

**Comhairle Cathrach  
& Contae Phort Láirge**  
Waterford  
City & County Council

## **Housing Department - Report**

**Planning & Development Act, 2000 (as amended)**

**Planning & Development Regulations 2001**

**(as amended), Part VIII**

**Presented to:** Waterford Metropolitan Meeting

**Date of Meeting:** 16<sup>th</sup> March 2020

**Proposed Development:** Construction of 22 no. houses comprising; (i) 18 no. 2 bed / 4 person 2-storey houses, and (ii) 4 no. 3 bed / 5 person 2-storey houses; plus supporting development works including; (i) temporary construction signage, (ii) boundary treatment, (iii) landscaping, and (iv) all associated site works, on lands at Ballynaneashagh, Waterford City.

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## **SITE CONTEXT:**

The overall site is located within the Waterford City Development Plan extents, is greenfield and WC&CC owned – it is divided by Butlerstown Road, (L90645, known locally as Ballycashin Hill) which links the Outer Ring Road (R710) to the south, and the Cork Road (R680) / Ballybeg Drive (L1518) to the north.

## **RELEVANT PLANNING HISTORY:**

- PD 00506307* Outline Permission was sought for the construction of 2.x bungalows on part of the eastern side of the overall site. This application was Granted, (date, Dec 1985).
- PD 00506480* Outline Permission was sought for the construction of 5.x dwellings on part of the western side of the overall site. This application was Granted, (date, July 1986).
- PD 00506790* Outline Permission was sought for the construction of a bungalow and septic tank on part of the eastern side of the overall site. This application was Refused because its proposed location was “on the line of, and would prejudice the construction of, the (then) proposed Outer Ring Road”, (date, July 1987).

## **THE PART 8 PROCESS**

The Part 8 process started on Monday 21<sup>st</sup> October 2019, with Notification of commencement at the Waterford Metropolitan District Meeting.

2.x site notices were erected on the existing site boundary gates – one leading into the western part of the site and one leading into the eastern part of the site. An advert was placed in the Munster Express newspaper informing the general public of the commencement of the process.

Plans and particulars of the proposed development were available for inspection, at the Customer Care Offices, Waterford City & County Council, Baileys New Street, Waterford, between the hours of 9.30 am - 4:00 pm Monday to Friday, for the period of 29<sup>th</sup> October 2019 up to and including 27<sup>th</sup> November 2019, (4 calendar weeks - including Bank and Public Holidays).

A copy of the plans and particulars of the proposed development were also available for viewing / downloading from the Waterford City & County Council’s website at [www.waterfordcouncil.ie](http://www.waterfordcouncil.ie).

All submissions or observations with respect to the proposed development, dealing with the proper planning and sustainable development of the area in which the proposed development would be situated, were invited to be made in writing to the Director of Services, Housing Department, WC&CC, City Hall, The Mall or by emailing [part8housingsubs@waterfordcouncil.ie](mailto:part8housingsubs@waterfordcouncil.ie) either during the initial 4 week public display period outlined above, or alternatively during an additional 2 week period thereafter provided for such submissions, but in either case not later than 4.00 pm. on 12<sup>th</sup> December 2019.



## **PUBLIC SUBMISSIONS:**

Prior to the 12<sup>th</sup> December deadline, 48 submissions were received:

Annette Buck, Carrigrue, X91 Y1R7; received 22<sup>nd</sup> November 2019.  
James Buck, Carrigrue, X91 Y1R7; received 22<sup>nd</sup> November 2019.  
Rachel Buck, Carrigrue, X91 Y1R7; received 22<sup>nd</sup> November 2019.  
Niamh Buck, Carrigrue, X91 Y1R7; received 22<sup>nd</sup> November 2019.  
Pauline Connell, Ballynaneashagh, X91 RH59; received 29<sup>th</sup> November 2019.  
Joan Mason, Ballynaneashagh; received 29<sup>th</sup> November 2019.  
Sile O'Brien, Ballynaneashagh, X91 N2Y7; received 29<sup>th</sup> November 2019.  
Plunkett O'Brien, Ballynaneashagh, X91 N2Y7; received 29<sup>th</sup> November 2019.  
Paula O'Brien, Ballynaneashagh, X91 N2Y7; received 29<sup>th</sup> November 2019.  
Kathleen Fitzgerald, Ballynaneashagh; received 29<sup>th</sup> November 2019.  
William Butler, Ballynaneashagh; received 29<sup>th</sup> November 2019.  
Alice Butler, Ballynaneashagh, X91 C2P0; received 29<sup>th</sup> November 2019.  
Pat Butler, Ballynaneashagh, X91 C2P0; received 29<sup>th</sup> November 2019.  
Frank Douglas, Ballynaneashagh; received 29<sup>th</sup> November 2019.  
Joan Power, Witches Lane, X91 C3C2; received 29<sup>th</sup> November 2019.  
Annette Power, Witches Lane, X91 W31C; received 29<sup>th</sup> November 2019.  
Tony Foley, Ballynaneashagh, X91 H2H7; received 29<sup>th</sup> November 2019.  
Marian O'Keefe, Ballynaneashagh, X91 X8P2; received 29<sup>th</sup> November 2019.  
Ted O'Keefe, Ballynaneashagh, X91 X8P2; received 29<sup>th</sup> November 2019.  
Michael Greaney, Ballynaneashagh, X91 VE24; received 29<sup>th</sup> November 2019.  
Betty Lonergan, Ballynaneashagh, X91 K6K1; received 29<sup>th</sup> November 2019.  
Francie Lonergan, Ballynaneashagh, X91 K6K1; received 29<sup>th</sup> November 2019.  
Yvonne Lonergan, Ballynaneashagh, X91 K6K1; received 29<sup>th</sup> November 2019.  
Patricia Foley, Ballynaneashagh, X91 H2H7; received 9<sup>th</sup> December 2019.  
John Power, Ballynaneashagh, X91 W29R; received 9<sup>th</sup> December 2019.  
Therese Greaney, Ballynaneashagh, X91 VE24; received 9<sup>th</sup> December 2019.  
Vicky Doherty, Ballynaneashagh, X91 F6KC; received 9<sup>th</sup> December 2019.  
Denise Doherty, Ballynaneashagh, X91 W1D0; received 9<sup>th</sup> December 2019.  
Emmet Doherty, Ballynaneashagh, X91 F6KC; received 9<sup>th</sup> December 2019.  
Sharon Doherty, Ballynaneashagh, X91 W29R; received 9<sup>th</sup> December 2019.  
Clodagh Doherty, Ballynaneashagh, X91 W1D0; received 9<sup>th</sup> December 2019.  
Nicholas Harrington, Carrigrue, Ballynaneashagh; received 18<sup>th</sup> November 2019.  
John Waters, Witches Lane, X91 X3N3; received 11<sup>th</sup> December 2019.  
John Waters, Chair of Residents Association, X91 X3N3; received 11<sup>th</sup> December 2019.  
Michael and Martina Walsh, Carrigrue; received 29<sup>th</sup> November 2019.  
Martina Walsh, Carrigrue; received 29<sup>th</sup> November 2019.  
Kenny and Bruna Williamson, Ballynaneasgh, X91 W8Y4; received 29<sup>th</sup> November 2019.  
Joseph Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Teresa Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Zara Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Alex Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Jake Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Sianna Crowley, Witches Lane, X91 RKC7; received 4<sup>th</sup> December 2019.  
Dale McEvoy, Collins Avenue, X91 P7N3; received 4<sup>th</sup> December 2019.  
Maria Shortall, Carrigrue, X91 P7T2; received 9<sup>th</sup> December 2019.  
Stephen Shortall, Carrigrue, X91 P7T2; received 9<sup>th</sup> December 2019.  
Cllr Donal Barry, St. Johns Park, X91 NXW4; received 11<sup>th</sup> December 2019.  
Joan Mangan, Carrigrue; received 10<sup>th</sup> December 2019.

GDPR regulations restrict Waterford City & County Council from issuing copies of the original submissions within this Report, however the spreadsheet at the back of this Report itemizes all the topics raised in the submissions received by WC&CC, during the Part 8 Public Consultation period.

#### **SUMMARY AND EXTRACTS FROM SUBMISSIONS:**

1. Concern regarding proposed 2-storey development as opposed to single-storey.
2. Concern regarding over-shadowing and over-looking of adjacent existing properties.
3. Level of existing Social Housing in adjoining Ward 3 to the north-east of the site.
4. Concern regarding proposed number of houses, (ie; density) of the development.
5. Request for Traffic Impact Assessment, Road Safety Audit, & Mobility Management Plan.
6. Request for Ecology / Arborist Report.
7. Suggestion of a further CPO to acquire additional lands as part of the development.
8. Requests for Dilapidation Surveys to properties prior to commencement of work.
9. Annotation / graphical errors and omissions on Part 8 drawings.
10. Comments re: the proposed architectural character / design of the proposed development.
11. Designing in accordance with existing building lines.
12. Comments regarding both public and private open space.
13. Treatment of existing boundaries and proposed removal / replacement, (as applicable).
14. Comments regarding bat roosting.
15. Query regarding potential use of site for Affordable Housing delivery.
16. Proximity of site entrances to existing junctions / sight-lines, etc.
17. Concern regarding lack of car parking associated with the proposed development.
18. Sufficient access for bin lorries and delivery trucks, etc.
19. Comparison of proposed development against historic planning applications for the site.
20. Query regarding surface water run-off, and collection of same.
21. Comment regarding insufficient public lighting on Witches Lane.
22. Comment on existing level of public footpaths on Ballycashin Hill.
23. Apparent inaccurate demarcation of red-line boundary to adjoining private property.

#### **REFERRALS:**

Referrals received include the following;

- Irish Water – Received following pre-connection enquiry; Part 8 proposal can be facilitated.

#### **COUNCILLORS WORKSHOP:**

WC&CC Housing met Waterford councillors for a Workshop review on 12<sup>th</sup>. February, 2019, in the Council Chamber, City Hall, Waterford city. During the course of this, a request was made for a Traffic Impact Assessment (formally known as a 'Traffic & Transport Assessment', or TTA), due to increased traffic on Ballycashin Road, and potential use of an adjoining site for future WC&CC use.

A TTA is not required for residential developments of less than 200 dwellings, (*as per, Table 2.1, Traffic & Transport Assessment Guidelines, by TII, May 2014, and Table 1.4, Traffic Management Guidelines*). However, even though this development is only 22 dwellings, WC&CC agreed to have a TTA carried out – find in full to the rear of this Report. It concludes negligible impact generated by this Part 8 development, as well as any potential combined use of an adjoining site by WC&CC.



## **PLANNING DEPARTMENT'S CONSIDERATIONS:**

The purpose of the proposed development is to deliver 22 residential units. The proposed development will support the policies and objectives of the current City Development Plan 2013-2019 and complies with ministerial guidelines, government policies and with the Regional Planning Guidelines. It is considered therefore that the development is in accordance with the proper planning and sustainable development of the area.

Refer to separate Planning Report

## **HOUSING DEPARTMENT RECOMMENDATION:**

The objective of the proposal is to provide the provision of 22 housing units in Waterford city. The proposed scheme meets the objectives of Waterford City & County Council and DHPLG.

The proposed scheme has been approved in principle and funding-approved by DHPLG.

The statutory requirements of the Part 8 planning process have been completed and complied with.

48 Public Observations were received within the deadline date – full consideration to these submissions has been given and certain amendments are proposed. See main items below and the Summary Spreadsheet attached to this Report.

### Public Observations:

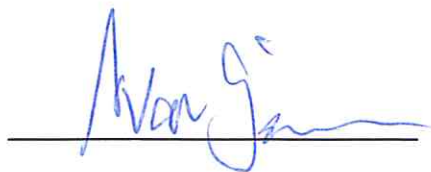
1. **Issue;** *Qualitative open public space is non-existent and there is no central open space for the occupants to benefit from within the scheme.*

**Amendment;** The proposed public open space location and design is specific and bespoke to this scheme, however WC&CC have taken comments / observations onboard with further considered and developed design of the public open area. The amended design includes modern railings to the edge of the space, grassed play areas, seating areas, landscaping to include semi-mature trees and paved patterns.

The proposed development complies with and meets all of the relevant national and local standards, requirements and guidelines.

The Planning Authority supports the proposed housing development and concludes that the development is in accordance with the proper planning and sustainable development of the area.

It is therefore recommended that the Council adopt and approve the proposed development as originally presented and with modification as outlined above.



**Ivan Grimes**  
Director of Services  
Housing Community & Emergency Services

## Observations - Summary Spreadsheet

Item	Topic	Observations	Consideration by Housing Department	Chief Executive Response
1	2-storey development of the area.	<p><u>Proposed WC&amp;CC houses are 2-storey while other houses in the Ballynaneashagh area are mainly bungalows. Previously, local residents were not allowed dormer-bungalows or 2-storey houses under conditions attached to their PP.</u></p>	<p><i>There is recent precedent in the Ballynaneashagh area of planning approval for 6x private detached 2-storey part-dormer dwellings and all associated site works; planning ref; 13/118, (dated February 2014). There are existing 2-storey properties too, eg: an adjacent dwelling to the site is 2-storey, with a converted third-storey, and was granted permission for a 2-storey extension in March 2001 (planning ref; 00500388) whilst other dwellings are also dormer-bungalows.</i></p>	<p>No change to Part 8 design.</p>
2	Overlooking / privacy.	<p><u>Five houses will look directly into my property from an elevated viewpoint. I will totally lose the privacy of my property given the proposed scale, location proximity and height of the proposed development. This is a serious and impactful reduction in the quality of life that I currently enjoy when living in and using my property.</u></p>	<p><i>There are no first-floor bedroom windows overlooking this property at X91 Y1R7, (a 2-storey house with converted third-storey), or any other property, from the five houses referenced, due to their considered site-specific design and internal arrangement. Proposed bathroom windows at first-floor will be frosted for privacy of both parties.</i></p>	<p>No change to Part 8 design.</p>
3	Clarification of Information request.	<p><u>Additional drawings, dimensions and line-boundaries required, for Clarification purposes.</u></p>	<p><i>This information has been provided as Clarification of original Part 8 information, and is contained within the updated Part 8 drawings (where relevant) attached to this Report.</i></p>	<p>No change to Part 8 design.</p>



4	Tenure mix.	<p><u>The proposed development of Social housing should be an Affordable housing scheme in the interests of balance for the housing type developments in the area.</u></p>	<p>WC&amp;CC currently await details of a national Affordable Housing scheme. The tenure of the dwellings does not materially affect the granting of planning permission. WC&amp;CC have DHP&amp;LG approval for housing on this site.</p>	No change to Part 8 design.
5	Density.	<p><u>The proposed development should be scaled back to a reduced number of bungalow houses, which would be aligned with the other dwelling types in the area.</u></p>	<p>The density is approximately 22 units / hectare, which is considerably lower (almost 1/3 lower) than other similar housing developments located on the periphery of the city approved recently by either the local authority or An Bord Plenala, (for example; Planning Ref 16/833, for 285 units at Knockboy, Waterford city).</p>	No change to Part 8 design.
6	Road safety 1.	<p><u>WC&amp;CC have not provided a Traffic Impact Assessment / Road Safety Audit / Mobility Management Plan with the application.</u></p>	<p>A Traffic Impact Assessment (formally known as a 'Traffic &amp; Transport Assessment', or TTA), is not required for residential developments of less than 200 dwellings, (as per, Table 2.1, Traffic &amp; Transport Assessment Guidelines, by TII, May 2014, and Table 1.4, Traffic Management Guidelines). A Road Safety Audit is required for permanent changes to a National Road, not a housing development. A Mobility Management Plan is only required for developments which may generate significant trip demand which this proposed development will certainly not generate.</p> <p>NOTE: A TTA was requested at the Councillors Workshop, dated 12th February 2019, on the grounds of increased traffic on Ballycashin Road, and potential use of an adjoining site for future WC&amp;CC use . Although not required for a development of this size, WC&amp;CC agreed to have a TTA carried out. Find attached in full to the rear of this Report.</p>	No change to Part 8 design.

7	Road safety 2.	<p><u>This section of road is extremely busy as it acts as a feeder for the Outer Ring Road to the Industrial estate, WIT, local schools, Walsh Park, the local retailing areas, and residential parts of the city.</u></p>	<p><i>This section of road was upgraded within the last 10 years to include widening, pavement, footpath, ramps, public lighting and utilities. There is also a 3.5 tonne weight restriction on this road. There are existing traffic calming measures already in place - 2x speed ramps that will be either side of the development access.</i></p>	No change to Part 8 design.
8	Development of Ballynaneashagh area.	<p><u>In a previous development at the top of Ballycashin Hill, directly adjacent to the ring road roundabout, planning permission was refused for an entrance directly onto Ballycashin Hill. Therefore permission for two more entrances onto this road should be refused.</u></p>	<p><i>There is no specific detail in this statement as to the location or Planning Ref number of the refused planning application. However it is likely to be 08/32. The original layout for these 2-storey houses had access onto Ballycashin Hill but was refused as access would be too close to the new ring-road junction. The site layout was revised and application was granted. The Planning Report to the WC&amp;CC Director of Services for 08/032, states; "Submissions received object to development on the grounds that the area is rural with predominantly single-storey house-types and a deficient road network. I would hold that the character of the area has been fundamentally altered by the (combined) construction of the Outer Ring Road, the proposal... to realign Ballycashin Hill, and the proposal to provide mains services for the area. In these circumstances the continuation of the existing pattern of development on zoned and serviced land, (ie.; single-storey housing on large plots), is unsustainable." (March 2008). The area has to become denser in terms of its built environment.</i></p>	No change to Part 8 design.
9	Architectural character.	<p>Proposal has no regard for the existing characteristics or aesthetic of this rural area. It has no regard to the scale or makes no attempts to assimilate the proposal to reflect the existing properties.</p>	<p><i>It is acknowledged that the proposed development, while actually considered and positively responding to its surroundings, does not copy surrounding properties in form and detail, and will therefore positively contribute to the identity and sense of place of this development. The existing houses in this location are a mix of</i></p>	No change to Part 8 design.



	continued...	<p>typologies with different finishes. There is in our view, no aesthetic or design that is common to the adjoining properties. The house types developed for this project have, (despite the neighbours comments to the contrary), been specifically designed for this site. The design proposes simple housing types and finishes, in a legible layout, giving identity to this "Edge of City" housing scheme. The design for this proposed development meets the development Standard of the Waterford City Development Plan 2013-2019, and the Quality Housing for Sustainable Communities document, issued by the Department of the Environment, Heritage and Local Government.</p>	<p>Change to WC&amp;CC design; Further Information added and revision included to this Report.</p>
10	Open space.	<p><u>Qualitative open space is non-existent and there is no central open space for the occupants to benefit from within the scheme.</u></p>	<p>The proposed Open Space location and design is specific and bespoke to this scheme. However, we have taken the comments / observations from neighbours on board, and further considered and developed the design for the Open Area. The proposed design includes:</p> <ul style="list-style-type: none"> <li>• Modern railings to the edge of the space;</li> <li>• Grassed play areas;</li> <li>• Seating areas;</li> <li>• Landscaping incl semi-mature trees;</li> <li>• Paved patterns;</li> </ul>
11	Building-lines / Boundary treatment.	<p><u>The proposal has no regard to existing building lines or boundary treatments, infact it is unknown what the boundary treatments are proposed.</u></p>	<p>The WC&amp;CC proposal acknowledges and responds to existing building lines along the road. Boundary treatment information has been provided as Clarification of original Part 8 information, and is contained within the updated Part 8 drawings (where relevant) attached to this Report.</p> <p>No change to Part 8 design.</p>

12	Shadow-study.	<p><u>WC&amp;CC should have undertaken a shadow-study to understand the impact both physically and imposing this development will have on the amenity value of the existing residents.</u></p>	<p><i>It is our opinion that a Shadow Study was not required for the following reasons:</i></p> <ol style="list-style-type: none"> <li><i>1. The proposed Houses 1 to 5 to the North West of the scheme are designed to be circa 28m to 30m from the existing houses to the north;</i></li> <li><i>2. The proposed House 6 to the North East of the site is designed to be circa 9.5m from the existing house to the north, and there is an existing mature hedge approx 3m high between the WCCC site and existing house.</i></li> <li><i>3. The proposed scheme is a low density modest 2-storey design, and with approx 12m distances between the proposed houses; the site is Zoned Residential, so there should be a reasonable expectation that a housing scheme, such as that proposed, is likely on this site.</i></li> </ol>	No change to Part 8 design.
13	Sight-lines at junctions.	<p><u>Concerns regarding the functionality of the proposed opposing entrances which is not good road design or practice, but also the lack of sightlines horizontally and vertically.</u></p>	<p><i>There are existing traffic calming measures already in place - 2x speed ramps that will be either side of the development access. Sightlines will be provided appropriate to the speed limit of the road in accordance with the Design Manual for Urban Roads &amp; Streets.</i></p>	No change to Part 8 design.
14	Hedgerows & bio-diversity.	<p><u>WC&amp;CC have not provided any justification or mitigation for the removal of the existing mature hedgerows along the front boundaries, the loss of biodiversity, etc..</u></p>	<p><i>A desk-top study was carried out during the early stages of the project. The subject site lies outside the Proposed Natural Heritage Area (PNHA), Special Area of Conservation (SAC), and Special Protection Area (SPA), in accordance with the LAP. Removal of the existing hedgerows along the road are to provide appropriate and safe sightlines both ways along Ballycashin Road. Mitigation of any loss of biodiversity here, as for example feeding</i></p>	No change to Part 8 design.



		continued...	source, can be provided through compensation planting of the generous number of replacement trees and shrubs spread across the site.	
15	Bats.	<u>WC&amp;CC have not carried out or provided any evidence in relation to bat surveys, roosting in existing hedgerows, etc.</u>	Approximately three quarters of bat species in the UK and Ireland are known to roost in trees, whilst the remaining species tend to favour human-made structures because of a lack of suitable and available tree habitat. Trees provide shelter and attract a diverse range of insect species for bats to feed on. Since bats are not able to bore holes or make nests, they use whatever gaps are available – including cavities and crevices made by other animals, the natural decay of the wood or arboricultural methods. There are no structures on the site, and thus the proposed development will not incur loss of any bat roost.	No change to Part 8 design.
16	Ecology.	<u>WC&amp;CC have no supporting Ecology or Arborist Report, suggesting the development is a design-first solution and environment-second approach.</u>	A desk-top study was carried out during the early stages of the project. The subject site lies outside the Proposed Natural Heritage Area (PNHA), Special Area of Conservation (SAC), and Special Protection Area (SPA), in accordance with the LAP.	No change to Part 8 design.
17	Car parking.	<u>Proposed development has very little roadside parking. Questions safe access for bin lorries and delivery trucks.</u>	The development has 51 car parking spaces contained within the site boundary - all off-road. This equates to more than 2 spaces per household, which is in excess of the Waterford City Development Plan. The design team have carried out a Swept Path Analysis to ensure safe and adequate space for movement in and out of the development for bin lorries and delivery trucks.	No change to Part 8 design.

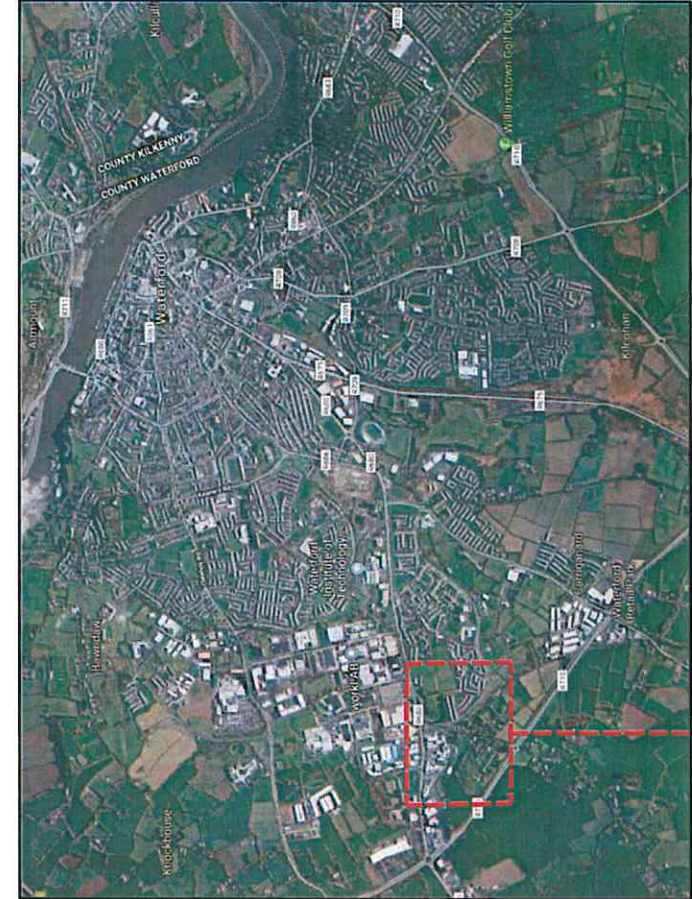
18	School bus.	<p><u>Asks where children will get the bus to school? States that if the bus parks on Witches Lane during peak times it would cause chaos</u></p>	<p><i>Ultimately this answer depends on which school the children will go to, which is not a WC&amp;CC decision. The most prudent and obvious location for children to get the bus to school would be 300m away at the existing stop on Ballybeg Drive, adjacent to Crystal Mews, thereby negating a requirement for collection on Witches Lane. This location in turn links to other public services to different parts of the city.</i></p>	No change to Part 8 design.
19	Future issues.	<p><u>Suggests the development would act as a catalyst to initiate movement of existing residents away if the traffic, population density, general peacefulness, safety of the area deteriorated due to the addition of the proposed social housing development in its current form.</u></p>	<p><i>The design for this proposed development meets the development Standard of the Waterford City Development Plan 2013-2019, and the Quality Housing for Sustainable Communities document, issued by the Department of the Environment, Heritage and Local Government. It is noted the comment is somewhat subjective.</i></p>	No change to Part 8 design.
20	Surface-water drainage.	<p><u>During light rain there is immediate spot flooding and a river appears on Witches Lane from manholes at The Stove Depot, which runs towards the crossroads resulting in flooding at my gate opposite Inn the Doghouse. Claims the drains in Witches Lane are too small in diameter / number.</u></p>	<p><i>The design for this proposed development meets the development standard of the Waterford City Development Plan 2013-0219 and incorporates Sustainable Urban Drainage Systems (SUDS) including runoff treatment/attenuation. This item is not an issue for the WC&amp;CC Housing or this Part 8 application.</i></p>	No change to Part 8 design.
21	Public footpaths.	<p><u>Public footpaths are insufficient both on Ballycashin Hill and Witches Lane. Therefore with an increased number of residents living in the area due to the development, traffic accidents would become more likely.</u></p>	<p><i>There is an existing footpath running almost 220 metres on the east side of Ballycashin Hill passing in front of the proposed Part 8, providing access to all the existing and proposed houses. There is no continuous footpath on the western side of the road however the new development will include a footpath which will provide a link and continuity with those existing and immediately</i></p>	No change to Part 8 design.



		continued...	adjacent. Footpaths along Witches Lane are outside the remit of this Part 8 housing application, proposed by the WC&CC Housing Department, and should be directed to the appropriate Dept.	
22	Private gardens.	<u>Tiny gardens of no material benefit to residents.</u>	It has been found generally that residents in local authority generated housing do not want large gardens due to the upkeep and ongoing maintenance of same - indeed if they are too big to look after they become a maintenance issue for the tenant and subsequently an eye-sore for adjoining parties. The design meets the development Standard of the Waterford City Development Plan 2013-2019, and the Quality Housing for Sustainable Communities document, issued by the Department of the Environment, Heritage and Local Government.	No change to Part 8 design.
23	Ground conditions.	<u>The ground is shale and as such likely that building work will cause vibration damage to my property given close proximity to proposed development - requests dilapidation survey.</u>	As per the Site Investigation Report, the majority of rock excavation shall be either 'ripping' or 'hard-digging' due to the nature of the bedrock. Rock breaking may be required but will be the exception. A dilapidation survey can be carried out on the immediately adjacent properties prior to works commencing, in order to record the existing condition of the property, and help identify any damage that may arise; this would be standard procedure in such instances.	No change to Part 8 design.
24	Construction Management Plan.	<u>Consider the upheaval on a small narrow local road with high traffic levels whilst a building site of this size is operational. It is unsuitable to take increased traffic flow.</u>	A Construction Management Plan to minimise construction impact during construction phase-would be standard procedure, and would be prepared prior to works commencing on site and in compliance with any planning conditions applied.	No change to Part 8 design.

## *Drawings*





The site is located just of the Cork road on the south/west outskirts of Waterford City

**GENERAL NOTES:**

- A. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS THE SPECIFICATION AND ALL RELEVANT STANDARD DETAIL DRAWINGS.
- B. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT CIVIL, STRUCTURAL MECHANICAL AND ELECTRICAL DRAWINGS TOGETHER WITH THE SPECIFICATIONS AND SCHEDULES.
- C. ALL DIMENSIONS IN MILLIMETERS. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
- D. CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE SETTING OUT COMMENCING WORK OR PRODUCING ANY SHOP DRAWINGS.



Revisions	Date	Job	Client	Date
		Housing at Ballyneaneashagh	Waterford City & County Council	15-10-19
			Title Site Location	Scale @ A3 Not to scale
			20 Cruises street Limerick, V94 R6P9, Ireland	Drawn NW
			63 Fitzwilliam sq Dublin 2 D02 N938, Ireland	Checked MI
			tel (081) 312 249 e-mail: limerick@eml.ie	Drawing No. 3478-SK-0.01
			tel (01) 970 7677 e-mail: dublin@eml.ie	Rev





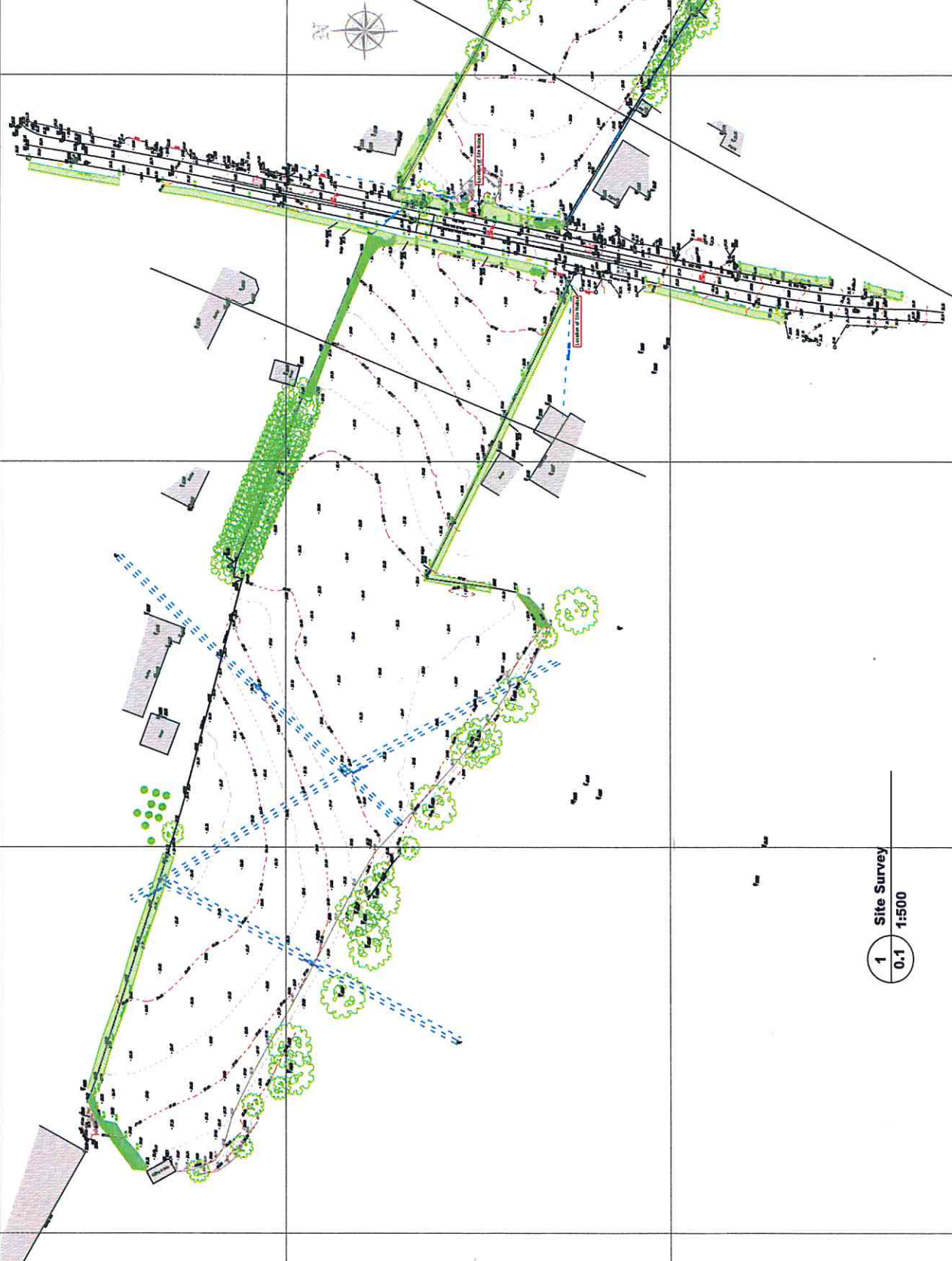
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25 Court Street, 63 Fitzwilliam St,  
 Lower Level, Dublin 2,  
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 info@eml.ie / eml.ie

**e ml architects**

Client	Waterford City & County Council
Date	29-10-19
Scale	1:500
Drawn	N.W.
Checked	M.L.
Project No.	3478-P-02



1 Site Survey  
 0.1 1:500



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Legend	
	Existing Trees and hedgerows to be retained
	Proposed Trees
	Proposed Gardens
	Proposed Open Play Area (gravel/tarmac)
	Proposed Open Seating Area (gravel/tarmac)
	Proposed Low level Hedge
	2 story, 2 bed units (House Type A)
	2 story, 3 bed units (House Type B)
	Units 1-4, 7-16, 19-22
	Units 5, 6, 17, 18

2m high blockwork wall (capped & plastered) to all boundaries between proposed houses / gardens and existing houses.

**Notes:**  
 Refer to Drawing 3478-P-0.0 For sections A & B  
 Refer to Drawing 3478-P-0.2 For sections C, D, E & E

Revision: 01  
 Date: 15.03.2019  
 28 Court Street, 51 Fitzwilliam St, Dublin 1, D02 YK03  
 0035332249  
 info@emlarchitects.com  
 www.eml.ie

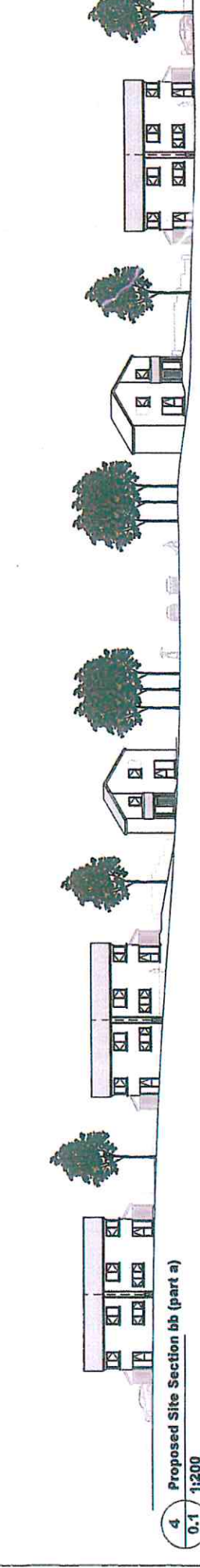
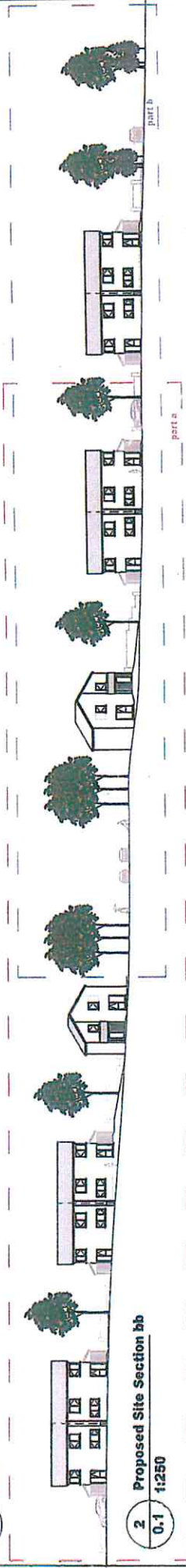
Client:	Waterford City & County Council
Date:	29-10-19
Scale:	1:500
Site:	Ballynecaseagh Housing
Drawn:	N.W.
Checked:	M.L.
Project No.:	3478-P-0.1-A
Rev:	A



1 Site Layout: Proposed  
 0.1 1:500

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**eml architects**

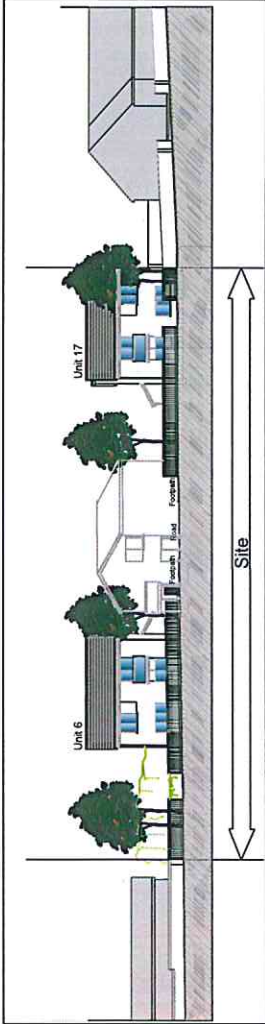
Waterford City & County Council  
Ballymacaugh Housing  
Proposed Site Sections

02-10-19  
1:250  
N.W.  
ML  
3478-P-2.0

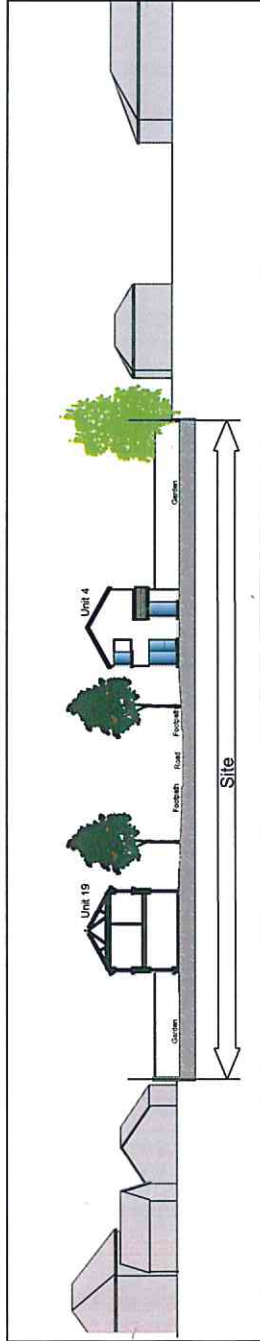


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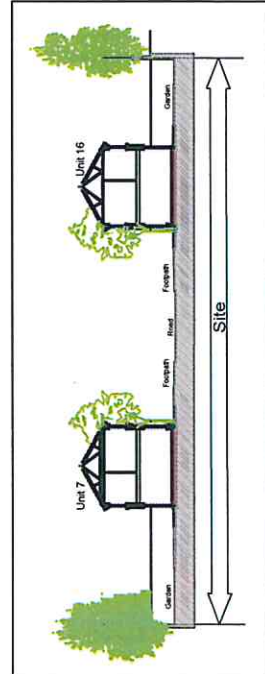
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**C Proposed Contiguous / Site Section CC**  
0.1 1:200



**D Proposed Site Section DD**  
0.1 1:200



**E Proposed Site Section EE**  
0.1 1:200

Revisions	Date

22 Cross Street    D1 Athlone NS  
 Athlone    Co. Wick  
 Ireland    E02 9078  
 Tel: +353 01 852 3124    Fax: +353 01 852 3125  
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Client	Waterford City & County Council	Date	29-10-19
Site	Ballynaneasagh Housing	Scale	1:250
Drawn	N.W.	Checked	N.L.
Title	Proposed Site Sections C, D & E	Drawing No.	3478-P-2.2
	Sheet 2		

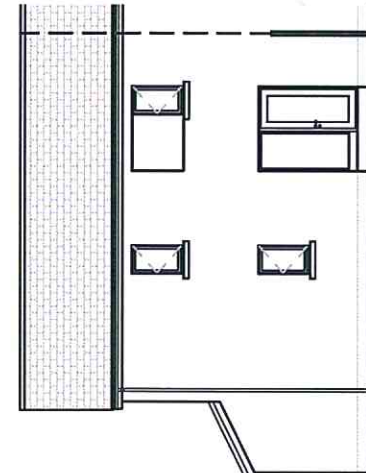
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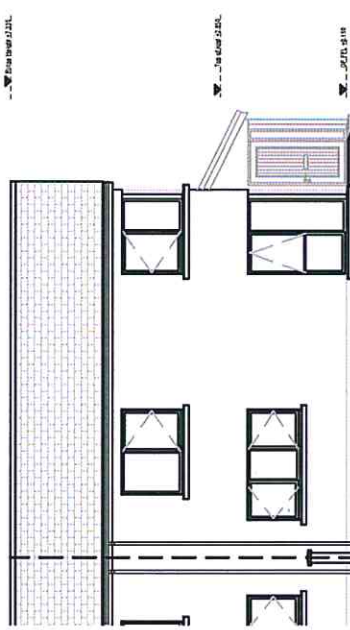
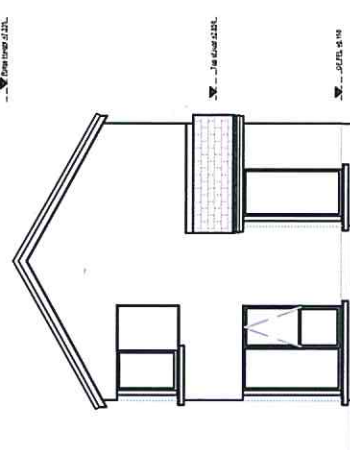
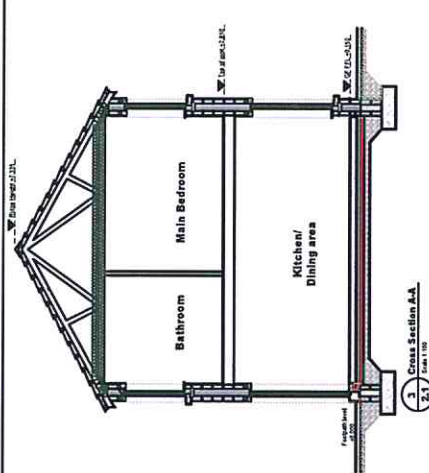
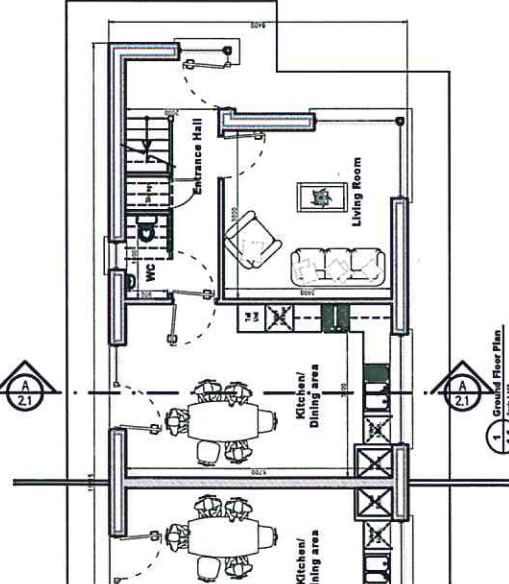
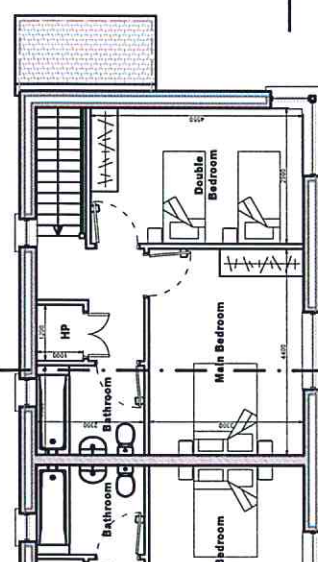
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Room	Area	Volume	Perimeter	Volume	Perimeter
Living Room	12.00	12.00	12.00	12.00	12.00
Dining Room	10.00	10.00	10.00	10.00	10.00
Kitchen	8.00	8.00	8.00	8.00	8.00
Bedroom	12.00	12.00	12.00	12.00	12.00
Bathroom	5.00	5.00	5.00	5.00	5.00
WC	2.00	2.00	2.00	2.00	2.00
Entrance Hall	3.00	3.00	3.00	3.00	3.00
Staircase	4.00	4.00	4.00	4.00	4.00
HP	1.00	1.00	1.00	1.00	1.00
Double Bedroom	12.00	12.00	12.00	12.00	12.00
Main Bedroom	12.00	12.00	12.00	12.00	12.00
Bedroom	12.00	12.00	12.00	12.00	12.00
<b>Total</b>	<b>70.00</b>	<b>70.00</b>	<b>70.00</b>	<b>70.00</b>	<b>70.00</b>



Revisions	Date	Job	Client	Title	Date
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					Scale @ A3 1:100
					Drawn TM
					Checked MI
					Drawing No. 3478A-P-1.0
					Rev



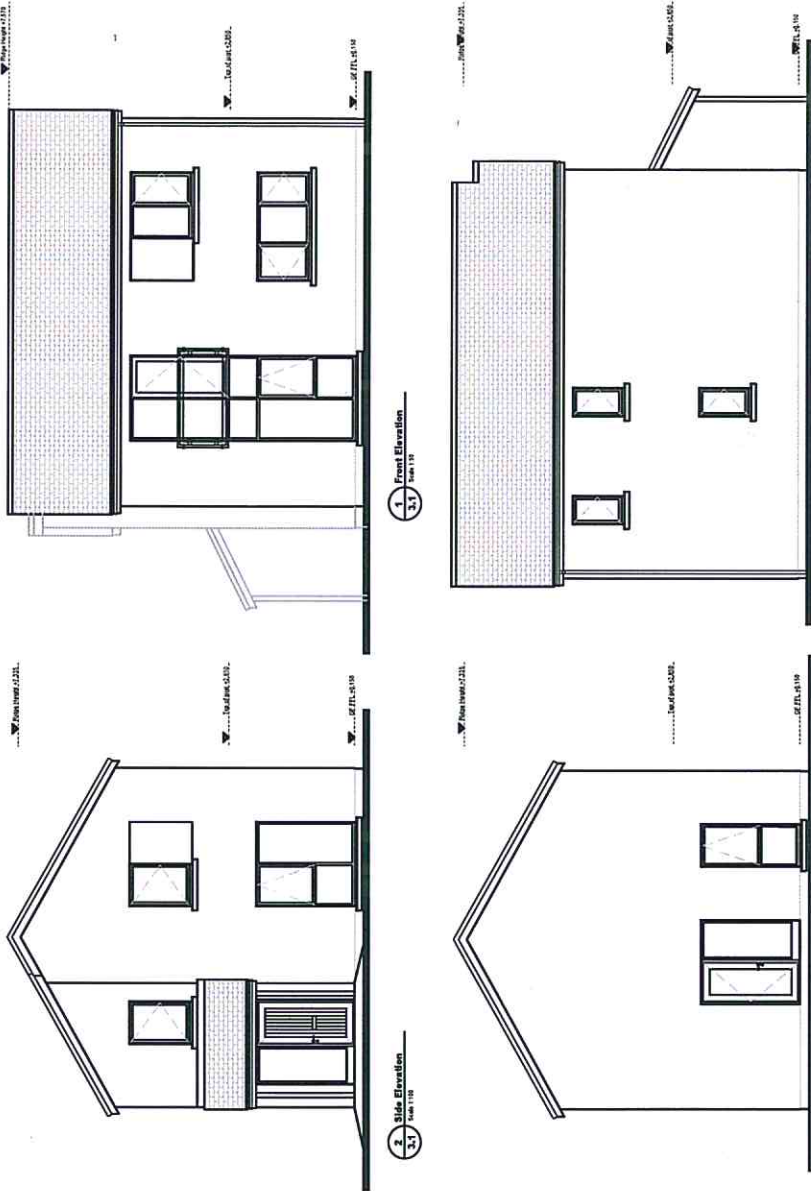
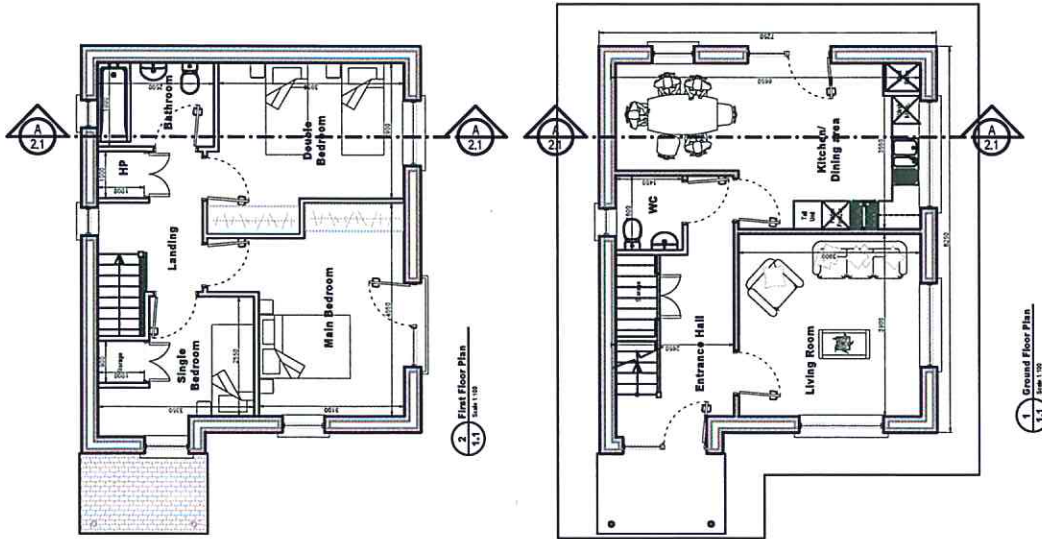
20 Cruises street  
Limerick  
V94 R6P9, Ireland  
tel (061) 312 249  
e-mail: limerick@eml.ie

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Dublin 2  
D02 N938, Ireland  
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Revisions	Date	Job	Client	Date
		Housing at Ballynaneashagh	Waterford City & County Council	29-10-19
			House Type B	Scale @ A3 1:100
			20 Cruises street Limerick V94 R6P9, Ireland	Drawn TM
			63 Fitzwilliam sq Dublin 2 D02 N938, Ireland	Checked MI
			tel (061) 312 249 e-mail: limerick@emli e-mail: cddub@emli	Drawing No. 3478B-P-1.0
			tel (01) 670 7677 e-mail: cddub@emli	Rev



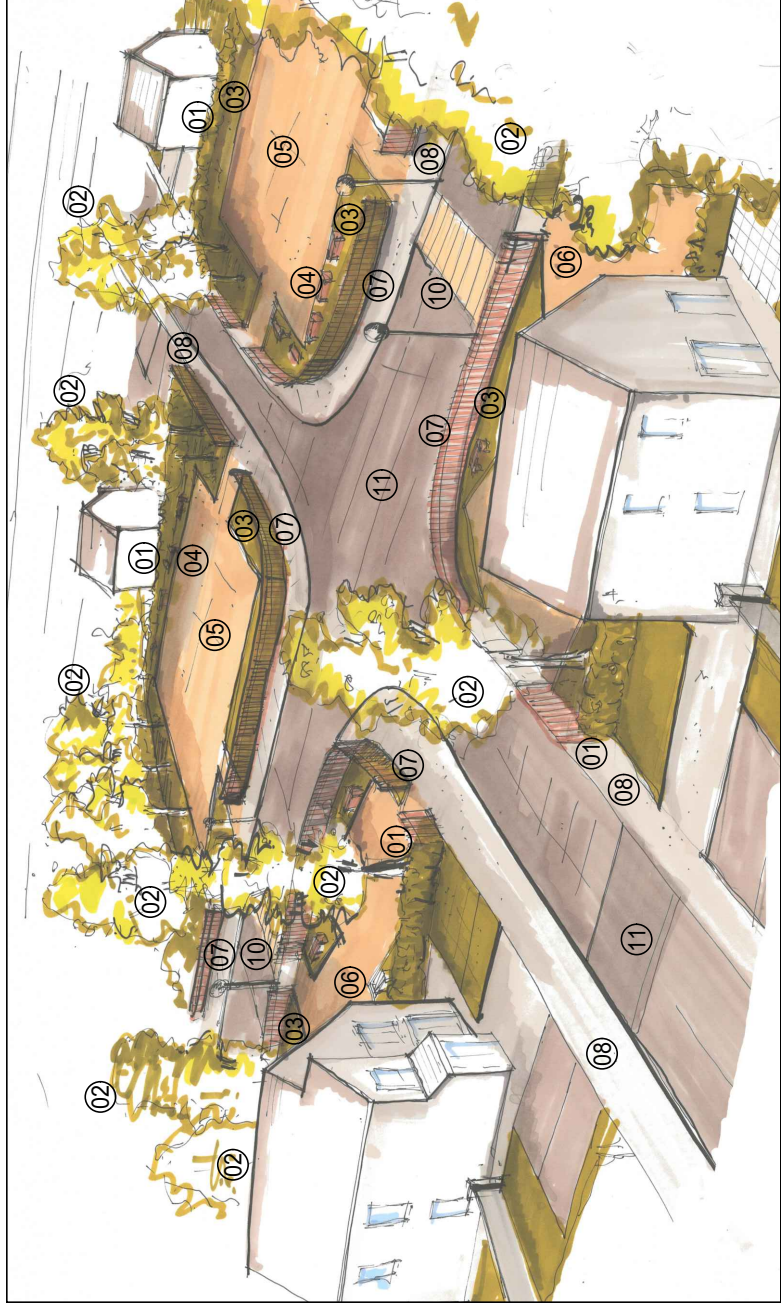


**Legend**

- 01 Denotes low level Hedge
- 02 Denotes Mature Trees
- 03 Denotes Grass verge
- 04 Denotes Bench
- 05 Denotes Open Play Area (gravel/tarmac)
- 06 Denotes Seating Area (gravel/tarmac)
- 07 Denotes Boundary fencing to open areas
- 08 Denotes Public Footpath
- 09 Denotes Public Road
- 10 Denotes Uncontrolled Pedestrian Crossing
- 11 Denotes Traffic Calming



**SITE OPEN AREA PLAN**



**3d View**

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<b>Revisions</b>	<b>Date</b>	<b>Job</b> Ballynaneasagh Housing	<b>Client</b> Waterford City & County Council	<b>Date</b> February 2020
			<b>Title</b> Open Area Plan	<b>Scale</b> @ A3
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			63 Fitzwilliam Sq Dublin 2 D02 N938, Ireland	<b>Checked</b>
			(061) 312249 limerick@emli.e	<b>Drawing No.</b> 3478-P-2.1
			(01) 6707677 dublin@emli.e	<b>Rev</b>
				
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## ***Referrals***



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[www.water.ie](http://www.water.ie)

Philip O' Regan  
11 Mallow Street  
Limerick  
Co. Limerick

12 July 2019

Dear Philip O' Regan,

**Re: Connection Reference No CDS19001786 pre-connection enquiry - Subject to contract | Contract denied**

**Connection for Housing Development of 22 unit(s) at Ballynaneashagh, Waterford, Co. Waterford.**

Irish Water has reviewed your pre-connection enquiry in relation to a water connection at Ballynaneashagh, Waterford, Co. Waterford.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

**Wastewater:**

In order to complete the proposed connection at the Premises, the Irish Water wastewater network will have to be extended by approximately 75m. Irish Water currently does not have any plans to extend its network in this area. Should you wish to consider extending the wastewater infrastructure to a point to connect to the Irish Water network, please contact Irish Water.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at [www.water.ie/connections](http://www.water.ie/connections). Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

If you have any further questions, please contact John Hennessy from the design team on 022 52256 or email [jhennessy@water.ie](mailto:jhennessy@water.ie). For further information, visit [www.water.ie/connections](http://www.water.ie/connections).

Yours sincerely,

**Stiúrthóirí / Directors:** Mike Quinn (Chairman), Eamon Gallen, Cathal Marley, Brendan Murphy, Michael G. O'Sullivan

**Oifig Chláraithe / Registered Office:** Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.

**Uimhir Chláraithe in Éirinn / Registered in Ireland No.:** 530363



## ***Traffic & Transport Assessment***

Project

Residential Development at Ballynaneashagh, Waterford

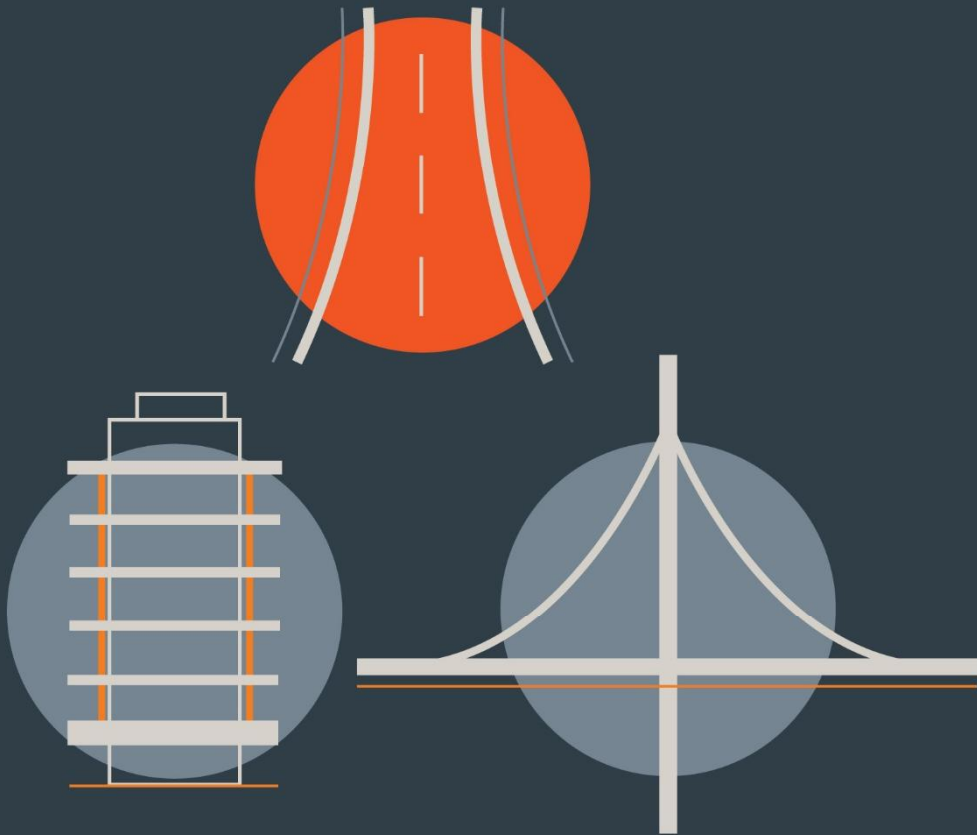
Report Title

TRAFFIC AND TRANSPORT ASSESSMENT REPORT

Client

Waterford City and County Council

TRANSPORTATION



DBFL CONSULTING ENGINEERS



## Document Control

Job Title: Residential Development at Ballynaneashagh, Waterford

Job Number: p200042

Report Ref: p200042-rep-001 TTA Final

Author: Daniel Garvey

Reviewed by: Mark McKenna

Date: March 2020

Distribution: Client  
DBFL Consulting Engineers  
Planning Authority

Revision	Issue Date	Description	Prepared	Reviewed	Approved
1 <sup>st</sup> Draft	09/03/2020	Client Review	DG	MMK	MMK
Final	11/03/2020	Planning	DG	MMK	TJ

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## APPENDICES

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APPENDIX C	PICADY Output Files

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (DBFL) has been commissioned by Waterford City and County Council to compile a Traffic and Transport Assessment (TTA) for a proposed residential development on a greenfield site located at Ballynaneashagh, Waterford City, Co. Waterford.

1.1.2 This TTA has been undertaken to accompany a planning application for a 22 unit local authority housing development comprising 18 no. 2bed units and 4 no. 3 bed units with a total provision of 54 no. car parking spaces. The subject site will be accessed via the L90645 Butlerstown Road which bisects the subject development lands. Whilst the subject planning application relates to the 22 unit residential development, two additional sensitivity analysis tests have been undertaken to investigate the potential future scenario should the remaining parcel of lands located to the west of the subject development plot are developed and in place in the adopted future design years. It is possible that the potential development on the western plot could take the form of either i) a commercial development as per the existing land use zoning on this plot or ii) a residential scheme (which would require either a material change of use or rezoning as part of a separate exercise).

1.1.3 The report has been produced to address any potential concerns that the local roads authority may have pertaining to the level of influence of the proposed development upon the local transportation system.

1.1.4 During the development of this report, traffic turning count surveys that were undertaken at key junctions in the vicinity of the site were used to analyse existing traffic movement patterns across the local road network. This information has been supplemented with data obtained from site audits of the local road network, subsequently enabling the identification of existing local travel characteristics and an appreciation of the local receiving environment from a transportation perspective.

### 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 development. The scope of the assessment covers transport and related sustainability issues including means of

vehicular access, pedestrian, cyclist and local public transport connections. The principal objective of the report is to quantify any level of impact across the local road network and subsequently ascertain both the existing and future operational performance of the local road network.

### 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) National Road Authority;
- *'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
- Waterford City Development Plan 2013-2019.

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

- **Background Review:** This important exercise incorporated three parallel tasks which included (a) an examination of the local regulatory and development management documentation; (b) an analysis of previous 'transport' related, strategic and site specific studies of development and transport infrastructure proposals across the area and (c) a review of planning applications to establish the legal status of various third party development schemes that have emerged and received full planning permission since.
- **Site Audit:** A site audit was undertaken to quantify the 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.



- **Traffic Counts:** The results of traffic count surveys were analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.
- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed development.
- **Trip Distribution:** Based upon both the existing and future network characteristics, 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 site access strategy more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2021, 2026 and 2036 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 and subsequently ascertain the existing and future operational performance of the local transport system. The structure of the report responds to the various stages of this exercise including the key tasks summarised below.
- 1.4.2 Chapter 2 of this report describes the existing conditions at the proposed development location and surrounding area, whilst Chapter 3 provides a summary of the relevant transport policies that influence the design and appraisal of the subject residential proposal.
- 1.4.3 A description of the proposed development scheme is described in Chapter 4 whilst Chapter 5 outlines the trip generation exercise carried out and the adopted methodology for applying growth factors to establish design year network traffic flows and the predicted scale of impact upon the local road network.
- 1.4.4 The operational performance of the key junction is assessed for the 2021 Opening Year and the 2026 (Opening Year +5 years) and the 2036 (Opening Year +15 years) Horizon Years are summarised within Chapter 6.

1.4.5 The main conclusions and recommendations derived from the analysis are summarised in Chapter 7.

## 2.0 RECEIVING ENVIRONMENT

### 2.1 LAND USE

2.1.1 The subject development site is located on greenfield lands within the Ballynaneashagh area of Waterford City. The eastern section of the overall masterplan lands which comprise the subject 22 unit residential development are zoned 'Developed Residential' within the Waterford City Development Plan 2013-2019. The potential future development lands located to the west of the subject residential plot are zoned 'General Business' as presented in Figure 2.1.

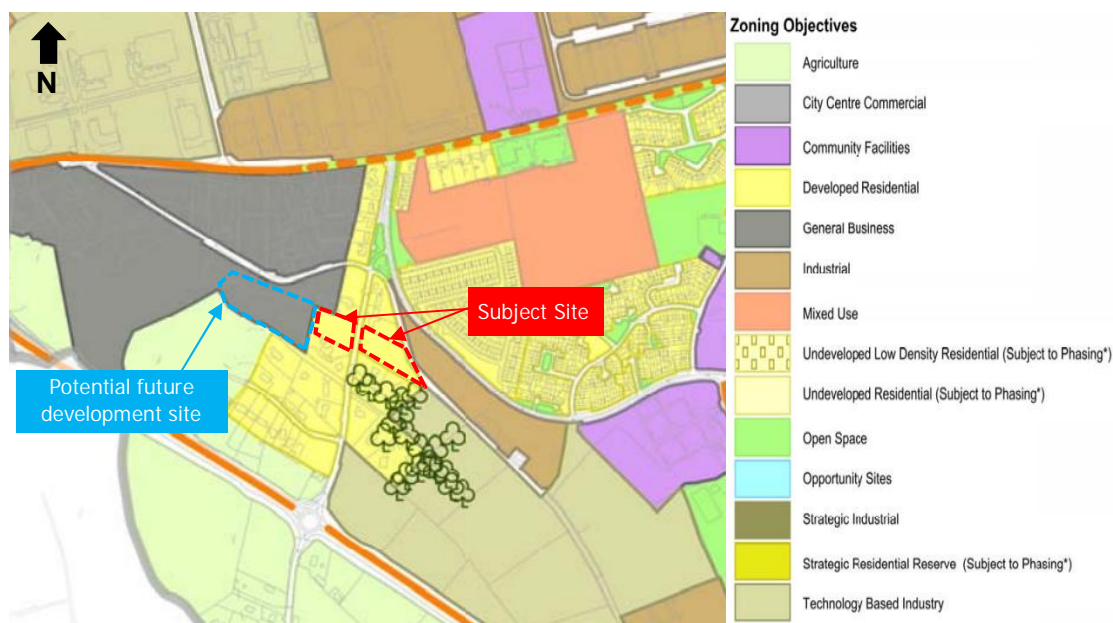


Figure 2.1: Waterford City and County Council Zoning Objectives

### 2.2 LOCATION

2.2.1 The subject site is located approximately 4km south-west of Waterford City Centre and offers good access to the N25 National Road accessible approximately 3 km north-west of the site via the R710 Outer Ring Road.

2.2.2 The general location of the subject site in relation to the surrounding road network is illustrated below in Figure 2.2, whilst Figure 2.3 indicatively shows the extent of the subject site boundary and neighbouring lands.

2.2.3 The subject site is bounded to the west by greenfield lands and to the east by Green Road. The northern and southern boundaries are formed by private residential dwellings.





Figure 2.2: Site Location (Source: [www.google.ie/maps](http://www.google.ie/maps))



Figure 2.3: Indicative 'Residential' Site Boundary (Source: [www.google.ie/maps](http://www.google.ie/maps))

2.3 LOCAL AMENITIES

2.3.1 The proposed development site is very well placed in terms of proximity to local amenities including educational institutions including St. Saviours National School, St

Paul's Community College as well as Waterford Institute of Technology. Additionally, the site is also conveniently situated close to Waterford Shopping Centre approximately 1.8km to the north-east and Tesco Superstore located approx.. 1.5km to the east.

2.3.2 In terms of leisure facilities, Crystal Sport & Leisure Centre and Waterford Regional Sports Centre are situated approximately 600m and 2.3 km northeast of the development site respectively. There are health care facilities in close proximity to the site, including Whitfield Medical Clinic located 1.5km west of the development site.

2.3.3 The subject site is ideally located to benefit from potential employment opportunities at the IDA industrial estate located within 10 minutes walking distance from the subject site. Figure 2.4 below show indicatively the subject site's location in relation to the aforementioned local amenities.

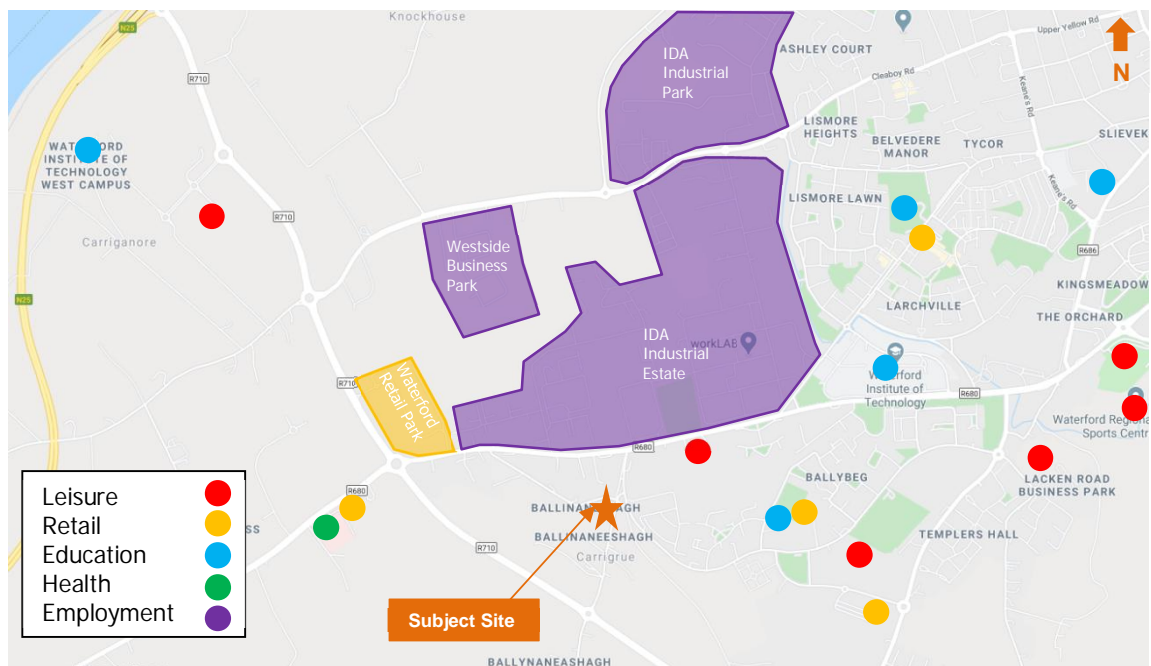


Figure 2.4: Subject Site Area Local Amenities

## 2.4 EXISTING TRANSPORTATION INFRASTRUCTURE

### Road Network

2.4.1 Butlerstown Road runs in a north-south direction bisecting the subject development site and comprises a two-way single lane carriageway with 2.75m wide traffic lanes in the vicinity of the proposed site access. Butlerstown Road is subject to a speed limit of 50kph.



2.4.2 Butlerstown Road connects to a four-arm roundabout junction with the Outer Ring Road (R710) approximately 350m to the south of the development site, which operated between the N25 Junction located 3.2km north-west of the site and University Hospital Waterford at its eastern extents. The N25 subsequently provides access to the M9 motorway and New Ross / Wexford to the north / northeast and Dungarvan (approx. 42Km) / Cork to the southwest. Approximately 350m to the north of the subject site, Butlerstown Road connects to a three-arm priority controlled junction with Ballybeg Drive and subsequently a signalised junction with Cork Road (R680), which leads to Waterford City Centre 4.2km to the north-east and the aforementioned R710 Outer Ring Road to the south west.

2.4.3 Figure 2.5 below illustrates the location of the subject site within the context of the existing road network.



Figure 2.5: Existing Road Network (Source: [www.google.ie/maps](http://www.google.ie/maps))

### *Existing Pedestrian and Cycling Facilities*

2.4.4 A footpath is provided on the eastern side of Butlerstown Road between the development site access location and the 4 arm priority controlled junction at the northern extent of Butlerstown Road. Along Ballybeg Drive to the northwest, a segregated pedestrian footpath is available along the eastern side of the road in addition to a footway on the western side along the local access road operating parallel to Ballybeg Drive. Similarly, to the south of the development site a footpath is provided on the western side of Butlerstown Road on approach to the Ballycashin Roundabout on the Outer Ring Road.



2.4.5 In addition to the aforementioned pedestrian facilities on Butlerstown Road, a shared cycle / pedestrian facility is available along the length of the Outer Ring Road and dedicated pedestrian footways are provided on both sides of the Cork Road corridor.

2.4.6 The aforementioned pedestrian facilities are presented in Figure 2.6 below.



Figure 2.6: Pedestrian Facilities on Surrounding Road Network

### *Public Transport – Bus*

2.4.7 An audit of the existing bus transport services accessible from the subject development site location has been undertaken. Bus Eireann operates six routes (City, commuter / rural and intercity services) including routes 40, 360/360A, 362, W1 and W2. The nearest interchange for Bus Eireann services 40, 362 and W2 is located at Waterford IT approximately 1.5km to the northeast (approx. 18 minutes walking distance) of the subject development site access. Bus Eireann Route 360A is accessible at the IDA bus interchange located approximately 850m to the northeast (approx. 10 minutes walking distance) of the subject development site access. City

service Route W1 is the most accessible bus service to the subject development site location and is accessible via a bus interchange along Ballybeg Drive approximately 300m away.

2.4.8 In addition to the aforementioned Bus Eireann services, Suirway Route 609 is accessible at the IDA bus interchange located approximately 850m to the northeast (approx. 10 minutes walking distance) of the subject development site access. JJ Kavanagh operate Route 736 and Local Link operate Route 367A both of which are accessible at Waterford IT approximately 1.5km to the northeast (approx. 18 minutes walking distance) of the subject development site access.

2.4.9 The aforementioned services and their associated local interchange locations are presented in Figure 2.7 below whilst Figure 2.8 presents the Bus Eireann Waterford City services network.

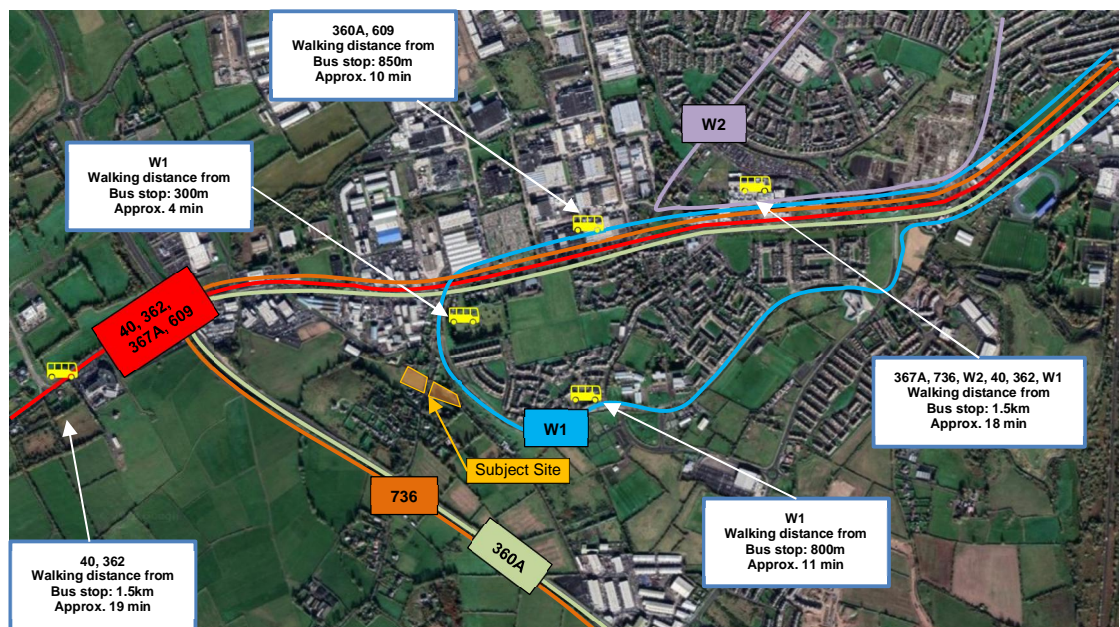


Figure 2.7: Existing Bus Routes and walking distance from Bus Stops  
(Source: [www.google.ie/maps](http://www.google.ie/maps))

2.4.10 The quantum daily services and origin / destination of the aforementioned bus services accessible from the subject development site is summarised in Table 2.1 below. Bus Eireann Route 40 operates between Rosslare Harbour and Tralee via Wexford, Waterford, Cork and Killarney. Bus Eireann Routes 360/360A operates between Waterford and Tramore. Bus Eireann Route 362 operates between Waterford and Dungarvan. Bus Eireann Routes W1 and W2 provide convenient access to and from Waterford City Centre. Suirway Route 609 operates between Waterford and Portlaoise via Kilmeaden. JJ Kavanagh Route 736 operates between Tramore and Dublin



Airport via Dublin City, Carlow and Kilkenny. Finally, Local Link Route 367A operates between Waterford and Dungarvan via Kilmeaden and Kill.

Operator	Route Number	Route	Monday – Friday	Saturday	Sunday
Bus Eireann	40	Rosslare - Tralee	13	13	11
	360	Tramore – Waterford	28	28	28
	360A	Tramore – Waterford	3	0	0
	362	Dungarvan - Waterford	1	1	1
	W1	Clock Tower – Merchant’s Quay	47	43	30
	W2	Clock Tower – Meagher’s Quay	46	42	29
Suirway	609	Portlaw – Waterford City	4	4	0
JJ Kavanagh	736	Tramore – Dublin Airport	14	14	14
Local Link	367A	Dungarvan - Waterford	2	2	0

Table 2.1: Bus Service Frequency (No. of Services)

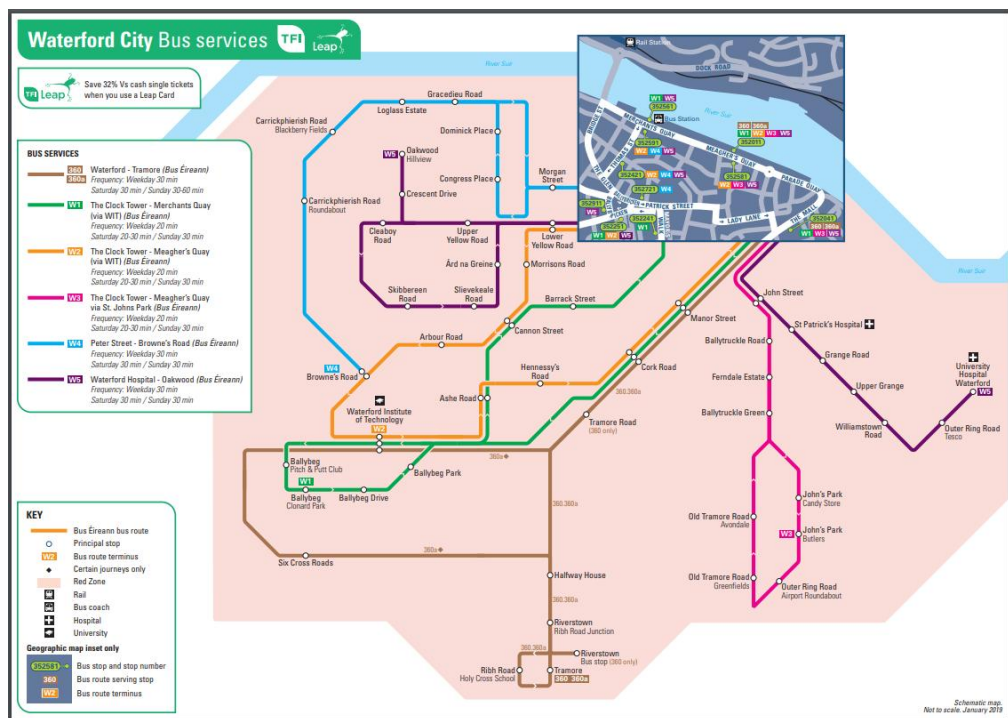


Figure 2.8: Waterford City Bus Services (Source: Bus Eireann)

## 2.5 ROAD SAFETY REVIEW

2.5.1 With the objective of ascertaining the road safety record of the immediate routes leading to/from the subject site, the collision statistics as detailed on the Road Safety Authority’s (RSA) website (www.rsa.ie) have been examined. The RSA website



includes basic information relating to reported collisions over the most recent twelve-year period, from 2005 to 2016 inclusive.

2.5.2 The RSA database records detail where collision events has been officially recorded such as the when the Garda being present to formally record details of the incident.

2.5.3 Table 2.2 below summarises the RSA Collision Data in the vicinity of the proposed development.

Ref	Severity	Year	Vehicle	Circumstances	Day	Time	Casualty
1	Serious	2015	Bus	Pedestrian	Fri	1600-1900	1
2	Minor	2015	Car	Rear end, straight	Tue	1000-1600	1
3	Minor	2005	Car	Rear end, straight	Sat	1000-1600	N/A
4	Minor	2016	Bicycle	Other	Thu	1000-1600	1

Table 2.2: RSA Collision Data ([www.rsa.ie](http://www.rsa.ie))



Figure 2.9: RSA Collision Data ([www.rsa.ie](http://www.rsa.ie))

2.5.4 The review of the RSA data reveals that the local road network exhibits a good safety record as only four incidents has been recorded in the vicinity of the subject site.

2.5.5 In summary the review confirms that no significant incident trends or significant safety concerns are evident across the local road network.

## 2.6 EMERGING TRANSPORT DEVELOPMENTS

### *Cycle Network Improvements*

2.6.1 There are cycle facilities proposed along Cork Road between the existing on-road cycle lanes in place which currently terminate at the western IDA Industrial Estate access to the west and to the east of Waterford IT main campus. Furthermore, new cycle facilities are proposed along Paddy Browne's Road. The introduction of these cycle facilities will provide an improved connection between the proposed development and local amenities including schools, leisure activities, places of employment and Waterford City Centre. Figure 2.10 below is an extract from Map 1 of the Waterford City Development Plan 2013-2019 which illustrates the aforementioned local cycle network improvements.

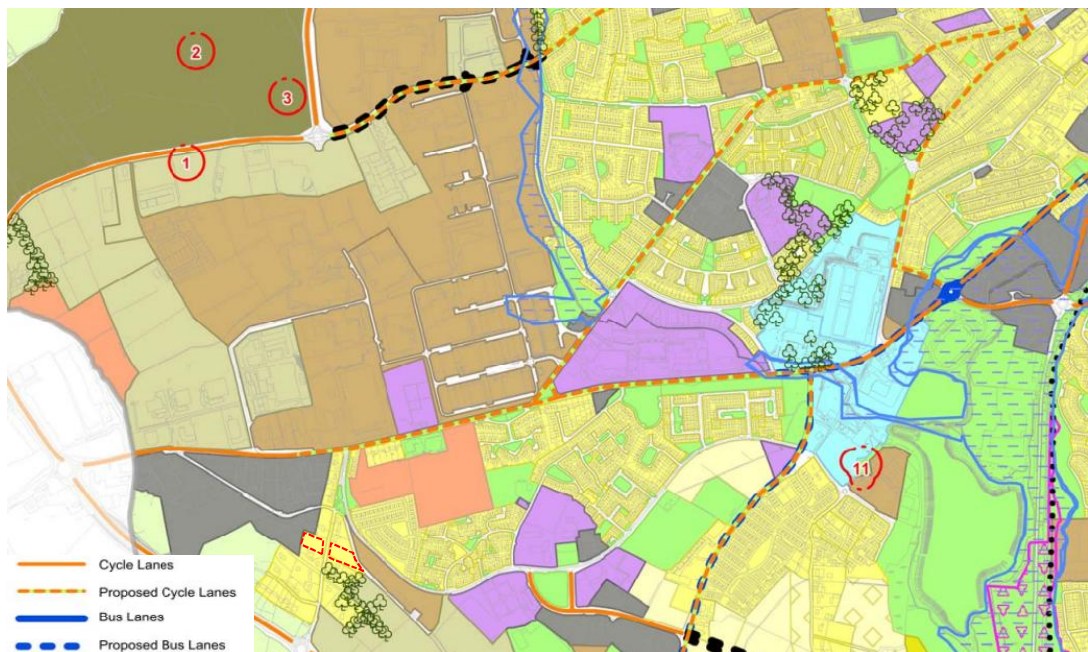


Figure 2.10: Proposed Cycle Routes  
(Extract of Map A1 Waterford City Development Plan 2013-2019)

## 3.0 POLICY FRAMEWORK

### 3.1 WATERFORD CITY DEVELOPMENT PLAN 2013-2019

3.1.1 The Waterford City Development Plan 2013-2019 sets out *“an overall strategy for the proper planning and sustainable development of the functional area of Waterford City”*. In the context of the subject proposals, the following are the relevant transport and development objectives set out in the plan: -

#### *Transport & Mobility Objectives*

3.1.2 It is the policy of the Council to promote the sustainable development of the City through the creation of an integrated transport network and re-balance movement priorities toward sustainable modes of transportation, as set out in the following relevant objectives:

*“Objective 6.2.1: To provide a citywide cycle network to link all areas of the city to each other via main routes. Existing and proposed extension of the City’s cycle network is also outlined on the zoning objectives map. The proposed network is both radial and orbital, with some elements located off street in amenity areas.”*

*“Objective 6.2.3: To provide additional dedicated bicycle parking racks as financial resources permit.”*

*“Objective 6.2.4: To provide cycle and walking networks between neighbourhood areas, further negating the need for car based journeys.”*

*“Objective 6.2.12: To provide for the necessary roads infrastructure to facilitate development of the neighbourhood structure and neighbourhood centres as demand requires.”*

*“Objective 6.2.13: To facilitate and promote the continued enhancement of the public transport bus service, through the further expansion of: the green routes, realtime passenger information, provision of high quality bus shelters, traffic management measures, and by ensuring that the design and layout of the neighbourhoods facilitate the expansion of the bus service.”*

*“Objective 6.2.14: To further develop the existing network of cycleways on the existing road network, within and between the neighbourhoods, and within selected amenity areas.”*



## 3.2 DEVELOPMENT CONTROL

### *Car Parking Standards*

- 3.2.1 Reference is made to Section 13.2 of the Waterford City Development Plan (2013-2019) which outlines the car parking standards for the City.
- 3.2.2 The proposed development is located in Zone 2 as per the Waterford City Development Plan car parking standards and consequently the relevant Zone 2 car parking standards are applicable. With regards to the proposed development schedule, the associated car parking requirements are outlined in Table 3.1 below.

Development Type	Development Standard	Number	Development Plan Requirement
Local Authority Housing	1 / unit	22	22

Table 3.1: Car Parking Standards

- 3.2.3 In response to the above local development management standards a provision of 22 no. on-site car parking spaces is required.

### *Cycle Parking Standards*

- 3.2.4 Reference has been made to the Waterford City Development Plan (2013-2019) which does not specify a cycle parking requirement for new dwelling house units.

## 4.0 CHARACTERISTICS OF PROPOSALS

### 4.1 OVERVIEW

- 4.1.1 The subject proposals seek permission for the provision of a 22 unit residential development comprising 18 no. 2-bed housing units and 4 no. 3-bed housing units.
- 4.1.2 As introduced previously, the parcel of lands located to the west of the subject development site could potentially comprise either i) a commercial development as per the existing land use zoning on this western section of the overall lands or ii) a residential scheme (which would require either a material change of use or rezoning) and will be subject to a separate future planning application.
- 4.1.3 The subject 22 unit residential development layout is presented in Figure 4.1 below. The scheme proposals include for 12 no. housing units on the eastern side of Butlerstown Road and 10 no. housing units on the western side.

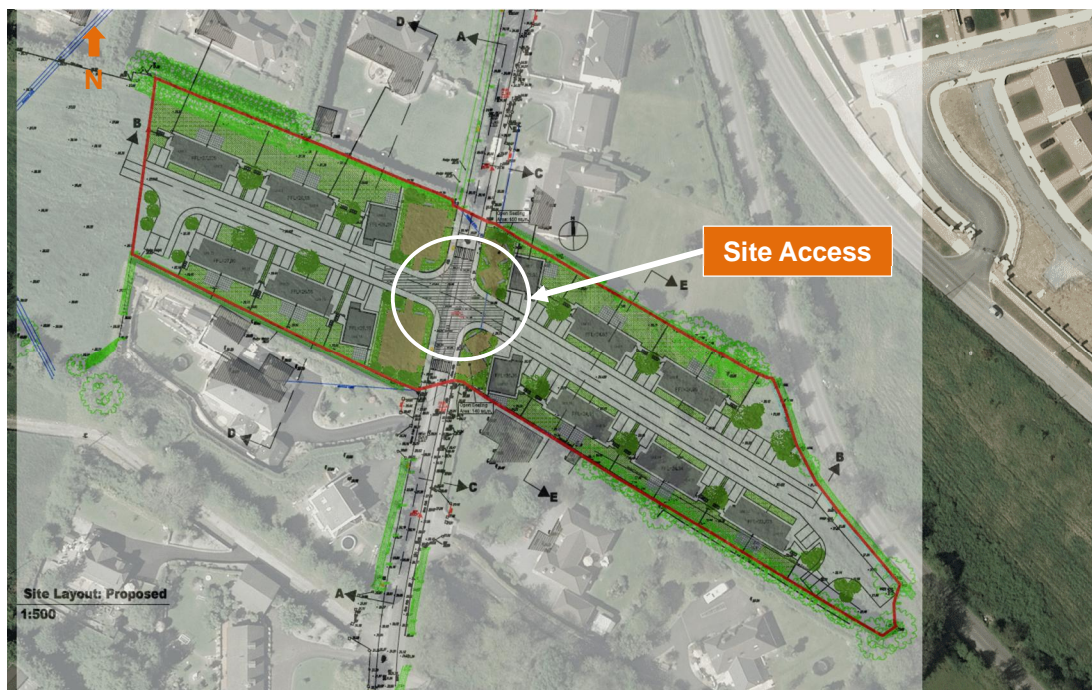


Figure 4.1: Proposed Residential Development Layout

### 4.2 SITE ACCESS ARRANGEMENTS

- 4.2.1 The subject development site access will comprise a 4-arm priority controlled cross-road junction on Butlerstown Road and will accommodate access to the subject development for all modes of travel.
- 4.2.2 In addition, pedestrian crossing points are proposed on the northern and southern approaches to the proposed site access junction.

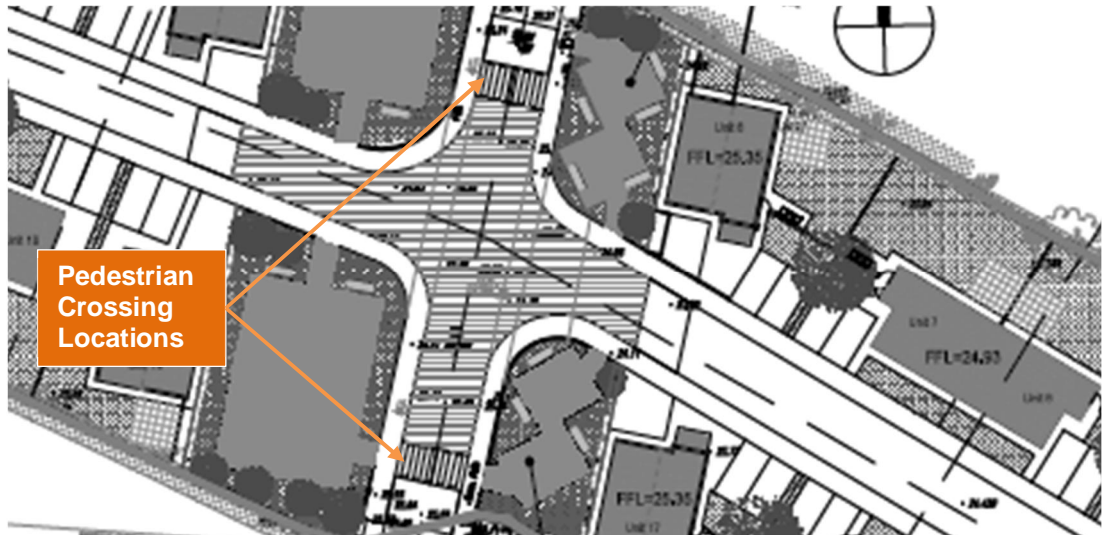


Figure 4.2: Proposed Site Access & Pedestrian Crossing Locations

### 4.3 PARKING

#### *Car Parking*

4.3.1 The subject development proposals provide for a total of 54 no. on-site car parking spaces comprising 44 no. dedicated residents car parking spaces and 10 no. visitor car parking spaces as presented in Figure 4.3 below.



Figure 4.3: Proposed Car Parking Locations



- 4.3.2 The proposed provision of 54 no. car parking spaces for the subject development is higher than the WCC Development Plan standards which require a car parking provision of 22 no. spaces and therefore will reduce the likelihood for the occurrence of inappropriate car parking practices on-site. This provision will ensure that no overspill of car parking will arise on the external road network.

#### *Cycle Parking Facilities*

- 4.3.3 Each of the residential units benefit from a dedicated side entrance to rear gardens. Accordingly, it is envisioned that cyclist can utilise side accesses to gain access to private parking opportunities located to the rear of the houses.

## 5.0 TRIP GENERATION AND DISTRIBUTION

### 5.1 INTRODUCTION

5.1.1 The following paragraphs present the process by which the potential level of vehicle trips, associated with the proposed development have been generated and subsequently assigned across the local road network. In order to assess the operation of the proposed road network and its future capacity, an excel based traffic model of the existing network and proposed links have been created.

### 5.2 TRAFFIC SURVEYS

5.2.1 In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed development, traffic surveys were undertaken in February 2020. The local road network characteristics are very much influenced by both i) commuter traffic and ii) school / college generated traffic.

5.2.2 With the objective of quantifying the existing traffic movements across the local road network, junction turning counts were conducted over a 3.5-hour survey period from 07:45 to 09:15 and 16:00 to 18:00 on Wednesday 26<sup>th</sup> February 2020 at the following two junctions;

- Butlerstown Road / Ballybeg Drive Priority Junction; and
- Butlerstown Road / Witches Lane Priority Junction.

5.2.3 The analysis of the survey results established that the local weekday AM and PM peak hours occurred between 08:15 - 09:15 and 17:00 – 18:00 respectively.

5.2.4 In order to analyse and assess the impact of the predicted traffic generation from the proposed development upon the local road network, an excel based traffic model incorporating the aforementioned local junctions has been created. Figure 5.1 illustrates the junctions surveyed and included in the traffic analysis. The recorded 2020 peak hour traffic flows at the aforementioned junctions are presented in Appendix A.



Figure 5.1: Junctions Surveyed

### 5.3 TRIP GENERATION

- 5.3.1 To estimate the potential level of vehicle trips that could be generated by the proposed development, reference has been made to the TRICS database. TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development.
- 5.3.2 TRICS data is primarily UK based, although a number of Irish sites have recently been included and the number of Irish sites continues to expand. Nevertheless, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.
- 5.3.3 Notwithstanding the above, internal research undertaken by TRICS has shown that there is no direct evidence of trip rate variation by country or region. The use of English, Scottish or Welsh data can be equally applicable to Ireland if users take into account important site selection filtering factors such as levels of population, location type, local public transport provision, and development size and car ownership level, amongst others.
- 5.3.4 Data supplied for inclusion in TRICS undergoes a procedure of validation testing, and there is no evidence from this procedure suggesting that data from Ireland bears any significant fundamental differences to that from the other countries included.



Consequently, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

5.3.5 Table 5.1 presents the predicted trip generation and the estimated traffic flows arriving and departing the proposed development during the morning and evening peak hour periods. As introduced previously, the subject application pertains to 22 no. housing units only. Nevertheless, in the interest of providing a robust assessment, two additional sensitivity assessments incorporating potential future development on the lands to the west of the subject development plot has been undertaken. Accordingly, a TRICS based trip generation exercise has been undertaken for the potential future development that may arise within the western development plot based on the following schedules;

- Sensitivity Analysis 1 - 4000m<sup>2</sup> commercial warehouse, and
- Sensitivity Analysis 2 - 28 no. apartments.

5.3.6 The TRICs output data is provided within Appendix B.

Land Use	Unit	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
Local Authority Houses	Per Unit	0.158	0.269	0.256	0.179
Warehousing (Commercial)	Per 100m <sup>2</sup>	0.150	0.071	0.033	0.129
Local Authority Apartments	Per Unit	0.137	0.151	0.160	0.137

Table 5.1: Trip Rates (TRICS)

5.3.7 Based on the above trip rates, potential peak hour vehicle trip generation has been calculated for the proposed 22 unit residential development and potential future development opportunities on adjacent lands as summarised in Table 5.2.

Land Use	Units / GFA	AM Peak Hour			PM Peak Hour		
		Arr	Dep	2-way	Arr	Dep	2-way
Local Authority Houses	22	3	6	9	6	4	10
Warehousing (Commercial)	4000m <sup>2</sup>	6	3	9	1	5	6
Local Authority Apartments	28	3	4	7	4	3	7

Table 5.2: Trip Generation

## 5.4 TRIP DISTRIBUTION & ASSIGNMENT

### *Proposed Development Trip Distribution*

5.4.1 The proposed distribution of the subject developments forecast generated vehicle movements as proposed by DBFL are presented in Appendix A of this report. The predicted development vehicle trips have been assigned to the surrounding road network based on the surveyed traffic movements.

## 5.5 TRAFFIC GROWTH

5.5.1 The TTA adopts an Opening Design year of 2021 and accordingly an Interim Design Year of 2026 (Opening Year +5 years) and a Future Design Year of 2036 (Opening Year + 15 years) as per Transport Infrastructure Ireland (TII) guidelines. To ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the TII traffic projections. Table 6.1 (Unit 5.3 – Travel Demand Projections) within the TII Project Appraisal Guidelines provides Annual Growth Factors for the different metropolitan areas within Ireland. The subject site lies within ‘Waterford’ metropolitan area with the growth factors as outlined within Table 5.3 below.

Metropolitan Area	Low Sensitivity Growth				Central Growth				High Sensitivity Growth			
	2016-2030		2030-2040		2016-2030		2030-2040		2016-2030		2030-2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Waterford	1.0123	1.0301	1.0031	1.0131	1.0140	1.0317	1.0052	1.0153	1.0173	1.0352	1.0091	1.0194

Table 5.3: National Traffic Growth Forecasts: Annual Growth Factors (Extract from Table 6.1 PAG)

5.5.2 In order to provide a robust assessment DBFL have assumed ‘Central Growth’ rates for the adopted Opening Year of 2021 and Future Design Years of 2026 & 2036. As such, applying the annual factors as outlined in Table 5.3 above, the following growth rates were adopted to establish corresponding 2021, 2026 and 2036 baseline network flows: -

- 2020 to 2021 – 1.0140 (1.40%);
- 2020 to 2026 – 1.10870 (8.70%); and
- 2020 to 2036 – 1.1752 (17.52%).

5.5.3 It is noted that the TII Project Appraisal Guidelines states that *“the central growth rates are intended for use in project appraisal with the low and high growth rates to be used as sensitivity tests for economic and environmental impacts.”*

## 5.6 ASSESSMENT SCOPE

### *Assessment Scenarios*

- 5.6.1 Two different traffic scenarios have been assessed, namely (a) the 'Base' ("Do-Nothing") traffic characteristics and (b) the 'Post Development' ("Do-Something").
- 5.6.2 The "Do-Nothing" traffic scenario takes into account the potential level of traffic that could be generated by the existing flows travelling across the network.
- 5.6.3 The proposed development traffic flows are then added to the network's "Do-Nothing" (Base) traffic flows to establish the new 'Post Development' traffic flows. Three separate scenarios have been incorporated into the subject assessment, namely, the subject application scheme proposals (22 houses), Sensitivity Analysis 1 (subject 22 residential units plus 4000m<sup>2</sup> commercial warehouse), and Sensitivity Analysis 2 (subject 22 residential units plus 28 apartment units). In summary the following scenarios are considered: -

#### *Do Nothing*

- A1 – 2021 Do Nothing
- A2 – 2026 Do Nothing
- A3 – 2036 Do Nothing

#### *Do Something*

- B1 – 2021 Do Nothing (A1) + Subject Development Flows
- B2 – 2026 Do Nothing (A2) + Subject Development Flows
- B3 – 2036 Do Nothing (A2) + Subject Development Flows

#### *Sensitivity Analysis 1*

- C1 – 2026 Do Something (A2) + 4000m<sup>2</sup> commercial warehouse
- C2 – 2036 Do Something (A3) + 4000m<sup>2</sup> commercial warehouse

#### *Sensitivity Analysis 2*

- D1 – 2026 Do Something (A2) + 28 no. apartment units
- D2 – 2036 Do Something (A3) + 28 no. apartment units

#### *Assessment Period*

- 5.6.4 The AM and PM peak hour flows have been identified as occurring between 08:15 - 09:15 and 17:00 – 18:00 respectively. These peak hour periods form the basis of the 2021, 2026 and 2036 network assessments.



### *Network Vehicle Flows*

5.6.5 The following Figures as included in Appendix A present the vehicle flows across the local road network for each of the adopted development scenarios: -

- Figure 2 – 2021 Do-Nothing
- Figure 3 – 2026 Do-Nothing
- Figure 4 – 2036 Do-Nothing
- Figure 9 – 2021 Do-Something (Proposed Development)
- Figure 10 – 2026 Do-Something (Proposed Development)
- Figure 11 – 2036 Do-Something (Proposed Development)
- Figure 13 – 2026 Sensitivity Analysis 1
- Figure 14 – 2036 Sensitivity Analysis 1
- Figure 16 – 2026 Sensitivity Analysis 2
- Figure 17 – 2036 Sensitivity Analysis 2

## 5.7 NETWORK IMPACT

5.7.1 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.

5.7.2 In accordance with the TII guidelines, we have undertaken an assessment to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken we have based the analysis upon the 2021 Opening Year and the 2026 and 2036 Future Design Year scenarios.

### *Proposed Development Network Impact*

5.7.3 Table 5.4 details the predicted scale of network impact at each of the key off-site local junctions during the 2021, 2026 and 2036 design years for the subject development proposals.

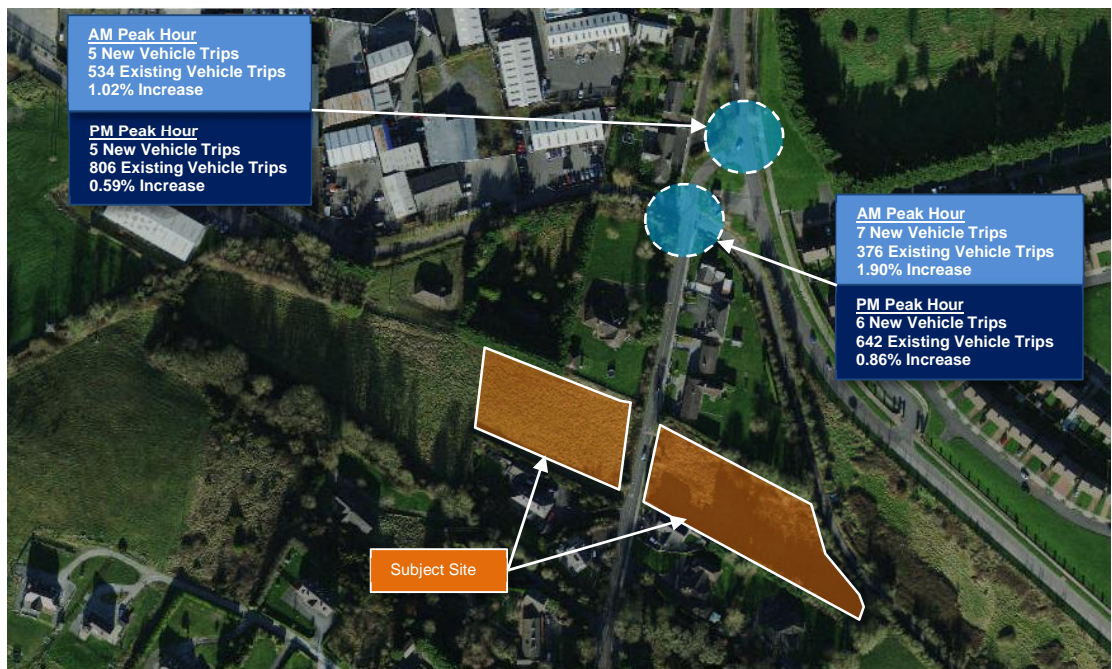
5.7.4 The network impact assessment reveals that the impact on the surrounding road network will be sub-threshold at all junctions following the introduction of the subject development and associated vehicle trips. A maximum percentage impact of 2.2% is

observed at the Witches Lane / Butlerstown Road 4-arm priority controlled junction during the AM peak hour. The highest percentage impact during the PM peak hour is again predicted to occur at this off-site junction with percentage impact of 1.0% predicted.

Junction No.	Junction	Design Year	Percentage Impact	
			AM Peak Hour	PM Peak Hour
1	Ballybeg Drive / Butlerstown Road Priority Junction	2021	1.2%	0.7%
		2026	1.1%	0.6%
		2036	1.0%	0.6%
2	Witches Lane / Butlerstown Road Priority Junction	2021	2.2%	1.0%
		2026	2.1%	0.9%
		2036	1.9%	0.9%

**Table 5.4: Proposed Developments Network Impact**

5.7.5 Figure 5.2 below details the total amount of two-way vehicle trips that will pass through the key off-site junctions in the 2036 Future Design Year for the subject development scheme and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.



**Figure 5.2: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2036)**

5.7.6 These predicted impacts are below the TII threshold for assessment for normal and congested networks and as such the proposed development is not anticipated to have a material impact on the adjacent network.

### *Sensitivity Analysis Network Impact*

5.7.7 As introduced previously, a sensitivity analysis incorporating potential development opportunities on the western section of the overall development site has been undertaken. Table 5.5 details the potential scale of impact predicted at each of the key local junctions during the 2021, 2026 and 2036 design years for both Sensitivity Analysis scenarios.

5.7.8 Table 5.5 indicates that the impact on the surrounding road network will be sub-threshold at all junctions in all development scenarios.

Scenario	Junction No.	Junction	Design Year	Percentage Impact	
				AM Peak Hour	PM Peak Hour
SA1	1	Ballybeg Drive / Butlerstown Road Priority Junction	2021	1.2%	0.7%
			2026	2.2%	1.0%
			2036	2.0%	0.9%
	2	Witches Lane / Butlerstown Road Priority Junction	2021	2.2%	1.0%
			2026	3.9%	1.4%
			2036	3.6%	1.3%
SA2	1	Ballybeg Drive / Butlerstown Road Priority Junction	2021	1.2%	0.7%
			2026	1.9%	1.1%
			2036	1.8%	1.0%
	2	Witches Lane / Butlerstown Road Priority Junction	2021	2.2%	1.0%
			2026	3.6%	1.6%
			2036	3.3%	1.5%

Table 5.5: Potential Overall Development Network Impact

### *Network Impact Summary*

5.7.9 The network impact assessment reveals that for all development scenarios, the impact at key off-site junctions is predicted to be insignificant and below TII 'material' thresholds. Accordingly, further detailed assessment has not been undertaken at these 2 no. off-site junctions. Nevertheless, a detailed assessment of the proposed new site access junction on Butlerstown Road has been undertaken as detailed within Chapter 6 of this TTA.



## 6.0 NETWORK ANALYSIS

### 6.1 INTRODUCTION

6.1.1 The operational assessment of the proposed new site access junction on Butlerstown Road has been undertaken using the Transport Research Laboratory (TRL) computer package PICADY for the priority junction.

6.1.2 For the PICADY analyses, a 90-minute AM and PM period has been simulated, from 08:00 to 09:30 and 16:45 to 18:15, respectively. For these junction analysis sets traffic flows were entered using an Origin-Destination table for the peak hours.

6.1.3 When considering priority 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 the performance of the junction deteriorates quickly.

6.1.4 In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic model of the key junction of Butlerstown Road / Site Access Junction was analysed for the following:

- 2021 Opening Year
- 2026 Interim Year (Opening Year +5 years)
- 2036 Future Horizon Year (Opening Year +15 years)

### 6.2 BUTLERSTOWN ROAD / SITE ACCESS JUNCTION

6.2.1 The proposed Butlerstown Road / Site Access Junction has been analysed for all modelling scenarios using the Transport Research Laboratory's (TRL) Junctions 9.0 PICADY software package.

6.2.2 The results of the operational assessment of this proposed priority junction for the subject development and subsequently the previously introduced Sensitivity Analysis scenarios are summarised in the following sections. The PICADY modelling output files are contained within Appendix C of this report.

6.2.3 The four site access junction arms were labelled as follows within the PICADY model (Figure 6.1):

- Arm A: Butlerstown Road (S)
- Arm B: Site Access (W)
- Arm C: Butlerstown Road (N)
- Arm D: Site Access (E)

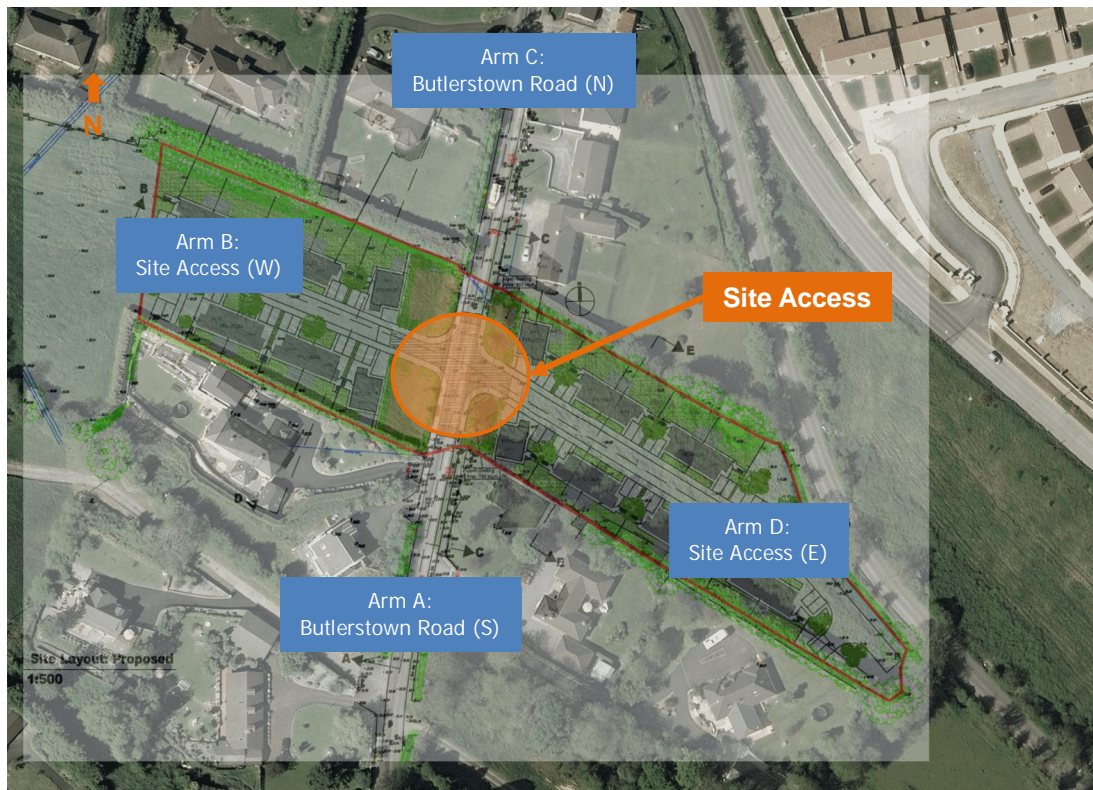


Figure 6.1: Butlerstown Road / Site Access Junction

### 6.3 PROPOSED DEVELOPMENT PICADY ASSESSMENT

- 6.3.1 The PICADY results based on the subject 22 unit residential development only during each of the adopted design years are presented in Table 6.1 below.
- 6.3.2 The PICADY analysis output indicates that the Butlerstown Road / Site Access four arm priority junction will operate with significant reserve capacity for all design years.
- 6.3.3 It is predicted that, with the introduction of the subject development traffic, zero queues and negligible delays are predicted during all design years on all approaches to the proposed new site access junction. The PICADY assessment reveals that for all approach arms, zero RFC values have been recorded.

Year Scenario	Period	Arm	Description	RFC	Mean Max Queue (pcu)	Delay (s)
2021	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.16
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	5.47
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.86
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	4.40
		D	Site Access (E)	0.00	0.0	0.00
2026	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.13
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	5.46
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.88
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	4.42
		D	Site Access (E)	0.00	0.0	0.00
2036	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.09
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	5.45
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.90
		B	Site Access (W)	0.00	0.0	0.00
		C	Butlerstown Road (N)	0.00	0.0	4.35
		D	Site Access (E)	0.00	0.0	0.00

Table 6.1: Proposed Development PICADY Analysis Results

## 6.4 SENSITIVITY ANALYSIS 1 PICADY ASSESSMENT

6.4.1 Similar to the subject development assessment discussed in Section 6.3 above, the PICADY analysis output indicates that the Butlerstown Road / Site Access four arm priority junction will operate with significant reserve capacity for all design years for the scenario which considers the introduction of a 4000m<sup>2</sup> commercial warehouse development on the parcel of lands located immediately to the west of the subject development lands.

6.4.2 It is predicted that, with the introduction of the subject development traffic and potential commercial warehouse unit, zero queues and negligible delays are predicted during all design years on all approaches to the proposed new site access junction in this sensitivity analysis scenario. A maximum RFC value of 0.02 is recorded on the western site access arm of the junction whilst a maximum RFC of 0.01 is recorded on the Butlerstown Road northern approach to the junction.



Year Scenario	Period	Arm	Description	RFC	Mean Max Queue (pcu)	Delay (s)
2026	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.13
		B	Site Access (W)	0.01	0.0	6.85
		C	Butlerstown Road (N)	0.01	0.0	5.49
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.88
		B	Site Access (W)	0.02	0.0	8.12
		C	Butlerstown Road (N)	0.01	0.0	4.42
		D	Site Access (E)	0.00	0.0	0.00
2036	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.09
		B	Site Access (W)	0.01	0.0	6.89
		C	Butlerstown Road (N)	0.01	0.0	5.48
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.90
		B	Site Access (W)	0.02	0.0	8.23
		C	Butlerstown Road (N)	0.01	0.0	4.35
		D	Site Access (E)	0.00	0.0	0.00

**Table 6.2: Sensitivity Analysis 1 PICADY Analysis Results**

## 6.5 SENSITIVITY ANALYSIS 2 PICADY ASSESSMENT

6.5.1 Similar to the subject development assessment and Sensitivity Analysis 1 discussed in Sections 6.3 and 6.4 above, the PICADY analysis output indicates that the Butlerstown Road / Site Access four arm priority junction will operate with significant reserve capacity for all design years for the scenario which considers the introduction of 28 no. apartment units on the parcel of lands located immediately to the west of the subject development lands.

Year Scenario	Period	Arm	Description	RFC	Mean Max Queue (pcu)	Delay (s)
2026	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.13
		B	Site Access (W)	0.01	0.0	6.84
		C	Butlerstown Road (N)	0.01	0.0	5.48
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.88
		B	Site Access (W)	0.01	0.0	8.18
		C	Butlerstown Road (N)	0.01	0.0	4.44
		D	Site Access (E)	0.00	0.0	0.00
2036	AM Peak	A	Butlerstown Road (S)	0.00	0.0	5.09
		B	Site Access (W)	0.01	0.0	6.89
		C	Butlerstown Road (N)	0.01	0.0	5.47
		D	Site Access (E)	0.00	0.0	0.00
	PM Peak	A	Butlerstown Road (S)	0.00	0.0	5.90
		B	Site Access (W)	0.01	0.0	8.30
		C	Butlerstown Road (N)	0.01	0.0	4.36
		D	Site Access (E)	0.00	0.0	0.00

**Table 6.3: Sensitivity Analysis 2 PICADY Analysis Results**

6.5.2 It is predicted that, with the introduction of the subject development traffic and a potential apartment development traffic, zero queues and negligible delays are predicted during all design years on all approaches to the proposed new site access junction in this sensitivity analysis scenario. A maximum RFC value of 0.01 is recorded on the western site access arm and Butlerstown Road northern approach to the junction.

## 7.0 SUMMARY AND CONCLUSION

### 7.1 OVERVIEW

7.1.1 DBFL Consulting Engineers (DBFL) has been commissioned by Waterford City and County Council to compile a Traffic and Transport Assessment (TTA) for a proposed residential development on a greenfield site located at Ballynaneashagh, Waterford City, Co. Waterford.

7.1.1 This TTA has been undertaken to accompany a planning application for a 22 unit local authority housing development comprising 18 no. 2bed units and 4 no. 3 bed units with a total provision of 54 no. car parking spaces. The subject site will be accessed via the L90645 Butlerstown Road which bisects the subject development lands. Whilst the subject planning application relates to the 22 unit residential development, two additional sensitivity analysis tests have been undertaken to investigate the potential future scenario should the remaining parcel of lands located to the west of the subject development plot are developed and in place in the adopted future design years. It is possible that the potential development on the western plot could take the form of either i) a commercial development as per the existing land use zoning on this plot or ii) a residential scheme (which would require either a material change of use or rezoning as part of a separate exercise).

7.1.2 The subject development site is located on greenfield lands within the Ballynaneashagh area of Waterford City. The section of the overall lands which comprise the subject 22 unit residential development are zoned 'Developed Residential' within the Waterford City Development Plan 2013-2019. The potential future development lands located to the west of the subject residential site are zoned 'General Business'.

7.1.3 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 transport impact generated as a result of the proposed development. Our methodology incorporated a number of key inter-related stages including:

- Site Audit,
- Planning File Review,
- Policy Review,
- Analysis of Traffic Surveys,
- Trip Generation, Distribution and Assignment, and Network Impact



- Network Analysis.

7.1.4 As per best practice guidance this TTA has carried out a range of network assessments investigating different traffic conditions for an Opening Year of 2021, the Interim Year of 2026 and the Future Horizon Year of 2036.

## 7.2 SUMMARY

7.2.1 The findings of the analysis summarised within this TTA are as follows:

- The subject development is conveniently located to benefit from good accessibility to local, city and inter-city bus services.
- The subject development proposals provide for a total of 54 no. on-site car parking spaces comprising 44 no. dedicated residents' car parking spaces and 10 no. visitor car parking spaces. The total provision is higher than the WCC requirement of 1 no. space per residential unit.
- The network impact assessment demonstrates that the subject development proposals will generate a subthreshold impact upon all local key off-junctions.

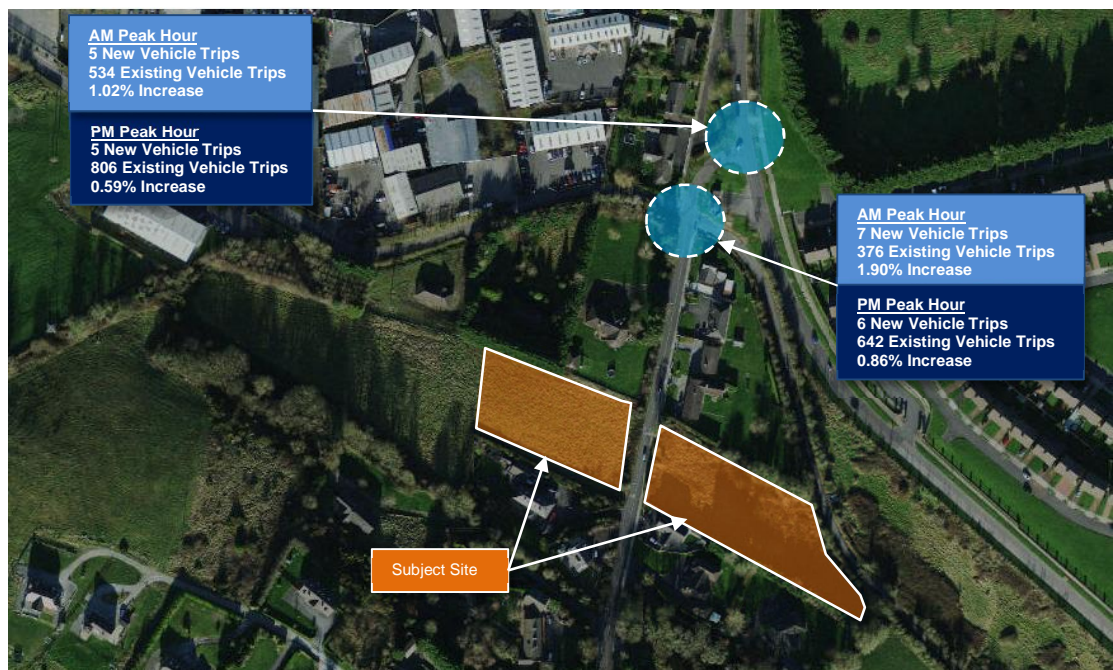


Figure 7.1: Increase in Vehicle Trips Generated Through Key Off-Site Junctions (2036)

- A further network impact assessment has been undertaken which considers the scenario that the parcel of lands to the west of the subject site are developed. Accordingly, for both potential development scenarios on these

adjacent lands (4000m<sup>2</sup> commercial warehouse or 28 no. residential apartments), the network impact assessment demonstrates that the subject development proposals plus the potential development on adjacent lands will again generate a subthreshold impact upon all local key off-junctions.

- The network impact assessment reveals that for all development scenarios, the impact at key off-site junctions is predicted to be insignificant. Accordingly, further detailed assessment has not been undertaken at these 2 no. off-site junctions. Nevertheless, a detailed assessment of the proposed new site access junction on Butlerstown Road has been undertaken.
- Following a PICADY analysis on the Butlerstown Road / Site Access junction, results have shown that the junction will operate well within capacity for both AM and PM peak hour across all design years and development scenarios.

## 7.3 CONCLUSION

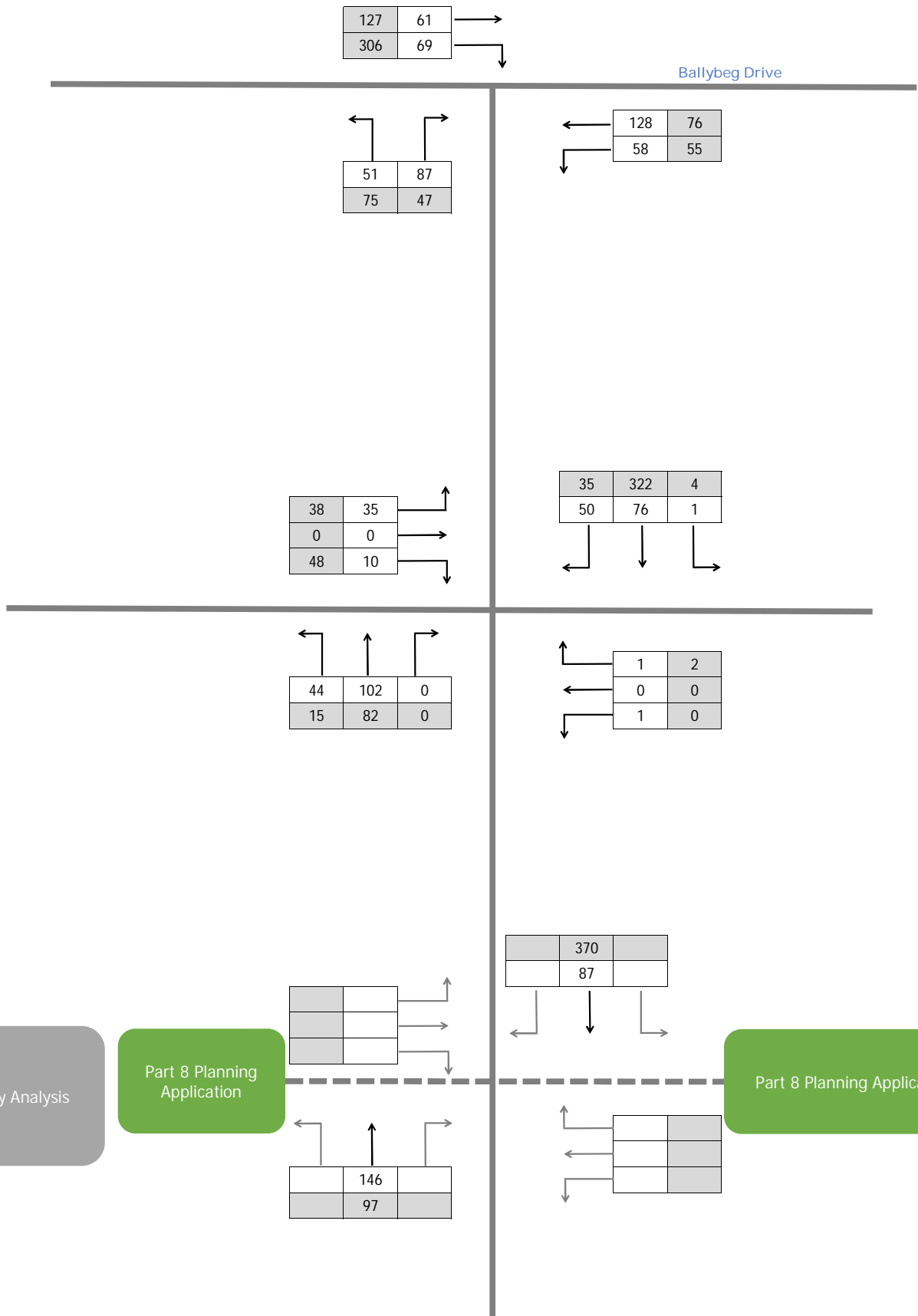
7.3.1 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed development on the surrounding road network will be negligible. This is based on the anticipated levels of traffic generated by the proposed development and the information and analysis summarised in the above report.

7.3.2 It is concluded that the proposals represent a sustainable and practical approach to development on the subject lands and there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed residential development.

## APPENDICES



APPENDIX A  
Traffic Flow Diagrams



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

**Waterford Office:**  
 Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford  
 phone: +353 51 309 500  
 email: info@dbfl.ie  
 website: www.dbfl.ie

**Project :**  
 Proposed Residential Development  
 Ballynaneashagh, Waterford City

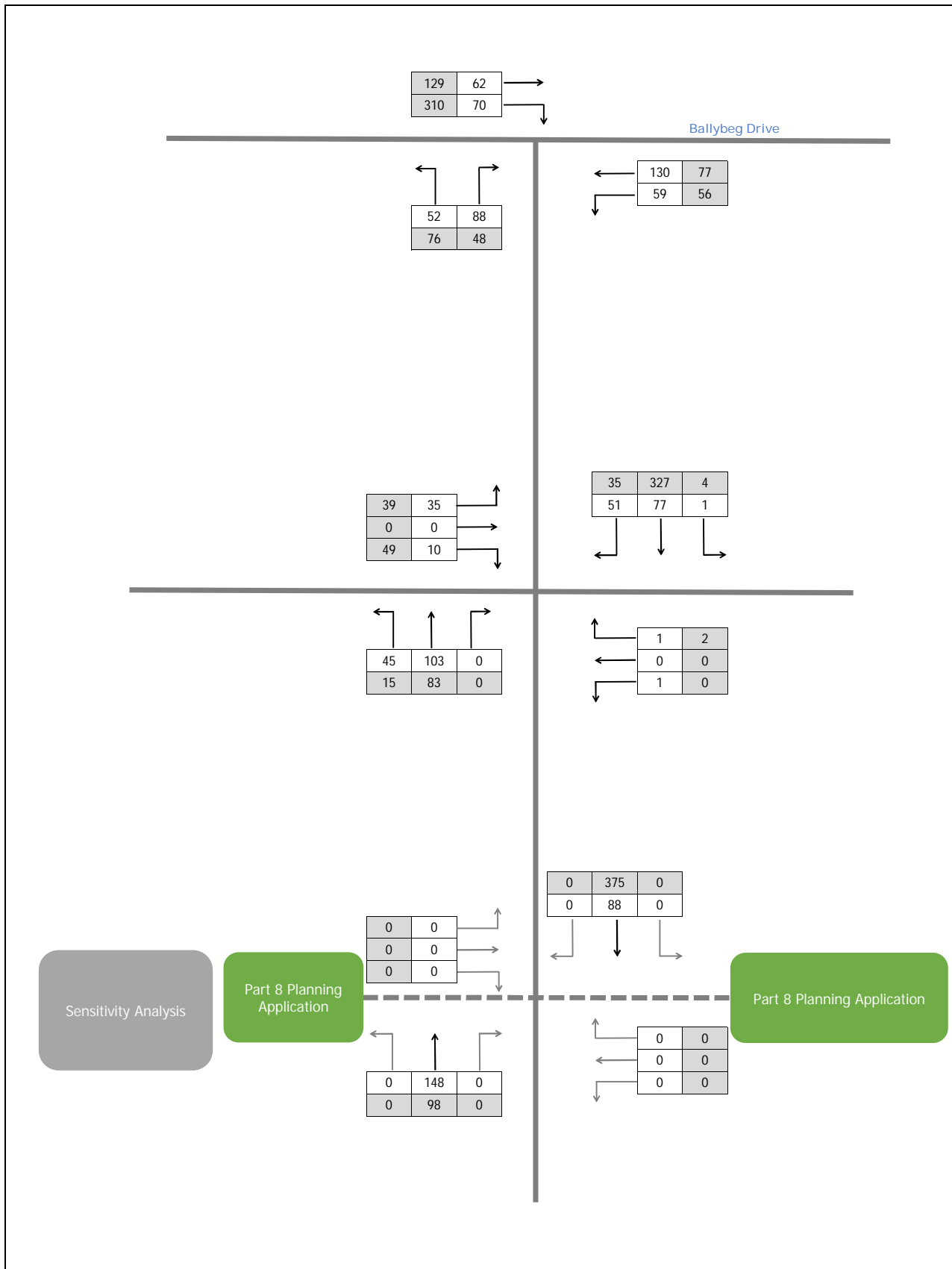
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 2020 Base Flows




**Key:**

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	PM Peak Hour (1700-1800)

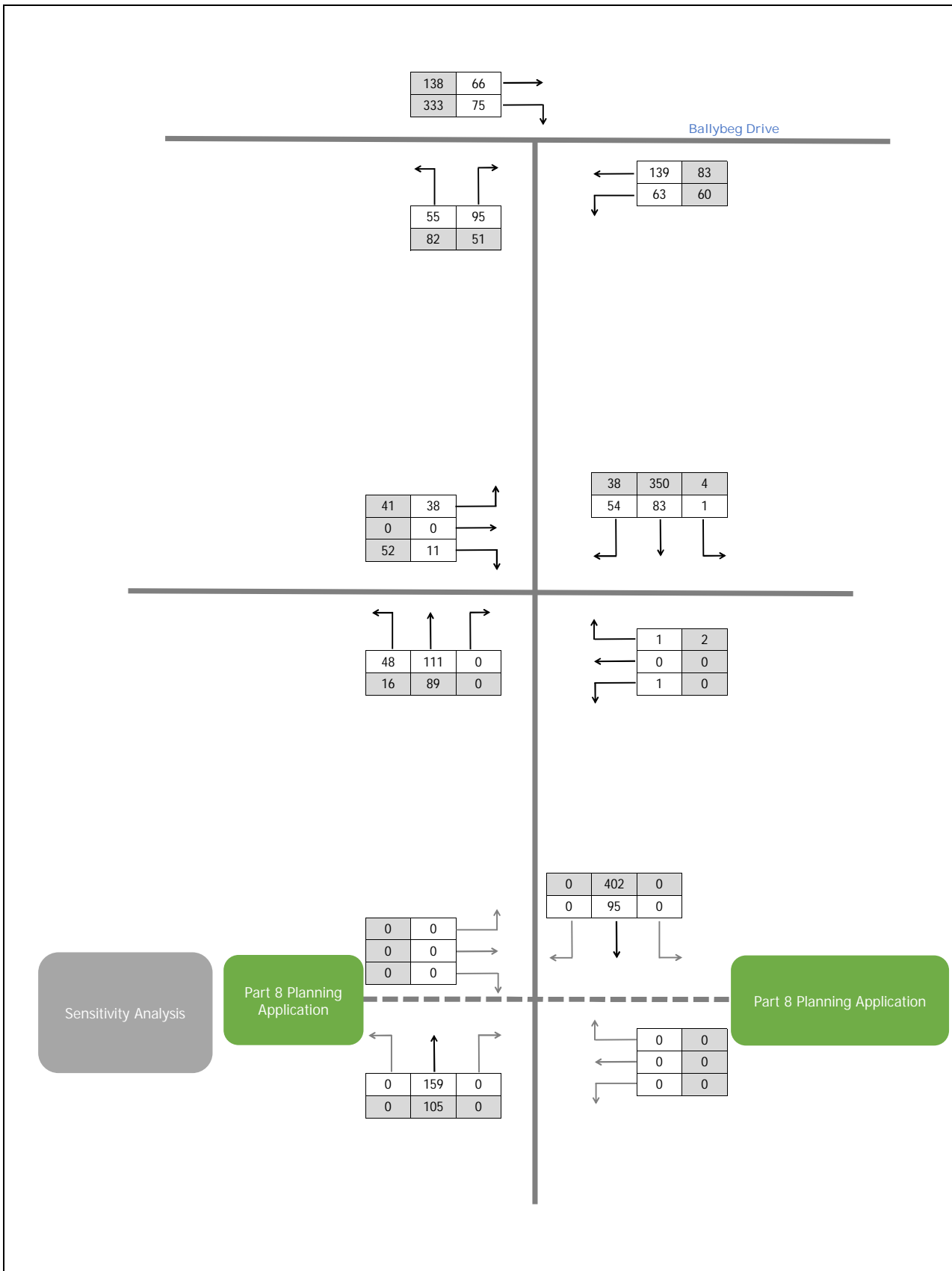
Flows measured in Vehicles

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 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City	Key:  AM Peak Hour (0815-0915)  PM Peak Hour (1700-1800)  Flows measured in Vehicles	Dwn: DG Ckd: MMK Date: 28/02/2020
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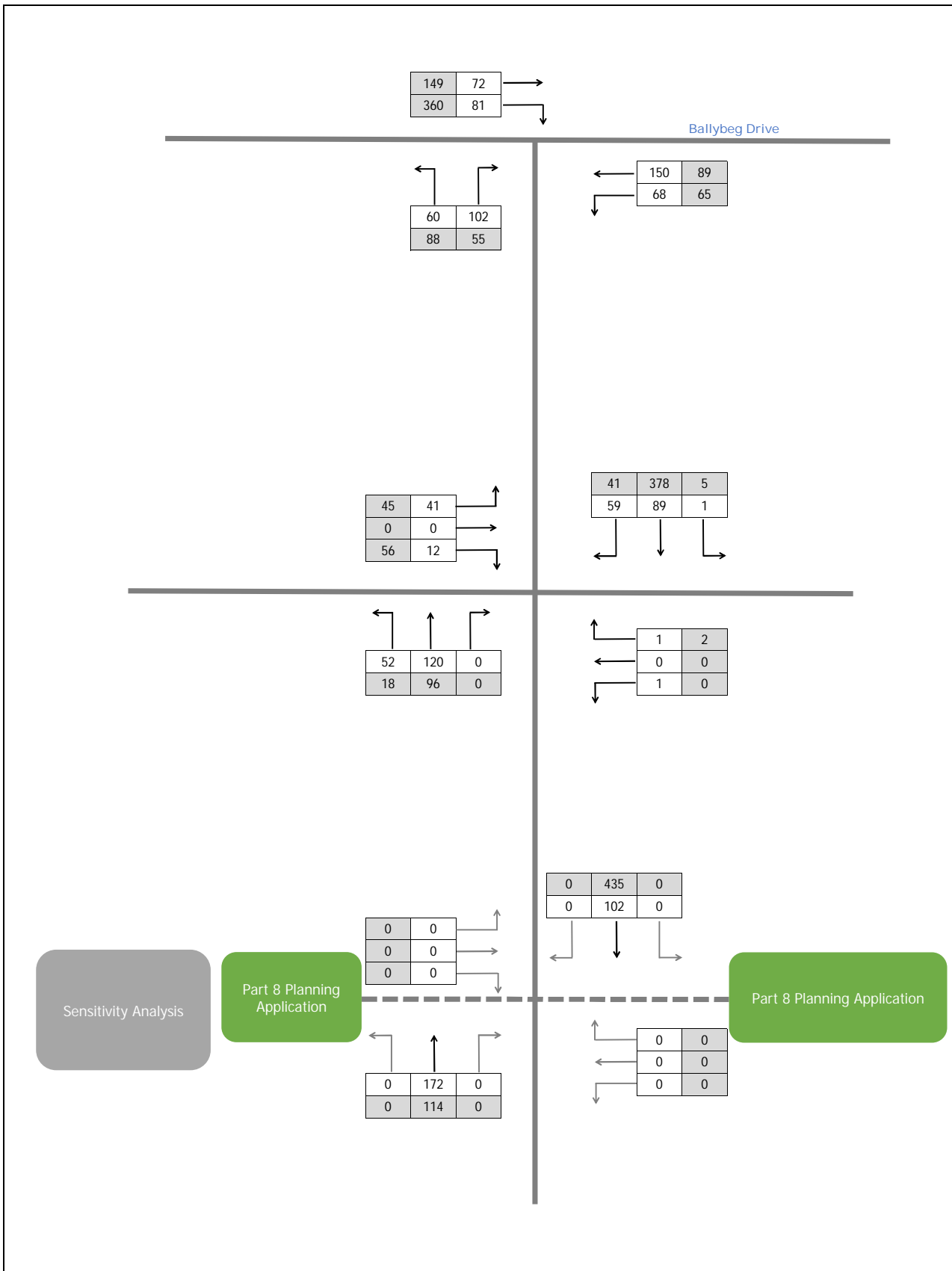





Sensitivity Analysis

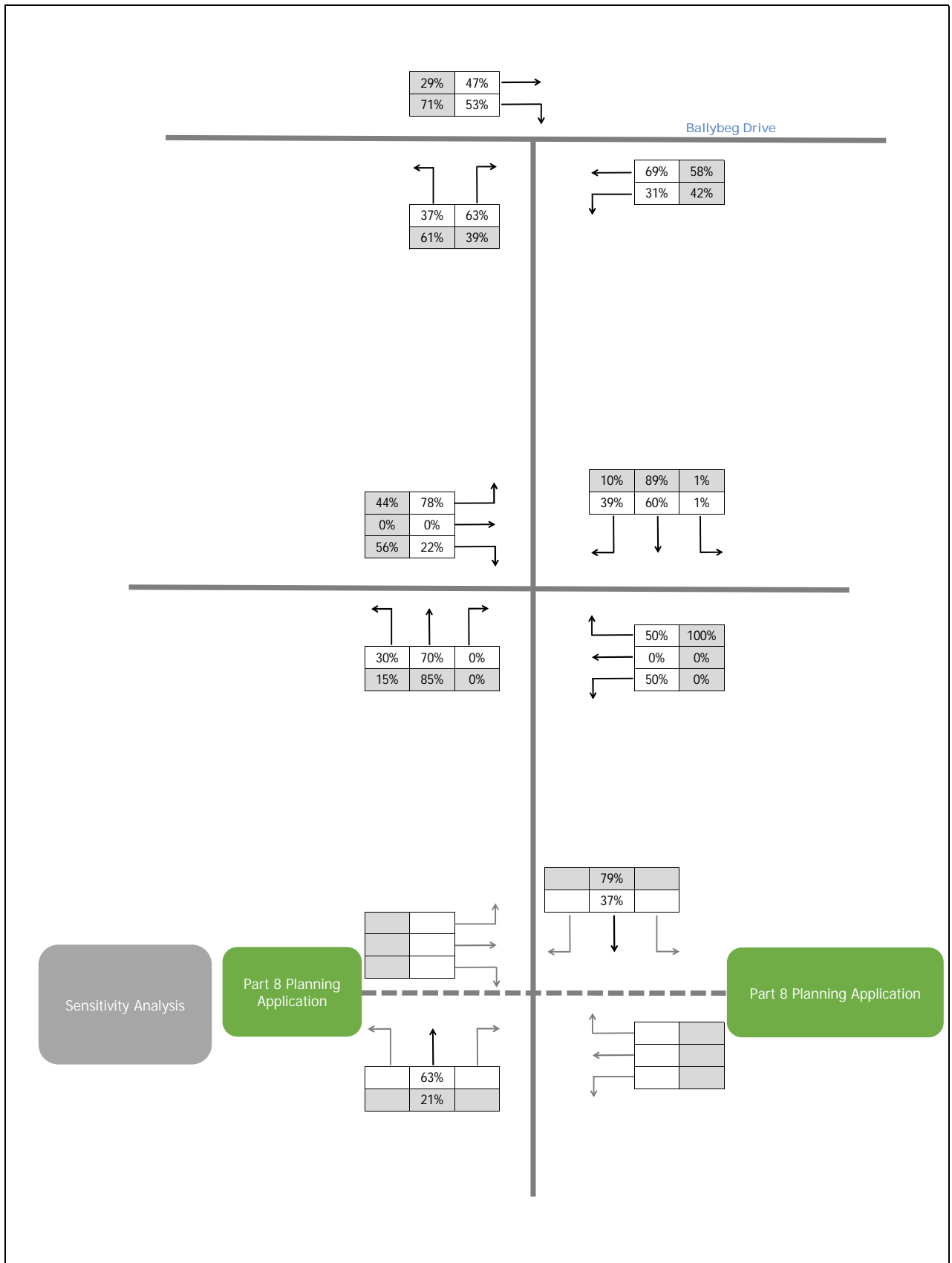
Part 8 Planning Application

Part 8 Planning Application

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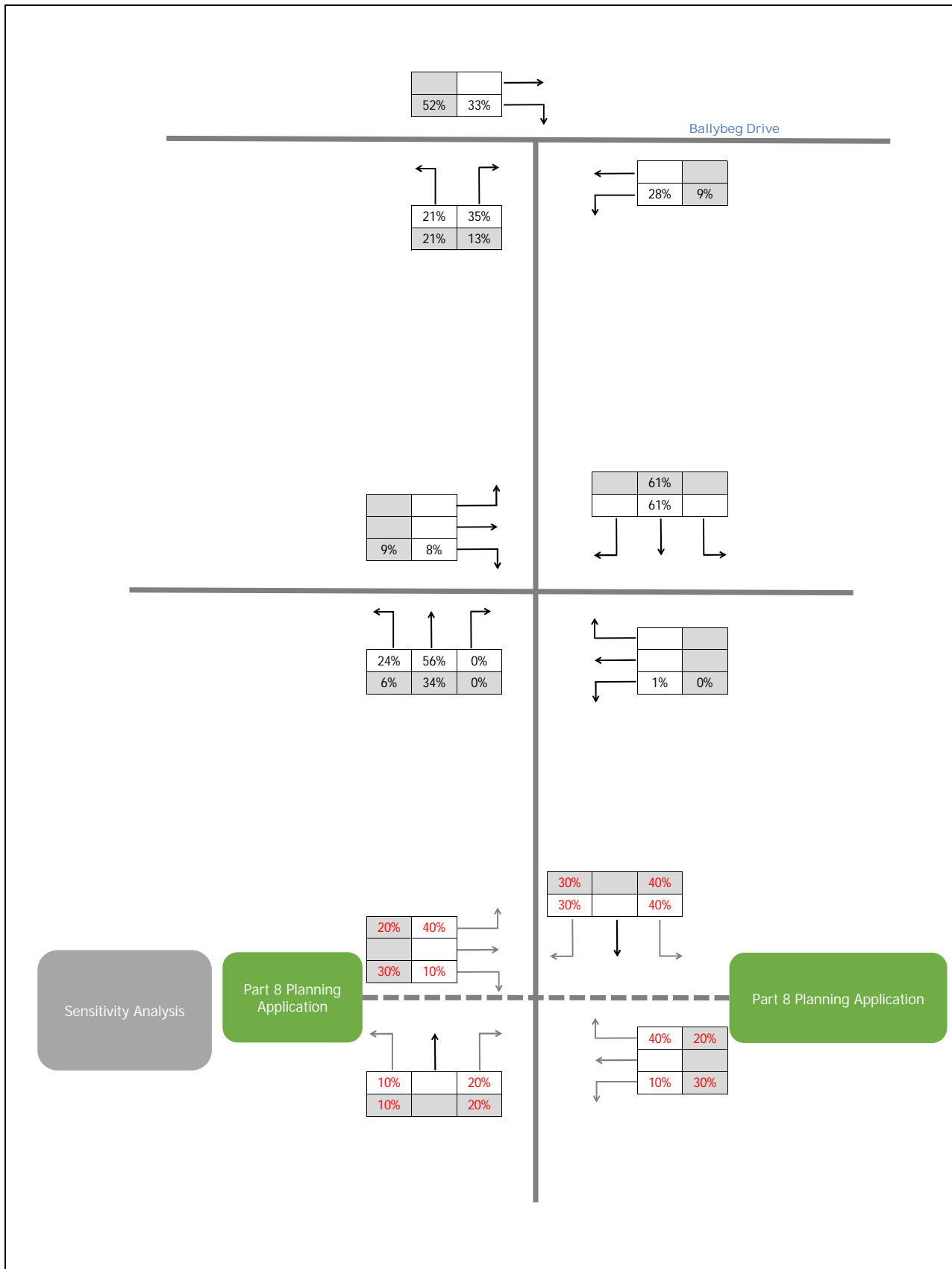


 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City	Key:  AM Peak Hour (0815-0915)  PM Peak Hour (1700-1800)  Flows measured in Vehicles	Dwn: DG Ckd: MMK Date: 28/02/2020
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 <small>DBFL Consulting Engineers</small>	<b>Dublin Office:</b> <small>Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7</small> phone: +353 1 400 4000	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <table style="margin-left: 20px;"> <tr><td style="width: 20px; height: 10px; background-color: white; border: 1px solid black;"></td> AM Peak Hour (0815-0915)</tr></table>	

  
 Flows measured in Vehicles
 
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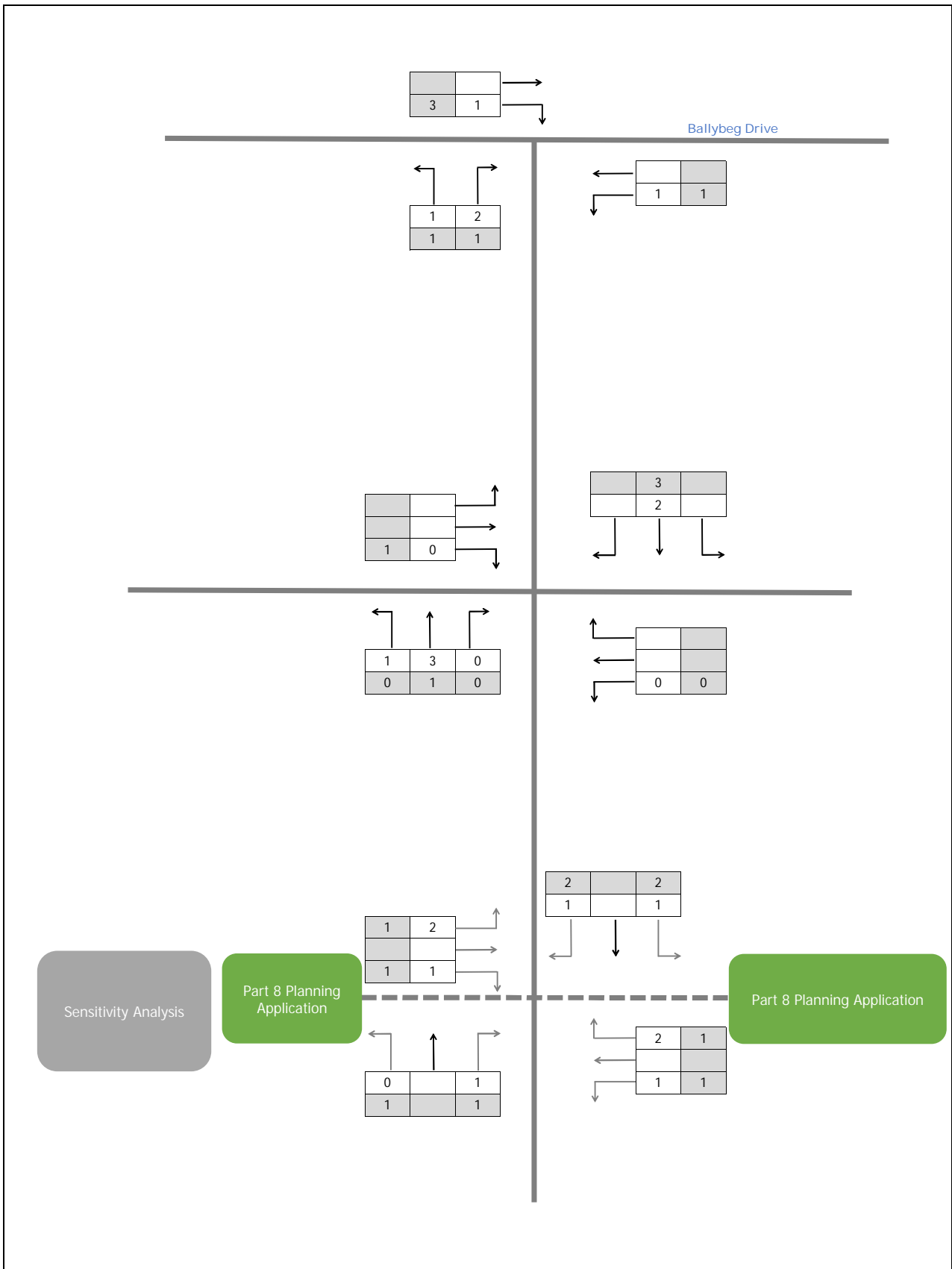





<p style="font-size: small; margin-top: 5px;">DBFL Consulting Engineers</p>	<b>Dublin Office:</b> Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  <b>Waterford Office:</b> Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <table style="margin-left: 20px;"> <tr><td style="width: 20px; height: 10px; background-color: white; border: 1px solid black;"></td> AM Peak Hour (0815-0915)</tr></table>	

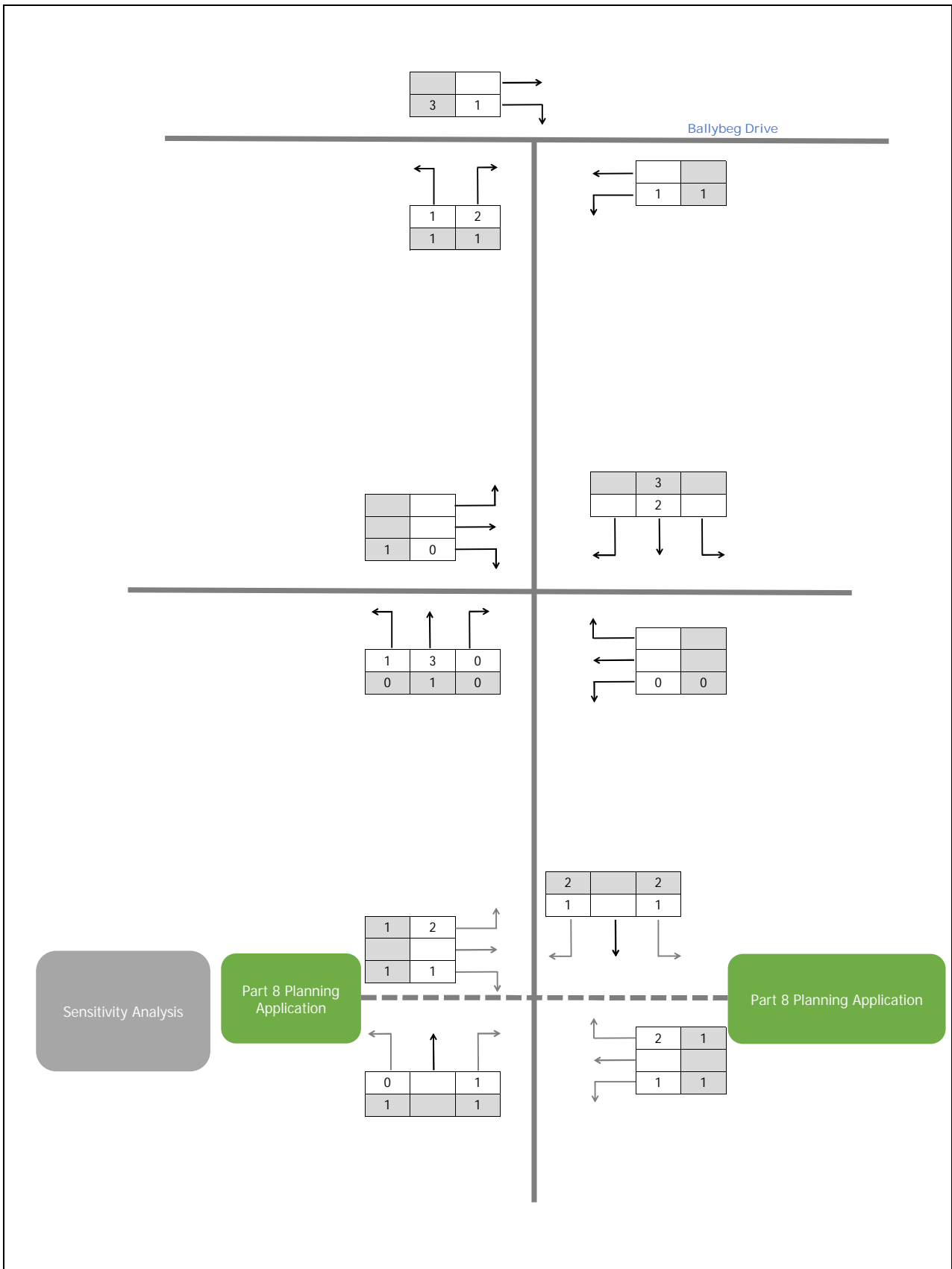
Flows measured in Vehicles




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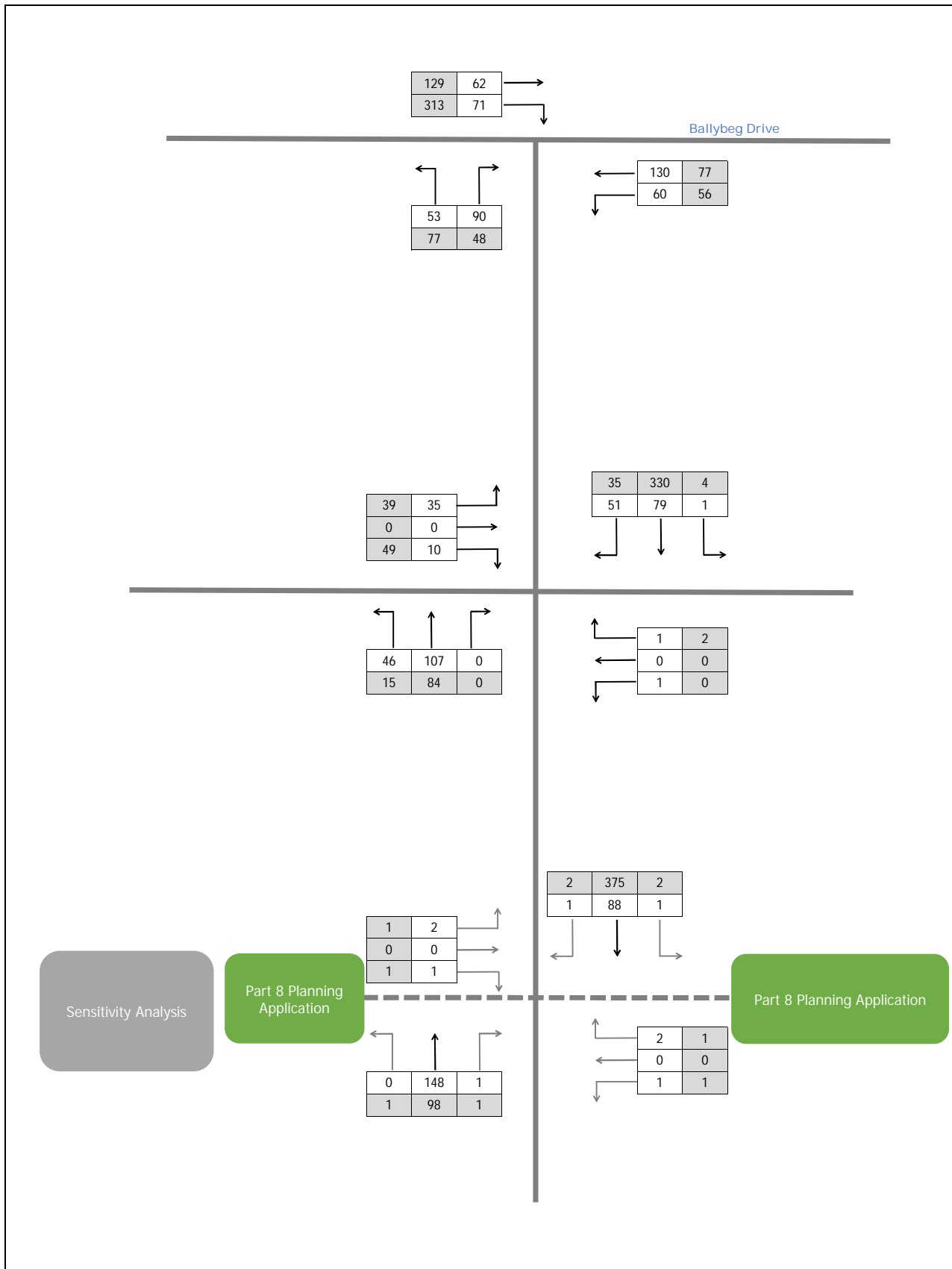




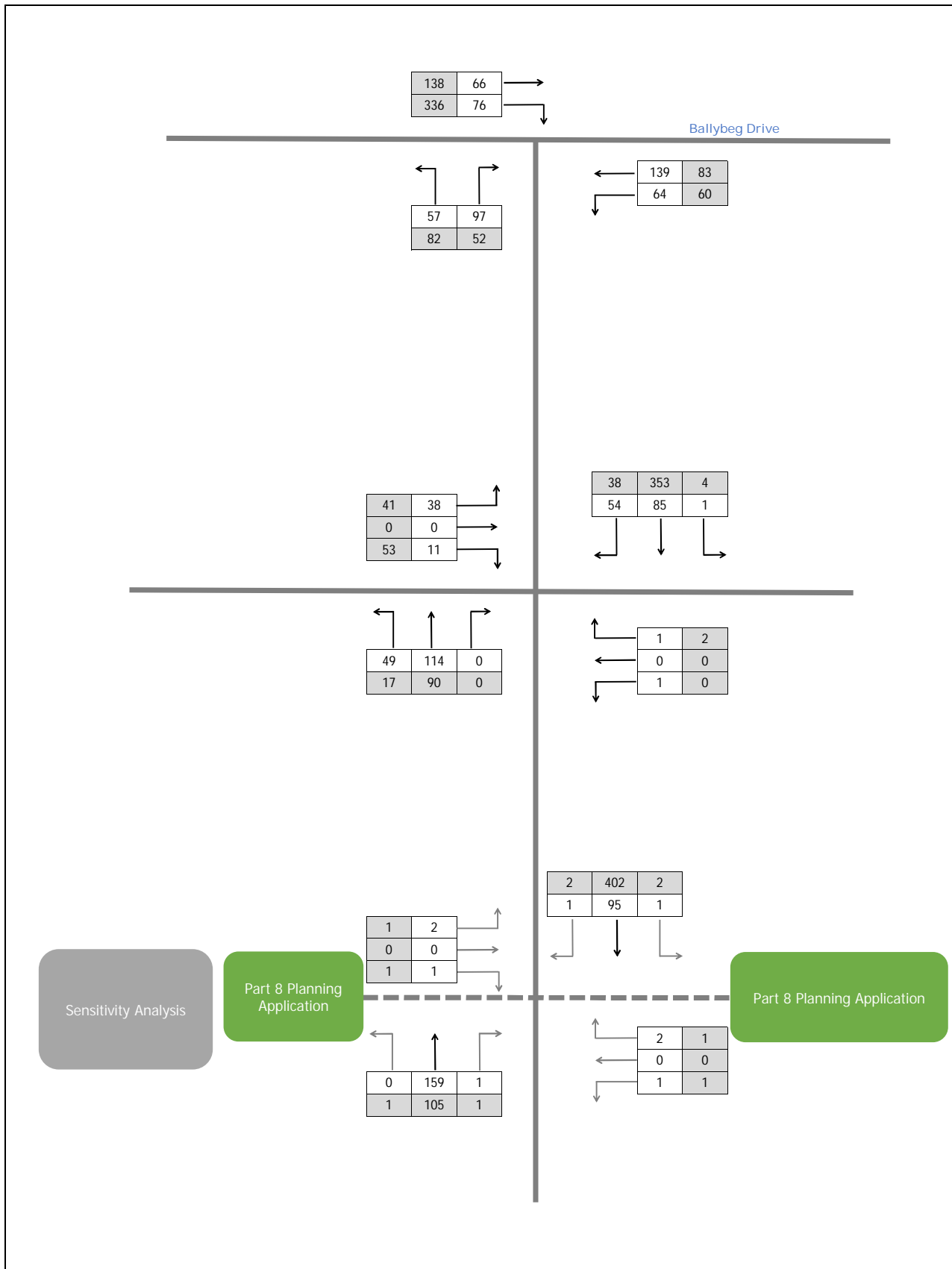
 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000 Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City	Key:  AM Peak Hour (0815-0915)  PM Peak Hour (1700-1800) Flows measured in Vehicles	Dwn: DG Ckd: MMK Date: 28/02/2020
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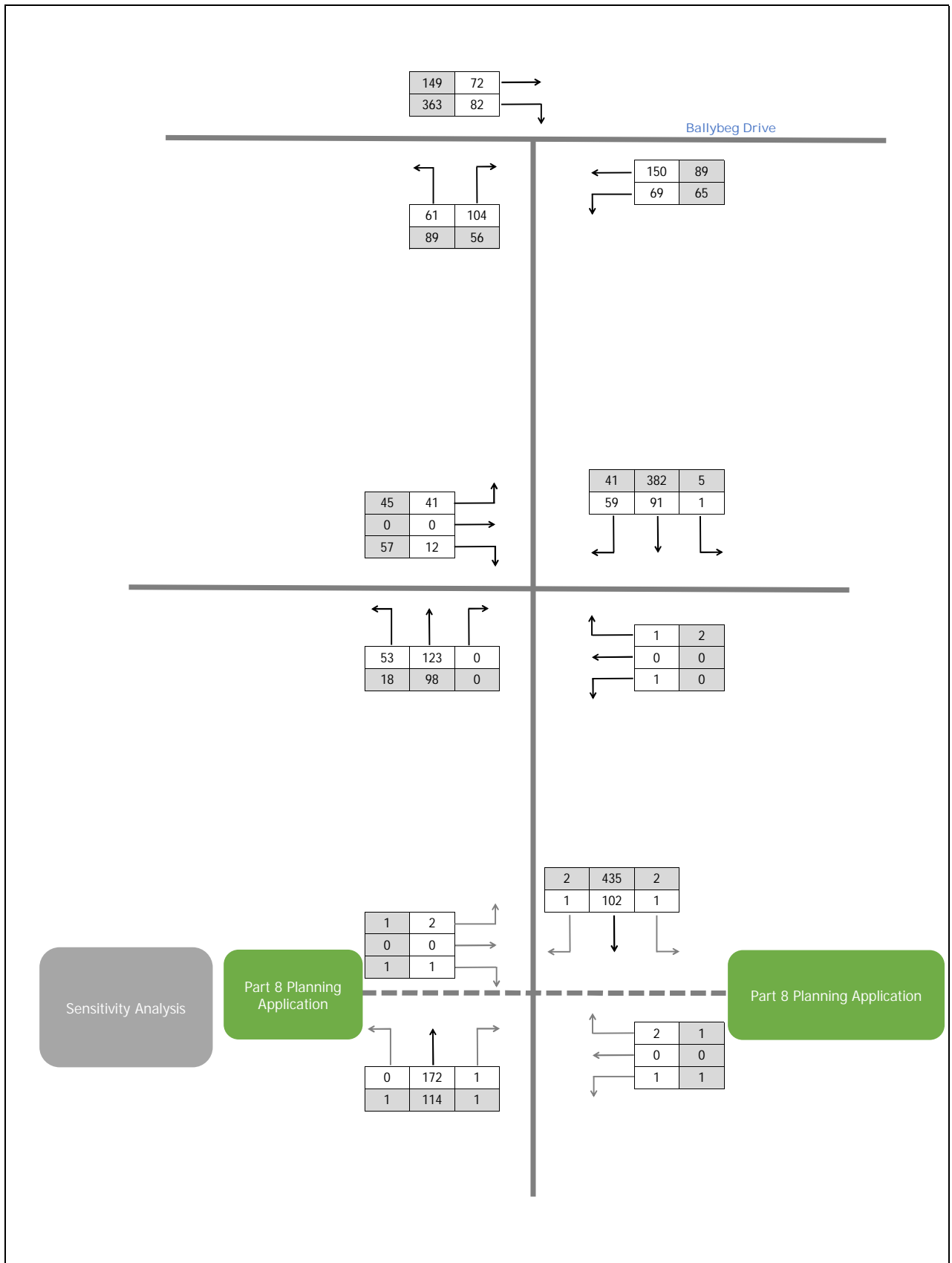


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DRG. Title : Network Traffic Flows 2021 Do-Something		Figure: 9						

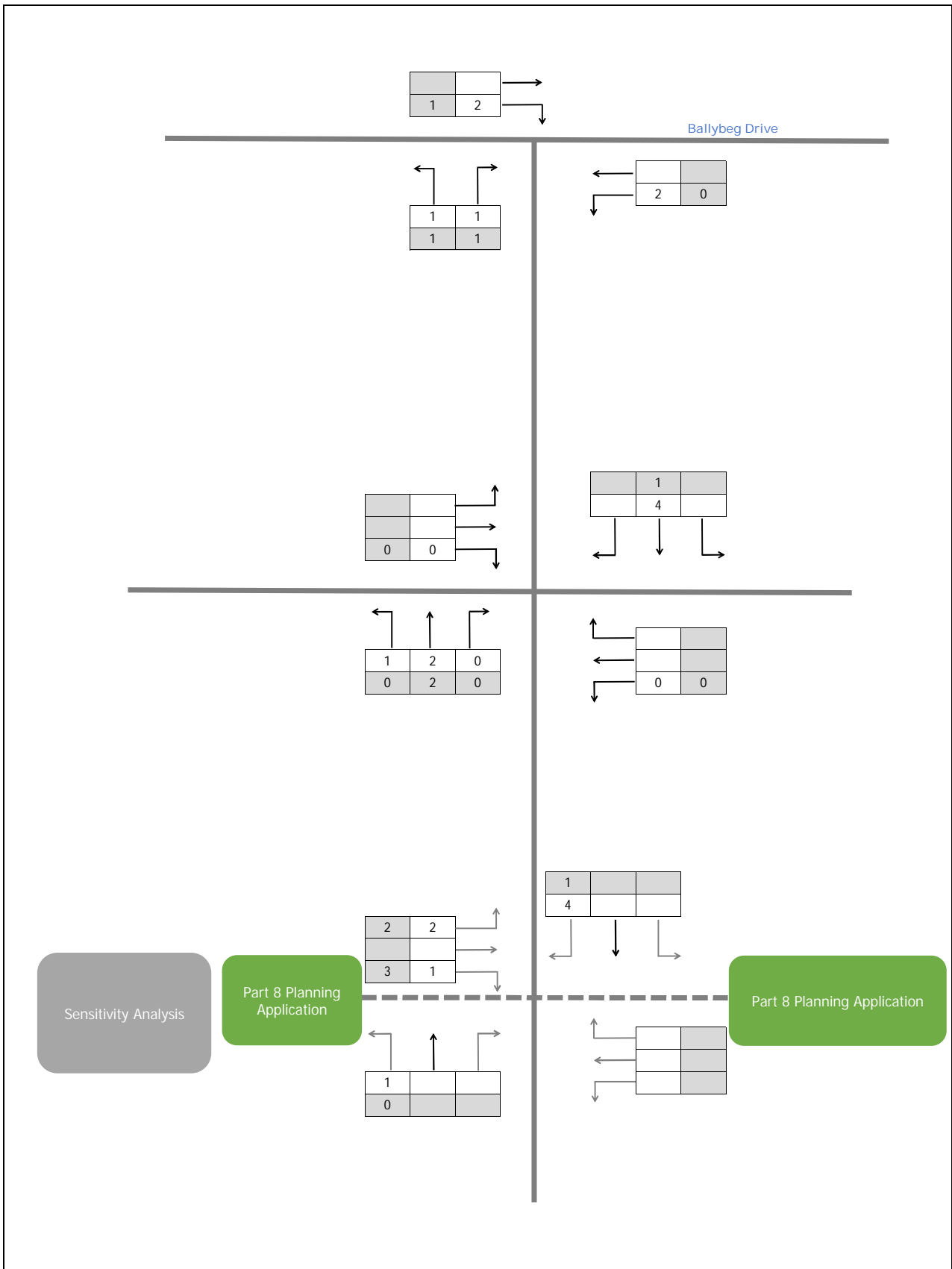



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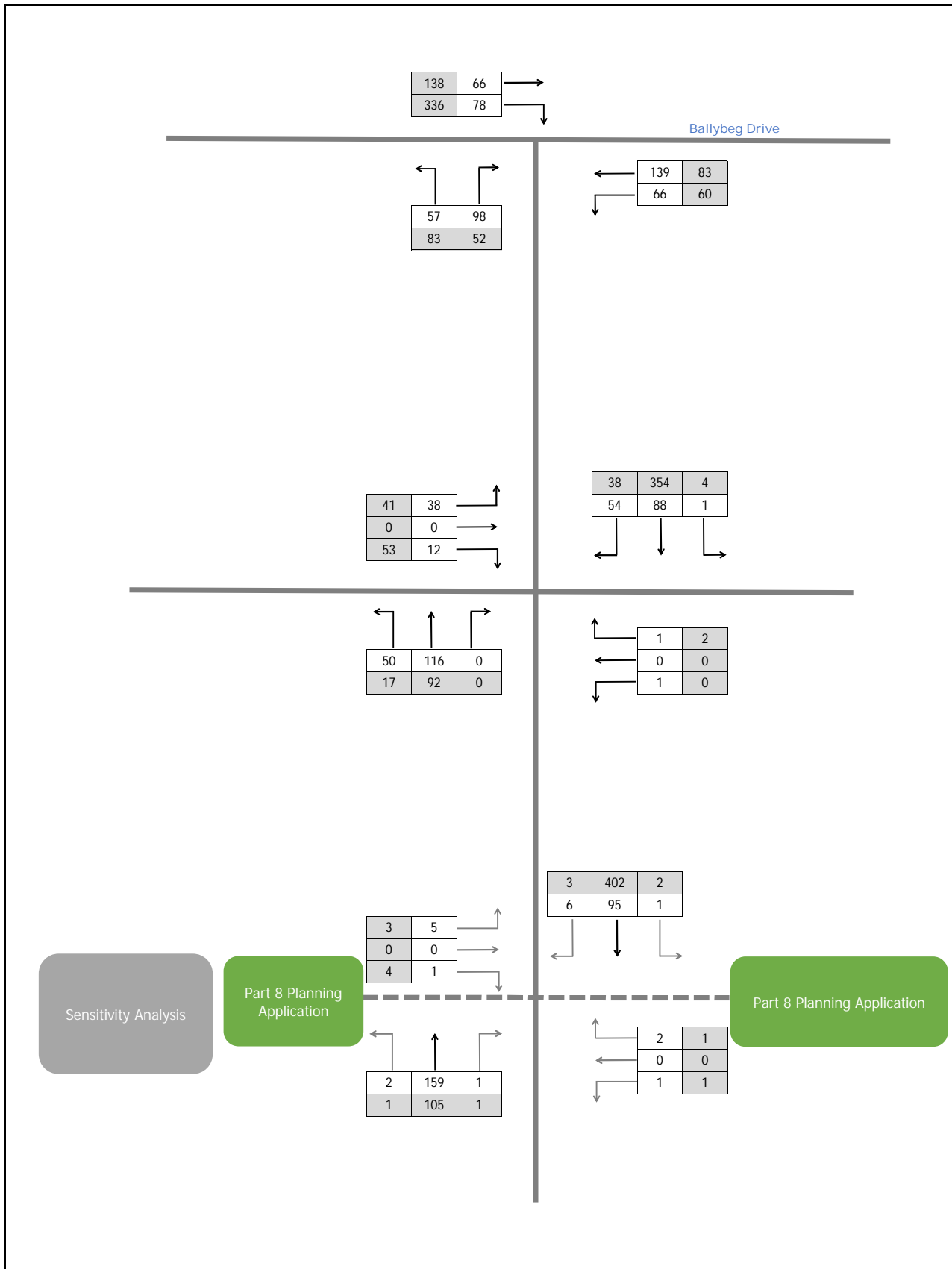




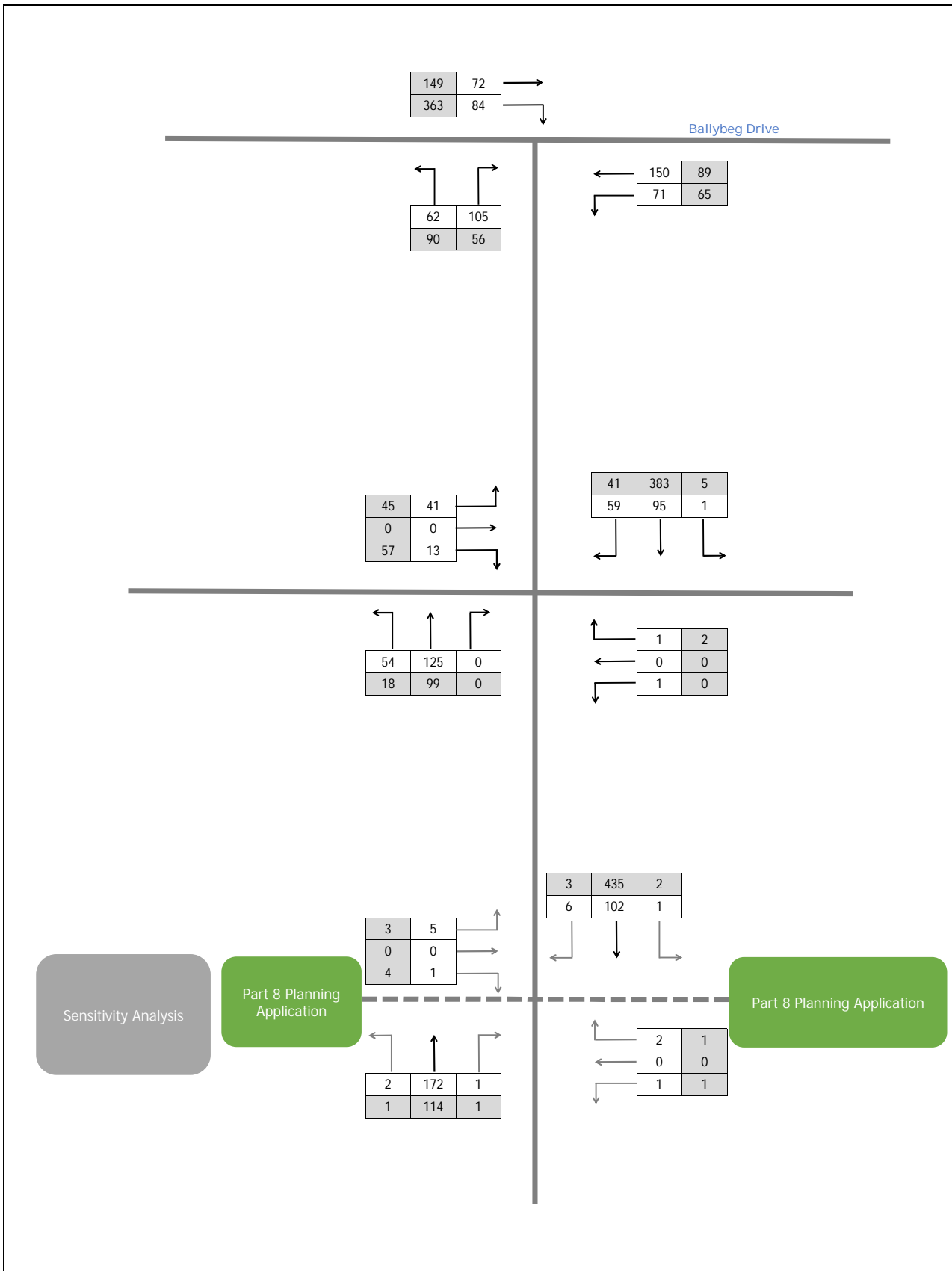
<p style="font-size: 8px; margin-top: 5px;">DBFL Consulting Engineers</p>	<b>Dublin Office:</b> Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  <b>Waterford Office:</b> Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 20px; height: 10px; background-color: white; border: 1px solid black; margin-right: 5px;"></div> <span>AM Peak Hour (0815-0915)</span> </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></div> <span>PM Peak Hour (1700-1800)</span> </div> <p style="margin-top: 5px; font-size: 8px;">Flows measured in Vehicles</p>	<b>Dwn:</b> DG	<b>Ckd:</b> MMK	<b>Date:</b> 28/02/2020	
	<b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001						
	<b>DRG. Title :</b> Network Traffic Flows 2036 Do-Something			<b>Figure:</b> 11			<b>Rev:</b> .



 DBFL Consulting Engineers	<b>Dublin Office:</b> Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 20px; height: 10px; background-color: white; border: 1px solid black; margin-right: 5px;"></div>         AM Peak Hour (0815-0915)       </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 20px; height: 10px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></div>         PM Peak Hour (1700-1800)       </div> <p style="text-align: center; margin-top: 5px;">Flows measured in Vehicles</p>	<b>Dwn:</b> DG	<b>Ckd:</b> MMK	<b>Date:</b> 28/02/2020	
	<b>Waterford Office:</b> Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	<b>DRG. Title :</b> Network Traffic Flows Proposed Development SA1 2026 - 2036		<b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001			
				<b>Figure:</b> 12	<b>Rev:</b> .		




<p style="font-size: small; color: #A52A2A;">DBFL Consulting Engineers</p>	<b>Dublin Office:</b> Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  <b>Waterford Office:</b> Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <table style="margin-left: 20px;"> <tr><td style="width: 20px; height: 10px; background-color: white; border: 1px solid black;"></td><td>AM Peak Hour (0815-0915)</td></tr> <tr><td style="width: 20px; height: 10px; background-color: #cccccc; border: 1px solid black;"></td><td>PM Peak Hour (1700-1800)</td></tr> </table> <p style="text-align: center; font-size: x-small;">Flows measured in Vehicles</p>		AM Peak Hour (0815-0915)		PM Peak Hour (1700-1800)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>Dwn:</b> DG</td> <td style="width: 30%;"><b>Ckd:</b> MMK</td> <td style="width: 40%;"><b>Date:</b> 28/02/2020</td> </tr> <tr> <td colspan="3"><b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001</td> </tr> <tr> <td><b>Figure:</b> 13</td> <td colspan="2"><b>Rev:</b> .</td> </tr> </table>	<b>Dwn:</b> DG	<b>Ckd:</b> MMK	<b>Date:</b> 28/02/2020	<b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001			<b>Figure:</b> 13	<b>Rev:</b> .	
		AM Peak Hour (0815-0915)															
		PM Peak Hour (1700-1800)															
<b>Dwn:</b> DG	<b>Ckd:</b> MMK	<b>Date:</b> 28/02/2020															
<b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001																	
<b>Figure:</b> 13	<b>Rev:</b> .																
<b>DRG. Title :</b> Network Traffic Flows 2026 Do-Something + SA1																	



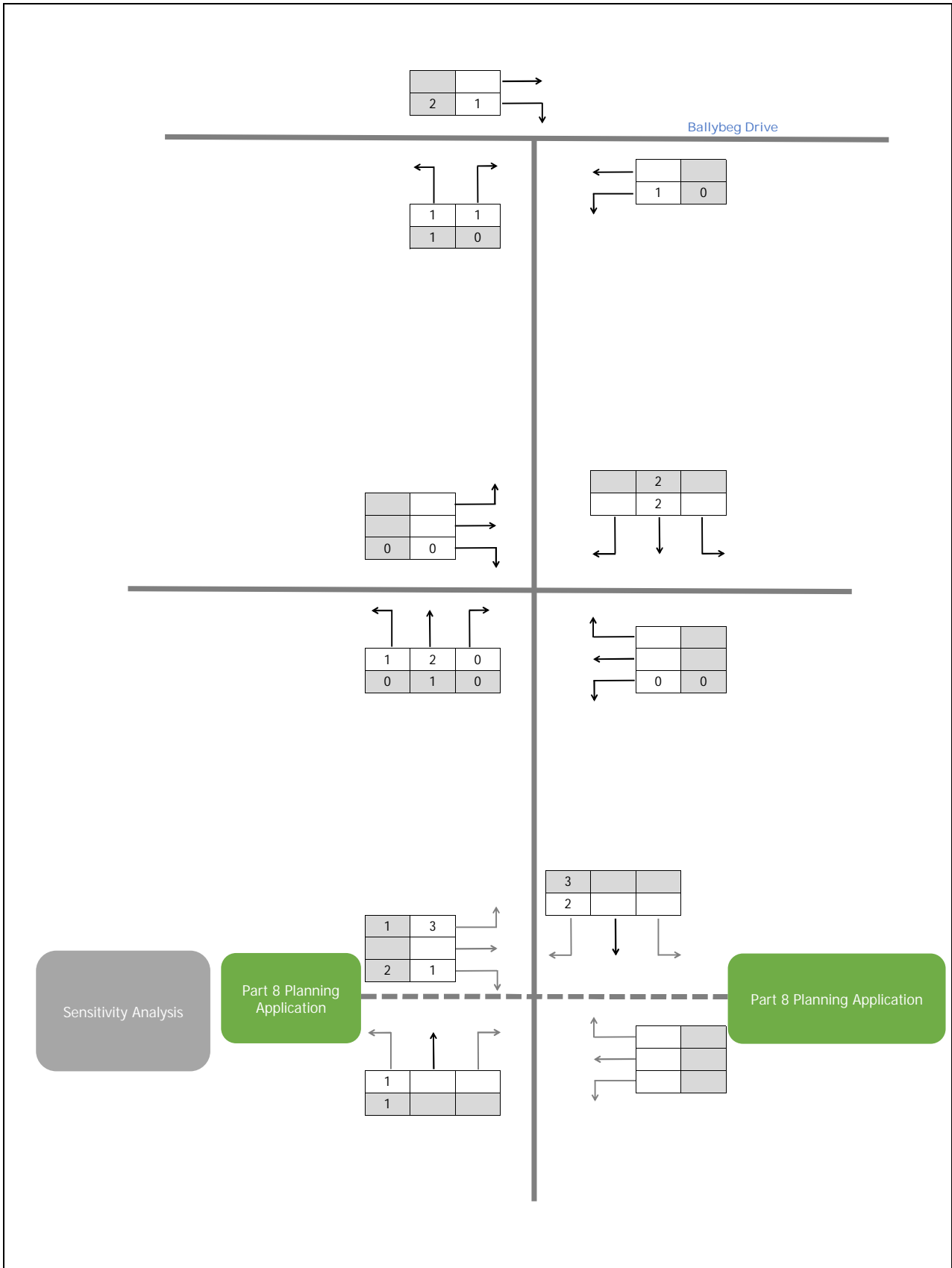
Sensitivity Analysis




Part 8 Planning Application

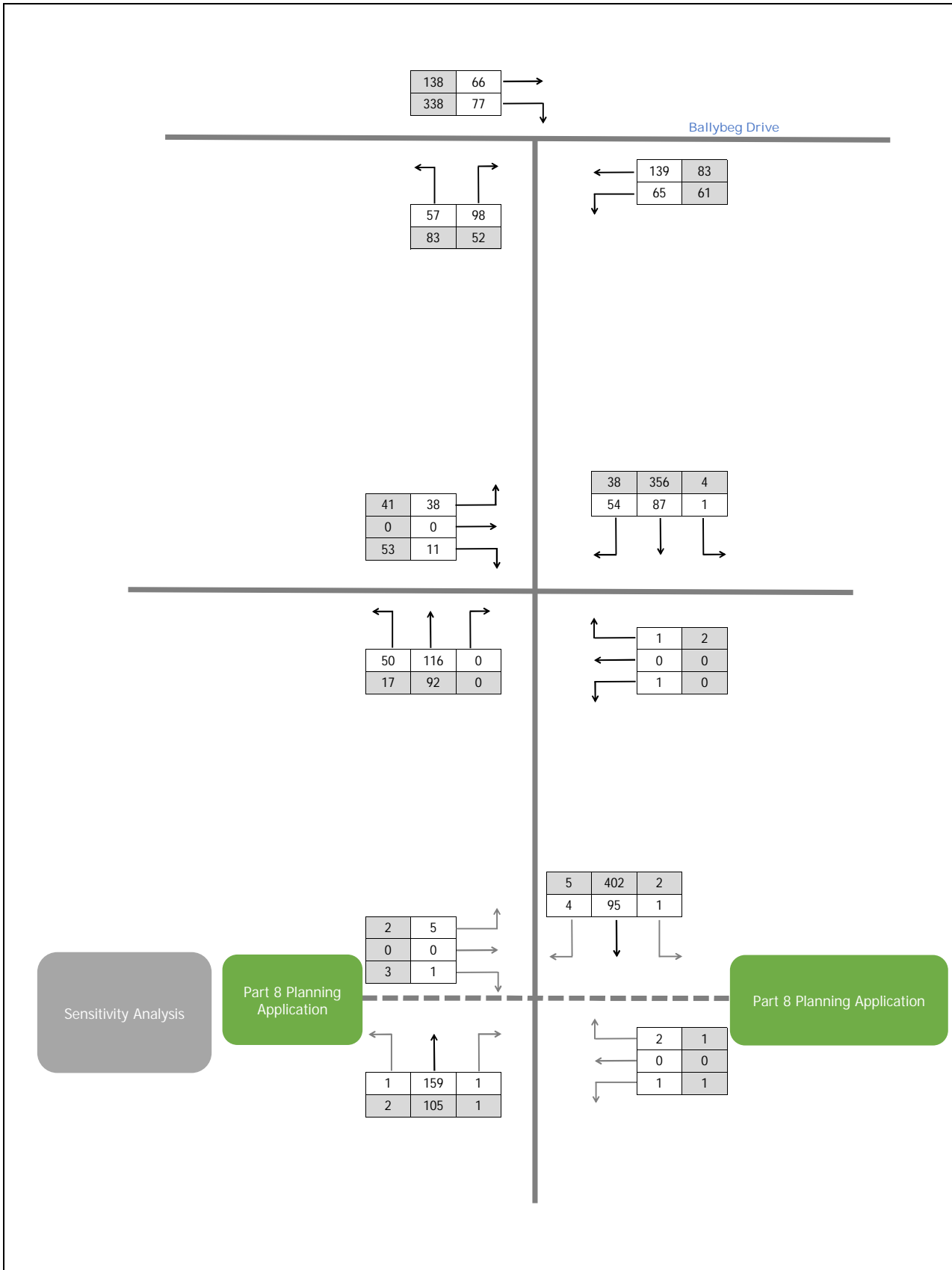
Part 8 Planning Application


 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City  DRG. Title : Network Traffic Flows 2036 Do-Something + SA1	Key: <table border="1" style="margin-left: 20px;"> <tr><td style="background-color: #e0e0e0;"></td><td>AM Peak Hour (0815-0915)</td></tr> <tr><td style="background-color: #cccccc;"></td><td>PM Peak Hour (1700-1800)</td></tr> </table> <p style="text-align: center;">Flows measured in Vehicles</p>		AM Peak Hour (0815-0915)		PM Peak Hour (1700-1800)	Dwn: DG Ckd: MMK Date: 28/02/2020
		AM Peak Hour (0815-0915)						
		PM Peak Hour (1700-1800)						
Ref: p200042\calcs\excel\traffic\200042-traffic-model-001								
Figure: 14		Rev:						

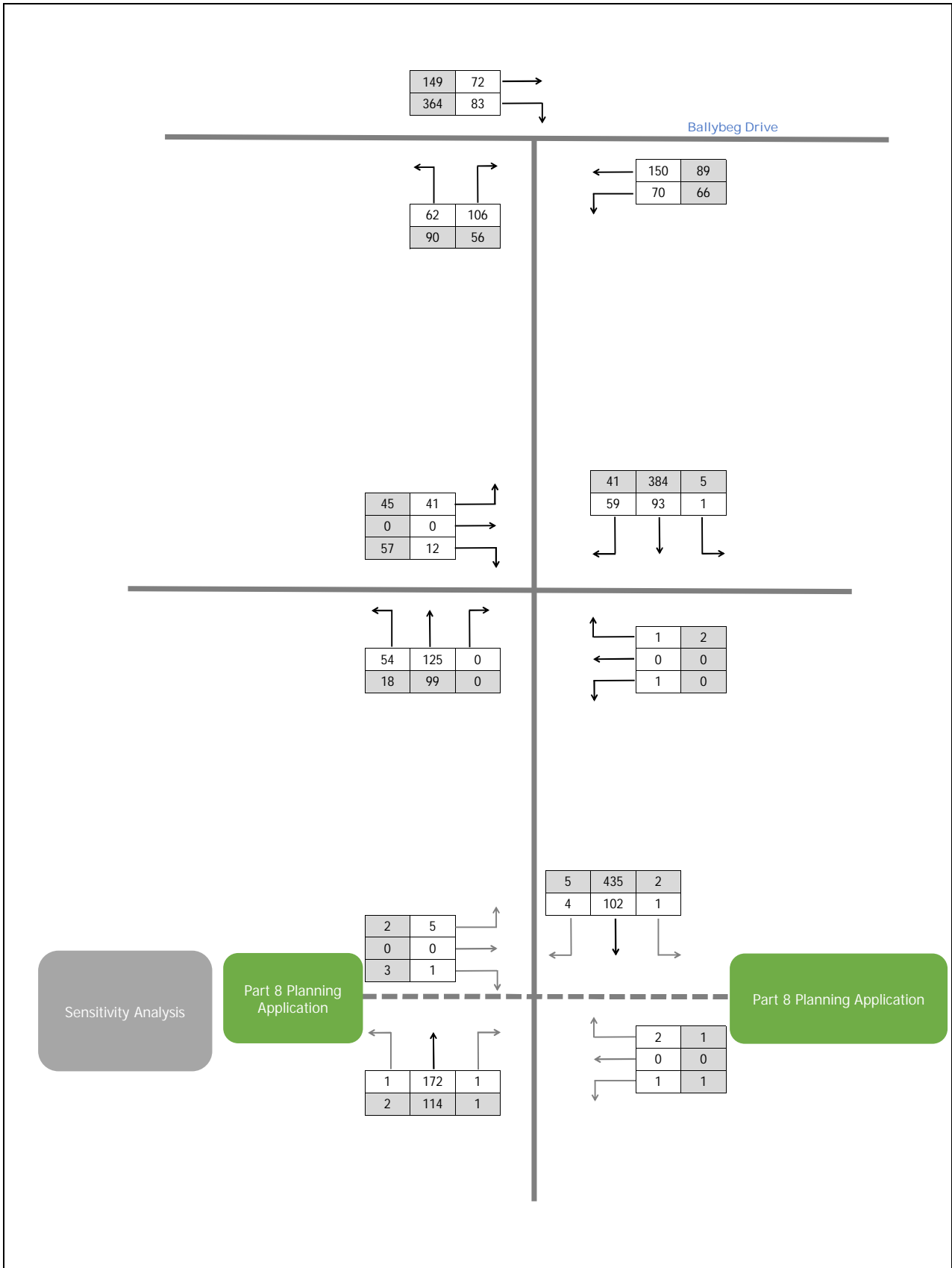





 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000 Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City DRG. Title : Network Traffic Flows Proposed Development SA2 2026 - 2036	Key:  AM Peak Hour (0815-0915)  PM Peak Hour (1700-1800) Flows measured in Vehicles	Dwn: DG Ckd: MMK Date: 28/02/2020
	Ref: p200042\calcs\excel\traffic\200042-traffic-model-001			
	Figure: 15		Rev:	



 DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000 Waterford Office: Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Ballynaneashagh, Waterford City DRG. Title : Network Traffic Flows 2026 Do-Something + SA2	Key: <table border="1" data-bbox="863 1861 927 1924"> <tr><td style="background-color: #e0e0e0;"></td></tr> <tr><td style="background-color: #cccccc;"></td></tr> </table> AM Peak Hour (0815-0915) PM Peak Hour (1700-1800) Flows measured in Vehicles			Dwn: DG Ckd: MMK Date: 28/02/2020 Ref: p200042\calcs\excel\traffic\200042-traffic-model-001 Figure: 16 Rev:



 DBFL Consulting Engineers	<b>Dublin Office:</b> Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 phone: +353 1 400 4000  <b>Waterford Office:</b> Suite 8b, The Atrium, Maritana Gate, Canada Street, Waterford phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	<b>Project :</b> Proposed Residential Development Ballynaneashagh, Waterford City	<b>Key:</b> <table border="1"> <tr><td style="background-color: #e0e0e0;"></td><td>AM Peak Hour (0815-0915)</td></tr> <tr><td style="background-color: #cccccc;"></td><td>PM Peak Hour (1700-1800)</td></tr> </table> <p>Flows measured in Vehicles</p>		AM Peak Hour (0815-0915)		PM Peak Hour (1700-1800)	<table border="1"> <tr> <td>Dwn:</td> <td>Ckd:</td> <td>Date:</td> </tr> <tr> <td>DG</td> <td>MMK</td> <td>28/02/2020</td> </tr> </table>	Dwn:	Ckd:	Date:	DG	MMK	28/02/2020
		AM Peak Hour (0815-0915)												
		PM Peak Hour (1700-1800)												
Dwn:	Ckd:	Date:												
DG	MMK	28/02/2020												
<b>DRG. Title :</b> Network Traffic Flows 2036 Do-Something + SA2			<b>Ref:</b> p200042\calcs\excel\traffic\200042-traffic-model-001											
		<b>Figure:</b> 17	<b>Rev:</b> .											





APPENDIX B  
TRICS Output Data

Calculation Reference: AUDIT-638801-200303-0328

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL  
 Category : B - AFFORDABLE/LOCAL AUTHORITY HOUSES  
 VEHICLES

Selected regions and areas:

03	SOUTH WEST	
	WL WILTSHIRE	1 days
04	EAST ANGLIA	
	NF NORFOLK	1 days
06	WEST MIDLANDS	
	WO WORCESTERSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	3 days
08	NORTH WEST	
	CH CHESHIRE	1 days
	LC LANCASHIRE	1 days
	MS MERSEYSIDE	1 days
09	NORTH	
	NB NORTHUMBERLAND	1 days
11	SCOTLAND	
	DU DUNDEE CITY	1 days
13	MUNSTER	
	TI TIPPERARY	2 days

*This section displays the number of survey days per TRICS® sub-region in the selected set*

Secondary Filtering selection:

*This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.*

Parameter: Number of dwellings  
 Actual Range: 8 to 97 (units: )  
 Range Selected by User: 8 to 516 (units: )

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/11 to 19/10/18

*This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.*

Selected survey days:

Monday	5 days
Tuesday	3 days
Wednesday	1 days
Thursday	1 days
Friday	3 days

*This data displays the number of selected surveys by day of the week.*

Selected survey types:

Manual count	13 days
Directional ATC Count	0 days

*This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.*

Selected Locations:

Edge of Town Centre	2
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	5
Neighbourhood Centre (PPS6 Local Centre)	1

*This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.*

Selected Location Sub Categories:

Residential Zone	12
------------------	----

*This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.*

Secondary Filtering selection:

Use Class:

C3 13 days

*This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.*

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	6 days
10,001 to 15,000	1 days
15,001 to 20,000	2 days
25,001 to 50,000	3 days

*This data displays the number of selected surveys within stated 1-mile radii of population.*

Population within 5 miles:

5,001 to 25,000	3 days
25,001 to 50,000	1 days
75,001 to 100,000	3 days
125,001 to 250,000	6 days

*This data displays the number of selected surveys within stated 5-mile radii of population.*

Car ownership within 5 miles:

0.6 to 1.0	8 days
1.1 to 1.5	5 days

*This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.*

Travel Plan:

No 13 days

*This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.*

PTAL Rating:

No PTAL Present 13 days

*This data displays the number of selected surveys with PTAL Ratings.*





LIST OF SITES relevant to selection parameters (Cont.)

10	WO-03-B-02	TERRACED HOUSES	WORCESTERSHIRE
	GOODREST WALK		
	WORCESTER		
	MERRIMANS HILL		
	Neighbourhood Centre (PPS6 Local Centre)		
	Residential Zone		
	Total Number of dwellings:	16	
	Survey date: MONDAY	14/11/16	Survey Type: MANUAL
11	WY-03-B-02	MIXED HOUSES	WEST YORKSHIRE
	WHITEACRE STREET		
	HUDDERSFIELD		
	DEIGHTON		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	54	
	Survey date: TUESDAY	17/09/13	Survey Type: MANUAL
12	WY-03-B-03	TERRACED HOUSES	WEST YORKSHIRE
	LINCOLN GREEN ROAD		
	LEEDS		
	Suburban Area (PPS6 Out of Centre)		
	Built-Up Zone		
	Total Number of dwellings:	29	
	Survey date: THURSDAY	19/09/13	Survey Type: MANUAL
13	WY-03-B-04	TERRACED HOUSES	WEST YORKSHIRE
	SYKES CLOSE		
	BATLEY		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	17	
	Survey date: FRIDAY	19/10/18	Survey Type: MANUAL

*This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	13	42	0.070	13	42	0.170	13	42	0.240
08:00 - 09:00	13	42	0.161	13	42	0.286	13	42	0.447
09:00 - 10:00	13	42	0.148	13	42	0.218	13	42	0.366
10:00 - 11:00	13	42	0.144	13	42	0.161	13	42	0.305
11:00 - 12:00	13	42	0.144	13	42	0.133	13	42	0.277
12:00 - 13:00	13	42	0.164	13	42	0.129	13	42	0.293
13:00 - 14:00	13	42	0.144	13	42	0.142	13	42	0.286
14:00 - 15:00	13	42	0.172	13	42	0.190	13	42	0.362
15:00 - 16:00	13	42	0.216	13	42	0.172	13	42	0.388
16:00 - 17:00	13	42	0.251	13	42	0.140	13	42	0.391
17:00 - 18:00	13	42	0.256	13	42	0.179	13	42	0.435
18:00 - 19:00	13	42	0.170	13	42	0.137	13	42	0.307
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>2.040</b>			<b>2.057</b>			<b>4.097</b>

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

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#### Parameter summary

Trip rate parameter range selected: 8 - 97 (units: )  
Survey date range: 01/01/11 - 19/10/18  
Number of weekdays (Monday-Friday): 13  
Number of Saturdays: 0  
Number of Sundays: 0  
Surveys automatically removed from selection: 0  
Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-638801-200302-0328

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT  
Category : F - WAREHOUSING (COMMERCIAL)  
VEHICLES

Selected regions and areas:

03	SOUTH WEST	
	DV DEVON	2 days
04	EAST ANGLIA	
	SF SUFFOLK	2 days
05	EAST MIDLANDS	
	DS DERBYSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	1 days
09	NORTH	
	CB CUMBRIA	1 days
10	WALES	
	BG BRIDGEND	1 days
	WR WREXHAM	1 days
11	SCOTLAND	
	ML MIDLOTHIAN	1 days
12	CONNAUGHT	
	GA GALWAY	1 days
14	LEINSTER	
	CC CARLOW	1 days
	LU LOUTH	1 days
15	GREATER DUBLIN	
	DL DUBLIN	1 days
17	ULSTER (NORTHERN IRELAND)	
	AN ANTRIM	1 days

*This section displays the number of survey days per TRICS® sub-region in the selected set*

Secondary Filtering selection:

*This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.*

Parameter: Gross floor area  
Actual Range: 190 to 50000 (units: sqm)  
Range Selected by User: 190 to 80066 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/11 to 03/04/19

*This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.*

Selected survey days:

Monday	2 days
Tuesday	4 days
Wednesday	3 days
Thursday	2 days
Friday	4 days

*This data displays the number of selected surveys by day of the week.*

Selected survey types:

Manual count	15 days
Directional ATC Count	0 days

*This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.*

Selected Locations:

Edge of Town Centre	2
Suburban Area (PPS6 Out of Centre)	2
Edge of Town	8
Free Standing (PPS6 Out of Town)	3

*This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.*

*This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.*

Secondary Filtering selection:

Use Class:

B2	1 days
B8	12 days

*This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.*

Population within 1 mile:

1,000 or Less	4 days
1,001 to 5,000	2 days
5,001 to 10,000	6 days
15,001 to 20,000	1 days
25,001 to 50,000	2 days

*This data displays the number of selected surveys within stated 1-mile radii of population.*

Population within 5 miles:

5,001 to 25,000	3 days
25,001 to 50,000	5 days
50,001 to 75,000	2 days
75,001 to 100,000	2 days
125,001 to 250,000	3 days

*This data displays the number of selected surveys within stated 5-mile radii of population.*

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	9 days
1.6 to 2.0	1 days
2.1 to 2.5	1 days

*This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.*

Travel Plan:

No	15 days
----	---------

*This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.*

PTAL Rating:

No PTAL Present	15 days
-----------------	---------

*This data displays the number of selected surveys with PTAL Ratings.*

LIST OF SITES relevant to selection parameters

1	AN-02-F-03 KENNEDY WAY BELFAST KENNEDY WAY IND. EST. Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: 12234 sqm <i>Survey date: TUESDAY 11/10/16</i>	PACKAGING COMPANY	ANTRIM	<i>Survey Type: MANUAL</i>
2	BG-02-F-01 PARC CRESCENT BRIDGEND WATERTON IND. EST. Edge of Town Industrial Zone Total Gross floor area: 3050 sqm <i>Survey date: MONDAY 13/05/14</i>	LOGISTICS COMPANY	BRIDGEND	<i>Survey Type: MANUAL</i>
3	CB-02-F-01 COWPER ROAD PENRITH GILWILLY IND. ESTATE Edge of Town Industrial Zone Total Gross floor area: 2950 sqm <i>Survey date: TUESDAY 10/06/14</i>	DOMINO'S PIZZA	CUMBRIA	<i>Survey Type: MANUAL</i>
4	CC-02-F-01 O'BRIEN ROAD CARLOW  Edge of Town Industrial Zone Total Gross floor area: 10500 sqm <i>Survey date: WEDNESDAY 25/05/16</i>	HYDRAULIC CYCLINDERS	CARLOW	<i>Survey Type: MANUAL</i>
5	DL-02-F-02 TURVEY AVENUE DUBLIN DONABATE Free Standing (PPS6 Out of Town) Industrial Zone Total Gross floor area: 3950 sqm <i>Survey date: THURSDAY 29/09/11</i>	DISTRIBUTION CEN	DUBLIN	<i>Survey Type: MANUAL</i>
6	DS-02-F-01 FORRESTERS BUSINESS P.. DERBY SINFIN LANE Edge of Town Centre Commercial Zone Total Gross floor area: 1900 sqm <i>Survey date: TUESDAY 05/07/11</i>	ARMADILLO S. STORAGE	DERBYSHIRE	<i>Survey Type: MANUAL</i>
7	DV-02-F-01 ALDERS WAY PAIGNTON  Edge of Town Industrial Zone Total Gross floor area: 190 sqm <i>Survey date: FRIDAY 29/03/19</i>	OPTICS WAREHOUSE	DEVON	<i>Survey Type: MANUAL</i>
8	DV-02-F-02 CHILLPARK BRAKE NEAR EXETER CLYST HONITON Free Standing (PPS6 Out of Town) Out of Town Total Gross floor area: 50000 sqm <i>Survey date: WEDNESDAY 03/04/19</i>	LIDL DISTRIBUTION CENTRE	DEVON	<i>Survey Type: MANUAL</i>
9	GA-02-F-01 PARKMORE WEST GALWAY IDA BUS. & TECH. PARK Edge of Town Industrial Zone Total Gross floor area: 11000 sqm <i>Survey date: FRIDAY 12/10/12</i>	LOGISTICS	GALWAY	<i>Survey Type: MANUAL</i>



LIST OF SITES relevant to selection parameters (Cont.)

10	LU-02-F-01 MATTHEWS LANE DROGHEDA LAGAVOOREN Edge of Town No Sub Category	PACKAGING COMPANY	LOUTH
	Total Gross floor area:	5350 sqm	
	Survey date: FRIDAY	19/06/15	Survey Type: MANUAL
11	ML-02-F-01 UNIT 53 DALKEITH MAYFIELD IND. ESTATE Edge of Town Industrial Zone	WINDOWS	MIDLOTHIAN
	Total Gross floor area:	750 sqm	
	Survey date: WEDNESDAY	04/05/11	Survey Type: MANUAL
12	SF-02-F-02 WALTON ROAD FELIXSTOWE	WAREHOUSING	SUFFOLK
	Suburban Area (PPS6 Out of Centre) Industrial Zone		
	Total Gross floor area:	22270 sqm	
	Survey date: THURSDAY	11/07/13	Survey Type: MANUAL
13	SF-02-F-03 CENTRAL AVENUE IPSWICH WARREN HEATH Edge of Town Industrial Zone	ROAD HAULAGE	SUFFOLK
	Total Gross floor area:	4700 sqm	
	Survey date: FRIDAY	18/09/15	Survey Type: MANUAL
14	WR-02-F-01 UNIT 1-2 PACIFIC PARK NEAR WREXHAM WREXHAM IND. ESTATE Free Standing (PPS6 Out of Town) Industrial Zone	WAREHOUSE	WREXHAM
	Total Gross floor area:	9000 sqm	
	Survey date: TUESDAY	18/10/11	Survey Type: MANUAL
15	WY-02-F-01 MORTIMER STREET CLECKHEATON	ELECTRONICS DISTRIBUTION	WEST YORKSHIRE
	Edge of Town Centre Built-Up Zone		
	Total Gross floor area:	1507 sqm	
	Survey date: MONDAY	19/09/16	Survey Type: MANUAL

*This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.*

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30	4	18853	0.011	4	18853	0.012	4	18853	0.023
05:30 - 06:00	4	18853	0.015	4	18853	0.013	4	18853	0.028
06:00 - 06:30	4	18853	0.021	4	18853	0.021	4	18853	0.042
06:30 - 07:00	4	18853	0.032	4	18853	0.019	4	18853	0.051
07:00 - 07:30	14	9900	0.051	14	9900	0.040	14	9900	0.091
07:30 - 08:00	15	9290	0.146	15	9290	0.027	15	9290	0.173
08:00 - 08:30	15	9290	0.073	15	9290	0.027	15	9290	0.100
08:30 - 09:00	15	9290	0.083	15	9290	0.037	15	9290	0.120
09:00 - 09:30	15	9290	0.060	15	9290	0.041	15	9290	0.101
09:30 - 10:00	15	9290	0.053	15	9290	0.034	15	9290	0.087
10:00 - 10:30	15	9290	0.039	15	9290	0.044	15	9290	0.083
10:30 - 11:00	15	9290	0.043	15	9290	0.040	15	9290	0.083
11:00 - 11:30	15	9290	0.041	15	9290	0.037	15	9290	0.078
11:30 - 12:00	15	9290	0.035	15	9290	0.039	15	9290	0.074
12:00 - 12:30	15	9290	0.038	15	9290	0.043	15	9290	0.081
12:30 - 13:00	15	9290	0.037	15	9290	0.052	15	9290	0.089
13:00 - 13:30	15	9290	0.070	15	9290	0.061	15	9290	0.131
13:30 - 14:00	15	9290	0.056	15	9290	0.056	15	9290	0.112
14:00 - 14:30	15	9290	0.039	15	9290	0.049	15	9290	0.088
14:30 - 15:00	15	9290	0.052	15	9290	0.047	15	9290	0.099
15:00 - 15:30	15	9290	0.039	15	9290	0.052	15	9290	0.091
15:30 - 16:00	15	9290	0.032	15	9290	0.045	15	9290	0.077
16:00 - 16:30	15	9290	0.042	15	9290	0.050	15	9290	0.092
16:30 - 17:00	15	9290	0.028	15	9290	0.114	15	9290	0.142
17:00 - 17:30	15	9290	0.022	15	9290	0.074	15	9290	0.096
17:30 - 18:00	15	9290	0.011	15	9290	0.055	15	9290	0.066
18:00 - 18:30	14	9846	0.014	14	9846	0.036	14	9846	0.050
18:30 - 19:00	14	9846	0.039	14	9846	0.051	14	9846	0.090
19:00 - 19:30	4	18853	0.020	4	18853	0.016	4	18853	0.036
19:30 - 20:00	4	18853	0.008	4	18853	0.011	4	18853	0.019
20:00 - 20:30	4	18853	0.008	4	18853	0.013	4	18853	0.021
20:30 - 21:00	4	18853	0.019	4	18853	0.016	4	18853	0.035
21:00 - 21:30	1	22270	0.018	1	22270	0.009	1	22270	0.027
21:30 - 22:00	1	22270	0.013	1	22270	0.009	1	22270	0.022
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
<b>Total Rates:</b>			1.308			1.290			2.598

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

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#### Parameter summary

Trip rate parameter range selected:	190 - 50000 (units: sqm)
Survey date date range:	01/01/11 - 03/04/19
Number of weekdays (Monday-Friday):	15
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

*This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.*

Calculation Reference: AUDIT-638801-200303-0335

## TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL  
 Category : D - AFFORDABLE/LOCAL AUTHORITY FLATS  
 VEHICLES

Selected regions and areas:

05	EAST MIDLANDS	
	LN LINCOLNSHIRE	1 days
06	WEST MIDLANDS	
	WO WORCESTERSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	1 days
11	SCOTLAND	
	DU DUNDEE CITY	1 days
12	CONNAUGHT	
	RO ROSCOMMON	1 days
17	ULSTER (NORTHERN IRELAND)	
	AN ANTRIM	1 days
	DO DOWN	1 days

*This section displays the number of survey days per TRICS® sub-region in the selected set*

## Secondary Filtering selection:

*This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.*

Parameter: Number of dwellings  
 Actual Range: 12 to 56 (units: )  
 Range Selected by User: 10 to 132 (units: )

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/11 to 07/10/16

*This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.*

Selected survey days:

Wednesday	2 days
Thursday	5 days
Friday	1 days

*This data displays the number of selected surveys by day of the week.*

Selected survey types:

Manual count	8 days
Directional ATC Count	0 days

*This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.*

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	1
Neighbourhood Centre (PPS6 Local Centre)	1

*This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.*

Selected Location Sub Categories:

Residential Zone	8
------------------	---

*This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.*

Secondary Filtering selection:

Use Class:

C3 8 days

*This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.*

Population within 1 mile:

1,001 to 5,000	5 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days
25,001 to 50,000	1 days

*This data displays the number of selected surveys within stated 1-mile radii of population.*

Population within 5 miles:

5,000 or Less	1 days
5,001 to 25,000	2 days
25,001 to 50,000	2 days
100,001 to 125,000	1 days
125,001 to 250,000	2 days

*This data displays the number of selected surveys within stated 5-mile radii of population.*

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	5 days

*This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.*

Travel Plan:

No 8 days

*This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.*

PTAL Rating:

No PTAL Present 8 days

*This data displays the number of selected surveys with PTAL Ratings.*



LIST OF SITES relevant to selection parameters

1	AN-03-D-03 BELFAST ROAD CARRICKFERGUS WEST DIVISION Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 37 Survey date: WEDNESDAY 07/12/11	FLATS & BUNGALOWS	ANTRIM	Survey Type: MANUAL
2	CH-03-D-01 HEATH LANE CHESTER BOUGHTON HEATH Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 30 Survey date: THURSDAY 24/05/12	BLOCK OF FLATS	CHESHIRE	Survey Type: MANUAL
3	DO-03-D-01 CHURCH STREET NEWTOWNARDS  Edge of Town Centre Residential Zone Total Number of dwellings: 20 Survey date: THURSDAY 17/11/11	BLOCK OF FLATS	DOWN	Survey Type: MANUAL
4	DU-03-D-01 JUBILEE PARK NEAR DUNDEE LETHAM Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 17 Survey date: FRIDAY 06/05/11	FLATS IN HOUSES	DUNDEE CITY	Survey Type: MANUAL
5	LN-03-D-02 ADDISON DRIVE LINCOLN  Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 22 Survey date: WEDNESDAY 01/07/15	FLATS	LINCOLNSHIRE	Survey Type: MANUAL
6	RO-03-D-01 CIRCULAR ROAD BALLAGHADEREEN  Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 12 Survey date: THURSDAY 14/07/11	FLATS	ROSCOMMON	Survey Type: MANUAL
7	WO-03-D-02 CRANHAM DRIVE WORCESTER  Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total Number of dwellings: 18 Survey date: THURSDAY 22/05/14	BLOCKS OF FLATS	WORCESTERSHIRE	Survey Type: MANUAL
8	WY-03-D-03 CARR STREET HECKMONDWIKE LIVERSEDGE Edge of Town Residential Zone Total Number of dwellings: 56 Survey date: THURSDAY 01/05/14	BLOCK OF FLATS	WEST YORKSHIRE	Survey Type: MANUAL

*This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	8	27	0.042	8	27	0.075	8	27	0.117
08:00 - 09:00	8	27	0.137	8	27	0.151	8	27	0.288
09:00 - 10:00	8	27	0.137	8	27	0.151	8	27	0.288
10:00 - 11:00	8	27	0.160	8	27	0.198	8	27	0.358
11:00 - 12:00	8	27	0.118	8	27	0.127	8	27	0.245
12:00 - 13:00	8	27	0.179	8	27	0.137	8	27	0.316
13:00 - 14:00	8	27	0.146	8	27	0.127	8	27	0.273
14:00 - 15:00	8	27	0.184	8	27	0.170	8	27	0.354
15:00 - 16:00	8	27	0.123	8	27	0.123	8	27	0.246
16:00 - 17:00	8	27	0.108	8	27	0.066	8	27	0.174
17:00 - 18:00	8	27	0.160	8	27	0.137	8	27	0.297
18:00 - 19:00	8	27	0.123	8	27	0.132	8	27	0.255
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			1.617			1.594			3.211

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

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#### Parameter summary

Trip rate parameter range selected:	12 - 56 (units: )
Survey date range:	01/01/11 - 07/10/16
Number of weekdays (Monday-Friday):	8
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.



APPENDIX C  
PICADY Output Files

<b>Junctions 9</b>
<b>PICADY 9 - Priority Intersection Module</b>
Version: 9.0.0.4211 [] © Copyright TRL Limited, 2020
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: <a href="http://www.trlsoftware.co.uk">http://www.trlsoftware.co.uk</a>
<b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>

**Filename:** Proposed Development.j9

**Path:** G:\2020\p200042\calcs\picady

**Report generation date:** 11/03/2020 14:59:49

- 
- »Proposed Development - 2021, AM
  - »Proposed Development - 2021, PM
  - »Proposed Development - 2026, AM
  - »Proposed Development - 2026, PM
  - »Proposed Development - 2036, AM
  - »Proposed Development - 2036, PM



## Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>Proposed Development - 2021</b>								
Stream B-ACD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream A-BCD	0.0	5.16	0.00	A	0.0	5.86	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.47	0.00	A	0.0	4.48	0.00	A
Stream C-D								
Stream C-A								
<b>Proposed Development - 2026</b>								
Stream B-ACD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream A-BCD	0.0	5.13	0.00	A	0.0	5.88	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.46	0.00	A	0.0	4.42	0.00	A
Stream C-D								
Stream C-A								
<b>Proposed Development - 2036</b>								
Stream B-ACD	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream A-BCD	0.0	5.09	0.00	A	0.0	5.90	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.45	0.00	A	0.0	4.35	0.00	A
Stream C-D								
Stream C-A								

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

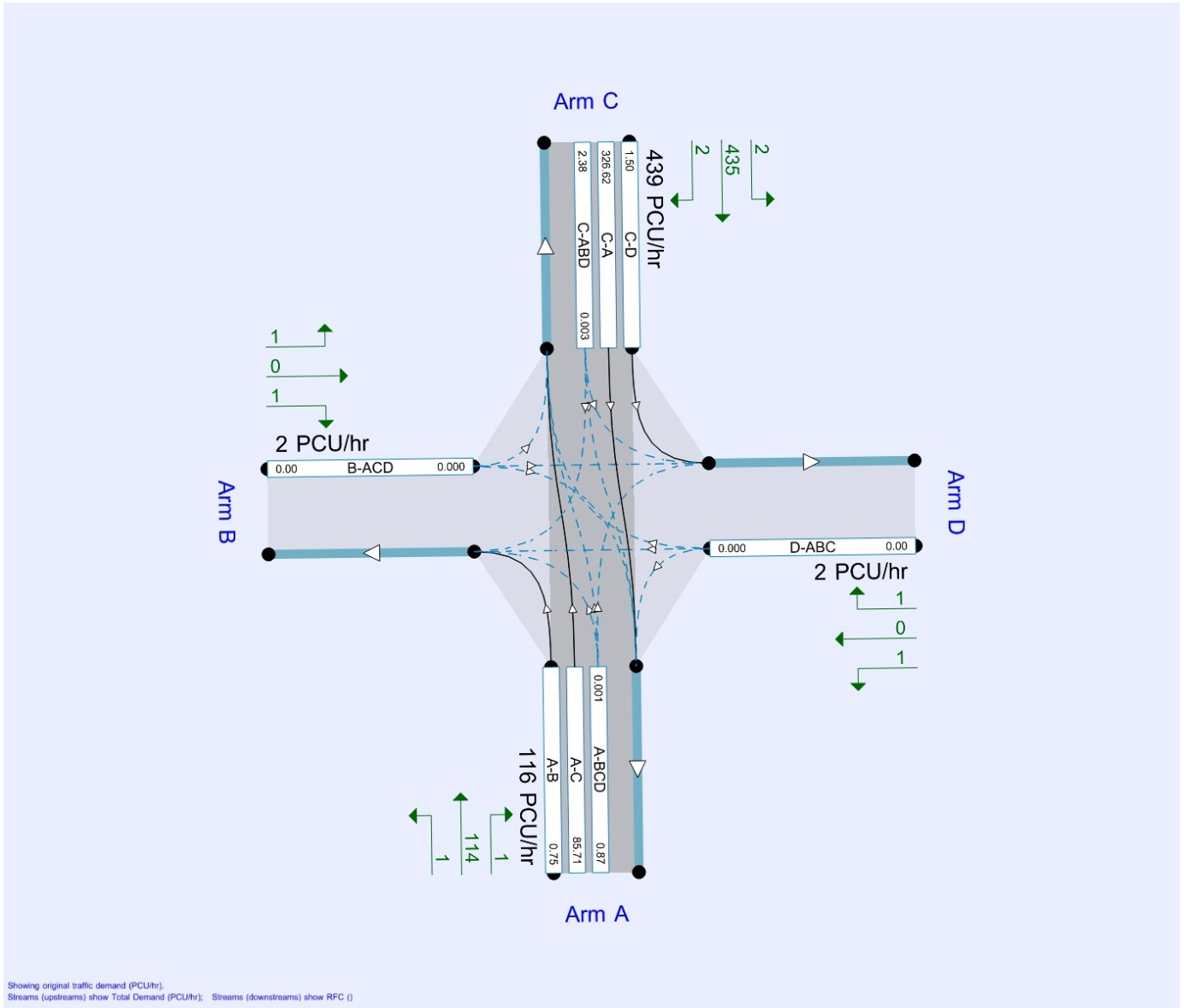
## File summary

### File Description

<b>Title</b>	(untitled)
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	05/03/2020
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	HEADOFFICE"GARVEYD
<b>Description</b>	

## 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	AM	ONE HOUR	08:00	09:30	15
2021	PM	ONE HOUR	17:00	18:30	15
2026	AM	ONE HOUR	08:00	09:30	15
2026	PM	ONE HOUR	17:00	18:30	15
2036	AM	ONE HOUR	08:00	09:30	15
2036	PM	ONE HOUR	17:00	18:30	15

# Proposed Development - 2021, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.05	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
D	untitled		Minor

## 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)
A	6.00			120.0	✓	0.00
C	6.00			120.0	✓	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	2.25	45	45
D	One lane	2.90	35	35

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
1	A-D	643.457	-	-	-	-	-	-	0.249	0.356	0.249	-	-	-
1	B-A	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	-	0.219	0.219	0.110
1	B-C	603.288	0.092	0.234	-	-	-	-	-	-	-	-	-	-
1	B-D, nearside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	B-D, offside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	C-B	643.457	0.249	0.249	0.356	-	-	-	-	-	-	-	-	-
1	D-A	639.503	-	-	-	-	-	-	0.248	-	0.098	-	-	-
1	D-B, nearside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-B, offside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-C	501.076	-	0.145	0.330	0.115	0.231	0.231	0.231	0.231	0.091	-	-	-

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	AM	ONE HOUR	08:00	09:30	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		✓	149.00	100.000
B		✓	3.00	100.000
C		✓	90.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	0.000	148.000	1.000
	B	1.000	0.000	2.000	0.000
	C	88.000	1.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

# Vehicle Mix

## Heavy Vehicle proportion

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

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.16	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	5.47	0.0	A
C-D				
C-A				

## 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-ACD	0.00	469.28	0.000	0.00	0.0	0.000	A
A-BCD	0.89	698.86	0.001	0.89	0.0	5.157	A
A-B	0.00			0.00			
A-C	111.28			111.28			
D-ABC	0.00	500.01	0.000	0.00	0.0	0.000	A
C-ABD	0.84	659.45	0.001	0.83	0.0	5.465	A
C-D	0.75			0.75			
C-A	66.17			66.17			



**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-ACD	0.00	462.86	0.000	0.00	0.0	0.000	A
A-BCD	1.10	709.73	0.002	1.10	0.0	5.079	A
A-B	0.00			0.00			
A-C	132.85			132.85			
D-ABC	0.00	494.20	0.000	0.00	0.0	0.000	A
C-ABD	1.02	662.76	0.002	1.02	0.0	5.439	A
C-D	0.90			0.90			
C-A	78.99			78.99			

**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-ACD	0.00	453.96	0.000	0.00	0.0	0.000	A
A-BCD	1.41	724.78	0.002	1.41	0.0	4.976	A
A-B	0.00			0.00			
A-C	162.64			162.64			
D-ABC	0.00	486.16	0.000	0.00	0.0	0.000	A
C-ABD	1.29	667.45	0.002	1.29	0.0	5.403	A
C-D	1.10			1.10			
C-A	96.71			96.71			

**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-ACD	0.00	453.96	0.000	0.00	0.0	0.000	A
A-BCD	1.41	724.78	0.002	1.41	0.0	4.976	A
A-B	0.00			0.00			
A-C	162.64			162.64			
D-ABC	0.00	486.16	0.000	0.00	0.0	0.000	A
C-ABD	1.29	667.45	0.002	1.29	0.0	5.405	A
C-D	1.10			1.10			
C-A	96.71			96.71			

**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-ACD	0.00	462.86	0.000	0.00	0.0	0.000	A
A-BCD	1.10	709.73	0.002	1.10	0.0	5.081	A
A-B	0.00			0.00			
A-C	132.85			132.85			
D-ABC	0.00	494.20	0.000	0.00	0.0	0.000	A
C-ABD	1.02	662.76	0.002	1.02	0.0	5.439	A
C-D	0.90			0.90			
C-A	78.99			78.99			

**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-ACD	0.00	469.28	0.000	0.00	0.0	0.000	A
A-BCD	0.89	698.86	0.001	0.89	0.0	5.159	A
A-B	0.00			0.00			
A-C	111.28			111.28			
D-ABC	0.00	500.00	0.000	0.00	0.0	0.000	A
C-ABD	0.84	659.45	0.001	0.84	0.0	5.467	A
C-D	0.75			0.75			
C-A	66.17			66.17			

# Proposed Development - 2021, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.04	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	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		✓	100.00	100.000
B		✓	2.00	100.000
C		✓	379.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	1.000	98.000	1.000
	B	1.000	0.000	1.000	0.000
	C	375.000	2.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.86	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	4.48	0.0	A
C-D				
C-A				

## 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-ACD	0.00	451.87	0.000	0.00	0.0	0.000	A
A-BCD	0.85	622.92	0.001	0.85	0.0	5.786	A
A-B	0.75			0.75			
A-C	73.68			73.68			
D-ABC	0.00	453.29	0.000	0.00	0.0	0.000	A
C-ABD	2.25	806.05	0.003	2.24	0.0	4.478	A
C-D	1.50			1.50			
C-A	281.58			281.58			

### 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-ACD	0.00	441.92	0.000	0.00	0.0	0.000	A
A-BCD	1.05	619.57	0.002	1.05	0.0	5.819	A
A-B	0.90			0.90			
A-C	87.95			87.95			
D-ABC	0.00	438.39	0.000	0.00	0.0	0.000	A
C-ABD	2.88	836.52	0.003	2.88	0.0	4.318	A
C-D	1.79			1.79			
C-A	336.04			336.04			

### 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-ACD	0.00	428.05	0.000	0.00	0.0	0.000	A
A-BCD	1.33	615.27	0.002	1.33	0.0	5.863	A
A-B	1.10			1.10			
A-C	107.67			107.67			
D-ABC	0.00	417.77	0.000	0.00	0.0	0.000	A
C-ABD	3.87	877.64	0.004	3.86	0.0	4.119	A
C-D	2.19			2.19			
C-A	411.23			411.23			

### 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-ACD	0.00	428.05	0.000	0.00	0.0	0.000	A
A-BCD	1.33	615.27	0.002	1.33	0.0	5.865	A
A-B	1.10			1.10			
A-C	107.67			107.67			
D-ABC	0.00	417.77	0.000	0.00	0.0	0.000	A
C-ABD	3.87	877.64	0.004	3.87	0.0	4.121	A
C-D	2.19			2.19			
C-A	411.22			411.22			



**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-ACD	0.00	441.91	0.000	0.00	0.0	0.000	A
A-BCD	1.05	619.57	0.002	1.05	0.0	5.819	A
A-B	0.90			0.90			
A-C	87.95			87.95			
D-ABC	0.00	438.39	0.000	0.00	0.0	0.000	A
C-ABD	2.88	836.52	0.003	2.89	0.0	4.318	A
C-D	1.79			1.79			
C-A	336.04			336.04			

**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-ACD	0.00	451.87	0.000	0.00	0.0	0.000	A
A-BCD	0.85	622.91	0.001	0.86	0.0	5.788	A
A-B	0.75			0.75			
A-C	73.68			73.68			
D-ABC	0.00	453.28	0.000	0.00	0.0	0.000	A
C-ABD	2.25	806.05	0.003	2.26	0.0	4.480	A
C-D	1.50			1.50			
C-A	281.58			281.58			

# Proposed Development - 2026, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.05	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	AM	ONE HOUR	08:00	09:30	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		✓	160.00	100.000
B		✓	3.00	100.000
C		✓	97.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	0.000	159.000	1.000
	B	1.000	0.000	2.000	0.000
	C	95.000	1.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.13	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	5.46	0.0	A
C-D				
C-A				

## 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-ACD	0.00	466.81	0.000	0.00	0.0	0.000	A
A-BCD	0.90	702.98	0.001	0.90	0.0	5.127	A
A-B	0.00			0.00			
A-C	119.55			119.55			
D-ABC	0.00	497.74	0.000	0.00	0.0	0.000	A
C-ABD	0.84	660.92	0.001	0.84	0.0	5.453	A
C-D	0.75			0.75			
C-A	71.43			71.43			

### 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-ACD	0.00	459.90	0.000	0.00	0.0	0.000	A
A-BCD	1.12	714.65	0.002	1.12	0.0	5.044	A
A-B	0.00			0.00			
A-C	142.72			142.72			
D-ABC	0.00	491.49	0.000	0.00	0.0	0.000	A
C-ABD	1.03	664.55	0.002	1.03	0.0	5.425	A
C-D	0.90			0.90			
C-A	85.27			85.27			

### 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-ACD	0.00	450.34	0.000	0.00	0.0	0.000	A
A-BCD	1.43	730.81	0.002	1.43	0.0	4.935	A
A-B	0.00			0.00			
A-C	174.73			174.73			
D-ABC	0.00	482.82	0.000	0.00	0.0	0.000	A
C-ABD	1.30	669.69	0.002	1.30	0.0	5.385	A
C-D	1.10			1.10			
C-A	104.40			104.40			

### 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-ACD	0.00	450.34	0.000	0.00	0.0	0.000	A
A-BCD	1.43	730.81	0.002	1.43	0.0	4.937	A
A-B	0.00			0.00			
A-C	174.73			174.73			
D-ABC	0.00	482.82	0.000	0.00	0.0	0.000	A
C-ABD	1.30	669.69	0.002	1.30	0.0	5.387	A
C-D	1.10			1.10			
C-A	104.40			104.40			

**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-ACD	0.00	459.90	0.000	0.00	0.0	0.000	A
A-BCD	1.12	714.65	0.002	1.12	0.0	5.044	A
A-B	0.00			0.00			
A-C	142.72			142.72			
D-ABC	0.00	491.48	0.000	0.00	0.0	0.000	A
C-ABD	1.03	664.55	0.002	1.03	0.0	5.425	A
C-D	0.90			0.90			
C-A	85.27			85.27			

**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-ACD	0.00	466.81	0.000	0.00	0.0	0.000	A
A-BCD	0.90	702.97	0.001	0.91	0.0	5.129	A
A-B	0.00			0.00			
A-C	119.55			119.55			
D-ABC	0.00	497.73	0.000	0.00	0.0	0.000	A
C-ABD	0.84	660.92	0.001	0.85	0.0	5.455	A
C-D	0.75			0.75			
C-A	71.43			71.43			



# Proposed Development - 2026, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.04	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	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		✓	107.00	100.000
B		✓	2.00	100.000
C		✓	406.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To				
	A	B	C	D	
From	A	0.000	1.000	105.000	1.000
	B	1.000	0.000	1.000	0.000
	C	402.000	2.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.88	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	4.42	0.0	A
C-D				
C-A				

## 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-ACD	0.00	448.25	0.000	0.00	0.0	0.000	A
A-BCD	0.86	621.65	0.001	0.86	0.0	5.798	A
A-B	0.75			0.75			
A-C	78.94			78.94			
D-ABC	0.00	447.82	0.000	0.00	0.0	0.000	A
C-ABD	2.31	817.38	0.003	2.30	0.0	4.416	A
C-D	1.50			1.50			
C-A	301.85			301.85			

### 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-ACD	0.00	437.56	0.000	0.00	0.0	0.000	A
A-BCD	1.06	618.15	0.002	1.06	0.0	5.833	A
A-B	0.90			0.90			
A-C	94.23			94.23			
D-ABC	0.00	431.86	0.000	0.00	0.0	0.000	A
C-ABD	2.97	849.79	0.003	2.97	0.0	4.250	A
C-D	1.79			1.79			
C-A	360.22			360.22			

### 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-ACD	0.00	422.68	0.000	0.00	0.0	0.000	A
A-BCD	1.35	613.68	0.002	1.35	0.0	5.878	A
A-B	1.10			1.10			
A-C	115.36			115.36			
D-ABC	0.00	409.76	0.000	0.00	0.0	0.000	A
C-ABD	4.00	893.38	0.004	4.00	0.0	4.047	A
C-D	2.19			2.19			
C-A	440.82			440.82			

### 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-ACD	0.00	422.68	0.000	0.00	0.0	0.000	A
A-BCD	1.35	613.68	0.002	1.35	0.0	5.878	A
A-B	1.10			1.10			
A-C	115.36			115.36			
D-ABC	0.00	409.75	0.000	0.00	0.0	0.000	A
C-ABD	4.00	893.38	0.004	4.00	0.0	4.047	A
C-D	2.19			2.19			
C-A	440.82			440.82			

**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-ACD	0.00	437.56	0.000	0.00	0.0	0.000	A
A-BCD	1.06	618.15	0.002	1.06	0.0	5.835	A
A-B	0.90			0.90			
A-C	94.23			94.23			
D-ABC	0.00	431.86	0.000	0.00	0.0	0.000	A
C-ABD	2.97	849.79	0.004	2.98	0.0	4.250	A
C-D	1.79			1.79			
C-A	360.22			360.22			

**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-ACD	0.00	448.25	0.000	0.00	0.0	0.000	A
A-BCD	0.86	621.65	0.001	0.86	0.0	5.798	A
A-B	0.75			0.75			
A-C	78.94			78.94			
D-ABC	0.00	447.82	0.000	0.00	0.0	0.000	A
C-ABD	2.31	817.39	0.003	2.32	0.0	4.416	A
C-D	1.50			1.50			
C-A	301.84			301.84			

# Proposed Development - 2036, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.05	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	AM	ONE HOUR	08:00	09:30	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		✓	173.00	100.000
B		✓	3.00	100.000
C		✓	104.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	0.000	172.000	1.000
	B	1.000	0.000	2.000	0.000
	C	102.000	1.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.09	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	5.45	0.0	A
C-D				
C-A				

## 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-ACD	0.00	464.01	0.000	0.00	0.0	0.000	A
A-BCD	0.92	708.06	0.001	0.91	0.0	5.090	A
A-B	0.00			0.00			
A-C	129.33			129.33			
D-ABC	0.00	495.28	0.000	0.00	0.0	0.000	A
C-ABD	0.85	662.04	0.001	0.85	0.0	5.444	A
C-D	0.75			0.75			
C-A	76.69			76.69			

### 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-ACD	0.00	456.55	0.000	0.00	0.0	0.000	A
A-BCD	1.14	720.73	0.002	1.13	0.0	5.002	A
A-B	0.00			0.00			
A-C	154.39			154.39			
D-ABC	0.00	488.54	0.000	0.00	0.0	0.000	A
C-ABD	1.04	665.93	0.002	1.04	0.0	5.413	A
C-D	0.90			0.90			
C-A	91.55			91.55			

### 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-ACD	0.00	446.23	0.000	0.00	0.0	0.000	A
A-BCD	1.46	738.25	0.002	1.46	0.0	4.885	A
A-B	0.00			0.00			
A-C	189.01			189.01			
D-ABC	0.00	479.21	0.000	0.00	0.0	0.000	A
C-ABD	1.32	671.43	0.002	1.32	0.0	5.371	A
C-D	1.10			1.10			
C-A	112.09			112.09			

### 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-ACD	0.00	446.23	0.000	0.00	0.0	0.000	A
A-BCD	1.46	738.25	0.002	1.46	0.0	4.885	A
A-B	0.00			0.00			
A-C	189.01			189.01			
D-ABC	0.00	479.21	0.000	0.00	0.0	0.000	A
C-ABD	1.32	671.43	0.002	1.32	0.0	5.373	A
C-D	1.10			1.10			
C-A	112.09			112.09			

**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-ACD	0.00	456.55	0.000	0.00	0.0	0.000	A
A-BCD	1.14	720.73	0.002	1.14	0.0	5.004	A
A-B	0.00			0.00			
A-C	154.39			154.39			
D-ABC	0.00	488.54	0.000	0.00	0.0	0.000	A
C-ABD	1.04	665.93	0.002	1.04	0.0	5.416	A
C-D	0.90			0.90			
C-A	91.55			91.55			

**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-ACD	0.00	464.00	0.000	0.00	0.0	0.000	A
A-BCD	0.92	708.06	0.001	0.92	0.0	5.090	A
A-B	0.00			0.00			
A-C	129.33			129.33			
D-ABC	0.00	495.27	0.000	0.00	0.0	0.000	A
C-ABD	0.85	662.04	0.001	0.85	0.0	5.446	A
C-D	0.75			0.75			
C-A	76.69			76.69			

# Proposed Development - 2036, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Development	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.04	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	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		✓	116.00	100.000
B		✓	2.00	100.000
C		✓	439.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	1.000	114.000	1.000
	B	1.000	0.000	1.000	0.000
	C	435.000	2.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.00	0.00	0.0	A
A-BCD	0.00	5.90	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.00	4.35	0.0	A
C-D				
C-A				

## 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-ACD	0.00	443.74	0.000	0.00	0.0	0.000	A
A-BCD	0.87	620.37	0.001	0.87	0.0	5.810	A
A-B	0.75			0.75			
A-C	85.71			85.71			
D-ABC	0.00	441.10	0.000	0.00	0.0	0.000	A
C-ABD	2.38	831.07	0.003	2.37	0.0	4.343	A
C-D	1.50			1.50			
C-A	326.62			326.62			

### 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-ACD	0.00	432.14	0.000	0.00	0.0	0.000	A
A-BCD	1.08	616.73	0.002	1.08	0.0	5.846	A
A-B	0.90			0.90			
A-C	102.31			102.31			
D-ABC	0.00	423.82	0.000	0.00	0.0	0.000	A
C-ABD	3.08	865.76	0.004	3.07	0.0	4.172	A
C-D	1.79			1.79			
C-A	389.78			389.78			

### 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-ACD	0.00	415.97	0.000	0.00	0.0	0.000	A
A-BCD	1.38	612.15	0.002	1.38	0.0	5.893	A
A-B	1.10			1.10			
A-C	125.24			125.24			
D-ABC	0.00	399.89	0.000	0.00	0.0	0.000	A
C-ABD	4.17	912.23	0.005	4.17	0.0	3.964	A
C-D	2.19			2.19			
C-A	476.98			476.98			

### 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-ACD	0.00	415.97	0.000	0.00	0.0	0.000	A
A-BCD	1.38	612.15	0.002	1.38	0.0	5.895	A
A-B	1.10			1.10			
A-C	125.24			125.24			
D-ABC	0.00	399.88	0.000	0.00	0.0	0.000	A
C-ABD	4.17	912.24	0.005	4.17	0.0	3.965	A
C-D	2.19			2.19			
C-A	476.98			476.98			



**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-ACD	0.00	432.14	0.000	0.00	0.0	0.000	A
A-BCD	1.08	616.73	0.002	1.08	0.0	5.846	A
A-B	0.90			0.90			
A-C	102.31			102.31			
D-ABC	0.00	423.82	0.000	0.00	0.0	0.000	A
C-ABD	3.08	865.77	0.004	3.08	0.0	4.174	A
C-D	1.79			1.79			
C-A	389.78			389.78			

**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-ACD	0.00	443.73	0.000	0.00	0.0	0.000	A
A-BCD	0.87	620.36	0.001	0.88	0.0	5.810	A
A-B	0.75			0.75			
A-C	85.71			85.71			
D-ABC	0.00	441.09	0.000	0.00	0.0	0.000	A
C-ABD	2.39	831.07	0.003	2.39	0.0	4.345	A
C-D	1.50			1.50			
C-A	326.61			326.61			

<b>Junctions 9</b>
<b>PICADY 9 - Priority Intersection Module</b>
Version: 9.0.0.4211 [] © Copyright TRL Limited, 2020
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**Filename:** SA 1.j9  
**Path:** G:\2020\p200042\calcs\picady  
**Report generation date:** 09/03/2020 11:10:42

- »SA 1 - 2026, AM
- »SA 1 - 2026, PM
- »SA 1 - 2036, AM
- »SA 1 - 2036, PM

### Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
<b>SA 1 - 2026</b>								
Stream B-ACD	0.0	6.85	0.01	A	0.0	8.12	0.02	A
Stream A-BCD	0.0	5.13	0.00	A	0.0	5.88	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.49	0.01	A	0.0	4.42	0.01	A
Stream C-D								
Stream C-A								
<b>SA 1 - 2036</b>								
Stream B-ACD	0.0	6.89	0.01	A	0.0	8.23	0.02	A
Stream A-BCD	0.0	5.09	0.00	A	0.0	5.90	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.48	0.01	A	0.0	4.35	0.01	A
Stream C-D								
Stream C-A								

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

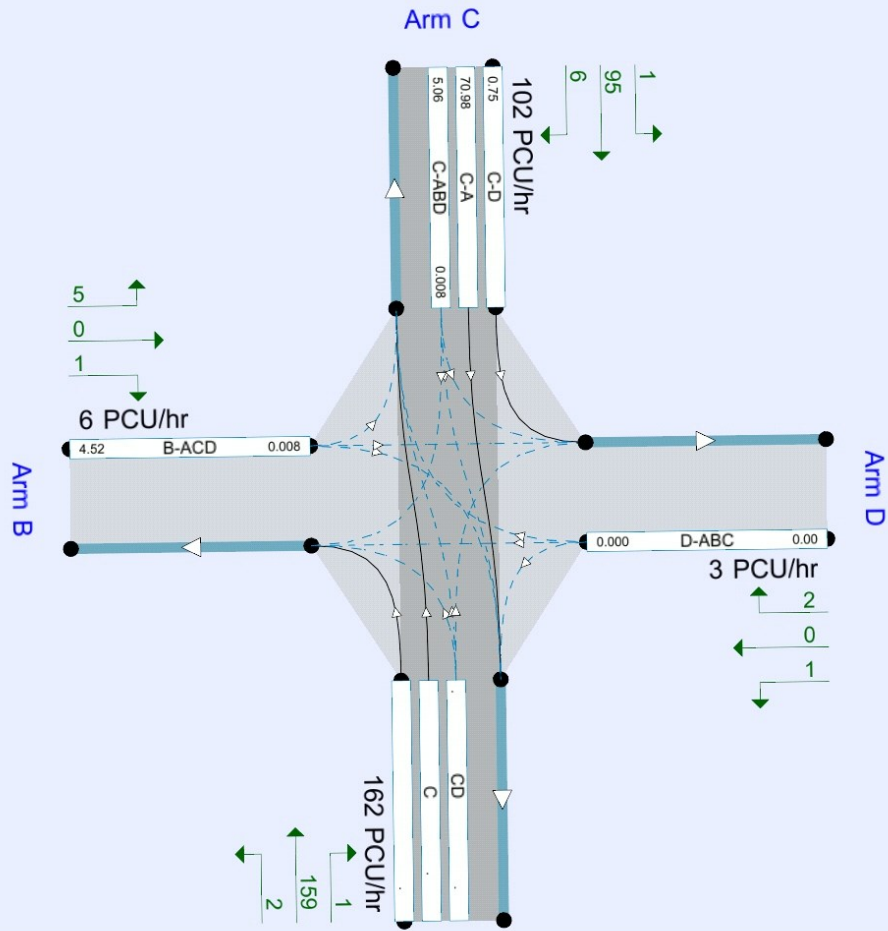
## File summary

### File Description

<b>Title</b>	(untitled)
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	05/03/2020
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	HEADOFFICE"GARVEYD
<b>Description</b>	

## 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)
2026	AM	ONE HOUR	08:00	09:30	15
2026	PM	ONE HOUR	17:00	18:30	15
2036	AM	ONE HOUR	08:00	09:30	15
2036	PM	ONE HOUR	17:00	18:30	15

# SA 1 - 2026, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 1	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.32	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
D	untitled		Minor

## 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)
A	6.00			120.0	✓	0.00
C	6.00			120.0	✓	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	2.25	45	45
D	One lane	2.90	35	35

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
1	A-D	643.457	-	-	-	-	-	-	0.249	0.356	0.249	-	-	-
1	B-A	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	-	0.219	0.219	0.110
1	B-C	603.288	0.092	0.234	-	-	-	-	-	-	-	-	-	-
1	B-D, nearside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	B-D, offside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	C-B	643.457	0.249	0.249	0.356	-	-	-	-	-	-	-	-	-
1	D-A	639.503	-	-	-	-	-	-	0.248	-	0.098	-	-	-
1	D-B, nearside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-B, offside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-C	501.076	-	0.145	0.330	0.115	0.231	0.231	0.231	0.231	0.091	-	-	-

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	2026	AM	ONE HOUR	08:00	09:30	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		✓	162.00	100.000
B		✓	6.00	100.000
C		✓	102.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	2.000	159.000	1.000
	B	1.000	0.000	5.000	0.000
	C	95.000	6.000	0.000	1.000
	D	1.000	0.000	2.000	0.000



# Vehicle Mix

## Heavy Vehicle proportion

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

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	6.85	0.0	A
A-BCD	0.00	5.13	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	5.49	0.0	A
C-D				
C-A				

## 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-ACD	4.52	546.63	0.008	4.48	0.0	6.639	A
A-BCD	0.91	702.70	0.001	0.90	0.0	5.129	A
A-B	1.50			1.50			
A-C	119.55			119.55			
D-ABC	0.00	496.60	0.000	0.00	0.0	0.000	A
C-ABD	5.06	660.56	0.008	5.03	0.0	5.491	A
C-D	0.75			0.75			
C-A	70.98			70.98			

**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-ACD	5.39	540.61	0.010	5.39	0.0	6.725	A
A-BCD	1.12	714.33	0.002	1.12	0.0	5.047	A
A-B	1.80			1.80			
A-C	142.72			142.72			
D-ABC	0.00	490.11	0.000	0.00	0.0	0.000	A
C-ABD	6.19	664.12	0.009	6.18	0.0	5.471	A
C-D	0.89			0.89			
C-A	84.62			84.62			

**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-ACD	6.61	532.27	0.012	6.60	0.0	6.847	A
A-BCD	1.44	730.44	0.002	1.44	0.0	4.937	A
A-B	2.20			2.20			
A-C	174.73			174.73			
D-ABC	0.00	481.14	0.000	0.00	0.0	0.000	A
C-ABD	7.82	669.17	0.012	7.81	0.0	5.442	A
C-D	1.09			1.09			
C-A	103.39			103.39			

**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-ACD	6.61	532.27	0.012	6.61	0.0	6.847	A
A-BCD	1.44	730.44	0.002	1.44	0.0	4.937	A
A-B	2.20			2.20			
A-C	174.73			174.73			
D-ABC	0.00	481.13	0.000	0.00	0.0	0.000	A
C-ABD	7.82	669.18	0.012	7.82	0.0	5.445	A
C-D	1.09			1.09			
C-A	103.39			103.39			

**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-ACD	5.39	540.61	0.010	5.40	0.0	6.728	A
A-BCD	1.12	714.32	0.002	1.12	0.0	5.047	A
A-B	1.80			1.80			
A-C	142.72			142.72			
D-ABC	0.00	490.11	0.000	0.00	0.0	0.000	A
C-ABD	6.19	664.13	0.009	6.20	0.0	5.471	A
C-D	0.89			0.89			
C-A	84.61			84.61			

**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>B-ACD</b>	4.52	546.62	0.008	4.52	0.0	6.642	A
<b>A-BCD</b>	0.91	702.68	0.001	0.91	0.0	5.131	A
<b>A-B</b>	1.50			1.50			
<b>A-C</b>	119.55			119.55			
<b>D-ABC</b>	0.00	496.59	0.000	0.00	0.0	0.000	A
<b>C-ABD</b>	5.07	660.56	0.008	5.08	0.0	5.493	A
<b>C-D</b>	0.75			0.75			
<b>C-A</b>	70.98			70.98			

# SA 1 - 2026, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 1	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.17	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	2026	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		✓	107.00	100.000
B		✓	7.00	100.000
C		✓	407.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	1.000	105.000	1.000
	B	4.000	0.000	3.000	0.000
	C	402.000	3.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.02	8.12	0.0	A
A-BCD	0.00	5.88	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	4.42	0.0	A
C-D				
C-A				

## 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-ACD	5.27	474.56	0.011	5.23	0.0	7.670	A
A-BCD	0.86	621.39	0.001	0.86	0.0	5.800	A
A-B	0.75			0.75			
A-C	78.94			78.94			
D-ABC	0.00	447.43	0.000	0.00	0.0	0.000	A
C-ABD	3.46	817.38	0.004	3.44	0.0	4.422	A
C-D	1.50			1.50			
C-A	301.45			301.45			

### 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-ACD	6.29	464.82	0.014	6.28	0.0	7.850	A
A-BCD	1.06	617.84	0.002	1.06	0.0	5.836	A
A-B	0.90			0.90			
A-C	94.23			94.23			
D-ABC	0.00	431.38	0.000	0.00	0.0	0.000	A
C-ABD	4.45	849.79	0.005	4.45	0.0	4.258	A
C-D	1.79			1.79			
C-A	359.64			359.64			

### 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-ACD	7.71	451.19	0.017	7.69	0.0	8.117	A
A-BCD	1.35	613.31	0.002	1.35	0.0	5.882	A
A-B	1.10			1.10			
A-C	115.36			115.36			
D-ABC	0.00	409.16	0.000	0.00	0.0	0.000	A
C-ABD	6.00	893.38	0.007	6.00	0.0	4.056	A
C-D	2.19			2.19			
C-A	439.92			439.92			

### 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-ACD	7.71	451.19	0.017	7.71	0.0	8.117	A
A-BCD	1.35	613.31	0.002	1.35	0.0	5.882	A
A-B	1.10			1.10			
A-C	115.36			115.36			
D-ABC	0.00	409.16	0.000	0.00	0.0	0.000	A
C-ABD	6.01	893.38	0.007	6.01	0.0	4.058	A
C-D	2.19			2.19			
C-A	439.92			439.92			



**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-ACD	6.29	464.82	0.014	6.31	0.0	7.852	A
A-BCD	1.06	617.84	0.002	1.06	0.0	5.838	A
A-B	0.90			0.90			
A-C	94.23			94.23			
D-ABC	0.00	431.38	0.000	0.00	0.0	0.000	A
C-ABD	4.46	849.79	0.005	4.46	0.0	4.260	A
C-D	1.79			1.79			
C-A	359.64			359.64			

**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-ACD	5.27	474.55	0.011	5.28	0.0	7.673	A
A-BCD	0.86	621.39	0.001	0.86	0.0	5.803	A
A-B	0.75			0.75			
A-C	78.94			78.94			
D-ABC	0.00	447.42	0.000	0.00	0.0	0.000	A
C-ABD	3.47	817.39	0.004	3.47	0.0	4.424	A
C-D	1.50			1.50			
C-A	301.44			301.44			

# SA 1 - 2036, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 1	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.30	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	2036	AM	ONE HOUR	08:00	09:30	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		✓	175.00	100.000
B		✓	6.00	100.000
C		✓	109.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	2.000	172.000	1.000
	B	1.000	0.000	5.000	0.000
	C	102.000	6.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	6.89	0.0	A
A-BCD	0.00	5.09	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	5.48	0.0	A
C-D				
C-A				

## 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-ACD	4.52	544.16	0.008	4.48	0.0	6.670	A
A-BCD	0.92	707.79	0.001	0.91	0.0	5.092	A
A-B	1.50			1.50			
A-C	129.33			129.33			
D-ABC	0.00	494.14	0.000	0.00	0.0	0.000	A
C-ABD	5.11	661.68	0.008	5.07	0.0	5.482	A
C-D	0.75			0.75			
C-A	76.21			76.21			

### 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-ACD	5.39	537.66	0.010	5.39	0.0	6.762	A
A-BCD	1.14	720.41	0.002	1.14	0.0	5.004	A
A-B	1.80			1.80			
A-C	154.39			154.39			
D-ABC	0.00	487.17	0.000	0.00	0.0	0.000	A
C-ABD	6.25	665.50	0.009	6.24	0.0	5.460	A
C-D	0.89			0.89			
C-A	90.85			90.85			

### 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-ACD	6.61	528.65	0.013	6.60	0.0	6.895	A
A-BCD	1.47	737.89	0.002	1.47	0.0	4.888	A
A-B	2.20			2.20			
A-C	189.01			189.01			
D-ABC	0.00	477.52	0.000	0.00	0.0	0.000	A
C-ABD	7.92	670.92	0.012	7.91	0.0	5.429	A
C-D	1.09			1.09			
C-A	111.00			111.00			

### 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-ACD	6.61	528.65	0.013	6.61	0.0	6.895	A
A-BCD	1.47	737.89	0.002	1.47	0.0	4.888	A
A-B	2.20			2.20			
A-C	189.01			189.01			
D-ABC	0.00	477.52	0.000	0.00	0.0	0.000	A
C-ABD	7.92	670.92	0.012	7.92	0.0	5.429	A
C-D	1.09			1.09			
C-A	111.00			111.00			

**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-ACD	5.39	537.66	0.010	5.40	0.0	6.763	A
A-BCD	1.14	720.41	0.002	1.14	0.0	5.006	A
A-B	1.80			1.80			
A-C	154.39			154.39			
D-ABC	0.00	487.16	0.000	0.00	0.0	0.000	A
C-ABD	6.25	665.50	0.009	6.27	0.0	5.462	A
C-D	0.89			0.89			
C-A	90.84			90.84			

**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-ACD	4.52	544.16	0.008	4.52	0.0	6.673	A
A-BCD	0.92	707.77	0.001	0.92	0.0	5.092	A
A-B	1.50			1.50			
A-C	129.33			129.33			
D-ABC	0.00	494.13	0.000	0.00	0.0	0.000	A
C-ABD	5.11	661.68	0.008	5.12	0.0	5.482	A
C-D	0.75			0.75			
C-A	76.20			76.20			

# SA 1 - 2036, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 1	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.16	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	2036	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		✓	116.00	100.000
B		✓	7.00	100.000
C		✓	440.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To				
	A	B	C	D	
From	A	0.000	1.000	114.000	1.000
	B	4.000	0.000	3.000	0.000
	C	435.000	3.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.02	8.23	0.0	A
A-BCD	0.00	5.90	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	4.35	0.0	A
C-D				
C-A				

## 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-ACD	5.27	470.45	0.011	5.23	0.0	7.738	A
A-BCD	0.87	620.11	0.001	0.87	0.0	5.812	A
A-B	0.75			0.75			
A-C	85.71			85.71			
D-ABC	0.00	440.70	0.000	0.00	0.0	0.000	A
C-ABD	3.57	831.07	0.004	3.55	0.0	4.350	A
C-D	1.50			1.50			
C-A	326.18			326.18			

### 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-ACD	6.29	459.86	0.014	6.28	0.0	7.936	A
A-BCD	1.08	616.43	0.002	1.08	0.0	5.849	A
A-B	0.90			0.90			
A-C	102.31			102.31			
D-ABC	0.00	423.34	0.000	0.00	0.0	0.000	A
C-ABD	4.62	865.77	0.005	4.61	0.0	4.180	A
C-D	1.79			1.79			
C-A	389.15			389.15			

### 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-ACD	7.71	445.02	0.017	7.69	0.0	8.231	A
A-BCD	1.38	611.78	0.002	1.38	0.0	5.897	A
A-B	1.10			1.10			
A-C	125.24			125.24			
D-ABC	0.00	399.29	0.000	0.00	0.0	0.000	A
C-ABD	6.26	912.24	0.007	6.25	0.0	3.973	A
C-D	2.19			2.19			
C-A	476.00			476.00			

### 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-ACD	7.71	445.02	0.017	7.71	0.0	8.231	A
A-BCD	1.38	611.78	0.002	1.38	0.0	5.899	A
A-B	1.10			1.10			
A-C	125.24			125.24			
D-ABC	0.00	399.29	0.000	0.00	0.0	0.000	A
C-ABD	6.26	912.24	0.007	6.26	0.0	3.973	A
C-D	2.19			2.19			
C-A	476.00			476.00			

**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-ACD	6.29	459.86	0.014	6.31	0.0	7.937	A
A-BCD	1.08	616.43	0.002	1.08	0.0	5.849	A
A-B	0.90			0.90			
A-C	102.31			102.31			
D-ABC	0.00	423.33	0.000	0.00	0.0	0.000	A
C-ABD	4.62	865.77	0.005	4.63	0.0	4.181	A
C-D	1.79			1.79			
C-A	389.14			389.14			

**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-ACD	5.27	470.44	0.011	5.28	0.0	7.739	A
A-BCD	0.87	620.11	0.001	0.88	0.0	5.815	A
A-B	0.75			0.75			
A-C	85.71			85.71			
D-ABC	0.00	440.69	0.000	0.00	0.0	0.000	A
C-ABD	3.58	831.07	0.004	3.58	0.0	4.350	A
C-D	1.50			1.50			
C-A	326.18			326.18			

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.0.0.4211 [] © Copyright TRL Limited, 2020
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**Filename:** SA 2.j9  
**Path:** G:\2020\p200042\calcs\picady  
**Report generation date:** 09/03/2020 10:33:56

- »SA 2 - 2026, AM
- »SA 2 - 2026, PM
- »SA 2 - 2036, AM
- »SA 2 - 2036, PM

### Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
SA 2 - 2026								
Stream B-ACD	0.0	6.84	0.01	A	0.0	8.18	0.01	A
Stream A-BCD	0.0	5.13	0.00	A	0.0	5.88	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.48	0.01	A	0.0	4.44	0.01	A
Stream C-D								
Stream C-A								
SA 2 - 2036								
Stream B-ACD	0.0	6.89	0.01	A	0.0	8.30	0.01	A
Stream A-BCD	0.0	5.09	0.00	A	0.0	5.90	0.00	A
Stream A-B								
Stream A-C								
Stream D-ABC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-ABD	0.0	5.47	0.01	A	0.0	4.36	0.01	A
Stream C-D								
Stream C-A								

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

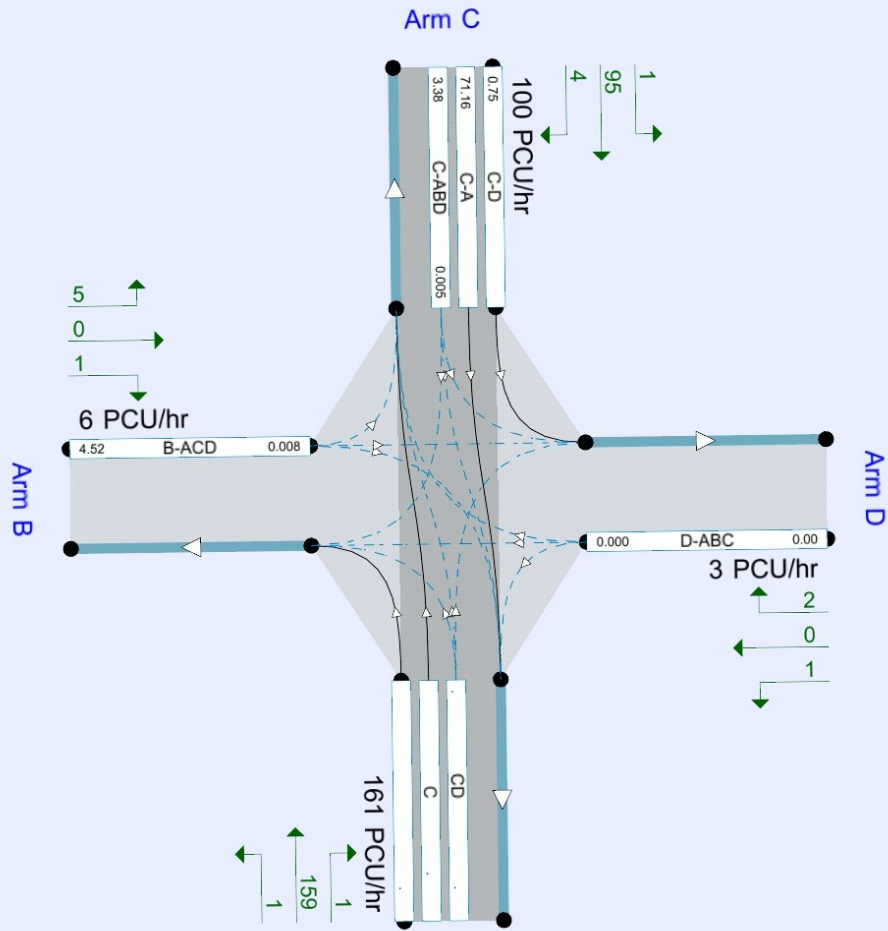
## File summary

### File Description

<b>Title</b>	(untitled)
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	05/03/2020
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	HEADOFFICE"GARVEYD
<b>Description</b>	

## 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)
2026	AM	ONE HOUR	08:00	09:30	15
2026	PM	ONE HOUR	17:00	18:30	15
2036	AM	ONE HOUR	08:00	09:30	15
2036	PM	ONE HOUR	17:00	18:30	15

# SA 2 - 2026, AM

## Data Errors and Warnings

No errors or warnings

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 2	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.27	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
D	untitled		Minor

## 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)
A	6.00			120.0	✓	0.00
C	6.00			120.0	✓	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	2.25	45	45
D	One lane	2.90	35	35



## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
1	A-D	643.457	-	-	-	-	-	-	0.249	0.356	0.249	-	-	-
1	B-A	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	-	0.219	0.219	0.110
1	B-C	603.288	0.092	0.234	-	-	-	-	-	-	-	-	-	-
1	B-D, nearside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	B-D, offside lane	475.747	0.087	0.219	0.219	-	-	-	0.138	0.313	0.138	-	-	-
1	C-B	643.457	0.249	0.249	0.356	-	-	-	-	-	-	-	-	-
1	D-A	639.503	-	-	-	-	-	-	0.248	-	0.098	-	-	-
1	D-B, nearside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-B, offside lane	501.076	0.145	0.145	0.330	-	-	-	0.231	0.231	0.091	-	-	-
1	D-C	501.076	-	0.145	0.330	0.115	0.231	0.231	0.231	0.231	0.091	-	-	-

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	2026	AM	ONE HOUR	08:00	09:30	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		✓	161.00	100.000
B		✓	6.00	100.000
C		✓	100.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	1.000	159.000	1.000
	B	1.000	0.000	5.000	0.000
	C	95.000	4.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

# Vehicle Mix

## Heavy Vehicle proportion

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

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	6.84	0.0	A
A-BCD	0.00	5.13	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	5.48	0.0	A
C-D				
C-A				

## 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-ACD	4.52	546.82	0.008	4.48	0.0	6.637	A
A-BCD	0.90	702.71	0.001	0.90	0.0	5.129	A
A-B	0.75			0.75			
A-C	119.55			119.55			
D-ABC	0.00	496.96	0.000	0.00	0.0	0.000	A
C-ABD	3.38	660.74	0.005	3.35	0.0	5.475	A
C-D	0.75			0.75			
C-A	71.16			71.16			

**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-ACD	5.39	540.84	0.010	5.39	0.0	6.722	A
A-BCD	1.12	714.34	0.002	1.12	0.0	5.047	A
A-B	0.90			0.90			
A-C	142.72			142.72			
D-ABC	0.00	490.55	0.000	0.00	0.0	0.000	A
C-ABD	4.13	664.34	0.006	4.12	0.0	5.452	A
C-D	0.89			0.89			
C-A	84.88			84.88			

**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-ACD	6.61	532.56	0.012	6.60	0.0	6.843	A
A-BCD	1.44	730.45	0.002	1.43	0.0	4.937	A
A-B	1.10			1.10			
A-C	174.73			174.73			
D-ABC	0.00	481.67	0.000	0.00	0.0	0.000	A
C-ABD	5.21	669.43	0.008	5.21	0.0	5.419	A
C-D	1.09			1.09			
C-A	103.80			103.80			

**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-ACD	6.61	532.56	0.012	6.61	0.0	6.843	A
A-BCD	1.44	730.45	0.002	1.44	0.0	4.937	A
A-B	1.10			1.10			
A-C	174.73			174.73			
D-ABC	0.00	481.67	0.000	0.00	0.0	0.000	A
C-ABD	5.21	669.43	0.008	5.21	0.0	5.421	A
C-D	1.09			1.09			
C-A	103.79			103.79			

**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-ACD	5.39	540.84	0.010	5.40	0.0	6.722	A
A-BCD	1.12	714.34	0.002	1.12	0.0	5.047	A
A-B	0.90			0.90			
A-C	142.72			142.72			
D-ABC	0.00	490.54	0.000	0.00	0.0	0.000	A
C-ABD	4.13	664.34	0.006	4.13	0.0	5.452	A
C-D	0.89			0.89			
C-A	84.88			84.88			

**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>B-ACD</b>	4.52	546.82	0.008	4.52	0.0	6.637	A
<b>A-BCD</b>	0.91	702.70	0.001	0.91	0.0	5.129	A
<b>A-B</b>	0.75			0.75			
<b>A-C</b>	119.55			119.55			
<b>D-ABC</b>	0.00	496.95	0.000	0.00	0.0	0.000	A
<b>C-ABD</b>	3.38	660.74	0.005	3.38	0.0	5.478	A
<b>C-D</b>	0.75			0.75			
<b>C-A</b>	71.16			71.16			

# SA 2 - 2026, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 2	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.16	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	2026	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		✓	108.00	100.000
B		✓	5.00	100.000
C		✓	409.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	2.000	105.000	1.000
	B	3.000	0.000	2.000	0.000
	C	402.000	5.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	8.18	0.0	A
A-BCD	0.00	5.88	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	4.44	0.0	A
C-D				
C-A				

## 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-ACD	3.76	469.70	0.008	3.73	0.0	7.726	A
A-BCD	0.86	621.39	0.001	0.86	0.0	5.800	A
A-B	1.50			1.50			
A-C	78.94			78.94			
D-ABC	0.00	447.14	0.000	0.00	0.0	0.000	A
C-ABD	5.77	817.23	0.007	5.74	0.0	4.436	A
C-D	1.50			1.50			
C-A	300.65			300.65			

### 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-ACD	4.49	459.70	0.010	4.49	0.0	7.908	A
A-BCD	1.06	617.85	0.002	1.06	0.0	5.836	A
A-B	1.79			1.79			
A-C	94.23			94.23			
D-ABC	0.00	431.04	0.000	0.00	0.0	0.000	A
C-ABD	7.43	849.61	0.009	7.42	0.0	4.274	A
C-D	1.78			1.78			
C-A	358.47			358.47			

### 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-ACD	5.51	445.70	0.012	5.49	0.0	8.177	A
A-BCD	1.36	613.34	0.002	1.36	0.0	5.881	A
A-B	2.20			2.20			
A-C	115.36			115.36			
D-ABC	0.00	408.74	0.000	0.00	0.0	0.000	A
C-ABD	10.01	893.17	0.011	10.00	0.0	4.075	A
C-D	2.18			2.18			
C-A	438.13			438.13			

### 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-ACD	5.51	445.70	0.012	5.50	0.0	8.177	A
A-BCD	1.36	613.34	0.002	1.36	0.0	5.881	A
A-B	2.20			2.20			
A-C	115.36			115.36			
D-ABC	0.00	408.73	0.000	0.00	0.0	0.000	A
C-ABD	10.01	893.18	0.011	10.01	0.0	4.077	A
C-D	2.18			2.18			
C-A	438.12			438.12			



**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-ACD	4.49	459.69	0.010	4.50	0.0	7.908	A
A-BCD	1.06	617.85	0.002	1.06	0.0	5.836	A
A-B	1.79			1.79			
A-C	94.23			94.23			
D-ABC	0.00	431.03	0.000	0.00	0.0	0.000	A
C-ABD	7.43	849.62	0.009	7.44	0.0	4.274	A
C-D	1.78			1.78			
C-A	358.47			358.47			

**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-ACD	3.76	469.69	0.008	3.77	0.0	7.728	A
A-BCD	0.86	621.38	0.001	0.87	0.0	5.803	A
A-B	1.50			1.50			
A-C	78.94			78.94			
D-ABC	0.00	447.13	0.000	0.00	0.0	0.000	A
C-ABD	5.78	817.24	0.007	5.79	0.0	4.437	A
C-D	1.50			1.50			
C-A	300.64			300.64			

# SA 2 - 2036, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 2	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.26	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	2036	AM	ONE HOUR	08:00	09:30	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		✓	174.00	100.000
B		✓	6.00	100.000
C		✓	107.00	100.000
D		✓	3.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0.000	1.000	172.000	1.000
	B	1.000	0.000	5.000	0.000
	C	102.000	4.000	0.000	1.000
	D	1.000	0.000	2.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	6.89	0.0	A
A-BCD	0.00	5.09	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	5.47	0.0	A
C-D				
C-A				

## 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-ACD	4.52	544.35	0.008	4.48	0.0	6.667	A
A-BCD	0.92	707.80	0.001	0.91	0.0	5.092	A
A-B	0.75			0.75			
A-C	129.33			129.33			
D-ABC	0.00	494.50	0.000	0.00	0.0	0.000	A
C-ABD	3.40	661.86	0.005	3.38	0.0	5.466	A
C-D	0.75			0.75			
C-A	76.40			76.40			

### 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-ACD	5.39	537.89	0.010	5.39	0.0	6.759	A
A-BCD	1.14	720.42	0.002	1.14	0.0	5.004	A
A-B	0.90			0.90			
A-C	154.39			154.39			
D-ABC	0.00	487.60	0.000	0.00	0.0	0.000	A
C-ABD	4.17	665.71	0.006	4.16	0.0	5.441	A
C-D	0.89			0.89			
C-A	91.13			91.13			

### 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-ACD	6.61	528.94	0.012	6.60	0.0	6.891	A
A-BCD	1.47	737.89	0.002	1.46	0.0	4.888	A
A-B	1.10			1.10			
A-C	189.01			189.01			
D-ABC	0.00	478.05	0.000	0.00	0.0	0.000	A
C-ABD	5.28	671.18	0.008	5.27	0.0	5.405	A
C-D	1.09			1.09			
C-A	111.44			111.44			

### 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-ACD	6.61	528.94	0.012	6.61	0.0	6.891	A
A-BCD	1.47	737.89	0.002	1.47	0.0	4.888	A
A-B	1.10			1.10			
A-C	189.01			189.01			
D-ABC	0.00	478.05	0.000	0.00	0.0	0.000	A
C-ABD	5.28	671.18	0.008	5.28	0.0	5.407	A
C-D	1.09			1.09			
C-A	111.44			111.44			

**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>B-ACD</b>	5.39	537.89	0.010	5.40	0.0	6.760	A
<b>A-BCD</b>	1.14	720.42	0.002	1.14	0.0	5.006	A
<b>A-B</b>	0.90			0.90			
<b>A-C</b>	154.39			154.39			
<b>D-ABC</b>	0.00	487.60	0.000	0.00	0.0	0.000	A
<b>C-ABD</b>	4.17	665.72	0.006	4.18	0.0	5.443	A
<b>C-D</b>	0.89			0.89			
<b>C-A</b>	91.13			91.13			

**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>B-ACD</b>	4.52	544.35	0.008	4.52	0.0	6.670	A
<b>A-BCD</b>	0.92	707.79	0.001	0.92	0.0	5.094	A
<b>A-B</b>	0.75			0.75			
<b>A-C</b>	129.33			129.33			
<b>D-ABC</b>	0.00	494.49	0.000	0.00	0.0	0.000	A
<b>C-ABD</b>	3.41	661.86	0.005	3.41	0.0	5.469	A
<b>C-D</b>	0.75			0.75			
<b>C-A</b>	76.40			76.40			

# SA 2 - 2036, PM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	SA 2	100.000

# Junction Network

## Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	0.15	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	2036	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		✓	117.00	100.000
B		✓	5.00	100.000
C		✓	442.00	100.000
D		✓	2.00	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To				
	A	B	C	D	
From	A	0.000	2.000	114.000	1.000
	B	3.000	0.000	2.000	0.000
	C	435.000	5.000	0.000	2.000
	D	1.000	0.000	1.000	0.000

## Vehicle Mix

### Heavy Vehicle proportion

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.01	8.30	0.0	A
A-BCD	0.00	5.90	0.0	A
A-B				
A-C				
D-ABC	0.00	0.00	0.0	A
C-ABD	0.01	4.36	0.0	A
C-D				
C-A				



## 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-ACD	3.76	465.51	0.008	3.73	0.0	7.796	A
A-BCD	0.87	620.12	0.001	0.87	0.0	5.812	A
A-B	1.50			1.50			
A-C	85.71			85.71			
D-ABC	0.00	440.42	0.000	0.00	0.0	0.000	A
C-ABD	5.95	830.92	0.007	5.92	0.0	4.363	A
C-D	1.50			1.50			
C-A	325.31			325.31			

### 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-ACD	4.49	454.65	0.010	4.49	0.0	7.997	A
A-BCD	1.08	616.45	0.002	1.08	0.0	5.849	A
A-B	1.79			1.79			
A-C	102.31			102.31			
D-ABC	0.00	422.99	0.000	0.00	0.0	0.000	A
C-ABD	7.69	865.59	0.009	7.69	0.0	4.195	A
C-D	1.78			1.78			
C-A	387.87			387.87			

### 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-ACD	5.51	439.42	0.013	5.49	0.0	8.296	A
A-BCD	1.38	611.82	0.002	1.38	0.0	5.896	A
A-B	2.20			2.20			
A-C	125.24			125.24			
D-ABC	0.00	398.86	0.000	0.00	0.0	0.000	A
C-ABD	10.43	912.03	0.011	10.42	0.0	3.992	A
C-D	2.18			2.18			
C-A	474.04			474.04			

### 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-ACD	5.51	439.42	0.013	5.50	0.0	8.296	A
A-BCD	1.39	611.82	0.002	1.39	0.0	5.899	A
A-B	2.20			2.20			
A-C	125.24			125.24			
D-ABC	0.00	398.86	0.000	0.00	0.0	0.000	A
C-ABD	10.43	912.04	0.011	10.43	0.0	3.994	A
C-D	2.18			2.18			
C-A	474.04			474.04			

**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-ACD	4.49	454.64	0.010	4.51	0.0	7.999	A
A-BCD	1.08	616.44	0.002	1.08	0.0	5.849	A
A-B	1.79			1.79			
A-C	102.31			102.31			
D-ABC	0.00	422.99	0.000	0.00	0.0	0.000	A
C-ABD	7.70	865.60	0.009	7.71	0.0	4.196	A
C-D	1.78			1.78			
C-A	387.87			387.87			

**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-ACD	3.76	465.51	0.008	3.77	0.0	7.798	A
A-BCD	0.87	620.11	0.001	0.88	0.0	5.813	A
A-B	1.50			1.50			
A-C	85.71			85.71			
D-ABC	0.00	440.40	0.000	0.00	0.0	0.000	A
C-ABD	5.97	830.92	0.007	5.97	0.0	4.363	A
C-D	1.50			1.50			
C-A	325.30			325.30			