Proposed LRD, Parklands Pointe Apartments, Fortunestown Lane & Parklands Parade, Co. Dublin

Traffic and Transportation Assessment

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1 INTRODUCTION

1.1 BACKGROUND

DBFL Consulting Engineers (DBFL) has been commissioned by Greenacre Residential DAC to compile a Traffic and Transport Assessment (TTA) report in support of a planning application for proposed Large-Scale Residential Development (LRD) on lands located at Fortunestown Lane, Citywest, Dublin.

The proposed development will consist will consist of modifications to the permitted apartment Blocks C, D and E to include an additional storey on each block and reconfiguration of the previously permitted floor levels to provide a total of 396 no. apartments in lieu of the previously permitted 310 no. apartments.

1.2 SCOPE OF ASSESSMENT

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 proposed development in Citywest, Dublin.

The scope of the assessment covers transport and sustainability Issues including access, pedestrian, cyclist and public transport connections. Recommendations contained within this report are based on existing and proposed road layout plans, site visits, on site traffic observations and the review of junction vehicle turning count data.

During the development of this report, traffic surveys have been undertaken specifically for this assessment, with the objective of providing up to date background information relating to existing traffic movement patterns across the local road network surrounding the subject development site. 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.

1.3 METHODOLOGY

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) TII;
- Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- Design Manual for Urban Roads and Streets (DMURS) (2019);
- Sustainable Residential Development and Compact Settlements (2024);and
- South Dublin City Development Plan 2022 2028;

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

- Site Audit: A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.
- **Traffic Counts:** Junction turning traffic counts were undertaken and 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 that could be 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 junction in the post development 2026, 2031 and 2041 development scenarios in accordance with TII best practice guidelines.



1.4 REPORT STRUCTURE

As introduced above, this TTA seeks to quantify 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.

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 proposal.

A description of the proposed development scheme from a transportation perspective is described in **Chapter 4** whilst **Chapter 5** outlines the vehicle trip generation and distribution 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.

The predicted scale of traffic impact generated by the proposed development upon each of the key local junctions is quantified in **Chapter 6** whilst the existing public transport capacity and project impact on public transport services is detailed in **Chapter 7**.

The operational performance of key local junctions is assessed for the 2026 Opening Year and the 2031 (Opening Year +5 years) and the 2041 (Opening Year +15 years) Horizon Years are summarised within **Chapter 8**.

A response to the traffic and transport related items as raised within the SDCC LRD Opinion report are included in **Chapter 9**.

The main conclusions and recommendations derived from the analysis are summarised in **Chapter 10**.



2 RECEIVING ENVIRONMENT AND PROPOSED DEVELOPMENT

2.1 SITE LOCATION

The proposed development is located to the north of the Fortunestown Lane corridor and east of Garter Lane in Citywest, Dublin (approximately 16km south west of Dublin City Centre). The general location of the subject site in relation to the surrounding road network is illustrated in **Figure 2-1** below whilst **Figure 2-2** indicatively shows the extent of the subject site boundary and neighbouring lands.



Figure 2-1: Site Location (Source Google Maps)



Figure 2-2 : Site Location (Source: Google Maps)



2.2 LAND USE

The subject lands are *zoned "Objective RES-N To provide for new residential communities in accordance with approved area plans"* within the South Dublin County Development Plan 2022 - 2028 as shown in **Figure 2-3** below.





2.3 EXISTING TRANSPORT FACILITIES & SERVICES

2.3.1 Existing Road Network

To the south of the subject site, the Fortunestown Road corridor runs in an east-west direction and provides a through route between the Citywest Road corridor (L2011) to the east and Garter Lane to the west. Travelling in a westerly direction on Fortunestown Road leads to the Fortunestown Lane / Garter Lane signal-controlled junction. Travelling northbound along Garter



Lane provides a direct route to the N7 southbound carriageway, whilst travelling southbound leads to the village of Saggart, located approximately 650m away. Travelling eastbound on the Fortunestown Lane Corridor from the subject site leads to a signalised junction providing access to Citywest Avenue, Citywest Drive and Parklands Parade. The strategic M50 motorway (northbound and southbound) is accessible via the M50 Junction 9 located approximately 10km to the northeast whilst Dublin City Centre is accessible via the Naas Road corridor and is located approx. 16km away.

2.3.2 Pedestrian And Cycle Facilities

The Fortunestown Lane is subject to a speed limit of 50kph with street lighting available on one side. Pedestrians currently benefit from the provision of footpaths on both sides of the Fortunestown Lane corridor as shown in **Figure 2-4**. Cycle tracks are also available on both sides with advanced Stop Line at Fortunestown Lane/ Parklands Parade Road junction.



Figure 2-4: Pedestrian & Cycle Facilities on Fortunestown Lane



Figure 2-5: Pedestrian & Cycle Facilities on Parklands Parade



The corridor linking Fortunestown Lane and Parklands Parade benefits from street lighting on one side of the road whilst cyclists and pedestrians can benefit from cycle tracks and footpaths available on both sides of the road. Dedicated pedestrian and cycle infrastructure are proposed to be implemented as part of the subject scheme as per permitted planning application ABP-305563-19 as will be discussed in more detail later in this report.

The existing cycle routes within the vicinity of subject site are illustrated in Figure 2-6.



Figure 2-6: Existing Cycle Network Plan (Source: SDCC Active Travel GIS Map)

2.3.3 Public Transport – Bus

The subject site benefits from excellent public transport accessibility levels. Dublin Bus operates four routes that serve the subject site locale including the Route 69 (Hawkins St. Towards Rathcoole), Route 65b (Citywest – Poolbeg Street), Route 77a (Citywest – Ringsend Road), Route 77x (Citywest Towards UCD Belfield). All four routes provide links from the subject site's general vicinity to the city centre via alternative routes thereby serving different catchment areas between Citywest and the City Centre including Clondalkin (Route 69), Terenure (Route 65b) and Firhouse (Route 77a). Go ahead operates 2 routes that serve the subject site which includes S8 (Citywest - Dun Laoghaire via Sandyford) and W62 (The Square - St Finian's NS (Newcastle)).



The local Bus stops are all within walking distance of the subject site as illustrated in **Figure 2-7** below.



Figure 2-7: Bus Stop Locations

	Weekdays		Saturdays		Sundays & Bank Holidays	
Bus Route	To City Centre	From City Centre	To City Centre	From City Centre	To City Centre	From City Centre
DB 65b	18	20	17	19	15	15
DB 69	20	18	21	18	12	12
DB 77a	57	52	46	46	32	34
DB 77x	1 service	-	-	-	-	-
GA W62	36	36	34	34	30	30
GA S8	60	58	38	38	34	34

DB = Dublin Bus, GA = Go-Ahead Bus

Table 2-1: Bus Service Frequency (No. of Services per Day)

2.3.4 Public Transport – LUAS Services

The subject site is conveniently located to benefit from frequent high-capacity LUAS Red Line services as presented in **Figure 2-8**. The 'Saggart' interchange is located within a short convenient walking distance and is positioned immediately south of the subject site. The LUAS Red Line currently operates between Saggart / Tallaght and The Point. At the Belgard interchange, the LUAS Red line branches in two directions; to Saggart and to Tallaght. **Table 2-2** below summarises the frequency with which the LUAS service operates.





Figure 2-8 : LUAS Interchange in the Vicinity of the Subject Site

Link	Weekdays		Saturdays		Sundays & Bank Holidays	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
Eastbound	3-10	5-20	10-13	5-20	10-11	10-20

Table 2-2: LUAS Service Frequency (In minutes)

2.4 LOCAL AMENITIES

As illustrated in **Figure 2-9**, the proposed development site is well placed in terms of the availability of and access to local amenities. There are a number of primary and post primary schools within 2km of the subject site. These include Citywest Educate Together National School, Scoil Aoife, St. Mary's National School Saggart, St Thomas Senior National School, Citywest & Saggart Community National School and St Aidan's Community School. The subject site also benefits from good access to local retail and leisure facilities. Lidl and Citywest Shopping Centre are both within 5 minutes walking distance from the subject site. Additionally, Centra Saggart and Dunnes Stores are approx. 1km to the south-west of the site. Citywest Convention centre is located to the west of the site and can be accessed via Church Road. Furthermore, the subject development site is well placed to benefit from local employment opportunities at Citywest Business Campus and Baldonnel Business Park located to the north and Magna Business Park located in the south east.





Figure 2-9: Local Amenities in the vicinity of subject site

2.5 PROPOSED TRANSPORT INFRASTRUCTURE

2.5.1 Greater Dublin Area Cycle Network -2022

The Transport Strategy for the Greater Dublin Area 2022-2042 as compiled by the National Transport Authority sets out the Strategic Transport Plan for the Greater Dublin Area for the period up to 2042. It provides a substantial update and expanse of the 2013 GDA Cycle Network Plan, supported with technical assessment and stakeholder input.

The GDA Cycle Network comprises of Primary, Secondary, Feeder, Greenway and Inter-urban routes for the region, including dedicated town networks for all settlements. The revised network forms a key component of the overall transport network for the region. The 2022 GDA Cycle Network Plan routes within the vicinity of the subject site are indicated in **Figure 2-10**.





Figure 2-10: Cycle Network Proposals (Extract of Map N6 GDA Cycle Network Plan)

2.6 Public Transport Proposals

BusConnects Dublin Network Redesign is an initiative launched by the NTA with the aim of overhauling the bus system in the Dublin Region. This initiative includes a review of the core bus network which comprises radial, orbital and regional core bus corridors. It also includes enhancements to ticketing and fare systems as well as transition to a new low emission vehicle fleet.

The Dublin Area Bus Network Redesign aims "to provide a network designed around the needs of Dublin today and tomorrow, rather than based on the past". **Figure 2-11** below presents the proposed public transport provision in the vicinity of the subject development site as per the emerging Dublin Area Bus Network Redesign (2024).

As part of the BusConnects proposals, the proposed development will benefit from branch **D2** which will operate between Citywest and Clare Hall via City Centre. The route will operate along Citywest Road every 15 minutes on weekdays and 15-20 minutes on weekends.

Orbital route **S8** (launched in in November 2023) provides a link between Citywest Road and Dún Laoghaire via Tallaght and Sandyford. This all-day service will have a frequency of one service every 20 minutes on weekdays (every 15 minutes at peak) and every 30 minutes on weekends. Orbital W route **W61** and **W62** (launched on 25th June 2023) operated by Go-Ahead Ireland provides access between Maynooth, Celbridge, Saggart, Citywest, and Tallaght via Celbridge, Saggart and Citywest.

Radial route **58** is proposed to operate every 60 minutes between Rathcoole and Dublin City Centre whilst peak hour express route **X58** (existing route 69X) will offer a direct route between Rathcoole and Dublin City Centre.





Figure 2-11: Proposed Bus Network near vicinity of subject site.

2.7 SITE ACCESSIBILITY

2.7.1 Pedestrian Catchment

As illustrated in **Figure 2-12** future residents / visitors walking to / from the site will be within a 10minute walk of bus stops, Saggart Luas stop, Citywest Shopping Centre, Citywest convention centre and Citywest Educate Together National School. Within the 20-minute walking time catchment, pedestrians can access Saggart, employment centres in Citywest Campus. Within the 30-minutes walking catchment, pedestrians can access Magna Business Park and residential areas in Brook field and Fortunestown.





Figure 2-12: Pedestrian Accessibility- Walking Time from Site (Source: www.app.traveltimeplatform.com)

2.7.2 Cycling Catchment

The site is very accessible by bicycle located within a network of cyclable streets which currently benefit from dedicated cycle infrastructure. **Figure 2-13** illustrates cycle travel time catchment areas reachable from the subject site.

Cyclists from the site can travel to Tallaght, Clondalkin, Newcastle, Brittas within 30-minutes. Within a 45-minutes cycle time catchment, cyclists from the subject site can travel as far as Leixlip, Lucan, Harolds Cross, Terenure, Celbridge and Kill.





Figure 2-13: Bicycle Accessibility (Cycle Time from Site) (Source: <u>www.app.traveltimeplatform.com</u>)

2.7.3 Public Transport Catchment

Figure 2-14 illustrates analysis of public transport catchment areas from the site. Areas such as Clondalkin, Tallaght, Rathcoole, Newcastle are within a 30-minute public transport journey. Dublin Airport, Naas, City centre can be accessed in 60 minutes of public transport journey times from the site.





Figure 2-14: Public Transport Accessibility (Public Transit and Walking Time from Site) (Source: <u>www.app.traveltimeplatform.com</u>)



3 POLICY FRAMEWORK

3.1 DEVELOPMENT POLICY

In the context of transportation, the subject site policy framework is influenced by the following key documentations. A common theme through each of these key documents is the emphasis placed upon the importance of travel demand management, with many identifying the need to implement mobility management plans with the objective of promoting sustainable travel patterns. These documents include;

- National Sustainable Mobility Policy Action Plan 2022-2025
- Sustainable Residential Development and Compact Settlements (2024)
- Design Manual for Urban Roads and Streets (DMURS) (2019)
- Greater Dublin Area Transport Strategy 2022-2042
- Dublin City Council Development Plan 2022-2028

3.1.1 National Sustainable Mobility Policy

The National Sustainable Mobility Policy was published in April 2022 by the Department of Transport and replaces Smarter Travel 2009. The overall aim of the Policy is *to "set out a strategic framework for 2030 for active travel and public transport to support Ireland's overall requirement to achieve a 51% reduction in carbon emissions by the end of this decade"*.

The Policy is a direct response to the fact that continued growth in demand for road transport is not sustainable due to the resulting adverse impacts of increasing congestion levels, localised air pollution, contribution to global warming and the



additional negative impacts to health through promoting increasingly sedentary lifestyles.

The following 3 key Policy areas and 10 goals form the basis of the National Sustainable Mobility Policy:

Safe and Green Mobility

- 1. Improve mobility safety
- 2. Decarbonise public transport



- 3. Expand availability of sustainable mobility in metropolitan areas
- 4. Expand availability of sustainable mobility in regional and rural areas
- 5. Encourage people to choose sustainable mobility over the private car

People Focused Mobility

- 6. Take a whole journey approach to mobility, promoting inclusive access for all
- 7. Design infrastructure according to Universal Design Principles and the Hierarchy of Road Users model
- 8. Promote sustainable mobility through research and citizen

Better Integrated Mobility

- 9. Better integrate land use and transport planning at all levels
- 10. Promote smart and integrated mobility through innovative technologies and development of appropriate regulation

The policy is accompanied by an Action Plan with a total 91 actions organised by goal to be completed by 2025. Each action has been assigned to a specific government department or body with the hope of creating accountability for their implementation. The success of the policy will be measured using an annual National Household Travel Survey administered by the National Transport Authority.

3.1.2 Sustainable Residential Development and Compact Settlements

The 'Sustainable Residential Development and Compact Settlements - Guidelines for Planning Authorities' (January 2024) set out policy and guidance in relation to the planning and development of urban and rural settlements, with a focus on sustainable residential development and the creation of compact settlements.

These Guidelines replace the Sustainable Residential Development in Urban Areas Guidelines for Planning Authorities issued as Ministerial guidelines under Section 28 of the Act in 2009, which in turn replaced the Residential Density Guidelines issued in 1999.



They build on and update previous guidance to take account of current Government policy and economic, social and environmental considerations. There is a renewed focus in the Guidelines on



the renewal of existing settlements and on the interaction between residential density, housing standards and quality urban design and placemaking to support sustainable and compact growth.

Cycling provides a flexible, efficient and attractive transport option for urban living and these Guidelines require that this transport mode be fully integrated into the design of all new residential scheme. Access to secure storage of bicycles is a key concern for residents in more compact housing developments. SPPR 3 – Car Parking of guideline states the car parking requirements as follows:

- "In city centres and urban neighbourhoods of the five cities, defined in Chapter 3 (Table 3.1 and Table 3.2) car-parking provision should be minimised, substantially reduced or wholly eliminated. The maximum rate of car parking provision for residential development at these locations, where such provision is justified to the satisfaction of the planning authority, shall be 1 no. space per dwelling.
- In accessible locations, defined in Chapter 3 (Table 3.8) car- parking provision should be substantially reduced. The maximum rate of car parking provision for residential development, where such provision is justified to the satisfaction of the planning authority, shall be 1.5 no. spaces per dwelling.
- In intermediate and peripheral locations, defined in Chapter 3 (Table 3.8) the maximum rate of car parking provision for residential development, where such provision is justified to the satisfaction of the planning authority, shall be 2 no. spaces per dwelling."

SPPR 3 (Car Parking) also mentions that there "should be a requirement to provide a rationale and justification for the number of car parking spaces proposed and to satisfy the planning authority that the parking levels are necessary and appropriate, particularly when they are close to the maximum provision. The maximum car parking standards do not include bays assigned for use by a car club, designated short stay on–street Electric Vehicle (EV) charging stations or accessible parking spaces. The maximum car parking standards include the provision for visitor parking."

Furthermore, for the Guidelines state the following requirements for cycle parking and storage are recommended, as per SPPR 4 (i) and SPPR 4 (ii) which are as follows:

"Quantity – in the case of residential units that do not have ground level open space or have smaller terraces, a general minimum standard of 1 cycle storage space per bedroom should be applied. Visitor cycle parking should also be provided. Any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors



such as location, quality of facilities proposed, flexibility for future enhancement/ enlargement, etc. It will be important to make provision for a mix of bicycle parking types including larger/heavier cargo and electric bikes and for individual lockers.

• **Design** – cycle storage facilities should be provided in a dedicated facility of permanent construction, within the building footprint or, where not feasible, within an adjacent or adjoining purpose-built structure of permanent construction. Cycle parking areas shall be designed so that cyclists feel safe. It is best practice that either secure cycle cage/compound or preferably locker facilities are provided."

3.1.3 Design Manual for Urban Roads and Streets (DMURS) - 2019

DMURS guidance document was produced by the Department of Transport, Tourism and Sports and the Department of Environment, Community and Local Government in March 2013 and updated in May 2019. It provides guidance relating to the design of urban roads and streets. It presents a series of principles, approaches and standards that are necessary to achieve balanced, best practice design outcomes with regard to street networks and individual streets.



The manual places a significant emphasis on car dominance in Ireland and the implications this has had regarding the pedestrian

and cycle environment. The document encourages more sustainable travel patterns and safer streets by proposing a hierarchy for user priorities. This hierarchy places pedestrians at the top, indicating that walking is the most sustainable form of transports and that by prioritizing pedestrians first, the number of short car journeys can be reduced, and public transport made more accessible. Second in the hierarchy are cyclists with public transport third in the hierarchy and private motor vehicles at the bottom. By placing private vehicles at the bottom of the hierarchy, the document indicates that there should be a balance on street networks and cars should no longer take priority over the needs of other users.

The manual emphasizes that narrow carriageways are one of the most effective design measures that calm traffic. Standard width of an arterial and link street is 3.25m, however, this may be reduced to 3m where lower design speeds are being applied. Desirable footpath widths are between 2m – 4m. The 2m width should be implemented to allow for low to moderate pedestrian



activity. A 3m – 4m footpath should be implemented to allow for moderate to high pedestrian activity.

The focus of the manual is to create a place – based sustainable street network that balances the pedestrian and vehicle movements. The manual references the different types of street networks, including arterial streets, link streets, local streets, and highlights the importance of movement.

3.1.4 Greater Dublin Area Transport Strategy 2022-2042

The Greater Dublin Area Transport Strategy 2022-2042 has arisen from a review of the original 2016 strategy. The updated document *"sets out the framework for investment in transport infrastructure and services over the next two decades".*

The overall aim of the Transport Strategy is "to provide a sustainable, accessible and effective

transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth".



Four primary objectives have been identified as part of the Greater Dublin Area Transport Strategy 2022-2042. These are:

- An Enhanced Natural and Built Environment: To create a better environment and meet our environmental obligations by transitioning to a clean, low emission transport system, reducing car dependency, and increasing walking, cycling and public transport use.
- Connected Communities and a Better Quality of Life: To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling.
- A Strong Sustainable Economy: To support economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to and facilitating the efficient movement of goods.
- **An Inclusive Transport System:** To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.



3.1.5 South Dublin County Development Plan 2022 - 2028

The South Dublin County Development Plan 2022-2028 sets the broad development framework for the county and the development areas within its administrative boundary. In the context of the subject proposals, the following are the relevant transport and development objectives set out in the plan:

Housing

'H1 Objective 1: To ensure adequate and appropriate land is zoned to facilitate and implement the aims of the Core Strategy, to deliver affordable sustainable development, and to meet forecast future housing need in the County over the life of the Plan as identified by the Housing Strategy and Interim HNDA."

"H2 Objective 2: To ensure that sufficient zoned land, integrating land use and transport and which can be serviced is available at appropriate locations to satisfy the housing requirements of the County and to support and facilitate the development of housing lands based on the Settlement Strategy outlined in Chapter 2: Core Strategy and Settlement Strategy."

Sustainable Movement

"**Policy SM1- Overarching Transport and Movement :** It is the policy of the Council to promote ease of movement within, and access to South Dublin County, by integrating sustainable land-use planning with a high-quality sustainable transport and movement network for people and goods".

"SM1 Objective 1: To achieve and monitor a transition to more sustainable travel modes including walking, cycling and public transport over the lifetime of the County Development Plan, in line with the County mode share targets of 15% Walk; 10% Cycle; 20% Bus; 5% Rail; and 50% Private (Car / Van / HGV / Motorcycle). "

"**SM1 Objective 6:** To safeguard the County's strategic road network and to improve the local road and street network in a manner that will better utilise existing road space and encourage a transition towards more sustainable modes of transport."

"**Policy SM2- Walking and Cycling:** Re-balance movement priorities towards sustainable modes of travel by prioritising the development of walking and cycling facilities and encouraging a shift to active travel for people of all ages and abilities, in line with the County targets."



"SM2 Objective 1: To achieve and monitor a transition to the County's mode share targets of 15% Walk and 10% Cycle."

"SM2 Objective 3: To ensure that connectivity for pedestrians and cyclists is maximised and walking and cycling distances are reduced by promoting compact growth and permeability in the design and layout of new development areas."

"Policy SM3: Public Transport – General: Promote a significant shift from car-based travel to public transport in line with County targets and facilitate the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network."

"SM3 Objective 1: To achieve and monitor a transition to the County mode share targets of 20% Bus and 5% Rail."

3.2 DEVELOPMENT CONTROL

3.2.1 Car Parking Standards

In order to determine the appropriate quantum of vehicle parking for the proposed development, reference is made to the following guidance: -

- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities as published by the Department of Housing, Planning and Local Government (DHLGH), January 2024; and
- Table 12.25 of South Dublin County Development Plan 2022 2028

In reference to the *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities* the subject site's location, being adjacent to the Luas Red Line Saggart stop on Fortunestown Lane can be classified as a '*High Capacity Public Transport Node or Interchange*' as it is 'within reasonable walking distance (i.e., 1000m) to/from high capacity urban public transport stops (such as LUAS)'.

In relation to car parking, within 'Urban neighbourhoods', the guideline document states

"In city centres and urban neighbourhoods of the five cities, defined in Chapter 3 (Table 3.1 and Table 3.2) car-parking provision should be minimised, substantially reduced or wholly eliminated. The maximum rate of car parking provision for residential development at these



locations, where such provision is justified to the satisfaction of the planning authority, shall be 1 no. space per dwelling.

With reference to Table 12.25 of South Dublin County Development Plan (2022-2028) the recommended quantum of vehicle parking for the proposed development is outlined in **Table 3-1**.

Land Use Type	No of units/ GFA (sqm)	SDCC Development Plan (2022-2028) Standard (Maximum)	Sustainable Residential Development and Compact Settlements (Maximum)	DCC Development Plan Requirement	Sustainable Residential Development and Compact Settlements (Maximum)
Apartments (1 Bed)	106	0.75 Space per Bed (Zone 2)		80	106
Apartments (2 Bed)	239	1 Space per Bed (Zone 2)	1 no. space per dwelling	239	239
Apartments (3 Bed)	51	1.25 Space per Bed (Zone 2)		64	51
Retail	555	1 per 25 sq. m. GFA		22	
Café	197	1 per 20 sq. m. GFA		10	-
Total		-	-	414	396

Table 3-1: Car Parking Standards and Requirement

3.2.2 Disabled Car Parking

In reference to section 12.7.4 of the South Dublin County Council Development Plan (2022-2028), it states that car parking standard (Table 12.25) includes provisions for disabled parking as required by Part M of the Building Regulation. In reference to section 1.1.5 of the Building Regulations 2010 Part M, at least 5% of the total number of car parking spaces provided at a development should be designated as disabled car parking spaces.

3.2.3 Electric Vehicles

In reference to section 12.7.5 of the South Dublin County Council Development Plan (2022-2028), 20% of all car parking spaces provided at a development should be equipped with EV chargers. All other car parking spaces must be designed such that EV chargers may be installed at a later date.



3.2.4 Bicycle Parking

The appropriate level of cycle parking provision for the development proposals is to be provided in reference to both (i) South Dublin City Development Plan 2022 – 2028, and (ii) Sustainable Residential Development and Compact Settlements Guidelines. The corresponding bicycle parking standards and requirement for proposed developments are detailed in **Table 3-2** and **Table 3-3**.

Unit Type		No of units/ GFA (sam)	SDCC Develo (2022-2028	opment Plan) Standard	Sustainable Residential Development and Compact Settlements	
			Long Stay	Short Stay	Long Stay	Short Stay
Apartment	1 bed units	106		1 per 2 apartments	1 cycle storage space per bedroom	Rate Not Stated
	2 bed units	239	1 per bed			
	3 bed units	51				
Retail		555	1 per 5 staff	1 per 50 sq. m. Gross Floor Area (GFA)	-	-
Café		197	1 per 5 staff	1 per 10 seats	-	-

Table 3-2: Bicycle Parking Standards

Unit Type		No of units/GFA (sqm)	SDCC Develo (2022-2028) F	opment Plan Requirement	Sustainable Residential Development and Compact Settlements	
			Long Stay	Short Stay	Long Stay	Short Stay
Apartment	1 bed units	106		198	737	-
	2 bed units	239	737			
	3 bed units	51				
Retail		555	3	12	-	-
Café		197	1	4	-	-
Sub Total			741	214	737	-
Total		95	55	737 plus short stay		

Table 3-3: Bicycle Parking Requirement



4 CHARACTERISTICS OF PROPOSALS

4.1 OVERVIEW

The proposed development is a Large-Scale Residential Development (LRD) and will consist of modifications to the permitted apartment Blocks C, D and E to include an additional storey on each block and reconfiguration of the previously permitted floor levels to provide a total of 396no. apartments in lieu of the previously permitted 310no. apartments.

The revised blocks will consist of: - Block C: 6-storey block accommodating 129no. units (26no. 1 bed units, 84no. 2 bed units and 19no. 3 bed units) with 3no. retail/ commercial units (555sq.m) and a café/ bar/ restaurant unit (197sq.m) at ground floor level fronting onto the permitted local square; Block D:- 6-storey block accommodating 140no. units (32no. 1 bed units, 90no. 2 bed units and 18no. 3 bed units), Block E: 6-storey block accommodating 127no. units (48no. 1 bed units, 65no. 2 bed units and 14no. 3 bed units) and all associated communal amenity spaces and private amenity spaces comprising terraces/ balconies. Permission is also sought for modifications to the permitted single level basement below Blocks C, D and E to accommodate 342no. car parking spaces, cycle parking spaces, bulky item storage and bin storage areas with 2no. vehicular accesses provided from Parklands Parade; the ground level areas include 10 no. car parking spaces, cycle parking, public lighting, ESB substations, boundary treatments, surface water drainage infrastructure and all associated site development and infrastructure works. No modifications are proposed to the permitted Blocks A and B.

Block		Resid	ential	Non-Residential (GFA)		
	1 bed	2 bed	3 bed	Total	Retail	Café
С	26	84	19	129	555m ²	197
D	32	90	18	140	-	
E	48	65	14	127	-	
Total	106	239	51	396	555m²	197m ²

A summary of the subject scheme proposals are detailed within Table 4.1 below.

Table 4-1: Schedule of Accommodation

With reference to the Architect's scheme drawings, the layout of the proposed development is illustrated in **Figure 4-1**.





Figure 4-1: Proposed Site Layout

4.2 SITE ACCESS ARRANGEMENTS

4.2.1 Vehicle Access

The proposed development's basement car park will be accessed by vehicles via 2 no. access points provided at Blocks C and D. These accesses are proposed to be priority-controlled as illustrated in **Figure 4-2**.



Figure 4-2:Basement Access Locations

4.2.2 Pedestrian & Cyclists

Dedicated pedestrian / cycle access points are proposed at each of the 3 no. blocks from the aforementioned Parklands Parade corridor. Furthermore, the development site will be accessible


to pedestrians and cyclists from Fortunestown Lane, along with a plaza area adjacent the Saggart Luas Stop.



Figure 4-3: Pedestrian and Cycle Facility in Subject Development.



Figure 4-4: Connectivity to Saggart Luas Stop

4.3 PARKING PROVISION

4.3.1 Car Parking

Car parking is proposed to be provided at basement level car parks along with surface level car parking. The proposed development incorporates a total of **342** no. on-site car parking spaces, of which 332 no. spaces (including 2 No. Car Club spaces) will be provided within the basement and 10 no. spaces are provided on-street at surface level. **Table 4-2** below outlines car parking requirement and proposed provision.



A total 333 no. car parking spaces (Inclusive of 2 no. car club spaces and 33 no. visitor spaces) (0.84/unit) is proposed for the residential units of Blocks C, D, & E comprising (i) 298 no. for residents (ii) 33 no. for residential visitors, and (iii) 2 no car club spaces.

Excluding car club spaces, the car parking ratio per residential apartment unit equates to 0.84 car parking spaces per apartment unit. In comparison, the permitted 5 block apartment scheme proposed a ratio of 0.79 car parking per residential unit and this calculation was also based on apartment resident and visitor parking. Accordingly, this level of residential car parking provision is comparable to the permitted scheme albeit representing a slight increase. Should the visitor car parking spaces be omitted from this calculation, a car parking ratio of 0.78 spaces per residential unit is proposed which is slightly higher than the permitted ratio of 0.72 car parking spaces per residential unit (excluding visitor spaces).

This proposed level of provision is lower than the local development management maximum standard and is considered appropriate for the subject development particularly considering the sites (i) excellent public transport accessibility characteristics by bus services and Luas (ii) the proximity of both local, national and post-primary schools within walking distance of the development, (iii) the sites convenient location to both local retail and strategic Citywest Shopping Centre, (iv) with a number of strategic employment centres being within a convenient walking / cycling distance, (v) the high provision of cycle parking spaces and (vi) the proposed provision of 2 no. car club spaces.

A reduced car parking provision for the retail and café units is proposed due to the significant residential catchment surrounding these facilities. It is expected that these units will predominantly serve the local residential catchment and generate very little in the way of external vehicle trips thereby requiring less car parking when compared to a stand alone retail store or café.

Land Use Type	No of units/ GFA (sqm)	SDCC Development Plan Requirement	Sustainable Residential Development and Compact Settlements	Proposed	
Apartments	396	382	396	333	
Retail	555	22	-		
Café	Café 197		-	9	
То	tal	414	396	342	





4.3.2 Disabled Car Parking

A total of 16 no. disabled car parking spaces are proposed as illustrated in **Figure 4-5**. This equates to 5% of car parking spaces as required within the local development management standards.

4.3.3 Electric Vehicles

The South Dublin City County Development Plan 2022 – 2028 states that in all new developments, a minimum of 20% of all car parking spaces shall be equipped with fully functional EV Charging Point. It is proposed to provide a total of **68** no. electric vehicle car parking spaces (with charge point) which equates to 20% of the total car parking spaces of the proposed development.



Figure 4-5: Proposed Basement Car Parking



Figure 4-6: Permitted and Retained Surface Level Car Parking

4.3.4 Car Club Parking

The subject scheme proposes to include a total of 2 no. car club spaces at basement car parking. Managed by a specialised private operator all residents will have the option to become members of the car share service.



Car Club members can book cars online or via the app for as little as an hour, then unlock with their phone or Car Club smartcard. The keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include, (i) the reduction of the number of cars on the road and therefore traffic congestion, noise and air pollution; (ii) frees up land traditionally used for private parking spaces but which may not be used, (iii) increases use of public transport, walking and cycling as the need for car ownership is reduced and (iv) Car sharing allows those who cannot afford a car the opportunity to drive, encouraging social inclusivity

4.4 BICYCLE PARKING PROVISION

A total of **962** no. bicycle parking spaces are proposed as part of the subject development scheme. This include **748** no. long stay cycling parking spaces which are provided at basement level within Blocks C, D and E. A total of 198 no. residential short stay spaces are provided at surface level adjacent to block C, D and E and 12 no. surface level cycle parking are provided for the retail and 4 no. for café land uses. Provision for 3 No. Cargo Bikes are provided at surface level with 1 no. located at each block. The overall proposed cycle parking provision exceeds the development plan requirements and therefore represents a sustainable approach to cycle parking.

No of Unit Type units/GF		SDCC Requirement		Sustainable Residential Development and Compact Settlements		Proposed Provision	
	A (sqm)	Long Stay	Short Stay	Long Stay	Short Stay	Long Stay	Short Stay
Apartments	396	737	198	737	NA	744	198
Retail	555	3	12	-	-	3	12
Café	197	1	4	-	-	1	4
Sub Total		741	214	737	-	748	214
Total		954		737		962	

Table 4-3: Proposed Cycle Parking





Figure 4-7: Proposed Basement Cycle Parking



Figure 4-8: Proposed Surface level Cycle Parking



5 TRIP GENERATION AND DISTRIBUTION

5.1 BASELINE TRAFFIC CONDITIONS

In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed apartment development, traffic survey data recorded on 09th November 2023 was used for the purpose of this assessment.

The aforementioned traffic surveys (weekday classified junction turning counts) were conducted by IDASO between 07:00 to 19:00. The surveys undertaken included Junction Turning Counts (JTC). JTCs were carried out at six junctions within close proximity to the proposed development site. The following six locations were included within the survey (**Figure 5-1**):

- Junction 1 Fortunestown Road/Garter lane
- Junction 2 FortunestownRoad/ Citywest Avenue/Citywest Drive
- Junction 3 Citywest Drive/Carrigmore Glen
- Junction 4 Parklands Parade/Cuil Duin Avenue/School Access Lane
- Junction 5 Citywest Avenue/ L2011 Citywest Road
- Junction 6 Citywest Drive/L2011 CityWest Road



Figure 5-1: Location of Traffic Survey Junctions



In order to analyse and assess the predicted traffic impact as a result of the proposed residential development upon the local road network, an area wide traffic model incorporating these local junctions was created. Base traffic flows and the Flow Diagrams for all scenarios are included within **Appendix A**.

5.2 TRAFFIC GROWTH

An Opening Year of 2026 has been adopted for this traffic assessment. In accordance with TII (NRA) Guidance, Future Design years (+5 and +15 years) of 2031 and 2041 have also been adopted.

The TII Project Appraisal Guidelines (PAG) have been utilized to determine the traffic growth forecast rates. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

Table 6.1: Link Based Growth Rates within the PAG (2019) provides Annual National Traffic Growth Factors for the different regions within Ireland. The subject site lies within Dublin metropolitan area with the growth factors as outlined within **Table 5-1** below.

	Central Growth Rate								
Metropolitan Area	2016-2030		2030	-2040	2040-2050				
	LV	HV	LV	HV	LV	HV			
Dublin	1.0162	1.0295	1.0051	1.0136	1.0044	1.0162			

Table 5-1: National Traffic Growth Forecasts: Annual Growth

Applying the annual factors (central growth) as outlined in **Table 5-1** above for the adopted Opening Year of 2026 and Future Horizon Years of 2031 (+5 years) and 2041 (+15 years), the following growth rates have been adopted to establish corresponding 2026, 2031 and 2041 baseline network flows: -

- 2023 to 2026 1.0162 (or 4.94%);
- 2023 to 2031 1.0051 (or 11.25%); and
- 2023 to 2041 1.0044 (or 16.89%).

Traffic flow diagrams for the 2026, 2031 and 2041 flows are illustrated in **Appendix A** of this report.



5.3 TRAFFIC GENERATION

This section considers the potential traffic that could be generated by the subject development proposals. In addition, as per TII TTA Guidelines, third party committed developments that have the potential to generate additional vehicle movements across the local road network have been included.

5.3.1 Proposed Development Traffic Generation

TRICS generated trip rates for the proposed apartment development during the weekday morning and evening peak hour periods are outlined in **Table 5-2.** The local retail facility TRICS predicted vehicle trips have been discounted by 75% to account for the expected high proportion of local walk in trips expected at a neighbourhood focussed retail store such as this.

	1	AM Peak Hour		PM Peak Hour			
LAND USE	08:00-09:00 Arr Dep Two-Way			15:15-16:15			
				Arr	Dep	Two-Way	
Apartments (Block C,D,E)	0.063	0.192	0.255	0.118	0.080	0.198	
Retail	7.901	7.935	15.836	8.486	8.385	16.871	
Café	2.416	1.58	3.996	4.22	4.44	8.66	

Table 5-2:Trip Rates for Proposed Development (source TRICS)

		AM Peak Houi		PM Peak Hour				
LAND USE		08:00-09:00			15:15-16:15			
	Arr Dep Two-Way			Arr	Dep	Two-Way		
Apartments (Block C,D,E)	25	76	101	47	32	78		
Retail*	11	11	22	12	12	24		
Café	4	2	6	6	7	13		
Total Trips	40	40 89 129			50	115		

*discounted by 75%

Table 5-3:Predicted Vehicle Trip Generation

The trip generation exercise reveals that the proposed development has the potential to generate total 129 two-way vehicle trips during AM peak hour and 115 two-way vehicle trips during PM peak hour period.

5.3.2 Committed Development

(Previously Permitted Block A and B) (Planning Ref: SHD3ABP-305563-19)

The proposed development will consist of 488 apartment units comprising 118 one-bed units, 327 two-bed units and 43 three-bed units arranged in 5 blocks (Blocks A to E) and all associated public



open spaces comprising landscaped courtyards and communal amenity spaces and private amenity spaces comprising terraces/balconies. Non-residential floorspace is proposed in the form of a creche of 431sq.m gross floor area, community space of 186sq.m. **Table 5-4** below indicates the associated vehicle traffic generation for the committed development from Block A and B.

		AM Peak Hou	r	PM Peak Hour			
	Arr	Dep	Two-Way	Arr	Dep	Two-Way	
Apartments (Block A,B)	11	34	45	21	14	35	
Retail	28	28	56	30	30	60	
Creche	5	3	8	3	4	7	
Total Trips	44	65	109	54	48	102	

Table 5-4:Committed Development trips from Permitted Block A and B

421 residential units (Planning Ref: SHD3ABP-310570-21)

The proposed development will consist of residential scheme comprising 421 units, offices, retail units and residential amenity areas, within 9 blocks ranging in height from 1-13 storeys. The proposal will include 289 car parking spaces along with 650 cycle parking spaces. The development will provide public and communal open spaces throughout including a public plaza adjoining Fortunestown Luas stop. Provision of vehicular, pedestrian, and cyclist accesses to the site, including pedestrian bridge to the public park (under construction) to the east. The application includes for all landscaping, ESB substations, plant areas, bin storage, surface water attenuation and all other site development works, and site services required to facilitate the proposed development. The proposed development seeks to amend SHD permission ABP-302398-18 (under construction to the west), replacing 32 permitted duplex apartments along with associated amendments to internal roads and open spaces. The current proposal also replaces permission SD16A/0078 previously granted on this site. **Table 5-5** below indicates the associated vehicle traffic generation for the committed development.

		AM Peak Hou	r	PM Peak Hour		
LAND USE	Arr	Dep	Two-Way	Arr	Dep	Two-Way
421 Residential Unit	11	38	49	27	22	49
Total Trips	11 38 49 27 22				22	49

Table 5-5:Committed Development trips from 421 residential units



526 no. dwellings Residential Development (Planning Ref: ABP-300555-18)

The proposed development will consist residential development comprising 526 residential units and all associated site and development works. The development consists of 274 three-bed 2 storey terraced units, 185 four-bed 2 and 3 storey terraced and end of terrace units, 67 two-bed apartment/duplex units (37 Two-storey, 2 bed terraced duplexes, 18 one-storey 2 bed terraced apartments and 12 one storey 2 bed end of terrace apartments). The development also provides for a district park (4.58 ha) and a neighbourhood park (0.71 ha) in accordance with the Fortunestown Local Area Plan 2012. Permission is also sought for 789 car parking spaces, bin storage areas, ESB substations and all associated site development and infrastructural works. Vehicular access to serve the proposed development will be provided via two new access points off Garter Lane and via a new signalised junction at the southeastern corner of the site to replace the existing roundabout off Fortunestown Lane. Provision is made for a future access to Bianconi Avenue. In addition, an interim local square is proposed within the subject site providing a direct pedestrian link from the proposed development to the Saggart Luas stop. Two direct pedestrian links are proposed between the subject site and the adjoining school sites permitted under Reg Ref No SD16A/0255 providing a direct link between the school and the proposed district park and a direct link from the west of the school site to the proposed residential development. Table 5-6 below indicates the associated vehicle traffic generation for the committed development.

		AM Peak Hou	r	PM Peak Hour		
LAND USE	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Phase 1 526 Apartments	33	101	134	62	42	104
Total Trips	33	33 101 134			42	104

Table 5-6:Committed Development trips from 526 residential units

290 no. dwellings Residential Development (Planning Ref: ABP-305556-19)

The proposed development will consist 290 unit residential development over 2 no. plots in addition to The provision of c.246 sqm of residential amenity facilities (to include a gym, lounge, meeting room and cinema room) located within the ground floor of Block A, and c. 93 sqm of residential amenity facilities (to include a gym and lounge) located within the ground floor of Block E;A childcare facility (c. 265 sq m) located at the ground floor of Block D providing 71 no. childcare places, and an outdoor play area of c.500 sq m; 3 no. commercial / retail units located at the ground floor of Block F



(c.283 sq m). **Table 5-7** below indicates the associated vehicle traffic generation for the committed development.

		AM Peak Hou	r	PM Peak Hour		
LAND USE	Arr	Dep	Two-Way	Arr	Dep	Two-Way
290 Residential Units	22	81	103	49	38	87
Total Trips	22 81 103			49	38	87

Table 5-7:Committed Development trips from 421 residential units

463 no. dwellings Residential Development (Planning Ref: SHD3ABP-306602-20)

The Proposed development consist of residential development of 463 dwellings comprising 353 apartments, 89 houses and 21 duplex apartments, creche (c.587.8sq.m) and community building (c.141sq.m).401 car parking spaces (including 3 car sharing spaces) to serve overall development and 364 bicycle spaces ([for apartments] with apartment bicycle storage provided internally at ground floor level for apartment blocks 1-7). Provision of public open space areas within the development (including playground areas and communal open space areas); all ancillary landscape works, public lighting, planting and boundary treatments including regrading/reprofiling of site where required as well as provision of footpaths and cycle paths. Vehicular access to the proposed development will be from the Citywest Road (N82) and will include pedestrian crossings and works to facilitate access (including vehicular and footpath/bridges over stream/ditch), secondary vehicular and pedestrian access to boundary to lands to north (currently under construction) and pedestrian to boundary to Magna Drive. **Table 5-8** below indicates the associated vehicle traffic generation for the committed development.

		AM Peak Hou	r	PM Peak Hour		
LAND USE	Arr	Dep	Two-Way	Arr	Dep	Two-Way
463 Residential Units	25	100	125	91	42	133
Total Trips	25 100 125			91	42	133

Table 5-8:Committed Development trips from 463 residential units



6 NETWORK IMPACT ANALYSIS

6.1 ASSESSMENT SCOPE

Two different traffic scenarios have been assessed within this TTA, namely (a) the 'Base' (Do Nothing) traffic characteristics and (b) the 'Post Development' (Do Something) traffic characteristics.

The Do-Nothing traffic includes both the base network traffic flows plus the traffic that could be generated by the identified committed development schemes. The proposed development traffic flows have then been added to the network's 'Do-Nothing' (Base + Committed Development) traffic flows to establish the new 'Post' Development Do-Something traffic flows.

In summary the following network scenarios are considered.

Do Nothing

- A1 2026 Base Flows + Committed Development
- A2 2031 Base Flows + Committed Development
- A3 2041 Base Flows + Committed Development

Do Something

- B1 2026 Do Nothing (A1) + Proposed Development Flows
- B2 2031 Do Nothing (A2) + Proposed Development Flows
- B3 2041 Do Nothing (A3) + Proposed Development Flows

6.2 ASSESSMENT PERIODS

The weekday AM and PM peak hour flows have been identified in traffic survey as occurring between **08:00-09:00** and **15:15-16:15** respectively. These peak hour periods form the basis of the network assessments.

6.3 NETWORK VEHICLE FLOWS

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

- Figure 11 2026 Do Nothing (A1)
- Figure 12 2031 Do Nothing (A2)



- Figure 13 2041 Do Nothing (A3)
- Figure 14 2026 Do Something (B1)
- Figure 15 2031 Do Something (B2)
- Figure 16 2041 Do Something (B3)

6.4 NETWORK IMPACT

The TII document entitled Traffic and Transport Assessment Guidelines (2014) states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 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.

In accordance with the TII (NRA) guidelines, assessments have been undertaken to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken, the analysis incorporated the following traffic scenarios:

- 2026 Opening Year (Do Nothing & Do Something);
- 2031 Future Design Year Scenario (Do Nothing & Do Something); and
- 2041 Future Design Year Scenario (Do Nothing & Do Something).

Table 6-1 details the percentage impact of the relevant key junctions for the 2026, 2031 and 2041 design years are the following:

- Junction 1 Fortunestown Road/Garter lane
- Junction 2 FortunestownRoad/ Citywest Avenue/Citywest Drive
- Junction 3 Citywest Drive/Carrigmore Glen
- Junction 4 Parklands Parade/Cuil Duin Avenue/School Access Lane
- Junction 5 Citywest Avenue/ L2011 Citywest Road
- Junction 6 Citywest Drive/L2011 CityWest Road



lunction		Design	AM Peak	Hour (08:00	to 09:00)	PM Peak	Hour (15:15	to 16:15)
ID	Junction Location	Year	DN	DS	% Impact	DN	DS	% Impact
		2026	1360	1395	2.60%	1173	1206	2.80%
1	Fortunestown Road/Garter lane	2031	1436	1471	2.46%	1237	1270	2.65%
		2041	1504	1539	2.35%	1295	1328	2.53%
	FortunestownRoad/	2026	1434	1521	6.08%	1114	1210	8.57%
2	Citywest Avenue/Citywest	2031	1508	1595	5.78%	1168	1264	8.18%
	Drive	2041	1575	1662	5.53%	1216	1311	7.86%
	Citywest	2026	853	896	5.13%	755	799	5.87%
3	Drive/Carrigmore	2031	899	942	4.87%	794	838	5.58%
	Glen	2041	940	984	4.66%	829	874	5.35%
	Parklands	2026	924	1053	13.97%	456	571	25.12%
4	Parade/Cuil Duin Avenue/School	2031	968	1097	13.34%	472	587	24.29%
	Access Lane	2041	1006	1135	12.83%	486	601	23.60%
		2026	2432	2449	0.668%	1982	1996	0.71%
5	Citywest Avenue/ L2011 Citywest Road	2031	2570	2587	0.633%	2093	2107	0.67%
	L2011 CityWest Houd	2041	2694	2710	0.604%	2193	2207	0.64%
		2026	2308	2347	1.69%	2306	2345	1.68%
6	Citywest Drive/L2011 Citwest Road	2031	2434	2473	1.60%	2432	2471	1.59%
		2041	2546	2585	1.53%	2544	2583	1.52%

Table 6-1: Network Impact Assessment

Table 6-1 indicates, the proposed development will have a subthreshold impact upon all identified key junctions, with the exception of Junction 2 (Fortunestown Road/ Citywest Avenue/Citywest Drive) and 4 (Parklands Parade/Cuil Duin Avenue/School Access Lane).

Table 6-2 (AM Peak Hour) and **Table 6-3** (PM Peak Hour) the predicted impacts have been categorised for the 2041 Future Design Year. During the AM peak hour, with the exception of Junction 2 and 4, the subthreshold impacts is *Not Significant*, whilst the impact at junction 2 and 4 is ranges from *Slight* to *Moderate*.

During the PM peak hour, subthreshold impacts are predicted at Junctions 1, 5 & 6 and classified as *Not Significant*, whilst the impact at junction 2,3 and 4 are classified as *Slight* to *Significant*.

As a result of the impact assessment summarised above, only the Parklands Parade/Cuil Duin Avenue/School Access Lane is required to be assessed further as it is above the 10% threshold. Nevertheless, due to the proximity of the neighbouring Fortunestown Road / Citywest Avenue / Citywest Drive signal controlled junction to the aforementioned Parklands Parade/Cuil Duin



Avenue/School Access Lane junction, this junction has also been incorporated into the TRANSYT model to assess its operational performance.

(Ad	Junction - Nature of Impact ditional Vehicular Traffic on key Junctions)	Impact Scale	Impact Significance
1	Fortunestown Road/Garter lane	2.35 %	Not Significant
2	Fortunestown Road/ Citywest Avenue /Citywest Drive	5.53 %	Slight
3	Citywest Drive/Carrigmore Glen	4.66 %	Not Significant
4	Parklands Parade/Cuil Duin Avenue/School Access Lane	12.83 %	Moderate
5	Citywest Avenue/ L2011 Citywest Road	0.604 %	Not Significant
6	Citywest Drive/L2011 Citwest Road	1.53 %	Not Significant

Table 6-2: Network Impact Categorisation 2041 AM Peak Hour

(Ad	Junction - Nature of Impact ditional Vehicular Traffic on key Junctions)	Impact Scale	Impact Significance
1	Fortunestown Road/Garter lane	2.53 %	Not Significant
2	Fortunestown Road/ Citywest Avenue /Citywest Drive	7.86 %	Slight
3	Citywest Drive/Carrigmore Glen	5.35 %	Slight
4	Parklands Parade/Cuil Duin Avenue/School Access Lane	23.60 %	Significant
5	Citywest Avenue/ L2011 Citywest Road	0.64 %	Not Significant
6	Citywest Drive/L2011 Citwest Road	1.52 %	Not Significant

Table 6-3: Network Impact Categorisation 2041 PM Peak Hour





Figure 6-1: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2041)



7 PUBLIC TRANSPORT IMPACT

7.1 PUBLIC TRANSPORT OCCUPANCY SURVEY

A public transport occupancy survey was undertaken by Nationwide Data Collection Ltd. with the objective of establishing existing capacity on the local public transport network. The surveys were undertaken between 06:00 – 10:00 and 15:00 – 19:00 at 2 bus stops on Garter Lane and the Saggart Luas Stop (as presented in **Figure 7-1)** on Wednesday 13th March 2024.



Figure 7-1: Public Transport Survey Locations

It is widely accepted in the industry that the periods of maximum demand generated upon the public transport networks on a typical weekday are focused upon the AM (0700-1000) and PM (1600-1900) periods as predominantly influenced by travel to work, school, and college at any given location. Accordingly, in reference to the baseline modal data and considering the journey times required to reach potential work, school, and college destinations by bus, the number of existing (March 2024) public transport services stopping at these interchanges as located within close proximity to the proposed development have been the focus of the public transport capacity analysis.

7.2 Public Transport Survey Methodology

The demand profile for public transport services, like road traffic, is quite seasonal in nature. The timing and basis for the survey undertaken was dictated by current public transport usage patterns.



Furthermore:

- Demand for bus services, in general, is materially lower in the Summer and school holiday periods.
- Demand tends to be somewhat higher in the late Autumn and in the run up to the busy Christmas holiday. Surveying in the non-holiday weeks in the opening four or five months of the year, and early Autumn, represent a reliable indication of base-level predevelopment expressed demand for transport.
- Demand also varies by day of the week, with traffic demand generally lower on Mondays and Fridays, with some exceptions. Public transport usage on Saturdays and Sundays (in particular) are materially lower than mid-week demand.
- Demand for travel varies throughout the standard weekday but the morning peak is shorter and has patronage levels that are higher than the corresponding evening peak flows.

It follows that in determining whether spare capacity is available to meet increasing demand from any development site it is best to undertake surveys and test the midweek, morning peaks outside of the summer period when schools are open. The survey methodology provided the following information:

- Location of Stop
- Bus Service Number
- Estimated Seating Capacity of Bus and Luas
- Estimated Bus and Luas Standing Capacity
- Luas and Bus Passing or Stopping
- Number of Passengers Boarding
- Occupancy Count on Arrival
- Number of Passengers Alighting
- Occupancy Count on Departure
- Number of Passengers Remaining at Stop

7.3 Reserve Capacity of Existing Bus Services

The reserve capacity (Wednesday 13th March 2024) for the bus services calling at bus stops on Garter Lane is detailed in **Table 7-1** for the AM Peak Period (08:00-09:00) and for the PM Peak Period (15:15-16:15). The analysis of the survey data reveal that the bus services benefits from a two-way



Pariod Assossad	Rus Direction	No. of	Total Passenger	Total	Reserve Capacity	
Period Assessed	Bus Direction	Services	Capacity	Passengers	Pass. No's	%
AM (08:00-09:00)	Northbound	3	285	237.5	47.5	17%
	Southbound	4	380	190	190	50%
	Northbound	3	285	95	190	67%
PIVI (15.15-10.15)	Southbound	3	285	95	190	67%
AM (08:00-09:00)	Total	7	665	427.5	237.5	36%
PM (15:15-16:15)	Total	6	570	190	380	67%

reserve capacity of 36% in the AM Peak and 67% in the PM Peak.

Table 7-1: Bus Service Utilisation

7.4 Reserve Capacity of Existing LUAS Services

The reserve capacity (Wednesday 13th March 2024) for the LUAS service calling at the Saggart LUAS stop is detailed in **Table 7-2** for the AM Peak Period (08:00-09:00) and for the PM Peak Period (15:15-16:15). The analysis of the survey data reveal that the Luas network benefits from a two-way reserve capacity of 58% in the AM Peak and 77% in the PM Peak.

Devied Assessed	Luas	No. of	Total Passenger	Total	Reserve Capacity	
Period Assessed	Direction	Services	Capacity	Passengers	Pass. No's	%
AM (08:00-09:00)	Westbound	6	2148	152	1996	93%
	Eastbound	5	1790	1521.5	268.5	15%
DM (15,15,16,16,15)	Westbound	6	2148	182	1966	92%
PIVI (15.15-10.15)	Eastbound	6	2148	805.5	1342.5	63%
AM (08:00-09:00)	Total	11	3938	1673.5	2264.5	58%
PM (15:15-16:15)	Total	12	4296	987.5	3308.5	77%

Table 7-2: LUAS Reserve Capacity

7.4.1 Predicted Public Transport Demand

Based on modal split information obtained from the Census 2022 commuting data, the predicted modal split amongst the future residents of the proposed development has been estimated. The breakdown of modal split extrapolated from car trips calculated in **Section 5.3** is summarised in **Table 7-3**. Of the trips generated, **Table 7-4** highlights the number of trips predicted to be undertaken using sustainable modes of transport.



Moone of Troval	Modal	AM Pe	ak Period (08:	00-09:00)	PM Peak Period (15:15-16:15)			
Means of Travel	Split	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way	
On Foot	20%	20	46	67	33	26	59	
Bicycle	2%	2	5	8	4	3	7	
Bus, Minibus or coach	6%	6	13	19	10	7	17	
Train, DART or LUAS	17%	18	40	58	29	23	52	
Motorcycle or scooter	0%	0	1	1	1	0	1	
Car Driver	38%	40	89	129	65	50	115	
Car passenger	15%	16	35	51	25	20	45	
Van	3%	3	6	9	4	3	8	
	TOTAL	105	236	341	171	132	303	

Table 7-3: Modal Split of predicted Person Trips to be generated at Proposed Development

The proposed development is predicted to generate 19 no. new bus passengers (two-way) during the AM Peak hour(08:00-09:00) and 17 no. new bus passengers (two-way) during the PM Peak hour(15:15-16:15). In terms of additional LUAS patronage, the proposals are predicted to generate 58 no. new passengers (two-way) during the AM Peak hour(08:00-09:00) and 52 no. new passengers (two-way) during the AM Peak hour(08:00-09:00) and 52 no. new passengers (two-way) during the PM Peak hour(15:15-16:15).

Peak Period	PT (LUAS)	PT (Bus)	Cycling	Walking
AM Peak Period (08:00-9:00)	58	19	8	67
PM Peak Period (15:15-16:15)	52	17	7	59

Table 7-4: Predicted Person Trips using Sustainable Modes of Transport

7.5 Trip Distribution and Assignment

The predicted person trips generated by the proposed development were assigned to the surveyed bus routes based on the number of services that were recorded during surveys. Distributing the person trips generated by the proposed development based on the number of services provides for a better understanding of the anticipated demand on each of the different routes during both the AM (08:00-09:00) and PM (15:15-16:15) Peak hours.

7.6 Public Transport Impact

Table 7-5 and **Table 7-6** summarise the impact that the proposed development is predicted to have on the local bus and LUAS services during the AM Peak and PM Peak hours.



As summarised in **Table 7-5**, with the inclusion of the proposed development's projected new bus passengers, the bus network capacity is predicted to continue to operate with a reserve capacity of 11% northbound (6% impact) and 49% southbound (1% impact) during the AM Peak hour and 61% northbound (6% impact) and 66% southbound (1% impact) during the PM Peak hour. A comparison between the pre and post development reserve capacity is presented in **Figure 7-2** below.

Accordingly, the existing bus service capacity is sufficient to accommodate the projected additional patronage generated by the subject proposals.

Dovied Assessed	Bus	Bus No. of		Total	Reserve Capacity		Post development	Impact
Period Assessed	Direction	Services	Capacity	Passengers	Pass. No's	%	reserve capacity	inpact
	Northbound	3	285	237.5	47.5	17%	11%	6%
AM (08:00-09:00)	Southbound	4	380	190	190	50%	49%	1%
PM (15:15-16:15)	Northbound	3	285	95	190	67%	61%	6%
	Southbound	3	285	95	190	67%	66%	1%

Table 7-5: Predicted Impact on Bus Services

As summarised in **Table 7-6**, with the inclusion of the proposed development's projected new LUAS passengers, the LUAS red line services are predicted to operate with a reserve capacity of 92% Westbound (1% impact) and 13% eastbound (2% impact) during AM peak hour and 90% westbound (2% impact) and 61% eastbound (6% impact) during PM peak hour. A comparison between the pre and post development reserve capacity is presented in **Figure 7-3** below.

Accordingly, the existing LUAS service capacity is sufficient to accommodate the projected additional patronage generated by the subject proposals

Devied Assessed	Luas	No. of	Total Passenger Capacity	Total	Reserve Capacity		Post development	Impact
Periou Assesseu	Direction	Services		Passengers	Pass. No's	%	reserve capacity	inipact
	Westbound	6	2148	152	1996	93%	92%	1%
AIM (08:00-09:00)	Eastbound	5	1790	1521.5	268.5	15%	13%	2%
PM (15:15-16:15)	Westbound	6	2148	182	1966	92%	90%	2%
	Eastbound	6	2148	805.5	1342.5	63%	61%	2%

Table 7-6: Predicted Impact on LUAS Services







Figure 7-2: Bus Service Reserve Capacity



Figure 7-3: Luas Service Reserve Capacity



8 NETWORK ANALYSIS

8.1 Overview

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

When considering signalised junctions a Degree of Saturation (DoS) of greater than 90% (0.90) would indicate a junction to be approaching capacity, as operation above this DoS value is poor and deteriorates quickly.

For the TRANSYT analysis a one-hour AM and PM period has been simulated from 08:00-09:00 and 15:15-16:15. Traffic flows have been entered using an Origin-Destination table for the peak hours.

In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic model of the key junctions was analysed for the scheme's following opening and design years:

- 2026 Opening Year
- 2031 Future Design Year (Opening Year +5 years)
- 2041 Future Design Year (Opening Year +15 years)

The proposals are predicted to generate a subthreshold impact upon all identified key junctions during the AM and PM peak hours during all adopted design years, with the exception of Junction 2 (Fortunestown Road/ Citywest Avenue/Citywest Drive) and 4 (Parklands Parade/Cuil Duin Avenue/School Access Lane). Therefore, Junction 2 and 4 has been subjected to more detailed assessment. Due to the close proximity of these two junctions, the have been modelled within the same TRANSYT assessment. Nevertheless, for the purposes of clarity, the results at each junction have been discussed separately in the following two sections.

8.2 JUNCTION 2: FORTUNESTOWNROAD/ CITYWEST AVENUE/CITYWEST DRIVE

The results of the operational assessment of this signal controlled off-site junction during the weekday morning and evening peaks are summarised in **Tables 8-1** to **Table 8-6** below. The arms were labelled as follows within the TRANSYT model:



- Arm A: Fortunestown Lane (East)
- Arm B: Fortunestown Lane (West)
- Arm C: Link Road
- Arm D: Citywest Avenue

8.2.1 2026 AM Peak



The TRANSYT results (**Table 8-1**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2026 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 58% and a maximum queue of 11.65 pcus recorded.

With the inclusion of the proposed development, the 2026 "Do Something" AM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 64% and a maximum queue of 12.71 pcus recorded.

Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	Λ1	Fortunestown Lane (East)	L	31	21.31	5.95
	AI		S,R	48	69.35	8.49
	D1	Fortunestown	S,L	44	44.56	11.65
Do	DI	Lane (West)	R	42	60.68	8.68
Nothing	C1	Link Road	S,L	58	72.89	9.43
			R	32	64.36	4.69
	1 م	Citywest Avenue	S,L	54	77.48	7.23
			R	34	87.94	2.04
	۸1	Fortunestown Lane (East)	L	32	21.82	6.02
	AI		S,R	51	70.40	9.17
	D1	Fortunestown	S,L	49	47.79	12.71
Do	DI	Lane (West)	R	43	61.71	8.75
Something	C1	Link Pood	S,L	64	72.22	9.75
		Link Road	R	35	62.52	5.38
	D1-	Citywest	S,L	56	79.31	7.31
	D1	Avenue	R	35	86.73	2.23

Table 8-1: 2026 AM Peak Hour Analysis



8.2.2 2026 PM Peak

The TRANSYT results (**Table 8-2**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2026 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 58% and a maximum queue of 11.61 pcus recorded.

With the inclusion of the proposed development, the 2026 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 58% and a maximum queue of 11.79 pcus recorded.

Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	۸1	Fortunestown Lane (East)	L	24	16.59	4.42
			S,R	29	63.64	4.90
	D1	Fortunestown Lane (West)	S,L	22	39.29	5.08
Do			R	48	56.50	11.61
Nothing	C1	Link Road	S,L	45	69.29	5.51
			R	23	63.38	2.87
		Citywest Avenue	S,L	58	81.14	7.34
			R	19	76.64	1.58
	۸1	Fortunestown Lane (East)	L	25	17.45	4.54
			S,R	35	65.16	6.17
	Fi Fi	Fortunestown Lane	S,L	26	42.79	6.02
Do	DI	(West)	R	50	58.54	11.79
Something	C1	Link Pood	S,L	50	71.35	6.79
		LINK ROAD	R	26	64.21	3.54
	D1 —	D1 Citywest Avenue	S,L	58	81.14	7.34
	D1		R	23	75.55	2.08

Table 8-2: 2026 PM Peak Hour Analysis

8.2.3 2031 AM Peak

The TRANSYT results (**Table 8-3**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2031 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 62% and a maximum queue of 12.37 pcus recorded.



With the inclusion of the proposed development, the 2031 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 63% and a maximum queue of 13.71 pcus recorded.

Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	۸1	Fortunestown Lane (East)	L	33	21.06	6.29
			S,R	49	68.79	8.90
	D1	Fortunestown	S,L	47	45.20	12.37
Do	ы	Lane (West)	R	45	61.36	9.27
Nothing	C1	Link Road	S,L	62	75.54	9.95
			R	34	65.36	5.11
	D1	Citywest Avenue	S,L	57	78.88	7.75
			R	36	88.61	2.15
	۸1	Fortunestown Lane (East)	L	34	22.62	6.52
	AI		S,R	54	71.19	9.67
	D1	Fortunestown	S,L	52	49.50	13.71
Do	DI	Lane (West)	R	47	63.51	9.42
Something	C1	Link Dood	S,L	63	73.20	11.33
		LINK ROAD	R	34	63.87	5.32
	D1_	Citywest Avenue	S,L	62	83.15	7.99
	וט		R	39	90.05	2.37

Table 8-3: 2031 AM Peak Hour Analysis

8.2.4 2031 PM Peak

The TRANSYT results (**Table 8-4**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2031 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 57% and a maximum queue of 12.44 pcus recorded.

With the inclusion of the proposed development, the 2031 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 61% and a maximum queue of 12.62 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	Δ1	Fortunestown Lane (East)	L	26	17.18	4.80
	AF		S,R	29	63.80	5.03
	D1	Fortunestown Lane	S,L	22	38.79	5.32
Do	Ы	(West)	R	52	58.33	12.44
Nothing	C1	Link Road	S,L	47	72.97	5.82
	Ci		R	24	66.48	3.01
	1	Citywest Avenue	S,L	57	78.88	7.75
			R	36	88.61	2.15
	۵1	Fortunestown Lane (East)	L	27	18.53	4.99
			S,R	38	67.56	6.48
	R1	Fortunestown Lane	S,L	27	42.26	6.27
Do		(West)	R	53	59.40	12.62
Something	C1	Link Road	S,L	48	67.06	6.88
			R	25	60.59	3.57
		Citywest Avenue	S,L	61	82.93	7.89
	וט		R	24	76.92	2.15

Table 8-4: 2031 PM Peak Hour Analysis

8.2.5 2041 AM Peak

The TRANSYT results (**Table 8-5**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2041 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 63% and a maximum queue of 13.15 pcus recorded.

With the inclusion of the proposed development, the 2041 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 67% and a maximum queue of 14.40 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	۸1	Fortunestown Lane (East)	L	35	22.33	6.82
	AI		S,R	52	70.74	9.36
	D1	Fortunestown	S,L	49	45.83	13.15
Do	DI	Lane (West)	R	48	63.04	9.86
Nothing	C1	Link Road	S,L	63	74.46	10.33
			R	35	64.34	5.14
	D1	Citywest Avenue	S,L	58	76.28	8.14
			R	38	89.32	2.26
	Δ1	Fortunestown Lane (East)	L	36	23.41	6.98
			S,R	54	70.51	10.04
	R1	Fortunestown	S,L	54	50.21	14.40
Do		Lane (West)	R	51	66.51	10.10
Something	C1	Link Road	S,L	67	75.19	12.14
			R	37	63.92	5.66
	_ 1_		S,L	60	80.26	8.24
	וש	Citywest Avenue	R	40	90.43	2.42

Table 8-5: 2041 AM Peak Hour Analysis

8.2.6 2041 PM Peak

The TRANSYT results (**Table 8-6**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2041 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 59% and a maximum queue of 13.30pcus recorded.

With the inclusion of the proposed development, the 2041 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 61% and a maximum queue of 13.41 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
	۸1	Fortunestown	L	28	18.26	5.25
		Lane (East)	S,R	31	65.02	5.28
	D1	Fortunestown	S,L	23	38.93	5.49
Do	DI	Lane (West)	R	55	60.20	Queue (pcu) 5.25 5.28 5.49 13.30 5.94 3.07 8.12 1.69 5.32 6.62 6.45 13.41
Nothing	C1	List, Deed	S,L	46	71.18	5.94
	CI		R	24	64.90	3.07
	D1	Citywost Avonuo	S,L	59	79.90	8.12
	וש	Citywest Avenue	R	21	78.17	1.69
	Δ1	1 Fortunestown	L	28	18.72	5.32
		Lane (East)	S,R	38	66.73	1.185.944.903.079.908.128.171.698.725.326.736.622.436.451.3413.412.077.20
	D1	Fortunestown	S,L	27	42.43	6.45
Do		Lane (West)	R	57	61.34	Queue (pcd) 5.25 5.28 5.49 13.30 5.94 3.07 8.12 1.69 5.32 6.62 6.45 13.41 7.20 3.7 8.23 2.24
Something	<u>C1</u>	Link Road	S,L	51	72.07	7.20
			R	27	64.71	3.7
			S,L	61	82.06	8.23
	Citywest Aven	Citywest Ave riue	R	25	77.19	2.24

Table 8-6: 2041 PM Peak Hour Analysis

8.3 JUNCTION 4: PARKLANDS PARADE/LINK ROAD/ CUIL DUIN AVENUE/SCHOOL ACCESS LANE

The results of the operational assessment of this signal controlled off-site junction during the weekday morning and evening peaks are summarised in **Tables 8-7** to **Table 8-12** below. The arms were labelled as follows within the TRANSYT model:

- Arm D: Link Road
- Arm E: Parklands Parade
- Arm F: School Access Lane
- Arm G: Cuil Duin Avenue





8.3.1 2026 AM Peak

The TRANSYT results (**Table 8-7**) indicate that the Parklands Parade/ Link Road/ Cuil Duin Avenue/School Access Lane signalised junction will operate within capacity for the 2026 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 57% and a maximum queue of 5.81 pcus recorded.

With the inclusion of the proposed development, the 2026 "Do Something" AM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 61% and a maximum queue of 6.00 pcus recorded.

Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
		Link Road	L	16	11.22	2.71
	D1		S	57	29.18	5.81
			R	5	19.95	0.42
Do	F1	Parklands Parade	S,L	33	38.02	2.48
Nothing	EI		R	53	43.11	4.22
	F1	School Access Lane	S,L	53	36.98	5.75
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	55	46.14	4.15
	D1	Link Road	L	19	13.01	3.64
			S	61	38.08	6.00
			R	5	26.27	0.43
Do	⊏1	E1 Parklands Parade	S,L	36	35.22	3.32
Something	EI		R	57	40.65	5.71
	F1	School Access	S,L	59	40.86	6.00
		Lane	R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	58	47.28	4.39

Table 8-7: 2026 AM Peak Hour Analysis

8.3.2 2026 PM Peak

The TRANSYT results (**Table 8-8**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2026 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 30% and a maximum queue of 3.62 pcus recorded.



With the inclusion of the proposed development, the 2026 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 35% and a maximum queue of 4.99 pcus recorded.

Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
		Link Road	L	18	17.04	3.62
	D1		S	16	53.42	0.38
			R	12	52.51	0.27
Do	F1	Darklands Darada	S,L	5	18.82	0.86
Nothing			R	17	20.09	2.87
	⊏1	School Access Lane	S,L	13	36.38	0.82
			R	9	35.80	0.57
	G1	Cuil Duin Avenue	S,R,L	30	48.25	1.30
	D1	Link Road	L	23	15.71	4.99
			S	18	55.20	0.43
			R	14	53.89	 3.62 0.38 0.27 0.86 2.87 0.82 0.57 1.30 4.99 0.43 0.30 0.96 3.29 1.43 0.00 1.48
Do	E1 Darklands Pered	Parklands Parade	S,L	6	16.00	0.96
Something	L I	Farkiands Parade	R	21	17.47	3.29
	F1	School Access	S,L	26	39.84	1.43
		Lane	R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	35	52.75	1.48

Table 8-8: 2026 PM Peak Hour Analysis

8.3.3 2031 AM Peak

The TRANSYT results (**Table 8-9**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2031 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 60% and a maximum queue of 6.18 pcus recorded.

With the inclusion of the proposed development, the 2031 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 63% and a maximum queue of 6.55 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
		Link Road	L	16	10.26	2.49
	D1		S	60	30.12	6.18
			R	5	19.83	0.45
Do	F1	Parklands Parade	S,L	33	37.44	2.53
Nothing			R	52	42.28	4.28
	F1	School Access Lane	S,L	56	37.76	6.07
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	58	46.99	4.32
	D1	Link Road	L	20	10.69	3.67
			S	62	32.25	6.43
			R	5	20.53	0.46
Do	F1	1 Parklands Parade	S,L	36	35.47	3.41
Something	EI		R	58	41.18	5.89
	F1	School Access Lane	S,L	62	42.34	6.55
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	63	50.85	4.81

Table 8-9: 2031 AM Peak Hour Analysis

8.3.4 2031 PM Peak

The TRANSYT results (**Table 8-10**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2031 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 31% and a maximum queue of 3.83 pcus recorded.

With the inclusion of the proposed development, the 2031 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 36% and a maximum queue of 5.12 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
		Link Road	L	19	17.57	3.83
	D1		S	16	53.01	0.43
			R	13	52.24	0.32
Do	F1	Parklands Parade	S,L	6	18.09	0.81
Nothing			R	18	19.39	2.74
	F1	School Access Lane	S,L	21	36.22	1.50
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	31	46.73	1.26
	D1	Link Road	L	24	16.52	5.12
			S	14	50.75	0.41
			R	12	50.27	0.32
Do	F1	E1 Parklands Parade	S,L	7	18.10	1.08
Something	EI		R	22	19.85	3.71
	F1	:1 School Access Lane	S,L	24	37.99	1.51
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	36	49.07	1.55

Table 8-10: 2031 PM Peak Hour Analysis

8.3.5 2041 AM Peak

The TRANSYT results (**Table 8-11**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2041 "Do Nothing" AM peak hour with a maximum Degree of Saturation (DoS) value of 61% and a maximum queue of 6.68 pcus recorded.

With the inclusion of the proposed development, the 2041 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 66% and a maximum queue of 6.98 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
			L	17	10.56	2.64
	D1	Link Road	S	61	29.86	6.56
			R	5	19.42	0.48
Do	E 1	Parklands Parade	S,L	34	38.36	2.62
Nothing			R	55	44.09	4.48
	F1	School Access Lane	S,L	60	39.90	6.68
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	58	46.51	4.51
	D1	Link Road	L	20	10.01	3.36
			S	66	33.23	6.86
			R	6	20.30	0.49
Do	F1	E1 Parklands Parade	S,L	38	36.37	3.54
Something	E		R	61	42.92	6.13
	F1	School Access Lane	S,L	66	43.76	6.98
			R	0	0.00	0.00
	G1	Cuil Duin Avenue	S,R,L	64	49.87	4.92

Table 8-11: 2041 AM Peak Hour Analysis

8.3.6 2041 PM Peak

The TRANSYT results (**Table 8-12**) indicate that the Fortunestown Lane/ Link Road/ Citywest Avenue signalised junction will operate within capacity for the 2041 "Do Nothing" PM peak hour with a maximum Degree of Saturation (DoS) value of 33% and a corresponding queue of 3.92 pcus recorded.

With the inclusion of the proposed development, the 2041 "Do Something" PM peak hour analysis reveals that the junction will be operating above capacity with a maximum DoS value of 36% and a maximum queue of 5.02 pcus recorded.



Scenario	Arm	Arm Name	Stream	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
		Link Road	L	19	17.71	3.92
	D1		S	17	53.86	0.47
			R	14	53.23	0.37
Do	F1	Parklands	S,L	6	17.87	0.85
Nothing		Parade	R	18	19.20	2.82
	E 1	School Access	S,L	23	36.90	1.55
		Lane	R	0	0.00	0.00
	G1	Cuil Duin	S,R,L	33	47.34	1.34
		D1 Link Road	L	23	13.48	5.02
	D1		S	17	52.75	0.47
			R	14	52.12	0.37
Do		Parklands	S,L	6	15.55	1.03
Something	LI	Parade	R	21	17.5	3.50
	F1	School Access	S,L	21	40.99	0.92
		Lane	R	15	39.88	0.66
	G1	Cuil Duin	S,R,L	36	48.07	1.63

Table 8-12: 2041 PM Peak Hour Analysis



9 **RESPONSE TO LRD OPINION**

This Chapter provides a response to the traffic and transport related items as raised within the SDCC LRD Opinion report.

Sustainable Movements (Roads)

The s32C pre-planning meeting addressed the following issues with regards to traffic, access and movement:

- Clarity needed across documents in terms of parking ratios, what has/has not been included for assessment and differences between permitted and proposed development.

Response: Car parking is proposed to be provided at basement level car parks along with surface level car parking. The proposed development incorporates a total of **342** no. on-site car parking spaces, of which 332 no. spaces (including 2 No. Car Club spaces) will be provided within the basement and 10 no. spaces are provided on-street at surface level. A total 333 no. car parking spaces (Inclusive of 2 no. car club spaces and 33 no. visitor spaces) (0.84/unit) is proposed for the residential units of Blocks C, D, & E comprising : -

- 298 no. for residents,
- 33 no. for residential visitors, and
- 2 no car club spaces.

Excluding car club spaces, the car parking ratio per residential apartment unit equates to 0.84 car parking spaces per apartment unit. In comparison, the permitted 5 block apartment scheme proposed a ratio of 0.79 car parking per residential unit and this calculation was also based on apartment resident and visitor parking. Accordingly, this level of residential car parking provision is comparable to the permitted scheme albeit representing a slight increase. Should the visitor car parking spaces be omitted from this calculation, a car parking ratio of 0.78 spaces per residential unit is proposed which is slightly higher than the permitted ratio of 0.72 car parking spaces per residential unit (excluding visitor spaces).

Item 6. A revised car parking calculation showing consistent floor area figures and parking rates

Response: Table 9-1 below outlines car parking requirement and proposed provision based on finalised and coordinated floor areas. The proposed development incorporates a total of **342** no. on-site car parking spaces, of which 332 no. spaces (including 2 No. Car Club spaces) will be provided


within the basement and 10 no. spaces are provided on-street at surface level. A total of **16** no. disabled car parking spaces are proposed which equates to 5% of car parking spaces as required within the local development management standards. It is proposed to provide a total of **68** no. electric vehicle car parking spaces (with charge point) which equates to 20% of the total car parking spaces of the proposed development. The figures showing the assignment of car parking spaces are illustrated in **Figure 4-5** and **Figure 4-6** in **Section 4.3** of this report.

Land Use Type	No of units/ GFA (sqm)	SDCC Development Plan Requirement	Sustainable Residential Development and Compact Settlements (Maximum)	Proposed	
Apartments	396	382	396	333	
Retail	555	22	-	0	
Café	197	10	-	9	
То	tal	414	396	342	

Table 9-1: Car parking requirement and Proposed Provision

Specified Information required in addition to Article 23 of the Planning and Development Regulation (as per Article 16A(7)).

Item 9. Traffic and Transport Assessment

- a. Updated to include current public transport routes serving the site.
- b. Capacity study of routes serving the site
- c. All drawings within report to be consistent with final proposal.

Response: The TTA has been updated with existing public transport routes near subject site and discussed further in detail in **Section 2.3.3** and **Section 2.3.4**.

A public transport occupancy survey was undertaken by Nationwide Data Collection Ltd with the objective of establishing existing capacity on the local public transport network on Wednesday 13th March 2024 between 06:00 – 10:00 and 15:00 – 19:00 at 2 bus stops on Garter Lane and the Saggart Luas Stop. The details of reserve capacity of existing bus service and LUAS service are discussed in **Chapter 7** of this report. The existing Bus service and LUAS service has capacity sufficient to accommodate the projected additional patronage generated by the subject proposals.



All figures within the TTA report have been updated to ensure consistency with the final scheme layout.



10 SUMMARY AND CONCLUSION

10.1 SUMMARY

DBFL Consulting Engineers (DBFL) has been commissioned by Greenacre Residential DAC to compile a Traffic and Transport Assessment (TTA) report in support of a planning application for proposed Mixed Use Development in lands located at Fortunestown Lane, Citywest, Dublin.

The proposed development will consist will consist of modifications to the permitted apartment Blocks C, D and E to include an additional storey on each block and reconfiguration of the previously permitted floor levels to provide a total of 396no. apartments in lieu of the previously permitted 310no. apartments.

Permission is also sought for modifications to the permitted single level basement below Blocks C, D and E to accommodate 342no. car parking spaces, cycle parking spaces, bulky item storage and bin storage areas with 2no. vehicular accesses provided from Parklands Parade; the ground level areas include 10 no. car parking spaces, cycle parking, public lighting, ESB substations, boundary treatments, surface water drainage infrastructure and all associated site development and infrastructure works. No modifications are proposed to the permitted Blocks A and B.

Excluding car club spaces, the car parking ratio per residential apartment unit equates to 0.84 car parking spaces per apartment unit. In comparison, the permitted 5 block apartment scheme proposed a ratio of 0.79 car parking per residential unit and this calculation was also based on apartment resident and visitor parking. Accordingly, this level of residential car parking provision is comparable to the permitted scheme albeit representing a slight increase. Should the visitor car parking spaces be omitted from this calculation, a car parking ratio of 0.78 spaces per residential unit is proposed which is slightly higher than the permitted ratio of 0.72 car parking spaces per residential unit (excluding visitor spaces). This proposed level of provision is lower than the local development management maximum standard and is considered appropriate for the subject development particularly considering the sites (i) excellent public transport accessibility characteristics by bus services and Luas (ii) the proximity of both local, national and post-primary schools within walking distance of the development, (iv) with a number of strategic employment centres being within a convenient walking / cycling distance, (v) the high provision of cycle parking spaces and (vi) the proposed provision of 2 no. car club spaces.



A total of **962**no. bicycle parking spaces are proposed as part of the subject development scheme. This include **748** no. long stay cycling parking spaces which are provided at basement level within Blocks C, D and E. A total of **214** no. residential short stay spaces are provided at surface level adjacent to block C, D and E and **12** no. surface level cycle parking are provided for the retail and 4 for café land uses. Provision for **3** No. Cargo Bikes are provided at surface level with 1 no. located at each block. The overall proposed cycle parking provision exceeds the development plan requirements and therefore represents a sustainable approach to cycle parking.

The trip generation exercise reveals that the proposed development could potentially generate 129 two-way vehicle trips during AM peak hour and 115 two-way vehicle trips during PM peak hour.

In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed mixed use development, traffic survey data recorded on 09th November 2023 was used for the purpose of this assessment. The weekday AM and PM peak hour flows have been identified in traffic survey as occurring between **08:00-09:00** and **15:15-16:15** respectively. These peak hour periods form the basis of the network assessments.

A public transport occupancy survey was undertaken by Nationwide Data Collection Ltd with the objective of establishing existing capacity on the local public transport network on Wednesday 13th March 2024 between 06:00 – 10:00 and 15:00 – 19:00 at 2 bus stops on Garter Lane and the Saggart Luas Stop. The existing Bus service and LUAS service has capacity sufficient to accommodate the projected additional patronage generated by the subject proposals.

The proposed development will have a subthreshold impact upon all identified key junctions, with the exception of Junction 2 (Fortunestown lane/ Citywest Avenue/Citywest Drive) and 4 (Parklands Parade/Cúil Dúin Avenue/School Access Lane).

The results of the TRANSYT analysis at Junction 2 (Fortunestown Lane/ Citywest Avenue/Citywest Drive) junction and Junction 4 (Parklands Parade/ Cúil Dúin Avenue/School Access Lane reveal that these junctions are predicted to operate with significant reserve capacity in the adopted design years of 2026, 2031 and 2041.

10.2 CONCLUSION

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



the above report which demonstrate that the proposed site access junctions on Parklands Parade and Fortunestown Lane is predicted to be operating within capacity in each future design year scenario.

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



Appendix A : Traffic Flow Diagrams





































Appendix B : TRICS

TRICS	7.10.	3 1809	923 B21.52	Database ri	ght of TRIC	S Consortiu	m Limited,	2024. All right	ts reserved	Wednesday	22/11/23 Page 1
DBFL	Ormo	ond Hou	use Dublir	ו						Licence N	No: 638801
								Calculatio	n Doforonco	AUDIT 420001 22	1100 1150
	TRIP	RATE	CALCULATI	ON SELECT	I ON PARAI	METERS:		Calculatio	n Reference:	AUDI1-038801-23	01122-1152
	Land	Use	: 03 - RES		0.1.0.55						
	Cateo	lory		5 PRIVATELY	OWNED						
	101	AL VE	HICLES								
	Solor	tod roc	tions and ar								
	$\frac{Selec}{0A}$	FAST		<u>as.</u>							
	04	CA	CAMBRIDG	FSHIRF			1 days				
		NF		Lonnie			1 days				
		SE	SUFFOLK				1 days				
	05	EAST	MIDLANDS				. aaje				
		DY	DERBY				1 days				
		LE	LEICESTER	SHIRE			1 days				
		NG	NOTTINGH	AM			2 days				
	08	NORT	H WEST				5				
		MS	MERSEYSI	DE			2 days				
	09	NORT	Ή				5				
		TW	TYNE & WE	AR			1 days				
	11	SCOT	LAND				5				
		EB	CITY OF ED	INBURGH			1 days				
		SR	STIRLING				1 days				
	13	MUNS	STER								
		WA	WATERFOR	D			1 days				
	14	LEINS	STER								
		LU	LOUTH				1 days				

3 days

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

15

DL

GREATER DUBLIN

DUBLIN

Primary 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: Actual Range: Range Selected by User:	No of Dwellings 9 to 332 (units:) 8 to 372 (units:)
Parking Spaces Range:	All Surveys Included
Parking Spaces per Dwellin	g Range: All Surveys Included
Bedrooms per Dwelling Ran	nge: All Surveys Included
Percentage of dwellings pri	vately owned: All Surveys Included
Public Transport Provision: Selection by:	Include all surveys
Date Range: 01/01	/15 to 15/10/21
This data displays the rang included in the trip rate ca	ge of survey dates selected. Only surveys that were conducted within this date range are lculation.
<u>Selected survey days:</u> Monday Tuesday Wednesday Friday	2 days 7 days 5 days 3 days
This data displays the num	nber of selected surveys by day of the week.
<u>Selected survey types:</u> Manual count Directional ATC Count	17 days O days
This data displays the num up to the overall number of are undertaking using mad	nber of manual classified surveys and the number of unclassified ATC surveys, the total adding of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys rhines.
<u>Selected Locations:</u> Suburban Area (PPS6 Out of Edge of Town Neighbourhood Centre (PP	of Centre) 13 2 S6 Local Centre) 2

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:	
Development Zone	2
Residential Zone	12
No Sub Category	3

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.

Inclusion of Servicing Vehicles Counts:	
Servicing vehicles Included	5 days - Selected
Servicing vehicles Excluded	12 days - Selected

Secondary Filtering selection:

<u>Use Class:</u> C3

17 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:	
1,001 to 5,000	3 days
5,001 to 10,000	2 days
20,001 to 25,000	5 days
25,001 to 50,000	7 days

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

Population within 5 miles:	
50,001 to 75,000	3 days
125,001 to 250,000	4 days
250,001 to 500,000	5 days
500,001 or More	5 days

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

Car ownership within 5 miles:	
0.5 or Less	1 days
0.6 to 1.0	10 days
1.1 to 1.5	6 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.

<u>Travel Plan:</u> No

17 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

17 days

Yes

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

Covid-19 Restrictions

At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

Licence No: 638801

LIST OF SITES relevant to selection parameters

Dublin

DBFL

Ormond House

1	CA-03-C-03 BLOCKS OF FLATS CROMWELL ROAD CAMBRIDGE		CAMBRI DGESHI RE
2	Suburban Area (PPS6 Out of Centre) No Sub Category Total No of Dwellings: <i>Survey date: MONDAY</i> DL-03-C-16 BLOCKS OF FLATS BOTANIC AVENUE DUBLIN DRUMCONDRA Suburban Area (PPS6 Out of Centre)	82 <i>18/09/17</i>	<i>Survey Type: MANUAL</i> DUBLIN
3	Residential Zone Total No of Dwellings: <i>Survey date: TUESDAY</i> DL-03-C-17 BLOCKS OF FLATS FINGLAS ROAD	31 <i>22/11/16</i>	<i>Survey Type: MANUAL</i> DUBLIN
4	DUBLIN FINGLAS Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: <i>Survey date: FRIDAY</i> DL-03-C-18 HAROLD'S CROSS ROAD DUBLIN	332 <i>23/10/20</i>	<i>Survey Type: MANUAL</i> DUBLIN
5	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: <i>Survey date: WEDNESDAY</i> DY-03-C-03 BLOCKS OF FLATS CAESAR STREET DERBY	102 <i>19/05/21</i>	<i>Survey Type: MANUAL</i> DERBY
6	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: <i>Survey date: WEDNESDAY</i> EB-03-C-01 BLOCKS OF FLATS MYRESIDE ROAD EDINBURGH CRAIGLOCKHART Suburban Area (PPS6 Out of Centre)	30 <i>25/09/19</i>	<i>Survey Type: MANUAL</i> CITY OF EDINBURGH
7	Residential Zone Total No of Dwellings: Survey date: TUESDAY LE-03-C-01 BLOCK OF FLATS NEW STREET LEICESTER	32 <i>26/05/15</i>	<i>Survey Type: MANUAL</i> LEICESTERSHIRE
8	OADBY Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total No of Dwellings: <i>Survey date: FRIDAY</i> LU-03-C-04 BLOCKS OF FLATS RIVER COURT DROGHEDA	19 <i>16/10/20</i>	<i>Survey Type: MANUAL</i> LOUTH
	Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total No of Dwellings: Survey date: WEDNESDAY	42 <i>22/09/21</i>	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

LIST	OF STIES relevant to	selection parameters (Co	<u>nt.)</u>	
9	MS-03-C-02 SOUTH FERRY QUAY	BLOCKS OF FLATS		MERSEYSI DE
	BRUNSWICK DOCK Suburban Area (PPS)	6 Out of Centre)		
	Development Zone Total No of Dwellings	\$: 5:	184	
10	Survey date: MS-03-C-03 MARINERS WHARF LIVERPOOL	<i>TUESDAY</i> BLOCK OF FLATS	13/11/18	<i>Survey Type: MANUAL</i> MERSEYSI DE
	QUEENS DOCK Suburban Area (PPS) Development Zone Total No of Dwellings	6 Out of Centre)	9	
11	Survey date: NF-03-C-02 HALL ROAD NORWICH LAKENHAM	<i>TUESDAY</i> MI XED FLATS & HOUS	<i>13/11/18</i> SES	<i>Survey Type: MANUAL</i> NORFOLK
	Suburban Area (PPS) Residential Zone Total No of Dwellings	6 Out of Centre)	82	
12	Survey date: NG-03-C-01 LAWRENCE WAY NOTTINGHAM	MONDAY HOUSES (SPLIT INTO	<i>18/11/19</i> FLATS)	<i>Survey Type: MANUAL</i> NOTTINGHAM
	Suburban Area (PPS) No Sub Category	6 Out of Centre)	56	
13	Survey date: NG-03-C-02 CASTLE MARINA RO/ NOTTINGHAM	<i>TUESDAY</i> HOUSES (SPLIT INTO AD	<i>08/11/16</i> FLATS)	<i>Survey Type: MANUAL</i> NOTTINGHAM
	Suburban Area (PPS No Sub Category Total No of Dwellings	6 Out of Centre)	135	Survey Type: MANUAL
14	SF-03-C-04 SAINT MARY'S ROAE IPSWICH	BLOCKS OF FLATS	09/11/10	SUFFOLK
	Suburban Area (PPS) Residential Zone Total No of Dwellings	6 Out of Centre)	56	
15	SR-03-C-03 KERSEBONNY ROAD STIRLING CAMBUSBARDON	BLOCK OF FLATS & TE	RRACED	STIRLING
	Edge of Town Residential Zone Total No of Dwellings		82	0 T 111111
16	Survey date: TW-03-C-01 CAULDWELL AVENUE WHITLEY BAY MONKESEATON Edge of Town	IUESDAY BLOCKS OF FLATS	01/09/20	<i>Survey Type: MANUAL</i> TYNE & WEAR
	Residential Zone		45	
	Survey date:	, FRIDAY	15/10/21	Survey Type: MANUAL

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DBFL	Ormo	ond House Dublin	1			Licence No: 638801
	LIST	OF SITES relevant	to selection parameters	<u>(Cont.)</u>		
	17	WA-03-C-01 UPPER YELLOW RC WATERFORD	BLOCKS OF FLATS DAD		WATERFORD	
		Suburban Area (PF Residential Zone Total No of Dwellin <i>Survey dat</i>	PS6 Out of Centre) ngs: <i>e: TUESDAY</i>	51 <i>12/05/15</i>	Survey Type: MAN	'UAL

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/C - FLATS PRIVATELY OWNED TOTAL VEHICLES Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.042	17	81	0.145	17	81	0.187
08:00 - 09:00	17	81	0.063	17	81	0.192	17	81	0.255
09:00 - 10:00	17	81	0.084	17	81	0.076	17	81	0.160
10:00 - 11:00	17	81	0.066	17	81	0.081	17	81	0.147
11:00 - 12:00	17	81	0.058	17	81	0.077	17	81	0.135
12:00 - 13:00	17	81	0.076	17	81	0.085	17	81	0.161
13:00 - 14:00	17	81	0.082	17	81	0.093	17	81	0.175
14:00 - 15:00	17	81	0.096	17	81	0.091	17	81	0.187
15:00 - 16:00	17	81	0.112	17	81	0.079	17	81	0.191
16:00 - 17:00	17	81	0.134	17	81	0.083	17	81	0.217
17:00 - 18:00	17	81	0.169	17	81	0.090	17	81	0.259
18:00 - 19:00	17	81	0.123	17	81	0.099	17	81	0.222
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.105			1.191			2.296

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:	9 - 332 (units:)
Survey date date range:	01/01/15 - 15/10/21
Number of weekdays (Monday-Friday):	17
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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED TAXIS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip	
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.004	17	81	0.004	17	81	0.008	
08:00 - 09:00	17	81	0.002	17	81	0.004	17	81	0.006	
09:00 - 10:00	17	81	0.006	17	81	0.004	17	81	0.010	
10:00 - 11:00	17	81	0.001	17	81	0.002	17	81	0.003	
11:00 - 12:00	17	81	0.003	17	81	0.002	17	81	0.005	
12:00 - 13:00	17	81	0.003	17	81	0.001	17	81	0.004	
13:00 - 14:00	17	81	0.003	17	81	0.004	17	81	0.007	
14:00 - 15:00	17	81	0.004	17	81	0.003	17	81	0.007	
15:00 - 16:00	17	81	0.001	17	81	0.002	17	81	0.003	
16:00 - 17:00	17	81	0.005	17	81	0.004	17	81	0.009	
17:00 - 18:00	17	81	0.001	17	81	0.002	17	81	0.003	
18:00 - 19:00	17	81	0.005	17	81	0.005	17	81	0.010	
19:00 - 20:00										
20:00 - 21:00										
21:00 - 22:00										
22:00 - 23:00										
23:00 - 24:00										
Total Rates:			0.038			0.037			0.075	

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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED OGVS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip	
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.000	17	81	0.000	17	81	0.000	
08:00 - 09:00	17	81	0.001	17	81	0.001	17	81	0.002	
09:00 - 10:00	17	81	0.001	17	81	0.001	17	81	0.002	
10:00 - 11:00	17	81	0.003	17	81	0.003	17	81	0.006	
11:00 - 12:00	17	81	0.001	17	81	0.001	17	81	0.002	
12:00 - 13:00	17	81	0.003	17	81	0.002	17	81	0.005	
13:00 - 14:00	17	81	0.000	17	81	0.000	17	81	0.000	
14:00 - 15:00	17	81	0.001	17	81	0.002	17	81	0.003	
15:00 - 16:00	17	81	0.000	17	81	0.000	17	81	0.000	
16:00 - 17:00	17	81	0.001	17	81	0.001	17	81	0.002	
17:00 - 18:00	17	81	0.000	17	81	0.001	17	81	0.001	
18:00 - 19:00	17	81	0.000	17	81	0.000	17	81	0.000	
19:00 - 20:00										
20:00 - 21:00										
21:00 - 22:00										
22:00 - 23:00										
23:00 - 24:00										
Total Rates:			0.011			0.012			0.023	

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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED PSVS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip	
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.000	17	81	0.000	17	81	0.000	
08:00 - 09:00	17	81	0.000	17	81	0.000	17	81	0.000	
09:00 - 10:00	17	81	0.000	17	81	0.000	17	81	0.000	
10:00 - 11:00	17	81	0.000	17	81	0.000	17	81	0.000	
11:00 - 12:00	17	81	0.000	17	81	0.000	17	81	0.000	
12:00 - 13:00	17	81	0.000	17	81	0.000	17	81	0.000	
13:00 - 14:00	17	81	0.000	17	81	0.000	17	81	0.000	
14:00 - 15:00	17	81	0.001	17	81	0.001	17	81	0.002	
15:00 - 16:00	17	81	0.000	17	81	0.000	17	81	0.000	
16:00 - 17:00	17	81	0.001	17	81	0.001	17	81	0.002	
17:00 - 18:00	17	81	0.000	17	81	0.000	17	81	0.000	
18:00 - 19:00	17	81	0.000	17	81	0.000	17	81	0.000	
19:00 - 20:00										
20:00 - 21:00										
21:00 - 22:00										
22:00 - 23:00										
23:00 - 24:00										
Total Rates:			0.002			0.002			0.004	

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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED CYCLISTS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.001	17	81	0.009	17	81	0.010
08:00 - 09:00	17	81	0.001	17	81	0.018	17	81	0.019
09:00 - 10:00	17	81	0.001	17	81	0.004	17	81	0.005
10:00 - 11:00	17	81	0.004	17	81	0.003	17	81	0.007
11:00 - 12:00	17	81	0.006	17	81	0.004	17	81	0.010
12:00 - 13:00	17	81	0.002	17	81	0.005	17	81	0.007
13:00 - 14:00	17	81	0.008	17	81	0.004	17	81	0.012
14:00 - 15:00	17	81	0.006	17	81	0.007	17	81	0.013
15:00 - 16:00	17	81	0.004	17	81	0.004	17	81	0.008
16:00 - 17:00	17	81	0.011	17	81	0.006	17	81	0.017
17:00 - 18:00	17	81	0.015	17	81	0.006	17	81	0.021
18:00 - 19:00	17	81	0.005	17	81	0.008	17	81	0.013
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.064			0.078			0.142

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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED CARS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES	;	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.036	17	81	0.133	17	81	0.169
08:00 - 09:00	17	81	0.050	17	81	0.175	17	81	0.225
09:00 - 10:00	17	81	0.067	17	81	0.066	17	81	0.133
10:00 - 11:00	17	81	0.047	17	81	0.061	17	81	0.108
11:00 - 12:00	17	81	0.047	17	81	0.066	17	81	0.113
12:00 - 13:00	17	81	0.055	17	81	0.072	17	81	0.127
13:00 - 14:00	17	81	0.067	17	81	0.074	17	81	0.141
14:00 - 15:00	17	81	0.081	17	81	0.077	17	81	0.158
15:00 - 16:00	17	81	0.095	17	81	0.062	17	81	0.157
16:00 - 17:00	17	81	0.115	17	81	0.067	17	81	0.182
17:00 - 18:00	17	81	0.154	17	81	0.076	17	81	0.230
18:00 - 19:00	17	81	0.109	17	81	0.082	17	81	0.191
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.923			1.011			1.934

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.
TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED LGVS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip	
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.003	17	81	0.007	17	81	0.010	
08:00 - 09:00	17	81	0.009	17	81	0.011	17	81	0.020	
09:00 - 10:00	17	81	0.009	17	81	0.005	17	81	0.014	
10:00 - 11:00	17	81	0.015	17	81	0.015	17	81	0.030	
11:00 - 12:00	17	81	0.008	17	81	0.007	17	81	0.015	
12:00 - 13:00	17	81	0.014	17	81	0.009	17	81	0.023	
13:00 - 14:00	17	81	0.011	17	81	0.015	17	81	0.026	
14:00 - 15:00	17	81	0.009	17	81	0.008	17	81	0.017	
15:00 - 16:00	17	81	0.015	17	81	0.014	17	81	0.029	
16:00 - 17:00	17	81	0.011	17	81	0.010	17	81	0.021	
17:00 - 18:00	17	81	0.012	17	81	0.008	17	81	0.020	
18:00 - 19:00	17	81	0.007	17	81	0.008	17	81	0.015	
19:00 - 20:00										
20:00 - 21:00										
21:00 - 22:00										
22:00 - 23:00										
23:00 - 24:00										
Total Rates:			0.123			0.117			0.240	

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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED MOTOR CYCLES Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	17	81	0.000	17	81	0.001	17	81	0.001
08:00 - 09:00	17	81	0.000	17	81	0.001	17	81	0.001
09:00 - 10:00	17	81	0.000	17	81	0.000	17	81	0.000
10:00 - 11:00	17	81	0.000	17	81	0.000	17	81	0.000
11:00 - 12:00	17	81	0.000	17	81	0.000	17	81	0.000
12:00 - 13:00	17	81	0.001	17	81	0.001	17	81	0.002
13:00 - 14:00	17	81	0.001	17	81	0.001	17	81	0.002
14:00 - 15:00	17	81	0.001	17	81	0.000	17	81	0.001
15:00 - 16:00	17	81	0.001	17	81	0.001	17	81	0.002
16:00 - 17:00	17	81	0.001	17	81	0.000	17	81	0.001
17:00 - 18:00	17	81	0.002	17	81	0.003	17	81	0.005
18:00 - 19:00	17	81	0.002	17	81	0.003	17	81	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates: 0.009 0.011 0.020									

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.

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		LN LINCO	OLNSF	HIRE			1 davs							
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	00	GM GREA	TFR M	ANCHESTER			1 days							
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	07						1 days							
	1 /		HOIVIL	DERLAND			i uays							
	14	LEINSIER												
		WC WICK	LOW				1 days							
	15	GREATER D	UBLI	N										
		DL DUBL	.IN				1 days							

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

Primary 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:	74 to 320 (units: sqm)
Range Selected by User:	74 to 320 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision: Selection by:

Include all surveys

Date Range: 01/01/15 to 25/11/22

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.

3 days
1 days
1 days
1 days

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

<u>Selected survey types:</u>	
Manual count	6 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 undertaking using machines.

<u>Selected Locations:</u>	
Town Centre	4
Neighbourhood Centre (PPS6 Local Centre)	2

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.

Inclusion of Servicing Vehicles Counts: Servicing vehicles Included

5 days - Selected 1 days - Selected

Secondary Filtering selection:

Servicing vehicles Excluded

<u>Use Class:</u> E(b)

6 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:	
1,000 or Less	1 days
5,001 to 10,000	2 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:	
5,001 to 25,000	2 days
50,001 to 75,000	1 days
125,001 to 250,000	1 days
500,001 or More	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	2 days
1.1 to 1.5	4 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.

<u>Travel Plan:</u> No

6 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

6 days

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

LIST OF SITES relevant to selection parameters

1	DL-06-K-01 CRUMLIN ROAD DUBLIN DRIMNAGH Neidbeurbood Ceptu	CAFÉ		DUBLIN
2	No Sub Category Total Gross floor area <i>Survey date:</i> GM-06-K-01 DEANSGATE MANCHESTER	a: <i>FRIDAY</i> CAFÉ	74 sqm <i>25/11/22</i>	<i>Survey Type: MANUAL</i> GREATER MANCHESTER
3	Town Centre Built-Up Zone Total Gross floor area <i>Survey date:</i> LN-06-K-01 RED LION SQUARE STAMFORD	a: <i>TUESDAY</i> CAFÉ & TEA ROOM	200 sqm <i>19/04/22</i>	<i>Survey Type: MANUAL</i> LI NCOLNSHI RE
4	Town Centre Built-Up Zone Total Gross floor area <i>Survey date:</i> NB-06-K-01 A69 REDBURN	a: <i>TUESDAY</i> STARBUCKS	190 sqm <i>12/10/21</i>	<i>Survey Type: MANUAL</i> NORTHUMBERLAND
5	Neighbourhood Centr Village Total Gross floor area Survey date: NF-06-K-01 SAINT GILES STREET NORWICH	re (PPS6 Local Centre) a: <i>SATURDAY</i> CAFÉ T	210 sqm <i>16/10/21</i>	<i>Survey Type: MANUAL</i> NORFOLK
6	Town Centre Built-Up Zone Total Gross floor area Survey date: WC-06-K-01 FITZWILLIAM SQUAR WICKLOW	a: <i>TUESDAY</i> CAFÉ RE	82 sqm <i>20/09/22</i>	<i>Survey Type: MANUAL</i> WICKLOW
	Town Centre High Street Total Gross floor area Survey date:	a: WEDNESDAY	320 sqm <i>16/11/22</i>	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 06 - HOTEL, FOOD & DRINK/K - CAFE TOTAL VEHICLES Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS				DEPARTURES	;	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.704	2	142	0.000	2	142	0.704
07:00 - 08:00	3	201	1.490	3	201	0.993	3	201	2.483
08:00 - 09:00	6	179	2.416	6	179	1.580	6	179	3.996
09:00 - 10:00	6	179	5.390	6	179	4.368	6	179	9.758
10:00 - 11:00	6	179	7.156	6	179	6.599	6	179	13.755
11:00 - 12:00	6	179	5.948	6	179	6.134	6	179	12.082
12:00 - 13:00	6	179	5.948	6	179	6.041	6	179	11.989
13:00 - 14:00	6	179	6.599	6	179	6.970	6	179	13.569
14:00 - 15:00	6	179	6.134	6	179	7.156	6	179	13.290
15:00 - 16:00	6	179	4.554	6	179	4.740	6	179	9.294
16:00 - 17:00	5	199	3.219	5	199	3.521	5	199	6.740
17:00 - 18:00	3	243	3.014	3	243	3.288	3	243	6.302
18:00 - 19:00	1	210	3.333	1	210	4.762	1	210	8.095
19:00 - 20:00	1	210	2.857	1	210	2.857	1	210	5.714
20:00 - 21:00	1	210	0.000	1	210	0.476	1	210	0.476
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			58.762			59.485			118.247

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:	74 - 320 (units: sqm)
Survey date date range:	01/01/15 - 25/11/22
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	1
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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE TAXIS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES		TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.000	2	142	0.000	2	142	0.000
07:00 - 08:00	3	201	0.000	3	201	0.000	3	201	0.000
08:00 - 09:00	6	179	0.000	6	179	0.000	6	179	0.000
09:00 - 10:00	6	179	0.000	6	179	0.000	6	179	0.000
10:00 - 11:00	6	179	0.093	6	179	0.093	6	179	0.186
11:00 - 12:00	6	179	0.093	6	179	0.093	6	179	0.186
12:00 - 13:00	6	179	0.000	6	179	0.000	6	179	0.000
13:00 - 14:00	6	179	0.093	6	179	0.093	6	179	0.186
14:00 - 15:00	6	179	0.093	6	179	0.093	6	179	0.186
15:00 - 16:00	6	179	0.000	6	179	0.000	6	179	0.000
16:00 - 17:00	5	199	0.000	5	199	0.000	5	199	0.000
17:00 - 18:00	3	243	0.000	3	243	0.000	3	243	0.000
18:00 - 19:00	1	210	0.000	1	210	0.000	1	210	0.000
19:00 - 20:00	1	210	0.000	1	210	0.000	1	210	0.000
20:00 - 21:00	1	210	0.000	1	210	0.000	1	210	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.372			0.372			0.744

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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE OGVS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES		TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.000	2	142	0.000	2	142	0.000
07:00 - 08:00	3	201	0.166	3	201	0.166	3	201	0.332
08:00 - 09:00	6	179	0.093	6	179	0.000	6	179	0.093
09:00 - 10:00	6	179	0.093	6	179	0.186	6	179	0.279
10:00 - 11:00	6	179	0.000	6	179	0.000	6	179	0.000
11:00 - 12:00	6	179	0.000	6	179	0.000	6	179	0.000
12:00 - 13:00	6	179	0.000	6	179	0.000	6	179	0.000
13:00 - 14:00	6	179	0.000	6	179	0.000	6	179	0.000
14:00 - 15:00	6	179	0.093	6	179	0.093	6	179	0.186
15:00 - 16:00	6	179	0.000	6	179	0.000	6	179	0.000
16:00 - 17:00	5	199	0.000	5	199	0.000	5	199	0.000
17:00 - 18:00	3	243	0.137	3	243	0.137	3	243	0.274
18:00 - 19:00	1	210	0.000	1	210	0.000	1	210	0.000
19:00 - 20:00	1	210	0.000	1	210	0.000	1	210	0.000
20:00 - 21:00	1	210	0.000	1	210	0.000	1	210	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.582			0.582			1.164

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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE CYCLISTS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS			[DEPARTURES		TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.000	2	142	0.000	2	142	0.000
07:00 - 08:00	3	201	0.000	3	201	0.000	3	201	0.000
08:00 - 09:00	6	179	0.000	6	179	0.000	6	179	0.000
09:00 - 10:00	6	179	0.279	6	179	0.186	6	179	0.465
10:00 - 11:00	6	179	0.000	6	179	0.093	6	179	0.093
11:00 - 12:00	6	179	0.000	6	179	0.000	6	179	0.000
12:00 - 13:00	6	179	0.279	6	179	0.093	6	179	0.372
13:00 - 14:00	6	179	0.093	6	179	0.279	6	179	0.372
14:00 - 15:00	6	179	0.000	6	179	0.000	6	179	0.000
15:00 - 16:00	6	179	0.093	6	179	0.093	6	179	0.186
16:00 - 17:00	5	199	0.000	5	199	0.000	5	199	0.000
17:00 - 18:00	3	243	0.000	3	243	0.000	3	243	0.000
18:00 - 19:00	1	210	0.000	1	210	0.000	1	210	0.000
19:00 - 20:00	1	210	0.000	1	210	0.000	1	210	0.000
20:00 - 21:00	1	210	0.000	1	210	0.000	1	210	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.744			0.744			1.488

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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE CARS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS				DEPARTURES	;	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.704	2	142	0.000	2	142	0.704
07:00 - 08:00	3	201	0.662	3	201	0.497	3	201	1.159
08:00 - 09:00	6	179	1.952	6	179	1.301	6	179	3.253
09:00 - 10:00	6	179	4.926	6	179	3.717	6	179	8.643
10:00 - 11:00	6	179	6.877	6	179	6.227	6	179	13.104
11:00 - 12:00	6	179	5.762	6	179	5.855	6	179	11.617
12:00 - 13:00	6	179	5.762	6	179	5.948	6	179	11.710
13:00 - 14:00	6	179	5.948	6	179	6.506	6	179	12.454
14:00 - 15:00	6	179	5.297	6	179	6.134	6	179	11.431
15:00 - 16:00	6	179	4.461	6	179	4.554	6	179	9.015
16:00 - 17:00	5	199	3.018	5	199	3.320	5	199	6.338
17:00 - 18:00	3	243	2.603	3	243	2.877	3	243	5.480
18:00 - 19:00	1	210	3.333	1	210	4.762	1	210	8.095
19:00 - 20:00	1	210	2.857	1	210	2.857	1	210	5.714
20:00 - 21:00	1	210	0.000	1	210	0.476	1	210	0.476
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			54.162			55.031			109.193

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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE LGVS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS			DEPARTURES		TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.000	2	142	0.000	2	142	0.000
07:00 - 08:00	3	201	0.662	3	201	0.331	3	201	0.993
08:00 - 09:00	6	179	0.372	6	179	0.279	6	179	0.651
09:00 - 10:00	6	179	0.279	6	179	0.372	6	179	0.651
10:00 - 11:00	6	179	0.186	6	179	0.279	6	179	0.465
11:00 - 12:00	6	179	0.093	6	179	0.186	6	179	0.279
12:00 - 13:00	6	179	0.186	6	179	0.093	6	179	0.279
13:00 - 14:00	6	179	0.558	6	179	0.372	6	179	0.930
14:00 - 15:00	6	179	0.558	6	179	0.743	6	179	1.301
15:00 - 16:00	6	179	0.093	6	179	0.186	6	179	0.279
16:00 - 17:00	5	199	0.101	5	199	0.101	5	199	0.202
17:00 - 18:00	3	243	0.274	3	243	0.274	3	243	0.548
18:00 - 19:00	1	210	0.000	1	210	0.000	1	210	0.000
19:00 - 20:00	1	210	0.000	1	210	0.000	1	210	0.000
20:00 - 21:00	1	210	0.000	1	210	0.000	1	210	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3 362			3 216			6 578

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.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE MOTOR CYCLES Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS				DEPARTURES	;	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	2	142	0.000	2	142	0.000	2	142	0.000
07:00 - 08:00	3	201	0.000	3	201	0.000	3	201	0.000
08:00 - 09:00	6	179	0.000	6	179	0.000	6	179	0.000
09:00 - 10:00	6	179	0.093	6	179	0.093	6	179	0.186
10:00 - 11:00	6	179	0.000	6	179	0.000	6	179	0.000
11:00 - 12:00	6	179	0.000	6	179	0.000	6	179	0.000
12:00 - 13:00	6	179	0.000	6	179	0.000	6	179	0.000
13:00 - 14:00	6	179	0.000	6	179	0.000	6	179	0.000
14:00 - 15:00	6	179	0.093	6	179	0.093	6	179	0.186
15:00 - 16:00	6	179	0.000	6	179	0.000	6	179	0.000
16:00 - 17:00	5	199	0.101	5	199	0.101	5	199	0.202
17:00 - 18:00	3	243	0.000	3	243	0.000	3	243	0.000
18:00 - 19:00	1	210	0.000	1	210	0.000	1	210	0.000
19:00 - 20:00	1	210	0.000	1	210	0.000	1	210	0.000
20:00 - 21:00	1	210	0.000	1	210	0.000	1	210	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.287			0.287			0.574

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.

TRICS	7.10.	3 18092	23 B21.52	Database right of T	RICS Consorti	um Limited, 20	024. All rights reserve	d Wednesday 22/ P	11/23 Page 1
DBFL	Orm	ond Hous	se Dublir	1				Licence No: 6	538801
	TRIF	P RATE C	CALCULATI	ON SELECTION PA	RAMETERS:		Calculation Referen	ce: AUDIT-638801-23112	2-1108
	Land Cate TOT	Use gory AL VEF	: 01 - RET. : 0 - CON\ HICLES	AIL /ENIENCE STORE					
	Sele	cted regio	ons and are	2 <u>85:</u>					
	07	YORKS	SHIRE & NO	ORTH LINCOLNSHI	RE				
		LS	LEEDS			1 days			
		NY	NORTH YOP	RKSHIRE		1 days			
	08	NORTH	I WEST						
		MS	MERSEYSIE	DE		1 days			
	09	NORTH	4						
		TW	TYNE & WE	AR		1 days			
	10	WALES	5						
		CF	CARDIFF			1 days			
	11	SCOTL	AND						
		AS .	ABERDEEN	SHIRE		1 days			
		EB	CITY OF ED	INBURGH		1 days			
	17	ULSTEI	R (NORTH	ERN I RELAND)					
		AN .	ANTRIM			1 days			
	This	section a	displays the	number of survey da	ays per TRICS	® sub-region i	in the selected set		

Ormond House

DBFL

Primary 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:	275 to 539 (units: sqm)
Range Selected by User:	120 to 1056 (units: sqm)

Parking Spaces Range: All Surveys Included

Dublin

Public Transport Provision: Selection by:

Include all surveys

Date Range: 01/01/15 to 17/09/22

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.

2 days
1 days
3 days
2 days

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

<u>Selected survey types:</u>	
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 undertaking using machines.

Selected Locations:	
Town Centre	2
Suburban Area (PPS6 Out of Centre)	2
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	2

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	
Built-Up Zone	

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.

6 2

Inclusion of Servicing Vehicles Counts: Servicing vehicles Included Servicing vehicles Excluded

2 days - Selected 6 days - Selected

Secondary Filtering selection:

Use Class:	
E(a)	7 days
F2(a)	1 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

<u>Population within 500m Range:</u> All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:	
1,001 to 5,000	2 days
5,001 to 10,000	1 days
10,001 to 15,000	2 days
25,001 to 50,000	2 days
50,001 to 100,000	1 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	2 days
25,001 to 50,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	1 days
250,001 to 500,000	2 days
500,001 or More	1 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	6 days
1.1 to 1.5	1 days
1.6 to 2.0	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.

Petrol filling station:	
Included in the survey count	0 days
Excluded from count or no filling station	8 days

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

<u>*Travel Plan:*</u> 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.

<u>PTAL Rating:</u> 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-01-0-01 QUEENSWAY LISBURN LAMBEG Edge of Town	SPAR		ANTRIM
2	Residential Zone Total Gross floor area <i>Survey date:</i> AS-01-O-01 REDCLOAK DRIVE STONEHAVEN	a: <i>THURSDAY</i> CO-OP	400 sqm <i>14/03/19</i>	<i>Survey Type: MANUAL</i> ABERDEENSHIRE
3	Edge of Town Residential Zone Total Gross floor area <i>Survey date:</i> CF-01-O-02 HEOL-Y-DERI CARDIFF	a: <i>WEDNESDAY</i> CO-OPERATI VE	275 sqm <i>20/04/22</i>	<i>Survey Type: MANUAL</i> CARDIFF
4	Neighbourhood Centr Residential Zone Total Gross floor area <i>Survey date:</i> EB-01-O-01 EARL GREY STREET EDINBURGH	re (PPS6 Local Centre) a: <i>FRIDAY</i> SAI NSBURY'S LOCAL	350 sqm <i>07/10/16</i>	<i>Survey Type: MANUAL</i> CITY OF EDINBURGH
5	Town Centre Built-Up Zone Total Gross floor area <i>Survey date:</i> LS-01-O-01 AINSTY ROAD WETHERBY	a: <i>THURSDAY</i> CO-OPERATI VE	350 sqm <i>28/05/15</i>	<i>Survey Type: MANUAL</i> LEEDS
6	Neighbourhood Centr Residential Zone Total Gross floor area Survey date: MS-01-O-02 SKELHORNE STREET LIVERPOOL	re (PPS6 Local Centre) a: <i>MONDAY</i> TESCO EXPRESS	539 sqm <i>26/09/16</i>	<i>Survey Type: MANUAL</i> MERSEYSIDE
7	Town Centre Built-Up Zone Total Gross floor area <i>Survey date:</i> NY-01-O-03 FOREST ROAD NORTHALLERTON	a: <i>THURSDAY</i> CO-OPERATI VE	400 sqm <i>07/04/22</i>	<i>Survey Type: MANUAL</i> NORTH YORKSHIRE
8	Suburban Area (PPSe Residential Zone Total Gross floor area <i>Survey date:</i> TW-01-O-02 ETHEL TERRACE SUNDERLAND	5 Out of Centre) a: <i>MONDAY</i> CO-OPERATIVE	305 sqm <i>19/09/16</i>	<i>Survey Type: MANUAL</i> TYNE & WEAR
	CASTLETOWN Suburban Area (PPS6 Residential Zone Total Gross floor area Survey date:	6 Out of Centre) a: <i>FRIDAY</i>	330 sqm <i>07/04/17</i>	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 01 - RETAIL/O - CONVENIENCE STORE TOTAL VEHICLES Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS		[DEPARTURES	;	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.500	1	400	0.000	1	400	0.500
06:00 - 07:00	4	399	2.509	4	399	2.509	4	399	5.018
07:00 - 08:00	8	369	6.036	8	369	5.459	8	369	11.495
08:00 - 09:00	8	369	7.901	8	369	7.935	8	369	15.836
09:00 - 10:00	8	369	7.019	8	369	7.155	8	369	14.174
10:00 - 11:00	8	369	6.036	8	369	5.765	8	369	11.801
11:00 - 12:00	8	369	7.019	8	369	6.985	8	369	14.004
12:00 - 13:00	8	369	7.528	8	369	7.087	8	369	14.615
13:00 - 14:00	8	369	6.985	8	369	7.155	8	369	14.140
14:00 - 15:00	8	369	8.037	8	369	7.765	8	369	15.802
15:00 - 16:00	8	369	8.444	8	369	8.376	8	369	16.820
16:00 - 17:00	8	369	8.613	8	369	8.410	8	369	17.023
17:00 - 18:00	8	369	8.511	8	369	9.291	8	369	17.802
18:00 - 19:00	8	369	7.494	8	369	7.325	8	369	14.819
19:00 - 20:00	8	369	6.002	8	369	5.731	8	369	11.733
20:00 - 21:00	8	369	4.612	8	369	5.290	8	369	9.902
21:00 - 22:00	7	382	3.515	7	382	3.852	7	382	7.367
22:00 - 23:00	1	400	2.000	1	400	2.250	1	400	4.250
23:00 - 24:00	1	400	0.000	1	400	0.500	1	400	0.500
Total Rates:			108.761			108.840			217.601

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:	275 - 539 (units: sqm)
Survey date date range:	01/01/15 - 17/09/22
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE TAXIS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS		DEPARTURES			TOTALS			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000
06:00 - 07:00	4	399	0.000	4	399	0.000	4	399	0.000
07:00 - 08:00	8	369	0.203	8	369	0.136	8	369	0.339
08:00 - 09:00	8	369	0.068	8	369	0.102	8	369	0.170
09:00 - 10:00	8	369	0.136	8	369	0.136	8	369	0.272
10:00 - 11:00	8	369	0.203	8	369	0.170	8	369	0.373
11:00 - 12:00	8	369	0.170	8	369	0.203	8	369	0.373
12:00 - 13:00	8	369	0.000	8	369	0.000	8	369	0.000
13:00 - 14:00	8	369	0.136	8	369	0.136	8	369	0.272
14:00 - 15:00	8	369	0.068	8	369	0.068	8	369	0.136
15:00 - 16:00	8	369	0.136	8	369	0.170	8	369	0.306
16:00 - 17:00	8	369	0.203	8	369	0.068	8	369	0.271
17:00 - 18:00	8	369	0.034	8	369	0.068	8	369	0.102
18:00 - 19:00	8	369	0.034	8	369	0.068	8	369	0.102
19:00 - 20:00	8	369	0.068	8	369	0.068	8	369	0.136
20:00 - 21:00	8	369	0.237	8	369	0.305	8	369	0.542
21:00 - 22:00	7	382	0.037	7	382	0.037	7	382	0.074
22:00 - 23:00	1	400	0.750	1	400	0.750	1	400	1.500
23:00 - 24:00	1	400	0.000	1	400	0.000	1	400	0.000
Total Rates:			2.483			2.485			4.968

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE OGVS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000
06:00 - 07:00	4	399	0.063	4	399	0.063	4	399	0.126
07:00 - 08:00	8	369	0.170	8	369	0.170	8	369	0.340
08:00 - 09:00	8	369	0.237	8	369	0.170	8	369	0.407
09:00 - 10:00	8	369	0.102	8	369	0.136	8	369	0.238
10:00 - 11:00	8	369	0.068	8	369	0.034	8	369	0.102
11:00 - 12:00	8	369	0.102	8	369	0.068	8	369	0.170
12:00 - 13:00	8	369	0.000	8	369	0.034	8	369	0.034
13:00 - 14:00	8	369	0.000	8	369	0.000	8	369	0.000
14:00 - 15:00	8	369	0.000	8	369	0.000	8	369	0.000
15:00 - 16:00	8	369	0.068	8	369	0.136	8	369	0.204
16:00 - 17:00	8	369	0.000	8	369	0.000	8	369	0.000
17:00 - 18:00	8	369	0.000	8	369	0.000	8	369	0.000
18:00 - 19:00	8	369	0.034	8	369	0.000	8	369	0.034
19:00 - 20:00	8	369	0.000	8	369	0.000	8	369	0.000
20:00 - 21:00	8	369	0.000	8	369	0.000	8	369	0.000
21:00 - 22:00	7	382	0.000	7	382	0.000	7	382	0.000
22:00 - 23:00	1	400	0.000	1	400	0.000	1	400	0.000
23:00 - 24:00	1	400	0.000	1	400	0.000	1	400	0.000
Total Rates:			0.844			0.811			1.655

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE PSVS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS			DEPARTURES	;			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000
06:00 - 07:00	4	399	0.000	4	399	0.000	4	399	0.000
07:00 - 08:00	8	369	0.000	8	369	0.000	8	369	0.000
08:00 - 09:00	8	369	0.034	8	369	0.034	8	369	0.068
09:00 - 10:00	8	369	0.000	8	369	0.000	8	369	0.000
10:00 - 11:00	8	369	0.000	8	369	0.000	8	369	0.000
11:00 - 12:00	8	369	0.000	8	369	0.000	8	369	0.000
12:00 - 13:00	8	369	0.000	8	369	0.000	8	369	0.000
13:00 - 14:00	8	369	0.000	8	369	0.000	8	369	0.000
14:00 - 15:00	8	369	0.034	8	369	0.000	8	369	0.034
15:00 - 16:00	8	369	0.034	8	369	0.068	8	369	0.102
16:00 - 17:00	8	369	0.000	8	369	0.000	8	369	0.000
17:00 - 18:00	8	369	0.000	8	369	0.000	8	369	0.000
18:00 - 19:00	8	369	0.000	8	369	0.000	8	369	0.000
19:00 - 20:00	8	369	0.000	8	369	0.000	8	369	0.000
20:00 - 21:00	8	369	0.000	8	369	0.000	8	369	0.000
21:00 - 22:00	7	382	0.000	7	382	0.000	7	382	0.000
22:00 - 23:00	1	400	0.000	1	400	0.000	1	400	0.000
23:00 - 24:00	1	400	0.000	1	400	0.000	1	400	0.000
Total Rates:			0.102			0.102			0.204

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE CYCLISTS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS		[DEPARTURES	;			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000
06:00 - 07:00	4	399	0.251	4	399	0.188	4	399	0.439
07:00 - 08:00	8	369	0.170	8	369	0.203	8	369	0.373
08:00 - 09:00	8	369	0.136	8	369	0.136	8	369	0.272
09:00 - 10:00	8	369	0.034	8	369	0.034	8	369	0.068
10:00 - 11:00	8	369	0.170	8	369	0.102	8	369	0.272
11:00 - 12:00	8	369	0.203	8	369	0.271	8	369	0.474
12:00 - 13:00	8	369	0.170	8	369	0.170	8	369	0.340
13:00 - 14:00	8	369	0.136	8	369	0.170	8	369	0.306
14:00 - 15:00	8	369	0.271	8	369	0.237	8	369	0.508
15:00 - 16:00	8	369	0.102	8	369	0.136	8	369	0.238
16:00 - 17:00	8	369	0.712	8	369	0.712	8	369	1.424
17:00 - 18:00	8	369	0.305	8	369	0.305	8	369	0.610
18:00 - 19:00	8	369	0.237	8	369	0.203	8	369	0.440
19:00 - 20:00	8	369	0.000	8	369	0.034	8	369	0.034
20:00 - 21:00	8	369	0.237	8	369	0.237	8	369	0.474
21:00 - 22:00	7	382	0.150	7	382	0.112	7	382	0.262
22:00 - 23:00	1	400	0.250	1	400	0.250	1	400	0.500
23:00 - 24:00	1	400	0.000	1	400	0.000	1	400	0.000
Total Rates:			3.534			3.500			7.034

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE CARS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS			DEPARTURES	;			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.500	1	400	0.000	1	400	0.500
06:00 - 07:00	4	399	2.008	4	399	2.008	4	399	4.016
07:00 - 08:00	8	369	4.883	8	369	4.340	8	369	9.223
08:00 - 09:00	8	369	6.816	8	369	6.884	8	369	13.700
09:00 - 10:00	8	369	6.138	8	369	6.409	8	369	12.547
10:00 - 11:00	8	369	5.290	8	369	5.053	8	369	10.343
11:00 - 12:00	8	369	6.273	8	369	6.239	8	369	12.512
12:00 - 13:00	8	369	6.782	8	369	6.341	8	369	13.123
13:00 - 14:00	8	369	6.205	8	369	6.307	8	369	12.512
14:00 - 15:00	8	369	7.426	8	369	7.155	8	369	14.581
15:00 - 16:00	8	369	7.596	8	369	7.494	8	369	15.090
16:00 - 17:00	8	369	7.833	8	369	7.799	8	369	15.632
17:00 - 18:00	8	369	7.935	8	369	8.613	8	369	16.548
18:00 - 19:00	8	369	6.952	8	369	6.782	8	369	13.734
19:00 - 20:00	8	369	5.459	8	369	5.324	8	369	10.783
20:00 - 21:00	8	369	4.137	8	369	4.612	8	369	8.749
21:00 - 22:00	7	382	3.179	7	382	3.515	7	382	6.694
22:00 - 23:00	1	400	1.250	1	400	1.500	1	400	2.750
23:00 - 24:00	1	400	0.000	1	400	0.500	1	400	0.500
Total Rates:			96.662			96.875			193.537

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE LGVS Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS			DEPARTURES	;		TOTALS	S	
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip	
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000	
06:00 - 07:00	4	399	0.439	4	399	0.439	4	399	0.878	
07:00 - 08:00	8	369	0.780	8	369	0.814	8	369	1.594	
08:00 - 09:00	8	369	0.746	8	369	0.746	8	369	1.492	
09:00 - 10:00	8	369	0.644	8	369	0.475	8	369	1.119	
10:00 - 11:00	8	369	0.407	8	369	0.475	8	369	0.882	
11:00 - 12:00	8	369	0.475	8	369	0.441	8	369	0.916	
12:00 - 13:00	8	369	0.712	8	369	0.678	8	369	1.390	
13:00 - 14:00	8	369	0.610	8	369	0.678	8	369	1.288	
14:00 - 15:00	8	369	0.509	8	369	0.543	8	369	1.052	
15:00 - 16:00	8	369	0.610	8	369	0.509	8	369	1.119	
16:00 - 17:00	8	369	0.543	8	369	0.543	8	369	1.086	
17:00 - 18:00	8	369	0.543	8	369	0.576	8	369	1.119	
18:00 - 19:00	8	369	0.475	8	369	0.475	8	369	0.950	
19:00 - 20:00	8	369	0.441	8	369	0.373	8	369	0.814	
20:00 - 21:00	8	369	0.237	8	369	0.373	8	369	0.610	
21:00 - 22:00	7	382	0.262	7	382	0.262	7	382	0.524	
22:00 - 23:00	1	400	0.000	1	400	0.000	1	400	0.000	
23:00 - 24:00	1	400	0.000	1	400	0.000	1	400	0.000	
Total Rates:			8.433			8.400			16.833	

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.

TRIP RATE for Land Use 01 - RETAIL/O - CONVENIENCE STORE MOTOR CYCLES Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

		ARRIVALS		[DEPARTURES	5			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	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	1	400	0.000	1	400	0.000	1	400	0.000
06:00 - 07:00	4	399	0.000	4	399	0.000	4	399	0.000
07:00 - 08:00	8	369	0.000	8	369	0.000	8	369	0.000
08:00 - 09:00	8	369	0.000	8	369	0.000	8	369	0.000
09:00 - 10:00	8	369	0.000	8	369	0.000	8	369	0.000
10:00 - 11:00	8	369	0.068	8	369	0.034	8	369	0.102
11:00 - 12:00	8	369	0.000	8	369	0.034	8	369	0.034
12:00 - 13:00	8	369	0.034	8	369	0.034	8	369	0.068
13:00 - 14:00	8	369	0.034	8	369	0.034	8	369	0.068
14:00 - 15:00	8	369	0.000	8	369	0.000	8	369	0.000
15:00 - 16:00	8	369	0.000	8	369	0.000	8	369	0.000
16:00 - 17:00	8	369	0.034	8	369	0.000	8	369	0.034
17:00 - 18:00	8	369	0.000	8	369	0.034	8	369	0.034
18:00 - 19:00	8	369	0.000	8	369	0.000	8	369	0.000
19:00 - 20:00	8	369	0.034	8	369	0.000	8	369	0.034
20:00 - 21:00	8	369	0.000	8	369	0.000	8	369	0.000
21:00 - 22:00	7	382	0.037	7	382	0.037	7	382	0.074
22:00 - 23:00	1	400	0.000	1	400	0.000	1	400	0.000
23:00 - 24:00	1	400	0.000	1	400	0.000	1	0.000	
Total Rates:			0.241			0.207			0.448

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.

Appendix C : TRANSYT



TRANSYT 15

Version: 15.5.3.7

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solution

Filename: Site 2 and 4.t15 Path: G:\2022\p220133\calcs\TRANSYT Report generation date: 03/05/2024 16:03:36

»A1 - 2023 BASE AM : D1 - 2023 BASE AM* :
»A2 - 2023 BASE PM : D2 - 2023 BASE PM* :
»A3 - 2026 DN AM : D3 - 2026 DN AM* :
»A4 - 2026 DN PM : D4 - 2026 DN PM* :
»A5 - 2031 DN AM : D5 - 2031 DN AM* :
»A6 - 2031 DN PM : D6 - 2031 DN PM* :
»A7 - 2041 DN AM : D7 - 2041 DN AM* :
»A8 - 2041 DN PM : D8 - 2041 DN PM* :
»A9 - 2026 DS AM : D9 - 2026 DS AM* :
»A10 - 2026 DS PM : D10 - 2026 DS PM* :
»A11 - 2031 DS AM : D11 - 2031 DS AM* :
»A12 - 2031 DS PM : D12 - 2031 DS PM* :
»A13 - 2041 DS PM : D13 - 2041 DS AM* :



Network Diagrams



A1 - 2023 BASE AM D1 - 2023 BASE AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	30	32	2	1	1
	2	~	1	B,C,H,I	46	49	3	2	2
4	3	✓	2	C,D,B	55	94	39	1	1
	4	✓	6	D,J	100	125	25	1	1
	5	~	4	E,F	131	158	27	1	7
	6	✓	3	A,B	164	16	32	1	1



Traffic Stream Green Times

Arm	Traffic Stream	Troffic Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Green Period 2		
Ann	Trainc Stream	Traffic Node	Controller Stream	Fliase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	46	94	48	164	16	32
A1	2	J1	1	A	164	16	32			
B1	1	J1	1	D	55	125	70			
B1	2	J1	1	С	46	94	48			
C1	1	J1	1	F	131	158	27			
C1	2	J1	1	E	131	158	27			
H1	1	J1	1	J	100	125	25			
H1	2	J1	1	I	38	49	11			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Т
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
Farm	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	143	159	16	1	1
	2	✓	3	E,D,C	165	167	2	1	2
	3	✓	5	C,B,A	173	8	15	1	1
	4	~	2	F,G	14	36	22	1	1
2	5	✓	4	I	48	52	4	1	1
	6	✓	1	Н	64	71	7	1	1
	7	~	3	E,D,C	77	89	12	1	2
	8	~	5	C,B,A	95	110	15	1	1
	9	~	2	F,G	116	137	21	1	1

Traffic Stream Green Times

A	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	165	8	23	77	110	33	
D1	2	J2	2	В	173	8	15	95	110	15	
D1	3	J2	2	А	173	8	15	95	110	15	
E1	1	J2	2	E	165	167	2	77	89	12	
E1	2	J2	2	D	165	167	2	77	89	12	
F1	1	J2	2	G	14	36	22	116	137	21	
F1	2	J2	2	F	14	36	22	116	137	21	
G1	1	J2	2	н	64	71	7	143	159	16	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

1									
ĺ	Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2
					7-1-1-2-8 				



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	4	4.00	14	525	91.57	89.89	98.96	0.50	100	Г
Ped5	Ped5	J2	2	I	10	2500	4	4.00	14	525	91.03	89.89	98.96	0.50	100	Г
Ped6	Ped6	J2	2	I	10	2500	4	4.00	14	525	91.09	89.89	98.96	0.50	100	Γ
Ped7	Ped7	J2	2	I	10	2500	4	4.00	14	525	90.89	89.89	98.99	0.50	100	
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	QUEUES		
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				337	Unrestricted	180	23.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				391	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			260	Unrestricted	180	70.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			213	Unrestricted	180	99.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				65	Unrestricted	180	106.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				264	Unrestricted	180	18.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				143	Unrestricted	180	20.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				198	Unrestricted	180	8.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	217 <	1856	80	0.00	26	251	20.11	18.36	60.34	4.75 +
	2	(untitled)	J1	1	А	148 <	2055	32	0.00	39	129	69.51	67.77	88.79	6.62 +
B1	1	(untitled)	J1	1	D	264 <	1854	70	0.00	36	149	44.55	39.87	70.28	9.42 +
ы	2	(untitled)	J1	1	С	185 <	2009	48	0.00	34	166	58.87	54.19	80.16	7.49 +
C1	1	(untitled)	J1	1	F	131 <	1895	27	5.00	44	103	69.82	65.68	94.90	6.26 +
	2	(untitled)	J1	1	Е	76	1998	27	12.00	24	268	64.60	60.34	87.82	3.46
	1	(untitled)	J2	2	С	53	1871 f	56	35.00	9	924	13.38	10.50	45.99	1.12
D1	2	(untitled)	J2	2	В	184 <	2080	30	0.00	50	81	28.87	25.99	67.47	5.20 +
	3	(untitled)	J2	2	А	15	1952	30	20.00	4	1982	22.31	19.43	59.07	0.39
E1	1	(untitled)	J2	2	Е	42	1915	14	12.00	25	265	48.19	41.95	94.70	1.09
L 1	2	(untitled)	J2	2	D	66	1886	14	0.00	39	129	52.16	45.92	100.08	1.81
E1	1	(untitled)	J2	2	G	205 <	1943 f	43	0.00	42	113	33.53	31.83	84.83	5.16 +
FI	2	(untitled)	J2	2	F	0	1972	43	45.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	120	1897	23	0.00	46	98	45.87	41.55	95.99	3.16
Ц1	1	(untitled)	J1	1	J	136	1800	25	0.00	52	72	83.71	78.77	95.68	6.55
	2	(untitled)	J1	1	I	29	1800	11	9.00	24	272	89.41	84.47	96.41	1.41
C 2	1	(untitled)	CC1			169	1975	180	103.00	9	952	1.09	0.09	0.00	0.00
62	2	(untitled)	CC1			38	2055	180	144.00	2	4767	1.02	0.02	0.00	0.00
D 2	1	(untitled)	DD1			27	1940	180	147.00	1	6489	1.33	0.01	0.00	0.00
02	2	(untitled)	DD1			226	2080	180	91.00	11	730	1.43	0.11	0.00	0.01
G2	1	(untitled)	GG1			120	1930	180	0.00	6	1348	14.41	0.06	0.00	0.00
H2	1	(untitled)	HH1			165	1800	180	0.00	9	882	25.49	0.10	0.00	0.00
A3	1	(untitled)	AA2			365	1980	180	89.00	18	388	1.21	0.21	0.00	0.02
B3	1	(untitled)	BB2			449	1925	180	33.00	23	286	1.48	0.28	0.00	0.04
C3	1	(untitled)	CC2			207	1915	180	96.00	11	733	1.11	0.11	0.00	0.01
D3	1	(untitled)	DD2			252	1965	180	66.00	13	602	1.21	0.13	0.00	0.01
E3	1	(untitled)	EE2			108	1800	180	0.00	6	1400	19.68	0.06	0.00	0.00
F3	1	(untitled)	FF2			205	1800	180	86.00	11	690	14.53	0.13	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1298.85	68.56	18.94	25.23	358.31	19.79	0.00	378.10
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1301.85	69.47	18.74	25.94	368.33	19.88	0.00	388.22

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX

A2 - 2023 BASE PM D2 - 2023 BASE PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	28	30	2	1	1
	2	~	1	B,C,H,I	44	51	7	1	1
4	3	✓	2	B,C,D	57	101	44	1	1
•	4	✓	6	D,J	107	133	26	1	1
	5	~	4	E,F	139	155	16	1	1
	6	~	3	B,A	161	14	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Troffic Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Green Period 2			
Ann	Traine Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	reen F End 14	Duration	
A1	1	J1	1	В	44	101	57	161	14	33	
A1	2	J1	1	A	161	14	33				
B1	1	J1	1	D	57	133	76				
B1	2	J1	1	С	44	101	57				
C1	1	J1	1	F	139	155	16				
C1	2	J1	1	E	139	155	16				
H1	1	J1	1	J	107	133	26				
H1	2	J1	1	1	36	51	15				

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					Т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
F	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	Т	12	12	12	12	12	12	12	12	


Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	7	10	3	1	1
	2	✓	3	E,D,C	16	37	21	1	1
	3	✓	5	C,B,A	43	51	8	1	1
2	4	✓	2	F,G	57	75	18	1	1
	5	✓	4	I	87	99	12	1	1
	6	✓	1	Н	111	121	10	1	1
	7	✓	3	E,D,C	127	147	20	1	1
	8	✓	5	C,B,A	153	154	1	1	1
	9	✓	2	F,G	160	1	21	1	1

Traffic Stream Green Times

Arm Traffic Stream	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Am	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	16	51	35	127	154	27	
D1	2	J2	2	В	43	51	8	153	154	1	
D1	3	J2	2	А	43	51	8	153	154	1	
E1	1	J2	2	E	16	37	21	127	147	20	
E1	2	J2	2	D	16	37	21	127	147	20	
F1	1	J2	2	G	57	75	18	160	1	21	
F1	2	J2	2	F	57	75	18	160	1	21	
G1	1	J2	2	н	111	121	10	7	10	3	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PEF	R PCU		QUEUES	WEIG	ЭH
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	15	13.00	19	380	102.59	78.59	93.36	1.40	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Γ
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	12	12.00	6	1525	80.20	78.52	92.44	0.47	100	Γ
Ped5	Ped5	J2	2	I	10	2500	12	12.00	6	1525	79.66	78.52	92.44	0.47	100	Γ
Ped6	Ped6	J2	2	I	10	2500	12	12.00	6	1525	79.72	78.52	92.44	0.47	100	Γ
Ped7	Ped7	J2	2	I	10	2500	12	12.00	6	1525	79.52	78.52	92.47	0.47	100	Г
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLC	ows		PER	FORMANCE		PER	PCU		QUEUES	ſ
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	
Aexit	1	(untitled)				344	Unrestricted	180	31.00	0	Unrestricted	79.43	0.00	0.00	0.00	
Bexit	1	(untitled)				308	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00	ſ
Cexit	1	(untitled)	DD3			81	Unrestricted	180	160.00	0	Unrestricted	2.16	0.00	0.00	0.00	
Dexit	1	(untitled)	CC3			102	Unrestricted	180	119.00	0	Unrestricted	3.00	0.00	0.00	0.00	
Eexit	1	(untitled)				73	Unrestricted	180	92.00	0	Unrestricted	105.09	0.00	0.00	0.00	
Fexit	1	(untitled)				21	Unrestricted	180	173.00	0	Unrestricted	61.07	0.00	0.00	0.00	ſ
Gexit	1	(untitled)				51	Unrestricted	180	114.00	0	Unrestricted	69.53	0.00	0.00	0.00	ſ
Hexit	1	(untitled)				117	Unrestricted	180	29.00	0	Unrestricted	123.58	0.00	0.00	0.00	ſ
	1		J1	1	В	196 <	1856	90	0.00	21	336	15.67	13.92	53.04	3.57 +	ſ
AI	2	(untitled)	J1	1	А	60	2055	33	1.00	15	482	63.61	61.86	83.15	2.51	ſ
	1	(untitled)	J1	1	D	102	1854	76	0.00	13	600	36.20	31.52	59.53	3.07	ſ
BI	2	(untitled)	J1	1	С	239 <	2009	57	0.00	37	144	53.24	48.56	76.82	9.27 +	ſ
	1	(untitled)	J1	1	F	67	1895	16	9.00	37	141	77.54	73.40	94.88	3.29	ſ
C1	2	(untitled)	J1	1	Е	37	1998	16	11.00	20	361	72.71	68.45	84.41	1.70	ſ
	1	(untitled)	J2	2	С	65	1871 f	62	52.00	10	825	29.40	26.52	77.87	1.51	ſ
D1	2	(untitled)	J2	2	В	12	2080	9	6.00	9	853	51.62	48.74	84.26	0.29	ſ
	3	(untitled)	J2	2	А	9	1952	9	8.00	8	1093	51.38	48.50	83.99	0.22	ſ
	1	(untitled)	J2	2	E	20	1915	41	41.00	4	1959	35.20	28.96	75.00	0.50	ſ
E1	2	(untitled)	J2	2	D	63	1886	41	0.00	14	544	36.30	30.06	77.59	1.62	ľ
	1	(untitled)	J2	2	G	50	1942 f	39	36.00	11	696	31.01	29.31	78.15	1.20	ſ
F1	2	(untitled)	J2	2	F	0	1972	39	41.00	0	Unrestricted	0.00	0.00	0.00	0.00	ľ
G1	1	(untitled)	J2	2	Н	28	1904	13	12.00	18	410	46.90	42.58	93.58	0.80	ſ
	1	(untitled)	J1	1	J	134	1800	26	0.00	50	81	81.71	76.76	94.51	6.38	ſ
H1	2	(untitled)	J1	1	I	15	1800	15	14.00	9	860	81.53	76.58	91.65	0.69	ľ
	1	(untitled)	CC1			85	1975	180	138.00	4	1987	1.04	0.04	0.00	0.00	ſ
C2	2	(untitled)	CC1			18	2055	180	165.00	1	9937	1.01	0.01	0.00	0.00	ľ
	1	(untitled)	DD1			32	1940	180	160.00	2	5297	1.34	0.02	0.00	0.00	ſ
D2	2	(untitled)	DD1			53	2080	180	156.00	3	3409	1.34	0.02	0.00	0.00	ľ
G2	1	(untitled)	GG1			28	1930	180	180.00	1	6104	14.36	0.01	0.00	0.00	ľ
H2	1	(untitled)	HH1			149	1800	180	0.00	8	987	25.48	0.09	0.00	0.00	t
A3	1	(untitled)	AA2			256	1980	180	11.00	13	596	1.13	0.13	0.00	0.01	t
B3	1	(untitled)	BB2			341	1925	180	35.00	18	408	1.40	0.20	0.00	0.02	t
C3	1	(untitled)	CC2			104	1915	180	115.00	5	1564	1.05	0.05	0.00	0.00	t
D3	1	(untitled)	DD2			86	1965	180	155.00	4	1964	1.12	0.04	0.00	0.00	t
E3	1	(untitled)	EE2			83	1800	180	0.00	5	1852	19.66	0.05	0.00	0.00	t
F3	1	(untitled)	FF2			50	1800	180	180.00	3	3140	14.43	0.03	0.00	0.00	t



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	888.91	45.01	19.75	15.36	218.12	11.39	0.00	229.51
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.85	3.51	0.65	9.30	0.09	0.00	9.39
Pedestrians								
TOTAL	891.91	45.86	19.45	16.02	227.42	11.48	0.00	238.90

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A3 - 2026 DN AM D3 - 2026 DN AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	29	31	2	1	1
	2	~	1	B,C,H,I	45	48	3	1	1
4	3	✓	2	B,C,D	54	87	33	1	1
	4	✓	6	D,J	93	120	27	1	1
	5	~	4	E,F	126	156	30	1	1
	6	~	3	B,A	162	15	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Traine Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	45	87	42	162	15	33
A1	2	J1	1	A	162	15	33			
B1	1	J1	1	D	54	120	66			
B1	2	J1	1	С	45	87	42			
C1	1	J1	1	F	126	156	30			
C1	2	J1	1	E	126	156	30			
H1	1	J1	1	J	93	120	27			
H1	2	J1	1	I	37	48	11			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
From	в				6	6	6	6	6	12
	С						6	6	6	12
	D	6	6				6	6	6	12
	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	140	151	11	1	1
	2	✓	3	E,D,C	157	171	14	1	1
	3	✓	5	C,B,A	177	10	13	1	1
2	4	✓	2	F,G	16	36	20	1	1
	5	✓	4	I	48	51	3	1	1
	6	✓	1	Н	63	74	11	1	1
	7	✓	3	E,D,C	80	91	11	1	1
	8	✓	5	C,B,A	97	112	15	1	1
	9	✓	2	F,G	118	134	16	1	1

Traffic Stream Green Times

A	Troffic Stream		Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	157	10	33	80	112	32	
D1	2	J2	2	В	177	10	13	97	112	15	
D1	3	J2	2	A	177	10	13	97	112	15	
E1	1	J2	2	E	157	171	14	80	91	11	
E1	2	J2	2	D	157	171	14	80	91	11	
F1	1	J2	2	G	16	36	20	118	134	16	
F1	2	J2	2	F	16	36	20	118	134	16	
G1	1	J2	2	н	63	74	11	140	151	11	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual dime Degree of total (s saturation (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)			JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w	
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	3	3.00	18	400	95.26	93.58	101.00	0.51	100	Г
Ped5	Ped5	J2	2	I	10	2500	3	3.00	18	400	94.72	93.58	101.00	0.51	100	Г
Ped6	Ped6	J2	2	I	10	2500	3	3.00	18	400	94.78	93.58	101.00	0.51	100	Γ
Ped7	Ped7	J2	2	I	10	2500	3	3.00	18	400	94.58	93.58	101.03	0.51	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				408	Unrestricted	180	17.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				467	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			340	Unrestricted	180	71.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			305	Unrestricted	180	95.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				138	Unrestricted	180	16.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				282	Unrestricted	180	14.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				200	Unrestricted	180	18.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				218	Unrestricted	180	4.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	249 <	1856	75	0.00	31	187	23.05	21.31	65.19	5.95 +
	2	(untitled)	J1	1	А	186 <	2055	33	0.00	48	88	71.09	69.35	90.54	8.49 +
D1	1	(untitled)	J1	1	D	306 <	1854	66	0.00	44	103	49.24	44.56	75.29	11.65 +
ы	2	(untitled)	J1	1	С	202 <	2009	42	0.00	42	114	65.36	60.68	85.18	8.68 +
C1	1	(untitled)	J1	1	F	189 <	1895	30	4.00	58	55	77.03	72.89	98.62	9.43 +
01	2	(untitled)	J1	1	Е	109	1998	30	8.00	32	184	68.62	64.36	83.36	4.69
	1	(untitled)	J2	2	С	112	1871 f	65	34.00	16	460	14.10	11.22	50.91	2.71
D1	2	(untitled)	J2	2	В	198 <	2080	28	0.00	57	58	32.06	29.18	88.78	5.81 +
	3	(untitled)	J2	2	А	16	1952	28	22.00	5	1730	22.83	19.95	68.92	0.42
E1	1	(untitled)	J2	2	Е	94	1915	25	0.00	33	175	44.26	38.02	90.91	2.48
E1	2	(untitled)	J2	2	D	149	1886	25	0.00	53	71	49.35	43.11	97.95	4.22
E1	1	(untitled)	J2	2	G	216 <	1943 f	36	0.00	53	71	38.69	36.98	92.04	5.75 +
FI	2	(untitled)	J2	2	F	0	1972	36	38.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	140	1901	22	0.00	55	63	50.46	46.14	101.12	4.15
U 4	1	(untitled)	J1	1	J	151 <	1800	27	0.00	54	67	82.43	77.48	95.09	7.23 +
	2	(untitled)	J1	1	I	41	1800	11	8.00	34	163	92.88	87.94	98.58	2.04
C 2	1	(untitled)	CC1			244	1975	180	113.00	12	630	1.13	0.13	0.00	0.01
62	2	(untitled)	CC1			55	2055	180	133.00	3	3294	1.02	0.02	0.00	0.00
D 2	1	(untitled)	DD1			56	1940	180	131.00	3	3018	1.35	0.03	0.00	0.00
02	2	(untitled)	DD1			270	2080	180	97.00	13	593	1.45	0.13	0.00	0.01
G2	1	(untitled)	GG1			140	1930	180	0.00	7	1141	14.42	0.07	0.00	0.00
H2	1	(untitled)	HH1			192	1800	180	2.00	11	744	25.51	0.12	0.00	0.01
A3	1	(untitled)	AA2			435	1980	180	107.00	22	310	1.26	0.26	0.00	0.03
В3	1	(untitled)	BB2			508	1925	180	55.00	26	241	1.54	0.34	0.00	0.05
C3	1	(untitled)	CC2			298	1915	180	90.00	16	478	1.17	0.17	0.00	0.01
D3	1	(untitled)	DD2			326	1965	180	68.00	17	442	1.26	0.18	0.00	0.02
E3	1	(untitled)	EE2			243	1800	180	0.00	14	567	19.77	0.16	0.00	0.01
F3	1	(untitled)	FF2			216	1800	180	103.00	12	650	14.54	0.14	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1611.29	87.18	18.48	33.43	474.65	26.23	0.00	500.88
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1614.29	88.09	18.33	34.13	484.68	26.32	0.00	510.99

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A4 - 2026 DN PM D4 - 2026 DN PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Т	J
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
From	D	6				6	6	14	6	6	
	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	31	33	2	1	1
	2	~	1	B,C,H,I	47	56	9	1	1
4	3	✓	2	B,C,D	62	97	35	1	1
•	4	✓	6	D,J	103	128	25	1	1
	5	~	4	E,F	134	157	23	1	1
	6	~	3	B,A	163	17	34	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Troffic Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Green Period 2			
Ann	Traine Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration	
A1	1	J1	1	В	47	97	50	163	17	34	
A1	2	J1	1	A	163	17	34				
B1	1	J1	1	D	62	128	66				
B1	2	J1	1	С	47	97	50				
C1	1	J1	1	F	134	157	23				
C1	2	J1	1	E	134	157	23				
H1	1	J1	1	J	103	128	25				
H1	2	J1	1	1	39	56	17				

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

		A B C D E F G H I A - - 6 6 6 6 6 12 B - - 6 6 6 6 6 6 12 C - - - 6 6 6 6 12													
		Α	в	С	D	Е	F	G	н	Ι					
From	Α				6	6	6	6	6	12					
	в				6	6	6	6	6	12					
	С						6	6	6	12					
	D	6	6				6	6	6	12					
	Е	6	6				6	6	6	12					
	F	6	6	6	6	6			6	12					
	G	6	6	6	6	6			6	12					
	н	6	6	6	6	6	6	6		12					
	Т	12	12	12	12	12	12	12	12						



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	174	176	2	1	1
	2	✓	3	E,D,C	2	44	42	1	1
	3	✓	5	C,B,A	50	53	3	1	1
	4	~	2	F,G	59	74	15	1	1
2	5	✓	4	I	86	92	6	1	1
	6	✓	1	Н	104	113	9	1	1
	7	✓	3	E,D,C	119	148	29	1	1
	8	~	5	C,B,A	154	156	2	1	1
	9	~	2	F,G	162	168	6	1	1

Traffic Stream Green Times

A	Arm Traffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Am	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	2	53	51	119	156	37	
D1	2	J2	2	В	50	53	3	154	156	2	
D1	3	J2	2	А	50	53	3	154	156	2	
E1	1	J2	2	E	2	44	42	119	148	29	
E1	2	J2	2	D	2	44	42	119	148	29	
F1	1	J2	2	G	59	74	15	162	168	6	
F1	2	J2	2	F	59	74	15	162	168	6	
G1	1	J2	2	н	104	113	9	174	176	2	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PEF	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle)) (%)			Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	17	15.00	17	440	100.16	76.16	91.92	1.38	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	Ι	10	2500	6	6.00	10	775	87.41	85.73	96.63	0.49	100	
Ped5	Ped5	J2	2	I	10	2500	6	6.00	10	775	86.87	85.73	96.63	0.49	100	Г
Ped6	Ped6	J2	2	I	10	2500	6	6.00	10	775	86.93	85.73	96.63	0.49	100	
Ped7	Ped7	J2	2	I	10	2500	6	6.00	10	775	86.73	85.73	96.66	0.49	100	
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Г



Traffic Stream Results

				SIGNA	LS	FLO	ows	PERFORMANCE			PER PCU C		QUEUES	I		
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	
Aexit	1	(untitled)				417	Unrestricted	180	28.00	0	Unrestricted	79.43	0.00	0.00	0.00	
Bexit	1	(untitled)				362	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00	Ī
Cexit	1	(untitled)	DD3			185	Unrestricted	180	71.00	0	Unrestricted	2.16	0.00	0.00	0.00	Ι
Dexit	1	(untitled)	CC3			175	Unrestricted	180	87.00	0	Unrestricted	3.00	0.00	0.00	0.00	
Eexit	1	(untitled)				209	Unrestricted	180	0.00	0	Unrestricted	105.09	0.00	0.00	0.00	
Fexit	1	(untitled)				22	Unrestricted	180	174.00	0	Unrestricted	61.07	0.00	0.00	0.00	Ι
Gexit	1	(untitled)				50	Unrestricted	180	116.00	0	Unrestricted	69.53	0.00	0.00	0.00	Ī
Hexit	1	(untitled)				149	Unrestricted	180	23.00	0	Unrestricted	123.58	0.00	0.00	0.00	Ī
	1		J1	1	В	216 <	1856	84	0.00	24	269	18.33	16.59	57.66	4.42 +	Ī
AI	2	(untitled)	J1	1	А	114 <	2055	34	0.00	29	215	65.38	63.64	85.34	4.90 +	Ī
D4	1	(untitled)	J1	1	D	149	1854	66	0.00	22	317	43.97	39.29	67.52	5.08	I
BI	2	(untitled)	J1	1	С	275 <	2009	50	0.00	48	86	61.18	56.50	83.64	11.61 +	Ī
64	1	(untitled)	J1	1	F	113	1895	23	0.00	45	101	73.43	69.29	96.57	5.51	Ī
CI	2	(untitled)	J1	1	E	62	1998	23	17.00	23	286	67.64	63.38	89.68	2.87	Ī
	1	(untitled)	J2	2	С	166	1871 f	88	52.00	18	407	19.92	17.04	75.36	3.62	Ī
D1	2	(untitled)	J2	2	В	13	2080	5	5.00	16	478	56.30	53.42	94.70	0.38	Ī
	3	(untitled)	J2	2	А	9	1952	5	5.00	12	659	55.39	52.51	93.72	0.27	Ī
-4	1	(untitled)	J2	2	E	41	1915	71	70.00	5	1605	25.06	18.82	58.83	0.86	Ī
EI	2	(untitled)	J2	2	D	130	1886	71	0.00	17	430	26.33	20.09	62.52	2.87	Ī
- 4	1	(untitled)	J2	2	G	33	1965 f	21	19.00	13	585	38.08	36.38	88.22	0.82	Ī
F1	2	(untitled)	J2	2	F	23	1972	21	20.00	9	886	37.51	35.80	87.11	0.57	Ī
G1	1	(untitled)	J2	2	Н	41	1911	11	8.00	30	203	52.57	48.25	99.12	1.30	Ī
	1	(untitled)	J1	1	J	150 <	1800	25	0.00	58	56	86.09	81.14	97.21	7.34 +	Ī
H1	2	(untitled)	J1	1	I	34	1800	17	14.00	19	376	81.59	76.64	92.28	1.58	Ī
	1	(untitled)	CC1			144	1975	180	81.00	7	1133	1.07	0.07	0.00	0.00	Ī
62	2	(untitled)	CC1			31	2055	180	157.00	2	5859	1.01	0.01	0.00	0.00	Ī
	1	(untitled)	DD1			83	1940	180	146.00	4	2004	1.36	0.04	0.00	0.00	Ī
D2	2	(untitled)	DD1			105	2080	180	143.00	5	1690	1.37	0.05	0.00	0.00	Ī
G2	1	(untitled)	GG1			41	1930	180	180.00	2	4137	14.36	0.02	0.00	0.00	Ī
H2	1	(untitled)	HH1			184	1800	180	5.00	10	780	25.51	0.11	0.00	0.01	Ī
A3	1	(untitled)	AA2			330	1980	180	61.00	17	440	1.18	0.18	0.00	0.02	t
B3	1	(untitled)	BB2			424	1925	180	61.00	22	309	1.46	0.26	0.00	0.03	t
C3	1	(untitled)	CC2			175	1915	180	81.00	9	884	1.09	0.09	0.00	0.00	t
D3	1	(untitled)	DD2			188	1965	180	70.00	10	843	1.18	0.10	0.00	0.01	t
E3	1	(untitled)	EE2		1	171	1800	180	0.00	10	847	19.72	0.10	0.00	0.00	t
F3	1	(untitled)	FF2			56	1800	180	180.00	3	2793	14.44	0.03	0.00	0.00	t



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1196.34	61.54	19.44	21.63	307.17	16.49	0.00	323.66
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.83	3.59	0.63	9.01	0.09	0.00	9.10
Pedestrians								
TOTAL	1199.34	62.37	19.23	22.27	316.18	16.58	0.00	332.76

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A5 - 2031 DN AM D5 - 2031 DN AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
-	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	28	30	2	1	1
	2	~	1	B,C,H,I	44	47	3	1	1
4	3	✓	2	B,C,D	53	86	33	1	1
•	4	✓	6	D,J	92	119	27	1	1
	5	~	4	E,F	125	154	29	1	1
	6	~	3	B,A	160	14	34	1	1



Traffic Stream Green Times

Arm Traffic Stream		Traffia Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Green Period 2			
Ann	Traine Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration	
A1	1	J1	1	В	44	86	42	160	14	34	
A1	2	J1	1	A	160	14	34				
B1	1	J1	1	D	53	119	66				
B1	2	J1	1	С	44	86	42				
C1	1	J1	1	F	125	154	29				
C1	2	J1	1	E	125	154	29				
H1	1	J1	1	J	92	119	27				
H1	2	J1	1	1	36	47	11				

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

	То													
		Α	в	С	D	Е	F	G	Н	Ι				
	Α				6	6	6	6	6	12				
	в				6	6	6	6	6	12				
	С						6	6	6	12				
Farm	D	6	6				6	6	6	12				
From	Е	6	6				6	6	6	12				
	F	6	6	6	6	6			6	12				
	G	6	6	6	6	6			6	12				
	н	6	6	6	6	6	6	6		12				
	I	12	12	12	12	12	12	12	12					

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	138	150	12	1	1
	2	✓	3	E,D,C	156	169	13	1	1
	3	✓	5	C,B,A	175	9	14	1	1
	4	✓	2	F,G	15	35	20	1	1
2	5	✓	4	I	47	49	2	1	1
	6	✓	1	Н	61	71	10	1	1
	7	✓	3	E,D,C	77	90	13	1	1
	8	✓	5	C,B,A	96	110	14	1	1
	9	✓	2	F,G	116	132	16	1	1

Traffic Stream Green Times

Arm Traffic Stream			Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	156	9	33	77	110	33	
D1	2	J2	2	В	175	9	14	96	110	14	
D1	3	J2	2	А	175	9	14	96	110	14	
E1	1	J2	2	E	156	169	13	77	90	13	
E1	2	J2	2	D	156	169	13	77	90	13	
F1	1	J2	2	G	15	35	20	116	132	16	
F1	2	J2	2	F	15	35	20	116	132	16	
G1	1	J2	2	н	61	71	10	138	150	12	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

	SIGNALS		LS	FLC		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	ЭH		
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Γ
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	2	2.00	24	275	102.60	100.92	104.99	0.53	100	Γ
Ped5	Ped5	J2	2	I	10	2500	2	2.00	24	275	102.06	100.92	104.99	0.53	100	Г
Ped6	Ped6	J2	2	I	10	2500	2	2.00	24	275	102.12	100.92	104.99	0.53	100	
Ped7	Ped7	J2	2	I	10	2500	2	2.00	24	275	101.92	100.92	105.02	0.53	100	Г
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Г



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER PCU		QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				430	Unrestricted	180	16.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				492	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			356	Unrestricted	180	69.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			317	Unrestricted	180	92.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				142	Unrestricted	180	15.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				298	Unrestricted	180	12.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				210	Unrestricted	180	15.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				230	Unrestricted	180	3.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	263 <	1856	76	0.00	33	175	22.80	21.06	64.92	6.29 +
	2	(untitled)	J1	1	А	195 <	2055	34	0.00	49	84	70.54	68.79	90.42	8.90 +
B1	1	(untitled)	J1	1	D	322 <	1854	66	0.00	47	93	49.88	45.20	76.07	12.37 +
ы	2	(untitled)	J1	1	С	214 <	2009	42	0.00	45	102	66.04	61.36	85.89	9.27 +
C1	1	(untitled)	J1	1	F	197 <	1895	29	4.00	62	44	79.68	75.54	100.29	9.95 +
	2	(untitled)	J1	1	Е	114	1998	29	6.00	34	163	69.62	65.36	85.55	5.11
	1	(untitled)	J2	2	С	116	1871 f	66	31.00	16	448	13.14	10.26	45.98	2.49
D1	2	(untitled)	J2	2	В	209 <	2080	28	0.00	60	49	33.00	30.12	89.40	6.18 +
	3	(untitled)	J2	2	А	17	1952	28	21.00	5	1622	22.71	19.83	68.59	0.45
E1	1	(untitled)	J2	2	Е	97	1915	26	0.00	33	176	43.68	37.44	90.22	2.53
L 1	2	(untitled)	J2	2	D	153	1886	26	0.00	52	73	48.52	42.28	97.00	4.28
E1	1	(untitled)	J2	2	G	229 <	1943 f	36	0.00	56	61	39.46	37.76	93.39	6.07 +
F I	2	(untitled)	J2	2	F	0	1972	36	38.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	146	1900	22	0.00	58	56	51.31	46.99	102.25	4.32
Ц1	1	(untitled)	J1	1	J	160 <	1800	27	0.00	57	58	83.83	78.88	96.20	7.75 +
	2	(untitled)	J1	1	I	43	1800	11	7.00	36	151	93.55	88.61	99.39	2.15
C 2	1	(untitled)	CC1			254	1975	180	115.00	13	600	1.13	0.13	0.00	0.01
02	2	(untitled)	CC1			57	2055	180	127.00	3	3145	1.02	0.02	0.00	0.00
D2	1	(untitled)	DD1			58	1940	180	130.00	3	2910	1.35	0.03	0.00	0.00
02	2	(untitled)	DD1			284	2080	180	96.00	14	559	1.46	0.14	0.00	0.01
G2	1	(untitled)	GG1			146	1930	180	0.00	8	1090	14.42	0.08	0.00	0.00
H2	1	(untitled)	HH1			203	1800	180	14.00	11	698	25.52	0.13	0.00	0.01
A3	1	(untitled)	AA2			458	1980	180	109.00	23	289	1.27	0.27	0.00	0.03
B3	1	(untitled)	BB2			536	1925	180	61.00	28	223	1.56	0.36	0.00	0.05
C3	1	(untitled)	CC2			311	1915	180	89.00	16	454	1.18	0.18	0.00	0.02
D3	1	(untitled)	DD2			342	1965	180	66.00	17	417	1.27	0.19	0.00	0.02
E3	1	(untitled)	EE2			250	1800	180	0.00	14	548	19.78	0.16	0.00	0.01
F3	1	(untitled)	FF2			229	1800	180	110.00	13	607	14.55	0.15	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1693.54	91.93	18.42	35.43	503.05	27.61	0.00	530.66
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1696.54	92.83	18.28	36.13	513.08	27.70	0.00	540.78

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A6 - 2031 DN PM D6 - 2031 DN PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	~	5	G	34	36	2	1	1
	2	~	1	B,C,H,I	50	58	8	1	1
4	3	✓	2	B,C,D	64	99	35	1	1
•	4	✓	6	D,J	105	131	26	1	1
	5	~	4	E,F	137	160	23	1	1
	6	✓	3	B,A	166	20	34	1	1



Traffic Stream Green Times

Arm	Arm Traffic Stream	Traffia Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	G	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	50	99	49	166	20	34
A1	2	J1	1	A	166	20	34			
B1	1	J1	1	D	64	131	67			
B1	2	J1	1	С	50	99	49			
C1	1	J1	1	F	137	160	23			
C1	2	J1	1	E	137	160	23			
H1	1	J1	1	J	105	131	26			
H1	2	J1	1	I	42	58	16			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

		Α	в	С	D	Е	F	G	Н	Ι					
	Α				6	6	6	6	6	12					
From	в				6	6	6	6	6	12					
	С						6	6	6	12					
	D	6	6				6	6	6	12					
From	Е	6	6				6	6	6	12					
	F	6	6	6	6	6			6	12					
	G	6	6	6	6	6			6	12					
	н	6	6	6	6	6	6	6		12					
	I	12	12	12	12	12	12	12	12						



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	2	4	2	1	1
	2	✓	3	E,D,C	10	49	39	1	1
	3	✓	5	C,B,A	55	59	4	1	1
	4	✓	2	F,G	65	74	9	1	1
2	5	✓	4	I	86	91	5	1	1
	6	✓	1	Н	103	112	9	1	1
	7	✓	3	E,D,C	118	148	30	1	1
	8	✓	5	C,B,A	154	155	1	1	1
	9	✓	2	F,G	161	176	15	1	1

Traffic Stream Green Times

A	Arm Traffic Stream		Controllor Stroom	Dhase	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	10	59	49	118	155	37	
D1	2	J2	2	В	55	59	4	154	155	1	
D1	3	J2	2	А	55	59	4	154	155	1	
E1	1	J2	2	E	10	49	39	118	148	30	
E1	2	J2	2	D	10	49	39	118	148	30	
F1	1	J2	2	G	65	74	9	161	176	15	
F1	2	J2	2	F	65	74	9	161	176	15	
G1	1	J2	2	н	103	112	9	2	4	2	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows	PERFORMANCE PER PCU				QUEUES	WEIC	эH			
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	16	14.00	18	410	101.35	77.35	92.63	1.39	100	
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Γ
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	5	5.00	12	650	89.20	87.52	97.63	0.49	100	Γ
Ped5	Ped5	J2	2	I	10	2500	5	5.00	12	650	88.66	87.52	97.63	0.49	100	Γ
Ped6	Ped6	J2	2	I	10	2500	5	5.00	12	650	88.72	87.52	97.63	0.49	100	
Ped7	Ped7	J2	2	I	10	2500	5	5.00	12	650	88.52	87.52	97.66	0.49	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PER	FORMANCE		PER	PCU		QUEUES	ſ
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	
Aexit	1	(untitled)				439	Unrestricted	180	27.00	0	Unrestricted	79.43	0.00	0.00	0.00	
Bexit	1	(untitled)				381	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00	ſ
Cexit	1	(untitled)	DD3			190	Unrestricted	180	70.00	0	Unrestricted	2.16	0.00	0.00	0.00	
Dexit	1	(untitled)	CC3			181	Unrestricted	180	85.00	0	Unrestricted	3.00	0.00	0.00	0.00	
Eexit	1	(untitled)				191	Unrestricted	180	2.00	0	Unrestricted	105.09	0.00	0.00	0.00	
Fexit	1	(untitled)				23	Unrestricted	180	172.00	0	Unrestricted	61.07	0.00	0.00	0.00	ſ
Gexit	1	(untitled)				77	Unrestricted	180	54.00	0	Unrestricted	69.53	0.00	0.00	0.00	ſ
Hexit	1	(untitled)				157	Unrestricted	180	20.00	0	Unrestricted	123.58	0.00	0.00	0.00	ſ
A4	1		J1	1	В	228 <	1856	83	0.00	26	246	18.93	17.18	58.87	4.80 +	ſ
AI	2	(untitled)	J1	1	А	117 <	2055	34	0.00	29	207	65.54	63.80	85.37	5.03 +	ſ
D4	1	(untitled)	J1	1	D	156	1854	67	0.00	22	304	43.47	38.79	67.43	5.32	ſ
ы	2	(untitled)	J1	1	С	290 <	2009	49	0.00	52	73	63.01	58.33	85.12	12.44 +	ſ
	1	(untitled)	J1	1	F	118	1895	23	3.00	47	92	77.11	72.97	97.84	5.82	ſ
61	2	(untitled)	J1	1	Е	64	1998	23	18.00	24	274	70.74	66.48	93.27	3.01	ſ
	1	(untitled)	J2	2	С	170	1871 f	86	52.00	19	384	20.45	17.57	75.41	3.83	ſ
D1	2	(untitled)	J2	2	В	13	2080	5	5.00	16	447	55.89	53.01	98.71	0.43	ſ
	3	(untitled)	J2	2	А	10	1952	5	5.00	13	583	55.12	52.24	97.87	0.32	ſ
	1	(untitled)	J2	2	E	42	1915	69	68.00	6	1519	24.33	18.09	59.95	0.81	ſ
E1	2	(untitled)	J2	2	D	134	1886	69	0.00	18	400	25.63	19.39	63.97	2.74	ſ
	1	(untitled)	J2	2	G	60	1943 f	24	1.00	21	321	37.93	36.22	88.35	1.50	ſ
F1	2	(untitled)	J2	2	F	0	1972	24	26.00	0	Unrestricted	0.00	0.00	0.00	0.00	ſ
G1	1	(untitled)	J2	2	н	43	1911	11	8.00	31	189	51.05	46.73	99.53	1.26	ſ
	1	(untitled)	J1	1	J	159 <	1800	26	0.00	59	53	85.66	80.71	97.26	7.79 +	ſ
H1	2	(untitled)	J1	1	I	35	1800	16	13.00	21	337	82.97	78.03	93.08	1.64	ľ
	1	(untitled)	CC1			150	1975	180	81.00	8	1082	1.08	0.08	0.00	0.00	ſ
C2	2	(untitled)	CC1			32	2055	180	157.00	2	5667	1.01	0.01	0.00	0.00	ſ
	1	(untitled)	DD1			85	1940	180	145.00	4	1954	1.36	0.04	0.00	0.00	ſ
D2	2	(untitled)	DD1			108	2080	180	142.00	5	1629	1.37	0.05	0.00	0.00	ľ
G2	1	(untitled)	GG1			43	1930	180	180.00	2	3940	14.37	0.02	0.00	0.00	ľ
H2	1	(untitled)	HH1			194	1800	180	15.00	11	735	25.51	0.12	0.00	0.01	t
A3	1	(untitled)	AA2			345	1980	180	64.00	17	417	1.19	0.19	0.00	0.02	ľ
B3	1	(untitled)	BB2			446	1925	180	68.00	23	288	1.48	0.28	0.00	0.03	t
C3	1	(untitled)	CC2			182	1915	180	82.00	10	845	1.10	0.10	0.00	0.01	t
D3	1	(untitled)	DD2			193	1965	180	69.00	10	815	1.18	0.10	0.00	0.01	t
E3	1	(untitled)	EE2			176	1800	180	0.00	10	820	19.72	0.11	0.00	0.01	t
F3	1	(untitled)	FF2			60	1800	180	0.00	3	2600	14.44	0.03	0.00	0.00	ľ



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1247.38	64.50	19.34	22.89	325.01	17.39	0.00	342.40
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.84	3.55	0.64	9.15	0.09	0.00	9.24
Pedestrians								
TOTAL	1250.38	65.34	19.14	23.53	334.16	17.48	0.00	351.64

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A7 - 2041 DN AM D7 - 2041 DN AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	30	32	2	1	1
	2	~	1	B,C,H,I	46	49	3	1	1
4	3	✓	2	B,C,D	55	87	32	1	1
•	4	✓	6	D,J	93	121	28	1	1
	5	~	4	E,F	127	157	30	1	1
	6	~	3	B,A	163	16	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Troffic Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Traine Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	46	87	41	163	16	33
A1	2	J1	1	A	163	16	33			
B1	1	J1	1	D	55	121	66			
B1	2	J1	1	С	46	87	41			
C1	1	J1	1	F	127	157	30			
C1	2	J1	1	E	127	157	30			
H1	1	J1	1	J	93	121	28			
H1	2	J1	1	1	38	49	11			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
Farm	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	141	152	11	1	1
	2	✓	3	E,D,C	158	171	13	1	1
	3	✓	5	C,B,A	177	11	14	1	1
	4	✓	2	F,G	17	36	19	1	1
2	5	✓	4	I	48	50	2	1	1
	6	✓	1	Н	62	74	12	1	1
	7	✓	3	E,D,C	80	92	12	1	1
	8	✓	5	C,B,A	98	113	15	1	1
	9	✓	2	F,G	119	135	16	1	1

Traffic Stream Green Times

A	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Operation Green Period Duration Start End Du 33 80 113 113 14 98 113 113 14 98 113 113 13 80 92 113 13 80 92 113 19 119 135 135	Duration		
D1	1	J2	2	С	158	11	33	80	113	33
D1	2	J2	2	В	177	11	14	98	113	15
D1	3	J2	2	А	177	11	14	98	113	15
E1	1	J2	2	E	158	171	13	80	92	12
E1	2	J2	2	D	158	171	13	80	92	12
F1	1	J2	2	G	17	36	19	119	135	16
F1	2	J2	2	F	17	36	19	119	135	16
G1	1	J2	2	н	62	74	12	141	152	11

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	2	2.00	24	275	102.60	100.92	104.99	0.53	100	Г
Ped5	Ped5	J2	2	I	10	2500	2	2.00	24	275	102.06	100.92	104.99	0.53	100	Г
Ped6	Ped6	J2	2	I	10	2500	2	2.00	24	275	102.12	100.92	104.99	0.53	100	
Ped7	Ped7	J2	2	I	10	2500	2	2.00	24	275	101.92	100.92	105.02	0.53	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				449	Unrestricted	180	15.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				515	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			371	Unrestricted	180	69.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			330	Unrestricted	180	92.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				145	Unrestricted	180	11.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				314	Unrestricted	180	10.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				218	Unrestricted	180	15.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				241	Unrestricted	180	0.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	275 <	1856	74	0.00	35	156	24.07	22.33	66.84	6.82 +
	2	(untitled)	J1	1	А	203 <	2055	33	0.00	52	72	72.49	70.74	91.58	9.36 +
D1	1	(untitled)	J1	1	D	337 <	1854	66	0.00	49	84	50.51	45.83	76.93	13.15 +
ы	2	(untitled)	J1	1	С	224 <	2009	41	0.00	48	88	67.72	63.04	87.26	9.86 +
C1	1	(untitled)	J1	1	F	205 <	1895	30	3.00	63	43	78.60	74.46	99.82	10.33 +
CI	2	(untitled)	J1	1	Е	119	1998	30	6.00	35	160	68.60	64.34	82.96	5.14
	1	(untitled)	J2	2	С	118	1871 f	66	31.00	17	439	13.44	10.56	46.42	2.64
D1	2	(untitled)	J2	2	В	220 <	2080	29	0.00	61	47	32.74	29.86	84.92	6.56 +
	3	(untitled)	J2	2	А	18	1952	29	20.00	5	1581	22.30	19.42	65.86	0.48
E1	1	(untitled)	J2	2	Е	99	1915	25	0.00	34	161	44.60	38.36	91.19	2.62
L 1	2	(untitled)	J2	2	D	157	1886	25	0.00	55	62	50.33	44.09	98.86	4.48
E1	1	(untitled)	J2	2	G	241 <	1943 f	35	0.00	60	49	41.60	39.90	95.95	6.68 +
F I	2	(untitled)	J2	2	F	0	1972	35	37.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	154	1900	23	0.00	58	54	50.83	46.51	101.63	4.51
U 1	1	(untitled)	J1	1	J	168 <	1800	28	0.00	58	55	83.22	78.28	96.15	8.14 +
	2	(untitled)	J1	1	Ι	45	1800	11	7.00	38	140	94.26	89.32	99.77	2.26
C 2	1	(untitled)	CC1			265	1975	180	115.00	13	572	1.14	0.14	0.00	0.01
02	2	(untitled)	CC1			60	2055	180	125.00	3	3008	1.03	0.03	0.00	0.00
D2	1	(untitled)	DD1			59	1940	180	128.00	3	2859	1.35	0.03	0.00	0.00
02	2	(untitled)	DD1			297	2080	180	99.00	14	530	1.46	0.14	0.00	0.01
G2	1	(untitled)	GG1			154	1930	180	0.00	8	1028	14.43	0.08	0.00	0.00
H2	1	(untitled)	HH1			213	1800	180	21.00	12	661	25.53	0.13	0.00	0.01
A3	1	(untitled)	AA2			478	1980	180	113.00	24	273	1.29	0.29	0.00	0.04
B3	1	(untitled)	BB2			561	1925	180	66.00	29	209	1.58	0.38	0.00	0.06
C3	1	(untitled)	CC2			324	1915	180	89.00	17	432	1.19	0.19	0.00	0.02
D3	1	(untitled)	DD2			356	1965	180	67.00	18	397	1.28	0.20	0.00	0.02
E3	1	(untitled)	EE2			256	1800	180	0.00	14	533	19.78	0.17	0.00	0.01
F3	1	(untitled)	FF2			241	1800	180	116.00	13	572	14.56	0.15	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1767.98	96.37	18.35	37.38	530.86	28.89	0.00	559.75
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1770.98	97.27	18.21	38.09	540.89	28.98	0.00	569.87

1 N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A8 - 2041 DN PM D8 - 2041 DN PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	33	35	2	1	1
	2	~	1	B,C,H,I	49	57	8	1	1
4	3	✓	2	B,C,D	63	97	34	1	1
	4	✓	6	D,J	103	130	27	1	1
	5	~	4	E,F	136	160	24	1	1
	6	~	3	B,A	166	19	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	49	97	48	166	19	33
A1	2	J1	1	A	166	19	33			
B1	1	J1	1	D	63	130	67			
B1	2	J1	1	С	49	97	48			
C1	1	J1	1	F	136	160	24			
C1	2	J1	1	E	136	160	24			
H1	1	J1	1	J	103	130	27			
H1	2	J1	1	I	41	57	16			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
Farm	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	


Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	1	4	3	1	1
	2	✓	3	E,D,C	10	49	39	1	1
	3	✓	5	C,B,A	55	59	4	1	1
2	4	✓	2	F,G	65	75	10	1	1
	5	✓	4	I	87	92	5	1	1
	6	✓	1	Н	104	112	8	1	1
-	7	✓	3	E,D,C	118	149	31	1	1
	8	✓	5	C,B,A	155	156	1	1	1
	9	✓	2	F,G	162	175	13	1	1

Traffic Stream Green Times

A	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	een P	eriod 1	Gi	een P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
D1	1	J2	2	С	10	59	49	118	156	38
D1	2	J2	2	В	55	59	4	155	156	1
D1	3	J2	2	А	55	59	4	155	156	1
E1	1	J2	2	E	10	49	39	118	149	31
E1	2	J2	2	D	10	49	39	118	149	31
F1	1	J2	2	G	65	75	10	162	175	13
F1	2	J2	2	F	65	75	10	162	175	13
G1	1	J2	2	н	104	112	8	1	4	3

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PEF	PCU		QUEUES	WEIG	ЭH
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	16	14.00	18	410	101.35	77.35	92.63	1.39	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Γ
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	5	5.00	12	650	89.20	87.52	97.63	0.49	100	Γ
Ped5	Ped5	J2	2	I	10	2500	5	5.00	12	650	88.66	87.52	97.63	0.49	100	Г
Ped6	Ped6	J2	2	I	10	2500	5	5.00	12	650	88.72	87.52	97.63	0.49	100	\square
Ped7	Ped7	J2	2	I	10	2500	5	5.00	12	650	88.52	87.52	97.66	0.49	100	Г
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Г



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				458	Unrestricted	180	26.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				399	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			194	Unrestricted	180	71.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			187	Unrestricted	180	83.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				194	Unrestricted	180	1.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				25	Unrestricted	180	169.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				81	Unrestricted	180	47.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				164	Unrestricted	180	18.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	240 <	1856	81	0.00	28	221	20.00	18.26	60.74	5.25 +
AI	2	(untitled)	J1	1	А	121 <	2055	33	0.00	31	189	66.76	65.02	86.46	5.28 +
D1	1	(untitled)	J1	1	D	161	1854	67	0.00	23	292	43.61	38.93	67.53	5.49
ы	2	(untitled)	J1	1	С	303 <	2009	48	0.00	55	62	64.88	60.20	86.93	13.30 +
C1	1	(untitled)	J1	1	F	122	1895	24	1.00	46	94	75.32	71.18	96.95	5.94
01	2	(untitled)	J1	1	Е	66	1998	24	19.00	24	279	69.16	64.90	92.31	3.07
	1	(untitled)	J2	2	С	173	1871 f	87	54.00	19	381	20.59	17.71	75.66	3.92
D1	2	(untitled)	J2	2	В	14	2080	5	5.00	17	420	56.74	53.86	100.54	0.47
	3	(untitled)	J2	2	А	11	1952	5	5.00	14	521	56.11	53.23	99.86	0.37
E1	1	(untitled)	J2	2	Е	44	1915	70	69.00	6	1467	24.11	17.87	59.40	0.85
L 1	2	(untitled)	J2	2	D	138	1886	70	0.00	18	392	25.44	19.20	63.51	2.82
E1	1	(untitled)	J2	2	G	62	1943 f	23	0.00	23	292	38.60	36.90	89.21	1.55
FI	2	(untitled)	J2	2	F	0	1972	23	25.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	45	1911	11	8.00	33	176	51.66	47.34	99.96	1.34
Ц1	1	(untitled)	J1	1	J	166 <	1800	27	0.00	59	52	84.85	79.90	97.11	8.12 +
	2	(untitled)	J1	1	I	36	1800	16	13.00	21	325	83.12	78.17	93.13	1.69
C 2	1	(untitled)	CC1			155	1975	180	80.00	8	1048	1.08	0.08	0.00	0.00
02	2	(untitled)	CC1			33	2055	180	157.00	2	5511	1.01	0.01	0.00	0.00
D2	1	(untitled)	DD1			87	1940	180	144.00	4	1918	1.36	0.04	0.00	0.00
02	2	(untitled)	DD1			112	2080	180	141.00	5	1579	1.37	0.05	0.00	0.00
G2	1	(untitled)	GG1			45	1930	180	180.00	2	3760	14.37	0.02	0.00	0.00
H2	1	(untitled)	HH1			202	1800	180	21.00	11	702	25.52	0.13	0.00	0.01
A3	1	(untitled)	AA2			361	1980	180	69.00	18	394	1.20	0.20	0.00	0.02
B3	1	(untitled)	BB2			464	1925	180	75.00	24	273	1.50	0.30	0.00	0.04
C3	1	(untitled)	CC2			188	1915	180	79.00	10	818	1.10	0.10	0.00	0.01
D3	1	(untitled)	DD2			198	1965	180	68.00	10	793	1.18	0.10	0.00	0.01
E3	1	(untitled)	EE2			182	1800	180	0.00	10	790	19.73	0.11	0.00	0.01
F3	1	(untitled)	FF2			62	1800	180	0.00	3	2513	14.44	0.04	0.00	0.00



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1297.79	67.15	19.33	23.86	338.85	18.14	0.00	356.99
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.84	3.55	0.64	9.15	0.09	0.00	9.24
Pedestrians								
TOTAL	1300.79	68.00	19.13	24.51	348.00	18.23	0.00	366.23

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A9 - 2026 DS AM D9 - 2026 DS AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	15	17	2	1	1
	2	~	1	B,C,H,I	31	35	4	1	1
4	3	✓	2	B,C,D	41	72	31	1	1
•	4	✓	6	D,J	78	104	26	1	1
	5	~	4	E,F	110	142	32	1	1
	6	~	3	B,A	148	1	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Traine Stream	Traffic Node	Controller Stream	Fliase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	31	72	41	148	1	33
A1	2	J1	1	A	148	1	33			
B1	1	J1	1	D	41	104	63			
B1	2	J1	1	С	31	72	41			
C1	1	J1	1	F	110	142	32			
C1	2	J1	1	E	110	142	32			
H1	1	J1	1	J	78	104	26			
H1	2	J1	1	I	23	35	12			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
From	в				6	6	6	6	6	12
	С						6	6	6	12
	D	6	6				6	6	6	12
	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	137	147	10	1	1
	2	✓	3	E,D,C	153	172	19	1	1
	3	✓	5	C,B,A	178	9	11	1	1
2	4	✓	2	F,G	15	33	18	1	1
	5	✓	4	I	45	47	2	1	1
	6	✓	1	Н	59	71	12	1	1
	7	✓	3	E,D,C	77	90	13	1	1
	8	✓	5	C,B,A	96	111	15	1	1
	9	✓	2	F,G	117	131	14	1	1

Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	de Controller Stream		Gi	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	153	9	36	77	111	34	
D1	2	J2	2	В	178	9	11	96	111	15	
D1	3	J2	2	А	178	9	11	96	111	15	
E1	1	J2	2	E	153	172	19	77	90	13	
E1	2	J2	2	D	153	172	19	77	90	13	
F1	1	J2	2	G	15	33	18	117	131	14	
F1	2	J2	2	F	15	33	18	117	131	14	
G1	1	J2	2	н	59	71	12	137	147	10	

Phase Timings Diagram for Controller Stream 2



									>
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2	
				FL FT		HA HA			



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr) Calculated sat flow (PCU/hr)		Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	12	10.00	23	290	106.94	82.94	95.88	1.44	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	2	2.00	24	275	102.60	100.92	104.99	0.53	100	Г
Ped5	Ped5	J2	2	I	10	2500	2	2.00	24	275	102.06	100.92	104.99	0.53	100	Г
Ped6	Ped6	J2	2	I	10	2500	2	2.00	24	275	102.12	100.92	104.99	0.53	100	
Ped7	Ped7	J2	2	I	10	2500	2	2.00	24	275	101.92	100.92	105.02	0.53	100	
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLOWS			PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				438	Unrestricted	180	13.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				488	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			372	Unrestricted	180	72.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			360	Unrestricted	180	90.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				177	Unrestricted	180	14.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				282	Unrestricted	180	11.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				235	Unrestricted	180	16.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				223	Unrestricted	180	4.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	249 <	1856	74	0.00	32	183	23.57	21.82	65.82	6.02 +
	2	(untitled)	J1	1	А	199 <	2055	33	0.00	51	76	72.15	70.40	91.44	9.17 +
D1	1	(untitled)	J1	1	D	321 <	1854	63	0.00	49	85	52.47	47.79	78.31	12.71 +
ы	2	(untitled)	J1	1	С	202 <	2009	41	0.00	43	109	66.39	61.71	85.87	8.75 +
C1	1	(untitled)	J1	1	F	224 <	1895	32	0.00	64	40	76.36	72.22	86.72	9.75 +
CI	2	(untitled)	J1	1	Е	130	1998	32	7.00	35	154	66.78	62.52	82.71	5.38
D1 .	1	(untitled)	J2	2	С	144	1871 f	70	2.00	19	368	15.89	13.01	51.10	3.64
	2	(untitled)	J2	2	В	198 <	2080	26	0.00	61	47	40.96	38.08	105.79	6.00 +
	3	(untitled)	J2	2	А	16	1952	26	26.00	5	1608	29.15	26.27	92.58	0.43
E1	1	(untitled)	J2	2	Е	129	1915	32	0.00	36	152	41.46	35.22	88.10	3.32
L 1	2	(untitled)	J2	2	D	204	1886	32	0.00	57	57	46.89	40.65	96.27	5.71
E1	1	(untitled)	J2	2	G	216 <	1943 f	32	0.00	59	53	42.57	40.86	96.68	6.00 +
F I	2	(untitled)	J2	2	F	0	1972	32	34.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	147	1902	22	0.00	58	55	51.60	47.28	102.38	4.39
ци	1	(untitled)	J1	1	J	151 <	1800	26	0.00	56	61	84.26	79.31	96.18	7.31 +
пі	2	(untitled)	J1	1	I	45	1800	12	8.00	35	160	91.68	86.73	98.33	2.23
C 2	1	(untitled)	CC1			289	1975	180	107.00	15	515	1.16	0.16	0.00	0.01
02	2	(untitled)	CC1			65	2055	180	125.00	3	2745	1.03	0.03	0.00	0.00
D2	1	(untitled)	DD1			72	1940	180	128.00	4	2325	1.36	0.04	0.00	0.00
02	2	(untitled)	DD1			286	2080	180	122.00	14	555	1.46	0.14	0.00	0.01
G2	1	(untitled)	GG1			147	1930	180	0.00	8	1082	14.42	0.08	0.00	0.00
H2	1	(untitled)	HH1			196	1800	180	4.00	11	727	25.52	0.12	0.00	0.01
A3	1	(untitled)	AA2			448	1980	180	112.00	23	298	1.27	0.27	0.00	0.03
B3	1	(untitled)	BB2			523	1925	180	65.00	27	231	1.55	0.35	0.00	0.05
C3	1	(untitled)	CC2			354	1915	180	86.00	18	387	1.21	0.21	0.00	0.02
D3	1	(untitled)	DD2			358	1965	180	70.00	18	394	1.28	0.20	0.00	0.02
E3	1	(untitled)	EE2			333	1800	180	0.00	19	386	19.84	0.23	0.00	0.02
F3	1	(untitled)	FF2			216	1800	180	111.00	12	650	14.54	0.14	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1742.04	95.52	18.24	37.40	531.06	28.99	0.00	560.05
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.89	3.37	0.69	9.81	0.09	0.00	9.90
Pedestrians								
TOTAL	1745.04	96.41	18.10	38.09	540.87	29.08	0.00	569.95

1 N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A10 - 2026 DS PM D10 - 2026 DS PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

		To A B C D E F G H I J A - - 6 6 6 6 14 6 6 6 B - - 6 6 6 14 - 1 6 C 6 - 6 6 6 14 - 1 6 D 6 - - 6 6 6 14 - 1 6													
		Α	в	С	D	Е	F	G	Н	Ι	ſ				
	Α			6	6	6	6	14	6	6	6				
	в					6	6	14			6				
	С	6				6	6	14			6				
From	D	6				6	6	14	6	6					
	Е	6	6	6	6			14	6	6	6				
	F	6	6	6	6			14	6	6	6				
	G	14	14	14	14	14	14		6	6	6				
	Н	6			6	6	6	6			6				
	I	6			6	6	6	6			6				
	J	6	6	6		6	6	6	6	6					

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	34	36	2	1	1
	2	~	1	B,C,H,I	50	61	11	1	1
1	3	✓	2	B,C,D	67	98	31	1	1
•	4	✓	6	D,J	104	129	25	1	1
	5	~	4	E,F	135	160	25	1	1
	6	~	3	B,A	166	20	34	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Troffic Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Trainc Stream	Traffic Node	Controller Stream	Fliase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	50	98	48	166	20	34
A1	2	J1	1	A	166	20	34			
B1	1	J1	1	D	67	129	62			
B1	2	J1	1	С	50	98	48			
C1	1	J1	1	F	135	160	25			
C1	2	J1	1	E	135	160	25			
H1	1	J1	1	J	104	129	25			
H1	2	J1	1	I	42	61	19			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

		To A B C D E F G H I A														
		Α	в	С	D	Е	F	G	Н	Ι						
	Α				6	6	6	6	6	12						
	в				6	6	6	6	6	12						
From	С						6	6	6	12						
	D	6	6				6	6	6	12						
	Е	6	6				6	6	6	12						
	F	6	6	6	6	6			6	12						
-	G	6	6	6	6	6			6	12						
	н	6	6	6	6	6	6	6		12						
	I	12	12	12	12	12	12	12	12							



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	179	1	2	1	1
	2	✓	3	E,D,C	7	52	45	1	1
	3	✓	5	C,B,A	58	61	3	1	1
	4	~	2	F,G	67	73	6	1	1
2	5	✓	4	I	85	90	5	1	1
	6	✓	1	Н	102	111	9	1	1
	7	✓	3	E,D,C	117	148	31	1	1
	8	✓	5	C,B,A	154	155	1	1	1
	9	✓	2	F,G	161	173	12	1	1

Traffic Stream Green Times

Arm	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	Gr	reen P	eriod 1	Gi	een P	eriod 2
Am	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
D1	1	J2	2	С	7	61	54	117	155	38
D1	2 J2		2	В	58	61	3	154	155	1
D1	3 J2		2	А	58	61	3	154	155	1
E1	1	J2	2	E	7	52	45	117	148	31
E1	2	J2	2	D	7	52	45	117	148	31
F1	1	J2	2	G	67	73	6	161	173	12
F1	2	J2	2	F	67	73	6	161	173	12
G1	1	J2	2	н	102	111	9	179	1	2

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

• •	-							
Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PEF	R PCU		QUEUES	WEIC	эH
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	19	17.00	15	500	97.94	73.94	90.59	1.36	100	
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Γ
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	5	5.00	12	650	89.20	87.52	97.63	0.49	100	Γ
Ped5	Ped5	J2	2	I	10	2500	5	5.00	12	650	88.66	87.52	97.63	0.49	100	Γ
Ped6	Ped6	J2	2	I	10	2500	5	5.00	12	650	88.72	87.52	97.63	0.49	100	
Ped7	Ped7	J2	2	I	10	2500	5	5.00	12	650	88.52	87.52	97.66	0.49	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FL	ows	PERFORMANCE				PER PCU		QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				434	Unrestricted	180	25.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				376	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			242	Unrestricted	180	73.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			213	Unrestricted	180	78.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				251	Unrestricted	180	0.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				22	Unrestricted	180	174.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				85	Unrestricted	180	37.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				157	Unrestricted	180	23.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	216 <	1856	82	0.00	25	261	19.20	17.45	58.86	4.54 +
	2	(untitled)	J1	1	А	141 <	2055	34	0.00	35	155	66.91	65.16	86.81	6.17 +
B1	1	(untitled)	J1	1	D	168	1854	62	0.00	26	248	47.47	42.79	70.98	6.02
ы	2	(untitled)	J1	1	С	275 <	2009	48	0.00	50	79	63.22	58.54	85.02	11.79 +
C1	1	(untitled)	J1	1	F	138 <	1895	25	2.00	50	78	75.49	71.35	97.69	6.79 +
	2	(untitled)	J1	1	Е	76	1998	25	4.00	26	241	68.47	64.21	92.17	3.54
	1	(untitled)	J2	2	С	223 <	1871 f	92	38.00	23	294	18.59	15.71	75.58	4.99 +
D1	2	(untitled)	J2	2	В	13	2080	4	4.00	18	395	58.08	55.20	103.72	0.43
	3	(untitled)	J2	2	А	9	1952	4	4.00	14	551	56.77	53.89	102.31	0.30
E1	1	(untitled)	J2	2	Е	53	1915	76	74.00	6	1309	22.24	16.00	56.52	0.96
L 1	2	(untitled)	J2	2	D	168	1886	76	0.00	21	338	23.71	17.47	60.85	3.29
E1	1	(untitled)	J2	2	G	56	1943 f	18	14.00	26	247	41.54	39.84	92.97	1.43
FI	2	(untitled)	J2	2	F	0	1972	18	20.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	49	1914	11	8.00	35	154	52.75	48.43	100.84	1.48
Ц1	1	(untitled)	J1	1	J	150 <	1800	25	0.00	58	56	86.09	81.14	97.21	7.34 +
	2	(untitled)	J1	1	I	45	1800	19	15.00	23	300	80.50	75.55	91.83	2.08
C 2	1	(untitled)	CC1			176	1975	180	86.00	9	909	1.09	0.09	0.00	0.00
02	2	(untitled)	CC1			38	2055	180	155.00	2	4763	1.02	0.02	0.00	0.00
D2	1	(untitled)	DD1			112	1940	180	142.00	6	1466	1.38	0.06	0.00	0.00
02	2	(untitled)	DD1			133	2080	180	131.00	6	1306	1.38	0.06	0.00	0.00
G2	1	(untitled)	GG1			49	1930	180	180.00	3	3445	14.37	0.02	0.00	0.00
H2	1	(untitled)	HH1			195	1800	180	5.00	11	731	25.51	0.12	0.00	0.01
A3	1	(untitled)	AA2			357	1980	180	81.00	18	399	1.20	0.20	0.00	0.02
B3	1	(untitled)	BB2			443	1925	180	63.00	23	291	1.48	0.28	0.00	0.03
C3	1	(untitled)	CC2			214	1915	180	72.00	11	705	1.12	0.12	0.00	0.01
D3	1	(untitled)	DD2			245	1965	180	71.00	12	623	1.21	0.13	0.00	0.01
E3	1	(untitled)	EE2			221	1800	180	0.00	12	633	19.76	0.14	0.00	0.01
F3	1	(untitled)	FF2			56	1800	180	180.00	3	2793	14.44	0.03	0.00	0.00



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1310.75	68.03	19.27	24.31	345.16	18.80	0.00	363.96
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.82	3.68	0.62	8.75	0.09	0.00	8.83
Pedestrians								
TOTAL	1313.75	68.85	19.08	24.92	353.91	18.89	0.00	372.80

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A11 - 2031 DS AM D11 - 2031 DS AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	~	5	G	28	30	2	1	1
	2	~	1	B,C,H,I	44	47	3	1	1
4	3	✓	2	B,C,D	53	84	31	1	1
•	4	✓	6	D,J	90	115	25	1	1
	5	~	4	E,F	121	155	34	1	1
	6	~	3	B,A	161	14	33	1	1



Traffic Stream Green Times

Arm Traffic Stream		Traffia Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
A1	1	J1	1	В	44	84	40	161	14	33	
A1	2	J1	1	A	161	14	33				
B1	1	J1	1	D	53	115	62				
B1	2	J1	1	С	44	84	40				
C1	1	J1	1	F	121	155	34				
C1	2	J1	1	E	121	155	34				
H1	1	J1	1	J	90	115	25				
H1	2	J1	1	I	36	47	11				

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					Т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
F	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	140	149	9	1	1
	2	✓	3	E,D,C	155	174	19	1	1
	3	✓	5	C,B,A	0	11	11	1	1
	4	~	2	F,G	17	36	19	1	1
2	5	✓	4	I	48	50	2	1	1
	6	✓	1	Н	62	74	12	1	1
	7	~	3	E,D,C	80	93	13	1	1
	8	~	5	C,B,A	99	115	16	1	1
	9	✓	2	F,G	121	134	13	1	1

Traffic Stream Green Times

Arm	Troffic Stroom	Troffic Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
D1	1	J2	2	С	155	11	36	80	115	35
D1	2	J2	2	В	0	11	11	99	115	16
D1	3	J2	2	А	0	11	11	99	115	16
E1	1	J2	2	E	155	174	19	80	93	13
E1	2	J2	2	D	155	174	19	80	93	13
F1	1	J2	2	G	17	36	19	121	134	13
F1	2	J2	2	F	17	36	19	121	134	13
G1	1	J2	2	н	62	74	12	140	149	9

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	-
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	_
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	-
Ped4	Ped4	J2	2	I	10	2500	2	2.00	24	275	102.60	100.92	104.99	0.53	100	-
Ped5	Ped5	J2	2	I	10	2500	2	2.00	24	275	102.06	100.92	104.99	0.53	100	-
Ped6	Ped6	J2	2	I	10	2500	2	2.00	24	275	102.12	100.92	104.99	0.53	100	
Ped7	Ped7	J2	2	I	10	2500	2	2.00	24	275	101.92	100.92	105.02	0.53	100	
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	



Traffic Stream Results

				SIGNA	LS	FLO	ows	PERFORMANCE				PER PCU		QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				460	Unrestricted	180	15.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				512	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			389	Unrestricted	180	72.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			372	Unrestricted	180	88.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				182	Unrestricted	180	6.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				298	Unrestricted	180	10.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				244	Unrestricted	180	15.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				235	Unrestricted	180	2.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	263 <	1856	73	0.00	34	165	24.36	22.62	67.10	6.52 +
	2	(untitled)	J1	1	А	208 <	2055	33	0.00	54	68	72.93	71.19	92.20	9.67 +
B1	1	(untitled)	J1	1	D	338 <	1854	62	0.00	52	73	54.18	49.50	79.97	13.71 +
ы	2	(untitled)	J1	1	С	214 <	2009	40	0.00	47	92	68.19	63.51	87.31	9.42 +
C1	1	(untitled)	J1	1	F	232 <	1895	34	2.00	63	43	77.34	73.20	94.84	11.33 +
	2	(untitled)	J1	1	Е	134	1998	34	4.00	34	161	68.13	63.87	79.33	5.32
	1	(untitled)	J2	2	С	148	1871 f	71	12.00	20	361	13.57	10.69	49.23	3.67
D1	2	(untitled)	J2	2	В	209 <	2080	27	0.00	62	44	35.13	32.25	100.23	6.43 +
	3	(untitled)	J2	2	А	17	1952	27	23.00	5	1565	23.41	20.53	76.10	0.46
E1	1	(untitled)	J2	2	Е	131	1915	32	0.00	36	149	41.71	35.47	88.35	3.41
L 1	2	(untitled)	J2	2	D	208	1886	32	0.00	58	54	47.42	41.18	96.76	5.89
E1	1	(untitled)	J2	2	G	229 <	1943 f	32	0.00	62	44	44.04	42.34	98.71	6.55 +
FI	2	(untitled)	J2	2	F	0	1972	32	34.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	154	1902	21	0.00	63	42	55.17	50.85	106.30	4.81
Ц1	1	(untitled)	J1	1	J	160 <	1800	25	0.00	62	46	88.09	83.15	98.68	7.99 +
	2	(untitled)	J1	1	I	47	1800	11	7.00	39	130	95.00	90.05	100.12	2.37
C 2	1	(untitled)	CC1			299	1975	180	112.00	15	494	1.16	0.16	0.00	0.01
62	2	(untitled)	CC1			67	2055	180	123.00	3	2660	1.03	0.03	0.00	0.00
D 2	1	(untitled)	DD1			74	1940	180	124.00	4	2259	1.36	0.04	0.00	0.00
02	2	(untitled)	DD1			300	2080	180	109.00	14	524	1.47	0.15	0.00	0.01
G2	1	(untitled)	GG1			154	1930	180	0.00	8	1028	14.43	0.08	0.00	0.00
H2	1	(untitled)	HH1			207	1800	180	19.00	12	683	25.52	0.13	0.00	0.01
A3	1	(untitled)	AA2			471	1980	180	116.00	24	278	1.28	0.28	0.00	0.04
B3	1	(untitled)	BB2			552	1925	180	72.00	29	214	1.58	0.38	0.00	0.06
C3	1	(untitled)	CC2			366	1915	180	83.00	19	371	1.22	0.22	0.00	0.02
D3	1	(untitled)	DD2			374	1965	180	71.00	19	373	1.30	0.22	0.00	0.02
E3	1	(untitled)	EE2			339	1800	180	0.00	19	378	19.85	0.23	0.00	0.02
F3	1	(untitled)	FF2			229	1800	180	119.00	13	607	14.55	0.15	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1823.46	100.39	18.16	39.55	561.65	30.62	0.00	592.27
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1826.46	101.30	18.03	40.26	571.68	30.71	0.00	602.39

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A12 - 2031 DS PM D12 - 2031 DS PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Η	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	33	35	2	1	1
	2	~	1	B,C,H,I	49	59	10	1	1
4	3	✓	2	B,C,D	65	97	32	1	1
•	4	~	6	D,J	103	128	25	1	1
	5	~	4	E,F	134	161	27	1	1
	6	✓	3	B,A	167	19	32	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	G	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	49	97	48	167	19	32
A1	2	J1	1	A	167	19	32			
B1	1	J1	1	D	65	128	63			
B1	2	J1	1	С	49	97	48			
C1	1	J1	1	F	134	161	27			
C1	2	J1	1	E	134	161	27			
H1	1	J1	1	J	103	128	25			
H1	2	J1	1	I	41	59	18			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	н	Ι
	Α				6	6	6	6	6	12
From	в				6	6	6	6	6	12
	С						6	6	6	12
	D	6	6				6	6	6	12
	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	



Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	179	1	2	1	1
	2	✓	3	E,D,C	7	48	41	1	1
	3	✓	5	C,B,A	54	59	5	1	1
	4	~	2	F,G	65	75	10	1	1
2	5	✓	4	I	87	92	5	1	1
	6	✓	1	Н	104	113	9	1	1
-	7	~	3	E,D,C	119	149	30	1	1
	8	✓	5	C,B,A	155	156	1	1	1
	9	✓	2	F,G	162	173	11	1	1

Traffic Stream Green Times

Arm	Troffic Stroom	Traffia Nodo	Controllor Stroom	Bhaco	Gr	een P	eriod 1	Green Period 2			
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	7	59	52	119	156	37	
D1	2	J2	2	В	54	59	5	155	156	1	
D1	3	J2	2	А	54	59	5	155	156	1	
E1	1	J2	2	E	7	48	41	119	149	30	
E1	2	J2	2	D	7	48	41	119	149	30	
F1	1	J2	2	G	65	75	10	162	173	11	
F1	2	J2	2	F	65	75	10	162	173	11	
G1	1	J2	2	н	104	113	9	179	1	2	

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2
		Et It					Et It	



Final Prediction Table

Link Results

			SIGNA	LS	FLOWS PERFORMANCE				PEF	R PCU		QUEUES	WEIG	эH		
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	18	16.00	16	470	99.03	75.03	91.24	1.37	100	
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Γ
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Γ
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	5	5.00	12	650	89.20	87.52	97.63	0.49	100	Γ
Ped5	Ped5	J2	2	I	10	2500	5	5.00	12	650	88.66	87.52	97.63	0.49	100	Γ
Ped6	Ped6	J2	2	I	10	2500	5	5.00	12	650	88.72	87.52	97.63	0.49	100	
Ped7	Ped7	J2	2	I	10	2500	5	5.00	12	650	88.52	87.52	97.66	0.49	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				456	Unrestricted	180	24.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				395	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			248	Unrestricted	180	74.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			219	Unrestricted	180	83.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				255	Unrestricted	180	0.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				23	Unrestricted	180	173.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				89	Unrestricted	180	37.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				164	Unrestricted	180	19.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	228 <	1856	80	0.00	27	234	20.28	18.53	60.75	4.99 +
	2	(untitled)	J1	1	А	145 <	2055	32	0.00	38	134	69.31	67.56	88.61	6.48 +
D1	1	(untitled)	J1	1	D	175	1854	63	0.00	27	239	46.94	42.26	70.71	6.27
ы	2	(untitled)	J1	1	С	290 <	2009	48	0.00	53	70	64.08	59.40	85.99	12.62 +
C1	1	(untitled)	J1	1	F	142 <	1895	27	2.00	48	87	71.20	67.06	96.20	6.88 +
CI	2	(untitled)	J1	1	Е	78	1998	27	4.00	25	259	64.85	60.59	88.77	3.57
	1	(untitled)	J2	2	С	227 <	1871 f	89	39.00	24	275	19.40	16.52	76.49	5.12 +
D1	2	(untitled)	J2	2	В	13	2080	6	6.00	14	540	53.63	50.75	96.17	0.41
	3	(untitled)	J2	2	А	10	1952	6	6.00	12	681	53.15	50.27	95.65	0.32
E1	1	(untitled)	J2	2	Е	54	1915	71	68.00	7	1194	24.34	18.10	59.61	1.08
L 1	2	(untitled)	J2	2	D	172	1886	71	0.00	22	300	26.09	19.85	63.95	3.71
E1	1	(untitled)	J2	2	G	60	1943 f	21	0.00	24	272	39.69	37.99	90.67	1.51
F I	2	(untitled)	J2	2	F	0	1972	21	23.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	50	1914	11	8.00	36	149	53.39	49.07	101.08	1.55
U 1	1	(untitled)	J1	1	J	159 <	1800	25	0.00	61	47	87.88	82.93	98.52	7.89 +
	2	(untitled)	J1	1	I	46	1800	18	14.00	24	272	81.87	76.92	92.68	2.15
C 2	1	(untitled)	CC1			181	1975	180	88.00	9	882	1.09	0.09	0.00	0.00
02	2	(untitled)	CC1			39	2055	180	154.00	2	4642	1.02	0.02	0.00	0.00
D2	1	(untitled)	DD1			114	1940	180	142.00	6	1438	1.38	0.06	0.00	0.00
02	2	(untitled)	DD1			137	2080	180	132.00	7	1271	1.38	0.06	0.00	0.00
G2	1	(untitled)	GG1			50	1930	180	180.00	3	3374	14.37	0.02	0.00	0.00
H2	1	(untitled)	HH1			205	1800	180	17.00	11	690	25.52	0.13	0.00	0.01
A3	1	(untitled)	AA2			373	1980	180	87.00	19	378	1.21	0.21	0.00	0.02
B3	1	(untitled)	BB2			465	1925	180	70.00	24	273	1.50	0.30	0.00	0.04
C3	1	(untitled)	CC2			220	1915	180	78.00	11	683	1.12	0.12	0.00	0.01
D3	1	(untitled)	DD2			250	1965	180	72.00	13	607	1.21	0.13	0.00	0.01
E3	1	(untitled)	EE2			226	1800	180	0.00	13	617	19.76	0.14	0.00	0.01
F3	1	(untitled)	FF2			60	1800	180	0.00	3	2600	14.44	0.03	0.00	0.00



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1365.99	71.00	19.24	25.43	361.17	19.66	0.00	380.84
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.83	3.64	0.63	8.88	0.09	0.00	8.96
Pedestrians								
TOTAL	1368.99	71.83	19.06	26.06	370.05	19.75	0.00	389.80

1 N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A13 - 2041 DS AM D13 - 2041 DS AM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	~	5	G	30	32	2	1	1
	2	~	1	B,C,H,I	46	49	3	1	1
4	3	✓	2	B,C,D	55	84	29	1	1
•	4	~	6	D,J	90	117	27	1	1
	5	~	4	E,F	123	156	33	1	1
	6	~	3	B,A	162	16	34	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Traffia Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Trainc Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	46	84	38	162	16	34
A1	2	J1	1	A	162	16	34			
B1	1	J1	1	D	55	117	62			
B1	2	J1	1	С	46	84	38			
C1	1	J1	1	F	123	156	33			
C1	2	J1	1	E	123	156	33			
H1	1	J1	1	J	90	117	27			
H1	2	J1	1	I	38	49	11			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
F	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	I	12	12	12	12	12	12	12	12	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	141	151	10	1	1
	2	✓	3	E,D,C	157	173	16	1	1
	3	✓	5	C,B,A	179	12	13	1	1
	4	✓	2	F,G	18	36	18	1	1
2	5	✓	4	I	48	50	2	1	1
	6	✓	1	Н	62	74	12	1	1
	7	✓	3	E,D,C	80	95	15	1	1
	8	✓	5	C,B,A	101	115	14	1	1
	9	✓	2	F,G	121	135	14	1	1

Traffic Stream Green Times

A	Troffic Stream		Controllor Stroom	Dhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration
D1	1	J2	2	С	157	12	35	80	115	35
D1	2	J2	2	В	179	12	13	101	115	14
D1	3	J2	2	А	179	12	13	101	115	14
E1	1	J2	2	E	157	173	16	80	95	15
E1	2	J2	2	D	157	173	16	80	95	15
F1	1	J2	2	G	18	36	18	121	135	14
F1	2	J2	2	F	18	36	18	121	135	14
G1	1	J2	2	н	62	74	12	141	151	10

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2



Final Prediction Table

Link Results

			SIGNA	LS	FLC	ows		PERF	ORMANCE		PER	PCU		QUEUES	WEIG	эн
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	11	9.00	25	260	108.72	84.72	96.89	1.46	100	Γ
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	2	2.00	24	275	102.60	100.92	104.99	0.53	100	Г
Ped5	Ped5	J2	2	I	10	2500	2	2.00	24	275	102.06	100.92	104.99	0.53	100	Г
Ped6	Ped6	J2	2	I	10	2500	2	2.00	24	275	102.12	100.92	104.99	0.53	100	Γ
Ped7	Ped7	J2	2	I	10	2500	2	2.00	24	275	101.92	100.92	105.02	0.53	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Γ



Traffic Stream Results

				SIGNA	LS	FLO	ows		PEF	FORMANCE		PER	PCU		QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				479	Unrestricted	180	14.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				535	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			402	Unrestricted	180	71.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			385	Unrestricted	180	89.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				185	Unrestricted	180	4.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				314	Unrestricted	180	9.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				253	Unrestricted	180	14.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				246	Unrestricted	180	0.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	275 <	1856	72	0.00	36	150	25.15	23.41	68.40	6.98 +
	2	(untitled)	J1	1	А	216 <	2055	34	0.00	54	66	72.26	70.51	91.76	10.04 +
D1	1	(untitled)	J1	1	D	352 <	1854	62	0.00	54	66	54.89	50.21	80.95	14.40 +
ы	2	(untitled)	J1	1	С	224 <	2009	38	0.00	51	75	71.19	66.51	89.49	10.10 +
C1	1	(untitled)	J1	1	F	240 <	1895	33	2.00	67	34	79.33	75.19	99.24	12.14 +
CI	2	(untitled)	J1	1	Е	139	1998	33	4.00	37	144	68.18	63.92	79.85	5.66
	1	(untitled)	J2	2	С	151	1871 f	70	11.00	20	346	12.89	10.01	45.69	3.36
D1	2	(untitled)	J2	2	В	220 <	2080	27	0.00	66	37	36.11	33.23	95.65	6.86 +
	3	(untitled)	J2	2	А	18	1952	27	20.00	6	1472	23.18	20.30	71.68	0.49
E1	1	(untitled)	J2	2	Е	134	1915	31	0.00	38	136	42.61	36.37	89.35	3.54
L 1	2	(untitled)	J2	2	D	212	1886	31	0.00	61	47	49.16	42.92	98.58	6.13
E1	1	(untitled)	J2	2	G	241 <	1943 f	32	0.00	66	37	45.47	43.76	100.26	6.98 +
F I	2	(untitled)	J2	2	F	0	1972	32	34.00	0	Unrestricted	0.00	0.00	0.00	0.00
G1	1	(untitled)	J2	2	Н	161	1901	22	0.00	64	42	54.19	49.87	105.77	4.92
U 1	1	(untitled)	J1	1	J	168 <	1800	27	0.00	60	50	85.20	80.26	97.29	8.24 +
	2	(untitled)	J1	1	I	48	1800	11	7.00	40	125	95.37	90.43	100.30	2.42
C 2	1	(untitled)	CC1			310	1975	180	120.00	16	474	1.17	0.17	0.00	0.01
02	2	(untitled)	CC1			70	2055	180	120.00	3	2561	1.03	0.03	0.00	0.00
D2	1	(untitled)	DD1			76	1940	180	122.00	4	2213	1.36	0.04	0.00	0.00
02	2	(untitled)	DD1			314	2080	180	106.00	15	497	1.47	0.15	0.00	0.01
G2	1	(untitled)	GG1			161	1930	180	0.00	8	979	14.43	0.08	0.00	0.00
H2	1	(untitled)	HH1			216	1800	180	23.00	12	650	25.53	0.14	0.00	0.01
A3	1	(untitled)	AA2			491	1980	180	118.00	25	263	1.30	0.30	0.00	0.04
В3	1	(untitled)	BB2			576	1925	180	76.00	30	201	1.60	0.40	0.00	0.06
C3	1	(untitled)	CC2			379	1915	180	84.00	20	355	1.23	0.23	0.00	0.02
D3	1	(untitled)	DD2			389	1965	180	70.00	20	355	1.31	0.23	0.00	0.02
E3	1	(untitled)	EE2			346	1800	180	0.00	19	368	19.85	0.24	0.00	0.02
F3	1	(untitled)	FF2			241	1800	180	125.00	13	572	14.56	0.15	0.00	0.01



Network Results

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1898.25	104.90	18.10	41.56	590.20	31.96	0.00	622.15
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.91	3.31	0.71	10.02	0.09	0.00	10.12
Pedestrians								
TOTAL	1901.25	105.80	17.97	42.27	600.22	32.05	0.00	632.27

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 *f* = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



A14 - 2041 DS PM D14 - 2041 DS PM*

Signal Timings

Network Default: 180s cycle time; 180 steps

Intergreen Matrix for Controller Stream 1

						То					
		Α	в	С	D	Е	F	G	Н	Ι	ſ
	Α			6	6	6	6	14	6	6	6
	в					6	6	14			6
	С	6				6	6	14			6
	D	6				6	6	14	6	6	
From	Е	6	6	6	6			14	6	6	6
	F	6	6	6	6			14	6	6	6
	G	14	14	14	14	14	14		6	6	6
	Н	6			6	6	6	6			6
	I	6			6	6	6	6			6
	J	6	6	6		6	6	6	6	6	

Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	5	G	35	37	2	1	1
	2	~	1	B,C,H,I	51	61	10	1	1
4	3	✓	2	B,C,D	67	98	31	1	1
•	4	✓	6	D,J	104	130	26	1	1
	5	~	4	E,F	136	162	26	1	1
	6	~	3	B,A	168	21	33	1	1



Traffic Stream Green Times

Arm	Troffic Stream	Troffic Nodo	Controllor Stroom	Bhase	Gr	een P	eriod 1	Gi	reen P	eriod 2
Ann	Trainc Stream	Traffic Node	Controller Stream	Filase	Start	End	Duration	Start	End	Duration
A1	1	J1	1	В	51	98	47	168	21	33
A1	2	J1	1	A	168	21	33			
B1	1	J1	1	D	67	130	63			
B1	2	J1	1	С	51	98	47			
C1	1	J1	1	F	136	162	26			
C1	2	J1	1	E	136	162	26			
H1	1	J1	1	J	104	130	26			
H1	2	J1	1	1	43	61	18			

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

					т	0				
		Α	в	С	D	Е	F	G	Н	Ι
	Α				6	6	6	6	6	12
	в				6	6	6	6	6	12
	С						6	6	6	12
F	D	6	6				6	6	6	12
From	Е	6	6				6	6	6	12
	F	6	6	6	6	6			6	12
	G	6	6	6	6	6			6	12
	н	6	6	6	6	6	6	6		12
	Т	12	12	12	12	12	12	12	12	


Resultant Stages

Controller Stream	Resultant Stage	ls base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
	1	✓	1	Н	177	178	1	1	1
	2	✓	3	E,D,C	4	52	48	1	1
	3	✓	5	C,B,A	58	62	4	1	1
	4	✓	2	F,G	68	73	5	1	1
2	5	✓	4	I	85	89	4	1	1
	6	✓	1	Н	101	112	11	1	1
	7	✓	3	E,D,C	118	149	31	1	1
	8	✓	5	C,B,A	155	156	1	1	1
	9	~	2	F,G	162	171	9	1	1

Traffic Stream Green Times

A	Troffic Stream	Troffic Node	Controllor Stroom	Dhase	G	reen P	eriod 1	Green Period 2			
~~~	Tranic Stream	Traffic Node	Controller Stream	Phase	Start	End	Duration	Start	End	Duration	
D1	1	J2	2	С	4	62	58	118	156	38	
D1	2	J2	2	В	58	62	4	155	156	1	
D1	3	J2	2	А	58	62	4	155	156	1	
E1	1	J2	2	E	4	52	48	118	149	31	
E1	2	J2	2	D	4	52	48	118	149	31	
F1	1	J2	2	G	68	73	5	162	171	9	
F1	2	J2	2	F	68	73	5	162	171	9	
G1	1	J2	2	н	101	112	11	177	178	1	

# Phase Timings Diagram for Controller Stream 2



### Stage Sequence Diagram for Controller Stream 2

Stage 1	Stage 3	Stage 5	Stage 2	Stage 4	Stage 1	Stage 3	Stage 5	Stage 2
		Et It					Et It	



# **Final Prediction Table**

# Link Results

		SIGNALS		FLOWS		PERFORMANCE				PEF	R PCU	QUEUES	WEIG	ЭH		
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)	w
Luas T	Luas	J1	1	н	30	1800	18	16.00	16	470	99.03	75.03	91.24	1.37	100	
Ped1	Ped1	J1	1	G	10	2500	2	2.00	24	275	103.80	100.92	104.99	0.53	100	Г
Ped2	Ped2	J1	1	G	10	2500	2	2.00	24	275	104.16	100.92	104.99	0.53	100	Г
Ped3	Ped3	J1	1	G	10	2500	2	2.00	24	275	102.96	100.92	104.99	0.53	100	Γ
Ped4	Ped4	J2	2	I	10	2500	4	4.00	14	525	91.57	89.89	98.96	0.50	100	Γ
Ped5	Ped5	J2	2	I	10	2500	4	4.00	14	525	91.03	89.89	98.96	0.50	100	Г
Ped6	Ped6	J2	2	I	10	2500	4	4.00	14	525	91.09	89.89	98.96	0.50	100	
Ped7	Ped7	J2	2	I	10	2500	4	4.00	14	525	90.89	89.89	98.99	0.50	100	Γ
Ped8	Ped8	J1	1	G	10	2500	2	2.00	24	275	102.58	100.92	104.99	0.53	100	Г



# **Traffic Stream Results**

				SIGNA	LS	FL	ows		PEF	FORMANCE		PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
Aexit	1	(untitled)				474	Unrestricted	180	23.00	0	Unrestricted	79.43	0.00	0.00	0.00
Bexit	1	(untitled)				413	Unrestricted	180	0.00	0	Unrestricted	130.20	0.00	0.00	0.00
Cexit	1	(untitled)	DD3			253	Unrestricted	180	73.00	0	Unrestricted	2.16	0.00	0.00	0.00
Dexit	1	(untitled)	CC3			225	Unrestricted	180	76.00	0	Unrestricted	3.00	0.00	0.00	0.00
Eexit	1	(untitled)				286	Unrestricted	180	0.00	0	Unrestricted	105.09	0.00	0.00	0.00
Fexit	1	(untitled)				25	Unrestricted	180	169.00	0	Unrestricted	61.07	0.00	0.00	0.00
Gexit	1	(untitled)				67	Unrestricted	180	71.00	0	Unrestricted	69.53	0.00	0.00	0.00
Hexit	1	(untitled)				172	Unrestricted	180	17.00	0	Unrestricted	123.58	0.00	0.00	0.00
A1	1		J1	1	В	240 <	1856	80	0.00	28	217	20.47	18.72	61.49	5.32 +
AI	2	(untitled)	J1	1	А	149 <	2055	33	0.00	38	134	68.47	66.73	88.12	6.62 +
D1	1	(untitled)	J1	1	D	180	1854	63	0.00	27	230	47.11	42.43	70.97	6.45
ы	2	(untitled)	J1	1	С	303 <	2009	47	0.00	57	59	66.02	61.34	87.72	13.41 +
C1	1	(untitled)	J1	1	F	146 <	1895	26	3.00	51	75	76.21	72.07	98.00	7.20 +
	2	(untitled)	J1	1	Е	80	1998	26	5.00	27	237	68.97	64.71	92.13	3.72
	1	(untitled)	J2	2	С	231 <	1871 f	96	37.00	23	297	16.36	13.48	71.50	5.02 +
D1	2	(untitled)	J2	2	В	14	2080	5	5.00	17	420	55.63	52.75	100.99	0.47
	3	(untitled)	J2	2	А	11	1952	5	5.00	14	521	55.00	52.12	100.31	0.37
<b>E1</b>	1	(untitled)	J2	2	Е	56	1915	79	77.00	6	1285	21.79	15.55	54.65	1.03
E1	2	(untitled)	J2	2	D	176	1886	79	0.00	21	334	23.29	17.05	59.24	3.50
E1	1	(untitled)	J2	2	G	36	1965 f	14	12.00	21	337	42.70	40.99	93.85	0.92
FI	2	(untitled)	J2	2	F	26	1972	14	13.00	15	507	41.58	39.88	92.64	0.66
G1	1	(untitled)	J2	2	Н	53	1914	12	9.00	36	153	52.39	48.07	99.80	1.63
Ц1	1	(untitled)	J1	1	J	166 <	1800	26	0.00	61	46	87.01	82.06	98.35	8.23 +
	2	(untitled)	J1	1	I	48	1800	18	14.00	25	256	82.14	77.19	92.77	2.24
<b>C</b> 2	1	(untitled)	CC1			186	1975	180	86.00	9	856	1.09	0.09	0.00	0.00
02	2	(untitled)	CC1			40	2055	180	153.00	2	4524	1.02	0.02	0.00	0.00
D2	1	(untitled)	DD1			116	1940	180	141.00	6	1412	1.38	0.06	0.00	0.00
02	2	(untitled)	DD1			141	2080	180	127.00	7	1232	1.38	0.06	0.00	0.00
G2	1	(untitled)	GG1			53	1930	180	180.00	3	3177	14.37	0.03	0.00	0.00
H2	1	(untitled)	HH1			214	1800	180	23.00	12	657	25.53	0.13	0.00	0.01
A3	1	(untitled)	AA2			389	1980	180	88.00	20	358	1.22	0.22	0.00	0.02
B3	1	(untitled)	BB2			483	1925	180	77.00	25	259	1.51	0.31	0.00	0.04
C3	1	(untitled)	CC2			226	1915	180	70.00	12	663	1.13	0.13	0.00	0.01
D3	1	(untitled)	DD2			256	1965	180	71.00	13	591	1.22	0.14	0.00	0.01
E3	1	(untitled)	EE2			232	1800	180	0.00	13	598	19.76	0.15	0.00	0.01
F3	1	(untitled)	FF2			62	1800	180	0.00	3	2513	14.44	0.04	0.00	0.00



### **Network Results**

	Distance travelled (PCU- km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Excess queue penalty (€ per hr)	Performance Index (€ per hr)
Normal traffic	1427.43	74.03	19.28	26.41	375.02	20.23	0.00	395.26
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	3.00	0.83	3.64	0.63	8.88	0.09	0.00	8.96
Pedestrians								
TOTAL	1430.43	74.85	19.11	27.04	383.90	20.32	0.00	404.22

N = at least one source for this link/traffic stream carries normal traffic

1 T = at least one source for this link/traffic stream carries Tram traffic

1 <= adjusted flow warning (upstream links/traffic streams are over-saturated)

1 f = average saturation flow for flared link/traffic stream

1 *= Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%

1 ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%

1 + = average link/traffic stream excess queue is greater than 0

1 P.I. = PERFORMANCE INDEX



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