Street	**Retain**
O26	Implement one-way restrictions for general traffic on Victoria Street	**Retain**

Next Steps

The retained options from the preliminary option design exercise associated with Table 2 as discussed in this Technical Note will now progress through a design process to inform detailed appraisal and outline design.

Appendix A – A947 Active Travel Provision Map



(Source – OS Opendata Base Map)

Appendix D –
Table 2 Design Technical Note

Delivering a better world

Project:	**A947 Detailed Appraisal & OBC**		
Subject:	**Technical Note - Table 2 Design Overview**		
Prepared by:	**Dan Baines**	Date:	**11/06/2024**
Checked by:	**Steven Smith**	Date:	**12/06/2024**
Verified by:	**Joanne Melarkey**	Date:	**18/06/2024**
Approved by:	**Andrew Robb**	Date:	**19/06/2024**

Introduction

This Technical Note details the Option Development undertaken as part of the Detailed Appraisal and Outline Business Case (OBC) stage of the A947 Multi-Modal Corridor Study. This Option Development exercise focuses on the 'Table 2' options specified for further development, design and appraisal following initial review of the remaining options at the start of the study.

Table 1 – 'Table 2' Options for Detailed Appraisal

Option Ref	Description
AT26	Improve active travel connectivity between the A947 study area and TECA
AT31	Improve active travel links between the Riverside Path and housing within Dyce
AT33	Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road
AT35a	Implement improvements to develop a mixed-traffic street (which allows for safe, on-road cycling) on the local road network to the west of the A947, incorporating Bankhead Road, Greenburn Road and Millhill Brae
AT41a/b	Improve active travel access to the retail park at the Bucksburn Roundabout
AT43	Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)
AT48a	Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North
AT51	Implement with-flow segregated cycleway on Old Meldrum Road
AT52	Implement two-way segregated cycleway on Old Meldrum Road
AT58	Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport
AT61a	Implement package of active travel measures on Victoria Street
AT65	Implement streetscape improvements and widened pavements along Mugiemoss Road
PT2	Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor
O2	Review the layout of the Victoria Street/Skene Place Junction
O3	Review the layout of the Riverview Drive/Balloch Way Junction
O4	Review the layout of the Riverview Drive/Todlaw Walk Junction
O5	Review the layout of the Riverview Drive/Netherview Avenue Junction
O7	Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer
O8	Review the layout of the A947/Stoneywood Brae Junction
O10	Review layout of the A947/McDonalds access road junction
O16	Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce

Option Ref	Description
O25	Implement access only restrictions for general traffic on Victoria Street
O26	Implement one-way restrictions for general traffic on Victoria Street

General arrangement (GA) layouts for the design-orientated options are available in Appendix E of the Detailed Appraisal Report and the basis of design, key design details and recognised risks and unknowns are discussed within the main body of this Technical Note.

Design Guidance Overview

Cycling by Design provides guidance for permanent active travel infrastructure design in Scotland and has been considered and referenced throughout this Technical Note. The guidance defines 'desirable minimum' and 'absolute minimum' widths for various forms of active travel facility. 'Desirable minimum' widths should be considered as the minimum requirement and reductions below this level should only be applied where specific constraints are identified, such that it cannot be reasonably achieved. In such cases, limited reductions are permissible, but the highest achievable standard should be maintained. 'Absolute minimum' widths represent the scope of permissible reduction to the requirement. Where elements of the design are subject to statutory obligations, these must be adhered to.

The Cycling by Design footway and cycle track width requirements for different cycle track types are outlined in the table below.

Table 2 – Cycling by Design Track Width Requirements

Cycle Track Types		Footway Width	Cycle track width *One-way, less than 300 cycles per hour peak*	Cycle track width *Two-way, less than 300 cycles per hour peak*
Remote Cycle Tracks Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Remote Cycle Tracks Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m
Cycle Tracks adjacent to carriageway Separated from pedestrians	Desirable minimum	2.0m	2.0m	3.0m
	Absolute minimum	1.5m	1.5m	2.0m
Cycle Tracks adjacent to carriageway Shared with pedestrians	Desirable minimum	N.A.	Not Recommended	4.0m
	Absolute minimum	N.A.	Not Recommended	2.5m

In addition to the direct width of the usable facility, consideration of the minimum buffer width for a facility adjacent to a carriageway is also required and is defined by the posted road speed limit. Table 3 is also taken from Cycling by Design and outlines these minimum requirements.

Table 3 – Minimum Buffer Widths

Speed Limit	Minimum Buffer Width
30mph	0.5m
40mph	1.00m
50mph	2.00m (including any hard strip)
60mph	2.50m (including any hard strip)
70mph	3.50m (including any hard strip)

The Design Manual for Roads and Bridges (DMRB) has also been referenced in this Technical Note. The DMRB provides design guidance for the development of the trunk road network in the UK. Where no standard specific to the local road network is available, the DMRB becomes the primary point of reference and the requirements set out within the standards were considered to evaluate road layout interventions and opportunities in accordance with several of the Table 2 options.

Active Travel Option Appraisal

AT26 – Improve active travel connectivity between the A947 study area and TECA

The Event Complex Aberdeen (TECA) was designed with an extensive core path network which provides active travel users access between the facilities on site and the A947 study area due to their shared use classification. There is a mixture of surface makeups across the network between bound and unbound. Based on Cycling by Design's core design principle of Comfort, the sections of unbound surface provide a low level of service to users.

The focus of option AT26 is to upgrade the existing unbound surfaces to a bound makeup and widen where suitable to Cycling by Design's desirable minimum width requirement of 4.0m for shared use as outlined in Table 2. The current unbound surfaces are located to the east, west and south of TECA and are approximately 2.0m wide; upgrading the surface and widening will provide a higher level of service to users and as a result, improve connectivity between TECA and the study area.

Key Design Features:

- Resurfacing of unbound paths to the east, west and south of TECA to a bound asphalt surface.
- Widening of existing 2.0m paths to 4.0m desirable minimum width with new footpath construction.
- Introduction of additional wayfinding signage at the entrance/exit locations throughout the path network.

Risks and Unknowns

There is no proposed change to the existing route topography however gradients should be reviewed against survey data to evaluate compliance with Cycling by Design guidance in line with the design review process.

Existing drainage to be reviewed and assessment carried out to understand if existing system can handle the additional surface runoff from the widened footpaths.

Some existing vegetation will require removal to accommodate widening. Preliminary ecological appraisal would be required to inform impact and constraint mapping.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT26 is £1,114,000 including risk and contingency at 44%.

AT31 – Improve active travel links between the Riverside Path and housing within Dyce

The Riverside Path runs adjacent to the River Don and connects into the southbound verge of Riverview Drive at two established locations, east of Overton Circle and east of Balloch Way. The current connection between the Riverside Path and housing in Dyce is through informal dropped kerb crossings on Riverview Drive which do not meet desirable accessibility requirements. Connection improvements across Riverview Drive, as covered by Table 1 options AT14 and AT60, promote improved connection with the Riverside Path network at key existing locations.

A review of pedestrian desire lines has been undertaken to determine potential missing links between the Riverside Path and nearby housing areas. A worn section of verge was identified south of the Todlaw Walk junction, approximately 280m south of the established Riverside Path entrance.

Figure 1 – Worn verge at Todlaw Walk (Site walkover photo)

Proposed works to formalise this connection would include a new uncontrolled crossing on Riverview Drive and approximately 40m of a new bound surface from the Riverside Path to Riverview Drive. Suitable wayfinding signage would also be required on the new proposed bound surface.

The proposed uncontrolled crossing would provide dropped kerbs and tactiles along with a reconfiguration of the existing island to bring this in line with current inclusive design standards. The proposed new island would be widened to 3.0m resulting in the narrowing of the carriageway lanes at this point to 3.4m each. Localised realignment of the kerb on approach to the island would be required to support carriageway narrowing at an appropriate taper. The narrowing on approach to the island would provide a secondary benefit through provision of a minor traffic calming effect.

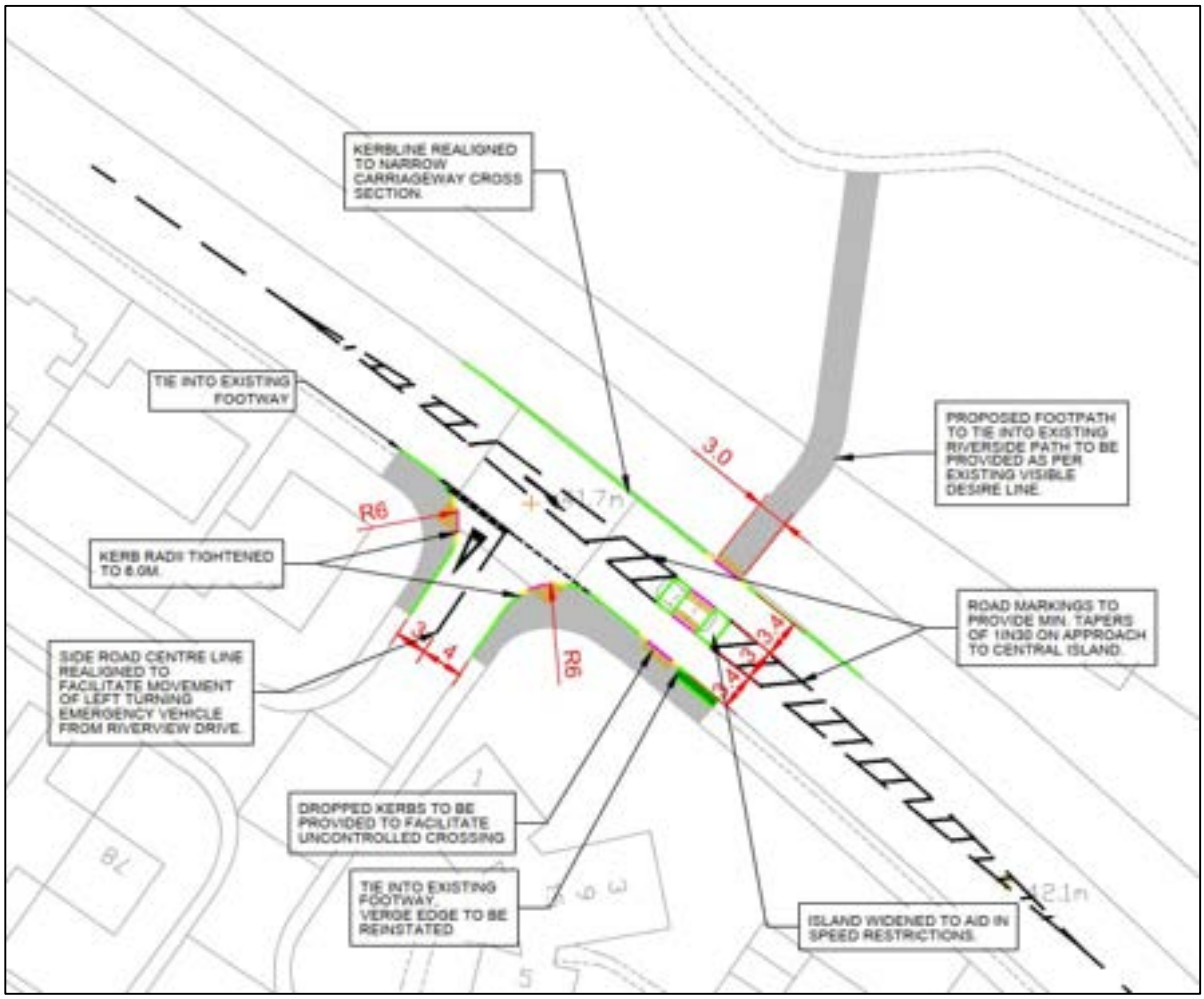


Figure 2 – Proposed crossing and footpath arrangement

Key Design Features:

- New 3.0m wide island to be provided on Riverview Drive, narrowing carriageway lanes to 3.4m at crossing to impact upon traffic calming on approach to the crossing.
- Dropped kerbs and tactiles to be provided over Riverview Drive to facilitate the movement of pedestrians from the Riverside Path.
- New 40m bound footpath to be provided from Riverside Path and Riverview Drive, with appropriate wayfaring signage.
- 1in30 hatched tapers to be provided on approach to proposed widened island.

Risks and Unknowns

Existing ground conditions of proposed footpath between Riverview Drive and the Riverside Path are to be determined and due to the lack of topographical information, the drainage requirements are unknown. Porous asphalt may require consideration to maintain existing surface water infiltration.

Proposed island crossing would not be feasible if Option AT48a is implemented to introduce a two-way segregated cycleway along Riverview Drive. The Riverside Path connection could still be developed alongside Option AT48a, however accessibility from housing within Dyce would be compromised.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT31 is £56,000 including risk and contingency at 44%.

AT33 – Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road

Station Road is the main link between Dyce Rail Station and Victoria Street. The corridor consists of a 5.5m carriageway with 1.5m footways each side and parking restrictions at various locations throughout. Due to low traffic volumes and speeds along Station Road, the introduction of one-way side roads is proposed as part of the associated Option O2.

The introduction of a one-way system on Station Road and adjacent streets allows the opportunity for the adoption of a contra-flow cycle lane on Station Road for direct cycle access to and from the Dyce Railway Station. The proposed cycle lane varies in width between a desirable minimum 2.0m and 2.2m to ensure the constant reduced width of the carriageway to an absolute maximum 3.2m width. Existing on-street parking would be removed to accommodate the formalised allocation of existing carriageway space for the contra-flow lane. There is minimal scope to provide widened footways without compromising the contra flow cycle lane and vehicle swept path on Station Road. It is therefore proposed that existing absolute minimum width footways are retained.

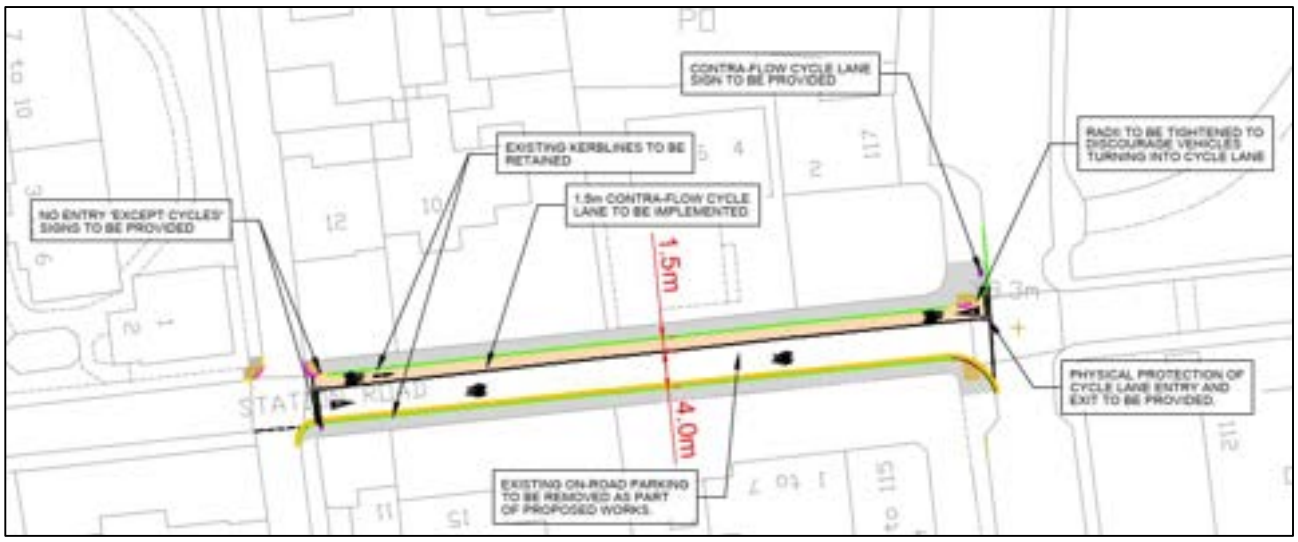


Figure 3 – Proposed layout of new segregated cycleway on Station Road

Key Design Features:

- Contra-flow cycle lane is to be provided with the one-way carriageway lane reduced to 3.2m in width, allowing the provision of a minimum 2.0m cycle lane. The proposed one-way system will form part of Option O2.
- Physical protection at the start and end of the cycle lane is provided to reduce the risk of encroachment into the cycle lane.
- The new one-way system and exception to the one-way restriction is to be indicated by signs advising of the exception.
- Existing footways widths of 1.5m are to be retained.
- All on-street parking is to be removed as part of this option due to the proposed cycle lane on the south side of Station Road. To the north of Station Road, the existing double yellow lines are to be retained.
- Radii on exit of cycle lane is to be tightened to deter vehicles from turning into the cycle lane.

Risks and Unknowns

On-street parking for residents will be removed along Station Road for residents; while most residents seem to have access to off-street parking spaces, there is a risk they may park and obstruct the cycle lane. A parking survey should be undertaken to understand the risk of this occurring.

Utility chambers are observed throughout the existing street. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, Scottish Water and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT33 is £84,000 including risk and contingency at 44%.

AT35a – Implement improvements to develop a mixed traffic street (which allows for safe, on-road cycling) on the local road network to the west of the A947, incorporating Bankhead Road, Greenburn Road and Millhill Brae

Following a review of Option AT35, the wording of the option was redefined to broaden the scope from focusing on quiet route measures to active travel improvements. The option reference has now been updated to AT35a to reflect this change. Following on from the Preliminary Option Development Technical Note, active travel improvements for this option have been focused along Bankhead Road, Greenburn Road and Millhill Brae. Both Millhill Brae and Greenburn Road have been reviewed within the proposed active travel improvements as they have been highlighted as key connecting roads to Bankhead Road for active travel users. There is an underpass at the end of Millhill Brae which provides users with access to the east of the A947 and potential longer distance strategic active travel connections as promoted by Option AT48 as part of this study.

Due to the constrained nature of Greenburn Road and a requirement to retain residential parking, the options that can be implemented are limited. As a result, it is proposed that Greenburn Road is promoted as a quiet route in conjunction with traffic calming measures to provide a safer environment around Stoneywood School. To implement a traffic calming effect on Greenburn Road, a give-way chicane has been proposed with vehicles from Bankhead Road giving way to vehicles from Greenburn Drive – this will slow vehicles down on approach to Stoneywood School, providing a safer traffic environment. In addition, a dropped kerb will be provided on the buildout to allow active travel users to cross to the car park opposite the school and the stepped access down to Bankhead Road. The give way location is proposed on the side of the school to minimise impact on existing on-road parking.

Further improvements to pedestrian accessibility and permeability in the area are proposed with the introduction of raised tables at the Crossgates, Station Road and Millhill Brae junctions with Bankhead Road. These would provide a higher level of connectivity and priority to pedestrians, emphasising road user hierarchy priority in line with changes to the highway code. Additional calming measures west of the A947 where an existing island is located are proposed with the carriageway lanes either side of the island reduced to 3.2m, helping to encourage lower vehicle speeds in conjunction with the quiet route. The benefit of this measure is as a result of widening the footway and narrowing the carriageway there has been no impact upon the parking within the area. Similarly at the Bankhead Road/Crossgates junction, the

footways have been widened to narrow the carriageway lanes to 2.9m while the protected right turn lane into Crossgates has been widened to 3.0m.

To improve accessibility from Stoneywood School along Millhill Brae and through the underpass to the A947, a signalised crossing has been proposed as part of the improvements to replace the existing unsignalised island crossing as shown in Figure 44. To further enforce the quiet route measures where the signalised crossing has been proposed, the carriageway has been narrowed to 6.4m. Further improvements to Millhill Brae include the widening of the footway at the eastern end of the road and the provision of a dropped kerb, along with Millhill Brae being proposed as a quiet road.

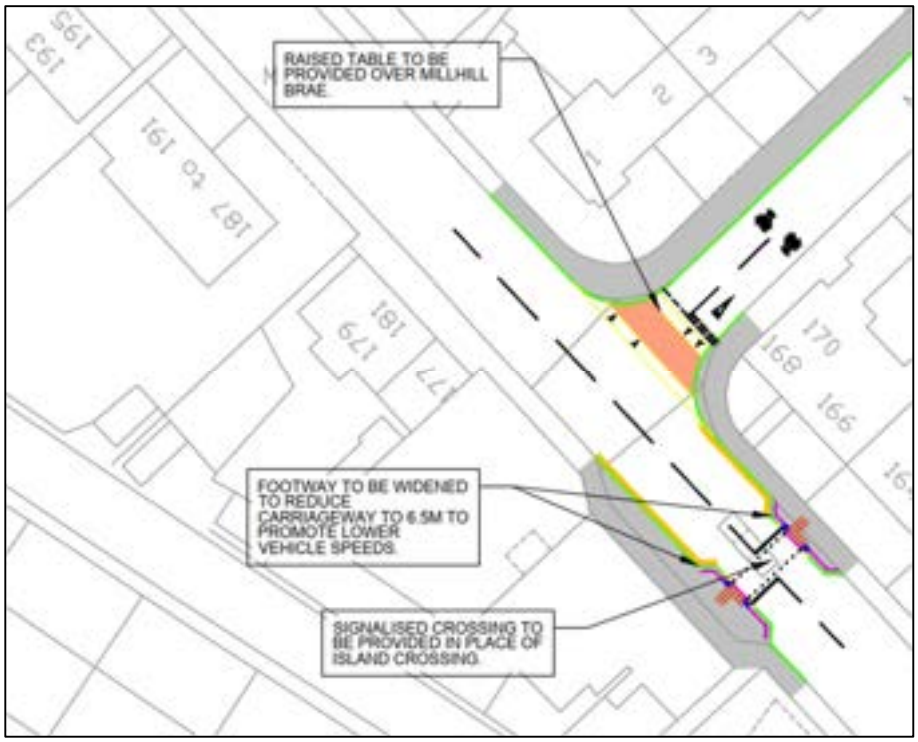


Figure 4 – Proposed widening of footway to provide a new signalised crossing

Key Design Features:

- Raised tables implemented on the Millhill Brae, Crossgates and Station Road junctions with Bankhead Road.
- Signalised crossing to replace island crossing on Bankhead Road near junction with Millhill Brae and carriageway narrowed to 6.4m at crossing.
- Quiet road implemented along Millhill Brae and Greenburn Road.
- Footway widened and dropped kerb provided at eastern end of Millhill Brae to provide improved connections to the underpass.
- Carriageway narrowed to provide 2.9m lanes at Crossgates junction with Bankhead Road, with footway to be widened to facilitate the change.
- Carriageway lanes narrowed to 3.2m at island on Bankhead Road east of A947, with footway to be widened to facilitate the change.
- Existing island crossings located near Crossgates junction with Bankhead Road to be upgraded providing tactiles.
- Eastern Bankhead Avenue Radii to be tightened to 6.0m. Narrowing of western radii not feasible due to bus movements.
- Existing access opposite Crossgates to provide a continuous footpath with a dropped kerb access for vehicles due to the limited properties using the lane for access.
- Chicane give-way island to be implemented on Greenburn Road in front of Stoneywood School.

Risks and Unknowns

Utility chambers are observed throughout the existing street. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, Scottish Water, SGN and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

Drainage conditions to be investigated due to proposed works within existing carriageway. It is noted that the introduction of the raised table crossings at the junctions may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

The proposed signalised crossing and associated widening would impact an existing access restricted lay-by which is potentially utilised for servicing and loading for the adjacent Bankhead Inn. Further engagement is required to determine the purpose and frequency of use of the lay-by.

A small section of parking will be impacted near Stoneywood School to allow the movement of vehicles around the proposed give-way chicane.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT35a is £299,000 including risk and contingency at 44%.

AT41a – Improve active travel access to the retail park at the Bucksburn Roundabout (Shared Use Option)

Following the recent installation of a toucan crossing on the A947, north of the Old Meldrum Road junction, there is a new opportunity to create an active travel link to the retail park along the A947 corridor. The A947 widens to a dual carriageway in this area which presents two options for the new active travel link. Option A focuses on upgrading the existing shared use facility west of the A947 between the toucan crossing and the retail park at Bucksburn Roundabout. The existing footway varies in width between 1.8m and 3m between the crossing and retail park with available verge space at the rear of the footway which could be utilised for widening to 4m wide with 1m buffer in line with Cycling by Design guidance for shared use. Through the retail park, the limited verge width restricts opportunity to widen existing footways with a maximum of 3m feasible. This is in excess of the absolute minimum defined in guidance for shared use and would still be considered to present an improvement on existing provision. Raised table crossings of the two existing service roads off the main retail park access are also proposed to improve accessibility and emphasise priority for active travel users.

Figure 5 – Proposed widened shared use arrangement

Key Design Features:

- Existing shared use footways west of the A947 widened to 4m using available verge space at rear.

- Existing footways at entrance to retail park widened to 3m using available verge space and promoted as shared use.
- Two raised tables introduced at side roads near the retail park entrance.
- Lighting columns to be relocated at the back of upgraded footways.
- Cycleway and footway to change to shared use footway on approach to Option O10/AT48a due to physical constraints. Tram/ladder tactiles to indicate the change from segregated to shared surface. Two raised crossings will be provided across two accesses as part of the shared use footway, widening the existing footway from 2m to 3m.
- Shared area to be provided at new toucan crossing where segregated cycleway and footway end, with tram/ladder tactiles to indicate the change from segregated to shared surface.

Risks and Unknowns

Utility chambers are observed throughout the existing footway. A C2 preliminary inquiry has been carried out and identified Scottish Water as a supplier who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

Drainage conditions to be investigated due to increased surface runoff. It is noted that the introduction of the raised table crossings may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT41a is £153,000 including risk and contingency at 44%.

AT41b – Improve active travel access to the retail park at the Bucksburn Roundabout (Segregated Option)

Reduction of the northbound carriageway to one lane, as shown in Figure 6, would facilitate a segregated two-way cycleway between the retail park and the new crossing facility to the north on the A947 in accordance with Cycling by Design's desirable minimum width. In line with the Traffic Signs Manual, a 1 in 40 taper would be required on the approach to the lane reduction. This would result in the reduction beginning approximately 100m north of the exit of Bucksburn Roundabout.

Figure 6 – Proposed segregated cycleway layout and A947 road taper

The proposed design will provide a segregated footway and two-way cycleway along with a 1m buffer which is required for roads with speed limit of 40mph in line with Cycling by Design guidance. The cycleway is to commence at the new toucan crossing at the top of Old Meldrum Road and combine with the proposed upgrades as part of Option O10/AT48a where the pedestrian and cycle facilities merge into a shared use area. The cycleway and footway will be vertically segregated with the cycleway at carriageway level. The existing bus stop will be retained as part of the design and reconfigured into a bus stop bypass where the cycleway will be ramped up on the approach and narrowed to 2m due to corridor width constraints. Shared use areas are to be provided on approach to Option AT48a and the new toucan crossing at the top of Old Meldrum Road. The shared use provision will extend into the retail park with raised table crossings of the two service accesses proposed to improve accessibility and emphasise priority for active travel users.

Key Design Features:

- Segregated 3m two-way cycleway at carriageway level with 1m raised buffer to be provided. Footway to be narrowed to a desirable minimum 2m where required and A947 northbound road carriageway reduced from two lanes to one.
- Bus stop retained and reconfigured as a bus stop bypass, cycleway to be ramped up and narrowed to 2m to slow cyclists on approach. Zebra crossing and tactiles to provide pedestrians with safe crossing over the cycleway.
- Lighting columns to be relocated where required to facilitate proposed cycleway.
- Raised table crossings provided across the two service accesses off the main retail park access as part of the shared use footway, widening the existing footway from 2m to 3m.
- Shared use area to be provided at new toucan crossing where segregated cycleway and footway end, with tram/ladder tactiles to indicate the change from segregated to shared use surface.

Risks and Unknowns

Utility chambers are observed throughout the existing footway. A C2 preliminary inquiry has been carried out and identified Scottish Water as a supplier who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low; however these suppliers will be engaged throughout future design stages.

It is assumed that breaks would be provided within the buffer to maintain A947 surface runoff flow paths as existing and minimise need for additional drainage features. It is noted that the introduction of the raised table crossings may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Further analysis of the operational impact on the A947 would be required if the option to reduce from two to one lane was taken forward. There is a noted risk of delay in relation to stationary buses at the St John's Road bus stop impeding traffic behind. There may be opportunity to reduce the central reserve width or reduce the posted speed limit to enable relaxation in the cycle buffer width and more efficiently allocate space within the corridor. Further investigation would be required to establish feasibility if this option was to be taken forward and traffic implications were recognised as a major constraint.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT41b is £562,000 including risk and contingency at 44%.

AT43 – Implement active travel connection between the A947 and the B977, utilising a section of the old A947 (pre-AWPR)

A section of the former A947 was repurposed for local access only when the primary route was diverted to align with new infrastructure as part of the AWPR project. The short section of former A947 spans between the revised A947 alignment and the B977. An existing access onto the Formartine and Buchan Way (F&B Way) is located approximately 100m to the north, off the B977. There is a short section of unbound footpath which connects the new and former A947 corridors and links with bus stops on the new route. Dropped kerbs provide informal pedestrian access across the A947 between the north and southbound bus stops.

The proposals for Option AT43 focus on improvements to the existing connection between the old and new A947 which is approximately 1.5m wide and comprises an unbound surface. There is adequate verge space to widen the existing footpath to a shared use path in line with Cycling by Design's desirable minimum width of 4m, and to upgrade to a bound surface, offering a higher level of service in comparison to the existing conditions. A 1.0m grass buffer could be maintained between the shared use path and carriageway for added protection for users. The existing uncontrolled crossing at this location, as shown in Figure 7, is proposed for upgrade with provision of dropped kerbs and tactiles to facilitate improved accessibility between the northbound and southbound A947 bus stops as well as to provide greater connectivity with the extended shared use route towards Dyce as is being progressed under Option AT59.

Figure 7 – Existing uncontrolled crossing

On the north side of the proposed widened shared use path between the new and old A947, the short section of former A947 would provide appropriate low traffic volume and speed conditions for promotion as a mixed-traffic street. However the opportunity to improve the extended connectivity along the B977 onto the F&B Way is constrained by the existing narrow road corridor, notably at the F&B Way overbridge, below desirable standard geometry and higher traffic speeds associated with the 60mph posted speed limit of the B977.

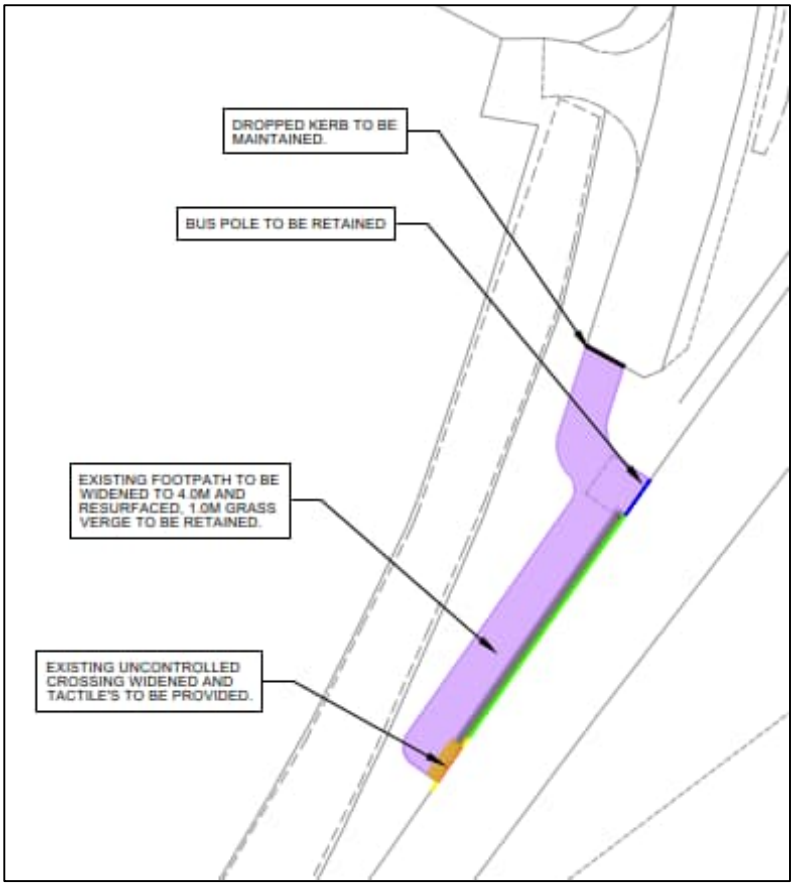


Figure 8 – Proposed path improvements

Key Design Features:

- Existing unbound footpath widened to 4.0m and a bound surface provided.
- 1.0m grass verge buffer maintained between the shared use footpath and carriageway.
- Existing uncontrolled crossing widened to 4.0m and tactiles provided.
- Existing bus stops and accessible kerbs maintained and surface on approach to bus stops upgraded from unbound to bound surfaces.

Risks and Unknowns

Existing gullies located along the carriageway edge may need to be relocated away from the proposed uncontrolled crossing to avoid the risks of slips, trips and falls.

Utility chambers are observed throughout the existing footway. A C2 preliminary inquiry has been carried out and identified BT as a supplier who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however this supplier will be engaged throughout future design stages.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT43 is £62,000 including risk and contingency at 44%.

AT48a – Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North

In order to capture sections along the A947 which are not considered under other targeted active travel options and to promote an overall coherent and connected network, AT48 has been reworded to incorporate the evaluation of solutions which offer a high level of service between the Bucksburn Roundabout and Riverview Drive Roundabout North, through the implementation of new shared use and segregated cycleway facilities. This would enable active travel improvements along the entirety of Riverview Drive. The option reference has now been updated to AT48a to reflect this change.

A mapping exercise was carried out to review any existing and proposed active travel facilities along the A947 corridor between the AWPR junction and the A947/A96 junction. The overview map created is shown in Appendix A. The was developed to understand the cumulative extents of the proposed active travel links and to identify any gaps in provision and potential missing links. Subsequently, improvements in the following sections will be taken forward: Bucksburn Roundabout to Old Meldrum Road, Old Meldrum Road to Stoneywood Brae and Stoneywood Brae to Beech Manor, with this option then extending as far as Riverview Drive Roundabout North.

Bucksburn Roundabout to Old Meldrum Road

Proposed improvements between the Bucksburn Roundabout and Option AT41 connecting to Old Meldrum Road would tie-in with the segregated cycleway improvements proposed and advancing as part of the A96 Multi-Modal Corridor Study as indicatively shown in Figure 99. There are no existing cycle or pedestrian facilities on the A947 corridor between Bucksburn Roundabout and the Bucksburn Retail Park access.

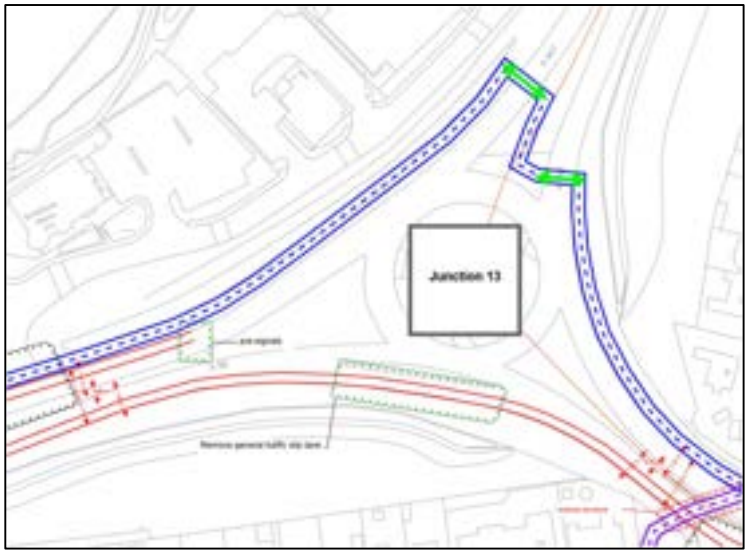


Figure 9 – Proposed Bucksburn Roundabout configuration proposed as part of the A96 Multi-Modal Corridor Study

Due to there being adequate verge space with the adjacent A947 (subject to a 40mph posted speed limit in this area), it is proposed a 3m two-way cycleway will be provided adjacent to the A947 with at least a 1m buffer provided between the cycleway and carriageway. The proposed cycleway will be located within the existing grass verge, connecting with the improved facilities proposed as part of Option AT41 at the north end. The existing raised table/speed ramp across the retail park access road is proposed to be upgraded as part of the interventions to provide a priority cycle crossing.

Key Design Features:

- Segregated 3m two-way cycleway at carriageway level with 1m buffer to be provided adjacent to carriageway, before diverging to cross the retail park access road.
- Existing raised table/speed ramp across access road to be upgraded as part of proposals to provide a priority cycle crossing and connect the segregated cycleway with the shared footway proposed as part of Option AT41 and extended network to the north.

Risks and Unknowns

Configuration of the proposed layout is subject to change relative to the advancement and design development of the active travel facilities as part of the A96 Multi-Modal Corridor Study.

Utility chambers are observed throughout the existing footways and available verge space. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

Lighting columns located within the A947 road verge may require relocation to accommodate the proposed works.

There is a potential requirement for minor earthworks to regrade the existing A947 road verge to accommodate the segregated cycleway cross section.

Old Meldrum Road to Stoneywood Brae

Due to constraints on the existing A947 road corridor between Old Meldrum Road and Stoneywood Brae, minimal intervention is proposed. An existing shared use footway with minimum 2.75m width is located in the southbound verge. A large embankment at the rear of the footway presents a constraint to improvement with significant engineering works required to allow widening of the existing facility. Consideration was given to widening to the footway on the west of the A947, however, to ensure continuity of the facility and connection with Old Meldrum Road to the east, this was discounted. Immediately north of the constrained section, the flatter topography and verge space would enable the shared footway to be widened to a desirable minimum 4m up to Stoneywood Brae.

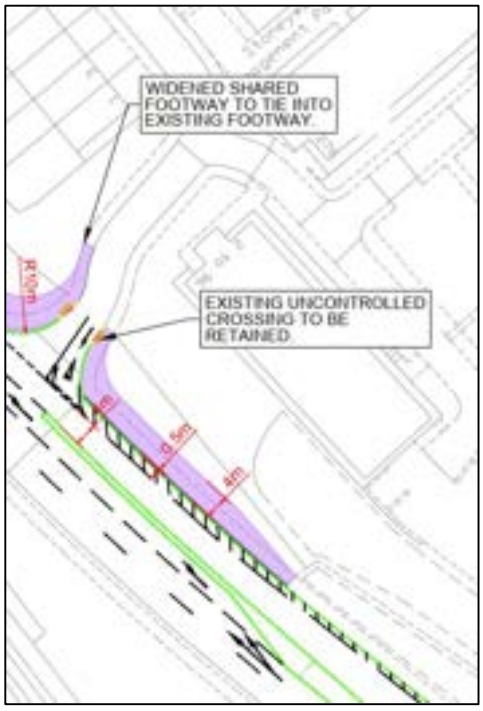


Figure 10 – Proposed section of footway widening

Key Design Features:

- Approximately 50m of localised widening of existing shared use footway to 4m towards Stoneywood Brae.

Risks and Unknowns

Potential requirement for minor earthworks to regrade verge at back of existing footway.

Lighting columns located within the A947 road verge may require relocation to accommodate the proposed works.

Stoneywood Brae to Wellheads Avenue

Improvement on the existing shared use footways, advisory cycle lanes and on-road quiet routes for active travel are proposed between Stoneywood Brae and Wellheads Avenue. Constraints relative to specific sections of the A947

corridor in this area dictate the achievable provision, but the highest practicable level of service has been targeted with a combination of segregated cycleways and shared use footways proposed.

Between Stoneywood Brae and Beech Manor, the existing shared use footway on the east side of the A947 will be upgraded to a 3m segregated two-way cycleway facility with 0.5m buffer and 2m footway by widening into the available verge space, retaining the carriageway width as existing. The proposed works will tie into the existing residential footway networks and the toucan crossings at Beech Manor. This existing controlled crossing layout will be used to facilitate connection with the active travel network which continues on the west side of the A947 to the north of Beech Manor.

A combination of segregated and shared use active travel improvements are proposed between Beech Manor and Market Street with the segregated cycleways proposed where adequate existing verge space is available and free from constraints such as fixed property boundaries, established vegetation and drainage features.

The geometry of the south Stoneywood Road junction located across from Beech Manor is proposed to be altered and the A947 locally narrowed to facilitate the widening of the pedestrian area and narrowing of the existing toucan crossing length to 9m. Property boundaries are present to the west of the current shared footway for approximately 200m and limit opportunity for fully segregated provision, however available verge space could still be utilised to widen the existing footway to a 4m desirable minimum for shared use and introduce a 0.5m buffer strip separation from the A947 carriageway. As the verge space increases on approach to north Stoneywood Road junction, the current footway can be upgraded to a 3m wide two-way segregated cycleway with adjacent 2m footway for approximately 200m, offering a high level of service to users.

The narrow A947 road corridor on approach to the Market Street junction with close adjacent property boundaries presents a constraint for active travel improvements. It is proposed that the carriageway would be narrowed by 1m, where this can be accommodated without reducing the number of approach lanes to the junction, to enable footway widening to an absolute minimum 2.5m shared use width with accompanying 0.5m buffer strip. This upgraded shared use footway would then tie into the existing controlled crossing located across the Market Street junction.

Between Market Street and Cedar Avenue there is an opportunity to repurpose 2m to 2.5m of existing road space which is allocated to advisory on-road cycle lanes to facilitate the widening of the existing pedestrian footways to a desirable minimum 4m for shared use with a 0.5m buffer strip. Widening of the footway will provide an opportunity to improve on the current National Cycle Network (NCN) route which directs users off the A947 and on-road through Polo Gardens.

North of Cedar Avenue, where the A947 Stoneywood Road is no longer bounded by properties on the west, the additional space offered by the existing verge would allow for a two-way segregated cycleway to extend to tie-in to the improvements as part of Option AT16 just north of Wellheads Avenue. Potential impacts on established vegetation and trees within the verge will dictate the optimum location for transition from shared use to segregation and inform construction.

Key Design Features:

- Reallocation of road space and utilisation of available verge space to upgrade existing active travel facilities to provide the optimum segregated or shared use facility within the space available and in recognition of the range of constraints which apply to specific sections of the corridor.
- 0.5m wide buffer strips between active travel facilities and the A947 road carriageway incorporated on all sections to provide separation from vehicular traffic.
- Existing formal crossing locations retained, and accessibility improved.

Risks and Unknowns

Lighting columns, signage and street furniture would be required to be relocated where the existing footway/shared use path is proposed to be widened into the verge space to accommodate an improved facility. Impacts on established vegetation will also inform design methodology.

Existing road drainage gullies would be required to be relocated as part of the proposed works where the existing kerb line is proposed to be amended to accommodate an improved segregated or shared use active travel link. Further consideration should be given to the increased paved surfaced area and capacity of the existing drainage network to cope with additional runoff as part of future stages of the works.

There is a potential requirement for minor earthworks to regrade verges to tie-in widening with the existing topography.

Utility chambers are observed throughout the existing footways and available verge space. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low; however these suppliers will be engaged throughout future design stages.

Riverview Drive South to Central

The existing 3m wide shared use footway along the southern straight of Riverview Drive is approximately 550m long and spans between the Riverview Drive/Stoneywood Road roundabout and Burnside Drive. In conjunction with the active travel improvements planned along Stoneywood Road, it is proposed that this existing link is also upgraded as part of Option AT48a to promote the highest level of service for users and create a coherent and continuous network along the A947 corridor.

Utilising the available verge space around the existing footway will allow for the introduction of a two-way segregated cycleway and pedestrian footway in place of the existing shared use facility, as outlined in Figure 11.

Figure 111 – Proposed segregated arrangement along the southern extents of Riverview Drive

There is sufficient available verge space at this location to support a facility which meets the desirable minimum widths for segregation as outlined in Cycling by Design, while also maintaining the existing grass verge buffer to the A947. Localised sections of shared use would be proposed at the connections with the residential area and existing signalised crossings. The segregated cycleway would transition to shared use on approach to Burnside Drive to tie-in with improvements to the existing crossing and connection to the Riverside Path which are covered under Options AT4 and AT60 as part of the Table 1 list of interventions. Tactile paving would be incorporated and upgraded as appropriate in line with national accessibility guidance to designate transition between shared and segregated spaces.

Key Design Features:

- Verge space proposed to be used to widen existing shared use footway to provide a 3m wide two-way segregated cycleway and 2m wide footway.
- Localised sections of shared use at interface with existing footway connections and Riverview Drive signalised crossing locations.
- Proposed design would tie-in to Options AT4, AT60 and AT16 from the Table 1 list of interventions to the east and west respectively to support a connected and continuous active travel route along the A947 corridor.

Risks and Unknowns

Utility chambers are observed throughout the existing footways and available verge space. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low; however, these suppliers will be engaged throughout future design stages.

The effectiveness and value of the improvements along the south section of Riverview Drive is dependent on the progression of Options AT4, AT60 and AT16.

Riverview Drive Central to North

Proposals to upgrade the Riverside Path to a high-quality active travel route, including improvements to the surfacing of the route, are being progressed separately by ACC as part of the Table 3 list of interventions.

Improvements on the northern section of the A947 Riverview Drive corridor are proposed as part of Option AT48a as a more direct alternative. It is proposed that the 3m of road space allocated to the existing on-road advisory cycle lanes and 1m grass verge strip at the roadside are repurposed, redistributing the traffic lanes and providing a two-way segregated cycleway with buffer separation in the northbound channel.

The existing on-road advisory lanes are discontinuous across the junctions, significantly up and downstream of Netherview Avenue where a ghost island provides space for right turning vehicles from the north. In order to maintain existing traffic conditions and accommodate a continuous active travel connection, localised realignment of the A947 road into the southbound verge would be required over an approximate 300m length.

Where spatial constraints exist with third party land at the Todlaw Walk and Balloch Way junction crossings, it is proposed that the segregated route would transition to localised shared use space.

Key Design Features:

- 3.0m wide two-way at-grade segregated cycleway with a 1.0m raised buffer on the northbound side of the Riverview Drive carriageway commencing 200m east of the Overton Circle junction.
- 2.0m wide footways directly adjacent to the cycleway with no impact to existing property boundaries.
- Approximately 550m^2 of new carriageway construction over a 300m length in the vicinity of the Netherview Avenue junction due to the need for localised carriageway realignment to retain the ghost island right turn lane in conjunction with implementation of a segregated cycleway.
- Localised sections of shared use at Todlaw Walk and Balloch Way junctions where spatial constraints preclude feasibility of full segregation up to the crossing.
- Proposed design would tie-in to Options AT14 and AT60 from the Table 1 list of interventions to the north and south respectively to support a connected and continuous active travel route along the A947 corridor.

Risks and Unknowns

Further engagement with the ACC roads team would be required in conjunction with the proposed alteration to the A947 road alignment.

Lighting columns, signage and street furniture would be required to be relocated on the north-east side of the corridor around the Netherview Drive junction to facilitate road carriageway widening and on the south-west side of the corridor between Todlaw Walk and Riverview Drive Roundabout to accommodate the segregated cycleway improvements.

Existing road drainage gullies would be required to be relocated as part of the proposed works where the existing kerb line is proposed to be amended to accommodate an improved segregated or shared use active travel link. Further consideration should be given to the increased paved surfaced area and capacity of the existing drainage network to cope with additional runoff as part of future stages of the works.

Utility chambers are observed throughout the existing footways and available verge space. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low; however, these suppliers will be engaged throughout future design stages.

The development of a segregated cycleway on the northern section of Riverview Drive would negate the viability of the proposed improvement to the existing traffic island at Todlaw Walk as part of Option AT31.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT48a is £4,939,000 including risk and contingency at 44%.

AT51 – Implement with-flow segregated cycleway on Old Meldrum Road

Works are ongoing to realign the northern section of Old Meldrum Road and Bankhead Road as part of the Barratt Homes development. Mill Drive has been developed as the primary route for vehicles coming off the A947 and Old Meldrum Road now meets the realigned Bankhead Road as the minor arm on a priority junction as shown in Figure 12.

Redevelopment of the Mugiemoss Road junction onto Old Meldrum Road is also ongoing with access off Old Meldrum Road stopped-up. As part of the redevelopment works, footways are being widened for shared use and the existing pedestrian crossing on Old Meldrum Road is being upgraded to a toucan crossing. As-built construction information is currently not available therefore for indicative purposes, the proposed northern extent of the Old Meldrum Road active travel improvements is south of Mugiemoss Road and subject to further development to tie-in.

Figure 12 – New layout north of Old Meldrum Road (Site Walkover Photo)

The southern extent of Old Meldrum Road meets the A96 Auchmill Road. Option AT8 developed as part of the Table 1 list of interventions investigated opportunity for reconfiguration of the junction to improve connections for pedestrians and cycle users. However, due to the greater significance of the interface with A96 Multi-Modal Corridor Study, improvements associated with the junction and tie-in between Old Meldrum Road and Auchmill Road are now to be progressed as part of the parallel study.

With-flow segregated cycleways on both sides of the carriageway, at a desirable minimum 2m width and with 0.5m buffer, are proposed as part of Option AT51. It is proposed that the footways are also generally retained at the existing desirable minimum 2m width however localised narrowing of the cycleway and footways and to an absolute minimum 1.5m width each is required to retain some on-street parking. The cycleway and footway will be provided in a stepped arrangement with the cycleway benefiting from both vertical and horizontal protection. The carriageway would also be reduced to a minimum of 6.5m with approximately 75m of existing parking retained to the north of Old Meldrum Road. Width constraints at the southern end of Old Meldrum Road would impose a need to remove on-street parking as part of the proposed design.

Old Meldrum Road has a number of accesses off both sides with minor junctions predominantly off the northbound side of the carriageway at Gilbert Road and Malcolm Road, with Station Road off the southbound side. At each of the accesses it is proposed that the cycleway and footway would be continuous with dropped kerbs provided for vehicle access. To provide this continuous arrangement across the minor junctions, it is proposed that a raised table ramp would be provided across the junction with the cycleway raising to the footway level and narrowing to 1.5m to align with the raised table.

Figure 13 – Proposed with-flow cycleway arrangement

Key Design Features:

- 2m wide with-flow cycleways to be provided on either side of the carriageway in a stepped arrangement along Old Meldrum Road.
- 2m wide footways to be maintained on either side of carriageway along Old Meldrum Road reducing to a minimum of 1.5m in constrained areas.
- Parking bays at the north end of Old Meldrum Road to be retained, with cycleway reduced to 1.5m. Dropped kerb access to be retained across the cycleway and footway to maintain existing access and enable users of the parking bays to safely access the footway. All other on-street parking would be removed as part of this option.
- Continuous footway/cycleway with raised table ramp across the carriageway at the Gilbert Road, Malcolm Road and Station Road junctions, cycleway to be narrowed to 1.5m to facilitate the ramp arrangement.

Risks and Unknowns:

Drainage conditions to be investigated due to proposed works within existing carriageway. It is noted that the introduction of the raised table crossings at the junctions may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Utility chambers are observed along the route. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

On-street parking capacity would be impacted as part of the proposed works, with roughly 75m of parking bays retained at the northern end of Old Meldrum Road.

The tie-in details for the Old Meldrum Road linear corridor improvements are subject to change based on the as-built information at the north end and the parallel A96 Multi-Modal Corridor Study at the south end.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT51 is £807,000 including risk and contingency at 44%.

AT52 – Implement two-way segregated cycleway on Old Meldrum Road

Option AT52 proposes an alternative segregated active travel arrangement for Old Meldrum Road with a two-way segregated cycleway on the southbound side of the carriageway, at a desirable minimum 3m width with 0.5m buffer. It is proposed that the footways are also generally retained at the existing desirable minimum 2m width however localised narrowing of the cycleway and footways to a minimum 1.8m width is required to retain some on-street parking. The cycleway and footway will be provided in a stepped arrangement with the cycleway benefiting from both vertical and horizontal protection. Approximately 75m of existing parking retained to the north of Old Meldrum Road. Width constraints at the southern end of Old Meldrum Road would impose a need to remove on-street parking as part of the proposed design.

The two-way cycleway is proposed on the southbound side of the carriageway to minimise junction interface with only the conflict with the minor Station Road junction to be managed with a proposed raised table arrangement. The two-way cycleway presents a higher risk of conflict with vehicles entering and exiting the junction and private accesses and not anticipating two-way cycle flow. It does however offer some coherence in arrangement with that proposed on the A96 corridor and throughout the A947 study area.

Figure 14 – Proposed two-way cycleway arrangement

Key Design Features:

- 3m wide two-way at-grade cycleway to be provided on the southbound carriageway with a raised 0.5m buffer along Old Meldrum Road.
- Generally, 2m wide footways are to be maintained on either side of carriageway along Old Meldrum Road reducing to a minimum of 1.8m in constrained areas.
- Carriageway would be narrowed to accommodate cycle infrastructure resulting in the loss of on-street parking for the majority of Old Meldrum Road.

- Parking bays at the north end of Old Meldrum Road could be retained, dropped kerb access across the cycleway and footway to maintain existing access and enable users of the bays access to the footway. All other on-street parking would be removed as part of this option.
- A continuous footway/cycleway with raised table is to be provided at the Station Road junction.

Risks and Unknowns:

Drainage conditions to be investigated due to proposed works within existing carriageway. It is noted that the introduction of the raised table crossings at the junctions may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Utility chambers are observed along the route. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

On-street parking capacity would be impacted as part of the proposed works, with roughly 70m of parking bays retained at the northern end of Old Meldrum Road.

The tie-in details for the Old Meldrum Road linear corridor improvements are subject to change based on the as-built information at the north end and the parallel A96 Multi-Modal Corridor Study at the south end.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT52 is £650,000 including risk and contingency at 44%.

AT58 – Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport

There is currently no pedestrian or active travel infrastructure to the west of the F&B Way access off the A947 at Dyce Drive. Option AT58 focuses on implementing a shared use path between the F&B Way and Kirkhill Industrial Estate to the west. Existing available verge space to the north of the carriageway along Dyce Drive is limited and construction of a 4m footway with a 2m buffer based on posted speed limit would require the acquisition of party land for large sections along the route.

The proposed route has been designed to the north of the carriageway for approximately 50% of its length, until it meets the bridge over the railway where space is constrained by the skewed verge and bridge parapet. There is 1.5m of hard surface between the carriageway edge and parapet wall which restricts any development at this location. As a result, it is proposed that an active travel compatible signalised crossing is installed on approach to the railway overbridge to transfer users to the south verge, where there is approximately 7m of available room between the carriageway and parapet wall due to the skew of the structure. To enable the adoption of the signalised crossing on approach to the railway overbridge, it is proposed to reduce the posted speed limit on Dyce Drive from the national speed limit to 40mph, in line with Traffic Signs Manual Chapter 6. The route would then continue along the southern verge and into the eastern verge of the carriageway, crossing junctions at Pitmedden Road, Dyce Drive and a local farm access road with appropriate crossing facilities included in the design.

On approach to Kirkhill Industrial Estate, another active travel signal crossing would be provided to transfer users to the eastern side of Dyce Drive, where the route will tie-in to the existing shared use infrastructure along Dyce Drive. Tie-in to the existing facilities will require an upgrade to the Howe Moss Avenue signal layout which currently has no inclusion for active travel users due to there being no footways in this area. Upgrading this crossing to a toucan crossing will assist in linking the new and existing shared use footways.

To improve directness of the proposed route from the A947 to Kirkhill Industrial Estate, an alternative route could also be considered. At the end of the eastern section of Dyce Drive, users would travel south rather than north towards Pitmedden Road which would be reclassified as a mixed traffic street. A reduction in the speed limit and improved visibility along the road would help to promote cycle users to travel on-road along this section, returning to Dyce Drive west of the railway line. As with the other option, a new shared use footway in the eastern verge would take users to Kirkhill Industrial Estate to tie in with the existing active travel facilities. This alternative option has not been developed in detail or indicatively costed at this stage of the assessment.

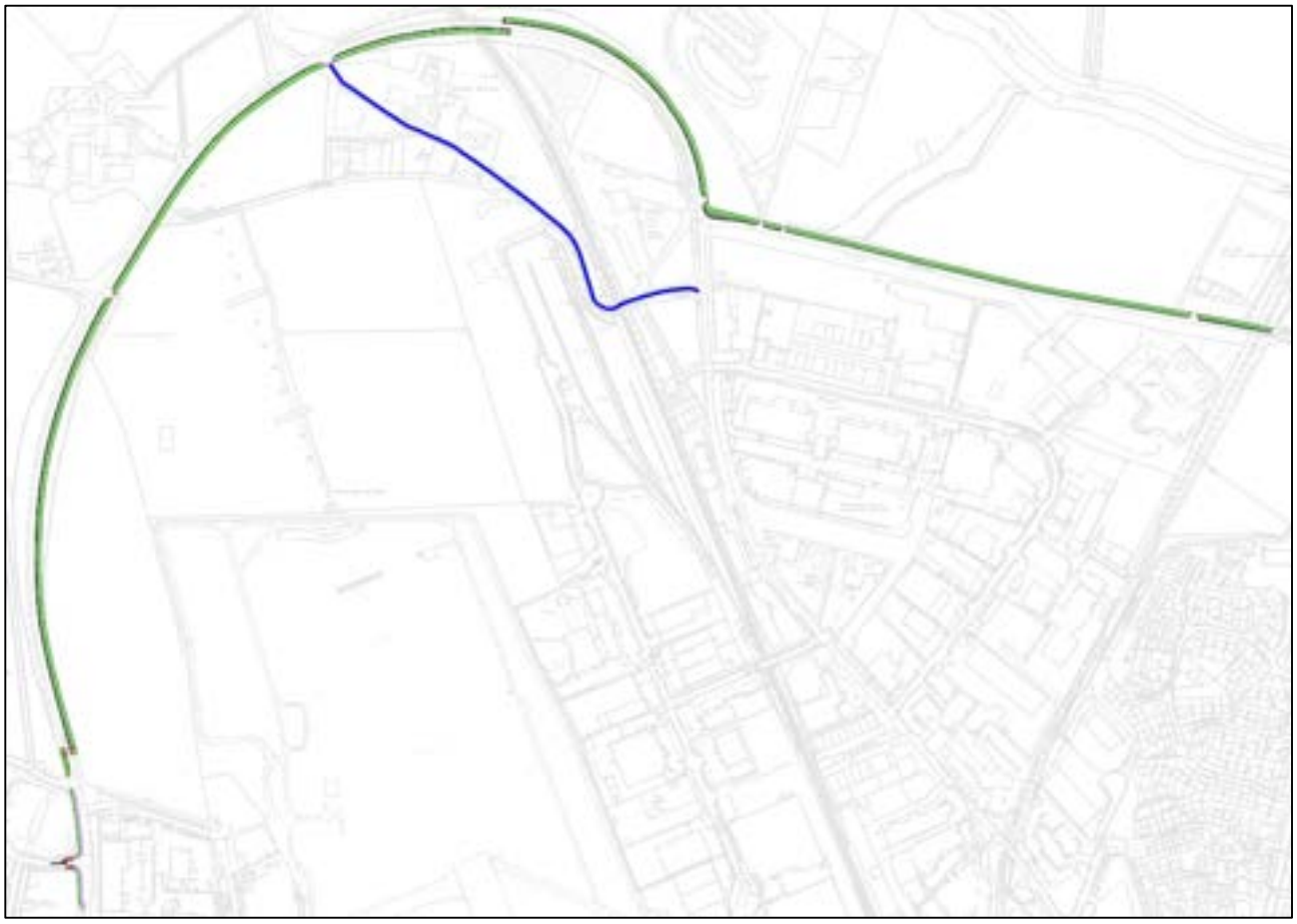


Figure 15 – Proposed route between the A947 and Kirkhill Industrial Estate

Key Design Features:

- New 4m shared use footway and 2m buffer strip between the F&B overbridge on Dyce Drive and the Kirkhill Industrial Estate. Construction of footway would require the acquisition of large pockets of third party land
- 2 x new toucan crossings and upgrading of a signalised junction to toucan crossing at Howe Moss Avenue
- A speed limit reduction to maximum 40mph to facilitate introduction of formal signalised crossings.
- Extending gateway 30mph speed limit on approach to Kirkhill Industrial Estate would support introduction of a new signalised toucan crossing and better manage vehicle speeds on approach.

Risks and Unknowns:

Utility chambers are observed within the carriageway where there are proposed alterations to the carriageway alignment. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

The acquisition of large areas of third party land along the proposed route introduces cost and feasibility risks to the deliverability of this option. Landowner engagement would be required to understand the acceptance and cost to the proposed route and plans.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT58 is £3,502,000 including risk and contingency at 44%.

AT61a – Implement package of active travel measures on Victoria Street

Victoria Street has been assessed to have a variable cross-sectional width along its length, with the most common width approximately 12m. As the urban centre of Dyce, implementation of a shared use path would bring a higher risk of conflict between users. Therefore, shared use is not considered appropriate on the primary residential and commercial section of Victoria Street. As a result of the recent reprioritisation of the A947 along Riverview Drive as part of the Roads Hierarchy revision, it is anticipated that there will be reduced traffic levels along Victoria Street with route reclassification. Despite the implementation of a shared use path being discounted, it is important to continue developing other active travel measures along Victoria Street to improve accessibility and active travel opportunities in the 'heart' of Dyce. AT61 has been reworded[1] to capture a broader range of options for active travel improvements along Victoria Street. The option reference has now been updated to AT61a to reflect this change and the option has been considered in three sections: 1) Victoria Street/Riverview Drive South Roundabout to Farburn Terrace; 2) Farburn Terrace to Pitmedden Road; and 3) Pitmedden Road to Victoria Street/Riverview Drive North Roundabout. In Section 1, there is adequate space on the eastern side to develop a segregated cycleway connection by reallocating the existing advisory cycle lanes and utilising the existing verge space. In Section 2, there is limited scope to widen the existing footways or reduce the carriageway width due to bordering property boundaries. A reduction of the speed limit to 20mph and introduction of various measures would allow this section to be formalised as a mixed traffic street. Section 3 has three sub-improvement options, with varying volumes of works required. Option 3a involves the reduction of the road carriageway width to 6m, removal of on-street parking and speed limit reduction to 20mph. Option 3b – reduction of speed limit to 20mph and removal of on street parking would create opportunity to widen and reclassify existing footways on Eastern side to shared use desirable minimum width, with local sections of absolute minimum shared use width due to corridor constraints. Option 3c would continue the measures introduced as part of Option 3b with a reduced speed limit to formalise Section 3 as a mixed traffic street.

In Section 1, to connect with the improvements proposed at the Riverview Drive/Victoria Street Roundabout and recent developments on Farburn Terrace, a shared footway would be provided on the western side of Victoria Street. This option would provide continuity and improve safety for cycle users on approach to the roundabout allowing them to avoid merging with traffic at the roundabout. To provide this option the existing footway on the western side of the road would be widened to a desirable minimum 4m shared use facility with additional 0.5m buffer separation from the road.

Figure 16 – Widened footways along Victoria Street south of Farburn Terrace

[1] Original **AT61** wording *"Implement shared use path on Victoria Street".*

For Section 2, there is limited scope to widen the existing footways or reduce the carriageway width due to bordering property boundaries. Measures which could be implemented to improve the attractiveness of the route for active travel users would include the implementation of raised table junctions to provide priority for pedestrians as well as act as a traffic calming measure along the route. In addition to this a reduction of the speed limit to 20mph would allow this section to be formalised as a mixed traffic street.

For Section 3 the current carriageway is in excess of 6.0m wide, and a reduction of the carriageway width would allow for the widening of the existing eastern footway north of the signalised crossing at Dyce Parish Church. A 4m shared footway with 0.5m buffer is achievable along the length of this section when narrowing the carriageway to 6m. Where the existing footway narrows adjacent to Fergus House, localised widening into third party land would be required to achieve a desirable minimum width for shared use in line with Cycling by Design guidance. To the north, the shared use footway would tie-in to the existing and proposed active travel infrastructure in the vicinity of the Victoria Street/Riverview Drive North roundabout. Appropriate transition detail between each section of the active travel route on Victoria Street would be configured as part of the next stage of design.

Key Design Features:

- A 4m shared footway with 0.5m buffer would be provided between Victoria Street/Riverview Drive South Roundabout widening the existing footway to the west into the verge, with cycle lanes removed on the carriageway.
- A 20mph speed limit would be implemented in Section 2 allowing this section to be formalised as a mixed traffic street.
- In Section 2 suitable traffic calming measures would be implemented at side roads which interact with Victoria Street, to be determined at later stages in the design.
- A 4m shared footway with 0.5m buffer is to be provided between Dyce Parish Church and Victoria Street/Riverview Drive North Roundabout widening the existing footway into the existing road carriageway, reducing the carriageway to 6m.

Risks and Unknowns

The proposals for Victoria Street are subject to change in conjunction with the development of Options O25 & O26, where access only and one-way restrictions have been proposed for Victoria Street.

Utility chambers are observed within the carriageway and verge where there are proposed alterations to the carriageway alignment and widening of the verges. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, NEOS Networks, Scottish Water, SGN, SSE and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

All on-street parking including a disabled bay would be impacted and localised third party land acquisition would be required to implement a desirable minimum width shared use active travel facility on Section 3 at the north end of Victoria Street.

Drainage conditions to be investigated due to proposed works within existing carriageway. It is noted that the introduction of the raised table crossings at the junctions may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Where widening works are proposed, lighting columns may be required to be relocated.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT61a is £645,000 including risk and contingency at 44%.

AT65 – Implement streetscape improvements and widened pavements along Mugiemoss Road

Following the Barratt Homes development to the north of Mugiemoss Road and the reconfiguration of road layout at the top of Old Meldrum Road, it is assumed that the existing bi-directional bus route along Mugiemoss Road will change to northbound only. This creates an opportunity to narrow the existing 6m carriageway and widen the existing footways along Mugiemoss Road. Scots National Roads Development Guidance states that where there is a 20mph speed limit and buses make up only a small proportion of the road's traffic flow, a carriageway width of 4.7m is sufficient. This would provide 1.3m of additional footway width to the northern footways along Mugiemoss Road. This additional space would create a variable width footway between 2.2m and 4m. Further assessment of the bus routing and engagement with operators would be required.

Figure 17 – Arrangement of widened footways along Mugiemoss Road

Key Design Features:

- Reduction of carriageway width to 4.7m between Old Meldrum Road and Mill Drive junctions
- Variable width footway along Mugiemoss Road. Allowing footway widths of up to 4m in sections and improving accessibility along corridor.
- Extension of enforceable parking restrictions along Mugiemoss Road to ensure reduced width carriageway would be navigable at all times by buses.
- Reduction in speed limit to 20mph.

Risks and Unknowns:

Drainage conditions to be investigated due to proposed works within existing carriageway. It is noted that the introduction of the raised table crossings at the junctions may impede existing runoff flow paths. Topographical survey information should be obtained, and further analysis undertaken to fully determine impact on surface runoff.

Utility chambers are observed along Mugiemoss Road. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, ESP, GTC, NEOS Networks, Scottish Water, SGN and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low, however these suppliers will be engaged throughout future design stages.

Further assessment of classified traffic flow volumes and engagement with bus operators is required to inform further advancement of these proposals.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option AT65 is £308,000 including risk and contingency at 44%.

PT2 – Conduct a traffic signal review to consider bus priority at all traffic signals along the A947 corridor

The initial part of the review was to identify signalised junctions which are part of the bus routes. On the A947 corridor, there are signal controlled junctions along Stoneywood Road with Beech Manor, Market Street/Stoneywood Terrace and Stoneywood Park at the southern end, and the B977 to the north. At each of these signalised junctions, there is currently only one single lane for through traffic.

The use of traffic signal technology is commonly used to improve bus journey times where space to implement physical bus priority measures is constrained. The types of technology available has seen a major growth in recent years for both local and network-based systems. On a larger scale, these advancements can provide the ability to locate and identify individual buses across a network. This information can be used to better control journey times to provide an improved and reliable service for users. For the A947 corridor, the forms of local technology are considered more effective due to the extent of the existing bus network. An approach style of traffic signal priority (TSP) would add value to the corridor by improving bus priority as they approach the existing signalised junctions.

Due to the single through lanes at the current junctions, implementing TSP would only improve bus through flow when the bus is detected close to the front of queuing traffic. There is available verge space in the north to widen the existing A947 carriageway to accommodate an additional through lane. However, widening the existing carriageway in the south has a number of constraints. There may be some minor journey time benefits in implementing approach detection but due to there only being four signal junctions within the A947 corridor, it is unlikely to lead to any significant improvements to bus journey times.

An assessment is also required to understand the impact that implementing TSP technology would have on the operational capacity of the A947 as the proposal may lead to potential delays for other vehicles utilising the corridor. Understanding the impact that bus priority would have on pedestrian wait times at these junctions is also another key factor as promotion of active travel through delivery of improved measures is the priority within the corridor.

Key Design Features

- Engagement with bus operators to receive feedback on the current bus route along the A947 corridor and the current operations.

Risks & Unknowns

Detailed transport modelling would be required to understand impacts that implementing traffic signal priority technology would have on the A947.

O2 – Review the layout of the Victoria Street/Skene Place Junction

Option AT33 explores the improvement of active travel links between Dyce Rail Station and the A947 through the adoption of Low Traffic Neighbourhood measures along Station Road and its side roads. Skene Place is linked to Station Road by Merrivale. The proposed layout as part of Option O2 is to simplify traffic movements to and from Victoria Street by introducing a one-way network using Station Road, Merrivale and Skene Place, as shown in Figure 18 below. As part of the design new road markings and no entry signs will be implemented on Station Road, Merrivale and Skene Place in addition to the changes promoted as part of Option AT33.

Figure 18 – Proposed One-Way System

Key Design Features:

- One-way system to be implemented on Station Road, Merrivale and Skene Place with associated signage and road markings implemented.

Risks and unknowns

On-street parking for residents will be removed along Station Road for residents; while most residents seem to have access to off-street parking spaces, there is a risk they may park and obstruct the cycle lane. A parking survey should be undertaken to understand the risk of this occurring.

Utility chambers are observed throughout the existing street. A C2 preliminary inquiry has been carried out and identified BT, CityFibre, Scottish Water and Vodafone as the suppliers who have apparatus in the area which may be affected. The proposed improvements are at-grade therefore the risk of utility impact and diversions is considered low; however these suppliers will be engaged throughout future design stages.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option O2 is £8,000 including risk and contingency at 44%.

O3/O4 – Review the layout of the Riverview Drive/Balloch Way Junction / Review the layout of the Riverview Drive/Todlaw Walk Junction

A reduction in kerb radii to 6m and a narrowing of the existing junction is proposed to reduce traffic speeds turning into Balloch Way and Todlaw Walk from Riverview Drive. Initial swept path analysis against an OS mapping base for an emergency vehicle suggests no encroachment into the opposing lane on entry and exit manoeuvres for Balloch Way. However, relocation of the centre line is required for Todlaw Walk to facilitate the movement. As a result of the relocation of the centre line, the lane upon exit is proposed to be reduced in width to a minimum 3m width.

Key Design Features:

- Corner radii at junctions reduced to 6m in line with DMRB CD123 & CbD guidance.

- Centre line at Todlaw Walk junction relocated to facilitate movement of emergency vehicle without encroachment onto the other side of carriageway.
- Dropped kerbs and tactiles reinstated following changes to radii.

Risks and Unknowns

Utility chambers are observed within the carriageway close to the corner radii with the intended tightening of the radii likely to impact this chamber, requiring an adjustment in the chamber level. A C2 preliminary inquiry has been carried out and identified BT and Scottish Water as the suppliers who have apparatus in the area which may be affected. These suppliers will be engaged throughout future design stages.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for each junction improvement is £29,000 including risk and contingency at 44%.

O5 – Review the layout of the Riverview Drive/Netherview Avenue Junction

A reduction in kerb radii to 10m and a narrowing of the existing junction is proposed to reduce traffic speeds turning into Netherview Avenue from Riverview Drive. Initial swept path analysis against an OS mapping base for a rigid industrial vehicle suggests realignment of the centre line road marking is required to facilitate the movement; as a result the kerb line on the northern edge of the junction needs realigning to maintain two minimum 3m wide lanes.

Key Design Features:

- Corner radii at junction reduced to a 10m radii in line with DMRB CD123 & CbD guidance.
- Carriageway widening required to facilitate the movement of an HGV and to maintain two 3m lanes to the north of the junction.
- Dropped kerbs and tactiles reinstated following carriageway widening.
- Existing gullies will need to be relocated to facilitate tightened radii at both corners of the junctions.

Risks and Unknowns

Utility chambers are observed within the carriageway close to the corner radii with the intended tightening of the radii likely to impact this chamber, requiring an adjustment in the chamber level. A C2 preliminary inquiry has been carried out and identified Scottish Water as a supplier who have apparatus in the area which may be affected. They will be engaged throughout future design stages.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option O5 is £45,000 including risk and contingency at 44%.

O7 – Review the layout of the A947/Stoneywood Road Junction at Co-Op/Marks and Spencer

Early public consultation identified a high frequency of illegal turning manoeuvres occurring from vehicles continuing straight though the ‘left only’ exit from Stoneywood Road to the Co-op and Marks and Spencer’s retail access at Beech Manor. The most suitable intervention to prevent illegal turning manoeuvres at the left turn lane has been determined to be the use of a raised splitter island which would physically prevent vehicles from undertaking a right turn or straight through manoeuvre on exit from the junction.

The splitter island would be approximately 15m long and 1m wide in line with Traffic Signs Manual Chapter 5 allowing sufficient room for right turning vehicles to manoeuvre from the A947 onto Stoneywood Road. The splitter island would not physically reduce the width of the existing road space due to implementation as replacement to the existing hatched markings.

Based on swept path analysis for an articulated vehicle exiting the junction with physical splitter island in place, it is proposed that the radii of the northern kerb line of Stoneywood Road will be widened into the existing grass verge space.

Key Design Features:

- A 15m long and 1m wide splitter island is proposed on the existing hatched road markings to prevent movement across the junction
- Northern radii of the A947/Stoneywood Road junction to be increased into the grass verge

Risks and Unknowns

Existing signage with lighting is observed within the existing grass verge; this would require relocation of the sign and associated cables. Additionally encroaching onto the verge may impact Scottish Water and SGN utility apparatus, however, as the proposed improvements are at-grade, the risk of utility impact and diversions is considered low.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option O7 is £30,000 including risk and contingency at 44%.

O8 – Review the layout of the A947/Stoneywood Brae Junction

Stakeholder consultation raised concerns about vehicle acceleration through the A947/Stoneywood Brae junction as the carriageway transitions from single to dual carriageway, creating a safety risk for on-road cycle users.

A review of this junction identified that the existing taper for change in carriageway width is not to the standard set out in DMRB CD 127 Cross Sections and Headroom. The DMRB is the primary referenced standard in this case due to the nature of the road corridor and absence of other overriding guidance specific to the taper length in a local road context. The speed limit on the A947 is 40mph, therefore, a minimum taper ratio of 1:35 is provided for implementation of the change in carriageway width.

To further help in the reduction of speed, the single lane running through the junction is proposed to be narrowed to 4m with corner radii tightened to 10m. Additionally, to the south of the junction, it is proposed that the hatched road markings in which the taper begins are widened to also reduce lane width to 4m.

Key Design Features:

- Junction radii tightened to 10m, and road carriageway narrowed to 4m to manage vehicle speed through the junction.
- Existing road lining revised to implement a 1 in 35 taper for change in width over a length of approximately 120m.
- Existing gullies would require relocation to facilitate adjustment to junction kerb radii.

Outline Cost Estimate

A high-level costing exercise has been undertaken to establish the outline construction costs. The estimated construction cost for Option O8 is £18,000 including risk and contingency at 44%.

O10 – Review layout of the A947/McDonalds access road junction

The existing junction radii meets DMRB CD 123 minimum requirements. Swept path analysis has been undertaken and confirmed that the existing kerb radii is appropriate to accommodate movement of an articulated vehicle. The geometry of the junction taper is proposed to be adjusted to facilitate the widening of the existing footpath and implementation of a segregated two-way cycleway as part of Option AT41.

Key Design Features:

- Existing radii retained with taper provided from tangent of existing radii to new two-way cycleway proposed as part of Option AT41.

Risks and Unknowns

The proposed tie-in arrangements are subject to change in accordance with the future development of Option AT41.

O16 – Implement package of measures to support implementation of a 20-minute neighbourhood in Dyce

The area highlighted within Figure 199 shows an initial indicative 20-minute neighbourhood extent which could be implemented within Dyce. While further assessment of the project area will be required along with engagement with the local community to ensure the implemented works best meet their needs within a 20-minute neighbourhood environment, the area shown within Figure 19 incorporates a number of key amenities that would meet most people's daily needs and that would be accessible by active means in line with the development of other options considered as part of this study. The outline area appropriate for consideration includes education facilities such as Dyce Primary School and Academy; local shops including Asda and Tesco Express; numerous recreational facilities; and public transport links.

However, the deliverability and benefits of any additional works would be subject to appraisal in line with various options defined in Tables 1 to 4 of the study brief.

Figure 19 – Initial indicative 20-minute neighbourhood in Dyce

Key Design Features:

The promotion of a 20-minute neighbourhood within the Dyce area would be subject to the development of other measures promoted as part of this study to improve accessibility and permeability of the area by active means.

Risks and Unknowns

The area of the 20-minute neighbourhood is subject to further assessment and engagement with the local community.

O25 – Implement access only restrictions for general traffic on Victoria Street

Reprioritisation of the A947 along Riverview Drive supports consideration of the implementation of access only restrictions for general traffic on Victoria Street. Further desk-based assessment has been undertaken since the Preliminary Option Development Technical Note was prepared to understand the impacts on residents, local businesses, and key transport service providers. It is only considered potentially feasible to provide access only restrictions from Pitmedden Road to Riverview Drive/A947 Roundabout. This is due to there being minimal public facilities that would be impacted with access primarily required for residential purposes. There is also potential to further expand the access only restriction to Station Road to the south of Pitmedden Road, but this would result in impacting traffic to the industrial facility and local recycling centre along Pitmedden Road and the local businesses of Victoria Street.

To the south of Station Road, the feasibility of access only restrictions is limited due to accessibility required to multiple local facilities and key attractors off Victoria Street such as Dyce Rail Station, Dyce Primary School, Aberdeen International Airport/Heliport, Pitmedden and Kirkhill Industrial Estates and other local businesses.

The feasibility of this option will be further assessed through consultation. Detailed analysis of traffic impacts would be required if it was favourable to progress further beyond the current stage of the study.

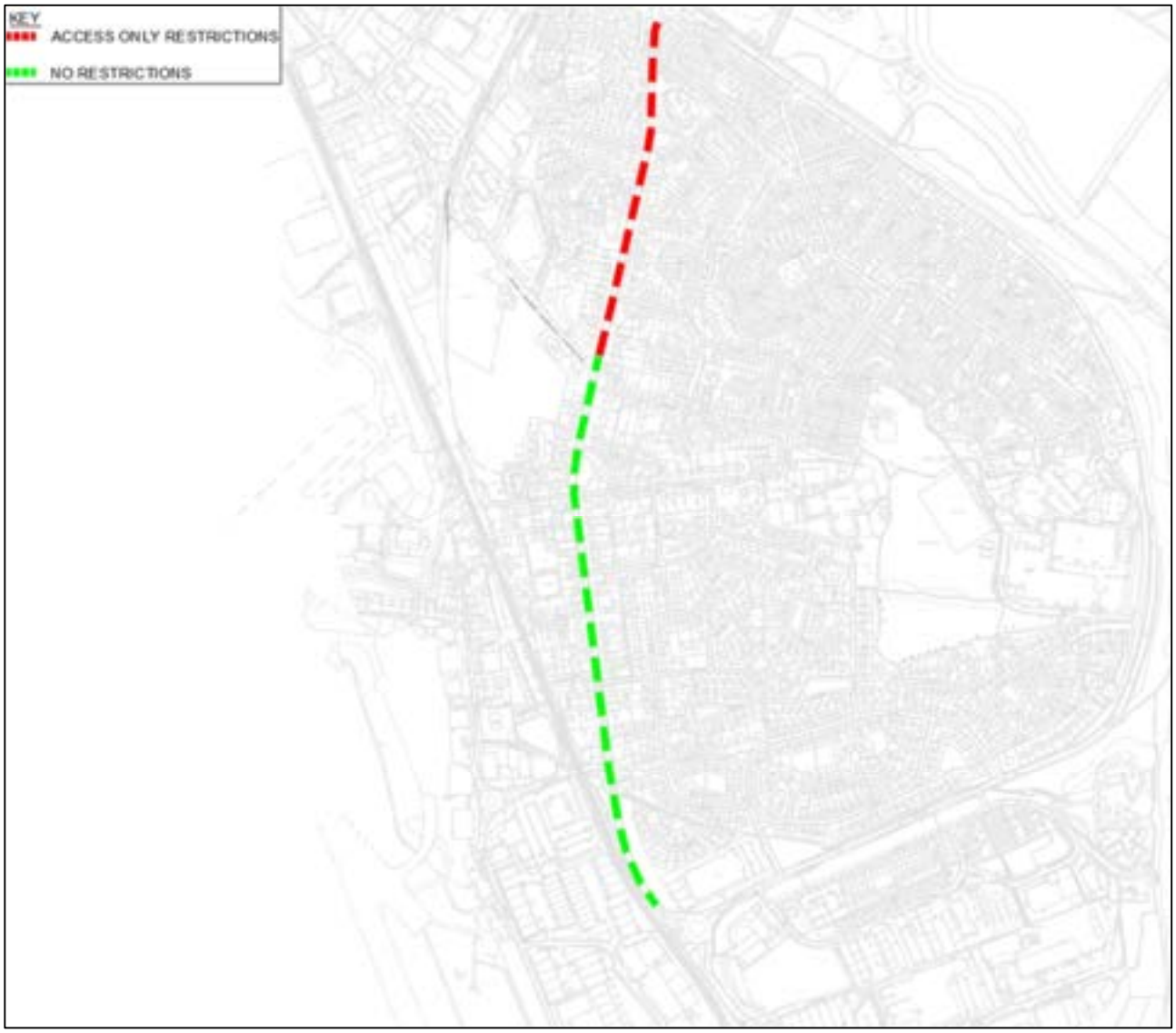


Figure 20 – Proposed Access Only Restrictions along Victoria Street

Key Design Features:

- Implementation of access only restrictions on Victoria Street between Pitmedden Road and Riverview Drive/A947 Roundabout.

Risks and Unknowns

Consultation and detailed traffic analysis would be required to inform viability and benefits associated with implementing access only restrictions on Victoria Street.

O26 – Implement one-way restrictions for general traffic on Victoria Street

Reprioritisation of the A947 along Riverview Drive supports consideration of the implementation of one-way restrictions for general traffic on Victoria Street. Further desk-based assessment has been undertaken since the Preliminary Option Development Technical Note was prepared to understand the impacts on residents, local businesses, and key transport service providers and it has been determined that currently, based on the information available, it is most suitable to provide one-way restrictions from Farburn Terrace to the Riverview Drive/A947 Roundabout. The reason for not further

extending the restrictions is to not restrict movement to and from Aberdeen International Airport/Heliport and Wellheads Industrial Estate.

As a result of proposed one-way restrictions along Victoria Street, there are opportunities to improve active travel facilities along the route such as segregated cycleway and widened pedestrian facilities. The implementation of a shared use footway has however been discounted as it would bring a higher risk of conflict between users as Victoria Street runs through the urban centre of Dyce.

The feasibility of this option will be further assessed through consultation. Detailed analysis of traffic impacts would be required if it was favourable to progress further beyond the current stage of the study. Option O26 could also be developed alongside Option O25 with a combination of both options being provided.

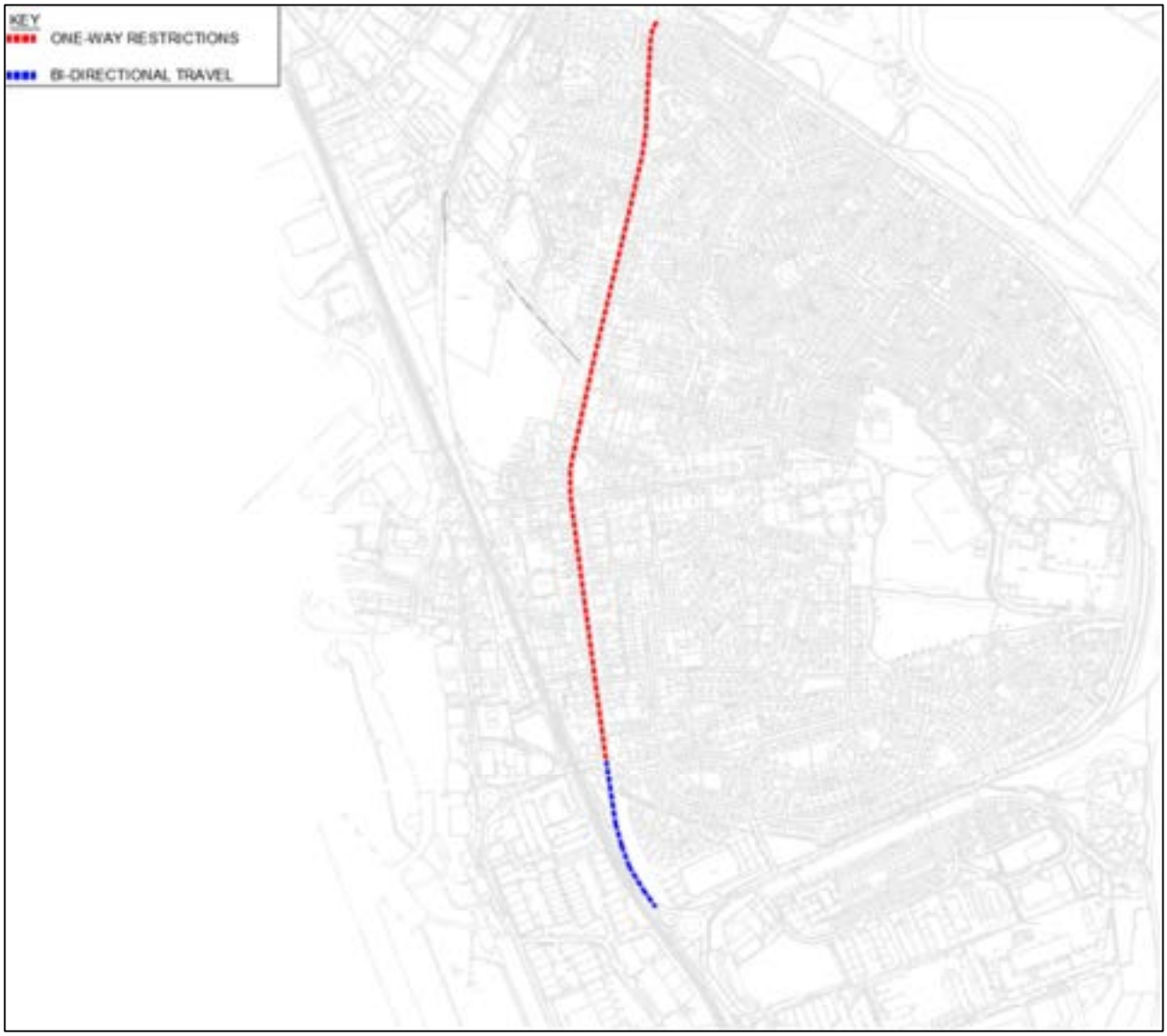


Figure 21 – Proposed one-way restrictions on Victoria Street

Key Design Features:

- Implementation of one-way restrictions on Victoria Street between Farburn Terrace and Riverview Drive/A947 Roundabout.

Risks and Unknowns

The proposal of a one-way section of Victoria Street is subject to public and stakeholder consultation to determine the impact the restrictions may have on local residents and business owners.

Detailed traffic modelling would be required to inform primary and secondary impacts from the redistribution of traffic and inform on optimum direction of flow if restrictions were to be taken forward.

Appendix E –
Table 2 Option Designs

Delivering a better world

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

LOCALISED NARROWING DUE TO WOODEN FOOTBRIDGE

UPGRADE TO BOUND SURFACE

RELOCATE BENCH LOCATIONS INTO AVAILABLE VERGE SPACE

4m

WIDENING TO WEST NOT FEASIBLE DUE TO PROXIMITY TO WATER BURN

RELOCATE BENCH LOCATIONS INTO AVAILABLE VERGE SPACE

APPROX. 2m WIDENING OF EXISTING PATH INTO AVAILABLE VERGE SPACE

UPGRADE TO BOUND SURFACE

FOOTPATH NARROWS ON APPROACH TO RAMPED SECTION

RELOCATE BENCH LOCATIONS INTO AVAILABLE VERGE SPACE

RETAIN EXISTING PATH WIDTH

Green Burn

GREENBURN ROAD

130

132

18

1

Post

N

Scale
0 5 10 20 40m
Original Size (A1) 1:500 @ A1 1:1000 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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NOTES

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT26 General Arrangement
Sheet 1 of 3

SHEET NUMBER

60709527-SHT-30-C-T2-0701

ISO A1 594mm x 841mm

Project Management Initials: Designer: JM Checked: SS Approved: PL

KEY

- NEW KERB LINE
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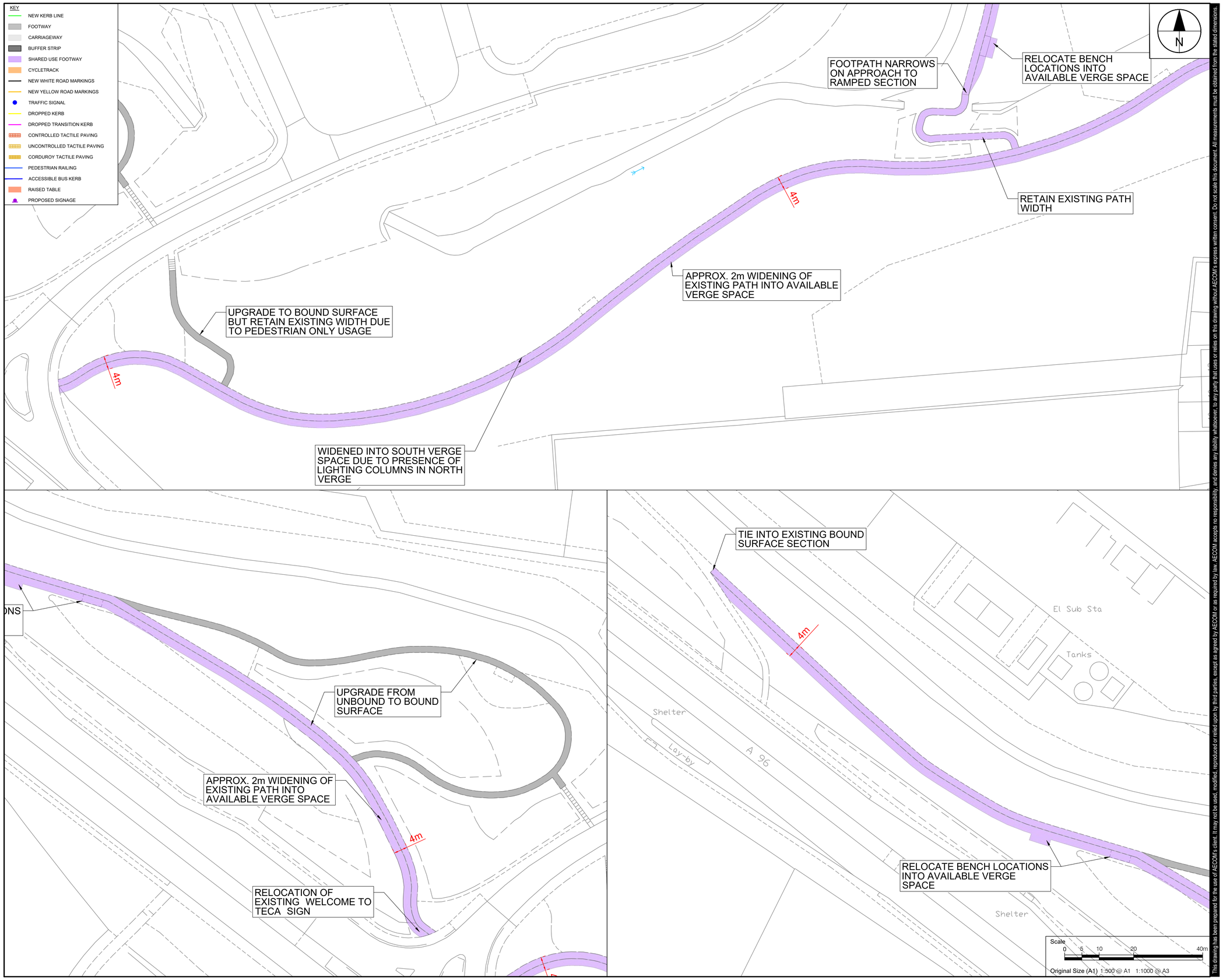

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A947 Table 2 Detailed Design
AT26 General Arrangement
Sheet 2 of 3

SHEET NUMBER

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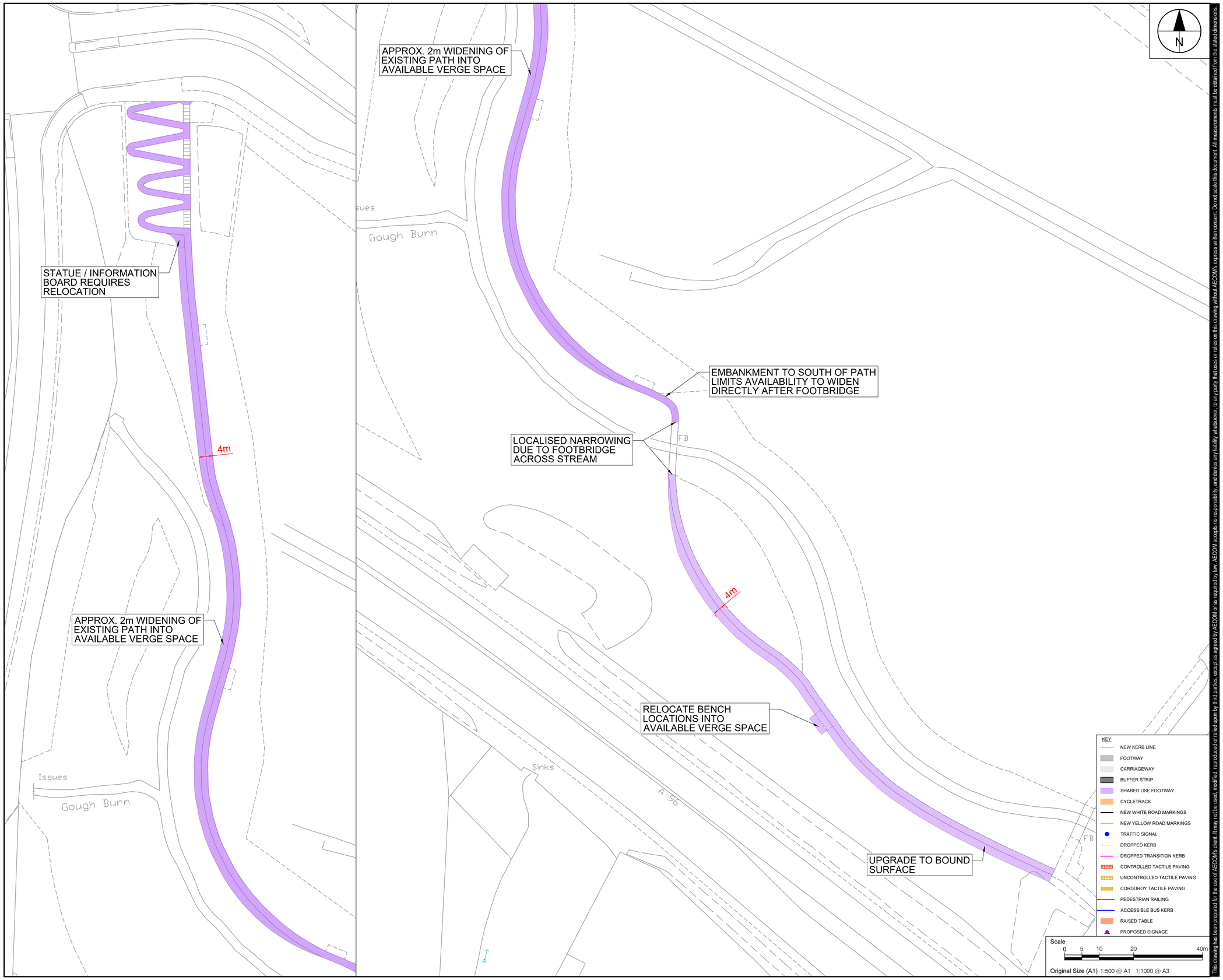

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A947 Table 2 Detailed Design
AT26 General Arrangement
Sheet 3 of 3

SHEET NUMBER

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

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- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

N

KERBLINE REALIGNED TO NARROW CARRIAGEWAY CROSS SECTION.

TIE INTO EXISTING FOOTWAY

PROPOSED FOOTPATH TO TIE INTO EXISTING RIVERSIDE PATH TO BE PROVIDED AS PER EXISTING VISIBLE DESIRE LINE.

3.0

41.7m

R6

KERB RADII TIGHTENED TO 6.0m.

ROAD MARKINGS TO PROVIDE MIN. TAPERS OF 1IN30 ON APPROACH TO CENTRAL ISLAND.

3.4

3.4

3.4

3.4

R6

SIDE ROAD CENTRE LINE REALIGNED TO FACILITATE MOVEMENT OF LEFT TURNING EMERGENCY VEHICLE FROM RIVERVIEW DRIVE.

DROPPED KERBS TO BE PROVIDED TO FACILITATE UNCONTROLLED CROSSING

TIE INTO EXISTING FOOTWAY, VERGE EDGE TO BE REINSTATED

ISLAND WIDENED TO AID IN SPEED RESTRICTIONS.

42.1m

70

78

25

1

6

3

5

11

17

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

CONSULTANT

AECOM
Aurora
120 Bothwell St
GLASGOW, G2 7JS
+44 (0) 141 248 0300 tel
www.aecom.com

NOTES

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2. JUNCTIONS HAVE NOT BEEN CONSIDERED AS PART OF THE FEASIBILITY DRAWINGS AND WILL NEED RE-VISITED IF DESIGN IS TO BE PROGRESSED.

ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT31/O4 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0704

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DOCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

KEY
- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

CONTRA-FLOW CYCLE LANE SIGN TO BE PROVIDED

EXISTING KERBLINES TO BE RETAINED

RADII TO BE TIGHTENED TO DISCOURAGE VEHICLES TURNING INTO CYCLE LANE

NO ENTRY 'EXCEPT CYCLES' SIGNS TO BE PROVIDED

1.5m CONTRA-FLOW CYCLE LANE TO BE IMPLEMENTED.

1.5m

4.0m

PHYSICAL PROTECTION OF CYCLE LANE ENTRY AND EXIT TO BE PROVIDED.

EXISTING ON-ROAD PARKING TO BE REMOVED AS PART OF PROPOSED WORKS.

ONE WAY SYSTEM TO BE IMPLEMENTED WITH NO ENTRY SIGNS TO BE PROVIDED

ONE WAY SYSTEM TO BE IMPLEMENTED WITH NO ENTRY SIGNS TO BE PROVIDED

UNION ROW
Merrivale
STATION ROAD
SKENE PLACE
VICTORIA STREET
Carnegie Hall
Bank
PO
PH
LB
57.5m
Scale 0 2.5 5 10 20m
Original Size (A1) 1:250 @ A1 1:500 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT33/O2 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0705

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

EXISTING ISLAND CROSSING UPDATED TO MEET ACCESSIBILITY REQUIREMENTS WITH THE IMPLEMENTATION OF TACTILES.

EXISTING ACCESS REPLACED WITH DROPPED KERB TO PROVIDE A CONTINUOUS FOOTWAY.

RAISED TABLE TO BE PROVIDED OVER CROSSGATES.

CARRIAGEWAY LANES NARROWED TO 3.5M AND PARKING RESTRICTIONS MAINTAINED.

CARRIAGEWAY LANES NARROWED TO 3.5M AND PARKING RESTRICTIONS MAINTAINED.

3.5m

3.5m

3.5m

3.5m

49.7m

47.9m

CROSSGATES

BANKHEAD AVENUE

El Sub Sta

Scale 0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

N

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT35a General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0706

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UK\GLG1\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-0706 ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- DROPPED KERB
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- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

FOOTWAY WIDENED AND DROPPED KERB PROVIDED

RAISED TABLE TO BE PROVIDED OVER MILLHILL BRAE.

MILLHILL BRAE TO BE IMPLEMENTED AS A MIXED TRAFFIC STREET

PARKING TO BE RETAINED ALONG GREENBURN ROAD

MILLHILL BRAE TO BE IMPLEMENTED AS A MIXED TRAFFIC STREET

SIGNALISED CROSSING TO BE PROVIDED IN PLACE OF ISLAND CROSSING.

FOOTWAY TO BE WIDENED TO REDUCE CARRIAGEWAY TO 6.5M TO PROMOTE LOWER VEHICLE SPEEDS.

EXISTING STAIRS TO BANKHEAD ROAD MAINTAINED

APPROX. 17M OF PARKING RESTRICTIONS PROPOSED.

WEST-BOUND VEHICLES TO GIVE-WAY.

DROPPED KERB PROVIDED TO IMPROVE ACCESSIBILITY TO STAIRS ONTO BANKHEAD ROAD.

BUILD-OUT OF FOOTWAY PROPOSED TO IMPLEMENT GIVE-WAY CHICANE.

RAISED TABLE TO BE PROVIDED OVER STATION ROAD.

RADII TIGHTENED TO 6.0M

Scale 0 5 10 20 40m

Original Size (A1) 1:500 @ A1 1:1000 @ A3

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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

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KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT35a General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0707

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\60709527_A947_OBC\900_CAD_GIS\910_CAD\2D-SHEETS\60709527-SHT-C-T2-0707-ARRANGEMENTS.DWG Last Plotted: 2024-04-25
Last saved by: JACK.MCKENNA

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
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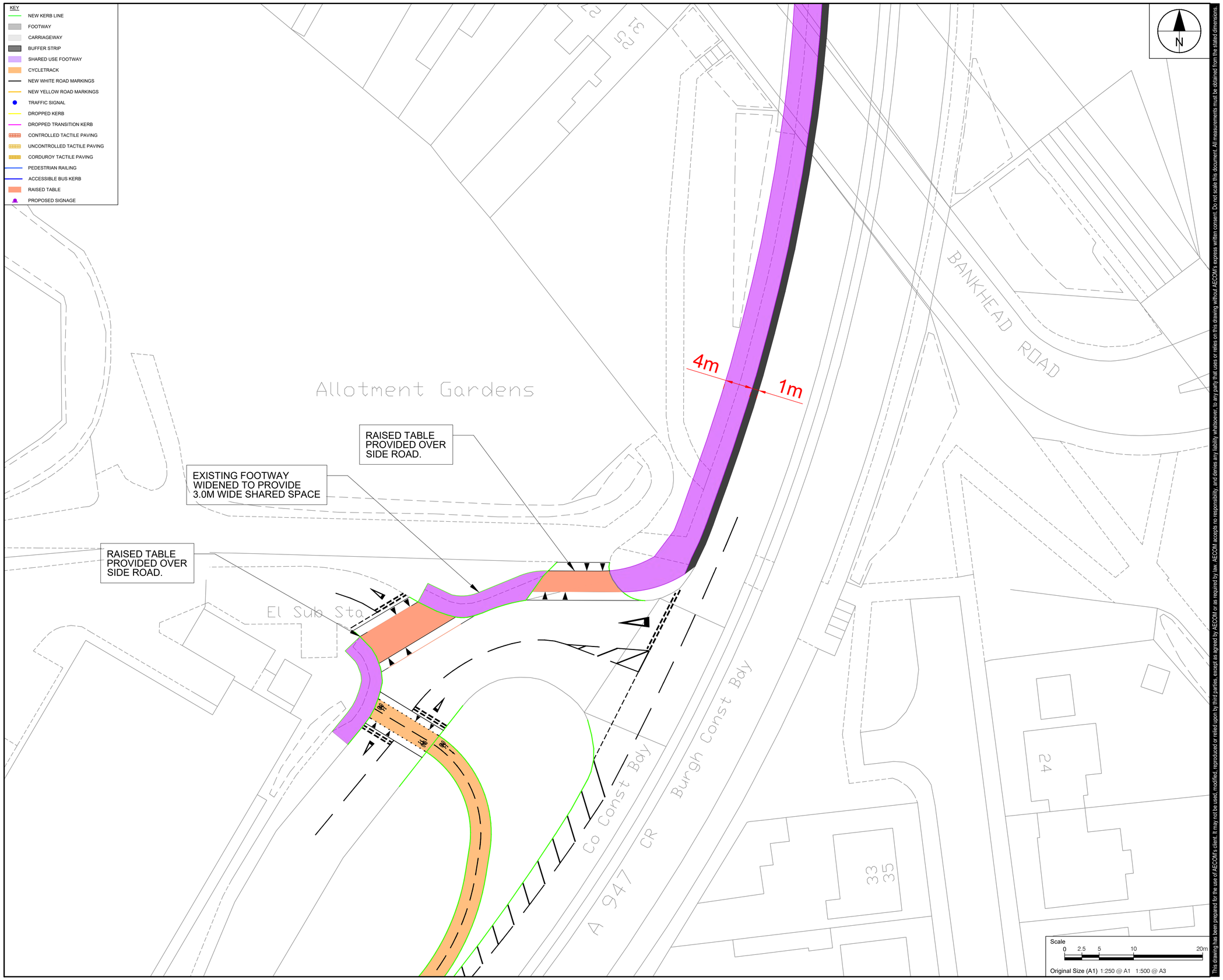
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE



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CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

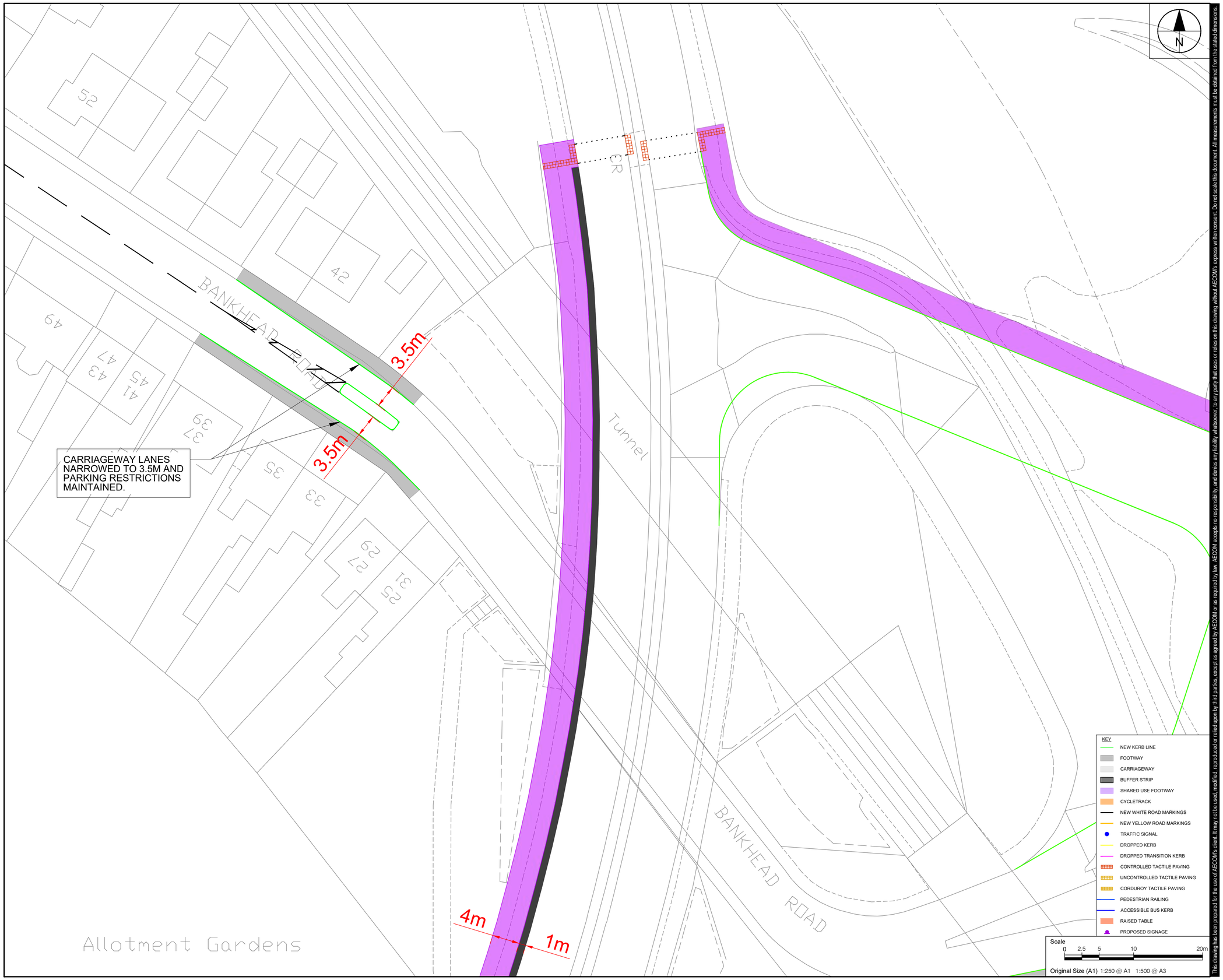
60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT41a General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0708



Project Management Initials: Designer: JM Checked: SS Approved: PL ISO A1 594mm x 841mm

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGL61\DCS\PROJECTS\Cit60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT41A GENERAL ARRANGEMENT.DWG
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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT41a General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0709

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

EXISTING FOOTWAY NARROWED TO 2.0M

CYCLE TRACK RAMPS UP AND NARROWS TO 2.0M WHEN PASSING PROPOSED ISLAND BUS STOP DUE TO CONSTRAINTS AND TO RESTRICT CYCLISTS SPEED.

EXISTING BUS STOP RETAINED AND RECONFIGURED. BUS SHELTER REMOVED AS PART OF WORKS DUE TO CONSTRAINTS.

EXISTING RADIUS RETAINED

RAISED TABLE PROVIDED OVER SIDE ROAD.

EXISTING FOOTWAY WIDENED TO PROVIDE 3.0M WIDE SHARED SPACE

1IN20 RAMP TO BE PROVIDED TO RAMP CYCLE TRACK UPTO SHARED FOOTWAY LEVEL.

RAISED TABLE PROVIDED OVER SIDE ROAD.

EXISTING FOOTWAY REALIGNED AND MIN. 3.0M WIDE SHARED SPACE PROVIDED FROM THE END OF THE SEGREGATED SECTION.

AT48a PROPOSED CYCLE TRACK TO TIE INTO SHARED SPACE AS PART OF OPTION AT41

EXISTING RAMP UPGRADED TO FACILITATE CROSSING OF CYCLISTS.

Allotment Gardens

El Sub Sta

BANKHEAD ROAD

A 947 CR Burgh Const Bdy

Co Const Bdy

24

33
35

N

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT41b General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0710

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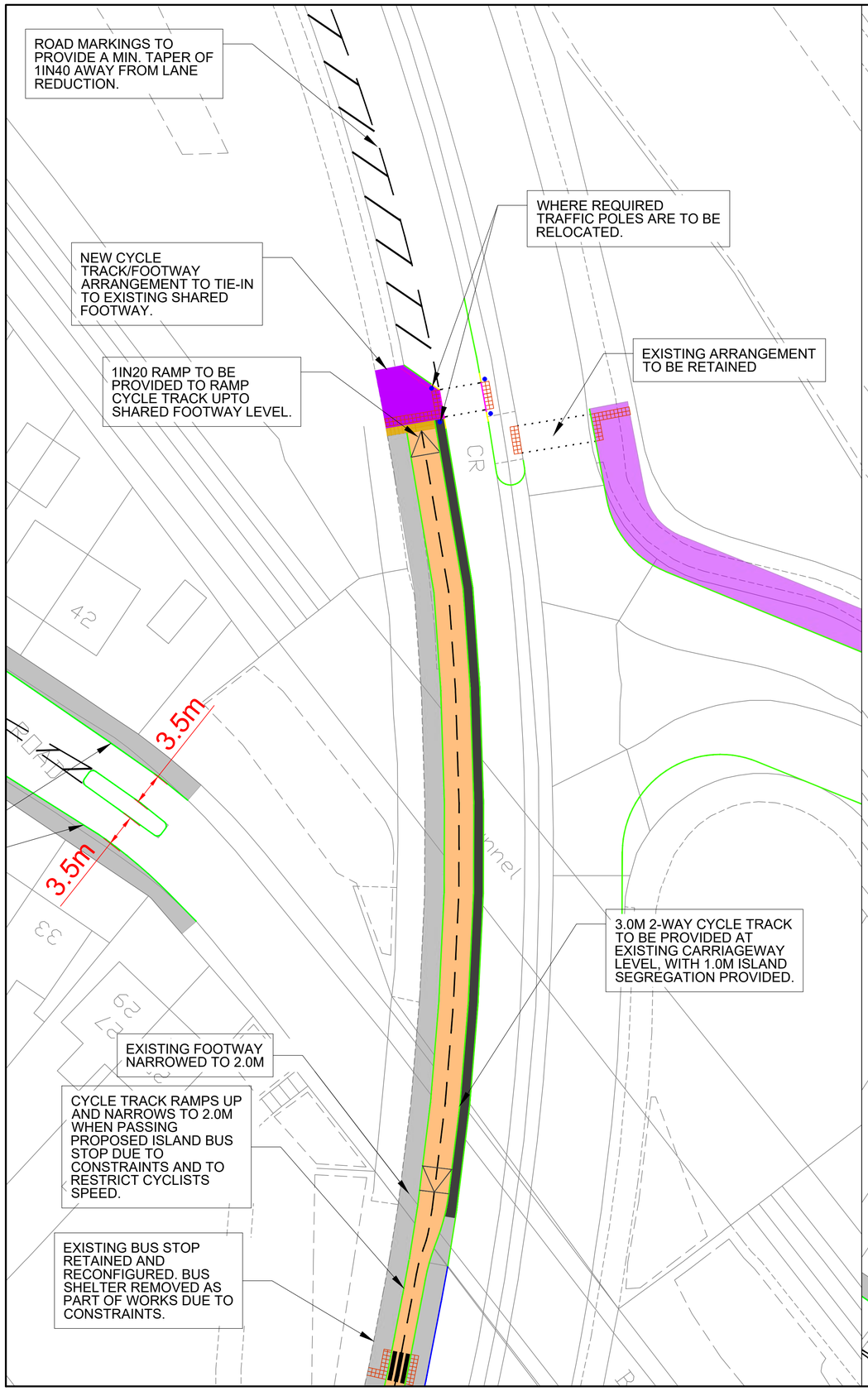
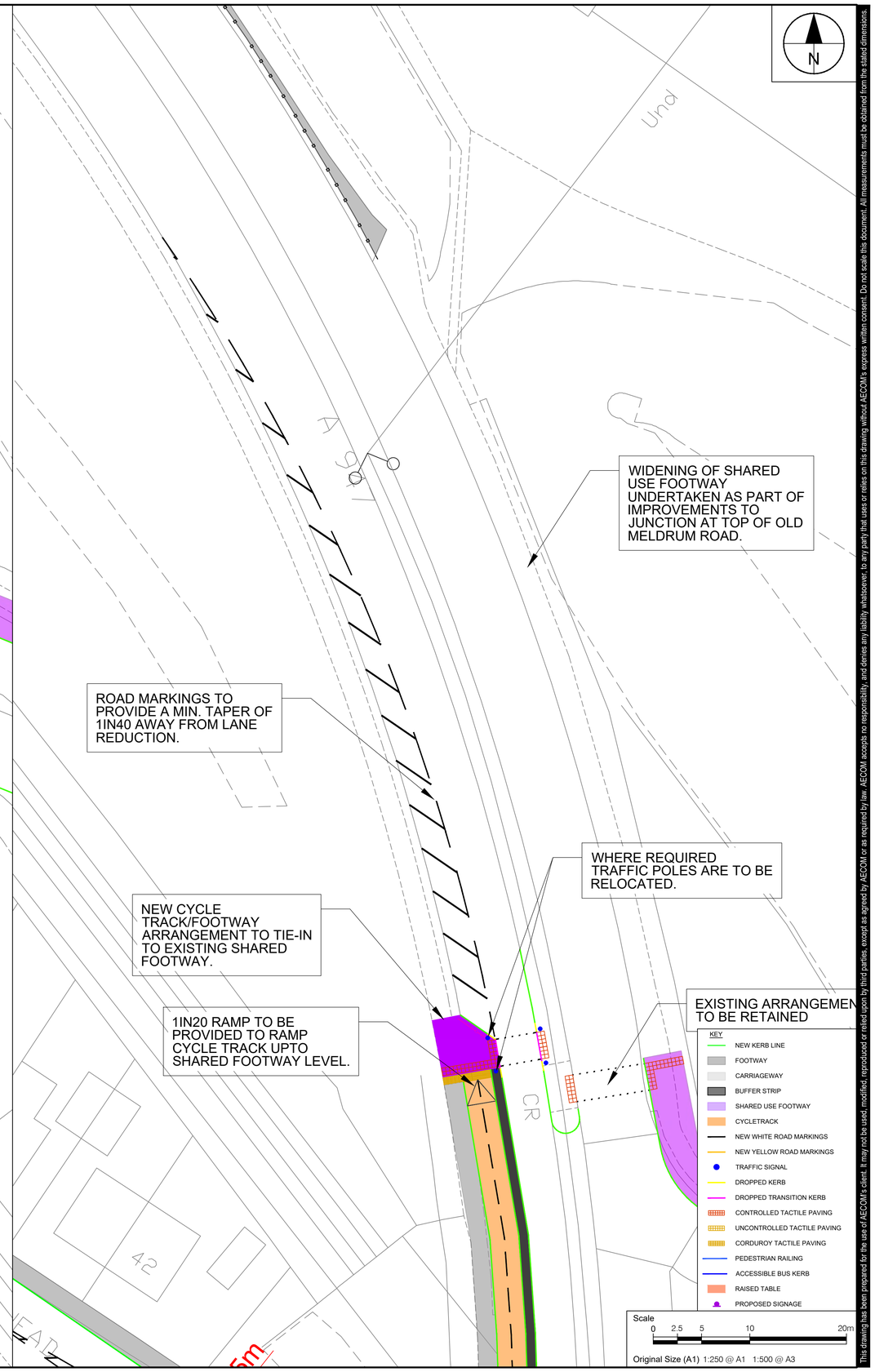
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25





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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT41b General Arrangement
Sheet 2 of 2

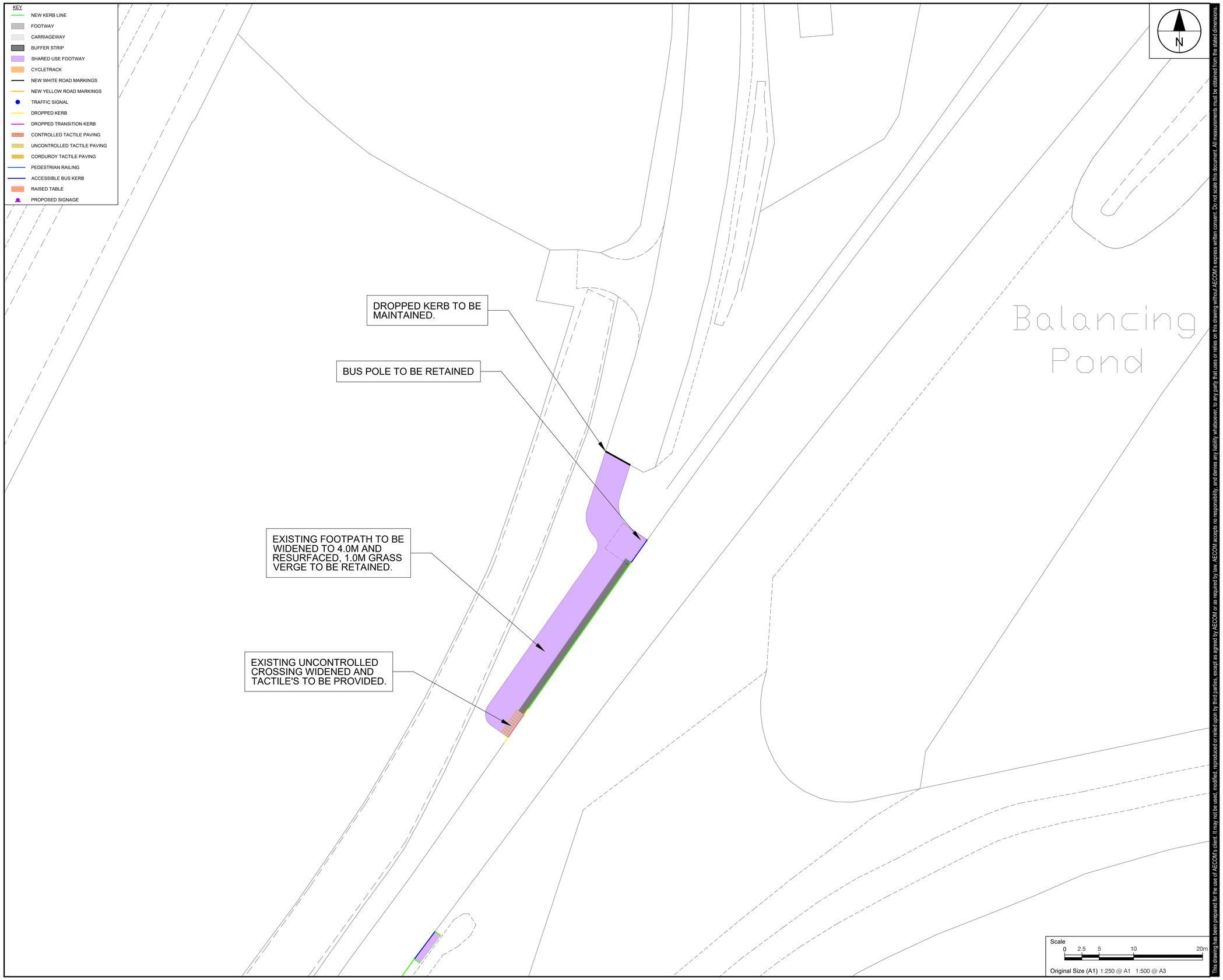
SHEET NUMBER

60709527-SHT-30-C-0711

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW\UKGLG1\DCS\PROJECTS\IC\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE



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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT43 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0712

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

TIE IN WITH AT14 TO BE DECIDED

EXISTING LIGHTING COLUMNS AND SIGNAGE ALONG RIVERVIEW DRIVE VERGE WILL REQUIRE RELOCATION

CARRIAGEWAY NARROWING TO ACCOMMODATE SEGREGATED CYCLE TRACK

EXISTING LIGHTING COLUMNS AND SIGNAGE ALONG RIVERVIEW DRIVE VERGE WILL REQUIRE RELOCATION

RIVERVIEW DRIVE

CORRENNIE CIRCLE

LOUDEN PLACE

ARDLAIR TERRACE

1m

3m

2m

Scale

0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 1 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0713

Filename: \\NA.AECOMNET.COM\LFSIEMEA\GLASGOW\UKGLG1\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT48A GENERAL ARRANGEMENT.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

REMOVAL OF EXISTING TRAFFIC ISLAND AND CARRIAGEWAY RESURFACING

WIDENING OF CARRIAGEWAY INTO VERGE SPACE DUE TO NEED FOR PROTECTED TURNING LANE

EXISTING LIGHTING COLUMNS AND SIGNAGE ALONG RIVERVIEW DRIVE VERGE WILL REQUIRE RELOCATION

RIVERVIEW DRIVE

TORNASHEAN GARDENS

HERVIEW AVENUE

GALLOWHILL TERRACE

NETHERVIEW AVENUE

Monument

41.7m

42.1m

42.6m

43.9m

Scale
0 5 10 20 40m

Original Size (A1) 1:500 @ A1 1:1000 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 2 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0714

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGL01\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT48A GENERAL ARRANGEMENT.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\Cl\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT48A GENERAL ARRANGEMENT.DWG

Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

CONSULTANT

AECOM
Aurora
120 Bothwell St
GLASGOW, G2 7JS
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www.aecom.com

NOTES

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

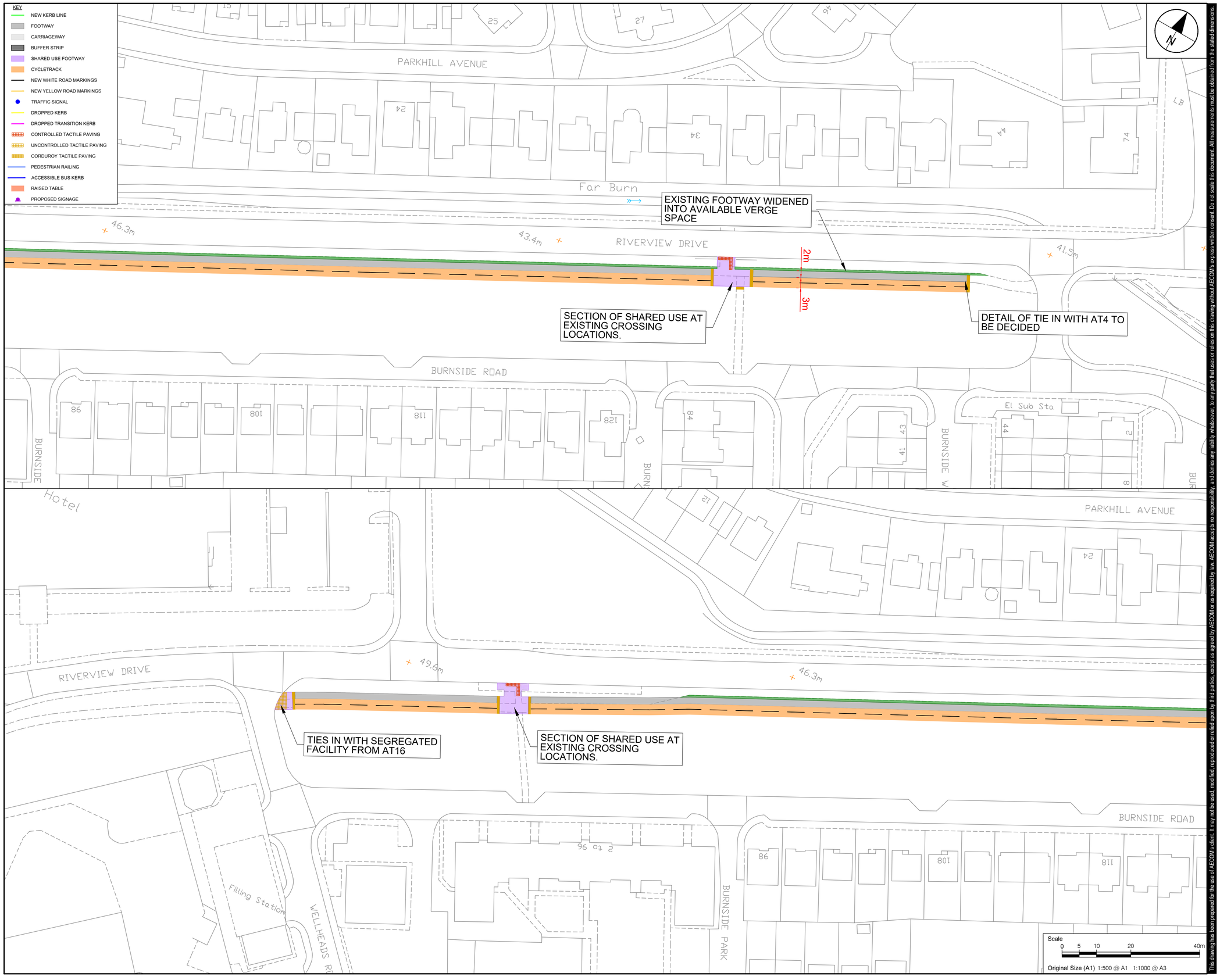
60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 3 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0715



ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

Filename: \\WA.AECOMNET.COM\LFS\EMEA\GLAS\GOW\JKGLG1\DCS\PROJECTS\IC\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT48A GENERAL ARRANGEMENT.DWG
Last saved by: JACK.MCKENNA
Last Plotted: 2024-04-26

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 4 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0716

ISO A1 594mm x 841mm

Project Management Initials: Designer: JM Checked: SS Approved: PL

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

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CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 5 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0717

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-AT48A GENERAL ARRANGEMENT.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

KEY
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- BUFFER STRIP
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- RAISED TABLE
- PROPOSED SIGNAGE

EXISTING CARRIAGEWAY GULLIES WILL REQUIRE RELOCATION TO FRONT OF NEW KERB LINE

REDUCTION TO ABSOLUTE MINIMUM WIDTH DUE TO FIXED PROPERTY BOUNDARIES

EXISTING TOUCAN CROSSING RETAINED.

0.5m

4m

2.5m

Scale
0 5 10 20 40m
Original Size (A1) 1:500 @ A1 1:1000 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 6 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0718

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

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- PROPOSED SIGNAGE

TRANSITION TO TWO-WAY CYCLE TRACK DUE TO AVAILABLE VERGE SPACE.

2m

3m

EXISTING CARRIAGEWAY GULLIES WILL REQUIRE RELOCATION TO FRONT OF NEW KERB LINE

4m

9m

CARRIAGEWAY NARROWING TO ACCOMMODATE WIDENED FOOTWAYS

EXISTING TOUCAN CROSSING RETAINED.

EXISTING TOUCAN CROSSING RETAINED.

WIDENED SHARED FOOTWAY TO TIE INTO EXISTING FOOTWAY.

TWO-WAY SEGREGATED CYCLE TRACK WITHIN AVAILABLE VERGE SPACE.

LIGHTING COLUMNS TO BE RELOCATED.

3.5m

3m

MILLGROVE ROAD
Waterton Cottage
48.3m
El Sub Sta
STONEYWOOD ROAD
46.1m
K-Lea
Fairways
43.8m
MILL PARK CRESCENT
MILL PARK VIEW
A 947
Subway
Sub Sta
STONEYWOOD BR
N

Scale
0 5 10 20 40m
Original Size (A1) 1:500 @ A1 1:1000 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 7 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0719

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
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WIDENED SHARED FOOTWAY TO TIE INTO EXISTING FOOTWAY.

EXISTING UNCONTROLLED CROSSING TO BE RETAINED.

PROPOSED CYCLE TRACK TO TIE INTO SHARED SPACE AS PART OF OPTION AT41

EXISTING RAMP UPGRADED TO FACILITATE CROSSING OF CYCLISTS.

POTENTIAL REQUIREMENT FOR EARTHWORKS TO FACILITATE CYCLE TRACK

ROAD MARKINGS TO PROVIDE A MIN. TAPER OF 1IN40 ON APPROACH THE LANE REDUCTION.(OPTION AT41)

EXISTING LIGHTING COLUMNS TO BE RELOCATED TO FACILITATE CYCLE TRACK.

WHERE REQUIRED ROAD MARKINGS HAVE BEEN PROVIDED TO FACILITATE THE REDUCTION OF LANES FROM 2 TO 1. (OPTION AT41)

OPTION AT48a TO TIE INTO PROPOSED A96 MULTI-MODEL STUDY STAG APPRAISAL. LAYOUT TO BE CONFIRMED.

Allotment Gardens

Mast (Telecommunication)

WOOD BRAE

Stoneywood Pavilion

A 947

Co Const Bdy

Burgh Const Bdy

RSLIE ROAD

GILBERT

R10m

R14m

R32m

11m

4m

0.5m

4m

2.76m

3m

1m

Scale 0 5 10 20 40m

Original Size (A1) 1:500 @ A1 1:1000 @ A3

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT48a General Arrangement
Sheet 8 of 8

SHEET NUMBER

60709527-SHT-30-C-T2-0720

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
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- NEW WHITE ROAD MARKINGS
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- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

TIE INTO NEW ROAD ALIGNMENT AND LAYOUT TO BE DETERMINED.

ACCESS TO INFORMAL PARKING PROVIDED VIA PROVISION OF DROPPED KERB.

DROPPED KERBS TO BE PROVIDED IN FRONT OF THE PARKING FACILITY WITH 2 SECTIONS OF DROPPED KERBS PROVIDED AT EITHER END OF THE PARKING FACILITY ALONG THE FOOTWAY TO FACILITATE CROSSING OF THE CYCLE TRACK.

CYCLE TRACK NARROWED TO 1.5M AND 0.5M WIDE SEPERATION STRIP OF COLOURED SURFACING TO BE PROVIDED BETWEEN THE CYCLE TRACK AND PARKING FACILITY

75M OF ON STREET PARKING TO BE MAINTAINED.

FOOTWAY WIDENED TO ALLOW FOR PARKING FACILITIES TO BE RETAINED FOLLOWING THE PROVISION OF THE CYCLE TRACK.

STEPPED CYCLE TRACK TO BE PROVIDED ON BOTH SIDES OF CARRIAGEWAY.

FOOTWAY NARROWED TO AN ABSOLUTE MIN. 1.5M.

RAISED TABLE TO BE PROVIDED OVER SIDE ROAD WITH CYCLE TRACK RAISED THROUGH JUNCTION TO FOOTWAY LEVEL.

CYCLE TRACK NARROWED TO 1.5M OVER RAISED TABLE TO FACILITATE RAMP.

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

CONSULTANT

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NOTES

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT51 General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0713

Filename: \\WA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-ARRANGEMENT.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

KEY

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- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

RAISED TABLE TO BE PROVIDED OVER SIDE ROAD WITH CYCLE TRACK RAISED THROUGH JUNCTION TO FOOTWAY LEVEL.

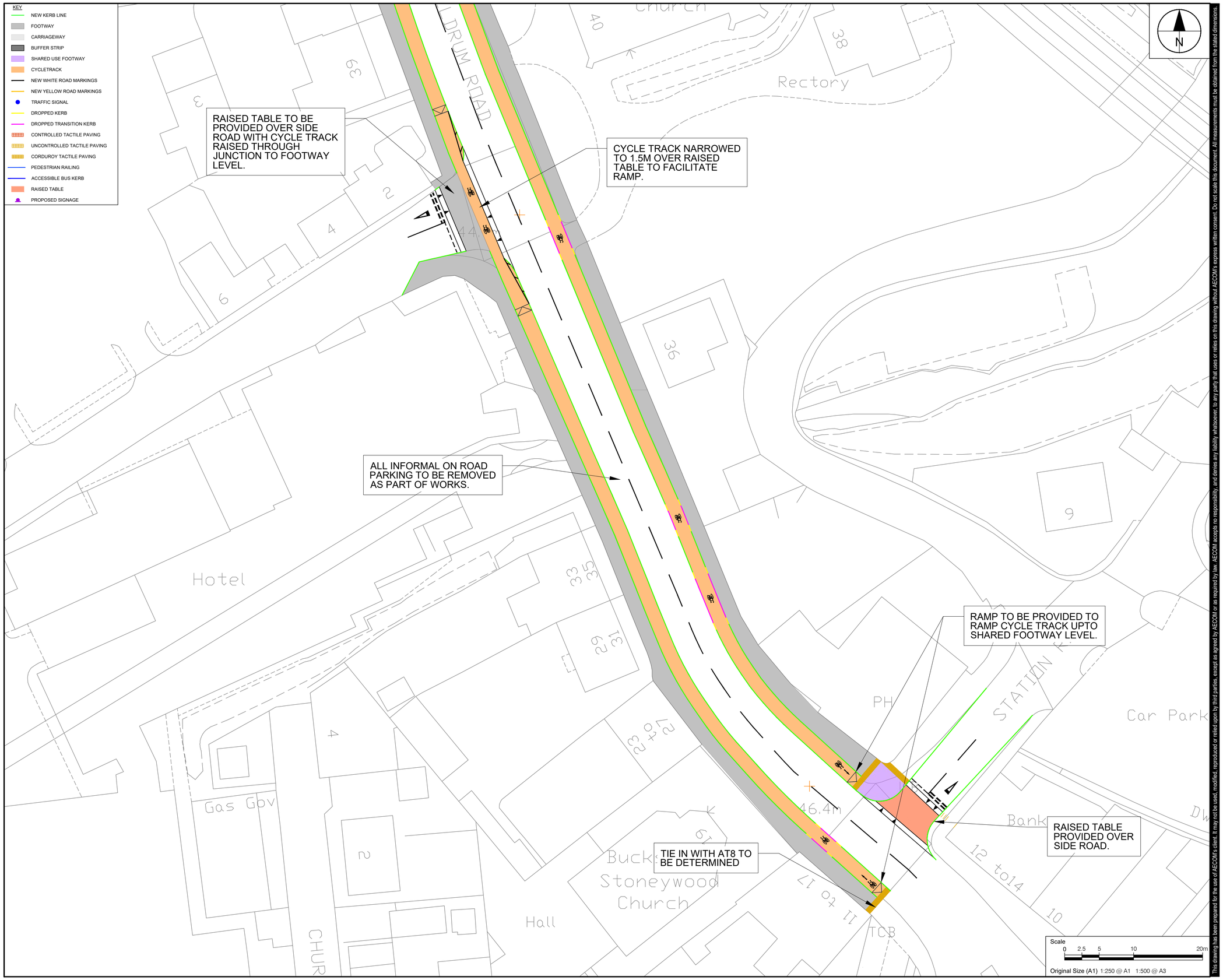
CYCLE TRACK NARROWED TO 1.5M OVER RAISED TABLE TO FACILITATE RAMP.

ALL INFORMAL ON ROAD PARKING TO BE REMOVED AS PART OF WORKS.

RAMP TO BE PROVIDED TO RAMP CYCLE TRACK UPTO SHARED FOOTWAY LEVEL.

RAISED TABLE PROVIDED OVER SIDE ROAD.

TIE IN WITH AT8 TO BE DETERMINED



Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

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KEY PLAN

PROJECT NUMBER

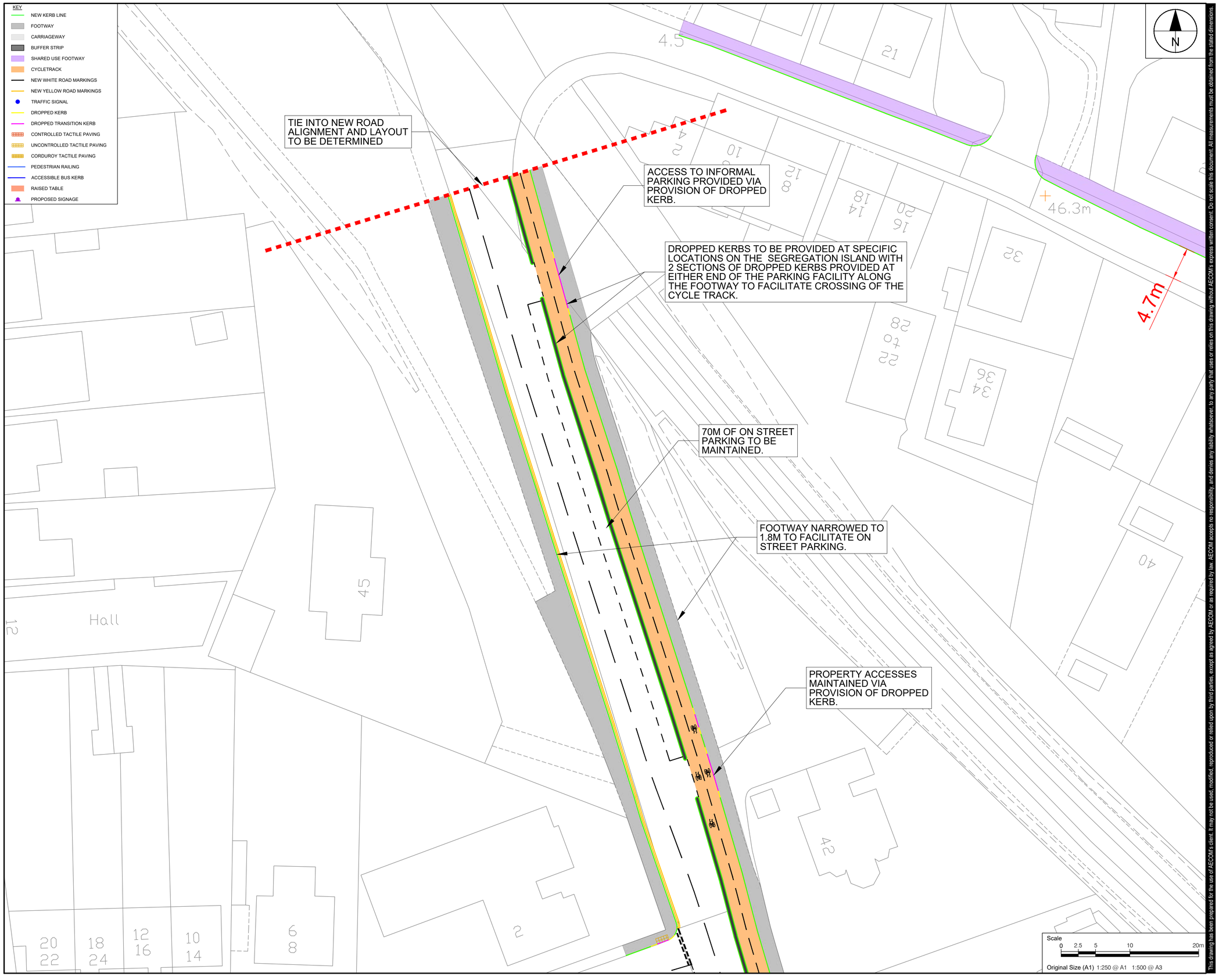
60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT51 General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-0714



ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

Filename: \\NA.AECOMNET.COM\LFSIEMEA\GLASGOW\UKGLG11\DCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT52 General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0723

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
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- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

ALL INFORMAL ON ROAD PARKING TO BE REMOVED AS PART OF WORKS.

1IN20 RAMP TO BE PROVIDED TO RAMP CYCLE TRACK UPTO SHARED FOOTWAY LEVEL.

RAISED TABLE PROVIDED OVER SIDE ROAD.

TIE INTO OPTION AT8 TO BE DETERMINED.

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT52 General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0724

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
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Project Management Initials: Designer: JM Checked: SS Approved: PL ISO A1 594mm x 841mm

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

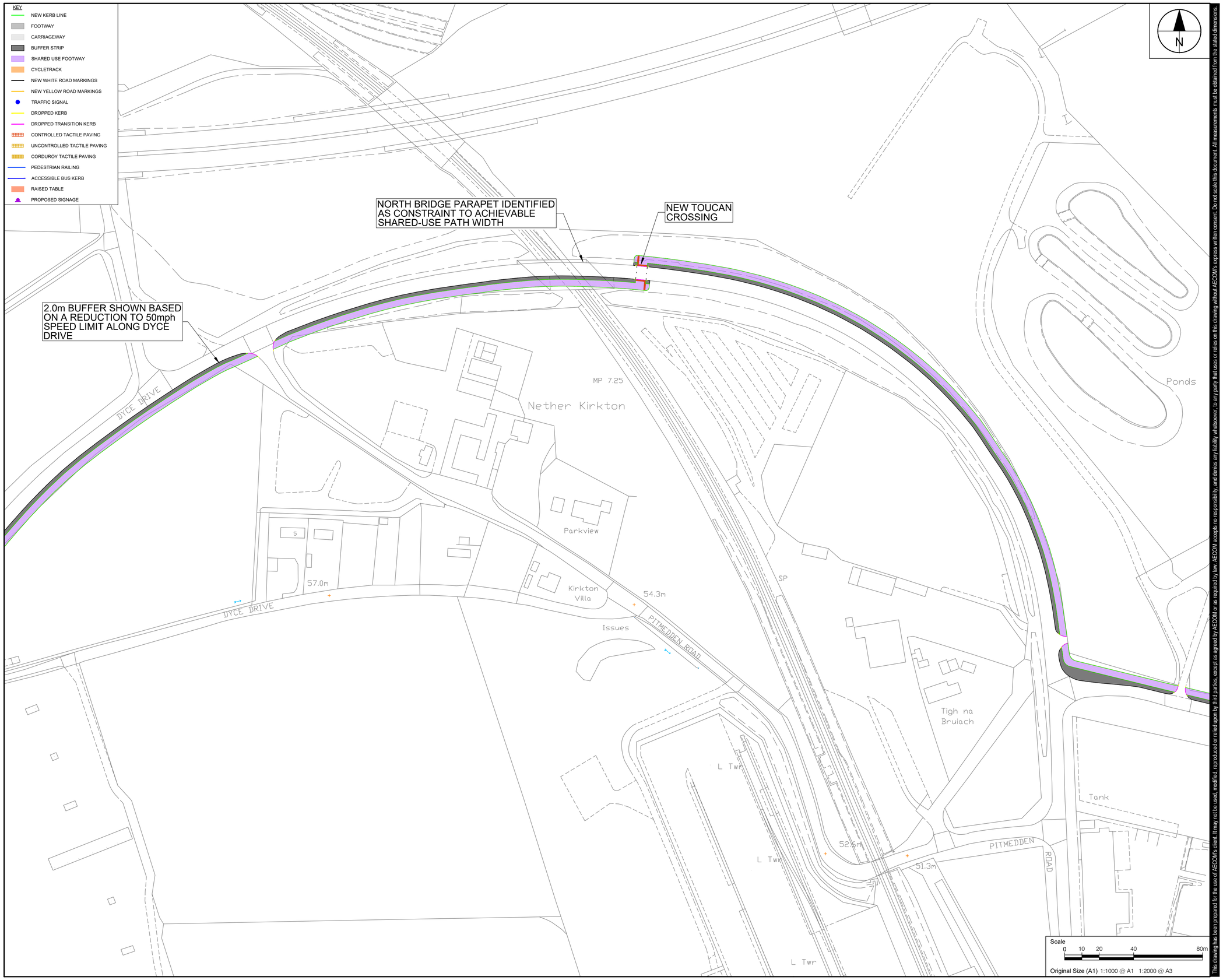
60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT58 General Arrangement
Sheet 1 of 3

SHEET NUMBER

60709527-SHT-30-C-T2-0725



ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT58 General Arrangement
Sheet 2 of 3

SHEET NUMBER

60709527-SHT-30-C-T2-0726

KEY
- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

CORRIDOR MOVES UPHILL FROM NORTH TO SOUTH. GRADIENT ASSESSMENT REQUIRED WITH TOPOGRAPHICAL INFO

EXISTING EMBANKMENT ADJACENT TO CARRIAGEWAY. REGRADING REQUIRED TO MEET DESIRED MIN WIDTH

EXISTING EMBANKMENT ADJACENT TO CARRIAGEWAY. REGRADING REQUIRED TO MEET DESIRED MIN WIDTH

RECOMMENDED TO RELOCATE EXISTING SPEED LIMIT CHANGE FURTHER NORTH DUE TO INTRODUCTION OF SIGNALISED CROSSING

NEW TOUCAN CROSSING

3RD PARTY LAND ACQUISITION AND RELOCATING EXISTING FENCELINE

EXISTING JUNCTION STOP LINES TO BE PUSHED BACK BY APPROX 8m

EXISTING SIGNALS TO BE UPGRADED TO CONTROLLED CROSSING

TIE INTO EXISTING SHARED USE FACILITIES

Overton Green
Kirkhill Reservoir (covered)
Issues
Tanks
Tank
Drain
ESS
El Sub Sta
Airside Business Park
HOWE MOSS AVENUE
DYCE DRIVE
79.7m
90.2m
90.4m
85.8m
81.1m

N

Scale 0 10 20 40 80m
Original Size (A1) 1:1000 @ A1 1:2000 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

ABERDEEN CITY COUNCIL

CONSULTANT

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www.aecom.com

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I/R	DATE	DESCRIPTION

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PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT58 General Arrangement
Sheet 3 of 3

SHEET NUMBER

60709527-SHT-30-C-T2-0727

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UK\GLG1\DCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- DROPPED KERB
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- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

FOOTWAY WIDENING TO PROVIDE A MIN. 2.0M FOOTWAY IMPACTING EXISTING VERGE BEYOND LIDDELL PLACE

DISABLED BAY TO BE REVIEWED

Scale
0 5 10 20 40m
Original Size (A1) 1:500 @ A1 1:1000 @ A3

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT61a General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0728

Filename: \\NA.AECOMNET.COM\LFSIEMEA\GLASGOW-UKGL01\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
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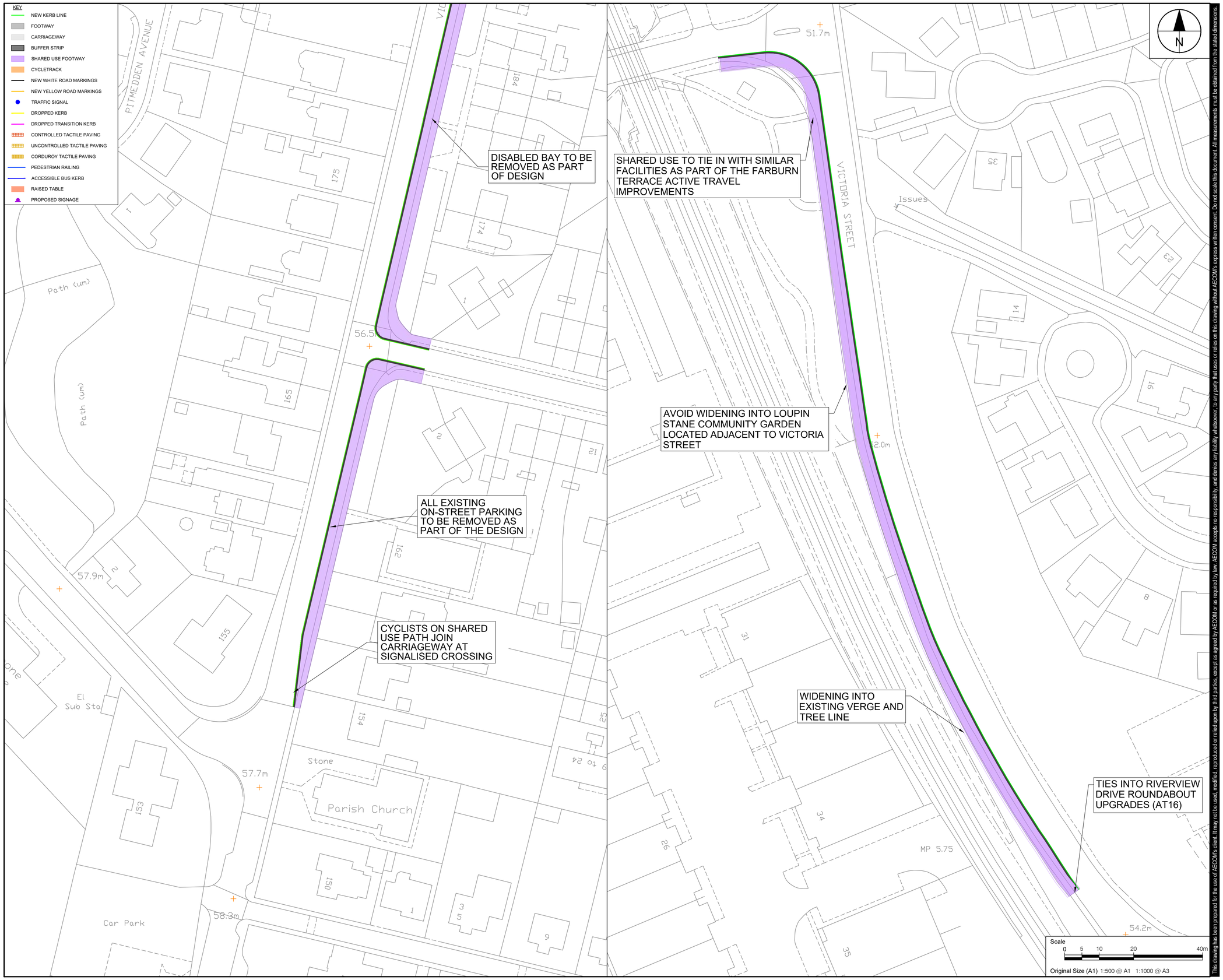

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DOCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

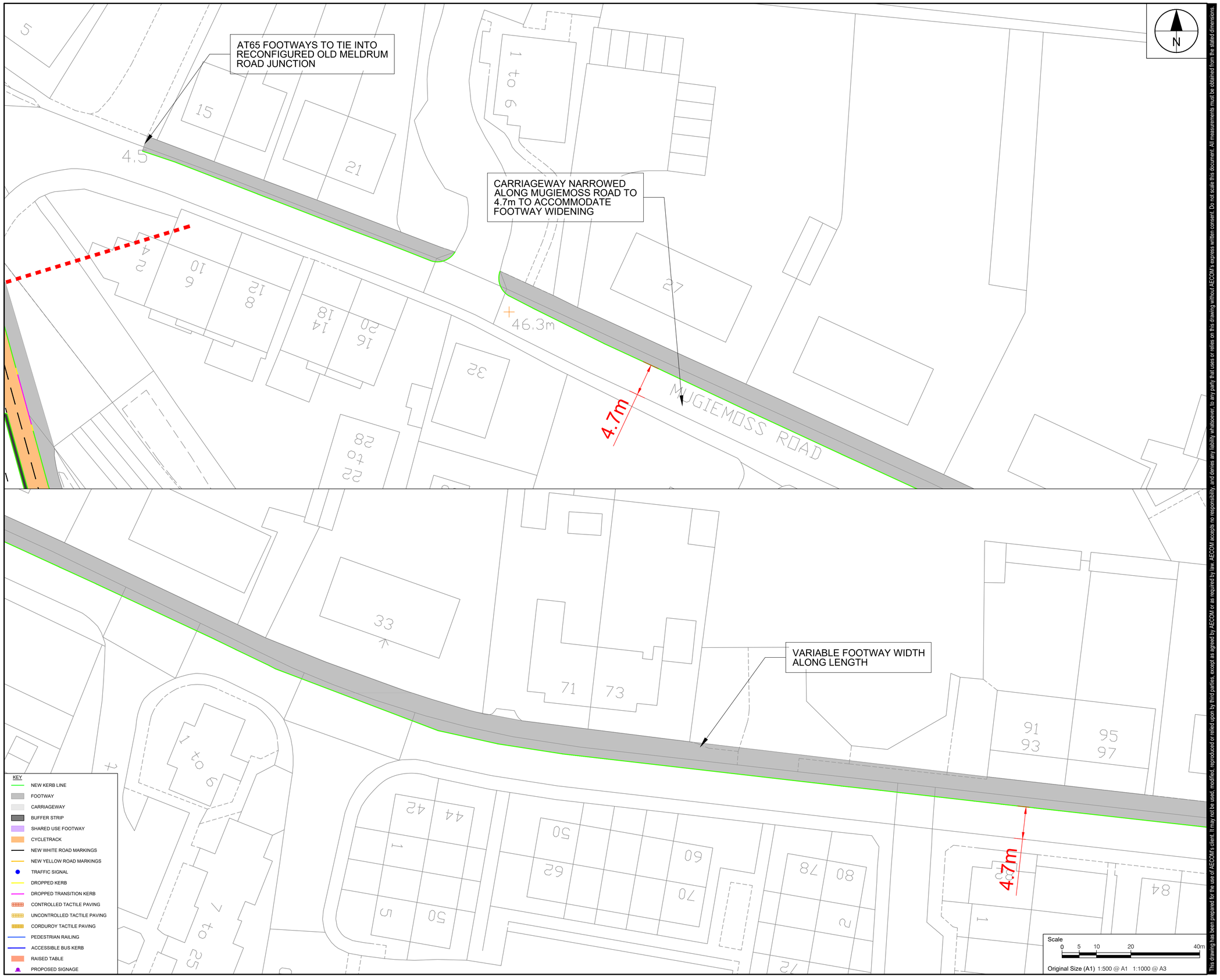
60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT61a General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0729



Project Management Initials: Designer: JM Checked: SS Approved: PL ISO A1 594mm x 841mm

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DCS\PROJECTS\C\60709527_A947_OBC\900_CAD_GIS\010_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT65 General Arrangement
Sheet 1 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0730

Original Size (A1) 1:500 @ A1 1:1000 @ A3

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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

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I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
AT65 General Arrangement
Sheet 2 of 2

SHEET NUMBER

60709527-SHT-30-C-T2-0731

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
- TRAFFIC SIGNAL
- DROPPED KERB
- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

N

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

AECOM

PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
O3 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0732

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

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- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

TIE INTO EXISTING FOOTWAY, VERGE EDGE TO BE REINSTATED

CARRIAGEWAY EXTENDED TO FACILITATE VEHICLE MOVEMENTS DUE TO NEW RADII.

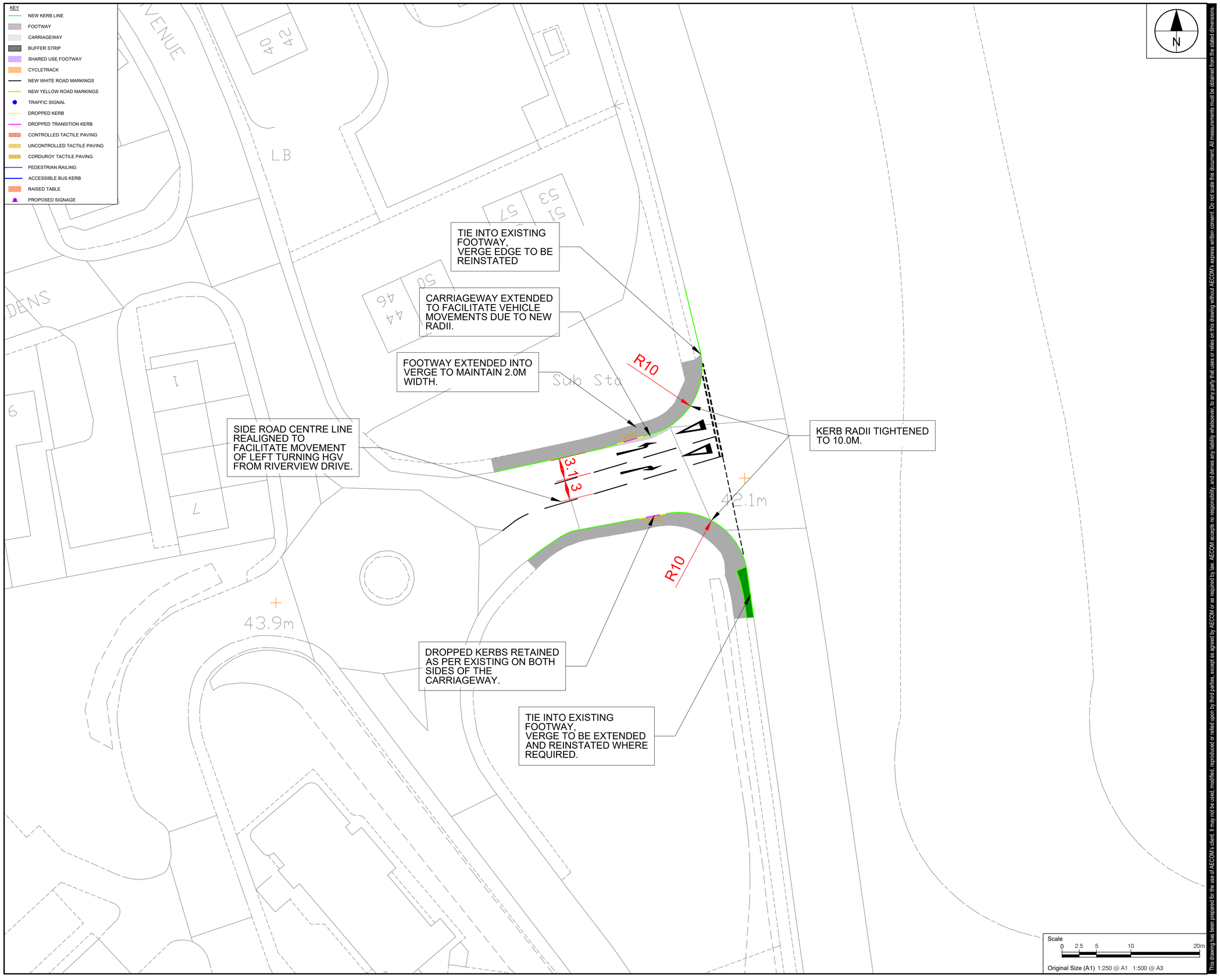
FOOTWAY EXTENDED INTO VERGE TO MAINTAIN 2.0M WIDTH.

SIDE ROAD CENTRE LINE REALIGNED TO FACILITATE MOVEMENT OF LEFT TURNING HGV FROM RIVERVIEW DRIVE.

KERB RADII TIGHTENED TO 10.0M.

DROPPED KERBS RETAINED AS PER EXISTING ON BOTH SIDES OF THE CARRIAGEWAY.

TIE INTO EXISTING FOOTWAY, VERGE TO BE EXTENDED AND REINSTATED WHERE REQUIRED.



N

Scale
0 2.5 5 10 20m
Original Size (A1) 1:250 @ A1 1:500 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
O5 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0733

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
- NEW YELLOW ROAD MARKINGS
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- DROPPED TRANSITION KERB
- CONTROLLED TACTILE PAVING
- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

RAISED ISLAND PROVIDED IN PLACE OF HATCHED ROAD MARKINGS.

CARRIAGEWAY AND SPLITTER ISLAND TO BE REALIGNED

EXISTING RIGHT TURN LANE GEOMETRY RETAINED.

15.3

1.1

N

El Sub Sta

187

144

1

7

1

10 to 16

Scale
0 2.5 5 10 20m

Original Size (A1) 1:250 @ A1 1:500 @ A3

Filename: \\NA.AECOMNET.COM\LFS\EMEA\GLASGOW-UKGLG1\DOCS\PROJECTS\CI\60709527_A947_OBC\900_CAD_GIS\910_CAD\20-SHEETS\60709527-SHT-C-T2-GENERAL ARRANGEMENTS.DWG
Last saved by: JACK.MCKENNA Last Plotted: 2024-04-26

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A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
O7 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0734

ISO A1 594mm x 841mm

Approved: PL

Checked: SS

Designer: JM

Project Management Initials:

KEY

- NEW KERB LINE
- FOOTWAY
- CARRIAGEWAY
- BUFFER STRIP
- SHARED USE FOOTWAY
- CYCLETRACK
- NEW WHITE ROAD MARKINGS
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- UNCONTROLLED TACTILE PAVING
- CORDUROY TACTILE PAVING
- PEDESTRIAN RAILING
- ACCESSIBLE BUS KERB
- RAISED TABLE
- PROPOSED SIGNAGE

RADIUS TIGHTENED TO FACILITATE NARROWING OF LANE FROM APPROX. 4.6M TO 4.1M.

ROAD MARKINGS PROVIDING A 1IN35 TAPER ARE TO BE PROVIDED FROM JUNCTION OVER APPROX. 122M.

BUFFER WIDENED AND LANE NARROWED TO 4.0M FROM APPROX. 4.6M.

EXISTING 40MPH SPEED LIMIT SIGNS TO BE RELOCATED.

0.5m

4m

2.76m

N

Scale
0 1 2 4 8m

Original Size (A1) 1:100 @ A1 1:200 @ A3

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PROJECT

A947 MULTI-MODAL STUDY - DETAILED APPRAISAL AND OBC

CLIENT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60709527

SHEET TITLE

A947 Table 2 Detailed Design
O8 General Arrangement
Sheet 1 of 1

SHEET NUMBER

60709527-SHT-30-C-T2-0735

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Last saved by: JACK.MCKENNA Last Plotted: 2024-04-25

Appendix F – Detailed Table 2 Option Cost Breakdown

Delivering a better world

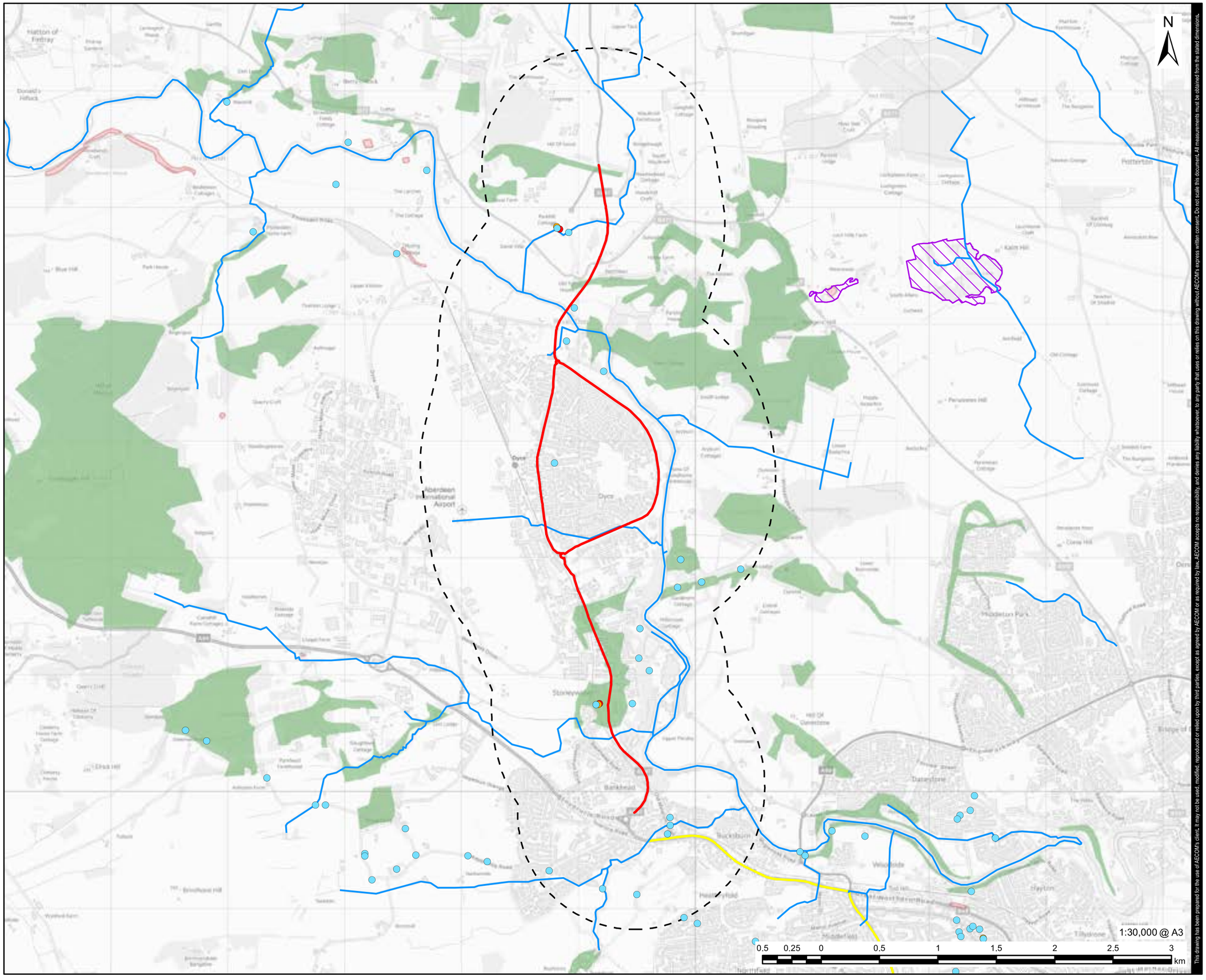
A947 Table 2 Options - Outline Cost Estimate
Summary

	AT26	AT31	AT33	AT35a	AT41a	AT41b	AT43	AT48a	AT51	AT52	AT58	AT61a	AT65	O2	O3	O4	O5	O7	O8
Construction Costs Sub-Total	**£606,000**	**£29,000**	**£44,000**	**£154,000**	**£78,000**	**£288,000**	**£32,000**	**£2,540,000**	**£415,000**	**£335,000**	**£1,801,000**	**£331,000**	**£159,000**	**£3,000**	**£15,000**	**£15,000**	**£23,000**	**£16,000**	**£9,000**
Risk and Contingency (44%)	£267,000	£13,000	£19,000	£68,000	£35,000	£127,000	£14,000	£1,118,000	£182,000	£147,000	£793,000	£146,000	£70,000	£2,000	£7,000	£7,000	£10,000	£7,000	£4,000
Construction Costs Sub-Total (inclusive of Risk and Contingency)	**£873,000**	**£42,000**	**£63,000**	**£222,000**	**£113,000**	**£415,000**	**£46,000**	**£3,658,000**	**£597,000**	**£482,000**	**£2,594,000**	**£477,000**	**£229,000**	**£5,000**	**£22,000**	**£22,000**	**£33,000**	**£23,000**	**£13,000**
Design	£87,000	£4,000	£6,000	£22,000	£11,000	£42,000	£5,000	£366,000	£60,000	£48,000	£259,000	£48,000	£23,000	£1,000	£2,000	£2,000	£3,000	£2,000	£1,000
Placemaking	£44,000	£2,000	£3,000	£11,000	£6,000	£21,000	£2,000	£183,000	£30,000	£24,000	£130,000	£24,000	£11,000	£300	£1,000	£1,000	£2,000	£1,000	£1,000
Site Supervision and Project Management	£44,000	£2,000	£3,000	£11,000	£6,000	£21,000	£2,000	£183,000	£30,000	£24,000	£130,000	£24,000	£11,000	£300	£1,000	£1,000	£2,000	£1,000	£1,000
Traffic Management	£22,000	£4,000	£6,000	£22,000	£11,000	£42,000	£5,000	£366,000	£60,000	£48,000	£259,000	£48,000	£23,000	£1,000	£2,000	£2,000	£3,000	£2,000	£1,000
Monitoring and Evaluation	£44,000	£2,000	£3,000	£11,000	£6,000	£21,000	£2,000	£183,000	£30,000	£24,000	£130,000	£24,000	£11,000	£300	£1,000	£1,000	£2,000	£1,000	£1,000
Base Construction Costs Total (inclusive of Risk, Contingency and Overheads)	**£1,114,000**	**£56,000**	**£84,000**	**£299,000**	**£153,000**	**£562,000**	**£62,000**	**£4,939,000**	**£807,000**	**£650,000**	**£3,502,000**	**£645,000**	**£308,000**	**£8,000**	**£29,000**	**£29,000**	**£45,000**	**£30,000**	**£18,000**

Appendix G – Environmental Constraints Mapping

Delivering a better world

Revision: 01 Drawn: ER Checked: LC Approved: AI Date: 2021-12-15



AECOM

PROJECT

A947 Multi-Modal Study - STAG-Based Apprasial

CLIENT

Aberdeen City Council

CONSULTANT

AECOM Limited
2 City Walk
Holbeck, Leeds
LS11 9AR
www.aecom.com

LEGEND

- Study Area
- 1km Study Corridor
- River
- Site of Special Scientific Interest (SSSI)
- Air Quality Management Area (AQMA)
- Ancient Woodland
- Scheduled Monument
- Grade 1 Listed Building
- Grade 2 Listed Building
- Grade 3 Listed Building

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60667436

FIGURE TITLE

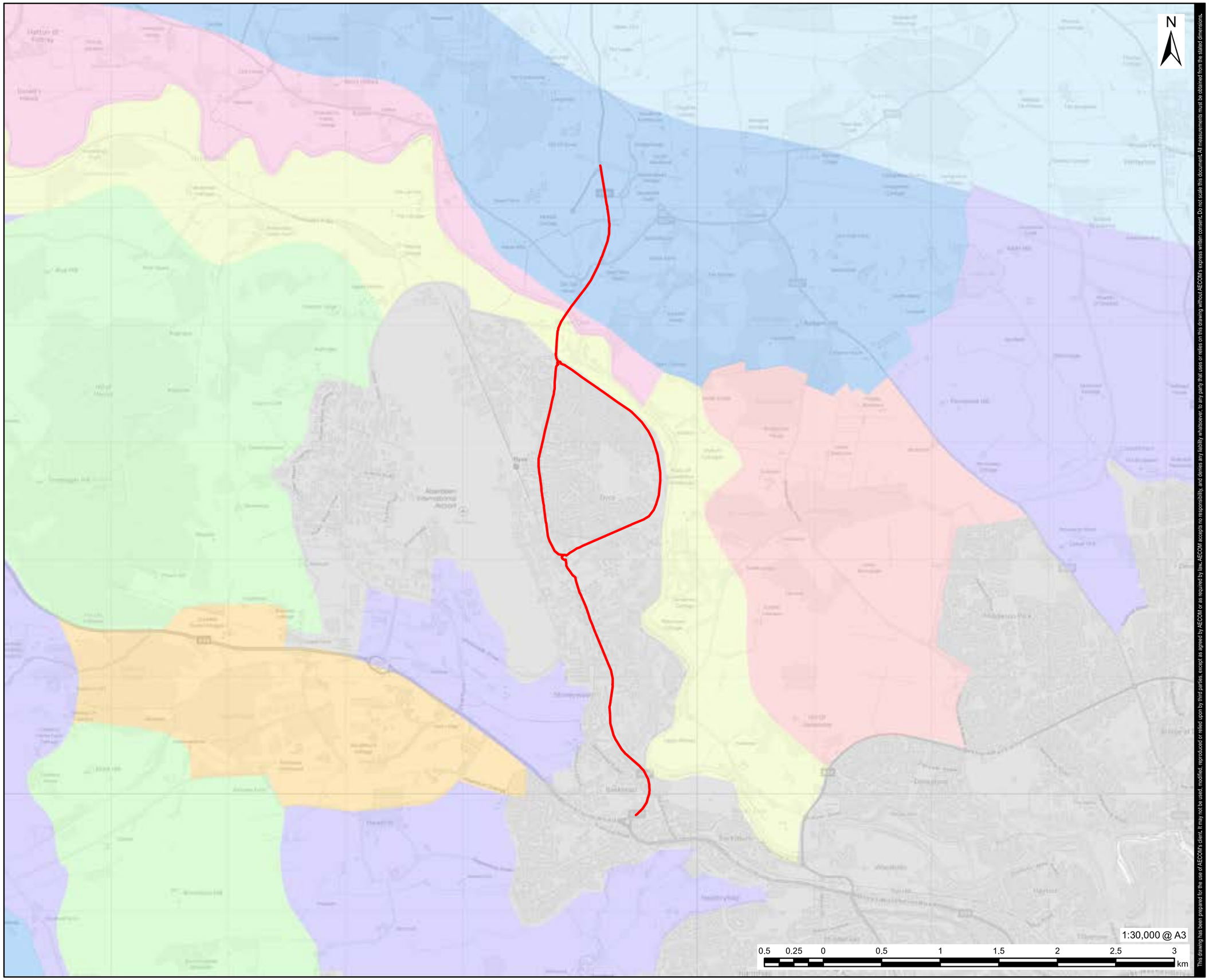
Environmental Constraints Plan

FIGURE NUMBER

Figure 1

Filename: C:\Users\RaineE\OneDrive - AECOM\Documents\Projects\A947\02_Maps\Fig1_EnvironmentalConstraints_211210.mxd

Revision: 01 Drawn: ER Checked: LC Approved: AI Date: 2021-12-15



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A947 Multi-Modal Study - STAG-Based Appraisal

CLIENT

Aberdeen City Council

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2 City Walk
Holbeck, Leeds
LS11 9AR
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LEGEND

Study Area

NOTES

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Soil Survey of Scotland Staff (1981). Soil maps of Scotland at a scale of 1:250 000. Macaulay Institute for Soil Research, Aberdeen. DOI: 10.5281/zenodo.4646891.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60667436

FIGURE TITLE

Landscape Character Areas

FIGURE NUMBER

Figure 2

Filename: C:\Users\RaineE\OneDrive - AECOM\Documents\Projects\A947\02_Maps\Fig2_Landscape_Character_Areas_211215.mxd

Revision: 02 Drawn: ER Checked: LC Approved: AI Date: 2022-02-04

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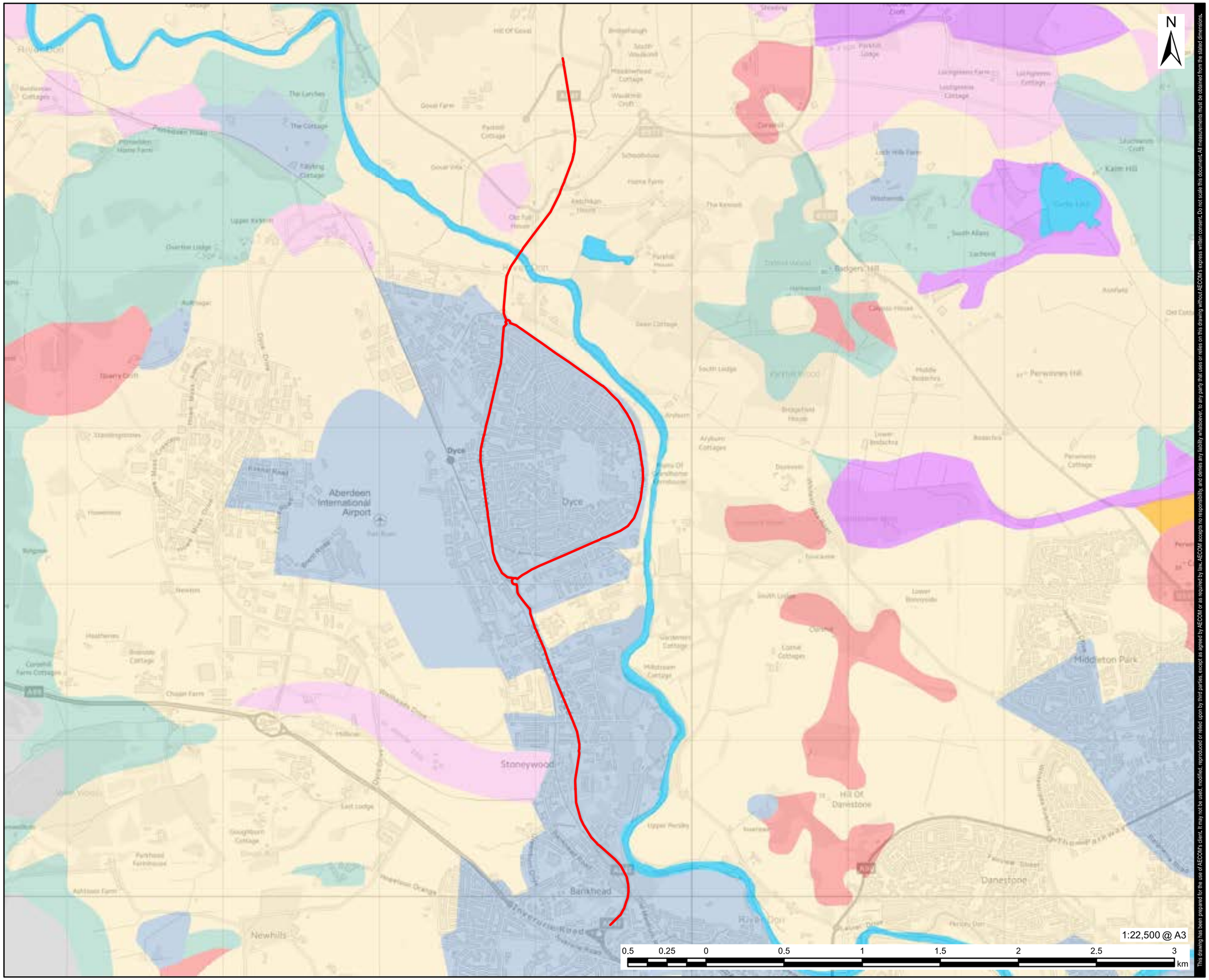

AECOM

PROJECT

A947 Multi-Modal Study - STAG-Based Appraisal

CLIENT

Aberdeen City Council

CONSULTANT

AECOM Limited
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LEGEND

- Study Area

Land Capability for Agriculture

- 3.1 - Land capable of producing consistently high yields of a narow range of crops and/or moderate yields of a wider range. Short grass leys are common.
- 3.2 - Land capable of average production though high yields of barley, oats and grass can be obtained. Grass leys are common.
- 4.1 - Land capable of producing a narrow range of crops, primarily grassland with short arable breaks of forage crops and cereal
- 4.2 - Land capable of producing a narrow range of crops, primarily on grassland with short arable breaks of forage crops.
- 5.2 - Land capable of use as improved grassland. Few problems with pasture establishment but may be difficult to maintain.
- 5.3 - Land capable of use as improved grassland. Pasture deteriorates quickly.
- 6.2 - Land capable of use as rough grazings with moderate quality plants.
- Urban
- Unknown

NOTES

Soil Survey of Scotland Staff (1981). Soil maps of Scotland at a scale of 1:250 000. Macaulay Institute for Soil Research,

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60667436

FIGURE TITLE

Land Capability for Agriculture

FIGURE NUMBER

Figure 3

Appendix H – Active Mode Appraisal Toolkit (AMAT) Assessment

Delivering a better world

Active Mode Appraisal Toolkit (AMAT) Assessment

Client name	Project name	Date	Project number
Aberdeen City Council	A947 Multi-Modal Corridor Study	16 August 2024	60709527

Prepared by	Approved by	Checked by	Verified by
Sam Stirling & Eleanor Bagnall	Andrew Robb	Rob Sutherland	Joanne Melarkey

Revision History

Revision	Revision date	Details	Authorised	Name	Position
0	06/06/2024	Draft for Client Comment	AR	Andrew Robb	Project Manager
1	16/08/2024	Final Appendix H	AR	Andrew Robb	Project Manager

1. Introduction

This Note sets out an assessment of potential costs and benefits arising from improved active travel infrastructure on the A947 corridor between the Aberdeen Western Peripheral Route (AWPR) and the A96 (at the Bucksburn Roundabout), as part of the A947 Multi-Modal Corridor Study. The Department for Transport's (DfT) Active Mode Appraisal Toolkit (AMAT) has been used to calculate these benefits and summarise these against costs in line with principles of best practice set out in Transport Analysis Guidance (TAG)[1].

This assessment appraises six options included in the Detailed Appraisal. This includes:

- AT33: Provide improved active travel links between Dyce Rail Station and the A947 and the eastern section of Dyce, particularly along Station Road;
- AT48a: Implement active travel improvements to support highest practicable level of service on the A947 between the Bucksburn Roundabout and Riverview Drive Roundabout North;
- AT51: Implement with-flow segregated cycleway on Old Meldrum Road;
- AT52: Implement two-way segregated cycleway on Old Meldrum Road;
- AT58: Implement shared use path on Dyce Drive between the A947 and Kirkhill Industrial Estate to the north of Aberdeen International Airport; and
- AT61a: Implement package of active travel measures on Victoria Street[2].

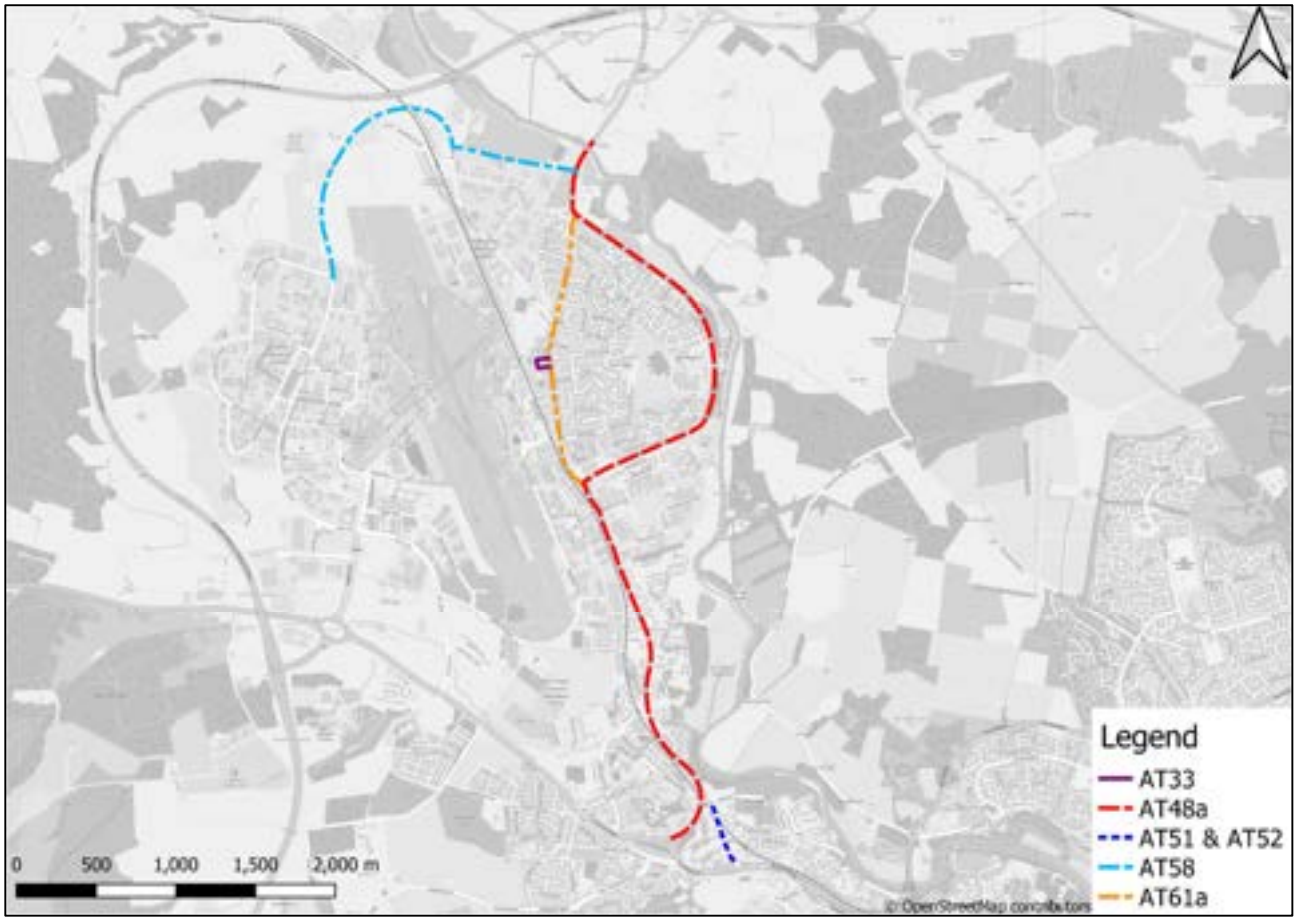
This assessment considers active travel only. The above options have been selected as those most likely to achieve modal shift, taking account of option route length and change in extent of physical infrastructure provision.

The options that have been assessed are illustrated in **Figure 1.1.**

[1] Transport Analysis Guidance (TAG), DfT, November 2022, https://www.gov.uk/guidance/transport-analysis-guidance-tag#supplementary-guidance

[2] This option provides the opportunity to improve accessibility and active travel opportunities in the 'heart' of Dyce and has been considered in three sections: 1) Victoria Street/Riverview Drive South Roundabout to Farburn Terrace; 2) Farburn Terrace to Pitmedden Road; and 3) Pitmedden Road to Victoria Street/Riverview Drive North Roundabout. In Section 1, there is adequate space on the eastern side to develop a segregated cycleway connection by reallocating the existing advisory cycle lanes and utilising the existing verge space. In Section 2, there is limited scope to widen the existing footways or reduce the carriageway width due to bordering property boundaries. A reduction of the speed limit to 20mph and introduction of various measures would allow this section to be formalised as a mixed traffic street. Section 3 has three sub-improvement options, with varying volumes of works required. Option 3a involves the reduction of the road carriageway width to 6m, removal of on-street parking and speed limit reduction to 20mph. Option 3b – reduction of speed limit to 20mph and removal of on street parking would create opportunity to widen and reclassify existing footways on Eastern side to shared use desirable minimum width, with local sections of absolute minimum shared use width due to corridor constraints. Option 3c would continue the measures introduced as part of Option 3b with a reduced speed limit to formalise Section 3 as a mixed traffic street.

Figure 1.1: Options Assessed



2. Demand

Baseline (Do Minimum) demand for walking and cycling has been estimated by applying mode share factors to a population catchment within a 1km buffer of the study routes. A background growth rate has then been applied to factor this demand to the estimated scheme opening year, assumed for the purposes of this assessment to be 2027.

Future (Do Something) demand for walking and cycling has been estimated using the disaggregate mode-choice model set out in Section 2.3 of TAG Unit A5.1[3]. This approach is described in the following sections below.

2.1 Population

A 1km buffer has been created in GIS for each option outlined in **Figure 1.1**. This buffer has then been intersected with Scottish Neighbourhood Statistics (SNS) Data Zones[4] to set out an estimate of the area of influence of each option. The data zones which intersect the buffer have then been spatially joined to the latest available data zone population estimates (2021) available from the National Records of Scotland (NRS)[5] to obtain a baseline (2021) population catchment for each option. It is noted that no weighting or scaling has been applied to the intersecting population catchment for each data zone, i.e. the full population for the data zone has been included in the catchment if the zone intersects the buffer.

As different mode share factors can be identified for different journey purposes, the population catchments for each option have been split into three constitutive age groups for the purposes of the demand analysis: 4-18 years, 19-66 years and 67+ years. The 4-18 years age range has been selected to be approximately representative of those who travel to education, and the 19-66 age range to be approximately representative of those who travel to work. **Table 2.1** shows the

[3] TAG Unit A5.1 - Active Mode Appraisal, DfT, November 2022, https://www.gov.uk/government/publications/tag-unit-a5-1-active-mode-appraisal
[4] Census Geographies, 2011, Scotland's Census, https://www.scotlandscensus.gov.uk/about/2011-census/2011-census-geographies/
[5] Mid-2021 Small Area Population Estimates for 2011 Data Zones, NRS, September 2022, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/small-area-population-estimates-2011-data-zone-based/mid-2021

baseline population catchment for each option in 2021, noting that options AT51 and AT52 are identical in terms of catchment area and subsequent catchment population.

Table 2.1: Population Catchments by Option and Age Group (2021)

Option	<4	4-18	19-66	67+
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	204	927	3,777	1,467
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	946	3,022	12,710	3,694
AT51: with-flow segregated cycleway on Old Meldrum Road	830	2,555	10,055	2,363
AT52: two-way segregated cycleway on Old Meldrum Road	830	2,555	10,055	2,363
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	322	1,159	4,731	1,745
AT61a: package of active travel measures on Victoria Street.	391	1,347	5,794	2,110

The 4-18 age group represents approximately 15% of the total population catchment, with the 19-66 age group representing approximately 61%[6]. In determining these figures, it has been assumed that either option AT51 or AT52 would be implemented (not both) and therefore AT51/AT52 has been considered as one option to avoid double counting.

It is noted that the focus of this assessment is on travel to work/education due to the nature of the mode-choice model being applied to estimate future growth, discussed further in the **Future Demand** section below. As such, the population of those over 67 years of age has not been included in this analysis, nor have estimates of the impacts to leisure demand more generally. This is not to say that the measures included as part of the options will not affect those travelling for leisure, nor that those over 66 years of age would not experience benefits, rather that modelling these impacts is difficult and not well understood. The results of this assessment could therefore be considered conservative as a result.

The scheme opening year has been assumed to be 2027 for the purposes of this analysis. Since the latest NRS mid-year population estimates are for 2021, a background growth factor has been applied to estimate the future population during the scheme opening year. This factor has been calculated as the unweighted average of (a) cycle trip growth between 2021 and 2027, obtained from the National Trip End Model (NTEM)[7], (b) walk trips growth between 2021 and 2027, obtained from the NTEM[8], and (c) population growth between 2021 and 2027, obtained from NRS Population Projections[9]. The resulting background growth factor is 1.4%.

2.2 Mode Share

Baseline mode share factors for walking and cycling have been identified for both travel to education (SUSTRANS Hands Up Survey, HUS)[10] and for travel to work (Scottish Household Statistics, SHS)[11] for the Aberdeen City area and have been applied. These mode share splits by journey purpose and active travel mode are shown in **Table 2.2.**

To mitigate against potential short-term travel trends, the mode shares presented here are five-year averages, 2015-2019 for travel to work (2019 being the latest available), and 2018-2022 for travel to education (2022 being the latest available). It is noted that HUS data includes all school types (but not nurseries). It is also noted that sample sizes for SHS data are very low (~130 responses for Aberdeen City in 2019), so some caution is urged with these results.

[6] The remaining population segments are less than four years old (4%) and 67 years old or older (20%)
[7] National Trip End Model (NTEM), DfT, February 2023, *https://www.data.gov.uk/dataset/11bc7aaf-ddf6-4133-a91d-84e6f20a663e/national-trip-end-model-ntem*
[8] National Trip End Model (NTEM), DfT, February 2023, *https://www.data.gov.uk/dataset/11bc7aaf-ddf6-4133-a91d-84e6f20a663e/national-trip-end-model-ntem*
[9] Population Projections for Scottish Areas (2018-based), NRS, 2020, *https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-projections/sub-national-population-projections/2018-based*
[10] Hands Up Survey Scotland, SUSTRANS, May 2023, *https://www.sustrans.org.uk/our-blog/projects/uk-wide/scotland/hands-up-scotland-survey*
[11] Scottish Household Survey Travel to Work, 2008-2019, Table 8.25, *https://scotland.shinyapps.io/sg-scottish-household-survey-data-explorer/*

Table 2.2: Do Minimum (baseline) Mode Share Factors

Local Authority	Education		Work	
	Walk	Cycle	Walk	Cycle
Aberdeen City	49.3%	4.0%	20.4%	2.5%

2.3 Do Something Demand

Do Something (with scheme) demand has been estimated using a disaggregate mode-choice model as set out in Section 2.3 of TAG Unit A5.1[12]. This model forecasts the impacts of improvements in the attractiveness of cycling for commuting trips based on several factors, including the type of infrastructure to be implemented, the existing mode share, distance travelled, and the proportion of those for whom cycling would be a viable alternative.

The AMAT guidance[13] notes that "[this model] *could be extended to cover walking but research in this area is problematic. People do not regard walking as a mode of transport in quite the same way as driving, using a bus or even cycling so studying their reaction to changes in the walking environment is difficult*". In the absence of a bespoke model to calculate walking (and non-commuting trips more generally), the uplift to walk trips to work and the uplift in both walk and cycle trips to education have been calculated by applying the same process. Some additional caution is therefore required around these figures. It is noted, however, that trips to work represent the majority of trips estimated in this assessment (the working population represents approximately 61% of the total population) and that the uplift in cycle trips calculated by the model is far larger than for walking – the uplift for walking is around 8% compared with 39% for cycling[14].

Mode share figures for the Do Something scenario, based on the above approach, are shown in **Table 2.3**.

Table 2.3: Do Something (with scheme) Mode Share Factors

Section	Education		Work	
	Walk	Cycle	Walk	Cycle
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	49.5%	4.1%	20.5%	2.5%
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	53.4%	7.5%	24.3%	4.8%
AT51: with-flow segregated cycleway on Old Meldrum Road	50.4%	4.3%	21.3%	2.6%
AT52: two-way segregated cycleway on Old Meldrum Road	50.4%	4.3%	21.3%	2.6%
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	53.0%	7.0%	23.9%	4.4%
AT61a: package of active travel measures on Victoria Street.	51.3%	4.8%	22.2%	3.0%

[12] TAG Unit A5.1 - Active Mode Appraisal, DfT, November 2022, https://www.gov.uk/government/publications/tag-unit-a5-1-active-mode-appraisal
[13] Ibid.
[14] Averaged across the options

3. Costs

Total investment (i.e. capital expenditure) costs for each option have been obtained utilising SPONS Civil Engineering and Highway Works Price Book, Local Authority Framework Rates and construction costs from similar projects. These costs include preliminaries; site clearance and construction costs for the individual measures included in each option. Risk and contingency has been set at 44% across all options in line with the Green Book for this design stage. More detail about specific measures included within the costings is included in Chapter 13 of the Detailed Appraisal Report.

No ongoing operating costs have been included, although these could be included as part of future sensitivity testing. Additionally, as per the AMAT User Guide[15], costs have been inserted in current (2024) nominal prices, i.e. they have not been adjusted for inflation. **Table 3.1** illustrates the total capital cost for each option.

Table 3.1: Costs by Option

Option	Total Costs (Inclusive of Risk and Contingency at 44%)
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	£84,000
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	£4,939,000
AT51: with-flow segregated cycleway on Old Meldrum Road	£807,000
AT52: two-way segregated cycleway on Old Meldrum Road	£650,000
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	£3,502,000
AT61a: package of active travel measures on Victoria Street.	£645,000

For the purposes of this assessment, these costs have been assumed to be incurred over a two-year period, 50% in 2026, and 50% in 2027.

[15] Section 3.3, AMAT User Guide, DfT, May 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102781/active-model-appraisal-toolkit-user-guidance.pdf

4. AMAT Assessment

Based on the methodology described in the sections above, the estimated number of trips per day across the options in the Do Minimum and Do Something scenarios are shown in **Table 4.1**. It is again noted that these trip numbers do not include leisure users, and as such the resulting demand uplift could be considered a conservative estimate[16].

Table 4.1: Daily Trip Estimates and % Uplift for each Option

Option	Do Minimum (baseline)		Do Something (with scheme)		Uplift	
	Walk	Cycle	Walk	Cycle	Walk	Cycle
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	473	50	475	51	1%	2%
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	1,572	168	1,812	322	15%	91%
AT51: with-flow segregated cycleway on Old Meldrum Road	1,275	136	1,321	145	4%	7%
AT52: two-way segregated cycleway on Old Meldrum Road	1,275	136	1,321	145	4%	7%
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	592	63	672	111	14%	76%
AT61a: package of active travel measures on Victoria Street.	711	76	762	92	7%	20%

The following additional assumptions have been included in the AMAT assessment across all options:

- The intervention opening year is defined as 2027, and the last year of funding has been defined as 2027.
- The appraisal period has been defined as 20 years. Sensitivity testing could be conducted on longer periods (up to 60 years), which would enhance benefits and may be considered appropriate for these options.
- The local area type has been defined as ‘Rural’ for option AT58 as the majority of this option lies within the more rural area to the north of Aberdeen International Airport. ‘Other Urban’ has been used as the local area type for all other options as the majority of these routes lie within the Aberdeen City boundary.
- No current existing cycling infrastructure is assumed. This has been selected as the most appropriate measure since the majority of the proposed route alignments have no existing cycling infrastructure. The proposed infrastructure type for options AT33 and AT58 has been chosen as ‘on-road non-segregated cycle lane’. For options AT48a, AT51 and AT52, ‘on-road segregated cycle lane’ has been chosen. The proposed infrastructure type for option AT61a has been chosen as ‘wider lane’, albeit some sections of the route will be on-road segregated cycle lane. Since AMAT is rigid in allowing only one proposed infrastructure type, this option has been selected to cover both.
- The proposals are assumed to include kerb levelling, pavement evenness, street lighting and directional signage, but not measures to implement information panels, reduce crowding, nor install benches[17].
- The present value of benefits and costs are discounted to 2010 prices and values.

Benefits identified in AMAT are grouped into three main categories: health, journey quality improvements, and mode shift. Each of these are considered below.

[16] A basic assumption could be made that the proposals would likely improve leisure trips via active modes
[17] AMAT User Guide Annex C, DfT, May 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102781/active-model-appraisal-toolkit-user-guidance.pdf

4.1 Health Benefits

The health benefits quantified in AMAT relate primarily to a reduced risk of premature death, and a reduced rate of absenteeism as a result of health benefits associated with improved active travel uptake.

Research shows that physical activity increases life expectancy and decreases the risk of many adverse health conditions, including coronary heart disease, type 2 diabetes, and breast and colon cancers[18]. Increased active travel uptake delivers health benefits due to the associated reduction in the risk of premature death.

Increased physical activity of individuals improves their health and therefore reduces their number of 'sick days', resulting in increased economic activity. There is evidence that better health due to increased physical activity (such as cycling or walking to work) can also lead to reduced rates of absenteeism[19], which provides a range of benefits resulting from increased workforce productivity. In the UK there are 4.6 days 'lost' per worker due to sickness or injury[20].

The toolkit indicates that, for all options combined, there would be an estimated 195 fewer days of short-term sick leave and an estimated £28,184 increased output from this reduction in absenteeism. It should be noted, that for the purposes of determining this metric, it has been assumed that either option AT51 or AT52 would be implemented (not both) and therefore AT51/AT52 has been considered as one option in the combined total to avoid double counting. **Table 4.2** shows the days reduced absenteeism by each option, per year, and **Table 4.3** shows the present value of these benefits over the 20-year appraisal period.

Table 4.2: Days reduced absenteeism (annual)

Option	Metric
	Annual Days Reduced Absenteeism
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	1
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	121
AT51: with-flow segregated cycleway on Old Meldrum Road	15
AT52: two-way segregated cycleway on Old Meldrum Road	15
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	39
AT61a: package of active travel measures on Victoria Street.	19

Table 4.3: Present Value of Health Benefits (2010 values and prices)

Option	Metric	
	Reduced Risk of Premature Death	Reduced Absenteeism
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	£8,720	£1,500
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	£1,210,020	£201,960
AT51: with-flow segregated cycleway on Old Meldrum Road	£133,220	£25,660
AT52: two-way segregated cycleway on Old Meldrum Road	£133,220	£25,660
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	£387,300	£65,200

[18] Impact of Physical Inactivity on the World's Major Non-Communicable Diseases, Lee et al, 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3645500/
[19] NICE, 2008, Business Case Tool for Physical Activity in the Workplace; Leisure time physical activity and sickness absenteeism: a prospective study, Van Amelsvoort et al, 2006; Effects of an Employee Fitness Program on Reduced Absenteeism, Lechner et al, 1997
[20] Office for National Statistics (ONS), Sickness Absence in the Labour Market, 2021, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/sicknessabsenceinthelabourmarket/2021

Option	Metric	
	Reduced Risk of Premature Death	Reduced Absenteeism
AT61a: package of active travel measures on Victoria Street.	£176,670	£32,280

4.2 Journey Quality Benefits

Journey quality impacts are generally comprised of improvements to journey ambience which might enhance and improve a user's experience of travelling along a route.

Benefits to new and existing cyclists or pedestrians as a result of improvements to infrastructure can relate to a perception of improved safety and/or environmental conditions. These benefits have been quantified using monetary values set out in TAG[21] for pedestrian and cycle features, including for aspects such as the quality of the infrastructure (for cycling) and street lighting, kerb levelling, pavement evenness etc. (for walking). The values are provided in pence per kilometre (for pedestrian features) and in pence per minute (for cycle infrastructure). These impacts are subjective and primarily experienced by existing route users, i.e. those who are best placed to measure the effects of the improvements. TAG recommends applying a 'rule of a half', whereby current users of a route will experience the full benefit of improvements to quality, but the benefits for new users should be divided by two.[22]

The table below shows the present value of these benefits for both new and existing users over the 20-year appraisal period.

Table 4.4: Present Value of Journey Quality Benefits (2010 values and prices)

Option	Metric
	Journey Ambience
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	£93,520
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	£326,840
AT51: with-flow segregated cycleway on Old Meldrum Road	£261,430
AT52: two-way segregated cycleway on Old Meldrum Road	£261,430
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	£157,860
AT61a: package of active travel measures on Victoria Street.	£99,340

4.3 Mode Shift Impacts

A transfer from car-based modes amongst functional route users would result in a reduction in vehicle kilometres travelled. The approximate amounts are displayed in **Table 4.5**.

Table 4.5: Approximate Reduction in Vehicle Kilometres Travelled

Option	Metric
	Approximate Reduction in Vehicle Kilometres Travelled
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	312
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	44,689
AT51: with-flow segregated cycleway on Old Meldrum Road	4,169
AT52: two-way segregated cycleway on Old Meldrum Road	4,169
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	14,182

[21] TAG Data Book, November 2019, Table 4.1.6 and Table 4.1.7, DfT, *https://www.gov.uk/government/publications/tag-data-book*
[22] DfT, TAG Unit A5.1 Active Mode Appraisal, November 2022, *https://www.gov.uk/government/publications/tag-unit-a5-1-active-mode-appraisal*

Option	Metric
	Approximate Reduction in Vehicle Kilometres Travelled
AT61a: package of active travel measures on Victoria Street.	5,912

These figures are calculated based on the total additional kilometres travelled by cyclists and pedestrians on each scheme, multiplied by the proportion of users who might otherwise use a car or taxi. The figures on proportion of users who would otherwise use a car or taxi have been obtained from cycling diversion factors set out in TAG[23].

This reduction creates benefits due to reduced traffic congestion, infrastructure benefits relating to reduced wear and tear on roads, fewer collisions, better air quality, less noise pollution, as well as indirect tax impacts. These benefits have been quantified according to TAG External Costs[24], which describe the marginal costs of each of these impacts in pence per vehicle kilometre. These costs have then been multiplied by the estimated reduction in vehicle kilometres for each option described above.

Table 4.6 shows the present value of these benefits over the 20-year appraisal period.

Table 4.6: Present Value of Journey Quality Benefits (2010 values and prices)

Option	Metric					
	Congestion Benefit	Accident	Local Air Quality	Noise	Greenhouse Gas	Indirect Taxation
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	£750	£120	£10	£10	£50	£0
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	£107,990	£17,400	£740	£1,160	£7,080	-£40
AT51: with-flow segregated cycleway on Old Meldrum Road	£10,070	£1,620	£70	£110	£660	£0
AT52: two-way segregated cycleway on Old Meldrum Road	£10,070	£1,620	£70	£110	£660	£0
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	£5,380	£1,290	£70	£70	£2,000	£100
AT61a: package of active travel measures on Victoria Street.	£14,290	£2,300	£100	£150	£940	-£10

4.4 Cost Benefit Summary

Table 4.7 provides a summary of the Present Value of Benefits (PVB), the Present Value of Costs (PVC), and the Benefit-Cost Ratio (BCR) for each option in 2010 values and prices. The PVB below is equal to the sum of the benefits included in **Table 4.3**, **Table 4.4,** and **Table 4.6**.

Table 4.7: Present Value of Benefits (PVB), Costs (PVC), and BCR (rounded, 2010 values and prices)

Option	Metric		
	PVB	PVC	BCR
AT33: improved active travel links between Dyce Rail Station and A947 and eastern section of Dyce, particularly along Station Road	£104,690	£41,710	2.51
AT48a: active travel improvements to support highest practicable level of service on A947 between Bucksburn Roundabout and Riverview Drive Roundabout North	£1,873,160	£2,451,490	0.76
AT51: with-flow segregated cycleway on Old Meldrum Road	£432,850	£400,570	1.08

[23] TAG Data Book v1.16, September 2021, Table A5.4.7, DfT, https://www.gov.uk/government/publications/tag-data-book
[24] TAG Data Book v1.16, September 2021, Table A5.4.2, DfT, https://www.gov.uk/government/publications/tag-data-book

Option	Metric		
	PVB	PVC	BCR
AT52: two-way segregated cycleway on Old Meldrum Road	£432,850	£322,740	1.34
AT58: shared use path on Dyce Drive between A947 and Kirkhill Industrial Estate north of Aberdeen International Airport	£619,270	£1,738,800	0.36
AT61a: package of active travel measures on Victoria Street.	£326,060	£320,190	1.02

Based on value of money categories described in the AMAT guidance[25], options AT48a and AT58 have a 'Poor' BCR (between 0 and 1), options AT51, AT52 and AT61a have a 'Low' BCR (between 1 and 1.5) and option AT33 has a 'High' BCR (between 2 and 4). However, it should be noted that Section 5 of AMAT Guidance states "Scheme length – in some circumstances issues arise in the calculation of benefits where shorter walking and cycling routes are introduced. For example, where a scheme proposes a new shorter link, the scheme may encourage new walking and cycling trips due to an improved route option. However, these benefits may be partially offset if they reduce the time people spend cycling or walking by providing a more direct route choice". This may be reflected in the BCRs for options AT33, AT51 and AT52, given the shorter lengths of these routes. In addition, option AT33 is in close proximity to Dyce Rail Station and would be expected to result in greater benefits beyond those captured by AMAT.

4.5 Additional Benefits and Limitations

It should be noted that there are a number of potential additional benefits that are not captured in the AMAT process:

- Research suggests that cycling benefits the local economy through bicycle manufacturing, cycle and accessory sales and cycling related employment. A study carried out by the London School of Economics[26] in 2010 concluded that each cyclist contributes a Gross Cycling Product (GCP) of £230 per year to the UK economy, accounting for a total of £2.9bn in 2010. This research is supported by a European-wide study[27] which found that cycling delivers wider economic benefits in terms of supporting jobs and driving tourism, with cycling having greater employment intensity than any other transport sub-sector. It is noted that additional benefits as a result of GCP have not been quantified as part of this study.
- There are a number of potential impacts of cycling and walking interventions which cannot currently be quantified in AMAT but nevertheless might constitute a material benefit of interventions such as improvements to landscape, townscape and heritage.
- Cyclist and pedestrian specific accident changes resulting from the intervention – AMAT only calculates safety impacts related to changes in car kilometres not from other factors such as the increase in cycling or adjustments based on infrastructure types such as segregation.
- Journey time impacts relating to changes in road space for other road users for example, cars and buses.
- Morbidity-related health impacts and health impacts for children.
- Impacts relating to improved natural surveillance and lighting.

[25] AMAT User Guide, Section 3.37, DfT, May 2022, *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102781/active-model-appraisal-toolkit-user-guidance.pdf*
[26] Gross Cycling Product Report, London School of Economics, 2010, *http://eprints.lse.ac.uk/38063/1/BritishCyclingEconomy.pdf*
[27] European Cycling Federation, CYCLING WORKS: Jobs and Job Creation in the Cycling Economy, 2014 *https://ecf.com/system/files/141125-Cycling-Works-Jobs-and-Job-Creation-in-the-Cycling-Economy.pdf*

5. Conclusion

This Note has provided an overview of the findings from the Active Mode Appraisal Toolkit (AMAT) Assessment undertaken to understand the potential costs and benefits arising from options for improving active travel infrastructure between the AWPR and the A96 (at the Bucksburn Roundabout), as part of the A947 Multi-Modal Corridor Study.

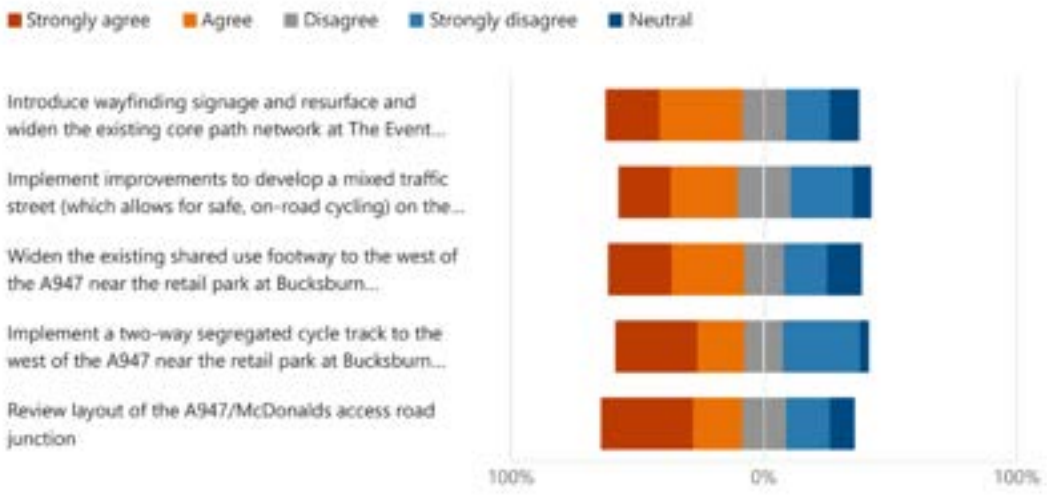
The assessment indicates that Options AT48a and AT58 would deliver poor value for money, Options AT51, AT52 and AT61a would deliver low value for money, and Option AT33 would be expected to deliver high value for money. As has been emphasised throughout this Note, this has been derived on travel to work/study and therefore does not include other potential benefits derived from leisure and recreational use. The shorter lengths of routes associated with Options AT33, AT51 and AT52 may reduce the time people spend cycling or walking by providing more direct route choice and may partially offset the benefits associated with new walking and cycling trips generated by these options. In addition, Option AT33 is in close proximity to Dyce Rail Station and would be expected to result in greater benefits beyond those captured by AMAT. It should also be noted that the options presented within this appraisal are not mutually exclusive and the cumulative effects would be greater.

Appendix I –
Consultation Results Outputs

Delivering a better world

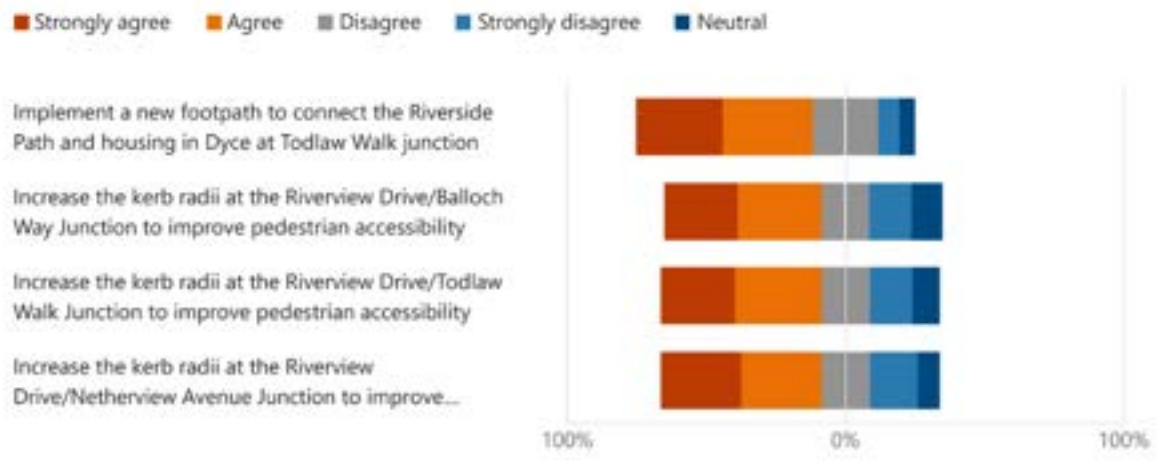
A947 Multi-Modal Corridor Study – Member of Public Respondent

1. To what extent do you agree that the options in the A947 (West) Package would improve travel conditions in the study area?



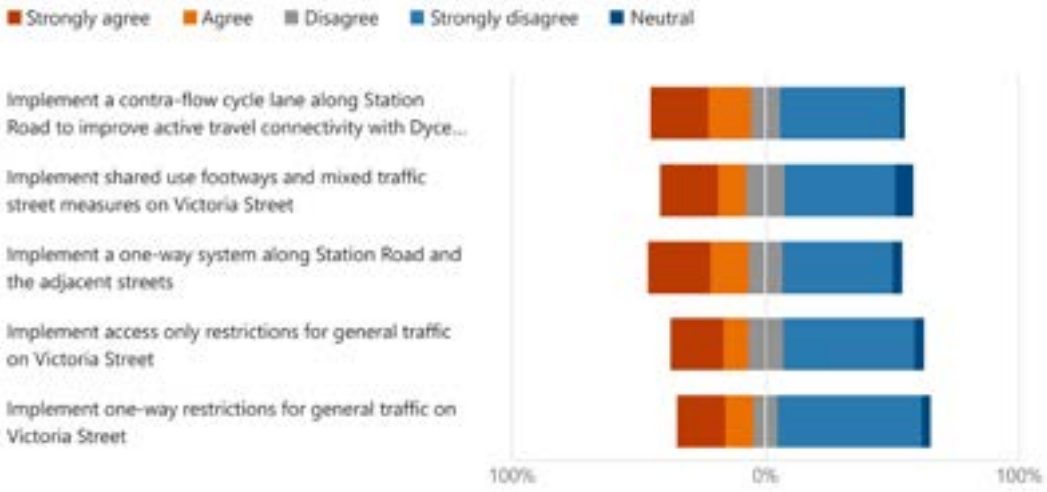
2. Do you have any comments on the individual options that make up the A947 (West) Package or on the package as a whole? 17 Responses

3. To what extent do you agree that the options in the Riverview Drive Package would improve travel conditions in the study area?



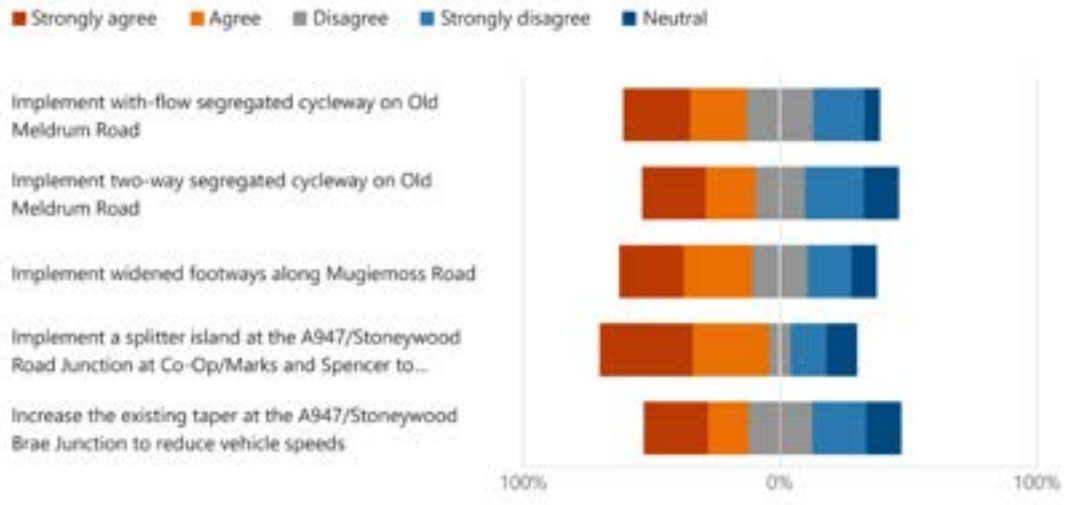
4. Do you have any comments on the individual options that make up the Riverview Drive Package or on the package as a whole? 12 Responses

5. To what extent do you agree that the options in the Victoria Street Package would improve travel conditions in the study area?



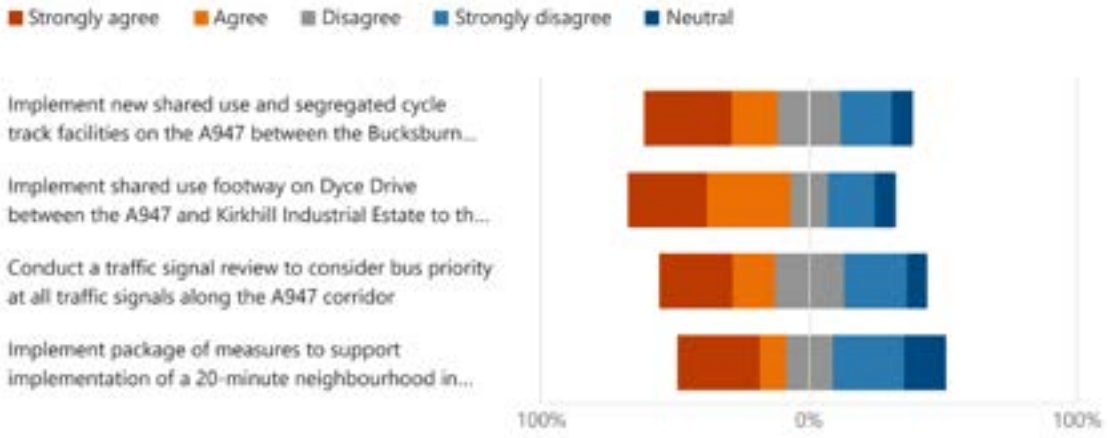
6. Do you have any comments on the individual options that make up the Victoria Street Package or on the package as a whole? 20
Responses

7. To what extent do you agree that the options in the Targeted Local Improvements Package would improve travel conditions in the study area?



8. Do you have any comments on the individual options that make up the Targeted Local Improvements Package or on the package as a whole? 7
Responses

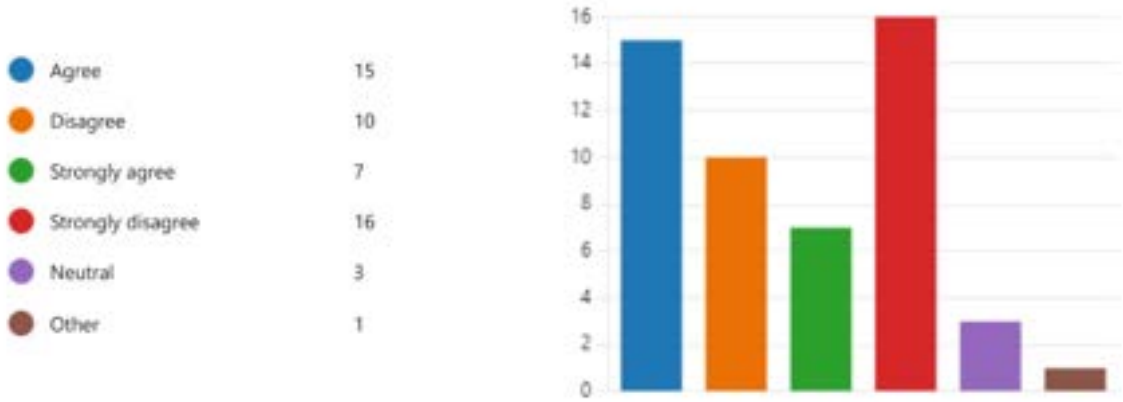
9. To what extent do you agree that the options in the Strategic Corridor Improvements Package would improve travel conditions in the study area?



10. Do you have any comments on the individual options that make up the Strategic Corridor Improvements Package or on the package as a whole?

11
Responses

11. The option packages represent combinations of options in different parts of the study area and various types of intervention. They are not mutually exclusive and the final list of measures for further development and design may include measures from across the different packages. To what extent do you agree with the overall transport strategy for the A947 corridor presented in the consultation materials?



12. Do you have any comments on the overall transport strategy we have for the A947 corridor?

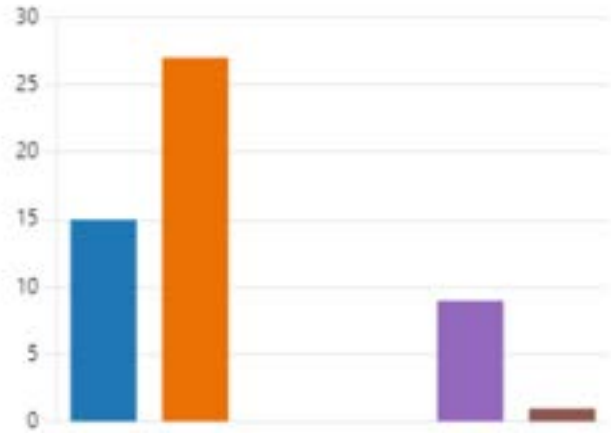
20
Responses

13. Please enter the first four digits of your postcode. This will only be used for mapping analysis.

49
Responses

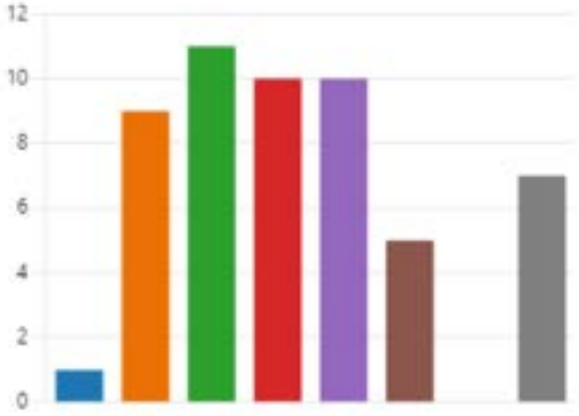
14. How would you describe your gender?

Woman (including trans woman)	15
Man (including trans man)	27
Non-binary / gender fluid	0
In another way	0
Prefer not to say	9
Other	1



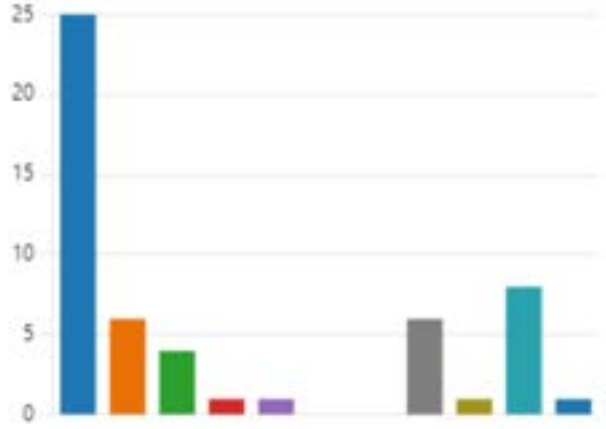
15. What is your age?

16-24	1
25-34	9
35-44	11
45-54	10
55-64	10
65-74	5
75+	0
Prefer not to say	7



16. What is your employment status?

Employed - full time	25
Employed - part time	6
Self employed	4
Unemployed	1
Student	1
Looking after family/home	0
Long term sick	0
Retired	6
Other	1
Prefer not to say	8
Other	1



17. Do you have a health condition or illness which affects your personal mobility?

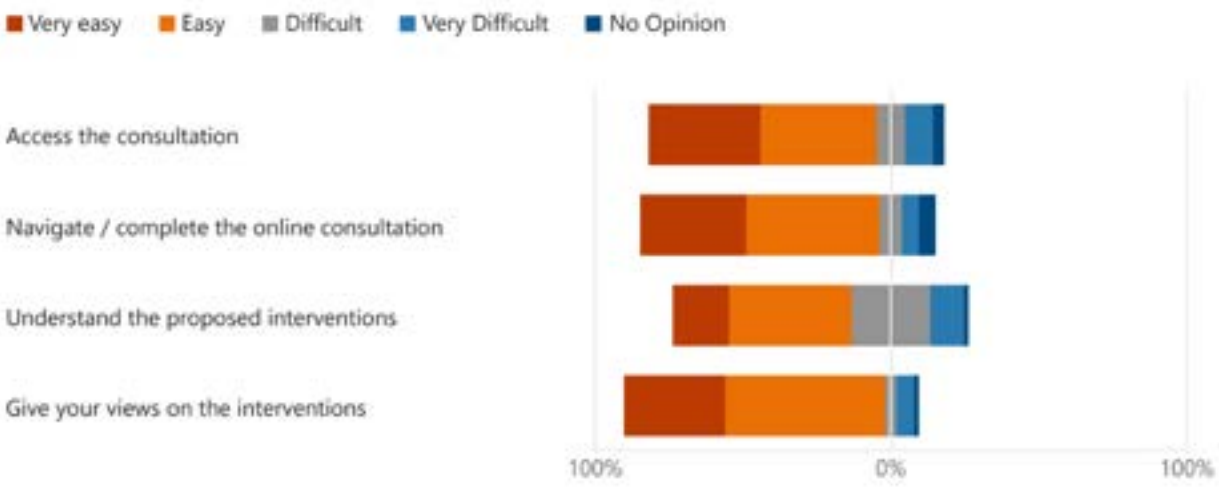
Yes, a lot	3
Yes, a little	8
No	35
Prefer not to say	6
Other	1

18. Does your condition or illness affect your ability to use public transport

Yes, a lot	2
Yes, a little	5
No	40
Prefer not to say	4
Other	1

19. How did you hear about the survey? 41 Responses

20. How easy was it for you to:



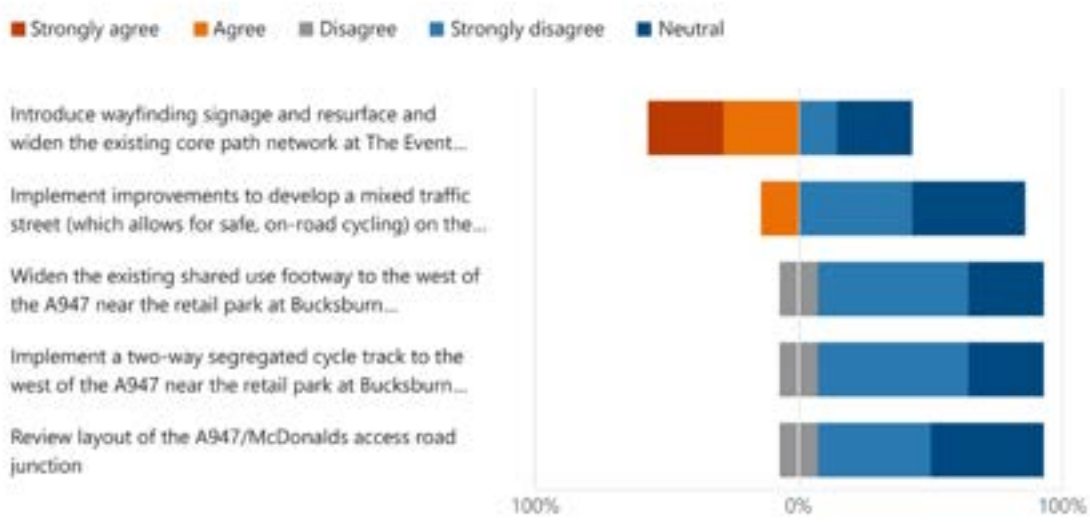
21. Do you have suggestions for how similar online consultations could be improved?

14
Responses

A947 Multi-Modal Corridor Study – Organisation Respondent

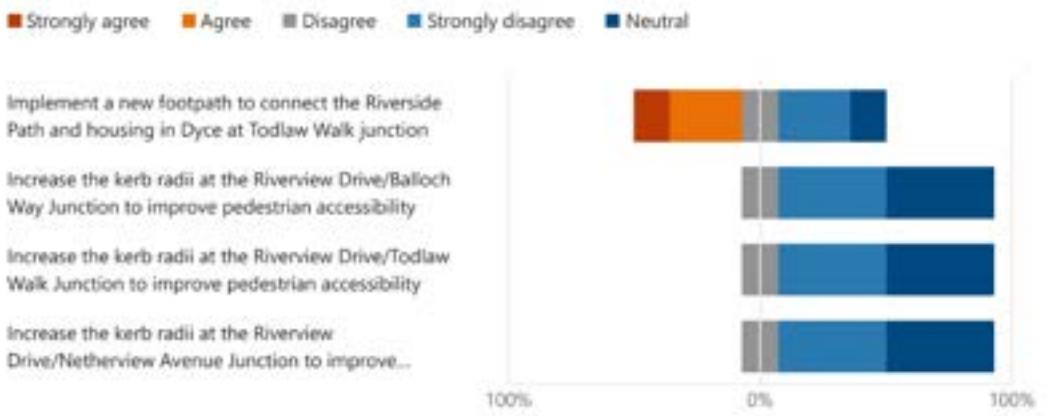
1. Organisation Name: 7 Responses

2. To what extent does your organisation agree that the options in the A947 (West) Package would improve travel conditions in the study area?



3. Does your organisation have any comments on the individual options that make up the A947 (West) Package or on the package as a whole? 4 Responses

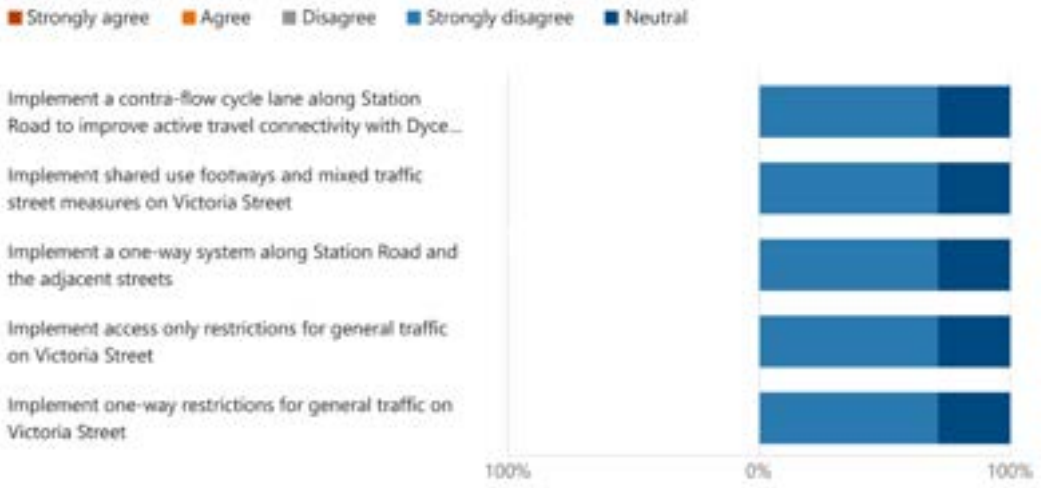
4. To what extent does your organisation agree that the options in the Riverview Drive Package would improve travel conditions in the study area?



5. Does your organisation have any comments on the individual options that make up the Riverview Drive Package or on the package as a whole? 5

Responses

6. To what extent does your organisation agree that the options in the Victoria Street Package would improve travel conditions in the study area?



7. Does your organisation have any comments on the individual options that make up the Victoria Street Package or on the package as a whole? 6

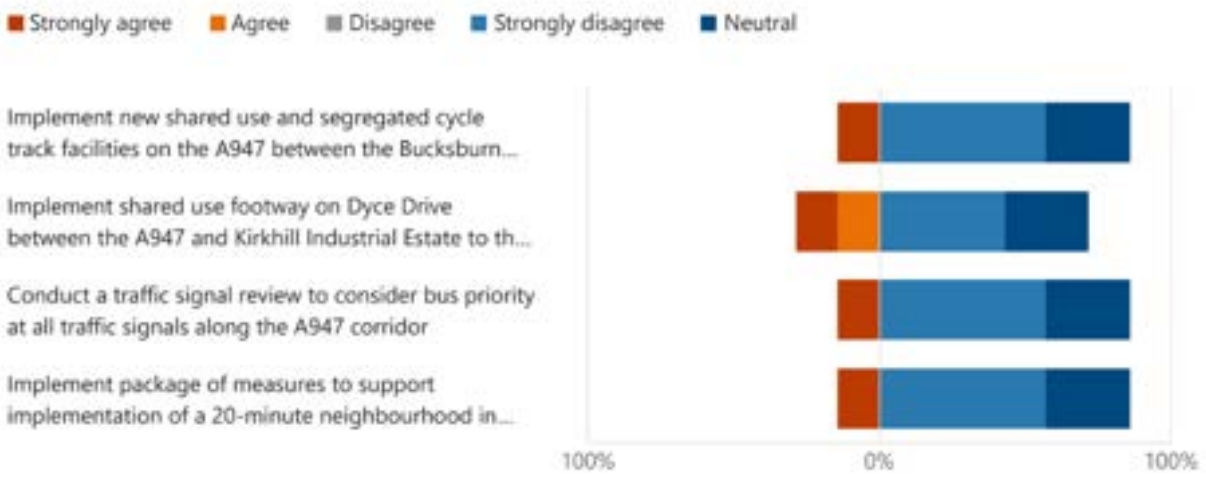
Responses

8. To what extent does your organisation agree that the options in the Targeted Local Improvements Package would improve travel conditions in the study area?

9. Does your organisation have any comments on the individual options that make up the Targeted Local Improvements Package or on the package as a whole? 2

Responses

10. To what extent does your organisation agree that the options in the Strategic Corridor Improvements Package would improve travel conditions in the study area?



11. Does your organisation have any comments on the individual options that make up the Strategic Corridor Improvements Package or on the package as a whole? 3

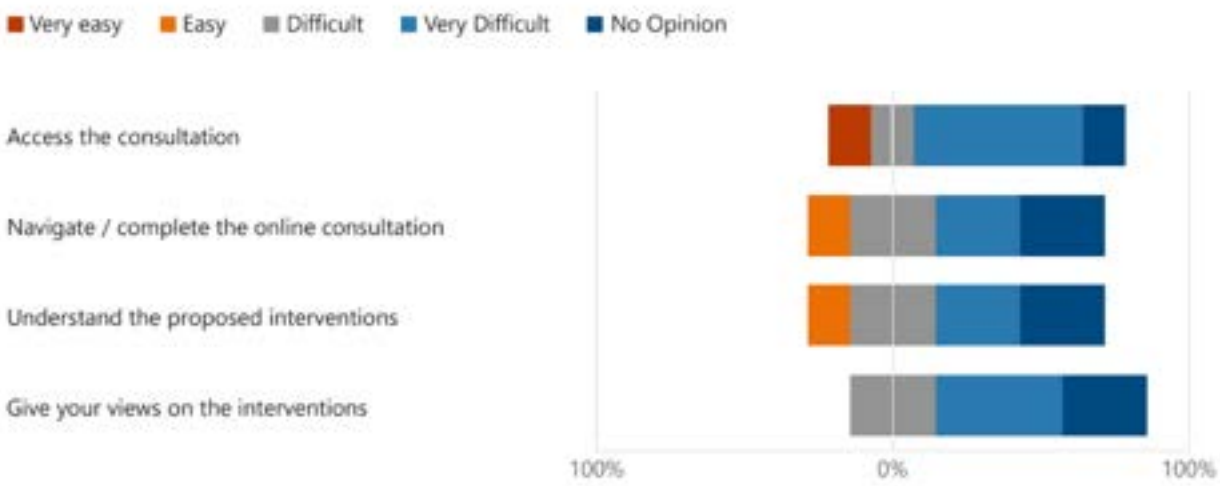
Responses

12. The option packages represent combinations of options in different parts of the study area and various types of intervention. They are not mutually exclusive and the final list of measures for further development and design may include measures from across the different packages. To what extent does your organisation agree with the overall transport strategy for the A947 corridor presented in the consultation materials?

13. Does your organisation have any comments on the overall transport strategy we have for the A947 corridor? 4

Responses

14. How easy was it for your organisation to:



15. Does your organisation have suggestions for how similar online consultations could be improved?

6
Responses