

Aberdeen City Council

Auchmill Road, Aberdeen
Feasibility Assessment of Cycling
Measures

Technical Note

December 2017

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Client Commission

Client:	Aberdeen City Council	Date Commissioned:	November 2017
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LTP PROJECT TEAM

As part of our commitment to quality the following team of transport professionals was assembled specifically for the delivery of this project. Relevant qualifications are shown and CV's are available upon request to demonstrate our experience and credentials.

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AUCHMILL ROAD, ABERDEEN

FEASIBILITY ASSESSMENT OF CYCLE MEASURES

TECHNICAL NOTE

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 Local Transport Projects Ltd (LTP) have been commissioned by Aberdeen City Council (ACC) to undertake a feasibility assessment of potential options to create improved cycle connectivity between Auchmill Terrace and Auchmill Road.
- 1.1.2 This feasibility assessment has been initiated as part of the ongoing regeneration work being carried out by ACC, part of which seeks to improve the accessibility of Heathryfold Park, Northfield and Middlefield by active modes, improve the connections to the existing city-wide core cycle network and provide a connection from these regeneration areas to the existing A96 Auchmill Road cycle route.
- 1.1.3 The feasibility assessment has also been prepared to align with the objectives and priorities of the Aberdeen Active Travel Action Plan 2017-2021, the Aberdeen Local Transport Strategy (LTS) 2016-2021 and the Cummings Park, Heathryfold, Northfield, Mastrick and Middlefield Draft Locality Plan 2017 – 27.

1.2 Scope of Report

- 1.2.1 LTP have been commissioned to produce feasibility designs, CDM designers risk assessments, cost estimates and a delivery timeframe for the following:
 - **Option 1:** upgrade of existing facilities at the Auchmill Road/Auchmill Terrace traffic signal junction to provide a dedicated cycle link between Auchmill Terrace and the shared pedestrian/cycle facility on the north-side of Auchmill Road; and,
 - **Option 2:** examination of options to improve cycle measures on the south-side of Auchmill Road together with options to provide crossing facilities across Auchmill Road both at the existing signal junction and at an alternative location either upstream or downstream of Auchmill Road.
- 1.2.2 To note, the CDM designers risk assessment will be prepared upon confirmation of the preferred option.

2.0 EXISTING TRANSPORT ENVIRONMENT

2.1 Auchmill Road (A96)

- 2.1.1 Auchmill Road (A96) forms part of the strategic road network, is subject to a 40mph speed limit and within the vicinity of the Auchmill Road/Auchmill Terrace junction comprises three 3.0m wide eastbound lanes, including one bus lane and two 3.0m wide westbound lanes. The eastbound and westbound lanes are separated by a 2.0m wide physical island.
- 2.1.2 The existing traffic signals operates seven phases in five stages with the A96 eastbound and westbound directions operating in one phase and then movements from the eastbound/westbound services lanes and Auchmill Terrace operating during the remaining stages.
- 2.1.3 A service road runs parallel alongside the southern side of the A96, operating in both eastbound and westbound directions. Left turn in/left turn out either end of the service road and all turning movements facilitated via the traffic signals at the junction with Auchmill Road/Auchmill Terrace. On-street parking occurs along both the eastbound and westbound service roads.
- 2.1.4 There is a shared pedestrian/cycle route on northern side of A96, which is discussed in detail below. An eastbound bus stop is located on the A96 approximately 35m east of the junction and a westbound bus stop located approximately 60m west of the junction.
- 2.1.5 This section of the A96 is currently controlled and operated by Transport Scotland but is due to be de-trunked in the medium term, when it will then become the responsibility of Aberdeen City Council.
- 2.1.6 The DfT www.dft.gov.uk/traffic-counts/ website provides traffic count data for points on the major and minor road network. Count Point 75459 on the A96 is located approximately 310m to the east of the Auchmill Road/Auchmill Terrace junction. The latest 2016 estimated AADT values for Count Point 75459 indicate a two-way flow of 40,264 vehicles.
- 2.1.7 Further information on the directional split of traffic flows has been obtained from www.uktrafficdata.info website and are reproduced in Table 1 below along with the proportion of HGV traffic. It is noted that the DfT data for this count point was last manually counted in 2015 which indicated an AADT of 40,806 vehicles. The directional split information is based on the 2014 count data.

Table 1: DfT Traffic Flows and Directional Split

Count Point 75459 (A96)		Eastbound		Westbound		Total (Two-Way)
		Total	HGV%	Total	HGV%	
2014	Counted	23,213 (52%)	5.6%	21,097 (48%)	6.0%	44,310
2015	Counted	-	-	-	-	40,806
2016	Estimated	-	-	-	-	40,264

- 2.1.8 Table 1 indicates a fairly even split between the eastbound and westbound traffic flow directions. In terms of HGV flows on the A96, these represent approximately 6% of the overall traffic flow.

2.2 Auchmill Terrace

- 2.2.1 Auchmill Terrace is a cul-de-sac, subject to a 30mph speed limit, providing access to a relatively small number of residential properties from the A96. It is a two-way carriage with 3.0m wide traffic lanes in either direction. On approach to the junction with Auchmill Road, a 1.6m wide footway is provided on the western side and on-street parking is prohibited on either side.
- 2.2.2 An uncontrolled pedestrian crossing is provided across the Auchmill Terrace arm of the junction with Auchmill Road. The general cross section of Auchmill Terrace is shown in Photo 1.

Photo 1: Auchmill Terrace Layout

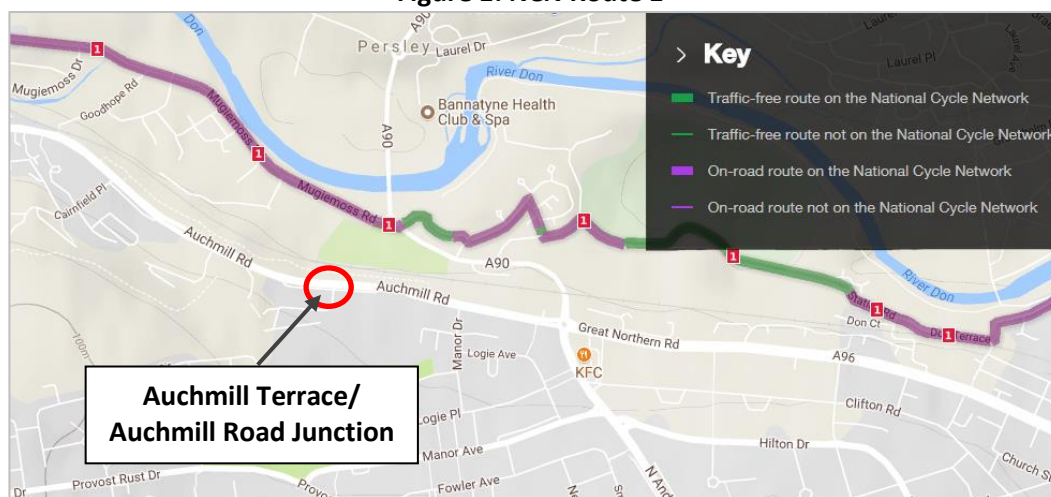


2.3 Existing Cycling Routes/Infrastructure

- 2.3.1 There is currently a 2.6m wide shared foot/cycle way along the northern side of the A96, which anecdotally, is well used primarily by commuters. This facility extends from Bucksburn in the west to the A96/Bank Street junction to the east. Provision is also available for cyclists to use the bus lane when travelling eastwards towards the city centre.
- 2.3.2 There are no formalised cycle facilities, either on-road or on path, on southern side of A96 for westbound cyclists. However, it is understood that this route is still popular with commuting cyclists travelling towards employment centres in Bucksburn, Dyce and Stoneywood.
- 2.3.3 Further north, National Cycle Network (NCN) Route 1 runs on-road along Mugiemoor Road. Within a local context this provides a connection to Bucksburn and Dyce to the Northwest and Aberdeen City Centre to the southeast. It also provides wider regional connections to Inverness and Edinburgh.

- 2.3.4 However, there are currently no direct cycle connections from the existing shared path along the north side of the A96 to NCN Route 1 in the immediate vicinity of the Auchmill Road/Auchmill Terrace junction. The existing railway line, which runs parallel to the A96 in the vicinity of the junction, makes a direct connection difficult. Therefore, the nearest connections to the NCN Route 1 to the east of the junction is via an on-road route on the A90 at the Haudagain Roundabout or via an overbridge connection to Goodhope Road to the west.

Figure 1: NCN Route 1



Source: <https://www.sustrans.org.uk/ncn/map/route/route-1>

2.4 Links Between A96 and Middlefield Greenspace

- 2.4.1 There are a number of existing formed paths providing pedestrian connectivity between the A96 and the Middlefield Greenspace area which currently undergoing significant redevelopment. The most direct link passes to the east of the Sunnybank Football ground, as shown in Photo 2, and past the allotments. This path varies in width between 1.0m - 2.0m wide and adjacent to the allotments is constrained on either side by a wooden fencing and steel railing as shown in Photo 3. Alongside the allotments the path has a significant downhill gradient towards the A96.

Photo 2: Layout of Middlefield Path



Photo 3: Layout of Middlefield Path Adjacent to Allotments



- 2.4.2 There are unsealed pedestrian routes linking Heathryfold/Middlefield Greenspace to the A96, which run through the wooded area to the east of Auchmill Golf Course. Sections of these routes have moderate/significant gradients, as shown in Photo 4 and Photo 5.

Photo 4: Path East of Golf Course Land



Photo 5: Pedestrian Route to Auchmill Road (A96)



- 2.4.3 An overview of the existing paths linking Middlefield and Auchmill Road are highlighted red in Figure 2.

Figure 2: Existing Paths Between Middlefield and Auchmill Road

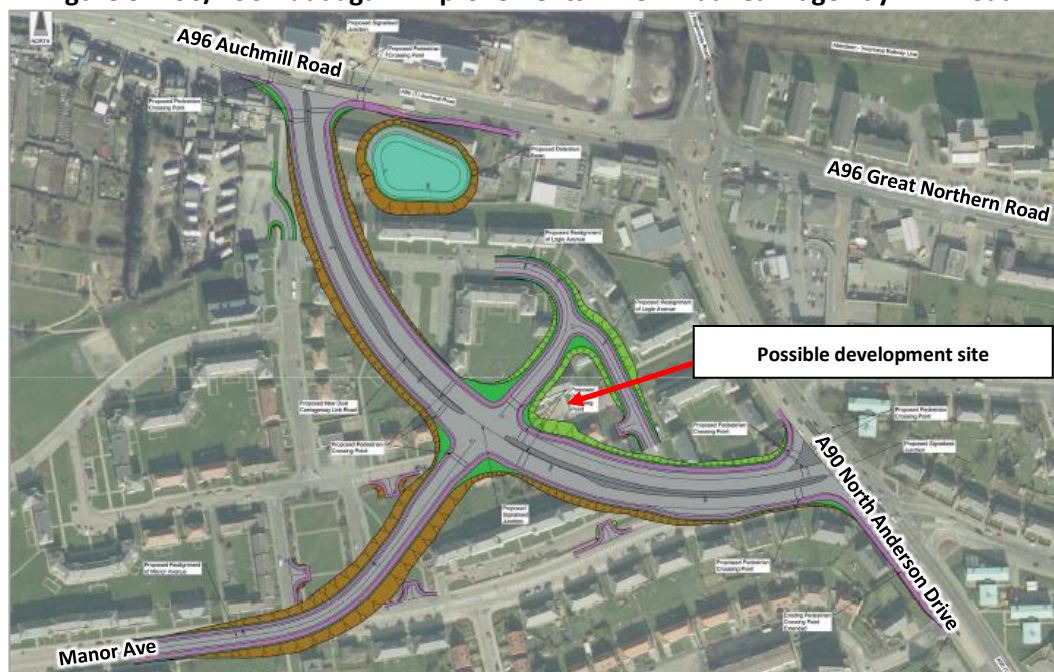


3.0 FUTURE COMMITTED TRANSPORT SCHEMES

3.1 Haudagain Improvement Scheme

- 3.1.1 The A90/A96 Haudagain Improvement scheme comprises a new 500m long dual carriageway link road. This will include construction of three new signal controlled junctions which connect the new link road to the existing road network as shown in Figure 3.
- 3.1.2 Manor Avenue realigned to tie-in to the new link road with Logie Avenue, Logie Place/Logie Terrace/Manor Terrace closed and stopped up. New footways and/or cycleways are proposed next to the new link road and Manor Avenue with traffic signals to include pedestrian crossings. It is anticipated that upon completion of the new link road or shortly thereafter, the A96 will become de-trunked and come under control of ACC.
- 3.1.3 There are proposals to market the area of land, known as the 'Triangle', on the north-eastern side of the new dual link road for a new supermarket and residential development. This is anticipated to become a key movement attractor within this area.

Figure 3: A90/A96 Haudagain Improvements – New Dual Carriageway Link Road



Source: Transport Scotland Public Consultation Drawing No: B1557630/PE/01/002 Rev.0

3.2 Middlefield Greenspace Project

- 3.2.1 The Middlefield Greenspace project is currently under construction and comprises a range of improvements to the parklands which surround The Hub community facility which serves the communities of Middlefield, Heathryfold and Northfield.

- 3.2.2 These improvements include reopening the Scatter Burn from underground to above ground as part of a flood alleviation scheme, creating new pedestrian and cycle paths throughout the park, improvements to the pavements on adjacent streets beside the development and installing new landscaping to create an attractive park area which will be user friendly to the residents.
- 3.2.3 The proposed new paths through the greenspace area are shown in Figure 4.

Figure 4: Middlefield Greenspace Plan



Source: <https://news.aberdeencity.gov.uk>

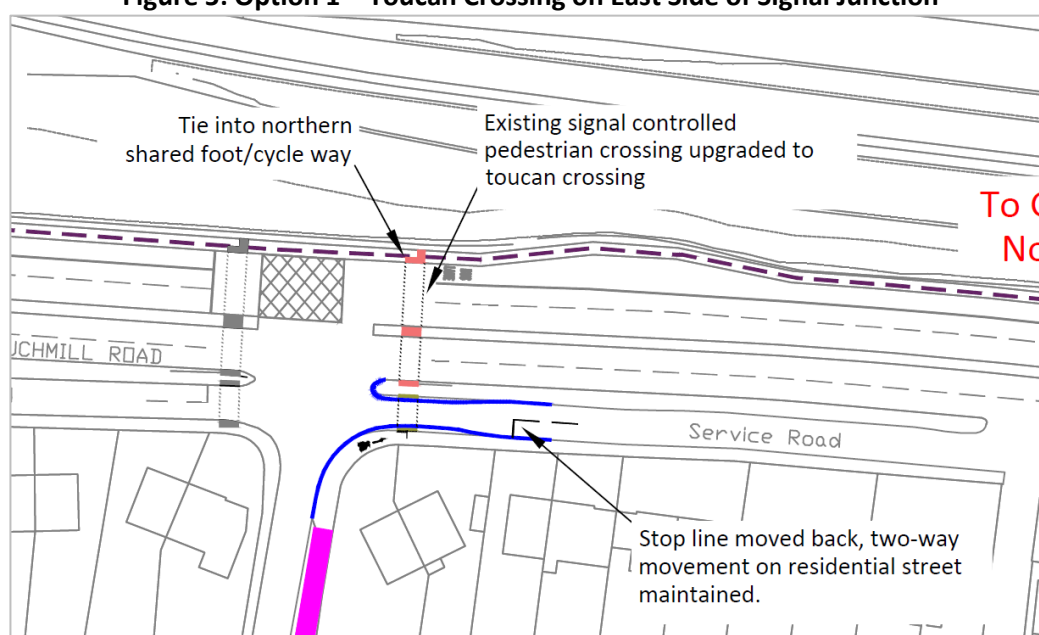
4.0 PROPOSED OPTIONS

4.1 Option 1: Toucan Crossing on East Side of Auchmill Road/Auchmill Terrace Signal Junction

Description

- 4.1.1 This option proposes to upgrade the existing controlled pedestrian crossing on the eastern side of the Auchmill Road/Auchmill Terrace junction to a Toucan crossing, as shown in Figure 5. This would provide a single stage crossing movement for pedestrians and cyclists over the A96. The signals currently operate a single stage crossing arrangement for pedestrians, so the impact on traffic flow compared to the existing operation as a result of the upgrading to a Toucan is considered to be negligible.

Figure 5: Option 1 – Toucan Crossing on East Side of Signal Junction



- 4.1.2 To facilitate the wider crossing arrangement, the stop line for westbound movements may be moved slightly back, although this is anticipated have a negligible impact in terms of intergreen times and sufficient clearance time should exist for traffic to clear the junction before traffic gaining the right of way on conflicting movements arrive.
- 4.1.3 An uncontrolled crossing point is retained across the eastern service road, where build-outs are proposed to widen the existing central reserve and footway to a depth of 3.0m to accommodate waiting pedestrians/cyclists. Consequently, the stop line on the east service road is moved back slightly to accommodate this. However, given that the demand from vehicles turning out of the service road is low, this is considered to have a negligible impact in terms of capacity.

- 4.1.4 The shared foot/cycle path continues around the eastern corner of Auchmill Terrace and along the existing path adjacent the allotments. The wooden and steel fences either side of the path alongside the allotments constrain the existing width to approximately 1.5m wide. There is also a steep incline along this section. It is understood that from previous discussions between ACC and the allotment owners, there is limited opportunity for acquiring additional land to the east. Available land to the west is also limited.
- 4.1.5 There is sufficient space either side of the existing path adjacent the Sunnybank football ground to facilitate widening work to create a 3.0m wide shared path. This then links into the network of shared foot/cycle paths within the Middlefield Greenspace. The preliminary concept design for the proposed crossing arrangements at the Auchmill Road/Auchmill Terrace junction s part of Option 1 are provided in Appendix 1.

Key Benefits/Opportunities

- Direct north/south link for cyclists travelling between Auchmill Road and Middlefield.
- Minimal delay for cyclists travelling between Middlefield and Auchmill Road due to the introduction of the Toucan crossing at Auchmill Road.
- The whole route would be street lit from the Auchmill Road signal junction, along the link adjacent the allotments and Sunnybank football ground.
- Ties into proposed Middlefield Greenspace pedestrian/cyclist facilities.

Key Issues/Constraints

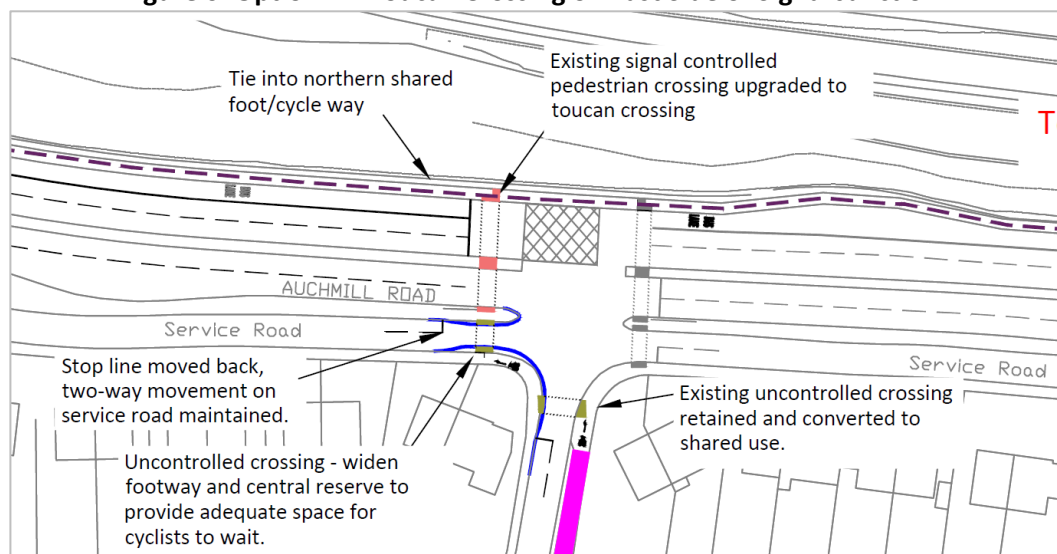
- Significant gradient from Auchmill Terrace adjacent allotments with limited opportunities for improvements or provision of rest areas.
- Potentially minor increased delays for motorists on Auchmill Road due to increased use of proposed Toucan crossing compared to existing controlled crossing.
- Vegetation/fencing either side of path may shelter it during winter and make it slippery during wet/icy conditions.

4.2 Option 2: Toucan Crossing on West Side of Auchmill Road/Auchmill Terrace Signal Junction, Uncontrolled Crossing on Auchmill Terrace

Description

- 4.2.1 This option proposes to upgrade the existing controlled pedestrian crossing on the western side of the Auchmill Road/Auchmill Terrace junction to a Toucan crossing, as shown in Figure 6. This would provide a single stage crossing movement for pedestrians and cyclists over the A96. The signals currently operate a single stage crossing arrangement for pedestrians, so the impact on traffic flow compared to the existing operation as a result of the upgrading to a Toucan is considered to be negligible.

Figure 6: Option 2 – Toucan Crossing on East Side of Signal Junction



- 4.2.2 To facilitate the wider crossing arrangement, the stop line for eastbound movements may be moved slightly back, although this is anticipated to have a negligible impact in terms of the intergreen times and sufficient clearance time should exist for traffic to clear the junction before gaining the right of way on conflicting movements arrive.
- 4.2.3 An uncontrolled crossing point is retained across the western service road, where build-outs are proposed to widen the existing central reserve and footway to a minimum 3.0m depth to accommodate waiting pedestrians/cyclists. Consequently, the stop line on the western service road is required to be set slightly further back to accommodate the build outs. However, this is expected to have a negligible impact on capacity given that traffic volumes are relatively low on the service road.
- 4.2.4 The shared foot/cycle path then crosses Auchmill Terrace at the existing uncontrolled crossing and continues along the existing path adjacent the allotments. The wooden and steel fences either side of the path alongside the allotments constrain the existing width to approximate 1.5m wide.
- 4.2.5 There is also a steep incline along this section. It is understood that from previous discussions between ACC and the allotment owners, there is limited opportunity for acquiring additional land to the east. Available land to the west is also limited.

- 4.2.6 There is sufficient space either side of the existing path adjacent the Sunnybank football ground to facilitate widening work to create a 3.0m wide shared path. This then links into the network of shared foot/cycle paths within the Middlefield Greenspace.
- 4.2.7 The benefits of Option 2 compared to Option 1 are largely comparable, although when assessing the routes in terms of directness, Option 2 is slightly less direct due to the need for an additional crossing to be made over Auchmill Terrace. However, given that Auchmill Terrace is likely trafficked, this is unlikely to result in any significant delays to cyclists using the route.
- 4.2.8 The preliminary concept design for the proposed crossing arrangements at the Auchmill Road/Auchmill Terrace junction as part of Option 2 are provided in Appendix 2.

Benefits/Opportunities

- Direct north/south link for cyclists travelling between Auchmill Road and Middlefield.
- Minimal delay for cyclists travelling between Middlefield and Auchmill Road due to the introduction of the Toucan crossing at Auchmill Road.
- The whole route would be street lit from the Auchmill Road signal junction, along the link adjacent the allotments and Sunnybank football ground.
- Ties into proposed Middlefield Greenspace pedestrian/cyclist facilities.

Issues/Constraints

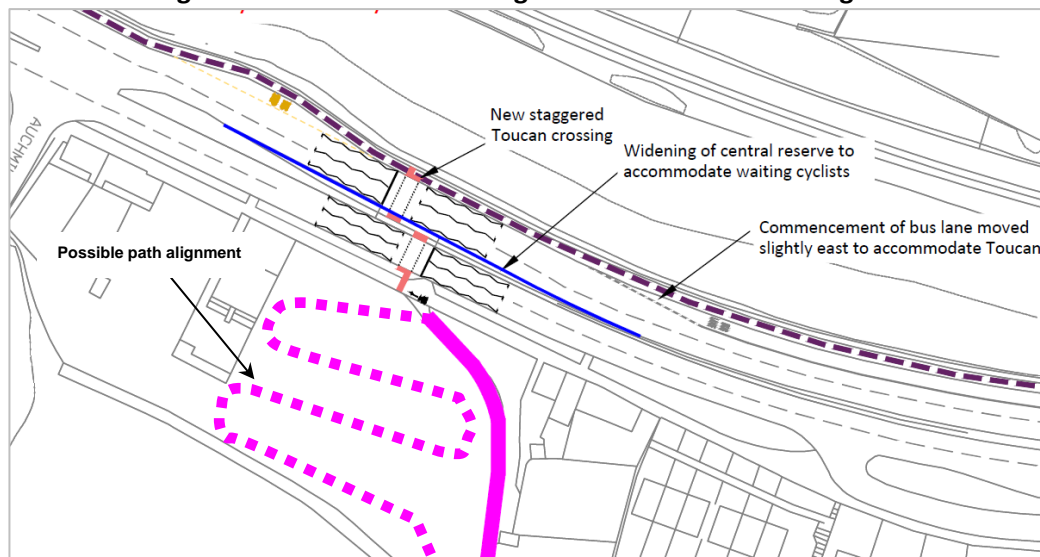
- Three crossing points required, over the A96, the residential access road and Auchmill Terrace.
- Significant gradient from Auchmill Terrace adjacent allotments with limited opportunities for improvements or provision of rest areas.
- Potentially minor increased delays for motorists on Auchmill Road due to increased use of proposed Toucan crossing compared to existing controlled crossing.
- Vegetation/fencing either side of path may shelter it during winter and make it slippery during wet/icy conditions.

4.3 Option 3a: New Toucan Crossing West of Auchmill Road Signals

Description

- 4.3.1 This option proposes to create a new controlled crossing at a point approximately 220m west of the Auchmill Terrace/Auchmill Road signal junction, as shown in Figure 7.

Figure 7: New Toucan Crossing West of Auchmill Road Signals



- 4.3.2 As the overall road width at this point is approximately 17.5m, it is advised that a staggered Toucan crossing facility is provided. This provides a direct pedestrian/cycle connection across the A96 which could link into the existing network of paths which cross the land to the east of the Auchmill Golf Course area. This area is understood to be public land. In order to accommodate the widening work necessary to facilitate a 3.0m central refuge area, the existing eastbound bus lane would have to be shortened by recommending it further to the east.
- 4.3.3 The existing path through to Middlefield/Heathryfold from this point has a significant incline which includes a set of steps. Therefore, to make this a suitable option for cyclists, a new off-road cycle track would need to be created connecting to the proposed Toucan crossing. The effect of the steep gradient could be minimised through zig-zagging the track along with segregating it from the existing pedestrian routes.
- 4.3.4 This could then re-join the existing path which runs between the rear of the houses on Heathryfold Circle and the Sunnybank Football Ground. This existing path would need to be widened to facilitate shared use.
- 4.3.5 A new shared path and crossing along Heathryfold Circle could then link into the network of shared paths within the Middlefield Greenspace. The preliminary concept design for the proposed crossing arrangements on Auchmill Road (A96) for Option 3a are provided in Appendix 3.

Benefits/Opportunities

- Relatively direct north/south link for cyclists travelling between Auchmill Road and Middlefield/Heathryfold.
- Minimal delay for cyclists travelling between Auchmill Road and Middlefield due to the introduction of the Toucan crossing.
- Pedestrian and cyclist routes could be separated to minimise potential conflicts.
- New path would be across public land which would avoid land ownership issues.

Issues/Constraints

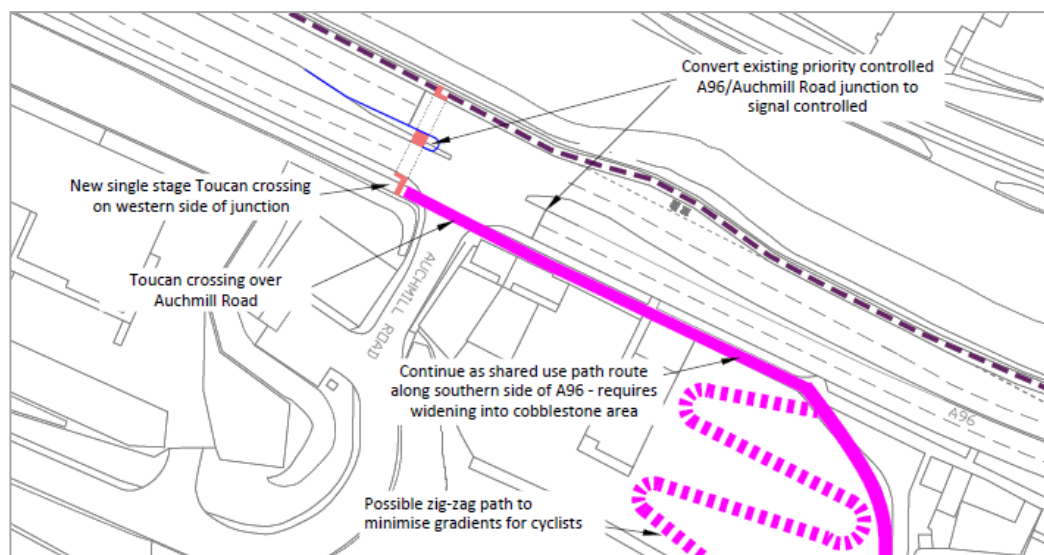
- Significant gradient change from Auchmill Road uphill through the wooded area.
- Minor delays for eastbound/westbound motorists due to the introduction of the staggered Toucan crossing on the A96.
- Shortening of eastbound bus lane to accommodate the new Toucan crossing is likely to be contentious with bus operators as it may result in delays to buses, particularly those pulling out from the adjacent bus stop. It would also result in a reduction of the available on-road facilities for cyclists given that the bus lane can be used by cyclists.
- Likely to be push back from local Heathryfold residents whose properties back onto the track due to it being lit and encouraging 24-hour access, although this could potentially be mitigated by introducing part time lighting e.g. lighting turned off between 11pm-6am.
- Could be perceived as an unsafe route due to it being secluded and not overlooked along most of the link.
- Existing issues with Japanese Knotweed within the wooded area to be resolved.
- Significant civils work required to provide suitable track surface, retaining walls, drainage, lighting etc. along with the new Toucan crossing on the A96.

4.4 Option 3b: New Signals at Auchmill Road Junction

Description

- 4.4.1 This option proposes a new signalised junction with Auchmill Road, approximately 330m to the west of Auchmill Terrace/Auchmill Road signal junction, as shown in Figure 8.

Figure 8: New Signal Junction at Auchmill Road



- 4.4.2 As per Option 3a, significant path improvements would be required through the Auchmill Woodland area to adequately cater for cyclists. At the point where the path from the Auchmill Woodland area joins the A96, the existing footway on the south side would be widened to 3.0m to form a shared use path. This widening could be achieved into the existing cobblestone area i.e. no kerb realignment required.
- 4.4.3 A Toucan crossing is proposed over Auchmill Road and the A96. The Toucan crossing over the A96 could potentially be a single stage crossing although the road width at this location is approximately 18m. Where road widths are greater than 15m, a staggered crossing is usually provided, however consideration could be given to a single stage crossing during further preliminary/detailed design.
- 4.4.4 To note, if this option is to be brought forward it would require further preliminary design and modelling to understand the impacts on delays to traffic flows on the A96 along with provision of either a single stage or two-stage Toucan crossing. Alternatively, the Toucan crossing over the A96 could be located further west, avoiding the need for signalling the junction and simply providing a priority-controlled crossing over Auchmill Road.
- 4.4.5 The preliminary concept design for the proposed crossing arrangements at the A96/Auchmill Road junction for Option 3b are contained in Appendix 4.

Benefits/Opportunities

- Relatively direct north/south link for cyclists travelling between Auchmill Road and Middlefield/Heathryfold.
- Likely to minimise delays for motorists turning into/out of Auchmill Road.

- Provides enhanced crossing facilities for pedestrians to cross the A96 from Auchmill Road.
- Minimal delay for cyclists travelling between Auchmill Road and Middlefield due to the introduction of the Toucan crossings.
- Pedestrian and cyclist routes could be separated to minimise potential conflicts.
- New path would be across public land which would avoid land ownership issues.
- Avoids the need to shorten the eastbound bus lane on the A96 as per Option 3a.

Issues/Constraints

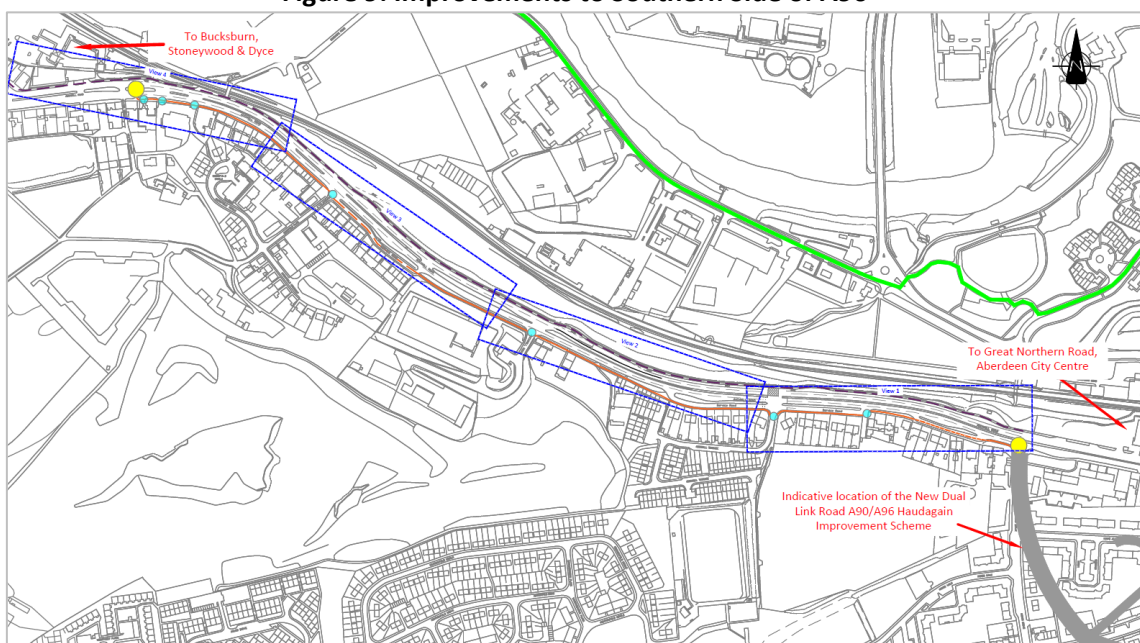
- Significant gradient change from Auchmill Road uphill through the wooded area.
- Minor delays for eastbound/westbound motorists due to the introduction of the signals at the A96/Auchmill Road junction, although these could be links to the Auchmill Road/Auchmill Terrace signals to lessen the impact.
- Likely to be push back from local Heathryfold residents whose properties back onto the track due to it being lit and encouraging 24-hour access, although this could potentially be mitigated by introducing part time lighting e.g. lighting turned off between 11pm-6am.
- Whilst suitable access needs to be achieved for cyclists along the entire link, there's a need to also consider anti-social activity with motorbikes in the Auchmill Woodland area which has been an issue in the past.
- Could be perceived as an unsafe route due to it being secluded and not overlooked along most of the link.
- Existing issues with Japanese Knotweed within the wooded area to be resolved.
- Significant civils work required to provide suitable track surface, retaining walls, drainage, lighting etc. along with the new signals on the A96.

4.5 Option 4: Alternative Manor Avenue/New Link Road Route & Provision of Facilities on the Southern Side of A96

Description

- 4.5.1 This option proposes to create a route comprising a mix of both on-road and off-road facilities along Auchmill Road which will tie into the new dual carriageway link road (as discussed in Section 3.1). There is sufficient road space to enable the necessary widening to accommodate a shared facility along Manor Avenue which ties into the proposed dual carriageway link.
- 4.5.2 The new dual carriageway link road will provide new footway/cycleway connections to Auchmill Road (A96) together with controlled crossing points over the A96 connecting to the existing shared foot/cycle path on the northern side. This option proposes cycle facilities along the southern side of Auchmill Road (A96) to tie into the new link road/A96 junction as shown in Figure 9.

Figure 9: Improvements to Southern Side of A96



- 4.5.3 There are sections identified where the existing footway will need to be widened to provide a suitable width for shared use. This can be achieved by widening into the existing grass verge/cobblestone areas i.e. no or minimal kerb realignment works needed to facilitate this. Some resurfacing work required along sections of the existing footway. Along the service road areas, there is insufficient space to provide an off-road facility. These service roads are used for residential access only and are lightly trafficked, low speed environments making them suitable for on-road cycling.
- 4.5.4 To cross cyclists back over to the existing shared path on the northern side of the A96, this could be done through one or a combination of the following:
- Upgrade existing controlled pedestrian crossing at the Auchmill Road/Auchmill Terrace junction (as per Option 1) with appropriate transition points; or

- Provide a new Toucan crossing over Auchmill Road (as per Option 3) further west on Auchmill Road; or
- Continue the westbound cycle path further west and upgrade the exiting pedestrian crossing on the A96 adjacent Newton Terrace to a Toucan crossing.

4.5.5 The preliminary concept design for the improved cycle facilities on the southern side of the A96 as part of Option 4 as provided in Appendix 4.

Benefits/Opportunities

- Largely level route, thereby avoiding the gradient issues presented by links on existing paths from Auchmill Terrace.
- Suitable pedestrian/cyclist facilities are already proposed as part of the design of the new link road.
- Unlikely to encounter significant opposition/resistance, as the route would tie in with proposals already in the public domain and ready to be implemented.
- Could offer benefits to the wider Cummings Park, Northfield areas i.e. increasing catchment area.
- Route would support active travel to/from the potential residential and commercial development at the 'Triangle' site off Logie Avenue.
- Route would be overlooked and with street lighting along the entire route.
- Route could connect to the NCN Route 1 via Goodhope Road at the upgraded Toucan crossing adjacent Newton Terrace.

Issues/Constraints

- A less direct route towards the northwest for Middlefield residents compared to the link from Auchmill Terrace/Auchmill Road junction.
- There may be some resistance/objection from residents along the westernmost end of the route, whose properties front the footway due to the loss of parking and potential conflict with cyclists as they step onto path. However, this could potentially be mitigated by marking a white line offset from the house frontages to guide cyclist away from the front doors of the properties.
- The combination of on-road and off-road facilities making it slightly inconsistent for cyclists travelling westbound.

5.0 OPTION ASSESSMENT

5.1 Option Assessment Tables

5.1.1 An appraisal framework has been developed, adapted from the route option appraisal framework provided by Cycling by Design.

5.1.2 Each of the options scored against a range of criteria of most relevance to increasing the levels of cycling in the study area. The criteria included:

- **Convenience:** Should be direct as possible and minimise detours and delays.
- **Safety:** Should minimise potential for actual/ perceived risks for all users.
- **Coherence:** Should be continuous and consistent from origin to destination.
- **Comfort:** Should meet surface width, quality and gradient standards and be convenient by avoiding complex manoeuvres.
- **Attractiveness:** Should complement and enhance its environment in such a way that cycling is attractive.
- **Deliverability:** Technical/ physical constraints and stakeholder objections should be overcome within delivery timeframe.

5.1.3 The scoring system undertaken as part of the option evaluation has been guided by the Scottish Transport Appraisal Guidance (STAG) assessment procedures. The scoring system applied uses a seven-point scale used within the STAG process when assessing the options against a specified set of criteria, whereby -3 represents a strong negative impact through to +3 which represents a strong positive impact. The seven point scoring system is shown in Table 2.

Table 2: Seven Point Scoring Scale

-3	-2	-1	0	+1	+2	+3
Strong Negative Impact	Moderate Negative Impact	Slight Negative Impact	Neutral Impact	Slight Positive Impact	Moderate Positive Impact	Strong Positive Impact

Table 3: Option 1 Appraisal

Option 1			
Option description	Upgraded Toucan crossing on the eastern side of the Auchmill Road/Auchmill Terrace signal junction with upgraded connection to Middlefield via existing path.	Estimated capital cost	£215,000
		Delivery Timeframes	3 - 5 Years
Assessment against Key Cycling Best Practice Criteria			
Criteria	Qualitative Information	Quantitative Information	Score (+/-3)
Convenience & Coherence	Provides a continuous and direct north-south connection between the shared foot/cycle path on northern side of A96 and Middlefield. Although path will vary in width and gradient due to the constraints adjacent to the allotments. Useable path width adjacent the allotments is narrow being 1.5m wide.	Introduction of Toucan crossing over the A96 minimises delays to pedestrians/cyclists. Uncontrolled crossing over the residential access road unlikely to result in significant delays due to low traffic volumes. Two crossings required as part of this route.	+3
Safety	Controlled Toucan crossing provides dedicated crossing facility over the A96.	Steep gradient, greater than the recommended maximum of 7% and slightly sheltered could result in slippery surface during wet/icy conditions. Cyclists could build up speed travelling downhill which may increase risk of collisions with other users or barriers at base of hill.	0
Comfort	The link between Middlefield and Auchmill Terrace would be a minimum 1.5m sealed width. Largely direct, although existing chicane arrangement maintained at Auchmill Terrace.	Steep path gradient, greater than the recommended maximum of 7%, adjacent to the allotments.	0
Attractiveness	Provides a largely quiet off-road link to Middlefield. Although this is slightly isolated and would require lighting along route.	Follows existing path alignment with improvement/widening works undertaken without being more visually intrusive compared to existing.	+2
Deliverability	Previous consultation with allotment owners indicates resistance to any improvement/widening work required to mitigate significant gradient issues along existing path.	Unlikely to be able to undertake significant realignment works required to provide appropriate gradients between 3-5% or alternatively 7% gradients with horizontal landings.	-3
Total Score			2

Table 4: Option 2 Appraisal

Option 2			
Option description	Upgraded Toucan crossing on the western side of the Auchmill Road/Auchmill Terrace signal junction, uncontrolled crossing over Auchmill Terrace and upgraded connection to Middlefield via existing path.	Estimated capital cost	£210,000
		Delivery Timeframes	3 - 5 Years
Assessment against Key Cycling Best Practice Criteria			
Criteria	Qualitative Information	Quantitative Information	Score (+/-3)
Convenience & Coherence	Provides a continuous and direct north-south connection between the shared foot/cycle path on northern side of A96 and Middlefield. Although path will vary in width and gradient due to the constraints adjacent to the allotments. Useable path width adjacent the allotments is narrow being 1.5m wide.	Introduction of Toucan crossing over the A96 minimises delays to pedestrians/cyclists. Uncontrolled crossing over the service road and Auchmill Terrace unlikely to result in significant delays due to low traffic volumes. Three crossing required compared to two in Option 1 making it slightly less direct.	+2
Safety	Controlled Toucan crossing provides dedicated crossing facility over the A96.	Steep gradient, greater than the recommended maximum of 7% and slightly sheltered could result in slippery surface during wet/icy conditions. Cyclists could build up speed travelling downhill which may increase risk of collisions with other users or barriers at base of hill.	0
Comfort	The link between Middlefield and Auchmill Terrace would be a minimum 1.5m sealed width. Largely direct, although existing chicane arrangement maintained at Auchmill Terrace.	Steep path gradient, greater than the recommended maximum of 7%, adjacent to the allotments.	0
Attractiveness.	Provides a largely quiet off-road link to Middlefield. Although this is slightly isolated and is unlit.	Follows existing path alignment with improvement/widening works undertaken without being more visually intrusive compared to existing.	+2
Deliverability	Previous consultation with allotment owners indicates resistance to improvement/realignment work required to mitigate significant gradient issues along existing path.	Unlikely to be able to undertake significant realignment works required to provide appropriate gradients between 3-5% or alternatively 7% gradients with horizontal landings.	-3
Total Score			1

Table 5: Option 3a Appraisal

Option 3a			
Option description	New staggered Toucan crossing located approximately 220m west of the Auchmill Road/Auchmill Terrace signal junction and upgraded connection to Middlefield/Heathryfold via public land.	Estimated capital cost	£544,000 (including estimated £200,000 for path improvements)
		Delivery Timeframes	3 - 5 Years
Assessment against Key Cycling Best Practice Criteria			
Criteria	Qualitative Information	Quantitative Information	Score (+/-3)
Convenience & Coherence	Provides a continuous although slightly indirect north-south connection between the A96 and Middlefield compared to Option 1 or Option 2.	Introduction of new Toucan crossing over the A96 will only have minor delays to pedestrians/cyclists. Also results in minor additional delays for motorists on the A96 as a result of the new crossing point.	+1
Safety	Staggered Toucan crossing provides controlled crossing facility over the A96.	New zig-zag path alignment would assist in reducing gradients through woodland area, although there is still likely to be a moderate gradient maintained.	+2
Comfort	New crossing on A96 provides easy to use crossing point for cyclists. New path through wooded still likely to have moderate gradient.	-	0
Attractiveness	Provides quiet off-road link to Middlefield, however this is very secluded, not overlooked and would need to be lit. Measures to deter motorbike access into the wooded area need to be considered based on previous anti-social issues experience in the area.	-	0
Deliverability	Potential resistance to cycle route from existing users, as it is well used by dog walkers. Unlikely to be supported by Heathryfold residents whose properties back onto the path due to it being lit and encouraging 24-hour access although this could be mitigated through part time lighting arrangements.	Significant civils works required to provide cycle path through the wooded area, issues to be resolved include appropriate drainage, surfacing, gradients, etc.	0
Total Score			3

Table 6: Option 3b Appraisal

Option 3b			
Option description	New Toucan crossing provided on western side of Auchmill Road as part of junction upgrade to signals (located approximately 330m west of the Auchmill Road/Auchmill Terrace signal junction) and upgraded connection to Middlefield/Heathryfold via public land.	Estimated capital cost	£590,000 (including estimated £200,000 for path improvements)
		Delivery Timeframes	3 - 5 Years
Assessment against Key Cycling Best Practice Criteria			
Criteria	Qualitative Information	Quantitative Information	Score (+/-3)
Convenience & Coherence	Provides a continuous although slightly indirect north-south connection between the A96 and Middlefield compared to Option 1 or Option 2.	Introduction of new Toucan crossing over the A96 will only have minor delays to pedestrians/cyclists. Also results in minor additional delays for motorists on the A96 as a result of the new crossing point. Delays for motorists turning into/out of Auchmill Road likely to be reduced as a result if signalling the junction.	+1
Safety	Toucan crossing facilities provide controlled crossing facilities over the A96 and Auchmill Road.	New zig-zag path alignment would assist in reducing gradients through woodland area, although there is still likely to be a moderate gradient maintained.	+2
Comfort	New crossing on A96 provides easy to use crossing point for cyclists. New path through wooded still likely to have moderate gradient.	-	0
Attractiveness	Provides quiet off-road link to Middlefield, however this is very secluded, not overlooked and would need to be lit. Measures to deter motorbike access into the wooded area need to be considered based on previous anti-social issues experience in the area.	-	0
Deliverability	Potential resistance to cycle route from existing users, as it is well used by dog walkers. Unlikely to be supported by Heathryfold residents whose properties back onto the path due to it being lit and encouraging 24-hour access although this could be mitigated through part time lighting arrangements.	Significant civils works required to provide cycle path through the wooded area, issues to be resolved include appropriate drainage, surfacing, gradients, etc.	0
Total Score			3

Table 7: Option 4 Appraisal

Option 4			
Option description	Alternative Manor Avenue/New Link Road and improved cycle facilities on south side of A96 and optional crossing points on A96 to northern shared path.	Estimated capital cost	£317,000
		Delivery Timeframes	3-5 Years
Assessment against Key Cycling Best Practice Criteria			
Criteria	Qualitative Information	Quantitative Information	Score (+/-3)
Convenience & Coherence	Provides indirect north-south connection between the shared foot/cycle path on northern side of A96 and Middlefield compared to Options 1, 2 & 3. Ties into new link road and offers potential to feed into wider network in Middlefield / Northfield and westbound cyclist travelling from elsewhere.	Combination of on-road and off-road facilities requiring a number of crossings over side roads and accesses, which could result in minor delays for cyclists.	+1
Safety	On-road sections along lightly trafficked service roads. A 3.5m shared path provided along most of the route which reduces potential for conflicts with A96 traffic. Appropriate crossing points required at side roads to highlight presence of cyclists and indicate priorities.	-	+2
Comfort	Widening work along existing footway required to provide 3.5m shared path width. Largely level route avoiding significant changes in gradients compared to Options 1, 2 and 3. Flush kerbs required for transitions between on-road and off-road.	-	+1
Attractiveness	Off-road link for westbound cyclists who currently travel on-road. Route is lit, appear to have low pedestrian flows. Transitions between on-road and off-road sections may make it less desirable and some cyclists may stay on-road.	-	+1
Deliverability	Kerb realignment/widening work and/or reallocation of road space/traffic lane widths to accommodate widening at certain points on the service roads. Consultation required with local community /residents regarding implications particularly on service roads and parking issues.	-	+1
Total Score			6

6.0 COST ESTIMATES

6.1 Option Construction Cost Estimates

6.1.1 Table 8 provides a breakdown of the estimated cost of construction for the proposed highway works, adopting what are considered to form robust assumptions in the absence of existing ground condition and associated information. To reiterate, the cost for the new woodland path is a high-level estimate and could vary depending on ground conditions.

6.1.2 To note, these cost estimates exclude Statutory Undertakers costs and costs to improve the pathway links.

Table 8: Cost Estimates

Cost Item	Estimated Construction Cost (£)				
	Option 1	Option 2	Option 3a	Option 3b	Option 4
Kerbing	4,500	3,000	5,000	5,000	12,000
Plane & Resurface		2,400	5,000	5,000	
Haunch	3,600				
Footway/Central Reserve	4,500	4,500	15,000	15,000	36,000
Road Markings	2,500	2,500	2,500	2,500	7,500
Upgrade to Toucan/Signals	120,000	120,000	120,000	150,000	120,000
Tactile Crossing	3,000	3,000			24,000
TRO			3,000	3,000	5,000
New Woodland Path			200,000	200,000	
Sub-total	138,100	135,400	350,500	380,500	204,500
Preliminaries & Traffic Management (15%)	20,715	20,310	52,575	57,075	30,675
Optimism Bias (40%)	55,240	54,160	140,200	152,200	81,800
Grand Total	215,000	210,000	544,000	590,000	317,000

6.1.3 The construction cost estimates including the addition of Optimism Bias of 40% added to reflect the preliminary design stage of the proposals. This value is consistent with the Optimism Bias required under the STAG guidance for CAPEX scheme costings at the preliminary design stage.

6.1.4 The costs of the upgrading of the existing pedestrian crossing to a Toucan crossing, under Options 1 and 2, at the Auchmill Road/Auchmill Terrace junction are relatively high as this would require the renewal of the existing high voltage signal equipment with more modern low voltage equipment.

7.0 CONCLUSIONS & RECOMMENDATIONS

7.1 Preferred Option

- 7.1.1 Through the option identification and evaluation process, it is clear that all options will have beneficial outcomes in terms of improving north-south cycling connectivity between the A96 and Middlefield area. The main point of differentiation is in terms of deliverability and potential technical/physical constraints that exist in terms of creating a complete north-south link.
- 7.1.2 While Option 1 and Option 2 score well in terms of convenience, coherence and attractiveness, they present significant challenges in terms of delivering a link through to Middlefield which is safe and comfortable for potential users. Option 3a and 3b offer benefits in terms of safety, convenience, coherence, comfort and attractiveness but also poses risks in terms of deliverability in terms of the high associated costs with a new path through the Auchmill Community Woodland area.
- 7.1.3 Option 3b would be preferable over Option 3a as it would avoid impacting on the existing eastbound bus lane. There would also be potential benefits in terms of reduced delays to Auchmill Road users. It is noted that there is a further alternative, to implement a new Toucan crossing further west of the Auchmill Road junction if it was deemed unnecessary/disadvantageous to signalise the A96/Auchmill Road junction following junction modelling.
- 7.1.4 Option 4, which comprises the improved cycle facilities along the southern side of the A96 (with potential crossing options connecting to the northern shared path), offers tangible benefits across all the assessment criteria and is the highest scoring out of the options considered.
- 7.1.5 It is considered that Option 4, improved cycling facilities on the south side of the A96, provides a deliverable solution that offers significant improvements for westbound cyclists from the Middlefield area and can be designed to easily connect to the existing northern A96 shared path and integrated into the new dual carriageway link road. However, there is also merit in potentially implementing Option 3b in combination with Option 4.

8.0 REFERENCES

Aberdeen City Council (ACC) (2017a) Aberdeen Active Travel Action Plan 2017 - 2021.

ACC (2017b) Cummings Park, Heathryfold, Northfield, Mastrick and Middlefield; Draft Locality Plan 2017-27.

ACC (2016) Local Transport Strategy (2016 – 2021).

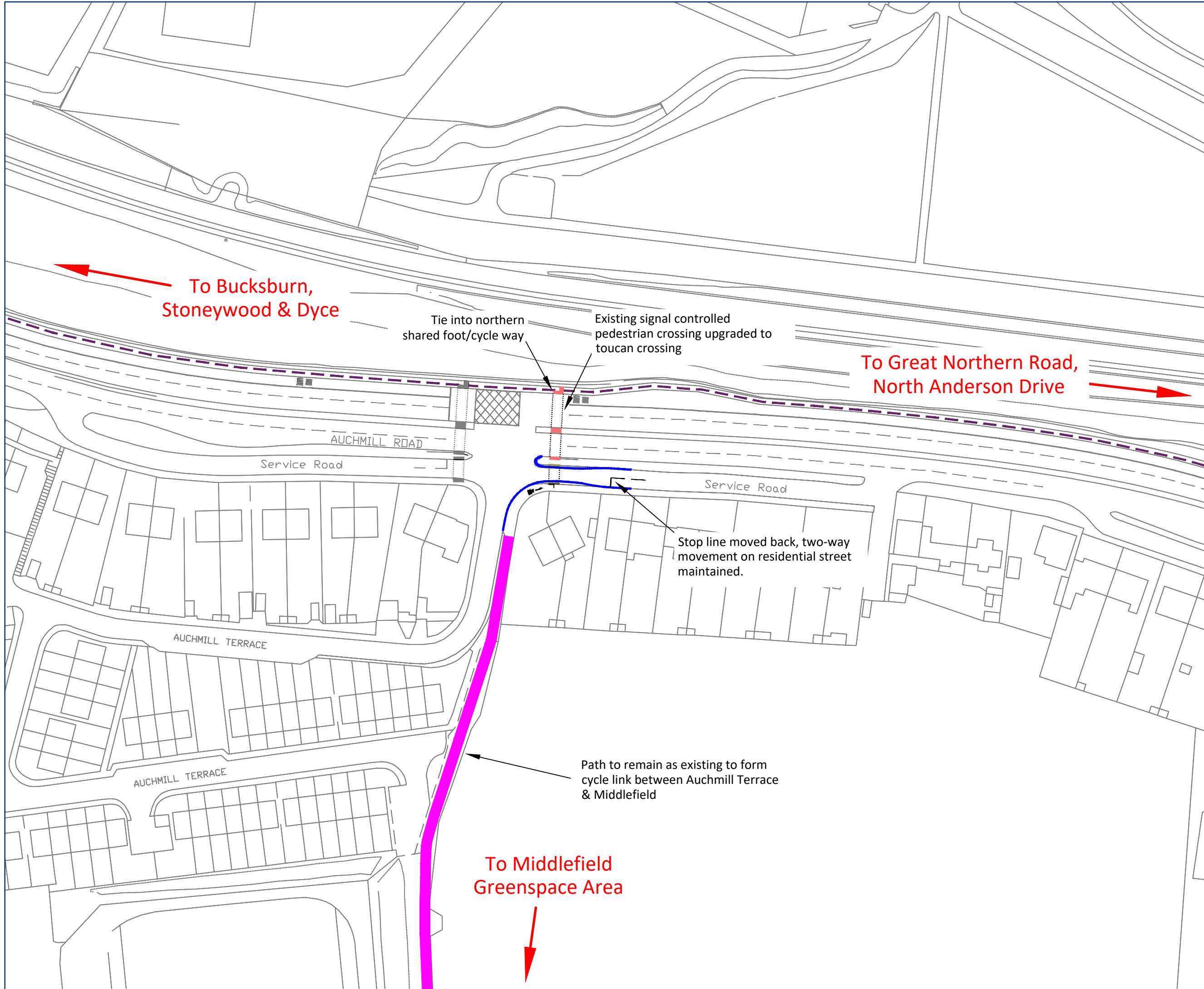
Department for Transport (DfT), 2008. Local Transport Note 2/08 Cycle Infrastructure Design.

The Scottish Government (2010) A Policy Statement for Scotland; Designing Streets.

Transport Scotland (2015) Scottish Transport Appraisal Guidance.

Transport Scotland (2010) Cycling by Design (Revision 1, June 2011).

Appendix I – Option I Preliminary Concept Design



To Bucksburn,
Stoneywood & Dyce

To Great Northern Road,
North Anderson Drive

To Middlefield
Greenspace Area

Tie into northern
shared foot/cycle way

Existing signal controlled
pedestrian crossing upgraded to
toucan crossing

Stop line moved back, two-way
movement on residential street
maintained.

Path to remain as existing to form
cycle link between Auchmill Terrace
& Middlefield

- Key:-**
- Existing northern shared foot/cycle way
 - Improvements required to convert existing path to shared foot/cycle path
 - Kerb realignment /widening work required

Notes:-

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 - iy. Preliminary design layout only. Scheme subject to further detailed design
 - v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

Rev.	Date	By	Chk	Description
A	23/01/18	AD	NW	Middlefield link to remain as existing

Client
Aberdeen City Council

Project
**Auchmill Road
Feasibility Assessment of
Cycle Measures**

Title
**Option 1:
Upgraded Toucan crossing on
eastern side of Auchmill
Road/Auchmill Terrace junction**

local transport projects
traffic engineering and transport planning

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 - CONSTRUCTION
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Drawing number

Project	Job	Drawing	Sheet	Revision
LTP/3010/02	001	01	A	

Appendix 2 – Option 2 Preliminary Concept Design

- Key:-**
- Existing northern shared foot/cycle way
 - Improvements required to convert existing path to shared foot/cycle path
 - Kerb realignment /widening work required

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 - iy. Preliminary design layout only. Scheme subject to further detailed design
 - v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

Rev.	Date	By	Chk	Description
A	23/01/18	AD	NW	Middlefield Link to remain as existing

Client
Aberdeen City Council

Project
Auchmill Road Feasibility Assessment of Cycle Measures

Title
**Option 2:
Upgraded Toucan crossing on western side of Auchmill Road/Auchmill Terrace junction**

local transport projects
traffic engineering and transport planning

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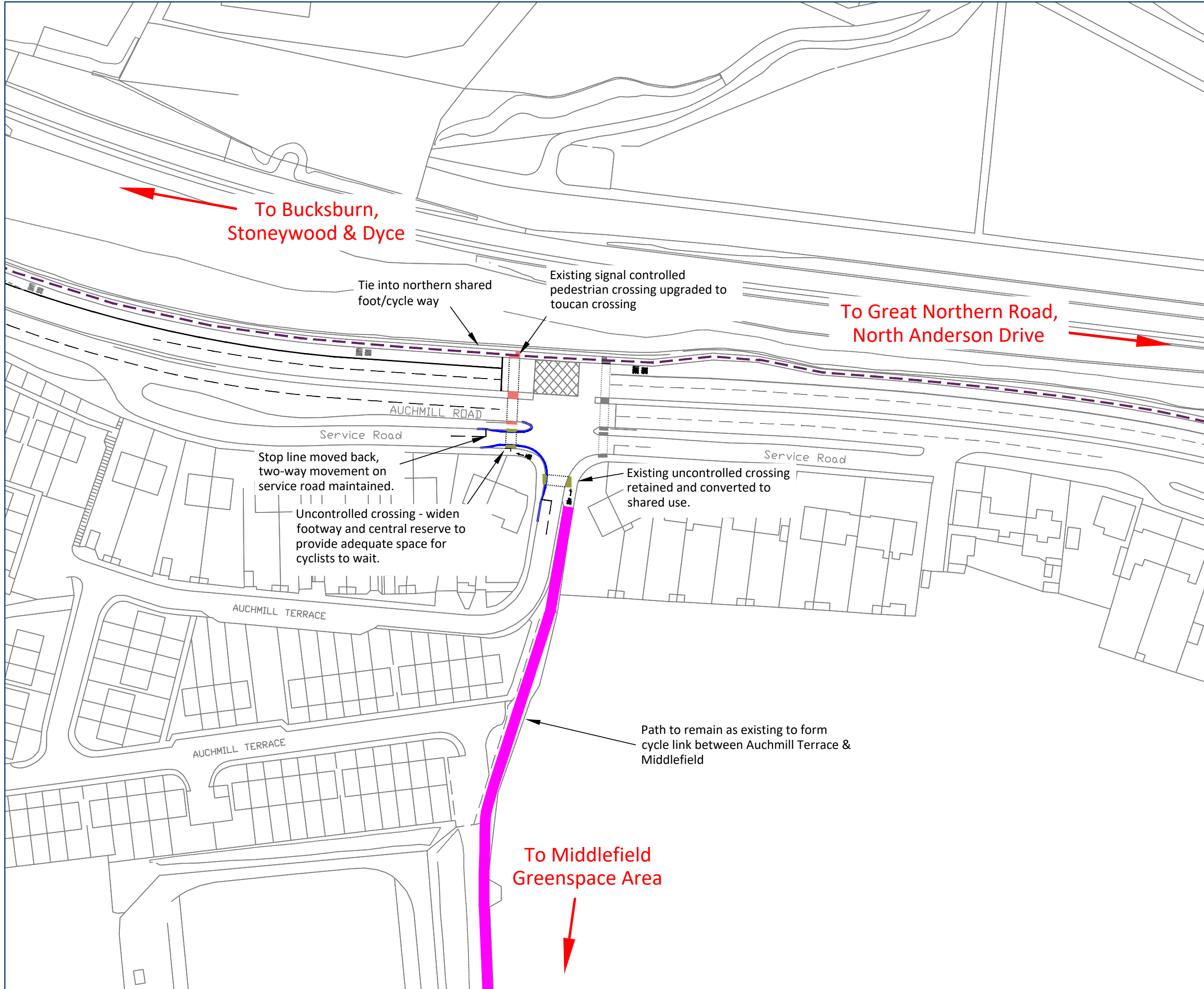
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Drawing number

Project	Job	Drawing	Sheet	Revision
LTP/3010/02	001	02	A	



To Bucksburn,
Stoneywood & Dyce

To Great Northern Road,
North Anderson Drive

To Middlefield
Greenspace Area

Tie into northern shared
foot/cycle way

Existing signal controlled
pedestrian crossing upgraded to
toucan crossing

Stop line moved back,
two-way movement on
service road maintained.

Uncontrolled crossing - widen
footway and central reserve to
provide adequate space for
cyclists to wait.

Existing uncontrolled crossing
retained and converted to
shared use.

Path to remain as existing to form
cycle link between Auchmill Terrace &
Middlefield

AUCHMILL ROAD

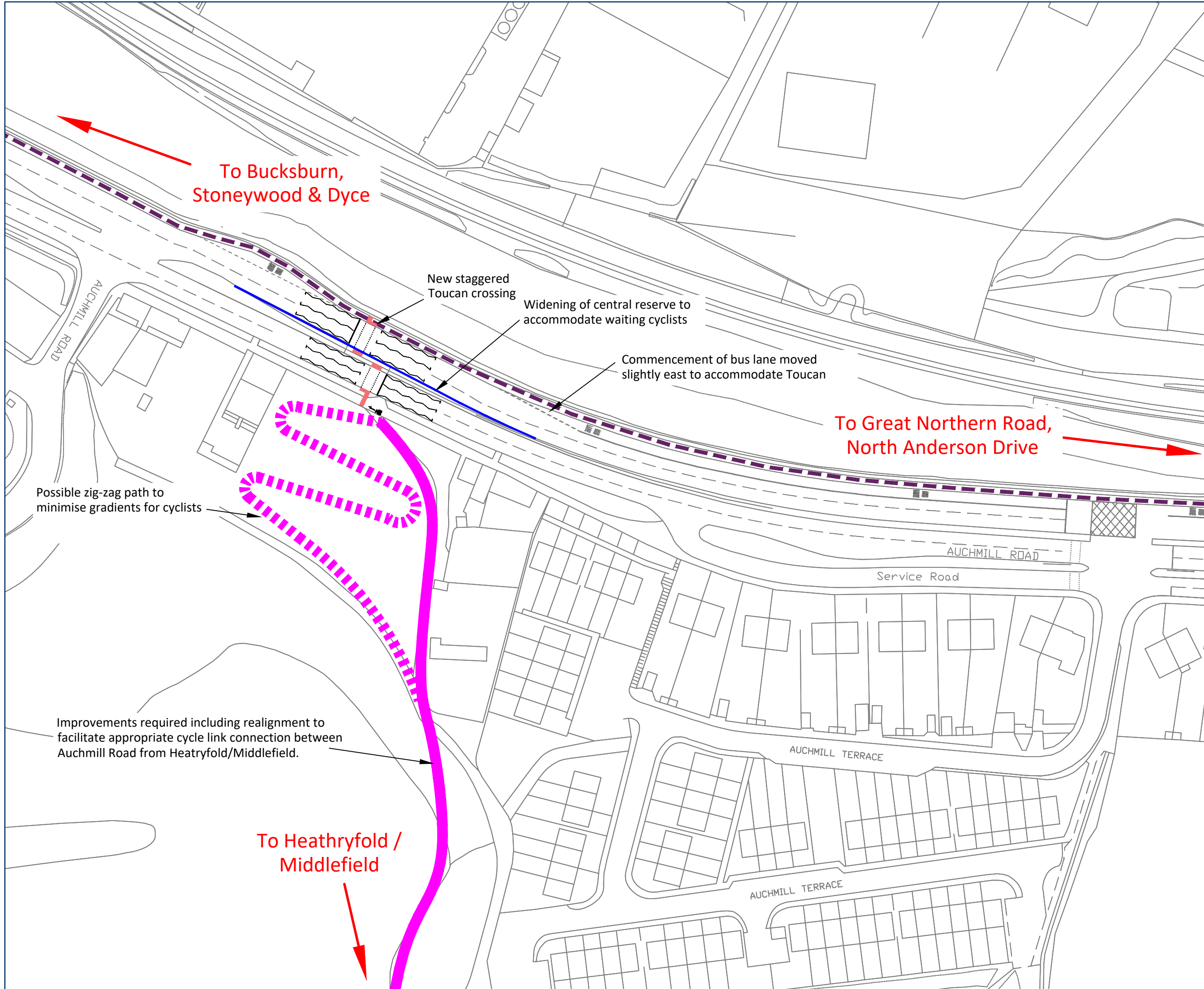
Service Road

Service Road

AUCHMILL TERRACE

AUCHMILL TERRACE

Appendix 3 – Option 3a Preliminary Concept Design



- Key:-**
- Existing northern shared foot/cycle way
 - Improvements required to convert existing path to shared foot/cycle path
 - Possible alternative path alignment to reduce gradients
 - Kerb realignment /widening work required
- Notes:-**
1. Existing road markings indicative only.

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 - v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

A	23/01/18	AD	NW	Show possible alternative route
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Rev.	Date	By	Chk	Description
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Client
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Project
Auchmill Road Feasibility Assessment of Cycle Measures

Title
**Option 3:
New Toucan crossing 220m west of Auchmill Road/Auchmill Terrace Junction**

local transport projects
traffic engineering and transport planning

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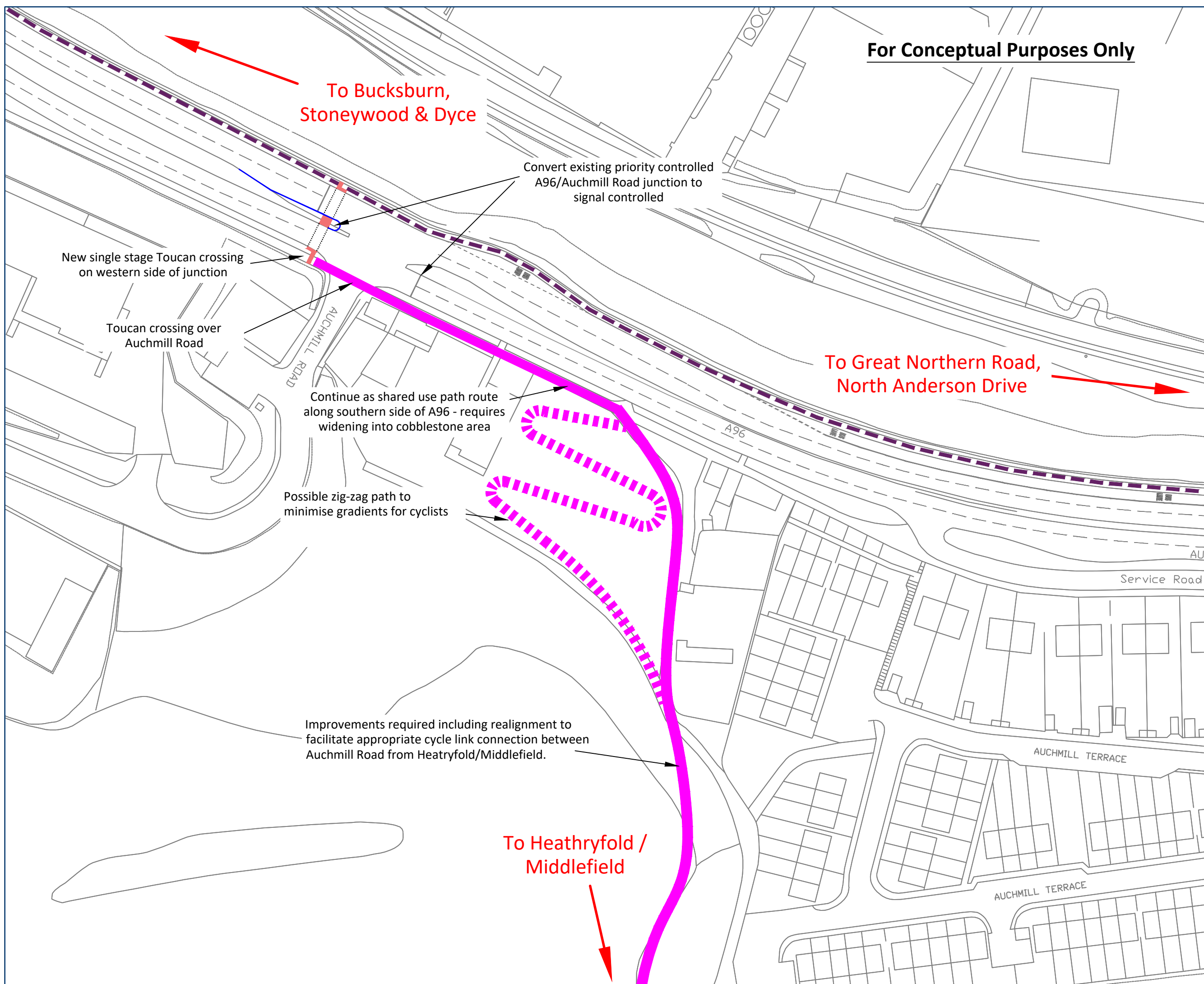
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Appendix 4 – Option 3b Preliminary Concept Design

For Conceptual Purposes Only



To Bucksburn,
Stoneywood & Dyce

Convert existing priority controlled
A96/Auchmill Road junction to
signal controlled

New single stage Toucan crossing
on western side of junction

Toucan crossing over
Auchmill Road

Continue as shared use path route
along southern side of A96 - requires
widening into cobblestone area

Possible zig-zag path to
minimise gradients for cyclists

To Great Northern Road,
North Anderson Drive

Improvements required including realignment to
facilitate appropriate cycle link connection between
Auchmill Road from Heathryfold/Middlefield.

To Heathryfold /
Middlefield

- Key:-**
- Existing northern shared foot/cycle way
 - Improvements required to convert existing path to shared foot/cycle path
 - Possible alternative path alignment to reduce gradients
 - Kerb realignment /widening work required
- Notes:-**
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 - ix. The design may be subject to change depending on the presence of underground services
 - iy. Preliminary design layout only. Scheme subject to further detailed design
 - v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

Rev.	Date	By	Chk	Description

Client
Aberdeen City Council

Project
**Auchmill Road
Feasibility Assessment of
Cycle Measures**

Title
**Option 3b:
New Signal Junction 300m west
of Auchmill Road/Auchmill
Terrace Junction**

local transport projects
traffic engineering and transport planning

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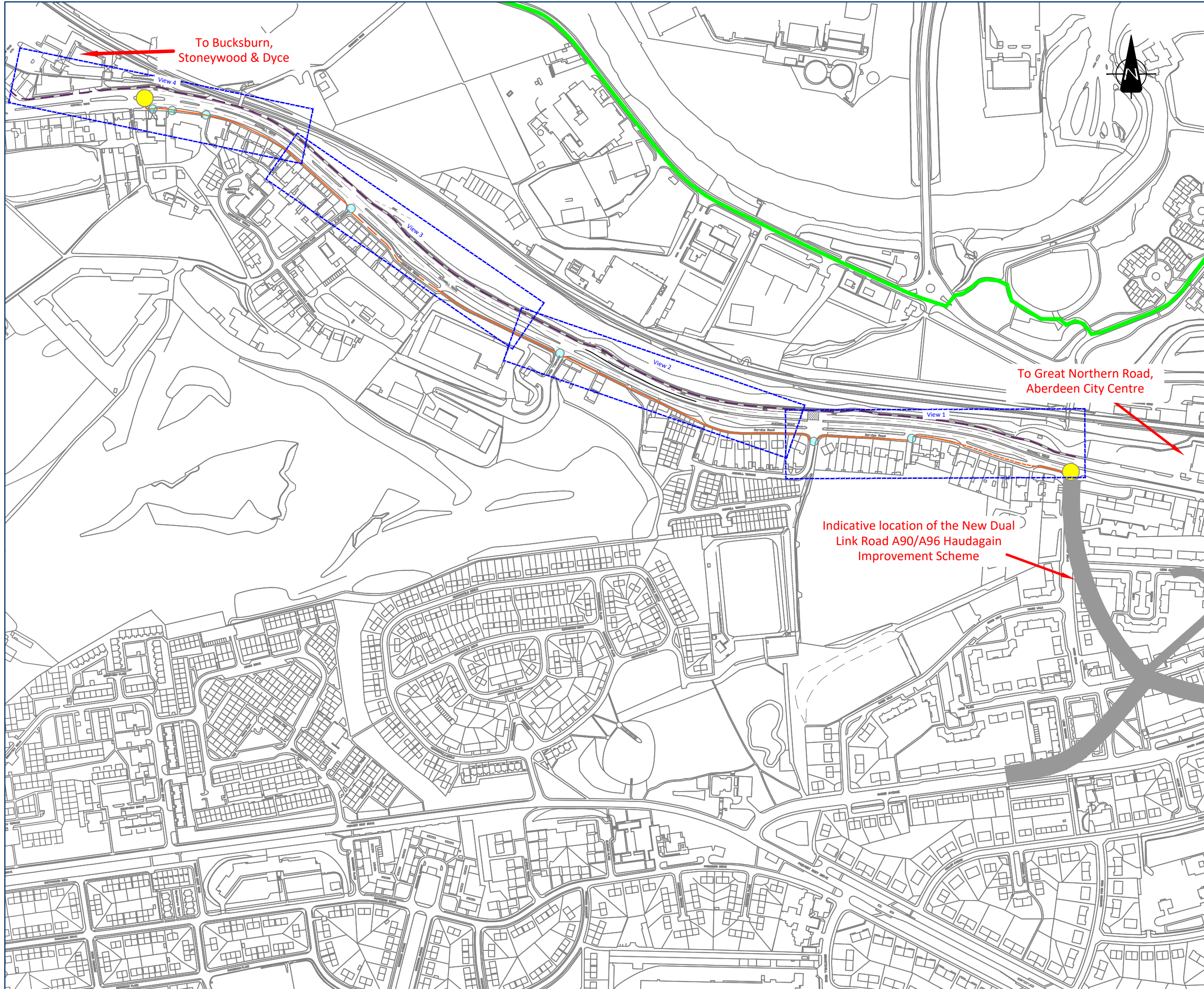
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 - PRELIMINARY
 - CONSTRUCTION
 - AS BUILT

Drawing number

Project	Job	Drawing	Sheet	Revision
LTP/3010/02	001	06		-

Appendix 5 – Option 4 Preliminary Concept Design



Key:-

- Existing northern shared foot/cycle way
- NCN Route 1
- Improvements required to convert existing path to shared foot/cycle path
- Kerb realignment / widening work required
- Potential southern shared foot/cycle path
- On-road section of route
- Design of appropriate crossing facility required

Notes:-

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 - iv. All work shall be carried out in accordance with local authority, statutory authority and health & safety requirements & regulations
 - iv. All signs and road markings in accordance with national guidance, standards and legislation
 - ix. The design may be subject to change depending on the presence of underground services
 - iv. Preliminary design layout only. Scheme subject to further detailed design
 - v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

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Rev.	Date	By	Chk	Description

Client
Aberdeen City Council

Project
Auchmill Road
Feasibility Assessment of
Cycle Measures

Title
Option 4
Improvements to
Southern Side of A96

local transport projects
traffic engineering and transport planning

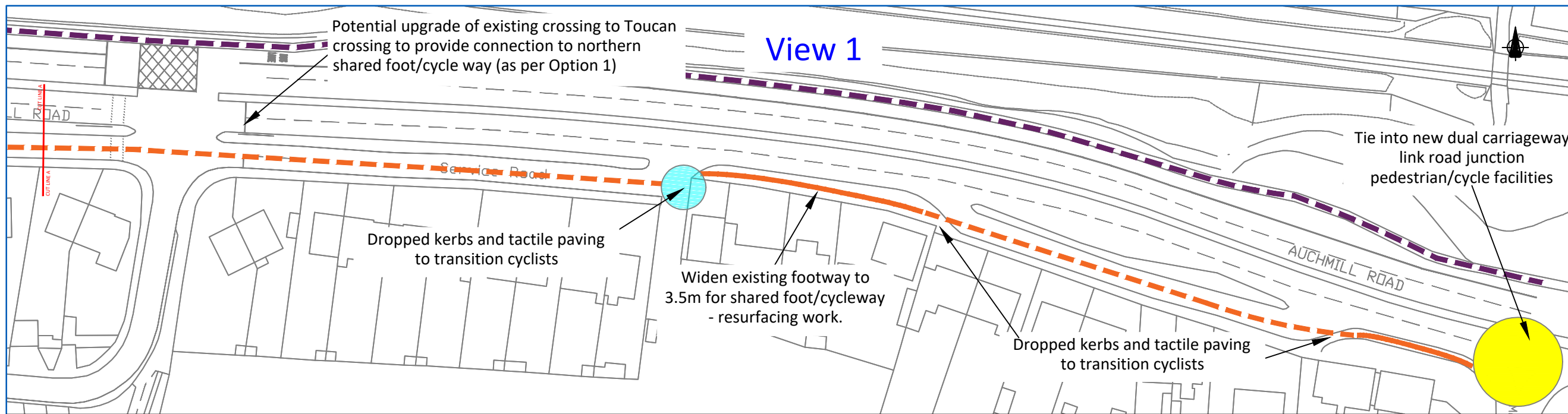
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Registered No. 5295328

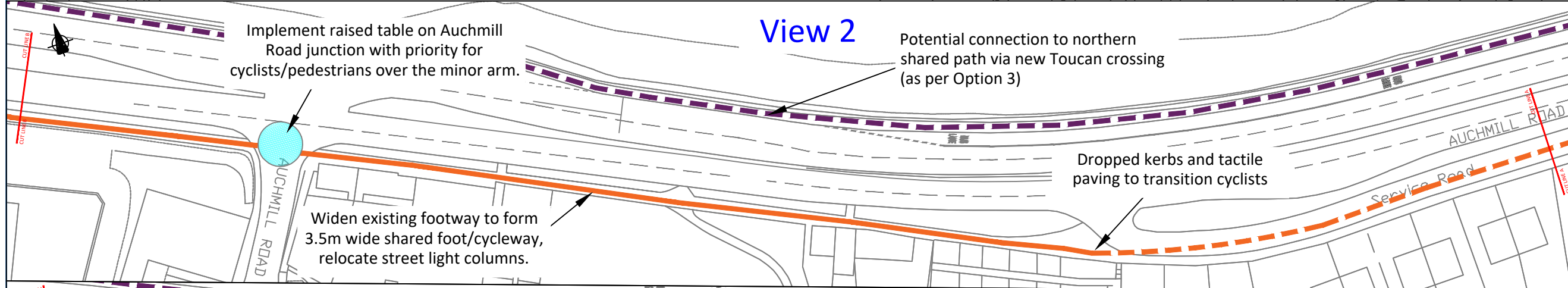
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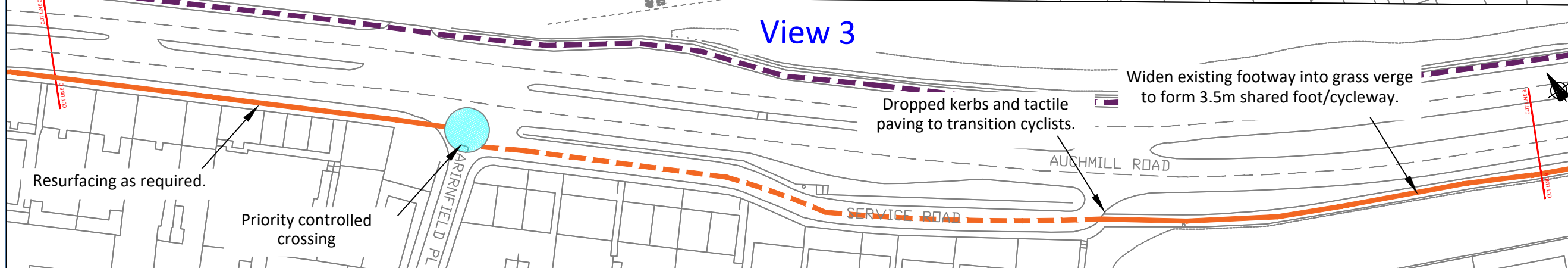
Drawing number	Project	Job	Drawing	Sheet	Revision
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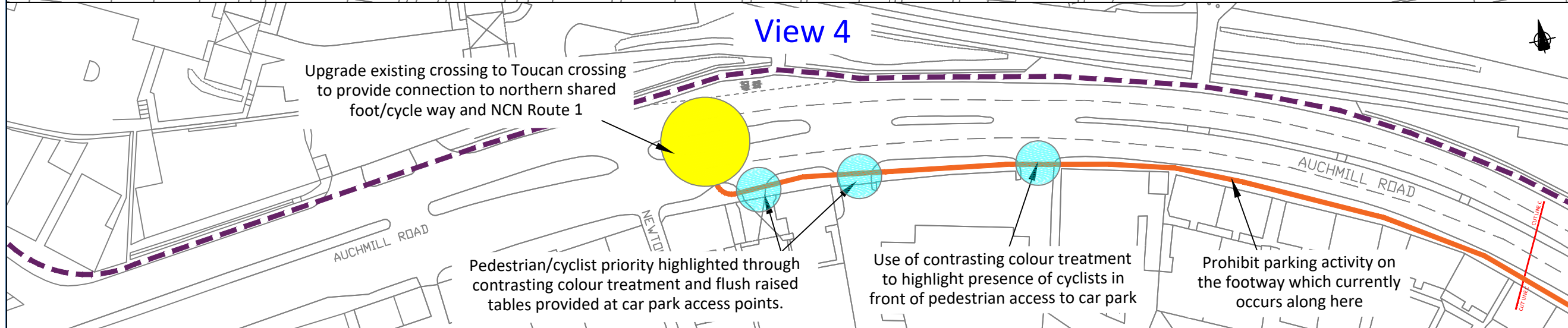
View 1



View 2



View 3



View 4

Key:-

- Existing northern shared foot/cycle way
- Improvements required to convert existing path to shared foot/cycle path
- Kerb realignment / widening work required
- Shared foot/cycle path
- On-road cycle route
- Design of appropriate crossing facility required

Notes:-

1. Existing road markings indicative only.

Disclaimers:-

- i. This drawing is copyright and must not be copied in part or in whole unless agreed in writing by Local Transport Projects Ltd
- ii. Reference should be made to the project's drawing register to ensure the latest drawing is being referred to.
- iii. All dimensions are to be checked by the contractor prior to commencement of work. Any discrepancy shall be reported immediately to Local Transport Projects Ltd
- iv. All work shall be carried out in accordance with local authority, statutory authority and health & safety requirements & regulations
- iv. All signs and road markings in accordance with national guidance, standards and legislation
- ix. The design may be subject to change depending on the presence of underground services
- iy. Preliminary design layout only. Scheme subject to further detailed design
- v. Based on Ordnance Survey base mapping supplied by Aberdeen City Council

Rev.	Date	By	Chk	Description
A	23/01/18	AD	NW	Amendments to route and overview plan

Client
Aberdeen City Council

Project
Auchmill Road Feasibility Assessment of Cycle Measures

Title
Option 4 Improvements to Southern Side of A96

local transport projects
traffic engineering and transport planning

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LTP/3010/02/001.05				05	0