

Grandhome Transport Assessment

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1 Introduction and Background

1.1 Overview of Proposals

- 1.1.1 This Transport Assessment (TA) has been prepared for the Grandhome Trust in support of the proposal for a sustainable community at Grandhome. The development is to be located near Danestone in Aberdeen and will comprise elements of residential, education, employment and retail land uses. This will offer the residents of Grandhome internally based opportunities in employment, retail and recreation thereby creating potential for a self contained community to develop. It is proposed that the residential element of the development will initially comprise 4700 houses with an estimated population of up to ten thousand people. The site is owned by the Grandhome Trust, a family-led-entity, which has held the land for more than 400 years.
- 1.1.2 Grandhome is a 320 hectare Greenfield site located 5 kms northwest of Aberdeen City Centre. To the north, the site links to open, undeveloped farmland extending out over the Buchan Plateau. The east of the site is bound by Whitestripes Avenue and further east is the residential development of Middleton Park. The south of the site is bounded by the A90 trunk road (the Parkway) and further south lies the residential development of Danestone. The west is bound by the River Don and further west is Aberdeen Airport and significant employment opportunities at Dyce. Residential developments in this area were built during the 1970s and 1980s and now have a combined population of around 22,000 residents and an assortment of community facilities.
- 1.1.3 The adopted Aberdeen Local Development Plan (LDP) identifies the site for Residential Development of up to 4700 homes in the Plan period to 2023 together with retail, commercial, education and employment land uses. The Grandhome Development Framework published in March 2013, sets out the key components of the new development and the approach to be adopted to ensure successful implementation of the proposals. This Development Framework is currently awaiting formal endorsement by the City Council as statutory guidance for development of the site.
- 1.1.4 It is intended that Grandhome will be built in a number of phases to ensure that an adequate level of amenities and opportunities are available for the residents within the site. In total there is provision for 7 phases, with the first phase comprising a complete neighbourhood. The phasing strategy reflects the housing allocation release set out in the LDP (with allowance for provision of up to 4700 households in the current Plan period) and recognises constraints posed by the delivery of the Aberdeen Western Peripheral Route (AWPR) and Third Don Crossing. The second phase will see the development of around 1,800 homes and the formation of Grandhome town centre. As the population of Grandhome grows through subsequent phases, additional demand will act as a catalyst for the development of further

retail and commercial uses that will ultimately complete the full complement of uses on the site.

1.1.5 The TA comprises part of a comprehensive Environmental Assessment of implications of the proposals required by statute. It will focus primarily on consideration of impacts of the development at two stages of development:

- The first assessment will consider the first phase of the development (up to 500 houses together with a mix of ancillary non residential land uses) in 2018. This phase is to be the subject of a future detailed planning application; and
- Further assessment will consider impacts of up to 4700 houses, together with a substantial mix of non residential land uses in support of a Planning Application in Principle for this level of development in line with the present LDP allocation.

Additional consideration will be given to the implications of two further stages in the development process:

- Whilst the initial LDP allocation had envisaged the implementation of development of the community of 4700 households by 2023, it is now recognised that such a rate of development is unrealistic in light of the downturn in national economic activity. Both the City Council and the applicants recognise that it is unlikely that more than 1500 households might be delivered in this timescale. Although such a scale of development does not relate directly to the Grandhome phasing strategy as outlined in the Development Framework, additional traffic analysis has been undertaken to assess the implications of this scale of development occurring in this time horizon as the basis for considering requirements for the staged implementation of infrastructure provision.
- A review of demands arising from the whole build out of the full masterplan in the longer term beyond the timeframe of the present LDP. This summary aims to support the future allocation of the site for this scale of further development in the 2030s/40s in the Structure Plan Review.

1.2 Consultation Process

1.2.1 A series of public consultation events has taken place engaging with residents and other local stakeholders to inform the production of the Grandhome development proposals. Following on from an initial consultation process in 2009/10, Grandhome was named by the Scottish Government as one of 11 candidate projects to be included in the Scottish Sustainable Communities Initiative (SSCI). The site eventually became one of three sites to be taken forward as part of the SSCI Charette Series. This was a national community engagement exercise comprising intensive, interactive sessions involving local people and organisations in the early planning and design/preparation of initial masterplan proposals.

- 1.2.2 Following initial modifications to the masterplan in mid-2010 to reflect the emerging LDP (involving further consultations with the local Community Councils and residents) a workshop was convened in early 2012 to develop proposals further in support of the planning process. This was then followed by a series of further consultations in mid 2012 with the community, City Council and statutory consultees. Proposals continued to develop through further design analysis and in response to feedback from this consultation process in late 2012 leading to pre-planning public exhibitions in October and Spring 2013 in anticipation of the submission of the planning applications.
- 1.2.3 Formal dialogue on the Transport Assessment process commenced with a meeting with the City Council in January 2012 leading to a series of meetings and further discussions with both the council and Transport Scotland in respect of implications for the adjoining trunk road. In addition separate discussions were held with the council's Public Transport Unit and principal operators leading to the identification of a Public Transport Strategy aimed at satisfying requirements for external travel by future residents of the site in the most sustainable manner. Scoping for the Transport Assessment was subsequently discussed with Aberdeen City Council in June 2013 following the submission of a Scoping Report.
- 1.2.4 In the course of this scoping process it was agreed that the traffic analysis should proceed on the basis of a conventional modelling assessment of the performance of the access junctions and junctions in the immediate vicinity of the site, relying on the latest up to date Paramics models (including traffic generation and distribution assumptions) provided by ACC for the assessment of network impacts.
- 1.2.5 This TA document is structured as follows:
- Section 2 comprises a summary of relevant Policy and Guidance.
 - Section 3 contains a review of existing transport networks and site accessibility including references to current committed infrastructure improvements.
 - Section 4 presents a summary of the Grandhome development proposals as detailed in the Development Framework, outlining strategies for accommodating pedestrians and cyclists, public transport provision, internal vehicle circulation, parking and vehicular access.
 - Section 5 summarises the Travel Demand assessment.
 - Section 6 refers to measures specifically aimed at promoting sustainable transport.
 - Section 7 summarises the impact assessment process for each stage of development.
 - Section 8 summarises construction proposals and anticipated impacts.

- Section 9 provides a summary of environmental impacts in response to the request by Transport Scotland.
- Section 10 provides an overall summary of conclusions.

2 Summary of Relevant Policy and Guidance

2.1 Overview

2.1.1 Current planning / transport policies in relation to new developments were considered when developing the transport strategy. The following are key policy documents.

- Scottish Planning Policy (SPP);
- Planning Advice Notice 75 (PAN75) – Transport and Planning;
- Designing Streets
- Approved Aberdeen City & Shire Structure Plan (August 2009)
- NESTRANS Regional Transport Strategy Finalised Strategy 2021 (June 2008)
- Aberdeen Local Development Plan (Adopted February 2012) (ALDP)
- Aberdeen Local Transport Strategy 2008 – 2012 (March 2008) (LTS)
- Grandhome Development Framework (March 2013)

2.2 National Policy

2.2.1 The principal national documents specifically relevant to the proposed site are:-

- The National Planning Framework for Scotland (NPF2-June 2009)
- ‘Scottish Planning Policy’ (February 2010)
- ‘Planning Advice Note 75 – Transport and Planning’. (August 2005)
- Scottish Sustainable Communities Initiative (SSCI) in May 2009
- Designing Streets (February 2010)

2.2.2 Taken together, these complementary documents set out the requirements of new development in ensuring consideration is given to promoting sustainable travel and minimising the impacts of development traffic upon the local transport network.

2.2.3 NPF2 emphasises the continuing pressure on accommodating growth in housing demand (despite the current economic downturn) and highlights the role of ‘Creating attractive, healthy, accessible and sustainable places’ in making ‘an important contribution to meeting regional housing and economic needs and improving the quality of the environment’. In respect of the ‘Spatial Perspective’ for the East Coast it identifies ‘The primary aim for Aberdeen and Aberdeenshire is to grow and diversify the economy, making sure the region has enough people, houses, jobs and facilities to maintain and improve its quality of life,’

2.2.4 The SPP states that design of the layout of new developments should consider the following in terms of transport:

- Encourage the use of, and enable access to, active travel networks and public transport; and
- Promote the efficient use of land, buildings and infrastructure.

The SPP also outlines requirements to provide:

- Direct links to walking and cycling networks;
- Access to public transport networks which would not involve walking more than 400m;

And ensure that:

- The development does not have a detrimental effect on the capacity of the strategic road / rail network; and
- There is provision of satisfactory mechanisms for meeting sustainable transport requirements.

2.2.5 Planning Advice Note 75 'Planning for Transport' (PAN75) identifies the undernoted guidance in relation to accessibility:

- 'A maximum threshold of 1600m for walking is broadly in line with observed travel behaviour'
- 'If there is a significant population within 800m then improvements to the quality of walking and cycling networks will increase accessibility'
- 'For accessibility of housing to public transport the recommended guidelines are less than 400m to bus services and up to 800m to rail services'

2.2.6 The Scottish Sustainable Communities Initiative (SSCI) was launched in June 2008 to encourage the creation of places, designed to be built to last, where a high quality of life can be achieved. The initiative was about creating places which are ambitious and inspiring, raising standards and developing skills in design, architecture and sustainable construction.

2.2.7 The SSCI initiative aimed to encourage the creation of a number of very low or zero carbon communities and provide a platform to stimulate a rise in environmental and design quality standards within new developments and to showcase the architectural and design skills that exist in Scotland. The aim was to create places that will be inherently sustainable as a result of their enduring appeal. An SSCI development is required to:

- contribute to meeting identified housing requirements in the area;
- demonstrate a level of innovation and quality of design which will lead to the creation of successful places and serve as an inspiration to future development in Scotland;

- make a significant contribution to reducing emissions of carbon dioxide both in construction and throughout the community's life;
- minimise pollution;
- create opportunities to live healthier, more active and environmentally responsible lives and so influence behaviour and attitudes;
- demonstrate that the delivery of high quality sustainable forms of new development is achievable within reasonable timescales; and incorporate provision for evaluation of the success and benefits of the approach and outcomes, so that future developments can benefit by learning from innovation.

2.2.8 Successful proposals were expected to benefit from support in progressing developments through regulatory processes and assistance with masterplanning, and innovative community engagement. One of the key requirements of the Initiative was that proposals should be developed in partnership - the public and private sector both needing to be signed up to enable the delivery of these new communities, which in some cases will be over the long term.

2.2.9 Designing Streets, published in February 2010, sets out Scottish Government policy aimed at securing attractive and well connected street networks as valuable social spaces and to encourage people to walk and cycle locally. It is based on the premise that 'Good street design should derive from an intelligent response to location, rather than the rigid application of standards, regardless of context'.

2.2.10 Designing Streets further identifies that street design should meet the six qualities of successful places, as set out in Designing Places:

- Distinctive
- Safe & pleasant
- Easy to move around
- Welcoming
- Adaptable, and
- Resource efficient'

2.2.11 Designing Streets goes on to confirm that it 'provides policy that should be followed in designing and approving all streets. Whilst its technical advice is aimed particularly at residential and lightly trafficked streets, many of the key principles are also applicable to other types of street, for example rural and high streets'.

2.3 Regional and Strategic

2.3.1 Regional Policy consists of the:

- Approved Aberdeen City & Shire Structure Plan (2009);
- NESTRANS Revised Transport Finalised Strategy 2012 (2008); and
- LTS (including SPG on STF).

2.3.2 The Structure Plan sets out plans for three Strategic Growth Areas (SGAs) in the north east which will accommodate around 75% to 80% of growth over the next 20 years or more. These SGAs are focussed on Aberdeen and the main transport routes around it to ensure adequate housing and facilities are developed to meet local demands and which can be appropriately accessed and integrated with existing activity. The Structure Plan also recognises the potential for the proposed Western Peripheral Route (AWPR) and other transport network improvements to provide improved access and encourage the use of more sustainable modes of travel.

2.3.3 The NESTRANS Transport Strategy highlights its objective to ensure enhanced travel choice, to improve availability of sustainable travel options and to support the local economy through an efficient transport network. The AWPR (together with the Third Don Crossing) is again identified as a key measure within the Strategy to assist its objectives being achieved, as it is within the Structure Plan.

2.3.4 Aberdeen City Council's Local Transport Strategy (LTS) sets out the transportation vision and objectives of the Council and provides a three-year Implementation Plan for meeting local challenges and needs. The LTS has been shaped by extensive consultation, including public and stakeholder sessions, and the submission of a Strategic Environmental Assessment (SEA).

2.3.5 The vision of the Aberdeen City LTS is to develop:

“A sustainable transport system that is fit for the 21st Century, accessible to all, supports a vibrant economy and minimises the impact on our environment.”

2.3.6 Strategic analysis of impacts relating to Structure Plan allocations on wider strategic networks within Aberdeen and Aberdeenshire were reported in the Cumulative Transport Appraisal (CTA) published by NESTRANS. This exercise, based on the Aberdeen Strategic Area Model 4 (ASAM4), was undertaken to inform the ALDP, justifying the allocations within it, including Grandhome. ASAM4 is the most recent version of the strategic multi-modal transport model covering Aberdeen and Aberdeenshire. It contains road and public transport assignment models and forecast year demand models which can be used to assess the change in travel levels over time related to a 2007 base year. The CTA allows for the

projected impact of full development of 4700 households at Grandhome with other committed LDP allocations in line with the phasing of the adopted Local Development Plan. The CTA identifies hot spots where strategic interventions are expected to be required.

- 2.3.7 As a mechanism to finance these strategic improvements the Aberdeen City and Shire Strategic Development Planning Authority (SDPA) has developed further guidance in the form of Supplementary Planning Guidance (SPG). This guidance is aimed at the establishment of a Strategic Transport Fund (STF) which is designed to cover the cost of strategic improvements required to implement the allocations within the Local Development Plan through developer contributions. The STF collects an amount per size of unit of development for every new development completed across Aberdeen City and Shire which will fund the schemes identified through the CTA. The priority in which these schemes will be implemented is in the process of being finalised by NESTRANS.
- 2.3.8 This approach potentially removes requirements for consideration of the wider impacts of the developments allocated in the LDP as mitigation measures are to be implemented as part of the STF process. On this basis analysis within TA documents for developments can concentrate on impacts local to the site.

2.4 Local Development Plan and Action Programme

- 2.4.1 The Aberdeen Local Development Plan (ALDP) adopted in 2012, identifies key policies which will be pursued to achieve the objectives of creating a sustainable city. The different key policies are as follows:
- Map based policies – which apply to specific areas on the Proposed Map
 - City wide policies – which apply to all new development proposals
 - Topic policies - which apply to certain types of development
- 2.4.2 It is noted in the ALDP that when determining the best locations for greenfield development careful consideration has to be given to environmental, topographical, and accessibility issues. Development locations should be within the AWPR where possible.
- 2.4.3 The ALDP sets out specific policies for ensuring that new developments contribute to delivering sustainable communities within the city. A number of these policies have relevance to the proposed development and these include:
- Policy I1 – Infrastructure Delivery and Developer Contributions
 - Policy T1 – Land for Transport
 - Policy T2 – Managing the Traffic Impact of Development
 - Policy D3 - Sustainable and Active Travel

2.4.4 The ALDP allocates sites for development over a period of 10 years from adoption and Grandhome is included as site OP12 as shown at Figure 2.1.

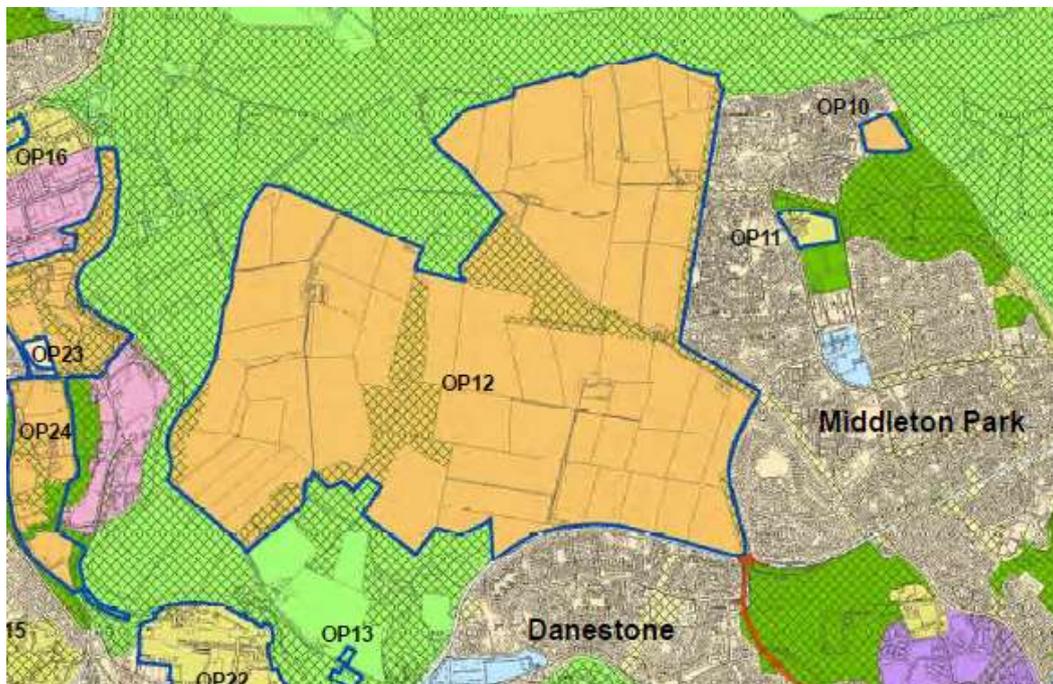


Figure 2.1 Site OP12 Grandhome – Aberdeen City LDP

2.4.5 The adopted LDP specifies provision for up to 4700 homes in the period to 2023, and suggests the possible further allocation of up to a total of 7000 subject to confirmation through review of the Structure Plan. There is also provision for 5ha employment land over the period 2007-2023.

2.4.6 An Action Programme prepared to accompany the document outlines the expectations of Aberdeen City Council with regards to the timings of application stages, phasing of development and specific infrastructure requirements associated with each development.

2.4.7 To support the ALDP, the Action Programme sets out actions required to deliver each of the plans, policies and proposals. In order to stimulate discussion, encourage action and assist with mediation on the delivery of specific sites or masterplan areas identified in the Plan, the City Council has also decided to host a series of Delivery Workshops.

2.4.8 For Grandhome the Programme sets out several infrastructure requirements for consideration which include:

- a strategic North / South and East/West route through site, linking to other strategic routes outwith the site
- a Link to Dyce via east/west route via a new bridge over the River Don,
- a Link to Denmore routes and the Bridge of Don area and

- a Link to National Cycle Network Route 1.
- A shared a footway/cycle path alongside the Parkway from Grandhome to Ellon Road.
- Public transport services to serve the whole of the development area.

2.4.9 Further 'Supplementary Guidance Notes' which also support the ALDP provide advice on 'Transport and Accessibility', which aims to assist developers in the preparation of planning applications. The document examines a number of transport and accessibility issues that may have to be considered as part of a planning application and should be read in conjunction with the LDP and the Local Transport Strategy. The document states that public transport should be available within 400 metres of the origins and destinations of trips with the development. Public transport provision should be at a frequency, times and places that:

- Are at intervals of no more than 15 minutes, and ideally 10-12 minutes;
- Meet the need of those without access to a car who would wish to access the development; and
- Provide an effective alternative for those who do not have access to a car.

2.5 TA and EIA Guidance

2.5.1 The TA is prepared in line with guidance issued by the Scottish Government in the publication 'Transport Assessment and Implementation: A Guide' (TAIG) August 2005.

2.5.2 The primary purpose of the TA is to provide a comprehensive review of the transport impacts of the proposed development in order to provide the level of information required to understand how it will operate. The TA will also provide information about any proposed mitigation that may be required as a consequence of the development.

2.5.3 The EIA sets out to determine both the beneficial and detrimental effects of the development upon the existing environment. Measures aimed at securing mitigation of any detrimental environmental effects are identified. As part of the assessment, the impacts of transport upon the environment are determined and assessed together with the mitigation measures (where appropriate) showing how the development can be accommodated. Findings of the TA process are therefore summarised in the EIA.

3 Existing Transport Networks and Site Accessibility

3.1 Introduction

- 3.1.1 As previously noted, the adopted Structure Plan has identified three strategic growth areas that will be the main focus for growth up to the year 2030 focussed around Aberdeen City and principal transport corridors feeding from it. Concentrating development in these areas will ensure good site accessibility, also helping to justify investment in infrastructure (including new primary and secondary schools, improvements to roads and railways, and new water and wastewater systems) anticipated to be essential for the successful delivery of the Plan proposals.
- 3.1.2 In line with SSCI and 'Designing Streets' objectives, the vision for Grandhome stems from the principle of place-making, which promotes the design of walkable neighbourhoods, offering a range of house types, as well as community facilities, shops and jobs. This approach tends to lessen car dependency and promote a sense of wellbeing and community.
- 3.1.3 Grandhome will occupy a site on the north-western periphery of Aberdeen City at a location adjacent to the A90 Parkway and Buckie Farm Roundabout. The nature of the development consists primarily of residential land use but is likely to attract a significant number of employment and retail related trips. It is therefore important to provide and maintain a good level of accessibility by all modes.
- 3.1.4 Aberdeen City Centre represents a major attractor of commuter, shopper, student and visitor trips from the area. Despite the aspirations for Grandhome to develop as a self-sustaining integrated community, it is envisaged that a principal focus in considering accessibility of the development (consistent with current practice) will relate to consideration of demands placed upon the transport infrastructure in accommodating access to the City Centre and the greater Aberdeen area. As such, maintaining strategic access from Aberdeen to this area to the north will be an important consideration.
- 3.1.5 The site is well located in terms of existing facilities and amenities. The Aberdeen Science and Technology Park, Aberdeen Airport, the Energetica Corridor and the Aberdeen Exhibition and Conference Centre are facilities of regional significance that lie within 3km of the site. Other amenities closer to the site include a range of shops, supermarkets, schools, sports centres, community buildings, public houses, restaurants, a post office, libraries, a police station and the employment areas of Dyce and Kirkhill. The location of these amenities is displayed in Diagram 3.1.

3.1.6 Before going on to consider issues of wider accessibility however, it is appropriate to review present provisions and accessibility of the Grandhome site to local attractions by sustainable modes consistent with the requirements of policy in prioritising their significance.

3.2 General Accessibility Opportunities and Constraints

3.2.1 Principal attractions to which residents of a new community at Grandhome might be expected to be drawn outwith the boundaries of the development site will include:

- places of employment
- retail centres
- community attractions and transport interchanges
- schools and
- personal business/visits/holidays etc.

3.2.2 Data from the National Travel Survey reveals that as much as 30 percent of travel demand is associated with commuting and business, 12 percent with shopping, 7 percent with education and the remainder with other purposes. With the significance of commuting and business even greater during peak periods (up to 45 percent) it is clear that optimising accessibility to employment will be critical in promoting an efficient and sustainable access strategy to accommodate the greatest proportion of travel demand.

3.2.3 Some of these travel demands can and will be accommodated internally within the community. That is particularly expected to be true for school trips assuming the implementation of current schooling proposals. However, current experience is that only relatively modest proportions of journey to work trips are retained internally. Recent travel diary data for employees of the Aberdeen Science and Energy Park suggests that only approximately 10 percent of employees are drawn from the wider Bridge of Don area. On the other hand, it is likely that retail provision within Grandhome will attract demands from adjoining residential areas helping to address the perceived inadequacy of existing provision across the wider area.

3.2.4 Several employment concentrations are located in the vicinity of the site including:

- Dyce approximately 1km to the west;
- Kirkhill approximately 2.5km to the north west;
- Stonewood approximately 500m to the west;
- Aberdeen Science and Energy Park (ASEP) and adjoining industrial development located approximately 2-3km to the east at Murcar, Denmore and Bridge of Don;

- Aberdeen City Centre and peripheral employment areas located approximately 5kms to the south east of the site;
- Kingfisher Business Park north of the Science and Energy Park and similar development on land south and west of Aberdeen Airport;
- the Energetica Corridor – a 25 year vision to create an exemplar low carbon, sustainable development corridor that will attract energy organisations and individuals to a natural and built coastal environment. Energetica covers a 30 mile stretch that extends from Bridge of Don and Aberdeen Airport to Peterhead;
- the Exhibition and Conference Centre (AECC) at Ellon Road comprising a primary focus points of local community and personal business attractions;
- The Jesmond Centre (a council run leisure centre);
- Danestone Medical Centre; and
- Bannatyne Health Club.

3.2.5 Aberdeen Airport is located 3km to the north west of the site boundary and is a significant transport interchange handling 2.7m passengers per annum.

3.2.6 Dyce railway station is located east of the Airport on the Aberdeen – Inverness line. Bridge of Don Park and Ride (P&R) site at Ellon Road adjoins the AECC and accommodates existing commuter demands in the Ellon Road corridor towards the city centre.

3.2.7 The location of the Grandhome site related to these potential attractions is shown on Diagram 3.2

3.2.8 It is envisaged that any external travel demands to schools would be to secondary schools except for the possible requirement to accommodate primary school pupils during initial phases of development. Local secondary schools are at Jesmond and Bridge of Don to the east of the site but potentially the biggest demand for external movements (assuming the future provision of an academy on the site) will arise in accommodating trips to independent schools. These are primarily located around the west of the city centre and include The Hamilton School, Robert Donald College, Camphill Rudolf Steiner, St. Margarets, Aberdeen Waldorf School and Albyn School.

3.2.9 The potential movements from the site will be channelled by the effects of physical geography. The biggest constraint is the presence of the Don valley to the south and west of the site. The Don valley currently has three bridges which primarily cater for vehicular traffic. The physical geography constraints are shown on Diagram 3.3.

3.2.10 At present the most convenient vehicular crossing point is Persley Bridge to the south and west of the site which carries the A90 trunk road up to the southern site boundary. Persley Bridge accommodates routes around the city centre to the south and provides connections to

Dyce, Aberdeen Airport, Kirkhill and destinations to the north west via the A96 trunk road from Haudagain Roundabout.



Persley Bridge

- 3.2.11 Parkhill Bridge on the A947 corridor north of Dyce accommodates alternative connections to the west. Primarily this bridge has the potential to provide an alternative route for Grandhome residents to employment locations in Kirkhill and Dyce in the absence of a more direct bridge connection north of Stoneywood. Whilst it involves a lengthier journey via secondary roads to the north of the site it potentially avoids peak period congestion around Persley Bridge and Haudagain.
- 3.2.12 Bridge of Don is approximately 4km south east of the site accommodating direct connections to the city centre and beyond. Access to this crossing involves traffic from the Grandhome site routing through Bridge of Don (a network which can become congested at peak times) and Ellon Road, which is part of the A90 to the North of the AECC and the A956 to the south. Ellon Road is a principal public transport corridor which includes the Park and Ride facility at the AECC opposite the Parkway junction and bus priority measures along the route.
- 3.2.13 Provision of the Third Don Crossing linking directly to the south east corner of the site will in future provide the most direct connection between the site and destinations in and around the city centre. The Third Don route will include cycle priority measures and bus route provision as well as providing a more direct route for vehicular traffic towards the City Centre. Following

an inquiry into the compulsory purchase of land in 2011 the City Council anticipates this link being in place by Autumn 2015.

3.2.14 The AWPR will provide an east-west orbital route around the city some 4km north of the Grandhome site with a junction with the A947 at Parkhill. This route will accommodate connections to wider destinations around the city to the west, south and beyond.

3.2.15 Proposals for a new pedestrian/cyclist connection to the redeveloped Mugiemoos Mill site to the south west will potentially add a further opportunity to serve local movement demands and integrate the site with local networks immediately to the south west. The recently published draft River Don Corridor Supplementary Guidance indicates aspirations for the provision of a number of additional non motorised crossings of the Don to the west of the site but these are not committed.

3.3 Current Path Networks – Foot and Cycle

3.3.1 Existing walk and cycle networks in the vicinity of the Grandhome site are heavily focussed on the existing road network. There are footways alongside both the Parkway and Whitestripes Avenue but only on the side opposite the site frontage. There is no provision along Whitestripes Road to the north of the site. A signalised pedestrian crossing is located across the Parkway to the east of the Whitestripes Avenue junction. However, there are no provisions for pedestrians to cross the Parkway to the west and no existing footpath connections are provided into the adjoining Danestone residential area to the south away from the Whitestripes Avenue junction. Pedestrian routes into Middleton Park from Whitestripes Avenue are available alongside existing residential access roads (Valentine Road and Buckie Road) with the former alignment of Whitestripes Road east of its junction with Whitestripes Avenue and as far as the Parkway preserved as a pedestrian/cycle route and part of the Core Path network serving Middleton Park.



Whitestripes Avenue Footpath

- 3.3.2 Under the Land Reform Act (Scotland) 2003, Local Authorities within Scotland are required to provide information on rights of way that provide reasonable access throughout an administrative area. This involves the preparation of a Core Paths Plan.
- 3.3.3 Aberdeen City Council's Core Paths Plan provides information regarding the nature and location of available footpaths and cycleways within the general location of the Grandhome development site. Details of these Core Paths and other rights of way are shown on the plan at Diagram 3.4. The existing Core Paths network comes close to the site in three locations – Whitestripes Farm, the corner of Whitestripes Road and Whitestripes Avenue and near the Parkway/Whitestripes Avenue roundabout. An existing footpath link runs through the site from the end of the Core Path at Whitestripes Farm westwards to Clerkhill Wood, then circles south via Cothill to Persley Quarry woods. This path continues beyond the site to connect to other established paths running east and west along the Don which have been identified by the Council as potential future Core Paths and part of the National Cycle network. A future connection will be created in respect of the pedestrian and cycle bridge at Davidson's Mill with other routes potentially being created elsewhere within the Don Corridor.
- 3.3.4 The Aberdeen Cycle Map (produced by Aberdeen Cycle Forum, a voluntary group encouraging and developing cycling within Aberdeen with support from Aberdeen Council) shows existing cycle facilities such as cycle lanes, as well as cycle shops, cycle parks, recommended quiet routes and recreational routes around Aberdeen. The A90 adjacent to

the south boundary of the site is classed as a 'Dual Use Path', which links onto National Cycle Route 1 further south of the site at the A90 roundabout with Mugiemoss Road.

3.4 Current Public Transport Provisions

3.4.1 Existing public transport in the immediate vicinity of the site is exclusively provided by bus with the route pattern shown in Figure 3.1. Reference is also made to other public transport provisions serving the wider area.

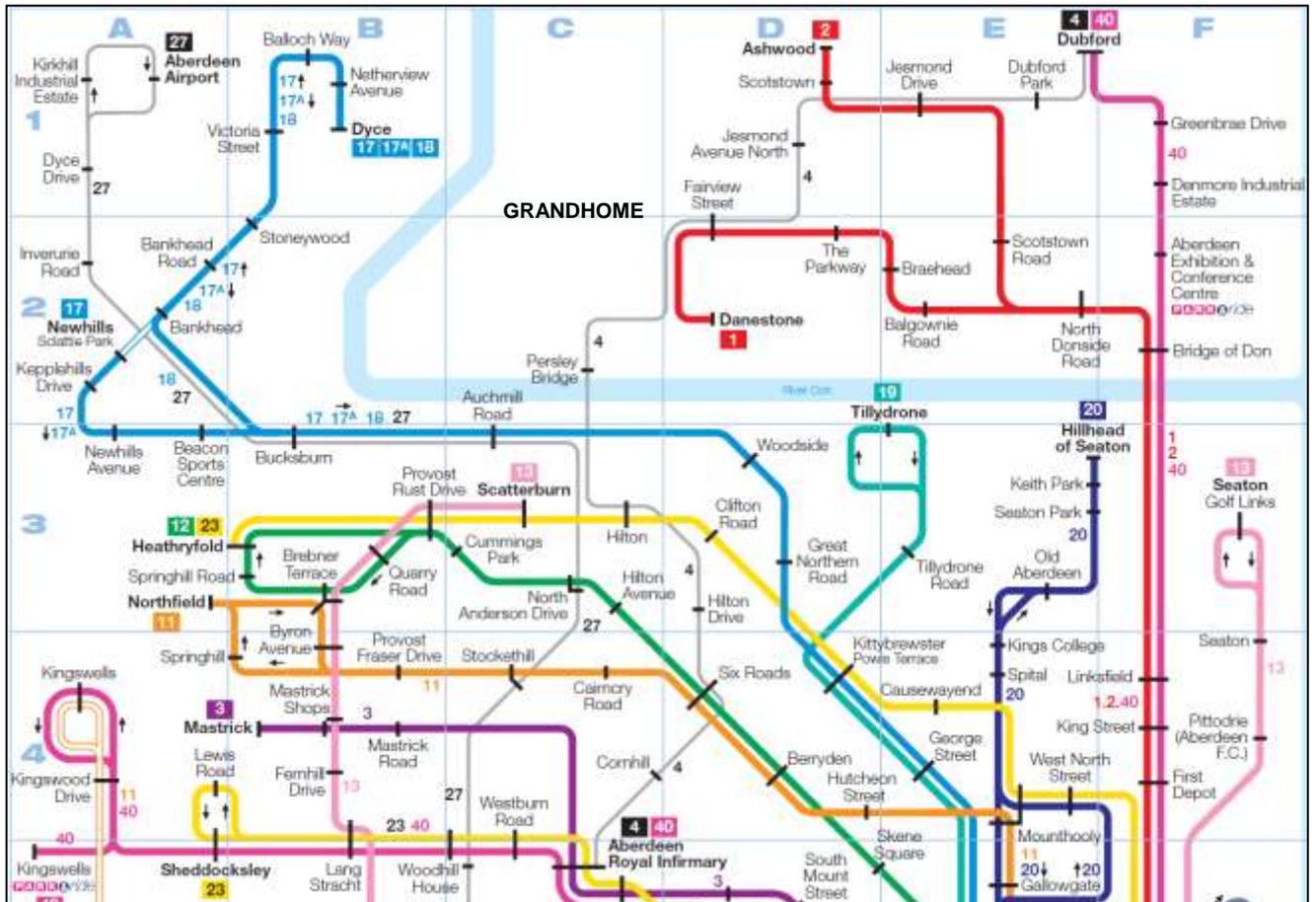


Figure 3.1 Extract from First Aberdeen Bus Route Network Plan

Bus

- 3.4.2 First Aberdeen provides a network of services in Aberdeen City, such services operate on routes 1 and 2 from the city centre via Bridge of Don to Danestone and Ashwood (journey times 36 and 34 minutes respectively). Alternatively route 4 operates to Dubford via the Parkway and Persley Bridge with journey times of 28 minutes to an interchange point at Aberdeen Hospital and a further 20 minutes to the City Centre. Route 4 terminates at the hospital.



First Aberdeen Service 19

- 3.4.3 Also of relevance for the future is service 19 which currently operates from Culter via the city centre to a terminus at Tillydrone south of the Don. Service 19 offers a basic 20 minute frequency service throughout the day with journey times of 16 minutes to the city centre (St. Nicholas Kirk). With provision of the Third Don Crossing it is envisaged that this service would be extended to serve communities north of the Don via the new bridge.
- 3.4.4 Bus priority measures along King Street and Ellon Road available to services on routes 1 and 2 primarily relate to the Bridge of Don Park & Ride site. This facility is proposed to be relocated closer to the AWPR junction at Black Dog to the north although there are as yet no firm proposals for this detailing where it would go.
- 3.4.5 First Aberdeen also provides additional Park and Ride services along the Ellon Road corridor and services to Aberdeen Airport. There are also important regional bus services and inter-

city coach links along this corridor linking the region to other centres in Scotland and beyond provided by Stagecoach Bluebird and other operators.

NESTRANS Bus Strategy

- 3.4.6 In 2009, NESTRANS prepared a Bus Action Plan for the North East of Scotland which outlines a series of measures to improve bus services across the region.
- 3.4.7 The possible introduction of orbital bus services serving new developments (such as those in the Strategic Growth Area) and other peripheral areas is shown to demonstrate a substantial reduction in bus travel time to key areas of the north east and assist growth in public transport journeys to and from new development sites.
- 3.4.8 This strategy is further endorsed in the CTA also produced on behalf of NESTRANS as an appraisal of LDP proposals. The CTA identifies 'a substantial reduction in bus travel time to key areas of the North East' with the provision of new orbital bus services and 'growth in public transport journeys to and from new development sites' assisting in 'providing a more sustainable orientation of travel movements associated with these new sites'.

Park and Ride

- 3.4.9 Bus-based Park & Ride sites are currently provided around Aberdeen at Ellon, Bridge of Don and Kingswells. These facilities have enjoyed varying degrees of success but are an important and growing resource offering travel choice. They contribute to reducing traffic in and on approaches to the City, and free up parking demand in the City Centre. Future proposals are for the completion of a ring of Park & Ride services around Aberdeen, linked to the AWPR, enabling easy access to the City. This will have benefits in terms of reducing congestion, improving urban air quality and providing wider transport choices.

Rail

- 3.4.10 The nearest rail station to the site is Dyce which is approximately 3km to the north west of the site, providing Scotrail services to Inverness to the north and Aberdeen to the south. Aberdeen Railway Station is located approximately 5km to the south east of the site providing East Coast Main Line (ECML) services. The ECML provides connections to a range of destinations with direct access from Aberdeen to Dundee, Edinburgh and Glasgow. Interchange at these locations also provides opportunities to travel further afield to destinations such as Inverness, Newcastle and London

3.5 Current Road Network and Committed Schemes

- 3.5.1 Aberdeen City Council identifies a hierarchy of road types accommodating communications across the city in its 'Roads Descriptor Map' included in its Supplementary Guidance on Transport and Accessibility. An extract from this map showing the status of key links in the vicinity of the Grandhome site is shown at Figure 3.2 below.

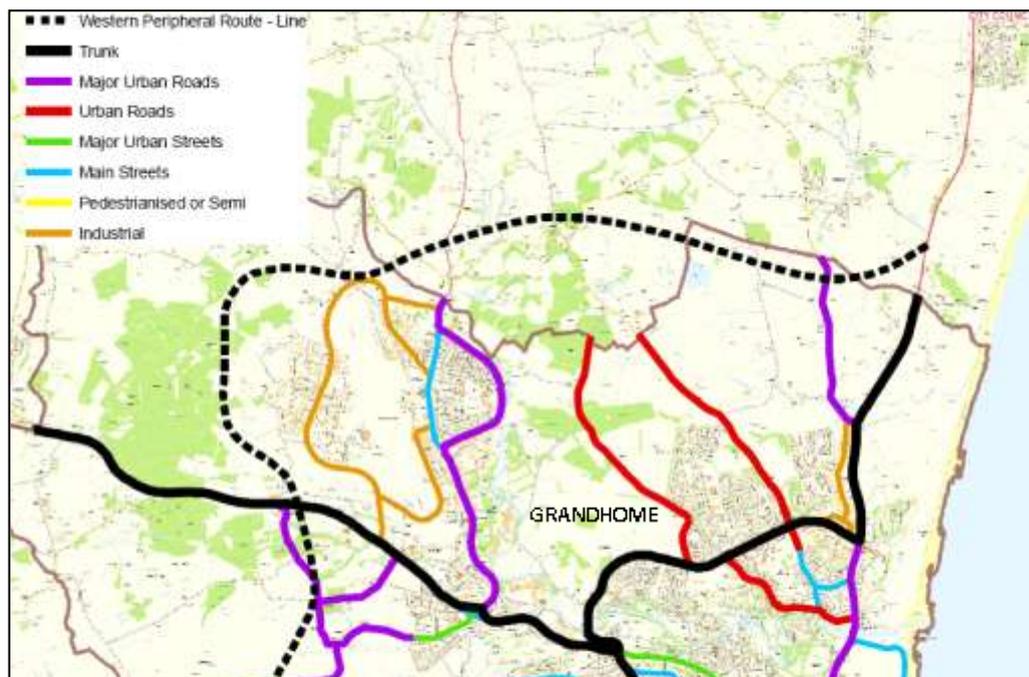


Figure 3.2 Extract from Aberdeen City Council 'Roads Descriptor' Map

3.5.2 At present the Parkway immediately to the south of the site is part of the A90 trunk road route extending from Edinburgh to Fraserburgh. The A90 trunk road presently routes around central Aberdeen via Anderson Drive and the Parkway, intersecting with key radials at major junctions. These include the Haudagain roundabout junction with the A96 trunk road to the south of the Don. From here Mugiemoos Road extends northwards across Persley Bridge to the Parkway and on towards Fraserburgh. The Parkway is a single carriageway with a 50mph speed limit where it passes the site. A section of the road includes a Crawler Lane from the roundabout with Laurel Drive to the start of the site boundary adjacent to the west.



A90 Parkway Crawler Lane

- 3.5.3 Scottish Planning Policy (SPP) confirms that the primary purpose of this network 'is to provide for the safe and efficient movement of strategic long distance traffic between major centres'. As such the provision of new junctions onto this network is 'not normally acceptable' with the case for consideration subject to demonstration of 'significant economic growth or regeneration benefit'. The SPP continues to suggest that 'Direct access onto any strategic road should be avoided as far as practicable'. This confirms the obstacles to be overcome in promoting any access onto this part of the network whilst it retains its present status.
- 3.5.4 Whitestripes Avenue is an 'Urban Road' located to the east of the site boundary; it is a single carriageway road with a 40 mph speed limit, joining onto the A90 to the south at the Buckie Farm roundabout and Whitestripes Road to the north. Whitestripes Road is another 'Urban Road' located to the north of the site boundary; it is a single carriageway road with a 30 mph speed limit initially, connecting onto Scotstown Road to the north, beyond the Aberdeenshire boundary. Scotstown Road is also classed as an 'Urban Road' (within Aberdeen City) providing access to the future AWPR orbital route at Parkhill.
- 3.5.5 In policy terms these 'Urban Roads' are defined as sharing 'Movement' and 'Place' functions equally. As such they would normally be considered appropriate routes from which access might be provided.

The AWPR

3.5.6 The AWPR will be a new orbital route around the west side of Aberdeen described as ‘the most important infrastructure project taking place in the North East (which) will bring a range of substantial benefits to the region’. Its construction is anticipated to provide ‘a much needed fast and safe route around Aberdeen which links with the existing major roads and key locations such as the airport, park and ride sites and the major industrial estates around the City’. The approved line of the AWPR is shown at Figure 3.3.



Figure 3.3 AWPR Route

- 3.5.7 The main part of the route follows an orbital alignment around the city to the west, with interchanges with the A93, A944, A96, A947 and A90 to the north of the city at Black Dog and planned to connect with the A90 at a replacement A956 interchange at Charleston to the south. It is projected to carry over 43,000 vehicles per day over its busiest section.
- 3.5.8 Being promoted by Transport Scotland as part of the expanded trunk road network, the AWPR was initially expected to be open to traffic by 2012 having received the approval of the Scottish Government following a public inquiry in 2008-2009. Following a series of legal challenge in 2011 (which had resulted in delay) the project is now going ahead and is expected to open to traffic in 2018.
- 3.5.9 Following completion of the AWPR the present trunk road network within the city (including the Parkway) will be de-trunked. However, existing routes are likely to remain 'Major Urban Roads' where the traffic and movement function will continue to dominate

Third Don Crossing

- 3.5.10 An extra bridge has been planned over the River Don between Tillydrone and land to the east of Grandhome for many years, together with a new road link to the Parkway, along with footways, segregated cycleways and landscaping along the route. The new road will start at the Buckie Farm roundabout between the Parkway and Whitestripes Avenue and follow the route of Fairview Street south towards the bridge. South of the river, the route will connect with St Machar Drive via Gordon's Mill Road, Tillydrone Road and Tillydrone Avenue. Following the successful outcome of a compulsory purchase audit process, the new crossing is expected to be completed by Autumn 2015.



Third Don Crossing

The Haudagain Junction

- 3.5.11 The Haudagain Roundabout between the existing A90 and A96 trunk roads has been described as the 'Worst roundabout in Britain' due to current levels of traffic congestion experienced at peak times. Despite the anticipated relief afforded to the operation of this key junction between the Anderson Drive orbital and Auchmill Road radial following the provision

of the AWPR and Third Don Crossing, Transport Scotland is committed to delivering improvements to address this concern. An initial public consultation process to consider alternative options for upgrading the present junction layout identified three possible options in 2006 and Transport Scotland has subsequently appointed design consultants in April 2013 to identify a preferred detailed design. Implementation is expected to follow opening of the AWPR in 2018 but details of a preferred scheme presently remain to be identified.



Haudagain Roundabout

4 Development Proposals

4.1 Overview of Masterplan and Development Framework Strategy

- 4.1.1 The Proposal for development at Grandhome, has emerged from a comprehensive and inclusive design development process. Commencing with the site's allocation through the SSCI initiative, this process has involved extensive consultation with stakeholders and members of the public as outlined previously. The vision for Grandhome stems from principles of sustainable urbanism, which promotes the design of walkable neighbourhoods offering a range of housing types, as well as shops and jobs, in order to lessen car dependency and promote a sense of wellbeing and community.
- 4.1.2 Preparation and approval of the Grandhome Development Framework forms part of the on-going process to deliver a new urban extension to Aberdeen to cater for the city's anticipated growth over the next 10-20 years. As such it sets out the key components of the new settlement of Grandhome and the approach to be adopted to ensure the successful development of up to 7000 dwellings and associated uses.
- 4.1.3 The key parameters for the development are as follows:
- A total of up to 7000 homes of which 25% will be affordable;
 - 5 hectares of employment land, including a technology park;
 - 7 neighbourhoods, each supported by shops and services;
 - Up to 3 primary schools incorporating sports pitches and community uses;
 - A community campus including an academy, library and sports centre;
 - A health centre;
 - A network of open space, connected to the wider area, including sports pitches, neighbourhood parks and habitat creations; and
 - A vibrant town centre high street to support the wider Bridge of Don area.
- 4.1.4 The Framework also provides the context within which future planning applications will be developed, and against which they will be assessed
- 4.1.5 Grandhome will be a walkable and connected new community, enabling a compact and efficient layout of development, designed following the policies contained within 'Designing Streets'. The vision is underpinned by the delivery of six core principles:
- Strong Sense of Place
 - Sustainable and Walkable Neighbourhoods
 - A well-balanced Mixed Community

- Green Spaces to Breathe
- Well-connected Streets
- A New Centre for the Bridge of Don

4.2 Phasing

4.2.1 The phasing strategy has been determined in response to the following considerations:

- Delivery of the first phase assumes that the Third Don Crossing is in place and aims to reach completion prior to the opening of AWPR;
- Second and future phases will be delivered after 2018, once the AWPR is in place;
- It has been agreed with both Aberdeen City Council and Transport Scotland that access should be taken from Whitestripes Avenue and Whitestripes Road in advance of de-trunking of the Parkway in 2018. Following the change in status of the Parkway it is also agreed that a principal access can be accommodated along this frontage subject to confirmation that adequate capacity can be provided to maintain acceptable performance of what will remain a major traffic route

4.2.2 In line with the current anticipated timescale for delivery of the AWPR by early 2018 and the completion of the Third Don Crossing by Autumn 2015, it is proposed to assess the implications of occupation of the 500 houses at Phase 1 related to existing network conditions with provision of the Third Don Crossing but not the AWPR at 2018. It is not envisaged that significant complementary land uses would be provided on the site in this timescale. However, it is accepted that further development would be subject to provision of the AWPR.

4.2.3 The Grandhome phasing strategy reflects housing allocation release phasing set out in the LDP and the delivery of the AWPR and Third Don Crossing. In total there are 7 phases (each with a neighbourhood), a vibrant town centre and business park with development of the first 5 phases allowed for in the PPiP and present traffic analysis. The neighbourhoods will be known as Laverock Brae, Whitestripes Bonnyside, Persley Brae, Clerkhill and Cothill – all names that correspond with historical features on the site. The proposed phasing is illustrated in Figure 4.1.

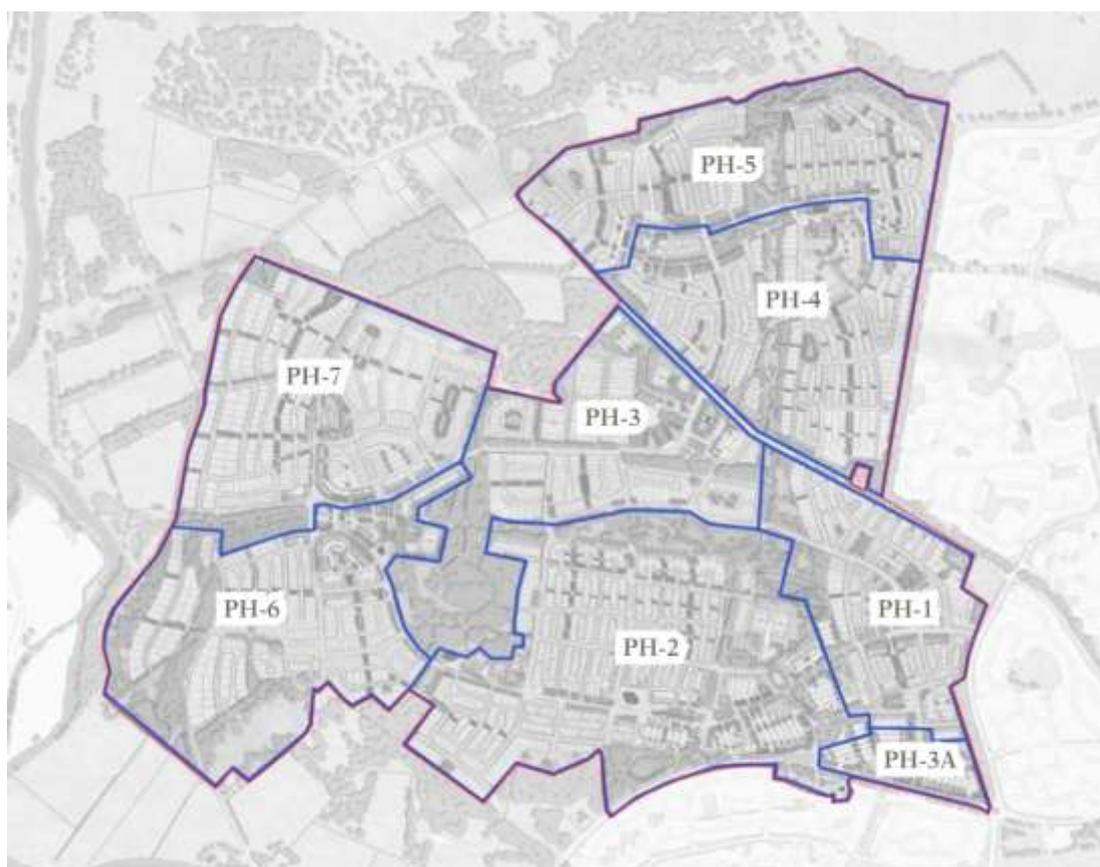


Figure 4.1 Proposed Phasing

4.2.4 The second phase of development will see the development of around an additional 1,800 homes and the formation of Grandhome town centre. As the population of Grandhome grows through subsequent phases, additional demand will act as a catalyst for the development of further retail and commercial uses that will ultimately complete the full complement of town centre uses. Table 4.1 displays the phasing sequence.

Phase	Neighbourhood	Approx units
1	Laverock Brae	500
2	Grandhome town centre	1800
3	Clerkhill	500
4	Whitestripes/Bonnyside	1200
5	Whitestripes/Bonnyside	950
6*	Persley Brae	1100
7*	Cothill	1000
Total		7000

* Available for delivery in the next Structure Plan period

Table 4.1 Phasing Sequence

4.2.5 The business park will sit outside the phasing sequence and will be delivered as demand requires.

4.2.6 As previously noted, current analysis focuses on the delivery of no more than 500 houses being occupied by 2018, 1500 at 2023, 4700 by 2032 with the possible future allocation of up to 7000 households occupied in the early 2040s. This is an assumed programme based on an annual completion rate of 200 homes. Clearly, if market demand increases, then delivery timescales would shorten.

4.3 Transport Network Provision

Principles

4.3.1 Transport networks within the site are based around a network of alternative routes aimed at maximising connectivity for all users between neighbourhoods, the town centre, employment centres and external points of access. Particular care has been taken to ensure that the needs of the elderly and mobility impaired can be addressed consistent with the requirements of the Disability Discrimination Act.

4.3.2 Consistent with the principles outlined in 'Designing Streets' internal networks have been developed to ensure the appropriate allocation of priorities between accommodating demand for movement and securing a sense of place for future residents and other users. In designing provisions for movement the opportunity has been taken to prioritise the needs of pedestrians as the most sustainable form of transport, cyclists (generally accommodated on the carriageway, following routes which are as direct as possible) and public transport following main thoroughfares designed for the purpose. Traffic movement is accommodated via a network of alternative connections avoiding the use of spine roads or cul de sacs and is channelled at slower speeds through neighbourhood centres and the town centre improving the viability and vitality of those centres.

4.3.3 As part of the design process 'Designing Streets' promotes the application of a Quality Audit process aimed at ensuring that an appropriate balance is achieved between the application of highway design principles and urban design priorities thereby securing an acceptable sense of place. Internal layout proposals for development at Grandhome have therefore been subject to a Quality Audit process as an integral part of the design and implementation procedure.

4.3.4 The Quality Audit comprises a comprehensive review of the layout proposals including:

- An Accessibility Audit detailing access to key facilities within the neighbourhood and wider study area by walking and cycling;
- A Walking Audit providing a review of the pedestrian networks;
- A Cycling Audit of routes most suitable for use by cyclists;
- A Non Motorised User Audit considering accessibility arrangements for those in wheelchairs, those with walking/mobility difficulties, people with pushchairs/young children and others;

- A Community Street Audit aimed at identifying how the local community might best utilise local streets for particular events;
- A Place Check Audit which reviews the design against the six key qualities of successful places identified in 'Designing Streets'; and
- A Visual Quality Audit summarising a review of the streetscape and landscaping proposals.

4.3.5 These initial audit processes will be followed by a more detailed Design Review and Road Safety Audit identifying detailed mitigation proposals aimed at improving the design and resulting in an improved sense of community. The process will conclude by reference to the six key qualities of successful place making identified in 'Designing Streets' aimed at ensuring that they are appropriately incorporated in the design proposals. Together with an accompanying Street Engineering Review it is considered that the process will provide a clear vision of how different aspects of the design will interact. In addressing many of the issues conventionally considered through the Road Construction Consent process it is also anticipated that the resource and time implications of that process should be appropriately reduced through application of the process.

4.3.6 The implementation of strategic infrastructure projects external to the site is key to the delivery of Grandhome. These include the AWPR, the Third Don Crossing and the upgrade of key junctions including the Haudagain roundabout. Together these projects will alleviate current pressures on the city's transport network including localised pinch points such as the Parkway and Persley Bridge. Preliminary discussions with Aberdeen City Council as local roads authority and Transport Scotland have confirmed in principle that initial development can be accommodated on the existing transport network.

Strategy for Pedestrians and Cyclists

Provisions for Pedestrians

4.3.7 Each neighbourhood is designed so that residents will live within a 5 minute walking distance of neighbourhood centres, ensuring ease of access on foot to all essential amenities as well as public transport nodes. Pedestrian provisions are to be provided in various forms or tiers.

4.3.8 Primary active paths form the first tier, linking neighbourhoods with key destinations outside the site. These routes link to the existing Core Paths network and form links between neighbourhood centres, schools and key play areas as shown on Diagram 4.1. These will be segregated all-hour, all weather paths, whether they run parallel to traffic routes or through green spaces. Proposals include a strategic North/South and East/West route through the site as identified in the Action Programme linking to strategic routes outwith the site. Links will be created onto existing core paths including those serving Denmore and Bridge of Don. Routes will connect to existing housing areas.

- 4.3.9 Secondary paths will extend out from primary parts and link to secondary destinations. They will also include attractive alternatives to the primary path network such as those running through wooded areas that may be designed to complement the surrounding natural landscape.
- 4.3.10 In places, shared-surface routes run through residential blocks providing spaces where children can play safely; these also provide convenient shortcuts for people moving through the area on foot or by bike. Pedestrian routes will also be designed to ensure Safe Routes to School principles are complied with.
- 4.3.11 The path network is designed to provide a range of attractive links within and between neighbourhoods, as well as offering a choice of longer routes around the new development and out into the countryside.

Provisions for Cyclists

- 4.3.12 Grandhome is designed to follow the progressive principles of the Scottish Government's 'Designing Streets' policy. The various neighbourhood phases will maximise connectivity using streets designed to promote cycling. The majority of streets within the development will be designated to ensure speeds of 20mph or less meaning they will provide a comfortable and safe environment for cyclists without the need for segregation.
- 4.3.13 Cycle links will ensure a high degree of permeability within the development, also providing connections to the existing core path network in the surrounding area. The Core path network reaches into surrounding built-up areas, such as Middleton Park, Danestone and Dyce, and along a section of the River Don to the west of the site, with an aspiration to extend it further along the river.
- 4.3.14 Where thoroughfares within the settlement link to the wider networks such connections will be designed to accommodate cycles safely and appropriate signage will be provided.
- 4.3.15 The masterplan also connects with the National Cycle Network to ensure site permeability and accessibility. The nearest cycle priority route to the site is NCR 1 which currently passes through Woodside to the south of the Don extending between the centre of Aberdeen and Inverness. As part of redevelopment proposals ACC is promoting the realignment of this route to follow a new off road riverside alignment linking Dyce to Old Aberdeen via new paths which will be DDA compliant. This realignment involves crossing the Don at Grandholm Bridge and passing through Danestone before recrossing the Don at a new bridge into the former Davidson's Mill site at Mugiemoos. It is understood that provision has been made to accommodate this bridge crossing in the design of the masterplan layout for redevelopment of the Davidson's Mill site.

Public Transport Strategy

- 4.3.16 Public transport provision will focus on bus services which will involve adapting and extending existing provision serving the area. The identification of a Public Transport Strategy to serve the phased implementation of development has been the subject of discussion with the Aberdeen City Council Public Transport Unit (PTU) and bus operators including First Aberdeen and Stagecoach Bluebird. It is anticipated that as the settlement grows it will become increasingly viable for operators to extend and divert services through the community on a commercial basis.
- 4.3.17 Bus stops are located within a short walk of all homes in line with Policy which requires access to bus services within a 400m walk distance. The location of stops within neighbourhood centres will allow passengers access to shops and other facilities as an integral part of their journey.
- 4.3.18 Because each neighbourhood is focussed on equivalent walking distances that means that numbers of bus stops can be suitably limited in the interests of minimising journey times and maximising attractiveness to users and operators whilst still ensuring appropriate penetration.
- 4.3.19 Bus routes within the site will be accommodated by designing a core network of main thoroughfares of width generally not less than 6.0m ensuring that all parts of the built up area are within 400m walk distances of bus stops as determined by PAN 75.
- 4.3.20 Both the high street and main street road types are able to accommodate buses, and are thus proposed bus routes. Bus routes have been identified for phased implementation, with an initial loop serving Phase 1 via access from Whitestripes Avenue. This penetration is progressively extended to serve subsequent phases with additional access from the Parkway and links between the town centre and the western neighbourhood centre and community campus as development progresses. This loop is further extended to serve Bonnyside and Whitestripes, north of Whitestripes Road at full development of 4700 households, with a further extension required to serve the possible future allocation of 7000 households to the west.
- 4.3.21 This internal route pattern within the Grandhome site at Phase 1 is shown on Diagram 4.2 with further extensions as the settlement develops illustrated at Diagram 4.3. These diagrams also show the suggested locations of bus stops and catchment areas confirming that all parts of the settlement are within the required 400m walk distance of the network of stops.
- 4.3.22 The scale of development proposed is anticipated to support provision of services at a suitable frequency without financial support prior to the full occupation of 4700 houses, further increasing the attractiveness of this mode of travel. Initial development of Phase 1 may be served by a variant of service 1 via Whitestripes Avenue. With the Third Don Crossing available prior to full occupation of Phase 1 it is anticipated that the most attractive option will entail extension of service 19 from Tillydrone to a new terminus within the site offering the most direct connection towards Aberdeen City Centre. Additional modifications to services 2

and 4 which currently operate in the vicinity of the site have also been the subject of discussion with the PTU and operators offering alternative connections as the community develops.

- 4.3.23 There is also the potential for the development of orbital routes serving existing attractions and future development opportunities around the periphery of the city. Options identified in the CTA study promoted by NESTRANS include a new service operating from Ellon to Stonehaven via Anderson Drive and Altens. Such a service is anticipated to operate on a 20 minute frequency with principal stopping points at Balmedie, Blackdog, Murcar, Dubford, Grandhome, Royal Infirmary, Woodhill House, Garthdee, Kincorth, Altens, Loirston, A90 South P&R, Portlethen, Chapelton, Newtonhill and Stonehaven.
- 4.3.24 Current discussions with operators have naturally focussed on requirements of serving initial phases of development with Phase 1 expected to be served via variants of service 1 and/or 19 as detailed above. Both operators have expressed interest in the provision of services and further discussions will consider additional opportunities as development proposals progress.

Strategy for Internal Vehicle Circulation

- 4.3.25 The Strategy for Street Design and Internal Vehicle Circulation adheres closely to the qualities identified in 'Designing Streets'. Following these principles emphasis has been placed on ensuring that the layout is: *Distinctive* in helping to identify the separate character of individual neighbourhoods; *Easy to Move Around* offering a legible network of thoroughfares, avoiding cul-de-sacs and providing suitable routes for buses; *Adaptable* allowing different combinations of vehicle movement and parking opportunities without compromising pedestrian/cyclist accessibility; and *Welcoming* in accommodating public spaces and safe street networks.
- 4.3.26 Grandhome's masterplan features a permeable, hierarchical street network ranging from the 'High Street' and 'Main Streets' through 'Streets', and 'Minor Streets' to 'Lanes' and 'Pedestrian Paths' as illustrated at Diagram 4.4. All of these street types are designed to promote safe movement, controlling traffic speeds to 20mph as the norm and accommodating shared use by pedestrians and cyclists. This will be achieved through a number of speed management devices, including the provision of staggered crossroads, structural planting along street verges and avoiding the incorporation of long straights with uninterrupted visibility which otherwise encourage speeding.
- 4.3.27 Whilst one of the key objectives is to promote permeability through the provision of alternative routes and connections, it is also appropriate to provide a hierarchical structure around which the internal network of streets can be designed. This is necessary to ensure that the needs of public transport (bus) operation can be properly accommodated as well as other large service vehicles whilst also emphasising an appropriate sense of place for residents and other users.

Parking Strategy

- 4.3.28 Aberdeen City Council recognises parking policy as an essential part of its Local Transport Strategy, influencing the way in which people choose to travel and this principle has been embraced by Grandhome's Parking Strategy. It is recognised that adequate parking is required to secure the attractiveness of an area for development but on the other hand over-provision of parking spaces can sterilise large tracts of land, lead to inflated land prices, reduce building densities and increase distances people must walk between adjacent land uses. A successful Parking Strategy must therefore reflect a balance of conflicting objectives and this requirement is recognised by the council in its application of parking standards.
- 4.3.29 The development framework includes a mixed neighbourhood parking strategy with residential areas allowing for on-street, on-site (side/rear garage), courtyard, and mews parking arrangements. The following principles will underpin the parking strategy for Grandhome:
- Minimising the impact of car parking on public realm, for instance locating car parks behind high-density mixed-use blocks to create more attractive streetscapes.
 - In mixed areas, ensuring car parking is shared when demand for different uses varies over different times and days
 - Garages shall be counted towards the overall parking provision for residential units.
- 4.3.30 This approach is entirely in line with the suggested application of parking standards as detailed in the Council's Supplementary Guidance on Transport and Accessibility. This document stresses the requirement to take account of the shared use of areas particularly if different land uses are in use at different times of day. It is also consistent with the requirements of 'Designing Streets': 'Parking should be accommodated by a variety of means to provide flexibility and lessen visual impact'. Accommodating on street parking is encouraged in the interests of promoting effective traffic calming, adding character and variety to the streetscape, and providing active frontages to the residential areas.
- 4.3.31 A typical section of the High Street and main street will accommodate parallel parking. Parking on residential streets will occur on street on both sides of the road for use by both the Grandhome residents and visitors. Minor streets will also accommodate on-street parking designated on one side. Some properties will feature rear lanes to access garages and back parking bays.

Vehicular Access Strategy-Phase 1

- 4.3.32 Recognising the continuing status of the Parkway as part of the national trunk road network at this time, it is proposed to provide vehicular access to Phase 1 development from Whitestripes Avenue and Whitestripes Road. This strategy also recognises the

appropriateness of the classification of both of these roads as 'Urban Roads' in its Roads Descriptor Map, roads on which the 'Movement' and 'Place' function is shared equally.

- 4.3.33 Outline proposals for the design of priority junctions onto Whitestripes Avenue (matching the existing standard of provision in accessing Valentine Road and Buckie Road on the opposite side of the street) are shown on drawing no. 92071/sk1000D. Proposals include a 'ghost island' layout serving the primary point of access closest to Whitestripes Road with a secondary simple priority junction to the south opposite the existing Buckie Road junction. It is envisaged that accesses onto Whitestripes Road would also comprise simple priority junctions (as indicated on the illustrative masterplan) with more detailed requirements for the design of layout proposals to be subject to the outcome of the capacity appraisal.

Vehicular Access Strategy-Subsequent Phases

- 4.3.34 Following comprehensive development of the settlement the main vehicular access will be provided from the A90 / Parkway with accesses on to Whitestripes Avenue to the east and Whitestripes Road to the north fulfilling a more secondary function.
- 4.3.35 Whilst the Parkway will no longer be part of the trunk road network when access requires to be provided from this frontage (thereby avoiding the objection in principle otherwise arising in respect of providing access onto roads of this status) it is recognised that the Parkway will remain a 'Major Urban Road' carrying significant traffic volumes. Therefore the proposed access junction has been designed in outline with these requirements in mind. Proposals (shown indicatively on drawing no. 92071/sk1003/B) envisage the provision of a large scale signalised crossroads junction also serving modest development on land under the applicants' control on the south side of the Parkway, thereby helping to integrate this part of Danestone into the development. It is envisaged that signal control of this junction, together with the future introduction of signal control at Buckie Farm and possibly other junctions along the Parkway will assist in the future management and control of through traffic.
- 4.3.36 The provision of this principal access onto the Parkway is only part of the Vehicular Access Strategy for full development of the Grandhome site. As previously noted Whitestripes Road is expected to become a principal movement corridor between the Third Don Crossing and the proposed AWPR junction at Parkhill reinforcing its status as an 'Urban Road'. As such it is envisaged that Whitestripes Road will be progressively upgraded through the Grandhome development area to match the existing alignment standards of Whitestripes Avenue. It will be lit and the present speed de-restriction replaced by limits of 30 or 40mph.
- 4.3.37 The Development Framework envisages the provision of some six or seven vehicular accesses onto this newly urbanised section of Whitestripes Road serving the Grandhome development area both to the north and to the south. At least two of these accesses will comprise crossroads junctions to maximise integration between development on both sides of the road. Here it is envisaged that signal control will be required, both to manage traffic

operations safely and also to control crossing flow demands by pedestrians and cyclists. Other junctions will be a mixture of simple and 'ghost island' priority junctions depending on the significance of each junction location and the associated traffic demands expected to arise. Details of junction proposals for all these locations are expected to be identified through further future investigations in the context of subsequent detailed planning applications.

5 Summary of Travel Demand Process

5.1 Introduction

- 5.1.1 Through the development of the Masterplan, details of the proposed land uses and their locations within the site, the travel demands at each assessment case can be quantified. This process has been the subject of extensive discussion with Aberdeen City Council and liaison with Transport Scotland.
- 5.1.2 The methodology developed in this way considered the travel demands arising at three key stages:
- Phase 1 considering up to 500 houses together with a mix of ancillary non residential land uses at 2018.
 - Further assessment of up to 4700 houses, together with a mix of non residential land uses in support of the Planning Application in Principle.
 - A final sensitivity test to consider the demands arising with the full build out of the masterplan of 7000 homes.
- 5.1.3 Full details of the methodology adopted and all input assumptions agreed with the authorities are summarised in the separate Transport Assessment Scoping Report of June 2012. This agreed methodology continues to be applied in forecasting total travel demands by all modes by Phase 1 of development and in deriving demands by non-motorised modes in respect of the 4700 household case.
- 5.1.4 However, following the availability of Aberdeen City Council's updated Access from the North PARAMICS models in September 2013 and agreement that these should be utilised as the basis for traffic analysis of impacts of development of the Grandhome proposals beyond Phase 1, a different approach was adopted to the identification of external vehicle traffic movements associated with these phases of development. This involved factoring the numbers of vehicle trips assigned to/from the Grandhome zones in the council's models by the adjusted level of development proposed by the applicants. Such an adjustment was required by the need to relate traffic demands to the different assessment cases designed to match the revised assumptions about the likely delivery dates for development agreed between the developer and the council (1,250-1,500 households at 2023 and 3,950-4,700 at 2032). In addition it also allows for the effective interaction between household vehicle trip generations and commercial vehicle trip attractions in a manner which is entirely consistent with the approach adopted in the council's models avoiding any inconsistency in approach.
- 5.1.5 This summary commences by outlining anticipated demands by all modes at Phase 1 as detailed in the Scoping Report. It then considers the total travel demands associated with the 4,700 development case now anticipated to be delivered by 2032 in terms of total people trips

and details the totals anticipated to travel by the more sustainable non-motorised modes. (No consideration is given to the movement demands by sustainable modes by the interim case considering development of 1,500 households by 2023 the purpose of which is simply to identify the staging of roads infrastructure provision. As previously noted, external traffic demands associated with this level of development are derived by factoring the matrices utilised in the agreed council PARAMICS models.) Finally, the process also refers to the totals likely to be generated by the possible future allocation of a total of up to 7,000 household on the site as the basis for consideration of the relative impacts of this possible future scale of development.

5.2 Total Travel Demand at Phase 1

- 5.2.1 It is anticipated that the 500 houses being provided at Phase 1 will comprise a typical mix of private house types as well as other land uses consisting of a small level of Retail, Financial and Professional, Food and Drink and Community and Civic land uses. Full details of land uses proposed on site at Phase 1 are detailed in Table 5.1.

Element	Size
Residential	500 Units
Retail	538 sqm
Financial and Professional	90 sqm
Food and Drink	269 sqm
Community and Civic	0.08 Ha

Table 5.1: Phase 1 Land Use Schedule

- 5.2.2 Estimates of travel demands by these Phase 1 development proposals are based on representative survey data from the national Trip Rate Information Computer System (TRICS) database in line with conventional practice. Summarised person trip estimates derived for the peak hour movements (0800-0900 and 1700-1800) associated with Phase 1 are identified in this way.

Mode Split

- 5.2.3 As required by agreement with Aberdeen City Council, the mode split applied to the residential element of Phase 1 is representative of the existing Journey to Work (JTW) mode split relevant to the areas adjoining the site. This information has been determined through the interrogation of Census data for the local area.
- 5.2.4 The application of the identified JTW mode split data to the total residential people trip generations results in the trip proportions during the AM/PM peak hours presented at Table 5.2.

Mode	Share	AM Peak		PM Peak	
		In	Out	In	Out
Train	0.16%	0	1	0	0
Bus	13.12%	13	59	41	21
Taxi	0.92%	1	4	3	1
Car (Driver)	52.07%	52	232	161	84
Car (Passenger)	9.87%	10	44	31	16
Motorcycle	0.81%	1	4	3	1
Bicycle	1.00%	1	4	3	2
On foot	22.05%	22	98	68	36
TOTALS	100%	100	447	310	162

Table 5.2 AM/PM Peak Hour Residential Trip Proportions and Trip Totals by Mode

5.2.5 The only other significant land use proposed for the development with the potential to attract external trips at Phase 1 is retail. Given the size and nature of the element of retail proposed on site, it is highly likely that the associated trips will be of a convenience store based nature. To this end, it is anticipated that the applicable mode split will be largely similar to that identified for the residential JTW based trips.

5.2.6 Applying appropriate TRICS data to the total retail floorspace identified at Table 5.1 and subsequent application of mode split data results in the total number of retail trips by mode shown at Table 5.3.

Mode	Share	AM Peak		PM Peak	
		In	Out	In	Out
Train	0.16%	0	0	0	0
Bus	13.12%	12	10	12	12
Taxi	0.92%	1	1	1	1
Car (Driver)	52.07%	47	40	47	49
Car (Passenger)	9.87%	9	8	9	9
Motorcycle	0.81%	1	1	1	1
Bicycle	1.00%	1	1	1	1
On foot	22.05%	20	17	20	21
TOTALS	100%	90	77	91	94

Table 5.3 AM/PM Peak Hour Retail Trip Proportions by Mode

5.2.7 Whilst there are Food and Drink, Financial and Professional and Civic Land Uses proposed, it has been assumed that the trips associated with these elements are entirely internal or

incidental to other uses. The people trip numbers associated with these land uses are particularly low and the size and nature of each would suggest that the influence they will exert in terms of trip attraction will be minor.

5.2.8 The pedestrian and cycle trips identified in this way will include internal trips interacting between generations and attractions as well as external trips accessing schools and other nearby facilities. (In practice, with the success of the sustainable transport initiatives being promoted for Grandhome, it is anticipated that the proportion of cycle trips would rapidly exceed the 1% observed in other existing adjoining neighbourhoods and provision will be made to accommodate more substantial proportions of trips by this mode in the impact assessment which follows.)

5.2.9 For purposes of securing robust traffic analysis at this initial phase of development, total vehicular trips are derived by aggregating totals from Tables 5.2 and 5.3 and these are distributed to the surrounding network in line with the following assumptions illustrated on Figure 5.1. Resulting demand flows are aggregated with factored observed traffic data for input to individual junction models as the basis for conventional assessment.

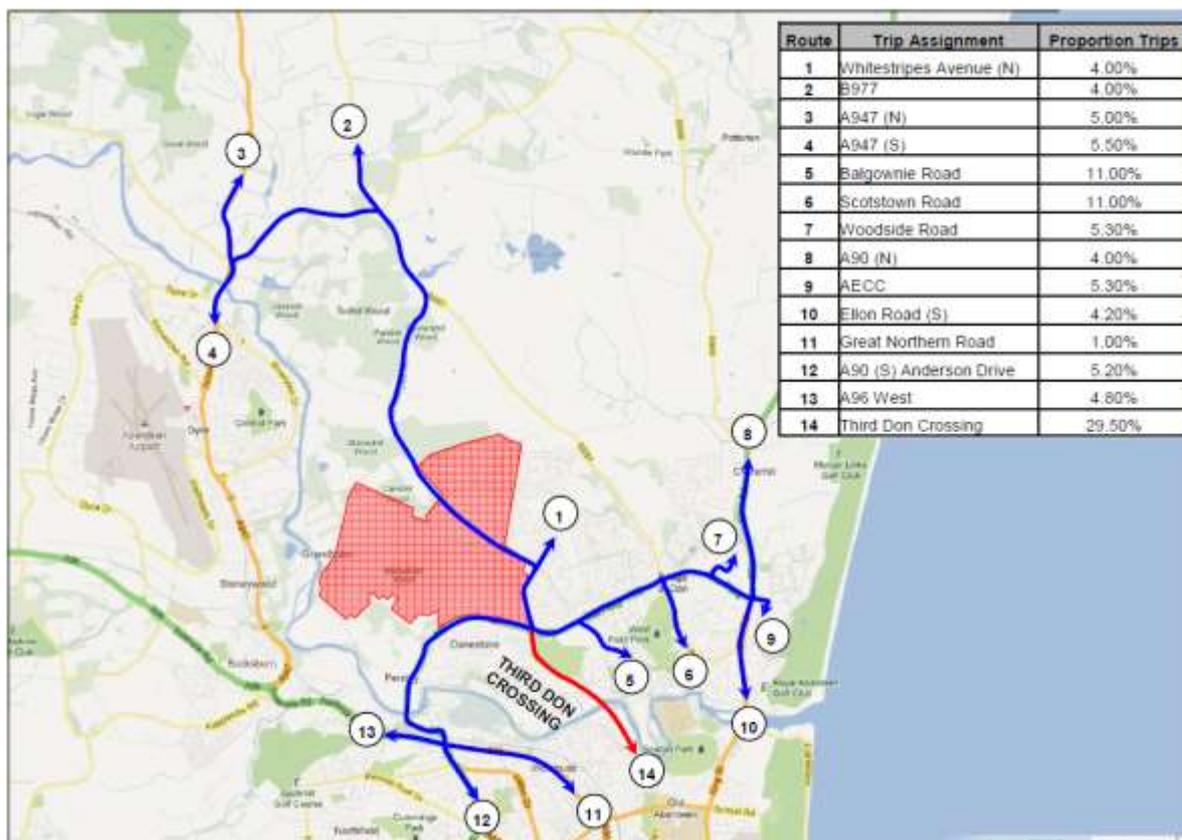


Figure 5.1 Grandhome (Whitestripes) Pre-WPR Trip Distribution

5.3 Total Travel Demand by 4700 Housing Units

5.3.1 The proposal to assess the impact of 4,700 houses assumes a similar mix of private house types together with additional commercial, civic and leisure related land uses. Full details of land uses proposed in this case are shown in Table 5.4.

Class	Use	Type	Size
1	Retail	Convenience	9695 sqm
		Comparison	5000 sqm
		Bulky	5000 sqm
		Supermarket	2700 sqm
2	Financial & Professional		1616 sqm
3	Food & Drink		4848 sqm
4	Business (Office)		18155 sqm
7	Hotels		75 Beds
9	Residential		4700 units
10	Non-Residential Institution	Civic/Community Building	4930 sqm
		School	21750 sqm
11	Assembly & Leisure		2200 sqm
	TOTAL		80394 sqm

Table 5.4: Development Proposals (4700 Units)

Development Residential Generations (4700)

5.3.2 Estimates of total person trip generations by the 4700 residential development have again been based on representative survey data obtained from the TRICS database. The outputs are included in the Scoping Report and summarised below at Table 5.5.

	AM Peak		PM Peak	
	In	Out	In	Out
Trip Rate	0.20	0.89	0.62	0.32
People Trips	940	4197	2909	1523

Table 5.5: Residential Trip generation estimates by 4700 Households

5.3.3 Applying the observed mode split values (as required by Aberdeen City Council) to the total number of people trips derived in this way results in total two way movements of between 975 and 1130 pedestrians, 580 and 675 bus passengers, and 45-51 cyclists generated by this scale of residential development. A majority of these pedestrian trips are expected to be contained internally in view of the typical trip length of journeys by this mode and the range of attractions provided. As noted previously, it is anticipated that the number of cycle trips would exceed these projections and provisions will be made to accommodate these on surrounding networks as well as internally. However, it is likely that the majority of bus passenger trips will require to be accommodated on external services, to and from the site.

Development Trip Attractions

5.3.4 The TRICS database has been used to determine the trip rates associated with the non residential land uses directly. Application of these rates to the relevant floor areas shown in Table 5.4 estimates the total number of person trip attractions during the peak hour.

5.3.5 Given the lack of trip rate information available with regards to the Convenience, Bulky and Comparison retail, it is not possible to accurately identify the number trips associated with each. In order to provide an appropriate estimate, the trip rates relevant to “Retail Park” land uses have been applied to the overall floor areas.

	AM Peak		PM Peak	
	In	Out	In	Out
Neighbourhood Centres				
Trip Rate	12.406	10.547	12.422	12.828
People Trips	200	170	200	207
Mixed Retail				
Trip Rate	0.551	0.299	0.755	0.891
People Trips	100	54	137	161
Supermarket				
Trip Rate	6.923	4.907	12.840	14.047
People Trips	187	132	347	379
Financial and Professional				
Trip Rate	2.207	0.153	0.220	1.973
People Trips	36	2	4	32
Food and Drink				
Trip Rate	0.000	0.000	12.918	6.564
People Trips	0	0	626	318
Offices				
Trip Rate	2.207	0.153	0.220	1.973
People Trips	401	28	40	358
Hotel				
Trip Rate	0.20	0.33	0.38	.27
People Trips	15	25	28	20
Community and Civic				
Trip Rate	15.419	7.489	27.638	13.065
People Trips	8	4	14	6
Assembly and Leisure				
Trip Rate	0.200	0.000	0.000	0.100
People Trips	4	0	0	2
TOTALS	950	416	1395	1484

Table 5.6: Trip Attractions, People Trip rates and Trip totals-4700 Households

- 5.3.6 Given the nature of the ‘Community and Civic,’ and ‘Assembly and Leisure’ land uses proposed, it has been assumed that trips associated with these trip attractors are likely to be secondary destinations for trips with a different primary purpose. School trips are also not separately identified as all movements are assumed to be internally generated, with school capacity provided to serve the local community from this stage onwards. Such trips are therefore already entirely accounted for in the assessment of residential generations.
- 5.3.7 Agreed trip rates and resulting peak hour person trip attractions to each of the principal land uses are summarised in Table 5.6.
- 5.3.8 Applying the observed mode split values from the TRICS rates by each land use category (as required by Aberdeen City Council) to the number of people trips derived in this way results in total two way movements of between 420 and 510 pedestrians, 50 and 60 bus passengers, and 10 and 20 cyclists generated by this scale of commercial development. A majority of these pedestrian trips are expected to be contained internally in view of the typical trip length of journeys by this mode to/from adjoining residential areas. As noted previously, it is anticipated that the number of cycle trips would exceed these projections and provisions will be made to accommodate these on surrounding networks as well as internally. However, it is likely that the majority of bus passenger trips will require to be accommodated on external services, to and from the site in addition to the residential generations.

5.4 Total Travel Demand at 7000 Housing Units

- 5.4.1 Consideration of the possible future allocation of up to 7000 households on the Grandhome site assumes a similar mix of Land uses for the 4700 case. This mix is shown in Table 5.7.

Class	Use	Type	GFA (sqm)
			Ph 1 - 7
1	Retail	Convenience	10610
		Comparison	5000
		Bulky	5000
		Supermarket	2700
2	Financial & Professional		1768
3	Food & Drink		5305
4	Business (Office)		18155
7	Hotels		75 Beds
9	Residential		7000 units
10	Non-Residential Institution	Civic/Community Building	5380
		School	25125
11	Assembly & Leisure		2200
		TOTAL	85743

Table 5.7: Development Proposals (7000 Units)

Development Residential Generations

5.4.2 Estimates of travel demand by the 7000 residential development have been based on representative survey data obtained from the TRICS database and the outputs are included in the Scoping Report and summarised below at Table 5.8.

	AM Peak		PM Peak	
	In	Out	In	Out
Trip Rate	0.20	0.89	0.62	0.32
People Trips	1400	6251	4333	2268

Table 5.8: Residential Trip generation estimates by 7000 Households

5.4.3 Applying the observed mode split values (as required by Aberdeen City Council) to the total number of people trips derived in this way results in total two way movements of between 1450 and 1790 pedestrians, 865 and 1000 bus passengers, and 65 and 80 cyclists generated by this scale of residential development. Once again, a majority of these pedestrian trips are expected to be contained internally in view of the typical trip length of journeys by this mode and the range of attractions provided. As noted previously, it is anticipated that the number of cycle trips would exceed these projections and provisions will be made to accommodate these on surrounding networks as well as internally. However, it is likely that the majority of bus passenger trips will require to be accommodated on external services, to and from the site.

Development Trip Attractions

5.4.4 The TRICS database has again been used to determine the trip rates associated with the non residential land uses. Application of these rates to the relevant floor areas shown in Table 5.7 enables the total number of trip attractions during the peak hour to be quantified.

5.4.5 Several assumptions were made with regards development trip attractions:

- The trip rates relevant to “Retail Park” land uses have been applied to the overall retail floor areas.
- Given the nature of the ‘Community and Civic’ and ‘Assembly and Leisure’ land uses proposed, it has been assumed that trips associated with these trip attractors are likely to be entirely internal to the development site or chained with trips of a different primary purpose as in the 4700 case.
- Primary School trips have been considered to be internal as the proposed new schools will to serve the local community.
- Trips to the Secondary School are composed of internal trips from the proposed residential development and an element of trips from the surrounding catchment.

5.4.6 Agreed trip rates and resulting peak hour person trip attractions to each of the principal land uses are summarised in Table 5.9.

Neighbourhood Centres	AM Peak		PM Peak	
	In	Out	In	Out
Trip Rate	12.406	10.547	12.422	12.828
People Trips	334	284	334	345
Mixed Retail				
Trip Rate	0.551	0.299	0.755	0.891
People Trips	114	62	156	184
Supermarket				
Trip Rate	6.923	4.907	12.840	14.047
People Trips	187	132	347	379
Financial and Professional				
Trip Rate	2.207	0.153	0.220	1.973
People Trips	39	3	4	35
Food and Drink				
Trip Rate	0.000	0.000	12.918	6.564
People Trips	0	0	685	348
Offices				
Trip Rate	2.207	0.153	0.220	1.973
People Trips	401	28	40	358
Hotel				
Trip Rate	0.20	0.33	0.38	0.28
People Trips	15	25	28	20
Community and Civic				
Trip Rate	15.419	7.489	27.638	13.065
People Trips	8	4	15	7
Assembly and Leisure				
Trip Rate	0.200	0.000	0.000	0.100
People Trips	4	0	0	2
TOTALS	1102	538	1608	1678

Table 5.9: Trip Attractions, People Trip rates and Trip totals-7000 Households

5.4.7 Applying the observed mode split values from the TRICS rates (as required by Aberdeen City Council) to the number of people trips derived in this way results in total two way movements of between 310 and 570 pedestrians, 50 and 60 bus passengers, and 20-30 cyclists generated by this scale of commercial development. A majority of these pedestrian trips are expected to be contained internally in view of the typical trip length of journeys by this mode to/from adjoining residential areas. As noted previously, it is anticipated that the number of cycle trips would exceed these projections and provisions will be made to accommodate

these on surrounding networks as well as internally. However, it is likely that the majority of bus passenger trips will require to be accommodated on external services, to and from the site in addition to the residential generations.

6 Measures to Promote Sustainable Travel

6.1 Introduction

- 6.1.1 As a proposal promoted through the Scottish Government's Sustainable Communities Initiative and subsequently selected as one of 11 development projects out of a total of 68 submissions which were considered 'best capable of demonstrating how sustainable communities can be delivered', it is clear that sustainability is at the heart of proposals for the Grandhome development. Of course such sustainability criteria relate to a number of factors other than transportation and travel, but sustainability of the site location is a key consideration with Grandhome promoted in part because of its 'excellent links to existing facilities in the city centre and neighbouring areas'.
- 6.1.2 The recently published Review of Projects Two Years On recognised travel and transportation as a widespread issue across the projects and reviewed the measures promoted to encourage the more sustainable forms of travel under the following headings:
- Facilitation
 - Incentivisation and
 - Promotion
- 6.1.3 'Facilitation' primarily relates to the provision of facilities in such a way as to promote the use of the most sustainable modes of transport through design. For example it includes the spatial design of walkable neighbourhoods and the design standards applicable to the network of streets and paths aimed at maximising the use of these modes. These are issues which are summarised in the Development Proposals summary at Section 4 and more fully detailed in the Development Framework.
- 6.1.4 'Incentivisation' also includes some design-related factors. For example designing the layout of pedestrian paths and walkways and provisions for cyclists to overcome perceived concerns with personal safety or accident potential. However, other incentives to encourage use of public transport for example involve the provision of up to date service information, timetable details and maps and even working with travel providers to negotiate discounted fares for regular bus users and maximise the take-up of existing schemes.
- 6.1.5 Finally 'Promotion' recognises the importance of providing information at the early stages of development in promoting the greatest success in engendering sustainable travel choices prior to the establishment of trends and through initiatives at local schools aimed at developing sustainable travel habits from an early age.
- 6.1.6 The Travel Demand assessment for Grandhome summarised in the preceding section of the TA is based on an extrapolation of existing travel practices by residents of adjoining Bridge of Don neighbourhoods as required by Aberdeen City Council to ensure the derivation of a robust assessment of transportation implications of the development. However, it is

recognised that in promoting the forms of sustainable development proposed for Grandhome there is a great potential to minimise impacts on the wider road network by managing personal travel more effectively. Not only is this objective appropriate in the context of delivering the sustainable community envisaged as securing compliance with objectives of the SSCI, it also has the very real potential of minimising impacts on the surrounding road network and helping to limit congestion. Current experience suggests that the successful implementation of management measures with these objectives in mind has the potential to reduce 'drive alone' commuting by as much as 15 percent if not more. When allowance is made for the fact that the timescale for delivery of full development on the Grandhome site is likely to extend to the 2030s/40s, it is inevitable that such reductions will be seen as a minimum requirement in promoting successful planning of the travel demands by the community.

- 6.1.7 The identification of management initiatives designed to realise these objectives to the fullest extent and their subsequent development and implementation requires ongoing commitment through the life of the project. However, it is clearly essential to identify measures from the outset to demonstrate commitment and to ensure the prospects for success. As the basis for this early intervention a Sustainable Travel Strategy (STS) has been identified and the details of this approach are summarised here.

6.2 Overview of Sustainable Travel Strategy

- 6.2.1 The purpose of the Sustainable Travel Strategy (STS) is to identify initiatives for reducing the need to travel, the distance travelled and the methodologies to maximise the number of trips that can be made by sustainable methods and so reduce the reliance on the use of private vehicles.
- 6.2.2 Proposals considered in the STS focus primarily on the potential to reduce the volume of trips by private car by providing initiatives and infrastructure to encourage a mode shift to more sustainable modes of travel. By appropriate design and the use of alternative working or shopping routines there is also the potential to minimise the need to make some trips.

6.3 Involvement Initiatives

- 6.3.1 Potential measures aimed at residents of the Grandhome Development include:
- Design focus on Walking and Cycling networks and Walkable neighbourhoods.
 - Walking schemes
 - Walking Buses (for schools)
 - Walk to Work Schemes
 - Appropriate and frequent Public Transport with initial provision of minibus shuttle connections to main line services at Newtonhill
 - Facilities to allow Working from Home

- Telecommuting / Teleconferencing
 - Shopper's Lockers
 - Public Cycle Hire Scheme
 - Car Sharing Scheme (CSS)
 - Pool Cars
- 6.3.2 The range of measures available to potential employers on the site includes:
- Dedicated bus / mini bus links to wider area
 - Public Transport Travel Pass Subsidies
 - Cycle buying schemes
 - Appropriate cycle storage and shower facilities on site
 - Car Sharing Scheme (CSS)
 - Intranet database for employees to arrange car shares
 - Preferential Parking for CSS users
 - Strict on site Car Parking Policies
 - Financial incentives for mode change
 - Flexible working hours
 - On site crèche
 - Working from Home
 - Telecommuting / Teleconferencing
- 6.3.3 Successfully achieving the benefits proposed through the implementation of the measures outlined in this strategy will require appropriate administration of an efficient monitoring and reporting system to ensure the measures are relevant and residents / employees subscribe to them.
- 6.3.4 This will involve a structured approach with the Grandhome Trust fulfilling an over-arching role in:
- Approving masterplan principles aimed at delivering an urban design focused on walkable neighbourhoods;
 - Delivering a core network of public transport services from the outset aimed at making public transport the most obvious option for longer distance journeys by most residents and employees;
 - Coordinating initiatives aimed at providing real travel choices for journeys within the settlement and to access other principal attractions.
 - Influencing employers to ensure the adoption of alternative travel initiatives by their employees; and
 - Monitoring overall performance in comparison with pre-determined targets and keeping initiatives under review to ensure that these targets can be achieved.

6.3.5 Within this context employers will be required to:

- Prepare individual Travel Plans to enforce targets for sustainable travel by their employees and visitors;
- Provide the necessary range of facilities to encourage options for working from home and ensure that sustainable travel options will be preferred options of choice; and
- Work with other employers to maximise the opportunities to encourage sustainable travel options through sharing initiatives.

6.3.6 Individual house builders will be required to:

- Ensure that facilities to accommodate working from home and encourage use of alternative modes are 'built in' from the outset (these are likely to include a wide range of measures from provision of high speed internet connections to secure cycle parking); and
- Provide future residents with 'Residential Travel Packs' on moving into their new homes highlighting the advantages of alternative travel and the options available.

6.3.7 Finally residents will be:

- Appraised of opportunities through ongoing initiatives to promote the health and other advantages of sustainable travel; and
- Encouraged to 'buy in' to the wider environmental advantages of choosing alternative travel options.

7 Impact Assessment

7.1 Introduction

- 7.1.1 The Impact Assessment process inevitably concentrates on consideration of the implications of accommodating forecast travel demands on external transport networks, with demands for movement within the site accommodated by planned infrastructure provision and management measures. With the scale of development proposed and the range of complementary land uses and attractions to be provided within the site (particularly as development progresses through subsequent phases) it is equally inevitable that the principal focus of attention is on accommodating demands by public transport and other motorised modes bound for external attractions. Nevertheless appropriate consideration is given to consideration of external demands for movement by more sustainable travel modes, particularly in the early stages of development when the scale and range of internal attractions is more modest.
- 7.1.2 The process concentrates primarily on consideration of impacts of development at two key stages consistent with the planning application process. These are the 'Phase I Assessment' of the impacts of the first stage development of up to 500 houses and the 'Full Development' of up to 4,700 houses on the site as envisaged in the adopted LDP which is the subject of the Planning Application in principle.
- 7.1.3 In addition to these two key stages, further consideration is given to the implications of accommodating up to 1,500 households on the site in traffic terms. As previously explained, this case is not consistent with the phasing strategy identified in the Development Framework. It is however agreed as the level of development most likely to be deliverable within the 2023 time horizon previously anticipated in the LDP.
- 7.1.4 The final stage of assessment involves consideration of the potential implications of final completion of up to 7000 households on the site subject to the further allocation of this scale of development in the emerging Structure Plan review. Based on current programmes it is not envisaged that such further development would be implemented before the 2040s, well beyond the time horizon for consideration of accurate traffic forecasts. As such, any conclusions regarding the implications of this final stage of development can only be regarded as indicative.
- 7.1.5 As noted previously the actual timescales for the delivery of these phases of development would be subject to market demands.

7.2 Impacts on Pedestrian and Cycle Networks

Phase 1

- 7.2.1 Whilst the scale of development envisaged at 'Phase I' (500 households) is comparatively modest compared with 'Full Development' (4,700 households) it is likely that there will be greater dependence on surrounding facilities at this stage of development and thus greater reliance on adjoining footpath and cycleway networks in accommodating predicted levels of demands for pedestrian/cycle movements attracted by nearby workplaces, schools and other attractions. Subsequently, as Grandhome continues to expand, many of these attractions will be accommodated internally suggesting that the principal external attractions for such trips are likely to be leisure-related
- 7.2.2 Principal external attractions for walk trips at Phase 1 are likely to include primary and secondary schools, with no schooling provisions available on site at this stage of development. Based on data agreed with the City Council it is envisaged there would be a maximum of 125 primary and 61 secondary school pupils at this stage of development.
- 7.2.3 It is understood that provision is to be made to accommodate the demands for these primary age pupils at Danestone Primary, with secondary pupils allocated to Oldmachar Academy. Data from the latest Sustrans 'Hands Up Survey' of modal choice by pupils at these schools suggests that, on average 62% of pupils attending Danestone Primary walk to school in 2012 with 76% of pupils attending Oldmachar Academy in 2009 walking (the latest date for which data is available). There is no record of pupils cycling to either school. Applying these proportions to the total number of pupils generated at the Phase I development at Grandhome gives totals of up to 77 pupils walking to Danestone and 46 walking to Oldmachar. In practice, due to the effects of distance (with Danestone Primary some 800m from the centre of Phase I development and Oldmachar Academy some 900m) it is anticipated that the demands for walk trips to school would be considerably less than these averages (with compensating increases in the use of other modes allowed for in the analysis).
- 7.2.4 For walk trips to Danestone Primary the most direct route from the site will be along the existing footway along the side of Whitestripes Avenue, crossing the Parkway via the existing signalised crossing east of the Buckie Farm roundabout and tying into existing Safer Routes to School via Fairview Street. Provision is made for an additional signalised crossing of Whitestripes Avenue to the south of the southern site access as shown on drawing 92071/300D to complete this connection. For movements to Oldmachar Academy the route is in the opposite direction along Whitestripes Avenue, with provision again included for a signalised crossing of Whitestripes Avenue on the approach to the Whitestripes Road junction on drawing 92071/300D.
- 7.2.5 As noted from the Travel Demand exercise the numbers of cycle trips generated by this scale of development is particularly modest, with few (if any) likely to be attracted to either school.

Cyclists could use the same routes as pedestrians. To reach amenities further afield to the south or west, they would have to use Persley Bridge (which is heavily trafficked and not ideal for cyclists) in advance of future provision of the proposed footbridge/cycleway connection through the Davidsons Mill site. Routes to destinations to the south and east (including connections to NCR1) will radically be improved by implementation of the Third Don Crossing and associated priority routes favouring these modes. Connections to these routes from the Phase I development are provided via Whitestripes Avenue and the existing signalised crossing across the Parkway.

'Full Development'

- 7.2.6 At 'Full Development' of 4700 households much greater proportions of the significantly increased movement totals projected to arise are expected to be contained internally and provision will be made to accommodate these on purpose-designed internal networks through the application of the strategies detailed at Section 4. The primary focus for attracting external walk and cycle trips is expected to be related to leisure activities which will be accommodated by links to the surrounding path network, with the footpath network alongside Whitestripes Avenue maintaining connections to commercial attractions. In addition a new direct pedestrian connection will be formed to the adjoining Danestone area via the proposed signalised crossing at the new access junction provided onto The Parkway.
- 7.2.7 Principal external attractions for walk trips at the full development are likely to include the amenities located within Danestone to the south via the proposed signalised crossing onto the Parkway. These include the medical centre, police station, Tesco supermarket, church and gym (as shown in Diagram 3.1).
- 7.2.8 Walking trips to attractions within Middleton Park to the east can be accommodated via the existing Core Path from the junction of Whitestripes Avenue and Whitestripes Road. Within Middleton Park various local amenities are located including local shops, a church, Jesmond Community Centre and Old Machar Academy as well as the Asda supermarket.
- 7.2.9 Cyclists will again access external attractions located further to the south and east via the Third Don Crossing with it dedicated cycling provisions. This route links onto NCR1 providing a route for cyclists towards the city centre. Routes to the south and west will utilise the proposed bridge connection to the Davidsons Mill site.

7.3 Impacts for Public Transport Operations

Phase I

- 7.3.1 Estimates of development public transport demand for Phase 1 (500 units) predict 69 departures and 13 arrivals in the AM peak hour. This level of demand can be comfortably accommodated within existing resource on an extended service 19. Service 19 currently operates using double deck vehicles at 12 minute intervals providing approximately 400 seats

per hour. The extension of this service to the development would mean that development passengers would be first to board each bus, with any possible capacity issues arising downstream towards the City Centre. In practice, as service 19 routes onto A96 at Powis Terrace along a high frequency bus corridor where a further nine Northern Lights services and a number of Stagecoach services operate, it is anticipated that these services would accommodate any displaced downstream demand arising from Phase 1 development.

- 7.3.2 PM peak hour public transport demands are predicted as 53 arrivals and 33 departures, which again can be comfortably accommodated within existing capacity on an extended service 19.

'Full Development'

- 7.3.3 Public transport demands at development of 4700 houses are predicted as 468 departures and 105 arrivals in the AM peak hour, and 325 arrivals and 170 departures in the PM peak hour.

- 7.3.4 The public transport strategy identifies a number of services operating through the development on different routes to serve this scale of development. The predicted levels of demand for AM peak departures are equivalent to six fully loaded double deck vehicles, and are therefore anticipated to require a bus departure approximately every five minutes from the development, with a fifteen minute frequency across three route variants combining to meet this level of demand.

- 7.3.5 Services are anticipated to route principally via the Third Don Crossing route and the A956 King Street corridors to the city centre by a combination of extension of existing services and new dedicated services. Extensions of existing services may be limited to every other vehicle on some high frequency routes to ensure that downstream capacity remains available, with buses serving the development operating in addition to existing resource. The provision of some limited stop services which orbit the development and operate non-stop to and from the City Centre are anticipated to prove attractive to passengers.

- 7.3.6 The opportunity exists to develop an orbital service between key employment centres at Aberdeen Energy Park/Berryhill via A90 Parkway and the development towards the Dyce area and Aberdeen Airport via Mugiemooss Road. Whilst development of the Grandhome site is unlikely to sustain the provision of such services on its own, together with demands arising from other significant developments in the area it is envisaged that there will be the opportunity to develop the provision of such services as envisaged in the CTA.

7.4 Traffic Impact

Procedure

- 7.4.1 The procedure adopted for traffic impact assessment follows the approach outlined in the agreed Scoping Report, adjusted to allow for the revised assumptions regarding the delivery

timescale for development which emerged subsequent to the completion of the scoping process and adjustments to the assessment of traffic demands to maintain consistency with the Council's PARAMICS model analysis. In summary the approach involves:

Phase 1 assessment of the implications of initial development of up to 500 households based on existing observed travel patterns and traffic flows over the network in the immediate vicinity of the site (but with allowance for the anticipated diversion effects of provision of the Third Don Crossing) and considering the performance of site access junctions and other local junctions as detailed in the agreed Scoping Report.

2023 assessment based on further revised travel patterns taking account of the implications of provision of the AWPR and programmed implementation of other identified LDP allocations. As agreed this future assessment is based on application of the Council's latest 'Access from the North' micro-simulation PARAMICS models to ensure robust allowance is made for the effects of these changes across the wider Bridge of Don network. However, the scale of development assumed to be delivered on the Grandhome site in this timescale is reduced from the 4,700 households envisaged in the Scoping Report (which was consistent with the initial LDP allocation and timescale) to 1,500 households (which is consistent with both the applicants' expectation of the scale of development likely to be delivered in this timescale and assumptions applied in the Council's PARAMICS model exercise). As is the case for the Phase 1 analysis, more detailed consideration is given to performance of site access junctions and other identified local junctions based on the PARAMICS model flows and the application of conventional junction analysis techniques.

4,700 assessment is based on the same approach as for the 2023 analysis but utilises the Council's 2032 PARAMICS models as the basis for assessment. Once again this adjustment in the scale of development to be allowed for is consistent with both the applicants' expectation of the scale of development likely to be delivered in this timescale and assumptions applied in the Council's PARAMICS model exercise.

Finally, in respect of the possible future allocation of up to **7,000 households** on the site, such a scale of development is not now anticipated to be deliverable before the late 2030s or early 2040s. Such timescales are well beyond the horizon for which it is realistically possible to make accurate estimates of likely traffic demands. It is also beyond the horizon of any analysis of wider network performance undertaken on behalf of the Council using ASAM or PARAMICS or any other model forecasts. In respect of consideration of the future case for this scale of development therefore, comment is restricted to the likely implications of accommodating the identified demands (based on current observed practices) on existing network proposals in the immediate vicinity of the site. However, it must be recognised that

any requirements for infrastructure changes identified through this process or consideration of wider network impacts would have to be the subject of future detailed investigation.

- 7.4.2 Results of the analysis are summarised in Tables 7.1, 7.2 and 7.3 showing the performance of key junctions in the vicinity of the site for each development case in AM and PM peak hours and highlighting the stages of development at which infrastructure modifications are expected to be required. Full details of junction performance in each case are summarised in relevant appendices.
- 7.4.3 At Phase I analysis is based on the traffic flow networks presented in the Scoping Report and reproduced in Appendix A and the impact assessment process demonstrating the containment of significant impact to this local network.
- 7.4.4 In respect of subsequent analysis cases reliance is based on the Council's 'Access from the North' PARAMICS models as presenting the most realistic forecast of future flows on this local network as well as across the wider Bridge of Don area as noted above. These models were developed following the adoption of the present LDP in 2012 to update previous analysis and ensure appropriate consideration of proposals for the Haudagain junction and Third Don crossing as part of the future Bridge of Don network. Finally made available in September 2013, these 2012 Base Models are based on 2012 traffic turning counts at 45 locations, journey time surveys along principal corridors, registration number surveys to identify through traffic distribution patterns between parallel routes, pedestrian crossing surveys, and comparison with traffic counter data to assess day to day and season to season variability in flows.
- 7.4.5 Future year models are available for 2023 and 2032 allowing for current committed network amendments (Third Don Crossing, AWPR, and Haudagain) together with anticipated levels of implementation of LDP developments including development of the Grandhome site. Where necessary allowance is also made for further notional network improvements expected to be required to accommodate these developments (particularly in the Ellon Road corridor in respect of the 2032 models).
- 7.4.6 These future year PARAMICS models are in turn based on Strategic ASAM4 models of the wider Aberdeen area which aim to take account of the complementary effects of traffic generation by residential proposals in one part of the network and attractions by employment, retail and other land uses elsewhere. This process is fundamental in ensuring no double-counting which would otherwise occur in simply aggregating the effects of individual developments.
- 7.4.7 In order to isolate the specific implications of significant development of the Grandhome site for purposes of the present analysis, further ASAM4 tests have been commissioned to derive 'No-Grandhome' base cases at both 2023 and 2032 by allowing for equivalent levels of trip

generation to be re-distributed across the wider Aberdeen area. This has ensured consistency in the approach applied to the analysis of both cases.

7.4.8 Finally, as the basis for detailed junction analysis of the local access network at 2023 and 2032, peak hour traffic flows are extracted from the relevant PARAMICS models as summarised at Appendix B.

Phase 1 Results Summary

7.4.9 The impact of Phase I development of the Grandhome site on the road network in the immediate vicinity of the site and the wider Bridge of Don network has been considered in the context of appropriate scenarios for both the AM and PM peak hours. These scenarios are:

- 2018 Base (Post Third Don Crossing); and
- 2018 Totals (Post Third Don Crossing)

7.4.10 The scenario '2018 Base (Post Third Don Crossing)' includes traffic associated with all committed developments in the area to 2018. Traffic flows are based on observed 2012 turning counts with allowance for diversion to the Third Don Crossing consistent with the findings of the 'Access from the North Proposals (Third Don Crossing) Final Report October 2005 (based on ASSAM3 modelling). No growth has been applied as the committed development traffic represents the level of traffic growth in the area between 2012 and 2018.

7.4.11 The final scenario '2018 Totals (Post Third Don Crossing)' includes the Grandhome Phase 1 development traffic.

7.4.12 The analysis of junction performance under each scenario has been carried out using PICADY or ARCADY as appropriate at the following locations:

- Proposed site access onto Whitestripes Road
- Proposed site access onto Whitestripes Avenue north
- Proposed site access onto Whitestripes Avenue south
- Whitestripes Avenue/Whitestripes Road junction
- Whitestripes Avenue/Buckie Road junction
- Whitestripes Avenue/Valentine Road junction
- Whitestripes Avenue/Parkway junction (Buckie Farm roundabout)

7.4.13 For each of the existing priority junctions models have been calibrated by reference to existing observed junction performance and levels of queues. At Buckie Farm Roundabout further checks have been made to ensure consistency of performance modelled through ARCADY with relevant Paramics model tests.

7.4.14 For testing purposes performance of the Whitestripes Road access junction has allowed for development traffic flows to/from destinations accessed by Whitestripes Road North only. Access junctions onto Whitestripes Avenue have been modelled to demonstrate the impact of full demands by this assessment case passing through each junction to allow for the potential implications of alternative routing. This approach ensures robust assessment of junction proposals.

7.4.15 A summary of the results of junction analysis at each location is shown in Table 7.1. It should be noted that the development access junctions will only be considered in the '2018 Totals' scenario as the junctions will not exist prior to the occupation and operation of the development. Further details are shown of each individual junction performance in Appendix C. In summary it can be seen that all junctions continue to operate within design capacity with or without addition of phase 1 development traffic with the exception of the Buckie Farm roundabout. Here the junction operates within absolute capacity in the AM peak and is overloaded in the PM peak in the base cases. However with minor amendments to junction entry geometry it is possible to restore no net detriment with the addition of development traffic in both cases.

Junction	Junction Performance Operation			
	AM		PM	
	2018 Base	2018 Base + Dev	2018 Base	2018 Base + Dev
Site Accesses				
To Whitestripes Road	-	✓✓	-	✓✓
To Whitestripes Avenue	-	✓✓	-	✓✓
Other Local Junctions				
Whitestripes Avenue /Whitestripes Road junction	✓✓	✓✓	✓✓	✓✓
Whitestripes Avenue /Buckie Road junction	✓✓	✓✓	✓✓	✓✓
Whitestripes Avenue/ Valentine Road/	✓✓	✓✓	✓✓	✓✓
Buckie Farm Roundabout	✓	NND	X	NND

✓✓ denotes junction operating within design capacity
 ✓ denotes junction operating within absolute capacity
 X denotes overcapacity
 NND denotes no net detriment

Table 7.1 Junction Performance Summary at Phase I

Interim Development

7.4.16 At Interim Development of 1500 households at 2023 performance of the access junctions onto the Whitestripes Avenue network (including the Buckie Farm roundabout) is assessed utilising individual ARCADY/PICADY models as appropriate based on the PARAMICS model outputs presented at Appendix B. In addition performance of a proposed interim signalised access junction onto the Parkway (shown on drawing no 92071/SK1004) is also assessed utilising individual LINSIG models. Results of each analysis are summarised in Table 7.2 and Appendix D confirming that all the proposed access junctions operate within design capacity with the addition of development traffic. At the junction of Whitestripes Road the addition of development traffic results in capacity being exceeded in the AM peak hour and spare capacity being minimised in the PM peak. This situation is resolved by the introduction of traffic signal control resulting in additional advantage for all road users by the incorporation of pedestrian crossing facilities. At Buckie Farm roundabout the performance of the junction is marginally improved as a result of diversion of vehicles to the AWPR and NND is maintained with the addition of development traffic.

Junction	Junction Performance Operation			
	AM		PM	
	2023 Base	2023 Base + Dev	2023 Base	2023 Base + Dev
Site Accesses				
To Whitestripes Road	-	✓✓	-	✓✓
To Whitestripes Avenue	-	✓✓	-	✓✓
To The Parkway	-	✓✓	-	✓✓
Other Local Junctions				
Whitestripes Avenue /Whitestripes Road junction	✓✓	X	✓✓	✓
Whitestripes Avenue /Whitestripes Road signals	-	✓✓	-	✓✓
Whitestripes Avenue /Buckie Road junction	✓✓	✓✓	✓✓	✓✓
Whitestripes Avenue/ Valentine Road/	✓✓	✓✓	✓✓	✓✓
Buckie Farm Roundabout	✓	✓	X	NND

✓✓ denotes junction operating within design capacity; ✓ denotes junction operating within absolute capacity
X denotes overcapacity ; NND denotes no net detriment

Table 7.2 Junction Performance Summary at 2023

7.4.17 Network performance statistics derived from the PARAMICS model tests reveal comparatively minor deterioration in overall network performance and increased journey times as a result of the predicted increases in Grandhome development traffic. This is illustrated by comparison of overall speeds for the AM and PM peak periods summarised at Figures 7.1 and 7.2 respectively.

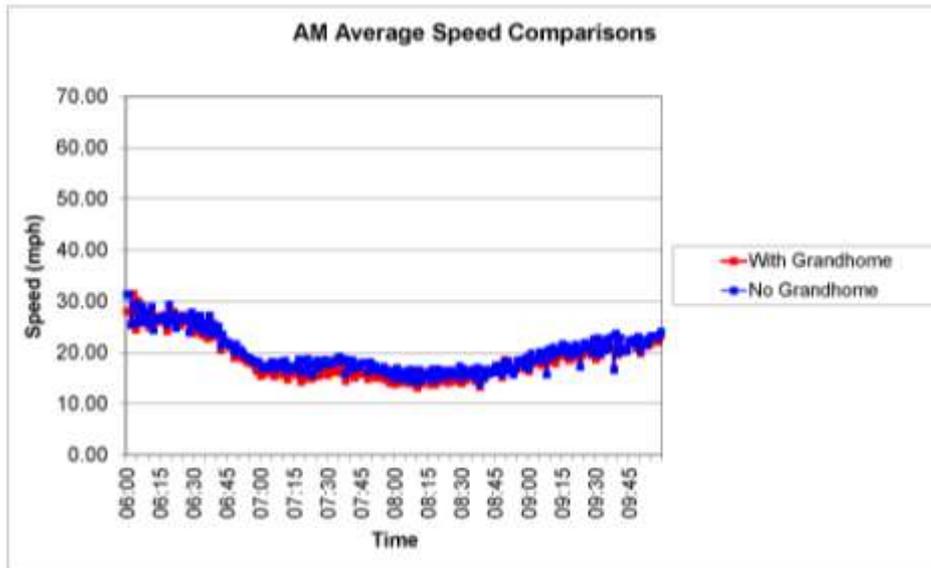


Figure 7.1 Average Network Speeds AM Peak Period 2023

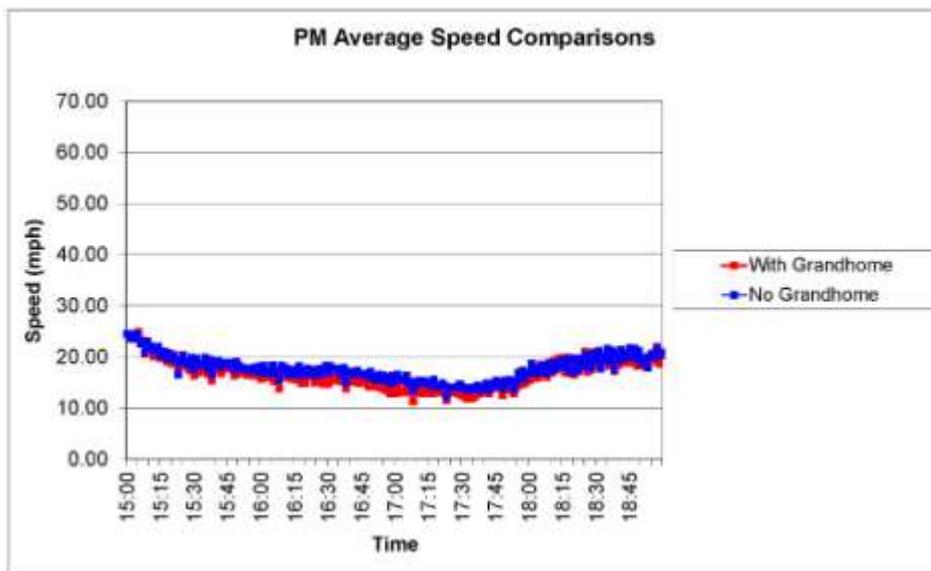


Figure 7.2 Average Network Speeds PM Peak Hour 2023

7.4.18 In addition average journey times have been examined across five routes leading to and from the site results of which are reproduced in Appendix E. The routes selected are:

- Between Haudagain and Ellon Road via the A90 and Buckie Farm roundabout in both directions;
- Between Great Northern Road and Inverurie Road via the A96 and Haudagain in both directions;
- Between King Street and the Parkway via the A956 and Bridge of Don in both directions;
- Between the Parkway and St Machar Drive via the Third Don Crossing in both directions; and
- Between the Parkway and Bridge of Don via Balgownie Road in both directions.

7.4.19 In summary most substantial increases in journey time occur on the route between Ellon Road and Haudagain in the AM peak period (where there is a predicted increase of 132 seconds between Buckie Farm and Persley Bridge) and on the Third Don route also in the AM peak period (where there is a predicted increase of 73 seconds between Tillydrone and St Machar Drive). All other AM peak period increases are comparatively modest (30 seconds or less) with maximum increases of less than 50 seconds in the PM peak period between Persley Bridge and Buckie Farm on the Haudagain-Ellon Road route and a similar increase on the Third Don route between Tillydrone and Buckie Farm.

Full Development

7.4.20 The same approach is followed in assessing the performance of the access junction network with Full Development at 2032 based on PARAMICS model outputs again reproduced at Appendix B. By 2032 the network traffic demands result in the requirement to upgrade the Buckie Farm roundabout to a signalised cross roads junction as shown on the model screen shot at Diagram 7.1. Analysis confirms the acceptability of performance of this junction together with the full implementation of the signalised site access junction to the Parkway (as shown on drawing 92071/SK1003B). Results of each analysis are summarised at Table 7.3 and Appendix F confirming that all junctions operate within design capacity following the implementation of appropriate mitigation.

Junction	Junction Performance Operation			
	AM		PM	
	2032 Base	2032 Base + Dev	2032 Base	2032 Base + Dev
Site Accesses				
To Whitestripes Road	-	✓✓	-	✓✓
To Whitestripes Avenue	-	✓✓	-	✓✓
To The Parkway	-	✓✓	-	✓✓
Other Local Junctions				
Whitestripes Avenue /Whitestripes Road junction	X	X	✓	X
Whitestripes Avenue /Whitestripes Road signals	-	✓✓	-	✓✓
Whitestripes Avenue /Buckie Road junction	✓✓	✓✓	✓✓	✓✓
Whitestripes Avenue/ Valentine Road/	✓✓	✓✓	✓✓	✓✓
Buckie Farm Signalised Junction	✓✓	✓✓	✓✓	✓✓

✓✓ denotes junction operating within design capacity
 ✓ denotes junction operating within absolute capacity
 X denotes overcapacity
 NND denotes no net detriment

Table 7.3 Junction Performance Summary at 2032

7.4.21 Network performance statistics derived from the PARAMICS model tests again reveal comparatively minor deterioration in overall network performance as a result of the predicted increases in Grandhome development traffic. This is illustrated by comparison of overall speeds for the AM and PM peak periods summarised at Figures 7.3 and 7.4 respectively.

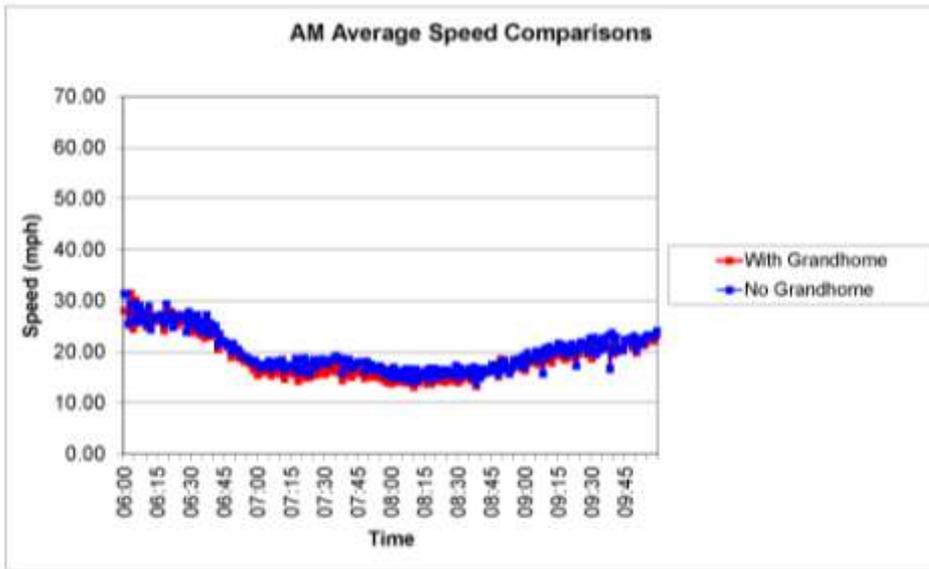


Figure 7.3 Average Network Speeds AM Peak Period 2032

Figure

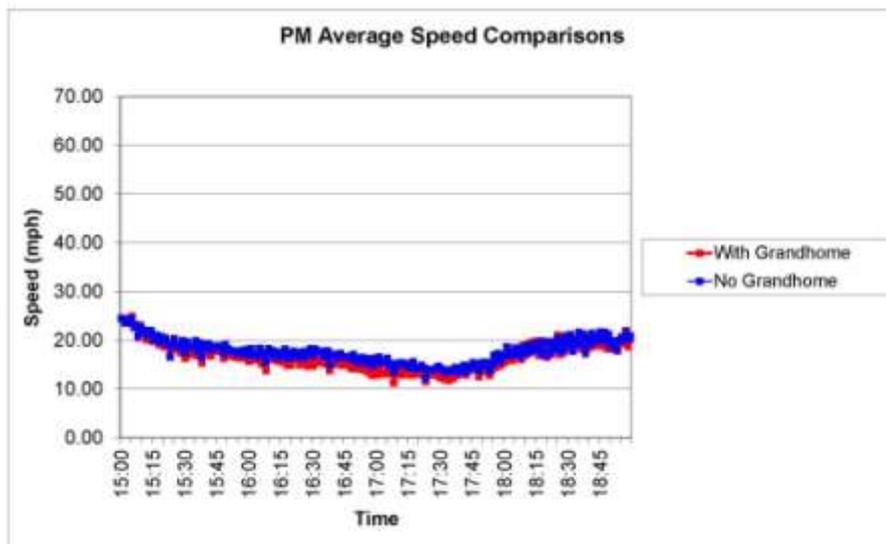


Figure 7.4 Average Network Speeds PM Peak Hour 2032

- 7.4.22 Average journey times for the same five routes leading to and from the site are again presented in Appendix G. In summary the most substantial increases are again experienced on the Ellon Road – Haudagain route in the AM peak period (92 seconds between Buckie Farm and Persley Bridge) and on the Third Don route (42 seconds between Tillydrone and St Machar Drive). In both cases it is noted that the increase in delay is significantly less than in the 2023 analysis. This is explained by the introduction of mitigation measures allowed for in the Council’s modelling at 2032 which assumes the provision of more extensive upgrades on the approach to Haudagain (dualling of Mugiemoos Road) and conversion of the St Machar Drive roundabout to signal control in this timetable. In the PM peak period four locations are identified as revealing journey time increases in excess of 30 seconds. These are the Haudagain – Persley link on the Haudagain – Ellon Road route (plus 78 seconds), Buckie Farm – Persley on the Ellon Road – Haudagain route (plus 62 seconds), Don Street – Haudagain on the A96 route (plus 57 seconds) and Tillydrone – Buckie Farm on the Third Don route (plus 82 seconds).
- 7.4.23 Further investigation into network performance at 2023 and 2032 suggests that the increased journey time on the Ellon Road – Haudagain route in the AM peak period is influenced by the operation of the Persley Bridge roundabout and the volume of traffic continuing to utilise Mugiemoos Road west through the Davidsons Mill development. Contrary to the planning objective to minimise the extent of rat-running traffic on this route and consequential turning movements at the roundabout, current models still allow for substantial volumes of through traffic choosing this route and the models assume a continued 30mph design speed influencing the attractiveness of the route. All this results in increased pressure on the operation of the Persley Bridge roundabout. There is also a design issue with maintaining the current roundabout layout in the context of the Haudagain upgrade proposals involving dualling the Mugiemoos approach which is assumed in the 2032 models. Preliminary investigations suggest that restricting the proportion of through traffic movements continuing to use Mugiemoos Road west and the possible replacement of the roundabout by signal control would result in significant improvement to journey times on this route.
- 7.4.24 As noted previously Whitestripes Road becomes a main urban traffic route giving access to development on both sides of the road. It also provides the most direct connection for existing residents of Danestone and Middleton Park as well as future residents of Grandhome to the AWPR junction at Parkhill. In recognition of these changes the present road alignment will be progressively upgraded through the development area to appropriate standards. This upgrading is envisaged to result in modest carriageway realignment and widening to accommodate an overall width of at least 6.0m, together with frontage footpaths. Lighting will be installed and speeds restricted to no more than 30mph.
- 7.4.25 Whilst it is inappropriate to assess the performance of proposed junctions onto this upgraded route in advance of the identification of more detailed proposals for development, it is noted

that the current Development Framework and street hierarchy promotes the provision of a number of priority junctions and crossroads. This strategy is required to access development areas on both sides of the road and to facilitate appropriate connectivity for movements between both parts of the development area. In recognition of potential safety concerns with the operation of uncontrolled cross roads, it is proposed that the number of cross road junctions would be limited and those provided subject to traffic signal control.

7.4.26 Forecast traffic flows along Whitestripes Road north of the development site area based on outputs from the PARAMICS model analysis indicate increases of no more than 60 vehicles per hour during the PM peak hour at 2032 with more modest increases at other times. Resulting total flows are no more than 600 vehicles per hour or less than 300 vehicles per hour per direction. Whilst it is difficult to assess the capacity of the present road alignment it is noted that the capacity of the lowest road category identified in TA 79/99 'Traffic Capacity of Urban Roads' is at least 750 vehicles per hour (two way) suggesting that no increased link capacity issues would arise as a result of this forecast increase.

7.4.27 In summary the following strategic network changes and access infrastructure are anticipated as being required to accommodate the phased implementation of the development.

Phase	Strategic Enhancements	Network	Site Access Arrangements	Local Mitigation
Phase 1 (500 homes)	<ul style="list-style-type: none"> • Third Don Crossing 		Whitestripes Avenue / Road	<ul style="list-style-type: none"> • Whitestripes Avenue Pedestrian Improvements
Phase 2 (1500 homes)	<ul style="list-style-type: none"> • AWPR • Haudagain Stage 1 Improvements 		Whitestripes Avenue / Road Parkway 'Interim'	<ul style="list-style-type: none"> • Minor alterations at Buckie Farm roundabout • Whitestripes Avenue/Whitestripes Road Junction Upgrade
Phase 3 (4700 homes)	<ul style="list-style-type: none"> • Haudagain Stage 2 Improvements • Buckie Farm Roundabout Replacement • Ellon Road/Parkway Junction Upgrades • Kingfisher Business Park Roundabout Upgrades • Mugiemoos Road Improvements • Whitestripes Road/Scotstown Road Junction Upgrades 		Whitestripes Avenue / Road Parkway 'Full'	<ul style="list-style-type: none"> • Parkway Dualling (site access to Buckie Farm Junction)

Table 7.4 Summary of Infrastructure Delivery Timescales

Future 7000 Households

- 7.4.28 No analysis of the implications of possible future traffic generation arising from development of up to 7000 households on the site has been undertaken in view of the extended timescale for delivery of this scale of development. Not only is it impossible to identify the level of network provision or base traffic levels which might be available in the early 2040s when such a scale of development might be fully occupied, it is equally impossible to quantify development traffic demands with any degree of confidence. Clearly a 40% increase in the scale of development has the potential to increase traffic demands by a similar percentage. However, with the implementation of the sustainable design elements within the Grandhome proposals, initiatives which comprise a fundamental part of the design concept for the new community, there is every prospect of containing such an increase in traffic demands.
- 7.4.29 Whilst the present traffic analysis for the 2032 time horizon (based on delivery of 4700 units with current travel demand practices) suggests that these demands are capable of being accommodated, further substantive increases in demand (if realised) could be expected to require the implementation of further infrastructure provisions (such as the provision of additional site accesses and/or additional off site network upgrades) which it is not presently possible to identify. This conclusion can be expected to apply in respect of any proposals for an equivalent scale of development anywhere in the greater Aberdeen area. However, the locational advantages of the Grandhome site within the existing urban context with the real potential to minimise increases in travel demands by motorised modes has the real potential to accommodate such an increase most effectively.

8 Construction Impacts

8.1 Introduction

8.1.1 Despite the extensive work undertaken to date in consideration of the phasing of development and identification of Masterplan proposals for Grandhome, it is not yet possible to identify definitive details of the types of materials and the quantities likely to be required for the construction process necessary to deliver the new community. This information will, in turn, determine the frequencies of deliveries which will only become available as the project progresses. Nevertheless it is possible and entirely appropriate at this stage of the development process to identify the framework of a Logistics Plan which can then be developed to ensure the effective management of the construction process which is the purpose of this summary.

8.2 Scope of Assessment

8.2.1 Typically a construction logistics study requires to take account of:

- the full range of materials anticipated to be required in the construction of each component of the development (residential, employment, retail, education and other service industry provisions);
- the full range of materials required to facilitate construction of the necessary infrastructure to service these developments (roads, footpath/cycleways, drainage, water supply, power supply etc.);
- the most likely origins of such materials from sources in the local catchment area for bulk materials and from wider markets for higher value components;
- the most likely options for access to the site (road, rail, water) and points of access; and
- the identification of those areas most likely to be susceptible to adverse impacts and therefore requiring protection.

8.2.2 Having identified the range of materials expected to be required to be imported to the site during each stage of the construction process and where these are most likely to be sourced, the exercise will first consider the potential for use of alternative delivery transport modes. In line with conventional practice it is anticipated that the most likely mode for final delivery to and distribution around the site will be road transport even where it may be possible to utilise other modes for longer distance delivery. It is therefore appropriate to focus particularly on requirements to accommodate access by vehicular modes.

8.2.3 In considering the implications of road transport it will be necessary to take account of:-

- traffic volumes – both anticipated volumes of movements to/from the site and likely interaction with peak traffic levels on existing surrounding networks;

- road safety – in respect of potential impacts on existing identified accident black spots and aimed at ensuring safe operation elsewhere on the network;
- prevailing traffic speeds on surrounding networks and implications for the formation of construction accesses;
- requirements to identify prescribed alternative routes for use by construction traffic to avoid areas of sensitive environmental impact or physical weight and width restrictions on existing networks;
- requirements to restrict hours of operation to address impact concerns on properties particularly in sensitive locations;
- requirements to identify noise and vibration issues as well as other adverse environmental impacts;
- requirements to identify local mitigation measures during construction (e.g. carriageway strengthening, traffic control, localised widening/provision of passing places etc); and
- implications of the need to avoid agricultural activities and land ownership constraints in identifying acceptable mitigation proposals.

8.3 Options for Use of Alternative Modes

8.3.1 A majority of materials used in typical construction operations are high volume bulk materials which are preferably located locally. In such circumstances there is typically little prospect for rail or water to be able to offer a competitive alternative to road transport with such modes only becoming competitive in respect of longer distance haulage. In the context of the Grandhome site there is no prospect for directly serving development by water and despite the relative proximity of the main Aberdeen-Inverness rail line, there are no convenient existing facilities capable of being developed to serve in accommodating bulk handling of materials for delivery to the site by rail.

8.3.2 Whilst there may be the prospect for higher value materials sourced from wider markets to be delivered to the local area by rail or water, such materials will have to pass through existing interchange facilities in nearby centres (notably Aberdeen) approaching the site by road. Therefore further consideration focuses on implications of accommodating road transport.

8.4 Identification of a Strategy for Road Access

8.4.1 As previously noted a principal reason for endorsing the suitability of the Grandhome site's suitability for development is its good accessibility from the existing and developing road network serving Aberdeen, including in particular the present A90 trunk road which directly adjoins the site. Not only does this route have the potential to provide direct access into the site, it also provides direct connections to principal suppliers in the local Aberdeen area to the

north and south, as well as providing access to strategic locations via other trunk road connections such as the A96 to the south.

- 8.4.2 The proposals for phased development of the site agreed in principle with the Roads Authorities involve the provision of access at Phase 1 exclusively from Whitestripes Avenue and Whitestripes Road giving the opportunity to limit any potential disruption to operation of The Parkway whilst it remains part of the A90 trunk road. This avoids potential conflicts and safety concerns with the introduction of additional turning movements at accesses onto this road as well as addressing concerns with the possibility of interfering with through trunk road traffic. All turning movements to/from the trunk road will be accommodated at the existing Buckie Farm roundabout presently providing access to Whitestripes Avenue. Buckie Farm roundabout will also accommodate direct connections to/from the city centre via the Third Don Crossing following the completion of this scheme.
- 8.4.3 Both Whitestripes Avenue and Whitestripes Road are classed in Aberdeen City Council's Roads Hierarchy as 'Urban Roads'. On such roads the functions of Movement and Place are given equal weight, suggesting that they are appropriate routes to accommodate servicing and construction activity in adjoining development areas. Existing traffic speeds are restricted to 40mph on Whitestripes Avenue which should ensure that turning movements entering the site via new purpose-built accesses (designed to the same standard as existing accesses along the route) do not give rise to interruptions to existing traffic.
- 8.4.4 Two vehicular access junctions are proposed onto Whitestripes Avenue to serve Phase 1 development of the site with the southernmost of these anticipated to assist in serving future employment and commercial development. The Logistics Plan therefore envisages the allocation of part of this site in the immediate short term to accommodate a construction depot and potential batching plant for handling the delivery of materials to the site accessed via early provision of this junction.
- 8.4.5 There will be the opportunity to source materials on site together with the objective to minimise earth moving and therefore requirements for importation of materials. Local knowledge suggests that a strategy focussed on access via Whitestripes Avenue from the A90 should be capable of directly accommodating delivery of a majority of bulk materials (from sources in Kintore and the A96 corridor), specialist locally sourced materials (from builders' suppliers in the Bridge of Don area) and other specialist materials (from either Aberdeen trans-shipment centres or direct delivery via the trunk road network). It is not envisaged that mitigation measures would be required in respect of the implications of this strategy in view of the availability of direct access arrangements via the existing network from the principal traffic route. However, it will be appropriate to ensure that adjoining residential areas (particularly Middleton Park to the east of Whitestripes, but also Danestone south of The Parkway) are protected from the possible through movements of construction traffic through the implementation of mandatory controls.

- 8.4.6 Although it is not possible to quantify demands for volumes of materials and associated lorry movements in greater detail for this or subsequent phases of development at present for the reasons outlined previously, it is understood that current batching plant capacities in the area have maximum capacities for no more than about 1,000 tonnes per day or 50 lorry loads of material. It is therefore reasonable to assume that this level of activity (representing no more than 1 loaded vehicle at 10 minute intervals over an 8 hour day) would represent the upper limit of frequency of movements. Related to an existing hgv flow of 350 vehicles per day along the A90 in the vicinity of the site such a flow would be expected to result in negligible impacts.
- 8.4.7 As the project develops beyond Phase 1 it is expected that the AWPR will be operational, with its nearest junction at Parkhill accessed via Whitestripes Road. With the de-trunking of The Parkway it is also agreed that a new principal vehicular access to the expanding Grandhome community will be provided onto this frontage. Such changes are unlikely to change the construction access strategy identified for Phase 1 fundamentally, other than helping to dilute the impact of activity on Whitestripes Avenue. Bulk movements from A96 corridor and greater Aberdeen area as well as deliveries of other specialist materials are expected to route via the AWPR and the Parkhill interchange, approaching the site via Whitestripes Road (which is to be progressively upgraded in the context of development of the site). In this context it will also be appropriate to ensure that the un-named lower road through Persley is also protected from use by construction traffic activity through the application of mandatory controls.
- 8.4.8 The location of the Grandhome site in relation to these proposed construction traffic routes and areas to be subject to mandatory controls is shown at Figure 8.1
- 8.4.9 The mandatory controls will be detailed in the Logistics Plan which will be subject to regular monitoring by the construction management team and subject to modifications agreed as necessary with the council to reflect changes in circumstances.

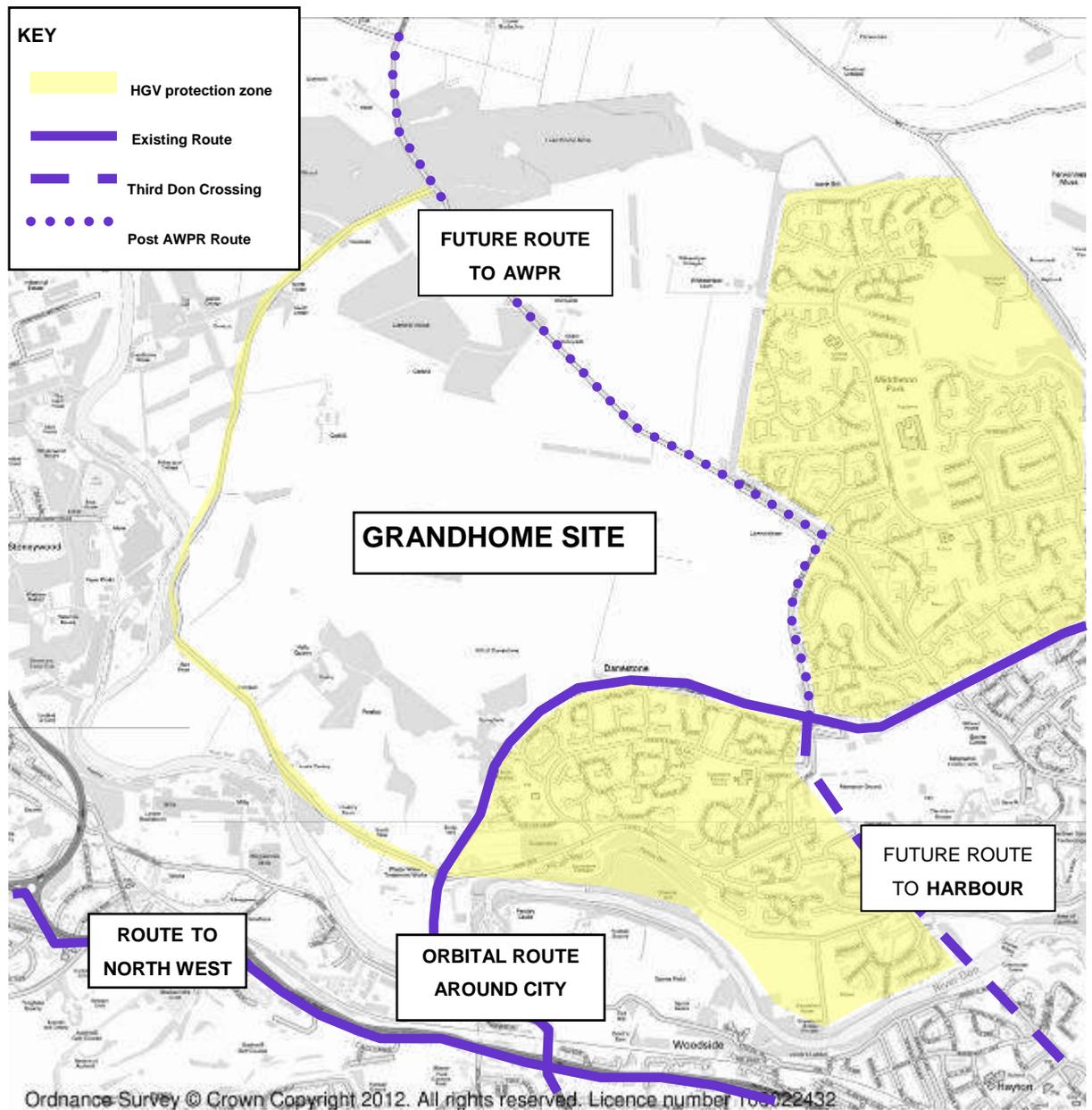


Figure 8.1 Construction Traffic Routes and Protection Zones

9 Summary of Environmental Impacts of Development

9.1 Introduction

9.1.1 In its letter of 26 October to the planning authority on behalf of Transport Scotland advises that the environmental effects of traffic resulting from the Grandhome development should be assessed using the Institute of Environmental Assessment's (IEMA) document "Guide for the Environmental Assessment of Road Traffic (Guidance Note 1)" of 1993.

9.1.2 This summary assesses the likely environmental effects of the proposed Development traffic in the context of this IEMA guidance.

9.1.3 Assessments of potential impacts are carried out and mitigation measures are considered for the increase in traffic on the road network and other potential environmental impacts resulting from the demolition and construction phase, as well as from the operational phase of the proposed Development. Residual impacts are then assessed, taking into account any necessary mitigation measures.

9.2 Assessment Methodology and Significance Criteria

Assessment Methodology

9.2.1 The methodology employed in this assessment was developed from guidance given in the IEMA Guidelines and the complementary IHT Guidelines on traffic impact assessment.

9.2.2 Methodologies detailed in the IHT Guidelines confirm that assessments of transportation and access undertaken as part of Environmental Impact Assessments (EIAs) of large developments should be carried out in accordance with the IEMA Guidelines noted above.

9.2.3 To assess the impacts of additional traffic generated by the proposed Development during the demolition and construction phase, as well as during the construction phase, the following was undertaken:

- The road sections likely to be affected by the Development were identified;
- The existing character of the road network was determined;
- The existing traffic levels on the road network was determined;
- The year of assessment was identified;
- The future base traffic levels were predicted;
- The additional traffic generated by the Development was estimated;
- The potential impacts of the additional traffic were assessed.

- Mitigation was considered, where appropriate;
- Residual impacts were assessed; and
- Summary and conclusions are provided.

Assessment of Sensitivity

9.2.4 The sensitivity of roads was evaluated based on the proximity and size of residential populations and other relevant sensitive receptors to each road. Although the IEMA Guidelines do not provide specific criteria for evaluating sensitivity, for the purposes of this assessment, the sensitivity of roads to potential environmental impacts was evaluated on a scale of 'very low', 'low', 'medium' and 'high'.

Assessment of Magnitude

9.2.5 The magnitude of traffic impacts is a function of base traffic volumes at the year of opening, the percentage increase due to the proposed Development and the changes in type of traffic. The IEMA Guidelines identify thresholds for impact magnitude based on percentage change in traffic levels. The magnitude of impacts arising from the increase in traffic volumes (taken as being either the traffic flow including all vehicles, or the Heavy Goods Vehicle (HGV) traffic flow, whichever is higher) is categorised as follows:

- Substantial: above 90% increase in traffic levels;
- Moderate: between 60% and 90% increase in traffic levels;
- Slight: between 30% and 60% increase in traffic levels; and
- Negligible: under 30% increase in traffic levels.

9.2.6 The determination of the magnitude of the impacts was undertaken by reviewing the proposed Development, establishing the parameters of the road traffic that have the potential to cause an impact and quantifying these impacts against the criteria set out above.

Assessment of Significance

9.2.7 The assessment of the significance of impacts was based on the categories of sensitivity and magnitude in accordance with the approach outlined above, as shown in Table 9.1.

Magnitude	Sensitivity			
	High	Medium	Low	Very Low
Substantial	Substantial	Substantial	Moderate	Negligible
Moderate	Substantial	Moderate	Minor	Negligible
Slight	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 9.1 Assessment of Significance for Impacts on Roads

9.2.8 Impacts are identified as being adverse where there is an increase in predicted traffic flow associated with the Development and beneficial where there is a predicted decrease. Impacts are also assessed as being temporary or permanent, and a spatial significance is assigned (i.e. Site-wide, local, district, regional, etc).

Limitations and Assumptions

9.2.9 Where existing traffic levels are exceptionally low, any increase in traffic flow is likely to result in traffic levels which exceed the thresholds for magnitude outlined in the Assessment of Magnitude section above.

9.2.10 On the other hand, where existing traffic flows are already very high, a further increase in traffic may only result in a very small percent increase, which could nonetheless be significant, as roads operating near or at capacity become more sensitive to an increase in traffic.

9.3 Baseline Conditions

Area of Study

9.3.1 To establish the study area, a threshold assessment was undertaken for the TA in accordance with the IHT Guidelines, which states the following:

“It is recommended that the threshold approach should be used to establish the area of influence of the development. Hence the area should include all links and associated junctions where traffic to and from the development will exceed 10% of the existing 2-way traffic (or 5% in congested or other sensitive locations)”.

9.3.2 Given the nature of the proposal, its location in relation to the existing road network and settlements and likelihood of traffic to travel via the A90 Parkway, it is considered that the A90 Parkway corridor is where the greatest level of impact will be realised. To this end, the flows on the A90 have been considered and increases in traffic at various points on the A90 resulting from the introduction of the new development assessed for the purposes of the threshold assessment.

9.3.3 As part of the TA methodology, consideration has also been given with regards to the large size of the development proposed and the anticipated year of opening. It has been assumed that an initial Phase 1 will be complete in c. 2018 and will represent a scenario where the development is operational prior to the completion of the Aberdeen Western Peripheral Route (AWPR). Delivery of the full development is expected c. 2032. To reflect this situation, pre and post AWPR reference and development cases have been considered at 2018 and 2032 respectively.

9.3.4 The results of the threshold assessment based on the above criteria indicated that the area of influence beyond the new Site access that should be considered in the EIA comprises the following junctions (refer to Figure 9.1):

- The A90 and access roads at the Buckie Farm junction at 2018 and 2032;
- The A90 and associated approaches to the Scotstown Road junction at 2018;
- The A90 and associated approaches to the Laurel Drive junction at 2032.

Phase 1

Full Development

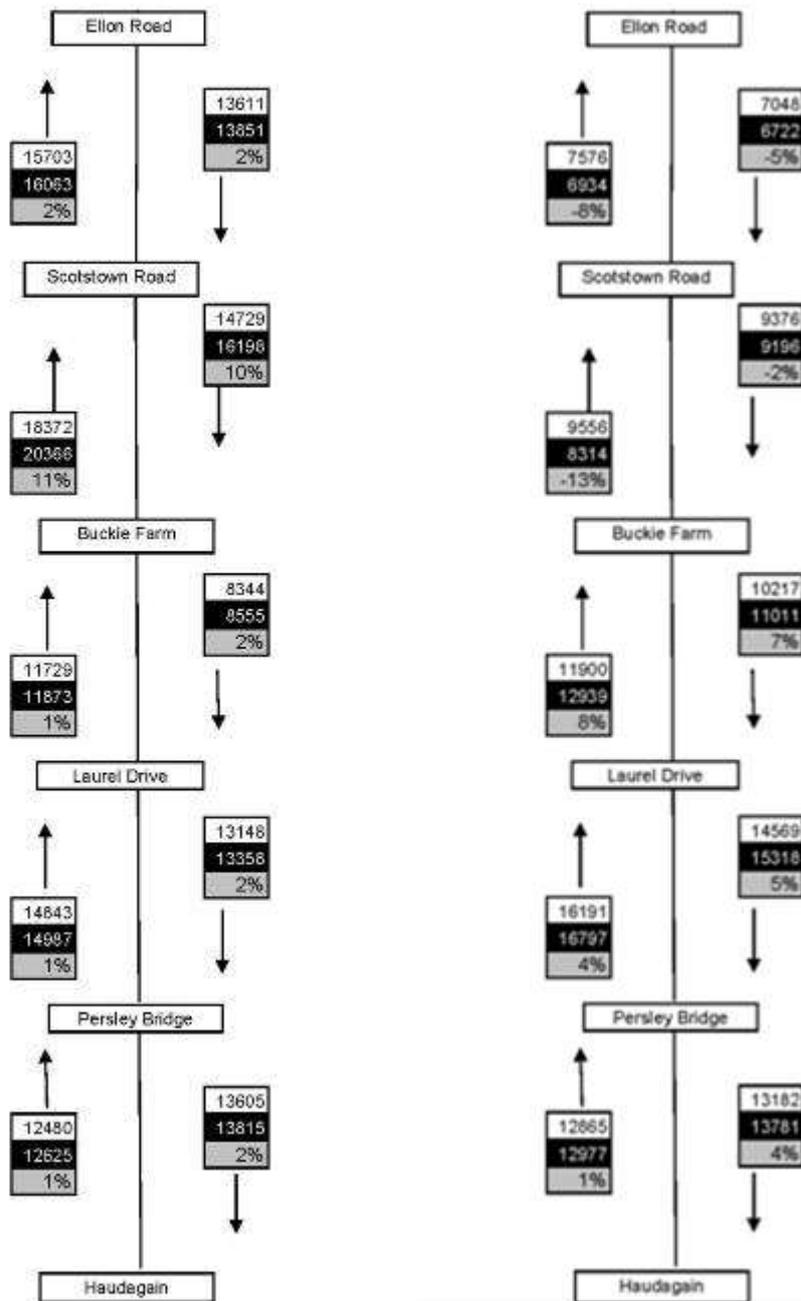


Figure 9.1: Increase in local traffic resulting from the introduction of development traffic at 2016 and 2023

9.3.5 These junctions and road links are appropriate for the purpose of the EIA in determining the potential impacts of increased traffic and other environmental impacts associated with demolition and construction, as well as with operation of the proposed Development.

Existing Road and Access Arrangements

- 9.3.6 The Site is accessed via Whitestripes Avenue from the Buckie Farm roundabout at 2018, and via Whitestripes Avenue and a proposed new Parkway access at 2032. Currently, Whitestripes Avenue provides access to/from existing residential development at Middleton Park and connections to the secondary road network at Parkhill. This development proposal seeks to serve an initial phase of development at Grandhome in the same way via new access junctions provided to a standard designed to accommodate the traffic associated with the development case. These accesses are supplemented by 2032 by the provision of a new signalised junction directly onto the Parkway following its de-trunking.
- 9.3.7 The A90 trunk road past the site currently forms part of the strategic transport corridor in the north east and is anticipated to accommodate all development related traffic travelling around Aberdeen city to destinations to the north and south of the development site. Whilst this trunk road function will cease following construction of the AWPR, it is anticipated that the Parkway will remain a major traffic artery facilitating the distribution of strategic traffic in and around Aberdeen city.
- 9.3.8 Due to the strategic nature of the Parkway corridor, it is considered that its sensitivity to an increase in road traffic and other related environmental impacts arising from the Development is low.

9.4 Potential Impacts

Overview

- 9.4.1 A qualitative assessment of the likely impacts on the surrounding road network associated with vehicle movements during construction (as the proposed development location is currently on a Greenfield Site, there is no demolition to take place and therefore no associated traffic) as well as for the operation of the Development, was undertaken and is described in the following sections.
- 9.4.2 Construction related traffic would comprise HGVs and light traffic associated with personnel travelling to the Site. These would use the road network for the duration of construction related activities, whilst operational traffic would be on-going for the design life of the Development.

9.5 Demolition and Construction

Public Road Network

- 9.5.1 It is expected that Site construction would create additional traffic on the link road between the site and the Buckie Farm roundabout and on the A90. However, estimates of traffic

associated with construction activities were not undertaken because these would only be known in detail following appointment of the main Contractor, sub-contractors and letting of supply contracts for materials.

9.5.2 It is not expected that heavy construction traffic would use local roads other than Whitestripes Avenue and, in future, Whitestripes Road as a main road connection to the proposed AWPR junction at Parkhill. Both Whitestripes Road and Whitestripes Avenue are classed as 'Urban Roads' in the City Council's Roads Descriptor Map, and they and the A90 are already used by HGVs. It is considered they have sufficient reserve capacity to accommodate the additional heavy traffic associated with the demolition and construction phases with minimal impact.

9.5.3 The potential impacts of demolition and construction traffic on operational capacity would, therefore, be of **negligible** significance.

Accidents and Safety

9.5.4 Professional judgement and discretion is required in order to determine any detrimental impacts associated with increased traffic due to construction. It is considered that there will only be a minor impact on the capacity and operation of the local road network.

9.5.5 Therefore, construction traffic flows would have a potential impact of **negligible** significance on accidents and safety.

Disruption and Driver Delay

9.5.6 The potential for traffic delay to occur on routes used by demolition and construction traffic was considered. However, the IEMA Guidelines note that "*these delays are only likely to be significant when the traffic on the network surrounding the Development is already at, or close to, the capacity of the system*". The TA exercise has shown that there are currently no capacity issues on the roads surrounding the Site.

9.5.7 The potential impact from disruption and driver delay resulting from construction traffic is therefore considered to be of **negligible** significance.

Fear, Intimidation and Pedestrian Amenity

9.5.8 Traffic volume, composition, speeds, pedestrian footways and crossings all contribute to the level of general pleasantness, fear and intimidation experienced by pedestrians and other vulnerable road users.

9.5.9 The roads in the immediate vicinity of the Development would be subject to a slight increase in construction traffic but this change is small enough in volume to be of **negligible** significance upon pedestrian amenity and levels of fear and intimidation.

Severance

- 9.5.10 The IEMA Guidelines note that “Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”.
- 9.5.11 Given that the development site is a Greenfield site accessed via the existing trunk road network, it is considered that the potential impact of increased severance would be of **negligible** significance.

9.6 Completed Development

Public Road Network

- 9.6.1 To assess the environmental impact of predicted operational traffic at opening, consideration was given to total opening year (i.e. 2018 and 2032 with the proposed Development) AADT flows are summarised in Figure 9.1.
- 9.6.2 Consideration was also given to the percentage increase in AADT between traffic levels that would exist at the year of opening with and without the proposed Development in order to establish the magnitude and level of significance as defined in the Assessment Methodology and Significance Criteria section above. This is summarised in Figure 9.1.
- 9.6.3 Figure 9.1 shows that the percent increase in AADT between the future opening year base and total traffic scenarios on all other roads would be of negligible magnitude (i.e. less than 30%), which indicates that, in line with the criteria presented in Figure 9.1, the significance of potential impacts at these locations would be **negligible**.

Accidents and Safety

- 9.6.4 With regard to operational traffic, the junction capacity assessment undertaken in the TA exercise demonstrates that the network would continue to operate satisfactorily with the addition of Development related traffic together with the implementation of the proposed improvements on the A90 corridor. It is therefore considered that the predicted increase in operational traffic would have a potential impact of **negligible** significance on accidents and safety.

Disruption and Driver Delay

- 9.6.5 As noted above, the IEMA Guidelines state that “delays are only likely to be significant when the traffic on the network surrounding the Development is already at, or close to, the capacity of the system”. Currently, there is a strategy associated with the development that proposes upgrades to the local and strategic road networks through a contributions mechanism where appropriate in order to maintain a level of operational capacity regardless of the level of development.

9.6.6 Therefore, the potential impact from disruption and driver delay resulting from operational traffic is considered to be of **negligible** significance.

Fear, Intimidation and Pedestrian Amenity

9.6.7 The increase in traffic related to the operation of the proposed Development is expected to have a potential impact of **negligible** significance on pedestrian amenity and levels of fear and intimidation.

Severance

9.6.8 The IEMA Guidelines note that “*Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery*”. Increases in traffic flows are not expected to be significant on arterial roads within nearby settlements once the proposed Development is operational. The potential impact of increased severance is therefore considered to be of **negligible** significance.

9.7 Mitigation Measures

Introduction

9.7.1 As discussed previously, demolition, construction and operational traffic flows would not be expected to lead to significant impacts in terms of accidents, disruption and driver delay, pedestrian amenity or severance. Nevertheless, in line with relevant guidance, policy and best practice, mitigation measures are proposed in order to accommodate traffic increase most efficiently and ensure that any impacts are reduced to an acceptably low level.

Demolition and Construction

9.7.2 It is proposed that the Contractor would be required to prepare a Traffic Management Plan, which would include, *inter alia*, the following mitigation measures:

- The Contractor would review the operation of the Site access to ensure that demolition and construction related traffic could be safely accommodated over and above existing operational traffic.
- The Contractor would appoint a Traffic Management Coordinator to liaise with officials from Aberdeen City Council and determine appropriate traffic management arrangements for construction vehicle movements;
- The Contractor would agree appropriate and safe routes to and from the Site with officials from Aberdeen City Council and all construction vehicles would be required to use approved access routes;
- Movement of loads would be restricted to take place outside peak flow hours to minimise disruption to general traffic flows;

- Signage warning other motorists of the presence of demolition and construction vehicles would be erected;
- The Contractor would be required to consider on-site parking, vehicle circulation and traffic management for visitors to the Site during demolition and construction; and
- Although continuous monitoring during demolition and construction is not considered to be necessary, the Traffic Management Coordinator would ensure that agreed mitigation measures are being implemented.

9.7.3 Where appropriate, the above mitigation measures would be incorporated into the proposed Environmental Management Plan (EMP) for the works.

Completed Development

9.7.4 With regard to public roads, i.e. those external to the Site, the capacity assessment and the strategic infrastructure upgrades undertaken for the road links within the vicinity of the Site shows that there would be no capacity issues in either of the future opening year traffic scenarios.

9.7.5 These strategic infrastructure upgrades include:

- Replacement of the Buckie Farm roundabout by a high capacity signalised interchange
- Provision of a new high capacity signalised junction to access the site directly from the Parkway

9.8 Residual Impacts

Demolition and Construction

Public Road Network

9.8.1 The residual impacts of demolition and construction traffic on local road network capacity would be of **negligible** significance.

Accidents and Safety

9.8.2 Demolition and construction traffic flows would have a residual impact of **negligible** significance on accidents and safety.

Disruption and Driver Delay

9.8.3 The residual impact from disruption and driver delay resulting from demolition and construction traffic is considered to be of **negligible** significance.

Fear, Intimidation and Pedestrian Amenity

- 9.8.4 The predicted increase in traffic related to demolition and construction activities is expected to have a residual impact of **negligible** significance on pedestrian amenity and levels of fear and intimidation.

Severance

- 9.8.5 The residual impact of severance is considered to be of **negligible** significance.

Completed Development

Public Road Network

- 9.8.6 The significance of residual impacts on all other roads would be **negligible**.

Accidents and Safety

- 9.8.7 The predicted increase in operational traffic would have a residual impact of **negligible** significance on accidents and safety.

Disruption and Driver Delay

- 9.8.8 The residual impact from disruption and driver delay resulting from operational traffic is therefore considered to be of **negligible** significance.

Fear, Intimidation and Pedestrian Amenity

- 9.8.9 The increase in traffic related to the operation of the proposed Development is expected to have a residual impact of **negligible** significance on pedestrian amenity and levels of fear and intimidation.

Severance

- 9.8.10 The potential impact of severance once the proposed Development is operational is considered to be of **negligible** significance.

9.9 Summary and Conclusions

- 9.9.1 No significant environmental impacts are predicted as a direct result of demolition and construction vehicles (e.g. HGVs) accessing the Site and the implementation of an EMP and a Traffic Management Plan would ensure that appropriate control measures are enforced.
- 9.9.2 Once the proposed Development is operational, there would be no significant residual impacts on the surrounding network.
- 9.9.3 No significant issues are likely in terms of accidents and safety; disruption and driver delay; fear, intimidation and pedestrian amenity; or severance during the demolition, construction and operational phases of the proposed Development.

10 Summary and Conclusions

10.1 Context

- 10.1.1 Grandhome is a 320 hectare greenfield site located 5kms north west of Aberdeen city centre, within the Bridge of Don area and within the line of the proposed Aberdeen Western Peripheral Route. Proposals are for the establishment of a sustainable neighbourhood on the site comprising elements of residential, education, employment and retail land uses offering future residents the opportunity to live within a self contained community.
- 10.1.2 Initially selected as an exemplar proposal through the Scottish Government's Sustainable Communities Initiative (SSCI) – in part because of its 'excellent links to existing facilities in the city centre and neighbouring areas' – the proposals have been the subject of extensive consultation with stakeholders and the general public leading to the identification of an approved Development Framework.
- 10.1.3 The adopted Aberdeen Local Development Plan confirms the allocation of the site for development of up to 4700 households in the current Plan period and suggests the possible future allocation of up to 7,000 households on the site. These allocations are consistent with the identification of Strategic Growth Areas in the approved Structure Plan, focussed on Aberdeen City and the main transport routes leading from it which are required to accommodate around 75% to 80% of growth over the next 20 years.
- 10.1.4 Due to its location within the existing urban fringe of Aberdeen city, the site is well located in terms of existing and proposed facilities and amenities. The Aberdeen Science and Technology Park, the Energetica Corridor, Aberdeen Airport and the Aberdeen Exhibition and Conference Centre are facilities of regional significance that lie within 3km of the site. Aberdeen city centre is a principal focus of external travel demand and existing bus services serving adjoining established communities at Danestone and Middleton Park already provide good accessibility between the Bridge of Don area and attractions in and around the city centre.
- 10.1.5 Accessibility for vehicular traffic is also good with the existing A90 trunk road following the southern boundary of the site. However, in view of the limited provision of crossing points across the River Don parts of the network (including the trunk road) operate under congested conditions at peak times. Proposals which are in place to address these shortcomings include the provision of a Third Don Crossing (due for completion by Autumn 2015 and tying into the existing road network at the south east corner of the Grandhome site), a new outer city bypass (the Aberdeen Western Peripheral Route which will remove trunk road traffic from the immediate vicinity of the site) and improvements to an existing key intersection on the inner orbital road network within the city (the Haudagain Roundabout). Implementation of these committed schemes (all of which are expected to be operational by 2020) will further

improve vehicular accessibility of the site. In addition provision of the Third Don Crossing will facilitate the extension of additional existing bus routes and cycle priority routes providing improved accessibility for movements to the city centre.

- 10.1.6 The identification of access arrangements between the site and these networks has been the subject of extensive dialogue between the development team, the public transport operators and the roads authorities leading to agreement in principle to provision of a phased access strategy. This focuses on the provision of new access junctions onto Whitestripes Avenue and Whitestripes Road to serve initial development of up to 500 households on the site. Subsequent phases of development will be served by the provision of a high capacity signalised intersection onto the Parkway (following de-trunking) and additional junctions with Whitestripes Road. Implementation of this strategy will accommodate appropriate site penetration by public transport as well as effective management and distribution of traffic impact.

10.2 Summary of Impacts at Full Development

- 10.2.1 At Full Development with 4700 households on the site there will be a wide range of potential attractions within the new community. The development will be designed on the basis of walkable neighbourhoods aimed at prioritising the use of sustainable modes within the community but opportunities and demands for movements by these modes on extreme networks are expected to be comparatively limited as a consequence of trip length constraints. Despite this, commitments to improve existing connectivity by these modes will include provision of a new signalised crossing point at the Parkway access junction accommodating improved connections to Danestone and connections to the proposed foot/cycleway bridge across the River Don linking with the adjacent Davidson's Mill development. Both of these connections, together with the provision of priority routes alongside the Third Don Crossing (to which existing routes will connect) will ensure the suitable priority is given to accommodating external demands for movements by these modes.
- 10.2.2 Public transport services will be developed primarily by the extension of existing routes with the potential to contribute towards the provision of new orbital services envisaged to provide improved connectivity between developments and existing attractions across the wider Aberdeen city region from Ellon in the north to Portlethen/Stonehaven in the south. Existing route extensions are expected to focus on Service 19 routeing via the Third Don Crossing and entering the site from Whitestripes Road and Service 2 and 4 entering the site from the Parkway. Internal route options have been identified to ensure that all residents will be within 400m walk distance of bus stops and proposals envisage a bus departure approximately every five minutes from the development, with a fifteen minute frequency across three routes required to meet anticipated levels of demand.

10.2.3 At Full Development with the implementation of access junctions on to Whitestripes Road, Whitestripes Avenue and The Parkway and the major upgrading of the Buckie Farm junction to a signalised crossroads, the detailed junction analysis confirms that the access network performs acceptably within capacity.

10.2.4 In considering the wider Bridge of Don road network the Paramics model tests reveal comparatively minor deterioration in overall network performance and increased journey times as a result of the predicted increases in Grandhome development traffic. The most substantial increases in journey time occur on the route between Buckie Farm and Mugiemooss Road which is a part of the network where committed improvement proposals are yet to be identified in detail.

10.3 The Position with Phased Development

10.3.1 With Phase 1 development of only 500 households on the site and more limited provision of complementary land use attractions (primarily neighbourhood shops) there will inevitably be a greater proportionate demand for pedestrian and cycle trips to be accommodated an external networks than at Full Development. Principal attractions will include local primary and secondary schools since there is to be no schools provision within the site at this stage. Provisions to accommodate these demands include the introduction of two signalised crossing points on the Whitestripes Avenue site frontage which will accommodate predicted demands to these two schools via existing path networks along this route.

10.3.2 Public transport demands will be accommodated by the provision of an extended bus route terminus centrally located within the Phase 1 site such that all parts of the development are within 400m of the proposal bus stop. It is envisaged that predicted demands can be accommodated satisfactorily on this basis by the extension of services on Route 19 providing a 12 minute frequency service to/from the city centre.

10.3.3 Traffic capacity assessment confirms that proposed access junctions onto Whitestripes Avenue / Whitestripes Road required to serve Phase 1 development will operate within appropriate design capacity with minimal queuing or delay. Other existing junctions at Buckie Road and Valentine Road will also continue to perform acceptably within their theoretical design capacity.

10.3.4 At Buckie Farm roundabout between the Parkway and Whitestripes Avenue, ARCADY analysis reveals the existing junction continuing to perform acceptably within capacity following the addition of traffic generated by Phase 1 development of the site. The existing roundabout also continues to perform in the interim assessment case with 1500 households on the site although modest mitigation measures are required to maintain NND.

10.3.5 With this interim level of development of 1500 households the new site access junction onto the Parkway becomes operational resulting in the diversion of demands from the Whitestripes Avenue junction. The supplementary LINSIG analysis confirms that the proposed site access

junction can be designed to operate within design capacity in this interim case. Further PICADY analysis also demonstrates the continued acceptable performance of access junctions onto Whitestripes Avenue.

Diagrams





Project Title:

92071 GRANDHOME

Drawing Title:

AADT Location Plan

KEY

1 AADT LOCATION



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Client:

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Date: SB

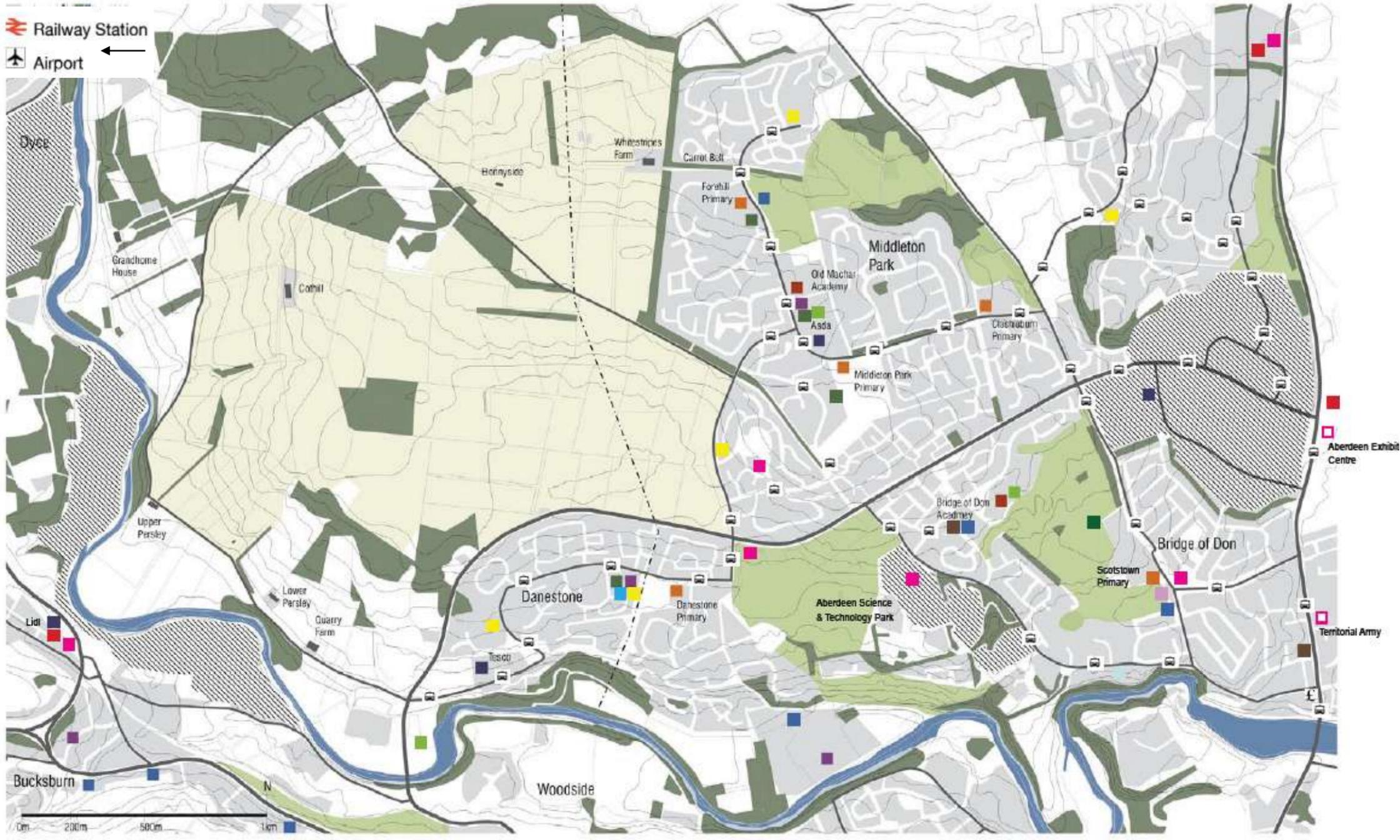
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Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 3.1: Amenities



- KEY**
- Primary/Nursery School
 - Secondary School
 - Community Centre
 - Sports Centre/Gym
 - Superstore
 - Local Shops
 - Doctor/Dentist
 - Industrial
 - £ Bank
 - Hotel
 - Cultural
 - Religious
 - Post Office
 - Pub/Restaurant (NOT ALL SHOWN)
 - Library
 - Bus Stop (NOT ALL SHOWN)
 - Railway Station
 - ✈ Airport
 - Police Station
 - Other

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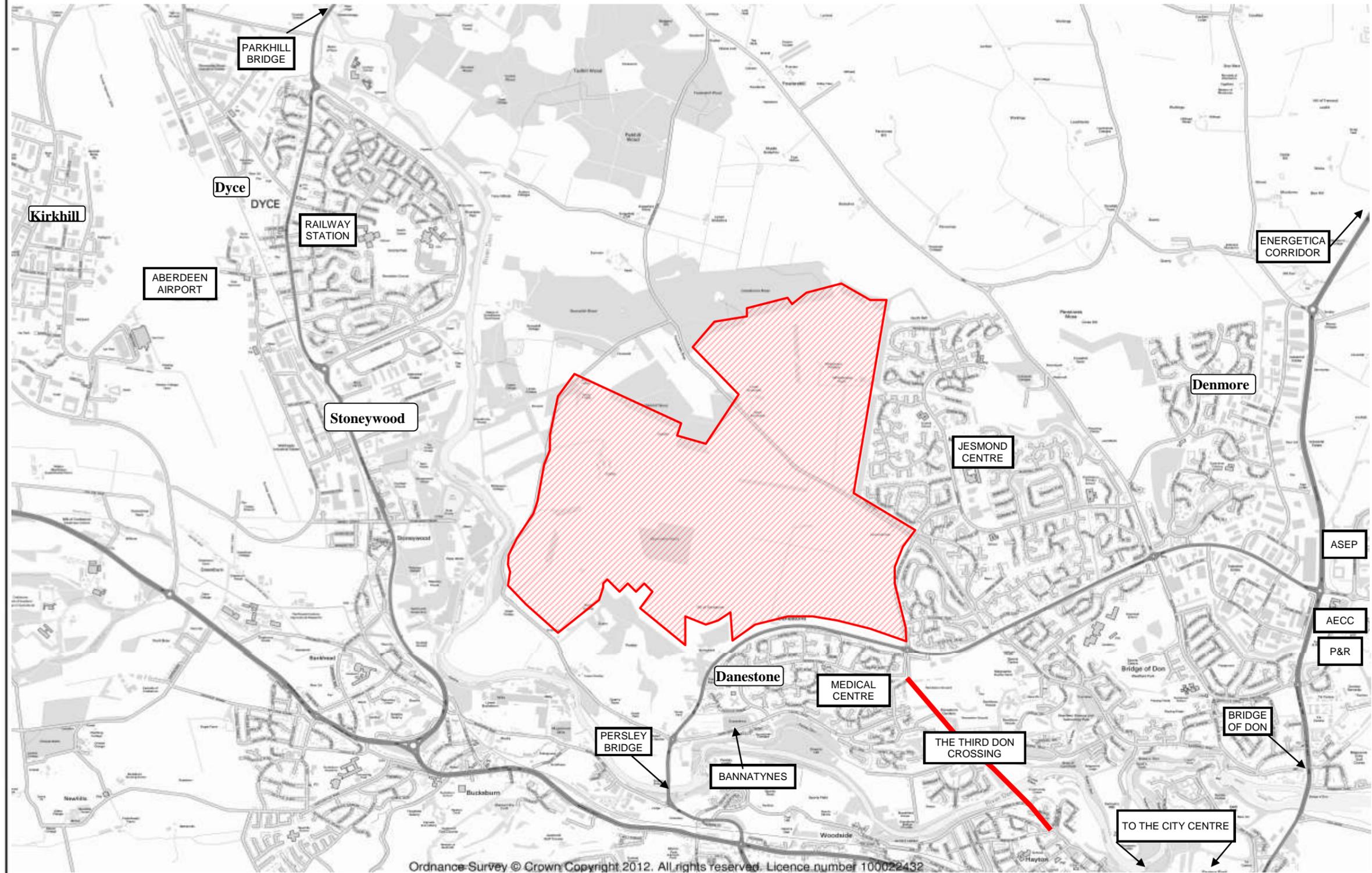


Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 3.2: Potential Attractions

KEY

-  DEVELOPMENT SITE
-  Aberdeen Exhibition & Conference Centre
-  Aberdeen Science & Energy Park
-  Park & Ride



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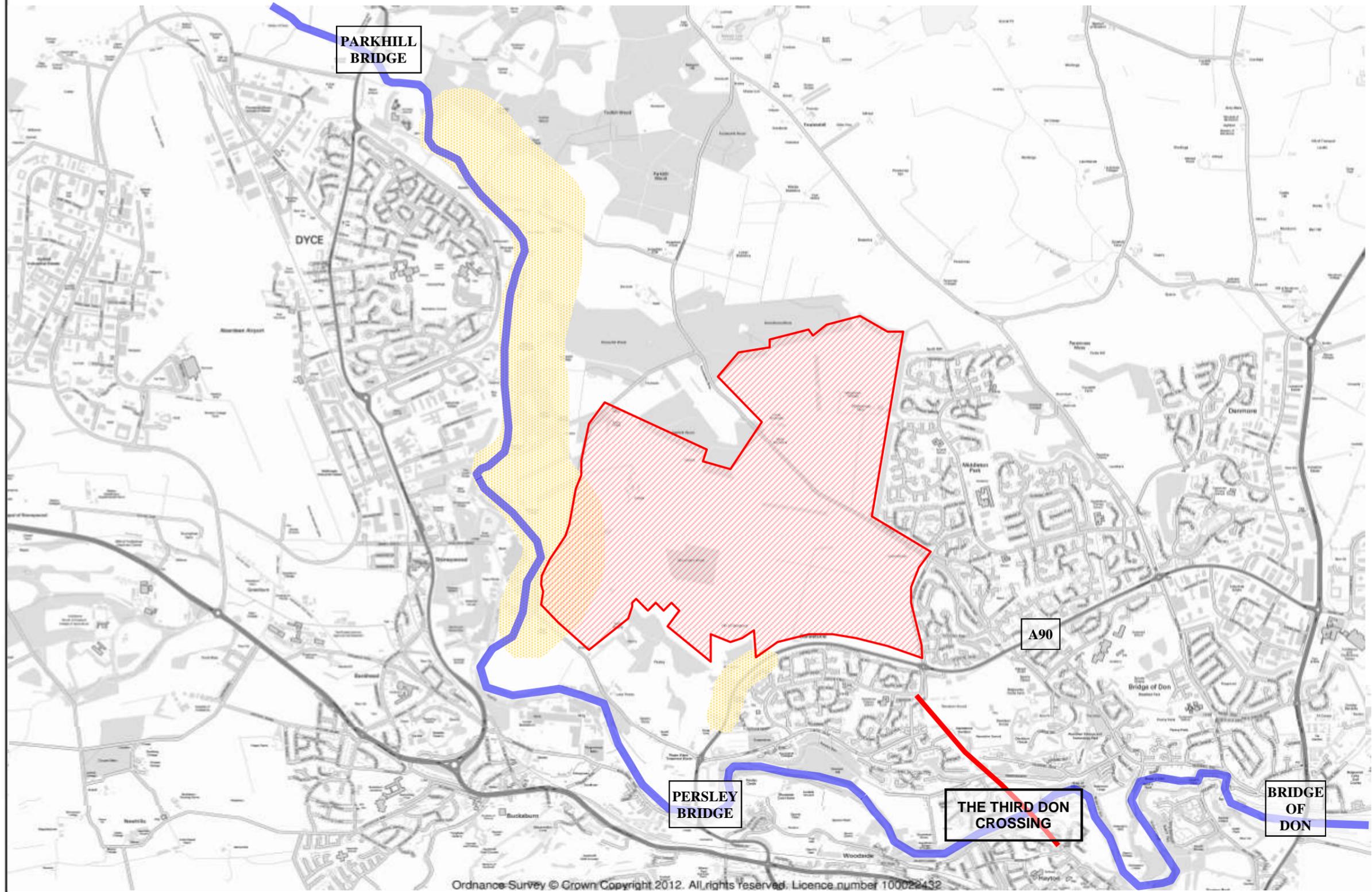


Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 3.3: Site Constraints

KEY

-  DEVELOPMENT SITE
-  STEEP TOPOGRAPHY
-  RIVER DON



Client:



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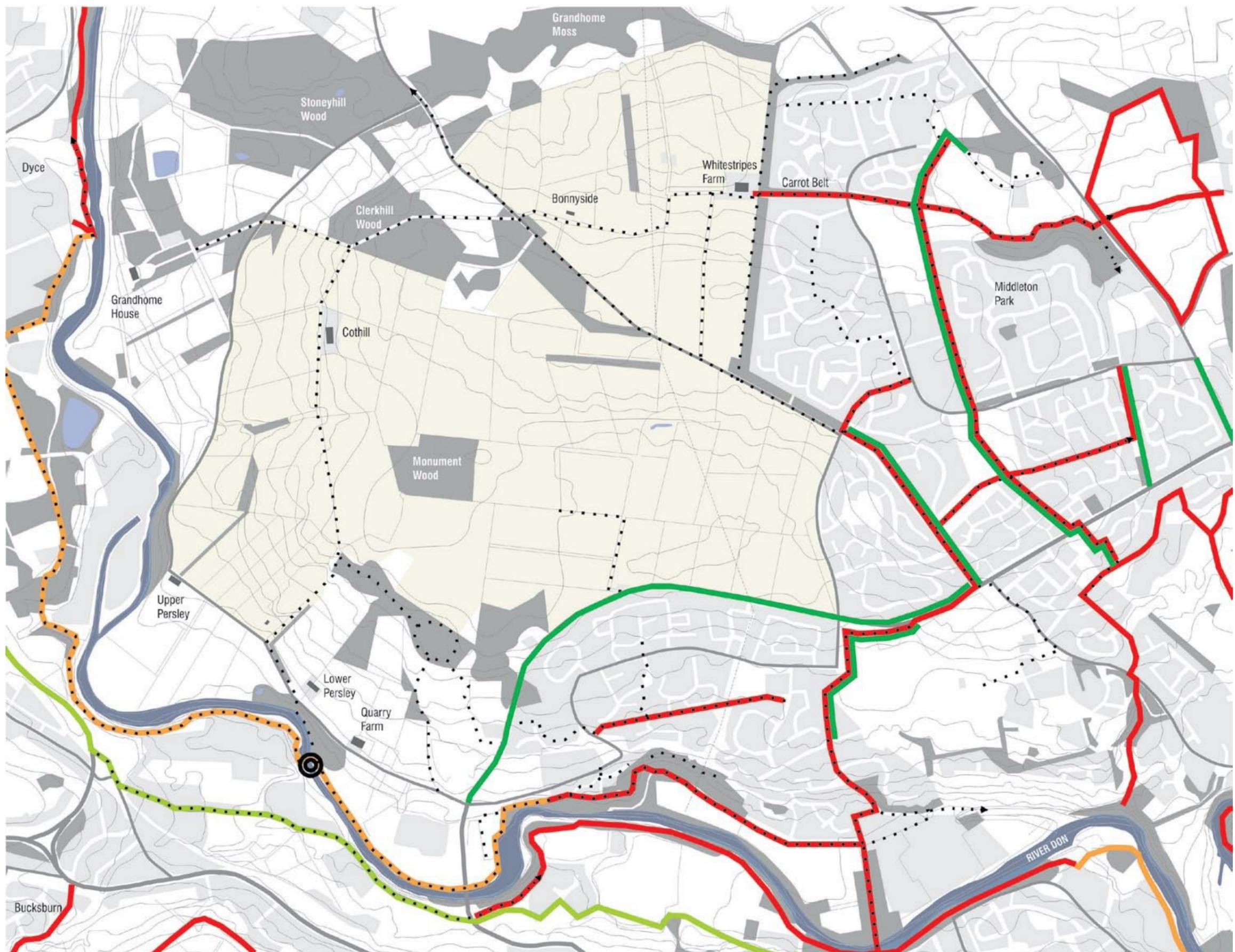


Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 3.4: Pedestrian and Cycle Routes

KEY

-  Footpaths*
(ACC database 15/12/2009)
-  Core Paths
(ALDP 2010)
-  Aspirational Core Paths
(ALDP 2010)
-  North Sea Cycle Route
-  Local Cycle Route
(ACC cycle paths maps)
-  Proposed new bridge as part of
Davidson's Mill development



Client:


Drawn: SB
Date:
FAIRHURST
43 George St.
Edinburgh
EH2 2HT
T. 0131 225 6741
F. 0131 225 6830

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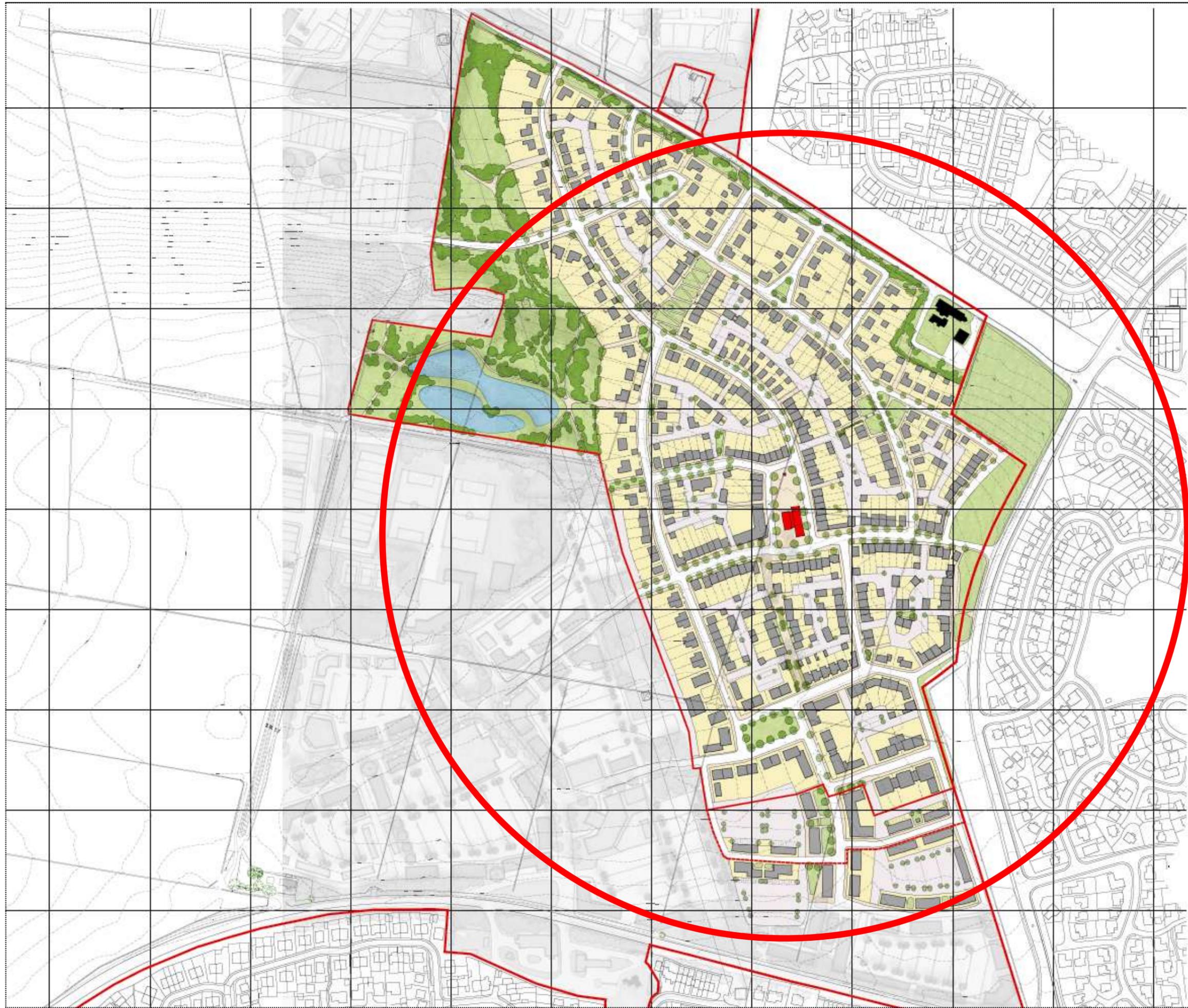


Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 4.2: Proposed Internal Bus Routes (Phase 1)

KEY

-  Phase 1
-  Stop Location
-  400m walk distance



Client:


Drawn: SB
Date:
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43 George St.
Edinburgh
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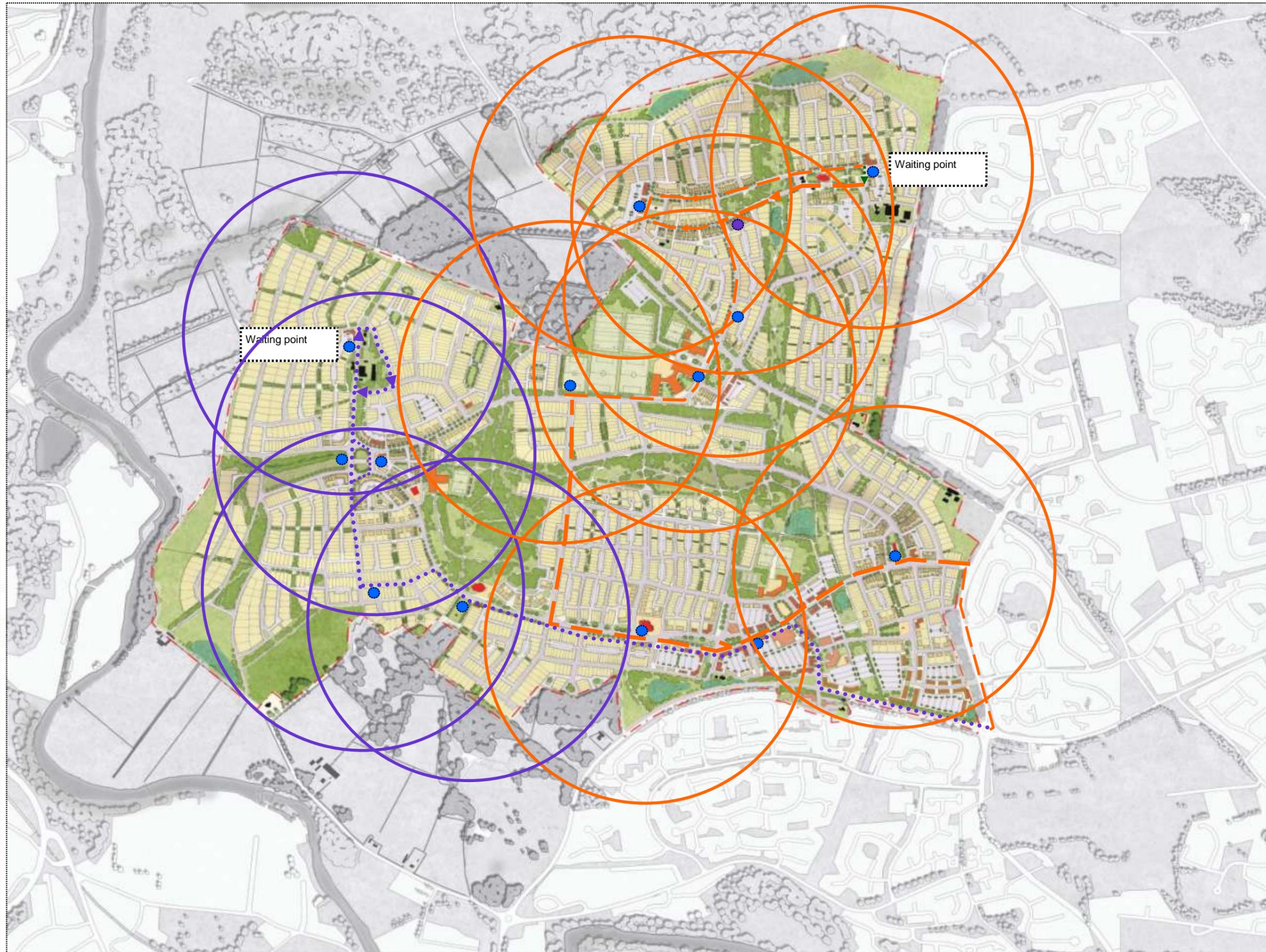


Project Title:
92071 GRANDHOME

Drawing Title:
Diagram 4.3: Proposed Internal Bus Routes (subsequent phases)

KEY

-  Proposed route to serve full development at 4700 households
-  Additional Routes to serve up to 7000 households
-  Stop Locations
-  400m walk distance to



Client:



Drawn: SB
Date:



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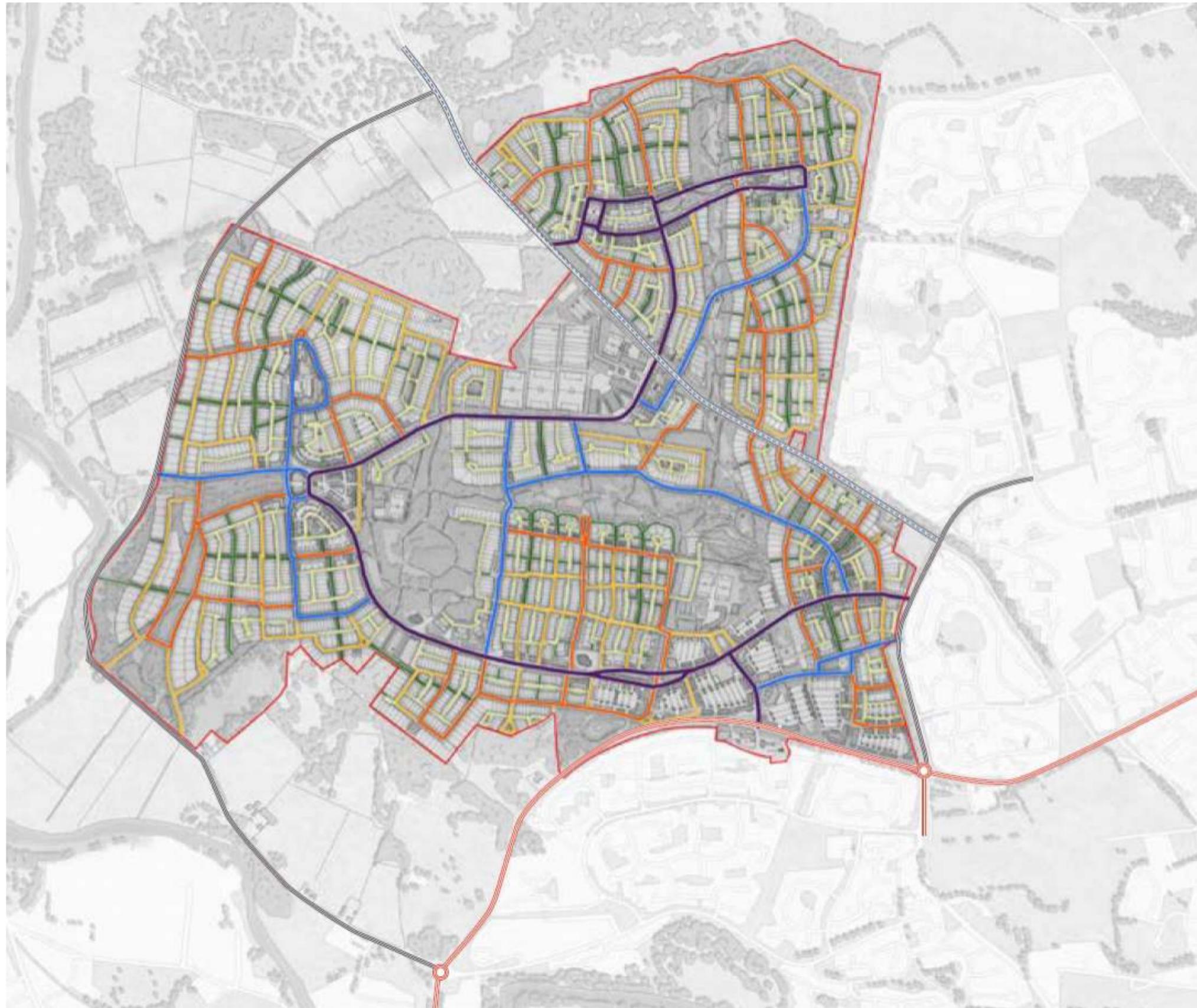


Project Title:
92071 GRANDHOME

Drawing Title:
**Diagram 4.4: Proposed Grandhome
Street Types**

KEY

-  Existing Bordering Thoroughfares
-  Whitestripes Road
(Preferred AWPR Connection Strategy)
-  High Street
(Capable of being bus route)
-  Main Street
(Capable of being bus route)
-  Street
-  Minor Street
-  Lane / Court
-  Pedestrian Path
-  A90 Parkway



Client:



Drawn: SB
Date:



43 George St.
Edinburgh
EH2 2HT

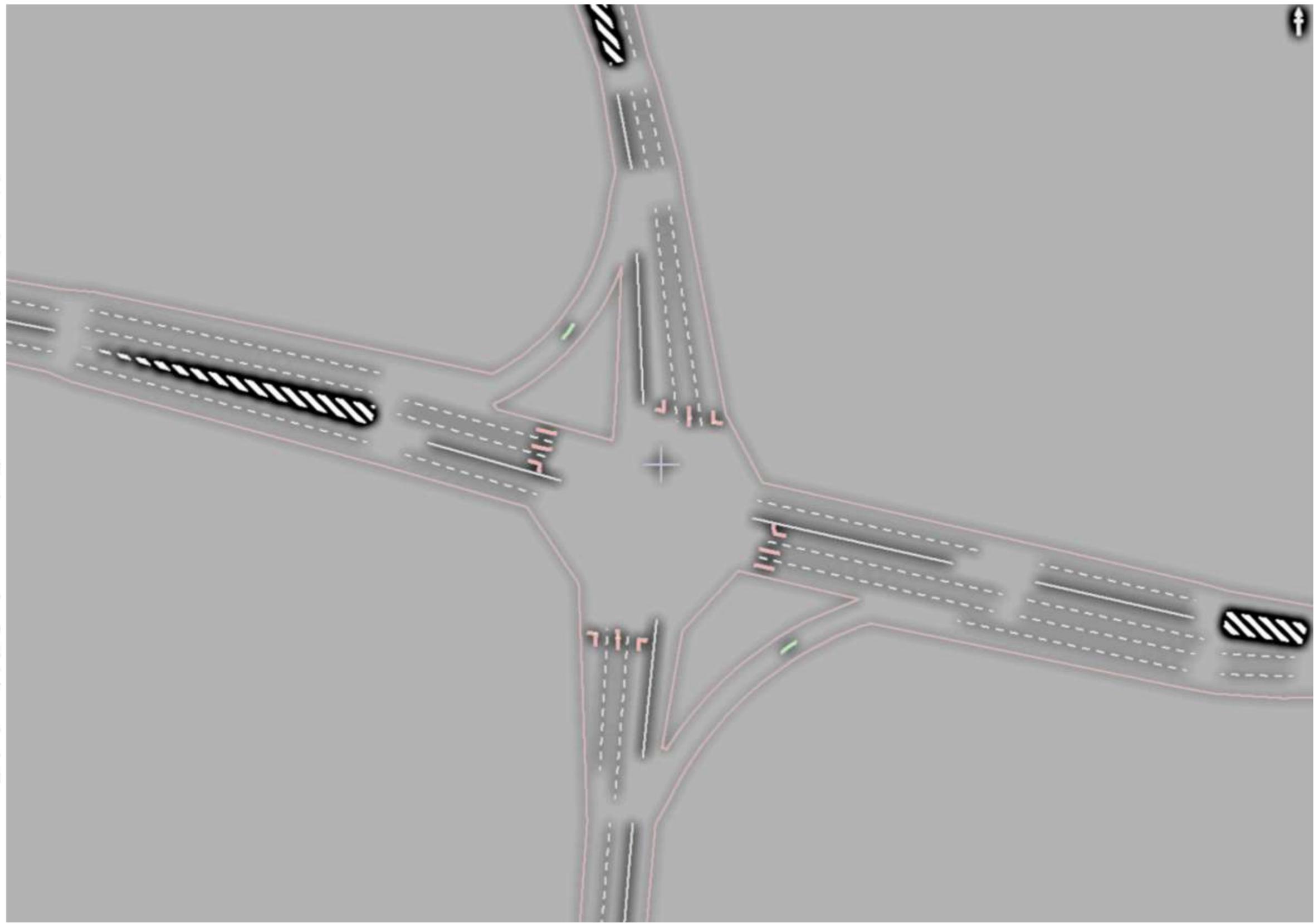
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Project Title:
92071 GRANDHOME

Drawing Title:
Diagram : 7.1 Buckie Farm Roundabout



Client:

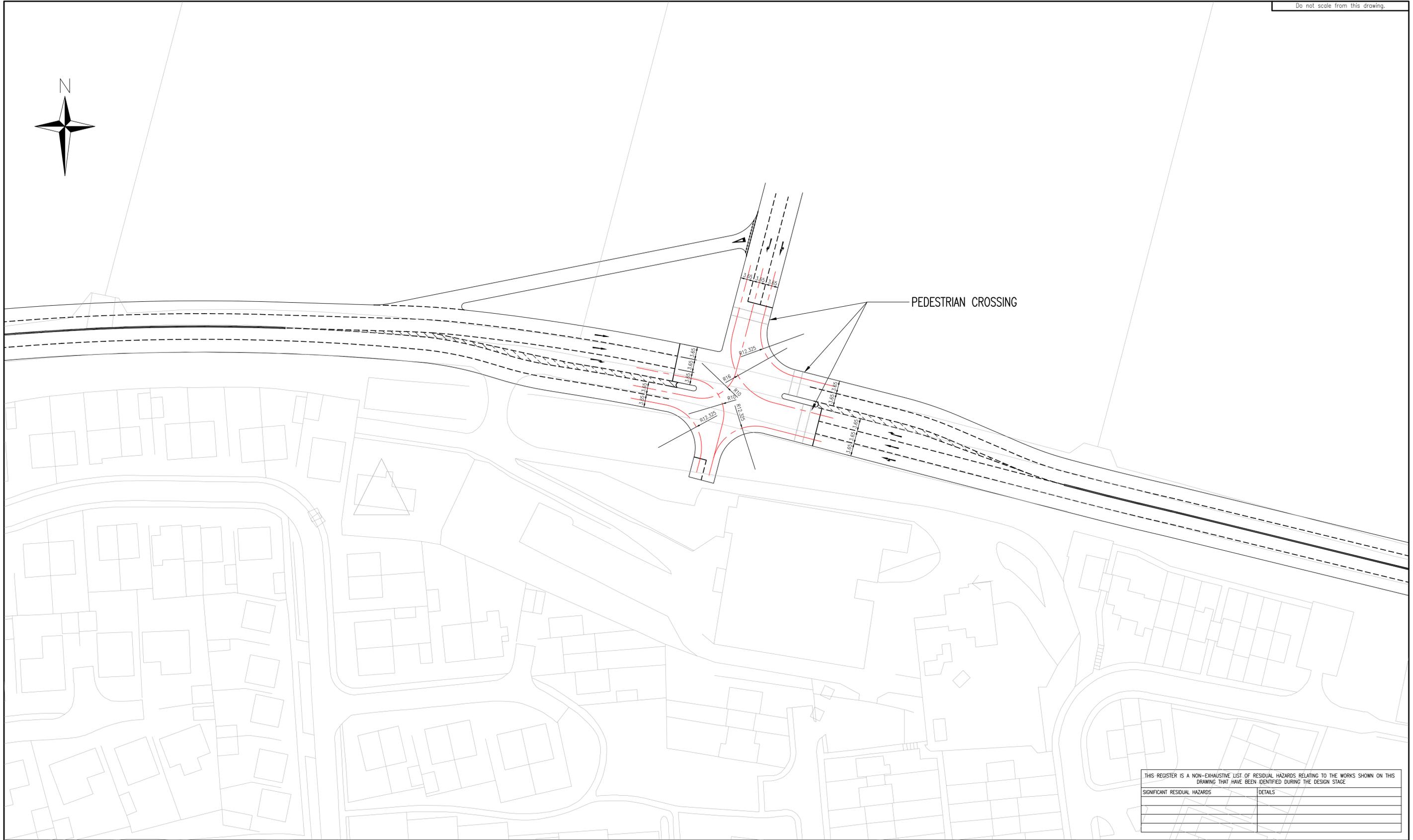


Drawn: SB
Date:

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SIGNIFICANT RESIDUAL HAZARDS	DETAILS

Rev.	Date	Description	Drawn	Checked	Approved
B	13/09/13	NO. OF JUNCTION APPROACH LANES INCREASED	GB	MM	MM
A	30/01/13	SOUTHERN ARM ADDED	CB	IM	IM

Notes:

Client:

Project Title:

GRANDHOME DEVELOPMENT

PARKWAY JUNCTION
OUTLINE PROPOSAL
FULL DEVELOPMENT

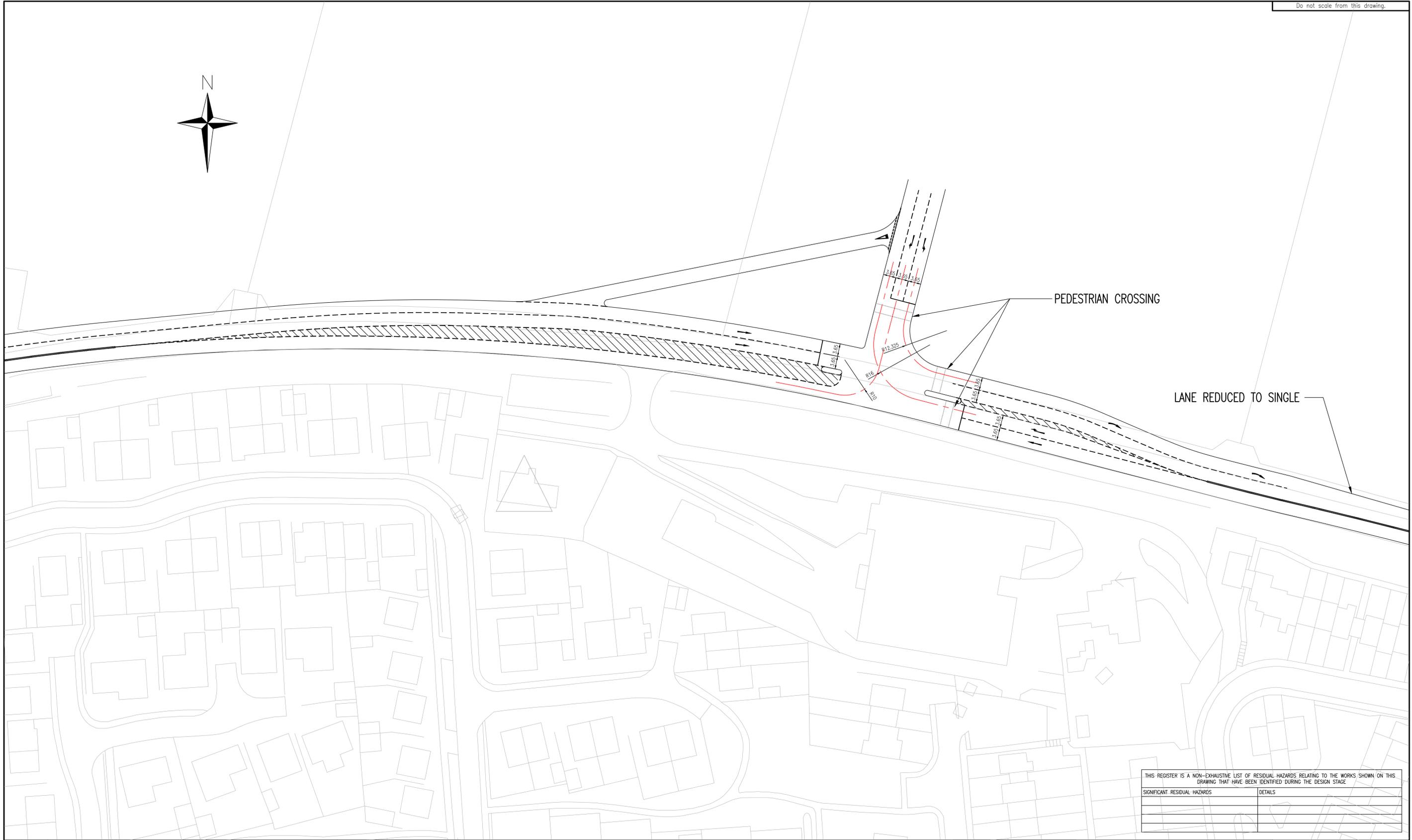
FAIRHURST

W.A. Fairhurst & Partners
43 George Street, EDINBURGH, EH2 2HT
Tel: 0131 225 6741 Fax: 0131 225 6830

Scale at A1: **1:500** Status: **For Information**

Drawn: CB	Checked: FF	Approved:
Date: 14/11/12	Date: 14/11/12	Date:

Drawing No.: **92071/sk1003** Revision: **B**



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SIGNIFICANT RESIDUAL HAZARDS	DETAILS

Rev.	Date	Description	Drawn	Checked	Approved

Notes:

Client:

Project Title:

Client:

Project Title:
GRANDHOME DEVELOPMENT

Drawing Title:
**PARKWAY JUNCTION
 OUTLINE PROPOSAL
 INTERIM SCHEME**

FAIRHURST

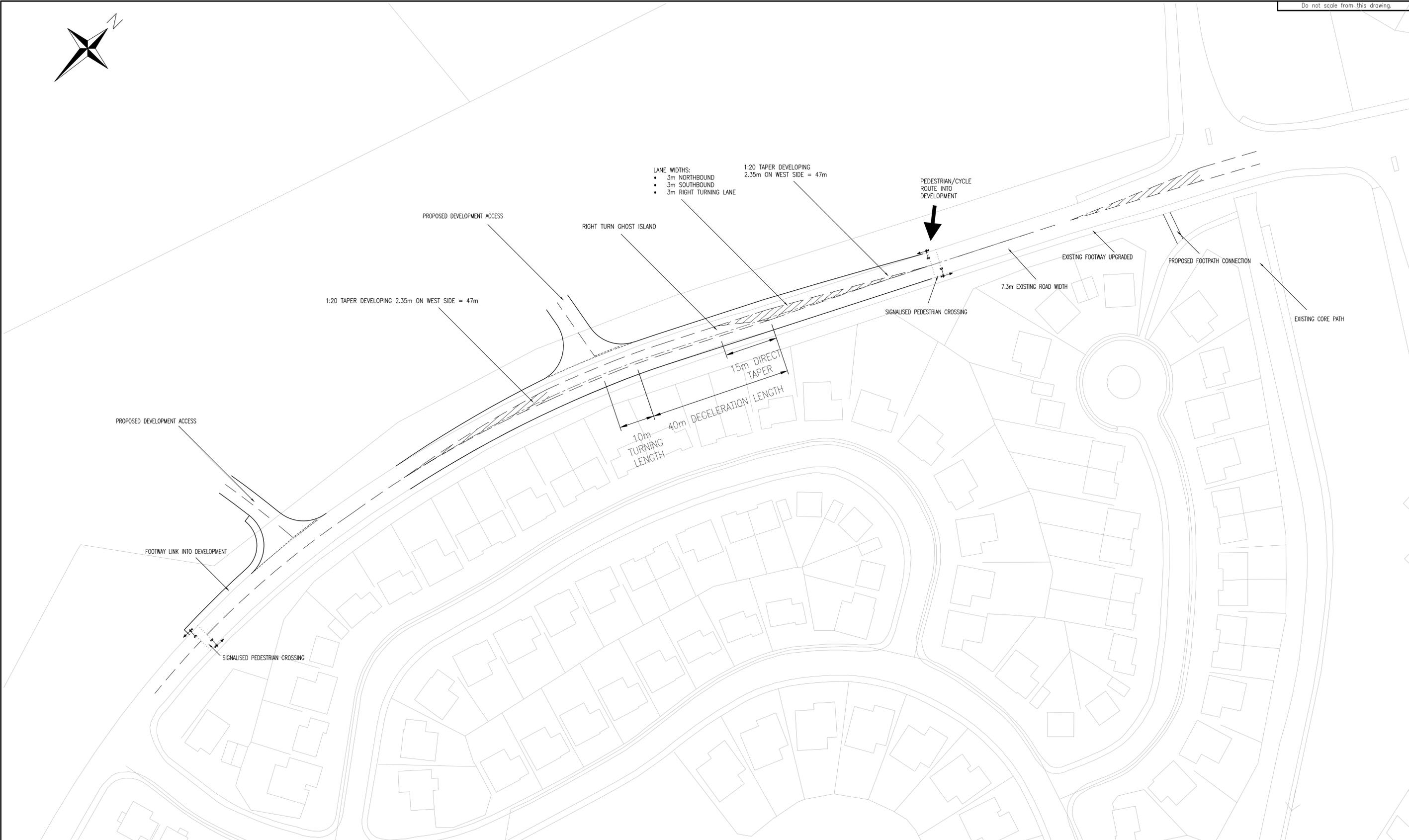
W.A. Fairhurst & Partners
 43 George Street, EDINBURGH, EH2 2HT
 Tel: 0131 225 6741 Fax: 0131 225 6830

Scale at A1:
1:500

Status:
For Information

Drawn: GB	Checked: MM	Approved:
Date: 14/11/12	Date: 14/11/12	Date:

Drawing No.: **92071/sk1004** Revision: **-**



- LANE WIDTHS:
- 3m NORTHBOUND
 - 3m SOUTHBOUND
 - 3m RIGHT TURNING LANE
- 1:20 TAPER DEVELOPING
2.35m ON WEST SIDE = 47m

Rev.	Date	Description	Drawn	Checked	Approved
D	20/09/13	PEDESTRIAN CROSSING ADDED ACROSS WHITESTripES AVENUE AND LINK INTO SITE PROVIDED AT SOUTH END OF SCHEME	FF	IM	IM
C	17/07/13	TESCO ACCESS OPTION REMOVED. ACCESS LOCATIONS AMENDED	FF	IM	IM
B	09/05/13	TESCO ACCESS OPTIONS INDICATED (IN RED)	FF	IM	IM
A	30/01/13	DEVELOPMENT ACCESS TO SOUTH ADDED	CB	IM	IM

Notes:

THIS REGISTER IS A NON-EXHAUSTIVE LIST OF RESIDUAL HAZARDS RELATING TO THE WORKS SHOWN ON THIS DRAWING THAT HAVE BEEN IDENTIFIED DURING THE DESIGN STAGE	
SIGNIFICANT RESIDUAL HAZARDS	DETAILS
THIS DRAWING IS PRELIMINARY, THEREFOR THERE ARE NO RESIDUAL HAZARDS RELATING TO THIS DRAWING.	

Client:

Project Title:
GRANDHOME DEVELOPMENT

Drawing Title:
**PHASE 1
ACCESS JUNCTION &
SIGNALISED PEDESTRIAN CROSSING**

FAIRHURST

43 George Street,
EDINBURGH, EH2 2HF
Tel: 0131 225 6741 Fax: 0844 381 4412

Scale at A1:
1:500

Status:
For Information

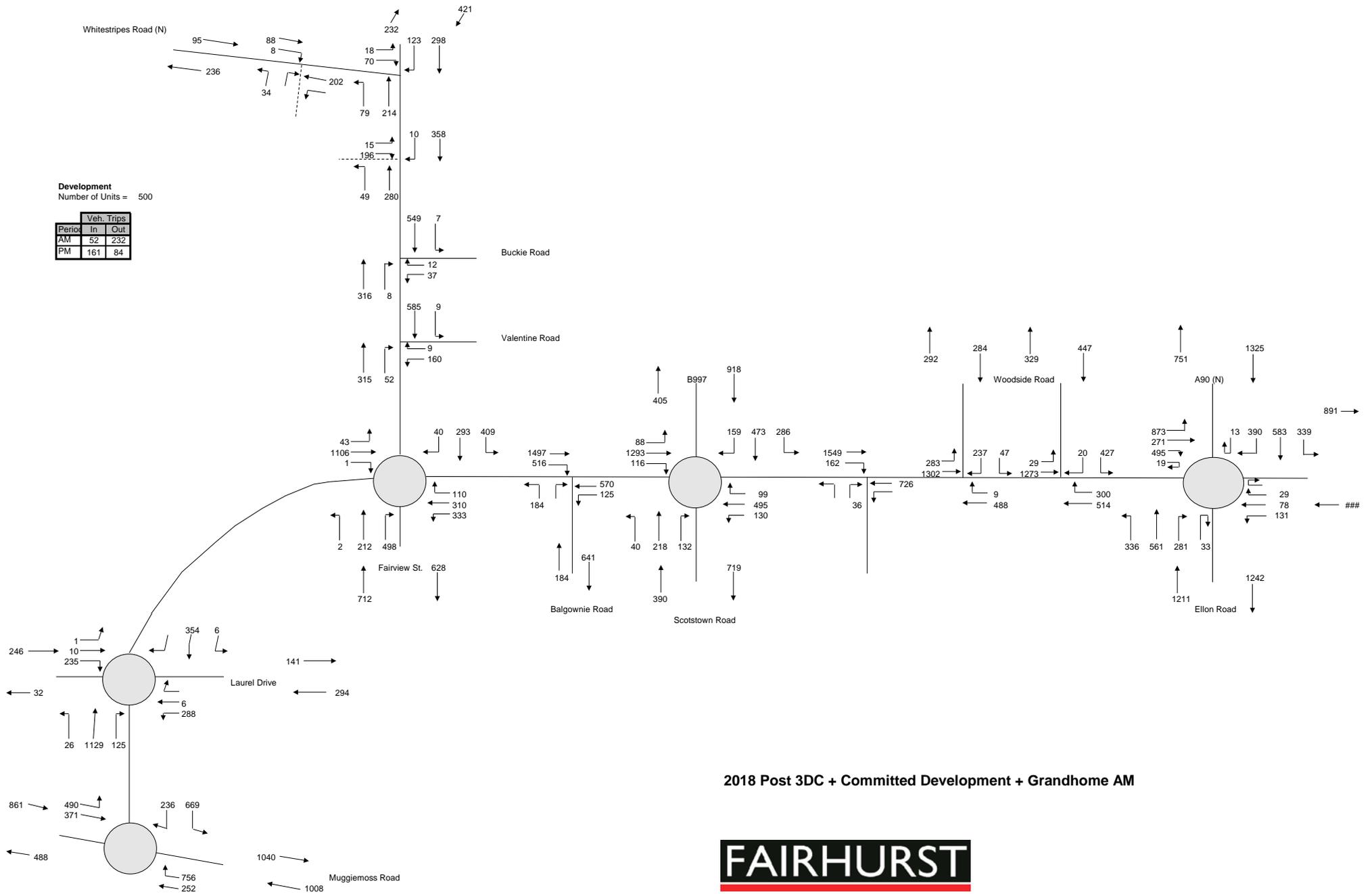
Drawn: CB	Checked: IM	Approved: IM
Date: 16/10/12	Date: 16/10/12	Date: 16/10/12
Drawing No.:	Revision:	
92071/sk1000	D	

Appendix A – 2018 Peak Hour Network Traffic Flows



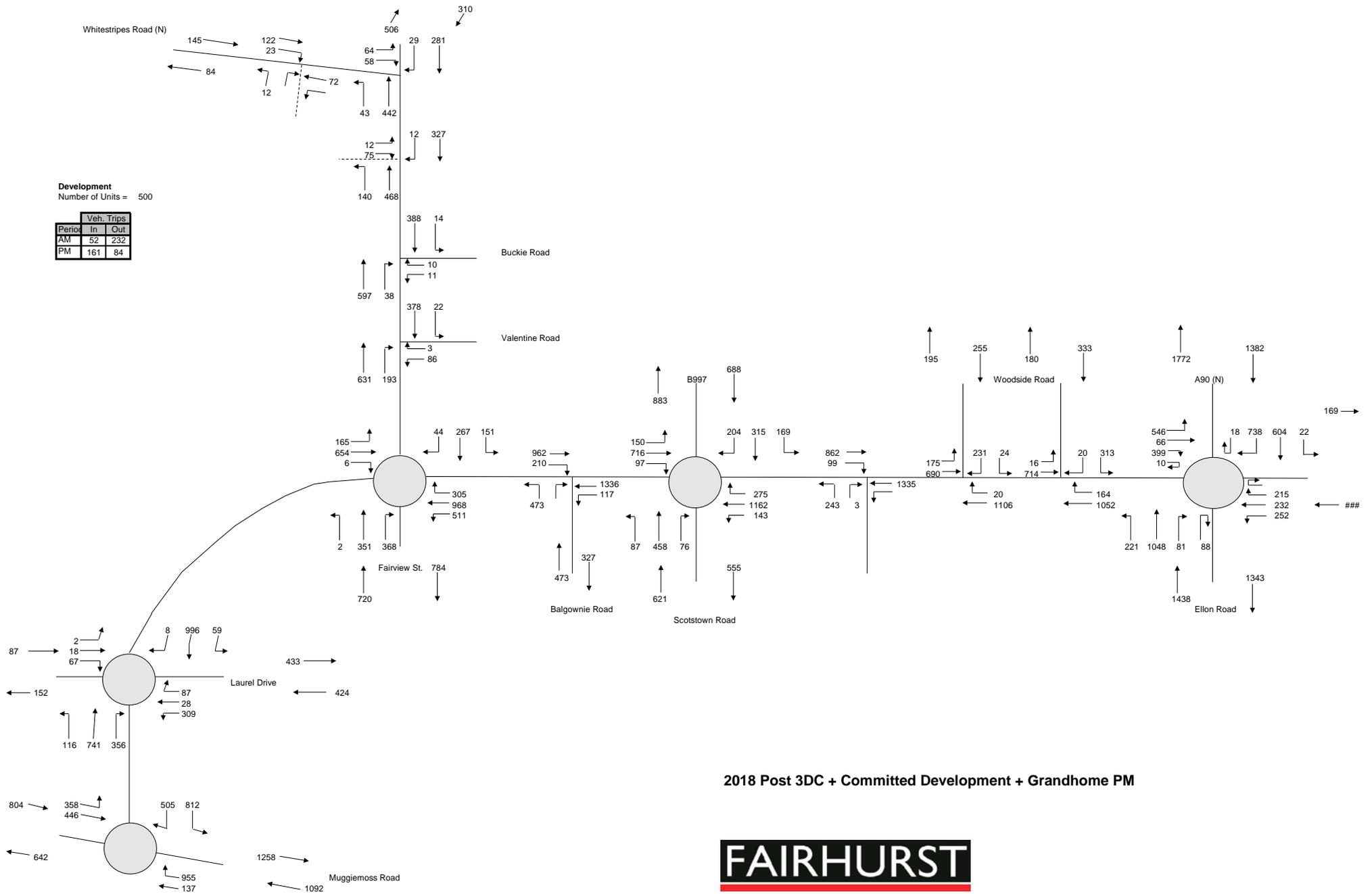
Development
Number of Units = 500

Period	Veh. Trips	
	In	Out
AM	52	232
PM	161	84



2018 Post 3DC + Committed Development + Grandhome AM

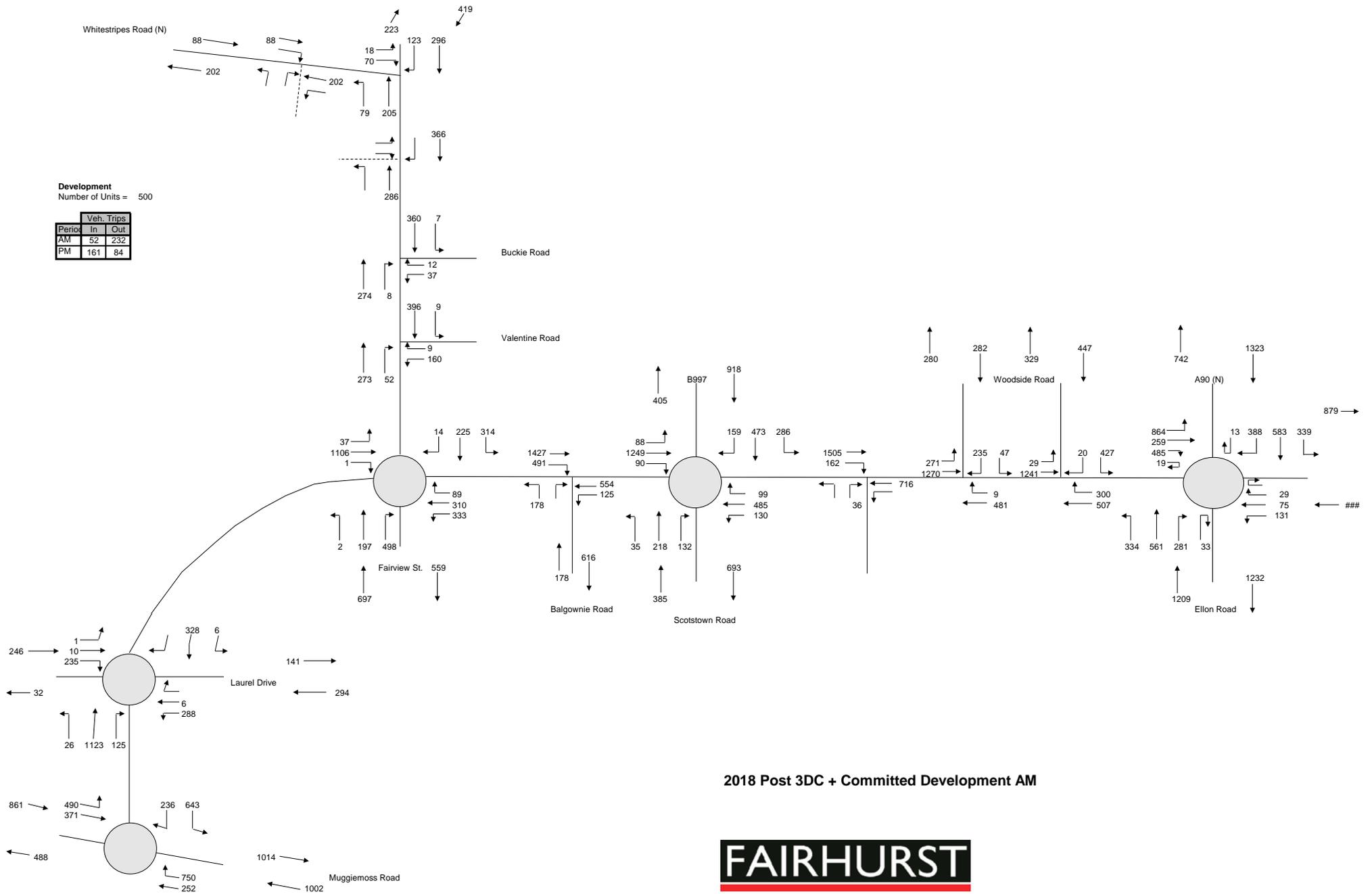




FAIRHURST

Development
Number of Units = 500

Period	Veh. Trips	
	In	Out
AM	52	232
PM	161	84

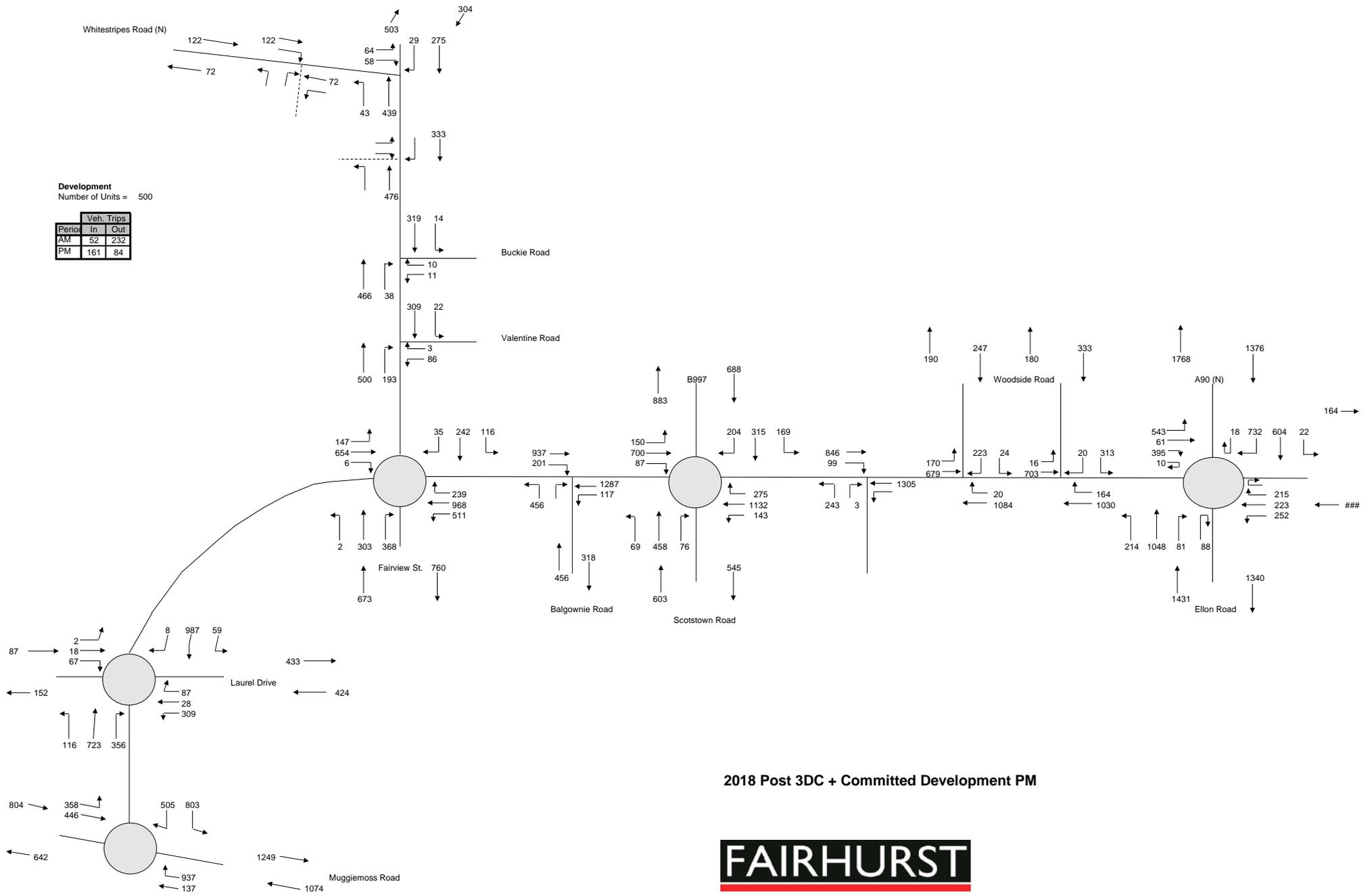


2018 Post 3DC + Committed Development AM



Development
Number of Units = 500

Period	Veh. Trips	
	In	Out
AM	52	232
PM	161	84



2018 Post 3DC + Committed Development PM



Appendix B – 2023 and 2032 Peak Hour Network Traffic Flows

Params: Data Analysis Tool - [Project: C:\params\data\Grandhome\Oct 2013 Test Models\Project-turns.dat]

File Edit Models Show Overlays Partitions Tools View Window Help

Colour by changes

Data overlays

- Turn Counts 2023 Dev
- Turn Counts 2032 Dev
- Turn Counts 2032 NG
- Turn Counts 2023 Dev a
- Turn Counts 2023 NGa

Filter >= 0.00 <= 0.00 All

Common scale

Refresh Refresh all

Models

Title

Base C:\params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG

- C:\params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG
- C:\params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_With Dev_Routes
- C:\params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_NG
- C:\params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_With Dev_Routes

Partitions

Turn Counts 2023 NGa: (0 to 2150)

Showing: 07:30:00 to 08:30:00

Modelled: 06:00:00 to 20:00:00

Entering ■

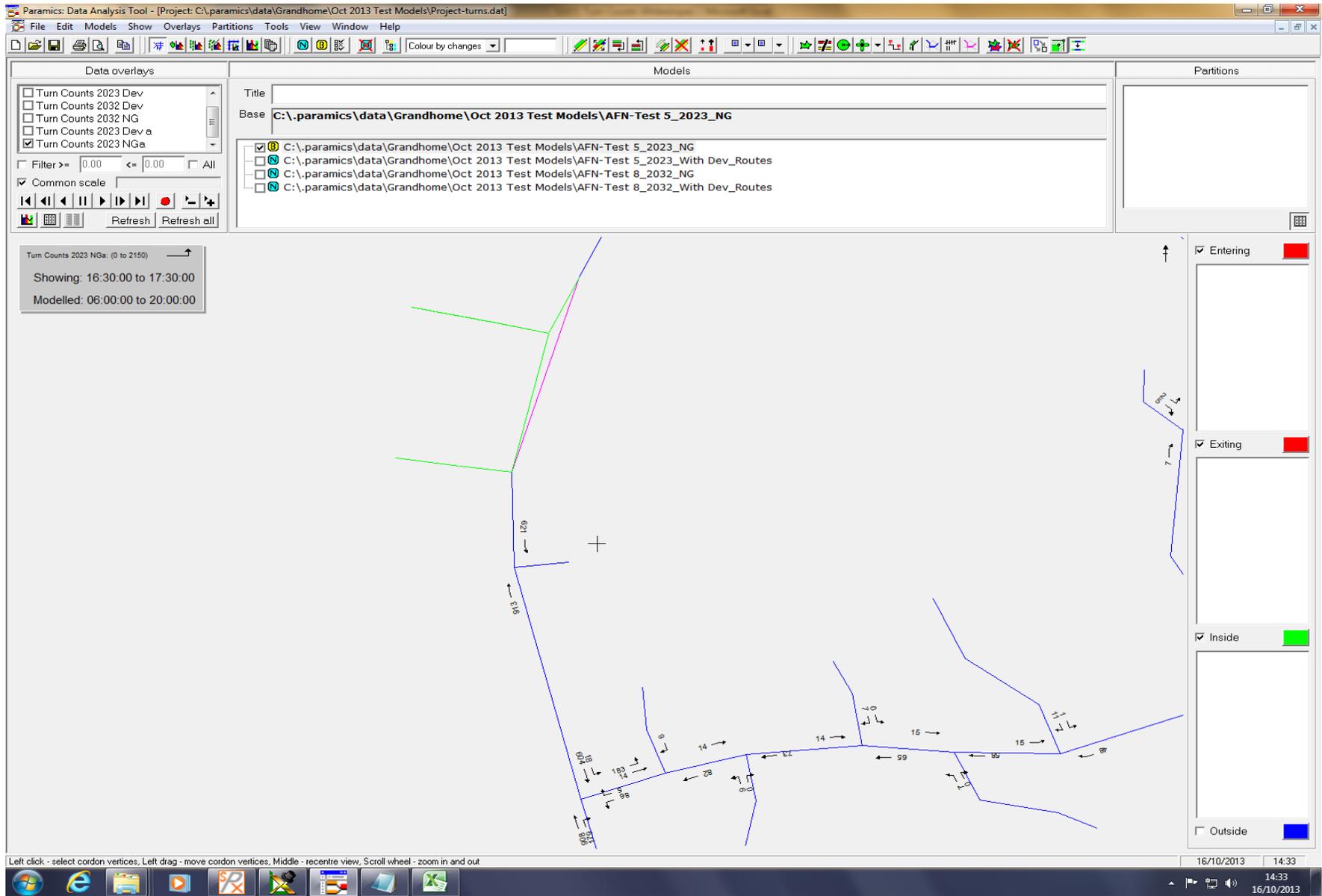
Exiting ■

Inside ■

Outside ■

Left click - select cordon vertices, Left drag - move cordon vertices, Middle - recentre view, Scroll wheel - zoom in and out

16/10/2013 14:31



Colour by changes

Data overlays

- Turn Counts 2023 Dev
- Turn Counts 2032 Dev
- Turn Counts 2032 NG
- Turn Counts 2023 Dev a
- Turn Counts 2023 NGa

Filter >= 0.00 <= 0.00 All

Common scale

Refresh Refresh all

Models

Title

Base: C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG

- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_With Dev_Routes
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_With Dev_Routes

Partitions

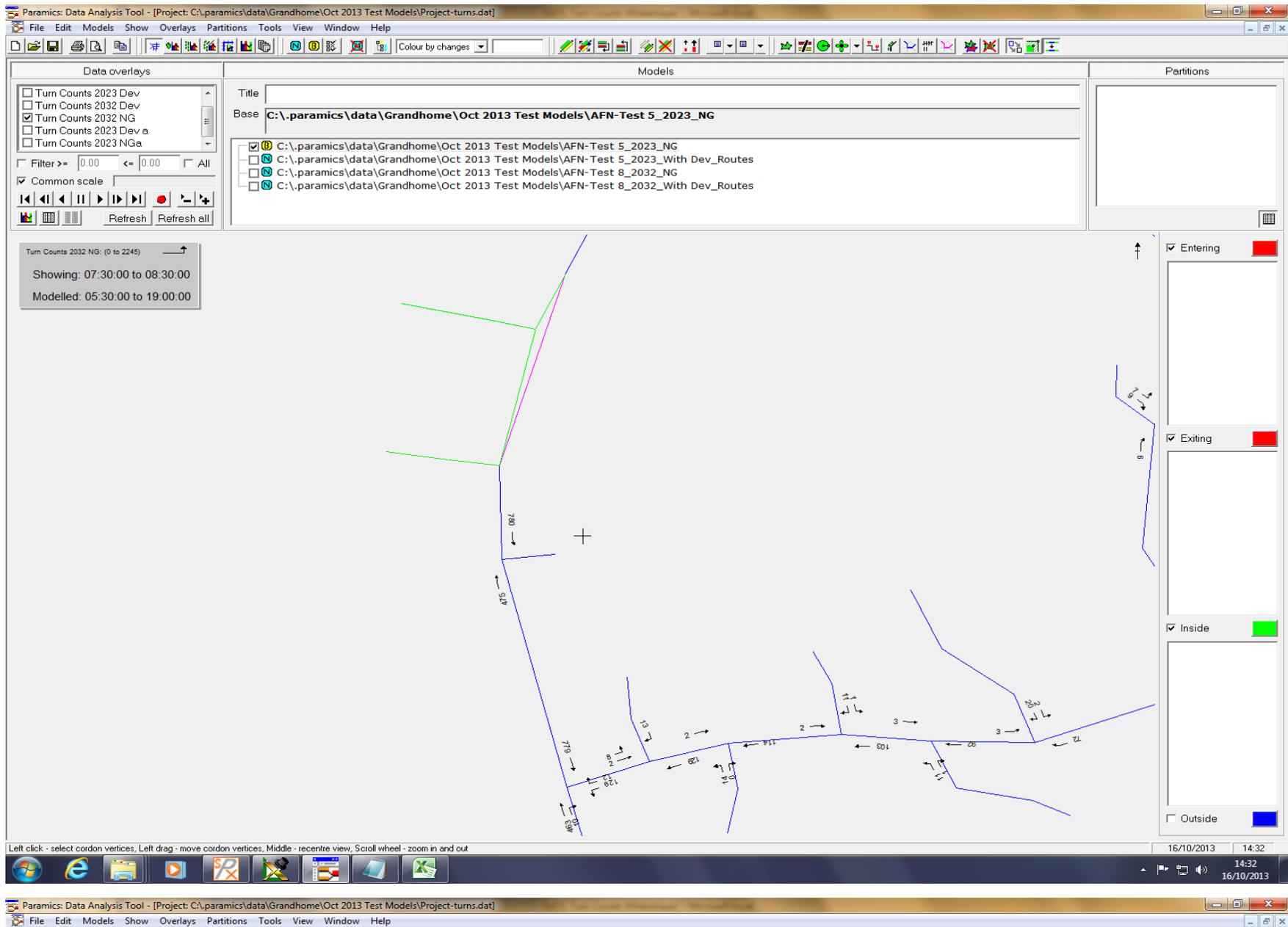
- Entering ■
- Exiting ■
- Inside ■
- Outside ■

Turn Counts 2023 Dev a: (0 to 2190)

Showing: 16:30:00 to 17:30:00
Modelled: 06:00:00 to 20:00:00

Left click - select cordon vertices, Left drag - move cordon vertices, Middle - recentre view, Scroll wheel - zoom in and out

16/10/2013 14:33
16/10/2013



Colour by changes

Data overlays

- Turn Counts 2023 Dev
- Turn Counts 2032 Dev
- Turn Counts 2032 NG
- Turn Counts 2023 Dev a
- Turn Counts 2023 NGa

Filter >= 0.00 <= 0.00 All

Common scale

Refresh Refresh all

Models

Title

Base: C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG

- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_With Dev_Routes
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_With Dev_Routes

Partitions

- Entering ■
- Exiting ■
- Inside ■
- Outside ■

Turn Counts 2032 NG: (0 to 2245) →

Showing: 16:30:00 to 17:30:00
Modelled: 05:30:00 to 19:00:00

Left click - select cordon vertices, Left drag - move cordon vertices, Middle - recentre view, Scroll wheel - zoom in and out

16/10/2013 14:33
16/10/2013

Turn Counts 2023 Dev
 Turn Counts 2032 Dev
 Turn Counts 2032 NG
 Turn Counts 2023 Dev a
 Turn Counts 2023 NGA

Filter >= 0.00 <= 0.00 All
 Common scale
 Refresh Refresh all

Title
 Base: C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG

- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_With Dev_Routes
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_NG
- C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_With Dev_Routes

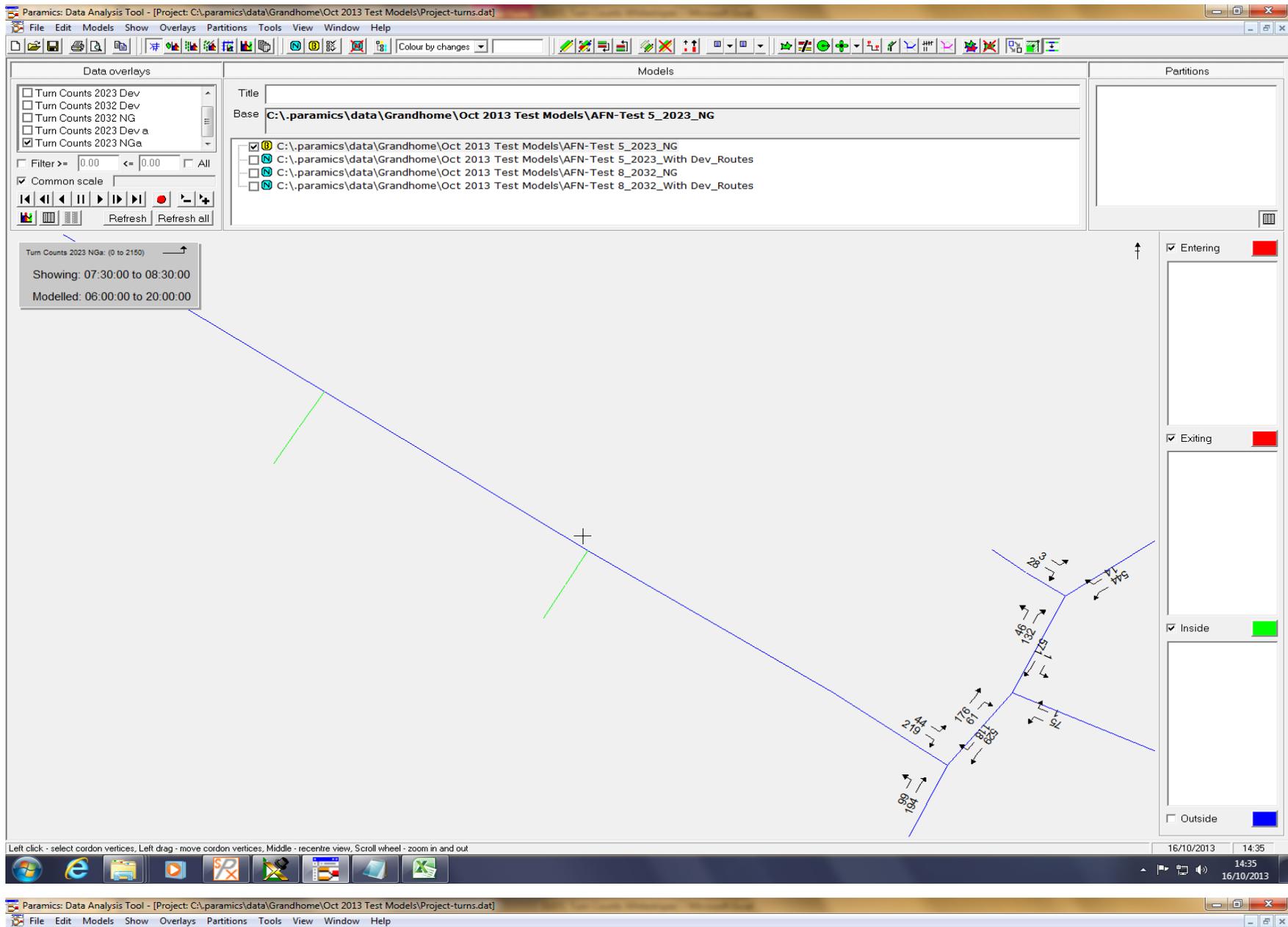
Partitions

Entering ■
 Exiting ■
 Inside ■
 Outside ■

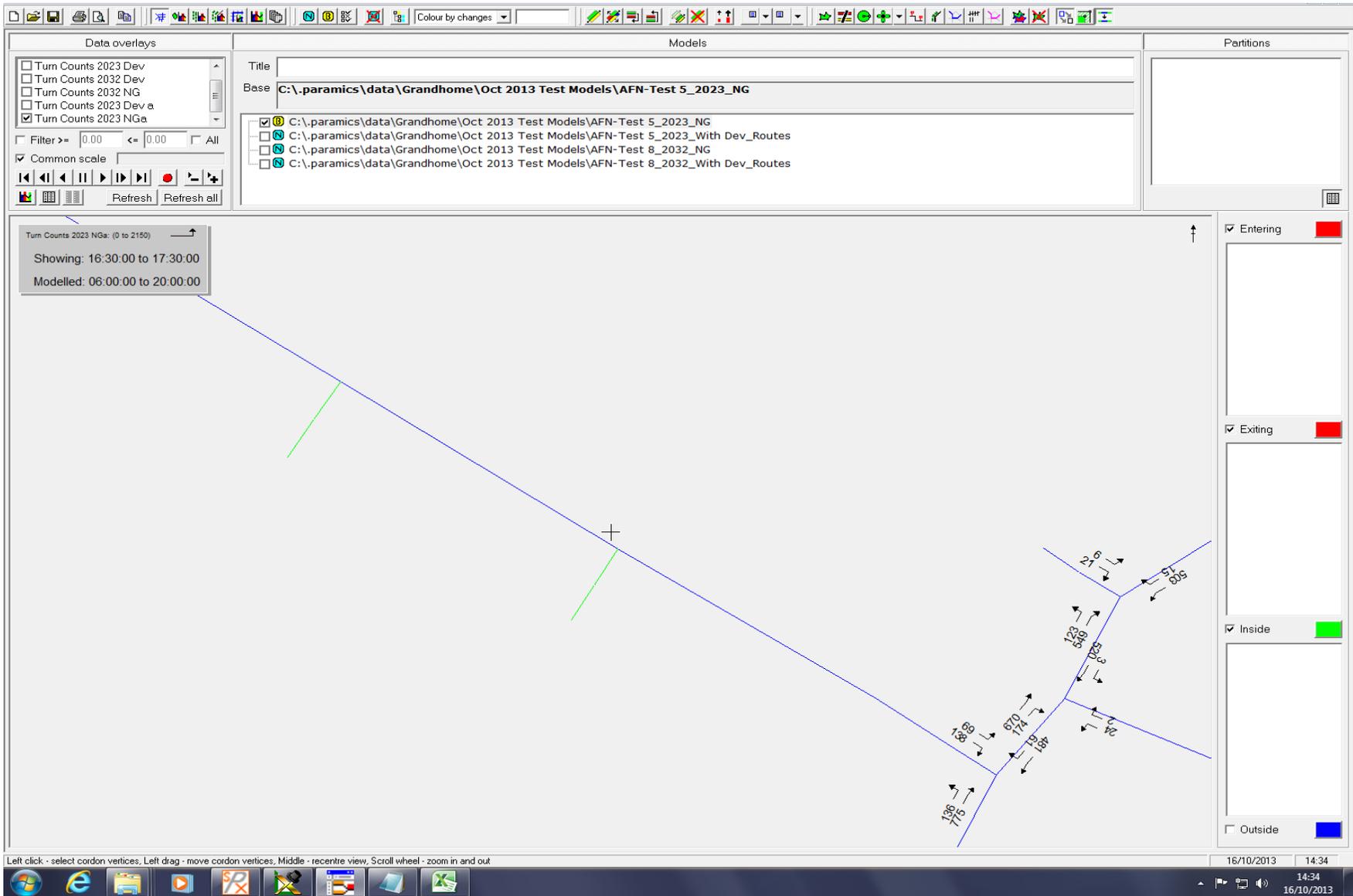
Turn Counts 2032 Dev: (0 to 2284) →
 Showing: 16:30:00 to 17:30:00
 Modelled: 05:30:00 to 19:00:00

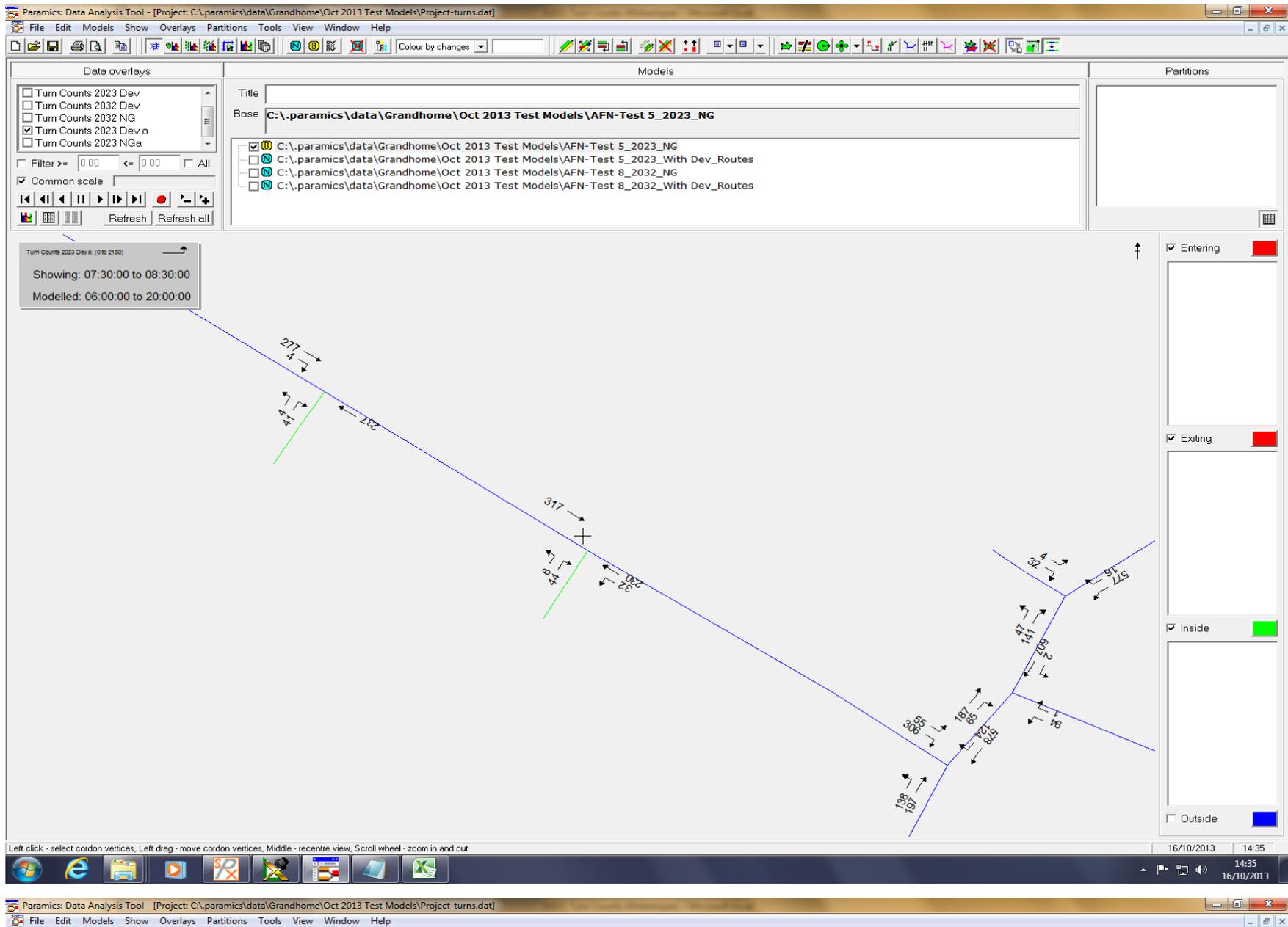
Left click - select cordon vertices, Left drag - move cordon vertices, Middle - recentre view, Scroll wheel - zoom in and out

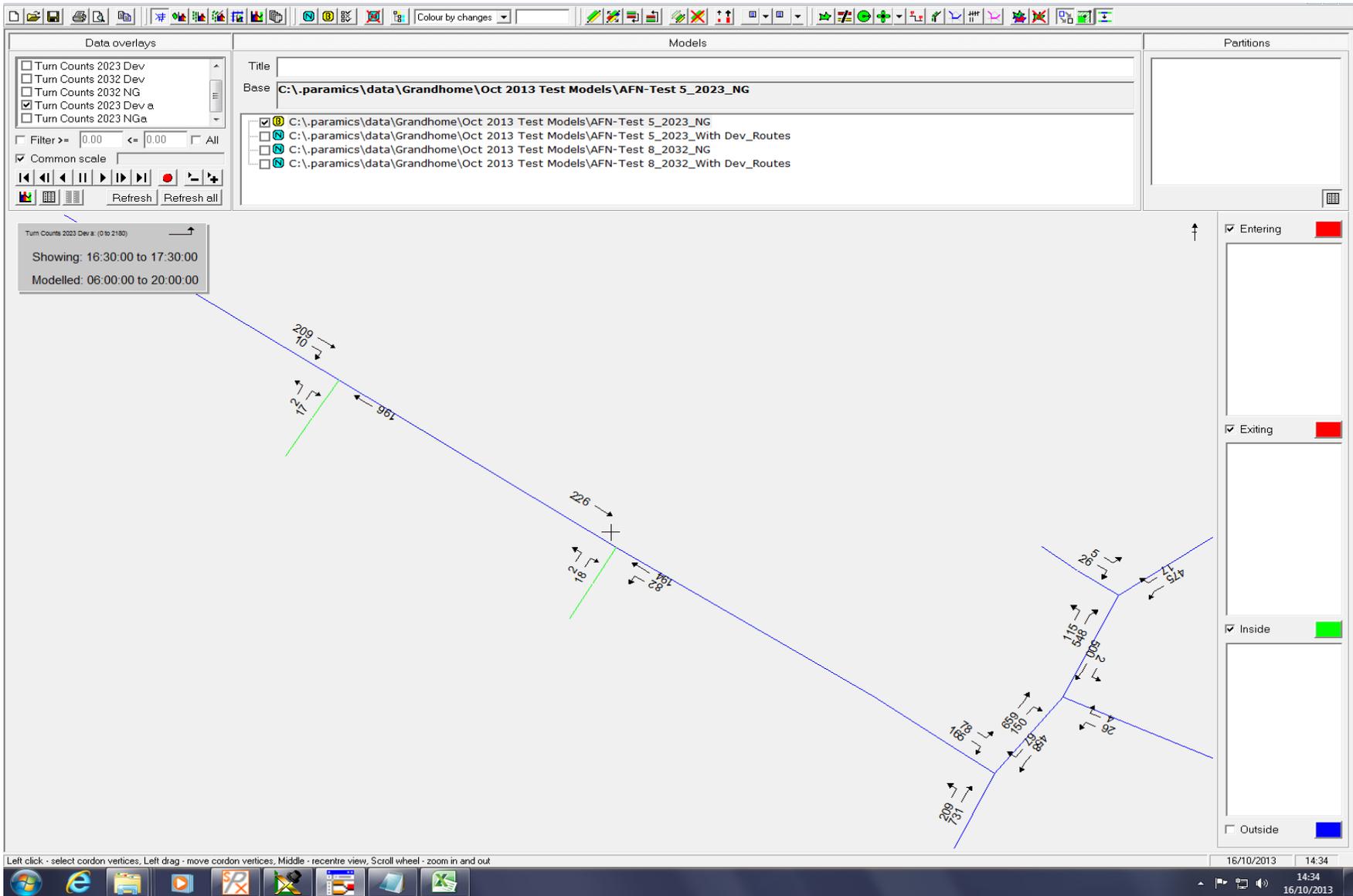
16/10/2013 14:32
 16/10/2013

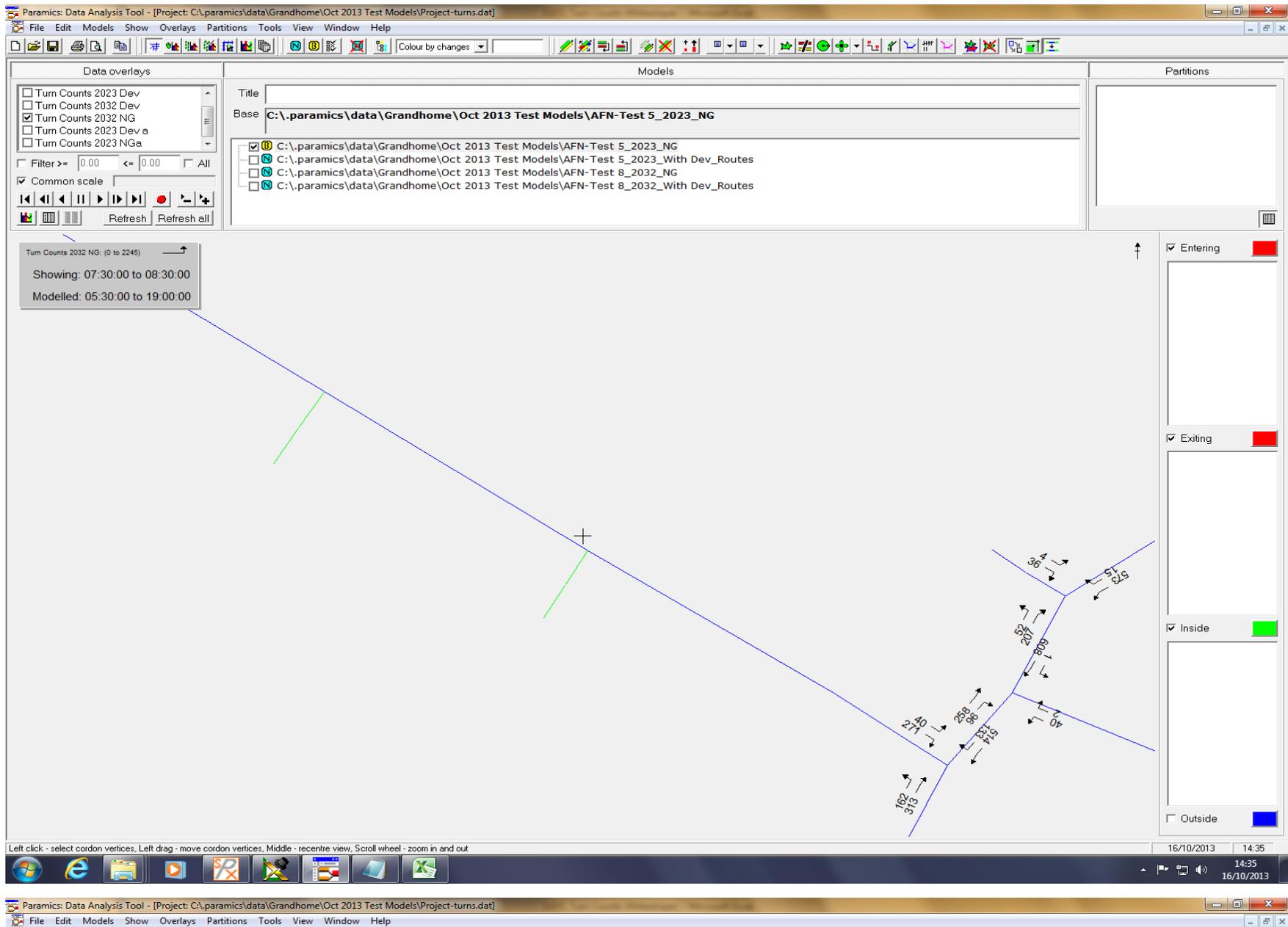


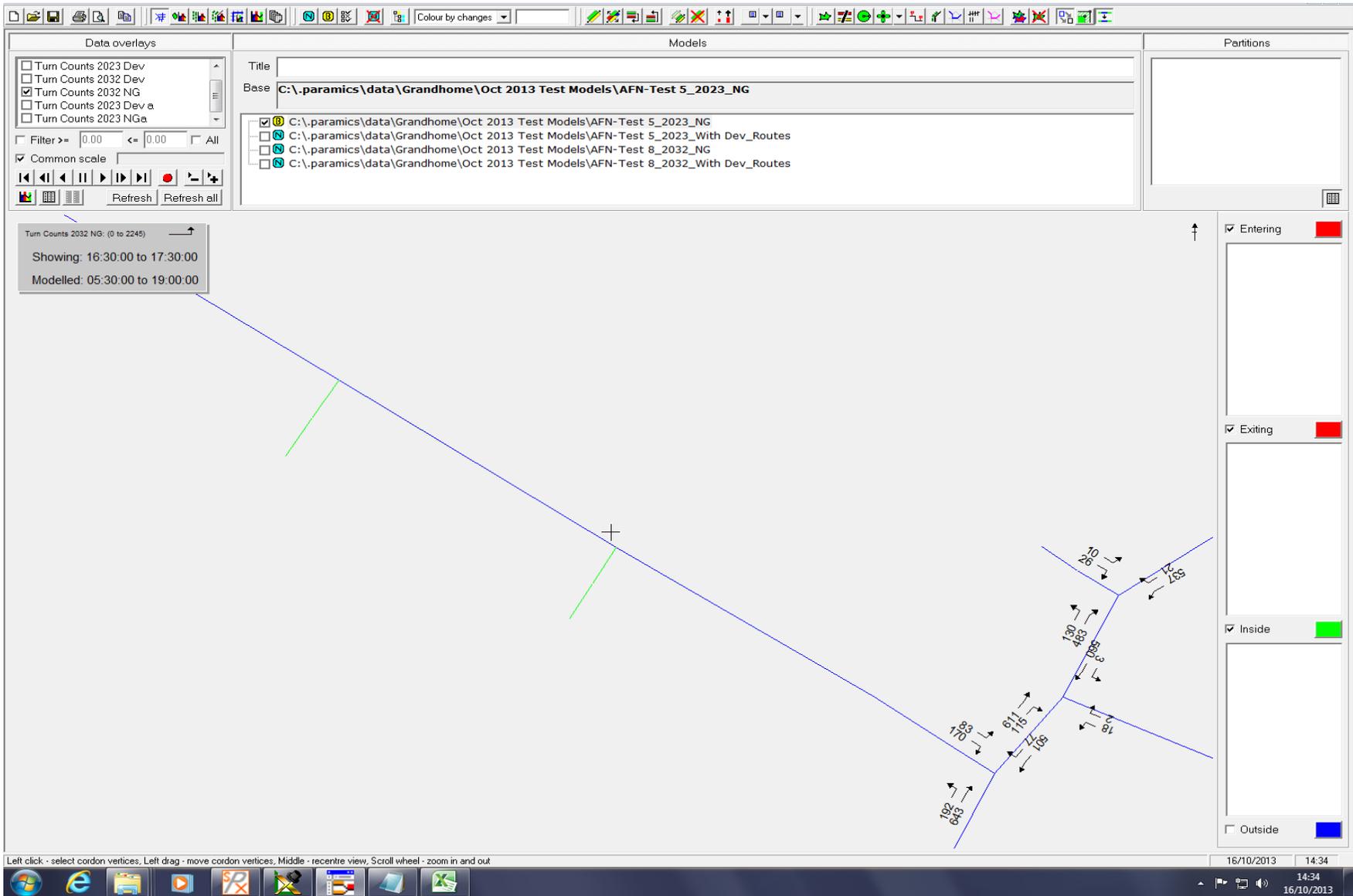
2023 Wh Rd NG

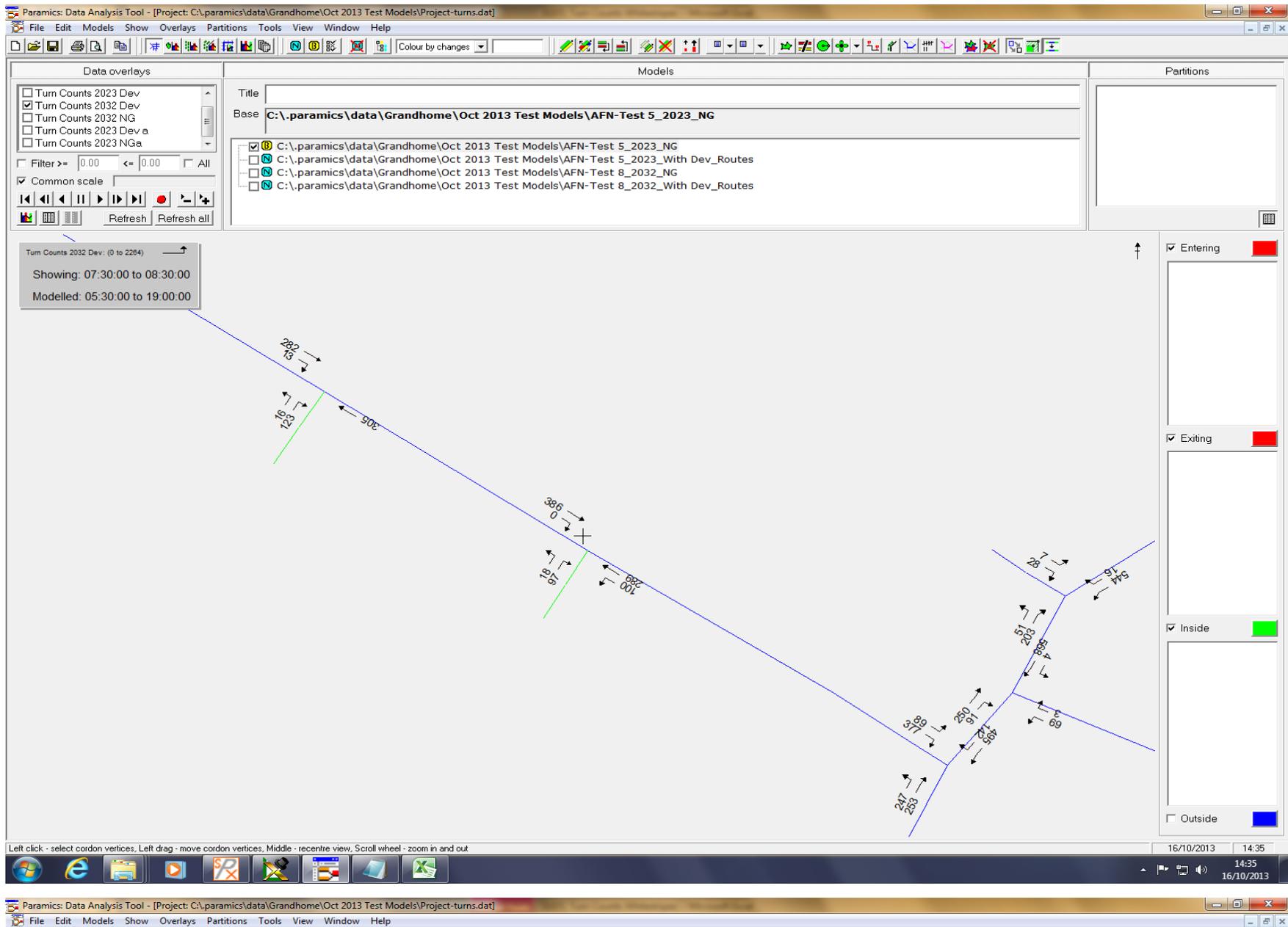












Turn Counts 2023 Dev
 Turn Counts 2032 Dev
 Turn Counts 2032 NG
 Turn Counts 2023 Dev a
 Turn Counts 2023 NGa

Filter >= 0.00 <= 0.00 All
 Common scale
 Refresh Refresh all

Title
 Base: C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG

C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_NG
 C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 5_2023_With Dev_Routes
 C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_NG
 C:\.params\data\Grandhome\Oct 2013 Test Models\AFN-Test 8_2032_With Dev_Routes

Turn Counts 2032 Dev: (0 to 2284)
 Showing: 16:30:00 to 17:30:00
 Modelled: 05:30:00 to 19:00:00

Entering
 Exiting
 Inside
 Outside

Left click - select cordon vertices, Left drag - move cordon vertices, Middle - recentre view, Scroll wheel - zoom in and out

16/10/2013 14:34
 16/10/2013

Appendix C – 2018 Junction Performance Summaries



Proposed site access onto Whitestripes Road

	Whitestripes Rd Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0	0	0	0
Dev Access Right	0.06	0	0.021	0
Whitestripes Rd right	0	0	0	0
Delay (min/veh)	0.01		0	

Table C1: 2018 With Development

Proposed site access onto Whitestripes Avenue North

	Whitestripes Ave \ Northern Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.030	0	0.024	0
Dev Access Right	0.561	1	0.253	0
Whitestripes Ave ahead right	0.028	0	0.038	0
Delay (min/veh)	0.06		0.02	

Table C2: 2018 With Development

Proposed site access onto Whitestripes Avenue South

	Whitestripes Ave \ South Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.030	0	0.024	0
Dev Access Right	0.561	1	0.253	0
Whitestripes Ave ahead right	0.028	0	0.038	0
Delay (min/veh)	0.06		0.02	

Table C3: 2018 With Development

Whitestripes Avenue/Whitestripes Road junction

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Road Left	0.032	0	0.118	0
Whitestripes Road Right	0.172	0	0.163	0
Whitestripes Ave Right	0.228	0	0.06	0
Delay (min/veh)	0.03		0.02	

Table C4: 2018 Base

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Road Left	0.032	0	0.118	0
Whitestripes Road Right	0.174	0	0.164	0
Whitestripes Ave Right	0.229	0	0.06	0
Delay (min/veh)	0.03		0.02	

Table C5: 2018 With Development

Whitestripes Avenue/Buckie Road junction

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.075	0	0.022	0
Buckie Rd Right	0.039	0	0.034	0
Whitestripes Ave Ahead right	0.018	0	0.084	0
Delay (min/veh)	0.01		0.01	

Table C6: 2018 Base

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.083	0	0.023	0
Buckie Rd Right	0.045	0	0.038	0
Whitestripes Ave Ahead right	0.02	0	0.087	0
Delay (min/veh)	0.01		0.01	

Table C7: 2018 With Development

Valentine Road/Whitestripes Avenue

	Valentine Rd / Whitestripes Ave			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.313	0	0.16	0
Valentine Rd Right	0.032	0	0.013	0
Whitestripes Ave Left	0.099	0	0.353	1
Delay (min/veh)	0.03		0.03	

Table C8: 2018 Base

	Valentine Rd / Whitestripes Ave			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.351	0	0.166	0
Valentine Rd Right	0.04	1	0.016	0
Whitestripes Ave Left	0.111	0	0.367	1
Delay (min/veh)	0.03		0.03	

Table C9: 2018 With Development

Buckie Farm Roundabout

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.61	2	0.29	0
A90 Parkway East	0.49	1	1.17	151
Fairview Street	0.38	0.62	0.50	1.01
A90 Parkway West	0.86	5.59	0.63	1.71
Delay (min/veh)	0.16		2.48	

Table C10: 2018 Base

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.82	4	0.34	1
A90 Parkway East	0.53	1	1.24	205
Fairview Street	0.40	1	0.54	1
A90 Parkway West	0.88	7	0.68	2
Delay (min/veh)	0.21		3.56	

Table C11: 2018 With Development

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.82	4	0.34	1
A90 Parkway East	0.50	1	1.17	152
Fairview Street	0.40	1	0.56	1
A90 Parkway West	0.88	7	0.69	2
Delay (min/veh)	0.21		2.32	

Table C12: 2018 with Mitigation

Appendix D – 2023 Junction Performance Summaries



Proposed site access onto Whitestripes Road

	Whitestripes Rd Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.011	0	0.004	0
Dev Access Right	0.091	0	0.035	0
Whitestripes Rd right	0	0	0	0
Delay (min/veh)	0.01		0	

Table D1: 2023 with Development

Proposed site access onto Whitestripes Avenue North

	Whitestripes Ave Northern Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.004	0	0.008	0
Dev Access Right	0.078	0	0.157	0
Whitestripes Ave ahead right	0.067	0	0.049	0
Delay (min/veh)	0.01		0.01	

Table D2: 2023 with Development

Proposed site access onto Whitestripes Avenue South

	Whitestripes Ave Southern Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0	0	0	0
Dev Access Right	0.015	0	0.028	0
Whitestripes Ave ahead right	0	0	0	0
Delay (min/veh)	0		0	

Table D3: 2023 with Development

Whitestripes Avenue/Whitestripes Road junction

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Jesmond Ave Left	0.157	0	0.049	0
Jesmond Avenue Right	0.004	0	0.012	0
Whitestripes Avenue Right to Whitestripes Road	0.261	0	0.198	0
Whitestripes Road Left	0.091	0	0.211	0
Whitestripes Road Right	0.699	2	0.771	3
Whitestripes Avenue Right to Jesmond Avenue	0.145	0	0.401	1
Delay (min/veh)	0.10		0.08	

Table D4: 2023 without Development

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Jesmond Ave Left	0.233	0	0.169	0
Jesmond Avenue Right	0.006	0	0.017	0
Whitestripes Avenue Right to Whitestripes Road	0.280	0	0.351	0
Whitestripes Road Left	0.114	0	0.195	0
Whitestripes Road Right	0.933	8	1.234	45
Whitestripes Avenue Right to Jesmond Avenue	0.158	0	0.216	0
Delay (min/veh)	0.18		0.82	

Table D5: 2023 with development

Whitestripes Avenue/Buckie Road junction

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.095	0	0.026	0
Buckie Rd Right	0.055	0	0.063	0
Whitestripes Avenue South ahead and right	0.023	0	0.100	0
Delay (min/veh)	0.01		0.01	

Table D6: 2023 without development

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.106	0	0.028	0
Buckie Rd Right	0.067	0	0.068	0
Whitestripes Avenue South ahead and right	0.025	0	0.101	0
Delay (min/veh)	0.01		0.01	

Table D7: 2023 with development

Valentine Road/Whitestripes Avenue

	Whitestripes Ave \ Valentine Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.304	0	0.125	0
Valentine Rd Right	0.035	0	0.052	0
Whitestripes Ave Left	0.111	0	0.389	1
Delay (min/veh)	0.02			

Table D8: 2023 without Development

	Whitestripes Ave \ Valentine Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.310	0	0.209	0
Valentine Rd Right	0.045	0	0.088	0
Whitestripes Ave Left	0.124	0	0.364	1
Delay (min/veh)	0.02		0.02	

Table D9: 2023 with Development

Buckie Farm Roundabout

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.68	2	0.60	1.50
A90 Parkway East	0.54	1	1.12	80
Fairview Street	0.40	1	0.31	0
A90 Parkway West	0.52	1	0.69	2
Delay (min/veh)	0.09		1.17	

Table D10: 2023 without Development

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.73	3	0.47	1
A90 Parkway East	0.52	1	1.02	33
Fairview Street	0.42	1	0.39	1
A90 Parkway West	0.56	1	0.73	3
Delay (min/veh)	0.11		0.57	

Table D11: 2023 with Development

Parkway Development Access

	Parkway Development Access					
	AM			PM		
	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)
A90 Parkway (E) Ahead Right	29.8	1	3	53	2	7
A90 Parkway (W) Ahead Left	25.8	1	3	33	1	4
A90 Parkway (W) Ahead	23.3	1	3	30	1	4
Development Access Left	30.2	1	2	16	1	1
Development Access Right	17.1	1	1	29	1	1
Cycle Time	90			90		
Peds called every	1			1		
Total Delay	3.6			4.6		

Table D12: 2023 with Development

Buckie Farm Roundabout

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.68	2	0.60	1.50
A90 Parkway East	0.54	1	1.12	80
Fairview Street	0.40	1	0.31	0
A90 Parkway West	0.52	1	0.69	2
Delay (min/veh)	0.09		1.17	

Table D10: 2023 without Development

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.73	3	0.47	1
A90 Parkway East	0.52	1	1.02	33
Fairview Street	0.42	1	0.39	1
A90 Parkway West	0.56	1	0.73	3
Delay (min/veh)	0.11		0.57	

Table D11: 2023 with Development

Parkway Development Access

	Parkway Development Access					
	AM			PM		
	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)
A90 Parkway (E) Ahead Right	29.8	1	3	53	2	7
A90 Parkway (W) Ahead Left	25.8	1	3	33	1	4
A90 Parkway (W) Ahead	23.3	1	3	30	1	4
Development Access Left	30.2	1	2	16	1	1
Development Access Right	17.1	1	1	29	1	1
Cycle Time	90			90		
Peds called every	1			1		
Total Delay	3.6			4.6		

Table D12: 2023 with Development

Buckie Farm Roundabout

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.68	2	0.60	1.50
A90 Parkway East	0.54	1	1.12	80
Fairview Street	0.40	1	0.31	0
A90 Parkway West	0.52	1	0.69	2
Delay (min/veh)	0.09		1.17	

Table D10: 2023 without Development

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.73	3	0.47	1
A90 Parkway East	0.52	1	1.02	33
Fairview Street	0.42	1	0.39	1
A90 Parkway West	0.56	1	0.73	3
Delay (min/veh)	0.11		0.57	

Table D11: 2023 with Development

Parkway Development Access

	Parkway Development Access					
	AM			PM		
	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)
A90 Parkway (E) Ahead Right	29.8	1	3	53	2	7
A90 Parkway (W) Ahead Left	25.8	1	3	33	1	4
A90 Parkway (W) Ahead	23.3	1	3	30	1	4
Development Access Left	30.2	1	2	16	1	1
Development Access Right	17.1	1	1	29	1	1
Cycle Time	90			90		
Peds called every	1			1		
Total Delay	3.6			4.6		

Table D12: 2023 with Development

Buckie Farm Roundabout

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.68	2	0.60	1.50
A90 Parkway East	0.54	1	1.12	80
Fairview Street	0.40	1	0.31	0
A90 Parkway West	0.52	1	0.69	2
Delay (min/veh)	0.09		1.17	

Table D10: 2023 without Development

	Buckie Farm Roundabout			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Whitestripes Avenue	0.73	3	0.47	1
A90 Parkway East	0.52	1	1.02	33
Fairview Street	0.42	1	0.39	1
A90 Parkway West	0.56	1	0.73	3
Delay (min/veh)	0.11		0.57	

Table D11: 2023 with Development

Parkway Development Access

	Parkway Development Access					
	AM			PM		
	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)	Deg Sat (%)	Delay PCU	Mean Max Queue (PCU)
A90 Parkway (E) Ahead Right	29.8	1	3	53	2	7
A90 Parkway (W) Ahead Left	25.8	1	3	33	1	4
A90 Parkway (W) Ahead	23.3	1	3	30	1	4
Development Access Left	30.2	1	2	16	1	1
Development Access Right	17.1	1	1	29	1	1
Cycle Time	90			90		
Peds called every	1			1		
Total Delay	3.6			4.6		

Table D12: 2023 with Development

Appendix E – 2023 Journey Time Comparisons

92071 - Journey Time Comparison - 2023

2023 Comparisons				
AM Simulation Period		No Grandhome	Comparative Results	
Route	Link	Average Journey Time (secs)	Average Journey Time (secs)	Difference
A90	Haudagain to Persley	51	54	3.00
A90	Persley Bridge	34	34	0.00
A90	Persley Bridge to Buckie Farm	186	206	20.40
A90	Buckie Farm to Scotstown Rd	83	84	1.40
A90	Scotstown Rd to Ellon Rd	102	105	2.80
A90	Ellon Rd to Scotstown Rd	71	70	-0.80
A90	Scotstown Rd to Buckie Farm	125	159	33.20
A90	Buckie Farm to Persley Bridge	260	392	132.20
A90	Persley Bridge	121	118	-2.40
A90	Persley to Haudagain	195	196	0.80
A96	Great Northern Road to St Machar Drive	23	28	4.80
A96	St Machar Drive to Don Street	56	56	0.00
A96	Don Street to Haudagain	121	128	7.80
A96	Auchmill Road to Stoneywood Road	104	104	0.20
A96	Inverurie Road	13	13	0.00
A96	Inverurie Road	14	14	0.00
A96	Stoneywood Road to Auchmill Road	142	139	-3.00
A96	Haudagain to Don Street	115	117	2.80
A96	Don Street to St Machar Drive	143	159	16.00
A96	St Machar Drive to Great Northern Road	25	24	-0.40
A956	King Street to St Machar Drive	36	39	3.00
A956	St Machar Drive to Bridge of Don	90	90	-0.40
A956	Bridge of Don to North Donside Road	107	108	1.40
A956	North Donside Road to Parkway	61	62	1.20
A956	Parkway to North Donside Road	50	51	0.40
A956	North Donside Road to Bridge of Don	84	87	2.60
A956	Bridge of Don to St Machar Drive	114	147	33.20
A956	St Machar Drive to King Street	27	28	1.20
3rd Don Crossing	Buckie Farm to Tillydrone	76	92	16.00
3rd Don Crossing	Tillydrone to St Machar Drive	196	269	73.40
3rd Don Crossing	St Machar Drive to Tillydrone	68	75	6.80
3rd Don Crossing	Tillydrone to Buckie Farm	92	103	11.20
Balgownie to Bridge of Don	Parkway to Scotstown Road	126	124	-1.80
Balgownie to Bridge of Don	Scotstown Road to Ellon Road	110	117	7.80
Balgownie to Bridge of Don	Ellon Road to Bridge of Don	23	23	0.80
Balgownie to Bridge of Don	Bridge of Don to Ellon Road	115	127	12.00
Balgownie to Bridge of Don	Ellon Road to Scotstown Road	38	38	0.00
Balgownie to Bridge of Don	Scotstown Road to Parkway	50	52	1.40

92071 - Journey Time Comparison - 2023

2023 Comparisons				
PM Simulation Period		No Grandhome	Comparative Results	
Route	Link	Average Journey Time (secs)	Average Journey Time (secs)	Difference
A90	Haudagain to Persley	168	188	20.60
A90	Persley Bridge	40	38	-1.80
A90	Persley Bridge to Buckie Farm	284	333	48.80
A90	Buckie Farm to Scotstown Rd	185	155	-29.20
A90	Scotstown Rd to Ellon Rd	270	243	-26.60
A90	Ellon Rd to Scotstown Rd	83	79	-3.60
A90	Scotstown Rd to Buckie Farm	95	110	15.00
A90	Buckie Farm to Persley Bridge	110	141	30.80
A90	Persley Bridge	41	49	7.80
A90	Persley to Haudagain	68	70	2.00
A96	Great Northern Road to St Machar Drive	14	22	8.00
A96	St Machar Drive to Don Street	77	85	8.40
A96	Don Street to Haudagain	228	263	34.60
A96	Auchmill Road to Stoneywood Road	155	172	16.20
A96	Inverurie Road	13	13	0.00
A96	Inverurie Road	14	14	0.00
A96	Stoneywood Road to Auchmill Road	127	129	1.80
A96	Haudagain to Don Street	121	124	2.80
A96	Don Street to St Machar Drive	51	57	6.20
A96	St Machar Drive to Great Northern Road	28	30	2.20
A956	King Street to St Machar Drive	133	145	11.60
A956	St Machar Drive to Bridge of Don	284	304	19.20
A956	Bridge of Don to North Donside Road	310	295	-14.80
A956	North Donside Road to Parkway	278	277	-1.00
A956	Parkway to North Donside Road	38	38	0.20
A956	North Donside Road to Bridge of Don	88	89	0.40
A956	Bridge of Don to St Machar Drive	117	118	1.20
A956	St Machar Drive to King Street	28	29	0.20
3rd Don Crossing	Buckie Farm to Tillydrone	91	112	20.20
3rd Don Crossing	Tillydrone to St Machar Drive	234	252	18.00
3rd Don Crossing	St Machar Drive to Tillydrone	70	76	5.60
3rd Don Crossing	Tillydrone to Buckie Farm	372	418	46.40
Balgownie to Bridge of Don	Parkway to Scotstown Road	140	157	17.00
Balgownie to Bridge of Don	Scotstown Road to Ellon Road	182	172	-10.20
Balgownie to Bridge of Don	Ellon Road to Bridge of Don	35	35	0.60
Balgownie to Bridge of Don	Bridge of Don to Ellon Road	424	408	-16.40
Balgownie to Bridge of Don	Ellon Road to Scotstown Road	40	44	4.00
Balgownie to Bridge of Don	Scotstown Road to Parkway	72	67	-4.80

Appendix F – 2032 Junction Performance Summaries

Proposed site access onto Whitestripes Road

	Whitestripes Rd Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.036	0	0.022	0
Dev Access Right	0.223	0	0.153	0
Whitestripes Rd right	0	0	0	0
Delay (min/veh)	0.02		0.01	

Table F1: 2032 with Development

Proposed site access onto Whitestripes Avenue North

	Whitestripes Ave \ Northern Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.042	0	0.024	0
Dev Access Right	0.445	1	0.445	1
Whitestripes Ave ahead right	0.118	0	0.255	1
Delay (min/veh)	0.03		0.04	

Table F2: 2032 with Development

Proposed site access onto Whitestripes Avenue South

	Whitestripes Ave \ Southern Access			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Dev Access Left	0.024	0	0.019	0
Dev Access Right	0.250	0	0.396	1
Whitestripes Ave ahead right	0	0	0	0
Delay (min/veh)	0.01		0.01	

Table F3: 2032 with Development

Whitestripes Avenue/Whitestripes Road junction

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Jesmond Ave Left	0.086	0	0.038	0
Jesmond Avenue Right	0.009	0	0.011	0
Whitestripes Avenue Right to Whitestripes Road	0.324	0	0.237	0
Whitestripes Road Left	0.098	0	0.243	0
Whitestripes Road Right	1.005	12	0.851	4
Whitestripes Avenue Right to Jesmond Avenue	0.233	0	0.272	0
Delay (min/veh)	0.23		0.10	

Table F4: 2032 without Development

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Jesmond Ave Left	0.169	0	0.062	0
Jesmond Avenue Right	0.017	0	0.029	0
Whitestripes Avenue Right to Whitestripes Road	0.351	1	0.223	0
Whitestripes Road Left	0.195	0	0.217	0
Whitestripes Road Right	1.234	46	0.808	4
Whitestripes Avenue Right to Jesmond Avenue	0.216	0	0.342	1
Delay (min/veh)	0.82		0.09	

Table F5: 2032 with Development

	Whitestripes Ave \ Whitestripes Rd			
	AM		PM	
	DoS	Max Q	DoS	Max Q
Whitestripes Road Right Left	77.1	11	85.7	11
Whitestripes Avenue S Left Ahead	49.6	8	84.3	24
Whitestripes Avenue N Ahead Right	65.2	11	67.9	9
Cycle Time	165		165	
Peds called every	2		2	
Total Delay	11		16	

Table F6: 2032 with Development and Mitigation

Whitestripes Avenue/Buckie Road junction

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.097	0	0.027	0
Buckie Rd Right	0.048	0	0.063	0
Whitestripes Avenue South ahead and right	0.023	0	0.103	0
Delay (min/veh)	0.01		0.01	

Table F7: 2032 without Development

	Whitestripes Ave \ Buckie Road			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Buckie Rd Left	0.116	0	0.029	0
Buckie Rd Right	0.090	0	0.123	0
Whitestripes Avenue South ahead and right	0.027	0	0.110	0
Delay (min/veh)	0.01		0.01	

Table F8: 2032 with Development

Valentine Road/Whitestripes Avenue

	Whitestripes Ave \ Valentine Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.324	0	0.139	0
Valentine Rd Right	0.068	0	0.021	0
Whitestripes Ave Left	0.024	0	0.117	0
Delay (min/veh)	0.02		0.01	

Table F9: 2032 Without Development

	Whitestripes Ave \ Valentine Rd			
	AM		PM	
	RFC	Max Q	RFC	Max Q
Valentine Rd Left	0.251	0	0.165	0
Valentine Rd Right	0.033	0	0.061	0
Whitestripes Ave Left	0.037	0	0.122	0
Delay (min/veh)	0.01		0.01	

Table F10: 2032 With Development

Buckie Farm Signals

	Buckie Farm Signals					
	AM			PM		
	Deg Sat (%)	Delay	Mean Max Queue (PCU)	Deg Sat (%)	Delay	Mean Max Queue (PCU)
A90 Parkway (E) Ahead Left	76.8%	4.1	9	56.5%	3.3	8.5
A90 Parkway (E) Ahead Right	83.8%	4.3	7	88.5%	9.4	11.6
A90 Parkway (W) Ahead Left	81.3%	6.1	13	87.1%	6.3	11.17
A90 Parkway (W) Ahead Right	81.6%	7.1	13	83.1%	6.6	11.8
Whitestripes Avenue Left Ahead	87.2%	9.8	25	53.8%	4.2	9.2
Whitestripes Avenue Right	57.2%	3.3	8	88.9%	8.5	17.4
Fairview Street Left Ahead	31.5%	2.1	6	89.5%	10.5	24
Fairview Street Right	85.6%	6.9	14	72.3%	5.2	12.1
Cycle Time	240			240		
Peds called every	2			2		
Total Delay	43.6			53.9		

Table F11: 2032 Base plus Development

Parkway Development Access

	Parkway Development Access					
	AM			PM		
	Deg Sat (%)	Delay	Mean Max Queue (PCU)	Deg Sat (%)	Delay	Mean Max Queue (PCU)
A90 Parkway (E) Ahead	17.8	0.3	2	31.1	0.8	4
A90 Parkway (E) Ahead Right	23	0.8	2	32.9	0.9	5
A90 Parkway (W) Ahead Left	35.3	1.1	5	49.5	1.8	7
A90 Parkway (W) Ahead	30.1	1.1	5	40	1.8	7
Development Access Left	33.2	0.9	1	22.2	0.7	2
Development Access Right	24.6	0.6	1	47.4	1.7	4
Cycle Time	90			90		
Peds called every	1			1		
Total Delay	5			8		

Table F12 2032 Base plus Development

Appendix G – 2032 Journey Time Comparisons

92071 - Journey Times Comparison 2032

2032 Comparisons				
AM Simulation Period		No Grandhome	Comparative Results	
Route	Link	Average Journey Time (secs)	Average Journey Time (secs)	Difference
A90	Haudagain to Persley	45	48	3.00
A90	Persley Bridge	34	35	0.60
A90	Persley Bridge to Buckie Farm	96	119	23.60
A90	Buckie Farm to Scotstown Rd	116	142	26.20
A90	Scotstown Rd to Ellon Rd	132	126	-6.40
A90	Ellon Rd to Scotstown Rd	66	66	-0.60
A90	Scotstown Rd to Buckie Farm	62	63	1.20
A90	Buckie Farm to Persley Bridge	159	250	91.80
A90	Persley Bridge	84	81	-3.00
A90	Persley to Haudagain	92	57	-35.40
A96	Great Northern Road to St Machar Drive	33	29	-3.80
A96	St Machar Drive to Don Street	56	57	0.80
A96	Don Street to Haudagain	149	125	-23.80
A96	Auchmill Road to Stoneywood Road	107	106	-0.40
A96	Inverurie Road	13	13	0.00
A96	Inverurie Road	14	14	0.00
A96	Stoneywood Road to Auchmill Road	114	114	0.00
A96	Haudagain to Don Street	116	114	-1.40
A96	Don Street to St Machar Drive	171	163	-7.80
A96	St Machar Drive to Great Northern Road	25	25	0.00
A956	King Street to St Machar Drive	39	40	0.40
A956	St Machar Drive to Bridge of Don	93	92	-1.60
A956	Bridge of Don to North Donside Road	115	113	-2.80
A956	North Donside Road to Parkway	103	91	-11.60
A956	Parkway to North Donside Road	47	47	-0.80
A956	North Donside Road to Bridge of Don	85	86	0.80
A956	Bridge of Don to St Machar Drive	106	125	19.20
A956	St Machar Drive to King Street	26	27	0.40
3rd Don Crossing	Buckie Farm to Tillydrone	78	85	7.40
3rd Don Crossing	Tillydrone to St Machar Drive	176	219	42.20
3rd Don Crossing	St Machar Drive to Tillydrone	69	71	2.00
3rd Don Crossing	Tillydrone to Buckie Farm	138	140	2.60
Balgownie to Bridge of Don	Parkway to Scotstown Road	132	134	1.80
Balgownie to Bridge of Don	Scotstown Road to Ellon Road	130	136	6.00
Balgownie to Bridge of Don	Ellon Road to Bridge of Don	22	23	1.00
Balgownie to Bridge of Don	Bridge of Don to Ellon Road	132	123	-9.00
Balgownie to Bridge of Don	Ellon Road to Scotstown Road	38	38	0.00
Balgownie to Bridge of Don	Scotstown Road to Parkway	53	52	-1.40

92071 - Journey Times Comparison 2032

2032 Comparisons				
PM Simulation Period		No Grandhome	Comparative Results	
Route	Link	Average Journey Time (secs)	Average Journey Time (secs)	Difference
A90	Haudagain to Persley	61	139	78.00
A90	Persley Bridge	35	37	2.00
A90	Persley Bridge to Buckie Farm	93	117	24.00
A90	Buckie Farm to Scotstown Rd	75	73	-1.60
A90	Scotstown Rd to Ellon Rd	138	109	-28.80
A90	Ellon Rd to Scotstown Rd	205	205	-0.40
A90	Scotstown Rd to Buckie Farm	71	77	6.40
A90	Buckie Farm to Persley Bridge	105	167	62.40
A90	Persley Bridge	52	46	-5.20
A90	Persley to Haudagain	53	68	14.40
A96	Great Northern Road to St Machar Drive	11	17	6.00
A96	St Machar Drive to Don Street	69	78	9.00
A96	Don Street to Haudagain	124	181	56.60
A96	Auchmill Road to Stoneywood Road	114	118	4.00
A96	Inverurie Road	13	13	0.00
A96	Inverurie Road	14	15	1.00
A96	Stoneywood Road to Auchmill Road	124	127	3.40
A96	Haudagain to Don Street	120	119	-1.60
A96	Don Street to St Machar Drive	51	59	7.60
A96	St Machar Drive to Great Northern Road	27	32	5.40
A956	King Street to St Machar Drive	156	130	-25.20
A956	St Machar Drive to Bridge of Don	245	262	16.80
A956	Bridge of Don to North Donside Road	106	101	-5.60
A956	North Donside Road to Parkway	85	79	-6.40
A956	Parkway to North Donside Road	47	45	-2.40
A956	North Donside Road to Bridge of Don	130	121	-9.20
A956	Bridge of Don to St Machar Drive	122	125	3.80
A956	St Machar Drive to King Street	29	31	1.40
3rd Don Crossing	Buckie Farm to Tillydrone	92	128	36.00
3rd Don Crossing	Tillydrone to St Machar Drive	206	226	20.40
3rd Don Crossing	St Machar Drive to Tillydrone	71	77	6.20
3rd Don Crossing	Tillydrone to Buckie Farm	138	221	82.40
Balgownie to Bridge of Don	Parkway to Scotstown Road	123	122	-1.20
Balgownie to Bridge of Don	Scotstown Road to Ellon Road	132	129	-3.00
Balgownie to Bridge of Don	Ellon Road to Bridge of Don	49	47	-1.80
Balgownie to Bridge of Don	Bridge of Don to Ellon Road	151	172	21.40
Balgownie to Bridge of Don	Ellon Road to Scotstown Road	38	38	0.00
Balgownie to Bridge of Don	Scotstown Road to Parkway	41	39	-1.80

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