Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

50MM SINGLE FRAME IMAGE

Viewing Information

With one eye closed, hold this sheet from your open eye at a viewing distance of 50cm between your eye and the page.

This image is best used for comparison in the field from the viewpoint location shown. It is not a substitute for visiting the viewpoint location.

Printing Note

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eamonn byrne
landscape architects

5-6 King's Court, Shambles, York YO1 7LD, UK
T +44 (0)1904 623 144 **E** mail@eb-la.com

Viewport Information

Photography date:	17.11.2023
Camera height:	1.6m
Direction:	South East
Range:	215m
WGS Coordinates:	53.42132, -6.30219

WO3 - STAFF CAR PARK SOUTH

VIEWPOINTS

DUBLIN AIRPORT, FINGAL

Viewpoint 05

REV 0

01.12.2023

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

50MM SINGLE FRAME IMAGE

Viewing Information

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Viewport Information

Photography date:	17.11.2023
Camera height:	1.6m
Direction:	South East
Range:	520m
WGS Coordinates:	53.42132, -6.30219

WO3 - STAFF CAR PARK SOUTH

VIEWPOINTS

DUBLIN AIRPORT, FINGAL

Viewpoint 06

REV 0

01.12.2023

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

50MM SINGLE FRAME IMAGE

Viewing Information

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Printing Note

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Viewport Information

Photography date:	17.11.2023
Camera height:	1.6m
Direction:	North West
Range:	86m
WGS Coordinates:	53.41898, -6.29534

WO3 - STAFF CAR PARK SOUTH

VIEWPOINTS

DUBLIN AIRPORT, FINGAL

Viewpoint 07

REV 0

01.12.2023

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

50MM SINGLE FRAME IMAGE

Viewing Information

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This image is best used for comparison in the field from the viewpoint location shown. It is not a substitute for visiting the viewpoint location.

Printing Note

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Viewport Information

Photography date:	17.11.2023
Camera height:	1.6m
Direction:	North West
Range:	478m
WGS Coordinates:	53.41844, -6.30142

WO3 - STAFF CAR PARK SOUTH

VIEWPOINTS

DUBLIN AIRPORT, FINGAL

Viewpoint 08

REV 0

01.12.2023

Point of Perspective

Point of Perspective

Point of Perspective

Point of Perspective

50MM SINGLE FRAME IMAGE

Viewing Information

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Viewport Information

Photography date:	17.11.2023
Camera height:	1.6m
Direction:	South East
Range:	478m
WGS Coordinates:	53.42505, -6.29431

WO3 - STAFF CAR PARK SOUTH

VIEWPOINTS

DUBLIN AIRPORT, FINGAL

Viewpoint 09

REV 0

01.12.2023

Appendix 6.3: Tree Survey and Report

Independent Tree Surveys Ltd

Tree Survey & Planning Report

Remote South Staff Car Park
Harristown Road
Swords
Co. Dublin

February 2024

Independent Tree Surveys Ltd
Our Lady's Cottage,
Drummond
Rosenallis
Co. Laois
T: 057 8628597
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www.independenttreesurveys.ie

Arboricultural ASSOCIATION
Professional Member

Contents

1.0 Introduction

It is proposed to construct a new staff car park on lands at Harristown, Swords, Co. Dublin; the proposed development will cater for 950 staff car parking spaces. The development site contains numerous trees, bushes, and hedges. This report has been prepared to provide an arboricultural assessment of the trees and hedges for input into the project design and planning application.

2.0 Instruction

To carry out a Tree Survey and prepare an Arboricultural Impact Assessment, Method Statement and Tree Protection Plan in accordance with BS5837: *Trees in relation to design, demolition and construction (2012)* of the trees and hedges around the site of the proposed Blue Carpark extension on lands at Harristown, Swords, Co. Dublin.

3.0 Report Limitations

- The inspection has been carried out from ground level using visual observation methods only.
- Trees are living organisms whose health and condition can change rapidly. Trees should be checked on a regular basis, preferably once a year. The conclusions and recommendations of this report are valid for one year.
- The fruiting bodies of some important species of decay fungi only emerge at certain times of the year and may not have been visible during this inspection.
- There is no such thing as a 100% safe tree in all conditions, since even perfectly healthy trees may fall or suffer branch break.
- Climbing plants and dense undergrowth can obscure structural defects and some symptoms of disease, where such plants prevent a thorough examination of a tree it is recommended that the vegetation be cleared and the tree re-inspected.

Report Prepared by

John Morgan
BSc (Hons) Tech Cert (Arbor A)
M Abor A (Membership number PR407)

16/02/2024

4.0 Survey Methodology

The trees and hedges in and around the site were assessed from ground level using Visual Tree Assessment (VTA) techniques and relevant observations and findings were recorded in compliance with the industry standard document BS5837: *Trees in relation to design, demolition and construction (2012)*. Inaccessible trees were assessed on what parts of the tree were visible to the surveyor. Groups of trees and hedges were assessed and described collectively.

4.1 Survey Key

Tree Numbers
The trees, tree groups and hedges assessed were allocated numbers. These numbers identify the trees, groups and hedges in the survey schedule and on the supporting survey drawings.

Tree Species
Common and botanical names of the tree species were recorded.

Tree Crown Dimensions
Tree height (Ht), crown clearance (Cl) and crown-spread (NESW cardinal points) measurements are in metres and are estimated.

Stem Diameter (Dbh)
Measurements are in millimetres and taken at 1.5m from ground level, multiple stems (St) are recorded as a function of the BS:5837 RPA formulae described below. Measurements were estimated where trees were inaccessible.

Tree age classes
Age classes were recorded as:

Y	Young	Recently planted (with 5 years or so)
SM	Semi-Mature	Well established young tree
EM	Early Mature	Established tree not yet fully grown
M	Mature	Full or near full grown tree
LM	Late Mature	Older specimen in full maturity
OM	Over Mature	Reached full maturity now declining through natural causes
Vet	Veteran	Notable due to large size, old age, ecological importance

Tree Physiological and Structural condition
Tree condition was graded as

Good:	No obvious defects visible, vigour and form of tree good.
Fair:	Tree in average condition for its age and the environment.
Poor:	Tree shows signs of ill health/structural defect
Bad:	Tree in seriously bad health/major structural problem

Work Recommendations
Preliminary management recommendations are made where necessary and pertain to current site conditions unless otherwise stated.

Estimated Remaining Contribution (ERC)
The approximate number of years that a tree should continue to live and contribute amenity, conservation or landscape value to the site under current site conditions.

4.2 Tree Retention Category (Cat) (BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations)

The tree retention category system grades a tree's suitability for retention within a development:

A Indicates a tree of high quality and value. These are trees that are particularly good examples of their species, which also provide landscape value. These trees are in such a condition as to be able to make a substantial contribution. (A minimum of 40 years is suggested)

B Indicates a tree of moderate quality and value. Trees that might be included in the high category, but are downgraded because of impaired condition. These trees are in such a condition as to make a significant contribution. (A minimum of 20 years is suggested)

C Indicates a tree of low quality and value - trees with an estimated remaining life expectancy of at least 10 years, or trees with a stem diameter of below 150mm and/or <10m in height.

U Trees that are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Sub Categories

Tree categories may be further categorised using the following sub-categories (e.g. C1, C2 or C3) - 1 mainly Arboricultural qualities, 2 mainly landscape qualities, 3 mainly cultural values.

4.3 Root Protection Area

The Root Protection Area **(**RPA) is the minimum area around individual trees to be protected from disturbance during construction works; RPA is recorded as a radius in metres measured from the tree stem and is shown on the tree survey/constraints drawing as a circle with the tree stem in the centre.

For single stem trees, the root protection area (RPA) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

For trees with more than one stem, one of the two calculation methods below should be used.
The calculated RPA for each tree should be capped to 707 m2.

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:
√ ((stem diameter 1)2 + (stem diameter 2)2 ... + (stem diameter 5)2)
b) For trees with more than five stems, the combined stem diameter should be calculated as follows:
√ ((mean stem diameter)2 × number of stems)

5.0 Findings

The trees were assessed during a site visit on the 19th of January 2024; the field data for the trees is contained in the accompanying Tree Survey Schedule and is shown on the Tree Survey Drawing 24004 _TS. The site borders Harristown Road to the north, the eastern edge of the access road to the east, open rough grazing to the south and scrub woodland to the west. The defined project site is approximately 4.26ha in area, and the tree survey extended beyond the precise redline boundary to the southwest and west for added detail and landscape context.

The main arboricultural features of the site include remnants of the agricultural past use of the lands; principally the tree group (labelled G4) extending from east to west in the north western part of the site (which includes the larger trees inside the boundary), the Hawthorn bushes along the stream/ditch running through the property (hedge H1) and the scrub area (group G3) north of the old hard standing yard in the central part of the site. Further remnants are located outside the western and southwestern boundary of the site, with a mature hedge along the field edge (H3) and dense scrub growth (G5) around the derelict buildings immediately west of the redline boundary.

The lands have been modified and partially developed in more recent times, with a young hedge now established along the fence line of the road frontage with Harristown Road to the north (H2), a group of young Horse Chestnuts (group G1) planted on a landscape mound in the northeast corner, and an avenue of young Lime trees (group G2) planted into the verges of the access road running south from Harristown Road along the eastern edge of the site.

Apart from rough grazing on the open grassland the old farmland appear to have been left unmanaged and virtually derelict for many years. During this period, the trees making up group G4 have become heavily overgrown with brambles etc. and whatever laneway may have been present running between the two parallel lines of trees and bushes along the twin ditches has become unpassable. The larger Ash trees along the northern side of the group are showing signs of ash dieback disease (ADB) and are likely to succumb to the disease over the next few years. The smaller trees and bushes include Hazel and Hawthorn in fairly good condition but are in an unkempt and unmanaged state. The group has some residual landscape and habitat value, but this has been further diminished somewhat by recent clearance and earthworks along the northern side of the group.

The more recent landscape planting (H2, G1 and G2) along the northern and eastern edges of the site is now well-established, however, the Horse Chestnut trees making up group G1 are of limited potential due to disease and low vitality, the Lime trees of G2 are still relatively small and young, and the roadside hedge (H2) is of limited species diversity.

Overall, the vegetation cover of the site is of comparatively low arboricultural value, with no significant mature trees or groups of trees present.

6.0 Preliminary Management Recommendations

Preliminary management recommendations for the trees assessed are listed in the tree survey schedule in the appendices; these pertain to *current* site conditions, unless otherwise stated.

All tree work should be carried out by qualified and experienced tree surgeons.

All tree work should be in accordance with *BS3998 (2010) Tree Work – Recommendations.*

7.0 Site Photographs

1. Tree group G1 viewed from the south

2. Avenue of young Lime trees group G2 along the access road along the eastern edge of the site, viewed from the south

3. Eastern end of hedge H1 and Willow T1 growing along the ditch

4. Scattered vegetation along western end of ditch

5. Scrub growth group G3 seen from the west

6. Larger tree group G4 viewed from the north east, with roadside hedge H2 on the right of the picture

7. Tree group G4 viewed from the southeast

8. Cluster of trees T4-T8 to the west of the site redline boundary

8.0 Arboricultural Impact of the New Development

The proposed development of the site will require the removal of much of the existing vegetation from the northern parts of the site to facilitate the new car park layout. The actual extent of tree and vegetation removal necessary is shown on the Tree Protection Plan Drawing 24004_TPP.

The young Horse Chestnut trees (group G1) growing on the landscape mound in the northeast of the site will be removed as the land is regraded; it is not considered worthwhile trying to transplant these trees, given their poor condition.

10 young Lime trees from the avenue making up group G2 are recommended for removal to facilitate the new layout; these trees should be considered for transplanting elsewhere on the site, or back into the new landscape layout of the avenue following completion of the main groundworks for the project.

The small Willow (T1) and short section of the far eastern end of H1 will be removed to allow for the new link road inside the new car park.

Trees T2 and T3 along with all of groups G3 and G4 will also be removed to facilitate the footprint of the new car park.

There will be some potential for unintended damage to be caused to trees and vegetation intended for retention inside and around the boundary unless the site is well managed during the pre-construction and construction phases of the development works. Tree protection recommendations are described in the Arboricultural Method Statement below and are shown on the Tree Protection Plan Drawing 24004_TPP.

There will be extensive new planting on the site as part of the new landscape plan, this will be concentrated along the northern boundary and in the areas alongside the watercourse (Santry Stream) running through the southern part of the site.

The quantity and quality of the trees proposed for removal is relatively low and the planned mitigation planting is substantial; this will mean that the overall arboricultural impact of the proposed development should be very low, and in time (as the new planting matures) should be positive.

9.0 Arboricultural Method Statement

9.1 Tree Work Operations

The trees making up groups G1, G3 (including trees labelled T2 and T3) and G4 will be felled and removed. Tree T1 and a short section of the eastern end of hedge H1 will also be removed. 10 young Lime trees from group G2 will be removed; these trees will be assessed for suitability for transplanting with a specialist tree spade before site activity begins. If they are deemed suitable for transplanting, they will be professionally extracted and either planted in locations away from construction activity or stored in appropriate conditions for later replanting.

Any light branching on the remaining Lime trees making up group G2 along the eastern edge of the site that has been broken or is at risk of being damaged by construction activity will be pruned back to suitable branch unions.

Tree pruning and felling work will be carried out by qualified and experienced tree surgeons; and be in accordance with *BS3998 (2010) Tree Work – Recommendations.*

Brash and woody arisings from the clearance works will be removed to a suitable green waste facility or processed into mulch for use as part of the landscape works on the site.

9.2 Tree Protection Measures

Sturdy tree protection fencing (or suitable site hoarding) will be erected along the indicative lines shown on the Tree Protection Plan Drawing 24004_TPP to prevent construction activity encroaching towards the vegetation being retained in and around the site. The fencing will be erected before site works commence, with the exact line of the fencing being determined by a qualified arborist and a site surveyor. The tree protection fencing should remain in place until its removal or re-location is authorised by a qualified arborist.

Where machinery access must encroach the RPAs of the trees to be retained for reasons unforeseen and unavoidable; suitable ground protection will be put in place to prevent any significant soil compaction or root damage near the trees; this should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight.

All new underground services such as water, foul water and electricity will be routed away from the RPAs of trees to be retained; where this is not practical the services will be installed under any significant tree roots into trenches excavated by compressed air lance (*Airspade*) or other approved tree root friendly system such as Air-Vacuum truck, Mole drilling etc.

All exposed roots and/or soil profiles containing roots of trees to be retained will be kept damp in dry conditions by regular watering and be covered with a double layer of hessian fabric to prevent desiccation. Roots should be pruned back to the soil face to leave a clean cut. Openings should be backfilled without undue delay, using good quality topsoil, structural soil or clean sand.

All site offices, materials storage, staff parking etc. will located outside of the RPAs of the trees being retained. If, for reasons unforeseen and unavoidable, some of these activities *must* be within the RPAs, the ground surface will be covered by an appropriate ground protection layer.

The retained trees will be assessed by a qualified arborist following the completion of the main construction works.

10.0 Appendices

A. Tree Survey Schedule

B. Tree Survey Drawing 24004_TS (Tree Constraints Plan)

C. Tree Protection Drawing 24004_TPP

Tree Survey Schedule
Harristown Road, Dublin
January 2024

Type	No.	Species	Age	Ht m	Dbh mm	St	Cr	N	S	E	W	ERC	Phys Cond	Structural Condition/Comments	Preliminary Recommendations	RPA m	Cat
T	1	Salix caprea (Goat Willow)	EM	6.5	346	6	0	3.5	3.5	3.5	3.5	10+	Good	Fair. Smaller Willow bush growing out of ditch bottom. Multiple stems below 1.5m.	No urgent works needed.	4.15	C2
T	2	Acer pseudoplatanus (Sycamore)	SM	8	300	1	2	3	5	4	3	10+	Fair	Fair. Small self-sown young tree by old yard.	No urgent works needed.	3.6	C2
T	3	Salix caprea (Goat Willow)	EM	5	304	5	0	4	4	4	4	10	Poor	Fair. Smaller tree by old yard. Multiple stems below 1.5m. Numerous bark wounds to lower stems.	No urgent works needed.	3.65	C2
T	4	Fraxinus excelsior (Ash)	SM	10	418	6	2	4	4.5	4.5	4	10	Poor	Fair. Smaller multi-stem coppice stool on edge of ditch. Unable to inspect stem due to undergrowth. Epicormic shoots on branching throughout crown indicative of infection by ADB.	Monitor tree condition for impact by ADB disease.	5.02	C2
T	5	Crataegus monogyna (Hawthorn)	M	5	361	4	1	4	4	5	1	10+	Fair	Fair. Smaller tree at edge of scrub. Unbalanced crown shape. Thick Ivy obscures view of tree stem.	Cut Ivy around stem base.	4.33	C2
T	6	Fraxinus excelsior (Ash)	M	16	500	1	2	7	6	8	8	10	Fair	Fair. Medium sized tree in unmanaged scrub outside western boundary of site. No significant Ash dieback disease (ADB) impact yet.	Monitor tree condition for impact by ADB disease.	6	C2
T	7	Fraxinus excelsior (Ash)	M	14	450	1	2	7	7	4	6	10	Poor	Fair. Medium sized tree in unmanaged scrub outside western boundary of site. Epicormic shoots on branching throughout crown indicative of infection by ADB.	Monitor tree condition for impact by ADB disease.	5.4	C2
T	8	Acer pseudoplatanus (Sycamore)	EM	12	400	1	2	5	6	3	5	10+	Fair	Fair/Poor. Medium sized tree in unmanaged scrub outside western boundary of site. Stem divides above 1.5m with tight union at fork. Asymmetric form due to group competition.	No urgent works needed.	4.8	C2
T	9	Salix caprea (Goat Willow)	EM	10	656	4	2	6	6	6	6	10+	Fair	Fair. Willow tree near fence to south of site boundary. Fair vitality. Unable to inspect stem due to undergrowth. Multiple stems below 1.5m.	Clear undergrowth to allow proper view of tree base.	7.87	C2
G	1	Aesculus hippocastanum (Horse Chestnut)	SM	4 to 7	100 to 250	1	2	2.5	2.5	2.5	2.5	10	Poor	Fair. Low vitality. Group planting on landscape mound. Variable condition, with some trees struggling with low vitality and disease. Epicormic shoots on branching and some bleeding canker lesions on stem-branches. Somewhat stunted growth. Quite significant and obviously repeated damage to tree stem bases and root flares by grass maintenance machinery; this has caused bark wounds and subsequent wood decay. Limited value and potential.	Review tree condition annually. Consider replacing with better quality planting stock.	3	C2

Tree Survey Schedule
Harristown Road, Dublin
January 2024

Type	No.	Species	Age	Ht m	Dbh mm	St	Cr	N	S	E	W	ERC	Phys Cond	Structural Condition/Comments	Preliminary Recommendations	RPA m	Cat
G	2	Tilia cordata (Small-leaved Lime)	SM	5 to 7	150 to 250	1	1.5	2.5	2.5	2.5	2.5	20+	Good	Fair. Linear group planting of Tilia along roadside verges. Mostly good overall condition, although several trees have sustained some minor branch and bark damage from recent construction activity, which has also resulted in soil compaction around some of the trees. The trees appear to have been lightly crown reduced in the past.	Target prune broken/damaged branches.	3	C2
G	3	Acer pseudoplatanus (Sycamore) Salix caprea (Goat Willow) Sambucus nigra (Elder) Fraxinus excelsior (Ash) Prunus spinosa (Blackthorn) Crataegus monogyna (Hawthorn)	SM	4 to 6	200	1	0	2	2	2	2	10+	Fair/Poor	Fair. Area of mixed scrub north of old yard. Bushes now heavily overgrown with brambles etc. Early signs of ADB amongst young Ash saplings. Ground disturbed all around group. Limited value and potential.	No urgent works needed.	2.4	C2
G	4	Corylus avellana (Hazel) Crataegus monogyna (Hawthorn) Fraxinus excelsior (Ash) Sambucus nigra (Elder) Prunus spinosa (Blackthorn)	EM	12	400	1	1	5	5	5	5	10+	Fair	Fair. Linear group of mixed species trees and bushes, with what appears to be two parallel lines of plants following twin ditches (with possibly the remains of an old track running between the 2 ditches). Mostly Hazel and smaller SM Ash along south side of group, with a series of larger EM Ash (10-12m tall) spaced along northern ditch. Some epicormic growth indicative of ADB disease, some apparently dead Ash stems in the western part of the group. The area to the north, between the ditch and Harristown Road has been extensively dug over/cleared in recent months. Some root and stem damage to some of the larger Ash trees is evident. Heavily overgrown with brambles etc. and impenetrable for detailed survey purposes.	Monitor condition of Ash trees for extent of ADB.	4.8	C2

Tree Survey Schedule
Harristown Road, Dublin
January 2024

Type	No.	Species	Age	Ht m	Dbh mm	St	Cr	N	S	E	W	ERC	Phys Cond	Structural Condition/Comments	Preliminary Recommendations	RPA m	Cat
G	5	Acer pseudoplatanus (Sycamore) Corylus avellana (Hazel) Crataegus monogyna (Hawthorn) Salix caprea (Goat Willow) Sambucus nigra (Elder) Fraxinus excelsior (Ash) Prunus spinosa (Blackthorn)	EM SM										Fair	Area of dense scrub growth outside the western boundary of the site that has become heavily overgrown as the land (next to the derelict buildings) has been left unmanaged. Limited arboricultural value, some habitat value. Impenetrable for survey purposes.	No urgent works needed.		C2
H	1	Crataegus monogyna (Hawthorn) Salix caprea (Goat Willow)	EM	5	173	3	0	2	2	2	2	10+	Fair	Fair. Linear group of mostly Hawthorn bushes and scrub growth forming hedge along ditch. Thick with Brambles and Dog Rose etc. making it virtually impenetrable.	No urgent works needed.	2.08	C2
H	2	Corylus avellana (Hazel) Acer campestre (Field Maple)	Y SM	3.5	150	1	0	1	1	1	1	10+	Fair/Good	Good. Young hedge established along the northern road frontage of the site, presumeably planted as the airport and road system was developed. Mostly comprised of multi-stemmed young Hazel plants, with some Field Maple towards the eastern end of the hedge. Formerly cut to around 1.5-2m high, but with regrowth extending to around 3.5m when surveyed.	Continue to manage through regular trimming.	1.8	C2
H	3	Crataegus monogyna (Hawthorn) Fraxinus excelsior (Ash) Corylus avellana (Hazel) Sambucus nigra (Elder)	M	12	450	1	0	5	5	5	5	10+	Fair/Poor	Fair. Mature hedge along field boundary with road to west of site. Larger Ash along southern end of hedge. No recent management, and hedge is becoming overgrown with thick Brambles and Ivy etc. Some epicormic growth on Ash, but no severe dieback yet.	Bring back into management by trimming back, coppicing/laying vegetation where appropriate. Monitor Ash for extent of ADB.	5.4	C2

INTERNAL AIRPORT SECURITY ROAD

R 108

Hedge H2

Group G4

Ash

Dead Ash

Group G3
Scrub Area

T3-C2

T2-C2

Group G1

Group G2

Group G5
Scrub Area

T8-C2

T7-C2

T6-C2

T5-C2

T4-C2

Hawthorn Bushes

Young Ash

Hedge H1

T1-C2

Hedge H3

Young Willow Bushes

T9-C2

RECEIVED: 14/06/2024

LEGEND

- Root Protection Area
- Tree Canopy
- Tree Stem & Category Colour
- Tree Tag Number & Category (T2-C2)
- Canopy Extent
- Tree Group/Hedge/Woodland Number (G4)

- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
- Category U Trees (Poor Condition)

N

W E

S

NOTES:
Please see Tree Survey Report for further detail.
All drawings to be read in conjunction with the consulting architects and engineers drawings.

Individual trees, groups and hedgerow extents are plotted in their approximate positions and should be regarded as indicative.

Independent Tree Surveys Ltd

Our Lady's Cottage
Drummond
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jmorgan@independenttreesurveys.ie
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Project Name: Remote South Staff Car Park, Harristown Road, Dublin

Drawing Title: Tree Survey/Constraints Plan

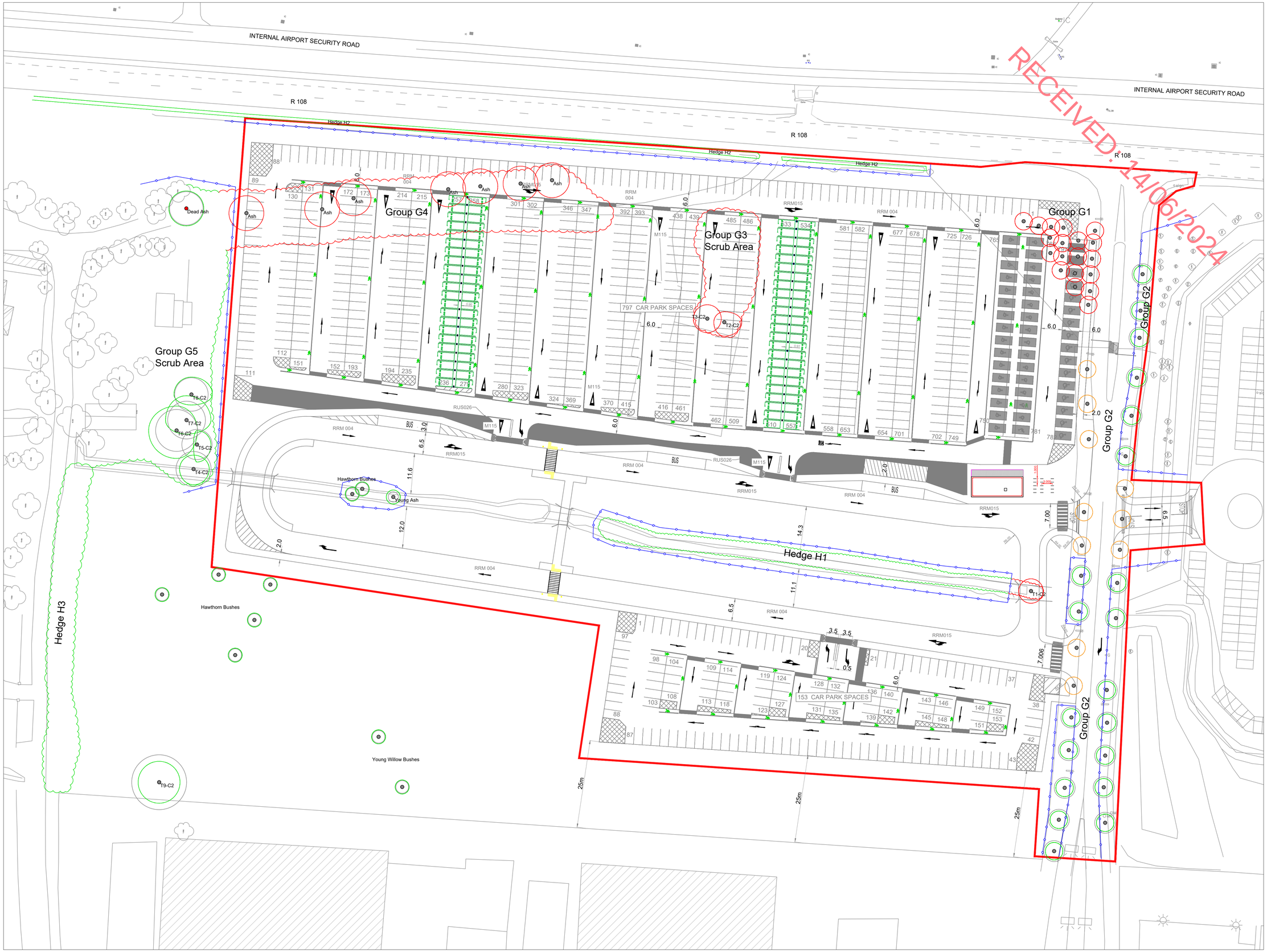
Drawing Number: 24004_TS

Client: DAA

Agent: Atkins

Date: 29/01/2024

Scale:1:500@A1



LEGEND

- Root Protection Area
- Tree Canopy
- Tree Stem & Category Colour
- Tree Tag Number & Category
- Canopy Extent
- Tree Group/Hedge/Woodland Number
- Tree to be Removed
- SM Lime tree with potential to be transplanted
- Extent of Tree Group to be Removed
- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
- Category U Trees (unsuitable for retention)
- Tree Protection Fence Indicative Line

N

NOTES:
Please see Tree Survey Report for further detail.
All drawings to be read in conjunction with the consulting architects and engineers drawings.

Individual trees, groups and hedgerow extents are plotted in their approximate positions and should be regarded as indicative.

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Our Lady's Cottage
Drummond
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Project Name: Remote South Staff Car Park, Harristown Road, Swords, Co. Dublin

Drawing Title: Tree Protection Plan

Drawing Number: 24004_TPP

Client: DAA

Agent: Atkins

Date: 31/01/2024

Scale: 1:500@A1

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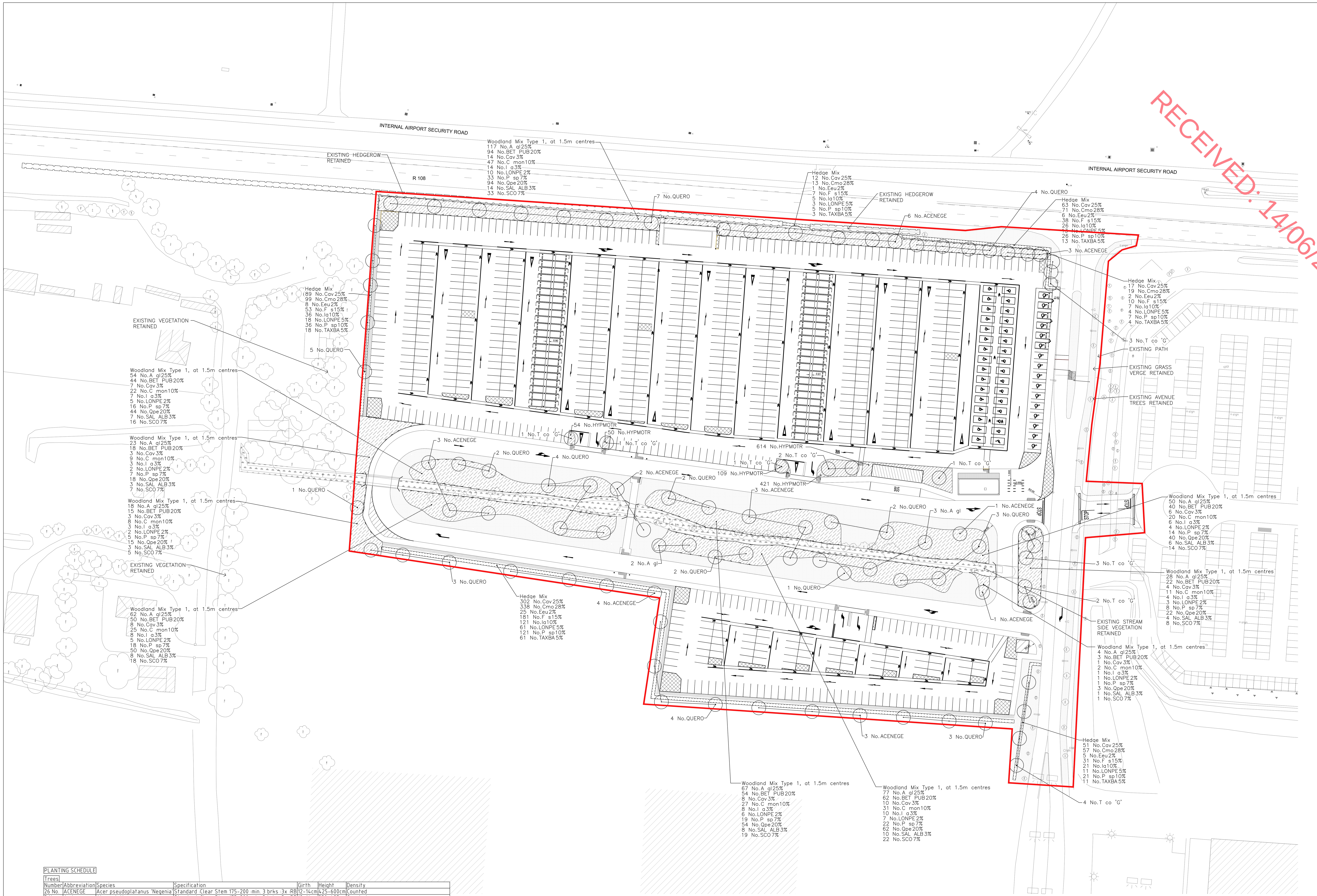
Appendix 6.4: Landscape Design



PLANTING SCHEDULE

Trees

Number	Abbreviation	Species	Specification	Girth	Height	Density
26 No.	ACENEGE	Acer pseudoplatanus 'Negenia'	Standard :Clear Stem 175-200 :min. 3 brks :3x :RB	12-14cm	425-600cm	Counted
5 No.	A gl	Alnus glutinosa	Standard :Clear Stem 175-200 :min. 3 brks :3x :RB	12-14cm	350-425cm	Counted
500 No.	A gl	Alnus glutinosa	1+1 :Transplant :B		60-80cm	1.5Ctr
402 No.	BET PUB	Betula pubescens	1+1 :Transplant :B		60-80cm	1.5Ctr
597 No.	Cmo	Crataegus monogyna	1+1 :Transplant :B		40-60cm	0.45Ctr Double Staggered at 0.4m offset
202 No.	C mon	Crataegus monogyna	1+1 :Transplant :B		60-80cm	1.5Ctr
47 No.	Eeu	Euonymus europaeus	1+1 :Transplant :B		40-60cm	0.45Ctr Double Staggered at 0.4m offset
320 No.	F s	Fagus sylvatica	1+1 :Transplant :B		60-80cm	0.45Ctr Double Staggered at 0.4m offset
216 No.	Ia	Ilex aquifolium	1+1 :Transplant :C		40-60cm	0.45Ctr Double Staggered at 0.4m offset
402 No.	Qpe	Quercus petraea	1+1 :Transplant :B		60-80cm	1.5Ctr
43 No.	QUERO	Quercus robur	Standard :Clear Stem 175-200 :min. 3 brks :3x :RB	12-14cm	350-425cm	Counted
64 No.	SAL ALB	Salix alba	0/1/2 :Cutting		60-80cm	1.5Ctr
143 No.	SCO	Salix cinerea subsp. oleifolia	0/1/2 :Cutting		60-80cm	1.5Ctr
18 No.	T co 'G'	Tilia cordata 'Greenspire'	Standard :Clear Stem 175-200 :min. 3 brks :3x :RB	16-18cm	min. 450cm	Counted

Shrubs

Number	Abbreviation	Species	Specification	Pot Size	Height	Density
534 No.	Cav	Corylus avellana	1+1 : Transplant: B		40-60cm	0.45Ctr Double Staggered at 0.4m offset
64 No.	Cav	Corylus avellana	1+1 :Branched :2 brks :B		40-60cm	1.5Ctr
1248 No.	HYPMOTR	Hypericum moserianum 'Tricolor'	Bushy :5 brks :C	3L	40-60cm	$5/m^2$
64 No.	I a	Ilex aquifolium	Bushy	2L	30-40cm	1.5Ctr
216 No.	P sp	Prunus spinosa	1+1 : Transplant: B		40-60cm	0.45Ctr Double Staggered at 0.4m offset
143 No.	P sp	Prunus spinosa	1+1 :Branched :2 brks :B		40-60cm	1.5Ctr

Climbers

Number	Abbreviation	Species	Pot Size	Specification	Height	Density
110 No.	LONPE	Lonicera periclymenum	2L	Several Shoots	60-80cm	0.45Ctr Double Staggered at 0.4m offset
45 No.	LONPE	Lonicera periclymenum	2L	Several Shoots	60-80cm	1.5Ctr

Conifers

Number	Abbreviation	Species	Specification	Height	Density
110 No.	TAXBA	Taxus baccata	1+1 :Transplant :Bushy :BR	40-60cm	0.45Ctr Double Staggered at 0.4m offset

PLANTING LEGEND:

SYM.	DESCRIPTION
	NATIVE/ NATURALISED SPECIES WOODLAND PLANTING - REFER TO SCHEDULE.
	TURF GRASS TYPE 1
	EXISTING STREAM SIDE VEGETATION (RETAINED).
	EXISTING TREES (RETAINED).
	EXISTING HEDGEROW (RETAINED).
	BARK MULCH ONLY
	HEDGEROW.
	TREE (DECIDUOUS), REFER TO SCHEDULE.
	SITE BOUNDARY.

NOTE:

1. PROVIDE MINIMUM DEPTH OF TOPSOIL TO PLANTED AREAS AS FOLLOWS:
GRASS AREAS 200MM
TREE AND SHRUB AREAS 450MM
STANDARD & FEATHERED TREE PITS 750MM

2. TO ALL TREES AND SHRUBS THE CONTRACTOR SHALL SUPPLY AND INCORPORATE A SLOW RELEASE FERTILISER.

3. STANDARD TREE PITS SHALL BE FILLED WITH A PRE-MIXED SOIL COMPOST MIXTURE INCORPORATING THE SLOW RELEASE FERTILISER NOTED ABOVE.

4. TRANSPLANT PITS SHALL BE EXCAVATED TO A DEPTH OF 300MM DIAMETER AND 300MM DEPTH BELOW EXISTING GROUND LEVEL. ALL PITS SHALL BE EXCAVATED TO SUFFICIENT DEPTH AND WIDTH TO ACCOMMODATE THE PLANT WITHOUT DISTURBING ITS ROOTS. DURING BACKFILLING THE FINAL SOIL LEVEL AROUND THE TREE SHOULD BE RAISED TO 40MM ABOVE THE SURROUNDING SOIL LEVEL.

5. CONTAINER GROWN STOCK SHALL BE PLANTED IN A PIT EXCAVATED TO SUFFICIENT DEPTH AND WIDTH TO ACCOMMODATE THE PLANT WITHOUT DISTURBING / COMPACTING ITS ROOTS, WITH FINAL FINAL SOIL LEVEL 40MM ABOVE SURROUNDING SOIL LEVEL AS ABOVE.

6. HEDGES TO BE PLANTED IN A DOUBLE STAGGERED ROW.

7. THE CONTRACTOR SHALL PLACE A 50MM DEPTH LAYER OF ORGANIC MULCH TO A CIRCLE 500MM RADIUS AROUND THE BASE OF ALL STANDARD TREES WITHIN GRASS AREAS. BEFORE APPLICATION OF THE MULCH THE AREAS SHALL BE WEED FREE. ORNAMENTAL & HEDGE PLANTING BEDS SHOULD BE KEPT COMPLETELY WEED FREE AND DEPTH OF MULCH MAINTAINED AT 50MM DEPTH.

8. A CIRCLE OF RADIUS 500MM SHOULD BE KEPT COMPLETELY WEED FREE AROUND EACH TRANSPLANT PLANTING STATION AND HEDGES.

9. STANDARD TREES SHOULD BE DOUBLE SINGLE STAKED WITH CROSSBAR.

10. RABBIT/ HARE GUARDS WILL BE REQUIRED EITHER INDIVIDUAL GUARDS OR FENCING.

11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION OF SERVICES PRIOR TO PLANTING. TREES WITHIN PLANTING MIXES SHOULD BE PLACED AWAY FROM ANY OVERHEAD POWER LINES.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

MAINTENANCE/CLEANING

DECOMMISSIONING/DEMOLITION

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

REVISION SCHEDULE

NO.	DATE	REVISED BY	DESCRIPTION
T00	11.04.24	EB	ISSUED FOR TENDER
T01	15.04.24	EB	ISSUED FOR TENDER

CLIENT:
daa

FRAMEWORK CONSULTANT :
AtkinsRéalis

ATKINS HOUSE,150 AIRSIDE BUSINESS PARK,
SWORDS, DUBLIN,K67 K5W4
Tel : +353 1 810 8000 Email : info.ie@atkinsrealis.com

PROJECT:
REMOTE SOUTH STAFF CAR PARK

TITLE:
PLANTING PLAN & SCHEDULE
(SHEET 1 OF 1)

ORIGINATOR:	CHECKER:	REVIEWER:	APPROVER:
XW	EB	EB	EB

STATUS:	SCALE:	SHEET:	DATE:
TENDER	1:500	A0	11.04.2024

DRAWING NUMBER:	REV:
D21081-ATK-SCS-01-XXX-DR-C-040-0002	T01

15/4/24 13:59:04

Appendix 10: Traffic

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Appendix 10.1 Traffic and Transport Assessment

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Remote South Staff Car Park

Traffic and Transport Assessment

daa

June 2024

Notice

This document and its contents have been prepared and are intended solely as information for daa and use in relation to daa Staff Car Park Extension

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This document has 22 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 0	Draft for Comment	DS	NV	CF	CF	12/09/2022
Rev 1	Draft for Comment	DS	NV	CF	CF	16/09/2022
Rev 2	Draft	DS/BM	NV	CF	CF	03/02/2023
Rev 3	Working Draft	DS	NV	NV	KB	07/02/2024
Rev 4	Working Draft	DS	NV	NV	NV	20/02/2024
Rev 5	Working Draft	DS	NV	NV	NV	23/02/2024
Rev 6	Final	DS	NV	NV	NV	12/04/2024
Rev 7	Final	DS	NV	NV	NV	07/06/2024

Client signoff

Client	daa
Project	Remote South Staff Car Park
Job number	5209452
Client signature / date	

Contents

Figures

1. Introduction

Dublin Airport Authority (daa) has appointed Atkins to provide traffic and transportation assessment in support of the daa plc. planning application for the Remote South Staff Car Park, to the west of the existing long-term blue car-park to the south of Dublin Airport.

The proposed development on a site of approximately 4.26ha, bounded by the South Parallel Road (R108) to the north, Harristown Lane to the west, Horizon Business Park to the south, and an existing former construction access road to Horizon Business Park and the existing Holiday Blue Long-Term Car Park to the east in the townland of Harristown, Dublin Airport, Co. Dublin. The proposed development will consist of: 1) the demolition of existing cattle pen and hard standing area (total 911m2) and the removal of 1 no. existing gated site entrance from the South Parallel Road (R108), and the construction of a westwards extension to the existing Holiday Blue Long-Term Car Park to provide an extended surface car park which will comprise 950 no. airport staff car parking spaces, of which 48 no. will be provided for Persons with Reduced Mobility (PRM) and 96 no. will be serviced by Electric Vehicle (EV) charging points, to be accessed off the South Parallel Road (R108) via an upgraded existing former temporary construction access/egress, with an emergency access also to be provided through the existing Holiday Blue Long-Term Car Park immediately east of the proposed development site via a tie in, with security barriers, to the existing internal roundabout; 2) 30 no. bicycle spaces; 3) 1 no. new bus shelter; 4) new internal road layout, with set down areas for buses and footpaths, incorporating 2 no. existing culverts (one of which is to be extended) and 1no. new culvert over the Santry River; 5) proposed riparian corridor either side of the Santry River; 6) 1 no. single-storey substation; 7) 1 no. new single storey welfare building; 8) 1 no. new single-storey security hut with security barriers; 9) new foul and surface water drainage system works incorporating attenuation; 10) the erection of CCTV equipment, security fencing, electrical enclosure, lighting, signage, and boundary fencing; and 11) all other associated site development works, including temporary construction compound, and all hard and soft landscaping.

2. Site Location

2.1. Site Location

Remote South staff car park is located to the south of Dublin Airport and to the immediate west of the existing long-term blue carpark. The site will be accessed from the existing long-term blue carpark access road which is directly from the R108. Figure 2-1 illustrates a detailed aerial view of proposed development while the high level location in the context of the airport complex is shown in Figure 2-2 below.

Figure 2-1 - Detailed Site Location (Source - Google Map)

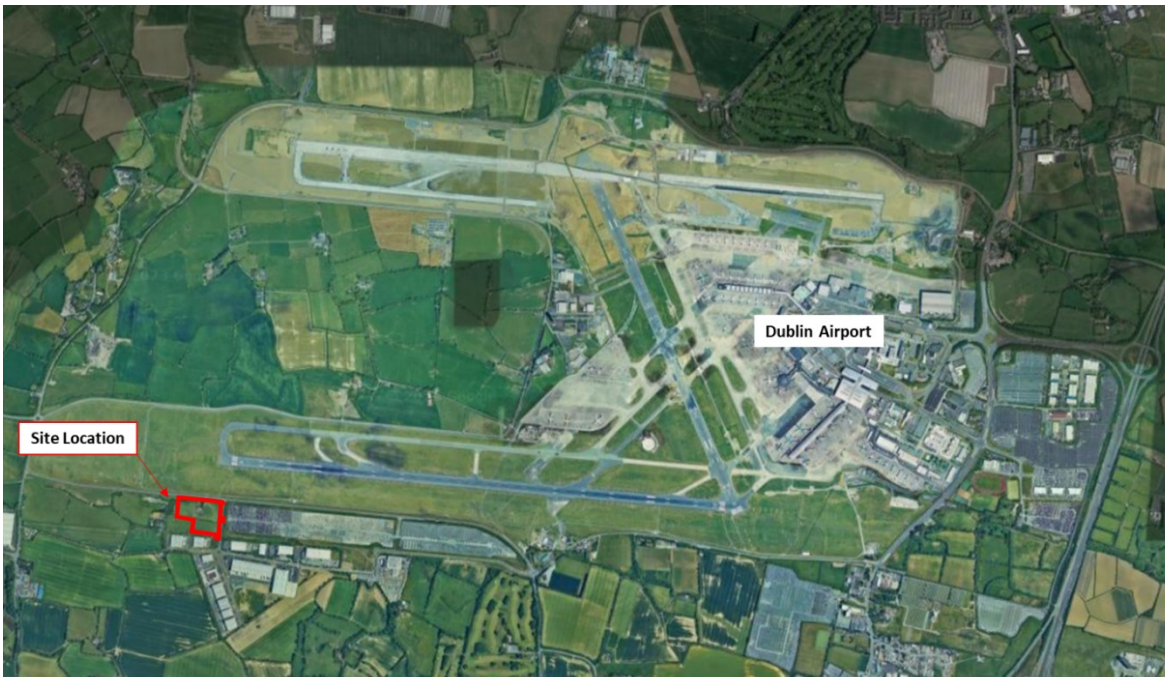


Figure 2-2 - High Level Site location (Source - Google Maps)

3. Receiving Environment

3.1. Surrounding Road Network

The proposed development is located in the vicinity of the M50, M1, R122 and Old Airport Road. The R108 is a 60km/hr, single carriageway regional road which, locally, starts from the M50 Ballymun Interchange and terminates at the R122 to the west. The Old Airport Road runs between the R108 and the R132 and provides access between the airport complex and the proposed development site. The M50 and M1 are the two National Roads nearest to the development site. The local road network in the vicinity of the proposed development is shown in Figure 3-1 while the typical cross-section of the R108 is shown in Figure 3-2 below.

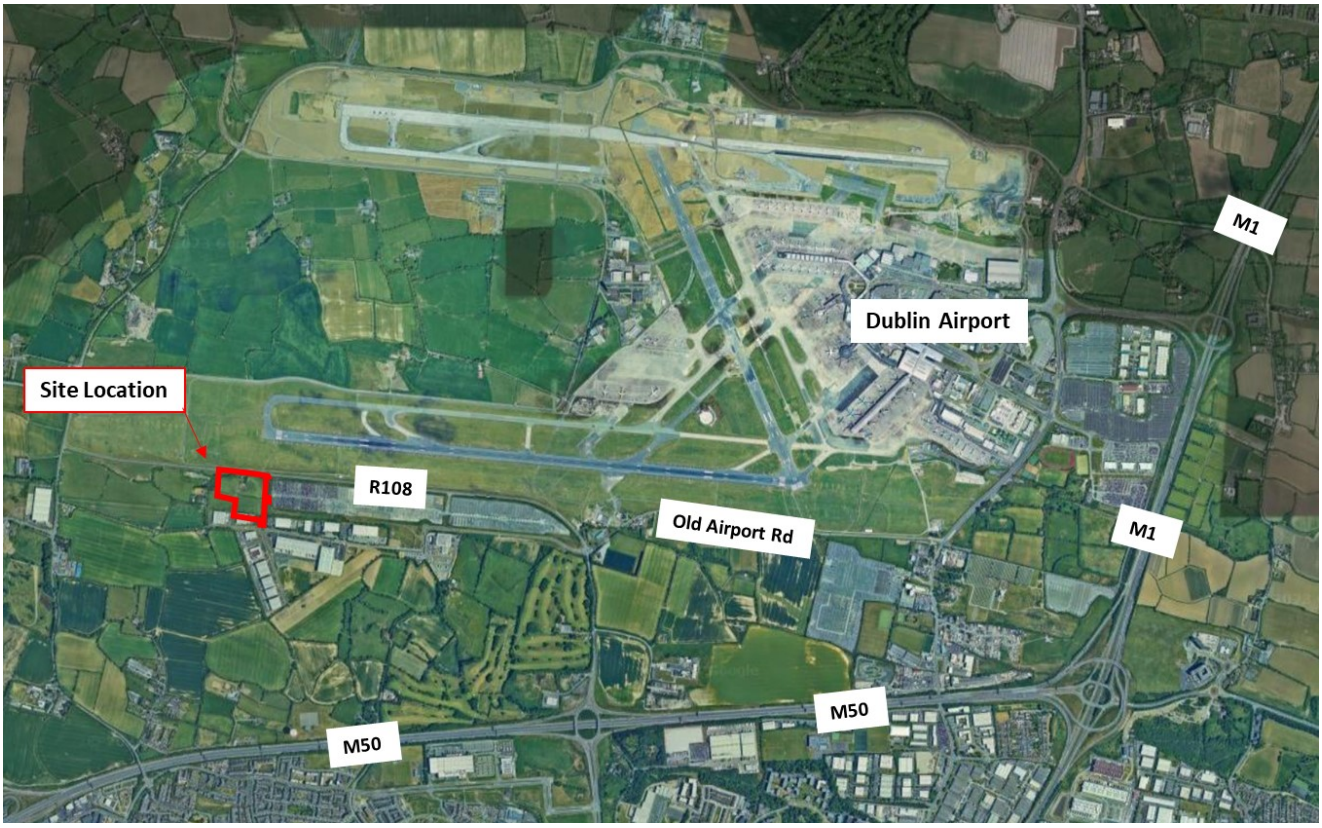


Figure 3-1 - Existing Road Network

Figure 3-2 - Road Cross Section - R108

3.2. Local Road Junctions

The key junctions in the area of influence of the proposed development in terms of potential vehicular traffic impact are illustrated in Figure 3-3 and described in this section.

Figure 3-3 - Local Road Junctions

3.2.1. R108/Old Airport Road Junction

The junction is located on the northern side of M50 Ballymun Junction where Old Airport Road intersects with R108. It is a four-legged signalised junction having pelican crossing facility for pedestrians. Figure **3-4** shows aerial view of R108/Old Airport Road Junction.

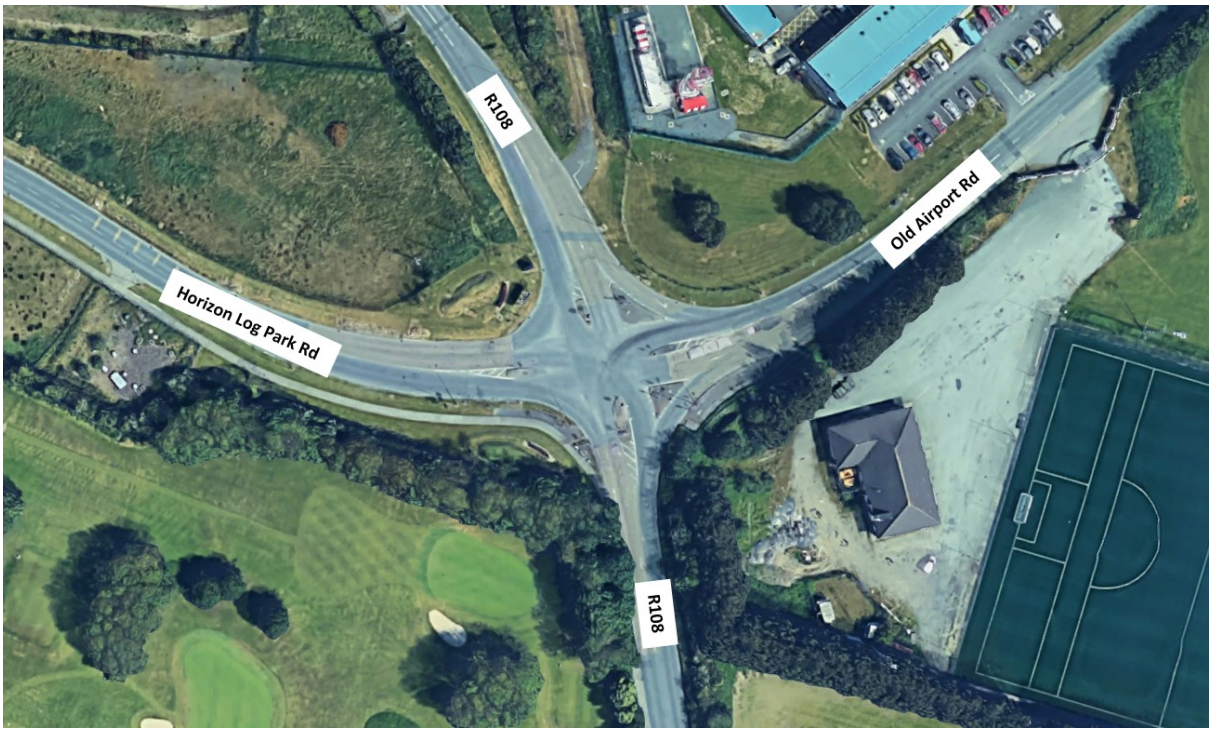


Figure 3-4 **- R108/Old Airport Road Junction**

3.2.2. M50 Ballymun Interchange

M50 Ballymun Interchange is a signalised junction located on southern side of R108/Old Airport Road Junction and considered as one of the key interchanges on M50. Figure 3-5 illustrates aerial view of the interchange.

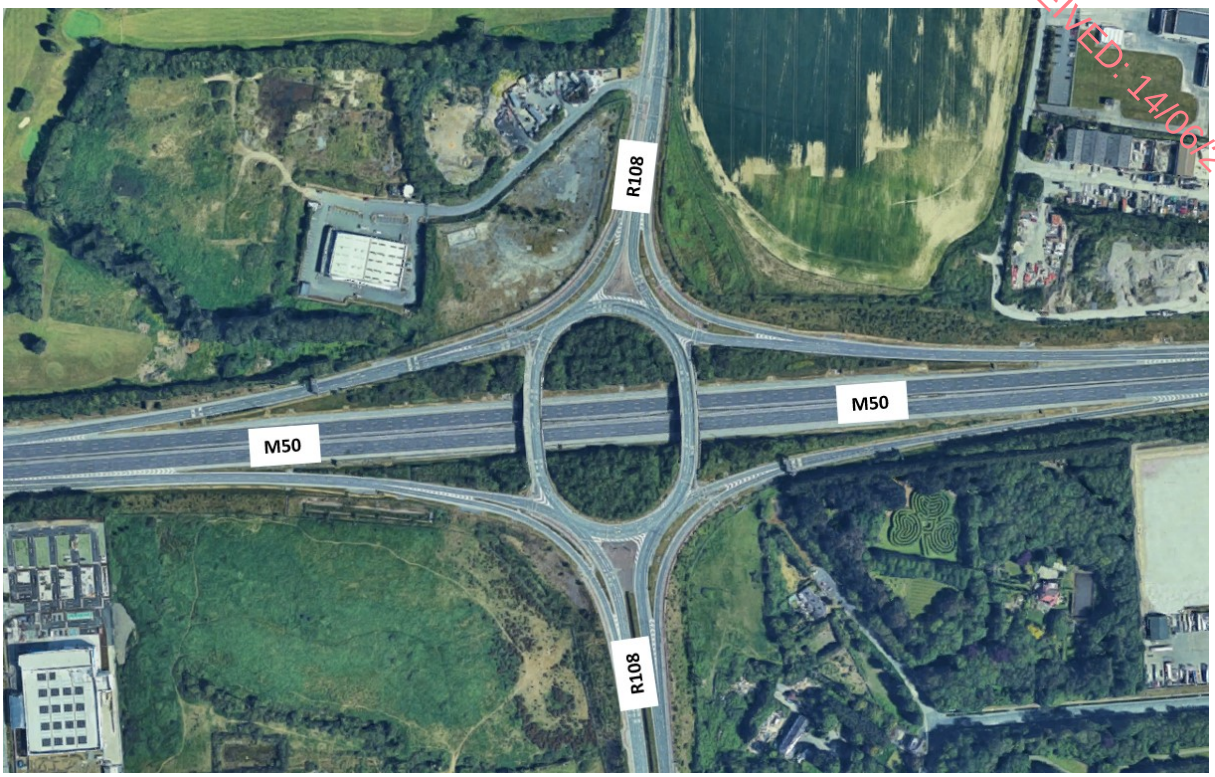


Figure 3-5 - M50 Ballymun Interchange

4. Policy Review

4.1. Capacity Determination

An exercise was undertaken in order to determine the allowable parking capacity based on historical precedents. The most relevant planning and policy documentation in order to ascertain the staff car parking thresholds are as follows:

- Dublin Airport – Terminal 2 application, including:
  - EIS report (2006);
  - An Bord Pleanála Permission Granted with associated conditions; and
- Dublin Airport LAP (2020).

Each document is discussed in further detail in the following sections.

4.2. Dublin Airport - Terminal 2 application

Details of Dublin Airport T2 application are described in this section.

4.2.1. EIS Report (2006)

Planning Application PL06F.220670 (FO6A/1248) related to the construction of a new terminal building at Dublin Airport, known as Terminal 2. The purpose of this planning application was to cater for ongoing growth which has allowed for the programming and prioritisation of capital development activities at Dublin Airport, with a budget of €1.2 billion to spend over ten years beginning in 2006. The development programme was one of the largest infrastructure programmes in Ireland and was in response to the growth in both passenger numbers and freight over the last decade and anticipated growth in the future. This application was granted approval by An Bord Pleanála (ABP) with the inclusion of condition 23c which states that there shall be no material increase in the number of employee car parking spaces at the airport. The response further states that this reflects the requirements of policy LAP which seeks to limit employee parking and that employee parking would ultimately be removed from the central campus in line with policy CP10.

4.2.2. An Bord Pleanála Permission Granted with associated conditions

The Dublin Airport – Terminal 2 Environmental Impact Statement (EIS), Volume 2 (F06A1248) was written in 2006 in support of the new terminal at Dublin Airport, known as Terminal 2. As mentioned in the previous section, this application was granted approval by An Bord Pleanála (ABP) with the inclusion of condition 23c which states the following:

23. *Provision of parking to serve the development hereby permitted shall be the subject of separate planning applications, as required. Any additional parking provided shall have regard to the mode share targets established by the Mobility Management Plan and the growth of passenger numbers using the Airport. Having regard to the assumptions underpinning the Environmental Impact Statement submitted with the subject application, the submitted Mobility Management Plan and the capacity of Phase 1 of the development, the following restrictions to car parking, which are a direct result of the proposed development, shall apply:*
    - *a) The total number of long-term public car parking spaces serving the Airport shall not exceed 26,800;*
    - *b) The total number of short-term public car parking spaces shall not exceed 4,000; and*
    - *c) There shall be no material increase in the number of employee car parking spaces at the airport.*

Therefore, with reference to Condition 23c of the permission, it is deemed that 5,360 car parking spaces is the threshold for limitation on the number of staff car parking spaces at the airport. Atkins have reviewed subsequent planning and policy documents and can confirm that this figure has not been superseded.

4.3. Dublin Airport LAP

The Dublin Airport Local Area Plan (LAP) was developed in 2020 which provided an update of the previous LAP which was developed in 2006. The reason for referencing the LAP is to confirm that the original threshold for staff parking, as defined in the original Dublin Airport – T2 Application, is still relevant for present applications. With this in mind, the LAP states the following:

"Staff Car Parks: There are approximately 5,360 car parking spaces available to serve this demand. These car parking facilities are spread through Dublin Airport in the vicinity of the buildings they serve."

Based on the information provided by daa on existing staff car parking in the airport, the actual figure is significantly lower than this value. It can therefore be confidently inferred this figure represents the maximum allowable staff car parking allowance based on the original T2 application.

4.4. Staff Car Parking Strategy

The existing staff car parking capacity at Dublin Airport is currently approximately 4394 no. of spaces. Condition 23c of planning permission PL06F.220670 (FO6A/1248) for the T2 Terminal Building states that there shall be no material increase in the number of employee car parking spaces at the airport, which was 5,360 spaces at the time of the application.

The proposed spaces are not additional spaces but are a replacement of spaces lost to developments in the Airport Campus, which need to be re-provided to serve the needs of existing Airport staff.

The erosion of staff car parking spaces can generally be attributed to the redevelopment of the central airport zone (Zone 1 according to the Dublin Airport Central Masterplan, 2016). Over time, staff parking has been replaced with more appropriate land-uses which has resulted in a significant reduction of staff car parking in the area. This process is anticipated to continue and will be facilitated with developments such as the subject application.

Hence, this application intends to develop a new staff car park to the west of the existing long term blue car park on the southern side of the Dublin Airport to accommodate staff car park facility.

5. Proposed Development

5.1. Development Characteristics

The proposed development is to facilitate a new staff car-park within the west of the existing long-term blue car-park to the south of Dublin Airport. The proposed carpark is currently a greenfield site with an area of approximately 4.26ha. The proposed development will make use of existing shuttle bus service to transport staff to the main airport campus. Shuttle bus runs with frequency of 15 minutes.

In addition, a new security hut with toilet and sink will be located on the traffic island along the existing entrance road. The proposed layout is shown in Figure 5-1 below. A more detailed version of the site layout is provided in Appendix A.

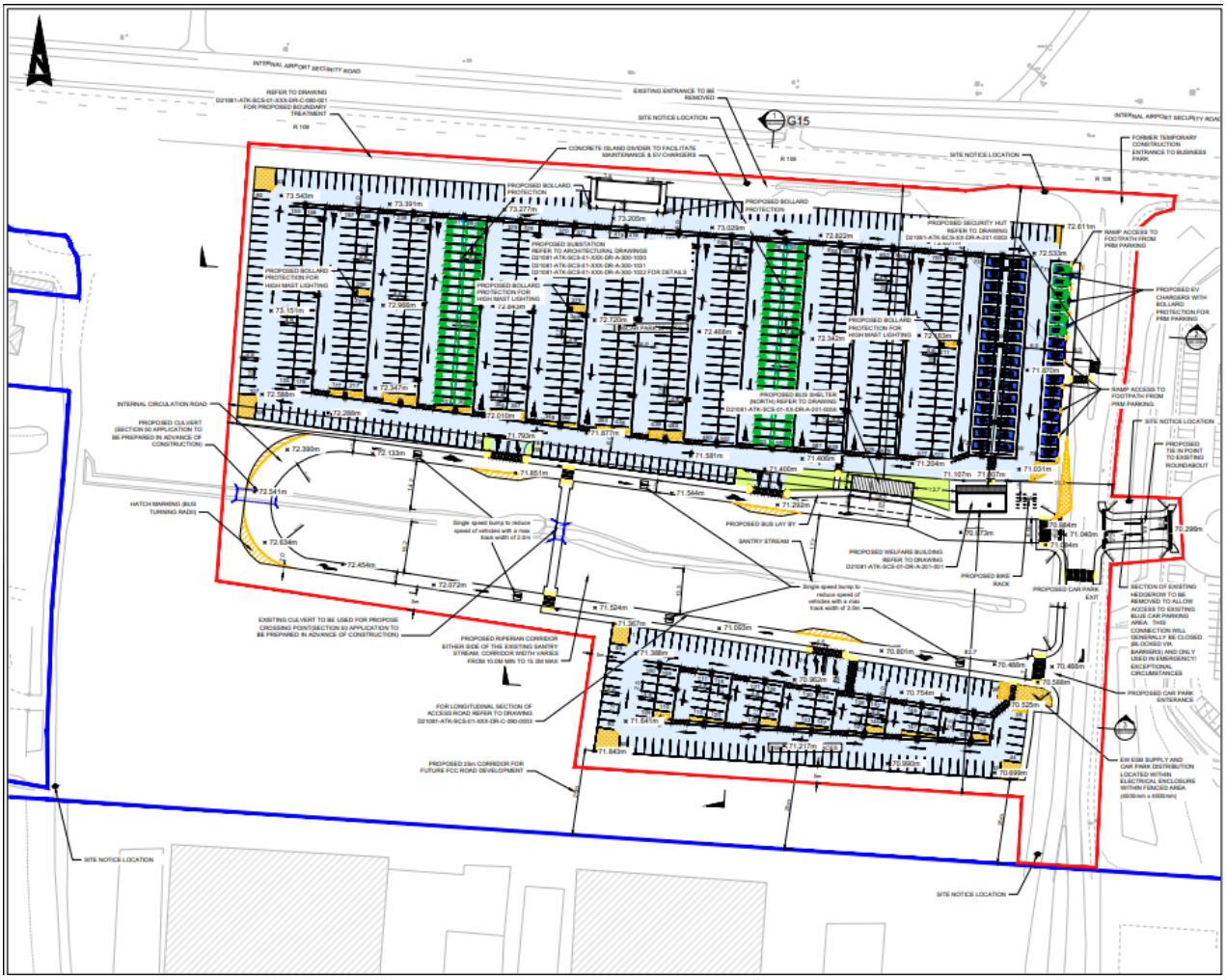


Figure 5-1 - Proposed Development Layout

5.2. Parking

The carpark will cater for 950 staff car-parking spaces. The development is inclusive of 96 no. electrical vehicle (EV) car park bays, 48 no. disabled parking bays, 30 no. cycle parking bays, 1 no. bus shelter, 1no. substation, 1no. welfare facility building and associated infrastructure to be installed to the west of the existing entrance. In addition, a new security hut with a toilet and sink will be located on the traffic island along the existing entrance road As per Fingal Development Plan (2023 - 2029), EV parking to be provided minimum of 10% of all spaces.

Disabled parking provision is also in line with the Fingal Development Plan (2023 - 2029) which requires disabled parking to be provided minimum of 5% of car parking spaces. This also results in a requirement of 48 no. spaces based on a total parking provision of 950.

5.2.1. Alternative use of Parking

A nominal amount of cycle parking has been provided to cater for cyclists who may choose to cycle in then catch the shuttle to work. The welfare building provides shower facilities to encourage walking and cycling as a mode of choice.

In terms of public transport usage, there is an existing airport bus shuttle system which is anticipated to cater for the majority of staff car park users. The site is located along future "BusConnects" Route 24. This route is a new public bus route running between the City Centre and Dublin Airport, as per the National Transport Authority's Dublin Bus Network Redesign (2020). BusConnects Route 24 is proposed to run through the site itself via the site's access road as shown on the Figure 5-2. Although staff are anticipated to use the shuttle, some may avail of existing public transport services such as this.

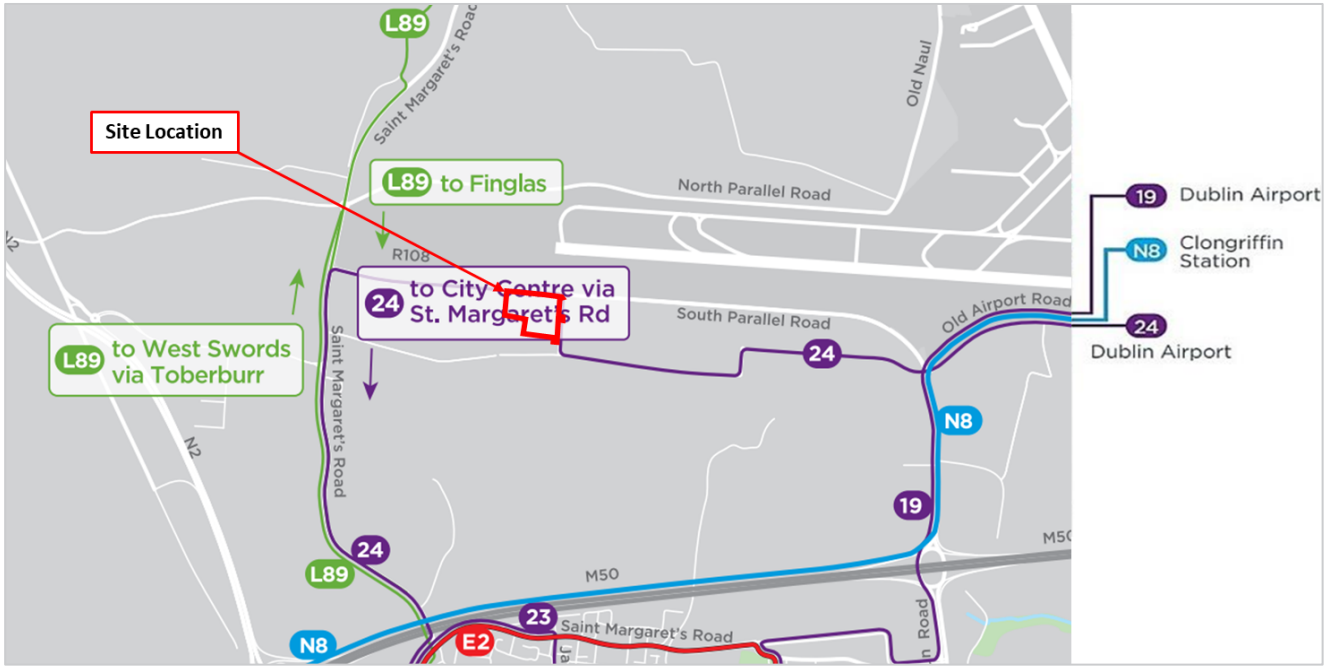


Figure 5-2 - "BusConnects" - Route 24

6. Traffic Impact Summary

6.1. Introduction

A Traffic Impact Assessment has been carried out as a part of Traffic and Transport Assessment for the proposed development. This assessment was carried out to determine impact of proposed staff car park on the surrounding network in terms of link and junction capacities. The proposed staff car park will eventually accommodate approximately 950 spaces. The scope of this exercise is to undertake traffic analysis of the impact of the proposed 950 spaces on the surrounding network, in terms of link and junction capacities.

6.2. Data Sources & Scenarios

The traffic flows used in this assessment were taken from a Local Area Model (LAM) of the road network in the vicinity of Dublin Airport, which has been developed to assess future projects at Dublin Airport. The following three scenarios were considered as part of the assessment:

- 2019 Base Year;
- 2031 Do Minimum; and
- 2031 Do Something.

A VISUM Local Area Model was used for link capacity analysis while LinSig 3.0 software was used for the junction capacity analysis. The summary of this analysis is incorporated in this section, however, a detailed report is included in Appendix B.

6.3. Methodology

The following methodology was used in the assessment:

- Traffic flows and turning movements for the relevant road links and junctions, respectively, were taken from the 2019 Base Model and 2031 Do Minimum model.
- A straight line interpolation / extrapolation exercise used the difference between these traffic flows to derive an annual growth rate which was used to determine Do Minimum traffic flows for 2023, 2028 and 2038.
- The development traffic flows were determined using the traffic flows to and from remote south staff car park in the 2031 Do Something model. These were factored-up to account for the potential increase in spaces from 950 in the model to 1,585 being proposed.
- The future staff parking strategy for the Airport is to control which staff use which car park based on where they live. This will determine how permits are issued and will look to ensure that the new southern staff car park is used only by employees who live to the south of the Airport, thereby removing the need for them to travel past the core Airport Central area via the R132. It is assumed that this permit control will be in operation when remote south staff car park opens.
- LinSig junction modelling was undertaken to determine the impact of the proposed car park on the operation of key junctions in the vicinity of the Airport. Considering the assumption above, LinSig modelling was only undertaken at two junctions:
    - R108 / Old Airport Road junction; and
    - M50 Ballymun Interchange.

6.4. Trip Generation & Distribution

The traffic flows for the relevant road links and junctions for this assessment were taken from the 2019 AM Peak and PM Peak, and 2031 Do minimum AM Peak and PM Peak models. Analysis was required for an opening year of 2023, an opening year +5 (2028) and opening year +15 (2038). Straight-line Interpolation and extrapolation was undertaken to calculate the traffic flows for these years, for two vehicle categories; light vehicles (LV) and heavy vehicles (HV).

It is assumed that permit control will be in operation when remote south staff car park opens. The trip distribution from the car park was based on the exiting distribution in the Do Something models and is mirrored between the AM and PM peaks.

6.5. Link Capacity Analysis

A link capacity analysis was carried out in order to understand and compare the current and expected volumes of traffic with the capacity of the road link directly east and west of the entrance to the proposed staff car park. current and expected traffic volumes on the R108 were compared against the determined link capacity in order to calculate a volume to capacity ratio. Volume to Capacity (V/C) ratios close to, or above 1.0 indicates that the link is over capacity and breakdown flow will likely occur, resulting in increased congestion and journey times. A V/C ratio of 0.85 is considered to be approaching capacity and should be avoided, where possible.

Although there is an increase in future year traffic in the DS scenario because of remote south staff car park, it can be seen from the volume to capacity ratio that the volume of traffic remains less than the capacity for both of the links analysed with the highest volume to capacity ratio in 2038 being a maximum of 40% during the 2023 future year PM peak hour.

The link capacity analysis has shown that the R108, in the vicinity of proposed staff car park, has adequate capacity to accommodate the traffic generated by proposed car park. The results can be found in the Traffic Impact Assessment in Appendix B.

6.6. Junction Analysis Conclusion

The junction capacity analysis focused on the following two junctions:

- R108 / Old Airport Road Junction; and
- M50 Ballymun Interchange.

It was determined that both junctions are already operating over capacity in the base 2019 scenario, the M50 Ballymun Interchange in the AM peak period and the R108/Old Airport Road Junction in the PM peak period.

The Do Something (DS) flows have little impact on the M50 Ballymun Interchange when compared with the Do Minimum (DM) flows. Whereas, for the R108/Old Airport Rd junction, the DS flows have a slight negative impact on the junction due to the extra trips generated by remote south staff car park present in the DS scenario.

For DS scenario, an upgraded junction layout was assessed which consisted of widening of the approaches from the R108 south and Old Airport Road to provide approx. 50m of two and three-lane approaches, respectively. Changes in signal timing were also proposed for R108/Old Airport Road Junction. Green time for give-way left turn was removed from stage 1 and 3 for Old Airport Road left turn slip and green time was provided for all movements together in stage 4. The proposed updates to the R108/Old Airport Road Junction improve the throughput of the junction and demonstrate that the junction would operate within the capacity for all scenarios.

It should be noted that the main purpose of the proposed upgrades are to improve the existing performance of the junction. The impact from the proposed car park is anticipated to be minor.

Further detail analysis can be found in Appendix B.

7. Outline Construction Management Plan

This section of the report deals with the impacts of construction of the subject development. As with any construction project, the contractor will be required to prepare a comprehensive traffic management plan for the construction phase. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period.

This section will provide an overview of the construction vehicle routing, based on a most likely scenario of construction. It should be noted that the impacts of the construction will be temporary, and it will be the contractor's responsibility to prepare a Construction Traffic Management Plan (CTMP) for approval in advance of any works.

7.1. Policy Guidance

Guidance for the temporary control of traffic at road works to facilitate the safety of the public during the works is provided below:

- Traffic Signs Manual Chapter 8, Temporary Measures and Sign Roadworks (2008);
- Addendum Transport Chapter 8, Temporary Measures and Sign Roadworks (2008); and
- Traffic Management Guidelines, Department of Transport (2003).

7.2. Access and Parking Arrangements

In terms of access, construction vehicles will gain entry and exit for deliveries etc. via the existing R108. It is intended at this stage that all construction vehicles will be accommodated on the adjacent Holiday Blue Car Park, to be confirmed with daa, and the ultimate Contractor at detailed CTMP stage. The contractor will be responsible for identifying an appropriately located site office and compound.

7.3. Construction Route

It is recommended that construction traffic access the site from the M50 Ballymun Interchange via the R108. This will ensure that construction vehicles travel the most direct route to access the site, and vice versa vehicles will exit the site using the same junction.

7.4. Environmental Control Measures

A Construction Management Plan will be developed by the contractor prior to the commencement of the work on site. Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with.

7.5. Hours of Operation

The daa have stated that building works typical hours of operation and site development works are to be carried out. Half days will be worked on Saturdays while no work will be undertaken on Sundays or public holidays. This is to be confirmed with Fingal County Council.

7.6. Traffic Management Measures

Following list of proposed traffic management measures need to be adopted during the construction works. Note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to prepare a detailed Construction Management Plan.

- It will be the responsibility of the contractor to ensure all relevant authorities are consulted, particularly in relation to the effect on the Ballymun / M50 interchange. Fingal County Council and TII are the relevant parties to be contacted.
- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access.
- Construction and delivery vehicles will be instructed to use only the approved and agrees means of access and movement of construction vehicles will be restricted to these designated routes.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material.

- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site.
- Parking of site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures.
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public road leading away from the construction site.
- All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off site will not be carried out on the public highway.
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.

The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

8. Summary & Conclusions

The applicant intents to submit a planning application for the extension of the existing holiday blue car park to facilitate a new staff within the west of the existing long-term blue car-park to the south of Dublin Airport.

The proposed car-park is currently a greenfield site with an area of approximately 4.26ha. The car-park will cater for 950 staff car-parking spaces. The development is inclusive of electrical vehicle car park bays, disabled parking bays, cycle parking, a bus stop, bus shelters and a welfare facility building and associated infrastructure to be installed to the west of the existing entrance. In addition, a new security hut with toilet and sink will be located on the traffic island along the existing entrance road.

The existing staff car parking capacity at Dublin Airport is currently approximately 4394 no. of spaces which is 966 parking bays short of the previously allowed of 5,360 (Condition 23c of planning permission PL06F.220670 (FO6A/1248)).

The car-park will cater for 950 staff car-parking spaces. The development is inclusive of 92 no. electrical vehicle (EV) car park bays, 48 no. disabled parking bays, 30 no. cycle parking bays, a bus stop, two bus shelters and a welfare facility building and associated infrastructure to be installed to the west of the existing entrance.

A Traffic Impact Assessment has been carried out as a part of Traffic and Transport Assessment for the proposed development. This assessment was carried out to determine impact of proposed staff car park on the surrounding network in terms of link and junction capacities.

Traffic flows and turning movements for the relevant road links and junctions, respectively, were taken from the 2019 Base Model and 2031 Do Minimum model.

A straight line interpolation / extrapolation exercise used the difference between these traffic flows to derive an annual growth rate which was used to determine Do Minimum traffic flows for 2023, 2028 and 2038.

The development traffic flows were determined using the traffic flows to and from remote south staff car park in the 2031 Do Something model. These were factored-up to account for the potential increase in spaces from 950 in the model to 1,585 being proposed.

The future staff parking strategy for the Airport is to control which staff use which car park based on where they live. This will determine how permits are issued and will look to ensure that remote south staff car park is used only by employees who live to the south of the Airport, thereby removing the need for them to travel past the core Airport Central area via the R132. It is assumed that this permit control will be in operation when remote south staff car park opens.

LinSig junction modelling was undertaken to determine the impact of the proposed car park on the operation of key junctions in the vicinity of the Airport. Considering the assumption above, LinSig modelling was only undertaken at two junctions:

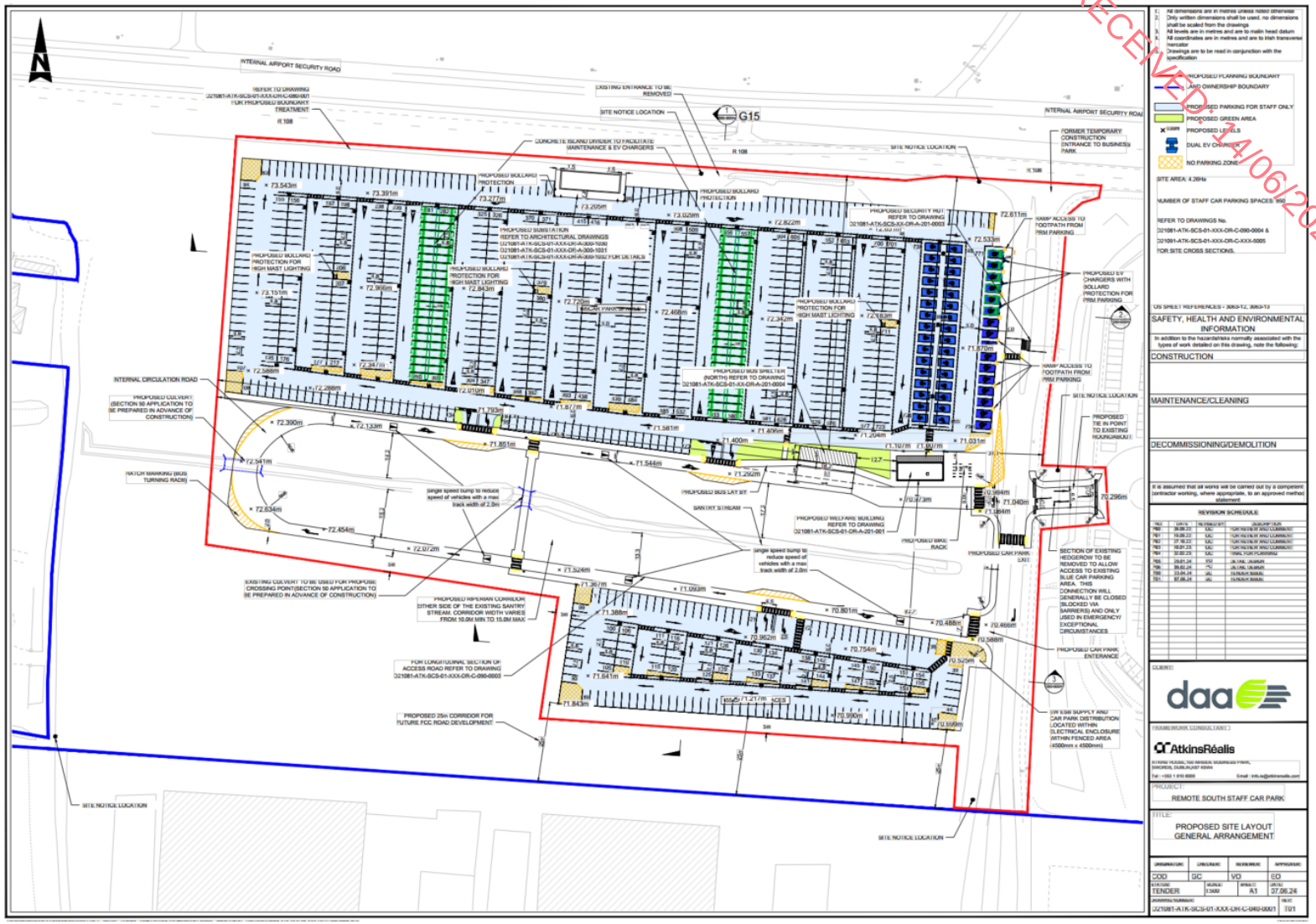
- R108 / Old Airport Road junction; and
- M50 Ballymun Interchange.

It was determined that both junctions are already operating over capacity in the base 2019 scenario, the M50 Ballymun Interchange in the AM peak period and the R108/Old Airport Road Junction in the PM peak period.

The Do Something (DS) flows have little impact on the M50 Ballymun Interchange when compared with the Do Minimum (DM) flows. Whereas, for the R108/Old Airport Rd junction, the DS flows have a slight negative impact on the junction due to the extra trips generated by the staff and long term passenger car park present in the DS scenario.

The proposed updates to the R108/Old Airport Road Junction improve the throughput of the junction and demonstrate that the junction would operate within the capacity for all scenarios. It should be noted that the main purpose of the proposed upgrades are to improve the existing performance of the junction. The impact from the proposed car park is anticipated to be minor.

Appendix A. Development Layout



Appendix B. Traffic Impact Analysis

Atkins House
150 Airside Business Park
Swords
Co. Dublin
K67 K5W4<contact info>

Specification No.	Client name	Discipline	Project name
Version 1.0	daa	Transportation	Southern Remote Staff Car Park
Date		**Prepared by**	**Approved by**
June 27th 2022		Ultan maguire	Beata Smyl
		Checked by	**Verified by**
		Keith Dalton	Neil Caughhey

1. Introduction

AECOM undertook traffic analysis as part of a wider Traffic and Transport Assessment for a proposed southern remote staff car park, adjacent to the existing Holiday Blue Long Stay Car Park at Dublin Airport.

The proposed staff car park will eventually accommodate approximately 1,585 spaces, but this application will apply for approximately 950 spaces.

The scope of this exercise is to undertake traffic analysis of the impact of the full proposed 1,585 spaces on the surrounding network, in terms of link and junction capacities.

The results of this exercise will be incorporated into the wider Traffic and Transport Assessment Report for the proposed car park.

2. Data Sources – Local Area Models

The traffic flows used in this assessment were taken from a Local Area Model (LAM) of the road network in the vicinity of Dublin Airport, which has been developed to assess future projects at Dublin Airport. The extent of the LAM is illustrated in Figure 2.1.

Figure 2.1. Local Area Model Extent

The various LAM scenarios used in the assessment and their relevant inputs/assumptions and outputs are summarised in Table 2.1 and discussed, below.

Table 2.1. LAM Scenarios

LAM Scenario	Key Inputs / Assumptions	Key Outputs Used in Assessment
2019 Base Year	2019 link and junction survey data	2019 Link Flows and Junction Turning Movements
2031 Do Minimum	Airport capped at 32mppa 2031 ERM outputs to reflect background growth	2031 Do Minimum Link Flows and Junction Turning Movements
2031 Do Something	As 2031 Do Minimum plus: • Airport growth to 40mppa and associated growth in staff and passenger demand • Relocation of staff car parks	Development Traffic for southern remote staff car park

The LAM has been built using VISUM modelling software. It is calibrated and validated to a 2019 Base, using extensive traffic surveys undertaken in May of that year to criteria outlined in Transport Infrastructure Ireland (TII's) Project Appraisal Guidelines for National Roads Unit 5.1 - Construction of Transport Models.

The airport reached its current 32 million passengers per annum (mppa) operating cap in 2019, before the impacts of Covid 19 saw a reduction in passenger numbers. As such, the LAM is considered appropriate to represent peak pre-Covid 'normal' conditions for the Airport in terms of its traffic impact on the surrounding road network. The Base LAM is also considered appropriate to represent general background traffic, which reduced significantly during Covid, but is approaching 2019 levels again .

The modelled time periods are the AM peak (08.00 – 09.00) and PM peak (17.00 – 18.00), which represent the peak periods for traffic on the road network in the vicinity of the Airport, as identified from traffic surveys undertaken in May 2019.

The future year LAM scenarios have been informed by a 2031 run of the National Transport Authority's (NTA) Eastern Regional Model (ERM), in terms of demand, modal split and planned future road network upgrades.

The ERM is a multi-modal model and consists of four input elements; Public Transport (PT); Walking and Cycling; and Highways.

The ERM is centred on Dublin City and comprises 1,854 zones (1,844 internal zones, 7 external zones and 3 special zones). Demand in the model is built upon Central Statistics Office POWSCAR[1] , NTA Household Travel Surveys, Transport Surveys and other transport related datasets. The staff demand at the Airport is based on CSO data with distribution based on CSO POWSCAR and NTA Household Surveys. The passenger demand distribution is based on data collected as part of the NTA Airport Surveys for Irish residents and a bespoke distribution model that links passengers to hotels/offices based on density for non-Irish passengers.

The future year ERM includes a number of committed or planned public transport schemes (i.e. MetroLink and BusConnects), which have informed the mode share and subsequent traffic flows in the LAM.

[1] Census 2016 Place of Work, School or College - Census of Anonymised Records (POWSCAR)

The 2031 Do Minimum Future Year LAM scenario reflects a situation where Airport growth remains static at 32mppa, but background growth and committed public transport and road schemes within the Eastern region have been delivered.

A 2031 Do Something Future Year LAM scenario has also been developed that includes airport growth to 40mppa, as well as a number of supporting measures, such as relocation of staff car parks to remote sites. One of these sites is the proposed southern staff car park, which is included in the LAM as a 1,074 space car park. As such, the Do Something future year LAM provides a proxy for the trip generation for the proposed staff car park.

3. Methodology

The following methodology was used in the assessment:

- Traffic flows and turning movements for the relevant road links and junctions, respectively, were taken from the 2019 Base Model and 2031 Do Minimum model.
- A straight line interpolation / extrapolation exercise used the difference between these traffic flows to derive an annual growth rate which was used to determine Do Minimum traffic flows for 2023, 2028 and 2038.
- The development traffic flows were determined using the traffic flows to and from the southern staff car park in the 2031 Do Something model. These were factored-up to account for the potential increase in spaces from 1,074 in the model to 1,585 being proposed.
- The future staff parking strategy for the Airport is to control which staff use which car park based on where they live. This will determine how permits are issued and will look to ensure that the new southern staff car park is used only by employees who live to the south of the Airport, thereby removing the need for them to travel past the core Airport Central area via the R132. It is assumed that this permit control will be in operation when the new southern car park opens.
- LinSig junction modelling was undertaken to determine the impact of the proposed car park on the operation of key junctions in the vicinity of the Airport. Considering the assumption above, LinSig modelling was only undertaken at two junctions (Illustrated in Figure 3.1);
  - R108 / Old Airport Road junction; and
  - M50 Ballymun Interchange

Figure 3.1. Junctions included in Capacity Analysis (Source: Google Maps)

4. Trip Generation and Trip Distribution

Trip Generation

The traffic flows for the relevant road links and junctions for this assessment were taken from the 2019 AM Peak and PM Peak, and 2031 Do minimum AM Peak and PM Peak models. Analysis was required for an opening year of 2023, an opening year +5 (2028) and opening year +15 (2038). Straight-line Interpolation and extrapolation was undertaken to calculate the traffic flows for these years, for two vehicle categories; light vehicles (LV) and heavy vehicles (HV).

The development traffic flows were determined using the traffic flows to and from the southern staff car park in the 2031 Do Something model. This model, however, assumed 1,074 spaces in the southern staff car park whereas the proposal being assessed is for 1,585 spaces. The trips generated by the additional 511 spaces were calculated using a combined trip generation rate derived from entry/exit surveys undertaken at multiple Airport staff car parks in 2019 (which informed the development of the Base LAM), as summarised below.

Table 4.1. Trip Generation Calculations

	AM Peak		PM Peak	
	Origin	Destination	Origin	Destination
2031 Car Park Trips (1,074 Spaces)	196	12	38	222
Trip Generation per Car Parking Space[2]	0.175	0.017	0.023	0.172
Additional Trips (511 Spaces)	89	9	12	88
2031 Car Park Trips (1,585 Spaces)	**285**	**21**	**50**	**310**

Trip Distribution

As noted in Section 3, it is assumed that permit control will be in operation when the new southern car park opens. The trip distribution from the car park was based on the exiting distribution in the Do Something models and is mirrored between the AM and PM peaks (i.e. AM Origin trips = PM Destination trips, and vice-versa). The percentage origin/destination splits are presented in Figures 4.1 and 4.2.

Figure 4.1. AM Origins & PM Destinations Trip Distribution

[2] trips generated per space across all Airport staff car parks

Figure 4.2. AM Destinations & PM Origins Trip Distribution

The resultant traffic flows used in the junction capacity analysis are summarised in Appendix A.

5. Link Capacity Analysis

A link capacity analysis was carried out in order to understand and compare the current and expected volumes of traffic with the capacity of the road link directly east and west of the entrance to the proposed staff car park. Link capacity refers to the maximum throughput of vehicles on a road before breakdown flow occurs assuming there is no build-up of traffic from surrounding junctions.

Using the parameters outlined in Table 1 of DMRB Advice Note TA 79/99 'Traffic Capacity of Urban Roads', the R108 was determined to be an Urban All Purpose (UAP 1). With a carriageway width of 6.75m, as per Table 2 of the same document, a two-way capacity of 2,640 vehicles per hour was determined.

For this link capacity analysis, current and expected traffic volumes on the R108 were compared against the determined link capacity in order to calculate a volume to capacity ratio. Volume to Capacity (V/C) ratios close to, or above 1.0 indicates that the link is over capacity and breakdown flow will likely occur, resulting in increased congestion and journey times. A V/C ratio of 0.85 is considered to be approaching capacity and should be avoided, where possible.

5.1 Assessment sites

Two sites were chosen for the purpose of a link capacity analysis. The sites are located south of the airport on the R108 either side of the entrance to the proposed staff carpark and are shown below in Figure 5.1.

Figure 5.1. Link Capacity Analysis Sites

5.2 Base 2019

Table 5.1. Base 2019 AM link capacity

Base 2019	2-Way Peak Hour Volume		Volume to capacity ratio	
	Site 2147483377	Site 2147483371	Site 2147483377	Site 2147483371
2019 AM	655	589	0.2481	0.2231
2019 PM	815	925	0.3087	0.3503

As can be seen from the volume to capacity ratios above, the level of traffic is less than the capacity for both of the links analysed at peak hours.

5.3 Do Minimum

Table 5.2. Peak hours DM scenario future year link capacity

AM DM	2-Way AM Peak Hour Volume		Volume to capacity ratio	
	Site 2147483377	Site 2147483371	Site 2147483377	Site 2147483371
2023	706	651	0.2673	0.2465
2028	769	728	0.2913	0.2757
2038	896	882	0.3393	0.3341
PM DM	**2-Way PM Peak Hour Volume**		**Volume to capacity ratio**	
	Site 2147483377	Site 2147483371	Site 2147483377	Site 2147483371
2023	802	914	0.3038	0.3462
2028	786	900	0.2976	0.3410
2038	753	873	0.2853	0.3306

It can be seen from the DM future years' volume to capacity ratios that the volume of traffic remains less than the capacity for both of the links analysed at peak hours.

5.4 Do Something

Table 5.3. Peak hours DS scenario future year link capacity

AM DS	2-Way AM Peak Hour Volume		Volume to capacity ratio	
	Site 2147483377	Site 2147483371	Site 2147483377	Site 2147483371
2023	842	823	0.3188	0.3116
2028	905	900	0.3428	0.3408
2038	1032	1054	0.3908	0.3992
PM DS	**2-Way AM Peak Hour Volume**		**Volume to capacity ratio**	
	Site 2147483377	Site 2147483371	Site 2147483377	Site 2147483371
2023	950	1067	0.3598	0.4042
2028	934	1053	0.3537	0.3990
2038	901	1026	0.3414	0.3885

Although there is an increase in future year traffic in the DS scenario because of the staff car park, it can be seen from the volume to capacity ratio that the volume of traffic remains less than the capacity for both of the links analysed with the highest volume to capacity ratio in 2038 being a maximum of 40% during the 2023 future year PM peak hour.

5.5 Summary

The Link Capacity Analysis has shown that the R108, in the vicinity of the proposed staff car park, has adequate capacity to cater for the traffic generated by the proposed car park.

6. Junction Capacity Analysis

The operational capacity of the two junctions outlined in Figure 3.1 has been assessed using LinSig, a common piece of software for the assessment of junctions.

LinSig allows the assessment of both individual entry 'arms' and the junction as a whole. For the individual arms, the outputs are Degree of Saturation (DoS) and Mean Maximum Queue Length (MMQ). A total-junction statistic known as the Practical Reserve Capacity (PRC) is also reported, which shows the percentage of 'spare' capacity remaining at the junction.

LinSig works on the basis that a junction is considered to be at capacity when the individual junction arm DoS values exceed 90%. Below this threshold, queues begin to increase slowly as the DoS increases. Above this threshold, queues begin to increase rapidly. As the DoS on any arm increases, the PRC remaining at the junction decreases. A negative PRC signifies that the overall junction is operating above capacity and will be subject to queuing and delays.

This section provides an overview of the LinSig results. Full LinSig results summary outputs are provided in Appendix B.

6.1 Assessment Sites

The existing layout of the M50 Ballymun Interchange and the R108/Old Airport Rd Junction are shown in Figure 6.1 and Figure 6.2, respectively.

Figure 6.1. Existing M50 Ballymun Interchange layout

Figure 6.2. Existing R108/Old Airport Rd Junction

6.2 Base 2019

6.2.1 M50 Ballymun Interchange

The existing M50 Ballymun Interchange was tested using LinSig. Figure 6.3 shows the arms and movements at the junction, as referenced in the LinSig results, while Table 6.1 and Table 6.2 presents the LinSig summary results for the junction for the base year of 2019.

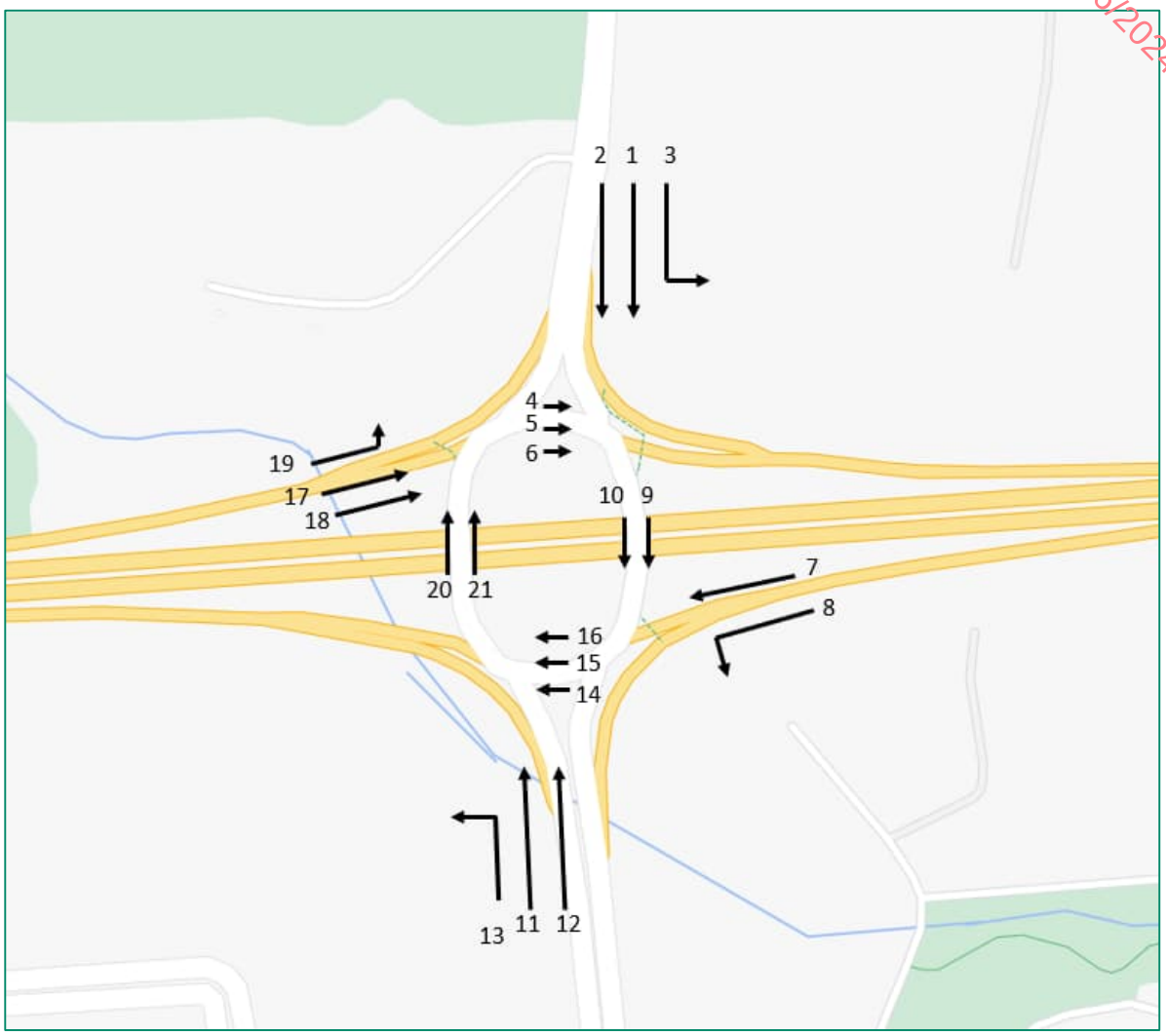


Figure 6.3. Location of junction movements, M50 Ballymun Interchange

Table 6.1. 2019 Base LinSig results, M50 Ballymun Interchange

Scenario	2019 AM		2019 PM	
PRC	-71.30%		-4.10%	
Cycle Time	80		80	
Location	**Deg Sat**	**MMQ**	**Deg Sat**	**MMQ**
1. R108 (North) Ahead Nearside	3%	0	21%	3
2. R108 (North) Ahead Offside	21%	3	42%	7
3. Left turn slip to M1 Interchange	3%	0	8%	0
4. Northern Circulatory Carriageway Nearside	93%	13	89%	16
5. Northern Circulatory Carriageway Centre	94%	11	94%	19
6. Northern Circulatory Carriageway Offside	97%	13	78%	4
7. M50 Off-Slip (East)	31%	3	17%	2
8. M50 Off-slip – Free flow Left Turn (East)	34%	0	14%	0
9. Eastern Circulatory Carriageway Nearside	32%	9	47%	8
10. Eastern Circulatory Carriageway Offside	51%	13	85%	24
11. R108 (South) Nearside	36%	5	63%	11
12. R108 (South) Offside	1%	0	25%	4
13. R108 (South) Free flow Left Turn	31%	0	57%	1
14. Southern Circulatory Carriageway Nearside	26%	3	19%	3
15. Southern Circulatory Carriageway Centre	67%	7	79%	13
16. Southern Circulatory Carriageway Offside	0%	0	0%	0
17. M50 Off-slip (West) Nearside	154%	127	50%	6
18. M50 Off-slip (West) Offside	152%	130	78%	12
19. M50 Off-slip (West) Free flow Left Turn	62%	1	42%	0
20. Western Circulatory Carriageway Nearside	45%	5	67%	7
21. Western Circulatory Carriageway Offside	80%	0	24%	2

It can be seen from Table 6.1 that the Ballymun Interchange currently operates above capacity for the base 2019 in the AM and PM periods with substantial queueing occurring on the M50 off-slip. This is predominantly due to a significant volume of city-bound traffic exiting at the interchange. The capacity issues at the junction are further highlighted by the negative PRC values in both peak hours.

6.2.1 R108/Old Airport Rd Junction

The existing R108/Old Airport Rd Junction was tested using LinSig, Figure 6.4 illustrates the arms / movements referenced in the results, while Table 6.2 presents the LinSig summary results for the junction for the base year of 2019.

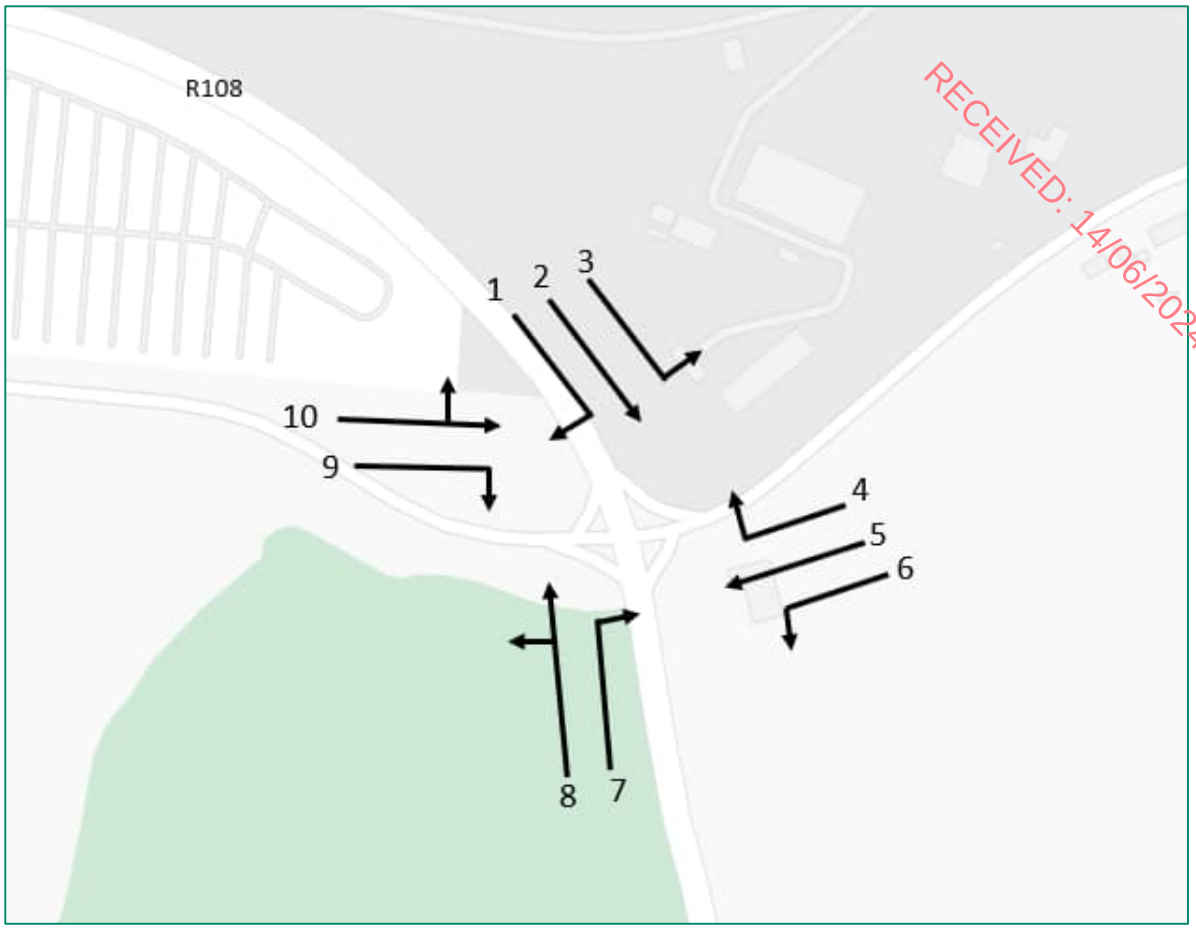


Figure 6.4. Location of junction movements, R108/Old Airport Rd Junction

Table 6.2. 2019 base LinSig results, R108/Old Airport Rd Junction

Scenario	2019 AM		2019 PM	
PRC	37.90%		-25.10%	
Cycle Time	120		120	
Location	**Deg Sat**	**MMQ**	**Deg Sat**	**MMQ**
1. R108 (North) Right Turn	0%	0	0%	0
2. R108 (North) Ahead	19%	3	96%	15
3. R108 (North) Left Turn Give-way	53%	3	43%	0
4. Old Airport Road Right Turn	53%	0	34%	0
5. Old Airport Road Ahead	53%	5	34%	6
6. Old Airport Road Left Turn	64%	6	113%	54
7. R108 (South) Right Turn	65%	11	108%	25
8. R108 (South) Ahead and Left	42%	8	79%	11
9. Horizon Log Park Right Turn	25%	1	100%	10
10. Horizon Log Park Ahead and Left	5%	0	0%	0

It can be seen from Table 6.2 that the R108/Old Airport Rn junction currently operates above capacity for the base 2019 in the PM period with substantial queueing occurring on the Old Airport Rd left turn. This is further emphasised by the negative PRC values in the PM peak.

6.3 Do Minimum

6.3.1 M50 Ballymun Interchange

The existing junction layout was tested with the 2023, 2028 and 2038 DM flows. Results are presented in Table 6.3 and Table 6.4 The individual scenarios have been optimised to the associated traffic flows to present the best possible results, hence the differing cycle times.

Table 6.3. Ballymun Interchange – DM – AM LinSig Summary

Scenario	2023 AM DM		2028 AM DM		2038 AM DM	
PRC	2.4%		-10.3%		-45.0%	
Cycle Time	104		108		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Ahead Nearside	6%	1	6%	1	5%	1
2. R108 (North) Ahead Offside	25%	5	25%	5	24%	5
3. Left turn slip to M1 Interchange	6%	0	9%	0	16%	0
4. Northern Circulatory Carriageway Nearside	47%	11	57%	13	68%	16
5. Northern Circulatory Carriageway Centre	86%	6	94%	10	94%	11
6. Northern Circulatory Carriageway Offside	85%	5	98%	14	101%	22
7. M50 Off-Slip (East)	19%	3	19%	3	21%	4
8. M50 Off-slip – Free flow Left Turn (East)	33%	0	31%	0	28%	0
9. Eastern Circulatory Carriageway Nearside	69%	22	71%	24	56%	23
10. Eastern Circulatory Carriageway Offside	88%	31	89%	34	76%	32
11. R108 (South) Nearside	45%	9	48%	10	47%	11
12. R108 (South) Offside	4%	1	20%	0	0%	0
13. R108 (South) Free flow Left Turn	33%	0	35%	0	41%	0
14. Southern Circulatory Carriageway Nearside	6%	1	6%	1	8%	2
15. Southern Circulatory Carriageway Centre	45%	10	49%	11	58%	13
16. Southern Circulatory Carriageway Offside	0%	0	0%	0	0%	0
17. M50 Off-slip (West) Nearside	86%	20	99%	33	131%	131
18. M50 Off-slip (West) Offside	85%	21	97%	31	127%	127
19. M50 Off-slip (West) Free flow Left Turn	64%	2	65%	2	69%	3
20. Western Circulatory Carriageway Nearside	56%	7	57%	8	54%	8
21. Western Circulatory Carriageway Offside	4%	0	20%	0	0%	0

It can be seen from Table 6.3 that the optimised signal times will allow the Ballymun Interchange to operate within capacity in the 2023 AM DM peak, albeit with several arms close to capacity. The junction is forecast to operate over capacity in the AM DM peak from 2028, with substantial queueing expected on the M50 Eastbound off-slip.

The southern circulatory carriageway offside lane is underutilised, which appears to be the result of the existing lane marking at this location facilitating only U-turn from M50 Westbound to M50 Eastbound.

Table 6.4. Ballymun Interchange – DM – PM LinSig Summary

Scenario	2023 PM DM		2028 PM DM		2038 PM DM	
PRC	-11.3%		-12.3%		-13.0%	
Cycle Time	115		116		112	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Ahead Nearside	29%	5	29%	5	28%	5
2. R108 (North) Ahead Offside	64%	15	65%	16	65%	16
3. Left turn slip to M1 Interchange	8%	0	8%	0	8%	0
4. Northern Circulatory Carriageway Nearside	44%	15	51%	17	72%	21
5. Northern Circulatory Carriageway Centre	91%	35	94%	37	98%	39
6. Northern Circulatory Carriageway Offside	27%	1	29%	1	36%	1
7. M50 Off-Slip (East)	12%	2	13%	2	14%	2
8. M50 Off-slip – Free flow Left Turn (East)	14%	0	14%	0	14%	0
9. Eastern Circulatory Carriageway Nearside	96%	33	97%	36	93%	32
10. Eastern Circulatory Carriageway Offside	100%	42	101%	46	102%	52
11. R108 (South) Nearside	74%	18	76%	19	82%	23
12. R108 (South) Offside	49%	11	45%	10	32%	6
13. R108 (South) Free flow Left Turn	60%	1	63%	1	70%	1
14. Southern Circulatory Carriageway Nearside	5%	2	5%	2	7%	2
15. Southern Circulatory Carriageway Centre	59%	20	63%	21	75%	23
16. Southern Circulatory Carriageway Offside	0%	0	0%	0	0%	0
17. M50 Off-slip (West) Nearside	54%	12	58%	14	68%	16
18. M50 Off-slip (West) Offside	27%	5	28%	6	35%	7
19. M50 Off-slip (West) Free flow Left Turn	42%	0	43%	0	45%	1
20. Western Circulatory Carriageway Nearside	82%	10	85%	11	90%	13
21. Western Circulatory Carriageway Offside	47%	3	42%	2	30%	2

Table 6.4 indicates that the Ballymun Interchange is forecast to operate over capacity in tested PM DM peak periods. Queueing is noted on both the northern and eastern circulatory carriageways. Again, the southern circulatory carriageway offside lane is underutilised.

6.3.2 R108/Old Airport Rd Junction

The existing junction layout was tested with the 2023, 2028 and 2038 DM flows. Results are presented in Table 6.5 and Table 6.6.

Table 6.5. R108/Old Airport Road – Existing Junction Layout – DM – AM - LinSig Summary

Scenario	2023 AM DM		2028 AM DM		2038 AM DM	
PRC	31.3%		21.6%		11.4%	
Cycle Time	120		120		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
11. R108 (North) Right Turn	0%	0	0%	0	0%	0
12. R108 (North) Ahead	29%	4	44%	6	79%	12
13. R108 (North) Left Turn Give-way	55%	3	58%	3	62%	4
14. Old Airport Road Right Turn	57%	6	64%	8	61%	9
15. Old Airport Road Ahead	57%	6	64%	8	61%	9
16. Old Airport Road Left Turn	68%	7	74%	8	81%	9
17. R108 (South) Right Turn	69%	12	74%	12	79%	14
18. R108 (South) Ahead and Left	42%	8	47%	9	53%	10
19. Horizon Log Park Right Turn	25%	1	54%	4	21%	1
20. Horizon Log Park Ahead and Left	5%	0	14%	1	7%	0

It can be seen from Table 6.5 that the R108/Old Airport Road junction is forecast to operate within capacity in all future AM DM scenarios.

Table 6.6. R108/Old Airport Road – Existing Junction Layout – DM – PM - LinSig Summary

Scenario	2023 PM DM		2028 PM DM		2038 PM DM	
PRC	-29.9%		-35.8%		-50.3%	
Cycle Time	120		120		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Right Turn	0%	0	0%	0	0%	0
2. R108 (North) Ahead	103%	22	105%	23	79%	12
3. R108 (North) Left Turn Give-way	44%	0	45%	0	62%	4
4. Old Airport Road Right Turn	35%	6	35%	6	36%	7
5. Old Airport Road Ahead	35%	6	35%	6	36%	7
6. Old Airport Road Left Turn	117%	64	122%	79	135%	114
7. R108 (South) Right Turn	110%	29	122%	42	130%	54
8. R108 (South) Ahead and Left	76%	10	77%	10	72%	9
9. Horizon Log Park Right Turn	102%	11	102%	11	103%	11
10. Horizon Log Park Ahead and Left	0%	0	0%	0	0%	0

It can be seen from Table 6.6 that the R108/Old Airport Road junction is forecast to operate over capacity in all future PM DM periods, with substantial queueing forecast on the Old Airport Road Left turn and the R108 (south) right turn in the future year scenarios.

6.4 Do Something

6.4.1 M50 Ballymun Interchange

The existing junction layout was tested with the 2023, 2028 and 2038 DS flows. Results are presented in Table 6.7 and Table 6.8, for the AM and PM peaks respectively. The individual scenarios have been optimised to the associated traffic flows to present the best possible results, hence the differing cycle times.

Table 6.7. Ballymun Interchange – DS – AM LinSig Summary

Scenario	2023 AM DS		2028 AM DS		2038 AM DS	
PRC	1.7%		-30.6%		-45.0%	
Cycle Time	100		118		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Ahead Nearside	8%	1	4%	1	6%	1
2. R108 (North) Ahead Offside	25%	4	25%	5	25%	5
3. Left turn slip to M1 Interchange	6%	0	9%	0	16%	0
4. Northern Circulatory Carriageway Nearside	48%	11	68%	15	68%	16
5. Northern Circulatory Carriageway Centre	86%	6	94%	11	94%	11
6. Northern Circulatory Carriageway Offside	86%	5	101%	20	101%	22
7. M50 Off-Slip (East)	26%	4	32%	6	30%	5
8. M50 Off-slip – Free flow Left Turn (East)	33%	0	31%	0	28%	0
9. Eastern Circulatory Carriageway Nearside	71%	21	53%	22	57%	23
10. Eastern Circulatory Carriageway Offside	89%	30	74%	31	77%	33
11. R108 (South) Nearside	47%	9	45%	10	48%	11
12. R108 (South) Offside	4%	1	0%	0	0%	0
13. R108 (South) Free flow Left Turn	33%	0	35%	0	41%	0
14. Southern Circulatory Carriageway Nearside	7%	2	11%	2	10%	2
15. Southern Circulatory Carriageway Centre	54%	12	67%	15	68%	16
16. Southern Circulatory Carriageway Offside	0%	0	0%	0	0%	0
17. M50 Off-slip (West) Nearside	87%	20	118%	83	131%	131
18. M50 Off-slip (West) Offside	86%	20	115%	78	127%	127
19. M50 Off-slip (West) Free flow Left Turn	82%	7	84%	9	87%	11
20. Western Circulatory Carriageway Nearside	63%	9	58%	11	61%	11
21. Western Circulatory Carriageway Offside	3%	0	0%	0	0%	0

Table 6.7 indicates that the Ballymun Interchange remains just under capacity in the AM DS peak in 2023 but is forecast to operate over capacity in the AM DS peak from 2028, with substantial queueing occurring on the M50 off-slip in the future years. The southern circulatory carriageway offside lane remains underutilised in the DS scenario.

Table 6.8. Ballymun Interchange – DS – PM LinSig Summary

Scenario	2023 PM DS		2028 PM DS		2038 PM DS	
PRC	-11.4%		-12.8%		-13.2%	
Cycle Time	119		120		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Ahead Nearside	31%	6	31%	6	30%	6
2. R108 (North) Ahead Offside	66%	17	67%	18	67%	18
3. Left turn slip to M1 Interchange	12%	0	12%	0	12%	0
4. Northern Circulatory Carriageway Nearside	47%	16	54%	18	74%	23
5. Northern Circulatory Carriageway Centre	92%	36	94%	38	98%	41
6. Northern Circulatory Carriageway Offside	27%	1	29%	1	36%	1
7. M50 Off-Slip (East)	12%	2	13%	2	15%	3
8. M50 Off-slip – Free flow Left Turn (East)	14%	0	14%	0	14%	0
9. Eastern Circulatory Carriageway Nearside	96%	35	97%	37	93%	35
10. Eastern Circulatory Carriageway Offside	100%	44	102%	50	102%	56
11. R108 (South) Nearside	74%	19	77%	21	82%	25
12. R108 (South) Offside	46%	10	42%	9	30%	6
13. R108 (South) Free flow Left Turn	60%	1	63%	1	70%	1
14. Southern Circulatory Carriageway Nearside	5%	2	5%	2	7%	2
15. Southern Circulatory Carriageway Centre	63%	22	67%	23	78%	26
16. Southern Circulatory Carriageway Offside	0%	0	0%	0	0%	0
17. M50 Off-slip (West) Nearside	56%	13	60%	15	69%	17
18. M50 Off-slip (West) Offside	26%	6	28%	6	36%	8
19. M50 Off-slip (West) Free flow Left Turn	49%	1	50%	1	52%	1
20. Western Circulatory Carriageway Nearside	83%	10	85%	11	89%	13
21. Western Circulatory Carriageway Offside	44%	3	40%	2	29%	2

Table 6.8 shows that the Ballymun Interchange is forecast to operate over capacity in all PM DS periods tested. Queueing is noted on both the northern and eastern circulatory carriageways. Again, the southern circulatory carriageway offside lane is underutilised.

In summary, the results indicate that the junction would exceed its capacity in the 2023 PM DM scenario. The additional traffic in the future years further decreases the performance of the junction and by 2028, the junction is over capacity in the AM DM scenario also.

6.4.1.1 Proposed Upgraded Junction

There are currently no proposals for upgrading the existing M50 Ballymun Interchange.

6.4.2 R108/Old Airport Rd Junction

The existing junction layout was tested with the 2023, 2028 and 2038 DS flows. Results are presented in Table 6.9 and Table 6.10. The individual scenarios have been optimised to the associated traffic flows to present the best possible results, hence the differing cycle times.

Table 6.9. R108/Old Airport Road – Existing Junction Layout – DS – AM - LinSig Summary

Scenario	2023 AM DS		2028 AM DS		2038 AM DS	
PRC	31.4%		23.7%		10.2%	
Cycle Time	120		120		120	
Location	DoS %	MMQ	DoS %	MMQ	DoS %	MMQ
1. R108 (North) Right Turn	0%	0	0%	0	0%	0
2. R108 (North) Ahead	34%	5	50%	7	80%	13
3. R108 (North) Left Turn Give-way	55%	3	58%	3	63%	4
4. Old Airport Road Right Turn	57%	6	60%	7	65%	10
5. Old Airport Road Ahead	57%	6	60%	7	65%	10
6. Old Airport Road Left Turn	69%	7	73%	7	82%	9
7. R108 (South) Right Turn	68%	12	72%	12	79%	14
8. R108 (South) Ahead and Left	68%	15	72%	16	78%	18
9. Horizon Log Park Right Turn	25%	1	23%	1	21%	1
10. Horizon Log Park Ahead and Left	5%	0	6%	0	7%	0

Table 6.9 indicates that the existing R108/Old Airport Road junction is forecast to operate within capacity in all future AM DS scenarios tested.

Table 6.10. R108/Old Airport Road – Existing Junction Layout – DS – PM - LinSig Summary

Scenario	2023 PM DS		2028 PM DS		2038 PM DS	
PRC	-38.9%		-40.3%		-53.1%	
Cycle Time	120		120		120	
Location	DoS %	MMQ	DoS %	MMQ	DoS %	MMQ
1. R108 (North) Right Turn	0%	0	0%	0	0%	0
2. R108 (North) Ahead	55%	12	123%	61	138%	82
3. R108 (North) Left Turn Give-way	47%	2	48%	2	50%	2
4. Old Airport Road Right Turn	74%	11	38%	7	44%	8
5. Old Airport Road Ahead	74%	11	38%	7	44%	8
6. Old Airport Road Left Turn	124%	78	126%	87	138%	118
7. R108 (South) Right Turn	125%	44	122%	42	130%	54
8. R108 (South) Ahead and Left	41%	8	76%	11	78%	11
9. Horizon Log Park Right Turn	68%	5	102%	11	51%	5
10. Horizon Log Park Ahead and Left	0%	0	0%	0	0%	0

It can be seen from Table 6.10 that the existing R108/Old Airport Road junction is forecast to operate over capacity in all future PM DS periods, with substantial queueing forecast on the Old Airport Road Left Turn in the future year scenarios and queue lengths increased when compared with the DM.

In summary, the results indicate that whilst the existing junction would operate within capacity in each of the future AM DM and DS scenarios tested, the junction would exceed its capacity in all of the PM DM and DS scenarios, with some sizeable queues forming.

6.4.2.1 Upgraded Junction Layout

As a potential mitigation measure to the capacity issues identified above, a high-level upgraded junction layout for the R108/Old Airport Road junction was tested in LinSig.

This upgrade consists of widening of the approaches from the R108 south and Old Airport Road to provide approx. 50m of two and three-lane approaches, respectively

Table 6.11. R108/Old Airport Road – Proposed Mitigation Junction Layout – DS – AM - LinSig Summary

Scenario	2023 AM DS		2028 AM DS		2038 AM DS	
PRC	46.3%		34.2%		15.7%	
Cycle Time	120		120		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Right Turn	0%	0	0%	0	0%	0
2. R108 (North) Ahead	61%	6	64%	8	77%	13
3. R108 (North) Left Turn Give-way	55%	3	58%	3	63%	4
4. Old Airport Road Right Turn	31%	5	33%	5	38%	6
5. Old Airport Road Ahead	62%	6	67%	8	78%	12
6. Old Airport Road Left Turn	62%	6	67%	8	78%	12
7. R108 (South) Right Turn	54%	10	62%	11	77%	13
8. R108 (South) Ahead	60%	9	66%	9	72%	9
9. R108 (South) Left	60%	9	66%	9	72%	9
10. Horizon Log Park Right Turn	25%	1	23%	1	21%	1
11. Horizon Log Park Ahead and Left	5%	0	6%	0	7%	0

Table 6.11 indicates that the R108/Old Airport Road updated junction is forecast to operate within capacity in all future AM DS scenarios tested.

Table 6.12. R108/Old Airport Road – Proposed Mitigation Junction Layout – DS – PM - LinSig Summary

Scenario	2023 PM DS		2028 PM DS		2038 PM DS	
PRC	23.3%		19.0%		10.4%	
Cycle Time	120		120		120	
Location	**DoS %**	**MMQ**	**DoS %**	**MMQ**	**DoS %**	**MMQ**
1. R108 (North) Right Turn	0%	0	0%	0	0%	0
2. R108 (North) Ahead	73%	14	76%	15	82%	16
3. R108 (North) Left Turn Give-way	48%	2	49%	2	51%	2
4. Old Airport Road Right Turn	64%	10	61%	10	60%	10
5. Old Airport Road Ahead	73%	11	75%	13	81%	16
6. Old Airport Road Left Turn	73%	11	75%	13	81%	16
7. R108 (South) Right Turn	72%	10	75%	11	80%	12
8. R108 (South) Ahead and Left	64%	8	61%	8	53%	6
9. Horizon Log Park Right Turn	64%	8	61%	8	53%	6
10. Horizon Log Park Ahead and Left	68%	5	74%	6	75%	6

Table 6.12 indicates that with the proposed improvements, the R108/Old Airport Road junction is forecast to operate within capacity in all future PM DS scenarios tested. It can also be seen that the previously seen queues on the Old Airport Road and R108 (south) approaches are greatly reduced with the upgraded junction layout.

In summary, the results indicate that with the proposed mitigation measures, the junction would continue to operate within capacity in all future year DS scenarios tested.

6.5 Junction Capacity analysis conclusion

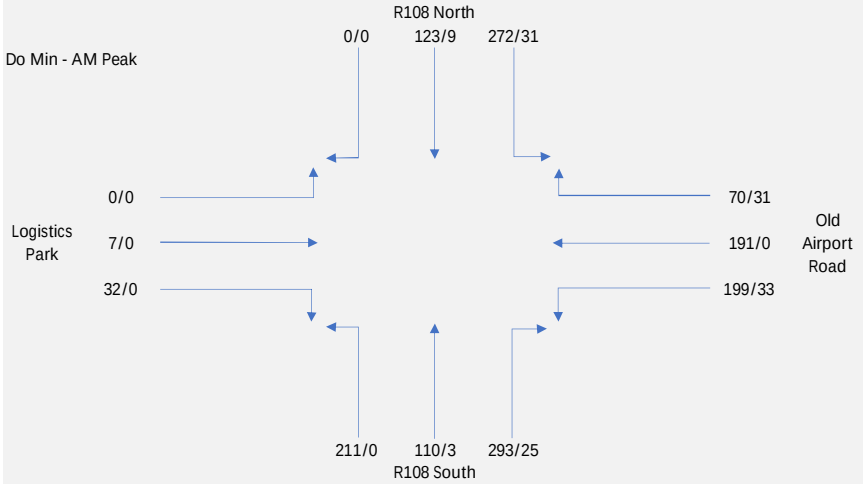
- Both junctions are already operating over capacity in the base 2019 scenario, the M50 Ballymun Interchange in the AM peak period and the R108/Old Airport Road Junction in the PM peak period.
- The DS flows have little impact on the M50 Ballymun Interchange when compared with the DM flows. Whereas, for the R108/Old Airport Rd junction, the DS flows have a negative impact on the junction due to the extra trips generated by the staff car park present in the DS scenario. This results in a greater degree of saturation and longer queue lengths.
- The proposed updates to the R108/Old Airport Rd junction improve the throughput of the junction and demonstrate that the junction would operate within the capacity for all scenarios.

Appendix A – Junction Turning Flows Used in Assessment

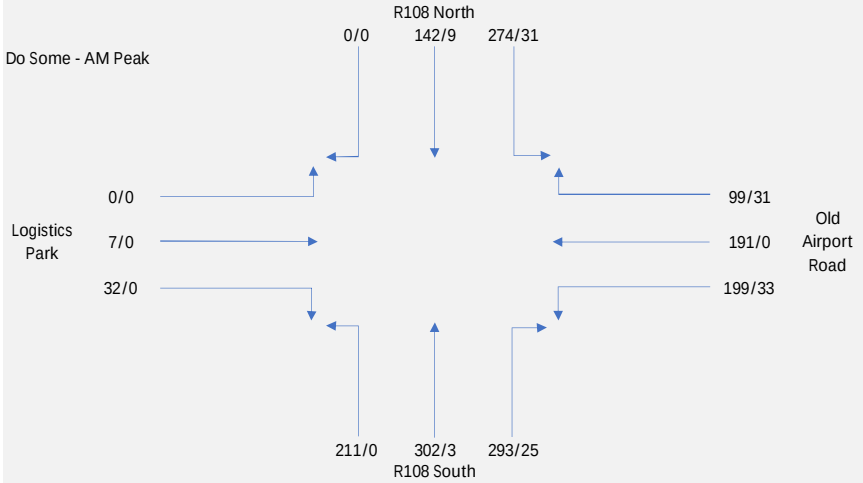
2023

R108/Old Airport Road Junction

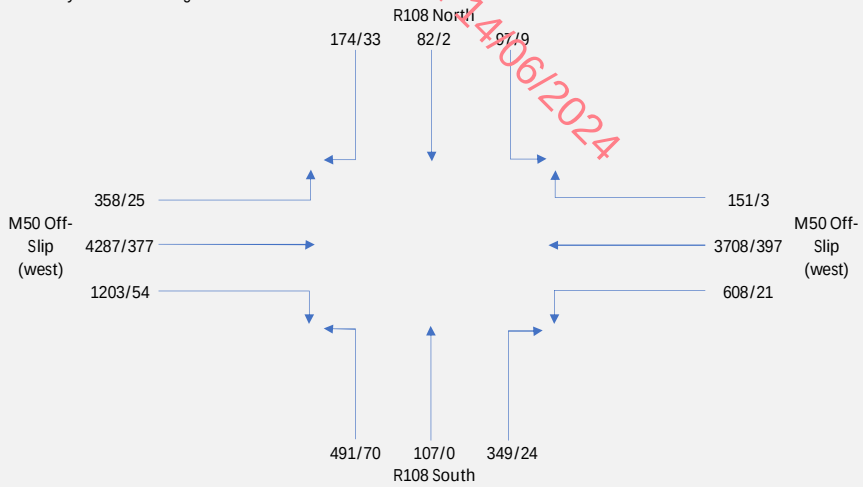
Do Min - AM Peak

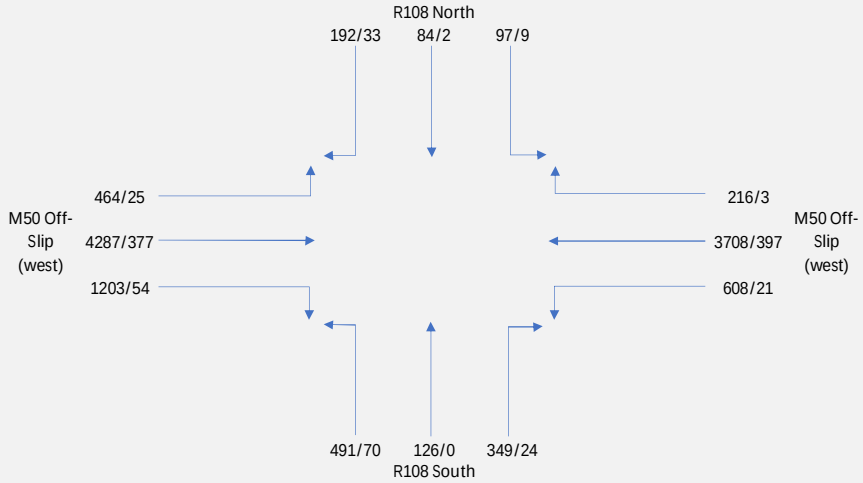


Do Some - AM Peak



M50 Ballymun Interchange

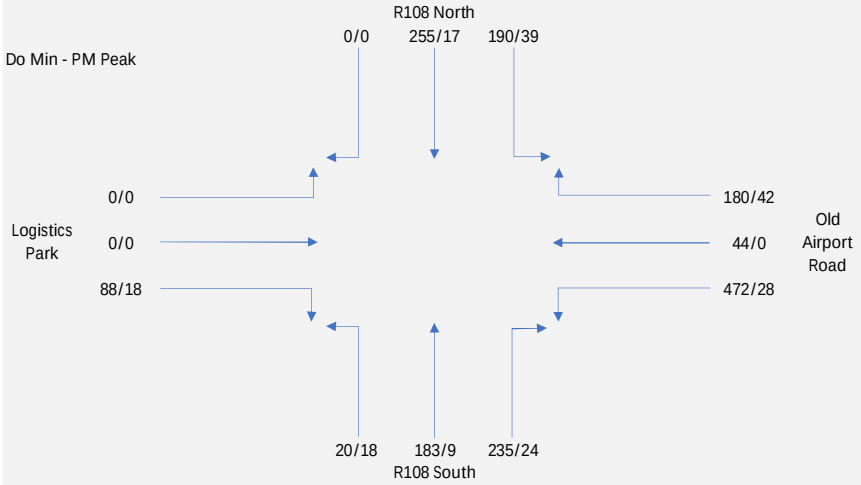




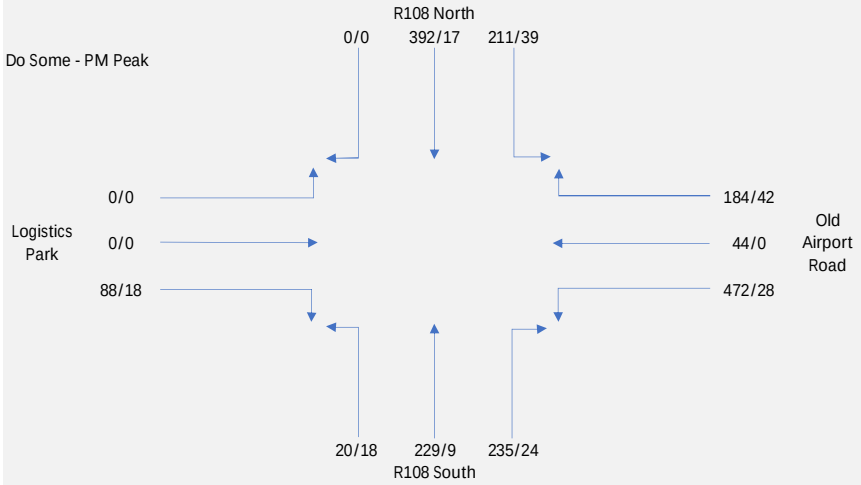
*Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format**

R108/Old Airport Road Junction

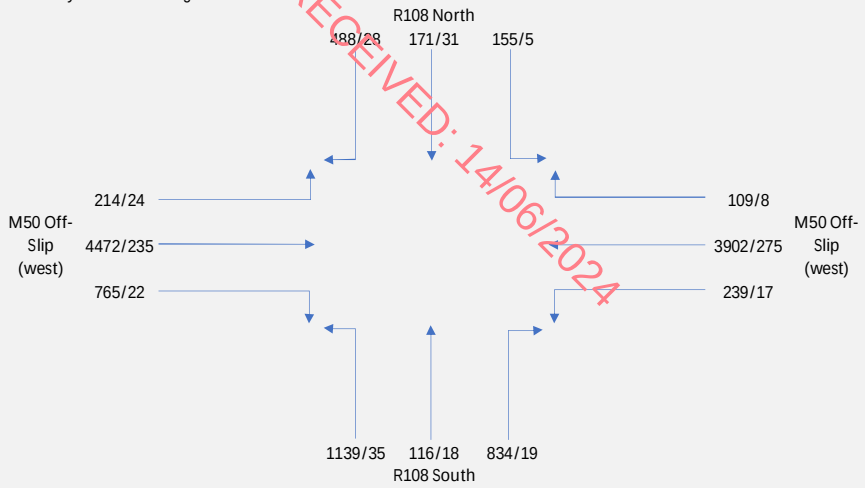
Do Min - PM Peak

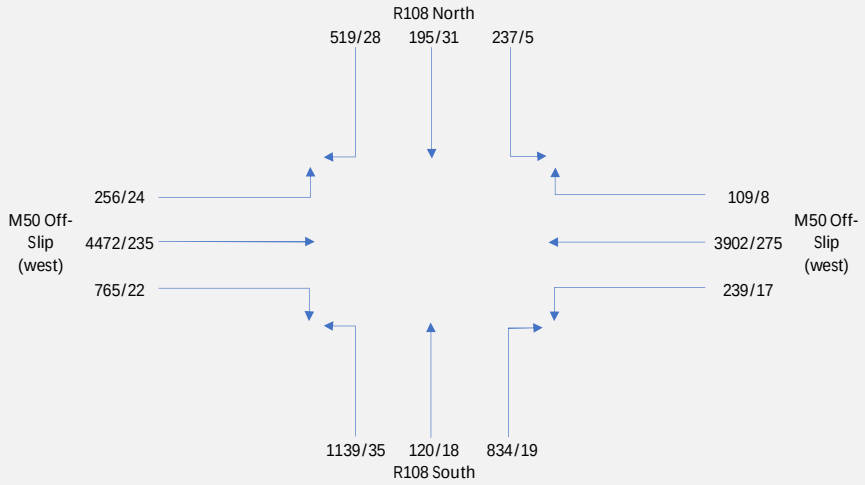


Do Some - PM Peak



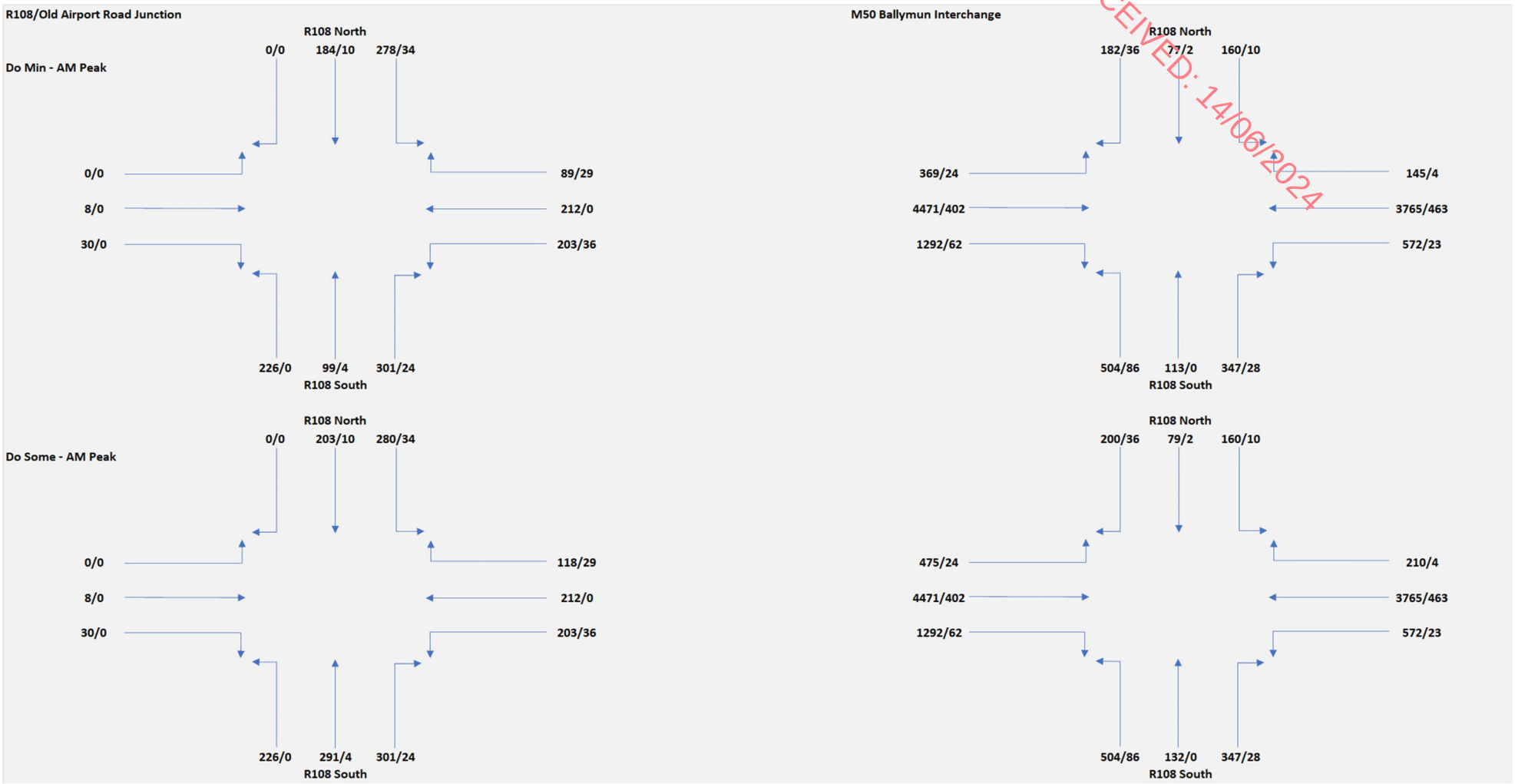
M50 Ballymun Interchange



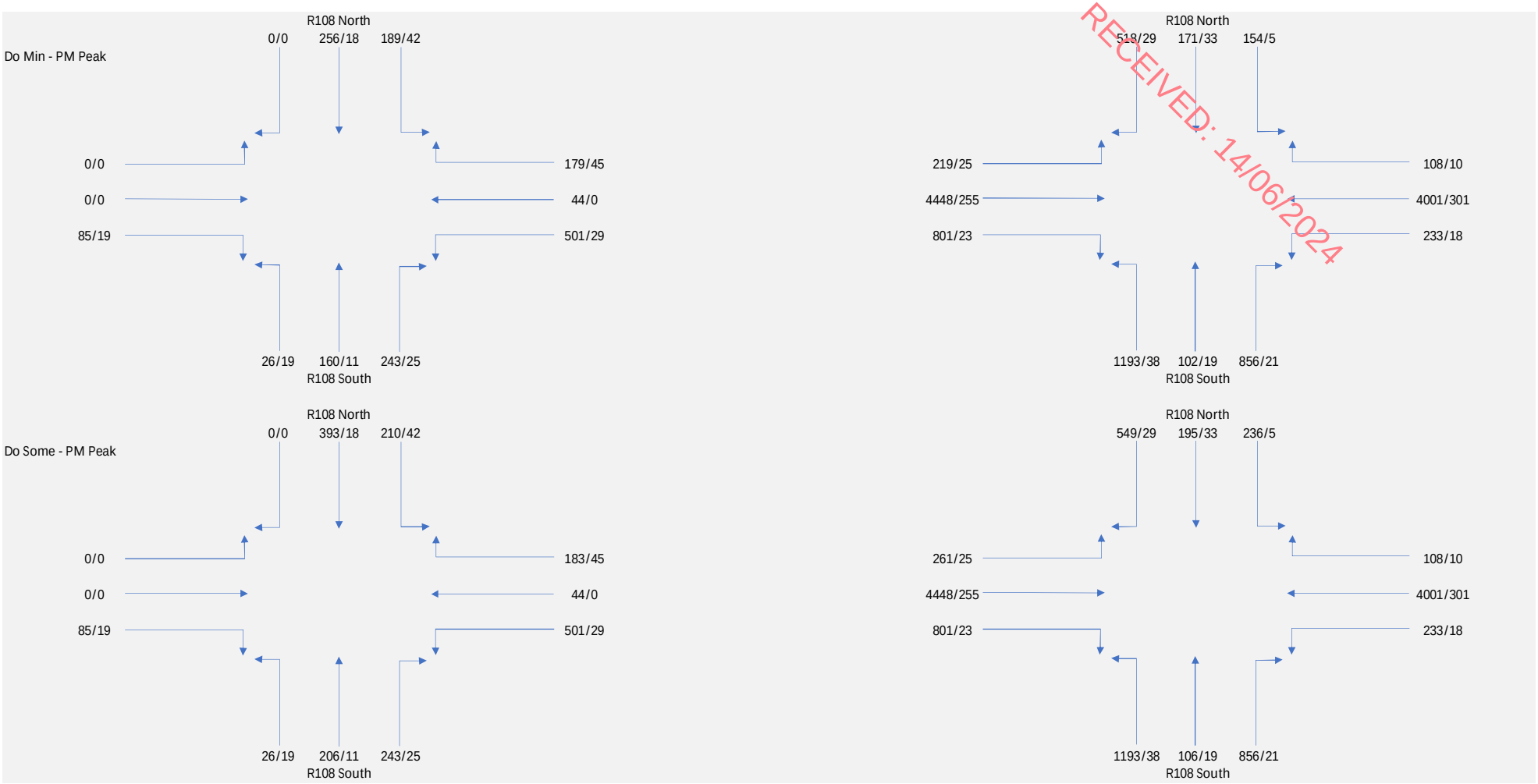


**Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format*

2028



**Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format*

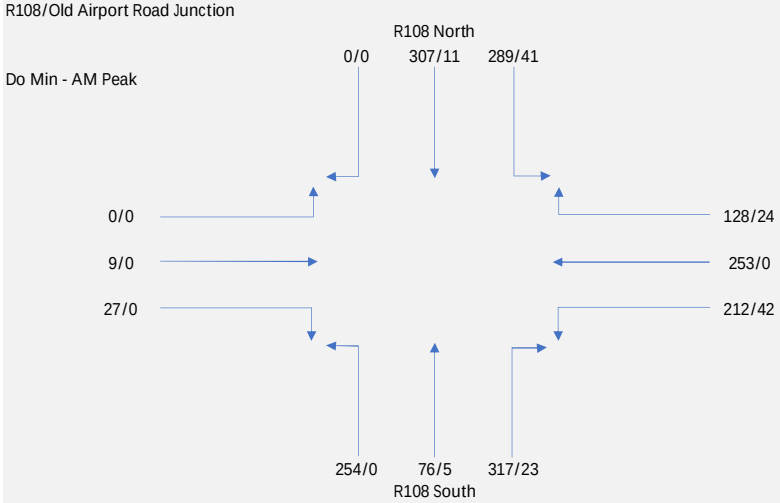


**Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format*

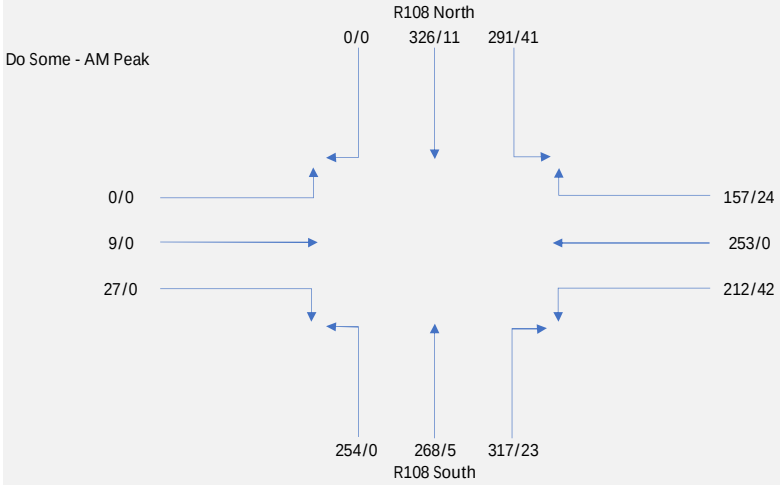
2038

R108/Old Airport Road Junction

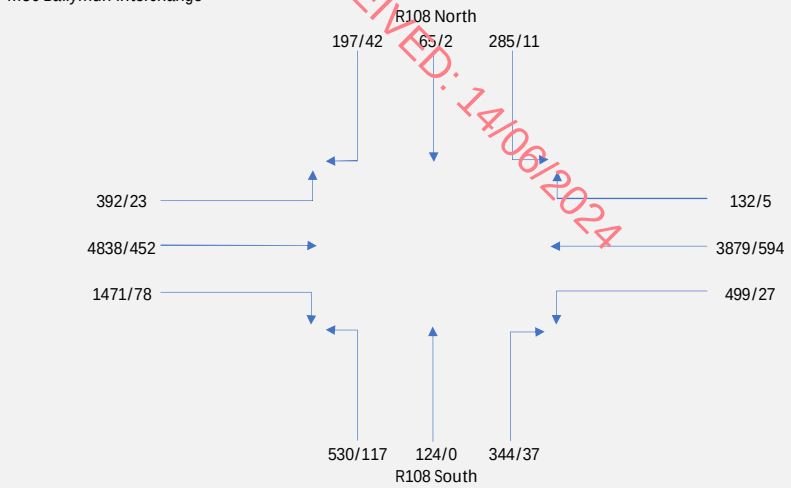
Do Min - AM Peak

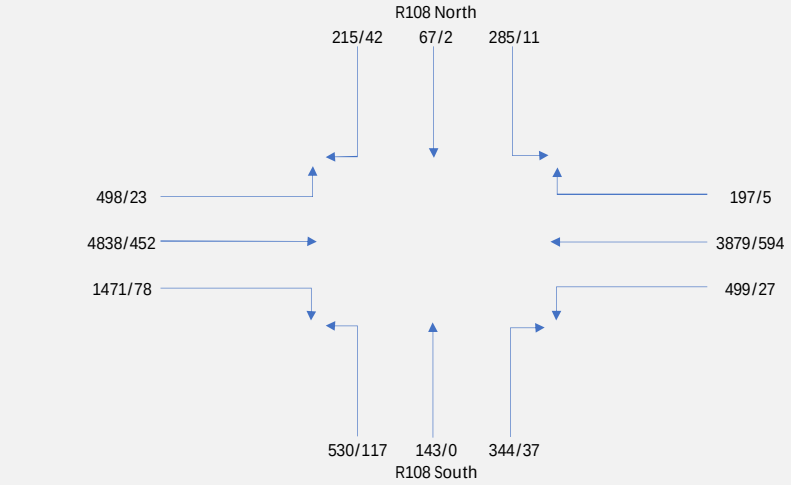


Do Some - AM Peak

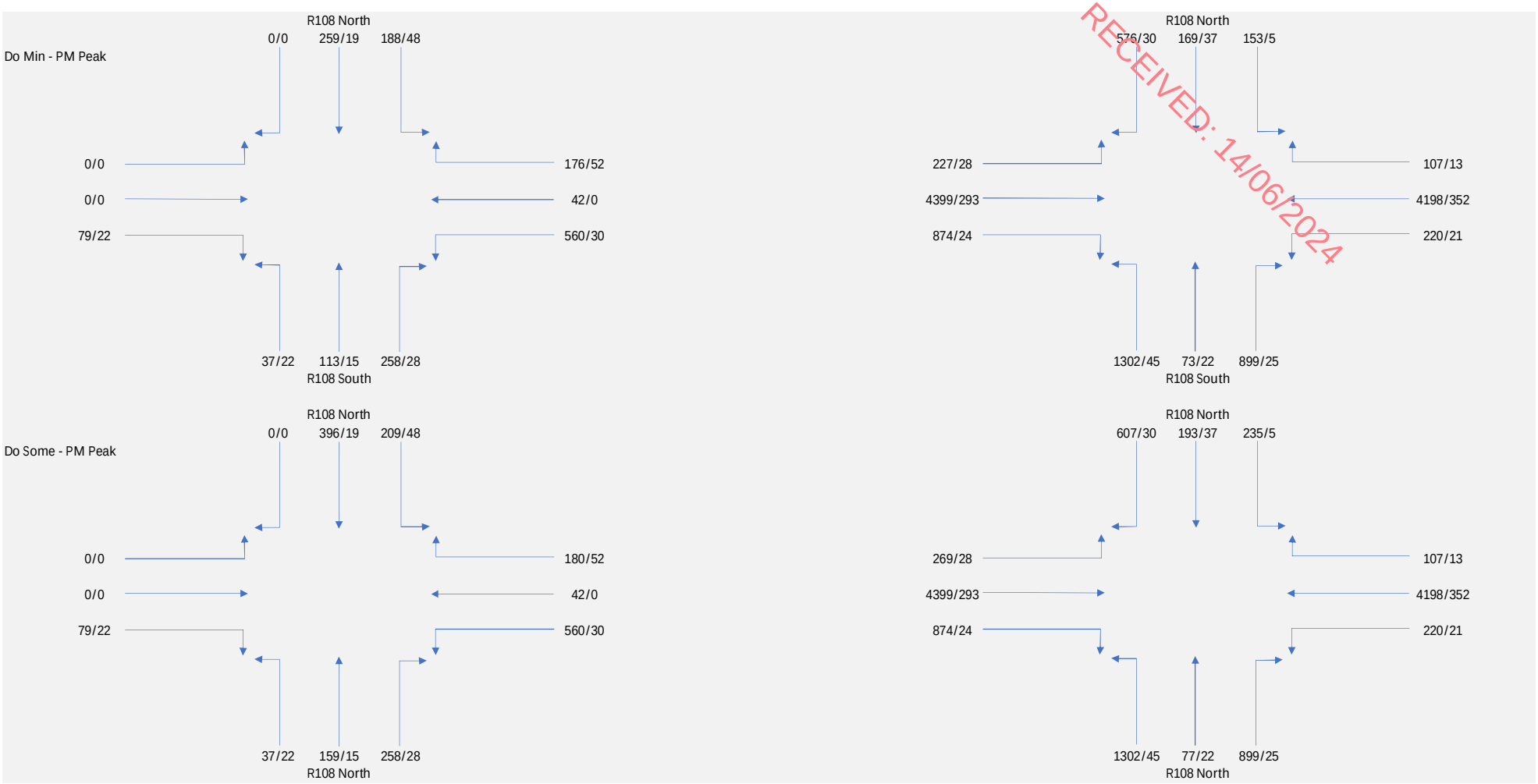


M50 Ballymun Interchange





**Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format*



**Traffic numbers provided are in Light Vehicle / Heavy Vehicle Format*

Appendix B – LinSig Output Reports

M50 Ballymun Interchange

Basic Results Summary

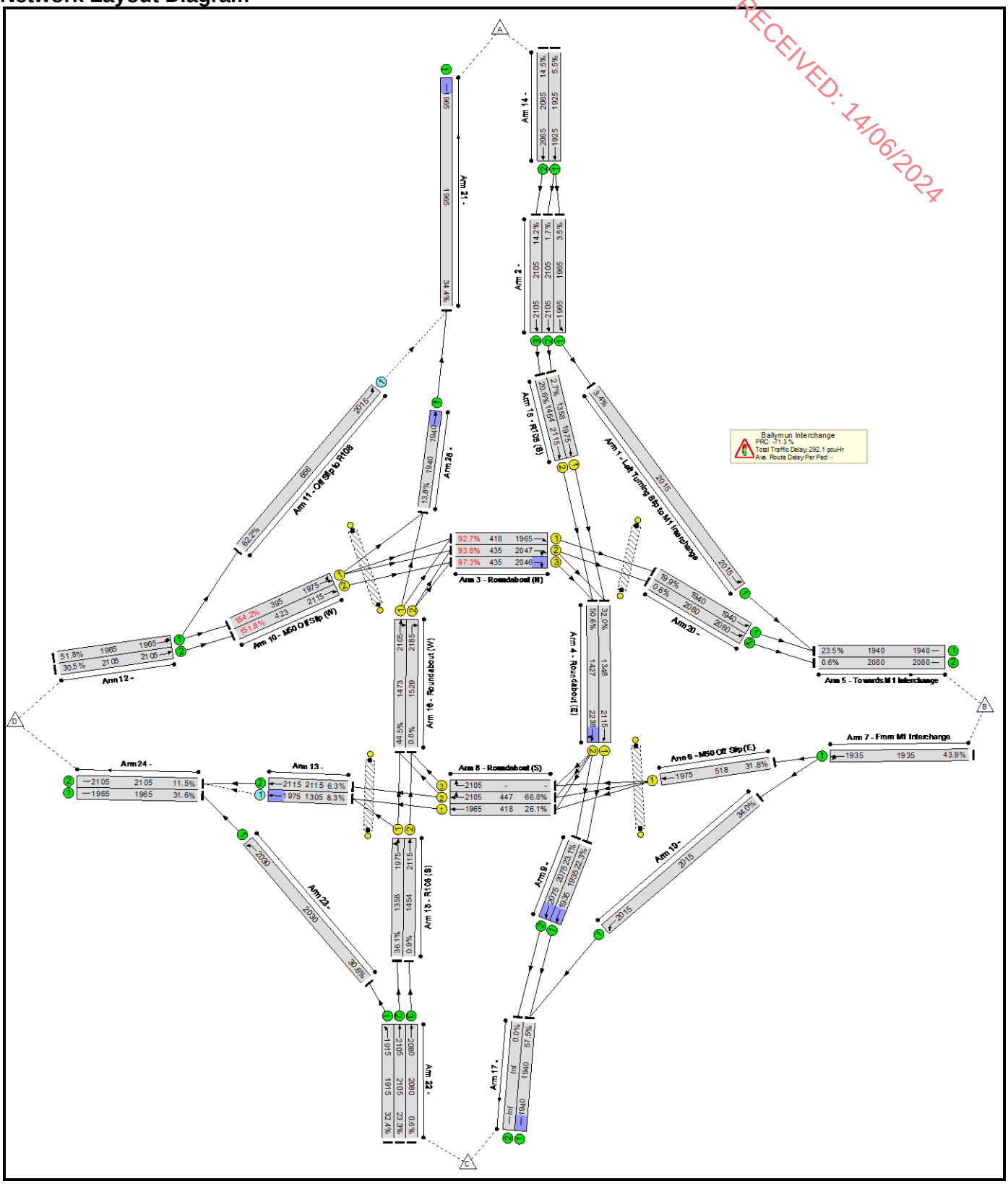
User and Project Details

Project:	**Dublin Airport Masterplan**
Title:	**Airport Roundabout**
Location:	
Additional detail:	
File name:	2. Ballymun Interchange_Base_DM_DS LAYOUTS.lsg3x
Author:	
Company:	AECOM
Address:	

Basic Results Summary

Scenario 1: '2019 Base AM - SCATS average' (FG1: '2019 Base AM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**154.2%**	**517**	**0**	**0**	**292.1**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**154.2%**	**517**	**0**	**0**	**292.1**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	69	2015	2015	3.4%	-	-	-	0.0	0.9	0.0
2/1	Ahead	U	-		-	-	-	69	1965	1965	3.5%	-	-	-	0.0	0.9	0.0
2/2	Ahead	U	-		-	-	-	36	2105	2105	1.7%	-	-	-	0.0	0.9	0.0
2/3	Ahead	U	-		-	-	-	299	2105	2105	14.2%	-	-	-	0.1	1.0	0.1
3/1	Roundabout (N) Ahead	U	B		1	16	-	387	1965	418	92.7%	-	-	-	8.9	82.7	13.4
3/2	Roundabout (N) Right Ahead	U	B		1	16	-	622	2047	435	93.8%	-	-	-	9.0	79.2	10.6
3/3	Roundabout (N) Right	U	B		1	16	-	642	2046	435	97.3%	-	-	-	11.5	97.7	13.0
4/1	Roundabout (E) Ahead	U	D		1	50	-	645	2115	1348	32.0%	-	-	-	0.8	6.6	8.7
4/2	Roundabout (E) Right Ahead	U	D		1	50	-	941	2238	1427	50.6%	-	-	-	1.8	8.9	13.3
5/1	Towards M1 Interchange	U	-		-	-	-	456	1940	1940	23.5%	-	-	-	0.2	1.2	0.2
5/2	Towards M1 Interchange	U	-		-	-	-	13	2080	2080	0.6%	-	-	-	0.0	0.9	0.0
6/1	M50 Off Slip (E) Ahead	U	C		1	20	-	165	1975	518	31.8%	-	-	-	1.3	28.8	3.2
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	850	1935	1935	43.9%	-	-	-	0.4	1.7	0.4
8/1	Roundabout (S) Ahead	U	H		1	16	-	109	1965	418	26.1%	-	-	-	1.1	37.7	2.6

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	16	-	299	2105	447	66.8%	-	-	-	2.6	31.0	7.0
8/3	Roundabout (S) Right	U	H		1	16	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	645	1935	1935	22.3%	-	-	-	0.1	1.3	0.3
9/2	Ahead	U	-		-	-	-	698	2075	2075	23.1%	-	-	-	0.2	1.2	0.2
10/1	M50 Off Slip (W) Ahead Left	U	F		1	15	-	609	1975	395	154.2%	-	-	-	122.2	722.2	126.7
10/2	M50 Off Slip (W) Ahead	U	F		1	15	-	642	2115	423	151.8%	-	-	-	125.2	702.1	130.1
11/1	Off Slip to R108 Ahead	O	-		-	-	-	408	2015	656	62.2%	408	0	0	0.8	7.2	1.4
12/1	Ahead Ahead2	U	-		-	-	-	1017	1965	1965	51.8%	-	-	-	0.5	1.9	0.5
12/2	Ahead	U	-		-	-	-	642	2105	2105	30.5%	-	-	-	0.2	1.2	0.2
13/1	Ahead	O	-		-	-	-	109	1975	1305	8.3%	109	0	0	0.2	5.0	1.5
13/2	Ahead	U	-		-	-	-	134	2115	2115	6.3%	-	-	-	0.0	0.9	0.0
14/1	Ahead	U	-		-	-	-	105	1925	1925	5.5%	-	-	-	0.0	1.0	0.0
14/2	Ahead	U	-		-	-	-	299	2065	2065	14.5%	-	-	-	0.1	1.0	0.1
15/1	R108 (S) Left Ahead	U	G		1	54	-	490	1975	1358	36.1%	-	-	-	1.0	7.3	4.8
15/2	R108 (S) Ahead	U	G		1	54	-	13	2115	1454	0.9%	-	-	-	0.0	5.3	0.1
16/1	Roundabout (W) Right Ahead	U	E		1	55	-	655	2105	1473	44.5%	-	-	-	1.0	5.6	5.4
16/2	Roundabout (W) Right	U	E		1	55	-	13	2185	1529	0.8%	-	-	-	0.0	4.5	0.1
17/1		U	-		-	-	-	1330	1940	1940	57.5%	-	-	-	0.7	2.3	1.0
18/1	R108 (S) Ahead	U	A		1	54	-	36	1975	1358	2.7%	-	-	-	0.1	5.4	0.3
18/2	R108 (S) Ahead	U	A		1	54	-	299	2115	1454	20.6%	-	-	-	0.5	6.1	2.5
19/1	Ahead	U	-		-	-	-	685	2015	2015	34.0%	-	-	-	0.3	1.4	0.3
20/1	Ahead	U	-		-	-	-	387	1940	1940	19.9%	-	-	-	0.1	1.2	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	13	2080	2080	0.6%	-	-	-	0.0	0.9	0.0
21/1		U	-		-	-	-	676	1965	1965	34.4%	-	-	-	0.3	1.4	0.3
22/1	Ahead	U	-		-	-	-	621	1915	1915	32.4%	-	-	-	0.2	1.4	0.2
22/2	Ahead	U	-		-	-	-	490	2105	2105	23.3%	-	-	-	0.2	1.1	0.2
22/3	Ahead	U	-		-	-	-	13	2080	2080	0.6%	-	-	-	0.0	0.9	0.0
23/1	Left	U	-		-	-	-	621	2030	2030	30.6%	-	-	-	0.2	1.3	0.2
24/1		U	-		-	-	-	621	1965	1965	31.6%	-	-	-	0.2	1.3	0.2
24/2		U	-		-	-	-	243	2105	2105	11.5%	-	-	-	0.1	1.0	0.1
25/1	Ahead	U	-		-	-	-	268	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	44	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	43	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -71.3
PRC Over All Lanes (%): -71.3

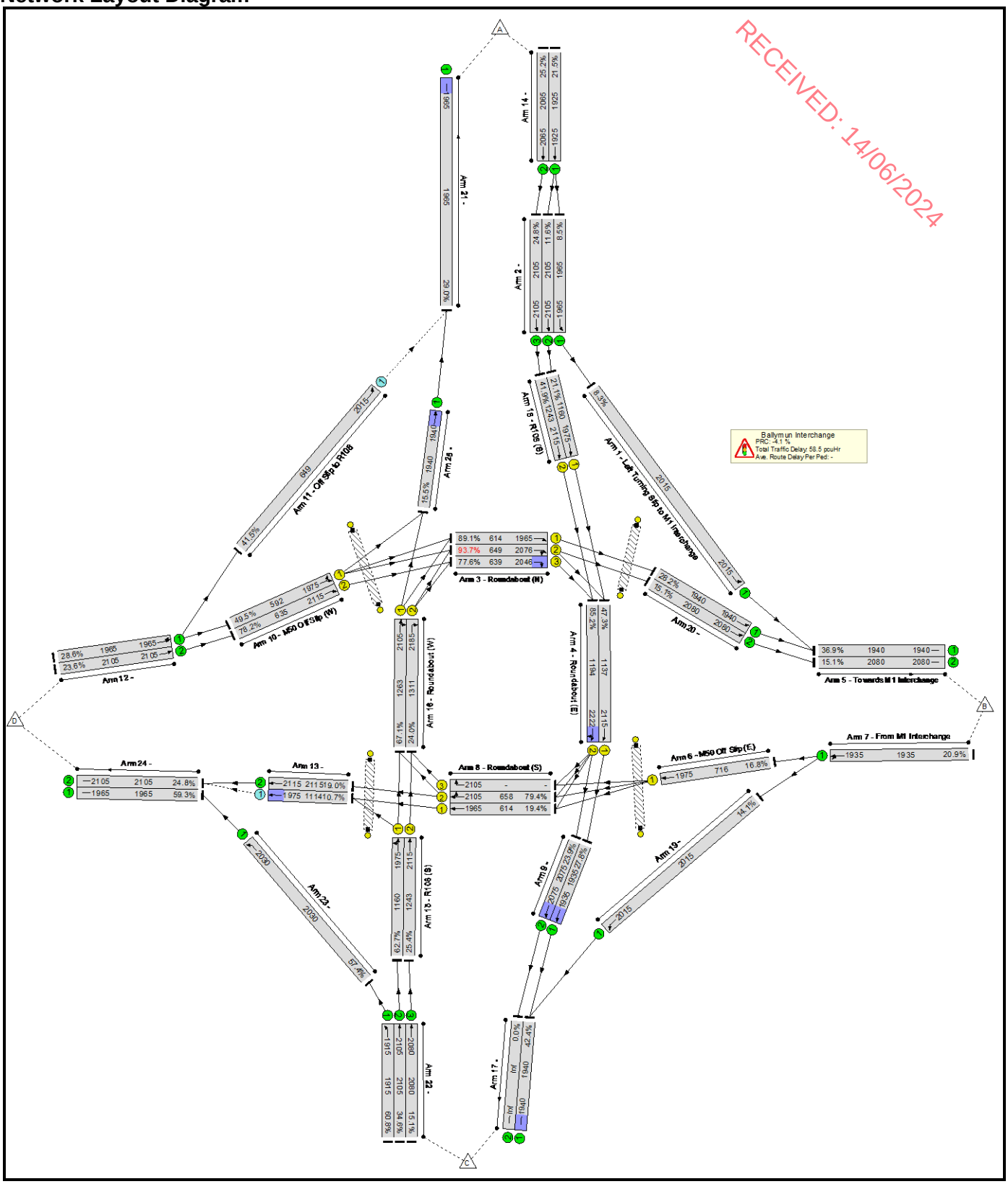
Total Delay for Signalled Lanes (pcuHr): 286.94
Total Delay Over All Lanes(pcuHr): 292.13

Cycle Time (s): 80

Basic Results Summary

Scenario 2: '2019 Base PM - SCATS average' (FG2: '2019 Base PM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**93.7%**	**388**	**0**	**0**	**58.5**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**93.7%**	**388**	**0**	**0**	**58.5**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	168	2015	2015	8.3%	-	-	-	0.0	1.0	0.0
2/1	Ahead	U	-		-	-	-	168	1965	1965	8.5%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	245	2105	2105	11.6%	-	-	-	0.1	1.0	0.1
2/3	Ahead	U	-		-	-	-	521	2105	2105	24.8%	-	-	-	0.2	1.1	0.2
3/1	Roundabout (N) Ahead	U	B		1	24	-	547	1965	614	89.1%	-	-	-	8.8	58.1	15.8
3/2	Roundabout (N) Right Ahead	U	B		1	24	-	608	2076	649	93.7%	-	-	-	9.1	53.7	19.1
3/3	Roundabout (N) Right	U	B		1	24	-	496	2046	639	77.6%	-	-	-	2.9	21.0	3.5
4/1	Roundabout (E) Ahead	U	D		1	42	-	538	2115	1137	47.3%	-	-	-	1.3	8.7	7.7
4/2	Roundabout (E) Right Ahead	U	D		1	42	-	1017	2222	1194	85.2%	-	-	-	6.1	21.5	23.9
5/1	Towards M1 Interchange	U	-		-	-	-	715	1940	1940	36.9%	-	-	-	0.3	1.5	0.3
5/2	Towards M1 Interchange	U	-		-	-	-	315	2080	2080	15.1%	-	-	-	0.1	1.0	0.1
6/1	M50 Off Slip (E) Ahead	U	C		1	28	-	120	1975	716	16.8%	-	-	-	0.7	20.3	1.9
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	405	1935	1935	20.9%	-	-	-	0.1	1.2	0.1
8/1	Roundabout (S) Ahead	U	H		1	24	-	119	1965	614	19.4%	-	-	-	0.9	26.1	2.8

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	24	-	522	2105	658	79.4%	-		-	5.5	37.7	13.3
8/3	Roundabout (S) Right	U	H		1	24	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	538	1935	1935	27.8%	-	-	-	0.2	1.3	0.3
9/2	Ahead	U	-		-	-	-	496	2075	2075	23.9%	-	-	-	0.2	1.2	0.3
10/1	M50 Off Slip (W) Ahead Left	U	F		1	23	-	293	1975	592	49.5%	-	-	-	2.4	29.0	5.8
10/2	M50 Off Slip (W) Ahead	U	F		1	23	-	496	2115	635	78.2%	-	-	-	5.3	38.3	11.8
11/1	Off Slip to R108 Ahead	O	-		-	-	-	269	2015	649	41.5%	269	0	0	0.4	4.7	0.4
12/1	Ahead Ahead2	U	-		-	-	-	562	1965	1965	28.6%	-	-	-	0.2	1.3	0.2
12/2	Ahead	U	-		-	-	-	496	2105	2105	23.6%	-	-	-	0.2	1.1	0.2
13/1	Ahead	O	-		-	-	-	119	1975	1114	10.7%	119	0	0	0.4	13.0	1.8
13/2	Ahead	U	-		-	-	-	402	2115	2115	19.0%	-	-	-	0.1	1.1	0.1
14/1	Ahead	U	-		-	-	-	413	1925	1925	21.5%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	521	2065	2065	25.2%	-	-	-	0.2	1.2	0.2
15/1	R108 (S) Left Ahead	U	G		1	46	-	728	1975	1160	62.7%	-	-	-	3.0	14.9	11.4
15/2	R108 (S) Ahead	U	G		1	46	-	315	2115	1243	25.4%	-	-	-	0.9	9.9	3.5
16/1	Roundabout (W) Right Ahead	U	E		1	47	-	848	2105	1263	67.1%	-	-	-	2.3	9.9	6.6
16/2	Roundabout (W) Right	U	E		1	47	-	315	2185	1311	24.0%	-	-	-	0.6	7.1	1.7
17/1		U	-		-	-	-	823	1940	1940	42.4%	-	-	-	0.4	1.6	0.4
18/1	R108 (S) Ahead	U	A		1	46	-	245	1975	1160	21.1%	-	-	-	0.7	9.7	2.7
18/2	R108 (S) Ahead	U	A		1	46	-	521	2115	1243	41.9%	-	-	-	1.7	11.5	6.6
19/1	Ahead	U	-		-	-	-	285	2015	2015	14.1%	-	-	-	0.1	1.0	0.1
20/1	Ahead	U	-		-	-	-	547	1940	1940	28.2%	-	-	-	0.2	1.3	0.2

Basic Results Summary

20/2	Ahead	U	-		-	-	-	315	2080	2080	15.1%	-	-	-	0.1	1.0	0.1
21/1		U	-		-	-	-	570	1965	1965	29.0%	-	-	-	0.2	1.3	0.2
22/1	Ahead	U	-		-	-	-	1165	1915	1915	60.8%	-	-	-	0.8	2.4	0.8
22/2	Ahead	U	-		-	-	-	728	2105	2105	34.6%	-	-	-	0.3	1.3	0.3
22/3	Ahead	U	-		-	-	-	315	2080	2080	15.1%	-	-	-	0.1	1.0	0.1
23/1	Left	U	-		-	-	-	1165	2030	2030	57.4%	-	-	-	0.7	2.1	0.7
24/1		U	-		-	-	-	1165	1965	1965	59.3%	-	-	-	0.7	2.2	0.7
24/2		U	-		-	-	-	521	2105	2105	24.8%	-	-	-	0.2	1.1	0.2
25/1	Ahead	U	-		-	-	-	301	1940	1940	15.5%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	42	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	36	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	42	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	35	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -4.1
PRC Over All Lanes (%): -4.1

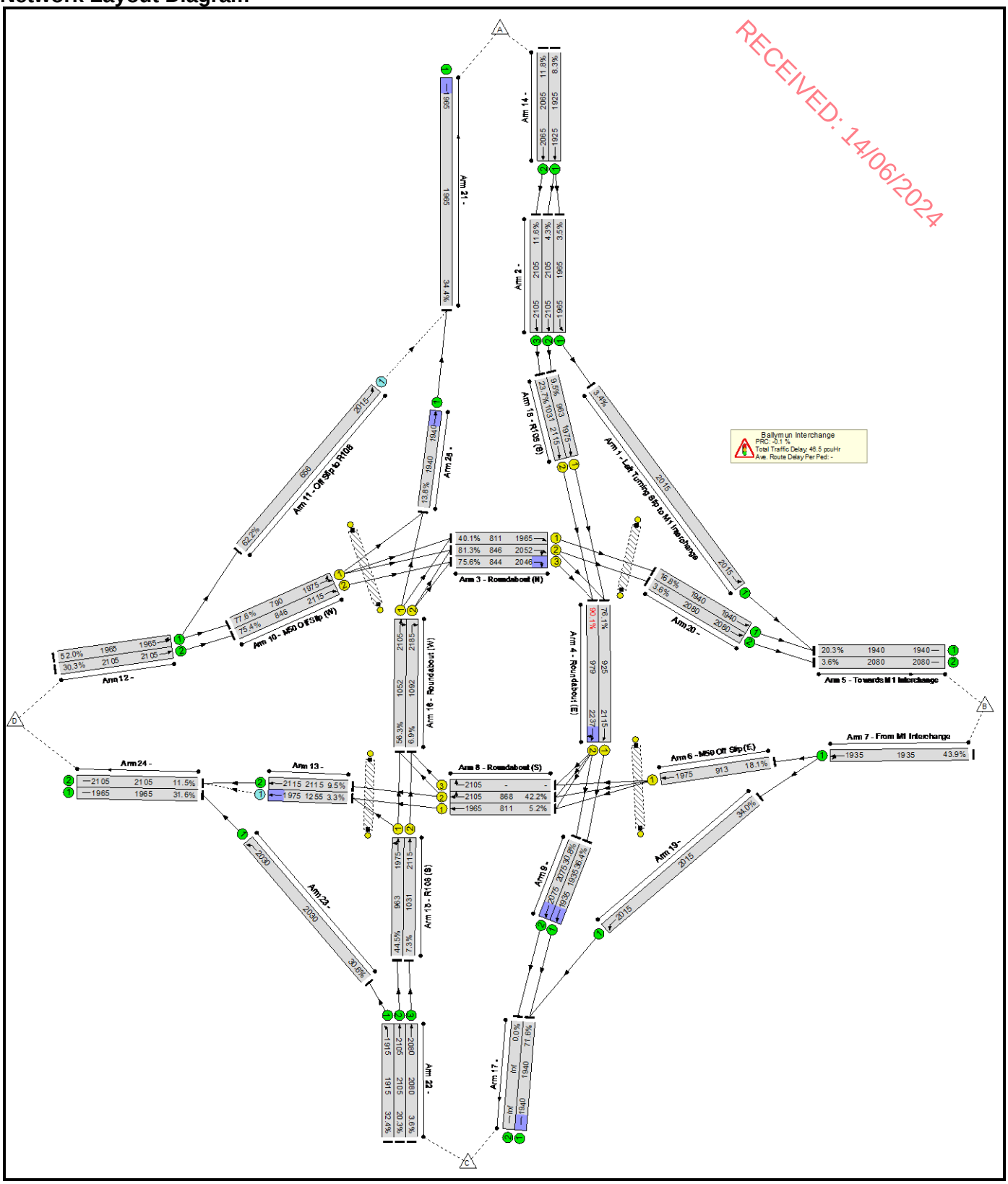
Total Delay for Signalled Lanes (pcuHr): 52.00
Total Delay Over All Lanes(pcuHr): 58.48

Cycle Time (s): 80

Basic Results Summary

Scenario 3: '2019 Base AM - SCATS hourly' (FG1: '2019 Base AM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**90.1%**	**450**	**0**	**0**	**46.5**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**90.1%**	**450**	**0**	**0**	**46.5**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	69	2015	2015	3.4%	-	-	-	0.0	0.9	0.0
2/1	Ahead	U	-		-	-	-	69	1965	1965	3.5%	-	-	-	0.0	0.9	0.0
2/2	Ahead	U	-		-	-	-	91	2105	2105	4.3%	-	-	-	0.0	0.9	0.0
2/3	Ahead	U	-		-	-	-	244	2105	2105	11.6%	-	-	-	0.1	1.0	0.1
3/1	Roundabout (N) Ahead	U	B		1	32	-	325	1965	811	40.1%	-	-	-	2.6	29.2	7.6
3/2	Roundabout (N) Right Ahead	U	B		1	32	-	688	2052	846	81.3%	-	-	-	3.4	17.8	5.3
3/3	Roundabout (N) Right	U	B		1	32	-	638	2046	844	75.6%	-	-	-	2.4	13.5	3.1
4/1	Roundabout (E) Ahead	U	D		1	34	-	704	2115	925	76.1%	-	-	-	4.5	23.2	16.9
4/2	Roundabout (E) Right Ahead	U	D		1	34	-	882	2237	979	90.1%	-	-	-	8.2	33.3	23.5
5/1	Towards M1 Interchange	U	-		-	-	-	394	1940	1940	20.3%	-	-	-	0.1	1.2	0.1
5/2	Towards M1 Interchange	U	-		-	-	-	75	2080	2080	3.6%	-	-	-	0.0	0.9	0.0
6/1	M50 Off Slip (E) Ahead	U	C		1	36	-	165	1975	913	18.1%	-	-	-	0.7	15.0	2.2
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	850	1935	1935	43.9%	-	-	-	0.4	1.7	0.4
8/1	Roundabout (S) Ahead	U	H		1	32	-	42	1965	811	5.2%	-	-	-	0.2	17.0	0.9

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	32	-	366	2105	868	42.2%	-		-	1.7	16.7	7.5
8/3	Roundabout (S) Right	U	H		1	32	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	704	1935	1935	36.4%	-	-	-	0.4	1.9	4.8
9/2	Ahead	U	-		-	-	-	639	2075	2075	30.8%	-	-	-	0.3	1.5	0.6
10/1	M50 Off Slip (W) Ahead Left	U	F		1	31	-	613	1975	790	77.6%	-	-	-	5.3	30.9	13.4
10/2	M50 Off Slip (W) Ahead	U	F		1	31	-	638	2115	846	75.4%	-	-	-	5.2	29.2	13.6
11/1	Off Slip to R108 Ahead	O	-		-	-	-	408	2015	656	62.2%	408	0	0	0.8	7.2	1.5
12/1	Ahead Ahead2	U	-		-	-	-	1021	1965	1965	52.0%	-	-	-	0.5	1.9	0.5
12/2	Ahead	U	-		-	-	-	638	2105	2105	30.3%	-	-	-	0.2	1.2	0.2
13/1	Ahead	O	-		-	-	-	42	1975	1255	3.3%	42	0	0	0.0	2.7	0.2
13/2	Ahead	U	-		-	-	-	201	2115	2115	9.5%	-	-	-	0.1	0.9	0.1
14/1	Ahead	U	-		-	-	-	160	1925	1925	8.3%	-	-	-	0.0	1.0	0.0
14/2	Ahead	U	-		-	-	-	244	2065	2065	11.8%	-	-	-	0.1	1.0	0.1
15/1	R108 (S) Left Ahead	U	G		1	38	-	428	1975	963	44.5%	-	-	-	2.0	16.8	6.6
15/2	R108 (S) Ahead	U	G		1	38	-	75	2115	1031	7.3%	-	-	-	0.3	12.8	0.9
16/1	Roundabout (W) Right Ahead	U	E		1	39	-	593	2105	1052	56.3%	-	-	-	2.1	13.0	6.3
16/2	Roundabout (W) Right	U	E		1	39	-	75	2185	1092	6.9%	-	-	-	0.2	8.8	0.4
17/1		U	-		-	-	-	1389	1940	1940	71.6%	-	-	-	1.8	4.6	17.0
18/1	R108 (S) Ahead	U	A		1	38	-	91	1975	963	9.5%	-	-	-	0.3	13.1	1.1
18/2	R108 (S) Ahead	U	A		1	38	-	244	2115	1031	23.7%	-	-	-	1.0	14.2	3.3
19/1	Ahead	U	-		-	-	-	685	2015	2015	34.0%	-	-	-	0.3	1.4	0.3
20/1	Ahead	U	-		-	-	-	325	1940	1940	16.8%	-	-	-	0.1	1.1	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	75	2080	2080	3.6%	-	-	-	0.0	0.9	0.0
21/1		U	-		-	-	-	676	1965	1965	34.4%	-	-	-	0.3	1.4	0.3
22/1	Ahead	U	-		-	-	-	621	1915	1915	32.4%	-	-	-	0.2	1.4	0.2
22/2	Ahead	U	-		-	-	-	428	2105	2105	20.3%	-	-	-	0.1	1.1	0.1
22/3	Ahead	U	-		-	-	-	75	2080	2080	3.6%	-	-	-	0.0	0.9	0.0
23/1	Left	U	-		-	-	-	621	2030	2030	30.6%	-	-	-	0.2	1.3	0.2
24/1		U	-		-	-	-	621	1965	1965	31.6%	-	-	-	0.2	1.3	0.2
24/2		U	-		-	-	-	243	2105	2105	11.5%	-	-	-	0.1	1.0	0.1
25/1	Ahead	U	-		-	-	-	268	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	34	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	28	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	34	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	27	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -0.1
PRC Over All Lanes (%): -0.1

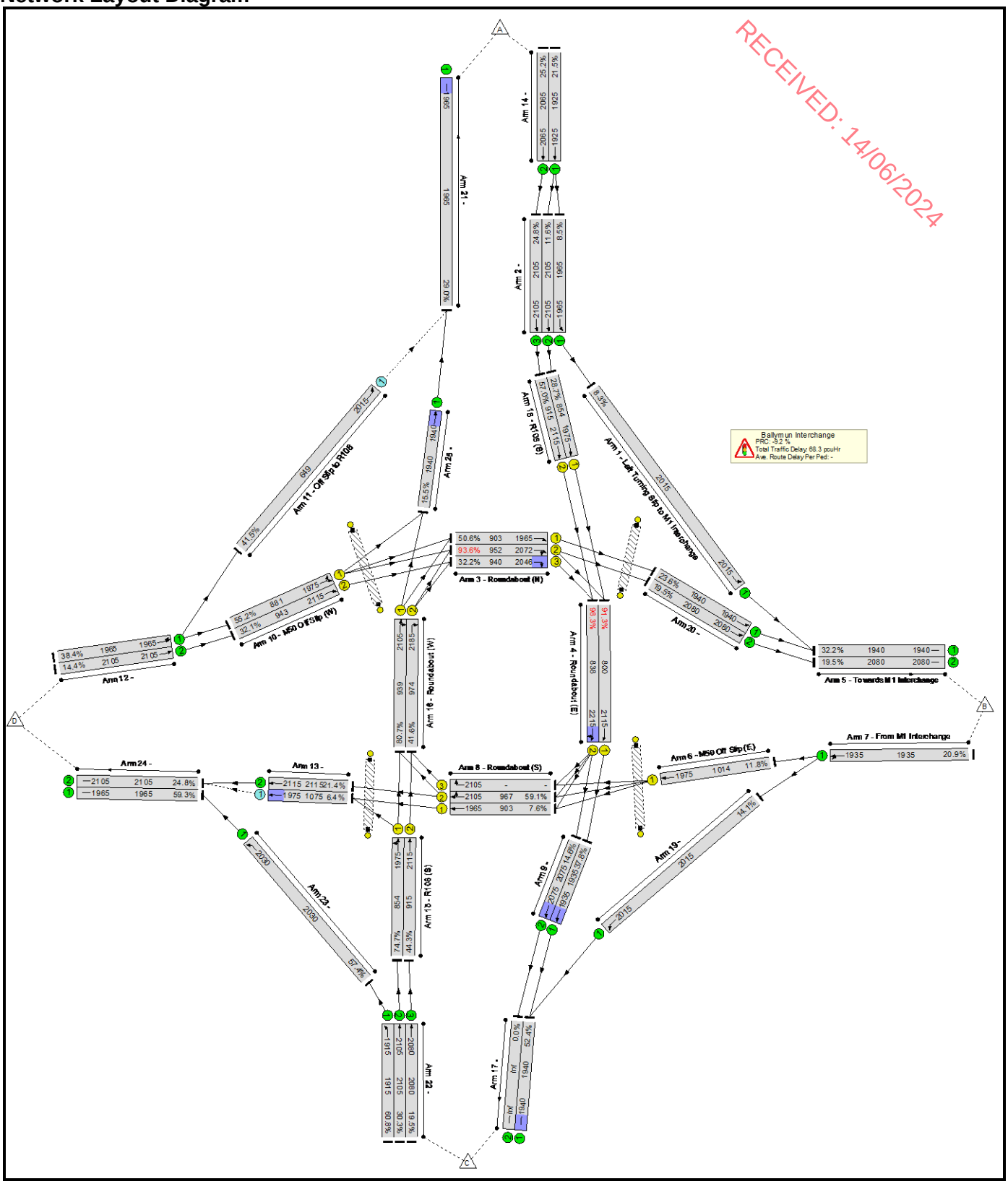
Total Delay for Signalled Lanes (pcuHr): 40.00
Total Delay Over All Lanes(pcuHr): 46.47

Cycle Time (s): 80

Basic Results Summary

Scenario 4: '2019 Base PM - SCATS hourly' (FG2: '2019 Base PM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**98.3%**	**338**	**0**	**0**	**68.3**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**98.3%**	**338**	**0**	**0**	**68.3**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	168	2015	2015	8.3%	-	-	-	0.0	1.0	0.0
2/1	Ahead	U	-		-	-	-	168	1965	1965	8.5%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	245	2105	2105	11.6%	-	-	-	0.1	1.0	0.1
2/3	Ahead	U	-		-	-	-	521	2105	2105	24.8%	-	-	-	0.2	1.1	0.2
3/1	Roundabout (N) Ahead	U	B		1	33	-	457	1965	903	50.6%	-	-	-	3.5	27.8	9.9
3/2	Roundabout (N) Right Ahead	U	B		1	33	-	891	2072	952	93.6%	-	-	-	9.6	38.8	24.0
3/3	Roundabout (N) Right	U	B		1	33	-	303	2046	940	32.2%	-	-	-	0.6	6.8	0.9
4/1	Roundabout (E) Ahead	U	D		1	27	-	731	2115	800	91.3%	-	-	-	7.2	35.2	19.2
4/2	Roundabout (E) Right Ahead	U	D		1	27	-	824	2215	838	98.3%	-	-	-	15.1	66.1	25.2
5/1	Towards M1 Interchange	U	-		-	-	-	625	1940	1940	32.2%	-	-	-	0.2	1.4	0.2
5/2	Towards M1 Interchange	U	-		-	-	-	405	2080	2080	19.5%	-	-	-	0.1	1.1	0.1
6/1	M50 Off Slip (E) Ahead	U	C		1	37	-	120	1975	1014	11.8%	-	-	-	0.4	11.4	1.3
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	405	1935	1935	20.9%	-	-	-	0.1	1.2	0.1
8/1	Roundabout (S) Ahead	U	H		1	33	-	69	1965	903	7.6%	-	-	-	0.3	16.4	1.4

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	33	-	572	2105	967	59.1%	-		-	3.8	23.7	12.0
8/3	Roundabout (S) Right	U	H		1	33	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	731	1935	1935	37.8%	-	-	-	0.4	1.9	4.3
9/2	Ahead	U	-		-	-	-	303	2075	2075	14.6%	-	-	-	0.1	1.0	0.1
10/1	M50 Off Slip (W) Ahead Left	U	F		1	32	-	486	1975	881	55.2%	-	-	-	2.6	19.6	7.9
10/2	M50 Off Slip (W) Ahead	U	F		1	32	-	303	2115	943	32.1%	-	-	-	1.4	16.1	4.2
11/1	Off Slip to R108 Ahead	O	-		-	-	-	269	2015	649	41.5%	269	0	0	0.4	4.7	0.4
12/1	Ahead Ahead2	U	-		-	-	-	755	1965	1965	38.4%	-	-	-	0.3	1.5	0.3
12/2	Ahead	U	-		-	-	-	303	2105	2105	14.4%	-	-	-	0.1	1.0	0.1
13/1	Ahead	O	-		-	-	-	69	1975	1075	6.4%	69	0	0	0.1	7.5	0.6
13/2	Ahead	U	-		-	-	-	452	2115	2115	21.4%	-	-	-	0.1	1.1	0.1
14/1	Ahead	U	-		-	-	-	413	1925	1925	21.5%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	521	2065	2065	25.2%	-	-	-	0.2	1.2	0.2
15/1	R108 (S) Left Ahead	U	G		1	31	-	638	1975	854	74.7%	-	-	-	4.6	25.8	12.4
15/2	R108 (S) Ahead	U	G		1	31	-	405	2115	915	44.3%	-	-	-	2.1	18.3	6.1
16/1	Roundabout (W) Right Ahead	U	E		1	32	-	758	2105	939	80.7%	-	-	-	5.2	24.6	9.7
16/2	Roundabout (W) Right	U	E		1	32	-	405	2185	974	41.6%	-	-	-	1.4	12.8	2.7
17/1		U	-		-	-	-	1016	1940	1940	52.4%	-	-	-	0.6	2.0	0.8
18/1	R108 (S) Ahead	U	A		1	31	-	245	1975	854	28.7%	-	-	-	1.1	16.6	3.4
18/2	R108 (S) Ahead	U	A		1	31	-	521	2115	915	57.0%	-	-	-	2.9	20.4	8.6
19/1	Ahead	U	-		-	-	-	285	2015	2015	14.1%	-	-	-	0.1	1.0	0.1
20/1	Ahead	U	-		-	-	-	457	1940	1940	23.6%	-	-	-	0.2	1.2	0.2

Basic Results Summary

20/2	Ahead	U	-		-	-	-	405	2080	2080	19.5%	-	-	-	0.1	1.1	0.1
21/1		U	-		-	-	-	570	1965	1965	29.0%	-	-	-	0.2	1.3	0.2
22/1	Ahead	U	-		-	-	-	1165	1915	1915	60.8%	-	-	-	0.8	2.4	0.8
22/2	Ahead	U	-		-	-	-	638	2105	2105	30.3%	-	-	-	0.2	1.2	0.2
22/3	Ahead	U	-		-	-	-	405	2080	2080	19.5%	-	-	-	0.1	1.1	0.1
23/1	Left	U	-		-	-	-	1165	2030	2030	57.4%	-	-	-	0.7	2.1	0.7
24/1		U	-		-	-	-	1165	1965	1965	59.3%	-	-	-	0.7	2.2	0.7
24/2		U	-		-	-	-	521	2105	2105	24.8%	-	-	-	0.2	1.1	0.2
25/1	Ahead	U	-		-	-	-	301	1940	1940	15.5%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	27	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	21	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	27	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	20	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -9.2
PRC Over All Lanes (%): -9.2

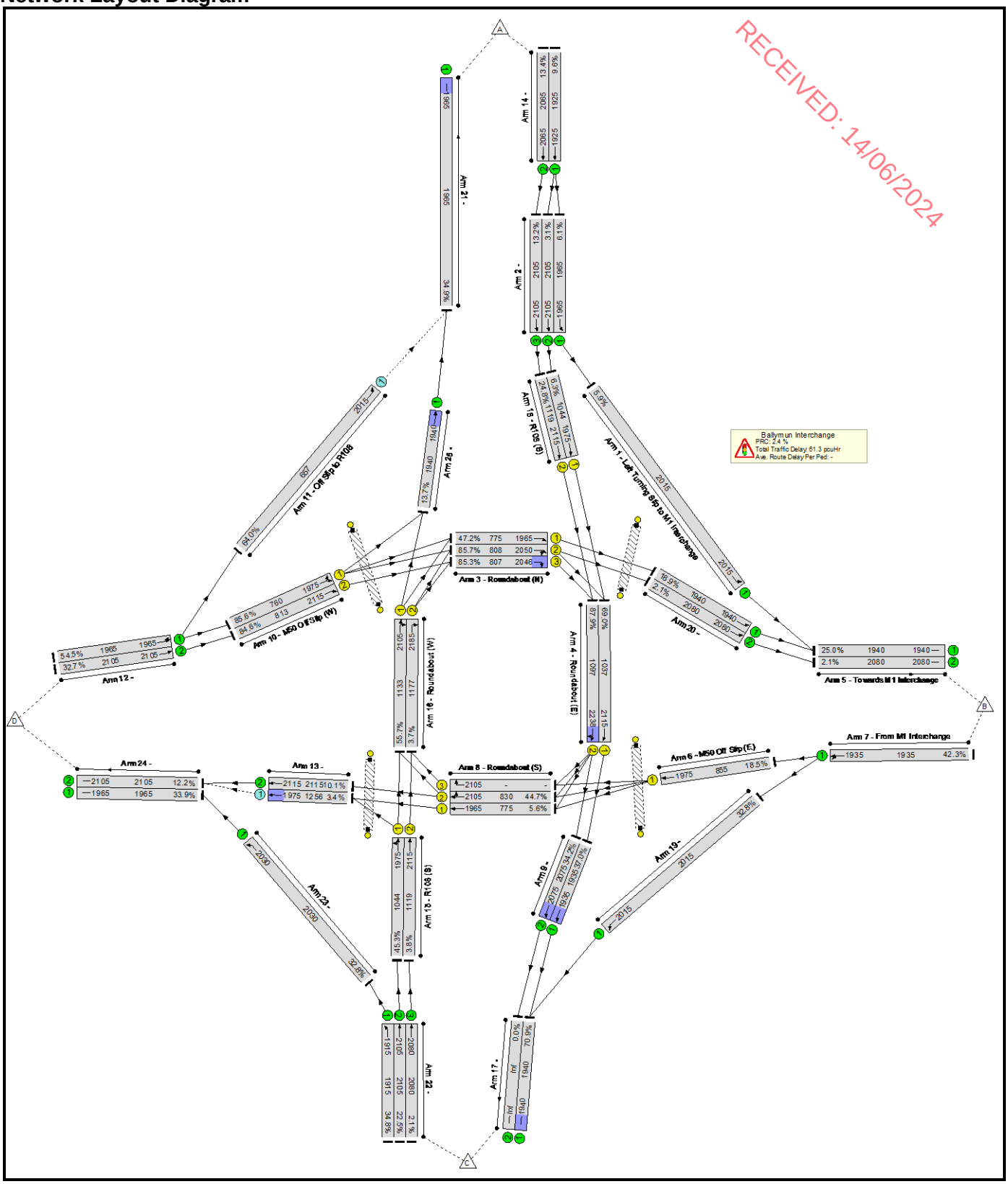
Total Delay for Signalled Lanes (pcuHr): 61.76
Total Delay Over All Lanes(pcuHr): 68.28

Cycle Time (s): 74

Basic Results Summary

Scenario 5: '2023 DM AM' (FG3: '2023 DM AM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**87.9%**	**463**	**0**	**0**	**61.3**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**87.9%**	**463**	**0**	**0**	**61.3**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	119	2015	2015	5.9%	-	-	-	0.0	0.9	0.0
2/1	Ahead	U	-		-	-	-	119	1965	1965	6.1%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	66	2105	2105	3.1%	-	-	-	0.0	0.9	0.0
2/3	Ahead	U	-		-	-	-	277	2105	2105	13.2%	-	-	-	0.1	1.0	0.1
3/1	Roundabout (N) Ahead	U	B		1	40	-	366	1965	775	47.2%	-	-	-	4.4	43.0	11.0
3/2	Roundabout (N) Right Ahead	U	B		1	40	-	693	2050	808	85.7%	-	-	-	4.3	22.2	5.8
3/3	Roundabout (N) Right	U	B		1	40	-	688	2046	807	85.3%	-	-	-	3.9	20.2	4.6
4/1	Roundabout (E) Ahead	U	D		1	50	-	716	2115	1037	69.0%	-	-	-	5.6	28.1	21.5
4/2	Roundabout (E) Right Ahead	U	D		1	50	-	965	2238	1097	87.9%	-	-	-	9.7	36.3	30.7
5/1	Towards M1 Interchange	U	-		-	-	-	485	1940	1940	25.0%	-	-	-	0.2	1.2	0.2
5/2	Towards M1 Interchange	U	-		-	-	-	43	2080	2080	2.1%	-	-	-	0.0	0.9	0.0
6/1	M50 Off Slip (E) Ahead	U	C		1	44	-	158	1975	855	18.5%	-	-	-	0.9	20.8	2.9
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	818	1935	1935	42.3%	-	-	-	0.4	1.6	0.4
8/1	Roundabout (S) Ahead	U	H		1	40	-	43	1965	775	5.6%	-	-	-	0.3	22.4	1.3

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	40	-	371	2105	830	44.7%	-		-	2.3	21.9	10.0
8/3	Roundabout (S) Right	U	H		1	40	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	716	1935	1935	37.0%	-	-	-	0.5	2.3	10.1
9/2	Ahead	U	-		-	-	-	709	2075	2075	34.2%	-	-	-	0.4	1.8	6.8
10/1	M50 Off Slip (W) Ahead Left	U	F		1	39	-	650	1975	760	85.6%	-	-	-	8.1	45.0	20.0
10/2	M50 Off Slip (W) Ahead	U	F		1	39	-	688	2115	813	84.6%	-	-	-	8.2	43.0	20.6
11/1	Off Slip to R108 Ahead	O	-		-	-	-	420	2015	657	64.0%	420	0	0	0.9	7.6	2.0
12/1	Ahead Ahead2	U	-		-	-	-	1070	1965	1965	54.5%	-	-	-	0.6	2.0	0.6
12/2	Ahead	U	-		-	-	-	688	2105	2105	32.7%	-	-	-	0.2	1.3	0.2
13/1	Ahead	O	-		-	-	-	43	1975	1256	3.4%	43	0	0	0.0	4.1	0.4
13/2	Ahead	U	-		-	-	-	213	2115	2115	10.1%	-	-	-	0.1	0.9	0.1
14/1	Ahead	U	-		-	-	-	185	1925	1925	9.6%	-	-	-	0.1	1.0	0.1
14/2	Ahead	U	-		-	-	-	277	2065	2065	13.4%	-	-	-	0.1	1.0	0.1
15/1	R108 (S) Left Ahead	U	G		1	54	-	473	1975	1044	45.3%	-	-	-	2.4	18.3	8.8
15/2	R108 (S) Ahead	U	G		1	54	-	43	2115	1119	3.8%	-	-	-	0.2	13.5	0.6
16/1	Roundabout (W) Right Ahead	U	E		1	55	-	631	2105	1133	55.7%	-	-	-	2.3	13.3	7.4
16/2	Roundabout (W) Right	U	E		1	55	-	43	2185	1177	3.7%	-	-	-	0.1	8.3	0.2
17/1		U	-		-	-	-	1376	1940	1940	70.9%	-	-	-	2.1	5.6	24.0
18/1	R108 (S) Ahead	U	A		1	54	-	66	1975	1044	6.3%	-	-	-	0.3	13.8	1.0
18/2	R108 (S) Ahead	U	A		1	54	-	277	2115	1119	24.8%	-	-	-	1.2	15.4	4.5
19/1	Ahead	U	-		-	-	-	660	2015	2015	32.8%	-	-	-	0.2	1.3	0.2
20/1	Ahead	U	-		-	-	-	366	1940	1940	18.9%	-	-	-	0.1	1.1	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	43	2080	2080	2.1%	-	-	-	0.0	0.9	0.0
21/1		U	-		-	-	-	685	1965	1965	34.9%	-	-	-	0.3	1.4	0.3
22/1	Ahead	U	-		-	-	-	666	1915	1915	34.8%	-	-	-	0.3	1.4	0.3
22/2	Ahead	U	-		-	-	-	473	2105	2105	22.5%	-	-	-	0.1	1.1	0.1
22/3	Ahead	U	-		-	-	-	43	2080	2080	2.1%	-	-	-	0.0	0.9	0.0
23/1	Left	U	-		-	-	-	666	2030	2030	32.8%	-	-	-	0.2	1.3	0.2
24/1		U	-		-	-	-	666	1965	1965	33.9%	-	-	-	0.3	1.4	0.3
24/2		U	-		-	-	-	256	2105	2105	12.2%	-	-	-	0.1	1.0	0.1
25/1	Ahead	U	-		-	-	-	265	1940	1940	13.7%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	44	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	50	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	43	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): 2.4
PRC Over All Lanes (%): 2.4

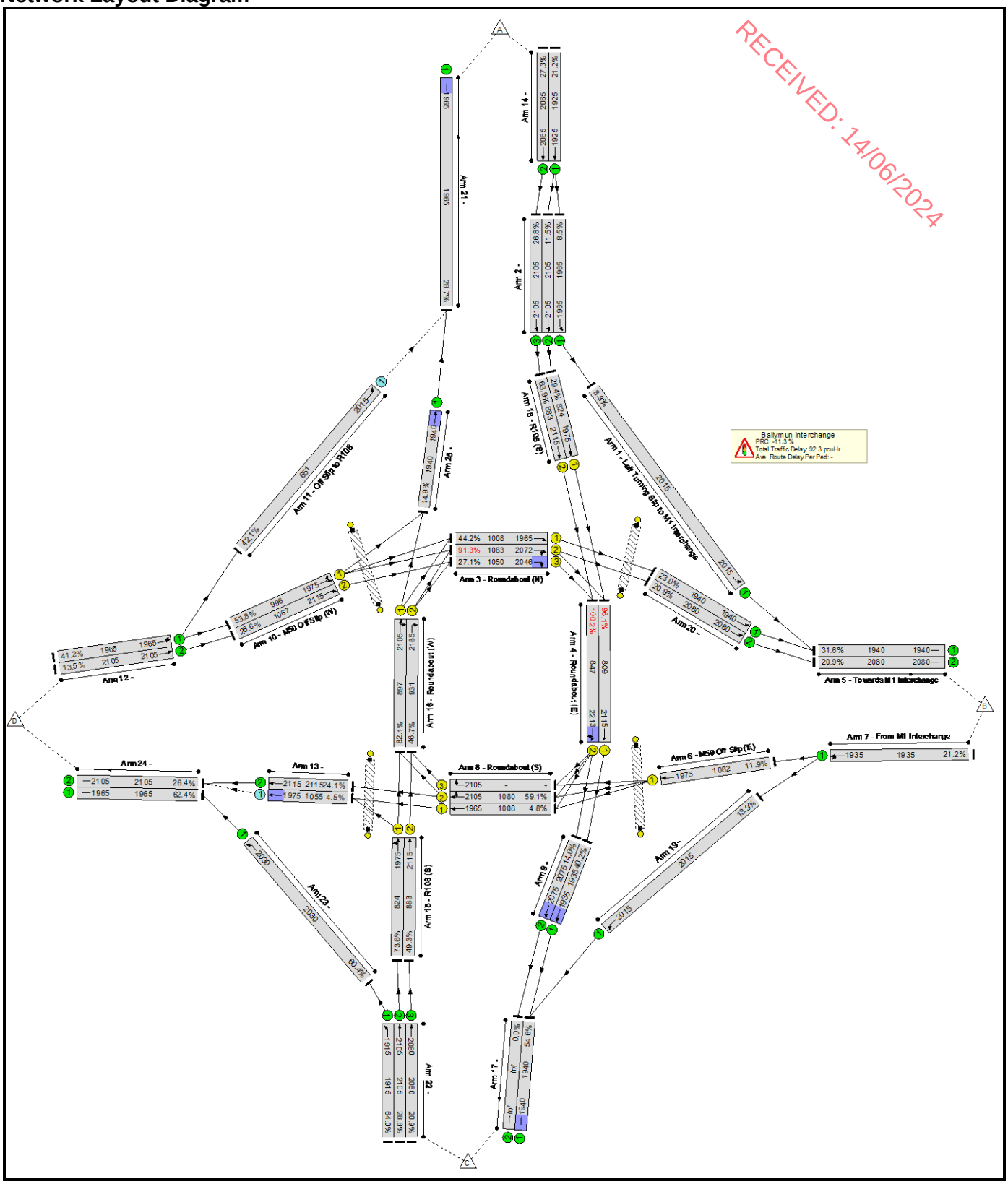
Total Delay for Signalled Lanes (pcuHr): 54.02
Total Delay Over All Lanes(pcuHr): 61.33

Cycle Time (s): 104

Basic Results Summary

Scenario 6: '2023 DM PM' (FG4: '2023 DM PM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**100.2%**	**322**	**0**	**0**	**92.3**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**100.2%**	**322**	**0**	**0**	**92.3**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	167	2015	2015	8.3%	-	-	-	0.0	1.0	0.0
2/1	Ahead	U	-		-	-	-	167	1965	1965	8.5%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	242	2105	2105	11.5%	-	-	-	0.1	1.0	0.1
2/3	Ahead	U	-		-	-	-	564	2105	2105	26.8%	-	-	-	0.2	1.2	0.2
3/1	Roundabout (N) Ahead	U	B		1	58	-	446	1965	1008	44.2%	-	-	-	4.6	37.1	14.6
3/2	Roundabout (N) Right Ahead	U	B		1	58	-	971	2072	1063	91.3%	-	-	-	11.3	41.8	34.8
3/3	Roundabout (N) Right	U	B		1	58	-	284	2046	1050	27.1%	-	-	-	0.5	6.0	0.8
4/1	Roundabout (E) Ahead	U	D		1	43	-	778	2115	809	96.1%	-	-	-	13.6	62.8	32.9
4/2	Roundabout (E) Right Ahead	U	D		1	43	-	848	2213	847	100.2%	-	-	-	20.5	86.8	42.0
5/1	Towards M1 Interchange	U	-		-	-	-	613	1940	1940	31.6%	-	-	-	0.2	1.4	0.2
5/2	Towards M1 Interchange	U	-		-	-	-	435	2080	2080	20.9%	-	-	-	0.1	1.1	0.1
6/1	M50 Off Slip (E) Ahead	U	C		1	62	-	129	1975	1082	11.9%	-	-	-	0.5	14.5	2.0
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	410	1935	1935	21.2%	-	-	-	0.1	1.2	0.1
8/1	Roundabout (S) Ahead	U	H		1	58	-	48	1965	1008	4.8%	-	-	-	0.3	20.8	1.5

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	58	-	639	2105	1080	59.1%	-		-	5.9	33.1	20.2
8/3	Roundabout (S) Right	U	H		1	58	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	778	1935	1935	40.2%	-	-	-	0.6	2.7	14.6
9/2	Ahead	U	-		-	-	-	290	2075	2075	14.0%	-	-	-	0.1	1.0	0.2
10/1	M50 Off Slip (W) Ahead Left	U	F		1	57	-	536	1975	996	53.8%	-	-	-	3.5	23.3	12.2
10/2	M50 Off Slip (W) Ahead	U	F		1	57	-	284	2115	1067	26.6%	-	-	-	1.5	18.6	5.3
11/1	Off Slip to R108 Ahead	O	-		-	-	-	274	2015	651	42.1%	274	0	0	0.4	4.8	0.4
12/1	Ahead Ahead2	U	-		-	-	-	810	1965	1965	41.2%	-	-	-	0.4	1.6	0.4
12/2	Ahead	U	-		-	-	-	284	2105	2105	13.5%	-	-	-	0.1	1.0	0.1
13/1	Ahead	O	-		-	-	-	48	1975	1055	4.5%	48	0	0	0.2	13.2	0.7
13/2	Ahead	U	-		-	-	-	510	2115	2115	24.1%	-	-	-	0.2	1.1	0.2
14/1	Ahead	U	-		-	-	-	409	1925	1925	21.2%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	564	2065	2065	27.3%	-	-	-	0.2	1.2	0.2
15/1	R108 (S) Left Ahead	U	G		1	47	-	607	1975	824	73.6%	-	-	-	6.1	36.4	17.6
15/2	R108 (S) Ahead	U	G		1	47	-	435	2115	883	49.3%	-	-	-	3.5	28.6	10.6
16/1	Roundabout (W) Right Ahead	U	E		1	48	-	736	2105	897	82.1%	-	-	-	5.0	24.3	10.0
16/2	Roundabout (W) Right	U	E		1	48	-	435	2185	931	46.7%	-	-	-	1.6	13.0	2.7
17/1		U	-		-	-	-	1059	1940	1940	54.6%	-	-	-	0.8	2.8	14.2
18/1	R108 (S) Ahead	U	A		1	47	-	242	1975	824	29.4%	-	-	-	1.7	25.3	5.3
18/2	R108 (S) Ahead	U	A		1	47	-	564	2115	883	63.9%	-	-	-	5.0	32.2	15.1
19/1	Ahead	U	-		-	-	-	281	2015	2015	13.9%	-	-	-	0.1	1.0	0.1
20/1	Ahead	U	-		-	-	-	446	1940	1940	23.0%	-	-	-	0.1	1.2	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	435	2080	2080	20.9%	-	-	-	0.1	1.1	0.1
21/1		U	-		-	-	-	564	1965	1965	28.7%	-	-	-	0.2	1.3	0.2
22/1	Ahead	U	-		-	-	-	1226	1915	1915	64.0%	-	-	-	0.9	2.6	0.9
22/2	Ahead	U	-		-	-	-	607	2105	2105	28.8%	-	-	-	0.2	1.2	0.2
22/3	Ahead	U	-		-	-	-	435	2080	2080	20.9%	-	-	-	0.1	1.1	0.1
23/1	Left	U	-		-	-	-	1226	2030	2030	60.4%	-	-	-	0.8	2.2	0.8
24/1		U	-		-	-	-	1226	1965	1965	62.4%	-	-	-	0.8	2.4	0.8
24/2		U	-		-	-	-	558	2105	2105	26.4%	-	-	-	0.2	1.2	0.2
25/1	Ahead	U	-		-	-	-	290	1940	1940	14.9%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	43	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	37	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	43	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	36	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -11.3
PRC Over All Lanes (%): -11.3

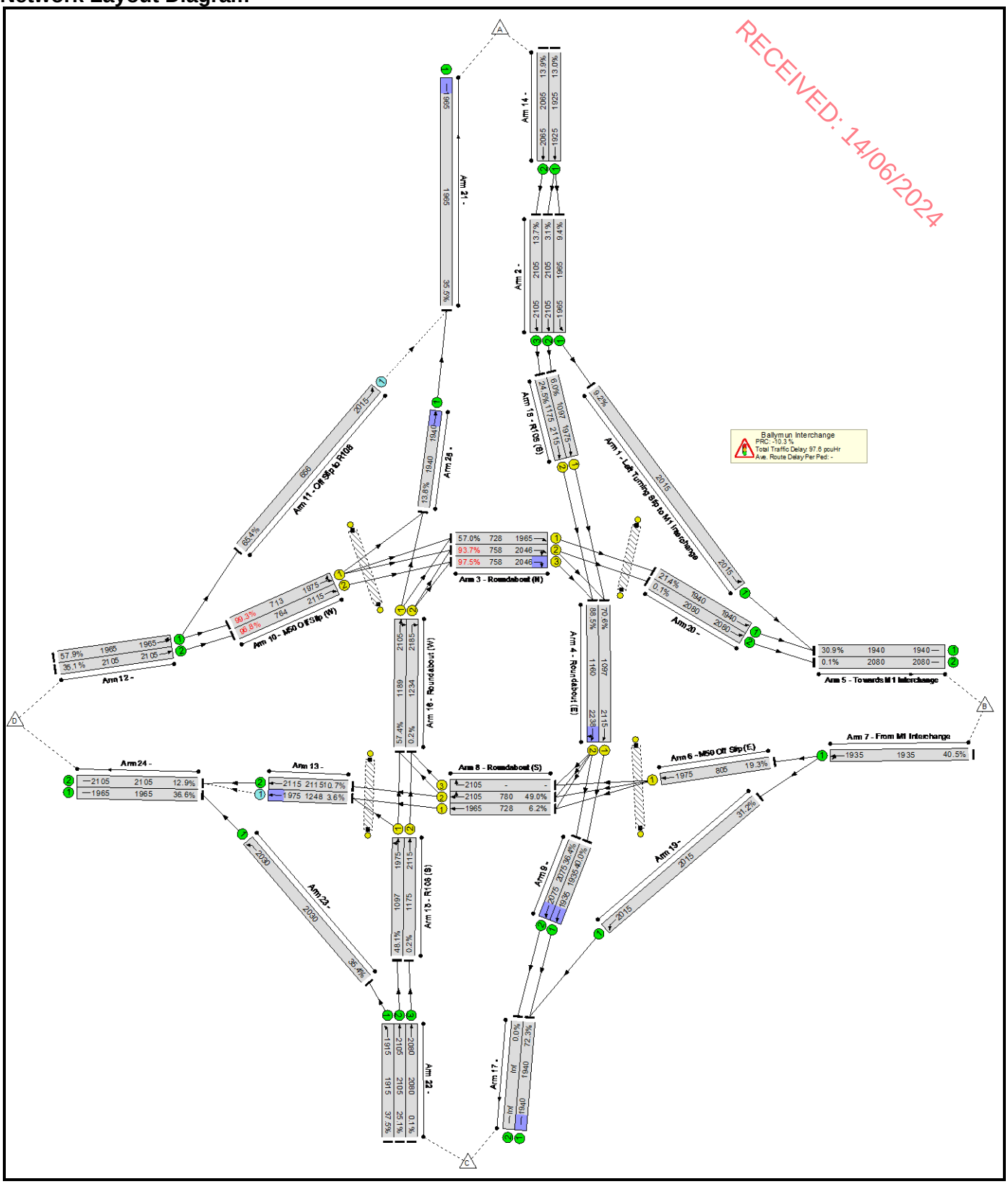
Total Delay for Signalled Lanes (pcuHr): 84.83
Total Delay Over All Lanes(pcuHr): 92.26

Cycle Time (s): 115

Basic Results Summary

Scenario 7: '2028 DM AM' (FG5: '2028 DM AM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**99.3%**	**474**	**0**	**0**	**97.6**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**99.3%**	**474**	**0**	**0**	**97.6**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	185	2015	2015	9.2%	-	-	-	0.1	1.0	0.1
2/1	Ahead	U	-		-	-	-	185	1965	1965	9.4%	-	-	-	0.1	1.0	0.1
2/2	Ahead	U	-		-	-	-	66	2105	2105	3.1%	-	-	-	0.0	0.9	0.0
2/3	Ahead	U	-		-	-	-	288	2105	2105	13.7%	-	-	-	0.1	1.0	0.1
3/1	Roundabout (N) Ahead	U	B		1	39	-	415	1965	728	57.0%	-	-	-	5.6	49.0	13.1
3/2	Roundabout (N) Right Ahead	U	B		1	39	-	710	2046	758	93.7%	-	-	-	8.6	43.9	10.3
3/3	Roundabout (N) Right	U	B		1	39	-	739	2046	758	97.5%	-	-	-	12.5	61.1	14.3
4/1	Roundabout (E) Ahead	U	D		1	55	-	774	2115	1097	70.6%	-	-	-	6.7	31.2	24.1
4/2	Roundabout (E) Right Ahead	U	D		1	55	-	1027	2238	1160	88.5%	-	-	-	11.1	39.0	33.8
5/1	Towards M1 Interchange	U	-		-	-	-	600	1940	1940	30.9%	-	-	-	0.2	1.3	0.2
5/2	Towards M1 Interchange	U	-		-	-	-	2	2080	2080	0.1%	-	-	-	0.0	0.9	0.0
6/1	M50 Off Slip (E) Ahead	U	C		1	43	-	155	1975	805	19.3%	-	-	-	1.0	23.4	3.1
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	784	1935	1935	40.5%	-	-	-	0.3	1.6	0.3
8/1	Roundabout (S) Ahead	U	H		1	39	-	45	1965	728	6.2%	-	-	-	0.3	23.9	1.4

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	39	-	382	2105	780	49.0%	-		-	2.6	24.3	10.9
8/3	Roundabout (S) Right	U	H		1	39	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	774	1935	1935	40.0%	-	-	-	0.5	2.5	12.8
9/2	Ahead	U	-		-	-	-	755	2075	2075	36.4%	-	-	-	0.4	2.0	9.2
10/1	M50 Off Slip (W) Ahead Left	U	F		1	38	-	708	1975	713	99.3%	-	-	-	18.8	95.7	33.1
10/2	M50 Off Slip (W) Ahead	U	F		1	38	-	739	2115	764	96.8%	-	-	-	15.7	76.5	30.5
11/1	Off Slip to R108 Ahead	O	-		-	-	-	429	2015	656	65.4%	429	0	0	0.9	7.9	2.2
12/1	Ahead Ahead2	U	-		-	-	-	1137	1965	1965	57.9%	-	-	-	0.7	2.2	0.7
12/2	Ahead	U	-		-	-	-	739	2105	2105	35.1%	-	-	-	0.3	1.3	0.3
13/1	Ahead	O	-		-	-	-	45	1975	1248	3.6%	45	0	0	0.1	4.9	0.5
13/2	Ahead	U	-		-	-	-	227	2115	2115	10.7%	-	-	-	0.1	1.0	0.1
14/1	Ahead	U	-		-	-	-	251	1925	1925	13.0%	-	-	-	0.1	1.1	0.1
14/2	Ahead	U	-		-	-	-	288	2065	2065	13.9%	-	-	-	0.1	1.0	0.1
15/1	R108 (S) Left Ahead	U	G		1	59	-	528	1975	1097	48.1%	-	-	-	2.6	17.7	10.0
15/2	R108 (S) Ahead	U	G		1	59	-	2	2115	1175	0.2%	-	-	-	0.0	12.4	0.0
16/1	Roundabout (W) Right Ahead	U	E		1	60	-	683	2105	1189	57.4%	-	-	-	2.4	12.5	7.8
16/2	Roundabout (W) Right	U	E		1	60	-	2	2185	1234	0.2%	-	-	-	0.0	7.7	0.0
17/1		U	-		-	-	-	1403	1940	1940	72.3%	-	-	-	2.4	6.2	27.3
18/1	R108 (S) Ahead	U	A		1	59	-	66	1975	1097	6.0%	-	-	-	0.2	12.8	0.9
18/2	R108 (S) Ahead	U	A		1	59	-	288	2115	1175	24.5%	-	-	-	1.2	14.4	4.6
19/1	Ahead	U	-		-	-	-	629	2015	2015	31.2%	-	-	-	0.2	1.3	0.2
20/1	Ahead	U	-		-	-	-	415	1940	1940	21.4%	-	-	-	0.1	1.2	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	2	2080	2080	0.1%	-	-	-	0.0	0.9	0.0
21/1		U	-		-	-	-	697	1965	1965	35.5%	-	-	-	0.3	1.4	0.3
22/1	Ahead	U	-		-	-	-	719	1915	1915	37.5%	-	-	-	0.3	1.5	0.3
22/2	Ahead	U	-		-	-	-	528	2105	2105	25.1%	-	-	-	0.2	1.1	0.2
22/3	Ahead	U	-		-	-	-	2	2080	2080	0.1%	-	-	-	0.0	0.9	0.0
23/1	Left	U	-		-	-	-	719	2030	2030	35.4%	-	-	-	0.3	1.4	0.3
24/1		U	-		-	-	-	719	1965	1965	36.6%	-	-	-	0.3	1.4	0.3
24/2		U	-		-	-	-	272	2105	2105	12.9%	-	-	-	0.1	1.0	0.1
25/1	Ahead	U	-		-	-	-	268	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	55	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	49	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	55	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	48	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -10.3
PRC Over All Lanes (%): -10.3

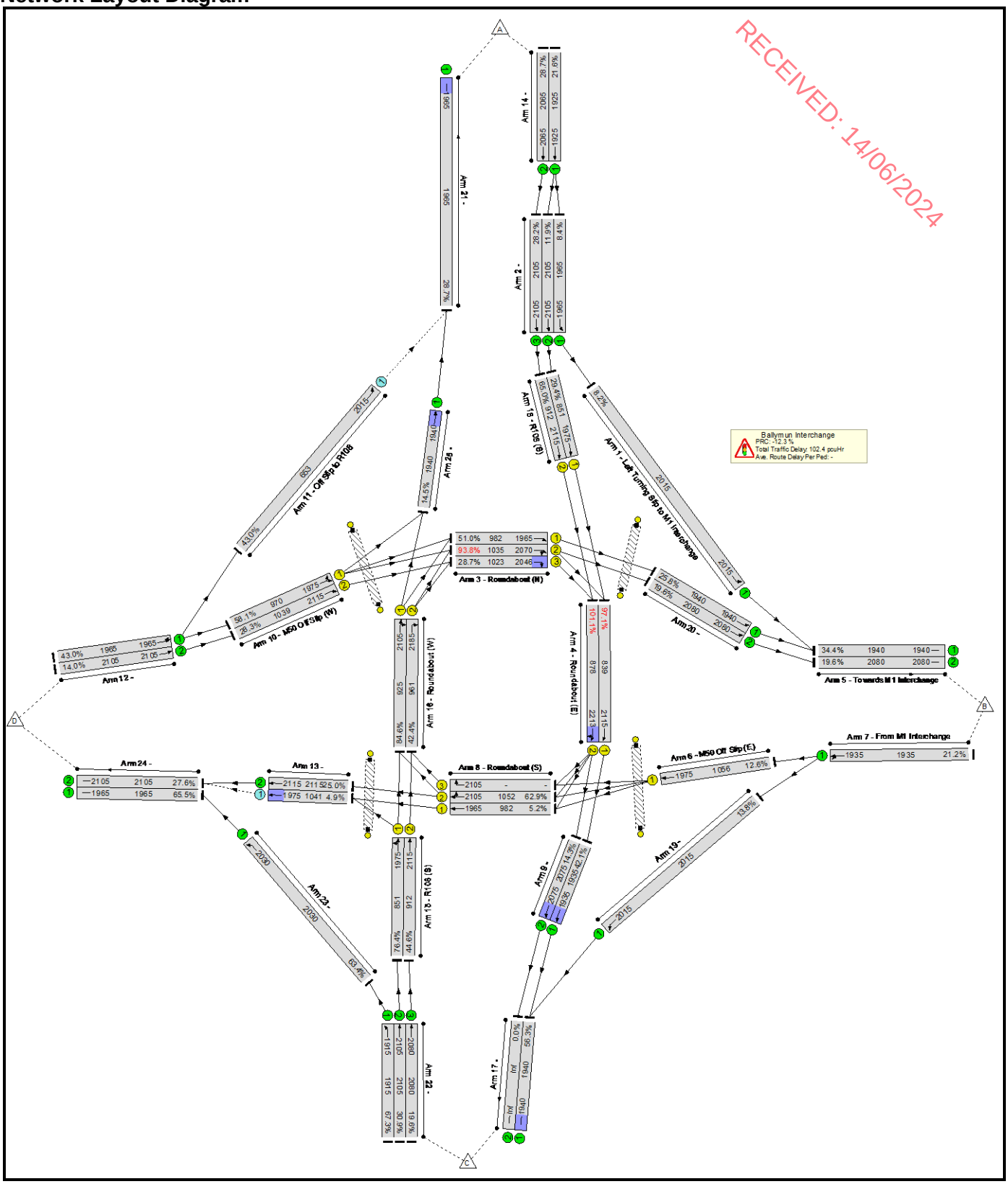
Total Delay for Signalled Lanes (pcuHr): 89.45
Total Delay Over All Lanes(pcuHr): 97.59

Cycle Time (s): 108

Basic Results Summary

Scenario 8: '2028 DM PM' (FG6: '2028 DM PM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**101.1%**	**332**	**0**	**0**	**102.4**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**101.1%**	**332**	**0**	**0**	**102.4**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	166	2015	2015	8.2%	-	-	-	0.0	1.0	0.0
2/1	Ahead	U	-		-	-	-	166	1965	1965	8.4%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	250	2105	2105	11.9%	-	-	-	0.1	1.0	0.1
2/3	Ahead	U	-		-	-	-	593	2105	2105	28.2%	-	-	-	0.2	1.2	0.2
3/1	Roundabout (N) Ahead	U	B		1	57	-	501	1965	982	51.0%	-	-	-	5.6	40.4	16.7
3/2	Roundabout (N) Right Ahead	U	B		1	57	-	971	2070	1035	93.8%	-	-	-	12.8	47.3	36.8
3/3	Roundabout (N) Right	U	B		1	57	-	294	2046	1023	28.7%	-	-	-	0.5	6.3	0.9
4/1	Roundabout (E) Ahead	U	D		1	45	-	814	2115	839	97.1%	-	-	-	15.1	66.9	35.5
4/2	Roundabout (E) Right Ahead	U	D		1	45	-	887	2213	878	101.1%	-	-	-	23.8	96.4	46.3
5/1	Towards M1 Interchange	U	-		-	-	-	667	1940	1940	34.4%	-	-	-	0.3	1.4	0.3
5/2	Towards M1 Interchange	U	-		-	-	-	407	2080	2080	19.6%	-	-	-	0.1	1.1	0.1
6/1	M50 Off Slip (E) Ahead	U	C		1	61	-	133	1975	1056	12.6%	-	-	-	0.6	15.4	2.2
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	411	1935	1935	21.2%	-	-	-	0.1	1.2	0.1
8/1	Roundabout (S) Ahead	U	H		1	57	-	52	1965	982	5.2%	-	-	-	0.3	22.1	1.7

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	57	-	671	2105	1052	62.9%	-		-	6.5	35.5	21.3
8/3	Roundabout (S) Right	U	H		1	57	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	814	1935	1935	42.1%	-	-	-	0.6	2.8	16.1
9/2	Ahead	U	-		-	-	-	297	2075	2075	14.3%	-	-	-	0.1	1.0	0.2
10/1	M50 Off Slip (W) Ahead Left	U	F		1	56	-	564	1975	970	58.1%	-	-	-	4.0	25.4	13.5
10/2	M50 Off Slip (W) Ahead	U	F		1	56	-	294	2115	1039	28.3%	-	-	-	1.6	19.8	5.8
11/1	Off Slip to R108 Ahead	O	-		-	-	-	281	2015	653	43.0%	281	0	0	0.4	4.8	0.4
12/1	Ahead Ahead2	U	-		-	-	-	845	1965	1965	43.0%	-	-	-	0.4	1.6	0.4
12/2	Ahead	U	-		-	-	-	294	2105	2105	14.0%	-	-	-	0.1	1.0	0.1
13/1	Ahead	O	-		-	-	-	52	1975	1041	4.9%	51	0	0	0.2	15.1	0.8
13/2	Ahead	U	-		-	-	-	538	2115	2115	25.0%	-	-	-	0.2	1.1	0.2
14/1	Ahead	U	-		-	-	-	416	1925	1925	21.6%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	593	2065	2065	28.7%	-	-	-	0.2	1.2	0.2
15/1	R108 (S) Left Ahead	U	G		1	49	-	650	1975	851	76.4%	-	-	-	6.6	36.8	19.3
15/2	R108 (S) Ahead	U	G		1	49	-	407	2115	912	44.6%	-	-	-	3.0	26.8	9.6
16/1	Roundabout (W) Right Ahead	U	E		1	50	-	783	2105	925	84.6%	-	-	-	5.5	25.1	10.8
16/2	Roundabout (W) Right	U	E		1	50	-	407	2185	961	42.4%	-	-	-	1.4	12.2	2.4
17/1		U	-		-	-	-	1092	1940	1940	56.3%	-	-	-	0.9	3.0	15.9
18/1	R108 (S) Ahead	U	A		1	49	-	250	1975	851	29.4%	-	-	-	1.7	24.5	5.4
18/2	R108 (S) Ahead	U	A		1	49	-	593	2115	912	65.0%	-	-	-	5.2	31.7	15.9
19/1	Ahead	U	-		-	-	-	278	2015	2015	13.8%	-	-	-	0.1	1.0	0.1
20/1	Ahead	U	-		-	-	-	501	1940	1940	25.8%	-	-	-	0.2	1.3	0.2

Basic Results Summary

20/2	Ahead	U	-		-	-	-	407	2080	2080	19.6%	-	-	-	0.1	1.1	0.1
21/1		U	-		-	-	-	563	1965	1965	28.7%	-	-	-	0.2	1.3	0.2
22/1	Ahead	U	-		-	-	-	1288	1915	1915	67.3%	-	-	-	1.0	2.9	1.0
22/2	Ahead	U	-		-	-	-	650	2105	2105	30.9%	-	-	-	0.2	1.2	0.2
22/3	Ahead	U	-		-	-	-	407	2080	2080	19.6%	-	-	-	0.1	1.1	0.1
23/1	Left	U	-		-	-	-	1288	2030	2030	63.4%	-	-	-	0.9	2.4	0.9
24/1		U	-		-	-	-	1288	1965	1965	65.5%	-	-	-	0.9	2.7	0.9
24/2		U	-		-	-	-	590	2105	2105	27.6%	-	-	-	0.2	1.2	0.2
25/1	Ahead	U	-		-	-	-	282	1940	1940	14.5%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	45	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	39	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	45	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	38	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -12.3
PRC Over All Lanes (%): -12.3

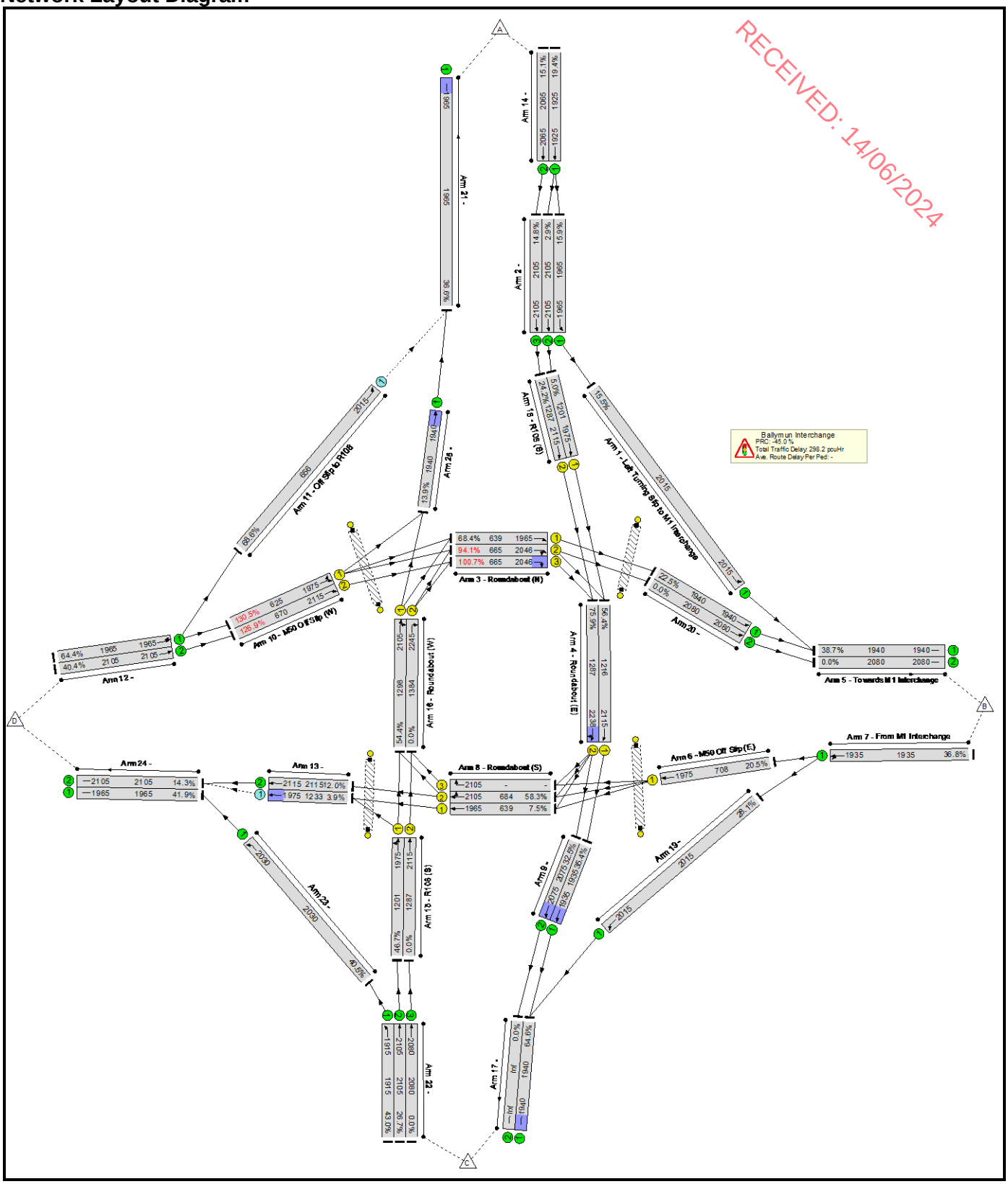
Total Delay for Signalled Lanes (pcuHr): 94.25
Total Delay Over All Lanes(pcuHr): 102.36

Cycle Time (s): 116

Basic Results Summary

Scenario 9: '2038 DM AM' (FG7: '2038 DM AM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**130.5%**	**498**	**0**	**0**	**298.2**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**130.5%**	**498**	**0**	**0**	**298.2**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	313	2015	2015	15.5%	-	-	-	0.1	1.1	0.1
2/1	Ahead	U	-		-	-	-	313	1965	1965	15.9%	-	-	-	0.1	1.1	0.1
2/2	Ahead	U	-		-	-	-	60	2105	2105	2.9%	-	-	-	0.0	0.9	0.0
2/3	Ahead	U	-		-	-	-	312	2105	2105	14.8%	-	-	-	0.1	1.0	0.1
3/1	Roundabout (N) Ahead	U	B		1	38	-	437	1965	639	68.4%	-	-	-	7.6	62.5	15.6
3/2	Roundabout (N) Right Ahead	U	B		1	38	-	816	2046	665	94.1%	-	-	-	9.0	52.0	10.7
3/3	Roundabout (N) Right	U	B		1	38	-	850	2046	665	100.7%	-	-	-	18.0	97.0	21.7
4/1	Roundabout (E) Ahead	U	D		1	68	-	876	2115	1216	56.4%	-	-	-	5.3	28.0	22.9
4/2	Roundabout (E) Right Ahead	U	D		1	68	-	1162	2238	1287	75.9%	-	-	-	8.4	31.0	32.4
5/1	Towards M1 Interchange	U	-		-	-	-	750	1940	1940	38.7%	-	-	-	0.3	1.5	4.1
5/2	Towards M1 Interchange	U	-		-	-	-	0	2080	2080	0.0%	-	-	-	0.0	0.0	0.0
6/1	M50 Off Slip (E) Ahead	U	C		1	42	-	145	1975	708	20.5%	-	-	-	1.2	29.9	3.5
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	712	1935	1935	36.8%	-	-	-	0.3	1.5	0.3
8/1	Roundabout (S) Ahead	U	H		1	38	-	48	1965	639	7.5%	-	-	-	0.5	34.2	1.6

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	38	-	399	2105	684	58.3%	-		-	3.9	34.9	13.3
8/3	Roundabout (S) Right	U	H		1	38	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	876	1935	1935	35.4%	-	-	-	0.5	2.4	12.1
9/2	Ahead	U	-		-	-	-	860	2075	2075	32.5%	-	-	-	0.4	1.9	9.5
10/1	M50 Off Slip (W) Ahead Left	U	F		1	37	-	816	1975	625	130.5%	-	-	-	117.8	519.6	130.9
10/2	M50 Off Slip (W) Ahead	U	F		1	37	-	850	2115	670	126.9%	-	-	-	112.6	476.9	126.8
11/1	Off Slip to R108 Ahead	O	-		-	-	-	450	2015	656	68.6%	450	0	0	1.1	8.8	2.8
12/1	Ahead Ahead2	U	-		-	-	-	1266	1965	1965	64.4%	-	-	-	0.9	2.6	0.9
12/2	Ahead	U	-		-	-	-	850	2105	2105	40.4%	-	-	-	0.3	1.4	0.3
13/1	Ahead	O	-		-	-	-	48	1975	1233	3.9%	48	0	0	0.1	7.6	0.7
13/2	Ahead	U	-		-	-	-	254	2115	2115	12.0%	-	-	-	0.1	1.0	0.1
14/1	Ahead	U	-		-	-	-	373	1925	1925	19.4%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	312	2065	2065	15.1%	-	-	-	0.1	1.0	0.1
15/1	R108 (S) Left Ahead	U	G		1	72	-	561	1975	1201	46.7%	-	-	-	2.4	15.7	10.6
15/2	R108 (S) Ahead	U	G		1	72	-	0	2115	1287	0.0%	-	-	-	0.0	0.0	0.0
16/1	Roundabout (W) Right Ahead	U	E		1	73	-	706	2105	1298	54.4%	-	-	-	2.1	10.6	8.0
16/2	Roundabout (W) Right	U	E		1	73	-	0	2245	1384	0.0%	-	-	-	0.0	0.0	0.0
17/1		U	-		-	-	-	1443	1940	1940	64.6%	-	-	-	1.6	4.7	23.6
18/1	R108 (S) Ahead	U	A		1	72	-	60	1975	1201	5.0%	-	-	-	0.2	11.1	0.8
18/2	R108 (S) Ahead	U	A		1	72	-	312	2115	1287	24.2%	-	-	-	1.1	12.6	4.9
19/1	Ahead	U	-		-	-	-	567	2015	2015	28.1%	-	-	-	0.2	1.2	0.2
20/1	Ahead	U	-		-	-	-	437	1940	1940	22.5%	-	-	-	0.1	1.2	0.1

Basic Results Summary

20/2	Ahead	U	-		-	-	-	0	2080	2080	0.0%	-	-	-	0.0	0.0	0.0
21/1		U	-		-	-	-	719	1965	1965	36.6%	-	-	-	0.3	1.4	0.3
22/1	Ahead	U	-		-	-	-	823	1915	1915	43.0%	-	-	-	0.4	1.6	0.4
22/2	Ahead	U	-		-	-	-	561	2105	2105	26.7%	-	-	-	0.2	1.2	0.2
22/3	Ahead	U	-		-	-	-	0	2080	2080	0.0%	-	-	-	0.0	0.0	0.0
23/1	Left	U	-		-	-	-	823	2030	2030	40.5%	-	-	-	0.3	1.5	0.3
24/1		U	-		-	-	-	823	1965	1965	41.9%	-	-	-	0.4	1.6	0.4
24/2		U	-		-	-	-	302	2105	2105	14.3%	-	-	-	0.1	1.0	0.1
25/1	Ahead	U	-		-	-	-	269	1940	1940	13.9%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	68	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	62	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	68	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	61	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -45.0
PRC Over All Lanes (%): -45.0

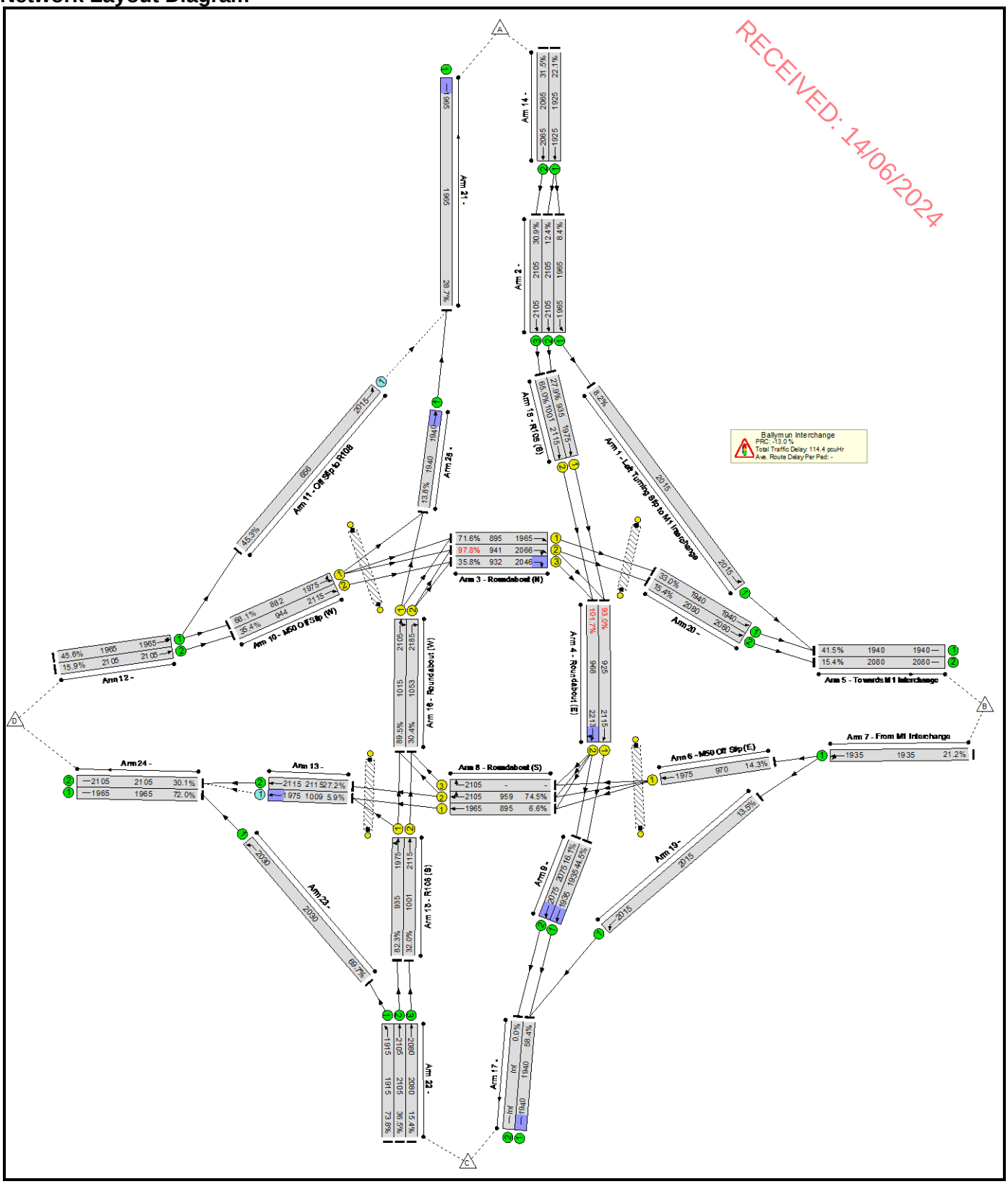
Total Delay for Signalled Lanes (pcuHr): 290.11
Total Delay Over All Lanes(pcuHr): 298.22

Cycle Time (s): 120

Basic Results Summary

Scenario 10: '2038 DM PM' (FG8: '2038 DM PM', Plan 1: 'Network Control Plan - AM')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Airport Roundabout	-	-	-		-	-	-	-	-	-	**101.7%**	**356**	**0**	**0**	**114.4**	-	-
Ballymun Interchange	-	-	-		-	-	-	-	-	-	**101.7%**	**356**	**0**	**0**	**114.4**	-	-
1/1	Left Turning Slip to M1 Interchange Left	U	-		-	-	-	165	2015	2015	8.2%	-	-	-	0.0	1.0	0.0
2/1	Ahead	U	-		-	-	-	165	1965	1965	8.4%	-	-	-	0.0	1.0	0.0
2/2	Ahead	U	-		-	-	-	261	2105	2105	12.4%	-	-	-	0.1	1.0	0.1
2/3	Ahead	U	-		-	-	-	651	2105	2105	30.9%	-	-	-	0.2	1.2	0.2
3/1	Roundabout (N) Ahead	U	B		1	50	-	641	1965	895	71.6%	-	-	-	8.7	48.8	21.2
3/2	Roundabout (N) Right Ahead	U	B		1	50	-	920	2066	941	97.8%	-	-	-	16.1	63.1	39.1
3/3	Roundabout (N) Right	U	B		1	50	-	334	2046	932	35.8%	-	-	-	0.7	7.2	1.0
4/1	Roundabout (E) Ahead	U	D		1	48	-	861	2115	925	93.0%	-	-	-	11.4	47.8	32.2
4/2	Roundabout (E) Right Ahead	U	D		1	48	-	985	2213	968	101.7%	-	-	-	27.5	100.4	51.6
5/1	Towards M1 Interchange	U	-		-	-	-	806	1940	1940	41.5%	-	-	-	0.4	1.6	6.8
5/2	Towards M1 Interchange	U	-		-	-	-	320	2080	2080	15.4%	-	-	-	0.1	1.0	0.1
6/1	M50 Off Slip (E) Ahead	U	C		1	54	-	139	1975	970	14.3%	-	-	-	0.7	17.8	2.4
7/1	From M1 Interchange Ahead Ahead2	U	-		-	-	-	411	1935	1935	21.2%	-	-	-	0.1	1.2	0.1
8/1	Roundabout (S) Ahead	U	H		1	50	-	61	1965	895	6.6%	-	-	-	0.4	24.0	1.9

Basic Results Summary

8/2	Roundabout (S) Ahead Right	U	H		1	50	-	729	2105	959	74.5%	-		-	8.0	40.6	23.1
8/3	Roundabout (S) Right	U	H		1	50	-	0	2105	-	-	-	-	-	-	-	-
9/1	Ahead	U	-		-	-	-	861	1935	1935	44.5%	-	-	-	0.7	2.9	16.7
9/2	Ahead	U	-		-	-	-	334	2075	2075	16.1%	-	-	-	0.1	1.1	0.2
10/1	M50 Off Slip (W) Ahead Left	U	F		1	49	-	600	1975	882	68.1%	-	-	-	5.2	31.0	15.9
10/2	M50 Off Slip (W) Ahead	U	F		1	49	-	334	2115	944	35.4%	-	-	-	2.2	23.3	7.0
11/1	Off Slip to R108 Ahead	O	-		-	-	-	297	2015	656	45.3%	297	0	0	0.4	5.0	0.5
12/1	Ahead Ahead2	U	-		-	-	-	897	1965	1965	45.6%	-	-	-	0.4	1.7	0.4
12/2	Ahead	U	-		-	-	-	334	2105	2105	15.9%	-	-	-	0.1	1.0	0.1
13/1	Ahead	O	-		-	-	-	61	1975	1009	5.9%	59	0	0	0.3	17.6	1.0
13/2	Ahead	U	-		-	-	-	590	2115	2115	27.2%	-	-	-	0.2	1.2	0.2
14/1	Ahead	U	-		-	-	-	426	1925	1925	22.1%	-	-	-	0.1	1.2	0.1
14/2	Ahead	U	-		-	-	-	651	2065	2065	31.5%	-	-	-	0.2	1.3	0.2
15/1	R108 (S) Left Ahead	U	G		1	52	-	769	1975	935	82.3%	-	-	-	7.7	36.0	22.8
15/2	R108 (S) Ahead	U	G		1	52	-	320	2115	1001	32.0%	-	-	-	1.9	21.0	6.4
16/1	Roundabout (W) Right Ahead	U	E		1	53	-	908	2105	1015	89.5%	-	-	-	6.9	27.3	13.3
16/2	Roundabout (W) Right	U	E		1	53	-	320	2185	1053	30.4%	-	-	-	0.9	10.4	1.8
17/1		U	-		-	-	-	1133	1940	1940	58.4%	-	-	-	1.0	3.2	15.9
18/1	R108 (S) Ahead	U	A		1	52	-	261	1975	935	27.9%	-	-	-	1.5	20.6	5.1
18/2	R108 (S) Ahead	U	A		1	52	-	651	2115	1001	65.0%	-	-	-	5.0	27.6	16.3
19/1	Ahead	U	-		-	-	-	272	2015	2015	13.5%	-	-	-	0.1	1.0	0.1
20/1	Ahead	U	-		-	-	-	641	1940	1940	33.0%	-	-	-	0.2	1.4	0.8

Basic Results Summary

20/2	Ahead	U	-		-	-	-	320	2080	2080	15.4%	-	-	-	0.1	1.0	0.1
21/1		U	-		-	-	-	564	1965	1965	28.7%	-	-	-	0.2	1.3	0.2
22/1	Ahead	U	-		-	-	-	1414	1915	1915	73.8%	-	-	-	1.4	3.6	1.4
22/2	Ahead	U	-		-	-	-	769	2105	2105	36.5%	-	-	-	0.3	1.3	0.3
22/3	Ahead	U	-		-	-	-	320	2080	2080	15.4%	-	-	-	0.1	1.0	0.1
23/1	Left	U	-		-	-	-	1414	2030	2030	69.7%	-	-	-	1.1	2.9	1.1
24/1		U	-		-	-	-	1414	1965	1965	72.0%	-	-	-	1.3	3.3	1.3
24/2		U	-		-	-	-	651	2105	2105	30.1%	-	-	-	0.2	1.2	0.2
25/1	Ahead	U	-		-	-	-	267	1940	1940	13.8%	-	-	-	0.1	1.1	0.1
Ped Link: P1	Unnamed Ped Link	-	I		1	48	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Unnamed Ped Link	-	J		1	42	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P3	Unnamed Ped Link	-	K		1	48	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P4	Unnamed Ped Link	-	L		1	41	-	0	-	0	0.0%	-	-	-	-	-	-

C1 - Ballymun Interchange

PRC for Signalled Lanes (%): -13.0
PRC Over All Lanes (%): -13.0

Total Delay for Signalled Lanes (pcuHr): 104.69
Total Delay Over All Lanes(pcuHr): 114.35

Cycle Time (s): 112