Project

Proposed Residential Development, Parkside 4, Parkside, Dublin 13

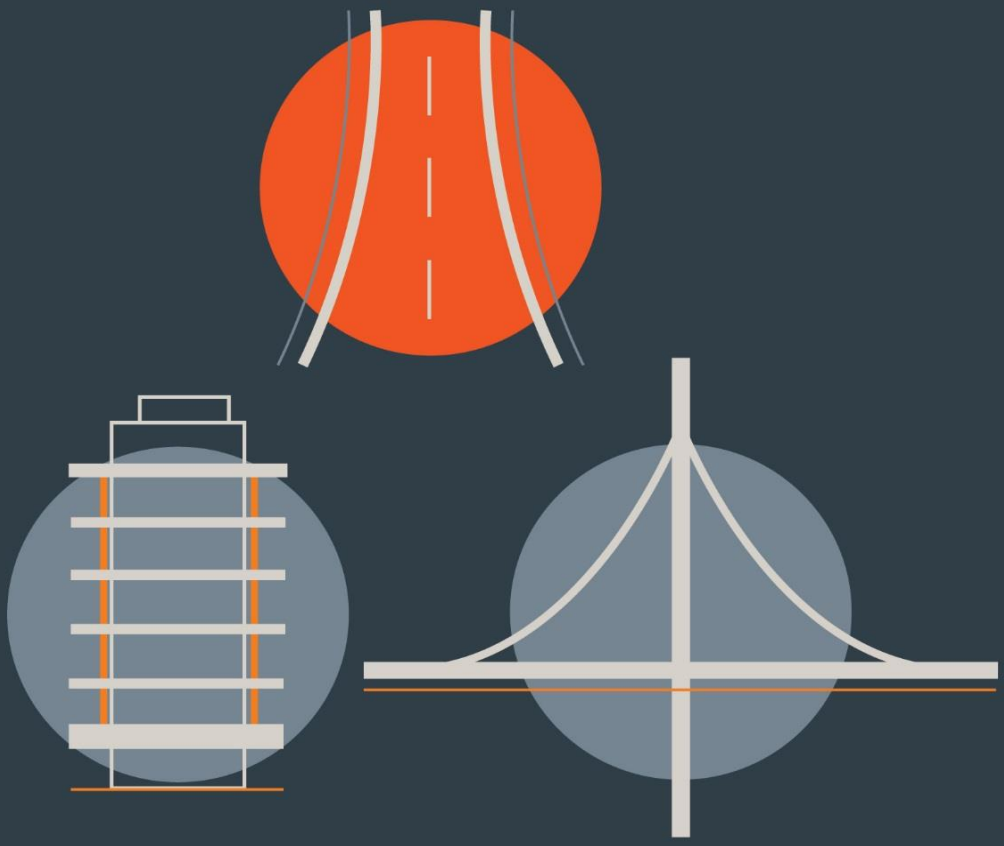
Report Title

TRAFFIC & TRANSPORT ASSESSMENT

Client

Cairn Homes Properties Ltd.

TRANSPORTATION



DBFL CONSULTING ENGINEERS

Document Control

Job Title: Proposed Residential Development, Parkside 4, Parkside, Dublin 13

Job Number: p190011

Report Ref: p190011-RP-D-0003

Author: Patrick McGeough

Reviewed by: Aimee Dunne

Date: 25 April 2019

Distribution: DBFL Consulting Engineers
Client

Revision	Issue Date	Description	Prepared	Reviewed	Approved
1st Draft	15/04/2019	Pre-Planning	PMG	AD	-
Stage 2	30/04/2019	Pre-Planning	PMG	AD	RK
Final Draft	20/09/2019	Planning	PMG	AD	RK
Final	09/10/2019	Planning	PMG	AD	RK

DBFL Consulting Engineers

Dublin Office
Ormond House
Ormond Quay
Dublin 7

Tel 01 4004000
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office
Unit 2
The Chandlery
1-2 O'Connell Street, Waterford

Tel 051 309500
Email info@dbfl.ie
Web www.dbfl.ie

Cork Office
Phoenix House
Monahan Road
Cork

Tel 021 202 4538
Email info@dbfl.ie
Web www.dbfl.ie

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (DBFL) have been commissioned to prepare a Traffic & Transport Assessment (TTA) for a proposed residential development on lands at Parkside, Dublin 13.

1.1.2 The Parkside Lands, which include the subject site, were previously granted planning permission as part of an overall Framework Plan for development of these Lands, (Ref. 4315/03) by Dublin City Council and by An Bord Pleanála (ABP) (Ref. PL29N.131019 and PL29N.207192), following third party appeals. These previous planning applications will be discussed in greater detail later in this report.

1.1.3 Phases 1, 2A, 2B, 2C, 3 and 5A of the Parkside development have either been constructed or are currently under construction, with the majority of units already occupied. The subject proposals represent Phase 4 of the Parkside development and will comprise a residential scheme of 282 residential units in 4 apartment blocks ranging in height from 3 to 7 storeys in height. Apartments will have north/ south / east / west facing balconies / terraces. The proposed development also includes residential amenity facilities (concierge, media centre, and gymnasium), 286 no. car parking, and 423 no. cycle parking throughout the development (in the basement and at surface level). The proposed development provides for the continuation and completion of the Mayne River Linear Park as well as public open space and communal open spaces between the buildings. The proposed development and all other development and associated works are as set out in full in the statutory planning notices.

1.1.4 The report has been produced to address potential concerns that the local planning authority (Dublin City Council) and ABP may have pertaining to the level of influence the proposed development will have upon the local transportation system.

1.2 SCOPE

1.2.1 The purpose of this TTA is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of any transport impact generated as a result of the proposed residential development. The scope of the assessment covers transport and related

sustainability issues including means of vehicular access, pedestrian, cyclist and local public transport connections.

1.3 METHODOLOGY

1.3.1 Our approach to the study accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include:

- '*Traffic and Transport Assessment Guidelines*' (May 2014) Transport Infrastructure Ireland (TII);
- '*Traffic Management Guidelines*' Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- '*Guidelines for Traffic Impact Assessments*' The Institution of Highways and Transportation; and
- Dublin City Development Plan (2016-2022).

1.3.2 Our methodology incorporated a number of key inter-related stages, including:-

- **Site Audit**: A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.

- **Background Review**: A background review of previous planning permissions on the subject Parkside Phase 4 site was undertaken.

- **Development Framework**: A review of Development Frameworks and supporting Transport focused studies was undertaken.

- **Trip Generation**: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.

- **Trip Distribution:** Based upon both the existing traffic characteristics and the network layout in addition to the spatial / land use configuration and

density of the urban structure across the catchments area of the development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.

- **Network Analysis:** Further to quantifying the predicted impact of vehicle movements across the local road network for the adopted optimum site access strategy, more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2020, 2025 and 2035 development scenarios.

1.4 REPORT STRUCTURE

1.4.1 As introduced above, this TTA seeks to clarify the potential level of influence generated by the proposed development upon the local road network. The structure of the report responds to the various stages of this exercise including the key tasks summarised below.

1.4.2 **Chapter Two** of this report describes the existing conditions at the proposed development location and surrounding area.

1.4.3 The relevant transportation policies that influence the design and appraisal of the subject development proposals are highlighted within **Chapter Three**.

1.4.4 **Chapter Four** provides a summary of the proposed development itself from a transportation perspective.

1.4.5 In **Chapter Five** a summary of the vehicle trip generation for the subject site is presented. The potential traffic impact of the proposals is assessed for the adopted 2021 Opening Year the 2036 Horizon Year are summarised within **Chapter Six.**

1.4.6 Finally, a summary of our appraisal together with the main conclusions of the assessment are provided in **Chapter Seven**.

2.0 RECEIVING ENVIRONMENT

2.1 LAND USE

2.1.1 The subject site is located on a brownfield site within the North Fringe Area of north Dublin, within the Clongriffin-Belmayne LAP lands. The north boundary of the subject development site runs adjacent to the Mayne River with the eastern boundary running adjacent to Balgriffin Park. The southern boundary is formed by Parkside Boulevard, whilst the western boundary is formed by the existing Parkside playground.

2.1.2 The Belmayne Educate Together National School and St. Francis of Assisi Primary School, were temporarily located on the proposed development site and the buildings will be demolished as the schools have permanently relocated to the newly constructed facilities located on Belmayne Avenue.

2.1.3 To the west and north of the subject site are the residential settlements of Belmayne and Balgriffin respectively. Immediately south of the development site is the wider Parkside development, whilst further south the residential areas of Clarehall and Donaghmede can be found. Father Collins Public Park and the Clongriffin residential area lie to the east of the subject site.

2.2 LOCATION

2.2.1 The general location of the subject site in relation to the surrounding road network is illustrated in **Figure 2.1**, while the extents of the subject site boundary and neighbouring lands are indicatively shown in **Figure 2.2**. The subject site is located approximately 10 kilometres northeast of Dublin City Centre.

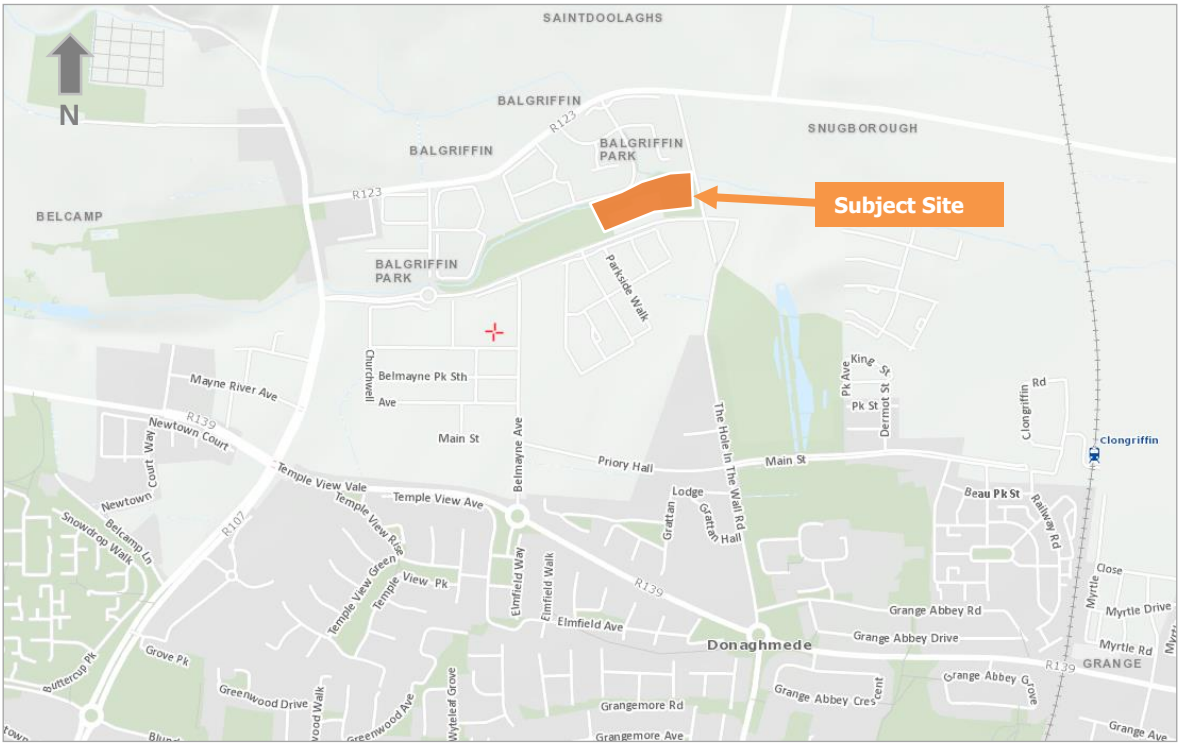


Figure 2.1: Site Location (Reference: http://maps.osi.ie)

2.2.2 To the south of the subject site, Parkside Boulevard runs in an east-west direction terminating to the west at a signalised junction with the R107 Malahide Road. To the north of the R107 Malahide Road / Parkside Boulevard junction, the R107 provides a direct route to Malahide, whilst to the south the R107 provides a connection to Dublin City Centre.

2.2.3 To the southwest of the subject site Belmayne Avenue runs in a north-south direction from Parkside Boulevard terminating at a roundabout junction with the R139 regional road. The R139 subsequently provides access to Donaghmede and Baldoyle to the east, whilst to the west it provides access to the M50 C-ring and the M1 motorway via junctions 3 and 1, respectively.

2.2.4 The destinations of Dublin Airport, Swords, Drogheda and Dundalk can all be reached by following the M1 northbound, whilst the M50 C-Ring allows access to all areas of Dublin.

2.2.5 Travelling east along Parkside Boulevard from the Parkside development, the route forms a 3-arm junction with Hole in the Wall Road. From the aforementioned junction, Hole in the Wall Road runs in a north-south direction terminating to the south at a roundabout junction with the strategic R139.

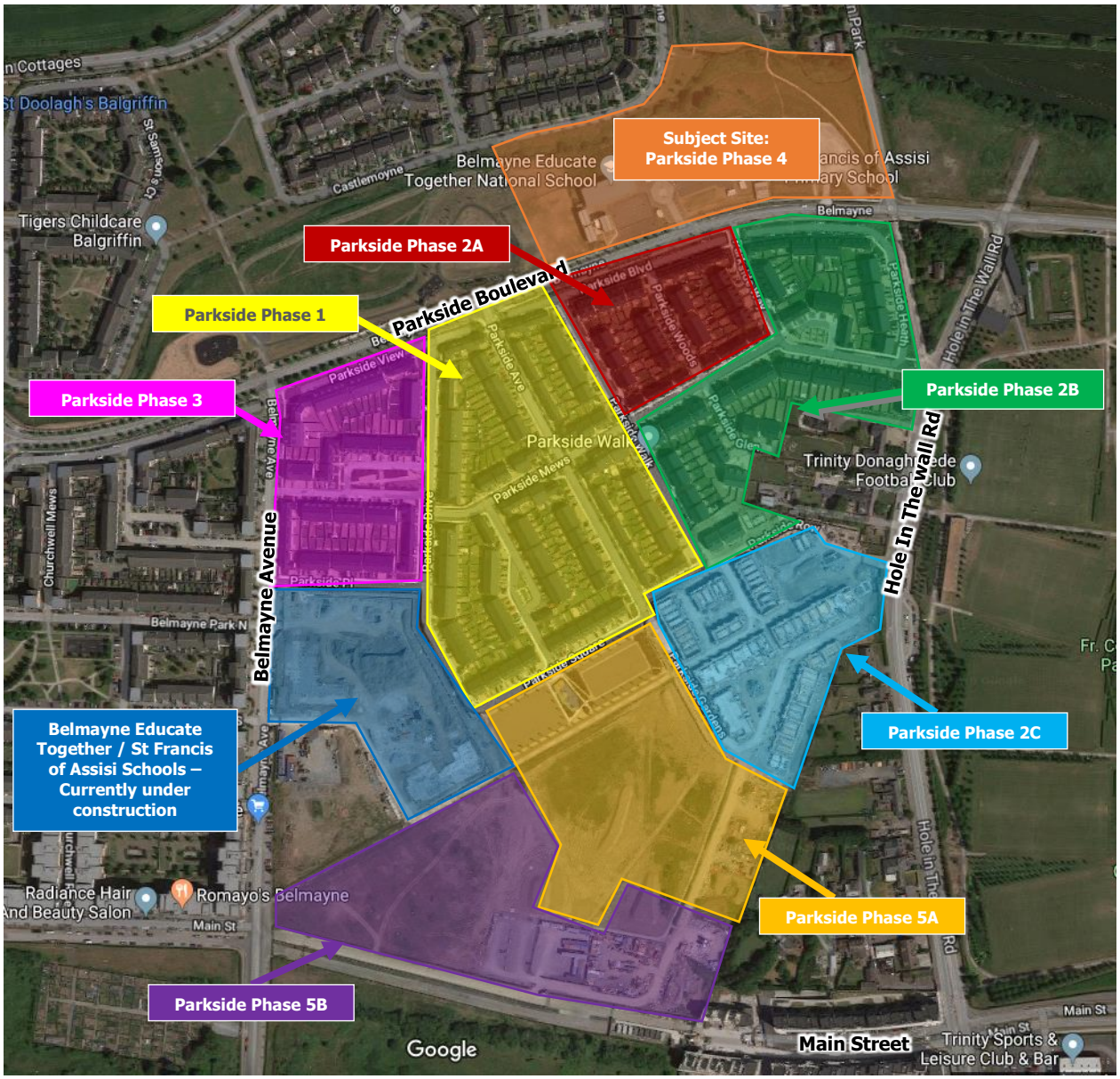


Figure 2.2: Indicative Subject Phase 4 site boundary in relation to full Parkside Development

2.3 EXISTING TRANSPORTATION INFRASTRUCTURE

Background

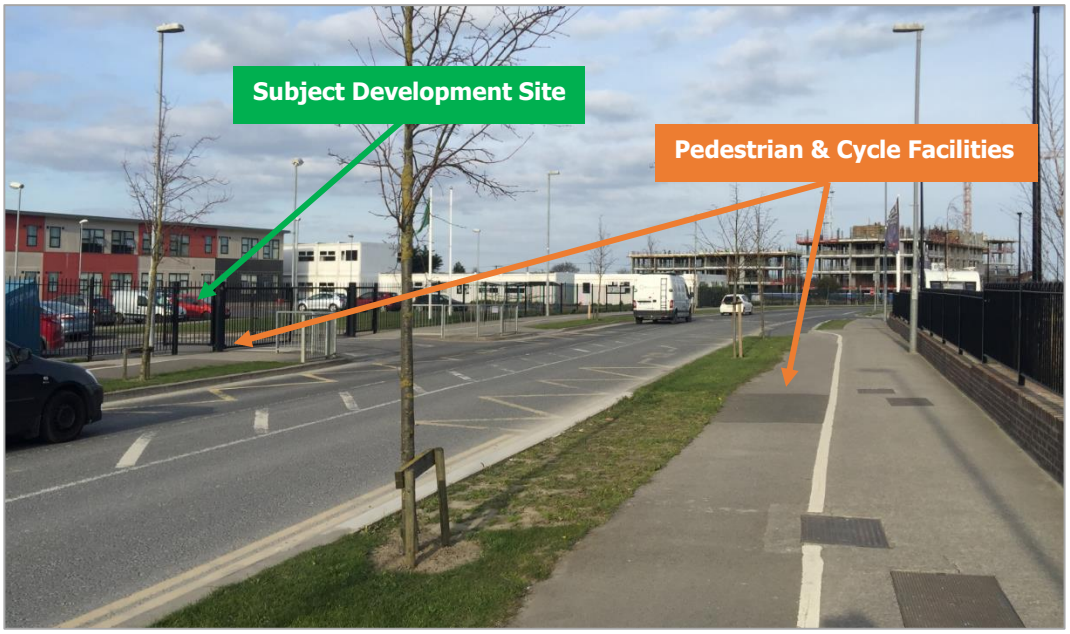
2.3.1 An important stage in the development of a TTA is the identification and appreciation of the local network's existing transport conditions and movement characteristics.

2.3.2 An audit of the local road network has therefore been undertaken to establish the existing transport conditions and movement patterns across the existing network.

Existing Cycling and Pedestrian Facilities

2.3.3 Parkside Boulevard is subject to a speed limit of 50kph with street lighting provided on both sides of the road. In the vicinity of the development site, high quality segregated pedestrian / cyclist paths are provided on both sides of the road, separated from the carriageway by grass verges as shown in **Photograph 2.1**.

2.3.4 These segregated pedestrian/cycle routes continue west to the Parkside Boulevard/R107 Malahide Road junction where there are formal pedestrian crossing facilities available on the Malahide Road (southern arm) and Parkside Boulevard (eastern arm) of the aforementioned junction.



Photograph 2.1: Parkside Boulevard Pedestrian & Cyclist Facilities
(View eastbound adjacent proposed development site)

2.3.5 Pedestrians also benefit from street lighting and a good quality pedestrian footpath on Belmayne Avenue as follows;

- On both sides between Parkside Boulevard and Parkside Place; and
- On the western side between Parkside Place and the R139/Belmayne Avenue.

2.3.6 These facilities provide a link to the pedestrian facilities on the R139 corridor to the south of the subject development site. There is also a controlled pedestrian crossing facility available on the R139 to the west of the R139/Belmayne Avenue roundabout junction which links to the pedestrian facilities and bus stops on the southern side of the carriageway.

2.3.7 In addition to the aforementioned cycle facilities, there is a green route (walk/cycle) available which connects Belmayne Avenue to Hole in the Wall Road via the Parkside development (**Photograph 2.2**). This green route is currently partially open from Hole in the Wall Road up to the construction site of the proposed relocated schools. The Green Route will open in its entirety following the completion of construction in the adjoining sites.

2.3.8 Access from the subject development site to the green route can be achieved via the internal Parkside development road network. The green route provides a high quality, street lit pedestrian/cyclist direct connection between Fr. Collins Park, and Belmayne Avenue.

Photograph 2.2: Green route from Belmayne Avenue to Hole in the Wall Road

2.3.9 There are also a variety of other cycling facilities available on routes surrounding the wider area to the subject site as illustrated in the extract from the Greater Dublin Area (GDA) Existing Cycle Network Plan as shown in **Figure 2.3.**

Figure 2.3: Existing Cycling Facilities (Source: Sheet E2 GDA Cycle Network Plan)

2.3.10 The wider existing pedestrian and cycle linkages surrounding the subject site offer good quality permeability and connectivity. Existing pedestrian and cyclist linkages within a 2km radius of the site are illustrated in **Drawing No. 190011-1000**, submitted as part of the Planning Application Package.

Public Transport – Bus

2.3.11 There are a number of Dublin Bus services in close proximity to subject site. Numbers 42 and 43 Dublin Bus routes travel along the R107 Malahide Road approximately 1.1km to the west of the subject site. Route numbers 15, 27 & 27X travel along the R139 approximately 540m to the south of the subject site. In addition, route number 29a travels along R809 Grange Road approximately 1.1km to the south of the subject site.

2.3.12 The vast majority of these Dublin Bus services operate daily and offer relatively frequent services (i.e. every 10 minutes at peak times) as summarised in **Table 2.1**.

Bus Service	Route Number	Destination	Monday – Friday	Saturday	Sunday
Dublin Bus	15	Clongriffin - Ballycullen Rd	10	15	20
	27	Clare Hall - Jobstown	10-15	20	20
	27x	UCD Bellfield – Clare Hall	2 services in AM/PM Peak	-	-
	42	Talbot St - Portmarnock	30	20	30
	43	Talbot St - Swords Business Park	60	60	45-70

Table 2.1: Dublin Bus Service Frequency (minutes)

2.3.13 **Figure 2.4** below provides details of the above-named bus routes and the closest interchange opportunities available to the subject site.

Figure 2.4: Local Interchange Locations

2.3.14 A separate **Drawing No. 190011-1000** submitted as part of the Planning Application Package illustrates the existing public transport routes within a 2km radius of the subject site.

Public Transport – Rail

2.3.15 Clongriffin Rail Station is located approximately 1.4km east of the subject site on Station Way, as indicated in **Figure 2.5**. Dart services (Bray/Greystones and Malahide) call at Clongriffin Station with regular services throughout the day serving the destinations of;

- Greystones,
- Malahide,
- Dublin Pearse,
- Bray; and
- Dun Laoghaire.

2.3.16 Furthermore, the Dublin Pearse to Drogheda/Dundalk rail service also calls at this station. **Figure 2.6** shows the destinations which are accessible to/from the Clongriffin Station.

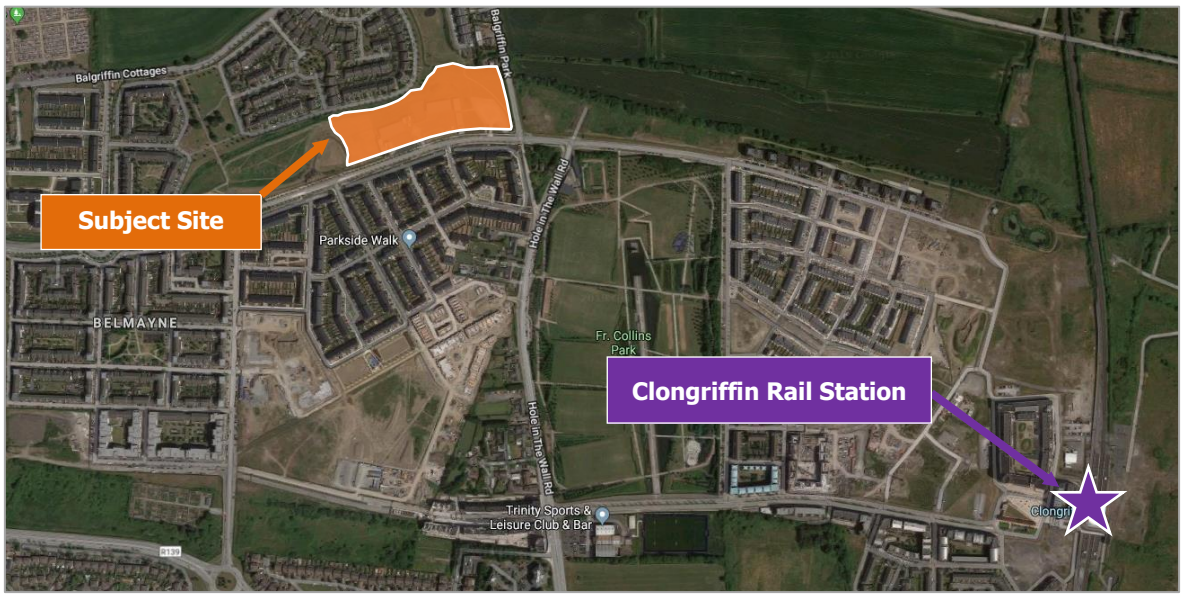


Figure 2.5: Subject Site Location in relation to Clongriffin Rail Station

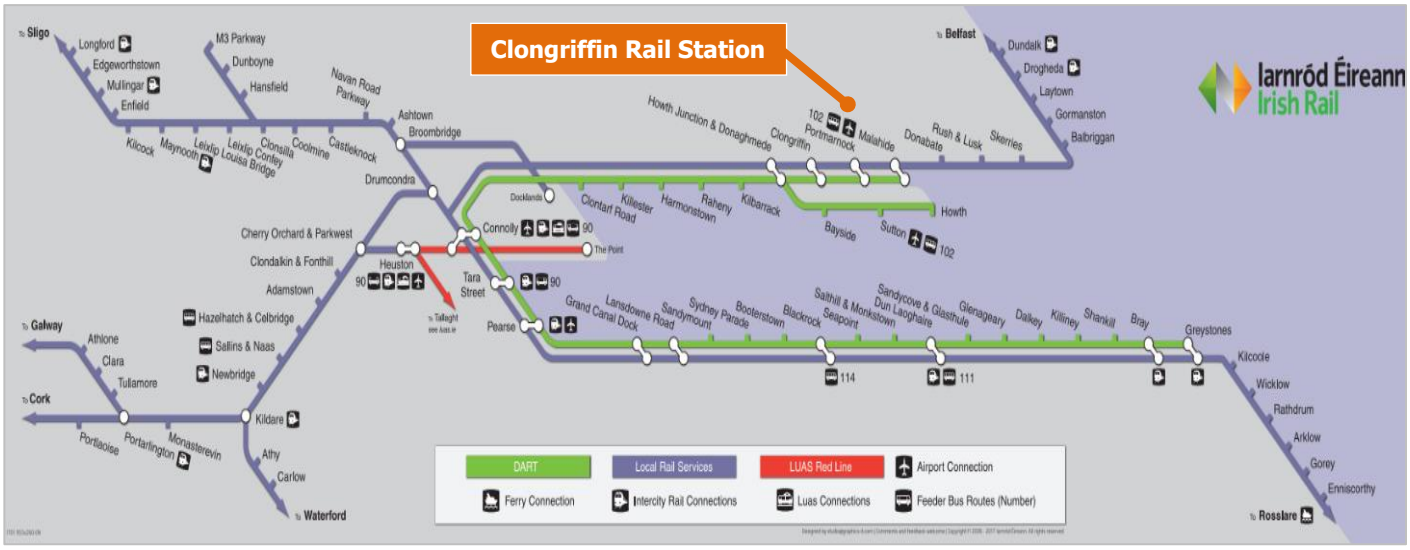


Figure 2.6: Rail Service Route Map (source www.irishrail.ie)

2.4 EMERGING TRANSPORT DEVELOPMENTS

Cycle Network Proposals

2.4.1 The Greater Dublin Area Cycle Network Plan (2013) includes proposals for the provision of four orbital routes in the north east sector of Dublin which seek to provide *"cross-links between the radial routes and give access to the destinations within this sector, and the adjoining north central sector"*.

2.4.2 In the vicinity of the subject site the following route additions are proposed in addition to those indicated on **Figure 2.7**:-

- *Radial Route 1A extension through Sutton Cross towards Howth in a loop and through Baldoyle to Portmarnock;*
- *Radial Route 1B along Raheny Road and Grange Road between Raheny and Clongriffin through Donaghmede; and*
- *Orbital Route NO5 along Tonlegee Road from Kilbarrack to Coolock and Oscar Traynor Road from Coolock to Kilmore at Northside Shopping Centre and onward to Santry.*
- *Clongriffin to City Centre Core Bus Corridor upgrades along Malahide Road and through Belmayne, including the completion of Belmayne Main Street, which proposes segregated facilities.*

2.4.3 Furthermore, the following greenways are proposed in addition to those indicated on **Figure 2.7:**

- *"Various local greenways within large public parks such as Saint Anne's Park in Raheny and Edenmore Park, similar to the new cycle track loop within Father Collins Park in Clongriffin."*

2.4.4 Also, segregated pedestrian and cyclist facilities are proposed to be constructed as part of the Belmayne Main Street scheme, which will provide a new 'Main Street' in Belmayne that links the Malahide Road in the west to New Priory in the east.

Figure 2.7: Proposed Cycle Routes (extract Sheet N2 GDA CNP)

2.4.5 The proposed cycle facilities and linkages within a 2km radius of the subject site are illustrated in a separate **Drawing No. 190011-1001** submitted as part of the Planning Application Package.

Bus Connects

2.4.6 Bus Connects is a strategic transport plan transforming and revamping the current bus system by building the 'next generation' of bus corridors on the busiest routes and redesigning routes with the aim to offer fast, predictable and reliable bus journeys.

2.4.7 Under the proposals there will be a *'new public transport only link between Clarehall and Belmayne Avenue'* served by several bus services. The proposed

Clongriffin to City Centre Core Bus Corridor (CBC 1), shown in **Figure 2.8**, will be accessible within an approximate 700m walking distance of the subject site.

Figure 2.8: BusConnects Proposed Clongriffin City Centre Core Bus Corridor
(source www.busconnects.ie)

2.4.8 Another new bus route is also proposed as part of the overall network redesign (D3), which will run along Parkside Boulevard directly serving the proposed development site as shown in **Figure 2.9**.

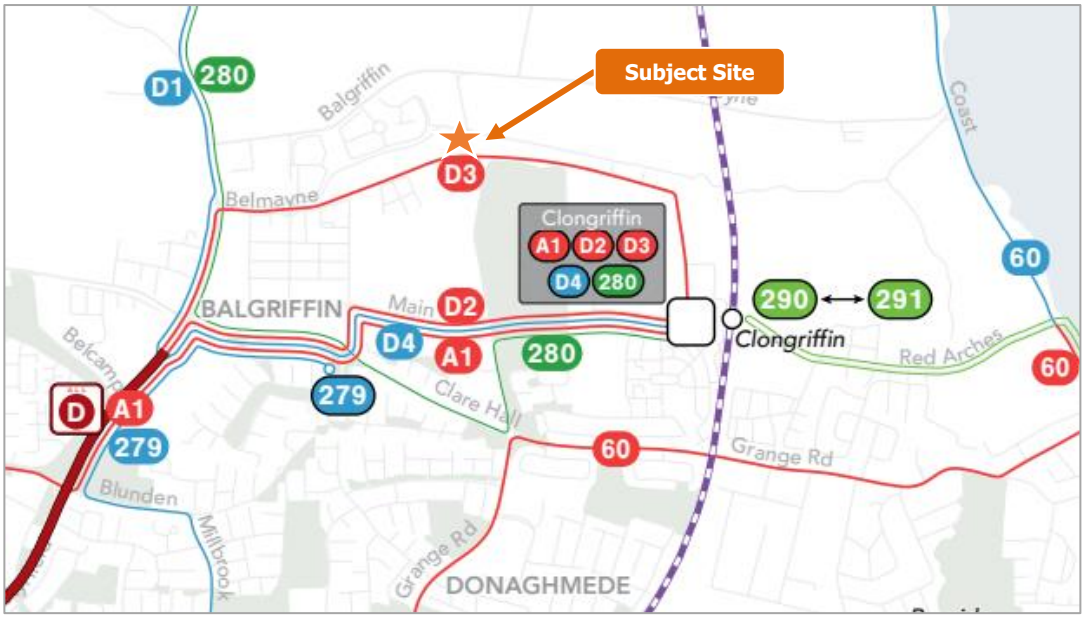


Figure 2.9: BusConnects Proposed Network (source www.busconnects.ie Extract Map P7)

2.4.9 This route will be an extension of the Clongriffin to City Centre (CBC) with a frequency of 10-15 minutes and it is anticipated that new bus stops will be provided

along Parkside Boulevard. The subject site will therefore benefit greatly from enhanced levels of accessibility offered by the Bus Connects initiatives.

Clongriffin/Belmayne Local Area Plan Movement & Transport Initiatives

2.4.10 The Clongriffin-Belmayne Local Area Plan (LAP) 2012-2018 included a number of Movement & Transport Initiatives as indicated in **Figure 2.10** for the LAP area. As the LAP was due to expire in 2018, Dublin City Council undertook a study in November 2017 which concluded that the current LAP should be extended for a further 5 years (up to December 2022) as a number of the proposed initiatives have yet to be realised.

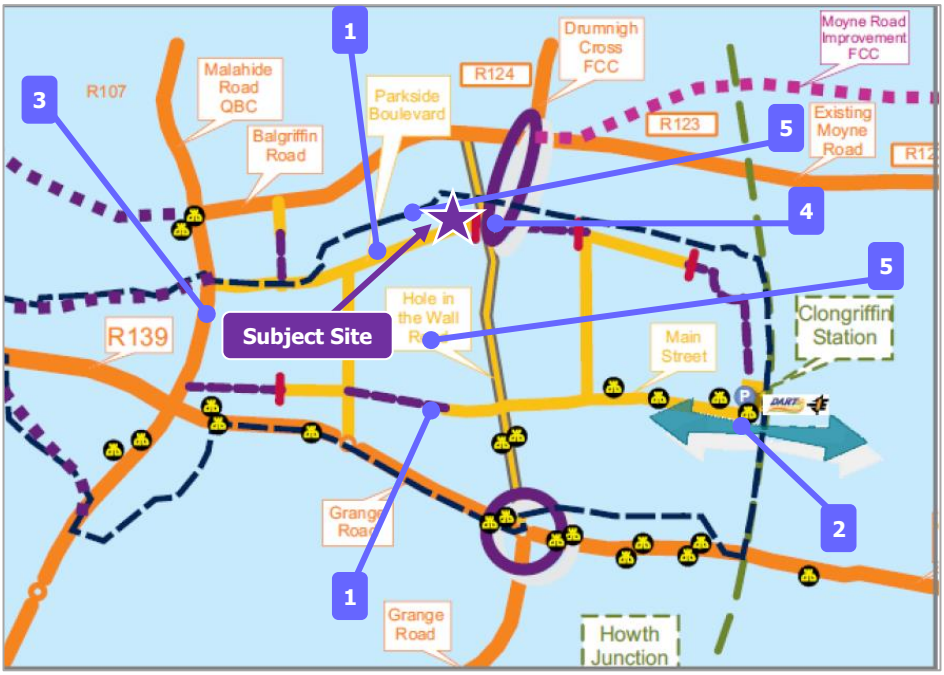


Figure 2.10: LAP Movement & Transport Strategy (source www.Dublincity.ie)

Figure 2.9 refer above	Infrastructure Proposal	Update (extracts from LAP update)
1	Completion of Main Street and Parkside Boulevard	*Main Street has been completed from Clongriffin Station to the Hole in the Wall Road. The remainder of Main Street still remains partially constructed due to the economic downturn. The Council has got approval for funding for the completion of 'Main Street' west of Priory Hall to the Malahide Road under the Local Infrastructure Housing Activation Fund (LIHAF), as part of the Rebuilding Ireland programme. The funding will facilitate the completion of the Main Street thereby linking Clongriffin Station to the Malahide Road and providing an axis linking the west and east town centres along a central civic route with public transport emphasis (including potentially Bus Rapid Transit). The completion of this road will facilitate the development of adjacent housing development at Belmayne and the development of Belmayne Town Centre. The Council's Roads Department is currently commissioning consultants to plan, design and construct the road. The northern distributor road network (Parkside Boulevard / Marrsfield Avenue) has been completed and a connection has been made to Clongriffin Railway Station. Parkside Boulevard has yet to be taken in charge but the developer is in discussion with Roads Maintenance.*
2	Cross Rail Street Connection into Baldoyle LAP Area	*Policy MPT2 seeks co-ordination with Fingal County Council on the completion of main street in to Stapolin LAP lands. To improve integration between the developing areas in both Dublin City Council and Fingal County Council on both sides of the Rail-line, a street that crosses the rail line is identified as an important link to facilitate movement and access. This link has not been provided to date and its delivery remains an objective of the LAP and the Baldoyle / Stapolin LAP. The LAP identifies the need for the development in the medium term of pedestrian and cycle facilities across the rail line. Fingal County Council has been approved Local Infrastructure Housing Activation Fund funding (LIHAF), as part of the Rebuilding Ireland programme, to provide a pedestrian / cycle link from its administrative area in Baldoyle / Stapolin to Clongriffin Railway Station. This link would replace the existing lift arrangement. This proposal is currently the subject of an appeal to An Bord Pleanala following Fingal County Council's decision to grant permission for a pedestrian and cycleway access to Clongriffin Train Station as part of a larger development proposal at 'The Coast, Baldoyle' in Fingal for a village centre / residential scheme (Reg. Ref. F16A/0412).*
3	The R107 and R139 (Malahide Road junction) By-Pass (R107 realignment)	*The R107 and R139 (Malahide Road junction) by-pass has not been progressed to-date. The LAP identifies that the completion of the R107 and R139 junction by pass as part of a realignment of the R107 is required in order to: (a) manage traffic at the western gateway into the development lands, (b) to facilitate the provision of sustainable public transport (e.g. the provision of Bus Rapid Transit (BRT)), (c) to provide an integrated Town Centre on the Malahide Road Junction which is traffic calmed, attractive and accessible for residents and businesses, and (d) to facilitate access to development lands in Fingal. The LAP identifies the by-pass as a longer term project and acknowledges that this and other major roads infrastructural projects in the area have to be considered in the context of the wider Northern Fringe region's development and transportation requirements across both Dublin City Council and Fingal County Council.* *Objective MT09 seeks co-ordination with Fingal County Council on trans-boundary transportation priorities. To this end a cross-boundary transportation study has commenced involving Dublin City Council, Fingal County Council, the National Transport Authority and Transport Infrastructure Ireland. This study is to progress the development of new roads infrastructure / public transport requirements as they pertain to DCC's North Fringe area and Fingal's South Fringe area. The proposed R107 and R139 (Malahide Road junction) By-Pass (R107 realignment) will be examined as part of this study.*
4	Hole in the Wall re-alignment and Drumnigh Cross Re-alignment /works	*Policy MTP2 seeks co-ordination with Fingal County Council on the Drumnigh Cross re-alignment. The road improvement scheme agreed between both Dublin City Council and Fingal County Council to re-align a section of the Hole in the Wall Road, and join it with the Drumnigh Road and thereby removing the staggered junction has been approved. Following approval under the Part 8 process, Fingal County Council is progressing to CPO. This scheme has been approved for LIHAF funding.*
5	Green Route and River Mayne Linear Park (Clongriffin and Belmayne)	*(a) Green Route:* *Policy MPT3 seeks the development of a cycle and pedestrian network through the plan area and the Plan identifies the need for a Green Route. The objective of the Green route is to provide an important walking and cycling corridor connecting Belmayne with Clongriffin via Father Collins Park thereby providing direct connections to the train station, to schools and local services.* *To date, the Green Route between Belmayne Avenue and the Hole in the Wall Road is in place but is still to be opened. It comprises a 3m wide cycle and pedestrian route within a 7m fenced reservation (Ref. Reg 2941/14 refers). The route as constructed is a temporary arrangement which will allow the benefit of the green link to be delivered in the short term and its permanent/final form will be agreed/constructed as part of future development phases along the route.* *The Green Route from the east of Father Collins Park (from Park Avenue) to the future Belltree Park (Panhandle Park) is partially in place. The first section of this route is in situ and in use i.e. along Park Terrace South. The remaining section of the Green Route which includes Belltree Park and the link to Station Square remains to be achieved.* *(b) River Mayne Linear Park:* *Objective MT07 seeks a pedestrian route along the River Mayne to the coast. The River Mayne Linear Park is envisaged as a greenway connecting the Plan area to the coast. This greenway has not progressed significantly since the LAP was made. Sections of the Park to the west of Marrsfield Avenue have been granted planning permission under Ref. Reg. 4016/16 and 4266/16 as part of residential development schemes which have yet to be developed.* *Both Fingal Parks & DCC Park are seeking to provide a coordinated approach to the treatment of the River Mayne corridor which lies between the two administrative areas. It is intended to commission a 'Landscape Plan' /study on the stretch of the river from the M1/M50 junction (Turnapin and Cuckoo streams) to where the Mayne River enters Baldoyle Bay. Further discussions are required between DCC and Fingal to advance this plan.*

Completion of Belmayne Main Street

2.4.11 Dublin City Council has been approved for LIHAF funding as part of the Rebuilding Ireland programme for the completion of Main Street. The projections from March 2018 include Public Infrastructure for Belmayne and Clongriffin *'The proposed Infrastructure will provide direct access to Clongriffin Rail station and allow through connection with the Malahide Road'*. The Belmayne Main Street and Belmayne Avenue subsequently received Part 8 approval for the proposed works to complete the unfinished Belmayne Main Street and refurbishments on Belmayne Avenue, which included:

- Construction of carriageway, footpaths and cycleways
- Bus lane facilities, including a new bus-gate link to the Malahide Road
- On-street parking, public lighting and other utilities.
- Signalised junctions at Belmayne Avenue/Belmayne Main Street and at Belmayne Main Street/Malahide Road.
- Pedestrian/toucan crossings for the new school on Belmayne Avenue, the park at Parkside Boulevard and at three locations on Belmayne Main Street; and
- Landscaping works.

2.4.12 Approximately half of the new Main Street road has been constructed, being the easternmost section of the route towards Clongriffin train station. The remaining westernmost section is still to be completed, with construction due to commence later this year and completion expected by the end of 2020. The status of Main Street in the context of the proposed development site is shown in **Figure 2.11.**

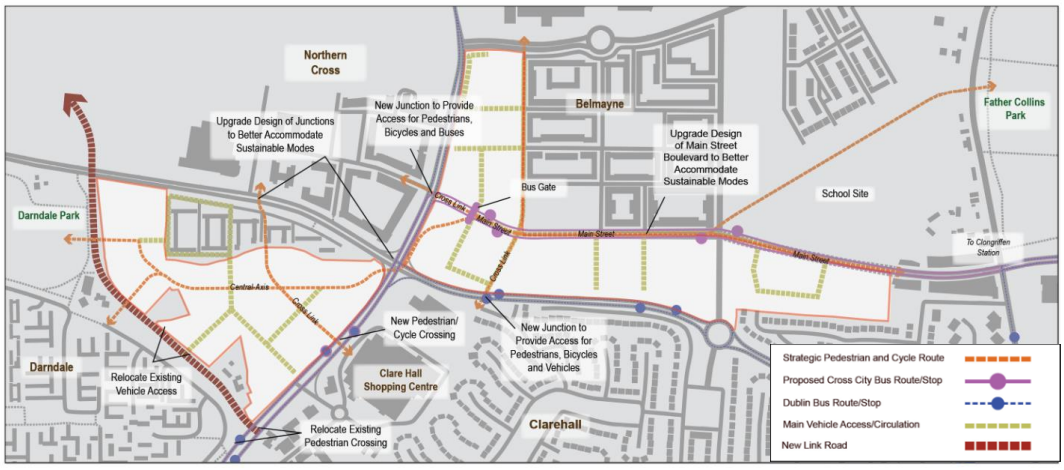


Figure 2.11: Status of Proposed New Main Street (DCC Masterplan for Belmayne and Belcamp)

2.4.13 The implementation of the above infrastructure schemes by the local authority will be subject to further design, public consultation, approval, and importantly availability of funding and resources. Typical cross sections of the Improvements

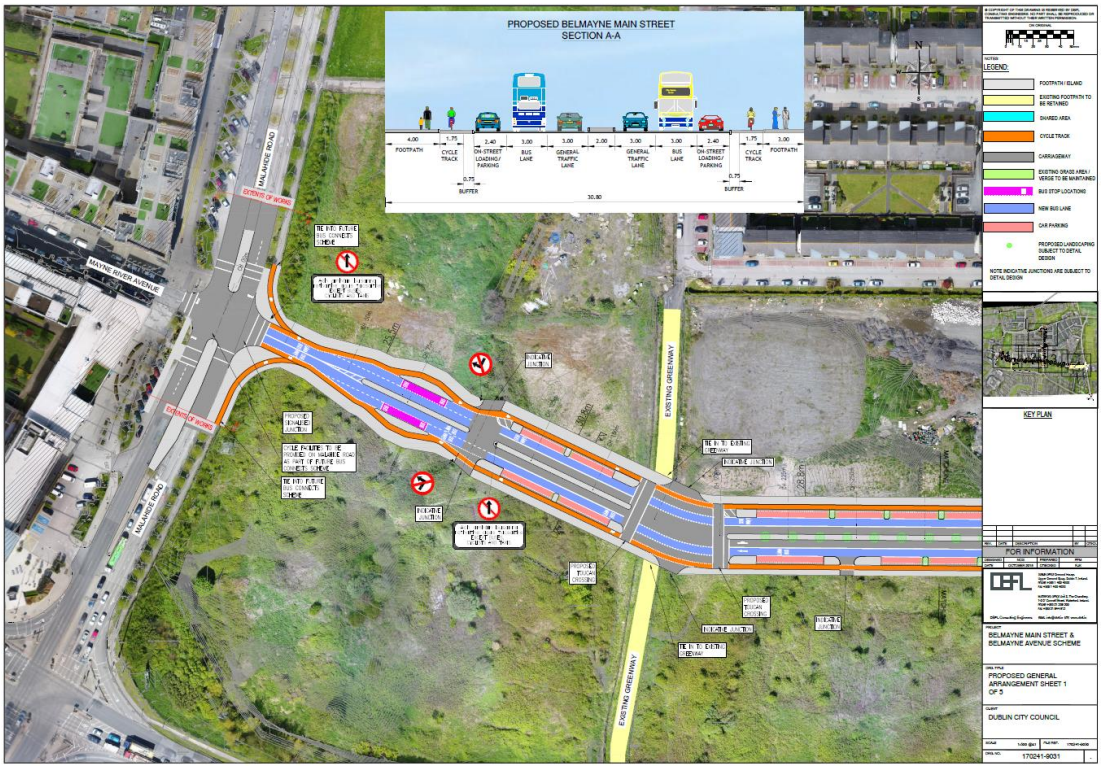


Figure 2.12: Proposed Design Layout & Cross Section for Belmayne Main Street

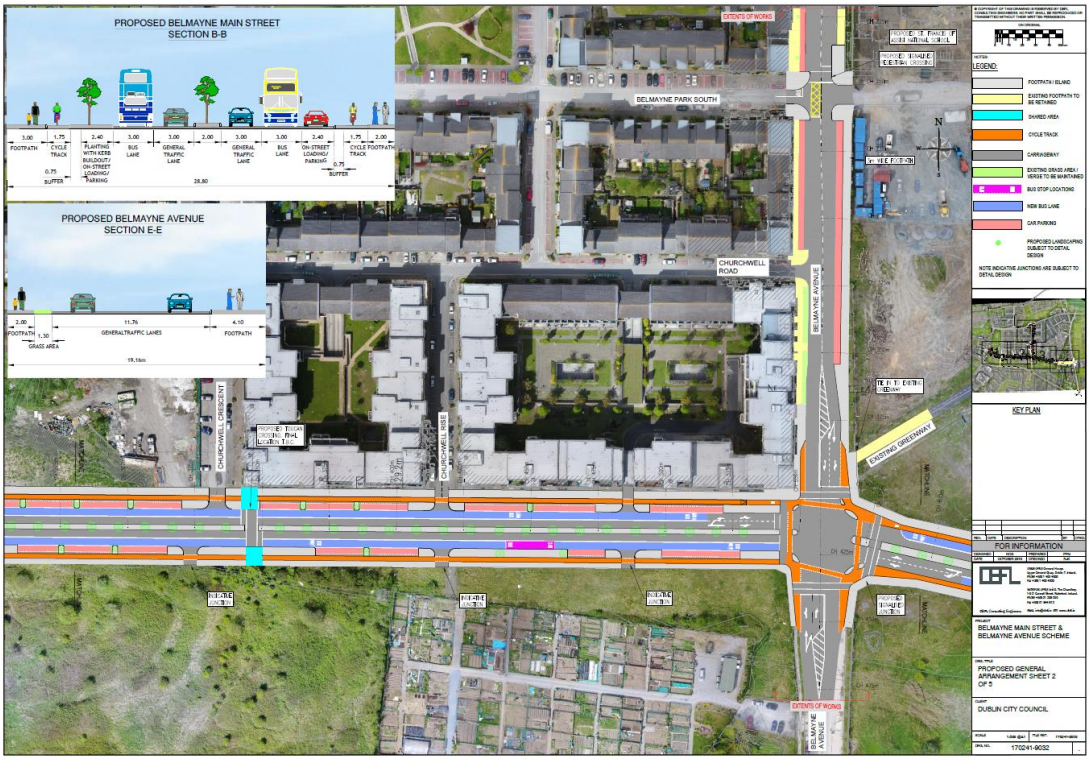
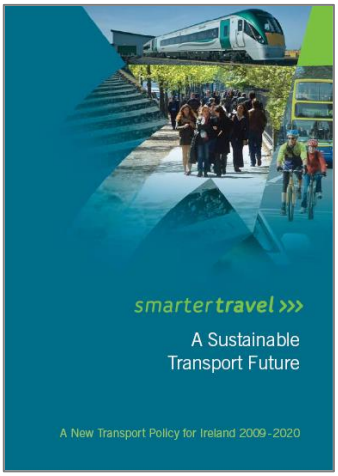


Figure 2.13: Proposed Design Layout & Cross Section for Belmayne Main Street

3.0 POLICY FRAMEWORK

3.1 SMARTER TRAVEL – A SUSTAINALBE TRANSPORT FUTURE 2009 - 2020



3.1.1 Smarter Travel - A Sustainable Transport Future, was published in February 2009, and represents a new transport policy for Ireland for the period 2009-2020. The policy recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to ensure that people choose more sustainable transport modes such as walking, cycling and public transport.

3.1.2 The policy is a direct response to the fact that continued growth in demand for road transport is not sustainable due to the resulting adverse impacts of increasing congestion levels, local air pollution, contribution to global warming, and the additional negative impacts to health through promoting increasingly sedentary lifestyles.

3.1.3 The following five key goals form the basis of the Smarter Travel policy document:

- Improve quality of life and accessibility to transport for all and, in particular, for people with reduced mobility and those who may experience isolation due to lack of transport.
- Improve economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks.
- Minimise the negative impacts of transport on the local and global environment through reducing localised air pollutants and greenhouse gas emissions.
- Reduce overall travel demand and commuting distances travelled by the private car.
- Improve security of energy supply by reducing dependency on imported fossil fuels.

3.1.4 These aims will be achieved through 49 specific actions listed within the Smarter Travel Policy, which can be broadly grouped into 4 key areas:

- Actions to reduce distance travelled by private car and encourage smarter travel,
- Actions aimed at ensuring that alternatives to the private car are more widely available,
- Actions aimed at improving the fuel efficiency of motorised transport through improved fleet structure, energy efficient driving and alternative technologies, and
- Actions aimed at strengthening institutional arrangements.

3.1.5 The Smarter Travel policy also includes for a comprehensive range of supporting 'actions' including mode specific (e.g. walking, cycling and public transport etc.) and behaviour change initiatives which both encourage and provide for sustainable travel practices for all journeys.

3.2 TRANSPORT STRATEGY FOR THE GREATER DUBLIN AREA 2016 – 2035

3.2.1 This strategy aims to provide for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades.

3.2.2 The Strategy Purpose of the document is "to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods".

3.2.3 As part of the strategy, a number of studies were undertaken which have identified routes where the demand for travel necessitates significant levels of infrastructural investment in order to minimise delays to bus services. From this, a 'Core Bus Network' was identified for the overall region. The identified core network comprises sixteen radial bus corridors, three orbital bus corridors and six regional bus corridors. The 2035 Core Bus Network – Radial Corridors is shown below in the map in **Figure 3.1**.

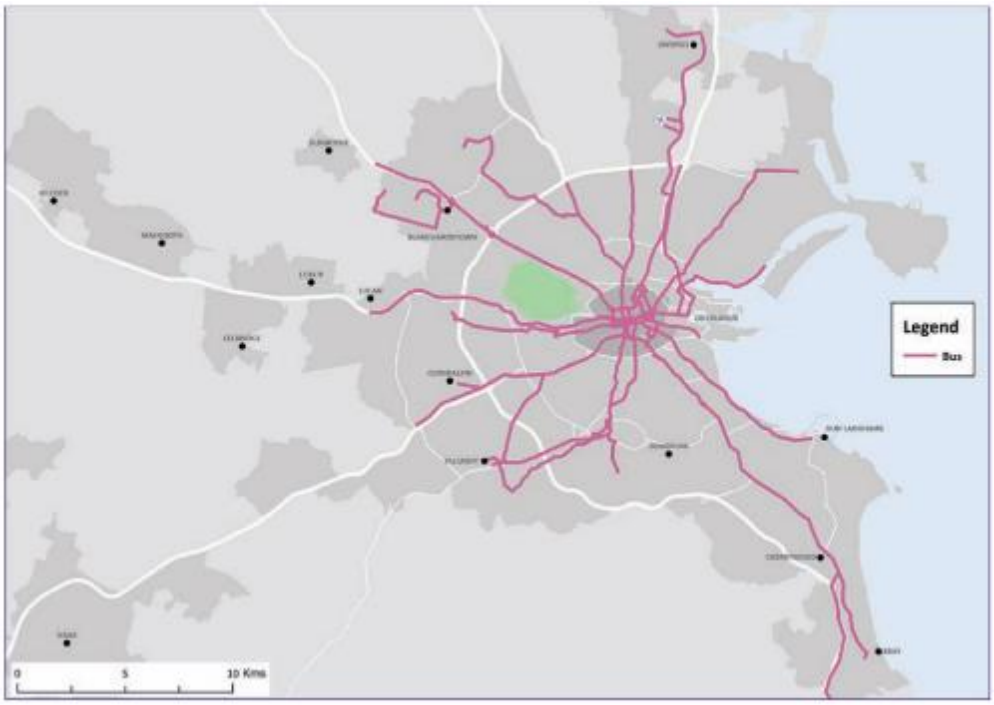


Figure 3.1: 2035 Core Bus Network – Radial Corridors
(Source: Transport Strategy for the Greater Dublin Area)

3.2.4 This map outlines that one of the radial bus routes is proposed along the R107, Malahide Road. This forms part of the Clongriffin – Artane – Fairview bus route. This bus route was proposed to be developed as a Bus Rapid Transit route, where passenger numbers forecast on the route is approaching the limits of conventional bus route capacity.

3.2.5 The National Transport Authority's 'Bus Connects' scheme, launched in 2017, aims to overhaul the current bus system within the Dublin region. The main objectives for the scheme are the following:

- Build a network of 'next generation' bus corridors on the busiest routes in order to make bus journeys faster, predictable and reliable;
- Introduce Bus Rapid Transit, a higher quality of bus system, on three of the busiest corridors;
- Redesign the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers;
- Develop a state of the art ticketing system and cashless payment system to make payments more convenient and time saving.

3.2.6 The NTA's 'Core Bus Corridors Project Report' was published in June 2018. This report provides an overview of the proposals and benefits of the Bus Connects scheme as well as the potential issues and likely impacts on the road network.

3.2.7 The document highlights that this scheme forms part of a major investment programme to improve public transport in Dublin and that the three major elements of that include the MetroLink, DART Expansion and BusConnects Dublin.

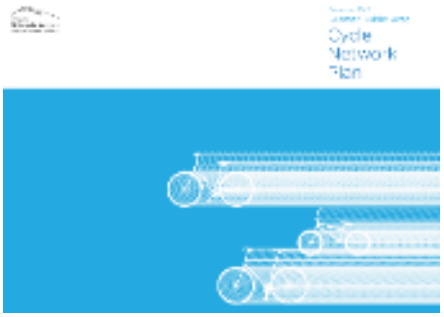
3.2.8 **Figure 3.2** shows the preliminary route for the Clongriffin to City Centre Core Bus Corridor (CBC). The route is proposed along the proposed Belmayne 'Main Street' link, terminating at Clongriffin Train Station. The corridor will take the form of a conventional Radial CBC as opposed to the originally proposed BRT corridor. The BRT concept no longer forms part of the BusConnects proposals.

Figure 3.2: Clongriffin – City Centre Core Bus Corridor Route for BusConnects (Source: Core Bus Corridors Project)

3.2.9 It has been referenced in the report that the Clongriffin – City Centre route, approximately 10kms in length, will provide improved journey times from the current bus journey time of 65mins down to 30-35mins.

3.2.10 At the time of writing, the BusConnects proposals were subject to Public Consultation.

3.3 GDA CYCLE NETWORK PLAN – DECEMBER 2013



3.3.1 The GDA Cycle Network Plan is a document, prepared on behalf of the National Transport Authority, that identifies and determines a consistent, clear and logical cycle network within the Greater Dublin Area.

3.3.2 The plan aims to ensure that cycling as a transport mode is supported, enhanced and exploited in order to achieve strategic objectives and reach national goals. The steps undertaken within the plan include the following:

1. Collate existing and planned network information;
2. Undertake quality of service review;
3. Identify gaps in existing network;
4. Cycle travel demand assessment;
5. Develop cycle network plan;
6. Target quality of service for routes;
7. Develop design concepts.

3.3.3 These seven steps proposed are in line with the National Cycle Manual methods for designing a Cycle Network.

3.3.4 The GDA Cycle Network map, shown in **Figure 3.3**, outlines the current proposals for the Belmayne/ Clongriffin area. This shows a primary cycle route 1C proposed along the R107, Malahide Road, and a secondary cycle route 1A proposed along the R139/R809.

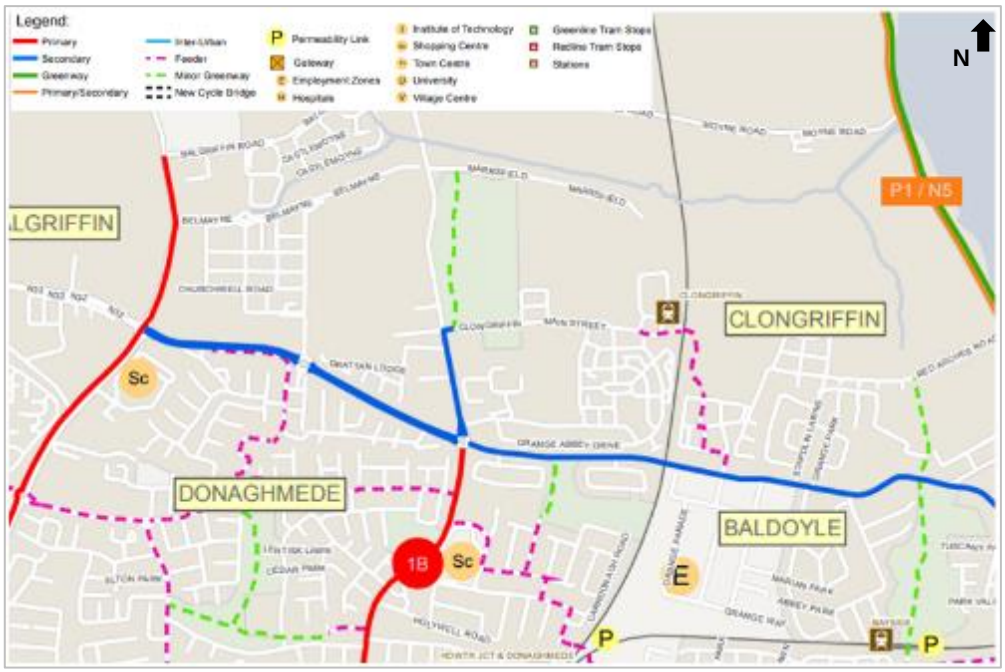


Figure 3.3: GDA Cycle Network Plan for Belmayne/Clongriffin Area
(Source: GDA Cycle Network Plan)

3.4 DUBLIN CITY DEVELOPMENT PLAN

3.4.1 The Dublin City Council Development Plan 2016-2022 sets out the policies and objectives for sustainable development in the County up to 2022. It has been prepared in accordance with the requirements and various provisions of the Planning and Development Act 2000 as amended and the Planning and Development (Strategic Environmental Assessment Regulations 2004).

3.4.2 The Development Plan states that *"The ultimate purpose of the development plan is social, providing for people's needs in all aspects of their lives and across their life cycle in areas such as housing, employment, recreation, social and commercial services, in a sustainable manner. This is reflected in the three principles of the core strategy and in every chapter of the development plan. The social purpose of the development plan is complemented by the Local Economic and Community Plan."*

3.4.3 In the context of the subject proposals, the following are the relevant transport and development policies set out in the plan:

Integrated Land-use and Transportation Policies & Objectives

- ***MTO1:*** *To encourage intensification and mixed-use development along existing and planned public transport corridors and at transport nodes where sufficient public transport capacity and accessibility exists to meet the sustainable*

transport requirements of the development, having regard to conservation policies set out elsewhere in this plan and the need to make best use of urban land …

Public Transport Policies & Objectives

- ***MT3:*** *To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city in association with relevant transport providers, agencies and stakeholders.*
- ***MTO2****: To support the development and implementation of integrated ticketing and real time passenger information systems across the public transport network in association with relevant transport providers and agencies. Progress on the integration of Dublin shared bike scheme and Leap Card schemes will be monitored.*
- ***MTO4:*** *To support improvements to the city's bus network and related services to encourage greater usage of public transport in accordance with the objectives of the NTA's strategy and the Government's 'Smarter Travel' document.*

Promoting Active Travel: Cycling & Walking Policies & Objectives

- ***MT7:*** *To improve the city's environment for walking and cycling through the implementation of improvements to thoroughfares and junctions and also through the development of new and safe routes, including the provision of foot and cycle bridges. Routes within the network will be planned in conjunction with green infrastructure objectives and on foot of (inter alia) the NTA's Cycle Network Plan for the Greater Dublin Area, and the National Cycle Manual, having regard to policy GI5 and objective GIO18.*
- ***MTO8:*** *To promote and facilitate, in co-operation with key agencies and stakeholders, the provision of high density cycle parking facilities at appropriate locations, taking into consideration (inter alia) the NTAs Cycle Network Plan, Dublin City Centre Cycle Parking Strategy, and Dublin City Council's Public Realm Strategy.*

- ***MTO9:*** *To develop, within the lifetime of this plan, the Strategic Cycle Network for Dublin city - connecting key city centre destinations to the wider city and the national cycle network, and to implement the NTA's Greater Dublin Area Cycle Network Plan to bring forward planning and design of the Santry River Greenway, incorporating strongly integrative social and community development initiatives.*
- ***MTO10:*** *"To improve existing cycleways and bicycle priority measures throughout the city, and to create guarded cycle lanes, where appropriate and feasible".*
- ***MTO12:*** *(i) To monitor the success of the shared bike scheme and to expand it to the entire city, in accordance with the content of the dublinbikes Strategic Planning Framework 2011-2016 or any subsequent review (ii) That developers will agree to fund the provision of a shared bike station near large developments, as community gain.*
- ***MTO18:*** *To develop a high-quality pedestrian environment at new public transport interchanges and to consider the needs of pedestrians in the design of all infrastructure projects.*
- ***MTO21:*** *To avail of opportunities to increase footpath widths particularly within the city centre where appropriate.*

Mobility Management & Travel Planning Polices & Objectives

- ***MT13:*** *To promote best practice mobility management and travel planning to balance car use to capacity and provide for necessary mobility via sustainable transport modes.*
- ***MTO23:*** *To require Travel Plans and Transport Assessments for all relevant new developments and/or extensions or alterations to existing developments,*
- ***MT14:*** *To minimise loss of on-street car parking, whilst recognizing that some loss of spaces is required for, or in relation to, sustainable transport provision, access to new developments, or public realm improvements.*
- ***MT18:*** *To encourage new ways of addressing the parking needs of residents (such as car clubs) to reduce the requirement for car parking.*

- ***MT19:*** *To safeguard the residential parking component in mixed-use developments*

Road & Bridge Improvements

- ***MT20:*** *To increase capacity of public transport, cycling and walking, where required, in order to achieve sustainable transportation policy objectives. Any works undertaken will include as an objective, enhanced provision for safety, public transportation, cyclists and pedestrians, and will be subject to environmental and conservation considerations.*
- ***MTO31:*** *To initiate and/or implement the following road improvement schemes and bridges within the six year period of the development plan, subject to the availability of funding and environmental requirements and compliance with the 'Principles of Road Development' set out in the NTA Transport Strategy.*
    - ***Roads***
        - *Malahide Road/R107 (including North Fringe Improvements)*
    - ***Bridges***
        - *Cycle Network and Strategic Green Infrastructure Network*

3.5 CLONGRIFFIN-BELMAYNE LOCAL AREA PLAN 2012-2018

3.5.1 The Clongriffin-Belmayne Local Area Plan (2012-2018) covers the development area (**Figure 3.1**) also known as the "*North Fringe Area*". As the LAP was due to expire in 2018, Dublin City Council undertook a study in November 2017 which concluded that the current LAP should be extended for a further 5 years (up to December 2022) as a number of the proposed initiatives have yet to be realised.

3.5.2 In the context of the subject development site and the proposed residential development, a number of the most relevant polices, and their current status detailed within the November 2017 study are detailed in **Table 3.4**:-

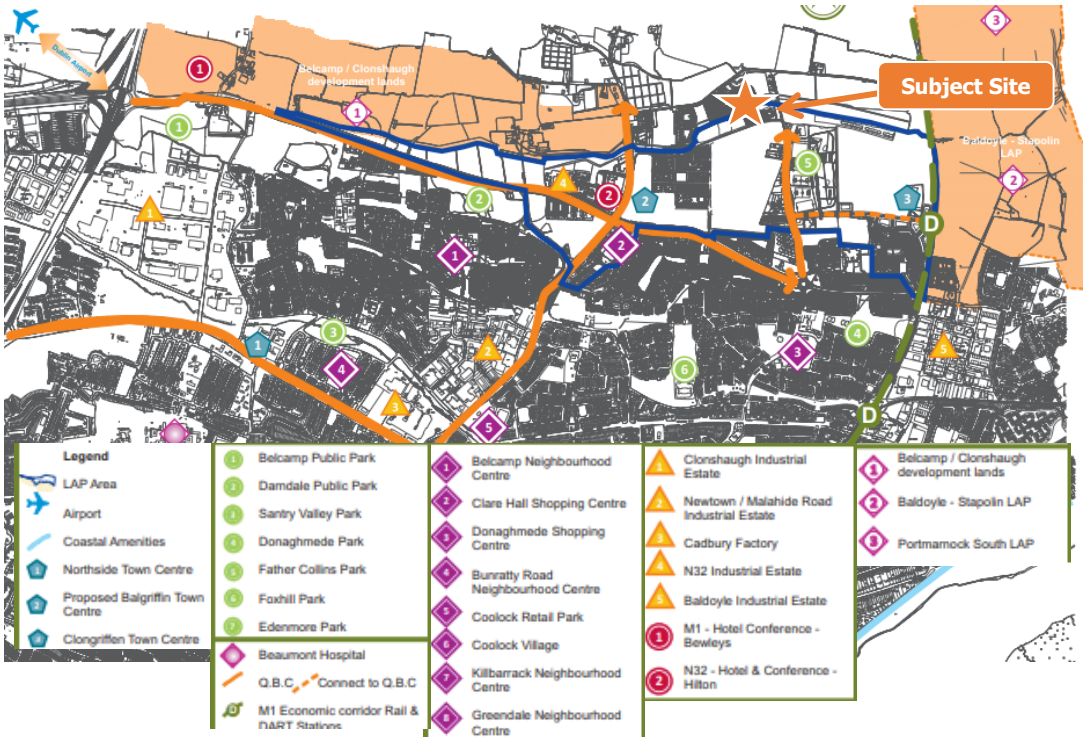


Figure 3.4: LAP Area (extract of Fig 2.2 Clongriffin Belmayne LAP)

Table 3.1 Movement and Transport Objectives (source: DCC Clongriffin-Belmayne LAP Nov 2017 study)	
Key Objective	**Update/Status 2017**
MTO1 *- To develop routes through sites that are likely to remain vacant in the long term, as pedestrian/cyclist routes, eliminate barriers to movement and provide significantly enhanced permeability and through access to adjoining streets that that are safe and pleasant to use by all.*	*Two new pedestrian cycle routes have been developed through vacant lands on the western side of Belmayne linking up to the Malahide Road and the Grange Road. The link to the Grange Road includes a new Toucan crossing.* *The Green Route from Belmayne to Father Collins Park has been constructed but is not yet open to the public - lands surrounding it still under construction. The link to the station still remains to be achieved.*
MTO2 *- To provide new patterns of pedestrian and cycle movement in both east-west and north-south directions throughout the area that is coherent, direct, safe and convenient.*	*See above. New patterns of pedestrian and cycle movement developing with the provision of interconnected network of residential streets. This objective remains to be achieved.*
MTO4 *- To facilitate enhanced patronage and efficient utilisation of public transport and promote walking and cycling through a range of measures including a reduced provision of car parking for commercial development.*	*Ongoing: through the Development Management Process. Car parking proposals in new schemes are checked against current car parking standards during the planning process to ensure compliance.* *This objective remains to be achieved.*
MTO5 *- To liaise with Irish Rail and promote greater frequency and enhanced services at Clongriffin Rail Station for commuters as the area continues to grow.*	*There is currently a half hour frequency on the Malahide / Greystones and Howth / Bray routes. From the end of this year a 20 minute frequency will be in place. Irish Rail has no immediate plans to build another platform at Clongriffin Station but recognises that a new platform will be triggered by demand.*
MTO7 *- To develop a pedestrian route along the River Mayne and access the potential to connect with amenity lands in Baldoyle Estuary and further amenities along the coastal routes.*	*Both Fingal Parks & DCC Park are seeking to provide a coordinated approach to the treatment of the River Mayne corridor which lies between the two administrative areas. It is intended to commission a study and further discussions are required between DCC & Fingal to advance this study. This objective remains to be achieved.*
MTO8 *- To seek well integrated design solutions for adequate car parking within the design and layout of schemes with particular attention to visitor parking and car storage.*	*No roads, streets or parking areas have been taken in charge to-date.* *Car parking proposals in new schemes are checked against current car parking standards during the planning process to ensure compliance.*
MTO9 *- Implementation of the Movement and Transport Strategy for the LAP will be considered in the context of the wider Northern Fringe region's development and transportation infrastructure requirements across both Dublin City Council and Fingal County Council. Consultation between both authorities, the NRA (TII) and NTA through the Trans-Boundary Transportation Strategy Steering Group, including the identification of trans-boundary transportation priorities, will guide the phasing and implementation of development and phasing and implementation of transport infrastructure over the timescale of the LAP.*	*Fingal County Council, in consultation with the NTA, TII and Dublin City Council, has commissioned consultants to prepare a cross boundary transportation study to progress the development of new roads infrastructure in its administrative area and within Dublin City Council's administrative area as it pertains to the development of Clongriffin-Belmayne. This objective remains to be achieved.*
MTO10 - *That the design of all streets fully comply with the design standards and requirements of the Roads and Traffic Department of DCC to facilitate the orderly taking in charge process for all public roads. Requirements of DCC for street design including public lighting, traffic and pedestrian control signalling, street signage and traffic calming shall be ascertained at the design stages and completed if requested before taking in charge.*	*No streets taken in charge yet but DCC have conditioned that all new roads streets to be constructed to Taking in Charge Standards, built in accordance with DMURS and to allow for 30kph speed limit. This objective remains to be achieved.*
MTO11 - *Consultation to be undertaken with existing retail, commercial and other service providers at the junction of the R139/R107 (in particular Northern Cross businesses and Clare Hall Shopping Centre) to ensure that customer access to important local services is not unduly severed during construction and access is fully considered in design and traffic movement options.*	*This objective has not been achieved to-date. This objective will be important for consideration in the design process for the R107/R139 junction by pass and in particular in the preparation of the Masterplan for Belmayne Town Centre.*
MTO12 - *To liaise with Dublin Bus and the NTA on the operation of bus services and alignment of bus routes through the area having regard to the location of new housing, community facilities and other services and new street completions (offering the potential for new route options) as they occur in the LAP area.*	*A Bus Rapid Transport route to link Clongriffin Town Centre to the city centre, options for which include a route via Main Street is currently being progressed by the NTA.*

3.6 PORTMARNOCK SOUTH LOCAL AREA PLAN JULY 2013

3.6.1 The Portmarnock South LAP covers the lands to the north east of the subject site with an area of approximately 86 acres. It is proposed that the LAP will be in effect for a period of 6 years after its adoption. The following infrastructure proposals (as shown in **Figure 3.5**) will be of benefit for pedestrians, cyclists, public transport users and motorists from the subject site:-

Green Infrastructure Proposals

Fingal Costal Way: *"A coastal walk is a long standing of the Council. The Fingal Development Plan 2011-2017 fully supports the development of a Fingal Coastal Way, a strategic walking and cycling route from Howth to north of Balbriggan."*

Additional Rail Tracks: *"It is an objective of the Development Plan that lands shall be reserved to provide for additional rail tracks along public transport corridors. This LAP shall provide for a reservation along the Dublin-Belfast rail-line to accommodate future rail infrastructure where required."*

Racecourse Park: The proposed Racecourse Park is located to the south of the Portmarnock South LAP lands and to the south east of the subject site. *"This linear park is important for recreation and amenity and protection of the river corridor and biodiversity. Permeable green routes will link the Portmarnock South LAP lands, the Baldoyle-Stapolin LAP lands and the Clongriffin-Belmayne LAP lands. The park offers the potential to create a greenway for pedestrians and cyclists connecting open space and amenity along the Fingal Coast and beyond the Fingal administrative area."*

Buses: *"The Council will facilitate relevant stakeholders including developers to engage with public transport operators to seek improvements to the bus transport network, particularly with regard to a bus link to Portmarnock Train Station and a bus route through the plan lands."*

Green Routes

The Portmarnock South LAP proposes a number of priority pedestrian/cycle routes within the LAP lands including:

- Station Road Green Route;
- Central Linear Park;
- Railway Linear Park;
- Green route between existing National Monuments;

- Green Route East of the Dublin Belfast Railway Line; and
- The Fingal Coastal Way.

Figure 3.5: Green Infrastructure Proposals (extract of Figure 5 Portmarnock South LAP 2013)

Road Infrastructure Proposals

Hole in the Wall Road Upgrade: *"A proposed realignment of the northern end of the Hole in the Wall Road to tie in at the R123 Moyne Road at a four-arm crossroads junction. This will address the existing deficient visibility at the existing junctions on the Moyne Road with the Hole in the Wall Road and the Drumnigh Road."*

Baldoyle Public Transport Bridge: *"An extension of Red arches Road and bridge over the rail line at Clongriffin DART station and connection with the east-west link of Clongriffin Main Street to accommodate buses, pedestrians and cyclists."*

Baldoyle Link Road: *"An extension of Clongriffin Main Street to the west of the Hole in the Wall Road and connecting the R107 Malahide Road to the north of the existing Clare Hall traffic signals."*

R107 Malahide Road Realignment: *"A significant realignment of the existing Malahide Road from Belcamp Lane to north of Chapel Road. The proposed new link is a dual-carriageway with a new grade separated junction with the R139 (old N32)."*

R139 (old N32) Upgrade: *"Upgrade of the R139 (old N32) to dual-carriageway from the existing Malahide Road to Clonshaugh Road."*

East-West Distributor Road: *"A new link road from the existing Malahide Road at Balgriffin Road to the R132 Swords Road at Collinstown Cross, incorporating a bridge over the M1 and facilitating access to new development lands at Belcamp and Clonshaugh."*

Figure 3.6: Proposed Road Schemes
(extract of Figure 6.3 Portmarnock South LAP 2013)

3.7 TRANSPORT PHASING ASSESSMENT (PORTMARNOCK SOUTH & BALDOYLE LAP)

3.7.1 The *"Transport Phasing Assessment: Portmarnock South and Baldoyle-Stapolin Local Area Plans"* (dated 5th October 2012) is a technical note undertaken by Roughan & O'Donovan and Aecom, and summarises an assessment of the phasing options for the proposed transport infrastructure as outlined in the Portmarnock South and Baldoyle-Stapolin Local Area Plans for the interim period between 2012 to 2025. The study area for the technical note is indicated in **Figure 3.7** below.

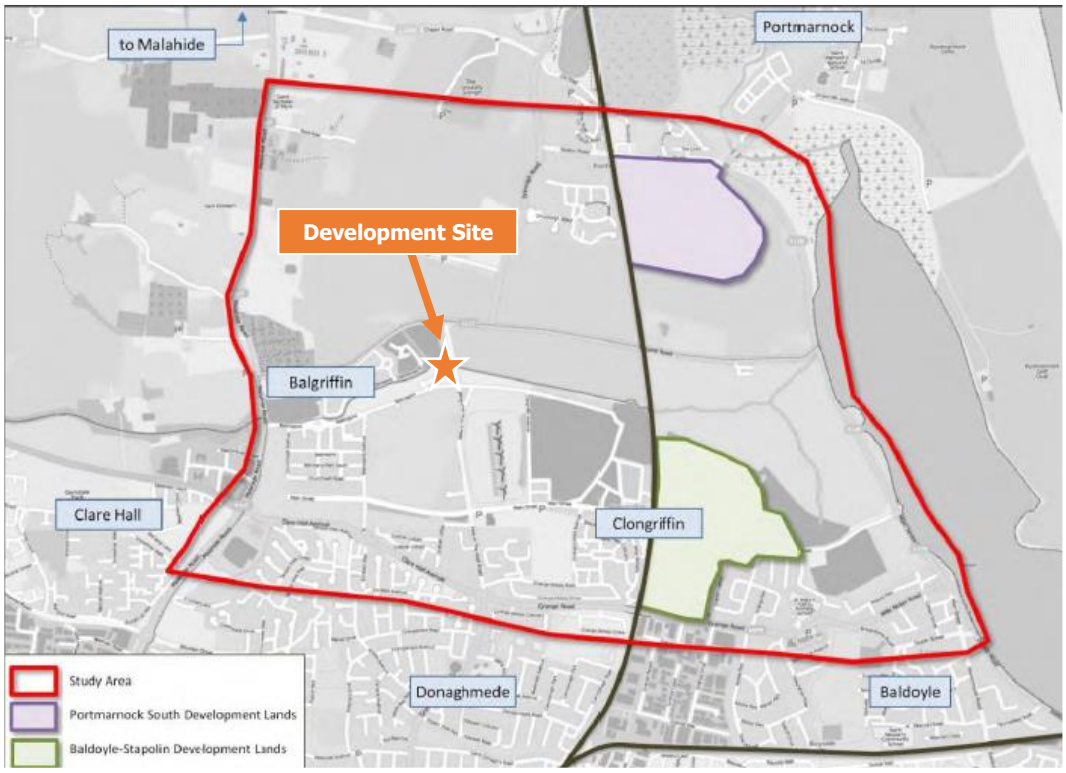


Figure 3.7: Study Area (extract of Figure 1.1 Transport Phasing Assessment: Portmarnock South and Baldoyle-Stapolin Local Area Plans)

3.7.2 The Technical Note carried out a range of assessments based on development forecast scenarios of 2014, 2018 and 2025 and as such recommended the following phasing for the proposed road infrastructure.

Period	Roads Infrastructure Requirements
2012-2014	Hole in the Wall Road Upgrade
	R107 Malahide Road Realignment Phase 1 (Clarehall Junction Upgrade)
2014-2018	Grange Road / Baldoyle Industrial Estate Junction Upgrade
	Willie Nolan Road / Baldoyle Main Street Junction Upgrade
	Drumnigh Road/ Station Road Junction Improvements
2018-2025	Full R107 Malahide Road Realignment
	Baldoyle Link Road
	East-West Distributor Road
	Baldoyle Public Transport Bridge

Table 3.2: Phasing of Road Infrastructure (Extract from Table 8.1 Transport Phasing Assessment: Portmarnock South and Baldoyle-Stapolin Local Area Plans)

3.8 BALDOYLE – STAPOLIN LOCAL AREA PLAN

3.8.1 The Baldoyle – Stapolin Local Area Plan May 2013-2019 covers lands to the east of both the subject site and the Clongriffin-Belmayne LAP lands. The LAP lands are zoned (**Figure 3.8**) as follows:

- *"41 hectares of land zoned Objective RA – Provide for new residential communities in accordance with approved local area plans and subject to the provision of the necessary social and physical infrastructure."*
- *"81 hectares of land zoned Objective HA – Protect and enhance high amenity areas."*

3.8.2 The Baldoyle–Stapolin Local Area Plan takes cognisance of the phasing recommendations as outlined in the *"Transport Phasing Assessment: Portmarnock South and Baldoyle-Stapolin Local Area Plans"* (**Table 3.2** above).

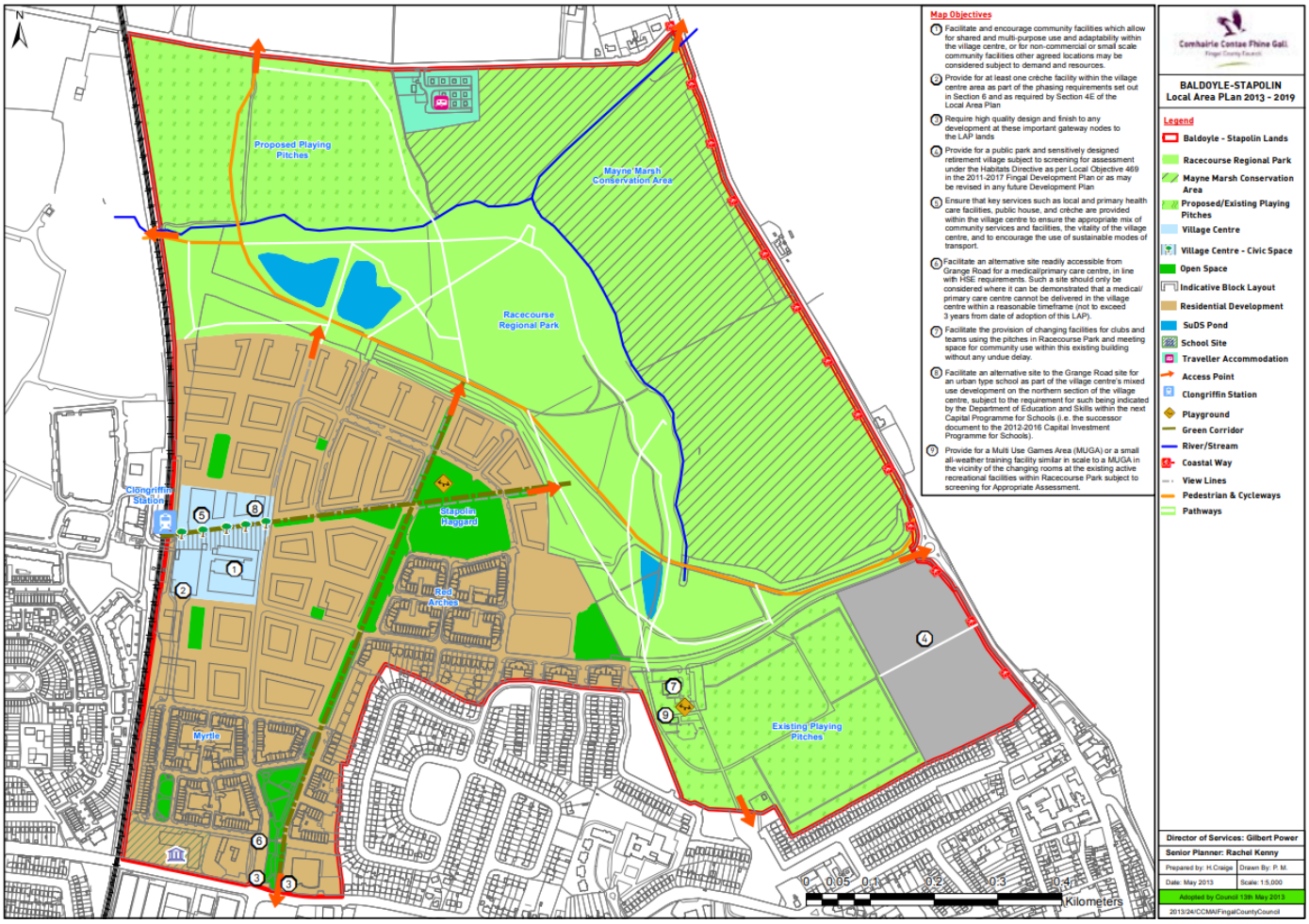


Figure 3.8: Baldoyle Stapolin LAP Proposals (extract from LAP)

3.9 DEVELOPMENT MANAGEMENT STANDARDS

Car Parking

3.9.1 Reference has been made to both Table 16.1 of the Dublin City Development Plan (2016-2022) and Chapter 4 of Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, as published by the Department of Housing, Planning and Local Government (DHPLG) in March 2018.

3.9.2 As stated within the Clongriffin-Belmayne LAP, the LAP area encompasses two parking zones, 2 & 3. "*Area 2 standards apply to lands adjacent to public transport stations and rail line corridors (applies to the area around Clongriffin rail station). Area 3 standards apply to other areas outside the immediate corridor catchment.*" The subject site is currently located within Zone 3.

3.9.3 Furthermore, in reference to the DHPLG (March 2018) guidance the location of the Parkside Phase 4 site can be classified as an "***Intermediate Urban Location***".

For residential developments located within an ***Intermediate Urban Location*** the DHPLG design standards state in reference to local authority development management requirements that;

> "***planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard.***"

3.9.4 With regard to the proposed development schedule the associated DCC and DHPLG car parking requirements are outlined in Table 3.3 below. It is noted that the DCC car parking standards are MAXIMUM standards within the development plan.

Land Use	Units/Area	DCC (Area 3) Dev. Standard	DHPLG Standard	DCC (max) Requirement	DHPLG Requirement
Apartment – 1 bed	94 No.	1.5	Reduced overall car parking standard	141	Reduced overall car parking standard
Apartment – 2 bed	175 No.	1.5		263	
Apartment – 3 bed	13 No.	1.5		20	
Media Centre	80 sqm	n/a	n/a	n/a	n/a
Gym	167sqm	Dependant on nature and location of use	n/a	-	n/a

Table 3.3: Car Parking Standards and Requirements

Disabled Parking

3.9.5 In regard to the provision of dedicated disabled car parking spaces Section 16.38.5 of the DCC Development Plan states; "*At least 5% of the total number of spaces should be designated car-parking spaces, with a minimum provision of at least one such space.*" With the redevelopment proposals incorporating the provision of 286 on-site car parking spaces the above standards imply a requirement of 14 dedicated disabled car parking spaces.

Electric Vehicle Car Parking

3.9.6 Whilst Chapter 16 of the development plan does not explicitly raise the requirement for the provision of electric vehicle charge points / bays in private developments, it is suggested that in reference to national guidance that at least 10% of all on-site car parking spaces are be equipped with one functional Electric Vehicle Charging Point. Therefore, a minimum provision of 28 Electric Vehicle Charge Points could be provided as part of the subject Parkside Phase 4 proposals.

Motorcycle Parking

3.9.7 Section 16.38.6 of the DCC Development Plan states; "*New developments shall include provision for motorcycle parking in designated, signposted areas at a rate of 4% of the number of car parking spaces provided.*" With the development proposals incorporating the provision of 286 on-site car parking spaces the above standards imply a requirement of at least 11 number dedicated motorcycle parking spaces.

Bicycle Parking

3.9.8 The appropriate level of cycle parking provision for the proposed residential element of the development proposals is to be provided in reference to both (i) the DCC Development Plan standards, and (ii) the DHPLG guidelines. The corresponding bicycle parking standards for residential developments are detailed in Table 3.2 below.

Parking Type (Duration)	Units (Beds)	DCC Dev. Standard	DHPLG Standard	DCC (max) Requirement	DHPLG Requirement
Long Stay	282 (473)	1 per Unit	1 per Bed	282	473
Short Stay		Decided on a case by case basis	1 per 2 Units	TBC	141
			Total	280+	614

Table 3.4: Residential Bicycle Parking Standards and Requirements

3.9.9 The location of bicycle parking is also addressed in the DCC standards with secure bicycle racks to be located within 25m of a destination for short-term parking and within 50m for long-term parking (residential, office). Furthermore, the DCC standards require that all long-term (more than three hours) cycle racks should be protected from the weather.

4.0 CHARACTERISTICS OF PROPOSALS

4.1 PREVIOUS PLANNING APPLICATIONS

4.1.1 The subject site was previously granted planning permission as part of an overall Framework Plan for development of the Belmayne Lands (Ref. 4315-03) by Dublin City Council and by ABP (Ref. PL29N.131019 and PL29N.207192) following third party appeals.

4.1.2 The first phase of the Framework Plan proposal (Ref. 0354-02 and ABP Ref. PL29N.131019) consisted of a mixed use development comprising of:-

- 629 residential units;
- 2 Crèche facilities;
- 2,691sqm of ground floor Retail/Commercial with alternative "live/work" uses; and
- Ancillary active and passive Public Open Space.

4.1.3 The second planning application (Ref. 4315-03 and ABP Ref. PL29N.207192) represents "*a portion of Phases 2, 3 and all of Phase 4 and 5 of an overall residential/mixed use development*" and consisted of:-

- 2,180 residential units;
- 10,052 sqm Retail/Commercial and Community Uses; and
- Ancillary active and passive Public Open Space.

4.1.4 The status of each of the Parkside development phases are as follows:

- Phase 1 of the Parkside development (Ref. 2941/14, approved planning by DCC in October 2014) is fully completed and occupied.
- Phase 2A (Ref. 2296/16, approved planning by DCC in July 2016) is fully complete and occupied.
- Phase 2B (Ref. 2679/16, approved planning by DCC in November 2016) is fully complete and occupied.
- Phase 2C (Ref. 3486/17, approved planning by DCC in November 2017) is fully complete and nearly fully occupied.
- Phase 3 (Ref. 2114/15, approved planning by DCC in March 2015) is fully complete and occupied.
- Phase 5A (Ref. 3791/18, approved by DCC in March 2019) is expected to commence construction in the Summer of 2019.

4.2 CURRENT APPLICATION PROPOSALS – PARKSIDE PHASE 4

4.2.1 The subject proposals represent Phase 4 of the Parkside development. The development schedule for the proposed residential development comprises the following:

- 282 no. residential apartment units comprising:
  - 94 no. 1 bed apartments;
  - 175 no. 2 bed apartments; and
  - 13 no. 3 bed apartments.
- Concierge (226sqm);
- Media Centre (80sqm); and
- Gym (167sqm).

4.2.2 Further details of the development proposals including the site layout and transport network arrangements are illustrated in the architects' scheme drawings as submitted with this planning application.

Cycle Parking Facilities

4.2.3 A total of 423 cycle parking spaces are proposed, of which 289 will be provided at basement level (resident/long term parking) and 134 will be provided at surface level (visitor/short term parking), which has been illustrated in **Figure 4.3**.

4.2.4 For the proposed quantum of development, the DCC Development Plan requires 280+ cycle parking spaces to be provided. By comparison the DHPLG guidelines require a total of 621 cycle parking spaces to be provided.

4.2.5 It is therefore considered, that the provision of 423 cycle parking spaces (which equates to 1.5 cycle spaces per unit) is acceptable given that it is between the requirements of both DCC guidelines and the DHPLG guidelines.

Car Parking

4.2.6 A total of 286 car park spaces are proposed, comprising 277 spaces at basement level and 9 spaces at surface level. Of the 286 car park spaces, 14 will be dedicated for mobility impaired users (10 located at basement level and 4 at surface level). This complies with the DCC Development Plan minimum requirements.

4.2.7 The total car parking provision on site has been determined with regard to the proposed development schedule and the associated DCC and DHPLG car parking

requirements. The DCC Development Plan car parking standards require a maximum provision of 424 car park spaces, while the DHPLG states that "*planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard*".

4.2.8 The proposed Media Centre and Gym facilities on site are ancillary activities and will be for the sole use of residents. These activities will therefore not generate parking demand and have not been allocated car parking spaces.

4.2.9 The car parking provision of 277 spaces at basement level will be managed through the building management company, as discussed in detail in Section 7.0, while the 9 surface level spaces will be taken in charge by DCC and shall not be assigned for private use. Therefore, the provision of 277 spaces, which equates to 0.98 spaces per unit, is considered to be appropriate due to the accessible nature of the site by sustainable modes including bus and rail, the ample cycle parking provision on-site and the recommendation of the DHPLG regarding a reduced overall car parking supply.

Motorcycle Parking

4.2.10 A total of 12 motorcycle parking spaces are proposed as part of the development which will be located at basement level. This is above the 11 spaces as required by the DCC Development Plan guidelines. The layout of the proposed parking facilities at both basement and surface level is shown in **Figure 4.2** and **Figure 4.3** respectively.

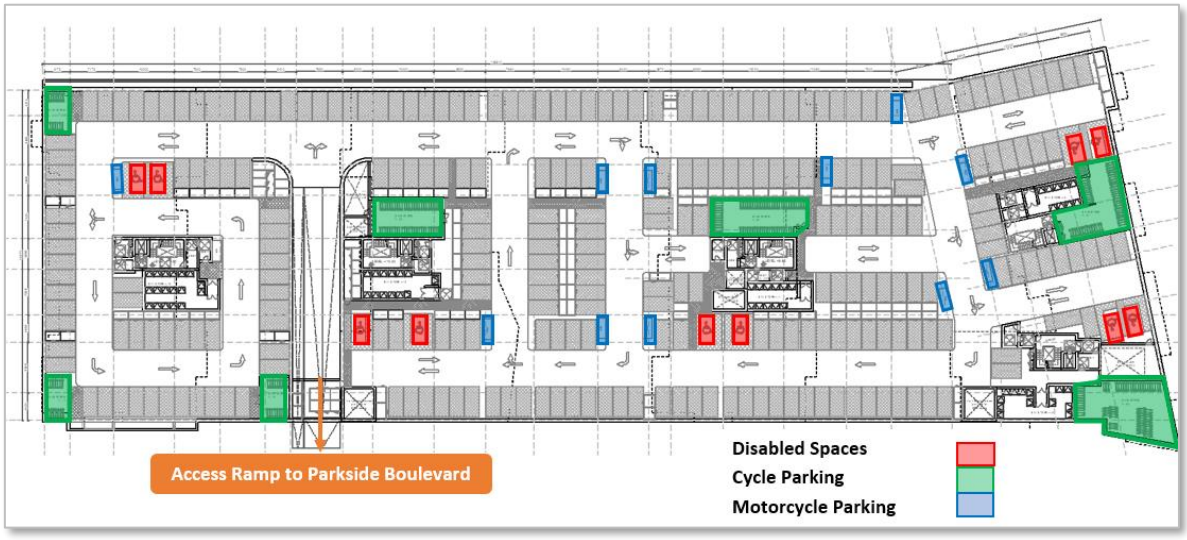


Figure 4.2: Proposed Basement Parking Layout

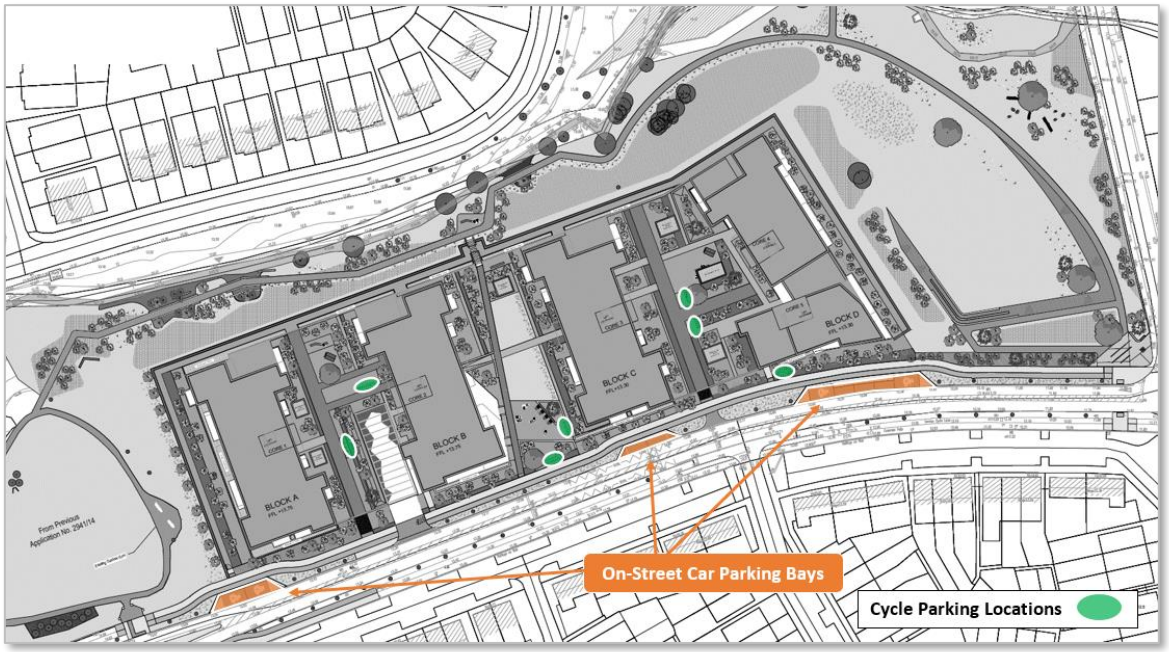


Figure 4.3: Proposed Surface Parking Layout (Vehicle and Cycle)

4.3 SITE ACCESS ARRANGEMENTS

Pedestrians and Cyclists

4.3.1 As previously introduced, the subject site will be highly accessible to pedestrians and cyclists from Parkside Boulevard, Belmayne Avenue and Hole in the Wall Road. Within the internal site layout, a series of interconnected paths are provided ensuring desire lines are accommodated. Three separate pedestrian/cyclist access points are provided at surface level.

4.3.2 The proposed basement access ramp includes a segregated bike lane for cyclists accessing the secure cycle parking facilities at basement level. Pedestrians and cyclists travelling on the segregated path along subject site frontage will be given priority over vehicles at the site access junction with Parkside Boulevard.

4.3.3 The proposed development also includes the following pedestrian infrastructure improvements:

- Upgrading of an existing uncontrolled crossing to a Toucan crossing on Parkside Boulevard, located to the east of the junction with Parkside Avenue (see **Figure 4.4**);
- New uncontrolled crossing on Parkside Boulevard, located to the west of the junction with Balgriffin Park; and

- Provision of a new footpath along the northern and eastern site boundary providing linkages to the existing Parkside playground and footbridge connection to the residential area off Castlemoyne (north of the site).

Figure 4.4: Proposed Pedestrian Crossing Improvement on Parkside Boulevard

4.3.4 These pedestrian crossing improvements will further enhance connectivity to the wider pedestrian network including the green route which runs south of the subject site and links the pedestrian and cycle facilities on Hole in the Wall Road with Belmayne Avenue. They also improve connections for pedestrians/cyclists from the subject site can travelling through to Fr Collins Park and eastwards towards Clongriffin train station.

Vehicular Access

4.3.5 The site will gain direct vehicular access from Parkside Boulevard, providing linkages to Belmayne town centre via Belmayne Avenue and also to Malahide Road (R107) to the west. The vehicular access will serve the underground basement car park area, as well as the secure cycle storage areas. The basement car park area will be accessed via a ramp with barriers at basement level, allowing for vehicle storage along the ramp preventing queueing along Parkside Boulevard.

4.3.6 Dropped kerbs will be provided at two of the surface level access points to enable access for emergency vehicles. The locations of the proposed vehicle, pedestrian and cyclist access points on Parkside Boulevard are shown in **Figure 4.5**.

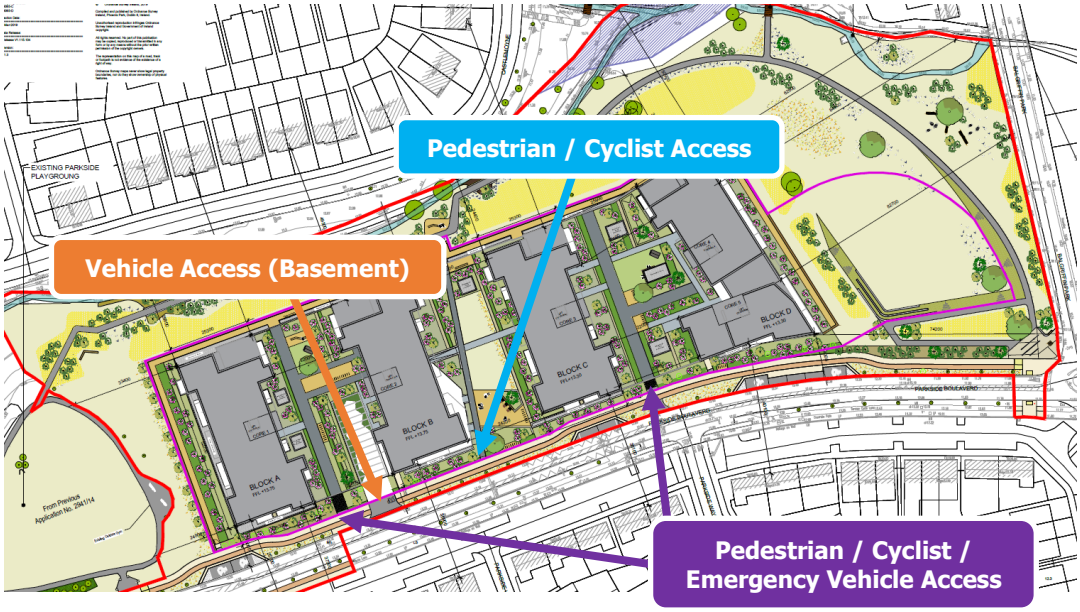


Figure 4.5: Proposed Site Access Locations

Public Transport

4.3.7 The bus stops on Malahide Road (R107) (to the west) are accessible within 900m of the development site and the bus stops on the R139 (to the south) are also accessible within an approximate 900m walking distance of the subject site via the Green Route or Belmayne Avenue.

4.3.8 Furthermore, as stated within the Clongriffin-Belmayne Local Area Plan (2012-2018), there is an objective to:

"liaise with Dublin Bus and the NTA on the operation of bus services and alignment of bus routes through the area having regard to the location of new housing,

community facilities and other services and new street completions (offering the potential for new route options) as they occur in the LAP area".

4.3.9 As noted previously, under the NTA's BusConnects scheme there will be a *'new public transport only link between Clarehall and Belmayne Avenue'* which will be served by the high frequency Clongriffin to City Centre Core Bus Corridor (CBC) plus a new route (D3) which will run along Parkside Boulevard, directly serving the proposed Parkside Phase 4 development. As such, pedestrians from the subject site will be able to utilise these future bus services that pass through the Clongriffin-Belmayne LAP lands, thereby enabling better access and shorter walking distances to these public transport services than the current provision.

5.0 TRIP GENERATION

5.1 INTRODUCTION

5.1.1 The following paragraphs present the process by which the potential level of vehicle trips, associated with the proposed Parkside Phase 4 residential development have been generated.

5.2 TRIP GENERATION

Proposed Parkside Phase 4 Development

5.2.1 To estimate the potential level of vehicle trips that could be generated by the proposed Parkside Phase 4 residential development, we have made reference to the traffic flows surveys carried out as part of the recent Dublin City Council Planning Scheme for Belmayne Main Street (*Ref. 4214/18*), and to the trip rates included within the Transportation Assessments that were submitted with the planning applications of the adjacent phases of the Parkside development (*i.e. Phase 1 - Ref. 2941/14, Phase 2A - Ref. 2296/16, Phase 2B - Ref. 2679/16, Phase 2C - Ref. 3486/17, Phase 3 -Ref. 2275/17 and Phase 5A – Ref. 3791/18*).

5.2.2 During the adopted morning and evening peak hour periods potential peak hour traffic movements are calculated based on the development schedule of 282 apartment units. **Table 5.1** summarises these predicted peak hour, (07:45-08:45) AM and (16:15-17:15) PM, trip rates and resulting vehicle movements generated by the Parkside Phase 4 development, once complete and fully occupied.

Land Use	Period	Trip Rates (per unit)		Traffic generation	
		Arr	Dep	Arr	Dep
Residential	AM	0.055	0.239	**16**	**67**
	PM	0.207	0.069	**58**	**19**

Table 5.1: Proposed Parkside Phase 4 Development Trip Rates & Traffic Generation

5.2.3 It can be seen from **Table 5.1** the proposed Parkside Phase 4 development (282 units) would result in the generation of only 83 and 77 New Vehicle Trips (two-way) the AM and PM peak hour periods respectively. This represents only one vehicle entering/exiting the subject site every 45 seconds during the peak hour periods. These very low traffic movements would have a nominal effect on the operation of the site access junction, and the surrounding local road network.

5.2.4 Due to the relocation of Belmayne Educate Together National School and St Francis of Assisi Primary School onto the new site located on Belmayne Avenue, the trips associated with the existing schools on the subject site must also be redistributed throughout their network. This redistribution is carried out in accordance with existing network travel trends and existing school trip numbers, determined from the respective schools' mobility management plans, which carried out travel surveys for the existing schools to predict existing travel trends as well as travel trends to the new school site.

Committed Developments

5.2.5 There are four committed developments in the vicinity of the site which hold planning permissions and may have an effect on the local road networks to influence traffic flows and junction performances.

5.2.6 The Parkside Phase 2C development (Ref: 3486/17) site is located to the south of the proposed development site, across Parkside Boulevard, and forms a phase of the Parkside development lands. Phase 2C of the Parkside development comprises a total of 89. No residential units and is now largely complete and occupied. The trips from this development access the local road network via Belmayne Avenue, with an access/egress priority-controlled junction.

5.2.7 The Parkside development Phase 5A (Ref: 3791/18) site is also located to the southwest of the proposed residential site, and accesses the local road network also via a priority controlled junction with Belmayne Avenue in accordance with this development's transportation analysis, with this development permitting 96 no. residential units.

5.2.8 The residential development located on lands at Marrsfield Avenue (Ref: 3696/18) located to the east of the proposed development site was granted permission and comprised 240 no. apartments with 204 basement car parking spaces and 28 on street parking spaces.

5.2.9 A second residential development located on lands at Marrsfield Avenue (Ref: 4266/16) located to the east of the proposed development site was granted permission for 132 no. apartments with 176 basement level car park spaces and 8 surface level car park spaces.

Committed Development Trips

5.2.10 Committed development trip rates have been determined from their relevant transportation assessments from Dublin City Council's planning department and applied to the network according to each development's scheduled proposals. Accordingly, trip rate information applied to this assessment for committed developments has been carried out to the rates and figures previously accepted by Dublin City Council.

5.2.11 In the absence of a Traffic and Transport Assessment for the proposed third party residential development, in order to provide a robust assessment DBFL have applied the same trip rates used for the subject residential development to determine potential level of traffic that could be generated as a result of this third party residential development.

5.3 IMPACTS OF PROPOSALS

5.3.1 The NRA/TII document entitled Traffic and Transport Assessment Guidelines (2014) provides thresholds in relation to the impact of a proposed development upon the local road network. It is considered material when the level of traffic it generates surpasses the thresholds of 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance.

5.3.1 **Table 5.2** below details the percentage difference of two-way vehicle trips that will travel through the transport network in the 2021 opening year and 2036 future year scenario. The development scenarios considered full construction and occupation of the committed and proposed developments by 2020 opening year, to show how the development may impact the network across design years. Percentage impacts were calculated for the impact of the development in 'Do Something' Scenarios vs 'Do Minimum' scenarios for the corresponding years. It may be noted that overall these junctions will experience a net decrease in traffic volumes due to the diversion of trips.

5.3.2 For the key off-site junctions, it can be seen that the proposed development (282 units) in 2036 analyses the following junctions:

- **Junction 1** - Priority Control – Site Access / Parkside Boulevard;

- **Junction 2** - Priority Control – Parkside Boulevard / Belmayne Avenue;
- **Junction 3** - Roundabout – R139 / Belmayne Avenue / Clarehall; and
- **Junction 4** - Priority Control – Parkside Boulevard / Malahide Road.

Junction ID	Location	2021		2036	
		AM Peak	PM Peak	AM Peak	PM Peak
1	Site Access / Parkside Boulevard	21.8%	19.4%	19.87%	17.6%
2	Parkside Boulevard / Belmayne Avenue	5.2%	7.9%	4.4%	7.0%
3	R139 / Belmayne Avenue / Clarehall	1.0%	1.3%	0.9%	1.2%
4	Parkside Boulevard / Malahide Road	1.4%	1.5%	1.2%	1.3%

Table 5.2: Network Impact Through Key Off Site Junctions

5.3.3 For this proposed development's analysis, four junctions have been analysed for potential network impacts. As only one Junction is at or exceeding the 10% threshold for junction impact, only junction 1 is required to be analysed in Chapter 6.

5.4 CONSTRUCTION TRAFFIC

5.4.1 It is anticipated that the generation of HGV during this same construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods. An appropriate routing strategy for HGVs can also be implemented for the duration of site works if found necessary. Furthermore, during the various phases of construction, sufficient parking will be sought to be provided on site to accommodate the aforementioned construction generated vehicle movements, thereby ensuring that there is not an overspill of parked vehicles onto the surrounding local road network.

5.4.2 It is anticipated that all construction activities including hours/days of operation will be governed by a Construction Management Plan (CMP). The appointed contractor will be responsible for compiling the CMP which in addition to respecting any conditions applied by the local authority will need to be agreed in full with the planning authority prior to commencement of construction on the subject Phase 4 plot.

6.0 NETWORK ANALYSIS

6.1 INTRODUCTION

6.1.1 The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package PICADY for priority controlled junctions.

6.1.2 When considering priority controlled junctions, a Ratio of Flow to Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly.

6.1.3 A 90-minute AM and PM period has been simulated, from 07:45 to 09:15 and 17:00 to 18:30. Traffic flows were entered using an Origin-Destination table for the peak hours.

6.1.4 In order to determine if the proposed site access junction will cater for the predicted level of traffic generation, a traffic model of the site access junction, the Parkside Boulevard/Belmayne Avenue junction and Belmayne Avenue/R139 junction was analysed for the schemes 2021 opening year and subsequent 2036 future design year.

6.2 JUNCTION 1: SITE ACCESS / PARKSIDE BOULEVARD PRIORITY CONTROLLED JUNCTION

6.2.1 The existing three arm priority-controlled junction has been analysed for the 'Do Something' modelling scenario using the Junctions 9 PICADY software package. The results of the operational assessment of this junction during the weekday morning and evening peaks for the Do Something scenario is summarised in **Table 6.1** below.

6.2.2 In the "Do Something" scenario the three arms were labelled as follows within the ARCADY model:

Arm A: Parkside Boulevard West

Arm B: Site Access

Arm C: Parkside Boulevard

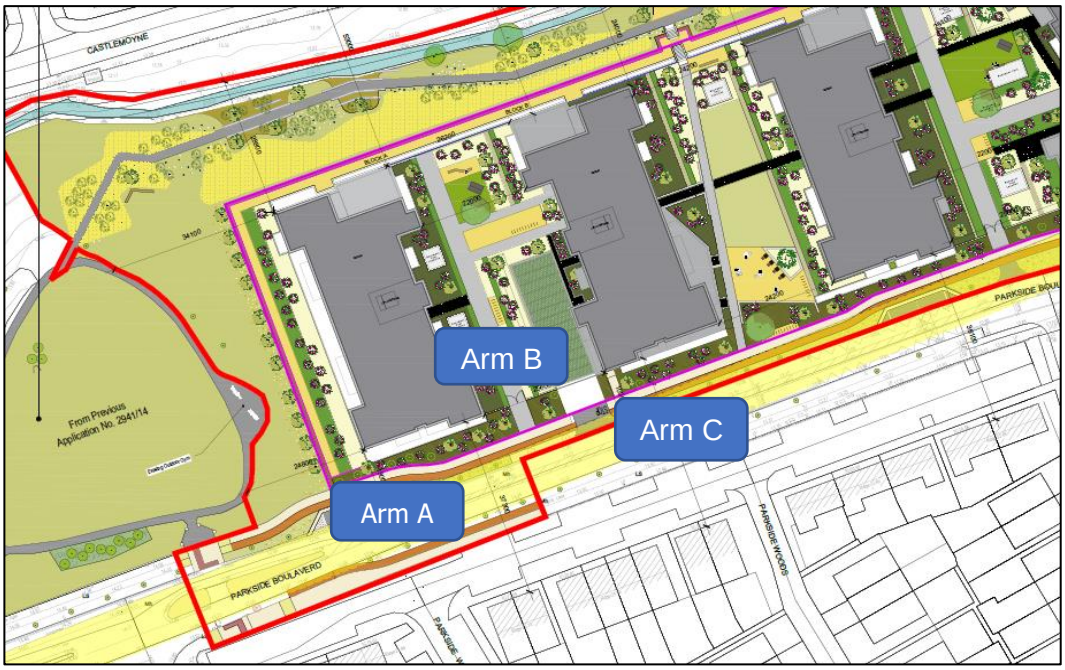


Figure 6.3: Junction 2 Priority Controlled Junction

Do Minimum Scenario

6.2.3 The PICADY results (**Table 6.1**) indicate that the Parkside Phase 4 vehicle site access three-arm priority-controlled junction will operate within capacity for the 2021 AM peak hour with a 'Do Something' a maximum RFC value of 0.15 and a corresponding queue of 0.2 pcus being recorded on the Site Access minor arm, which serves as an entrance to the Proposed Development site. For the 2021 "Do Something" PM peak hour, results show a maximum RFC value of 0.05 occurring on the major arm Parkside Boulevard East arm and a corresponding queue of 0.1 pcus, which is likely due to vehicles turning into the site.

Year Scenario	Period	Arm	Description	Queue (pcu)	Delay (s)	RFC
2021 DS	AM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.2	9.24	0.15
		C	Parkside Boulevard East	0.0	5.91	0.01
	PM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.0	7.73	0.05
		C	Parkside Boulevard East	0.1	5.55	0.05
2026 DS	AM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.2	9.31	0.15
		C	Parkside Boulevard East	0.0	5.89	0.01
	PM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.0	7.79	0.05
		C	Parkside Boulevard East	0.1	5.52	0.05
2036 DS	AM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.2	9.41	0.15
		C	Parkside Boulevard East	0.0	5.87	0.15
	PM Peak	A	Parkside Boulevard West	-	-	-
		B	Site Access Junction	0.0	7.86	0.05
		C	Parkside Boulevard East	0.1	5.49	0.05

Table 6.1: 2021 and 2036 Do Minimum Analysis for Junction 2

6.2.4 For the 2036 Future Horizon Year 'Do Something' scenario the PICADY results (**Table 6.1**) indicate that the Site Access / Parkside Boulevard three-arm priority-controlled junction will operate within capacity for the AM peak hour with a maximum RFC value of 0.15 and a corresponding Queue of 0.2 pcus being recorded on the minor arm, the Site Access arm. For the corresponding "Do Something" PM peak hour a maximum RFC value of 0.05 occurs on Parkside Boulevard East arm of the junction, exhibiting a corresponding Queue of 0.1 pcus.

7.0 CAR PARKING MANAGEMENT STRATEGY

7.1 INTRODUCTION

7.1.1 This section outlines the proposed Parking Strategy for the subject Parkside Phase 4 residential development. The Parking Strategy sets out the management measures that will be deployed to allocate the use and control of parking provided at the proposed development site. The principles of the parking management strategy set out in this section, should be read in conjunction with the Mobility Management Plan (MMP).

7.1.2 The MMP in particular sets out the excellent alternative modes of travel which will be available to residents of the proposed development as well as providing details on existing conditions surrounding the site. The MMP is a set of initiatives which are undertaken to influence a sustainable modal shift in future residents that will reduce demand for car usage.

7.2 VEHICLE PARKING

Residential Parking Provision

7.2.1 The development's vehicle parking proposals include the provision of a total 286 no. parking spaces, of which 9 spaces are provided at surface and 277 spaces are provided at basement level. The proposed allocation of spaces is as follows: -

- 9 no. parallel spaces have been provided at surface level on Parkside Boulevard. These spaces will be taken in charge by DCC and as such will be for general public use and not assigned for private use once taken in charge.
- 277 no. spaces located at basement level will be available for use by residents, of which 10 no. spaces are allocated for mobility impaired users. The spaces will not be automatically assigned to particular units or as part of an initial residential contract.

7.2.2 The proposed vehicle parking provision of 277 basement level car parking spaces for the residential units corresponds to an overall provision of 0.98 parking bays per residential unit and is considered appropriate based on existing accessibility levels and future public transport enhancements proposed for the area.

Service Vehicle Parking

7.2.3 The proposed development's residential units will generate a very small level of 'servicing' activities. Unlike a retail scheme no goods are being transferred for onward sale / returns. Accordingly, the majority of 'servicing' activities including inbound delivery and outward collections will constitute waste collections, general maintenance (indoor and outdoor), and general servicing activities.

Car Park Access

7.2.4 Access to the basement parking will be barrier controlled to ensure unpermitted vehicles cannot gain entry. Only residents who have paid parking subscriptions will gain access to the basement car park area.

7.3 MANAGEMENT OF ON-SITE PARKING FACILITIES

7.3.1 A key component in the continued efficiency of on-site car parking is an active and enforced parking management strategy. This strategy will be managed by the management company who will be responsible for the control of the parking and access arrangements within the internal basement parking area as well as the allocation of the parking spaces.

7.3.2 The Parking Management Strategy will be founded on the principle that none of the residential units will be allocated a parking space as part of the initial contract for the property. A rental cost will be associated with the parking spaces which will be at a rate specified so as to discourage the use of the private vehicle unless necessary and to encourage the uptake of more sustainable modes such as walking, cycling and public transport for which there are excellent opportunities within and directly adjacent to the development site. The parking spaces will be allocated to those paying the prescribed fee.

7.3.3 The 277 spaces within the proposed basement car park will be set aside for the use of residents who may rent a space for a defined period of time. None of the residential units will be automatically allocated a parking space as part of the initial contract for the property. In order to be allocated a parking space tenants will have to apply to the management company to gain a parking permit and an assigned dedicated parking space, i.e. a tenant is not automatically allocated a parking space when they take up residency at the site.

8.0 SUMMARY AND CONCLUSIONS

8.1 SUMMARY

8.1.1 DBFL Consulting Engineers (DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a proposed residential development on lands at Belmayne in Co. Dublin.

8.1.2 The subject proposals represent Phase 4 of the Parkside development and seek permission for the provision of 282 no. residential units, comprising 94 no. 1 bed apartments, 175 no. 2 bed apartments and 13 no. 3 bed apartments, along with ancillary activity including concierge, media centre and a gym. The development shall also provide a total of 286 car park spaces (277 at basement level and 9 at surface level) and a total of 423 bicycle parking spaces (289 at basement level and 134 at ground level).

8.1.3 The purpose of this report was to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of transport impact generated as a result of the proposed residential development.

8.1.4 The on-site car parking allocation has been derived for this development with consideration of both the DCC Development Plan and DHPLG 'Sustainable Urban Housing: Design Standards for New Apartments'. Ample cycle parking is proposed along with other initiatives to promote sustainable travel.

8.1.5 The principal findings that can be drawn from this Traffic & Transport Assessment are as follows:

- The Belmayne Lands, which include the subject site, were previously granted planning permission as part of an overall Framework Plan for development of these Lands (Ref. 4315-03) by Dublin City Council and by ABP (Ref. PL29N.131019 and PL29N.207192).
- Phases 1, 2A, 2B, 2C, 3 and 5A of the Parkside development are currently under construction, with the majority of units already occupied. The subject proposals represent Phase 4 of the Parkside development and seeks permission for the provision of 282 residential apartment units.
- The subject site is ideally positioned within the urban environment to maximise access to/from the site utilising sustainable forms of travel including walking, cycling and public transport. Furthermore, the subject

development proposals facilitate the Clongriffin-Belmayne Local Area Plan key objective *MT02 'To provide new patterns of pedestrian and cycle movement in both east-west and north-south directions throughout the area that is coherent, direct, safe and convenient'.'*

- The subject development proposals include the following upgrades to pedestrian facilities:
  - Upgrading of an existing uncontrolled crossing to a Toucan crossing on Parkside Boulevard, located to the east of the junction with Parkside Avenue;
  - New uncontrolled crossing on Parkside Boulevard, located to the west of the junction with Balgriffin Park; and
  - Provision of a new footpath along the northern and eastern site boundary providing linkages to the existing Parkside playground and footbridge connection to the residential area off Castlemoyne (north of the site).
- Under the NTA's BusConnects proposals there will be a new public transport only road link between Clarehall and Belmayne Avenue served by bus services with a 10-15-minute frequency. This new public transport link will be accessible within approximately 650m walking distance of the subject site.
- The subject development proposals support the Clongriffin-Belmayne Local Area Plan key objective *MT04 'To facilitate enhanced patronage and efficient utilisation of public transport and promote walking and cycling through a range of measures including a reduced provision of car parking for commercial development'.*
- A Part 8 application has been successfully approved proposing works to complete the unfinished section Belmayne Main Street and refurbishments on Belmayne Avenue. This works will enable direct access to Clongriffin Rail station and a through connection with the Malahide Road. This Project will also form a part of the BusConnects Core Bus Corridors phase 1, with the construction phase for upgrades planned to commence in 2021.
- At present, Clongriffin Train Station is located approximately 1.4km east of the subject site on Station Way. The train station is easily accessible both on foot and by bike from the subject development site.
- The site will gain direct vehicular access from Parkside Boulevard, providing linkages to Belmayne town centre via Belmayne Avenue and also to Malahide

Road (R107) to the west. The vehicular access will serve the underground basement car park area, as well as the secure cycle storage areas.

- Pedestrians and cyclists travelling along the segregated path along the site frontage will be given priority over vehicles at the site access junction with Parkside Boulevard.
- The subject Parkside Phase 4 development (282 units) would result in the generation of 82 vehicle trips (two-way) in the AM and 77 vehicle trips in the PM peak hour periods.
- A Car Parking Management Strategy will be implemented at the development site (an outline of which has been provided in Section 7) detailing how vehicle parking on site is to be allocated, accessed and managed for both residents and visitors to the site.

8.2 CONCLUSION

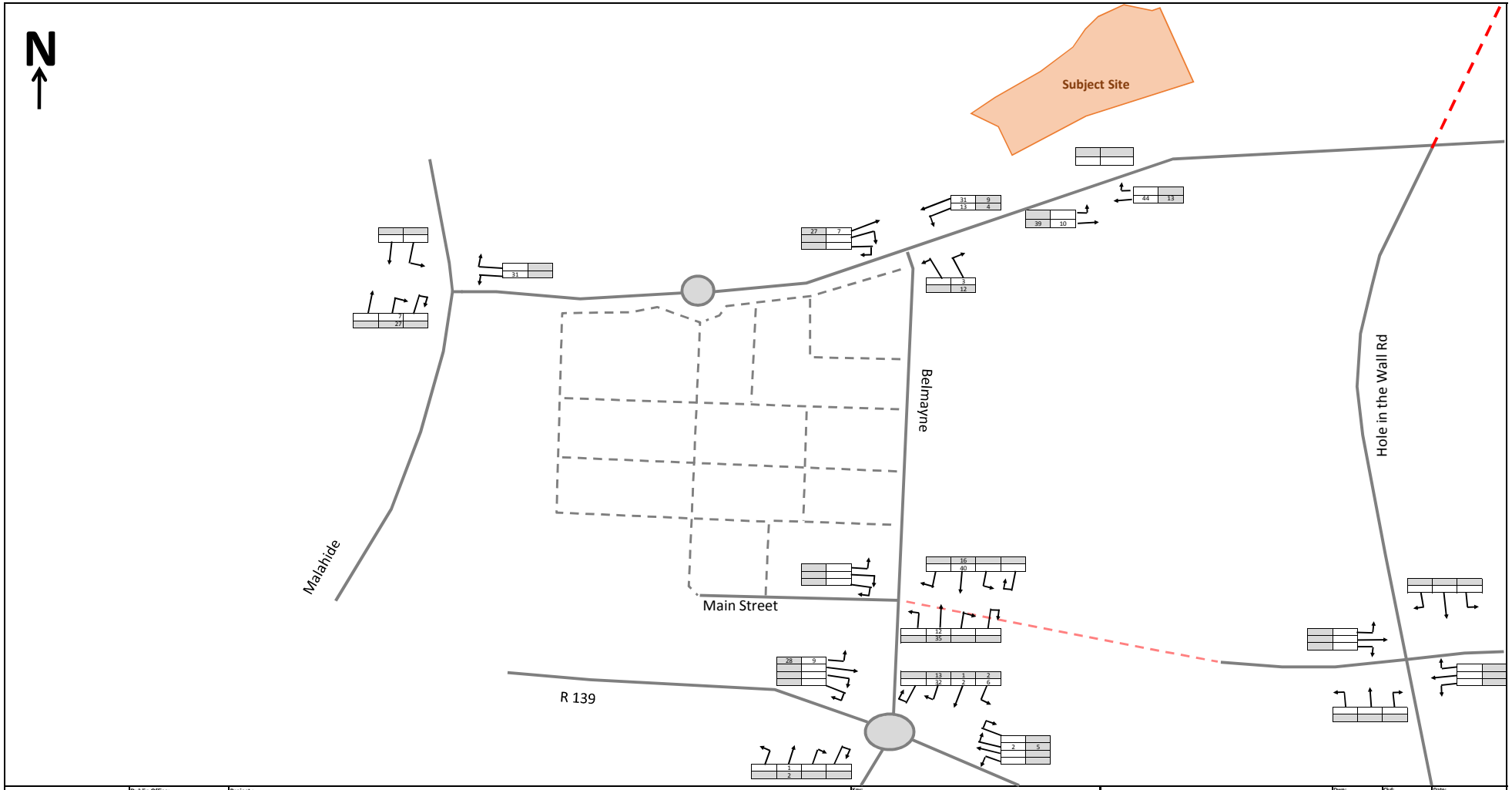
8.2.1 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed Parkside Phase 4 development on the Belmayne lands will be nominal. This is based on the anticipated levels of traffic generated by the proposed development, the existing and future road infrastructure and the information and analysis summarised in the above report.

8.2.2 The subject development proposals support the Clongriffin-Belmayne Local Area Plan objectives of improving pedestrian and cycle connections/linkages through the LAP lands. It is concluded that there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed development.

APPENDICES

APPENDIX A

Traffic Flow Diagrams



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
Comitted Development

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

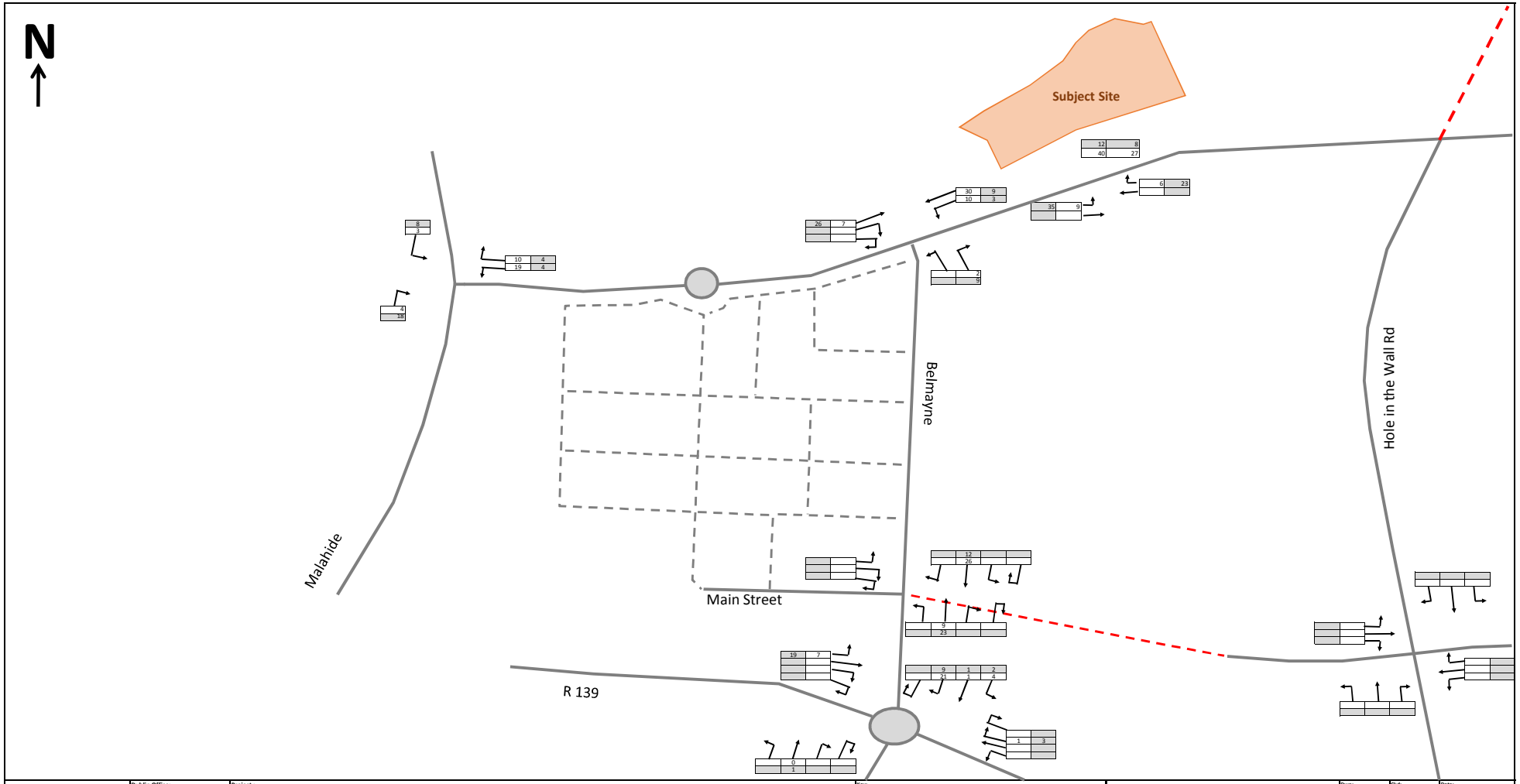
Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure: 1

Rev: A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
Development Trips

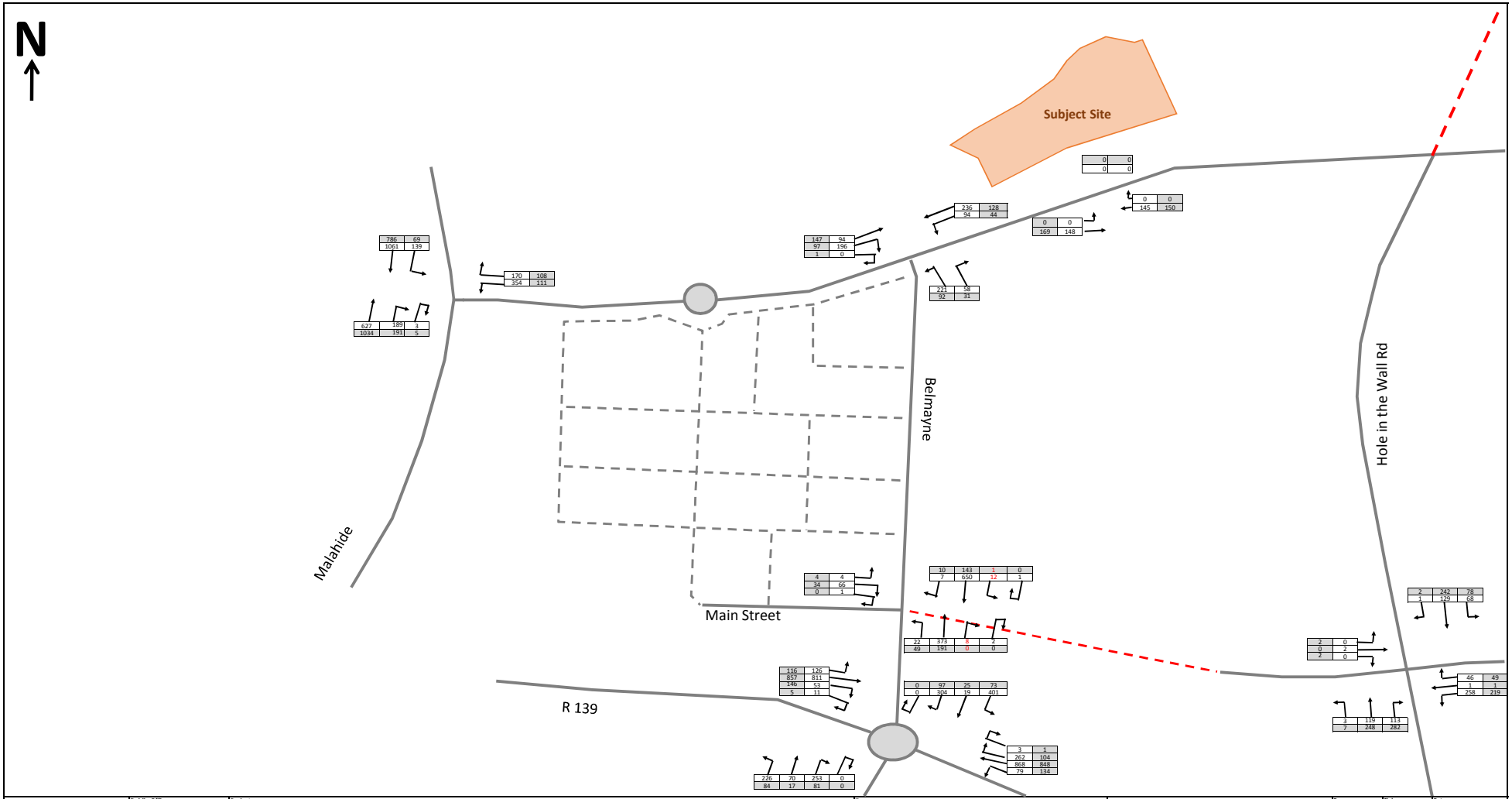
Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure:	Rev:
2	A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House,
Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 4, The Chandlery, 1-2
O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie

website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
2021 Do Minimum

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

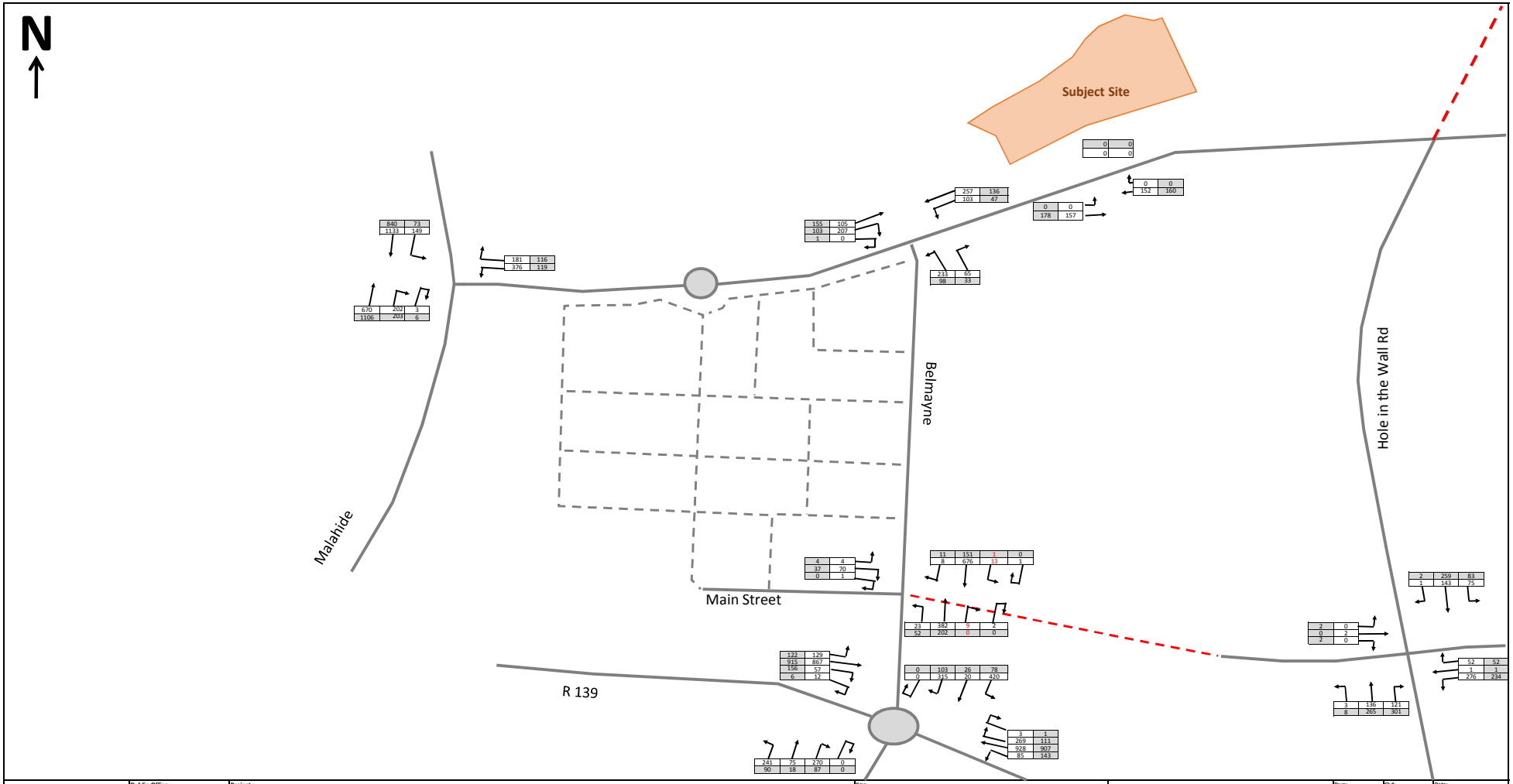
Traffic Growth Factor = 1.041

Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure:	Rev:
3	A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
2026 Do Minimum

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

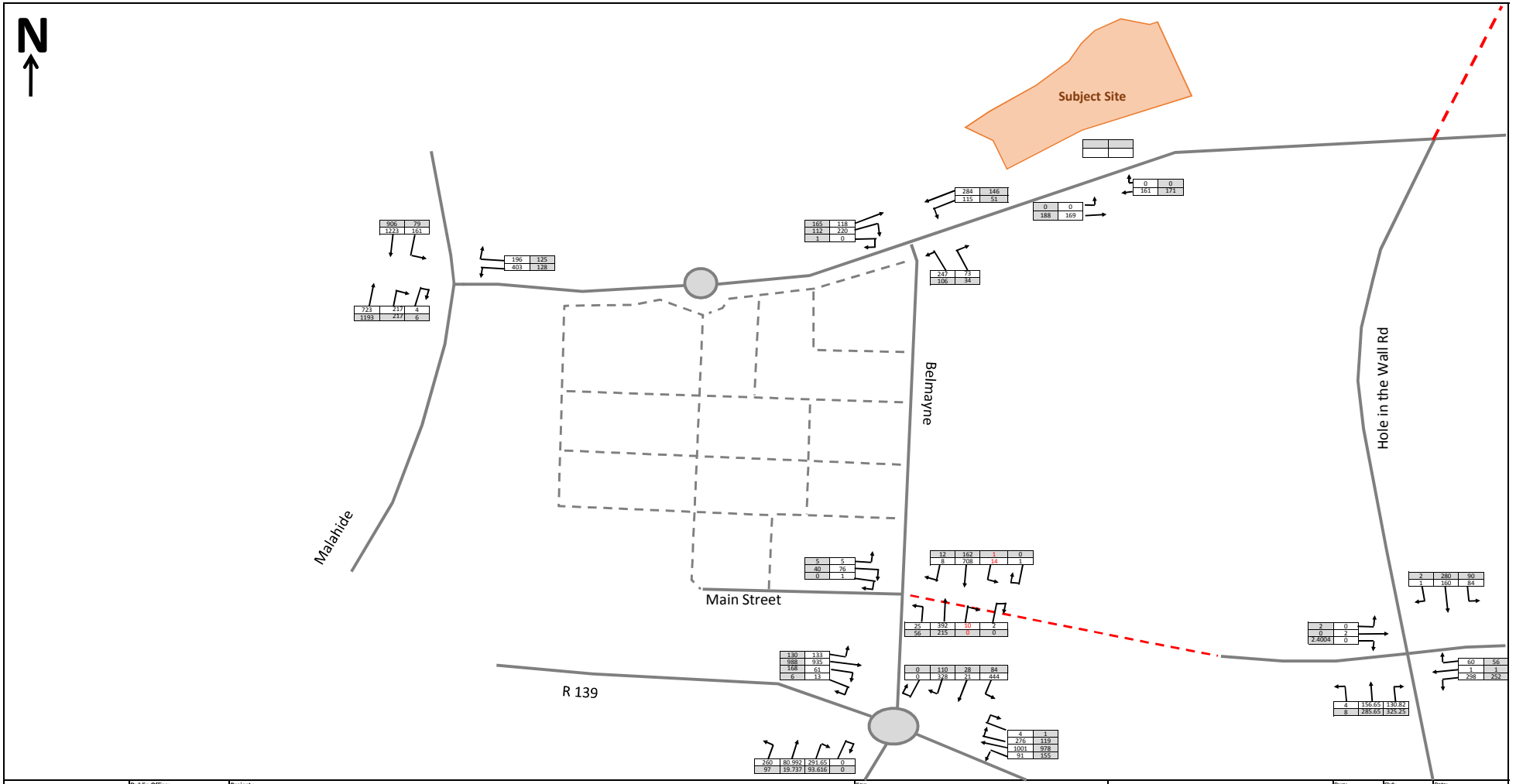
Traffic Growth Factor = 1.112

Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure:	Rev:
4	A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
2036 Do Minimum

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

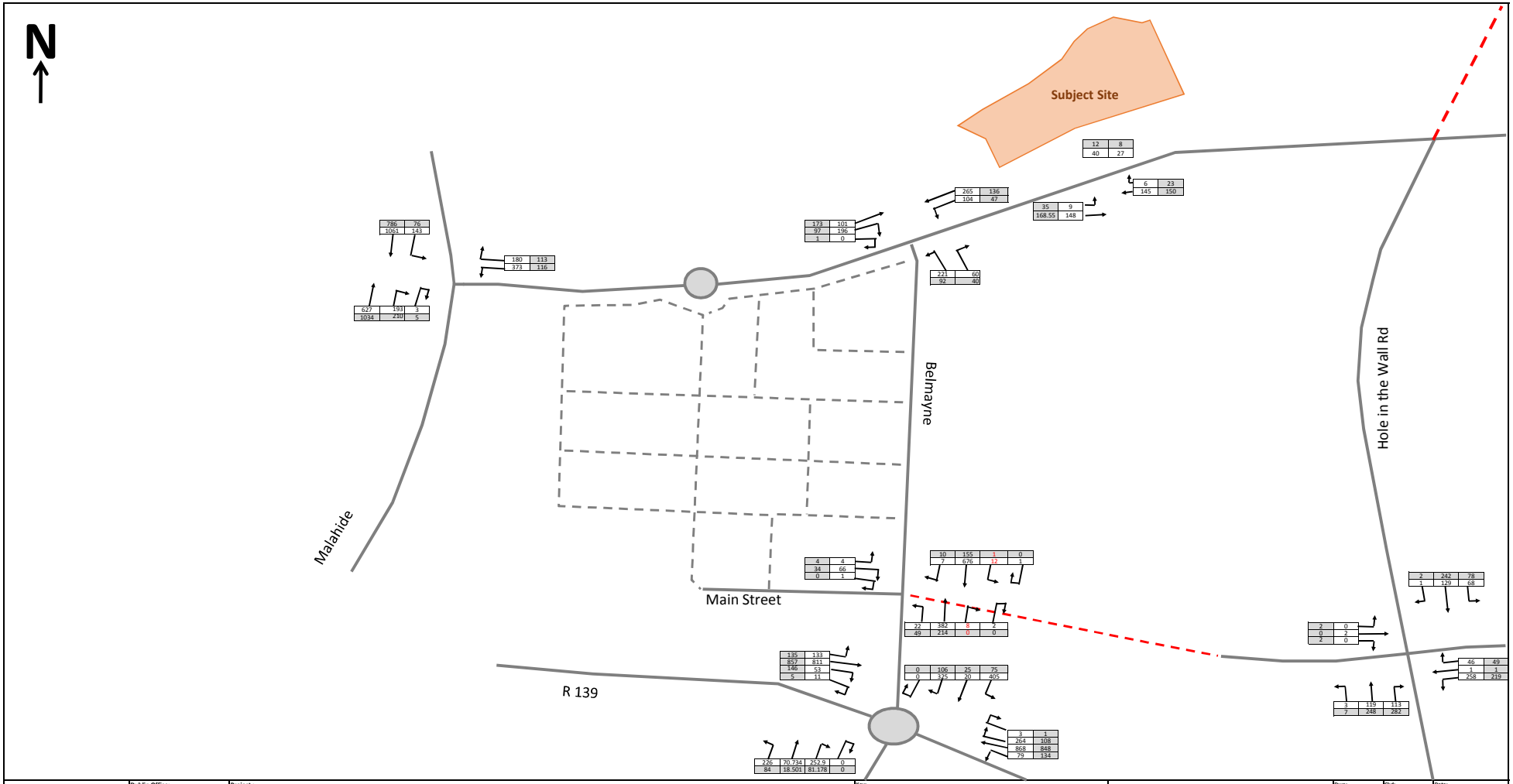
Traffic Growth Factor = 1.200

Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure:	Rev:
5	A

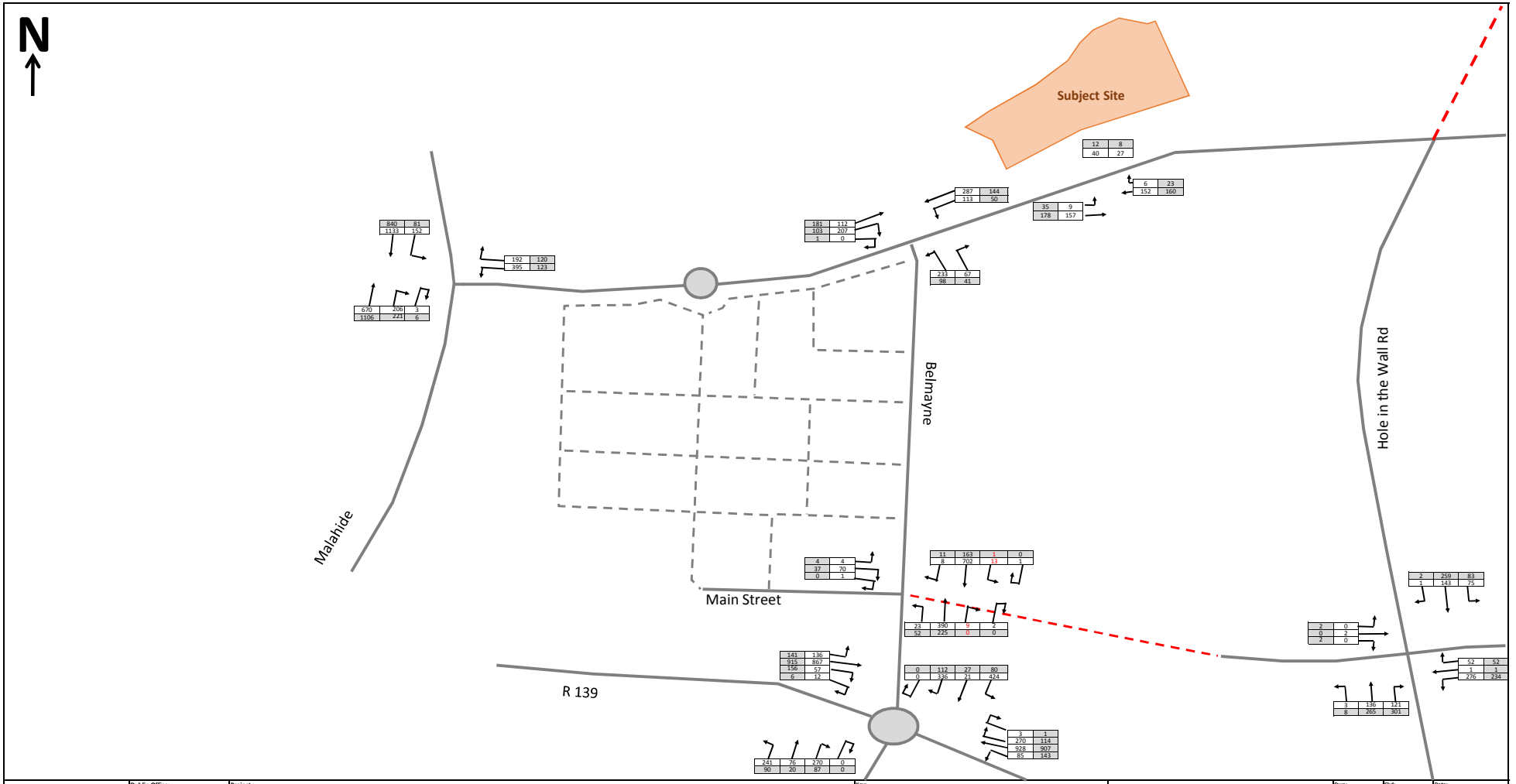


Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 **phone:** +353 1 400 4000 **Waterford Office:** Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford **phone:** +353 51 309 500 **email:** info@dbfl.ie **website:** www.dbfl.ie DBFL Consulting Engineers	**Project :** Proposed Residential Development Parkside, Belmayne, Dublin 17	**Key:** AM Peak Hour (0745 to 0845) PM Peak Hour (1615 to 1715)	**Legend:** Belmayne Roads Future Road
	DRG. Title : Network Traffic Flows - Vehicles 2021 Do Something	Traffic Growth Factor = 1.041	

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure: 6 **Rev:** A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie

website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
2026 Do Something

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

Traffic Growth Factor = 1.112

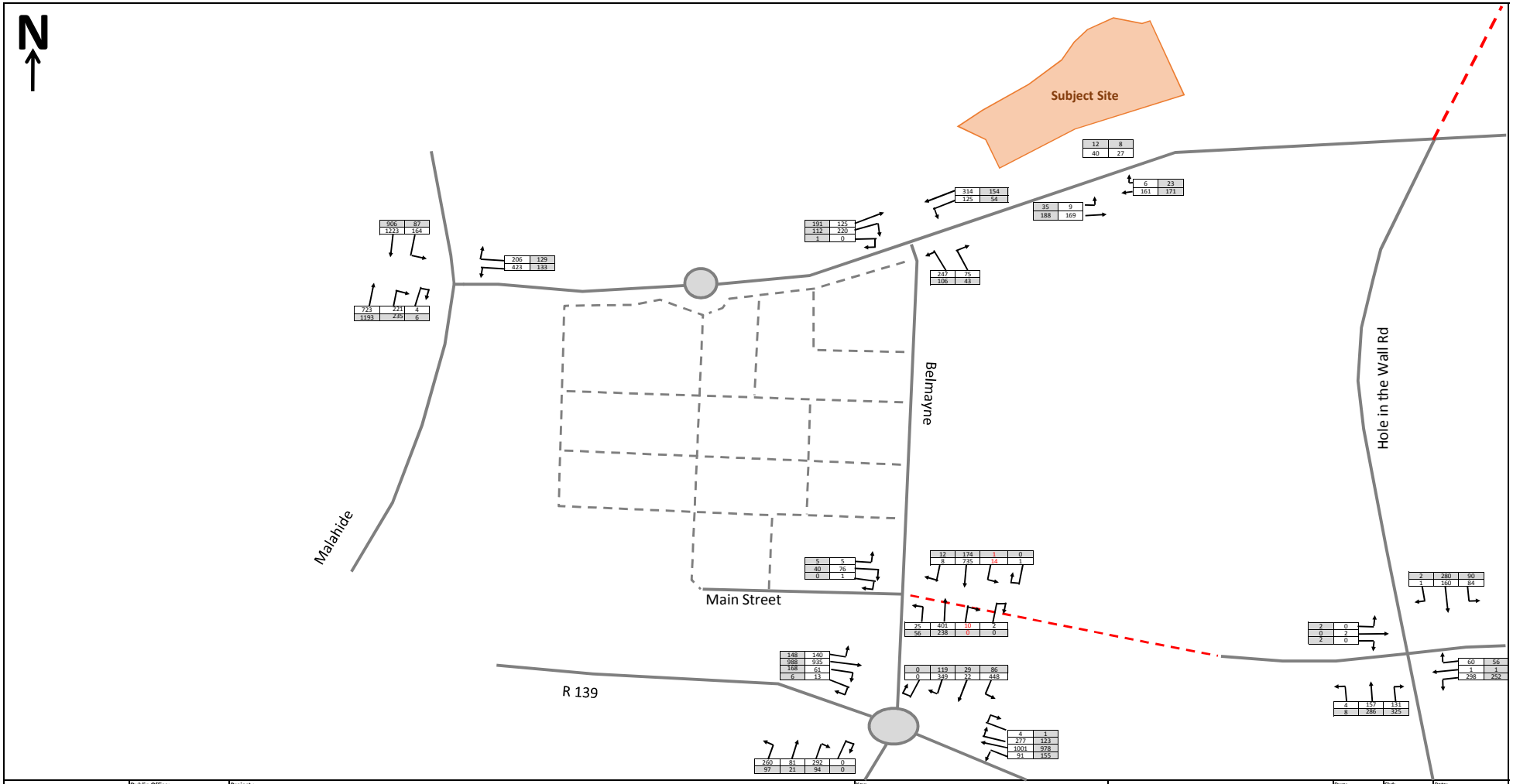
Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure: 7

Rev: A



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000

Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500

email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Parkside, Belmayne, Dublin 17

DRG. Title :
Network Traffic Flows - Vehicles
2036 Do Something

Key:
AM Peak Hour (0745 to 0845)
PM Peak Hour (1615 to 1715)

Traffic Growth Factor = 1.200

Legend:
Belmayne Roads
Future Road

Dwn:	Ckd:	Date:
PmG	AD	12/04/2019

Ref: G:\2019\p190011\calcs\excel\Traffic Model

Figure: 8

Rev: A

Appendix B

PICADY Output Files

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.0.4211 []

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: 190011 Site Access Junction DS.j9
Path: G:\2019\p190011\Calcs\PICADY
Report generation date: 02/10/2019 09:46:19

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2021 DS							
Stream B-AC	0.2	9.24	0.15	A	0.0	7.73	0.05	A
Stream C-AB	0.0	5.91	0.01	A	0.1	5.55	0.05	A
Stream C-A								
Stream A-B								
Stream A-C								
	2026 DS							
Stream B-AC	0.2	9.31	0.15	A	0.0	7.79	0.05	A
Stream C-AB	0.0	5.89	0.01	A	0.1	5.52	0.05	A
Stream C-A								
Stream A-B								
Stream A-C								
	2036 DS							
Stream B-AC	0.2	9.41	0.15	A	0.0	7.86	0.05	A
Stream C-AB	0.0	5.87	0.01	A	0.1	5.49	0.05	A
Stream C-A								
Stream A-B								
Stream A-C								

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

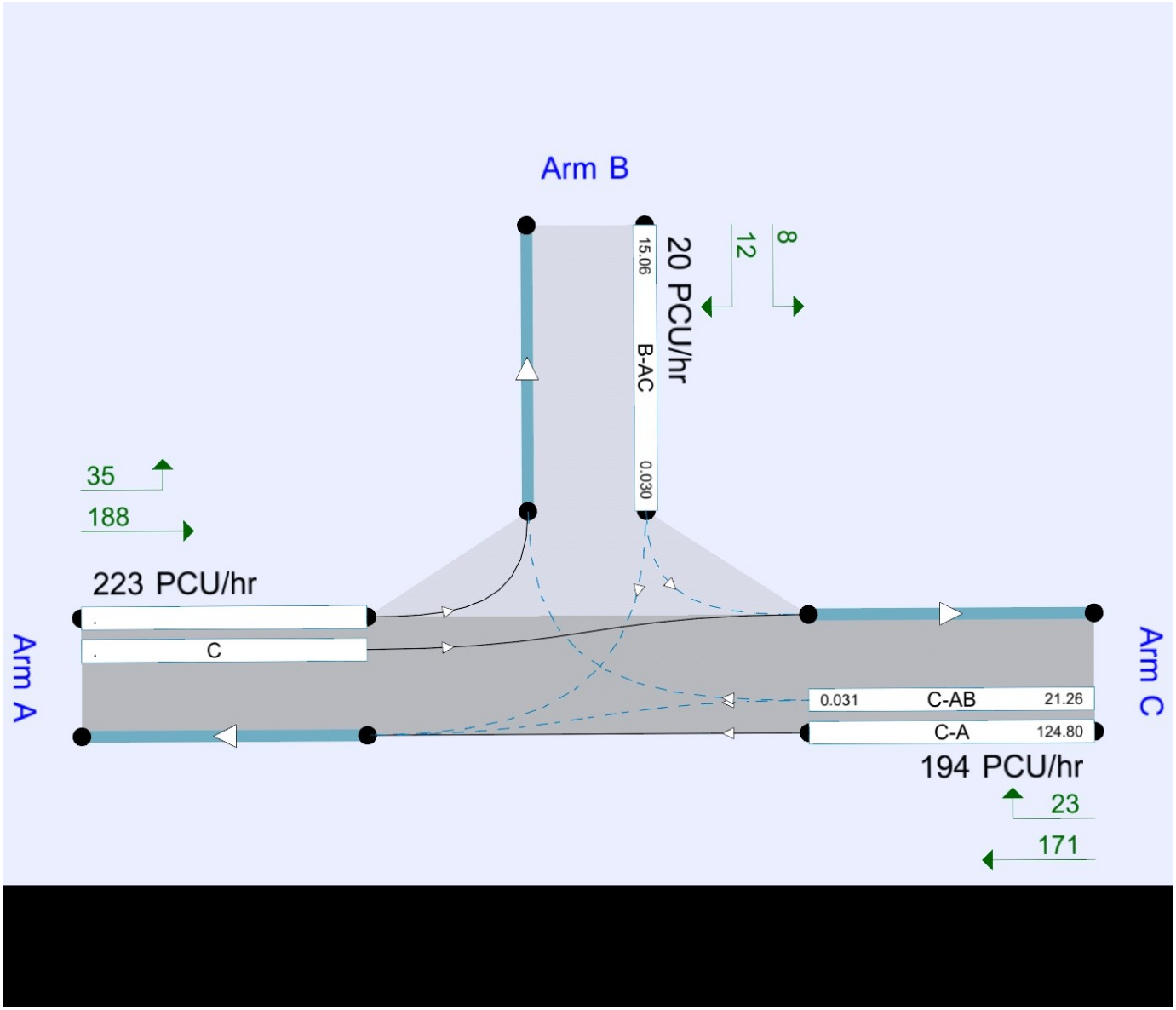
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	23/04/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	HEADOFFICE"mcgeoughp
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2021 DS	AM	ONE HOUR	08:00	09:30	15
2021 DS	PM	ONE HOUR	17:00	18:30	15
2026 DS	AM	ONE HOUR	08:00	09:30	15
2026 DS	PM	ONE HOUR	17:00	18:30	15
2036 DS	AM	ONE HOUR	08:00	09:30	15
2036 DS	PM	ONE HOUR	17:00	18:30	15

2021 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	1.77	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	45	45

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	514.370	0.094	0.237	0.149	0.338
1	B-C	652.266	0.100	0.253	-	-
1	C-B	631.874	0.245	0.245	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2021 DS	AM	ONE HOUR	08:00	09:30	15

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	157.00	100.000
B		✓	67.00	100.000
C		✓	151.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	9.000	148.000
	B	40.000	0.000	27.000
	C	145.000	6.000	0.000

Vehicle Mix

Heavy Vehicle proportion

	To			
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	9.24	0.2	A
C-AB	0.01	5.91	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	521.42	0.097	49.97	0.1	8.390	A
C-AB	5.37	675.28	0.008	5.33	0.0	5.910	A
C-A	108.31			108.31			
A-B	6.78			6.78			
A-C	111.42			111.42			

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	513.42	0.117	60.12	0.1	8.734	A
C-AB	6.63	684.00	0.010	6.62	0.0	5.845	A
C-A	129.11			129.11			
A-B	8.09			8.09			
A-C	133.05			133.05			

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	502.33	0.147	73.60	0.2	9.232	A
C-AB	8.50	696.15	0.012	8.49	0.0	5.758	A
C-A	157.75			157.75			
A-B	9.91			9.91			
A-C	162.95			162.95			

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	502.33	0.147	73.76	0.2	9.239	A
C-AB	8.51	696.15	0.012	8.51	0.0	5.760	A
C-A	157.75			157.75			
A-B	9.91			9.91			
A-C	162.95			162.95			

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	513.42	0.117	60.39	0.1	8.744	A
C-AB	6.63	684.00	0.010	6.65	0.0	5.845	A
C-A	129.11			129.11			
A-B	8.09			8.09			
A-C	133.05			133.05			

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	521.41	0.097	50.56	0.1	8.412	A
C-AB	5.37	675.29	0.008	5.38	0.0	5.913	A
C-A	108.31			108.31			
A-B	6.78			6.78			
A-C	111.42			111.42			

2021 DS, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.79	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2021 DS	PM	ONE HOUR	17:00	18:30	15

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	204.00	100.000
B		✓	20.00	100.000
C		✓	173.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	35.000	169.000
	B	12.000	0.000	8.000
	C	150.000	23.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.73	0.0	A
C-AB	0.05	5.55	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	511.58	0.029	14.94	0.0	7.246	A
C-AB	20.74	669.64	0.031	20.57	0.0	5.547	A
C-A	109.51			109.51			
A-B	26.35			26.35			
A-C	127.23			127.23			

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	501.68	0.036	17.95	0.0	7.441	A
C-AB	25.68	677.40	0.038	25.63	0.1	5.523	A
C-A	129.84			129.84			
A-B	31.46			31.46			
A-C	151.93			151.93			

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	487.97	0.045	21.98	0.0	7.725	A
C-AB	33.04	688.28	0.048	32.96	0.1	5.495	A
C-A	157.44			157.44			
A-B	38.54			38.54			
A-C	186.07			186.07			

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	487.95	0.045	22.02	0.0	7.726	A
C-AB	33.05	688.29	0.048	33.05	0.1	5.497	A
C-A	157.43			157.43			
A-B	38.54			38.54			
A-C	186.07			186.07			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	501.65	0.036	18.02	0.0	7.443	A
C-AB	25.70	677.42	0.038	25.77	0.1	5.527	A
C-A	129.82			129.82			
A-B	31.46			31.46			
A-C	151.93			151.93			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	511.53	0.029	15.08	0.0	7.253	A
C-AB	20.77	669.67	0.031	20.82	0.0	5.550	A
C-A	109.47			109.47			
A-B	26.35			26.35			
A-C	127.23			127.23			

2026 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	1.71	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2026 DS	AM	ONE HOUR	08:00	09:30	15

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	166.00	100.000
B		✓	67.00	100.000
C		✓	158.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	9.000	157.000
	B	40.000	0.000	27.000
	C	152.000	6.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	9.31	0.2	A
C-AB	0.01	5.89	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	519.18	0.097	49.97	0.1	8.431	A
C-AB	5.41	677.20	0.008	5.37	0.0	5.894	A
C-A	113.54			113.54			
A-B	6.78			6.78			
A-C	118.20			118.20			

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	510.74	0.118	60.12	0.1	8.786	A
C-AB	6.70	686.31	0.010	6.69	0.0	5.826	A
C-A	135.34			135.34			
A-B	8.09			8.09			
A-C	141.14			141.14			

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	499.03	0.148	73.60	0.2	9.304	A
C-AB	8.61	699.02	0.012	8.59	0.0	5.735	A
C-A	165.35			165.35			
A-B	9.91			9.91			
A-C	172.86			172.86			

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	499.03	0.148	73.76	0.2	9.311	A
C-AB	8.61	699.02	0.012	8.61	0.0	5.735	A
C-A	165.35			165.35			
A-B	9.91			9.91			
A-C	172.86			172.86			

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	510.73	0.118	60.40	0.1	8.796	A
C-AB	6.70	686.31	0.010	6.71	0.0	5.826	A
C-A	135.34			135.34			
A-B	8.09			8.09			
A-C	141.14			141.14			

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	519.17	0.097	50.56	0.1	8.454	A
C-AB	5.42	677.20	0.008	5.43	0.0	5.894	A
C-A	113.53			113.53			
A-B	6.78			6.78			
A-C	118.20			118.20			

2026 DS, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.76	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2026 DS	PM	ONE HOUR	17:00	18:30	15

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	213.00	100.000
B		✓	20.00	100.000
C		✓	183.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	35.000	178.000
	B	12.000	0.000	8.000
	C	160.000	23.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.79	0.0	A
C-AB	0.05	5.52	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	509.08	0.030	14.94	0.0	7.283	A
C-AB	20.98	673.08	0.031	20.82	0.0	5.520	A
C-A	116.79			116.79			
A-B	26.35			26.35			
A-C	134.01			134.01			

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	498.68	0.036	17.95	0.0	7.488	A
C-AB	26.05	681.53	0.038	26.00	0.1	5.493	A
C-A	138.47			138.47			
A-B	31.46			31.46			
A-C	160.02			160.02			

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	484.27	0.045	21.98	0.0	7.787	A
C-AB	33.61	693.39	0.048	33.53	0.1	5.455	A
C-A	167.88			167.88			
A-B	38.54			38.54			
A-C	195.98			195.98			

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	484.26	0.045	22.02	0.0	7.787	A
C-AB	33.63	693.41	0.049	33.63	0.1	5.459	A
C-A	167.86			167.86			
A-B	38.54			38.54			
A-C	195.98			195.98			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	498.65	0.036	18.02	0.0	7.489	A
C-AB	26.07	681.56	0.038	26.14	0.1	5.493	A
C-A	138.44			138.44			
A-B	31.46			31.46			
A-C	160.02			160.02			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	509.03	0.030	15.09	0.0	7.287	A
C-AB	21.02	673.11	0.031	21.07	0.0	5.521	A
C-A	116.75			116.75			
A-B	26.35			26.35			
A-C	134.01			134.01			

2036 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	1.64	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D5	2036 DS	AM	ONE HOUR	08:00	09:30	15

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	178.00	100.000
B		✓	67.00	100.000
C		✓	167.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	9.000	169.000
	B	40.000	0.000	27.000
	C	161.000	6.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	9.41	0.2	A
C-AB	0.01	5.87	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	516.21	0.098	49.97	0.1	8.485	A
C-AB	5.47	679.59	0.008	5.43	0.0	5.873	A
C-A	120.26			120.26			
A-B	6.78			6.78			
A-C	127.23			127.23			

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	507.19	0.119	60.12	0.1	8.856	A
C-AB	6.78	689.20	0.010	6.78	0.0	5.802	A
C-A	143.35			143.35			
A-B	8.09			8.09			
A-C	151.93			151.93			

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	494.67	0.149	73.59	0.2	9.400	A
C-AB	8.74	702.61	0.012	8.73	0.0	5.706	A
C-A	175.13			175.13			
A-B	9.91			9.91			
A-C	186.07			186.07			

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	73.77	494.67	0.149	73.76	0.2	9.408	A
C-AB	8.75	702.62	0.012	8.75	0.0	5.706	A
C-A	175.12			175.12			
A-B	9.91			9.91			
A-C	186.07			186.07			

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	60.23	507.18	0.119	60.40	0.1	8.866	A
C-AB	6.79	689.21	0.010	6.80	0.0	5.802	A
C-A	143.34			143.34			
A-B	8.09			8.09			
A-C	151.93			151.93			

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.44	516.20	0.098	50.56	0.1	8.507	A
C-AB	5.48	679.60	0.008	5.49	0.0	5.873	A
C-A	120.25			120.25			
A-B	6.78			6.78			
A-C	127.23			127.23			

2036 DS, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.73	A

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Major Arm Geometry
[same as above]

Minor Arm Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D6	2036 DS	PM	ONE HOUR	17:00	18:30	15

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	223.00	100.000
B		✓	20.00	100.000
C		✓	194.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	35.000	188.000
	B	12.000	0.000	8.000
	C	171.000	23.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	7.86	0.0	A
C-AB	0.05	5.49	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	506.30	0.030	14.94	0.0	7.324	A
C-AB	21.26	676.85	0.031	21.09	0.0	5.490	A
C-A	124.80			124.80			
A-B	26.35			26.35			
A-C	141.54			141.54			

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	495.35	0.036	17.95	0.0	7.540	A
C-AB	26.46	686.07	0.039	26.41	0.1	5.459	A
C-A	147.95			147.95			
A-B	31.46			31.46			
A-C	169.01			169.01			

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	480.17	0.046	21.98	0.0	7.857	A
C-AB	34.25	699.00	0.049	34.17	0.1	5.417	A
C-A	179.34			179.34			
A-B	38.54			38.54			
A-C	206.99			206.99			

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	22.02	480.16	0.046	22.02	0.0	7.857	A
C-AB	34.27	699.02	0.049	34.27	0.1	5.418	A
C-A	179.33			179.33			
A-B	38.54			38.54			
A-C	206.99			206.99			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	17.98	495.33	0.036	18.02	0.0	7.544	A
C-AB	26.48	686.10	0.039	26.56	0.1	5.461	A
C-A	147.92			147.92			
A-B	31.46			31.46			
A-C	169.01			169.01			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	15.06	506.26	0.030	15.09	0.0	7.331	A
C-AB	21.30	676.88	0.031	21.35	0.0	5.494	A
C-A	124.76			124.76			
A-B	26.35			26.35			
A-C	141.54			141.54			