

Appendix 14

Supporting Chapter 14 – People and Communities: Effects on All Travellers

Appendix 14.1 – Walking, Cycling and Horse-Riding Assessment Report

Appendix 14.2 – Driver Stress Assessment Data

Appendix 14.1 – Walking, Cycling and Horse-Riding Assessment Report

A720 Sheriffhall Roundabout

Walking, Cycling & Horse-Riding Assessment Report

Transport Scotland

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1. Introduction

1.1 Purpose of this Report

Improvements at Sheriffhall Roundabout will have a permanent impact on the trunk road and local road networks, therefore Design Manual for Roads and Bridges (DMRB) HD 42/17 Walking, Cycling & Horse-Riding Assessment and Review applies.

The aims of carrying out a Walking, Cycling & Horse-Riding Assessment are:

- a) To gain an appropriate understanding of all relevant existing facilities for pedestrians, cyclists and equestrians (users) in the local area.
- b) To provide background user information that can be referred to throughout the design process.
- c) To identify opportunities for improvement for users.

In accordance with HD 42/17, the scale of the scheme has been assessed by the Lead Assessor (defined in section 1.4) and is considered to qualify as a 'large' scheme for the purposes of this assessment. Therefore, improvements at Sheriffhall Roundabout are subject to a Walking, Cycling & Horse-Riding Assessment and this will then be followed by Walking, Cycling & Horse-Riding Reviews as the design progresses.

1.2 Background

Sheriffhall Roundabout is a junction on the A720 Edinburgh City Bypass and connects six A-class roads of local and regional importance, namely the A7 (North), the A6106 Millerhill Road, A720 Edinburgh City Bypass (East), the A6106 Old Dalkeith Road, A7 (South), and A720 Edinburgh City Bypass (West). Sheriffhall Roundabout is a signalised roundabout and has four lanes on the circulatory carriageway. It has an Inscribed Circle Diameter (ICD) of 100m. The location plan is shown on Figure 1.2.

Sheriffhall Roundabout is the only at-grade junction on the A720 Edinburgh City Bypass. The six-arm roundabout has undergone various improvements including localised widening, signalisation and the provision of additional lanes to try to alleviate the delays which occur at the junction. Despite the improvements, a congestion problem persists, particularly during peak hours.

There are extensive plans for residential and business development within the vicinity of Sheriffhall, including the South East Wedge (Shawfair) development. Sheriffhall also provides access to a number of growth areas, including the South East of Edinburgh where an Enterprise area has been established, and large developments along the A7 corridor. Sheriffhall also provides access from the east of Edinburgh City area to the growth areas around the West of Edinburgh and the M8 Corridor.

Underlying traffic volumes on the road network around Edinburgh are expected to increase by approximately 40% over the next 20 years. This increase is estimated from the impact of developments outlined in the emerging Strategic Development Plan. Congestion and delay on the A720 would increase, especially around key junctions such as Sheriffhall, and it is anticipated that traffic conditions around Sheriffhall Roundabout would deteriorate significantly.

AECOM was appointed by Transport Scotland in July 2013 to provide clarity on the most appropriate form of junction and to update previous STAG studies published in 2008, carried out prior to the opening of the A68 Dalkeith Bypass.

A total of eight junction options underwent DMRB Stage 1 scheme assessment. The assessment concluded with the recommendation that Options 1, 2, 6 and 8 were to be taken forward for further assessment at DMRB Stage 2. Further details can be found in the DMRB Stage 1 Scheme Assessment Report.

A significant level of design development was undertaken at DMRB Stage 2 to refine the layouts that emerged from DMRB Stage 1 to enable a detailed comparative assessment of the options and ultimately identification of an overall preferred junction layout.

The DMRB Stage 2 report recommended that Option B be adopted as the preferred option and taken forward for further development at DMRB Stage 3, with the recommendation that non-motorised user (NMU) provision and roundabout operational safety be given further consideration at DMRB Stage 3. The ongoing development is

subject to a Walking, Cycling & Horse-Riding Assessment and Review to ensure the evolving design meets the scheme objectives and best practice defined within the DMRB.

1.3 Study Area

In accordance with the requirements for a large scheme, as detailed in DMRB HD 42/17, a 5km radius has been used to define the study area for the assessment. The study area is shown on Figure 1.4.

Section 2 below summarises the policies, existing facilities and key trip generators within the study area. Detailed data is available within the immediate 500m vicinity of the proposed junction improvement works at Sheriffhall. Beyond this, the key facilities have been summarised for the full 5km study area.

1.4 Key Members of the Project Team

- Lead Assessor – Jill Irving
- Additional Assessor – Peter Leslie
- Design Team Leader – Steven Smith

2. Walking, Cycling & Horse-Riding Assessment

2.1 Review of Walking, Cycling & Horse-Riding Policies and Strategies

The national, regional and local planning policies and plans relevant to walking, cycling and horse-riding are set out below.

2.1.1 National Policy and Strategies

2.1.1.1 National Planning Framework 3 (June 2014)

The National Planning Framework (NPF 3) sets out the Scottish Government's development priorities over the next 20-30 years. "A Connected Place" is one of four themes of the NPF3. It states that "the road network (Scottish) has an essential role to play in connecting cities by car, public transport and active travel". Although the proposed upgrading of the A720 Sheriffhall Roundabout is not a specific NPF 3 development project, NPF 3 acknowledges its importance to the future economic development of Edinburgh in the statement on Page 13 – "Road network capacity, including the A720 where interventions are being taken forward at Sheriffhall Roundabout, has particular implications for future development".

2.1.1.2 Scottish Planning Policy (June 2014)

Scottish Planning Policy (SPP) states that "the case for a new junction will be considered where the planning authority considers that significant economic growth or regeneration benefits can be demonstrated. New junctions will only be considered if they are designed in accordance with DMRB and where there would be no adverse impact on road safety or operational performance". SPP (2014) also supports optimising the use of existing infrastructure and providing safe and convenient opportunities for walking and cycling for both active travel and recreation.

2.1.1.3 Cycling Action Plan for Scotland 2017 – 2020

The Cycling Action Plan for Scotland 2017 – 2020 outlines Transport Scotland's commitment to achieve the vision that 10% of everyday journeys in 2020 will be made by bike. The strategy outlined the commitment to continue to deliver and maintain high quality, local infrastructure to encourage people to choose active travel for short journeys and to improve integration with public transport, through partnership working with Scotrail, bus/coach operators and Regional Transport Partnerships.

2.1.1.4 A Long-Term Vision for Active Travel in Scotland 2030

The Transport Scotland report sets out the longer term vision for active travel in Scotland, building on the principles set out in the Cycling Action Plan for Scotland 2017 – 2020 and covering all user groups.

Key aspirations for Scotland in 2030, as outlined in the report, include:

- services and main trip attractors and generators which are all accessible by foot and by bicycle;
- segregated cycling provision or high quality direct, safe and pleasant alternatives on all main roads into town centres;
- crossings which prioritise people and give confidence to users;
- well-lit and with active/natural surveillance on routes to increase the perception of safety; and
- integration with public transport to provide an attractive alternative to car use for longer journeys

2.1.1.5 The National Walking Strategy

The National Walking Strategy outlines the Scottish Government's vision of a Scotland where everyone benefits from walking as part of their everyday journeys and where places are well designed and managed to encourage easy, convenient and safe independent mobility for all users.

2.1.2 Regional Policy and Strategies

2.1.2.1 SESplan

Strategic Development Plan (Adopted June 2013)

The South East Scotland Strategic Development Plan (SESplan) sets out a spatial strategy which recognises existing development commitments and promotes a sustainable pattern of growth across the City of Edinburgh, East Lothian, Fife, Midlothian, Scottish Borders and West Lothian Council areas. The strategy promotes the development of strategic transport and infrastructure networks to support economic growth and to meet the needs of communities. Paragraph 45 of SESplan states that the South East Edinburgh Strategic Development Area (SDA) is served by the City Bypass and Sheriffhall Roundabout "which are operating close to capacity and are severely congested at peak times" and that the upgrading of Sheriffhall Roundabout has been identified as an intervention within Transport Scotland's Strategic Transport Projects Review (STPR) whilst the expansion of park and ride facilities at Sheriffhall and a potential new park and ride facility to the north of the A68 / A720 junction are important to the "Regional Core". Paragraph 74 of SESplan identifies the grade separation of the Sheriffhall Roundabout as a "key transport infrastructure project" within the Midlothian/Borders Sub-Regional Area.

Proposed Strategic Development Plan (October 2016)

Work is underway on the next SESplan (SDP2) which is anticipated to be approved by the summer of 2018. The SDP2 Proposed Strategic Development Plan published in October 2016 highlights improvements to the A720 including the Sheriffhall Junction upgrade as a potential strategic cross-boundary project supporting the vision for the plan of a "better connected place".

2.1.2.2 SEStrans

Strategic Cross Boundary Cycle Development (June 2015)

The strategy was developed to guide investment in cross local authority boundary sections of the cycling network, with particular focus on routes suitable for commuters. The report highlights the location of key barriers and missing links within the existing cycling network and provides recommendations to overcome the existing issues. Sheriffhall Roundabout and Old Dalkeith Road are specifically identified as being a barrier to cyclists due to "dangerous and intimidating uncontrolled crossings" and "gaps in cycle lane provision". The provision of continuous and consistent cycle lanes along the entirety of the route and the use of coloured surfacing are recommended in the short term to address the identified issues. The provision of an overpass at Sheriffhall and a fully segregated route from Dalkeith into the central Edinburgh network is outlined as a longer term opportunity within the strategy.

2.1.3 Local Policy

2.1.3.1 City of Edinburgh Council

Edinburgh Local Development Plan (Adopted November 2016)

The Edinburgh Local Development Plan (LDP) (Adopted 2016) supersedes the Edinburgh City Council Adopted Local Plan (2010). The LDP contains a number of “Transport Proposals and Safeguards” (Table 9 – Page 39). One of the named transport proposals is the Sheriffhall Junction Upgrade (Ref: T13) “Grade separation of existing roundabout junction on city bypass should incorporate bus priority and safe crossing of the bypass for pedestrians and cyclists” (Page 39). The LDP also notes through Policy Tra 10 (New and Existing Roads) that planning permission will not be granted for development which would prejudice the proposed new roads and road network improvements listed in Table 9 and shown indicatively on the Proposals Map (Page 131).

2.1.3.2 Midlothian Council

Midlothian Local Development Plan (2017)

The Midlothian Local Development Plan (MLDP) was adopted in November 2017. The MLDP focuses on providing for, and managing, future change across the Council area in line with the SESplan requirements. It comprises a development strategy for the period to 2024 and a detailed policy framework to guide future land use in a way which best reflects SESplan's vision, strategic aims and objectives.

The Local Plan – Policy TRAN3 (Strategic Transport Network) states that Midlothian Council “supports the early implementation of the grade separation of the A720 Sheriffhall Junction” (Page 29). Policy TRAN2 (Transport Network Interventions) includes the safeguarding of land required for the ‘A720 Sheriffhall Junction Grade Separation’ and the ‘Sheriffhall (Extension) Park and Ride’ (Page 28).

The Settlement Statement for the SE (Shawfair) Strategic Development Area (Section 8.1), land allocated for around 4,000 houses and 23.5 hectares of employment land and a new town centre, states that “There will be a need to upgrade the A720 Sheriffhall Junction and contributions are being sought from the committed development towards this future investment”. (Page 83, paragraph 8.1.6).

2.1.3.3 East Lothian Council

Sheriffhall roundabout is not located within East Lothian, however East Lothian Council has been consulted and relevant plans and policies reviewed.

East Lothian Local Plan (Adopted October 2008)

The East Lothian Local Plan contains a number of policies regarding “Transport Infrastructure and Facilities – Standards” (Page 106) and includes a direction on pedestrian and cycling provision through Policy DP20 stating that “development proposals should be designed to make walking and cycling as attractive as possible. Where possible, links should be provided to existing pedestrian and cycle networks and segregated routes should be provided” (Page 107).

East Lothian Proposed Local Development Plan (September 2016)

The current target for the adoption of the East Lothian Local Development Plan is Spring 2018. The Proposed Plan (2016) builds upon the East Lothian Local Development Plan (ELDP) Main Issues Report consultations and focuses on providing for, and managing, future change across the Council area in line with the SESplan requirements. It comprises a development strategy for the periods up to 2019 and 2024 and a detailed policy framework to guide future land use in a way which best reflects SESplan's vision, strategic aims and objectives.

The East Lothian Segregated Active Travel Corridor (SATC) Section 2 extension is proposed to provide linkages to Midlothian at Old Craighall (PROP T3, Page 90). The proposed plan also includes policies to “protect its existing core paths and active travel networks and ensure that new developments do not undermine them, including convenience, safety and enjoyment of their use” (Policy T4, Page 90).

2.2 Topography

The topography of the study area mainly consists of gently undulating ground. The land surrounding the site mainly consists of arable farmland with occasional small residential or industrial properties. The Borders Railway

line runs north-south to the east of the roundabout. The road infrastructure is in cutting to the west of Sheriffhall and on embankment to the east. The existing Walking, Cycling and Horse-Riding user facilities generally comprise shallow gradients in the vicinity of Sheriffhall Roundabout.

2.3 Traffic Data

Manual Classified Counts (MCCs) were undertaken on 10 May 2017 between 06:00 and 20:00 hours within a focused study area around Sheriffhall to assist in establishing current traffic conditions. The 14-hour 2-way traffic flows on the A720 were found to be 45,686 west of Sheriffhall Roundabout and 45,342 east of Sheriffhall Roundabout. The 14-hour 2-way traffic flows on the roads surrounding Sheriffhall were found to be 14,149 on the A7 Old Dalkeith Road (North); 13,604 on the A7 South; 7,442 on the A6106 Millerhill Road and 11,903 on the A6106 Old Dalkeith Road.

The results of the May 2017 surveys indicate that 69,063 vehicles passed through the at-grade Sheriffhall Roundabout during the 14-hour survey period. 73% of eastbound vehicles on the A720 passed through Sheriffhall Roundabout and continued east on the A720. Similarly, 74% of westbound vehicles on the A720 passed through Sheriffhall Roundabout and continued west on the A720. The observed 14-hour vehicle movements recorded at each 2017 MCC site are shown in Figure 2.3.1

2.4 Cyclist and Pedestrian Data

Cyclist counts were undertaken at all MCC locations as part of the October 2013 and October 2014 traffic survey programmes. Pedestrian and cyclist counts were undertaken at Sheriffhall Roundabout as part of the May 2017 survey programme.

2.4.1 2013 Cyclist Counts

On Tuesday 8 October 2013, cyclist survey data was collected at three locations in 15-minute intervals between 07:00 and 19:00 hours to provide a 12-hour record of midweek turning movements. Approximately 100 cyclists were recorded over the 12-hour period at all three survey locations.

The largest single junction count was recorded at Gilmerton Junction with a total average of 86 cyclists observed using the junction. Only 14 cyclists were recorded at Sheriffhall Roundabout with 12 of the 14 trips travelling from A7 South to A7 North. There were no cyclists recorded at Millerhill Junction.

The observed 12-hour cyclist movements recorded at each 2013 MCC site are shown in Figure 2.4.1

2.4.2 2014 Cyclist Counts

On Wednesday 1 October and Thursday 2 October 2014, cyclist counts were undertaken at all MCC locations at 15-minute intervals between 07:00 and 19:00 hours to provide an update to the 12-hour record of turning movements. At the time of the survey, the A6106 Millerhill Road was closed to all users for improvement works.

Within the A720 corridor, the largest single junction count was recorded at Gilmerton Junction with a total of 87 cyclists observed using the junction. Only 16 cyclists were recorded at Sheriffhall Roundabout with 10 of the 16 trips travelling from the A6106 Old Dalkeith Road to A7 North. There was 1 cyclist recorded at Millerhill Junction.

The observed 12-hour cyclist movements recorded at each MCC Site are shown in Figure 2.4.2.

2.4.3 2017 Cyclist Counts

On Wednesday 10 May and Thursday 11 May 2017, cyclist counts were undertaken at all MCC locations at 15-minute intervals between 06:00 and 20:00 hours to provide a record of 14-hour turning movements.

Within the A720 corridor, the highest number of cyclists was recorded at Straiton Junction where a total of 188 cyclists were observed using the junction. A further 148 cyclists were recorded at Gilmerton Junction, while only 43 cyclists were recorded at Sheriffhall Roundabout.

The A7 North was recorded as the most used cycle route on the north side of the A720 Edinburgh City Bypass while the A7 South and A6106 Old Dalkeith Road experienced similar usage levels to the south.

In the surrounding area, the highest number of cyclists was recorded at Gilmerton Road Roundabout on the A7 South where a total of 210 cyclists were observed using the junction. A further 194 cyclists were also recorded at the A772 / Gilmerton Station Road roundabout north of Gilmerton Junction.

The observed 14-hour cyclist movements recorded at each MCC Site are shown in Figure 2.4.3.

2.4.4 2017 Pedestrian Counts

On Wednesday 10 May 2017, pedestrian counts were undertaken at Sheriffhall Roundabout between 06:00 and 20:00 hours. Approximately 47 pedestrians were observed crossing the arms of the roundabout during the 14-hour survey period.

The data collected shows the majority of pedestrian users moving between the A6106 Old Dalkeith Road and A7 North and crossing on the eastern side of the roundabout. Of the pedestrians recorded, 17 approached Sheriffhall Roundabout from the A6106 Old Dalkeith Road while 20 approached the roundabout from the A7 North. Similarly, 21 pedestrians were recorded leaving the junction on the A6106 Old Dalkeith Road, and 20 on the A7 North.

The observed 14-hour pedestrian movements recorded at Sheriffhall Roundabout are shown in Figure 2.4.4.

2.5 Road Accident Records

Personal injury collision data has been provided for the A720 Edinburgh City Bypass between the Lothianburn and Old Craighall Junctions. The data was refined to focus on accident records in the 5km study area and is displayed in Figure 2.5.1. The data covers the five year period between January 2012 and December 2016 and was provided by Transport Scotland. During this time there were 149 slight injury collisions, 13 serious injury collisions and 4 fatal injury collisions. Within the 500m detailed study area, 57 slight injury collisions, 4 serious injury collisions and 1 fatal injury collision were recorded.

Of the slight injury collisions recorded, two involved cyclists at Straiton Junction and one involved a pedestrian on the A720 mainline carriageway between Lasswade and Gilmerton Junctions. None of the slight injury collisions involved equestrians.

Of the fatal injury collisions recorded, one involved a pedestrian on the A720 mainline carriageway between Sheriffhall and Millerhill Junctions. None of the fatal injury collisions involved equestrians or cyclists.

None of the serious injury collisions involved cyclists, equestrians or pedestrians.

Analysis of the data within the 500m vicinity of the proposed Sheriffhall junction improvements has revealed that 36 of the 62 collisions between 2012 and 2016 occurred on the immediate approaches to or on the circulatory carriageway of Sheriffhall Roundabout. The injury collision locations within the 500m boundary are shown in Figure 2.5.2.

2.6 Key Trip Generators & Local Amenities

There are a wide variety of trip generators in the immediate 500m vicinity of proposed Sheriffhall junction improvements which could be attractive to walkers, cyclists and horse-riders. Residential properties, community facilities and business and industry premises are located within the 500m immediate vicinity and the wider 5km study area. The trip generators are detailed in the sections below with their locality in relation to the A720 Edinburgh City Bypass provided to give indication of potential desire lines across the A720. The reference numbers recorded against the trip generators and local amenities below are shown on Figures 2.6.1 and 2.6.2 to detail their location within the study area and immediate 500m vicinity of the proposed Sheriffhall junction improvements.

2.6.1 Residential Properties

The residential properties within 500m of the proposed Sheriffhall junction improvements are located at:

North of A720

- Summerside residences (Ref.1); and

- Campend residences (Ref.2).

South of A720

- Sheriffhall House (Ref.3);
- Old Sheriffhall Farmhouse residences (Ref.4);
- Melville Cottages (Ref.5); and
- Gilmerton Road Residences (Ref.6).

The population totals (based upon the 2011 Census) for the primary localities within the 5km study area are shown in Table 2.6.1.

Table 2.6.1 – Local Populations

Locality	Population
Danderhall	2,732
Dalkeith/Eskbank	12,342
Bonnyrigg	15,677
Whitecraig	1,198

A significant volume of housing development is proposed within the Midlothian Local Development Plan. The Shawfair and South Danderhall developments, north east of Sheriffhall Roundabout have an estimated capacity of approximately 4,000 homes and are to be delivered in line with the Shawfair masterplan.

2.6.2 Community, Business and Industry Facilities

There are a number of community, business and industry facilities within the immediate 500m vicinity of the proposed Sheriffhall junction improvements:

North of A720

- Sheriffhall Café (Ref.7);
- Sheriffhall Park and Ride (Ref.8);
- Shawfair Park (Ref.9); and
- Old Colliery Pub Restaurant (Ref.10);

South of A720

- Dalkeith Country Park (Ref.11);
- Elginhaugh Farm Pub Restaurant (Ref.12);
- Dobbies Garden Centre (Ref.13);
- Butterfly World (Ref.14);
- Melville Inn Pub Restaurant (Ref.15); and
- Melville Castle Hotel (Ref.16).

Within the wider 5km study area, additional community, business and industry trip generators include:

North of A720

- Shawfair Borders Railway Station (Ref.17)
- Newcraighall Borders Railway Station and Park & Ride (Ref.18)
- Burnstane Borders Railway Station (Ref.19);

- Spire Shawfair Park Hospital (Ref.20);
- Toddhills Business Park (Ref.21);
- Beijing Banquet Chinese Restaurant (Ref.22);
- Danderhall Leisure Centre and Library (Ref.23);
- Danderhall Medical Practice (Ref.24);
- Drum Riding for the Disabled Centre (Ref.25);
- Cockatoo Restaurant (Ref.26);
- Edinburgh Royal Infirmary (Ref.27);
- Calvary Chapel of Edinburgh (Ref.28);
- Chapter One Childcare Nursery (Ref.29);
- Craigmillar Castle (Ref.30);
- Musselburgh Railway Station (Ref.31);
- Queen Margaret University (Ref.32);
- King's Acre Golf Course (Ref.33);
- Broomieknowe Golf Course (Ref.34);
- Newbattle Golf Course (Ref.35);
- Fort Kinnaird Shopping Centre (Ref.36); and
- Edinburgh Bioquarter (Ref.37).

South of A720

- Borders Railway Stations – Newtongrange (Ref.38) and Eskbank (Ref.39);
- Melville Golf Centre (Ref.40);
- Lothian Bridge Caravan Park (Ref.41);
- Premier Inn Dalkeith (Ref.42);
- Dalhousie Castle Hotel (Ref.43);
- Scottish Mining Museum (Ref.44);
- Edinburgh & Lasswade Riding Centre (Ref.45);
- Edinburgh Equestrian Centre (Ref.46);
- Edinburgh College (Ref.47);
- Straiton Mains Retail Park (Ref.48);
- Straiton Park & Ride (Ref.49);
- Liberton Golf Course (Ref.50);
- Tesco Superstore Eskbank (Ref.51);
- Peel Retail Park, Straiton (Ref.52).

2.6.3 Future Trip Generators

In addition to the trip generators listed above, the review of planning policy and development plans has identified a number of future economic development areas and new community facilities proposed within the 5km study area. The town centres of Bonnyrigg, Loanhead, Dalkeith, Gilmerton and Niddrie, and the proposed town centre of Shawfair are also located within the 5km. These town centres will provide additional community, business and industry facilities outwith those listed above. However, it is assumed that these town centre facilities will be primarily local trip-generators with low impact on the A720 Sheriffhall Roundabout.

The Midlothian Local Development Plan proposes extension to the Shawfair Park site as well as further business development to the south of Sheriffhall Roundabout. As part of the Shawfair development, it is proposed that new schools, sports facilities, a medical centre, a library, and community woodland/ landscaping are provided.

The proposed developments and NMU facilities within the 5km study area are shown in Figure 2.6.3

2.6.4 Desire Lines

The likely desire lines for pedestrians, cyclists and equestrians at Sheriffhall Roundabout have been identified based on the survey data collected and the locality of the key trip generators and attractors outlined above.

The majority of pedestrian and cyclist movements recorded during the surveys occurred between the A7 North and A6106 Old Dalkeith Road. This aligns with the existing footway and cycleway network north and south of Sheriffhall Roundabout as well as the localities of a number of identified trip generators in Dalkeith and along the A7 North.

A number of key trip generators and attractors are located on the A7 South and A772 Gilmerton Road. The 2013 cyclist counts identified the proportionately high use of the A7 South by cyclists at this time despite there being no dedicated cyclist or pedestrian provision. It is likely that the lack of walking, cycling or horse-riding facilities on this route is serving as a barrier to its usage.

2.7 Scheduled Bus Services

Sheriffhall Park & Ride and 14 bus stops are located within the immediate 500m vicinity of the proposed Sheriffhall junction improvements. A summary of the scheduled bus services covering this area is provided in Table 2.7. The bus services travelling through Gilmerton Junction have also been included as these services may migrate to Sheriffhall Junction if traffic is improved. The bus facilities within the 500m boundary are shown in Figure 2.7.

Table 2.7 – Scheduled Bus Services Located within the A720 Sheriffhall Roundabout Study Area

Operator	Service Number	Service Route	Via Sheriffhall Roundabout	Via Gilmerton Junction
Lothian Buses	3	Clovenstone to Mayfield (via Gilmerton/Eskbank/Dalkeith) and vice versa		✓
	N3 (nighttime only)	Haymarket to Birkenside (via Gilmerton/Eskbank/Dalkeith) and vice versa		✓
	29	Silverknowes to Gorebridge (via Gilmerton) and vice versa		✓
	X29	Muirhouse to Gorebridge Express (via Gilmerton Crossroads) and vice versa		✓
	33	Baberton to Dalkeith (via the Sheriffhall P & R) and vice versa	✓	
	X33	Mayfield to Edinburgh (via the Sheriffhall P & R)	✓	

Operator	Service Number	Service Route	Via Sheriffhall Roundabout	Via Gilmerton Junction
	49	The Jewel to Rosewell (via the Sheriffhall P&R) and vice versa	✓	
Perryman's Buses	51/52	Edinburgh to Jedburgh/Kelso (via Danderhall) and vice versa	✓	
	527	Visit Midlothian Explorer Bus (April to October only)		✓
First Bus	95A, X95	Edinburgh to Carlisle (via Eskbank) and vice versa	✓	
Lothian Community Transport Services	R3	Dalkeith to The Jewel ASDA (via Danderhall-Newton-Millerhill) and vice versa	✓	

Source: Site Visit and reference to the Lothian Buses, Perryman's Buses, First Bus, E&M Horsburgh and the Lothian Community Transport Services websites

In addition to Sheriffhall Park & Ride, there are two other park and ride facilities within the 5km study area. Newcraighall Park & Ride is located 3.7km north of Sheriffhall Roundabout and Straiton Park & Ride is located 4.9km west of Sheriffhall. The park and ride facilities within the study area are included in the list of key trip generators under section 2.6.2 of this report, and shown on Figure 2.6.2.

2.8 Rail Services

ScotRail (operated by Abellio) currently provide passenger services on the Borders Railway line between Edinburgh (Waverley) and Tweedbank in the Scottish Borders. Monday to Saturday services are half-hourly in each direction until 20:00, with an hourly service provided after 20:00 and on Sundays. The route alignment between Millerhill and Eskbank passes below the A720 Edinburgh City Bypass to the east of the A720 Sheriffhall Roundabout. Borders Railway stations within the 5km study area are located at Newtongrange, Eskbank, Shawfair, Newcraighall and Brunstane.

Scotrail also provide passenger services on the North Berwick Railway line between Edinburgh (Waverly) and North Berwick. Monday to Friday services are hourly with an additional half-hourly service over peak hours. A half-hourly service operates on Saturdays and an hourly service on Sundays. Musselburgh Railway Station is located within the 5km study area on the North Berwick line. The locations of the railway stations within the study area are shown on Figure 2.6.1.

2.9 Consultation

Consultation has been undertaken in a comprehensive and open manner, ensuring that the views of all parties were properly heard, recorded and taken into consideration during the study and development of the scheme.

Written consultation was undertaken during February 2015 and November 2016 to identify issues affecting all users and inform the DMRB Stage 2 Options Assessment process.

A Stage 2 Wider Stakeholder Workshop was held on 25 October 2016. The purpose was to inform stakeholders of work to date, to understand stakeholders concerns and to obtain feedback on current options. The attendees were Transport Scotland, City of Edinburgh Council, East Lothian Council, Midlothian Council, Sustrans and SEStran.

An Emerging Options Public Exhibition was held locally on 6 and 7 December 2016 to inform the public of the various options being considered at this stage. This exhibition gave the local community and other interested parties a chance to consider the options and discuss any issues they may have with representatives from Transport Scotland and AECOM. 167 people were recorded as attending and 38 feedback responses were received.

In addition to the public exhibition a presentation was given to the Federation of Midlothian Community Councils on 18 January 2017. The presentation was followed with a short question and answer session to discuss and obtain feedback on the emerging options.

A two-part Wider Stakeholder Workshop was held in August and October 2017 to discuss stakeholder aspirations and concerns for the NMU facilities proposed as part of the junction improvement scheme. Design Objectives, Opportunities and Methodology were discussed and agreed, and several NMU options were assessed accordingly.

A series of meetings with local authorities (City of Edinburgh Council, Midlothian Council and East Lothian Council) were held in November and December 2017 to discuss the proposals in relation to the existing, proposed and aspirational Active Travel provision in the area. A cross-boundary workshop, facilitated by Sustrans, was also held in January 2018 to discuss the current active travel schemes proposed or under development within the City of Edinburgh Council and Midlothian Council boundaries. The workshop was also attended by representatives from Sustran, University of Edinburgh and Edinburgh & Lothians Greenspace Trust.

Table 2.9 below summarises the stakeholder responses from the consultation exercises.

Table 2.9 - Summary of Stakeholder Response to Consultation

Consultee	Summary of Responses
Scottish Natural Heritage (SNH)	<p>Dated 19/02/2015</p> <ul style="list-style-type: none"> • In its 2015 Stage 2 consultation response, SNH noted that users will “benefit from all junction options” and welcomes the commitment to improve active travel provision across the A720. SNH recommended that the Stage 2 Report highlight whether there are any differences in active travel outcomes between the options that are being taken forward, or, whether they will all result in the same level of provision. • SNH also noted that a Core Path crosses Sheriffhall roundabout from the A7 in the north onwards to the A6106 in the south and recommended consideration of maintaining access along this Core Path during the Scheme construction. If not, the Stage 2 report should explore the provision of an alternate, temporary, active travel route. <p>Dated 08/12/2016</p> <ul style="list-style-type: none"> • In its 2016 Stage 2 consultation response, SNH repeated its desire to see how the scheme would accommodate active travel and users. <p>Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017</p> <ul style="list-style-type: none"> • SNH noted this was a rapidly urbanising part of the city region. All allocated or under construction sites should be mapped, as new development in the study area will change the types of journeys people seek to make by active travel, • SNH also advised an active travel route over Borders Railway should be included as it would help deliver a key crossing on the planned city orbital route, as set out in the SESplan. It would also avoid the railway acting as a barrier to direct active travel connections.
VisitScotland	<p>Dated 18/02/2015</p> <p>The national tourism body is pleased that the following is being considered as part of the scheme objectives:</p> <ul style="list-style-type: none"> • Facilitating integration for different modes of transport along and across the A720 corridor between Gilmerton Junction and Dalkeith Northern Bypass. • In terms of access to Edinburgh from the A720 and to East and Midlothian from Edinburgh/A720, VisitScotland suggests that clear directional signage is a key component and some consideration should be given if there is opportunity for tourism signage that does not distract from the main directional signage and traffic regulation signage.
SEStran	<p>Dated 03/03/2015</p> <p>SEStran highlighted several issues for consideration:</p> <ul style="list-style-type: none"> • The potential for bus priority through the upgraded Sheriffhall junction to encourage residents in Midlothian and beyond to use public transport when travelling to and from Edinburgh. There is also the need to consider the bus and car linkages to the Orbital Bus proposals. • Improving the efficiency of bus linked to park and ride and cycle links across the bypass will help to reduce the impact of increased ease of access by car to and from Edinburgh. • SEStran is carrying out a study looking at missing links in the strategic cycle network especially cross-boundary links. Initial findings are that there is a missing link in this area across the A720 bypass. • SEStran state that “Option 6 or 6a seems to provide the best solution”, (now Option B) but that the ability to accommodate priority bus lanes and segregated cycle links is of prime

Consultee Summary of Responses

importance.

Discussion during Stage 2 Wider Stakeholder Workshop 25/10/2016

- Agreed that the existing A720 / Sheriffhall roundabout acts as a barrier for cyclists. Ideally a bridge should be provided for cyclists, i.e the bridge at the M9 at Gogar.
- Enquired whether an underpass or overbridge was preferable for grade separated crossings. Workshop discussion concluded that an underpass is ok if it is wide enough, well-lit and on the desire line if possible.
- Noted that bus patronage is declining therefore would support anything that can be done as part of Sheriffhall improvements to improve bus travel.

Buccleuch Estate

Dated 17/03/2015

- As a response on behalf of Dalkeith Country Park which is in Buccleuch Estates ownership, the proposed A720 Sheriffhall roundabout works are viewed as "a positive development to the roads network and in enhancing the accessibility to the Park".
- Buccleuch Estates stated preference in terms of the tabled options for Option 6A (now Option B).

Lothian Buses

Dated 27/01/2017

- Lothian Buses support the proposal to create a grade separated junction at Sheriffhall as it should improve journey time for its services that use the A7(N)-A6106(S) corridor.
- An objective for this scheme should be to encourage modal shift from car by improving the attractiveness of public transport and other non-car modes.

British Horse Society (BHS)

Dated 10/02/2015

- In its 2015 consultation response, the BHS welcomed the scheme and expressed desire for segregated multi-use access tracks for users.

Dated 29/11/2016

- In its 2016 consultation response, the BHS repeated its desire for off-road, multi-use provision to be included in the scheme considerations.

Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017

- BHS asked all horse riding facilities within the 5km study area be identified and included in the relevant plans.

Scottish Rights of Way and Accesses Society (Scotways)

Dated 08/12/2016

- Scotways is concerned that access to the Right of Way (RoW) (LM97) is maintained during both the construction and operation of the chosen revised option (following Stage 3 assessment). Scotways provided a "marked-up" map highlighting LM97. This RoW is also a Midlothian Council Core Path (section 4-8) and runs north-east from the A7 (north) between Campend and the Sheriffhall Park & Ride site.
- Scotways also wishes to see how the Sheriffhall Roundabout Improvement Scheme will improve walking, cycling and horse-riding access between the Edinburgh and its hinterland beyond the A720 City Bypass (and vice versa).

Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017

- Scotways remarked that Midlothian is primarily a suburb and people generally commute from Midlothian to work elsewhere. NMU provision should be included in the design for Sheriffhall Roundabout so people can commute via active travel means (modal shift).

Discussion during Stage 3 Wider Stakeholder Workshop, Part 2, 11/10/2017

- Scotways stressed the importance of adequate signage to avoid NMU clashes/collisions.
- Scotways also voiced concerns about emergency services access to the NMU routes.

Sustrans

Dated 27/01/2017

- In terms of the Hierarchy of Measures, Sustrans Scotland agree that off-carriageway facilities need to be provided for walking, cycling and other non-motorised users as part of the redesign, given the speed and volume of traffic at the A720 Sheriffhall Roundabout.
- Sustrans Scotland feel demand for walking and cycling is suppressed by current conditions at the Sheriffhall Roundabout and that it is important that new paths are included across and around the junction linking all the roads leading to/from it (with the exception of the A720, on which cycling and walking are prohibited). This will enable people to make local journeys across the junction on foot and by bike, reducing the severance caused by the A720. Sustrans Scotland also state that there are many potential active travel journeys which require a safe crossing of the A720 Sheriffhall Roundabout.
- Sustrans Scotland have assessed the 3 options presented (A, B and C) against the five Core Design Principles in Cycling by Design (Safety, Coherence, Directness, Comfort and Attractiveness) and conclude that Option C is the best for active travel (walking, cycling and non-motorised users). This is primarily because it is the most direct in terms of both distance

Consultee Summary of Responses

and time and also likely to be the safest option for users. Option C is also likely to be the most attractive for users - albeit steps must be taken to make sure that user's feelings of personal security are maximised.

- Although Sustrans Scotland consider Option C to be the best outline design, a number of proposals are made which Sustrans Scotland believe should be included in the detailed design to create the best facilities for walking and cycling.
- Sustrans Scotland are keen to discuss the designs of active travel infrastructure in the Sheriffhall project with AECOM and Transport Scotland, as it progresses towards construction.

Discussion during Stage 2 Wider Stakeholder Workshop 25/10/2016

- Sustrans did not favour cycle routes across roads and had rejected a proposed cycle route in Midlothian for that reason.

Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017

- Recommended that economic objectives be included within NMU provision objectives (e.g. using HEAT).

Midlothian Council
(MLC)

Dated 13/03/2015

Welcome the improvement works and have provided detailed general and option specific comments for consideration. Key general points relating to users and transport integration outlined below:

- Response mentions Tram Line 3 extension to Dalkeith from SESplan Action Programme.
- Suggest segregated cycle lanes, over/under passes and continental style roundabouts (TRL) for users.

Discussion during Stage 2 Wider Stakeholder Workshop 25/10/2016

- Reference made to Cycling Action Plan for Scotland targets (10% of all journeys by bike in 2020). With target in mind, Sheriffhall junction improvements should include a bridge for users and offline cycle routes.
- Advised that the proposed MLC LDP includes improvements to the A7 South which will include cyclist provisions.
- Noted that they would like to protect and encourage use of the existing Sheriffhall Park and Ride. Current capacity is 560 spaces, with current usage about 300-400 spaces daily, with a lunchtime peak, and a lot of hospital use.
- Also noted that bus schedule currently allow time for delays travelling through Sheriffhall. Advised that one bus service is routed through Gilmerton to avoid congestion at Sheriffhall. Believes some services might revert back to going through Sheriffhall should grade separation be provided and delays reduced / removed.

Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017

- MLC commented on the sparse use of cycle racks at Sheriffhall Park & Ride. Instead of cycling through Sheriffhall Roundabout people have been driving to Sheriffhall Park & Ride and cycling from there on to Edinburgh.
- MLC stated that conditions in ten years' time should be taken into account, and not just existing conditions, as the proposed new development (e.g. the A7 urbanisation) will affect these conditions and desire lines.
- Reference made to Midlothian's Active Travel Strategy, which was under development and included more minor (community) links for the area. MLC also advised Loanhead to Straiton route had gone out to tender and Shawfair to Gilmerton route was under construction.
- MLC also advised on plans for a segregated route on both sides of the A7 from south up to Gilmerton Road roundabout.
- MLC stated controlled crossings should be avoided as excessive time can be spent waiting at these. Would people use the facility? Would people wait?

Discussion during Stage 3 Wider Stakeholder Workshop, Part 2, 11/10/2017

- MLC noted that proposed A7 South active travel improvements include at-grade crossings, bus stops and reduced speed limits. Crossings could be utilised to enable an NMU link to be provided on only one side of A7 south carriageway on approach to Sheriffhall junction.

Discussion during Midlothian Council Active Travel Meeting 06/12/2017

- MLC noted that the A720 currently acts as a barrier to Active Travel. The A7 South is seen as the NMU route serving Bonnyrigg, Lasswade and Eskbank. The A6106 South is seen as the NMU route serving Dalkeith.
- MLC would support / promote a reduction in speed limit to 40mph on the A7 South, as part of the urbanisation measures discussed at this meeting and at the Stage 3 Workshops.
- MLC noted that providing an NMU link on the southbound side of A6106 Old Dalkeith road was the priority as would best tie-in with existing facilities.
- MLC Active Travel Strategy proposes an Active Travel link along east side of A7 North carriageway which continues beyond Shawfair Roundabout northwards. Therefore a connection onto the east side would be a requirement.
- Noted that providing NMU facilities in the road corridor would be suitable and would reduce overall land footprint.

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- MLC noted an aspiration to provide Active Travel link along Melville Gate Road to connect existing facilities on B6392 / A772 with existing facilities on A6106 Old Dalkeith Road

Discussion during Active Travel Cross-boundary Workshop 15/01/2018

- MLC noted they are keen to extend the Gilmerton to Shawfair route to connect into Danderhall, and the Greendyke to Wisp into Shawfair. MLC also noted a key future aspiration to provide a connection from the Shawfair cycleway onto the A7 towards Sheriffhall Roundabout.
- MLC stated they have committed to develop NMU link through recycling facility north-east of Shawfair Train Station. This proposal supports wider Sustrans aspiration for a link from Millerhill to QMU with 'cow tunnel' being used to cross A720.
- MLC noted congestion and a high number of cyclists on A720 trunk road travelling to/from 'the Bush'. Hillend priority junction layout presents a significant risk to users. MLC also advised they are preparing design tender for A701 relief road to connect into Straiton Junction, which might require a potential reconfiguration of Straiton Junction.

City of Edinburgh
Council
(CEC)

Discussion during Stage 2 Wider Stakeholder Workshop 25/10/2016

- Noted that the Sheriffhall Park and Ride is not used to full capacity and with the A7 getting busier as result of development, Edinburgh Council would like the Park and Ride to become more attractive. Envisage main cycling commuting journeys as being: Shawfair to Dalkeith (Equivalent commute - Calder / Sighthill / Heriot Watt).
- Noted the difficulties associated with cyclists trying to cross arms of unsignalised roundabouts.
- Poor provision for cyclists at the existing Sheriffhall roundabout and poor integration between cycle routes highlighted. Calder Road, Edinburgh, was cited as example of good cyclist provision. Further examples included Telford Road underpass, underpass at Fountainpark West, Gogar Station interchange, Cameron Toll central island.
- Reference made to Cycling Action Plan for Scotland targets (10% of all journeys by bike in 2020) and noted additional target in Edinburgh for journeys to work (15% by bike in 2020).
- Referred to planned and aspirational development of existing infrastructure. Disused railway line from Lasswade, has plans for extension in 2017/2018 and there is a long term aspiration for a Tram extension, to extend from Edinburgh Royal Infirmary (ERI) along A7 onwards to Dalkeith.

Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017

- Expressed concerns about the number of lanes of traffic which NMUs would have to cross and asked for this to be looked at in further detail.
- Stressed the importance of finding the balance between active travel and public transport, and noted several calls for integration with City Orbital travel route.

Discussion during Stage 3 Wider Stakeholder Workshop, Part 2, 11/10/2017

- CEC advised that consideration should be given to access for maintenance.
- Also advised that subways shouldn't have vertical sides. They should be open structures that create a feeling of open space.

Discussion during City of Edinburgh Council Active Travel Meeting 14/12/2017

- Asked particular importance is given to geometry, with shallow gradients being CEC's preference.
- CEC suggested there could be an opportunity to open up the central reserve of the A720 through Sheriffhall which would allow natural light to the roundabout and NMU route below.
- CEC see A7 North as the main priority, with NMU routes requested on both sides. CEC also stated that they would request that NMU route was extended from Sheriffhall up to Bioquarter.
- The A6106 South is also seen as a priority, with provision on the southbound side. CEC also requested that the existing cycle path northbound on approach to Sheriffhall be retained, as it would allow on-road cyclists to join NMU route through Sheriffhall junction. The A7 South is then also seen as important for NMU provision.
- CEC noted that if 5.0m total cross section width is provided through the subways then this could allow for any future upgrade widening of NMU facilities.

Discussion during Active Travel Cross-boundary Workshop 15/01/2018

- In relation to Gilmerton to Shawfair route, CEC stated they have an aspiration to add ramp onto Gilmerton Road in future.
- CEC also intend to provide new crossings to complete missing sections and ensure Quiet Route 61 Niddrie to Gilmerton is fully compliant with 'Quiet Route' criteria.
- Advised the Greendyke to Wisp route was out to tender.
- CEC also advised the A7 Cycle Corridor was one of their priorities, but also noted its current scope does not include for extension of link to CEC boundary/Sheriffhall Roundabout.

East Lothian
Council

Dated 08/12/2016

- Concerned about perceived lack of provision for users in the proposed scheme options – specifically the lack of a clear, prioritised shared use (walking/cycling) route providing safe access across the A720 into the west of East Lothian. A shared-use route would benefit active

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	<p>travel commuting and recreational walking/cycling.</p> <ul style="list-style-type: none"> Requests that detailed Active Travel proposals be provided in the Sheriffhall scheme proposals e.g. provision of an underpass to take users under the A720, without the need to interact with traffic “would be ideal”. Connectivity with the surrounding path/active travel network should also be explored. <p>Discussion during East Lothian Council / Active Travel meeting 22/11/2017</p> <ul style="list-style-type: none"> Noted that the A720 and A1 currently act as barriers to Active Travel routes. Noted that the QMU / Innocent Path cycleway has been identified as a potential Active Travel highway and highlighted Sustran’s aspiration to adopt the disused railway line from Lasswade as a cycle route. Aspiration would be for this to continue from Shawfair northwards toward Musselburgh and potentially connect into the existing NMU underpass at Newcraighall. Noted a point, already raised at the Stakeholder Workshops held in August and October 2017, that subways are less favoured as open spaces were felt to be more attractive for Active Travel.
Spokes	<p>Feedback following Emerging Options Public Exhibition</p> <ul style="list-style-type: none"> Bypass is a barrier to cyclists. Good cycle facilities are essential at the crossing of the bypass. Proposals are disappointing. Not in favour of long diversions to cross bypass, crossings on slip roads or 180 degree bends on overbridge alignment. <p>Discussion during Stage 3 Wider Stakeholder Workshop, Part 1, 30/08/2017</p> <ul style="list-style-type: none"> Noted that the World Health Organisation’s Health Economic Assessment Tool (HEAT) should also be used to assess economic criteria of options with regards to NMU provision and better health. <p>Discussion during Stage 3 Wider Stakeholder Workshop, Part 2, 11/10/2017</p> <ul style="list-style-type: none"> Queried the value of providing exemplar NMU facilities in isolation (e.g. despite there being no adjacent facilities to tie into).
Members of the Public	<p>Summary of feedback following Emerging Options Public Exhibition</p> <ul style="list-style-type: none"> Sheriffhall/A720 is barrier to active travel Request wide shared pedestrian/cyclist paths through junction Not in favour of uncontrolled at-grade crossings – preference for raised table/toucan crossings where at-grade crossings required. Design Option C generally preferred by pedestrian and cyclist users as it was only option presented that had grade-separated crossing (overbridge) on the primary desire line in the indicative layout.
Federation of Midlothian Community Councils	<p>Q&A following presentation 18/01/2017</p> <ul style="list-style-type: none"> Acknowledged that existing Sheriffhall layout is very poor for cyclists and requested that design options are optimised to provide better cycle facilities.

2.10 Existing Walking, Cycling and Horse-Riding Facilities

The existing walking, cycling and horse-riding facilities are outlined under the relevant sections below. A summary of the existing facilities within the immediate 500m vicinity of the proposed Sheriffhall junction improvements is shown in Figure 2.10.

2.10.1 Path Network

In the immediate 500m vicinity of the proposed Sheriffhall junction improvements, there are off-road sections of paths allowing for users to cross each of the arms of the roundabout; however there is no dedicated walking, cycling and horse-riding user traffic light phase. Users are required to cross the roundabout arms on the traffic signal phasing for vehicles.

There is footway provision along the A7 North, the A6106 Millerhill Road and the A6106 Old Dalkeith Road. There are several designated Core Paths located within the 5km study area. Figure 2.10.1 highlights adopted Core Paths within the Edinburgh City Council, Midlothian Council and East Lothian Council Local Authority Areas for the study area. It also highlights aspirational core paths and other council paths. A number of Midlothian Council “other paths” are contained within the boundaries of Dalkeith Country Park.

2.10.2 Cycle Paths/ Other Shared Routes

There is a network of local cycle routes within the immediate 500m vicinity of the proposed Sheriffhall junction improvements:

- A7 North – on-road cycle lanes on both carriageways with off-road crossing over the Sheriffhall Roundabout (no traffic controlled signals) ;
- A6106 Old Dalkeith Road – shared cycleway/footway on east side of the A6106 between Sheriffhall Roundabout and Melville Gate Road. There is also a short shared cyclepath/footpath on the west side of the A6106 linking to the south side of the Sheriffhall Roundabout; and
- A772 Gilmerton Road – shared cycleway/footway on north side of the A772 from the A7 South across the Gilmerton Junction with off-road access across the A720 Gilmerton Junction over-bridge.

Although there is no dedicated provision, both the A7 South and the A6106 Millerhill Road provide additional on-road cycling opportunities.

Cyclist access to the Sheriffhall section of the off-road Dalkeith to Penicuik Walkway, north of the Melville Gate Road, has been permanently severed since February 2013 when the route was reclaimed as part of the Borders Railway line corridor alignment.

National Cycle Network (NCN) routes 1, 76 and 196 are located within the 5km study area.

NCN 1 is a long distance, east coast, cycle route connecting Dover and the Shetland Islands. The route passes through Eskbank and Dalkeith to the south of Sheriffhall before crossing the A1 to the south of Old Craighall Junction and continuing north.

NCN 76 runs from Berwick-upon-Tweed to Edinburgh, Stirling and Kirkcaldy. The route is located on the eastern side of the A1 and at the outer extent of the study area.

NCN 196 runs between Haddington and Penicuik. The route shares its alignment with NCN 1 as it passes through Lasswade and Dalkeith before crossing the A68 and heading east towards Haddington.

Figure 2.10.2 shows the cycle paths and other shared routes located within the 5km study area.

2.10.3 Equestrian Routes

The Tyne Esk Equestrian Trails pass through the 5km study area, approximately 4.3km southwest of Sheriffhall Roundabout. There are no dedicated equestrian trails or centres within the immediate 500m vicinity of the proposed Sheriffhall junction improvements.

The closest riding centre is the Drum Riding for the Disabled Centre based at the Drum Estate, Gilmerton. The Centre is located less than 1.9km north-west of the Sheriffhall Roundabout but is accessed from the A772 Gilmerton Road (on the north side of the A720). The Centre provides riding therapy for over 250 riders from schools and adult learning centres across Edinburgh and the Lothians.

The Edinburgh and Lasswade Riding Centre is located approximately 3.3km south west of Sheriffhall and offers indoor and outdoor riding facilities. Outdoor riding activities from the centre generally follow old railway line, tracks and forest paths with occasional organised activities in Dalkeith Country Park.

The Edinburgh Equestrian Centre is based at Home Farm north-east of Dalkeith. Although the Centre is located approximately 4.9km east of the Sheriffhall Roundabout it manages horse riding activities in Dalkeith Country Park and part of its advertised 'Round Estate' riding trail fall within the 500m of the Sheriffhall junction improvements.

Figure 2.10.3 shows the equestrian facilities located within the 5km study area.

2.11 Site Visits

In addition to desk study work, the design team has undertaken several site visits during the design process, including on 10th May 2018, 20 Feb 2019 and 10th June 2019, to gain an understanding of the operating conditions and user needs. Background information has been collected as part of the WCHAR process and it is

considered that further site visits in Spring / Summer, when conditions are likely to encourage higher levels of active travel, will be appropriate to support this WCHAR Assessment and enable the collection of valuable data.

3. Design Objectives & Opportunities

3.1 Introduction

A central aim to the Walking, Cycling and Horse-Riding Assessment is the identification of opportunities for improvement for users.

In line with the overriding scheme objectives, targeted improvements are being considered at Sheriffhall Roundabout that address a number of existing issues affecting all users of the junction under its current layout.

Although identification of opportunities for improvement with regards to the walking, cycling and horse-riding facilities will not be restricted to the design scheme extents, bridging all recognised gaps within the wider 5km study area is out-with the scope of this specific study.

Consideration has been given to accident data, trip generators, local amenities and the existing user facilities within the 5km study area. Consultation feedback and local and national policies and strategies have also been reviewed to inform the conception of design opportunities for the implementation of walking, cycling and horse-riding facilities in the vicinity of Sheriffhall which can benefit the wider area and address user needs.

3.2 Design Objectives

The following Scheme Objectives have been set to address the main issues encountered at Sheriffhall Roundabout and have been used in the assessment to help determine the performance of the preliminary options.

- Improve the movement of traffic on the A720 between Gilmerton and Old Craighall by providing grade-separation of the A720 at the existing Sheriffhall Roundabout;
- Reduce the conflict between strategic and local traffic;
- Minimise traffic impact of local proposed developments in Midlothian, East Lothian and City of Edinburgh on the A720 between Gilmerton Junction and Old Craighall Junction and approach roads;
- Improve road safety for all users on the A720 and approach roads between Gilmerton Junction and Dalkeith Northern Bypass;
- Minimise intrusion of the new works on the natural environment, cultural heritage and people whilst enhancing the local environment where opportunities arise;
- Facilitate integration for different modes of transport along and across the A720 corridor between Gilmerton Junction and the Dalkeith Northern Bypass; and
- Reduce severance by improving accessibility across the A720 for all users.

From these objectives, the following relate to users and remain relevant in the context of this report:

- Improve road safety for all users on the A720 and approach roads;
- Minimise intrusion of the new works on people;
- Facilitate integration for different modes of transport; and
- Reduce severance by improving accessibility across the A720 for all users.

3.3 Design Constraints

The following key constraints have been identified:

- The existing road network;
- The Borders Railway;

- Ground conditions including historical mine workings and geological fault;
- Listed Buildings – Summerside (Cat B), 4. no at Old Sheriffhall Farm House (Cat B), Campend (Cat C), Dalkeith Park – Kings Gate, Walls and Lodge (Cat A);
- Accesses to residential properties, businesses and fields;
- Overhead and underground services;
- The Dean Burn;
- Flood Risk (Surface water and Dean Burn);
- Large areas of ancient woodland;
- Conservation Areas – Dalkeith House & Country Park
- The proposed grade separation of A720 and local roads at Sheriffhall, and
- Planned residential and business development.

3.4 Existing Problems

The following existing problems have been identified through consultation with key stakeholders and members of the public:

- The A720 Edinburgh Bypass acts as a barrier and severs the surrounding areas;
- The at-grade Sheriffhall Roundabout acts as a deterrent to walking, cycling and horse-riding users due to the speed and volume of traffic and the lack of dedicated crossing facilities;
- The A7 North has poorly integrated cycling facilities. On road cycle lanes terminate close to Sheriffhall Roundabout with no option to transition onto segregated route for continuation of journey;
- The A7 South has no walking, cycling or horse-riding facilities;
- A6106 Millerhill Road has no dedicated cycling or horse-riding crossing facilities, and
- There are no dedicated cycling facilities connecting the shared cycleway/footway on the A772 Gilmerton Road to the shared cycleway/footway on the A6106 Old Dalkeith Road.

3.5 Design Opportunities

The opportunities highlighted below are considered to be relevant to the scheme and should be evaluated by the wider design team, with further stakeholder input, in the progression of the scheme design.

Opportunity 1: Provide facilities which are attractive to users to encourage wider active travel and support modal shift.

Opportunity 2: Act as exemplar for integration of all modes in holistic solution developed in collaboration with stakeholders.

Opportunity 3: Ensure proposals take account of future developments and other active travel initiatives in the study area such as Edinburgh Orbital and A7 Urbanisation.

Opportunity 4: Segregate non-motorised users from motorised users to limit interaction with live traffic.

Opportunity 5: Improve user facilities at Sheriffhall Roundabout to provide safe passage across the trunk road. Direct /dedicated connections on the desire line which are conducive to personal safety and well integrated with the wider network should be targeted.

Opportunity 6: Improve user facilities along the A7 North to better facilitate integration with Sheriffhall Park & Ride.

Opportunity 7: Improve user facilities along the A6106 Old Dalkeith Road to provide better linkage to Dalkeith.

- Opportunity 8:** Provide user facilities along the A7 South to improve access to local amenities / A772 Gilmerton road corridor.
- Opportunity 9:** Provide user facilities north of Sheriffhall Roundabout to enable connection with the proposed development areas.
- Opportunity 10:** Provide controlled crossings, where appropriate, to integrate walking, cycling and horse-riding routes and local amenities.
- Opportunity 11:** Explore opportunities for future integration and developing links with horse-riding facilities in the study area

4. Assessment Team Statement

As Lead Assessor, I confirm that this Walking, Cycling & Horse-Riding Assessment Report has been compiled in accordance with DMRB HD 42/17 and thus contains the appropriate information for the wider design team. The Walking, Cycling & Horse-Riding Assessment was undertaken by the following Assessment and Review Team:

Walking, Cycling & Horse-Riding Lead Assessor

Jill Irving BEng (Hons) CEng MICE
Principal Engineer
AECOM

Signed:



Date: 28/03/2018

Walking, Cycling & Horse-Riding Assessor

Peter Leslie MSc MCIHT
Principal Engineer
AECOM

Signed:



Date: 28/03/2018

As design team leader I confirm that the assessment has been undertaken at the appropriate stage of scheme development and that the wider design team has been involved in the process.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the expected competencies contained in HD 42/17.

Design Team Leader

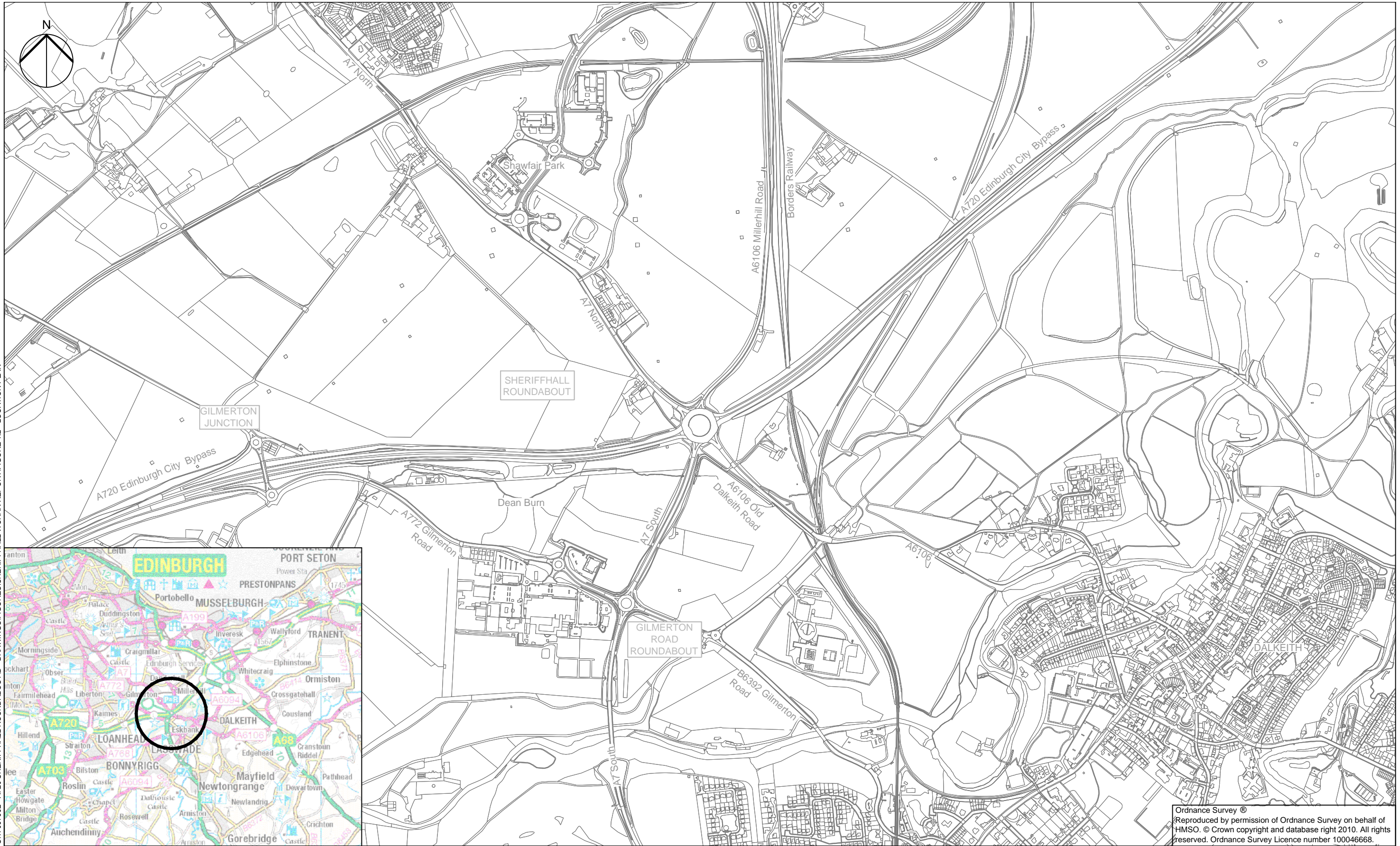
Steven Smith MEng GMICE
Senior Assistant Engineer
AECOM

Signed:




Date: 28/03/2018

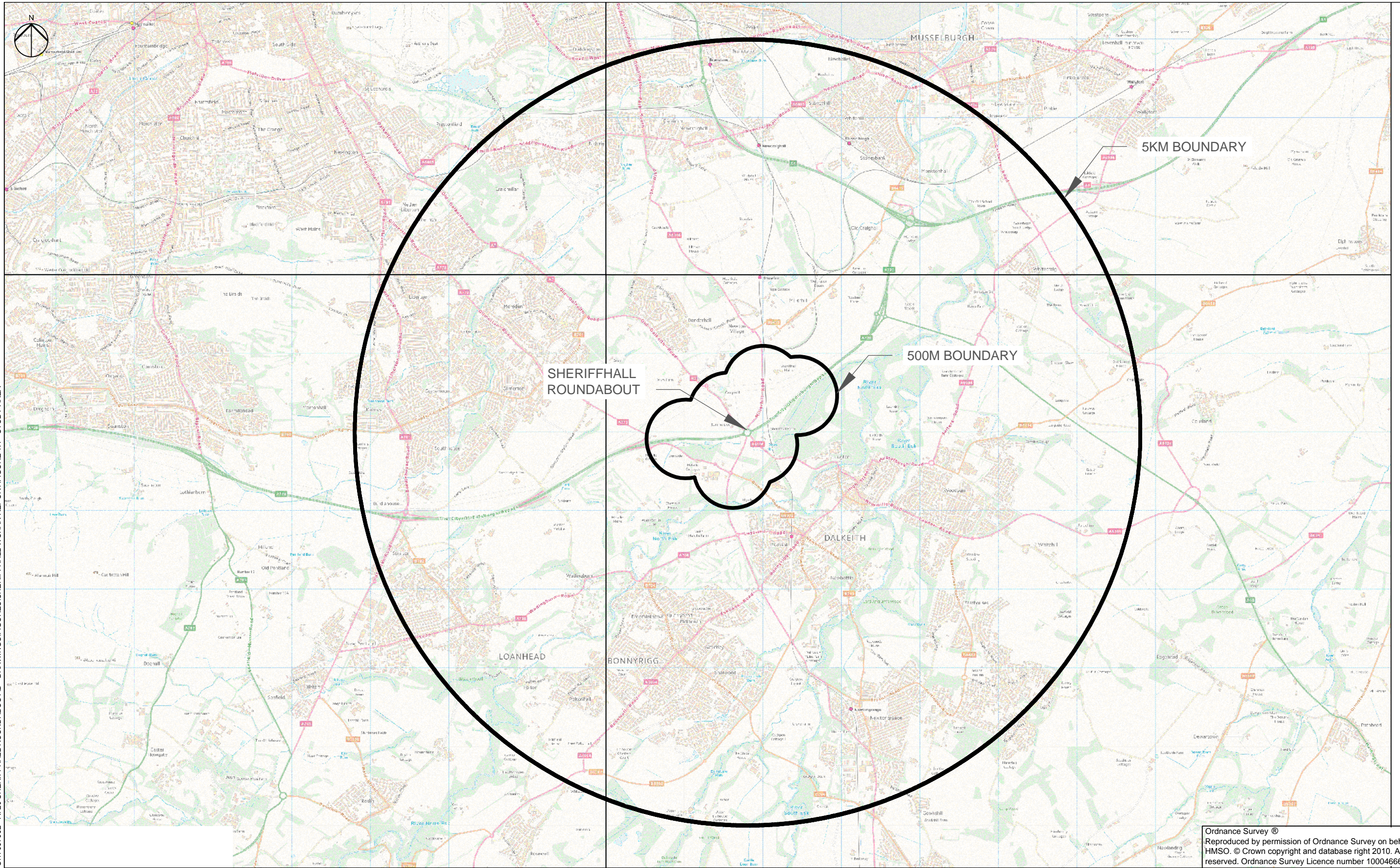
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File Name : J:\M02 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 1.2 - LOCATION PLAN





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Client 		Designed AF		Drawn MK		Checked SS		Approved JI	
		Date 25/07/2017		AECOM Internal Project No. 60470009		Suitability		Drawing Number FIGURE 1.2	
		Scale @ A3 NTS		Zone / Mileage		Rev -			

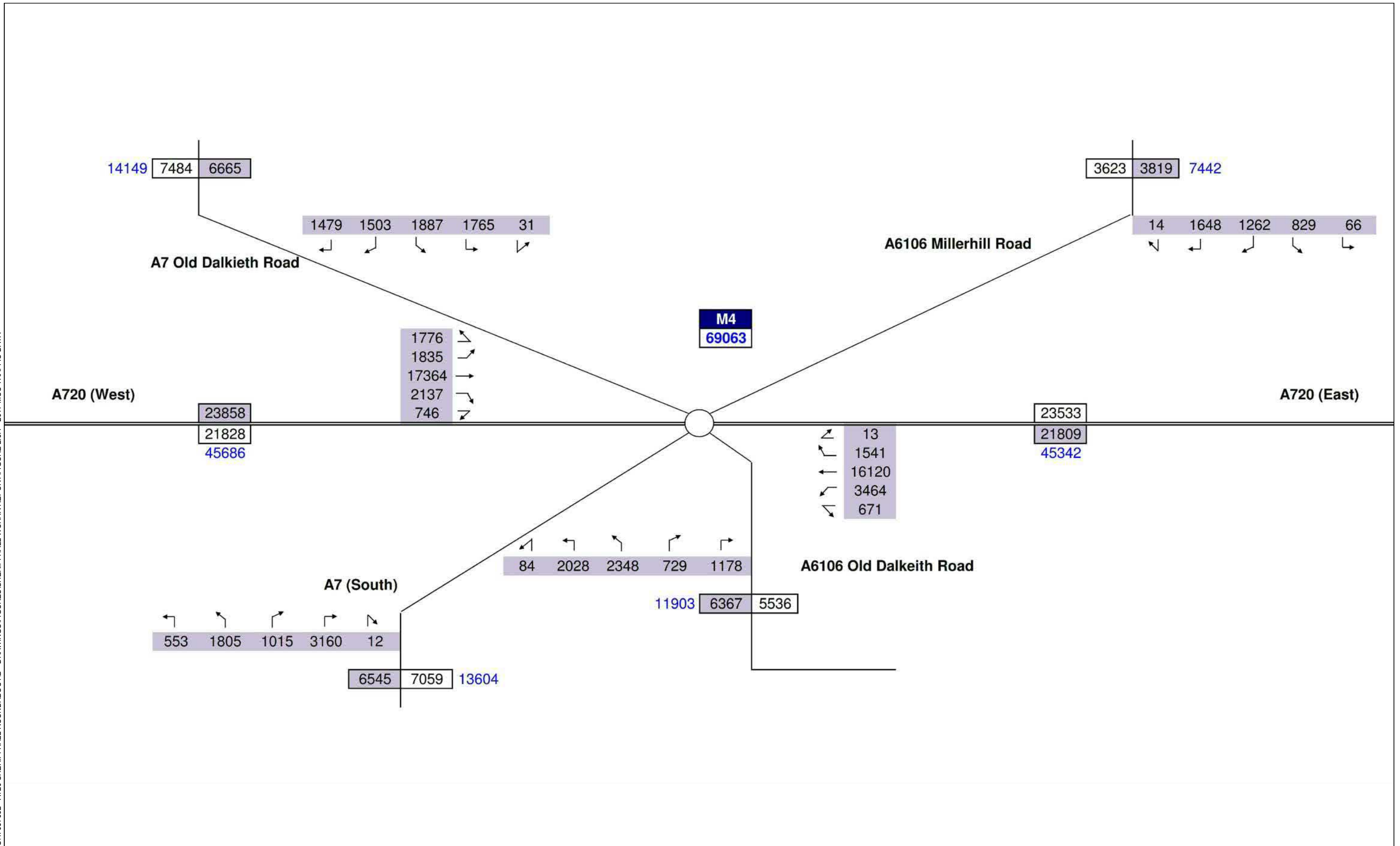
Plot Date : 17 August 2017 16:05:04
File Name : J:\M012 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 1.4 - STUDY AREA




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<p>Project Title</p> <p>A720 SHERIFFHALL ROUNDABOUT</p>	<p>Drawing Title</p> <p>WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT STUDY AREA</p>	<p>Purpose of issue</p> <p>FOR INFORMATION</p> <table border="1"> <tr> <td>Designed RN</td> <td>Drawn RN</td> <td>Checked SS</td> <td>Approved JI</td> <td>Date 10/08/17</td> </tr> <tr> <td colspan="2">AECOM Internal Project No. 60470009</td> <td colspan="3">Suitability</td> </tr> <tr> <td colspan="2">Scale @ A3 NTS</td> <td colspan="3">Zone / Mileage</td> </tr> </table>	Designed RN	Drawn RN	Checked SS	Approved JI	Date 10/08/17	AECOM Internal Project No. 60470009		Suitability			Scale @ A3 NTS		Zone / Mileage			<p>THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM' EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.</p>	<p>AECOM Infrastructure & Environment UK Limited Citypoint 2 25 Tyndrum St. Glasgow, G4 0JY, United Kingdom Tel:+44 (0)141-354-5600</p>
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AECOM Internal Project No. 60470009		Suitability																	
Scale @ A3 NTS		Zone / Mileage																	
<p>Client</p> 			<p>Drawing Number</p> <p>FIGURE 1.4</p>	<p>Rev</p> <p>-</p>  <p>www.aecom.com</p>															

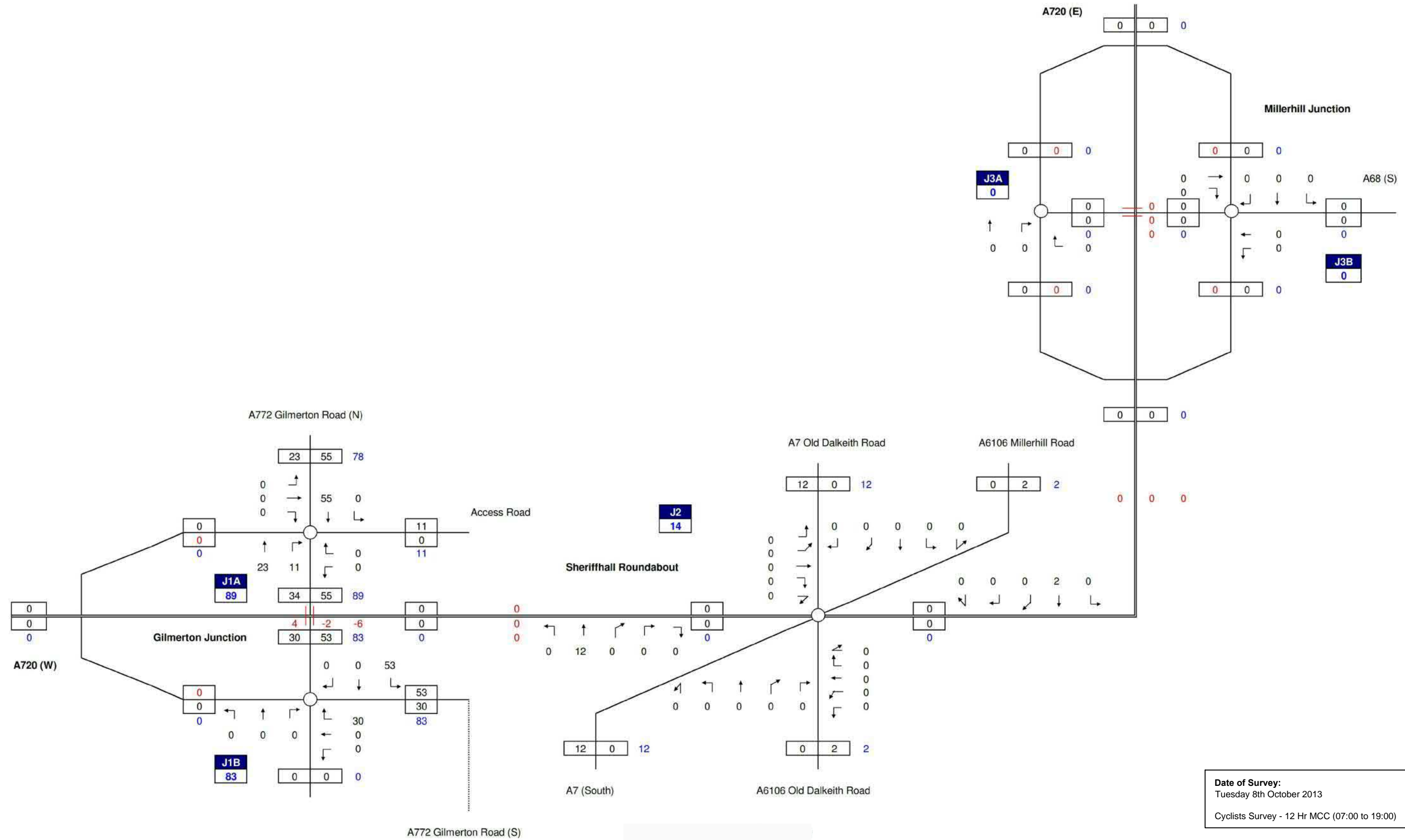
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Client 		AECOM Internal Project No. 60470009		Suitability				
		Scale @ A3 NTS		Zone / Mileage				



Plot Date : 05 June 2018 11:10:24
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Date of Survey:
 Tuesday 8th October 2013
 Cyclists Survey - 12 Hr MCC (07:00 to 19:00)

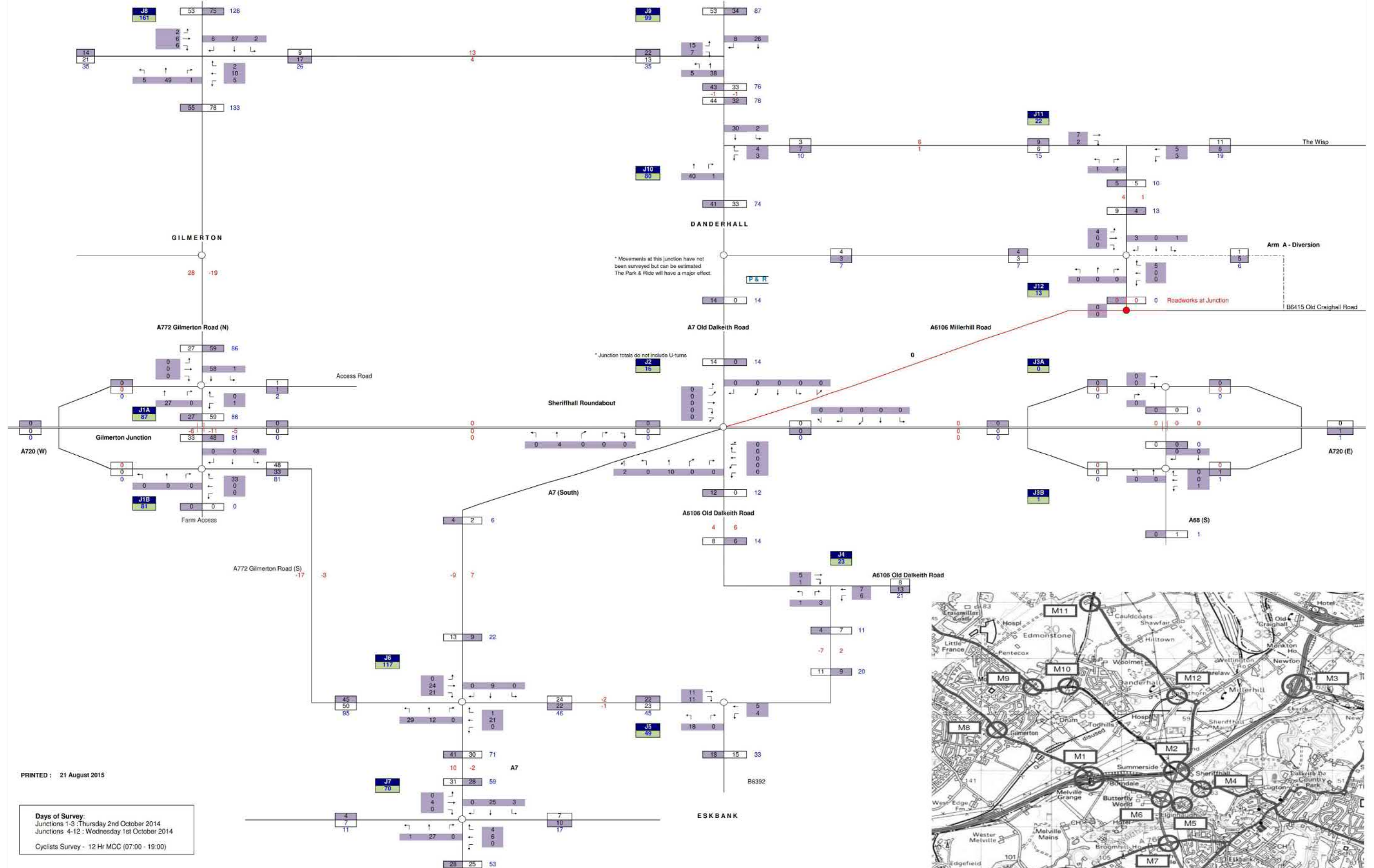
Project Title	A720 SHERIFFHALL ROUNDABOUT
Client	

Drawing Title	WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT 2013 MANUAL CLASSIFIED COUNTS CYCLIST DATA
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Purpose of issue				
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Drawing Number	Rev
Figure 2.4.1	-

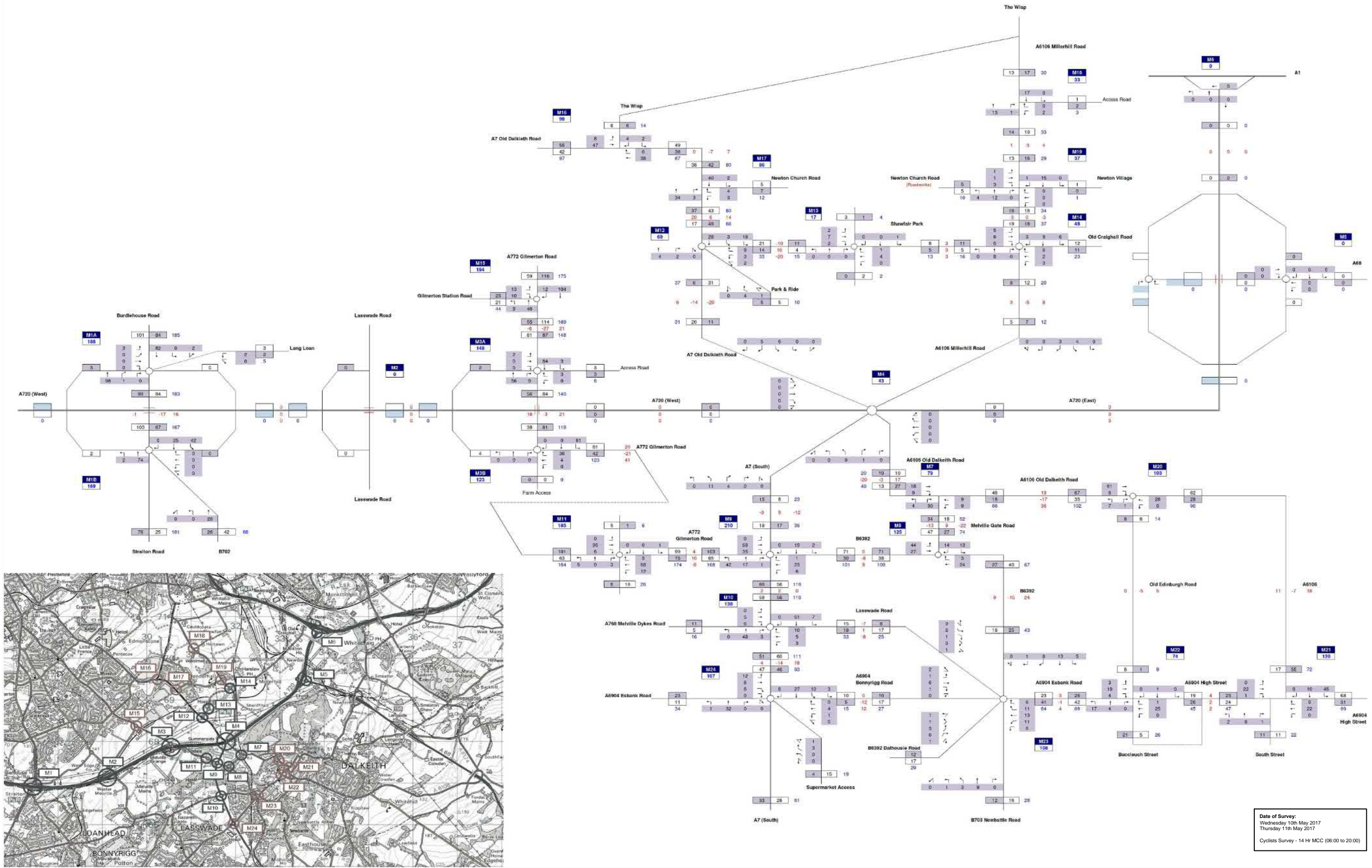
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PRINTED : 21 August 2015

Days of Survey:
 Junctions 1-3: Thursday 2nd October 2014
 Junctions 4-12: Wednesday 1st October 2014
 Cyclists Survey - 12 Hr MCC (07:00 - 19:00)

Project Title A720 SHERIFFHALL ROUNDABOUT		Drawing Title WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT		Purpose of issue FOR INFORMATION		THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.		AECOM Infrastructure & Environment UK Limited	
Client 		2014 MANUAL CLASSIFIED COUNTS CYCLIST DATA		Designed AS Drawn RN Checked SS Approved JI Date 10/08/17				Citypoint 2 25 Tyndrum St. Glasgow, G4 0JY, United Kingdom Tel: +44 (0)141-354-5600 www.aecom.com	
				AECOM Internal Project No. 60470009		Suitability		Drawing Number FIGURE 2.4.2	
				Scale @ A3 NTS		Zone / Mileage		Rev -	



Project Title	A720 SHERIFFHALL ROUNDABOUT
Client	

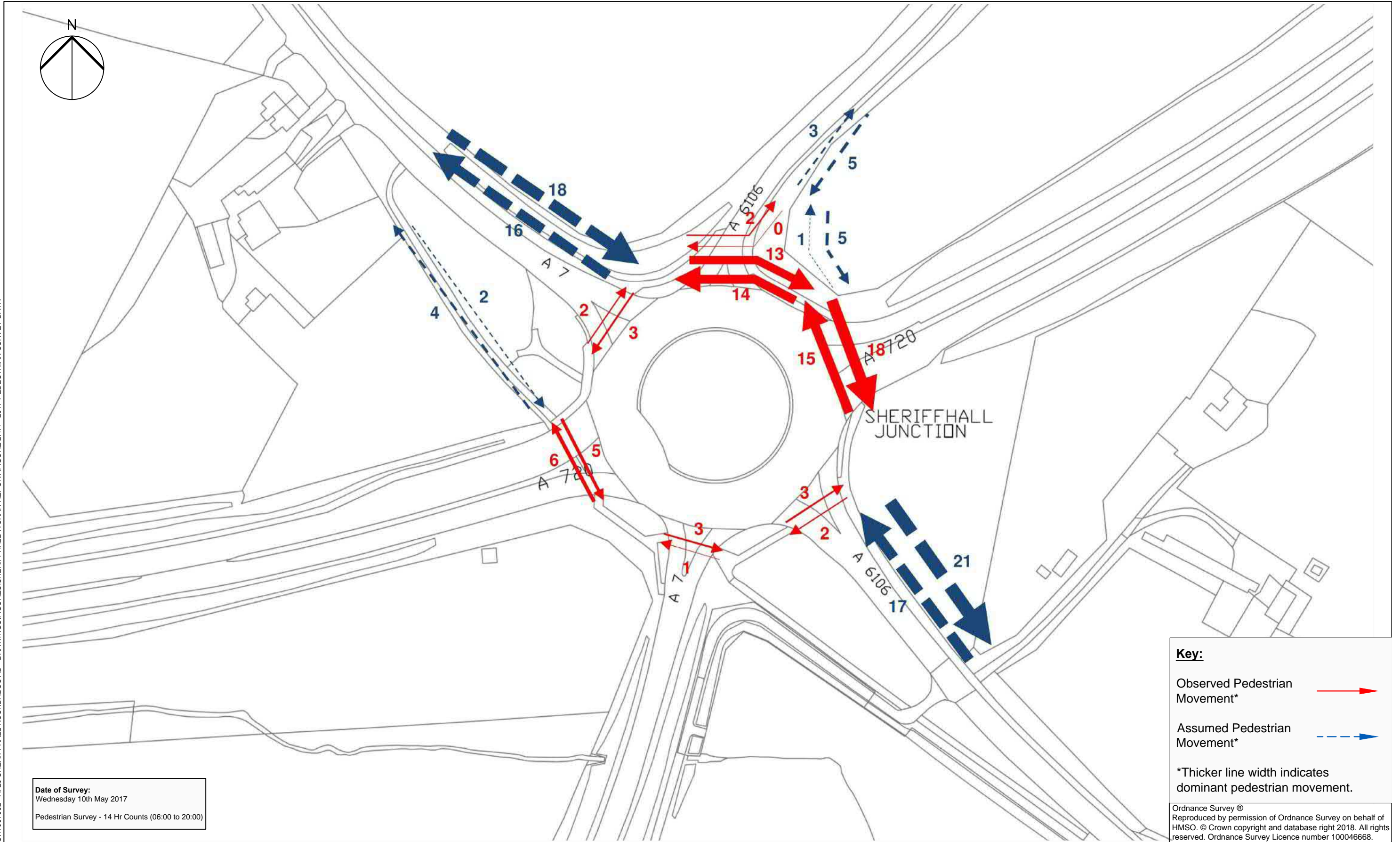
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Purpose of issue	FOR INFORMATION				
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FIGURE 2.4.3	-

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Date of Survey:
Wednesday 10th May 2017
Pedestrian Survey - 14 Hr Counts (06:00 to 20:00)

Project Title	A720 SHERIFFHALL ROUNDABOUT
Client	

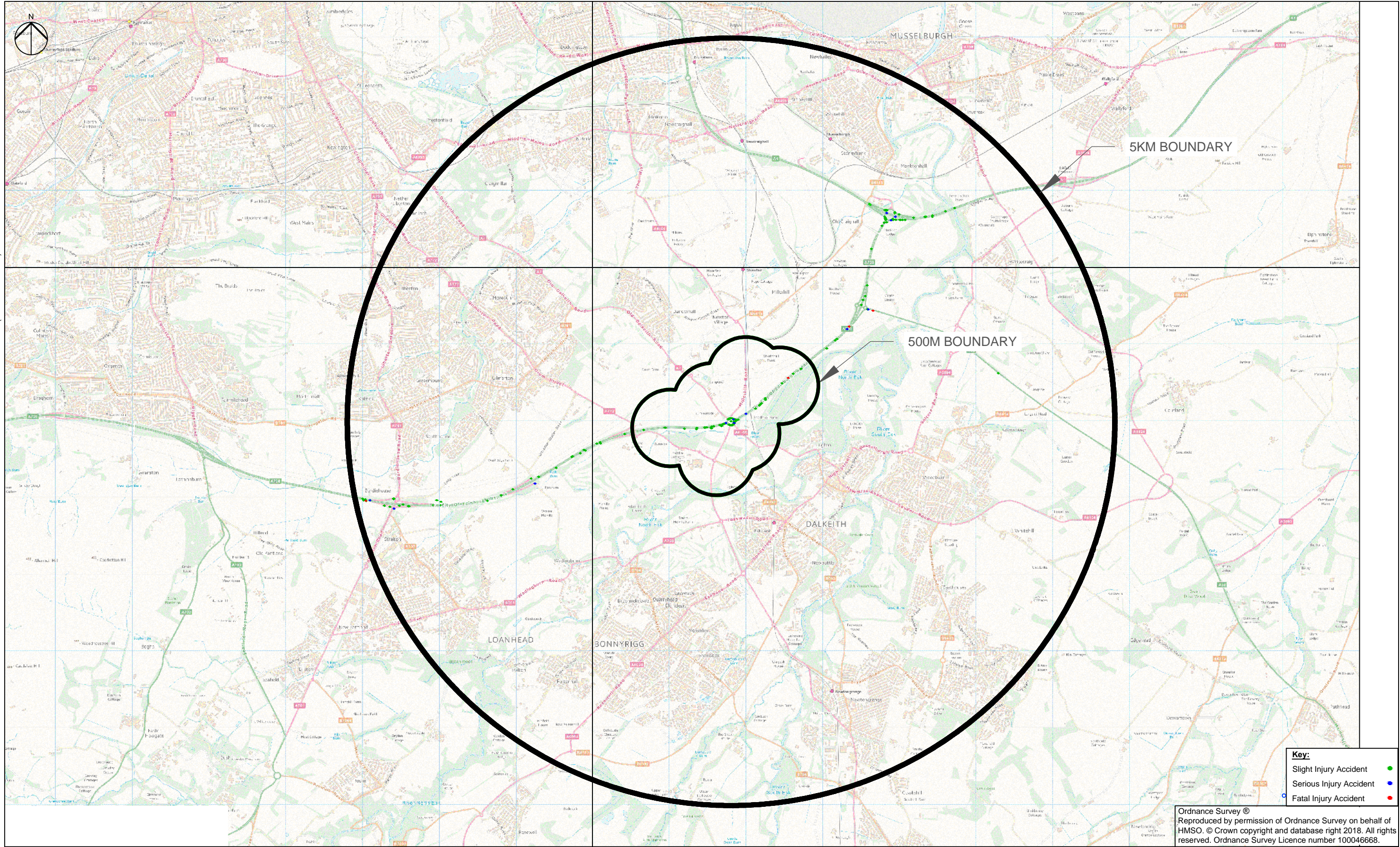
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Purpose of issue FOR INFORMATION				
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Plot Date : 04 June 2018 17:27:44
 File Name : J:\M02 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.5.1 - ACCIDENT PLOT 2012-2016 (5KM STUDY AREA)



Key:
 Slight Injury Accident ●
 Serious Injury Accident ●
 Fatal Injury Accident ●

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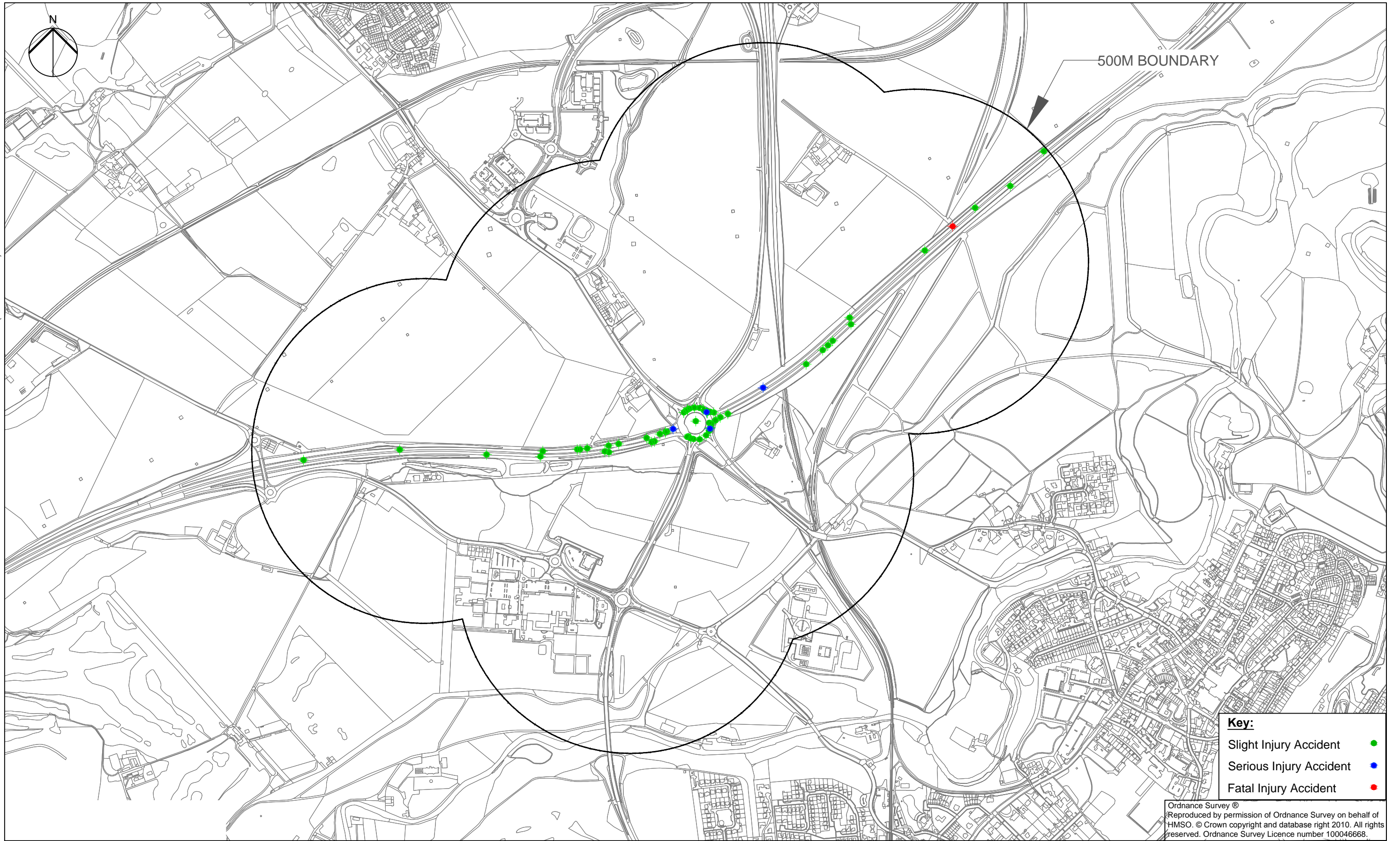
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Purpose of issue	FOR INFORMATION				
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AECOM Internal Project No. 60470009		Suitability			
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FIGURE 2.5.1	-

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 File Name : J:\M02 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.5.2 - ACCIDENT PLOT 2012-2016 (500M BOUNDARY)



Key:

Slight Injury Accident	●
Serious Injury Accident	●
Fatal Injury Accident	●

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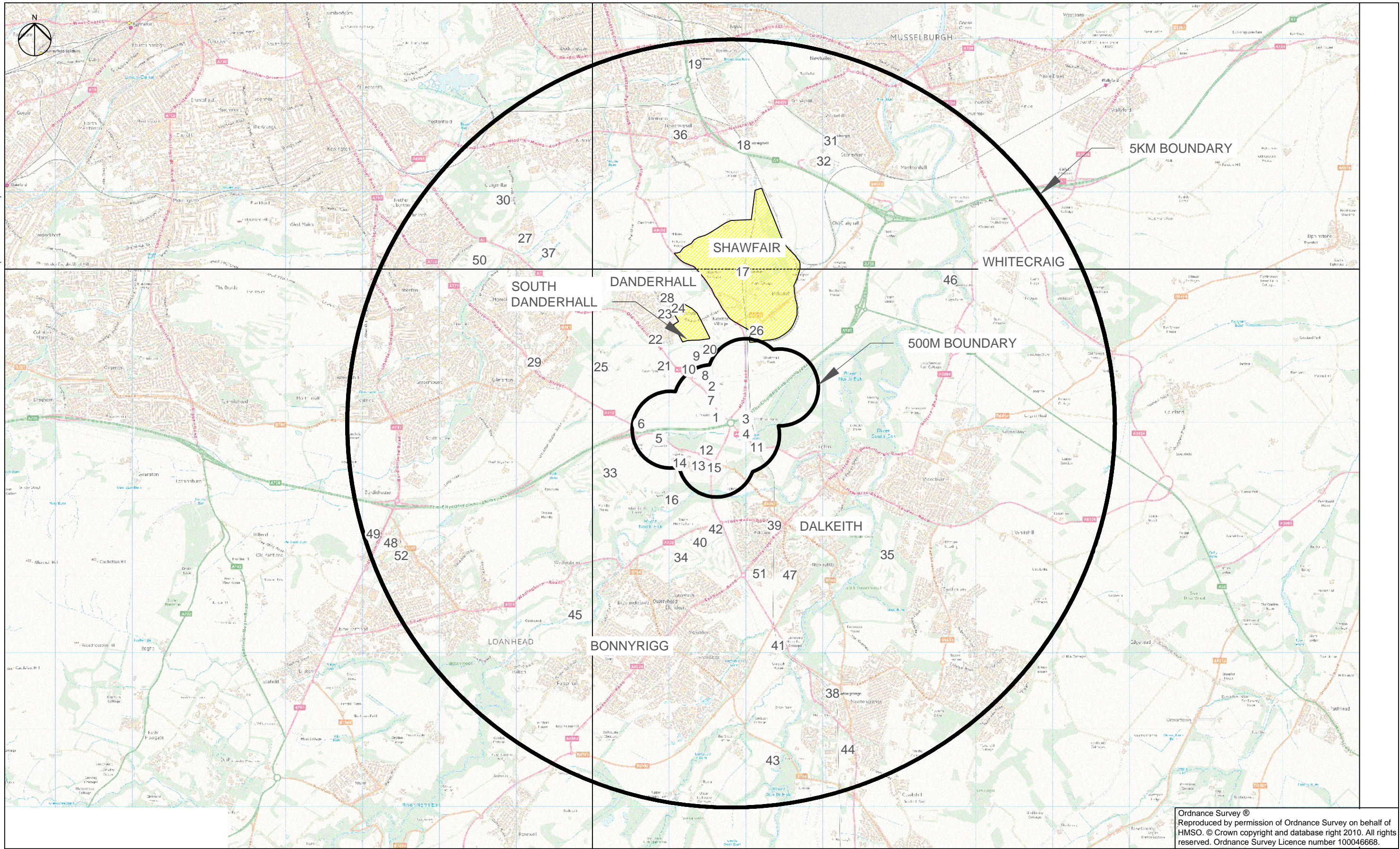
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Purpose of issue				
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FIGURE 2.5.2	-

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File Name : J:\M02 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.6.1 - TRIP GENERATORS AND LOCAL AMENITIES (5KM STUDY AREA)



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Drawing Title	WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT TRIP GENERATORS & LOCAL AMENITIES (5KM STUDY AREA)
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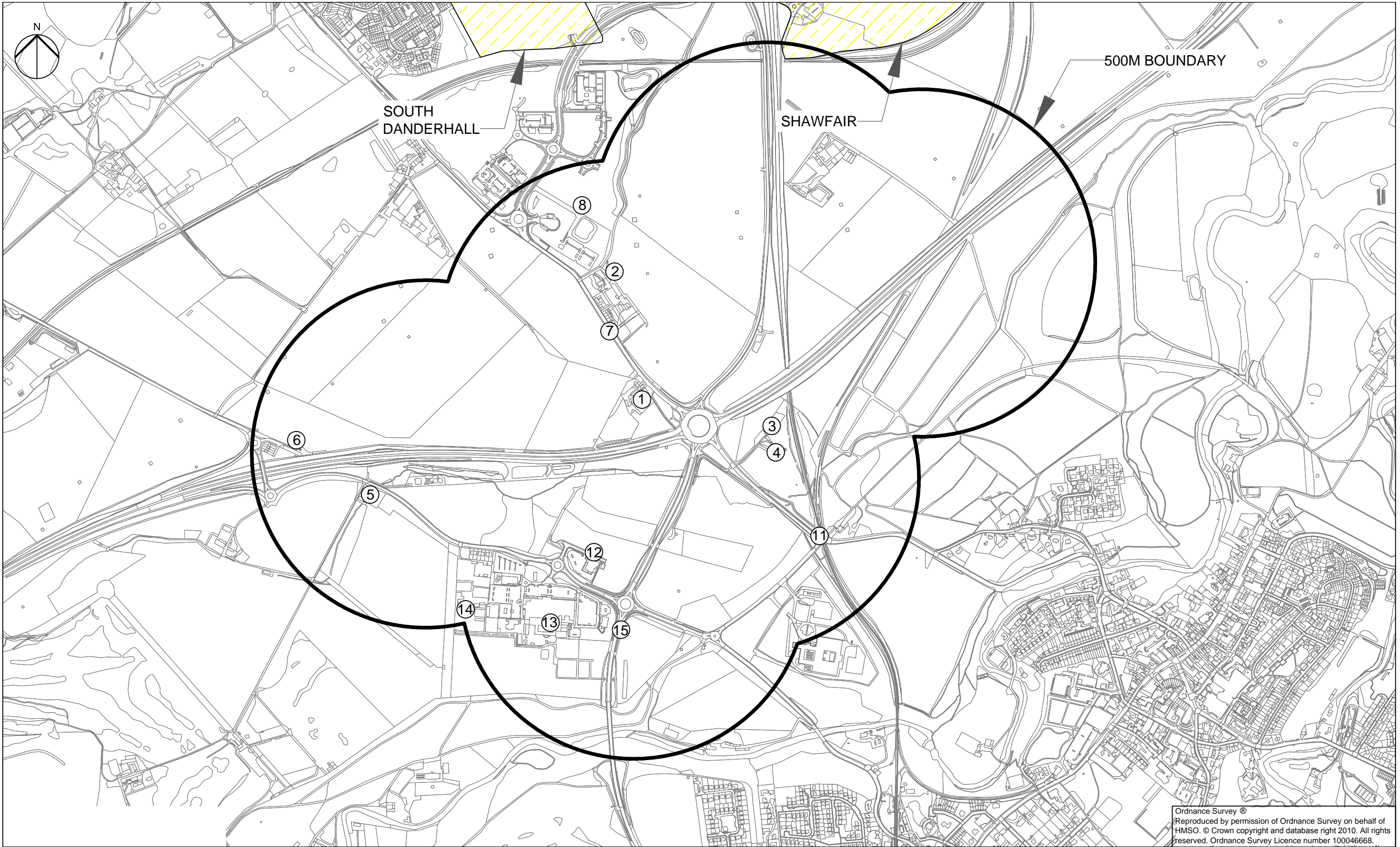
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File Name : J:\M02\PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WICHAR REPORT\FIGURE 2.6.2 - TRIP GENERATORS AND LOCAL AMENITIES (500M BOUNDARY)



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Project Title	A720 SHERIFFHALL ROUNDABOUT
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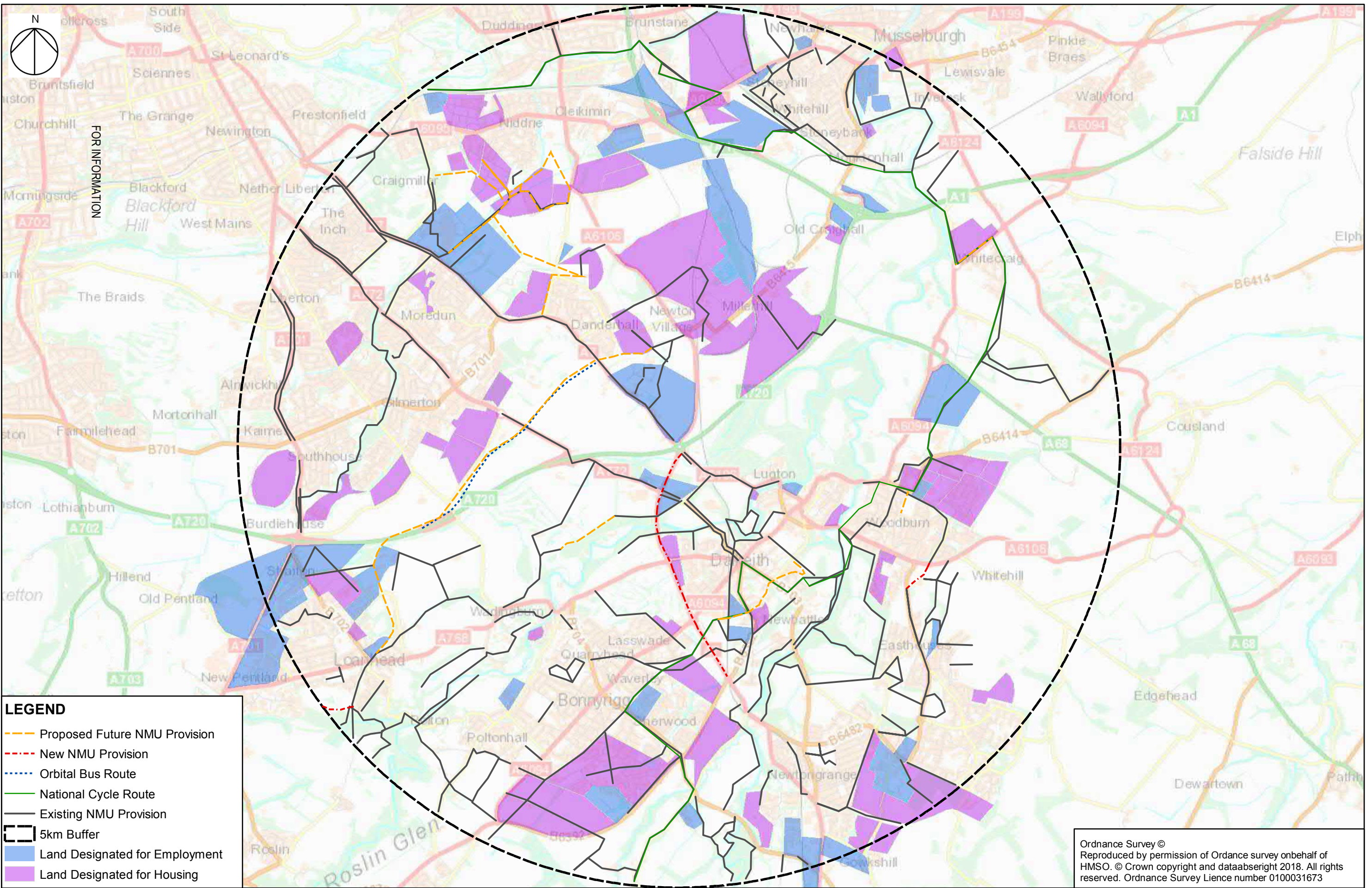
Drawing Title	WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT TRIP GENERATORS & LOCAL AMENITIES (500M BOUNDARY)
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LEGEND

- Proposed Future NMU Provision
- New NMU Provision
- Orbital Bus Route
- National Cycle Route
- Existing NMU Provision
- 5km Buffer
- Land Designated for Employment
- Land Designated for Housing

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Project Title:
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 -RIDING ASSESSMENT REPORT
 PROPOSED DEVELOPMENTS AND
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 (5KM STUDY AREA)**

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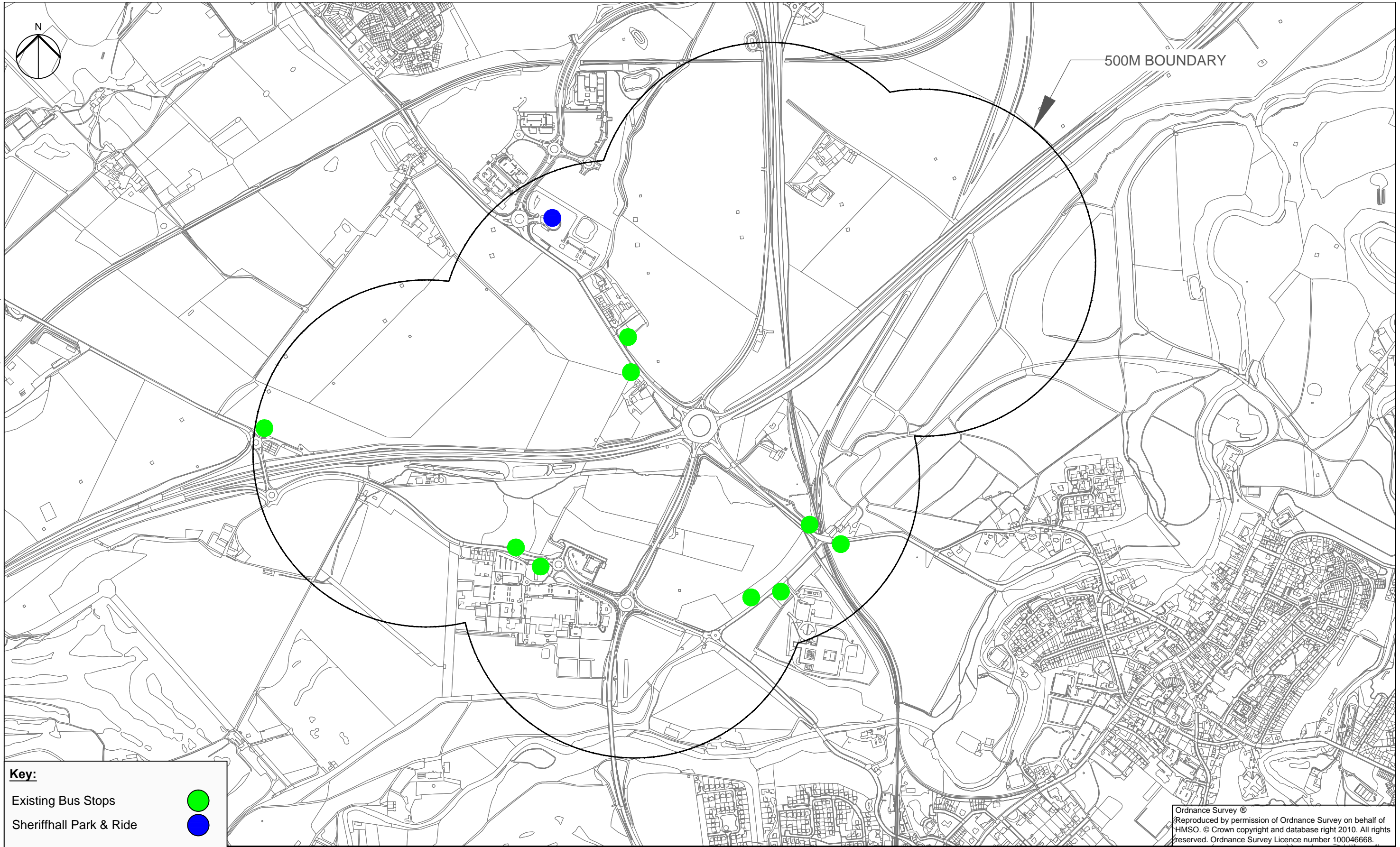
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File Name : J:\M02\PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WICHAR REPORT\FIGURE 2.7 - BUS FACILITIES (500M BOUNDARY)



Key:

Existing Bus Stops ●

Sheriffhall Park & Ride ●

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Project Title	A720 SHERIFFHALL ROUNDABOUT
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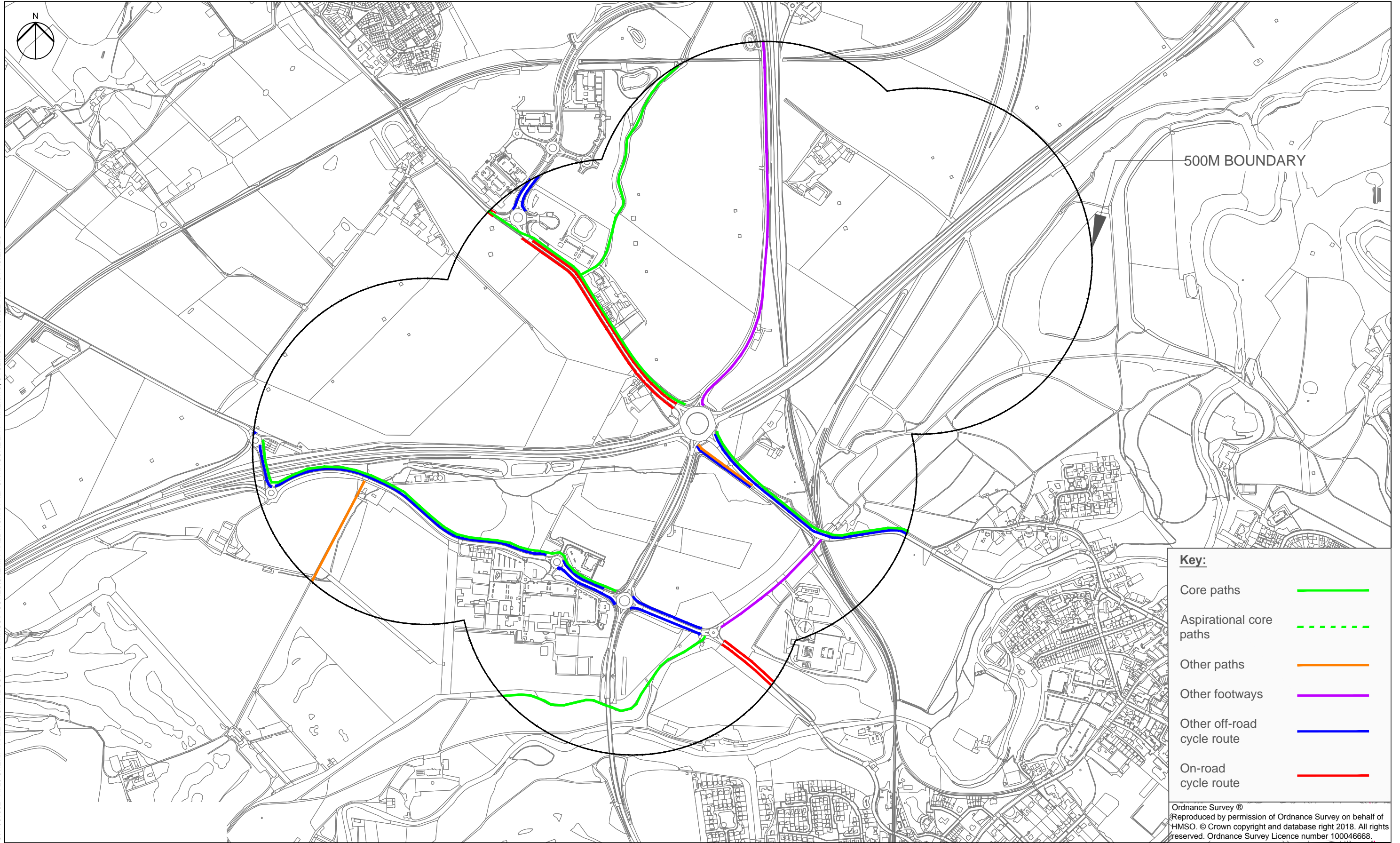
Drawing Title	WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT BUS FACILITIES
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 File Name : J:\M02 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.11 - WALKING, CYCLING AND HORSE-RIDING FACILITIES



500M BOUNDARY

Key:

Core paths	———
Aspirational core paths	- - - - -
Other paths	———
Other footways	———
Other off-road cycle route	———
On-road cycle route	———

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Project Title	A720 SHERIFFHALL ROUNDABOUT
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Drawing Title	WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT SUMMARY OF EXISTING NMU FACILITIES (500M BOUNDARY)
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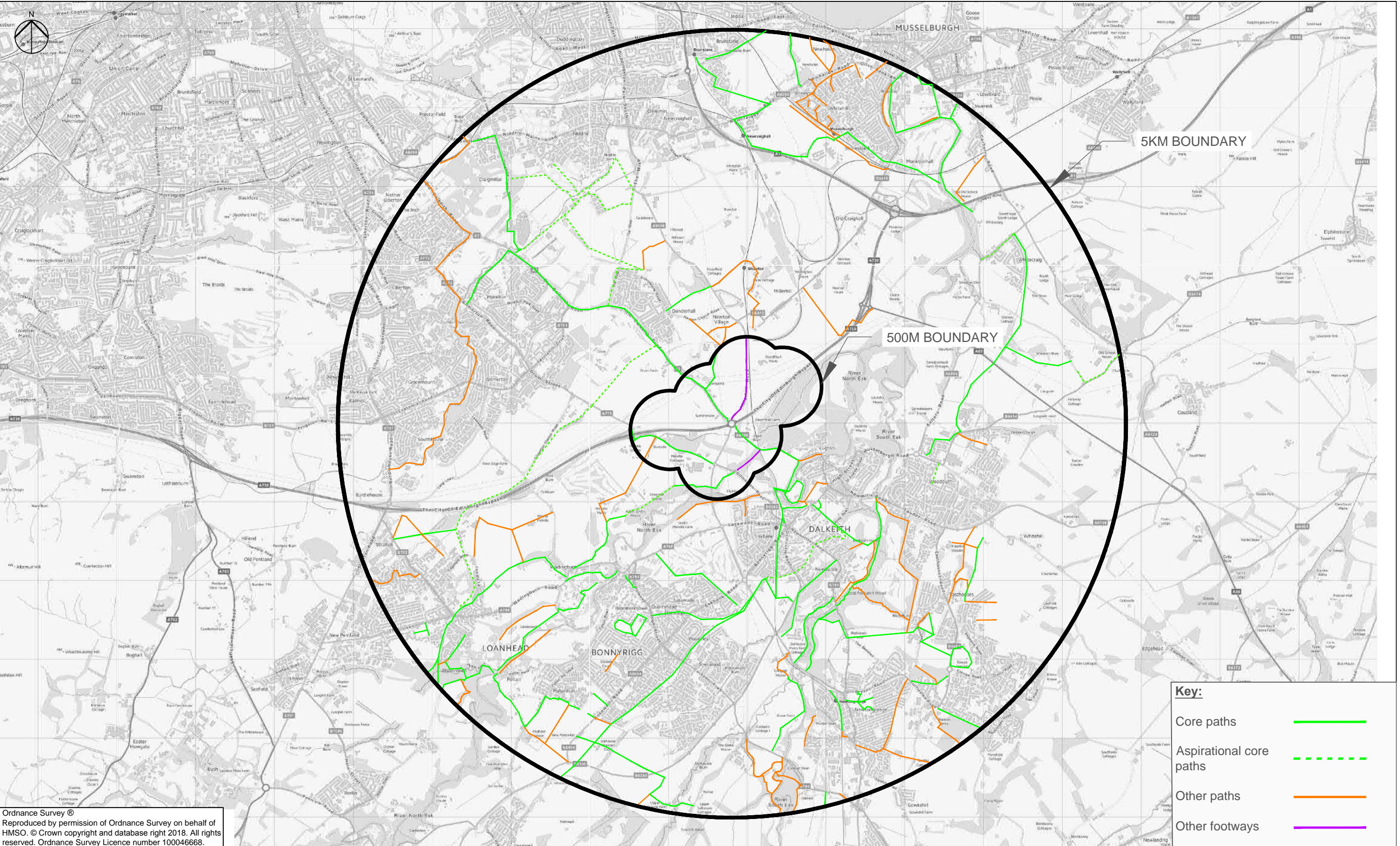
Purpose of issue				
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FIGURE 2.10	-

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File Name : J:\MOU2 PROJECTS\47067662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.11.1 TO 2.11.3 - WALKING, CYCLING AND HORSE-RIDING FACILITIES



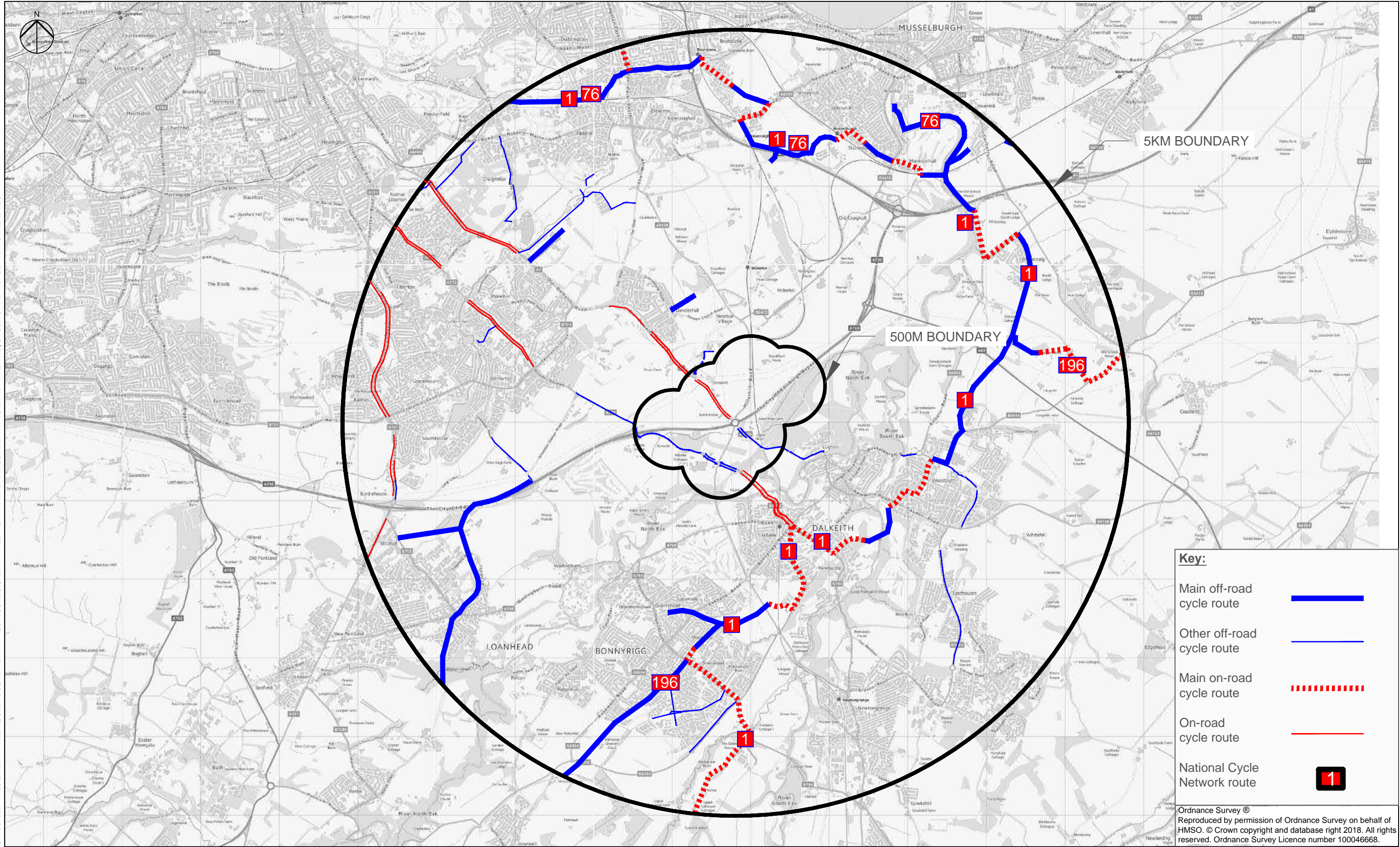
Key:

- Core paths ———
- Aspirational core paths - - - - -
- Other paths ———
- Other footways ———

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		Designed RN	Drawn RN	Checked SS	Approved JI	Date 16/08/2017		
Client 	AECOM Internal Project No. 60470009 Scale @ A3 NTS	Suitability Zone / Mileage						

Plot Date : 05 June 2018 10:09:56
File Name : J:\M02 PROJECTS\4707662 - A720 SHERIFFHALL ROUNDABOUT - DRAWINGS\FIGURES\SHERIFFHALL WCHAR REPORT\FIGURE 2.11.1 TO 2.11.3 - WALKING, CYCLING AND HORSE-RIDING FACILITIES



Key:

- Main off-road cycle route
- Other off-road cycle route
- Main on-road cycle route
- On-road cycle route
- National Cycle Network route

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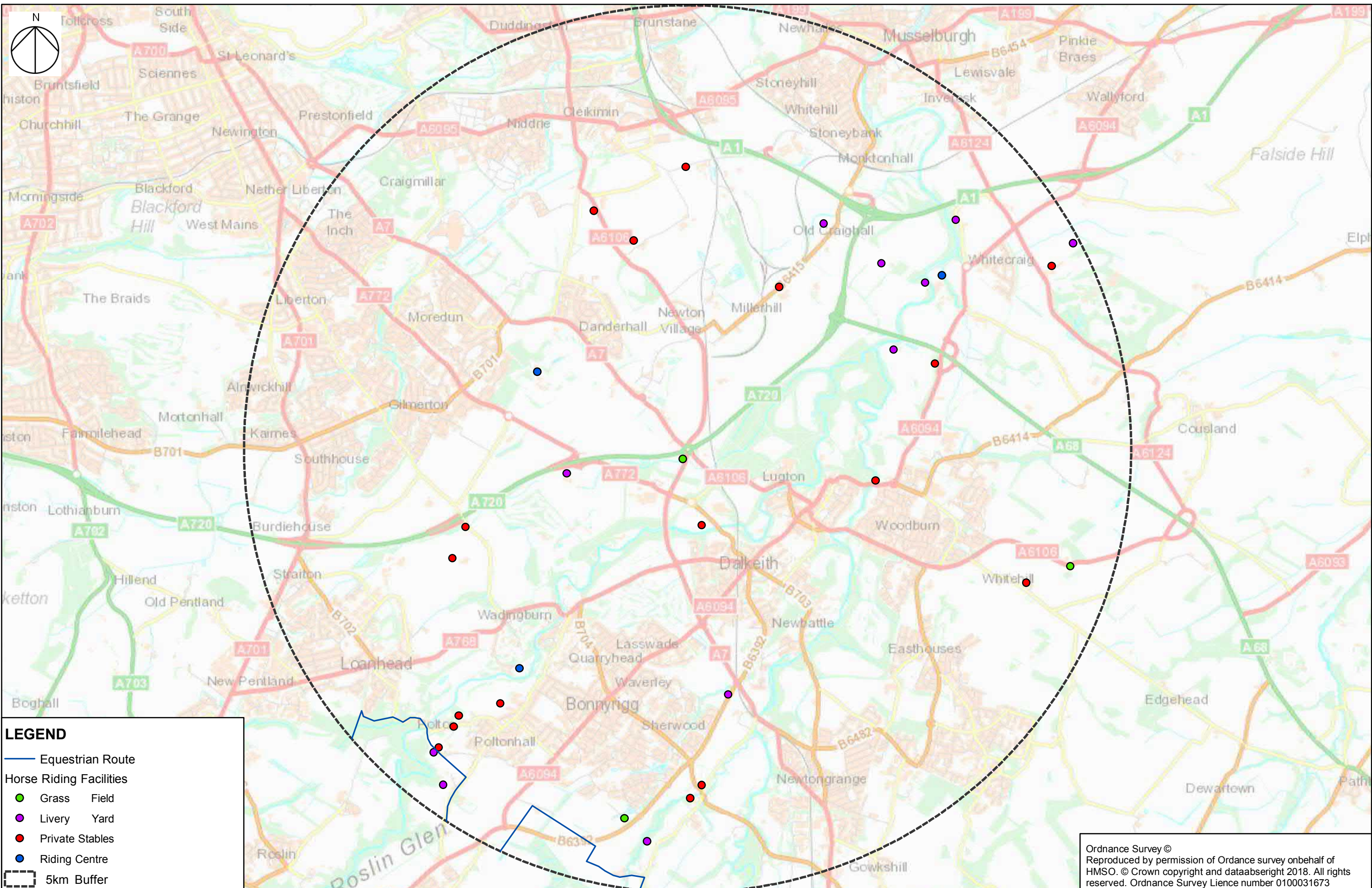
Project Title A720 SHERIFFHALL ROUNDABOUT	Drawing Title WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT EXISTING CYCLING FACILITIES (5K STUDY AREA)
Client 	

FOR INFORMATION				
Designed RN	Drawn RN	Checked SS	Approved JI	Date 16/08/2017
AECOM Internal Project No. 60470009		Suitability		
Scale @ A3 NTS		Zone / Mileage		

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Project Title A720 SHERIFFHALL ROUNDABOUT	Drawing Title WALKING, CYCLING & HORSE-RIDING ASSESSMENT REPORT EXISTING CYCLING FACILITIES (5K STUDY AREA)
Client 	



LEGEND

- Equestrian Route
- Horse Riding Facilities**
- Grass Field
- Livery Yard
- Private Stables
- Riding Centre
- 5km Buffer

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Project Title:
A720 SHERIFFHALL ROUNDABOUT

Client:


Drawing Title:
WALKING, CYCLING & HORSE RIDING ASSESSMENT REPORT EXISTING HORSE-RIDING FACILITIES (5KM STUDY AREA)

Purpose of issue				
FOR INFORMATION				
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AECOM Internal Project No. 60470009		Suitability		
Scale @ A3 1:40,000		Zone/Mileage		

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FIGURE 2.10.3

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Appendix 14.2 – Driver Stress Assessment Data

Appendix 14.2.1 – Assessment of Driver Stress

Table A14.2-1 Baseline Driver Stress for the Year 2024 (DM 2024)

Corridor	Direction	Link	No. of Lanes	AM Peak-Hour 2-Way Light Vehicle Flow	AM Peak-Hour 2-Way Heavy Vehicle Flow	AM Peak-Hour 2-Way Flow Units	PM Peak-Hour 2-Way Light Vehicle Flow	PM Peak-Hour 2-Way Heavy Vehicle Flow	PM Peak-Hour 2-Way Flow Units	Average Peak-Hour Flow Units per Lane	AM Peak-Hour Speeds (km/h)	PM Peak-Hour Speeds (km/h)	Average Peak-Hour Speed (km/h)	Driver Stress
Single Carriageway														
A6106 (N)	Two-Way	98:99	2	708	68	912	646	39	762	418	34	32	33	High
A6106 (S)	Two-Way	159:333	2	989	71	1,201	967	39	1,084	571	50	50	50	Moderate
A7 (N)	Two-Way	326:406	2	1,148	80	1,388	1,005	60	1,185	643	67	31	49	High
A7 (S)	Two-Way	111:112	2	924	84	1,174	1,027	56	1,195	592	39	33	36	High
Dual Carriageway														
A720 (East)	Eastbound	330:8	2	1,497	181	2,039	1,641	118	1,995	1,009	73	74	74	Moderate
	Westbound	6:324	2	1,814	196	2,401	1,574	112	1,911	1,078	69	8	39	High
	Two-Way		4	3,310	377	4,440	3,215	230	3,906	1,043	71	41	56	High
A720 (West)	Eastbound	327:28	2	1,702	136	2,111	1,729	141	2,151	1,065	75	69	72	Moderate
	Westbound	329:27	2	1,716	128	2,101	1,459	119	1,815	979	10	8	9	High
	Two-Way		4	3,417	265	4,211	3,187	260	3,966	1,022	43	39	41	High

Note: Flow Units = LV + 3*HV

Error! Reference source not found.**Table A14.2-2 Baseline Driver Stress for the Year 2039 (DM 2039)**

Corridor	Direction	Link	No. of Lanes	AM Peak-Hour 2-Way Light Vehicle Flow	AM Peak-Hour 2-Way Heavy Vehicle Flow	AM Peak-Hour 2-Way Flow Units	PM Peak-Hour 2-Way Light Vehicle Flow	PM Peak-Hour 2-Way Heavy Vehicle Flow	PM Peak-Hour 2-Way Flow Units	Average Peak-Hour Flow Units per Lane	AM Peak-Hour Speeds (km/h)	PM Peak-Hour Speeds (km/h)	Average Peak-Hour Speed (km/h)	Driver Stress
Single Carriageway														
A6106 (N)	Two-Way	98:99	2	704	67	905	651	38	766	418	32	32	32	High
A6106 (S)	Two-Way	159:333	2	1,014	70	1,225	987	39	1,104	582	50	50	50	Moderate
A7 (N)	Two-Way	326:406	2	1,137	79	1,374	977	60	1,158	633	66	31	49	High
A7 (S)	Two-Way	111:112	2	878	81	1,120	990	56	1,156	569	41	29	35	High
Dual Carriageway														
A720 (East)	Eastbound	330:8	2	1,441	174	1,964	1,592	120	1,953	979	73	75	74	Moderate
	Westbound	6:324	2	1,745	189	2,311	1,538	114	1,879	1,048	70	8	39	High
	Two-Way		4	3,187	363	4,276	3,130	234	3,832	1,013	72	41	56	High
A720 (West)	Eastbound	327:28	2	1,730	137	2,142	1,753	142	2,179	1,080	74	54	64	Moderate
	Westbound	329:27	2	1,687	128	2,072	1,453	122	1,819	973	10	8	9	High
	Two-Way		4	3,417	266	4,214	3,206	264	3,998	1,027	42	31	36	High

Note: Flow Units = Light Vehicles + 3*Heavy Vehicles

Error! Reference source not found.**Table A14.2-3 Operation Driver Stress for the Year 2024 (DS 2024)**

Corridor	Direction	Link	No. of Lanes	AM Peak-Hour 2-Way Light Vehicle Flow	AM Peak-Hour 2-Way Heavy Vehicle Flow	AM Peak-Hour 2-Way Flow Units	PM Peak-Hour 2-Way Light Vehicle Flow	PM Peak-Hour 2-Way Heavy Vehicle Flow	PM Peak-Hour 2-Way Flow Units	Average Peak-Hour Flow Units per Lane	AM Peak-Hour Speeds (km/h)	PM Peak-Hour Speeds (km/h)	Average Peak-Hour Speed (km/h)	Driver Stress
Single Carriageway														
A6106 (N)	Two-Way	449z:480z	2	780	78	1,014	790	43	919	483	55	48	51	Moderate
A6106 (S)	Two-Way	333:451z	2	996	68	1,199	983	38	1,099	574	37	35	36	High
A7 (N)	Two-Way	445z:446z	2	1,208	84	1,459	1,030	58	1,204	666	76	66	71	Moderate
A7 (S)	Two-Way	442z:443z	2	1,018	88	1,283	1,097	59	1,273	639	57	35	46	High
Dual Carriageway														
A720	Eastbound	436z:437z	2	1,203	153	1,661	1,361	104	1,672	833	92	92	92	Low
	Westbound	438z:439z	2	1,308	118	1,663	1,322	125	1,698	840	91	91	91	Low
	Two-Way		4	2,512	271	3,324	2,683	229	3,370	837	91	91	91	Low

Note: Flow Units = Light Vehicles + 3*Heavy Vehicles

Error! Reference source not found.**Table A14.2-4 Construction Driver Stress for the Year 2024 (DM 2024 with max speed of 64 km/h)**

Corridor	Direction	Link	No. of Lanes	AM Peak-Hour 2-Way Light Vehicle Flow	AM Peak-Hour 2-Way Heavy Vehicle Flow	AM Peak-Hour 2-Way Flow Units	PM Peak-Hour 2-Way Light Vehicle Flow	PM Peak-Hour 2-Way Heavy Vehicle Flow	PM Peak-Hour 2-Way Flow Units	Average Peak-Hour Flow Units per Lane	AM Peak-Hour Speeds (km/h)	PM Peak-Hour Speeds (km/h)	Average Peak-Hour Speed (km/h)	Driver Stress
Single Carriageway														
A6106 (N)	Two-Way	449z:480z	2	708	68	912	646	39	762	418	34	32	33	High
A6106 (S)	Two-Way	333:451z	2	989	71	1,201	967	39	1,084	571	50	50	50	Moderate
A7 (N)	Two-Way	445z:446z	2	1,148	80	1,388	1,005	60	1,185	643	67	31	49	High
A7 (S)	Two-Way	442z:443z	2	924	84	1,174	1,027	56	1,195	592	39	33	36	High
Dual Carriageway														
A720 (East)	Eastbound	436z:437z	2	1,497	181	2,039	1,641	118	1,995	1,009	73	74	64	Moderate
	Westbound	438z:439z	2	1,814	196	2,401	1,574	112	1,911	1,078	69	8	39	High
	Two-Way		4	3,310	377	4,440	3,215	230	3,906	1,043	71	41	56	High
A720 (West)	Eastbound	327:28	2	1,702	136	2,111	1,729	141	2,151	1,065	75	69	64	Moderate
	Westbound	329:27	2	1,716	128	2,101	1,459	119	1,815	979	10	8	9	High
	Two-Way		4	3,417	265	4,211	3,187	260	3,966	1,022	43	39	41	High

Note: Flow Units = Light Vehicles + 3*Heavy Vehicles

Error! Reference source not found.**Table A14.2-5 Operation Driver Stress for the Year 2039 (DS 2039)**

Corridor	Direction	Link	No. of Lanes	AM Peak-Hour 2-Way Light Vehicle Flow	AM Peak-Hour 2-Way Heavy Vehicle Flow	AM Peak-Hour 2-Way Flow Units	PM Peak-Hour 2-Way Light Vehicle Flow	PM Peak-Hour 2-Way Heavy Vehicle Flow	PM Peak-Hour 2-Way Flow Units	Average Peak-Hour Flow Units per Lane	AM Peak-Hour Speeds (km/h)	PM Peak-Hour Speeds (km/h)	Average Peak-Hour Speed (km/h)	Driver Stress
Single Carriageways														
A6106 (N)	Two-Way	449z:480z	2	783	77	1,014	788	43	915	482	55	53	54	Moderate
A6106 (S)	Two-Way	333:451z	2	996	67	1,196	982	39	1,098	574	36	34	35	High
A7 (N)	Two-Way	445z:446z	2	1,203	83	1,452	1,028	57	1,200	663	76	74	75	Moderate
A7 (S)	Two-Way	442z:443z	2	1,010	89	1,277	1,079	56	1,248	631	57	30	44	High
Dual Carriageway														
A720	Eastbound	436z:437z	2	1,203	151	1,654	1,360	104	1,673	832	92	92	92	Low
	Westbound	438z:439z	2	1,308	118	1,661	1,323	127	1,704	841	93	93	93	Low
	Two-Way		4	2,510	268	3,315	2,684	231	3,377	836	92	92	92	Low

Note: Flow Units = Light Vehicles + 3*Heavy Vehicles

Additional Notes

1: No additional growth in traffic expected during the peak periods in the Design model between 2024 and 2039 due to the effects of additional traffic being attracted to the area following grade-separation.

2: Links in Base and Design models are generally in the same location.

Appendix 14.2.2 – Assigning Significance of Effect

Table A14.2-6 Significance of Peak Operational Driver Stress

Corridor	Direction	2039 DM	2039 DS	Significance of Effect
Single Carriageways				
A6106 (N)	Two-Way	High	Moderate	Slight Beneficial
A6106 (S)	Two-Way	Moderate	High	Slight Adverse
A7 (N)	Two-Way	High	Moderate	Slight Beneficial
A7 (S)	Two-Way	High	High	Neutral
Dual Carriageway				
A720	Eastbound	Moderate	Low	Slight Beneficial
	Westbound	High	Low	Moderate Beneficial
	Two-Way	High	Low	Moderate Beneficial

Table A14.2-7 Significance of Peak Construction Driver Stress

Corridor	Direction	2024 DM	2024 DM (max. 64 km/h)	Significance of Effect
Single Carriageways				
A6106 (N)	Two-Way	High	High	Neutral
A6106 (S)	Two-Way	Moderate	Moderate	Neutral
A7 (N)	Two-Way	High	High	Neutral
A7 (S)	Two-Way	High	High	Neutral
Dual Carriageway				
A720	Eastbound	Moderate	Moderate	Neutral
	Westbound	High	High	Neutral
	Two-Way	High	High	Neutral