Ordinary Council Meeting

Agenda

27 August 2024

City of Belmont

Notice of Meeting

An **Ordinary Council Meeting** will be held in the Council Chamber of the **City of Belmont Civic Centre,** 215 Wright Street, Cloverdale, on **Tuesday 27 August 2024,** commencing at 6.30pm.

John Christie
Chief Executive Officer

Please read the following important disclaimer before proceeding

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CITY OF BELMONT

Ordinary Council Meeting

Agenda

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Alternative Formats

This document is available on the City of Belmont website and can be requested in alternative formats including electronic format by email, in hardcopy both in large and standard print and in other formats as requested. For further information please contact the Community Development team on (08) 9477 7219. For language assistance please contact TIS (Translating and Interpreting Service) on 131 450.

Councillors are reminded to retain any confidential papers for discussion with the minutes.

1 Official Opening

The Presiding Member will read aloud the Acknowledgement of Country.

Acknowledgement of Country
Before I begin, I would like to acknowledge the Whadjuk Noongar people as the Traditional Owners of this land and pay my respects to Elders past, present and emerging. I further acknowledge their cultural heritage, beliefs, connection and relationship with this land which continues today.

The Presiding Member will cause the Affirmation of Civic Duty and Responsibility to be read aloud by a Councillor.

Affirmation of Civic Duty and Responsibility
I make this affirmation in good faith and declare that I will duly, faithfully, honestly, and with integrity fulfil the duties of my office for all the people in the City of Belmont according to the best of my judgement and ability. I will observe the City's Code of Conduct and Standing Orders to ensure efficient, effective and orderly decision making within this forum.

2 Apologies and leave of absence

Cr Vijay (leave of absence) Central Ward

3 Declarations of interest that might cause a conflict

Councillors/Staff are reminded of the requirements of *s5.65* of the *Local Government Act 1995 (WA)*, to disclose any interest during the meeting when the matter is discussed, and also of the requirement to disclose an interest affecting impartiality under the City's Code of Conduct for Council Members, Committee Members and Candidates and the Code of Conduct for Employees.

3.1 Financial Interests

A declaration under this section requires that the nature of the interest must be disclosed. Consequently, a member who has made a declaration must not preside, participate in, or be present during any discussion or decision-making procedure relating to the matter the subject of the declaration.

Other members may allow participation of the declarant if the member further discloses the extent of the interest and the other members decide that the interest is trivial or insignificant or is common to a significant number of electors or ratepayers.

Name	Item No and Title	Nature of Interest (and extent, where appropriate)
Mr J Christie	14.2 - Staff Matter Chief Executive Officer Annual Performance Appraisal 2023-24	Direct Financial Interest as the item relates directly to the performance and remuneration of the Chief Executive Officer.

3.2 Disclosure of interest that may affect impartiality

Councillors and staff are required (Code of Conduct), in addition to declaring any financial interest, to declare any interest that might cause a conflict. The member/employee is also encouraged to disclose the nature of the interest. The member/employee must consider the nature and extent of the interest and whether it will affect their impartiality. If the member/employee declares that their impartiality will not be affected then they may participate in the decision-making process.

Name	Item No and Title	Nature of Interest (and extent, where appropriate)

4 Announcements by the Presiding Member (without discussion) and declarations by Members

4.1 Announcements

4.2 Disclaimer

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4.3 Declarations by Members who have not given due consideration to all matters contained in the business papers presently before the meeting

5 Public question time

5.1 Responses to questions taken on notice

5.1.1 Ms L Hollands on behalf of Belmont Resident and Ratepayer Action Group, Redcliffe

The following questions were taken on notice at the 23 July 2024 Ordinary Council Meeting. Ms Hollands was provided with a response on 14 August 2024 The response from the City is recorded accordingly:

1. What reason under the Local Government Act 5.23(2) could the confidential attachment for item 12.1 not be seen by the public?

Response

The confidential attachment for Item 12.1 contains submissions received from community stakeholders in relation to Draft Local Planning Policy No. 19 discussed at Item 12.1. These submissions disclose information relating to the submitters which is of a personal nature.

As provided by Section 5.23(2) of the *Local Government Act 1995 (WA),* Council is permitted to close a meeting to members of the public if part of the meeting deals with the personal affairs of any person. Therefore, the material relating to that part of the meeting which is closed cannot be disclosed to the public and is marked "confidential" accordingly.

5. Where is consultation found in the resolution?

Response

The Council Resolutions at the 25 June Ordinary Meeting of Council do not provide specific directions regarding the Redcliffe Area Traffic Study. The City had commissioned the study prior to the June Ordinary Council Meeting.

5.1.2 Ms L Hollands, Redcliffe

The following question was taken on notice at the 23 July 2024 Ordinary Council Meeting. Ms Hollands was provided with a response on 14 August 2024. The response from the City is recorded accordingly:

1. Can I have a breakdown of the cost of the airfares, insurances, accommodation and meals for the delegation of six that went to Adachi which included Mayor Rossi and Cr Sekulla?

Response

The costs for the six adult delegates were airfares totalling $19,116, accommodation totalling $6,861, insurance totalling $186, and meals, taxis and other incidentals totalling $3,095.

5.1.3 Mr T Whiting, Redcliffe

The following question was taken on notice at the 23 July 2024 Ordinary Council Meeting. Mr Whiting was provided with a response on 15 August 2024. The response from the City is recorded accordingly:

1. The City of Belmont refused to listen to the residents when they objected to the closure of Brearley Avenue, are they going to listen now with regard to the volume of airport generated rat running traffic in the East Ward residential streets?

Response

The City has commissioned the Redcliffe Area Traffic Study which has a comprehensive community consultation. The independent consultant will consider community feedback and traffic data when making their recommendations. The community will have the opportunity to review the draft report recommendations and provide comment.

5.1.4 Mr M Cardozo, Redcliffe

The following question was taken on notice at the 23 July 2024 Ordinary Council Meeting. Mr Cardozo was provided with a response on 15 August 2024. The response from the City is recorded accordingly:

1. Will there be a community engagement process for the Abernethy Traffic Study to gather resident feedback, similar to the Redcliffe Traffic Study? If not, why?

Response

The Abernethy Traffic Study is focused on the intersections of Abernethy and Keane Street, and Abernethy and Gabriel Street. There is considerable traffic and crash data available to facilitate modelling of alternative intersection layouts. The draft recommendations from the independent traffic consultant will be made available for public comment prior to endorsement by Council.

5.1.5 Mr Cardozo on behalf of Belmont East Ward Connect

The following questions were taken on notice at the 23 July 2024 Ordinary Council Meeting. Mr Cardozo was provided with a response on 15 August 2024 The response from the City is recorded accordingly:

1. T3/T4 airport traffic uses Stanton to and from Great Eastern Highway because it is quicker. Given the substantial ratepayer investment in traffic experts and the expectation of transparency in the decision-making process, can we request a simple comparative table from the traffic experts showing the resultant time delay impact of each traffic model, is this something the City could request of the experts?

Response

The model assumes traffic redistribution based on road network infrastructure conditions, traffic volumes and journey times as they influence the most likely routes taken at the critical morning and afternoon peak periods. The assumptions and results will be presented in the draft report and feature in the recommendations.

4. Can the City please clarify what the phrase "until the findings of the Redcliffe Area Traffic Study are endorsed by Council" means, specifically, can the Stanton LCURS project re-commence independently and upon endorsement of the simple receipt of the findings of Redcliffe Traffic Study, prior to any public scrutiny of the findings?

Response

This means "until the findings of the Redcliffe Area Traffic Study are approved by Council at an Ordinary Council Meeting".

Given that the findings of the Redcliffe Area Traffic Study must come before Council to be endorsed before any further work is undertaken, then the answer to the second thread of the question is "no". The project cannot recommence without Council approval following the study.

5.1.6 Ms D Ransome, Ascot

The following question was taken on notice at the 23 July 2024 Ordinary Council Meeting. Ms Ransome was provided with a response on 14 August 2024. The response from the City is recorded accordingly:

1. In relation to the Great Eastern Highway Urban Corridor Strategy, it does not mention heritage landmarks, except for the Belmont Primary School which will only be eligible for a landmark site if the school is moved to make way for a larger population catchment, can you please give me a definition of what larger population catchment means?

Response

The term 'larger population catchment' is not defined within the draft Great Eastern Highway Urban Corridor Strategy. The term refers to the potential opportunity to relocate Belmont Primary School within the local area to serve a larger catchment of residents.

5.1.7 Mr J Harris, Cloverdale

The following question was taken on notice at the 23 July 2024 Ordinary Council Meeting. Mr Harris was provided with a response on 15 August 2024. The response from the City is recorded accordingly:

3. Can the City please publish the instructions provided for the Redcliffe Traffic Study, specifically what scenarios will be modelled and what questions are intended to be answered in the study process?

Response

The study brief did not include any specific scenarios for modelling. The traffic consultant will test various road network changes based on traffic and crash data, community feedback and stakeholder engagement with the Department of Planning, Lands and Heritage, Main Roads WA and Perth Airport for future land use development scenarios. The output from the report will be recommendations for short, medium and long term initiatives to improve traffic safety and amenity in the Redcliffe Area.

5.2 Questions from members of the public

6 Confirmation of Minutes/receipt of Matrix

6.1 Matrix for the Agenda Briefing Forum held 20 August 2024

Officer Recommendation
That the Matrix of the Agenda Briefing Forum held on 20 August 2024, as printed and circulated to all Elected Members, be received and noted.

6.2 Ordinary Council Meeting held 23 July 2024

Officer Recommendation
That the Minutes of the Ordinary Council Meeting held on 23 July 2024, as printed and circulated to all Elected Members, be confirmed as a true and accurate record.

7 Questions by Members on which due notice has been given (without discussion)

8 Questions by members without notice

8.1 Responses to questions taken on notice

8.2 Questions by members without notice

9 New business of an urgent nature approved by the person presiding or by decision

10 Business adjourned from a previous meeting

11 Reports of committees

11.1 Executive Committee held 22 July 2024 (circulated under separate cover)

Officer Recommendation
That the Minutes of the Executive Committee held on 22 July 2024 as previously circulated to all Councillors, be received and noted.

11.2 Standing Committee (Audit and Risk) held 29 July 2024 (circulated under separate cover)

Officer Recommendation
That the Minutes of the Standing Committee (Audit and Risk) held on 29 July 2024 as previously circulated to all Councillors, be received and noted.

12 Reports of administration

12.1 Development Application for Use Not Listed - Presbytery - Lot 100 (No. 354-360) Daly Street, Cloverdale

Voting Requirement	:	Simple Majority
Subject Index	:	115/001
Location/Property Index	:	Lot 100 (354-360) Daly Street, Cloverdale
Application Index	:	169/2024
Disclosure of any Interest	:	Nil
Previous Items	:	Nil
Applicant	:	My Homes WA Pty Ltd
Owner	:	The Roman Catholic Archbishop of Perth
Responsible Division	:	Development and Communities

Council role

Quasi-Judicial	When Council determines an application/matter that directly affect a person's right and interests. The judicial character arises from the obligation to abide by the principles of natural justice. Examples of quasi-judicial authority include local planning applications, building licences, applications for other permits/licences (eg under Health Act, Dog Act or Local Laws) and other decisions that may be appealable to the State Administrative Tribunal.

Purpose of Report

For Council to determine a development application for a 'Use Not Listed – Presbytery' at Lot 100 (354-360) Daly Street, Cloverdale.

Summary and Key Issues

- On 20 May 2024, the City received an application for a 'Use Not Listed – Presbytery' at 354-360 Daly Street, Cloverdale.
- The subject site is zoned 'Place of Public Assembly' and 'Residental R20'.

- The proposal seeks to demolish the existing dwelling on the site and replace it with a two-storey presbytery.
- The proposed presbytery contains five offices, an archive room, a boardroom, and a three car garage on the ground floor, and a four bedroom living area on the first floor.
- The application was advertised to surrounding property owners and occupiers for comment. During the advertisement period two submissions were received, one in support and one in objection. The objection did not specify reasons for opposing the proposed development.
- The Notre Dame Catholic Church is located on the site and is listed on the City of Belmont's Local Heritage List. This application does not impact the Church or its heritage listing.
- The proposed 'Use Not Listed – Presbytery' is considered consistent with the objectives of the 'Place of Public Assembly' zone.
- The development aspect of the proposal aligns with the Residential Design Codes (R-Codes) and the provisions of the Local Planning Scheme No. 15 (LPS15).
- It is recommended that the Council approve the proposal subject to conditions.

Officer Recommendation

That Council approve planning application 169/2024 as detailed in plans dated 20 May 2024 submitted by My Homes WA on behalf of The Roman Catholic Archbishop of Perth for a 'Use Not Listed – Presbytery' at Lot 100 (354-360) Daly Street, Cloverdale, with the following conditions:

Conditions:

1. Development/land use shall be in accordance with the attached approved plan(s) dated 20 May 2024 and subject to any modifications required as a consequence of any condition(s) of this approval. The endorsed plans shall not be modified or altered without the prior written approval of the City.
2. Prior to commencement of demolition works, the heritage building, including but not limited to the area marked in red on the plans dated 20 May 2024, shall be appropriately fenced and/or protected during construction of the development to the satisfaction of the City.
3. Prior to lodging an application for a building permit, a detailed landscaping plan for the subject site and/or the road verge(s) shall be

submitted for approval and implemented to the satisfaction of the City. The plan must include the landscaping of:

(a) all areas of the property visible from the street; and

(b) the street verge in compliance with the *City of Belmont Consolidated Local Law 2020*.

4. Prior to occupation or use of the development, landscaping, plants, verge treatment and/or irrigation are to be installed and thereafter maintained in accordance with the approved landscaping and irrigation plan to the satisfaction of the City. Any species which fail to establish within the first two planting seasons following implementation must be replaced in consultation with and to the satisfaction of the City.

5. Prior to occupation or use of the development, the external face of the wall built on the boundary shall be finished in either:

(a) face brick;

(b) painted render; or

(c) painted brick work;

to the satisfaction of the City.

6. Prior to occupation or use of the development, the owner/applicant shall, after having obtained written approval from the City (Infrastructure Services Clearance Application), construct a vehicle crossover in accordance with the approved plans and the City's engineering specifications to the satisfaction of the City.

7. Prior to occupation or use of the development, the redundant crossover(s) to Lot 100, as shown on the approved plans, shall be removed and the verge and kerb reinstated in accordance with the City's Technical Specifications, to the satisfaction of the City.

8. All stormwater from roofed and paved areas shall be collected and disposed of on-site in accordance with the City of Belmont's engineering requirements and design guidelines.

9. Existing turf, irrigation, verge treatment or street trees located within the verge are City of Belmont assets and as such must not be damaged, removed or interfered with during construction and development on the site.

10. No services, such as air conditioners, fire boosters, meter service boards or water heaters shall be visible from the street.

Location

The subject site is located along the south-western side of Wright Street and opposite Miles Park (refer to Figure 1 below).

Figure 1: Location map

Consultation

This application was advertised for 28 days between 1 July 2024 and 28 July 2024 in accordance with Clause 64(1)(a) of the *Planning and Development (Local Planning Schemes) Regulations 2015 (WA), Schedule 2 – Deemed Provisions for Local Planning Schemes* (the Deemed Provisions). The consultation area covers surrounding properties that are within a 200m radius of the subject site and is illustrated by Figure 2 below.

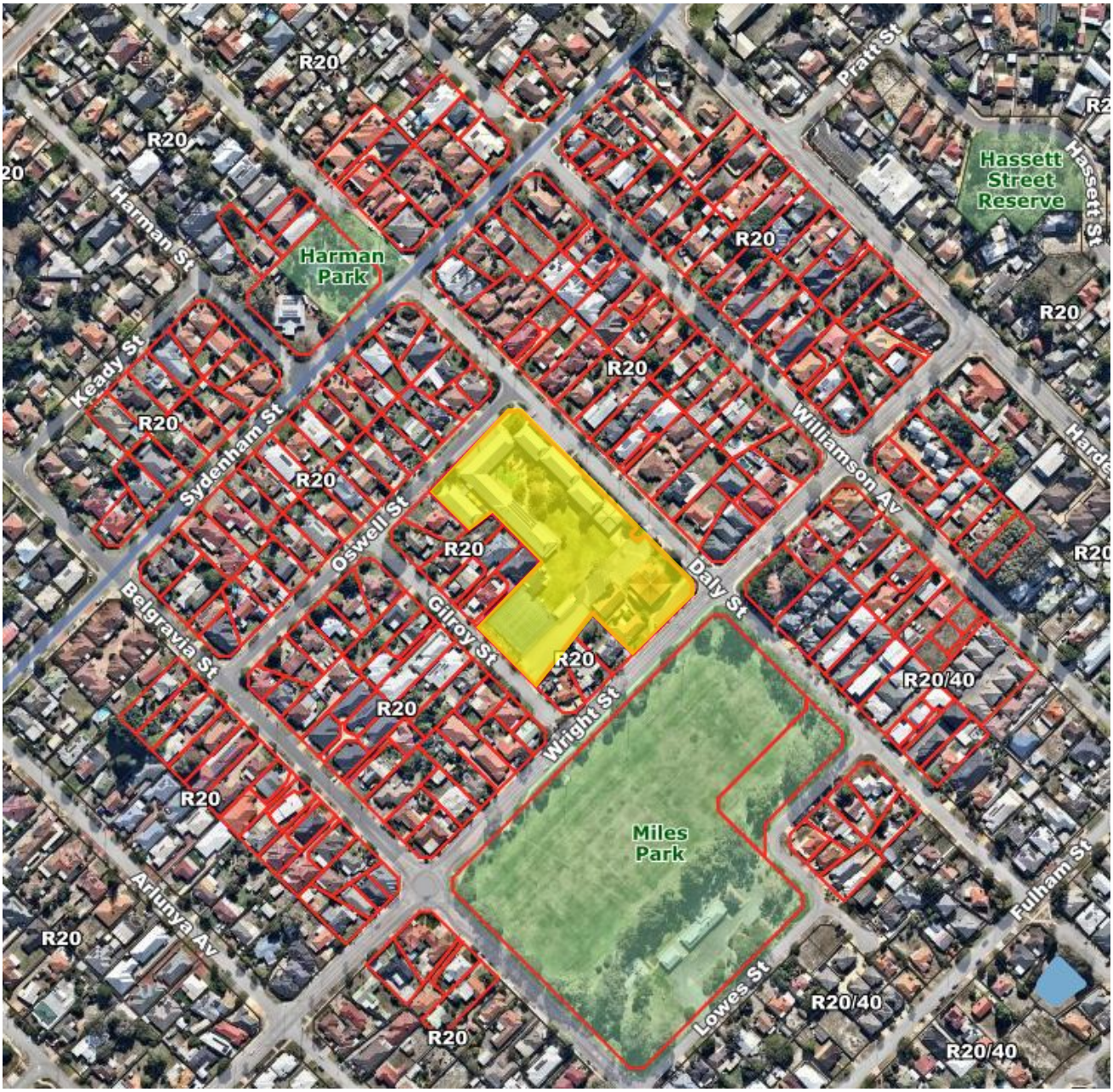

Figure 2: Consultation referral map – subject site highlighted yellow

At the conclusion of advertising, two submissions were received, one supported and one objected to the development. The objection did not provide any specific reasons or concerns.

Strategic Community Plan Implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: People
Objective 2.1: Respect, protect and celebrate our shared living histories, heritage and cultural diversity.

Key Performance Area: Place
Objective 6.1: Responsible planning and development to enhance liveability, with consideration for supporting infrastructure and services.

Key Performance Area: Performance
Objective 10.1: Deliver effective, fair and transparent leadership and governance.
Objective 11.1: Effectively inform and engage the community about local services, events and City matters.

Policy implications

Local Planning Policy No. 13: Vehicle Access for Residential Developments

Local Planning Policy No. 13 (LPP13) applies to all land where the Council may approve residential development. Local Planning Policy No. 13 stipulates that a maximum of one vehicle crossover is permitted for each 'Single House' lot. This application proposes a single crossover to service the garage of the 'Presbytery' building and therefore complies with this requirement of LPP13.

Statutory Environment

Residential Design Codes Volume 1 – Part B

As the 'Use Not Listed – Presbytery' has a residential component, the R-Codes have been used to provide guidance on aspects of this assessment that are not addressed by provisions in the LPS15.

The R-Codes provide a comprehensive basis for the guidance and control of residential development throughout Western Australia. Appendix 1 of the R-Codes defines 'Residential Development' as "development of permanent accommodation for people, and may include all dwellings, the residential component of a mixed-use development, and residential buildings proposing permanent accommodation."

The R-Codes include Deemed-to-Comply criteria and Design Principles. Applications not meeting the Deemed-to-Comply criteria must be assessed against the relevant Design Principles.

Local Planning Scheme No. 15

The subject site is zoned 'Place of Public Assembly' (shown in green colour in the Scheme Map extract below) and 'Residential R20' (shown in beige colour) under LPS15. However, the proposal is within the portions of the lot subject zoned 'Place of Public Assembly'. This is shown in blue outline in Figure 3 below.

Figure 3 – Extract of LPS15 zoning map

The objective of the 'Place of Public Assembly' zone is to:

> "allow for special places of assembly, such as halls, private schools, grounds for athletics, sports grounds with provisions for spectators, racecourses, trotting track, stadia and/or showgrounds."

The land use of 'Presbytery' is not listed in Table 1 of LPS15, so it is required to be classified as a 'use not listed' under Clause 3.4 of LPS15.

Under Clause 3.4.2 of LPS15, if a person proposes to carry out on land any use that is not specifically mentioned in the zoning table and cannot reasonably be determined as falling within the type, class or genus of activity of any other use category the local government may:

"(a) determine that the use is consistent with the objectives of the particular zone and is therefore permitted;

(b) determine that the use may be consistent with the objectives of the particular zone and thereafter follow the advertising procedures contained in Clause 64 of the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2; or

(c) determine that the use is not consistent with the objectives of the particular zone and is therefore not permitted."

Clause 4.14 sets out development standards that apply to developments proposed within the 'Place of Public Assembly' zone. These provisions are outlined below:

4.14.1 Proposals for land use and development are to demonstrate good urban design by:

A) the presentation of buildings and facades that are attractive and inviting, and which harmoniously relate with each other, and have regard to climate; and

B) the creation of spaces which encourage pedestrian movements and provide places for pedestrians to congregate.

4.14.2 Site and Development Requirements

(1) The extent of development shall be governed by the local government's requirements for car parking and landscaping determined in the light of the circumstances of any particular application.

(2) The local government, may as a conditions(s) of Development Approval, require amongst other things the integration of building layout and design with adjoining development and determine car parking layout, vehicular access and pedestrian circulation.

(3) Setback of Buildings from Site Boundaries: No part of any building shall be built upon that area of land between the street alignment and the building setback line drawn parallel thereto a distance of 15 meters within the site. In regard to any site having more than one street frontage, the minimum setback from the street alignment shall apply to the frontage of the site to the road or roads of higher category as determined by the local government and the setback from the lesser roads shall not be less than a distance of 7.5 meters.

Side or rear setbacks where a Residential land use abuts shall be a minimum of 4 meters and shall have regard to the potential impact of existing and future uses on the amenity of those residents.

(4) Pedestrian and Garden Areas: No less than 3 meters of the building setback area to the primary street frontage and 1 meter to the secondary street frontage must be set aside, developed and maintained as garden space for pedestrian use only. A landscaping and reticulation plan must be submitted to the local government for approval. The landscaping subsequently carried out shall be in accordance with the approved plan, the local government will require as a condition of Development Approval the reticulation and landscaping of the street verge.

Planning and Development (Local Planning Schemes) Regulation 2015 (WA)

Schedule 2 Part 9 Clause 67 of the *Planning and Development (Local Planning Schemes) Regulations 2015 (WA)* (the Regulations) states the matters to be considered by local government in determining a development application. In summary, the following matters are of relevance to this application:

"(a) The aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area;

(b) The requirements of orderly and proper planning;

(g) Any local planning policy for the Scheme area;

(k) The built heritage conservation of any place that is of cultural significance;

(m) The compatibility of the development with its setting, including -

(i) the compatibility of the development with the desired future character of its setting; and

(ii) the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;

(n) The amenity of the locality including the following -

(i) environmental impacts of the development;

(ii) the character of the locality;

(iii) social impacts of the development;

(p) Whether adequate provision has been made for the landscaping of the land to which the application relates and weather any trees or other vegetation on the land should be preserved;

(s) The adequacy of-

(i) the proposed means of access to and egress from the site; and

(ii) arrangements for the loading, unloading, maneuvering and parking of vehicles;

(w) The history of the site where the development is to be located;

(x) The impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;

(y) Any submissions received on the application."

City of Belmont Local Heritage List

The Notre Dame Catholic Church is listed on the City of Belmont's Local Heritage List.

The statement of significance of this site lists the Church's aesthetic, historic and social value as reasons for the heritage listing. It is classed as a 'Management Category 2 – Considerable Significance' site, which provides the following desired outcome:

- Conservation of the place is highly desirable. Any alterations or extensions should reinforce the significance of the place.
- A Heritage Assessment and Heritage Impact Statement should be undertaken before approval is given for any major redevelopment.

No other buildings on the site are subject to the heritage listing.

The materials and colors chosen for the dwelling reflect the materials and colors of the church. Refer to Attachment 12.1.2 for a schedule of materials.

Deemed Refusal

Under Clause 75 of the Deemed Provisions, the local government is taken to have refused to grant development approval if an application is not determined within 90 days from lodgment.

The deemed refusal date for this application is on 18 August 2024. It is noted that this date is prior to the time of consideration of the item at the August Ordinary Council Meeting. The applicant is aware that the proposal is being referred to the August Ordinary Council Meeting for determination.

Right of Review

Is there a right of review? ☒ Yes

The applicant/owner may make an application for review of a planning approval/planning refusal to the State Administrative Tribunal (SAT) subject to Part 14 of the *Planning and Development Act 2005 (WA)*. Applications for review must be lodged with SAT within 28 days. Further information can be obtained from the SAT website–www.sat.justice.wa.gov.au.

Background

Lodgement Date:	20 May 2024	**Use Class:**	Use Not Listed - Presbytery
Lot Area:	15,138m^2	**TPS Zoning:**	Place of Public Assembly and Residential R20
Estimated Cost of Development:	$956 300	**MRS:**	Urban

Site Description

The subject site contains the following uses:

- Notre Dame Catholic Primary School;
- Notre Dame Catholic Church;

- A Parish Centre for activies associated with the Notre Dame Catholic Church; and
- A dwelling – although this is associated with the Notre Dame Church and has been used as a 'parish house', it was approved as a dwelling.

These uses are shown in Figure 4 below.

Figure 4: Land use division of 354-360 Daly Street

Development Proposal

The key elements of the proposal are as follows:

- The demolition of the existing dwelling fronting Wright Street.
- The development of a two-storey 'presbytery', which includes:
  - Five offices, an archive room, boardroom and kitchen on the ground floor.
  - Four bedrooms (each with a dedicated ensuite), a kitchen, dining and living space on the first floor.
  - A three-car garage.

- A new 6m wide crossover.
- A 4.6m wide landscaping strip within the front setback.
- A dedicated pedestrian walkway accessing the Church and Presbytery from the Wright Street footpath.

A copy of the development plans is provided in Attachment 12.1.1, and the landscaping plan in Attachment 12.1.3.

Report

Land Use

The proposed presbytery does not fall under the 'Place of Worship' land use as no religious activities (sermons, weddings, baptisms etc) are proposed in the presbytery.

There is no land use definition in Schedule 1 of LPS15 that accounts for a building that is designed to be part office and part residence associated with a 'Place of Worship'. Accordingly, the proposal has been classed as a use not listed under Clause 3.4.2 of LPS15.

As part of the classification of the use, it is beneficial to consider its common definition. The Oxford English Dictionary defines a presbytery as:

1. "A body of Church elders and ministers, especially an administrative body representing all the local congregations of a district.
2. The house of a Roman Catholic priest."

The proposal contains both the residential and administrative functions outlined in the above definition. Therefore, it is considered that the land use of 'Presbytery' most accurately reflects the proposal.

Under Clause 3.4.2 of the LPS15 it is necessary to consider the suitability of 'Presbytery' land use against the objectives of the 'Place of Public Assembly' zone.

Local Planning Scheme No 15 outlines that that the objective of the 'Place of Public Assembly' zone is to:

> "allow for special places of assembly, such as halls, private schools, grounds for athletics, sports grounds with provisions for spectators, racecourses, trotting track, stadia and/or showgrounds."

When determining the suitability of a use not listed it is beneficial to consider nature of other uses capable of approval within the zone. In this case, it is

important to note that the 'Place of Worship' land use is as a 'D' use within the ‘Place of Public Assembly’ zone.

It is considered that the specific nature of the use of the presbytery is intrinsically linked to the broader 'Place of Worship' land use. While classified as a separate land use, it supports the residential and administrative needs of the 'Place of Worship' land use.

Based on the above, it is considered that the ‘Presbytery’ land use is consistent with the objectives of the ‘Place of Public Assembly’ zone as it operates alongside the Notre Dame Catholic Church.

Setbacks

As the area of the site subject to the proposal is zoned ‘Place of Public Assembly’, any development is to be assessed against the development requirements of Clause 4.14 of LPS15.

Table 1 below presents a comparison of the proposal against the LPS15 setback requirements.

Boundary	LPS15 Requirement	Proposed
Primary Street (Daly Street)	15m minimum	5.5m Does not comply
Side (343 Daly Street)	4m minimum	4.3m (complies) Boundary wall does not comply

Table 1: Proposed street setback, lot boundary setback and landscaping width

It is considered that the LPS15 setbacks for this zone are based on the larger scale development envisaged within the objective of the zone, such as halls, private schools, sports grounds, racecourses, trotting track, stadia and/or showgrounds.

In this case, the built form of the presbytery is aligned with a residential development. Furthermore, the proposal adjoins residential development to the south-west. Given these factors, it is appropriate to consider the proposed variations to the LPS15 street and lot boundary setbacks against the provisions of the R-Codes.

The R-Codes is an outcomes-based document that provides two pathways for development assessment and determination.

In most instances, the default and straightforward way is by satisfying the Deemed-to-Comply provisions.

Alternatively, the R-Codes acknowledges that there are circumstances where the site conditions, streetscape and design approach mean that the Deemed-to-Comply provisions cannot be met, and alternative design responses can be applied to meet the Design Principles.

Primary Street Setback

The Deemed—to-Comply provisions specifies a minimum setback of 6 meters to the Wright Street boundary. This can be reduced to 3 meters if there is open space behind the 6m setback that equals or exceeds the area of the building in front of the 6m setback (see Figure 5).

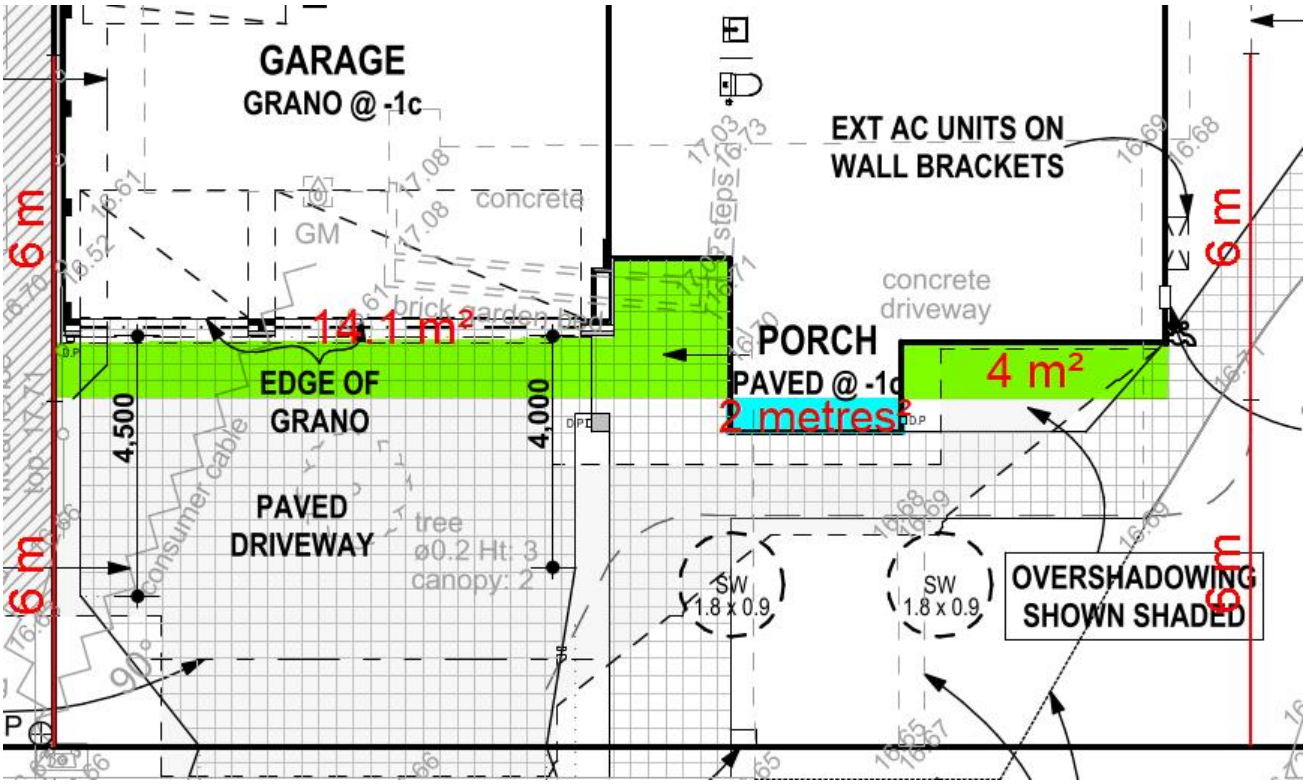

Figure 5: average primary street setback met

In this case, the proposed development is setback 5.5m from the street boundary, which satisfies the Deemed-to-Comply provisions.

In terms of broader streetscape, the northern side of Wright Street is characterized by dwellings with varying setbacks to Wright Street, as follows:

- 343 Wright Street: 7m
- 341 Wright Street: 6.8m

- 15 Gilroy Street: 6.3m
- 335 Wright Street: 9.5m
- 369 Wright Street: 3.5m
- 370 Wright Street: 7.3m.

As the primary street setbacks in the streetscape vary from 3.5m to 9.5m, the proposed 5.5m to 8.5m setback is consistent with the setbacks in the streetscape. The properties associated with assessment of these setbacks are shown in Figure 6 below.

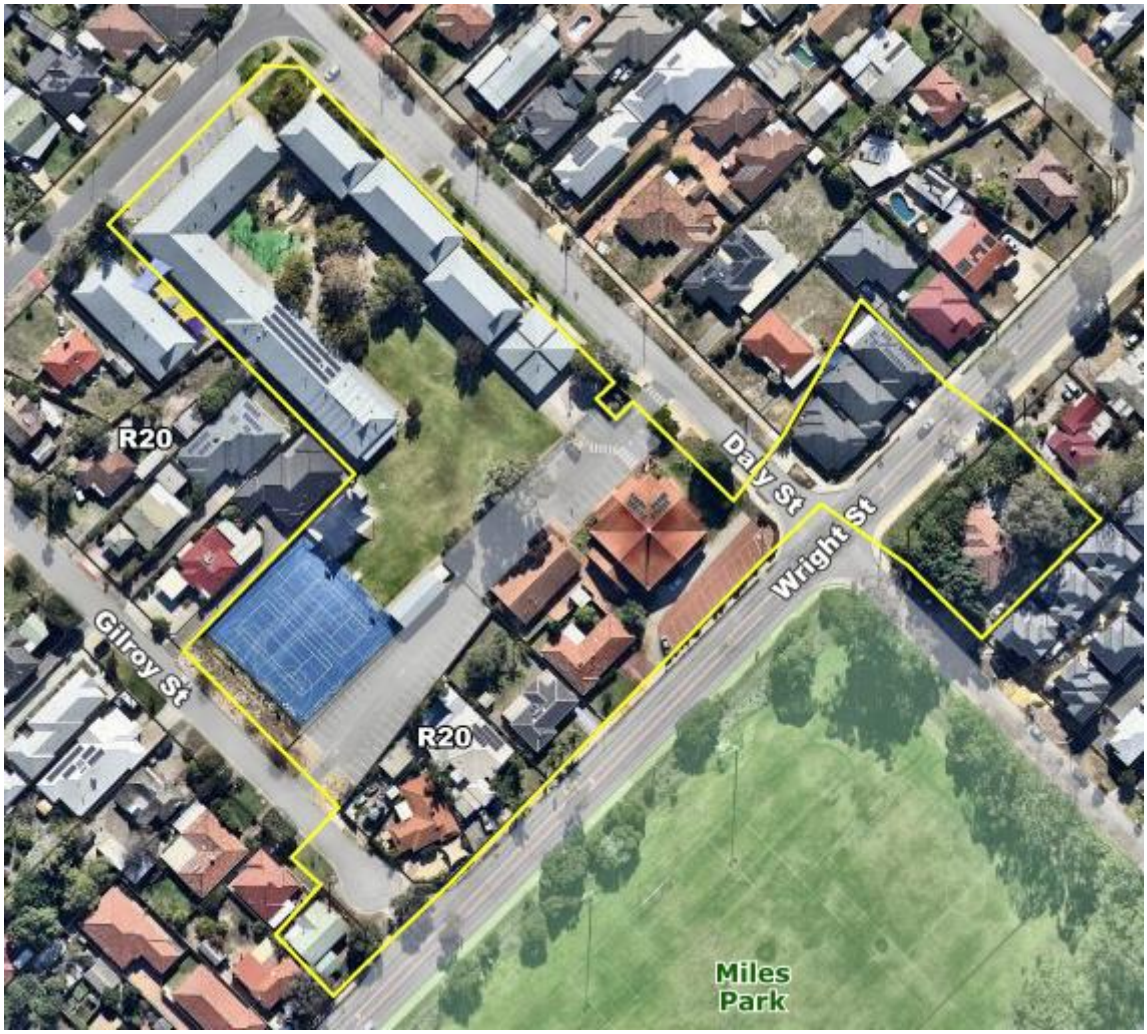

Figure 6: Aerial of subject site streetscape – bordered yellow

Given the above, the proposed street setback is considered consistent with the existing and likely future streetscape.

Side Setback

The proposed development is set back 4.3m from the south-western boundary, which satisfies Clause 4.14 of the LPS15. However, the south-western façade also includes a boundary wall. As the LPS15 does not specify any provisions for boundary walls in this zone, it is relevant to consider Clause 5.1.3 of the R-Codes for guidance.

Table 2 below presents a comparison of the proposal against the Deemed-to-Comply requirement for the boundary wall.

Boundary	R-Codes Requirement	Proposed
Side (343 Wright Street)	Height: 3.5m maximum Length: 9m maximum	Height: 3.6m maximum Length: 6m maximum Does not comply

Table 2: Proposed Boundary Wall

Figure 7 shows the extent the boundary wall exceeds the Deemed-to-Comply in red.

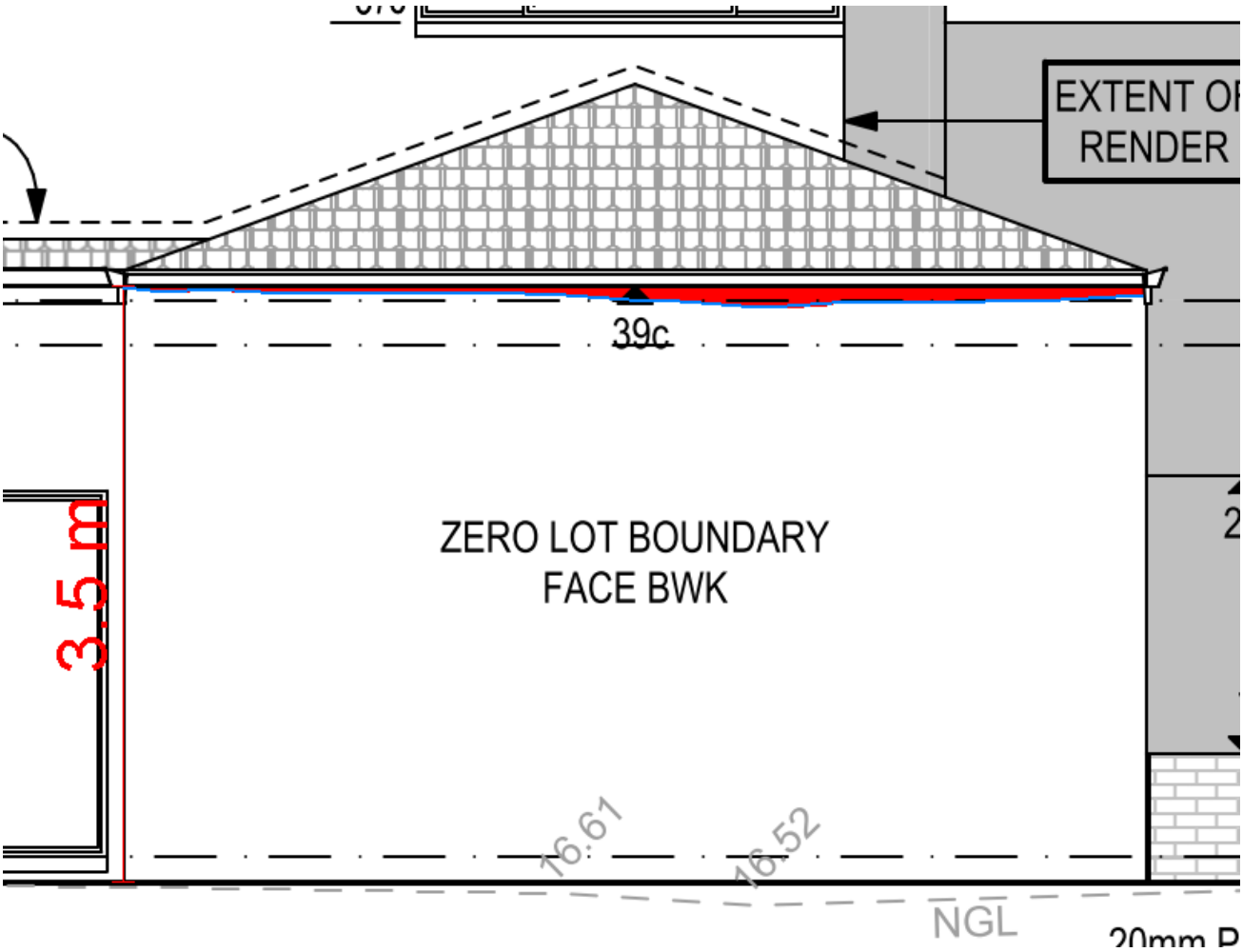

Figure 7: Boundary wall exceeding the Deemed-to-Comply (red)

The development application was advertised to the adjoining properties and no submission was received from the neighboring property (343 Wright Street). Notwithstanding, it must be assessed against the Design Principles (as listed in Table 3 below). On this basis, the following points are relevant:

Design Principles of Clause 5.1.3 – Lot Boundary Setback	**Assessment**
P3.1: Buildings set back from lot boundaries or adjacent buildings on the same lot so as to: • reduce impacts of building bulk on adjoining properties;	Apart from the boundary wall, the proposed south-western façade meets the set back requirements.This approach ensures that the dominant feature of the building is setback from the boundary to reduce the potential impacts of building bulk. The proposed boundary wall adjoins the existing garage of 343 Wright Street.

Design Principles of Clause 5.1.3 – Lot Boundary Setback	Assessment
• provide adequate sunlight and ventilation to the building and open spaces on the site and adjoining properties; and • minimize the extent of overlooking and resultant loss of privacy on adjoining properties.	Given this, the habitable rooms and dedicated outdoor living space of the adjoining property are not impacted by the boundary wall. Therefore, the proposed boundary wall does not compromise the adjoining property's access to sunlight and ventilation. In terms of visual privacy, windows and balconies on the first-floor level either have a high sill or screened to minimize overlooking onto the adjoining property.
P3.2: Buildings built up to boundaries (other than the street boundary) where this: • makes more effective use of space for enhanced privacy for the occupant(s) or outdoor living areas; • does not compromise the design principle contained in Clause 5.1.3 P3.1; • does not have any adverse impact on the amenity of the adjoining property; • ensures sunlight to major openings to habitable rooms and outdoor living areas for adjoining properties is not restricted; and • positively contributes to the prevailing or future development context and streetscape as outlined in	The proposed boundary wall enhances the privacy for the occupants by enclosing the south-western side of the property to restrict visibility from the street. As demonstrated previously, the proposed boundary wall does not compromise the amenity of the adjoining property. Furthermore, it is confirmed that the adjoining habitable rooms and outdoor living area are oriented to face the north-west and south-east. Therefore, the proposed boundary wall does not restrict sunlight to these spaces. The boundary wall is set back 7m from the primary street boundary, and is consistent with the minimum setback of 6m that is required for the residential properties along Wright Street. Therefore, the proposed development is consistent with the prevailing development context and streetscape.

Design Principles of Clause 5.1.3 – Lot Boundary Setback	Assessment
the local planning framework.	

Table 3: Lot Boundary Setback Design Principles Assessment

Car Parking

The proposed 'Presbytery' land use is not listed in the LPS15 and is not subject to a specific car parking standard. Therefore, it is necessary to evaluate parking based on the details of the proposal.

This evaluation has been based on the two primary land uses within the proposed development, which are 'Single House' and 'Office'.

A breakdown of the LPS15 and R-Codes parking requirements for the two uses are outlined in Table 4 below.

Use	Required	Proposed
SINGLE HOUSE	1 parking space	1 parking space in proposed garage.
OFFICE	*1 space for every 30m^2 of NLA or one space per employee, whichever is greater.* Two employees, one resident and one who resides offsite. 145.4sqm NLA results in a requirement for 4.8 (5) parking bay requirement	2 parking spaces in proposed garage.
	Total: 6 bays	**Total: 3 bays**

Table 4: Car parking requirements

As depicted in the table above, a breakdown of the land uses against the R-Codes and LPS15 parking provisions requires 6 bays. There is a total of 3 bays proposed but given the overall nature of this development and the

relationship between the uses, it is necessary to further analyse the proposed parking arrangement.

Residential Component

As depicted in Table 4 above, the number of bays available for the Residential component complies with the R-Codes requirements. Only one bay is required as the presbytery is 64m from a high frequency bus route (Wright Street after Gilroy Street on route 999). Although there are four bedrooms on the first floor, the applicant has confirmed that a maximum of three people will reside in the building on a permanent basis.

Office Component

Based on the LPS15 parking standards, the Office component requires five car bays, which coincides with the five offices and one archive room within the proposed building. It is noted that the basis for the LPS15 parking standard is predicated on a traditional office, which requires sufficient parking for all office staff and clients and does not assume that there is any reciprocity between the office and another land use, which is being proposed in this presbytery.

As indicated on the development plans, two of the rooms are spare offices and the applicant has also confirmed that there will be a maximum of three priests residing within the building and using the office spaces. Given this, the offices within the building function as facilities that accompany the overall function of the Place of Worship as opposed to a standalone service. Therefore, it is reasonable to allow for reciprocity of car parking between the residential and office component of the building, and the broader place of worship on the site.

It is also important to acknowledge that there are additional bays in the Notre Dame Church area of the site fronting Wright Street. These bays are shown in Figure 8 below.

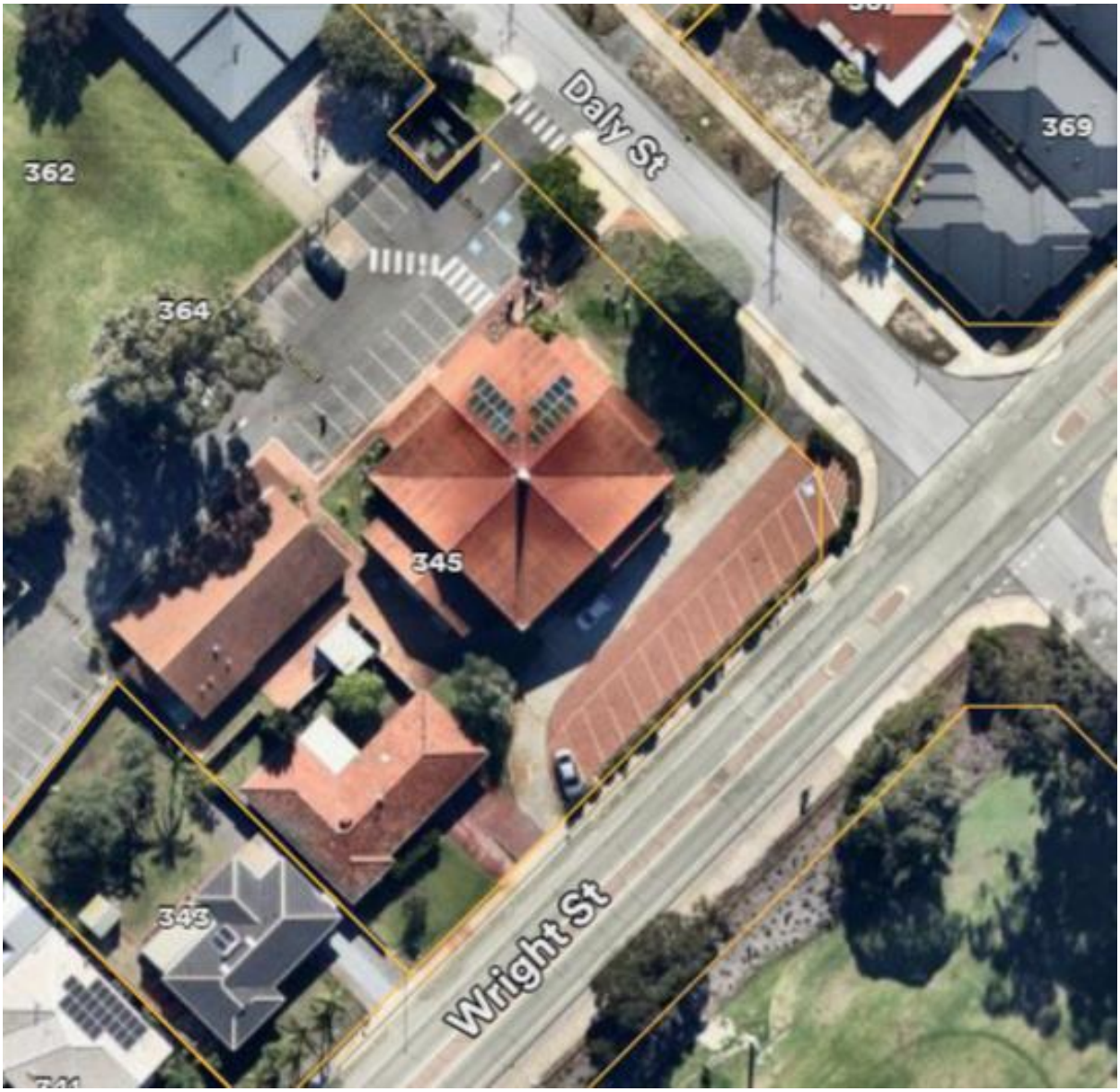

Figure 8: existing bays within the site

It is considered that the Notre Dame Catholic Church has the capacity to manage these bays and coordinate activities between the church and presbytery, ensuring that adequate car parking spaces are available.

Conclusion

It is considered that the proposed 'Use Not Listed – Presbytery' is consistent with the objectives of the 'Place of Public Assembly' zone, and the proposed works are consistent with the relevant development standards and requirements.

Financial Implications

There are no financial implications evident at this time.

Environmental Implications

There are no environmental implications associated with this report.

Social Implications

There are no social implications associated with this report.

Attachment Details

Attachment No and Title
1. Development Plans [**12.1.1** - 7 pages] 2. Schedule of Materials [**12.1.2** - 1 page] 3. Landscaping Plan [**12.1.3** - 1 page]

PRO WEST SURVEYING
Licensed and Engineering Surveying Consultants
T (08) 9242 8247 E: admin@prowestsurveying.com.au
F (08) 9242 8296 Web: www.prowestsurveying.com.au
Po Box 1463 Osborne Park DC 6916 DWG# 6684002

Feature & Contour Survey of: Lot 100, No. 354-360 Daly Street, Cloverdale

REVISION: A
SHEET: 1 OF 1

CLIENT: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH	PLAN: DP 67649	LOT AREA: 1.5138ha	SURVEY DATE: 06/10/23
BUILDER: MY HOMES WA	C/T Vol: 2826 Fol: 630		MAP REFERENCE:
BUILDER JOB # 24018	HEIGHT DATUM: AHD		COASTAL ZONE: >1KM
AUTHORITY: CITY OF BELMONT	HEIGHT CORRECTION TO AHD: NO		SEWER INFORMATION: YES

FEATURE SYMBOL LEGEND

POWER
CABLE DOME (P) · POWER POLE ○ PP
CABLE BOX CB · CONSUMER POLE ⊕ CP
POWER MARKER (P) · EXPOSED CABLES ✱ EC
LIGHT POLE ✳ LP · STAYWIRE ANCHOR ◎ SWA

WATER
WATER METER / TAP M · FIRE HYDRANT (H)
TAP · STOP VALVE SV
FLUSHING POINT FP · RETIC VALVE RV
BORE · WATER MARKER (W)

SEWERAGE
SEWER M/H (SQUARE LID) · SEWER M/H (ROUND LID)
INSPECTION SHAFT ○ IS · INSPECTION OPENING ○ IO
HOUSE CONNECTION ○ HC

TELSTRA
TELSTRA PIT · TELSTRA MANHOLE
TELSTRA MARKER

DRAINAGE
DRAIN M/H (SQUARE LID) · DRAIN M/H (ROUND LID) (D)
SIDE ENTRY PIT · DRAINAGE GRATE
COMBINED ENTRY PIT

GAS
GAS METER GM · GAS VALVE GV
GAS MARKER (G)

SURVEY MARKS
PEG FOUND PF ○ · PEG GONE PG
DRILL HOLE DH ○ · BENCH MARK
PEN MARK PM ○ · NAIL & PLATE NPL
NAIL NAIL △

MISCELLANEOUS INFO.
STREET SIGN (S) · SPOT HEIGHT 10.16
UNKNOWN SERVICE MARKER · BOLLARD ○ B
OVERHEAD POWER LINE · SEWER LINE — S —
FENCE LINE · WINDOW / OPENING W

SERVICE DETAILS

WATER: L
OVERHEAD POWER: L
U/G POWER: NS
TELSTRA: L
GAS: L
SEWER: L

SERVICE NOTES
L: LOCATED NS: NO SERVICE
A: AVAILABLE BUT NOT LOCATED
TBC: LOCATION TO BE CONFIRMED

SEWER JUNCTION DETAILS

HOUSE CONNECTION (HC) IL:	15.00
UP DISTANCE:	0.8
DEPTH TO CONNECTION:	1.22

NOTES
(1) ALL FEATURES IN GOOD CONDITION
(2) DEVELOPMENT AREA: ESTABLISHED
(3) FOR CLARITY,TREE SPREADS ARE NOT SHOWN TO SCALE
(4) (A) EASEMENT - SEWERAGE

SURVEY AREA PLAN
FOR LOCATION PLAN SEE DWG# 6684001

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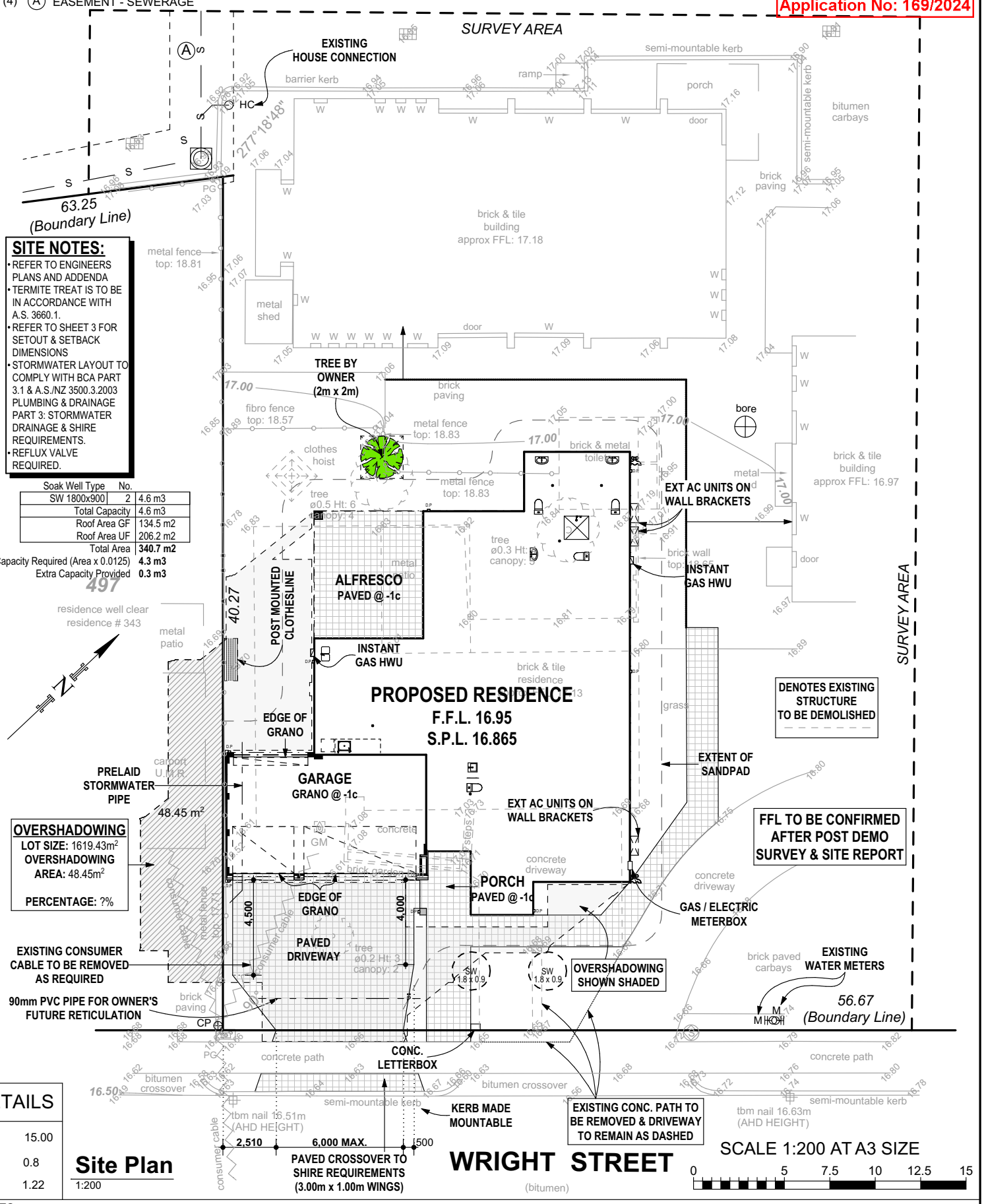
Application No: 169/2024

SITE NOTES:
- REFER TO ENGINEERS PLANS AND ADDENDA
- TERMITE TREAT IS TO BE IN ACCORDANCE WITH A.S. 3660.1.
- REFER TO SHEET 3 FOR SETOUT & SETBACK DIMENSIONS
- STORMWATER LAYOUT TO COMPLY WITH BCA PART 3.1 & A.S./NZ 3500.3.2003 PLUMBING & DRAINAGE PART 3: STORMWATER DRAINAGE & SHIRE REQUIREMENTS.
- REFLUX VALVE REQUIRED.

Soak Well Type	No.	
SW 1800x900	2	4.6 m3
Total Capacity		4.6 m3
Roof Area GF		134.5 m2
Roof Area UF		206.2 m2
Total Area		**340.7 m2**
Capacity Required (Area x 0.0125)		**4.3 m3**
Extra Capacity Provided		**0.3 m3**



Site Plan
1:200

IMPORTANT FEATURE SURVEY NOTES
1. The boundary information on this site plan is approximate only. The boundary has been positioned using a best-fit of available survey marks and fence lines. A repeg / bdy identification survey is recommended if an accurate position of features / improvements relative to the boundary is required.
2. The sewer junction on this plan has been plotted using information provided by the Water Corporation. A site inspection is required by the builder / developer in order to verify the position and depth of the sewer connection.
3. The lot dimensions shown on this feature survey plan have been taken from L.T.O survey plans. The final repegged dimensions may vary due to adjustments made during field survey.
4. All service information shown of this plan should be verified with the relevant authorities. 5. Pro West Surveying does not accept liability for any loss or damage caused by the use of this feature survey plan for any purpose.

my homes wa
WE TURN A HOUSE INTO A HOME
41 cedric st., stirling
phone - (08) 9440 9200 fax - (08) 9440 9201

House Type: CUSTOM	Job No:24018	Drawing Name: SITE PLAN	Sheet No: 1 of 18
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		Council: BELMONT	Specification: PREMIUM

THIS IS ONE OF THE DRAWINGS REFERRED TO IN THE CONTRACT

Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The home will be built to the dimensions on the working drawings within a reasonable tolerance

This plan shall remain the sole property of the builder and must not be given, lent, resold or otherwise disposed or copied without the permission in writing

VARIATIONS

REV NO.	VARIATION	DATE DRN.	BY
1	WORKING DRAWINGS	27/10/23	VN-DG
2	AMENDMENTS	13/01/24	VN-JC
3			
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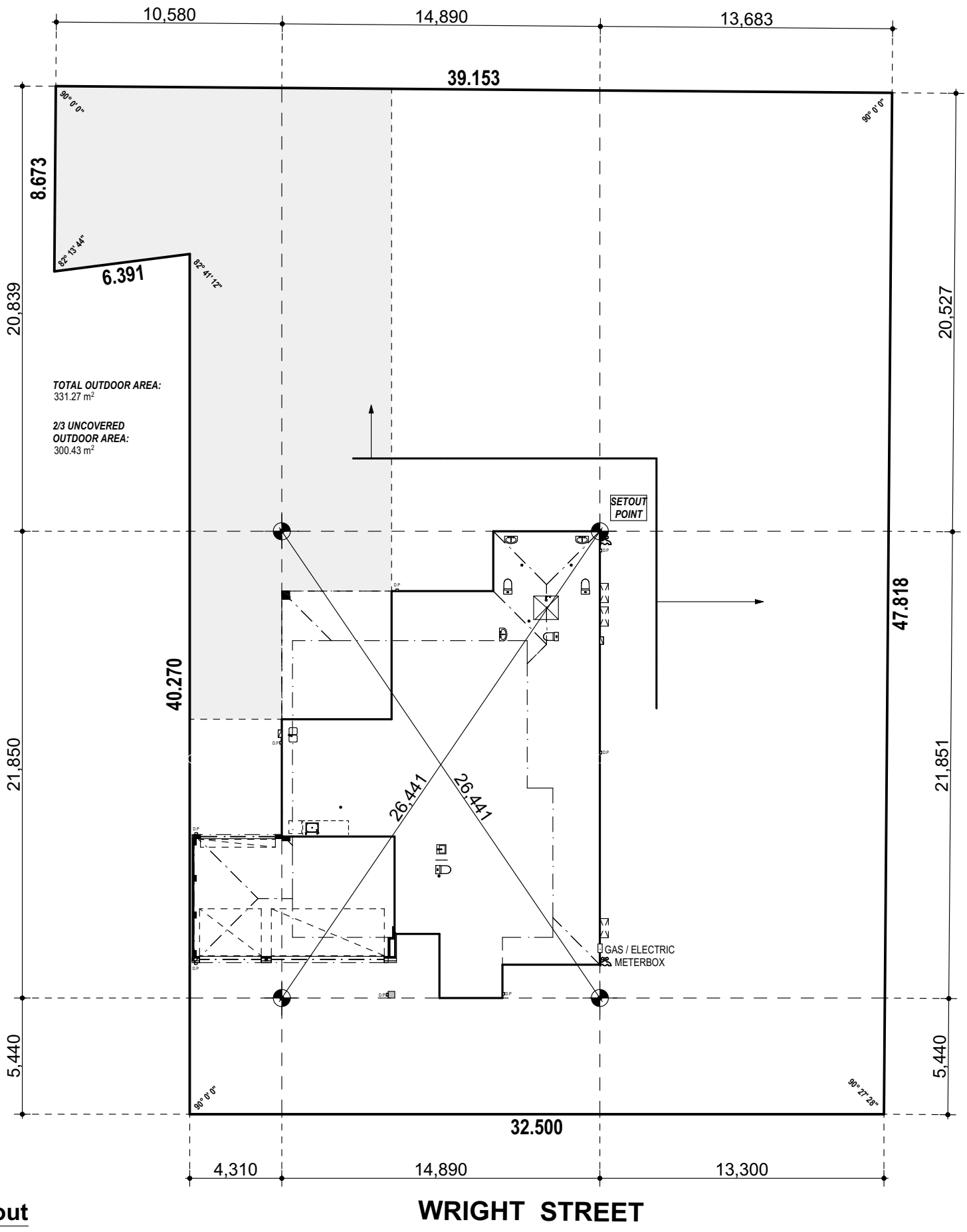
SITE COVERAGE

ZONED	
% ALLOWED	50%
SITE AREA	1,619.43m²
SITE COV. AREA	274.10m²

SITE COV. = 16.9%



Site Layout
1:200

WRIGHT STREET

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House Type: CUSTOM	Job No:24018	Drawing Name: SITE LAYOUT PLAN	Sheet No: 3 of 18
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		Council: BELMONT	Specification: PREMIUM

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Po Box 1463 Osborne Park DC 6916 DWG# 6684001

Feature & Contour Survey of: Lot 100, No. 354-360 Daly Street, Cloverdale

REVISION: A
SHEET: 1 OF 1

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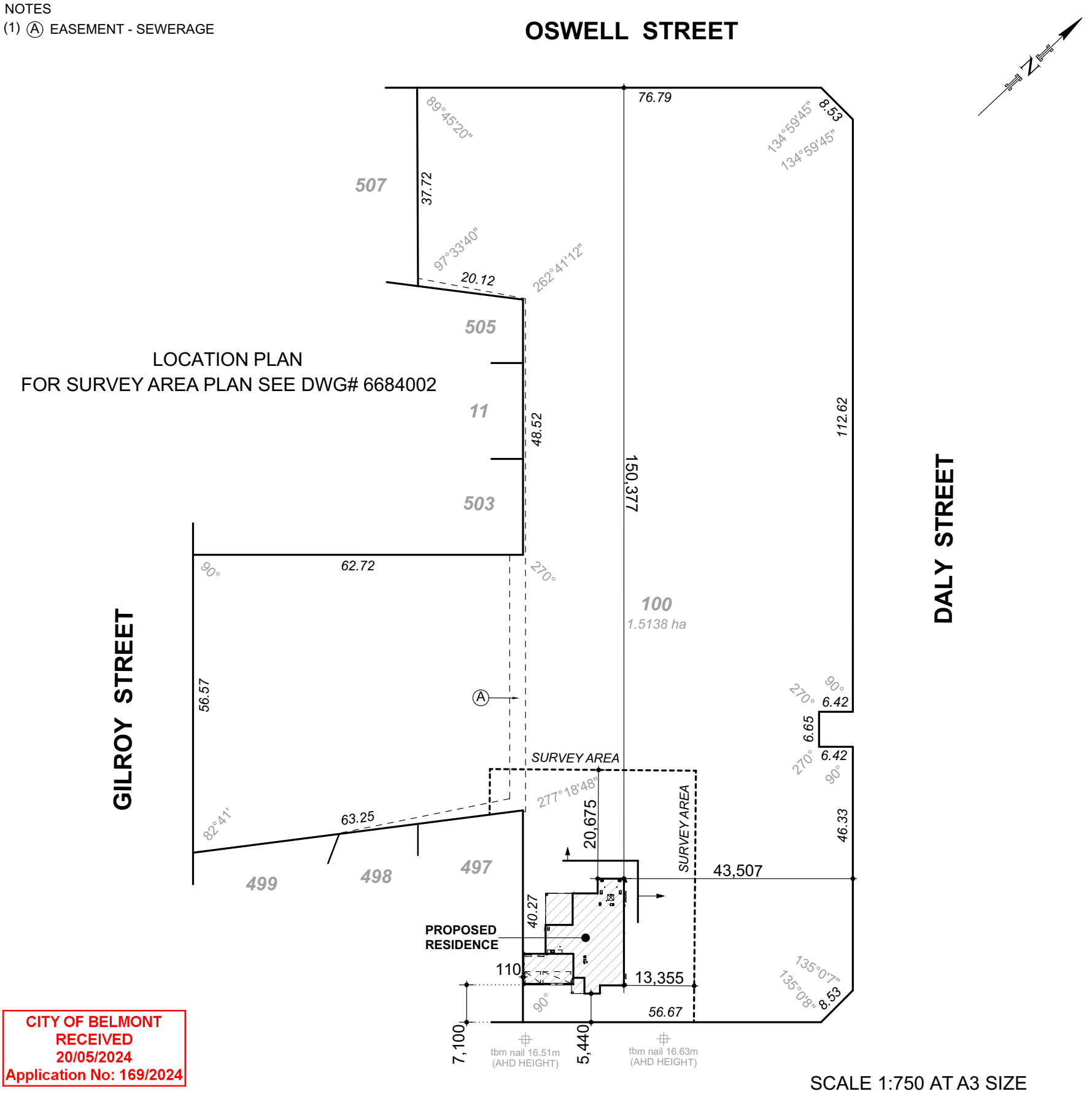
BUILDER JOB # 24018	HEIGHT DATUM: AHD		COASTAL ZONE: >1KM
AUTHORITY: CITY OF BELMONT	HEIGHT CORRECTION TO AHD: NO		SEWER INFORMATION: YES

NOTES
(1) Ⓐ EASEMENT - SEWERAGE



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Site Plan 1:750
1:750

SCALE 1:750 AT A3 SIZE
0 15 30 45 60

IMPORTANT FEATURE SURVEY NOTES

1. The boundary information on this site plan is approximate only. The boundary has been positioned using a best-fit of available survey marks and fence lines. A repeg / bdy identification survey is recommended if an accurate position of features / improvements relative to the boundary is required.
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3. The lot dimensions shown on this feature survey plan have been taken from L.T.O survey plans. The final repegged dimensions may vary due to adjustments made during field survey.
4. All service information shown of this plan should be verified with the relevant authorities. 5. Pro West Surveying does not accept liability for any loss or damage caused by the use of this feature survey plan for any purpose.

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House Type: CUSTOM	Job No:24018	Drawing Name: SITE PLAN 1:750	Sheet No: 2 of 18
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		Council: BELMONT	Specification: PREMIUM

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Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The home will be built to the dimensions on the working drawings within a reasonable tolerance

This plan shall remain the sole property of the builder and must not be given, lent, resold or otherwise disposed or copied without the permission in writing

VARIATIONS

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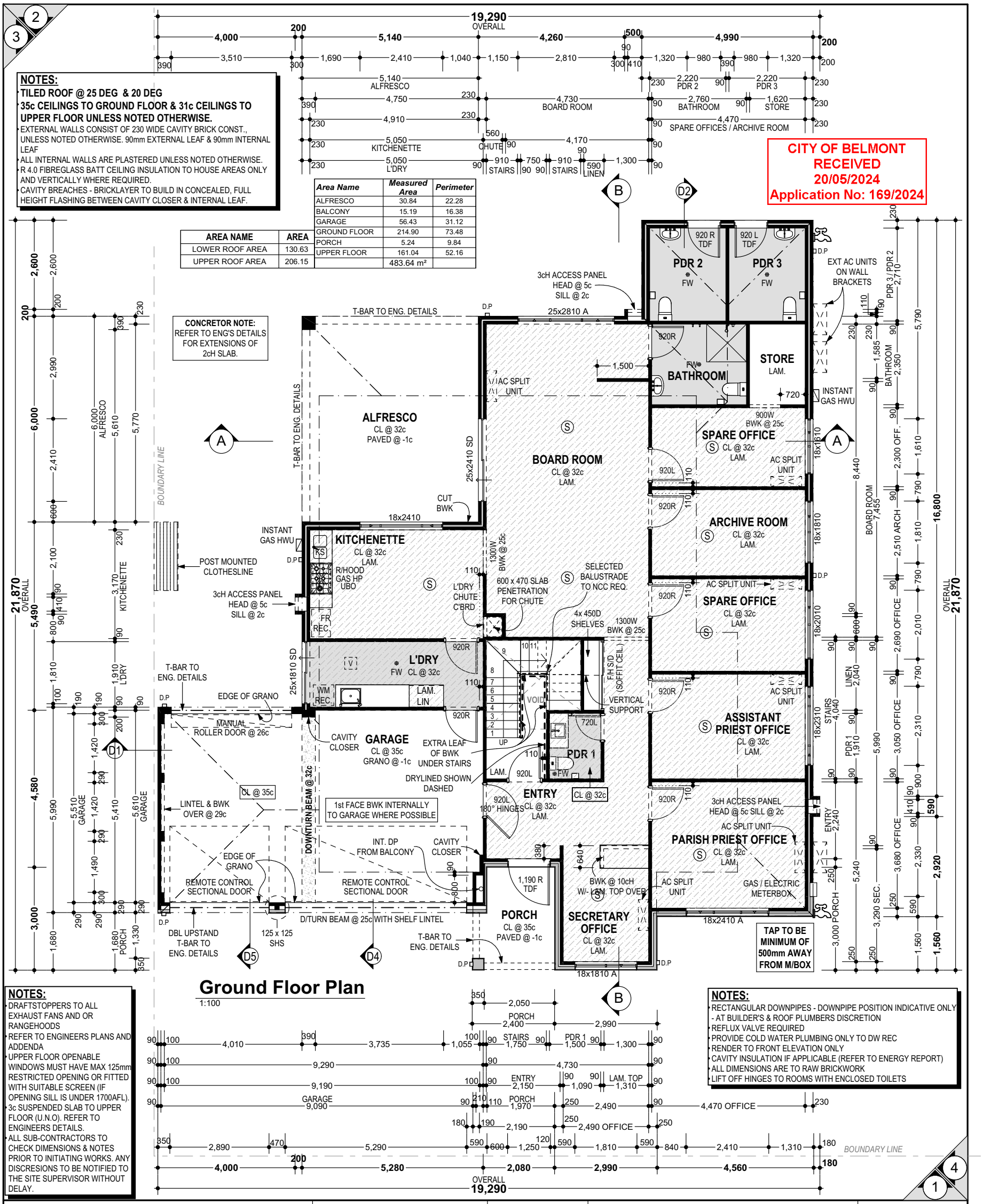

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House Type: CUSTOM	Job No:24018	Drawing Name: GROUND FLOOR PLAN	Sheet No: 4 of 18
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		Council: BELMONT	Specification: PREMIUM

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Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

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NOTES:
- **TILED ROOF @ 25 DEG & 20 DEG**
- **35c CEILINGS TO GROUND FLOOR & 31c CEILINGS TO UPPER FLOOR UNLESS NOTED OTHERWISE.**
- EXTERNAL WALLS CONSIST OF 230 WIDE CAVITY BRICK CONST., UNLESS NOTED OTHERWISE. 90mm EXTERNAL LEAF & 90mm INTERNAL LEAF
- ALL INTERNAL WALLS ARE PLASTERED UNLESS NOTED OTHERWISE.
- R 4.0 FIBREGLASS BATT CEILING INSULATION TO HOUSE AREAS ONLY AND VERTICALLY WHERE REQUIRED.
- CAVITY BREACHES - BRICKLAYER TO BUILD IN CONCEALED, FULL HEIGHT FLASHING BETWEEN CAVITY CLOSER & INTERNAL LEAF.
- DRAFTSTOPPERS TO ALL EXHAUST FANS AND OR RANGEHOODS
- REFER TO ENGINEERS PLANS AND ADDENDA
- UPPER FLOOR OPENABLE WINDOWS MUST HAVE MAX 125mm RESTRICTED OPENING OR FITTED WITH SUITABLE SCREEN (IF OPENING SILL IS UNDER 1700AFL).
- 3c SUSPENDED SLAB TO UPPER FLOOR (U.N.O). REFER TO ENGINEERS DETAILS.
- ALL SUB-CONTRACTORS TO CHECK DIMENSIONS & NOTES PRIOR TO INITIATING WORKS. ANY DISCRESIONS TO BE NOTIFIED TO THE SITE SUPERVISOR WITHOUT DELAY.

NOTES:
- RECTANGULAR DOWNPIPES - DOWNPIPE POSITION INDICATIVE ONLY - AT BUILDER'S & ROOF PLUMBERS DISCRETION
- REFLUX VALVE REQUIRED
- PROVIDE COLD WATER PLUMBING ONLY TO DW REC
- RENDER TO FRONT ELEVATION ONLY
- CAVITY INSULATION IF APPLICABLE (REFER TO ENERGY REPORT)
- ALL DIMENSIONS ARE TO RAW BRICKWORK
- LIFT OFF HINGES TO ROOMS WITH ENCLOSED TOILETS

FIXING CARPENTER NOTE:
DOORS TO BE UNDERCUT 35mm FROM SLAB SHOWN AS U

ENERGY ASSESSOR NOTE:
DOUBLE LEAF WITH CAVITY INSULATION

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20/05/2024
Application No: 169/2024

Upper Floor Plan
1:100

Area Name	Measured Area	Perimeter
ALFRESCO	30.84	22.28
BALCONY	15.19	16.38
GARAGE	56.43	31.12
GROUND FLOOR	214.90	73.48
PORCH	5.24	9.84
UPPER FLOOR	161.04	52.16
	483.64 m²	

AREA NAME	AREA
LOWER ROOF AREA	130.63
UPPER ROOF AREA	206.15

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House Type: CUSTOM	Job No:24018	Drawing Name: UPPER FLOOR PLAN	Sheet No: 5 of 18
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		Council: BELMONT	Specification: PREMIUM

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Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - Date: -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The home will be built to the dimensions on the working drawings within a reasonable tolerance

VARIATIONS

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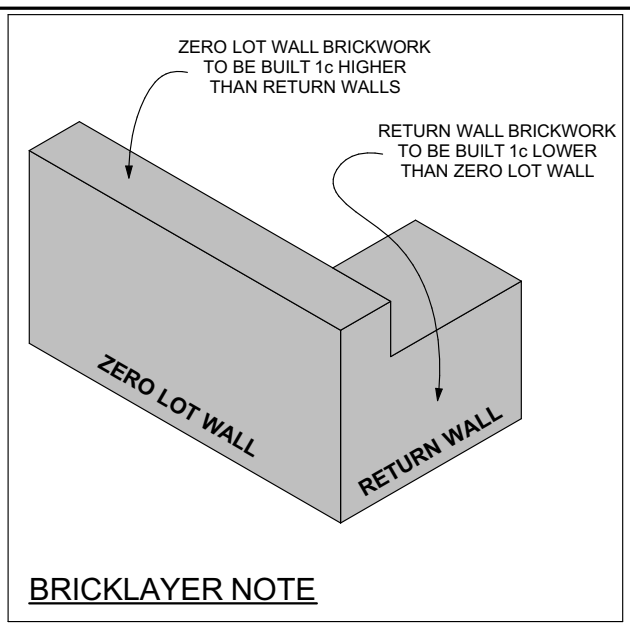


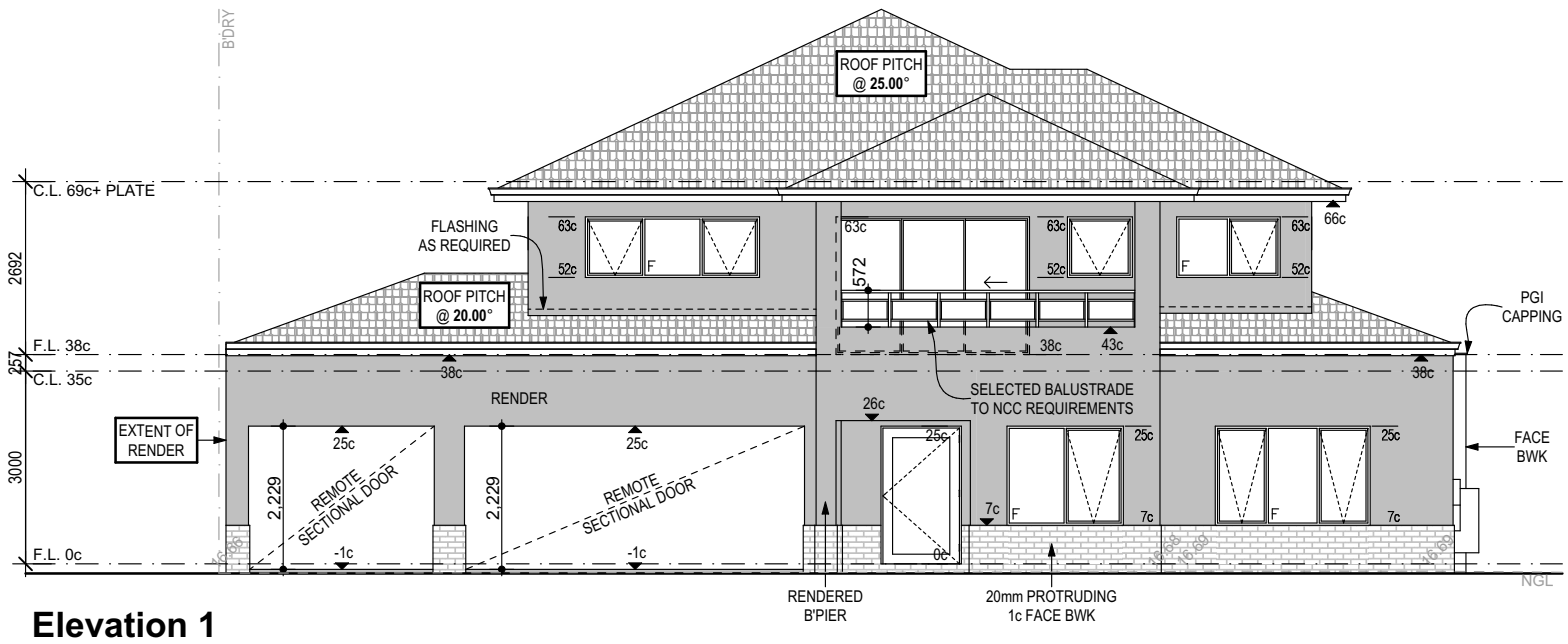
BRICKLAYER NOTE

NOTES:

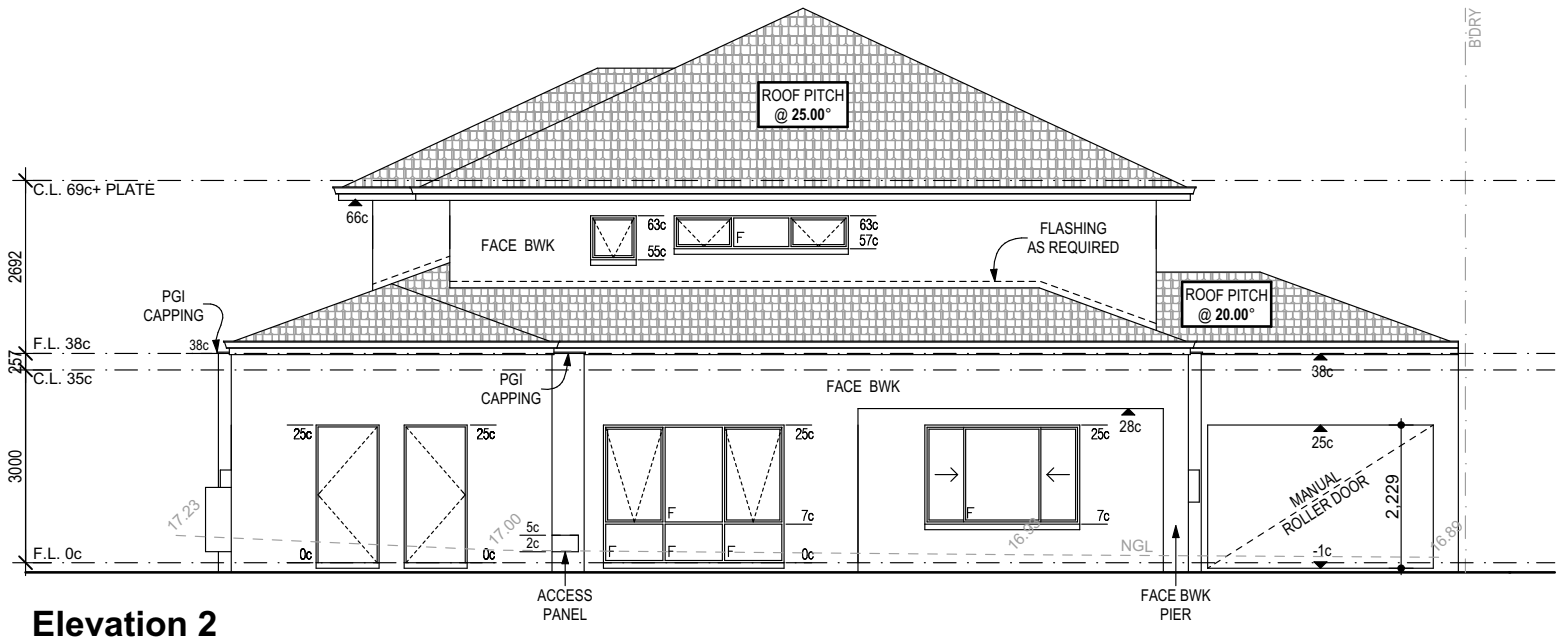
- **TILED ROOF @ 25 DEG & 20 DEG**
- **35c CEILINGS TO GROUND FLOOR & 31c CEILINGS TO UPPER FLOOR UNLESS NOTED OTHERWISE.**
- EXTERNAL WALLS CONSIST OF 230 WIDE CAVITY BRICK CONST., UNLESS NOTED OTHERWISE. 90mm EXTERNAL LEAF & 90mm INTERNAL LEAF
- ALL INTERNAL WALLS ARE PLASTERED UNLESS NOTED OTHERWISE.
- R 4.0 FIBREGLASS BATT CEILING INSULATION TO HOUSE AREAS ONLY AND VERTICALLY WHERE REQUIRED.
- CAVITY BREACHES - BRICKLAYER TO BUILD IN CONCEALED, FULL HEIGHT FLASHING BETWEEN CAVITY CLOSER & INTERNAL LEAF.
- DRAFTSTOPPERS TO ALL EXHAUST FANS AND OR RANGEHOODS
- REFER TO ENGINEERS PLANS AND ADDENDA
- UPPER FLOOR OPENABLE WINDOWS MUST HAVE MAX 125mm RESTRICTED OPENING OR FITTED WITH SUITABLE SCREEN (IF OPENING SILL IS UNDER 1700AFL).
- 3c SUSPENDED SLAB TO UPPER FLOOR (U.N.O). REFER TO ENGINEERS DETAILS.
- ALL SUB-CONTRACTORS TO CHECK DIMENSIONS & NOTES PRIOR TO INITIATING WORKS. ANY DISCRESIONS TO BE NOTIFIED TO THE SITE SUPERVISOR WITHOUT DELAY.

NOTES:

- RECTANGULAR DOWNPIPES - DOWNPIPE POSITION INDICATIVE ONLY - AT BUILDER'S & ROOF PLUMBERS DISCRETION
- REFLUX VALVE REQUIRED
- PROVIDE COLD WATER PLUMBING ONLY TO DW REC
- RENDER TO FRONT ELEVATION ONLY
- CAVITY INSULATION IF APPLICABLE (REFER TO ENERGY REPORT)
- ALL DIMENSIONS ARE TO RAW BRICKWORK
- LIFT OFF HINGES TO ROOMS WITH ENCLOSED TOILETS



Elevation 1
1:100



Elevation 2
1:100

my homes wa
WE TURN A HOUSE INTO A HOME
41 cedric st., stirling
phone - (08) 9440 9200 fax - (08) 9440 9201

House Type: CUSTOM	**Job No:24018**	**Drawing Name: ELEVATIONS 1**	**Sheet No: 6 of 18**
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		**Council: BELMONT**	**Specification: PREMIUM**

THIS IS ONE OF THE DRAWINGS REFERRED TO IN THE CONTRACT

Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH **Date:** -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - **Date:** -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The home will be built to the dimensions on the working drawings within a reasonable tolerance

This plan shall remain the sole property of the builder and must not be given, lent, resold or otherwise disposed or copied without the permission in writing

VARIATIONS

REV NO.	VARIATION	DATE DRN.	BY
1	WORKING DRAWINGS	27/10/23	VN-DG
2	AMENDMENTS	13/01/24	VN-JC
3			
4			
5			
6			
7			
8			
9			
10			

BRICKLAYER NOTE

NOTES:

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- **35c CEILINGS TO GROUND FLOOR & 31c CEILINGS TO UPPER FLOOR UNLESS NOTED OTHERWISE.**
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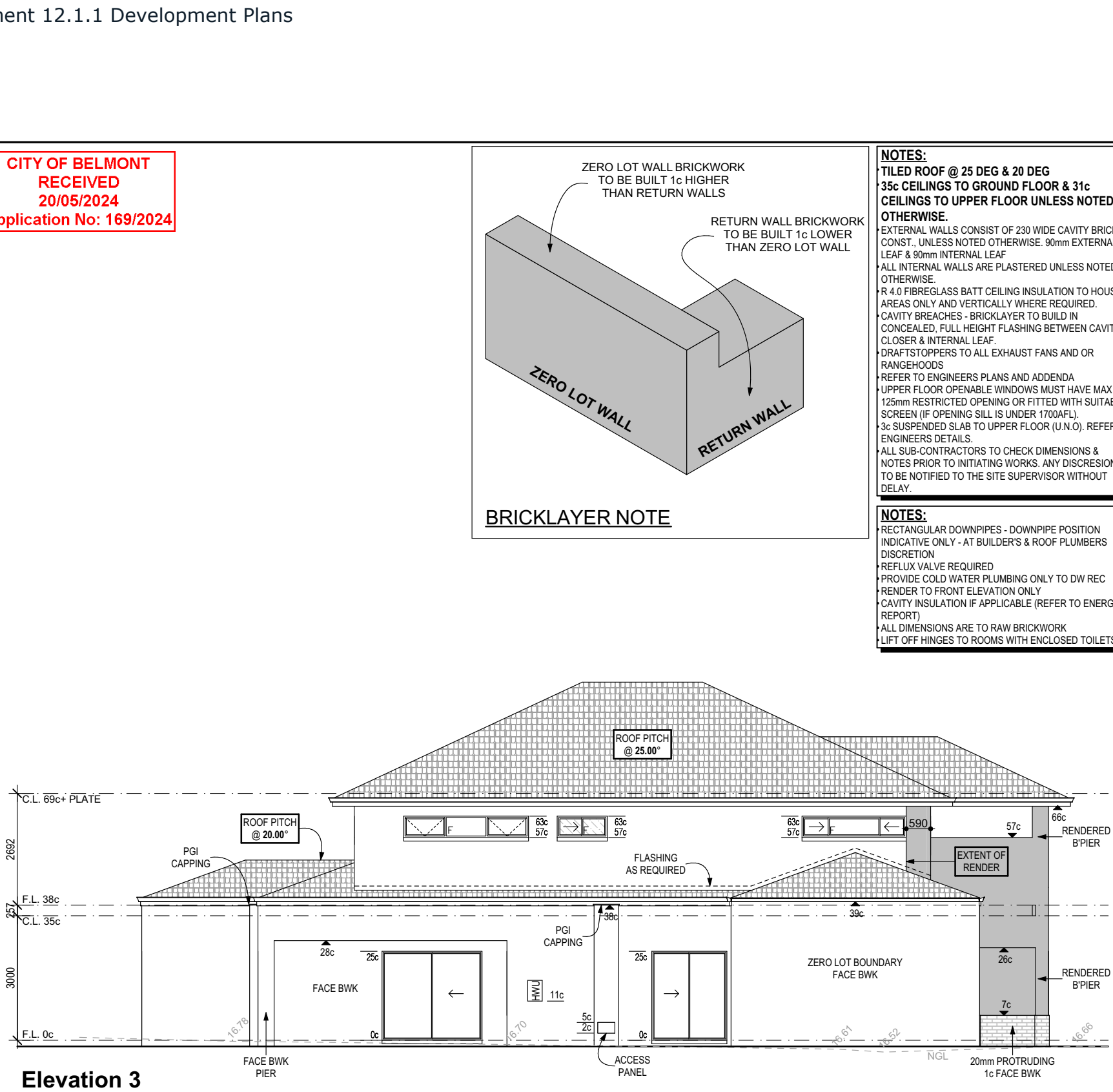
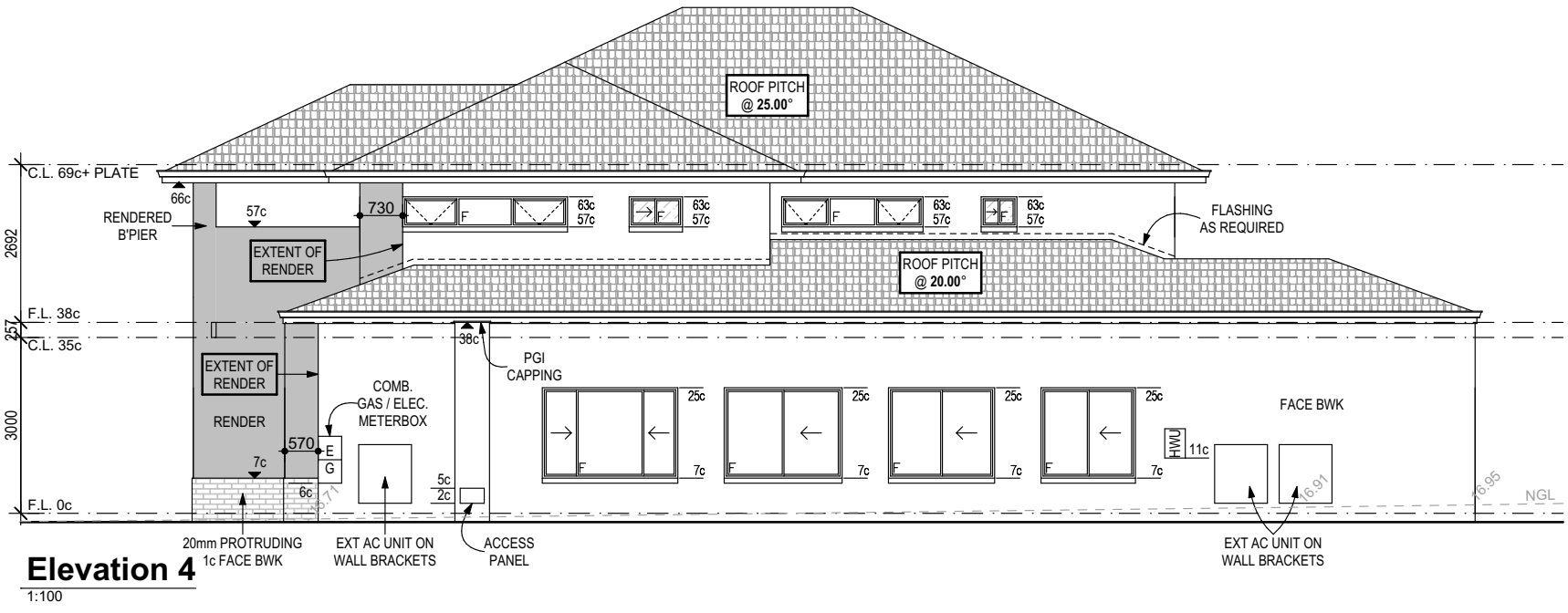


Elevation 3

1:100



Elevation 4

1:100

my homes wa
WE TURN A HOUSE INTO A HOME
41 cedric st., stirling
phone - (08) 9440 9200 fax - (08) 9440 9201

House Type: CUSTOM	**Job No:24018**	**Drawing Name: ELEVATIONS 2**	**Sheet No: 7 of 18**
Lot Address: LOT 100 (#354 - 360) DALY STREET, CLOVERDALE		**Council: BELMONT**	**Specification: PREMIUM**

THIS IS ONE OF THE DRAWINGS REFERRED TO IN THE CONTRACT

Client Name: THE ROMAN CATHOLIC ARCHBISHOP OF PERTH / CLOVERDALE PARISH **Date:** -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Client Name: - **Date:** -------/-------/-------
Signature: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The home will be built to the dimensions on the working drawings within a reasonable tolerance

VARIATIONS

REV NO.	VARIATION	DATE DRN.	BY
1	WORKING DRAWINGS	27/10/23	VN-DG
2	AMENDMENTS	13/01/24	VN-JC
3			
4			
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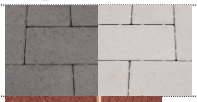
9			
10			

my homes wa
WE TURN A HOUSE INTO A HOME

MATERIALS & COLOUR SCHEDULE

Client:	The Roman Catholic Archbishop of Perth of Victoria Square	Job Number:	24018
Site:	Lot 100 (354-360) Daly Street CLOVERDALE WA 6105	Council:	Belmont

ITEM	MATERIAL	RANGE / PROFILE	COLOUR	SAMPLE
ROOF COVER	Concrete Tiles	Bristile Roofing – Designer	Sunset Duo	
GUTTER'S	Colorbond Steel	Slotted Streamline	Surfmist	
FASCIAS	Colorbond Steel	NA	Surfmist	
MAIN RENDER	Texture Coat	Dulux	Stone White	
FEATURE FACE BRICKS	NA	Classic – 1 course	Burnished Red	
ENTRY DOOR	Timber	Corinthian – Urban	Surfmist	
GARAGE DOORS	Colorbond	Steel Line- Flatline	Surfmist	
WINDOW FRAMES	Aluminium	NA	Monument Matt	
BALUSTRADING	Aluminium & Glass	Star Metal – Vista	Monument Matt	
PAVING	Brick	Midland Brick – Pavestone	Charcoal with Silver border	
MAIN FACE BRICKS	NA	Manor – 2 course	Roebuck	

If you require further information, please contact us at:		
My Homes WA	(08) 9440 9200	admin@myhomeswa.com.au

CITY OF BELMONT
RECEIVED
20/05/2024
Application No: 169/2024

LANDSCAPE PLAN

PLANT SCHEDULE

Image	Qty	Species	Size
	10	Raphiolepsis snow maiden	17cm
	20	Westringia fruiticosa	5lt
	12	Dianella cassa blue	5lt
	10	Callistemon little john	17cm
	12	Hibbertia scandens	1/cm
	20	Juniper conferta	17cm

Brickpaved

Natural Mulch

LANDSCAPE WORKS

-75mm of soil conditioner applied to all garden areas prior to planting.
- All garden areas to be irrigated via Netafim dripper system.
- Application of Pine Bark to complete all garden areas. 75mm in depth.
- Irrigation controllers to mains power. Location TBC
- Installation by qualified water wise technician.

Proposed Landscape Plan

The Roman Catholic Archbishop of Perth

CLOVERDALE PARISH

Site Address

Lot 100 (#354-360) Daly Street
Cloverdale
(City of Belmont)

Scale - 1:100 @A3 Date - 14/05/2024

JOB No - 24018

N

WILDFLORA LANDSCAPES EST. 1975

0418 919 525

12.2 Draft Golden Gateway Local Structure Plan

Voting Requirement	:	Simple Majority
Subject Index	:	116/113
Location/Property Index	:	Various Lots
Application Index	:	N/A
Disclosure of any Interest	:	N/A
Previous Items	:	28 August 2018 Ordinary Council Meeting Item 12.1 26 February 2019 Ordinary Council Meeting Item 12.6 23 June 2020 Ordinary Council Meeting Item 12.2
Applicant	:	City of Belmont
Owner	:	State Government, Local Government and Various Private Landowners
Responsible Division	:	Development and Communities

Council role

Legislative	Includes adopting local laws, local planning schemes and policies.

Purpose of report

For Council to consider the updated draft Golden Gateway Local Structure Plan (LSP) for the purpose of public consultation.

Summary and key issues

- The draft Golden Gateway LSP has been prepared to coordinate the future subdivision, zoning and development of a portion of land in Ascot.
- Council considered the draft LSP following public advertising at the 23 June 2020 Ordinary Council Meeting (OCM). At this meeting, Council resolved to investigate and make modifications to the draft LSP.
- Following investigations, the draft LSP has been revised, with key modifications relating to:
  - The road network;

  - The Central Belmont Main Drain and public open space;
  - Built form controls that consider current and future development feasibility; and
  - The designation of Perth Racing landholdings as subject to a separate planning process.
- It is recommended that Council support the modifications and re-advertising of the draft Golden Gateway LSP.

Officer Recommendation
That Council endorses the modified draft Golden Gateway Local Structure Plan for public advertising in accordance with *Schedule 2, Part 4, Clause 18 and Clause 19(2) of the Planning and Development (Local Planning Schemes) Regulations 2015 (WA)*.

Location

The draft Golden Gateway LSP encompasses land generally bound by Great Eastern Highway, the Swan River, Resolution Drive (north), Grandstand Road (north), the south-eastern boundary of Ascot Racecourse, Carbine Street and Hardey Road as reflected in Figure 1 below.

Although the Belmont Trust Land is not subject to development controls under the LSP, it is included within the precinct due to its potential for providing public open space and connectivity to the Swan River.

Figure 1: Golden Gateway Local Structure Plan area (outlined red)

Consultation

The draft Golden Gateway LSP was advertised in October 2019. Following advertising and consideration of submissions, Council resolved to investigate and make modifications to the draft LSP and supporting reports and readvertise these documents.

The *Planning and Development (Local Planning Schemes) Regulations 2015 (WA)* requires a local government to advertise a structure plan for 42 days by publishing:

- The proposed structure plan;
- A notice of the proposed structure plan; and
- Any accompanying material in relation to the proposed structure plan.

Additionally, the local government may advertise a structure plan by notifying affected owners and occupiers and erecting signs on the land.

Should Council endorse the modified LSP for advertising, it will be advertised by:

- Sending letters to landowners and occupiers within and surrounding the precinct, including all properties in Ascot Waters and the Residential and Stables area.
- Sending letters to Government Agencies.
- Sending letters to those who previously lodged a submission.
- Placing a notice in the Perth Now Newspaper.
- Displaying a notice and information on the City's website and the Belmont Connect webpage.

It should be noted that the *Planning and Development (Local Planning Schemes) Regulations 2015 (WA)* stipulate that a local government cannot advertise modifications more than once without approval from the Western Australian Planning Commission (WAPC). Therefore, this will be the final opportunity to advertise the LSP without the need to seek WAPC approval.

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: Place
Outcome: 6. Sustainable population growth with responsible urban planning.

Key Performance Area: Performance
Outcome: 11. A happy, well informed and engaged community.

Policy implications

There are no policy implications associated with this report.

Statutory environment

Strategic Planning Framework

Perth and Peel @ 3.5 Million

The State's 'Perth and Peel @ 3.5 Million' impacts upon the statutory direction for the City.

The Perth and Peel region will need to accommodate significant population growth by 2050 with an additional 1.5 million people requiring approximately 800,000 new homes. The 'Perth and Peel @ 3.5 million' strategic planning framework requires 47% of this growth to be delivered through infill

developments. It identifies that the City of Belmont population will increase from 37,360 to 60,260 people by 2050 and to accommodate that increase an additional 10,410 dwellings will be required.

Perth and Peel @ 3.5 Million promotes the concept of 'urban corridors' as a way of achieving integrated land use and transport outcomes. Great Eastern Highway is identified as an 'urban corridor' and abuts the Golden Gateway LSP area. The framework suggests that land around urban corridors is appropriate for increased residential densities and mixed land uses.

City of Belmont Local Planning Strategy

The City of Belmont Local Planning Strategy (2011) is the strategic planning document that broadly sets out the long-term planning direction for the City. The Strategy also informed the preparation of Local Planning Scheme No. 15 (LPS 15). The key objectives of the Local Planning Strategy and its supporting sub-strategies as relevant to the Golden Gateway precinct are as follows:

- Enhance the north-west entrance to the City.
- Encourage landmark development.
- Produce a Structure Plan and Implementation Plan for the locality.
- Utilise the development process to rationalise and improve traffic access to commercial properties along Great Eastern Highway.
- Provide more pedestrian crossing points along Great Eastern Highway.
- Provide for higher density residential development along Great Eastern Highway, in addition to mixed use, landmark buildings that create an entry statement and a high standard of urban amenity.
- Acknowledge that Ascot Racecourse and the Swan River are 'strategic tourism sites' of State significance to benefit future tourism development.
- Recognise the importance of the river for transport, commerce, tourism and leisure as well as its conservation values.

Draft Great Eastern Highway Urban Corridor Strategy

The Strategy establishes a 'vision' for the Great Eastern Highway corridor and proposes a series of implementation strategies to deliver this. It identifies four precincts along Great Eastern Highway and provides guidance on their development. Precinct 2 includes the section of Great Eastern Highway between Belmont Avenue and Hardey Road, of which the northern side of the highway falls within the Golden Gateway precinct.

The Strategy identifies this area as an 'activity node', which is envisioned to be developed as a creative hub comprising a mixture of commercial uses, civic spaces, offices, professional and technical service uses. Cafes and restaurants are also envisaged to emerge as the local workforce grows and will also be supported by higher density residential development.

Council endorsed modifications to and re-advertising of the draft Great Eastern Highway Urban Corridor Strategy at the 26 September 2023 OCM. The document was advertised from 27 June 2024 until 26 July 2024.

The draft Golden Gateway LSP and the draft Great Eastern Highway Urban Corridor Strategy will be coordinated to ensure both documents present a consistent direction for future development.

City of Belmont Activity Centre Planning Strategy

The Activity Centre Planning Strategy (ACPS) has been prepared to guide the future planning and coordination of activity centres within the City of Belmont. The ACPS identifies a future local centre within the Golden Gateway precinct, which includes a portion of Perth Racing's land.

Statutory Planning Framework

Metropolitan Region Scheme

Under the Metropolitan Region Scheme (MRS), the area is primarily zoned 'Urban', with a portion of land abutting the Swan River reserved for 'Parks and Recreation' and located within the Swan River Development Control Area. Great Eastern Highway, which abuts the precinct, is reserved as a 'Primary Regional Road' under the MRS and is controlled by Main Roads Western Australia (MRWA).

Planning and Development Act 2005 (WA)

Part 10, Division 3, Section 153 of the *Planning and Development Act 2005 (WA)* provides for the Commission to impose conditions as part of a subdivision approval for four lots or more which requires:

- A portion of land to be set aside for parks, recreation grounds or open space.
- A landowner to make a payment to the local government in lieu of providing public open space.

Section 154 of the Act requires money received by a local government to be paid into a separate reserve account established and maintained under the *Local Government Act 1995 (WA).* The Act requires this money to be applied:

- For the purchase of land for parks, recreation grounds or open spaces by the local government in the vicinity of which it was received.
- In repaying any loans raised by the local government for the purchase of such land.
- With the approval of the Minister for the improvement or development as parks, recreation grounds or open spaces vested in or administered by the local government for those purposes.

Planning and Development (Local Planning Schemes) Regulations 2015 (WA)

Part 4, Schedule 2 – Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015 (WA)* (the Regulations) outlines the procedure for the preparation, advertising and consideration of a structure plan. The key requirements under Part 4 of the Regulations are as follows:

- The local government must advertise a structure plan for at least 42 days unless otherwise approved by the WAPC.
- Within 60 days from the last day for making submissions, the local government must consider all submissions made on the proposed structure plan and prepare a report for the WAPC which includes the following:
  - A list of the submissions considered by the local government;
  - Any comments by the local government in respect of those submissions;
  - A schedule of any proposed modifications to address issues raised in the submissions;
  - The local government's assessment of the proposal based on appropriate planning principles; and
  - A recommendation by the local government on whether the proposed structure plan should be approved by the WAPC.
- If the WAPC is not given a report on a proposed structure plan they may make a decision on the proposed structure plan in the absence of a report. In making a decision, the WAPC may request technical advice or further information from the local government and if the local government fails to provide this, the WAPC may obtain the information themselves. If

the WAPC incur any costs during this process, they may seek to recover these from the local government.

- The local government may advertise any modifications proposed to the structure plan to address issues raised by submissions; however it cannot advertise modifications on more than one occasion without approval from the WAPC.
- On receipt of a report on a proposed structure plan from the local government, the WAPC must within 120 days, consider the plan and determine whether to approve the structure plan, require the structure plan to be modified or refuse the structure plan.
- The WAPC may direct the local government to readvertise the structure plan where it considers that major modifications have been made; however, it cannot direct the local government to readvertise the structure plan on more than one occasion.

Local Planning Scheme No. 15

Private landholdings within the precinct are predominantly zoned 'Mixed Use' under LPS 15, with parcels of Perth Racing land zoned 'Place of Public Assembly'. In addition, the open drain abutting Resolution Drive is reserved as 'Parks and Recreation' and various parcels of Crown land and road reserves are reserved as 'Local Roads' under LPS 15. Figure 2 illustrates the existing zoning of the precinct.

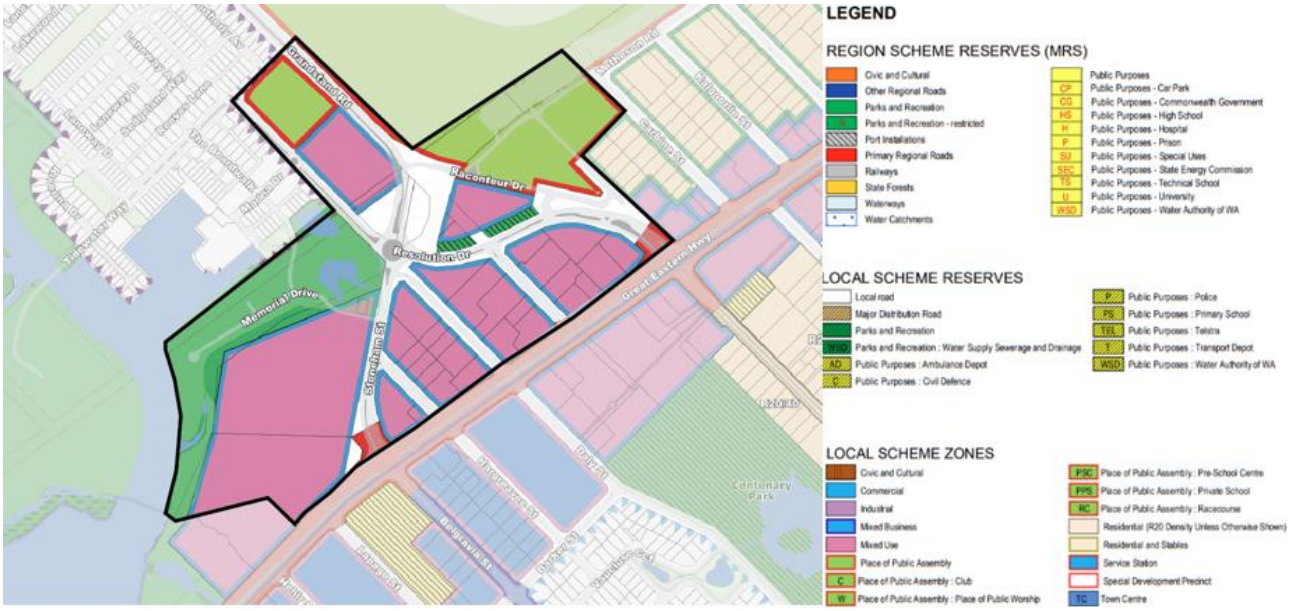


Figure 2: Extract of Scheme map

State Planning Policy 7.3 – Residential Design Codes

The Residential Design Codes (R-Codes) establish built form controls for all residential development within Western Australia and are used in the assessment of residential development and subdivision proposals. Volume 1 of the R-Codes establishes standards for single houses, grouped dwellings, and multiple dwellings up to R60. Volume 2 of the R-Codes specifically relates to multiple dwelling developments at the R80 code and above.

Liveable Neighbourhoods

Liveable Neighbourhoods is an operational policy that guides planning in greenfield and large urban infill areas. It provides guidance on the design of movement networks, activity centres, subdivision design and public open space provision.

Liveable Neighbourhoods typically requires a minimum contribution of 10% of the gross subdivisible area to be given up free of cost for public open space. However, in the case of mixed-use development, there is no minimum requirement for the provision of public open space. Instead, Liveable Neighbourhoods outlines that public open space contribution is to be determined by the WAPC on a case-by-case basis having regard to:

- The amount of mixed uses proposed and the potential number of residents;
- The amount of public open space available in 300m of the mixed-use area;
- The proportion of the mixed-use area likely to be used for non-residential purposes; and
- The level of innovation and quality of the resultant urban form in neighbourhood and town centres.

Background

Golden Gateway Precinct

In 2008, the Golden Gateway precinct was identified as a key strategic area due to its prominent position on Great Eastern Highway and at the north-western 'gateway' of the City of Belmont. It was recognised that there was significant potential for high quality mixed commercial and residential development in the location, however existing site access constraints and land fragmentation made it apparent that coordinated planning was required in the form of a structure plan.

Draft Golden Gateway Local Structure Plan

The draft Golden Gateway LSP was prepared to address the following:

- The proposed zoning, reservation and density coding of land within the precinct, and prescribes the suitability of certain land uses.
- Built form controls including plot ratio, minimum and maximum building height, setbacks and car parking requirements.
- The provision of public open space and public realm improvements.
- The identification of a road hierarchy and movement network for vehicles, pedestrians and cyclists, as well as the consideration of street design and traffic management.
- Strategies for the management and treatment of stormwater runoff within the precinct.
- The identification of infrastructure and servicing requirements for the redevelopment of the precinct.
- Requirements to facilitate implementation of the draft LSP.

Council resolved to advertise the draft structure plan at the 26 February 2019 OCM.

At the 23 June 2020 OCM, Council resolved to investigate various matters and undertake a number of modifications prior to readvertising. Council's resolution is contained as Attachment 12.2.8. A table of Council's requested investigations/modifications to the draft Structure Plan and the corresponding officer comment is contained as Attachment 12.2.9.

The following attachments are associated with this report:

- A copy of the updated LSP is included as Attachment 12.2.1.
- Attachment 12.2.2 through 12.2.6 include the technical appendices.
- Attachment 12.2.7 contains a copy of the 23 June 2020 OCM minutes.

Report

The revised draft LSP contains the following key modifications:

- The designation of Perth Racing landholdings as subject to a separate planning process;
- The road network;

- Built form controls that consider current and future development feasibility; and
- The Central Belmont Main Drain and public open space.

These matters are discussed in further detail below.

Area to which the Structure Plan Applies

The 'core' of the Golden Gateway precinct contains land parcels of fragmented ownership. The remainder of the precinct encompasses the Ascot Kilns site and Belmont Trust Land, as well as several land parcels owned by Perth Racing. These areas will be further discussed below.

Perth Racing Landholdings

Perth Racing are seeking to progress a planning framework for their landholdings to guide future development. This includes several of their lots located within the Golden Gateway precinct, as outlined in Figure 3.

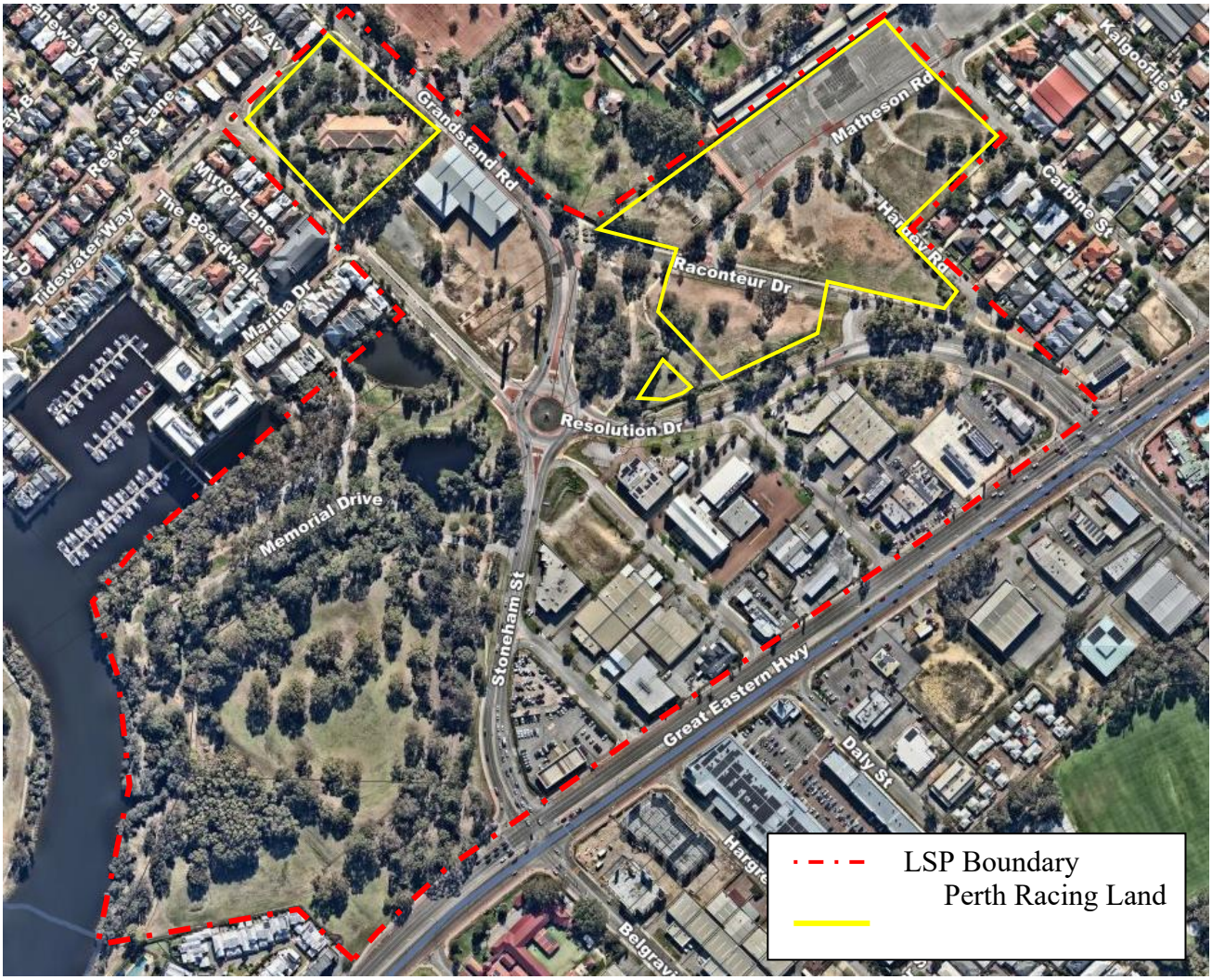


Figure 3: Perth Racing land subject to separate planning process

Following discussions with Perth Racing and the Department of Planning Lands and Heritage (DPLH), it is deemed appropriate to designate Perth Racing's land within the Golden Gateway precinct for further detailed planning. This approach allows Perth Racing to conduct their own planning while enabling the LSP to progress. Retaining Perth Racing's land within the broader LSP boundary ensures that future planning for both areas is coordinated holistically. Various modifications have been made to the document, including updates to Plan 2 – Precinct Plan, the Building Height Plan, the Precinct Development Table, and textual revisions throughout to account for this.

Belmont Trust Land

The Belmont Trust Land is subject to a Declaration of Trust which requires the land to be provided for public enjoyment and recreation.

In the June 2020 report to Council, officers noted the following regarding the Belmont Trust Land:

- The future use/development of the land for public enjoyment and recreation would have implications for the wider Golden Gateway precinct, such as public open space, access and traffic. It would be appropriate to consider these matters holistically rather than in isolation, which could be achieved by way of a later amendment to the LSP.
- The land provides a connection between the Swan River, the Golden Gateway precinct and the wider area.

To provide further clarification regarding the Belmont Trust Land, Council resolved to:

(a) Replace references to the Belmont Trust Land with Belmont Charitable Trust Land.

(b) Include text within the draft Local Structure Plan that explains that the Belmont Trust Land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties.

These modifications have been incorporated into the document.

The relationship between the Belmont Trust Land and public open space within the Golden Gateway precinct will be further detailed in the Public Open Space and Central Belmont Main Drain heading of the report.

Ascot Kilns

At the 23 June 2020 OCM, Council resolved to amend all plans within the draft LSP to identify the Kilns site as being owned by the State Government. Council also resolved to stipulate that the Ascot Kilns site requires a Local Development Plan and a minimum 10% public open space area. These modifications have been made to the document.

Road Network

The draft LSP originally proposed the following changes to the road network:

- Realigning Resolution Drive.
- Converting the existing roundabout at Stoneham Street, Grandstand Road and Resolution Drive to traffic signals.

- Proposing a new roundabout at the connection of Resolution Drive, Grandstand Road and Stoneham Street.
- Realigning Grandstand Road through private property to connect to Daly Street.

A comparison of the existing road network against the original proposal is shown in Figure 4 below.

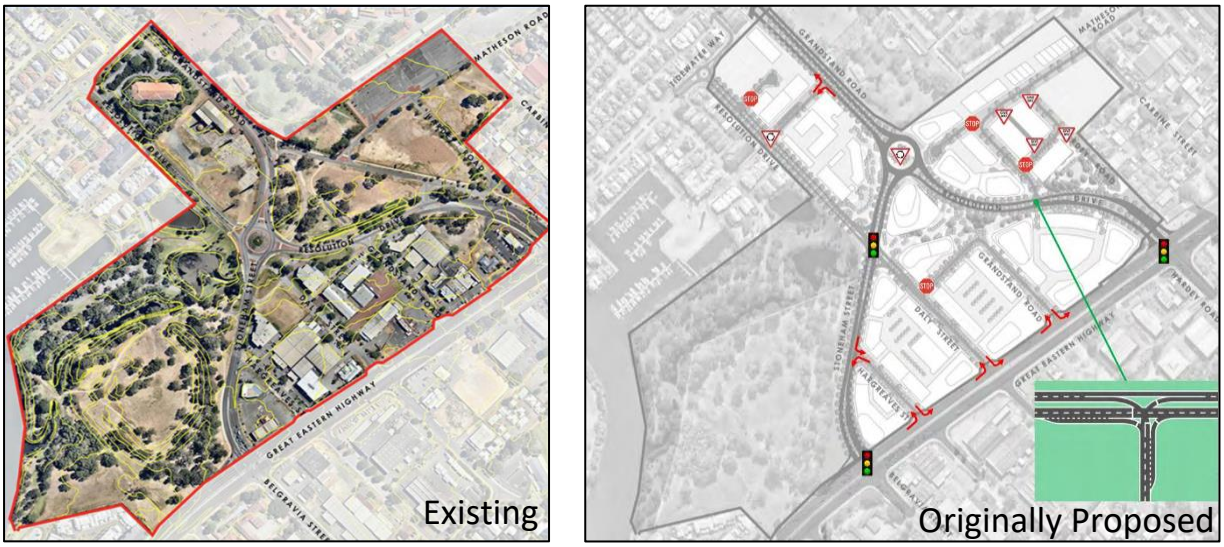


Figure 4: Existing and originally proposed road network

Following public advertising of the draft LSP, Council resolved at the 23 June 2020 OCM to require the following:

- Explore an alternative route for Grandstand Road to avoid traversing through private property.
- Investigate an alternative treatment for the intersection of Resolution Drive, Grandstand Road and Stoneham Street. This was due to MRWA not supporting the traffic signals.
- Reflect Matheson Road as being subject to further planning and investigation at a later date.
- Request Perth Racing keep the gate providing access between Raconteur Drive and Matheson Road shut into the future.

Various alternative road network options have been explored to address the above matters. This has resulted in the following:

- Grandstand Road is no longer proposed to run through private property and will instead remain in its existing location.

- Traffic lights are no longer proposed at the intersection of Resolution Drive, Grandstand Road and Stoneham Street. This results in the previously proposed roundabout at the intersection being removed.
- Access to Perth Racing's land, including Matheson Road, will be further investigated by Perth Racing as part of planning for their landholdings. In the meantime, gates providing access between Raconteur Drive and Matheson Road will remain shut.
- Resolution Drive will be retained in its current alignment to ensure appropriate permeability through the precinct.
- Daly Street will be closed and configured into a cul-de-sac (refer to Figure 5) to address the hazardous intersection of Daly Street and Stoneham Street, which is close to the roundabout. This change aligns with the MRWA vehicle access strategy for this section of Great Eastern Highway.

Figure 5: Amended/proposed road network

An amended Movement and Access Strategy evaluates the performance of current and proposed movement networks during weekday peak hours under various land use scenarios. In summary, by 2041, the draft structure plan predicts a minor decrease in road network performance at the intersections of Great Eastern Highway and Resolution Drive/Stoneham Street. However, modelling shows that these intersections will exceed capacity regardless of the Golden Gateway development. Thus, the reduced performance is not solely due

to the precinct's redevelopment but is also significantly attributed to regional growth.

Ultimately, the responsibility for monitoring traffic flows and associated queuing for Great Eastern Highway and undertaking improvements to address issues to improve performance rests with MRWA.

Development Feasibility

The draft LSP originally proposed a maximum building height of 15 storeys along Great Eastern Highway and 10 storeys for all other land bound by Resolution Drive, Stoneham Street, and Great Eastern Highway as reflected in Figure 6 below.

Figure 6: Original building heights

At the 23 June 2020 OCM, Council resolved to reduce building heights to nine storeys along Great Eastern Highway and six storeys for all other land bound by Resolution Drive, Stoneham Street, and Great Eastern Highway.

At the September 2023 OCM, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate building scales to ensure these align with current market conditions and future trends. These investigations were undertaken, and the key findings are as follows:

- Feasibility is currently severely impacted by inflated construction costs and builder capacity constraints.

- As a result, the viability of apartment projects depends heavily on an increase in property values.
- Although construction costs continue to rise, market values are not increasing at the same rate.
- Sites with higher density and building height provisions are likely to be feasible sooner.
- In the absence of viable development controls, there is a risk that proposals will be submitted without a residential component, or developers will pursue land uses that do not align with the objectives of the precinct. Examples of this include 'Service Station', 'Warehouse (self-storage facilities)' and 'Fast Food/Takeaway Outlet'.
- Considering these factors, heights of 10 and 15 storeys and plot ratios of 3:1 and 5:1 respectively are recommended. These controls were supported by input from a property and economic consultant engaged by the City. A copy of the consultant's report is contained as a confidential attachment (Attachment 12.2.10) as it contains commercially sensitive information.

  These controls are more likely to facilitate desirable land uses that incorporate a residential component.

The above heights are proposed by the draft LSP are shown in Figure 7.

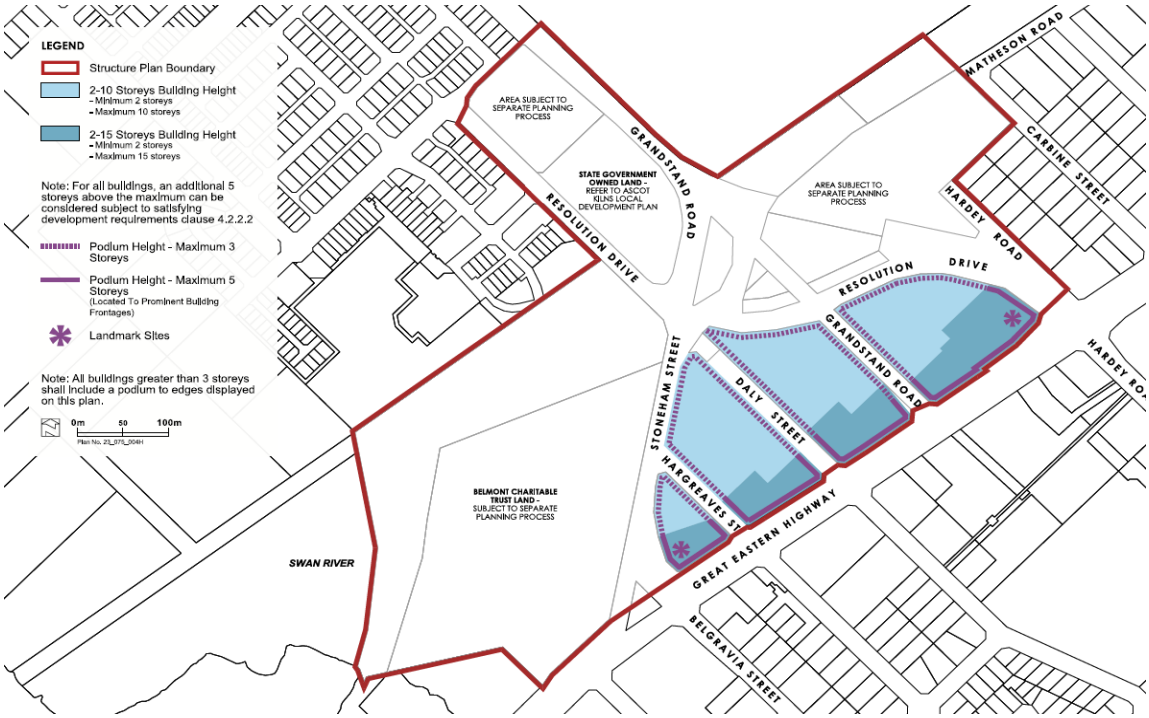


Figure 7: Updated Building Height Plan

To enhance the delivery of a high-amenity and sustainable precinct, building heights can be increased from 10 to 15 storeys and from 15 to 20 storeys respectively if the following criteria are met:

- An area of publicly accessible private open space;
- All windows double glazed;
- Provision of an additional tree on-site above what is required by State Planning Policy 7.3 Volume 2 – Apartment Design Code. The tree must be a native species with a pot size of between 100L – 200L;
- Provision of conduits and capacity within the electrical distribution system and metering or future provision of electric car charging for each unit within the development;
- Provision of a minimum of two electric vehicle charging bays within the development
- Provision for shared sustainable transport measures for the development that may include the electric bikes, scooters and vehicle/s;
- Achieving a Nationwide House Energy Rating Scheme (NatHERS) star rating of a minimum of one star above the current energy efficiency requirements of the Building Codes of Australia for the relevant class of building. The energy efficiency rating for the dwelling shall be certified by a suitably qualified and accredited energy assessor using accredited software and shall be provided at the development application stage; and
- Installation of a photovoltaic solar panel system that can provide the equivalent of at least 1Kw energy per dwelling.

Similar measures are used by other local governments and are contained within strategic planning documents.

Currently, there are no specified building height limits under LPS 15 for the Mixed Use zone, which makes up the dominant portion of land within the precinct. Introducing the proposed heights through the LSP provides the community and developers with further certainty regarding future development within the precinct. The proposed building heights balance development feasibility with appropriate built form outcomes.

Public Open Space and Central Belmont Main Drain

Public open space within the precinct was originally proposed to be achieved through the piping of the Central Belmont Main Drain and Resolution Drive realignment. A portion of public open space was also proposed on Perth

Racing's land adjacent to Hardey Road. This is shown in Figure 8 and provided 6,974m^2 of public open space within the precinct.

Figure 8: Original public open space layout

In regard to public open space and the Central Belmont Main Drain, the following is relevant:

- The piping of the Central Belmont Main Drain was premised on a Water Corporation report from 2009 that proposed the drain be piped to improve safety.
- More recently, the Department of Biodiversity, Conservation and Attractions and Water Corporation both have concerns with the piping as they consider this would not maintain or improve ecological values of the drain.
- There is currently not enough land on either side of the drain to convert it into a living stream, meaning that the drain must remain in its existing configuration.
- Resolution Drive is required to remain in its existing configuration eliminating the opportunity for public open space.
- The area adjacent to Hardey Road is owned by Perth Racing and is not designated by the draft LSP as public open space Given this, Perth

Racing may designate this land as public open space as part of the planning for their landholdings.

Considering the above points, alternative public open space opportunities have been explored for the precinct. This has led to the identification of the redundant Daly Street road reserve, providing 525m^2 of public open space (see Figure 9). This area of public open space provides a connection to the Belmont Trust Land and adjacent Swan River foreshore.

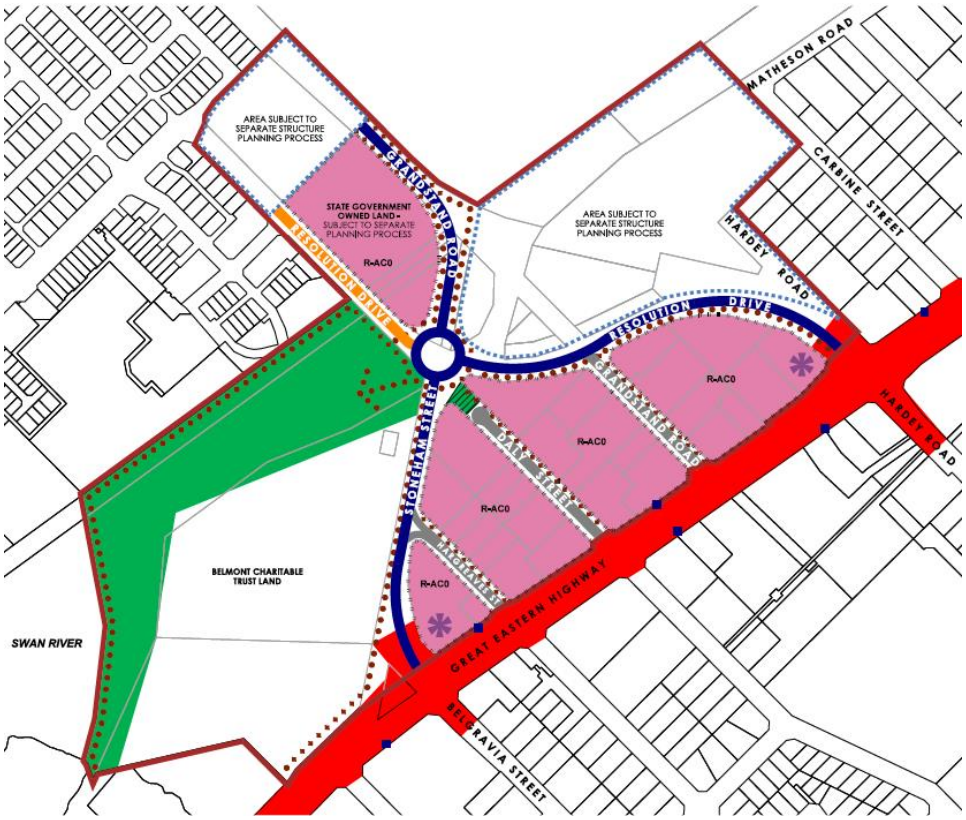


Figure 9: Revised public open space layout

Additional open space opportunities also exist within the precinct including the Belmont Trust Land, Ascot Kilns Site, and on private development sites as follows:

- The Belmont Trust land offers significant opportunities for public open space and a connection to the Swan River for future residents. Use of cash collected in lieu of public open space for the upgrading of the Belmont Trust Land requires approval from the Minister for Planning. The public open space section of the LSP has been updated to reflect this.
- The future redevelopment of the Ascot Kilns site presents an opportunity for public open space. Therefore, consistent with Council's 2020 resolution, the updated LSP requires the preparation of a Local Development Plan for the Ascot Kilns site, designating 10% of the area as public open space. It is noted that the draft Ascot Kilns Local

Development Plan concept proposed areas of public open space and communal private open space as reflected in Figure 10 below.

Figure 10: Draft Ascot Kilns Local Development Plan Concept

- Private development sites may present an opportunity for the establishment of additional open space areas. Therefore, as detailed in previous sections of this report, the LSP has been updated to include criteria that may encourage developers to provide publicly accessible private open space. These spaces have been successfully implemented in various areas including in West Perth, Melbourne and London as reflected in the images below.

Figure 11: Publicly accessible private open space at 1204 Hay Street, West Perth

Figure 12: Publicly accessible private open space at Melbourne Quarter (699 Collins Street, Docklands)

Figure 13: Publicly accessible private open space at Granary Square, Kings Cross, London

Together, these initiatives are anticipated to increase the amount and quality of public open space within the precinct.

In light of this, the 525m^2 area of public open space designated by the LSP is considered acceptable.

Local Centre

The draft LSP originally designated a Local Centre along Daly Street, designed in a main street format with approximately 1,200m^2 of retail floorspace.

The City's ACPS does not designate a specific site for a future local centre. Instead, the ACPS supports the development of a 1,200m^2 local centre within the broader Golden Gateway precinct with an anchor supermarket and complimentary shops and restaurants/cafes.

Considering the existing built form and land fragmentation along Daly Street, it is appropriate to provide opportunity for the development of a local centre within the broader area. Consequently, the LSP no longer identifies Daly Street as the Centre's location or designates it as a main street.

Procedural Considerations

The draft LSP is to be progressed according to the Regulations, which requires the advertising, consideration and determination of structure plans. The Regulations also establish processing timeframes which can only be varied subject to WAPC approval.

The Regulations stipulate that a local government can readvertise a structure plan once, unless otherwise approved by the WAPC. Therefore, this will be the last time that the document can be advertised, unless the WAPC provides permission to advertise it again. There is a risk that the WAPC will not consent to further advertising.

At the close of the advertising period, officers will consider the submissions and provide a recommendation to Council. If no decision is made on how to progress the draft LSP following advertising, the WAPC may determine how the draft LSP is to be progressed and may do so without referring to or considering the City's assessment and recommendation. The City may be liable to the WAPC for the costs the WAPC incurs during this process.

Conclusion

Following Council's 23 June 2020 resolution, investigations led to several changes to the draft LSP. These changes encompassed designating Perth Racing landholdings for detailed planning, adjusting the road network, revising public open space allocation, removing the specific location for the local centre, and updating built form and development controls. Updates were also made to the Movement and Access Strategy and Public Realm Strategy to align with the revised LSP.

It is recommended that Council adopt the modified LSP for the purpose of public advertising.

Financial implications

All costs associated with the preparation and advertising of the draft LSP are met by the Planning Services' operational budget.

Environmental implications

Environmental implications associated with the draft LSP are outlined in the Environmental Assessment Report (Attachment 12.2.3).

Social implications

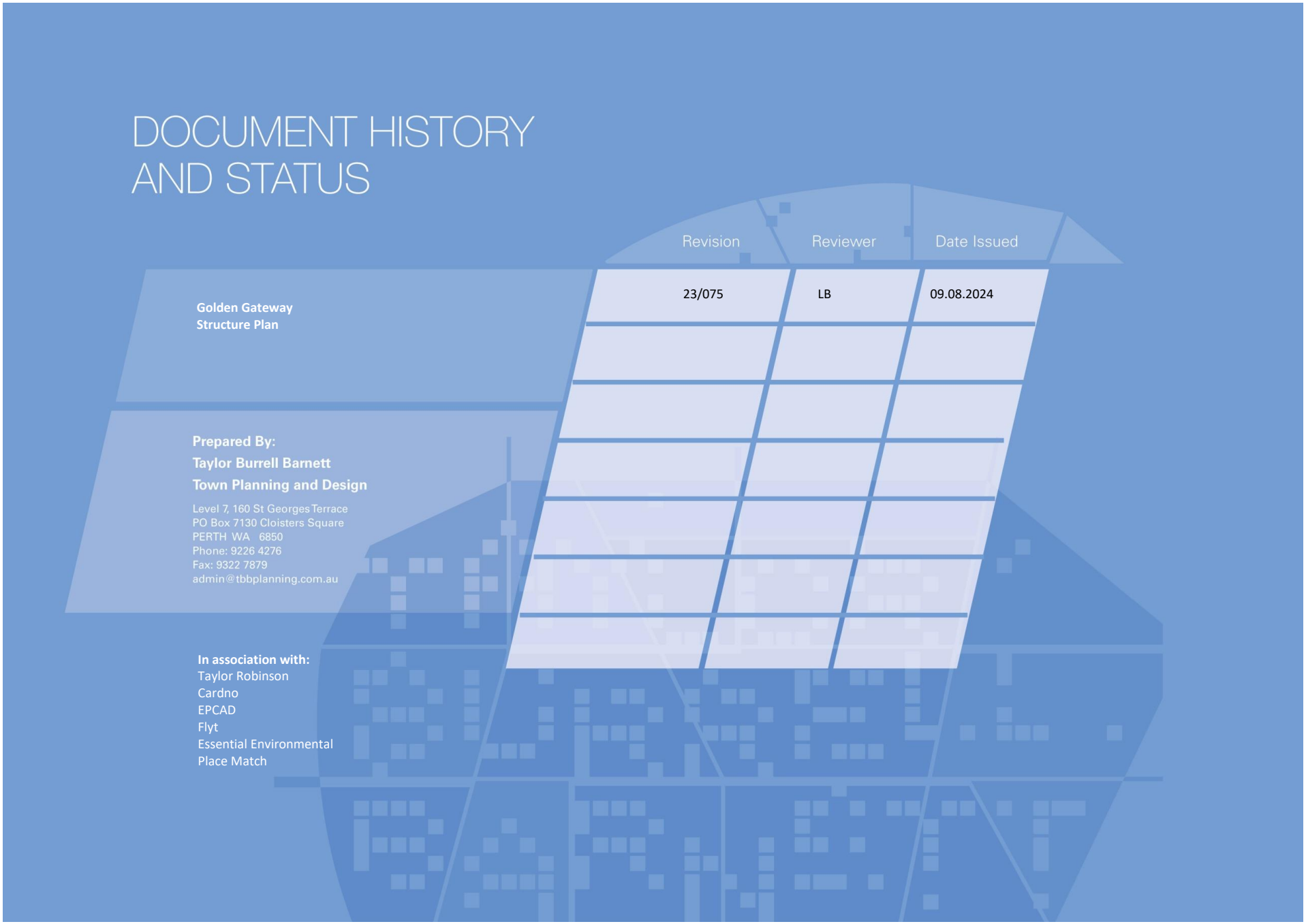
The draft LSP proposes a number of upgrades to the public realm which is intended to improve the overall amenity of the area.

Attachment details

Attachment No and title
1. Golden Gateway Local Structure Plan [**12.2.1** - 73 pages]
2. Bushfire Management Plan [**12.2.2** - 23 pages]
3. Environmental Assessment Report [**12.2.3** - 34 pages]
4. Movement and Access Strategy [**12.2.4** - 342 pages]
5. Infrastructure Assessment Report [**12.2.5** - 34 pages]
6. Public Realm Strategy [**12.2.6** - 26 pages]
7. Extract of 23 June 2020 Ordinary Council Meeting Minutes [**12.2.7** - 63 pages]
8. Council's Resolution [**12.2.8** - 4 pages]
9. Table of Council's Resolution with Corresponding Officer's Comments [**12.2.9** - 14 pages]
10. CONFIDENTIAL REDACTED - Consultant Report (Confidential matter in accordance with the Local Government Act 1995 (WA) section 5.23(e)) [**12.2.10** - 151 pages]

GOLDEN GATEWAY
STRUCTURE PLAN

Prepared for **City of Belmont**
Prepared by **Taylor Burrell Barnett**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LB
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Golden Gateway
Structure Plan
Prepared By:
Taylor Burrell Barnett
Town Planning and Design
Level 7, 160 St Georges Terrace
PO Box 7130 Cloisters Square
PERTH WA 6850
Phone: 9226 4276
Fax: 9322 7879
admin@tbbplanning.com.au
In association with:
Taylor Robinson
Cardno
EPCAD
Flyt
Essential Environmental
Place Match

ENDORSEMENT

This Structure Plan is prepared under the provision of the **City of Belmont Local Planning Scheme No. 15**

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

…… Date

Signed for and on behalf of the Western Australian Planning Commission

……

an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

…… Witness

…… Date

…… Date of Expiry

TABLE OF AMENDMENTS

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by WAPC

EXECUTIVE SUMMARY

This Structure Plan is prepared to guide the subdivision and development of land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan map (hereafter referred to as 'Golden Gateway' or 'Structure Plan area').

The subject land is located:

- Within the municipality of the City of Belmont;
- Approximately 5 kilometres (km) north-east of the Perth Central Business District (CBD) 3km north of Belmont Forum and mixed business area and 5km north-east of Victoria Park entertainment precinct; and
- Approximately 2.5km east of Graham Farmer Freeway and 2km west of Tonkin Highway.

The subject land encompasses a mix of uses comprising mixed business, retail (food and beverage), public uses associated with the Western Australian Turf Club (WATC), Ascot Racecourse and Ascot Kilns, Belmont Charitable Trust Land and Swan River environs. The remainder of the subject land is largely undeveloped and devoid of vegetation.

The development of the Belmont Charitable Trust Land, Ascot Kilns and WATC sites are subject to separate planning processes.

The Ascot Kilns site is owned by the Western Australian Planning Commission (WAPC) and is the subject of a draft Local Development Plan (LDP) and draft Local Planning Policy (LPP) that was considered for final approval by Council at its meeting of 12 December 2017. The draft LDP and LPP details the intended future planning vision for this site with regards to proposed land uses, built form, development standards and the retention of the majority of the heritage listed kilns and chimney structures.

The Belmont Charitable Trust Land is owned by the City of Belmont and managed by the 'Belmont Trust'. This land is not subject to any formal statutory planning processes at this stage and nor is there a specific timeline for the future planning of this land. The future consideration for this land is dependent upon the 'Belmont Trust'.

Land owned by the WATC is subject to a separate planning process.

The Structure Plan proposes development of land for:

- Commercial/Retail uses;
- Residential purposes comprising medium and high residential densities;
- Public Open Space (POS) including foreshore reserve; and
- Access streets.

Item	Data	Structure Plan Ref. (Section No.)
Total area covered by the Structure Plan	30.9223 ha	1.2.3
Area subject to controls under this Structure Plan	22.8822 ha	1.2.3
Area subject to separate planning process	8.0401 ha	1.2.3
Area of each land use proposed: • Residential • Mixed Use	**Hectares** 4.2473 ha 1.7578 ha	3.3
Estimated No. of Dwellings	2,268	3.3.1.1
Estimated Residential Site Density	378 Dwellings per site/ha	4.1.2.1
Estimated Population	4,082 persons	3.3.1.1
No. of High Schools	N/A	3.6
No. of Primary Schools	N/A	3.6
Estimated Commercial Floor Space	6,979m² nett lettable area	3.3.2.2
Estimated Retail Floor Space	1,200m² nett lettable area	3.3.2.2
Estimated area and percentage of Public Open Space (Local Parks)	0.2% 0.0525ha 1 park	3.3.7
Estimated area of natural area (existing Parks and Recreation Reservation)	4.5556 ha	3.3.7

TABLE OF CONTENTS

PART ONE
IMPLEMENTATION

1 STRUCTURE PLAN AREA

This Structure Plan shall apply to the Golden Gateway Precinct, being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan map (**Plan 1**). The provisions of this Structure Plan apply to all land within this area, except for land designated as subject to a separate planning process on **Plan 1**.

2 OPERATION

This Structure Plan commences operation on the date it is approved by the Western Australian Planning Commission (WAPC).

3 STAGING

The staging of subdivision and development will be primarily influenced by the timing of land rationalisation. As most of the developable land is fragmented and privately owned, the actual timing and sequence of development will be subject to market demand and individual development intentions. Land within the northern section of the subject land is less constrained by land ownership, with the WA Turf Club (WATC) and WAPC owning the majority of this land, however is subject to a separate planning process.

Servicing infrastructure required to support future development of the subject land is either in place or can be relocated/provided to service the subject land and as such is not regarded as an impediment to staging.

The modification of Daly Street into a cul-de-sac will be a trigger to enable development within the Daly Street Precinct.

Table 1 below provides an outline of the key triggers for enabling development within various parts of the Structure Plan area.

TABLE 1: STAGING TRIGGERS

STAGING TRIGGERS	PRECINCTS	COMMENT
1. Planning Framework implementation - Scheme Rezoning, Structure Plan approval	• Ascot Kilns	No subdivision or development to be approved until the planning framework is in effect.
2. Closure of Daly Street	• Daly Street	The connection of Daly Street and Stoneham Street will be closed and redundant road reserve converted to public open space
3. Progressive rationalisation of private landholdings	• Great Eastern Highway, Stoneham Street, Daly Street and Resolution Drive	
4. Progressive upgrade to roads and adjacent verges	• Great Eastern Highway, Stoneham Street, Daly Street and Resolution Drive	Development may be permitted to occur prior to upgrades subject to contribution towards upgrade works in cash or in king (where appropriate).

4 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

This Structure Plan comprises the plans outlined below:

- **Plan 1 – Structure Plan Map**
  Outlines the zones, reserves and residential densities applicable within the Structure Plan area.

- **Plan 2 – Precinct Plan**
  Identifies development precincts within the Structure Plan area, for the purpose of defining specific development criteria.

- **Plan 3 – Building Height Plan**
  Depicts the intended building heights within the Structure Plan area. All development should demonstrate compliance with the Building Height Plan.

4.1 LAND USE ZONES/RESERVES

The Structure Plan Map (**Plan 1**) outlines the following zones and reserves applicable within the Structure Plan area:

- Mixed use.
- Local roads.
- Parks and Recreation.

Land use permissibility within the subject land shall accord with the land use permissibility of the corresponding zone/reserve listed above, as specified in Table 1 of the City of Belmont Local Planning Scheme No. 15 (LPS 15) to the extent that the zoning of the land under LPS 15 permits. The Responsible Authority should also have due regard for the uses listed as "Unacceptable" under the following zoning statements.

4.1.1 MIXED USE (R-AC0)

The Mixed Use zone is intended to facilitate the development of a mix of varied, but compatible, land uses including residential, offices, retail, commercial, civic and entertainment uses, in a highly integrated built form environment.

The objectives of the Mixed Use area are to:

- Provide a diversity of land uses and housing types.

- Provide for development that contributes to the creation of a high quality public realm and creates a sense of identity and character.

- Provide local retail/commercial facilities to the subject land as well as the broader locality.

It is envisaged that the Mixed Use zone will predominantly accommodate residential development in the form of multiple dwellings With non-residential development comprising of active land uses (i.e. restaurant, café, shop) on ground level. The 'mixed use' designation provides the flexibility for land uses to change and evolve over time in response to market conditions.

4.1.1.1 LAND USE PERMISSIBILITY

Land use permissibility shall generally be in accordance with the corresponding zone in the Zoning Table in LPS 15. However, having regard for the amenity for future residents the following uses are considered to be Unacceptable in the subject land and should not be approved:

- Auction Mart
- Caretakers Dwelling
- Fast Food Outlet / Lunch Bar
- Home Store
- Garden Centre
- Industry - Light
- Industry - Service

- Motor Vehicle Repair
- Night Club
- Radio or TV Installation
- Restricted Premises
- Service Station
- Single House
- Vet Hospital
- Warehouse

Furthermore, 'Shop' is an Additional Use in the Mixed Use zone within the subject land.

Residential development within the Mixed Use zone shall be in accordance with the 'R-AC0' code and associated standards as set out in **Table 2**: Precinct Development Table for the relevant Precinct.

4.1.1.2 DWELLING TARGET

The dwelling targets for the Mixed Use zone is/are:

378 dwellings per site/ha

4.1.1.3 DENSITY

Plan 1 (Structure Plan) assigns a R-AC0 density code to the subject area.

4.1.2 PARKS AND RECREATION

The foreshore reserve and Belmont Charitable Trust Land are included in the Structure Plan Area for context only. No specific works or requirements are required under the Structure Plan for these areas. The Belmont Trust Land is for public recreation and enjoyment, further planning work will need to be undertaken to ensure adequate access to the site, and an appropriate interface with surrounding development.

Acknowledging the role that the Belmont Charitable Trust plays within the Structure Plan area, the Structure Plan provides for the collection of cash-in-lieu to be used for the upgrading of the Belmont Charitable Trust Land. The City can then make an application to the Minister for Planning under s.154(2)(c) of the *Planning and Development Act 2005* for approval to do this.

This does not preclude consideration being given to the allocation of land for additional POS where a developer chooses to do so at subdivision stage. The amount of cash or land to be provided would likely be based on the equivalent value of land which would otherwise be required, however this will ultimately be determined by the City of Belmont and the WAPC.

Within the balance of the Structure Plan Area, Public Open Space (POS) is to be provided generally in accordance with **Plan 1** and should be vested in the Crown and managed by the Local Government. POS within the Structure Plan area will be provided by the closure of Daly Street and the conversion of closed land, primarily serving a passive recreation and pedestrian connectivity function. The development of land included within the Swan and Canning River Development Control Area will be subject to the approval of the Department of Biodiversity, Conservation and Attractions (DBCA).

4.1.3 LOCAL ROADS

4.1.3.1 EXISTING ROADS

Existing local roads are to be upgraded to reflect an inner urban street character, featuring on-street parking, high quality landscape and pedestrian facilities. The existing 20m reserve width shall be maintained to ensure that the street serves a high quality public realm function in addition to facilitating local traffic movement.

It is not anticipated that additional roads will be required, however the introduction of additional roads within the Structure Plan Area may occur through possible future subdivision and in accordance with Part 10 of the Planning & Development Act 2005. Any new roads are to be designed to a residential standard in accordance with the requirements of the Local Government. Road reserve widths shall be 20m, to reflect similar characteristics to the existing road system, unless an alternative design is supported by the Local Government and approved by the WAPC.

Daly Street will be partially closed and converted to a cul-de-sac consistent with the Main Roads Western Australia Access Strategy for Great Eastern Highway. Redundant road reserve will be converted to POS.

4.2 DEVELOPMENT REQUIREMENTS

4.2.1 PRECINCT DEVELOPMENT REQUIREMENTS

The following precincts have been established to ensure that the Structure Plan Area is developed in a comprehensive and integrated manner having regard to desired character, preferred land uses, residential density, built form and public realm design principles:

- Precinct 1: Great Eastern Highway
- Precinct 2: Stoneham Street
- Precinct 3: Daly Street
- Precinct 4: Resolution Drive
- Precinct 5: Ascot Kilns

4.2.1.1 STATEMENTS OF INTENT

Precinct 1: Great Eastern Highway

The Great Eastern Highway Precinct will present itself as a strong, unified commercial and mixed-use edge. Active, commercial uses shall be provided at ground level and above with residential development to occupy upper storeys.

The visual prominence of the Great Eastern Highway frontage will require sensitive architectural treatment to ensure that the built form contributes positively to the aesthetic quality of the area. Two landmark sites are located at the eastern and western ends of the Precinct and these should seek to optimise the intrinsic benefits of a gateway position that responds to existing view corridors along Great Easter Highway.

Precinct 2: Stoneham Street

The Stoneham Street Precinct, whilst still remote from the river front, will be the primary interface between the Golden Gateway development and the river.

Understanding that planning for Belmont Charitable Trust Land is yet to be undertaken, it is recommended that any future planning should maintain strong physical links between the river and the future Golden Gateway population and workforce.

Development addressing Stoneham Street is to provide an appropriate interface to the Belmont Charitable Trust Land to ensure a high standard of visual amenity and surveillance within a mixed use environment. The aspect towards the river may be attractive for food and beverage uses, which should be accommodated. Active, commercial uses shall be provided at ground level and above with residential development to occupy upper storeys.

A tree-lined promenade along Hargreaves Street will create a unique vista with the Belmont Charitable Trust Land and the Swan River.

Precinct 3: Daly Street

The Daly Street Precinct will perform an important connective function between the remaining precincts adjacent to Great Eastern Highway. Mixed use development is encouraged; however, the ultimate land use mix should not rely upon passing traffic given the planned closure of the Daly Street and Stoneham Street intersection.

Daly Street is defined by numerous disparate landholdings that could be amalgamated to unlock the development potential of this precinct, and proposals for development should investigate the highest and best use of land.

Precinct 4: Resolution Drive

Buildings at the intersection of Resolution Drive and Stoneham Street should leverage its location as the northern 'arrival' point to Golden Gateway.

Active, commercial uses shall be provided at ground level and above with residential development to occupy upper storeys. Trees will line either side of the southern portion of Grandstand Road (between Great Eastern Highway and Resolution Drive) to create an attractive pedestrian environment.

Precinct 5: Ascot Kilns

This precinct is characterised by the historic kilns and landmark chimney stacks that are of considerable State heritage significance. Development will therefore have a strong heritage and landscape focus, using built form to celebrate and frame the historic structures, and to secure their ongoing preservation.

This precinct is the subject of separate Local Planning Policy (LPP) and Local Development Plan (LDP).

4.2.1.2 PRECINCT STANDARDS AND REQUIREMENTS

Table 2: Precinct Development Table outlines the standards and requirements for subdivision and development in the corresponding precincts designated on **Plan 2** Precinct Plan. Building height requirements should be read in conjunction with **Plan 3** Building Height Plan.

In addition to the Precinct Development Table, Design Guidelines may be adopted to provide further guidance for subdivision and development of the precinct pursuant to Section 5.1.

In relation to Precinct 5 Ascot Kilns, development standards and requirements in this Structure Plan should be read in conjunction with the Ascot Kilns Design Guidelines and LDP. The Ascot Kilns LDP should identify the requirement for a minimum of 10% POS to be delivered on site.

TABLE 2: PRECINCT DEVELOPMENT TABLE

Precinct		R-Code	Min. height	Max. height	Min. boundary setback	Min. street setback	Max. street setback	Plot ratio (Plot Ratio with Additional Height)
1	Great Eastern Highway	R-AC0	Podium: 2 storeys Tower: 7 storeys	Podium: 5 storeys Tower: 15 storeys	Podium: Nil Tower: as per State Planning Policy 7.3 Residential Design Codes Volume 2 - Apartments	Podium: Nil Tower: 3m	Podium: Nil Tower: N/A	5.0:1 (6.5:1)
2	Stoneham Street	R-AC0	Podium: 2 storeys Tower: 5 storeys	Podium: 3 storeys Tower: 10 storeys	Podium: Nil Tower: as per State Planning Policy 7.3 Residential Design Codes Volume 2 - Apartments	Podium: Nil Tower: 3m	Podium: Nil Tower: N/A	3.0:1 (5.0:1)
3	Daly Street	R-AC0	Podium: 2 storeys Tower: 5 storeys	Podium: 3 storeys Tower: 10 storeys	Podium: Nil Tower: as per State Planning Policy 7.3 Residential Design Codes Volume 2 - Apartments	Podium: Nil Tower: 3m	Podium: Nil Tower: N/A	3.0:1 (5.0:1)
4	Resolution Drive	R-AC0	Podium: 2 storeys Tower: 5 storeys	Podium: 3 storeys Tower: 10 storeys	Podium: Nil Tower: as per State Planning Policy 7.3 Residential Design Codes Volume 2 - Apartments	Podium: Nil Tower: 3m	Podium: Nil Tower: N/A	3.0:1 (5.0:1)
5	Ascot Kilns	R-AC0	Refer to Ascot Kilns Design Guidelines and Local Development Plan	Refer to Ascot Kilns Design Guidelines and Local Development Plan	Refer to Ascot Kilns Design Guidelines and Local Development Plan	Refer to Ascot Kilns Design Guidelines and Local Development Plan	Refer to Ascot Kilns Design Guidelines and Local Development Plan	N/A

Notes:

1. *Minimum and maximum building heights specified for tower components are inclusive of podium levels.*
2. *An additional 5 storeys in height can be considered subject to satisfying development requirements in section 4.2.2.2*
3. *This table is to be read in conjunction with the more detailed provisions of a LPP, where relevant.*
4. *In relation to Precinct 5 Ascot Kilns, this table is to be read in conjunction with the Ascot Kilns Design Guidelines and LDP.*

4.2.2 GENERAL DEVELOPMENT REQUIREMENTS

Development within the subject precinct shall be generally in accordance with the standards and requirements of the City's Local Planning Scheme and any relevant State Planning Policy, Local Development Plan and Local Planning Policy, having regard to the provisions contained within this structure plan.

Proposed variations to the standards and requirements of the City's Local Planning Scheme, any relevant State Planning Policy, Local Planning Policy, Local Development Plan or the provisions of this structure plan are to be outlined within a development application and will be considered by the Responsible Authority with due regard to the intent and purpose of the standards.

4.2.2.1 PARKING

Car parking should be provided in accordance with LPS 15 and the relevant R-Codes subject to the following variations:

1. The Local Government wishes to encourage innovative approaches to car parking provision, such as reciprocity, car-pooling programs or other innovations, that may result in reduced parking provision where appropriate.

   The Responsible Authority will consider approving a reduced parking provision where it can be demonstrated that an alternative parking proposal is sound and will result in a reduction in parking demand. Any proposed variation should be supported by a parking demand assessment undertaken by a suitably qualified professional.

2. The following specific requirements apply:

   a) For Mixed Use development, all residential parking in excess of 1 bay per dwelling, and at least 50% of the minimum required parking for non-residential uses shall be made available for general use of either residential or non-residential uses (these bays represent unallocated communal parking bays).

   b) Mixed Use development that proposes parking as outlined in 2a) above should be required, as a condition of Development Approval, to prepare a Car Parking Strategy that addresses the management of the unallocated communal parking provision, including:

      i. The hours during which parking bays shall be made available for general public access.

      ii. Location, signage and monitoring of usage of the unallocated communal parking bays.

   The provision of car parking that is in excess of the minimum required for the site will only be approved where it is designed to be adaptable for future conversion into habitable floor space, or other useable space for communal or private usage. In order for parking to be considered adaptable, it must be shown as located in a position that is suitable for an alternative use, not included in individual strata titles and constructed to comply with habitable floorspace standards.

   This requirement may be waived if it can be demonstrated that complying with the requirement would not be practical or would result in a less desirable outcome.

4.2.2.2 BUILDING HEIGHT

Minimum and maximum building heights within the Structure Plan Area are to be in accordance with the ranges identified in **Table 2** and on **Plan 3.**

All sites within the Structure Plan area may incorporate an additional 5 storeys in height, above the maximum identified in **Table 2** at the discretion of the decision maker subject to the following:

- The production of an exceptionally high quality of design, as determined by the appointed design review panel; and
- Incorporate the following:
    - An area of publicly accessible private open space; and
    - 100% of windows containing double glazing; and
    - Provide an additional tree on-site above what is required by State Planning Policy 7.3 Volume 2 – Apartment Design Code. The tree must be a native species with a pot size of between 100L – 200L; and
    - Provide conduits and capacity within the electrical distribution system and metering or future provision of electric car charging for each unit within the development; and
    - Provide a minimum of two electric vehicle charging bays within the development; and
    - Provide shared sustainable transport measures for the development that may include the provision of electric bikes, scooters and vehicle/s; and
    - Achieve a Nationwide House Energy rating Scheme (NatHERS) star rating of a minimum of one star in excess of the current energy efficiency rating for the dwelling shall be certified by a suitably qualified and accredited energy assessor using accredited software and shall be provided a the development application stage; and
    - Install a photovoltaic solar panel system that can provide the equivalent of at least 1Kw energy per dwelling.

Notwithstanding the provisions of **Table 2** and **Plan 3**, maximum building heights are subject to compliance with the Airports (Protection of Airspace) Regulations 1996.

Information on Obstacle Limitations Surfaces is available at https://www.perthairport.com.au/Home/corporate/planning-and-projects/airspace-protection.

4.2.2.3 LANDMARK SITES

Landmark site locations have been identified on **Plan 3.** These sites have been located in response to priority view lines and public vistas. They define local character and maximise legibility through high quality pedestrian scale, development of these sites is strongly recommended to respond to existing sight lines and maximise street presence.

Elements of design that should be investigated include articulation adjacent to, and above, the street level, building proportion that maximises the perception of bulk from a distance, intrinsic quality of materials that produce interest for pedestrians, detail that is revealed in proximity to the development and interesting distribution of mass.

5 OTHER REQUIREMENTS

5.1 SCHEME AMENDMENT

An amendment to the City of Belmont's LPS 15 will be required to apply the R-AC0 density code over the subject land and to exclude land uses that would be permissible within the Mixed Use zone as identified in section 4.1.1.1. This will also need to provide for the 'Shop' land use as an additional use.

5.2 INFRASTRUCTURE FUNDING STRATEGY

The City of Belmont may establish an appropriate funding strategy for the provision of infrastructure within the Structure Plan Area. The strategy may include the introduction of a Development Contribution Area (DCA) through LPS 15, under which a Development Contribution Plan (DCP) can be implemented to contribute to the funding of public infrastructure necessary to facilitate development in the Structure Plan Area.

Infrastructure items that would be eligible to be funded under a DCP should be in accordance with State Planning Policy 3.6 Development Contributions for Infrastructure (SPP 3.6).

5.3 BUSHFIRE MANAGEMENT

This Structure Plan is supported by a Bushfire Management Plan (BMP), which is contained at **Appendix A**.

Where appropriate, development will have regard to the Bushfire Attack Level (BAL) Assessment contained in this Report and be determined in accordance with Schedule 2, Part 10A of the Planning and Development (Local Planning Schemes) Regulations 2015 and section 6.3 of SPP 3.7 Planning in Bushfire Prone Areas (SPP 3.7).

An LDP is required to be prepared for all lots with a BAL of 12.5 or greater.

Where a subdivision application includes land with a BAL of 12.5 or greater, the Local Government shall recommend to the WAPC that a condition be imposed on the grant of subdivision approval for a notification to be placed on the Certificate of Title to suitably respond to the following:

"That a lot with a bushfire attack level BAL rating of 12.5 or higher is subject to a BMP."

5.4 ABORIGINAL HERITAGE

A search of the Department of Planning, Lands & Heritage (DPLH) Aboriginal Heritage Enquiry System identifies one site within the northern/western portion of the subject land (Site ID 3753).

Should the Aboriginal Heritage Site identified as meeting the requirements of section 5 of the Aboriginal Heritage Act 1972 (AHA) be proposed to be disturbed in any way, an application must first be made and consent granted under section 18 of the AHA.

Furthermore, where applicable, an Aboriginal Heritage Management Plan shall be prepared and implemented prior to subdivision of any land affecting the identified site.

5.5 NOISE ATTENUATION

An acoustic assessment shall be undertaken and included as part of any application to demonstrate that the proposed design will meet the internal noise level requirements of State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4).

In accordance with SPP 5.4 a notification shall be required to be placed on the Certificate of Title for lots where dwellings are exposed to traffic noise that exceeds the outdoor "Noise Target" as defined in SPP 5.4.

5.6 DESIGN REVIEW PANEL

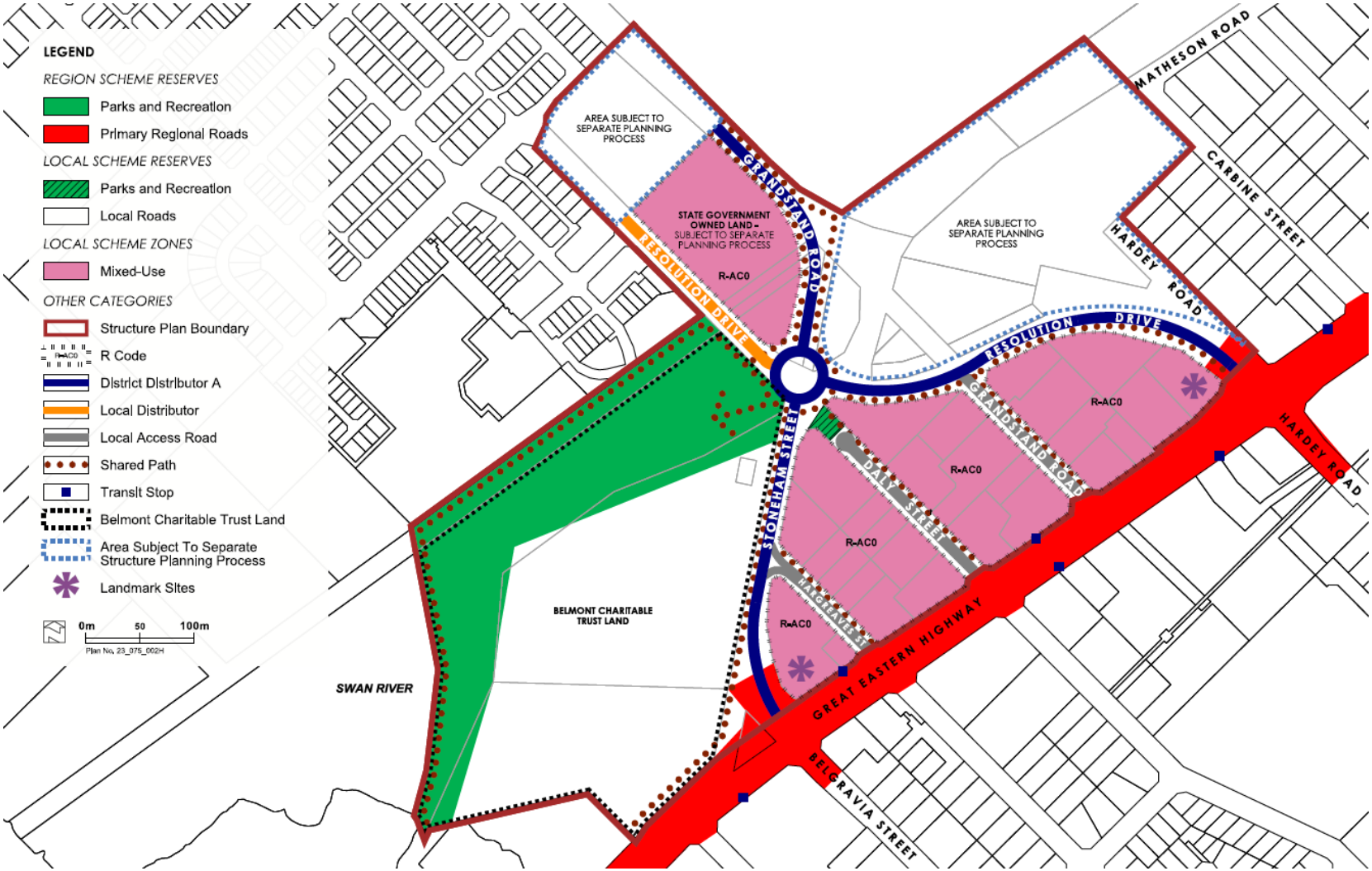
Any application for development within the Structure Plan area will be referred to the City's Design Review Panel for evaluation.

6 ADDITIONAL INFORMATION

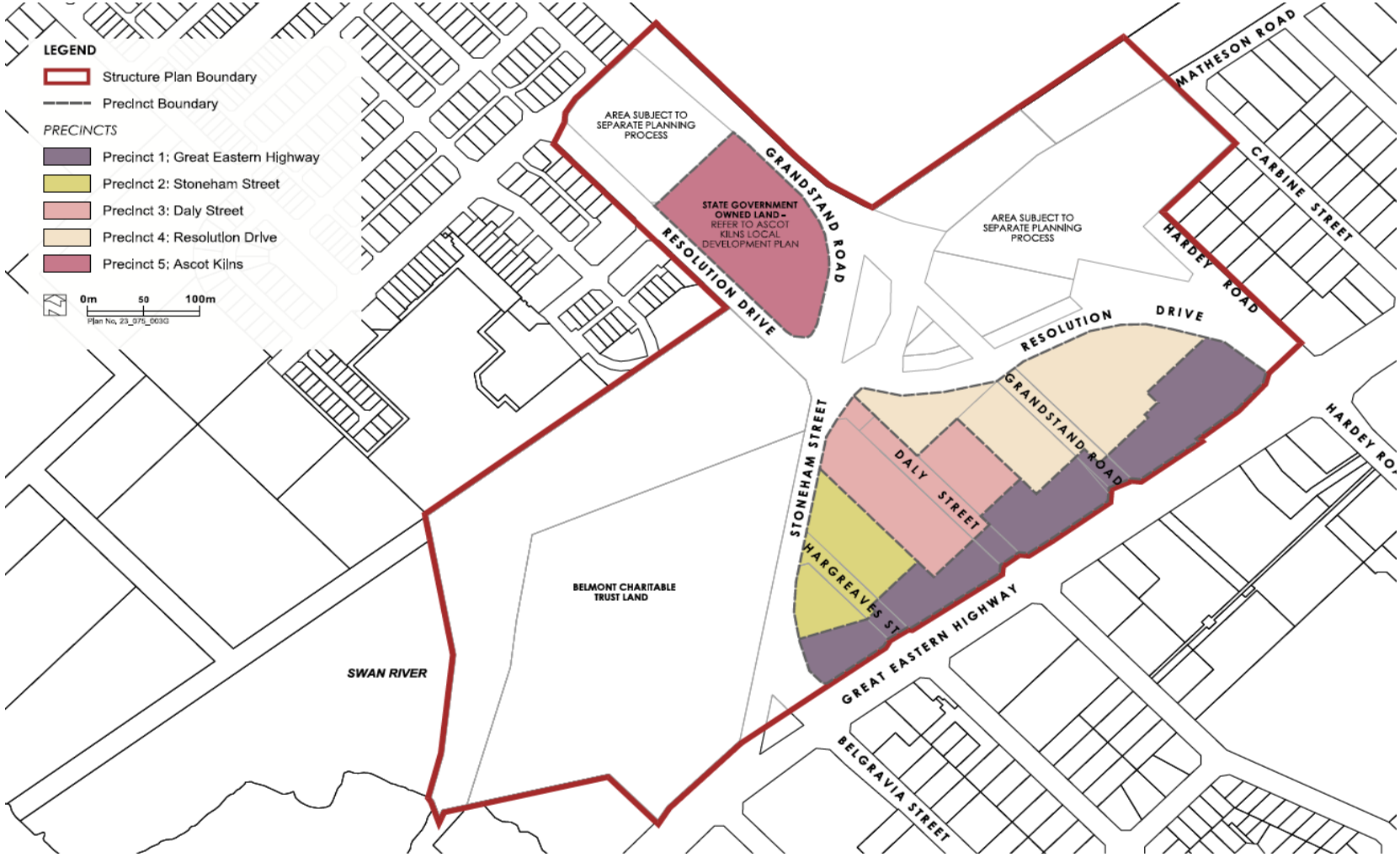
Table 4 below outlines additional information that will be required at future approval stages. Additional information requirements may not be limited to those listed; the City or WAPC may require other information in relation to particular proposals.

TABLE 4: MANAGEMENT PLANS, REPORTS AND STRATEGIES

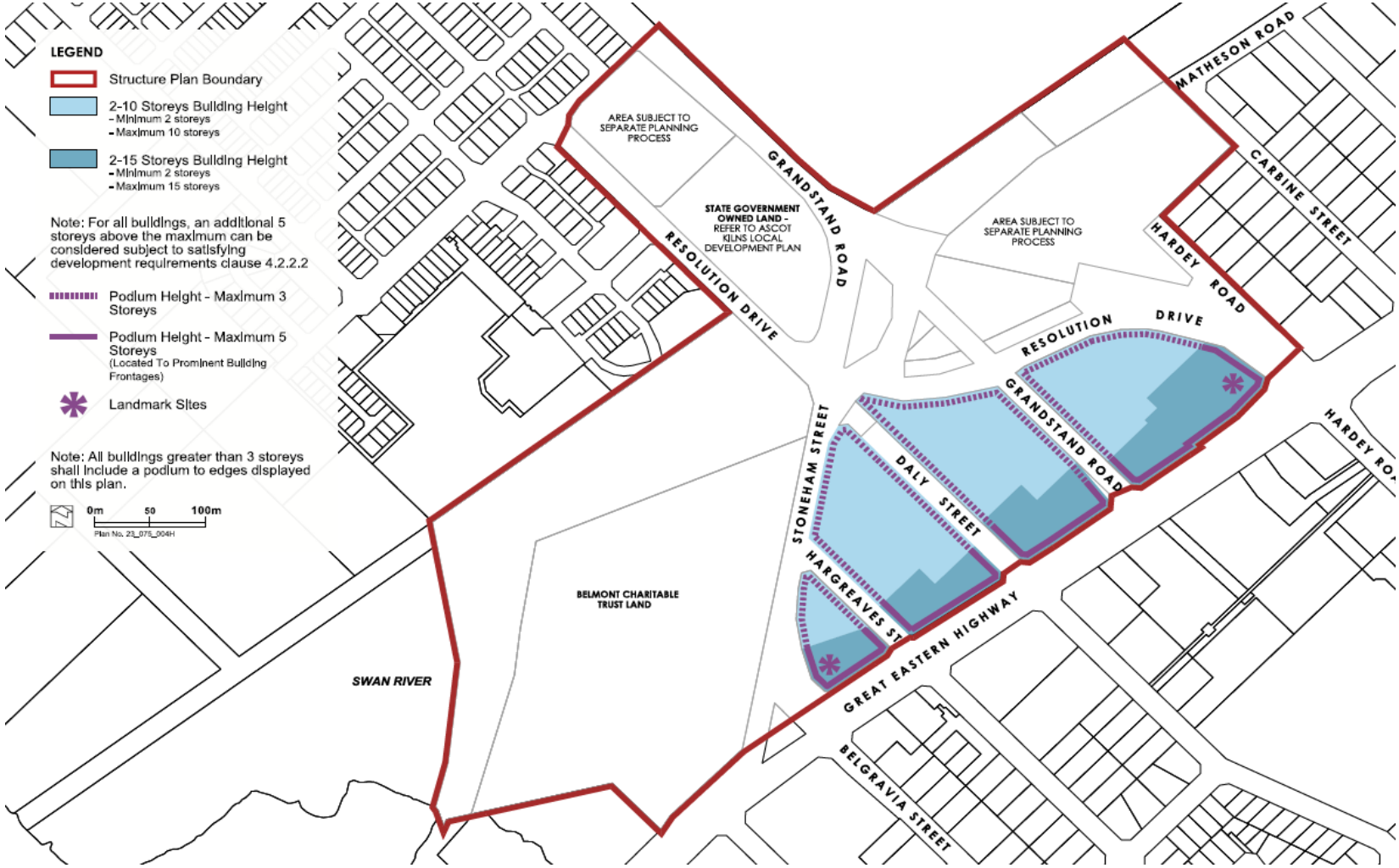
Additional information	Approval stage	Approving Authority
Water Management		
Local Water Management Strategy (LWMS)	Documented in Structure Plan and to be considered as part of Structure Plan process. Implementation as part of UWMP	WAPC, City, DWER
Urban Water Management Plan (UWMP)	Condition of subdivision	WAPC, City, DWER
Environment		
Environmental Assessment Report	Documented in Structure Plan Implementation via Subdivision	WAPC, City, OEPA,
Fire Management Plan	Condition of subdivision	WAPC, City
Foreshore Management Plan	Condition of Subdivision	WAPC, City, DBCA
Landscape Management Plan	Condition of subdivision	City
Aboriginal Heritage Management Plan	Condition of subdivision	DPLH
Acoustic Report (Noise Attenuation)	Condition of planning approval	City
Acid Sulphate Soils	Condition of Subdivision	DWER
Investigation for soil and groundwater contamination	Condition of Subdivision	WAPC, City
Identification and protection of vegetation worthy of protection	Condition of Subdivision	WAPC, City
Erosion and Sediment Management Plan	Condition of Subdivision	WAPC, City
Engineering		
Servicing Report	Documented in Structure Plan Condition of Subdivision	City, Water Corp, Western Power, ATCO Gas
Geotechnical	Condition of Subdivision	City
Other		
Local Development Plan(s)	Condition of subdivision if deemed necessary by City	City



Plan 1- Structure Plan



Plan 2 - Precinct Plan



Pan 3 - Building Height Plan

PART TWO
EXPLANATORY INFORMATION

1 PLANNING BACKGROUND

1.1 INTRODUCTION AND PURPOSE

This report has been prepared to provide a technical explanation for the provisions contained in Part 1- Implementation of the Golden Gateway Structure Plan.

The Structure Plan outlines the development vision for the ultimate development of the Golden Gateway Precinct (the subject land) and establishes key requirements. The Structure Plan also includes information regarding the development of the public realm and assesses the proposed development in context with the surrounding physical and natural environment.

The Project Team, responsible for preparing the information contained within this report, (in consultation with the City of Belmont and relevant Service Authorities) include those detailed in **Table 1.**

TABLE 1: PROJECT TEAM RESPONSIBILITIES

Project Role	Consultant
Town Planning and Urban Design	Taylor Burrell Barnett
Architectural	Taylor Robinson Chaney Broderick
Civil Engineering	Cardno
Environment Management and Hydrology	Urbaqua
Traffic and Transport	Flyt
Landscape	EPCAD
Community Engagement	Place Match
Bush Fire Management	Urbaqua

1.2 LAND DESCRIPTION

1.2.1 LOCATION

The location and extent of the subject land is outlined in **Figure 1.** The subject land is located at the axis of the key movement corridors of Great Eastern Highway, Stoneham Street, Grandstand Road and Resolution Drive and includes key strategic sites such as Belmont Charitable Trust Land, Ascot Kilns and Western Australian Turf Club (WATC) headquarters and associated land.

Figure 2 shows the subject land's district context. The land is located approximately 5 kilometres (km) north-east of the Perth Central Business District (CBD), 3km north of Belmont Forum and mixed business area, and 5km north-east of Victoria Park entertainment precinct. Within its immediate context, the subject land is located adjacent the Swan River and Ascot Racecourse.

It is also well connected to regional movement networks such as the Graham Farmer Freeway and Tonkin Highway. The Garratt Road Bridge also provides a key connection to the north across the Swan River.

Within the local context, the subject land can be regarded as lacking in basic convenience shopping facilities. The BP Service Station located on the corner of Great Eastern Highway and Resolution Drive and delicatessen located at Epsom Avenue approximately 2km south-east of the subject land provide the nearest local conveniences. However, the nearest neighbourhood centres (supermarkets) are Eastgate Commercial Centre, Kooyong Road, approximately 2.5km to the south-west, or Belvidere Street approximately 2.5km to the south. Additional services are located approximately 3km to the north-west of the subject land at Maylands Shopping Centre (neighbourhood centre) or 3km to the south at Belmont Forum (Secondary Centre).

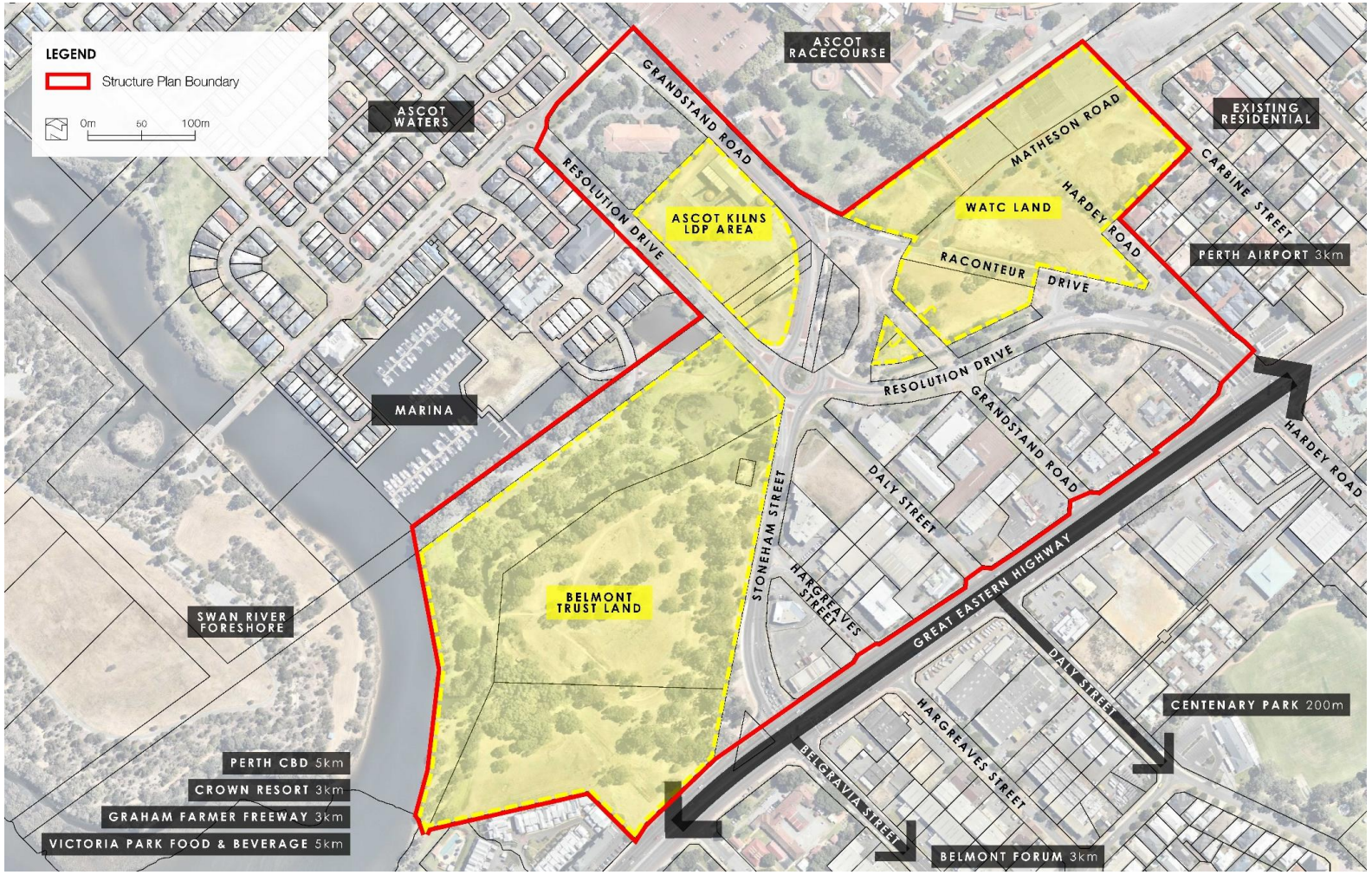


Figure 1 – Location Plan

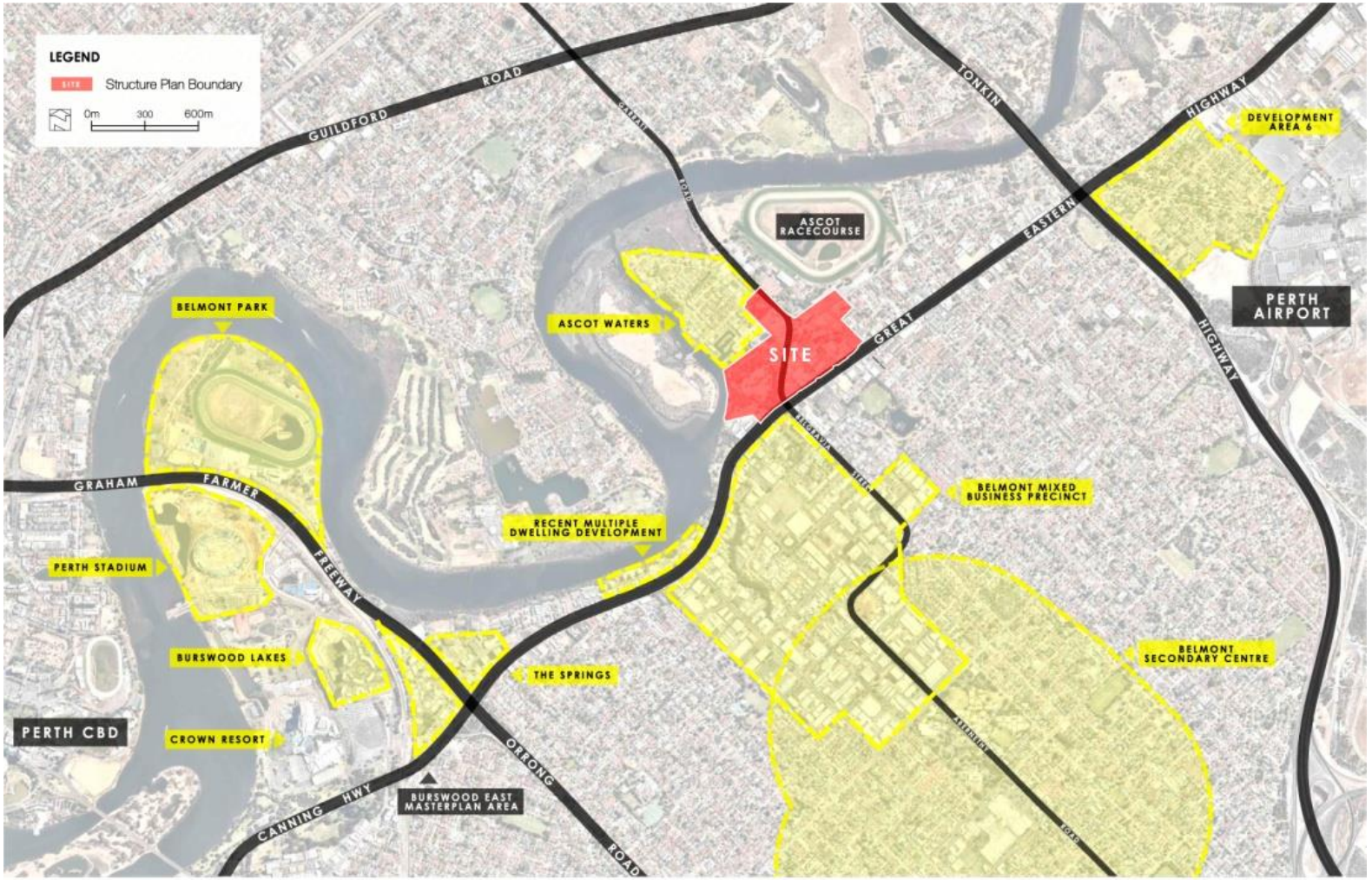


Figure 2 – District Context Plan

1.2.2 LAND USE

The subject land can be divided into four areas based on existing uses (refer **Figure 3**):

1. The area bounded by Great Eastern Highway, Stoneham Street and Resolution Drive is characterised by predominately mixed business development and small pockets of retail (food and beverage) uses along Great Eastern Highway;

2. The western portion of the subject land encompassing the Belmont Charitable Trust Land is largely cleared within the central portion with mature vegetation around the periphery. The site was historically used as a baseball field;

3. The northern portion of the subject land is partially developed with the WATC Headquarters and Ascot kilns and chimney stacks; and

4. The remainder of the subject land within the north-eastern corner is largely undeveloped and comprises a number of existing road reserves and WATC-owned land used for overflow parking on racing event days.

The development of the Belmont Charitable Trust Land, Ascot Kilns sites and the WATC land are subject to separate planning processes.

Figure 3 – Site Plan

1.2.3 LEGAL DESCRIPTION AND OWNERSHIP

The subject land is approximately 23.9871 hectares (ha) in area comprising the land identified in **Table 2** and **Figure 4**.

TABLE 2: LAND TENURE

Lot/Reserve	Landowner	Plan Number	Volume/Folio	Area (ha)
1 Resolution Drive	City of Belmont	P76257	2835/27	0.3642
5 Resolution Drive	City of Belmont	D64041	1776/785	4.1919
642 Great Eastern Highway	City of Belmont	P66341	2763/431	2.6481
950 Marina Drive / R52200	State of WA (City of Belmont)	P73752	LR3165/863	0.5843
512 Marina Drive / R51911	State of WA (City of Belmont)	P39786	LR3025/38	0.7749
513 The Boardwalk / R51911	State of WA (City of Belmont)	P32861	LR3025/39	0.2621
10417 Grandstand Road / R38783	State of WA (Water Corporation)	P185797	LR3048/920	0.1059
12645 Grandstand Road / R45069	State of WA (Water Corporation)	P15104	LR3064/783	0.2181
3 Grandstand Road	The Chairman of the Committee of the Western Aus Turf Club	D55346	1742/278	0.0351
13 Grandstand Road	The Chairman of the Committee of the Western Aus Turf Club	D26760	1883/670	0.7316
51Raconteur Drive	The Chairman of the Committee of the Western Aus Turf Club	P15104	1883/668	0.6940
100 Raconteur Drive	The Chairman of the Committee of the Western Aus Turf Club	P60341	2723/304	2.5726
452 Grandstand Road	The Chairman of the Committee of the Western Aus Turf Club	P60339	2723/355	1.1441
7705 Matheson Road	The Chairman of the Committee of the Western Aus Turf Club	P209359	1789/567	
1 Grandstand Road	State Planning Commission	D55346	1742/276	0.2452
197 Grandstand Road	State Planning Commission	P2635	1754/354	0.3927
236 Grandstand Road	State Planning Commission	P2635	1754/354	0.8925
237 Grandstand Road	WA Planning Commission	P2635	2117/791	0.9796
713 Grandstand Road	WA Planning Commission	D93557	2117/790	1.2806
707 Great Eastern Highway	Eurokars Australia Holdings Pty Ltd	P67257	2750/217	0.4767
709 Great Eastern Highway	Australian Postal Commission	P67258	1122/816	0.0551
1 Stoneham Street	5 Stoneham Road Belmont (Strata Scheme)	D41222	SP20374	0.2373
43 Hargreaves Street	Tarfield Holdings Pty Ltd	P2294	1582/988	0.1012
44 Hargreaves Street	Tarfield Holdings Pty Ltd	P2294	1582/989	0.1012

Lot/Reserve	Landowner	Plan Number	Volume/Folio	Area (ha)
45 Hargreaves Street	Jones, ED & Moore, JR	P2294	1977/545	0.1012
1 Great Eastern Highway	Ascot Grove (Strata Scheme)	P72552	SP65435	0.1966
60 Daly Street	Qube Ascot Development Ltd	D73791	1801/608	0.3934
36 Daly Street	Motwil Pty Ltd	P2294	1582/987	0.1012
35 Daly Street	Motwil Pty Ltd	P2294	1582/986	0.1012
650 Daly Street	76, 78 Daly Street, Belmont (Strata Scheme)	D59457	SP10988	0.2024
714 Great Eastern Highway	TLC Carousel Holdings Pty Ltd	P67260	2753/447	0.2033
52 Daly Street	SMC Pneumatics Australia Pty Ltd	D68380	1839/787	0.3798
801 Daly Street	Capital Growth Holdings Pty Ltd	P403687	2907/899	0.2440
21 Daly Street	Ashguard Pty Ltd	D78708	1892/169	0.2332
22 Grandstand Road	Ashguard Pty Ltd	D78708	1892/170	0.2031
23 Grandstand Road	Starttime Pty Ltd	D78708	1892/171	0.3731
11 Grandstand Road	The Easter Investment Pty Ltd	D17872	1182/103	0.1011
800 Great Eastern Highway	F&S Enterprises Pty Ltd	P403687	2907/898	0.2833
100 Resolution Drive	Dening Zhou Management Pty Ltd	D73202	1800/401	0.2071
101 Grandstand Road	127-129 Grandstand Street Belmont (Strata Scheme)	D73202	SP15951	0.3126
500 Grandstand Road	Kwik 'N' Kleen Pty Ltd	D90797	2076/935	0.3568
501 Great Eastern Highway	Sunlight Food Pty Ltd	D90797	2076/937	0.1063
502 Great Eastern Highway	Worldfirst Enterprises Pty Ltd	D90797	2076/938	0.1788
730 Great Eastern Highway	Novell Properties Pty Ltd	P67267	2753/474	0.3574
100 Great Eastern Highway	Selden Pty Ltd	P73087	2840/325	0.2622

Figure 4 - Land Tenure

1.3 PLANNING FRAMEWORK

1.3.1 ZONING AND RESERVATIONS

1.3.1.1 METROPOLITAN REGION SCHEME

The subject land is predominately zoned 'Urban' under the Metropolitan Region Scheme (MRS) (refer **Figure 5**).

Land abutting the Swan River within the subject land is reserved 'Parks and Recreation' and is situated within the 'Swan and Canning River Development Control Trust' area.

The south-eastern boundary abuts 'Primary Regional Roads' (PRR) reservation (Great Eastern Highway) directly to the south. This PRR reservation also extends north into the subject land at Stoneham Street and Grandstand Road.

The majority of the surrounding area is zoned 'Urban', whilst Ascot Racecourse is zoned 'Private Recreation'.

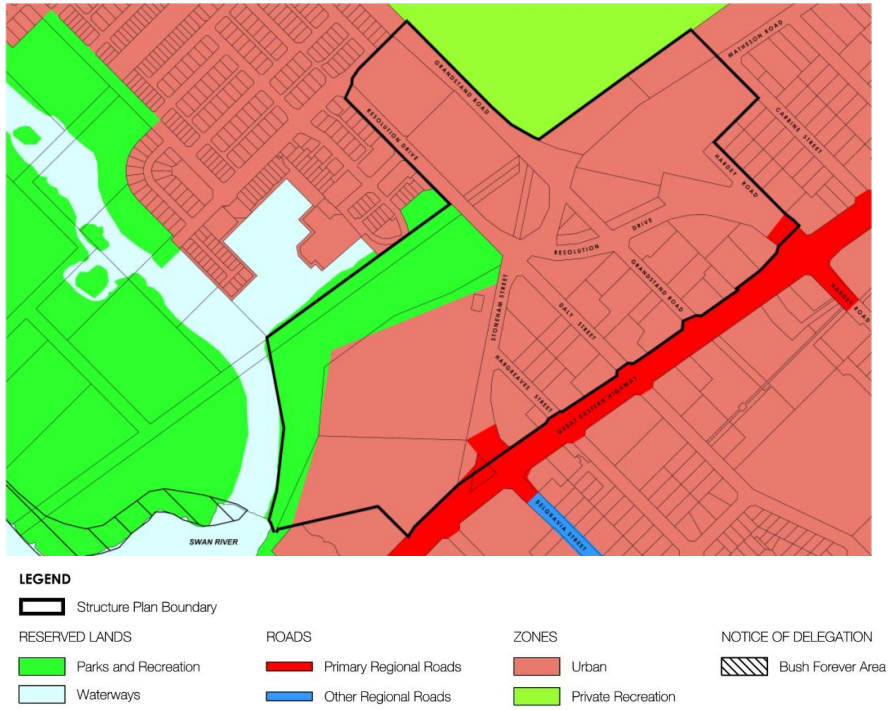


Figure 5 - MRS Zoning

1.3.1.2 CITY OF BELMONT LOCAL PLANNING SCHEME NO. 15

The subject land is predominantly zoned 'Mixed Use' under the City of Belmont's Local Planning Scheme No. 15 (LPS 15) (refer **Figure 6**).

Land within the north-eastern portion associated with Ascot Racecourse is zoned 'Place of Public Assembly – Racecourse' and identified with an 'Additional Use (A18)'. Land within the north-western portion of the subject land is also zoned 'Place of Public Assembly – Racecourse' associated with the WATC Headquarters (Lee-Steere House).

Consistent with the reservations under the MRS, the western portion of land abutting the Swan River is reserved 'Parks and Recreation' and Great Eastern Highway is reserved 'Primary Regional Roads' along with connecting sections of Stoneham Street and Hargreaves Street.

A stretch of land along Resolution Drive is reserved as Local Scheme Reserve - 'Parks and Recreation: Water supply sewerage and drainage'. This land contains a Water Corporation drain.

Land to the south of Great Eastern Highway, within proximity to Belgravia Street is predominantly zoned 'Mixed Business' with portions also zoned 'Mixed Use'.

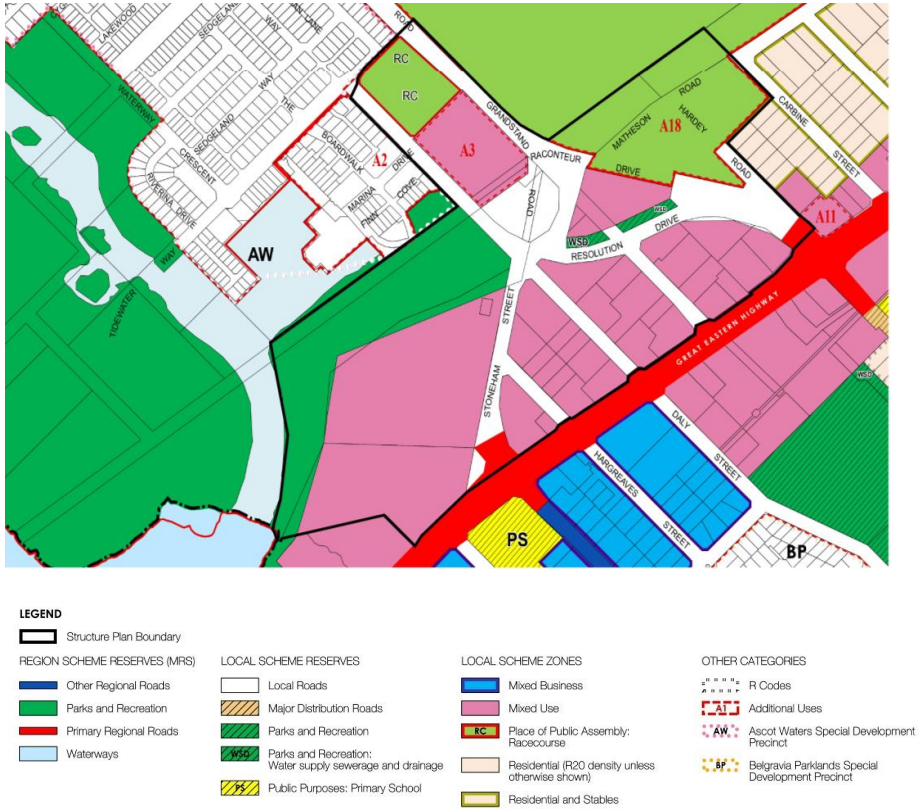


Figure 6 – LPS 15 Zoning

1.3.2 PLANNING STRATEGIES

1.3.2.1 PERTH AND PEEL@3.5MILLION

Perth and Peel@3.5million Planning Framework is a strategic suite of documents to guide future land uses through urban consolidation, integrated infrastructure and development, co-location of services and the strategic location of employment opportunities.

The subject land is located in the Central sub-region of the *Perth and Peel @3.5million Planning Framework* document.

The population in the Central sub-region is projected to grow by more than 468,000 people between 2011 and 2050 — from around 783,000 to nearly 1.2 million people. It is expected that more than 285,000 additional jobs will be accommodated in the Central subregion up to 2050.

The Central sub-region is expected to supply an additional 215,000 dwellings under the Framework, with 10,410 dwellings to be provided within the City of Belmont.

The Framework identifies Great Eastern Highway as an 'urban corridor' and Grandstand Road-Stoneham Street continuing into Hardey Road as a 'high frequency public transit' (refer **Figure 7**).

The Framework states that corridors should be the focus for investigating increased densities, with potential for mixed land uses where appropriate. The presence of existing or planned high-quality public transport is an important consideration in determining whether a corridor is suitable for a more-compact and diverse urban form.

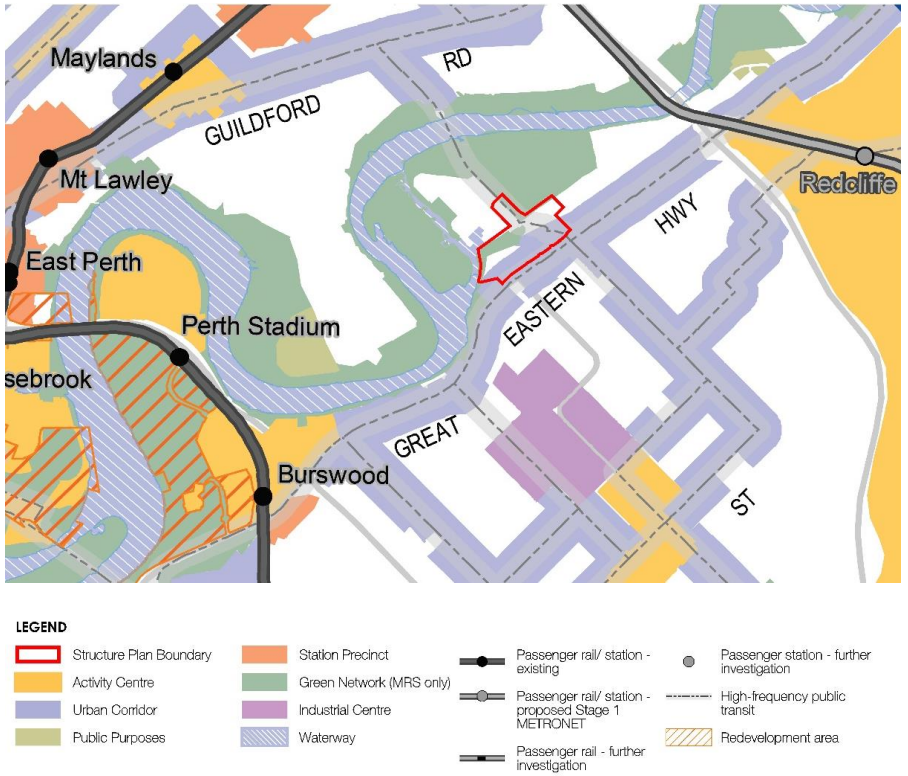


Figure 7 – Central Sub-regional Planning Framework

1.3.3 PLANNING POLICIES

1.3.3.1 STATE PLANNING POLICIES

SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning

State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4) seeks to minimise the adverse impact of transport noise, without placing unreasonable restrictions on noise-sensitive residential development. SPP 5.4 is applied where the proposal includes:

- A proposed new noise-sensitive development in the vicinity of an existing or future major road, rail or freight handling facility.
- A proposed new major road or rail infrastructure project in the vicinity of existing or future noise sensitive and uses.
- A proposed major redevelopment of existing major road or rail infrastructure in the vicinity of existing or future noise-sensitive land uses.
- A proposed new freight handling facility.

Great Eastern Highway is identified as a 'primary freight road' under SPP 5.4. Therefore, for any subdivision or development proposed within the threshold distance of Great Eastern Highway (200m) an acoustic report is required to be prepared and submitted with a development application.

Ascot Kilns Local Development Plan (Draft)

The draft Ascot Kilns Local Development Plan (LDP) and draft Local Planning Policy (LPP) was considered by Council for final approval at its Ordinary Council meeting of 12 December 2017.

The draft Ascot Kilns LDP and draft LPP proposes a vision to guide and coordinate future development across the 1.6ha former Bristile Kiln site. The draft LDP proposes the following outcomes:

- Creation of two development sites for residential apartments and some commercial uses within proposed building envelopes.
- Provision of an active edge component fronting onto the kilns cluster (promoting small-scale retail and hospitality).
- Development scale influenced by the surrounding lower scale residential context and the chimney stacks.
- Maintaining physical and visual access to the heritage structures from key aspects.
- Potential for integration of the heritage structures within future development sites to maximise opportunities for adaptive reuse and innovative design solutions.

Local Planning Policy 11 Public Art Contribution Policy

The City of Belmont's Local Planning Policy No. 11 (LPP 11) outlines the requirements for the provision of public art by the developer to protect and enhance the utility, amenity and identity of the public domain.

The City of Belmont requires all development proposals within the Policy Area of a value greater than $4.5 million to provide public art in accordance with the described method for determining public art contributions. The cost of any public art shall be no less than one percent of the value of the eligible proposal and provided in kind or alternatively, the Council may accept a cash-in-lieu payment.

A portion of the subject land falls within Precinct 4 – Great Eastern Highway Precinct of LPP 11 with the balance (excluding Ascot Kilns LDP area) situated within Precinct 5 – Swan River Foreshore.

1.3.4 PRE LODGEMENT CONSULTATION

A key component of the concept planning for the subject land has been stakeholder and community consultation and engagement. The DPLH has also been a key stakeholder in the concept planning process given the presence of the Ascot Kilns site within the Golden Gateway Precinct. The WATC have also been consulted separately given its significant landholding within the subject land, albeit subject to a separate planning process.

As part of the consultation and engagement strategy, three workshops were held during May 2016 and a fourth workshop in November 2016:

1. City of Belmont Council Staff Workshop (6 May 2016 – 22 participants)
2. Business and Landowners Workshop (26 May 2016 – 5 participants)
3. Community and Residents Workshop (31 May – 32 participants).
4. Combined Business/Landowners and Community/Residents Workshop (7 November 2016).

In addition to the above workshops, two online surveys were conducted by the City of Belmont (May and November 2016) to provide the community with the opportunity to provide additional comments. Feedback received was consistent with feedback provided at the various workshops as summarised below.

1.3.4.1 STAKEHOLDER WORKSHOPS

Overall, the overwhelming priority was the preservation and enhancement of POS both within Belmont Charitable Trust Land and throughout the remainder of the development. The emphasis was placed on the enhancement of active POS supported by recreational amenity and infrastructure.

Overall, residential development within the Golden Gateway Precinct was supported with varying degrees of density and height, however careful integration with existing residential to the north and east is paramount.

Other priorities included the creation of a destination / attraction for the City of Belmont and identification of 'place' qualities that will need to be considered in subsequent planning stages.

2 SITE CONDITIONS AND CONSTRAINTS

An Environmental Assessment Report was prepared by Urbaqua to support the Structure Plan. This report is included as **Appendix B**.

2.1 ENVIRONMENTAL ASSETS AND CONSTRAINTS

2.1.1 VEGETATION

No vegetation of conservation significance is located within the subject land. Due to historic clearing, commercial and recreational activities, the vegetation within the subject land is largely degraded. The subject land does contain some mature trees and these will be retained where possible.

Bush Forever Area 313 (Swan River Salt Marshes) is located to the north and west of the subject land. Surrounding this area, the Department of Water and Environmental Regulation (DWER) has mapped an Environmentally Sensitive Area described as 'Temperate Saltmarsh' and listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This area is an important habitat for local and migratory bird species, however is largely disconnected from the subject land.

2.1.2 FLORA

A search of the EPBC Protected Matters Database was undertaken to identify flora species of conservation significance potentially occurring within a 2km radius of the subject land.

The search identified two 'endangered' species under the EPBC Act (*Caladenia huegelii* King Spider-orchid and *Lepidossperma rostratum* Beacked Lepidosperma) and one critically endangered species (*Darwinia foetida* Muchea Bell*)*.

2.1.3 FAUNA

A search of the EPBC Protected Matters Database was undertaken to identify fauna species of conservation significance potentially occurring within a 2km radius of the subject land.

The search identified three species of 'endangered' status under the EPBC Act and seven 'vulnerable' species.

As a result of existing uses, the subject land supports limited or no remnant vegetation with a lack of intact understorey vegetation. The subject land therefore provides little, to no, fauna habitat of significant value to native fauna. The vegetation within Belmont Trust Land may provide important habitat for local and migratory birds.

2.2 LANDFORM AND SOILS

2.2.1 LANDSCAPE AND TOPOGRAPHY

The subject land is generally flat and grades gently from 6 metres (m) Australian Height Datum (AHD) in the south-east to 3mAHD in the west. A few low points exist within the centre of the subject land at approximately 1-2mAHD.

The surface geology is described broadly as Guildford formation: Alluvial sand and clay with shallow-marine and estuarine lenses and local basal conglomerate. Two-thirds of the north-western portion of the subject land is classified as Ms2 – Sandy Silt, which has a low permeability, and eastern third as S8 – Sand.

2.2.2 ACID SULFATE SOILS

A review of DWER acid sulfate soils (ASS) risk mapping identifies approximately two-thirds of the subject land, predominantly the area coinciding with surface geology Ms2-Sandy Silt, as containing a Class I 'high to moderate' risk of ASS and the remainder, coinciding with S8-Sand, classified as Class II 'moderate to low' risk occurring within 3m of the natural soil surface.

Given the Class I classification, an ASS investigation will be carried out where works are proposed in these areas consistent with the DWER Guidelines. Should ASS be present within the subject land, all site works must be carried out in accordance with an ASS management plan approved by DWER.

2.2.3 CONTAMINATED SITES

A search of the DWER Contaminated Sites database found a portion of the subject land as 'Possibly Contaminated – Investigation Required'.

2.3 GROUNDWATER AND SURFACE WATER

2.3.1 GROUNDWATER

Based on the DWER Ground Water Atlas, maximum groundwater levels are within 3m of the natural surface through the northern and central portions of the subject land, with groundwater flowing in a north-westerly direction toward the Swan River. As this drain is located adjacent to land owned by Perth Racing, they may explore opportunities for integration of the drain with future development as part of the planning they are progressing for their landholdings.

2.3.2 SURFACE WATER

A Water Corporation open drain is located within the centre of the subject land. The open drain is approximately 150m in length and directs flows of runoff from the eastern urban and industrial areas to piped drainage under the Stoneham Street / Resolution Drive roundabout to a compensation basin to the west of the subject land before travelling through a further 350m of open drain to the Swan River.

The Swan River is located adjacent to the western portion of the subject land. The DWER Floodway mapping indicates that a large area in the northern portion of the subject land lies within the Swan River 100 year average reoccurrence interval (ARI) flood fringe. Protection of the Swan River's environmental attributes will require the provision of a 50m buffer to the banks of the River consistent with its designation as an environmentally protected area and conservation category wetland (CCW) is generally applied.

The subject land also abuts the Swan and Canning River Development Control Area. The Department of Biodiversity, Conservation and Attractions Corporate Policy 49: Planning for Stormwater Affecting the Swan Canning Development Control Area provides further planning provisions to improve water quality, habitat, community benefits and amenity of the river system through stormwater management.

2.4 BUSHFIRE HAZARD

A very small portion of the subject land is identified as being located within a 'Bush Fire Prone Area' adjacent the Swan River and as such, a BMP has been prepared by Urbaqua in support of the Structure Plan (refer **Appendix A**). The BMP is a strategic level plan which identifies the bushfire protection measures to be applied to development on the subject site to accommodate compliance with:

- State Planning Policy 3.7 Planning in Bushfire Prone Areas;
- Guidelines for Planning in Bushfire Prone Areas; and
- Australian Standard for the construction of buildings in bushfire-prone areas (AS3959-2009).

As part of the BMP, a Bushfire Attack Level (BAL) Contour Map has been prepared which identifies the worst case BAL in relation to the subject land. The BAL Contour Map identifies a BAL of 'Low' across the majority of the subject land and a small portion of BAL-12.5 within the Belmont Charitable Trust Land. Given the Structure Plan does not propose development within the foreshore area subject to BAL-12.5 (or wider Belmont Charitable Trust Land), it is anticipated that any bushfire hazards can be appropriately managed.

It is expected that bushfire hazard assessment will be further refined as part of future subdivision or development stages in order to accurately assess the bushfire risk posed by surrounding classified vegetation and determine specific radiant heat exposure levels (and associated BAL) for future lots created within the Structure Plan area, as required.

2.5 HERITAGE

2.5.1 ABORIGINAL

A search of the Department of Planning, Lands & Heritage (DPLH) Aboriginal Heritage Enquiry System identifies one site occurring within the northern/western portion of the subject land.

Site ID 3753 – Registered site, Name: Perth, Type: Historical, mythological, hunting place, named place, natural feature.

Prior to disturbance of the above site, an application is to be made for consent to use the land under section 18 of the AHA.

2.5.2 EUROPEAN

The Ascot Kilns and chimneys were included on the State Heritage List in 2003 and are also included on the City's Local Heritage Survey and List. The Kilns were first built in 1930, manufacturing terracotta, stoneware and steel products. The draft Ascot Kilns LDP celebrates and enhances the site's heritage significance and maintenance.

The old Matheson Road railway line has historic value for its association with the rail link which connected Belmont to Perth and Guildford. This site is contained on the City's Local Heritage Survey. Where possible, development should recognise and interpret its significance.

2.6 EXISTING MOVEMENT NETWORK

The subject land benefits from a surrounding movement network that features access to key regional road connections, a high frequency public transport corridor and high-quality shared path cycling links.

2.6.1 GREAT EASTERN HIGHWAY

The subject land is bounded by Great Eastern Highway to the south which provides access to the west towards the Perth CBD, Graham Farmer Freeway and onto South Perth, Melville and Fremantle via Canning Highway. To the east, Great Eastern Highway provides access to Perth Airport, Tonkin/Roe Highway and onto Guildford, Midland and the Swan Valley.

Great Eastern Highway is classified as a 'Primary Distributor' under the Main Roads WA (MRWA) Functional Road Hierarchy and is regarded as one of the State's principal transport corridors carrying over 54,000 vpd, based on 2018 traffic counts.

Great Eastern Highway (between Kooyong Road in Rivervale to Tonkin Highway in Redcliffe) was subject to significant upgrade works between June 2011 and February 2013. These works included:

- Widening Great Eastern Highway, from four to six lanes, between Kooyong Road (Rivervale) and Tonkin Highway (Redcliffe) – a distance of 4.2 km;
- Constructing a central median for the full length of the project;
- Upgrading all major intersections to include dedicated turning movements;
- Providing U-turn facilities at key locations in order to maintain access to businesses fronting the Highway;
- Incorporating bus priority lanes into key intersections;
- Providing dedicated on-road cycling facilities;
- Constructing footpaths for pedestrians; and
- Relocating, replacing and protecting service utilities such as telecommunications, water, power and gas.

2.6.2 INTERNAL ROADS

The localised road network includes a network of local distributor and access roads providing access to key regional and district roads such as Great Eastern Highway and the Garret Road bridge. Grandstand Road, Resolution Drive and Stoneham Street are classified as 'District Distributor A' roads under the MRWA Functional Road Hierarchy. These are generally described as follows:

- Grandstand Road (20m road reserve) – a four lane road with a central median, running north-south within the subject land, connecting the Garratt Road crossing of the Swan River with Great Eastern Highway via Stoneham Street or Resolution Drive;
- Stoneham Street (20-25m road reserve) – a four lane road without a central median, running north-south within the subject land, connecting Grandstand Road/Resolution Drive with Great Eastern Highway and Belgravia Street; and
- Resolution Drive (22-47m road reserve) – a two lane with a central median, running east-west within the subject land, connecting Grandstand Road/Stoneham Street with Great Eastern Highway and Hardey Road.

All of these roads are under the control of the City of Belmont. The following roads are classified as 'Local Roads' under the MRWA Functional Road Hierarchy and are also under the control of the City of Belmont.

- Hargreaves Street (20m road reserve) – a two lane road without a central median, running north-west to south-east within the subject land, providing a connection between Stoneham Street (no right turn out) and Great Eastern Highway (left in/left out only);
- Daly Street (20m road reserve) – a two lane road without a central median, running north-west to south-east within the subject land, providing a connection between Stoneham Street (left out only onto Stoneham Street) and Great Eastern Highway (left in/left out only);
- Grandstand Road (south) (20m road reserve) – a two lane road without a central median, running north-west to south-east within the subject land, providing a connection between Resolution Drive and Great Eastern Highway (left in/left out only); and
- Raconteur Drive (20m road reserve) – operates as a one-way road from Grandstand Road to Matheson Road and is currently closed at the Grandstand Road intersection outside of event periods at Ascot Racecourse. Two-way access between Resolution Drive and Matheson Road is possible via the eastern extent of Resolution Drive.

2.6.3 PEDESTRIAN NETWORK AND CYCLING

2.6.3.1 PEDESTRIAN NETWORK

The extent and quality of the existing pedestrian infrastructure within, and surrounding, the subject land (with the exception of Great Eastern Highway) is poor and of a standard commensurate with the nature of existing development across the subject land (i.e. primarily light industrial/commercial unit style development).

However, Great Eastern Highway bordering the subject land to the south features good quality footpaths on both sides of the corridor. Within the vicinity of the subject land, the safe crossing of Great Eastern Highway by pedestrians is facilitated via traffic signal-controlled intersections at both Stoneham Street/Belgravia Street and Resolution Drive/Hardey Road intersections with Great Eastern Highway.

Each of the major road corridors running through the subject land (Grandstand Road, Resolution Drive and Stoneham Street) include footpaths along one side of the street – Grandstand Road along the eastern side adjacent to the Ascot Racecourse, Raconteur Drive along the northern side to connect to Grandstand Road, Resolution Drive along the eastern side adjacent to the Ascot Waters development and Stoneham Street along the western side adjacent to the Belmont Charitable Trust Land. There is an existing gap in pedestrian connectivity along Resolution Drive, opportunities to enhance connectivity may be explored by the City as part of a broader approach to infrastructure upgrade.

Local access streets (Hargreaves Street and southern section of Grandstand Road) providing access in a northerly direction from Great Eastern Highway are car dominated with no existing footpaths present. A footpath is located on Daly Street.

2.6.3.2 CYCLING

A number of existing shared paths and cycling connections are located within the subject land along primary routes, including Stoneham Street, Raconteur Drive and Grandstand Road. There is demand to upgrade facilities on Stoneham Street and Resolution Drive. Protected bicycle lanes and a shared path on Resolution Drive is essential, however the provision of 'on street' bicycle lanes on Stoneham Street will require further investigation dependent on the ultimate form of the road reserve.

A number of shared paths are also located within the Ascot Waters development directly to the north of the subject land. The Graham Farmer Freeway Principal Shared Path (PSP) is also located within close proximity to the subject land providing regional cycling connections and can be accessed via the shared path along the southern side of the Swan River.

The extent and quality of the existing cycling infrastructure within and surrounding the subject land is of a high standard, largely as a result of the Great Eastern Highway upgrades. Local connections are provided along Stoneham Street, Resolution Drive and Grandstand Road and further to the north within the Ascot Waters development. Regional connections are provided via high quality shared use paths along the Swan River Foreshore (via Belmont Charitable Trust Land towards the Graham Farmer Freeway PSP to access Perth CBD).

2.6.4 PUBLIC TRANSPORT

A number of existing bus routes operate within, or in close proximity to, the subject land. These include the Circle Route (998/999) via Raconteur Drive/Grandstand Road providing connections north to destinations including Bayswater Station, Morley Bus Station/Shopping Centre and south to destinations including Belmont Forum Shopping Centre, Oats Street Station and Curtin University.

In addition, existing bus routes (293 and 940) operate along high frequency bus corridor of Great Eastern Highway, providing connections east to destinations including Redcliffe Train Station, Perth Airport, Guildford, Midland and to the west to destinations including Victoria Park Transfer Station and Perth CBD.

Pedestrian access to existing public transport facilities is considered average with no bus stops currently located within the subject land. The closest bus stops are located on Grandstand Road immediately to the north of the subject land (close to the main pedestrian entry/exit to Ascot Racecourse). There are options to make improvements to public transport access if land uses within the subject land change over time to support additional public transport patronage.

2.7 ROAD TRAFFIC NOISE

As discussed in section 1.3.3.1, SPP 5.4 sets out specific requirements for addressing potential noise impacts from major transport arteries on adjacent noise-sensitive uses.

It has been identified that Great Eastern Highway, Resolution Drive and Grandstand Road are all likely to require consideration under SPP 5.4. In this respect any subdivision or development proposed adjacent to these roads will require an acoustic assessment to be undertaken and included as part of any application to demonstrate that the proposed design will meet the internal noise level requirements of SPP 5.4.

2.8 EXISTING INFRASTRUCTURE AND SERVICING

2.8.1 WATER SUPPLY

The Serpentine Trunk Main is located along Grandstand Road and Daly Street. A 915 steel distribution main is also located along Grandstand Road through the subject land. Existing development within the subject land is well serviced with a mixture of 100, 150 and 200 dia reticulation pipes made of asbestos cement, cast iron, PVC and steel.

2.8.2 WASTEWATER

Wastewater infrastructure general to the Ascot area is serviced by gravity style wastewater drainage infrastructure. A mixture of concrete and plastic arterial pipes on grade service all areas to local pump stations throughout the City of Belmont.

Lots within, and surrounding, the subject land are serviced by two main arterial sewer routes; a 225mm collector flowing north to south and a 225mm collector flowing east to west. Both collectors flow to the Redcliffe Pump Station 5 located on Stoneham Street. The Redcliffe Pump Station 5 collects all sewerage west of the Ascot Racecourse within the Ascot suburb and discharges it to the Redcliffe Pump Station 2 located on Abernethy Road.

2.8.3 POWER SUPPLY

Data obtained from the Western Power Network Mapping Tool indicates that the subject land is serviced by the Belmont Substation and the forecast network capacity for 2015 is >30MVA. There are High and Low Voltage power lines in the vicinity of the subject land.

2.8.4 GAS SUPPLY

Correspondence from ATCO Gas identifies Medium Pressure (MLP) gas mains (pressure indicated at 70kPa) along the majority of roads within the subject land.

2.8.5 TELECOMMUNICATIONS

The subject land is well serviced by telecommunications infrastructure with optical fibre running in or adjacent to the subject land. This infrastructure is owned by various telecommunications providers including Telstra, Optus and others. The National Broadband Network (NBN) has been rolled out in the subject area.

3 STRUCTURE PLAN

3.1 VISION AND OBJECTIVES

3.1.1 VISION

The objectives and design principles underpinning the Golden Gateway Structure Plan have been formulated around the following vision:

"The development of the Golden Gateway will transform this degraded and fragmented area into a vibrant precinct of residential and mixed use development, with strengthened connections to the Swan River and Ascot Waters, that derive best value from these attributes while respecting the area's rich culture and heritage."

3.1.2 OBJECTIVES

The overarching objectives for the Golden Gateway Precinct as established by the project team and reinforced through stakeholder engagement are as follows:

1. Improve **self-containment of facilities** – reduce car dependence
2. Improve people's connection to the **Swan River**
3. Create accessible, quality **public realm** within the precinct
4. Ensure **heritage values** are retained
5. Identify **appropriate uses/densities** in conjunction with **infrastructure improvement**
6. Optimise value of strategic sites – **planning certainty**

3.2 DESIGN PREPARATION

The Structure Plan design has been informed by a thorough analysis of the existing site conditions and the potential opportunities and issues offered by the location. The key outcomes of this analysis are noted in **Figures 8 and 9** and described overleaf:

3.2.1 OPPORTUNITIES

Land use

1. Opportunity for residential development to be accommodated in the precinct given the accessibility to high amenity riverside amenity.
2. Opportunity for retail convenience and food and beverage land uses to be integrated into development outcomes.
3. Potential for higher density development given precinct location, proximity to high amenity open space destinations, Perth CBD, localised employment and high frequency public transport.
4. Existing primary school adjacent the precinct offers opportunity to attract a diverse demographic, including young families.
5. Consider mixed use development in core area to broaden activity opportunities and long term transition of the precinct, and to offer improved amenities for the existing Ascot community.

Built form

1. Opportunity for landmark building form and massing to inner core areas to perform key gateway functions.
2. Future building form to appropriately interface with adjacent public realm.
3. Local activity hub potential within the precinct providing local centre retail, cafe/mini main street offerings in a shared street atmosphere.
4. Existing street block depths south of Resolution Drive are well suited for typical multiple dwelling apartment development parcels.

Public realm

1. Existing character and destination status of adjacent Swan River open space provides significant public amenity and recreation opportunities for future residents.
2. Promote pedestrian and cycle network connectivity through the site to strengthen access to the Swan River for both the existing Ascot community as well as future residents in the Golden Gateway Precinct.
3. Significant tree canopies within the Belmont Charitable Trust Land and peripheral open space offer significant ‘green horizon’ views to the precinct.
4. Opportunity to provide strong open space ‘cross-link’ as a ‘green ribbon’ link to the Swan River.
5. Celebrate the heritage significance of the Ascot Kilns and the potential for integration of the heritage structures to maximise amenity for residents.

Movement

1. Utilise existing local street network of Hargreaves Street, Daly Street and Grandstand Road to deliver a robust structure for future development access and vehicle circulation.
2. Generous existing road reserve dimensions provide ability for reconfigured pedestrian friendly streetscapes offering shade trees, soft landscaping and convenient on-street parking embayments.
3. Potential for alteration to the priority road network of Stoneham Street and Resolution Drive for the benefits of precinct consolidation and integration, in particular, the potential to downgrade priority of Stoneham Street for benefits to foster a stronger relationship between the Ascot community and the Swan River.
4. Investigate alternative road alignments that celebrate key view lines of surrounding visual features and future gateway elements.

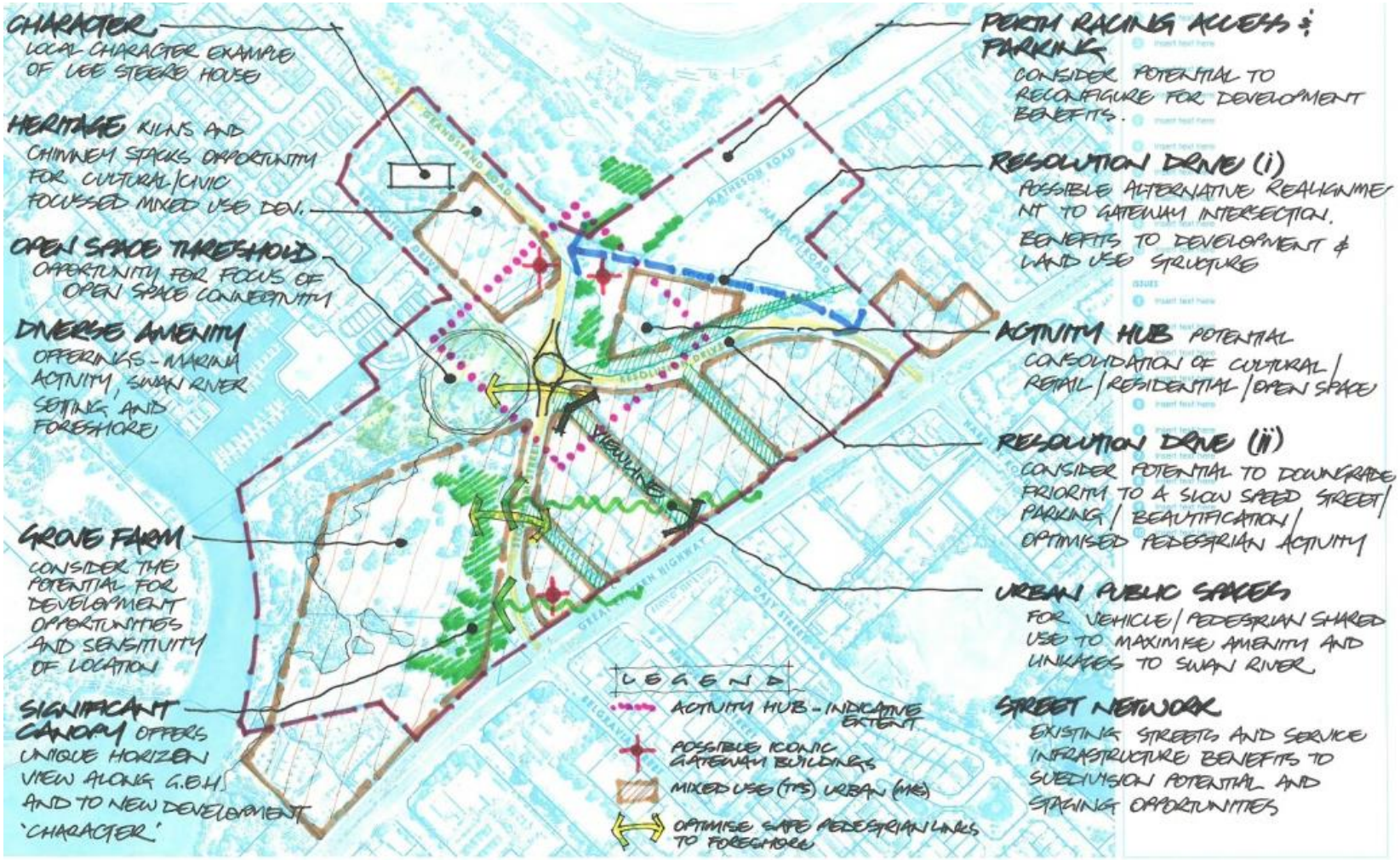


Figure 8 - Opportunities

3.2.2 ISSUES AND CONSTRAINTS

Land use

1. Service corridor extends northwards through Grandstand Road alignment.
2. Overland stormwater drainage, controlled by Water Corporation, extends east- west through the subject land located immediately north of Resolution Drive.
3. Careful consideration of existing residential development on periphery of precinct area.
4. Development adjacent Great Eastern Highway may be subject to noise attenuation.

Built form

1. Proposed development of Kilns area, which is subject to a Local Development Plan, to be considered in surrounding built form design.
2. Perth Airport restrictions based on flight path contours will potentially limit maximum building height.
3. Existing development is largely commercial and is located on a fractured land tenure base of multiple cadastral parcels.
4. Some future development may require land assembly to maximise development potential and desirable outcomes, and to rationalise redundant public reserves.

Public realm

1. Chimney locations in the Ascot Kilns area to be considered, surrounding public spaces and view lines should respect and celebrate these historic features.
2. Existing significant trees to be considered for integration into public realm, where appropriate.
3. Informal open space node to Hardey Road (east) to be considered, recognising relative disconnection of this area from other POS to the south of Resolution Drive.
4. Limited or no availability of suitable quality water from the superficial aquifer for the purpose of irrigation within the Golden Gateway area.

Movement

1. Existing roundabout impinges on precinct assimilation for all adjoining land quadrants.
2. Limited connection opportunities available to residents north of Resolution Drive.
3. Stoneham Street and its multi-lane configuration acts as a pedestrian barrier for development to interact with the POS area.

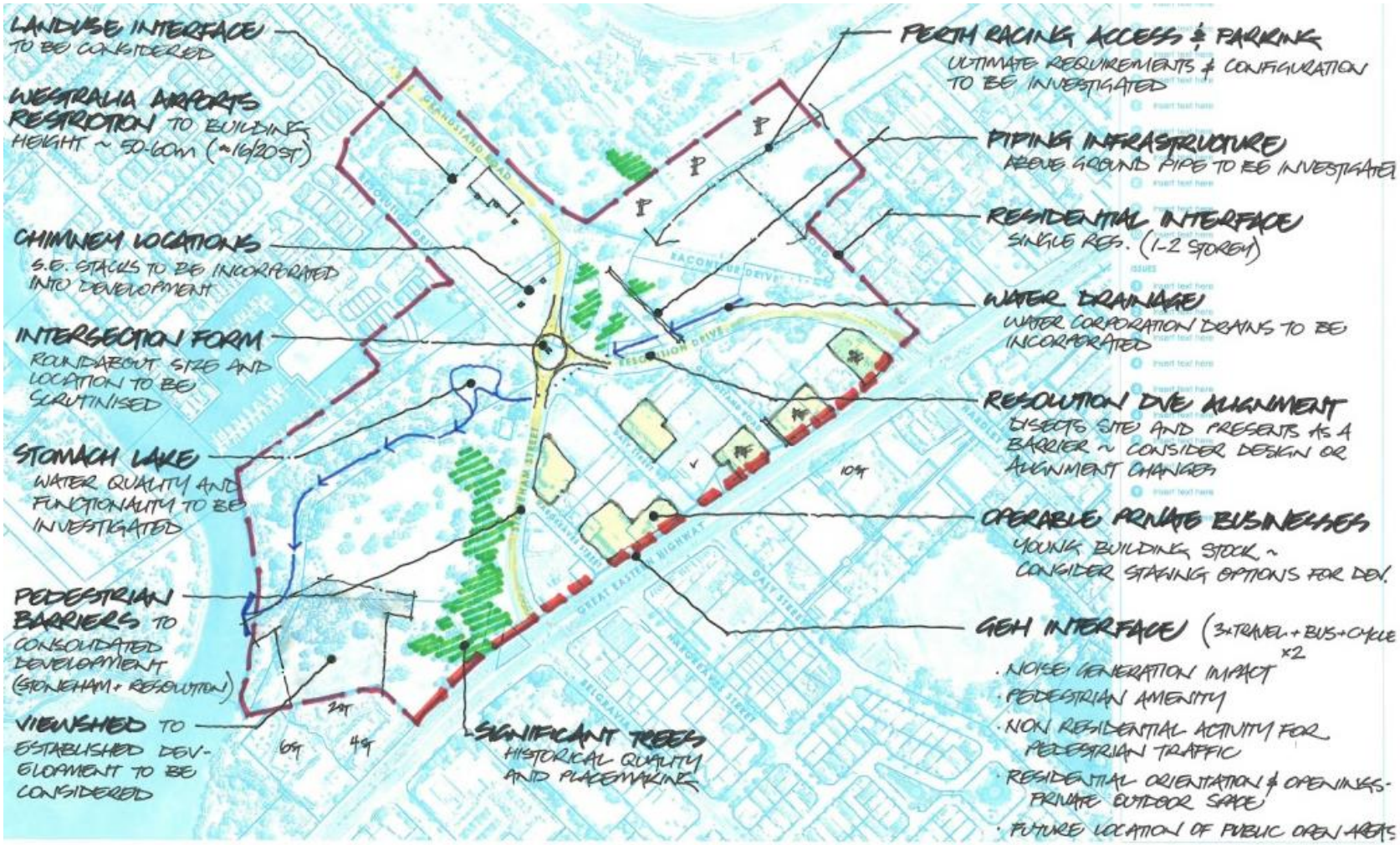


Figure 9 – Issues and Constraints

3.2.2.1 CONCEPT PLAN DEVELOPMENT – SITE ANALYSIS

One of the main challenges in testing development scenarios was to address the significant disunification of the precinct created by the heavily engineered road system, and the impact this has on local connectivity between the Precinct and the areas main natural attribute – the Swan River.

Figures 10 and **11 below** were produced to stimulate discussion, during the stakeholder engagement process, about ways in which the physical barrier to the Swan River could be removed, or at least, reduced. The stakeholder engagement process produced a number of specific considerations for the initial design phase to develop scenarios (refer **Figure 12**).

Figure 10 - Existing access and connectivity summary

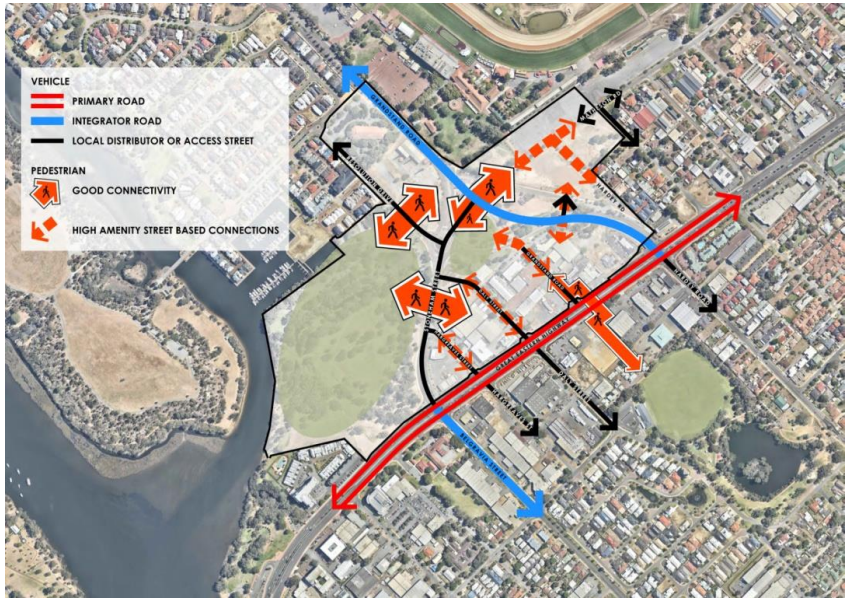


Figure 11 - Opportunity through altered vehicle priority for improved connectivity and access – to be considered further in design scenario testing

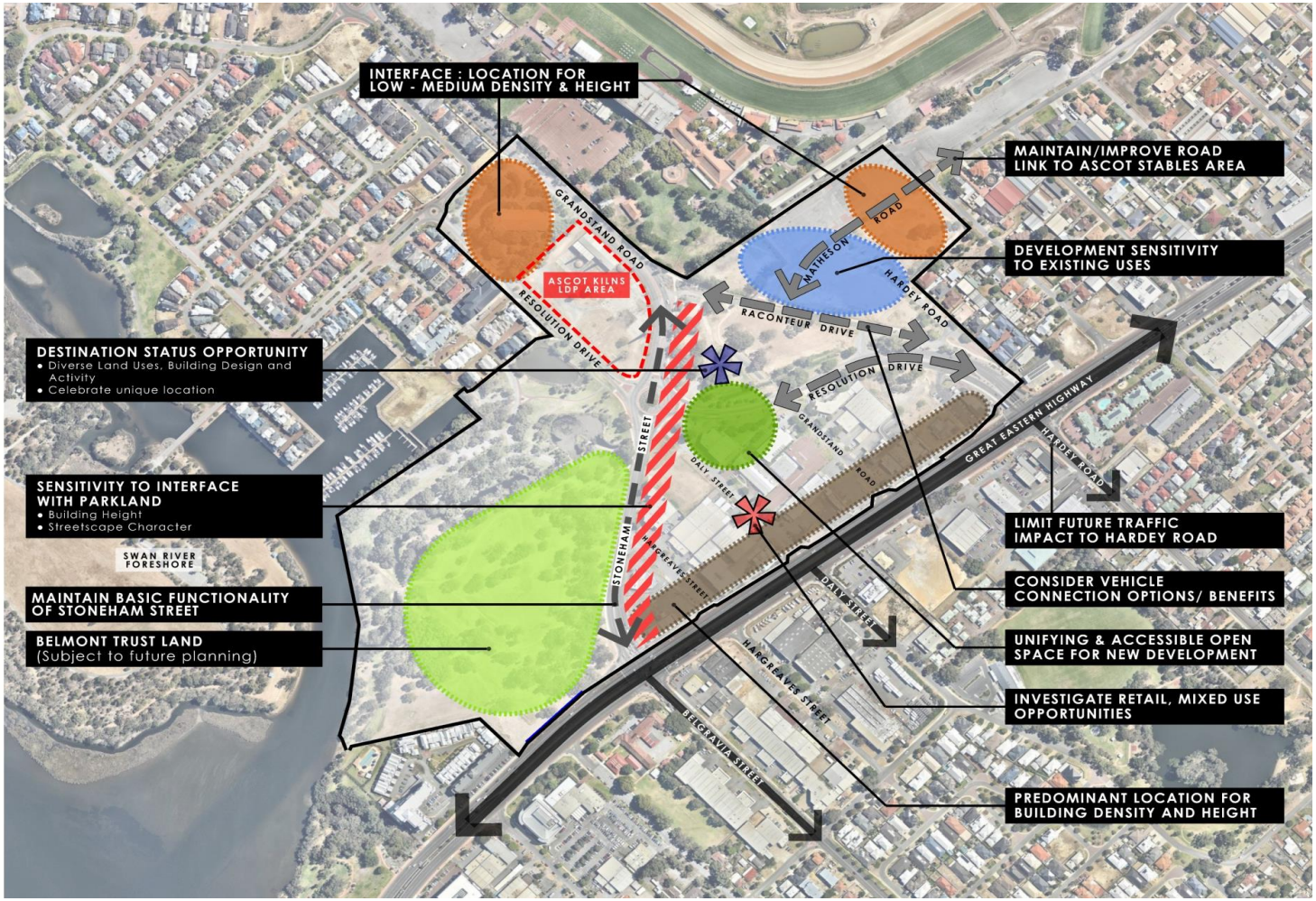


Figure 12 - Community engagement design feedback (summarised)

3.2.3 CONCEPT SCENARIO FORMULATION

Analysis of the subject land and key design principles resulted in the preparation of three development scenarios for testing and stakeholder discussion (refer **Figure 13**). The initial phase of high level scenario testing involved the preparation of Framework Diagrams, exploring structural opportunities and benefits to the following:

- **Landuse** – preferred structure and location.
- **Circulation** – enhancing connections, preferred hierarchy with future flexibility & rigour.
- **Character** – celebrating local qualities for unique place setting and to enhance the existing amenity.

Preliminary sketches exploring alternative land use and movement structures

The Framework Diagrams were discussed and analysed with the community and Council technical officers as key elements for the next phase of scenario evaluation. Various scenarios achieved the project objectives better than others, particularly with regard to public amenity and community integration with the Swan River foreshore.

Preliminary sketches developing framework scenarios

The next phase of scenario refinement resulted in the examination of appropriate land uses, building forms and public realm to test the structural opportunities and benefits for each of the scenarios**.** These were then evaluated by the project team and the community via design workshops and web based consultation sessions.

Preliminary design scenarios

In summary, Scenario A evaluates the development opportunities for the precinct whilst maintaining the existing road network. This scenario highlights the limitations this has on development consolidation and for connectivity of future residents with the foreshore amenity.

Scenario B evaluates the development outcome where the existing road priorities of Stoneham Street and Resolution Drive are modified to improve integration of the precinct's residents with the adjacent public amenity.

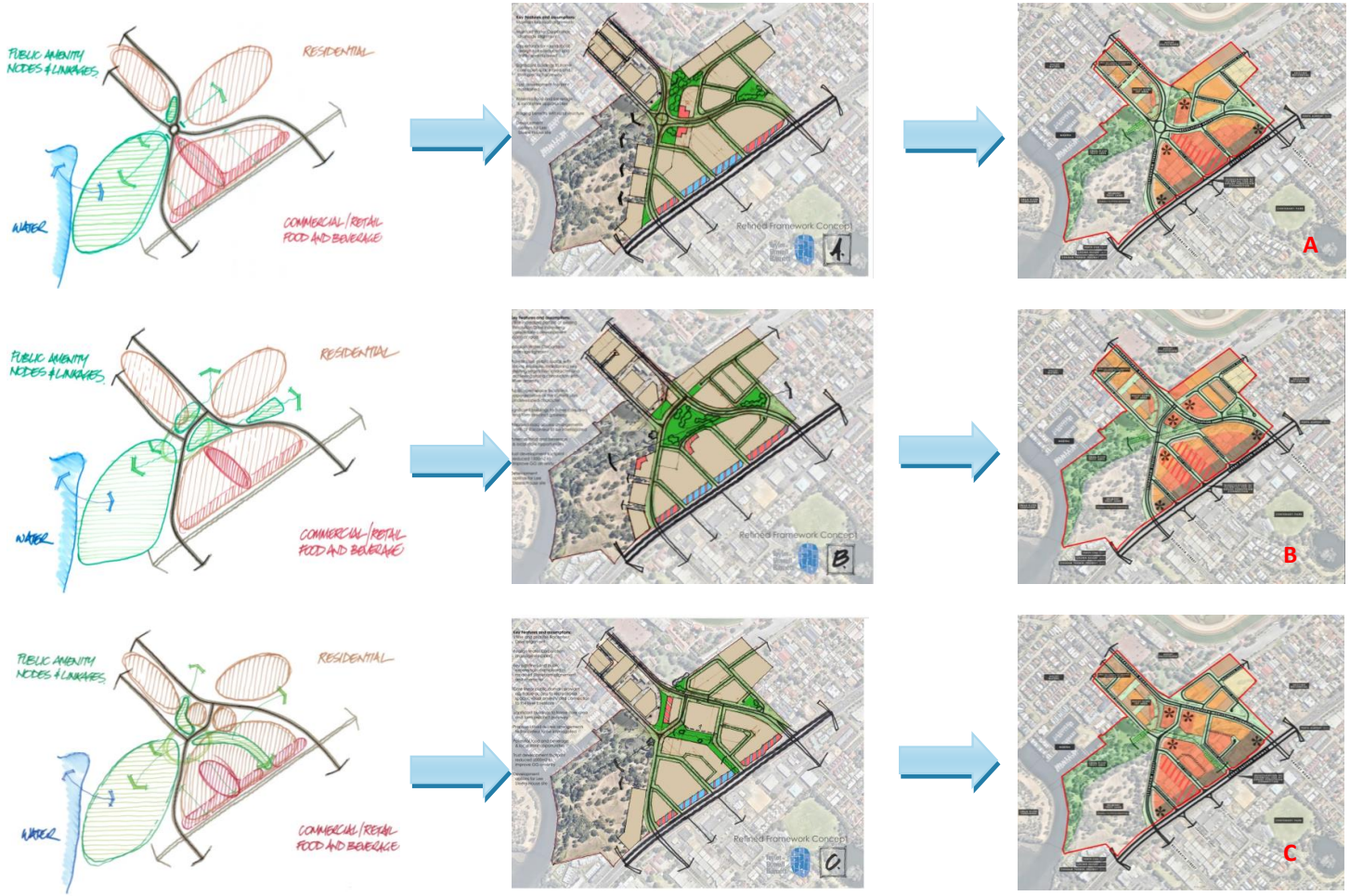
Scenario C evaluates an outcome where the original road alignment of Raconteur Drive is used to maximise future integration opportunities for development west of this road and consolidation of the precinct's future residents.

Scenario evaluation outcome

This scenario evaluation process led to the refined design outcome produced in the preferred scenario.

The preferred scenario was informed by detailed public response to the preliminary scenarios at the community workshops, and through other stakeholder contribution. That preferred scenario was further tested and developed into the preferred Golden Gateway concept, described in detail in section 3.2.4.

It should be noted that through the preparation of the Structure Plan, further assessment of the proposed movement network was undertaken in relation to the potential impacts on the Stoneham Street-Belgravia Street and Resolution Drive-Hardey Road corridors. Based on this assessment and in conjunction with MRWA, it was considered that any modifications to the redistribution of traffic flows (i.e. via Resolution Drive) would not be supported.



Preliminary sketches exploring alternative land use and movement structures

Preliminary sketches developing framework scenarios

Preliminary design scenarios

Figure 13 – Evolution of Design Scenarios

3.2.4 DEVELOPMENT CONCEPT PLAN

To support the formal Structure Plan included in Part 1 – Implementation, a Development Concept Plan was prepared to illustrate the development intent. The original Development Concept Plan that formed part of the advertised version of the Structure Plan document (**Figure 14**) was based on the preferred scenario that evolved from the Scenario Evaluation process.

Figure 14 – Original Development Concept Plan

Post-advertising Design Review

Following the public comment period, and having regard to the comments received from the community and government agencies, the City commissioned a review of the Movement and Access Strategy. The revised strategy (contained in **Appendix C**) recommended an amended movement network that is more closely aligned with the existing infrastructure. As a consequence of this, and other feedback received, the following key changes are proposed to the structure plan:

1. Adopting the movement network modifications recommended in the revised Movement and Access Strategy;
2. Removal of planning detail from land owned by the Western Australian Turf Club;
3. Removal of the linear open space proposed over the Water Corporation drainage alignment; and
4. Alteration of building height provisions.

In accordance with this direction the Development Concept has also been revised to maintain consistency with the Structure Plan (refer **Figure 15**). It should be noted that this graphical representation is indicative only and serves to illustrate a long term, mature development scenario. Its primary purpose is to graphically communicate the ultimate vision and intent underpinning the Structure Plan.

Figure 15 – Development Concept Plan

Key concept features

The key features of the Development Concept Plan are outlined as follows:

Access and connectivity

- Integrate Golden Gateway with the broader Belmont catchment.
- Minimise the barrier of Stoneham Street by formalising pedestrian movement opportunities.
- Enhance vehicle accessibility and circulation benefits offered by the existing movement framework.
- Reconfigure road network for enhanced development consolidation and precinct character benefits.

Planning and land use

- Sensitively integrate residential development of increased density with the surrounding area.
- Convenience retail, shops, restaurants and cafes located 'parkside', and within a pedestrian friendly street environment, to take advantage of the unique amenity and population growth of the location.
- Moderate building height and density to the residential interfaces of the precinct, providing an appropriate transition to existing development.
- Provide flexibility for commercial mixed-use development along Great Eastern Highway.
- Contemplate development controls to foster appropriate multi-level development to support denser living options.
- Opportunity for diversification of uses – facilities, amenity, destination uses and attractions.

Built Form

- The height and scale of new buildings will form an appropriate relationship with their environment and context, including adjacent residents.
- Use building form to create a more comfortable and characterful environment, enhancing the gateway location, particularly adjacent the public realm.
- Consider suitable building form and locations to enhance the precinct's outcomes.
- Retail opportunities promoted for improved sustainability outcomes of the precinct and adjacent residents.

Public realm

- Enhancement of existing public streets, utilising the wide reserve widths to produce unique character and pedestrian comfort.
- Prioritise the retention of established tree canopies where achievable.

Destination Planning

- Capitalise on the opportunity to leverage subject land's exceptional destination qualities.
- Creation of framework / strategies to support detailed place planning, investment attraction and place management.
- Creation of framework / strategies that will attract a diverse mix of uses, attracting visitors across different times of the day and week.

Images: Building Form Inspiration Images

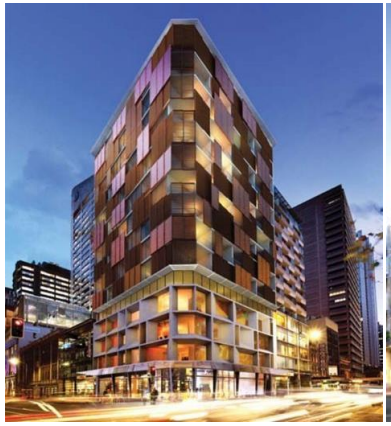
Above: Introduce transitional building height to development edges.

Above: Corner site development addressing both street frontages, with 3 storey podium height to building edges and mixed height elsewhere on site.

Above: Example of a 4 storey residential building detailing an appropriate level of articulation and surveillance through the use of balconies and architectural elements. Also illustrates an acceptable treatment to site retaining at lot edges.

Above: Example of 5 storey mixed use building featuring retail/food and beverage uses at the ground level and residential living above producing a sustainable and active development outcome. In addition, this illustrates the beneficial outcome for buildings to interact with key mature trees available within the proposed Golden Gateway public realm.


Left: Example of 8 storey buildings with suitable levels of architectural detail, material and artwork to achieve an appropriate response for Golden Gateway.
Right: Example of 10 storey building illustrating an appropriate podium design detail and landscape amenity.




Left: A 15 storey buildings providing an outstanding response to its corner location.
Right: A 8 storey building examples incorporating desirable podium design and setback to tower element(s).


Above: Landmark buildings providing exceptional architectural gateways into the Golden Gateway precinct.

Above: Example of appropriate response to podium requirements to achieve active and enjoyable streetscapes with building mass setback into the site.

3.3 LAND USE

Golden Gateway will provide for a diverse range of land uses. The primary land use within the Structure Plan Area is residential, supplemented by commercial uses and local open space. A summary of the land uses and areas is provided in **Table 3**.

TABLE 3: LAND USE

Zone / Reserve	Area (Ha)
Mixed Use	1.7578
Residential	4.2473
Parks and Recreation	4.5556
Public Open Space	0.0525
Local Roads	4.7542

As outlined in Part 1 and **Plan 2**, the subject land has been divided into Precincts.

A statement of intent for each Precinct is described in Part 1 together with development standards to ensure that the intent of each Precinct is achieved.

3.3.1 RESIDENTIAL

Due to the proximity of high amenity areas such as POS and future areas of activity such as Great Eastern Highway, Stoneham Street and Resolution Drive, a density code of R-AC0 is proposed.

The R-AC0 coding has been applied to all land within the Mixed Use zone and it is considered that the Structure Plan and the R-Codes provides sufficient guidance on built form outcomes.

Part 1 – Implementation also stipulates maximum plot ratios applicable within the Mixed Use zone.

3.3.1.1 DWELLING PRODUCT TYPE, MIX AND YIELD

It is envisaged that Golden Gateway will accommodate primarily multiple dwellings to contribute to the desired scale and density of the development.

The estimated yield is indicative only, based on the build-out potential under the Structure Plan. With respect to dwellings, the ultimate yield and product mix will be determined by the type of development pursued by proponents and will be subject to the market conditions at the time, although the Structure Plan does impose minimum development parameters (for setbacks and heights) as well as maximums. The ultimate yield and product mix will be determined during the construction and development phase.

The Development Concept Plan suggests a potential yield of at least 2,268 dwellings. This could accommodate a total population of up to 4,082 assuming an average household size of 1.8 people.

3.3.2 OTHER LAND USES

3.3.2.1 COMMERCIAL

Commercial development in Golden Gateway will service the surrounding residential catchment and racing activities and optimise the value of the precinct's highly visible and connected location. The anticipated yield for the precinct estimates a total of 6979m^2 commercial (non-retail) floorspace (GFA).

It is envisaged that commercial activity will be mostly focused within the Great Eastern Highway Precinct (Precinct 1) and will likely occupy the first 1-2 levels of buildings across the precinct.

Development of commercial space is only likely to proceed based on its commercial feasibility and the prevailing market conditions at the time of development.

In order to foster the progressive and timely development of the precinct, it is not intended that commercial uses will be mandated within the Mixed Use areas; however ground level design should be adaptable to enable land use to change over time.

3.3.2.2 RETAIL

The existing residential areas of Ascot Waters and the stables area presently suffer a lack of local shopping facilities, with the BP Service Station on the corner of Resolution Drive and Great Eastern Highway providing the only nearby outlet for basic convenience items. Development of the Golden Gateway Precinct provides an opportunity to establish a local centre for the benefit of the precinct as well as the broader local catchment.

The Mixed Use zone permits non-residential development and this is encouraged at ground level, it is anticipated that some discrete retail development will occur to service the local population.

The City of Belmont has prepared an Activity Centre Planning Strategy (ACPS) to guide the future planning and coordination of activity centres. The ACPS states that a new local centre is proposed to be established within the Golden Gateway precinct with 1,200m^2 of retail floor space and that its location will be guided by future detailed planning. Due to land fragmentation within the Structure Plan area it may be appropriate to locate the local centre on WATC land. This would however be subject to further detailed planning. Given this, a specific local centre location has not been designated within the Structure Plan area.

3.3.3 LAND USES

Part 1 – Implementation of this Structure Plan refers to corresponding zones within the Zoning Table of LPS 15 to determine land use permissibility within the various precincts. It does, however, stipulate some exclusions (uses that are considered Unacceptable, notwithstanding that they are listed as a discretionary use in the Zoning Table). Having regard for the amenity of future residents the unacceptable uses include:

- Auction Mart
- Caretakers Dwelling
- Fast Food Outlet / Lunch Bar
- Home Store
- Garden Centre
- Industry - Light
- Motor Vehicle Repair
- Night Club
- Radio or TV Installation
- Restricted Premises
- Service Station
- Single House
- Vet Hospital
- Warehouse

These uses have been excluded as they are considered to be inconsistent with the vision and objectives of the Structure Plan, and approval of such uses would compromise the urban fabric envisaged for the area.

Furthermore, 'Shop' is an Additional Use in the Mixed Use zone within the subject land.

3.3.4 BUILDING HEIGHT

Maximum building height limits apply to satisfy relevant protection of airspace, airport facilities and surfaces regulations due to the proximity of Perth Airport. Development must comply with maximum building height limitations as indicated on the Obstacle Limitations Surfaces (OLS) Ultimate Surfaces Map – maximum height of 61mAHD within the majority of the subject land, equating to approximately 19 storey buildings. The remainder of the subject land is located within the 'conical surface', being the 5% slope to 61mAHD.

Cygnet West were engaged to investigate development feasibility and built form controls along Great Eastern Highway and within the Structure Plan area. The building heights have been informed by their input and recommendations. Accordingly, a maximum building height of 15 storeys is encouraged along Great Eastern Highway given the prominence of this location and level of commercial activity envisaged for this precinct, with a maximum height of 10 storeys elsewhere. All sites within the Structure Plan area may incorporate an additional 5 storeys in height, above the maximum identified in **Table 2**. Achievement of additional height is subject to the discretion of the decision maker and will need to:

- The production of an exceptionally high quality of design, as determined by the appointed design review panel; and
- Incorporate the following:
    - An area of publicly accessible private open space; and
    - 100% of windows containing double glazing; and
    - Provide an additional tree on-site above what is required by State Planning Policy 7.3 Volume 2 – Apartment Design Code. The tree must be a native species with a pot size of between 100L – 200L; and

- Provide conduits and capacity within the electrical distribution system and metering or future provision of electric car charging for each unit within the development; and
- Provide a minimum of two electric vehicle charging bays within the development; and
- Provide shared sustainable transport measures for the development that may include the provision of electric bikes, scooters and vehicle/s; and
- Achieve a Nationwide House Energy rating Scheme (NatHERS) star rating of a minimum of one star in excess of the current energy efficiency rating for the dwelling shall be certified by a suitably qualified and accredited energy assessor using accredited software and shall be provided a the development application stage; and
- Install a photovoltaic solar panel system that can provide the equivalent of at least 1Kw energy per dwelling.

In order to ensure development is built to a sufficient scale to facilitate the density envisaged for Golden Gateway, and to achieve the desired urban design outcomes, it is also considered appropriate to set minimum building heights. Priority should be given to the relationship of ground floor uses and building design with the public domain to ensure that considerations such as activation, passive surveillance and appropriate combination of uses are optimised.

A maximum podium height of 3 storeys applies (2 storey minimum) unless within the Great Eastern Highway Precinct, in which case a maximum podium height of 5 storeys applies. Podium elements are encouraged to relate to and activate the street, with the levels above the podium to be sufficiently setback.

Minimum and maximum building heights for podium and tower elements across the subject land are shown on **Plan 3** (Part 1).

3.3.5 LANDMARK SITES

There are two key locations situated at the termination of key view lines and sites highly visible from outside of Golden Gateway, thereby acting as landmarks for the development. These sites will also act as key nodes located along important pedestrian movement connections and will assist in linking these sites with the public realm.

Landmark sites have been identified as shown in **Plan 3** taking into consideration view corridors, overshadowing impacts and amenity considerations. In this regard, higher buildings are located at key corners of Great Eastern Highway and Stoneham Street and Resolution Drive.

Landmark sites should also be designed incorporating architectural or sculptural features with a point of difference, and will be reviewed by the City's Design Review Panel as a component of a Development Application.

3.3.6 CAR PARKING

The City wishes to encourage innovative approaches to car parking provision, such as reciprocity, carpooling programs or other innovations, that may result in reduced parking provision where appropriate, consistent with contemporary State Planning Policy. In this respect, the Structure Plan applies the car parking rates that are set out in the relevant R-Codes, and will also enable the Responsible Authority to consider approving a reduced parking provision where it can be demonstrated that an alternative parking proposal is sound and will result in a reduction in parking demand. Any proposed variation should be supported by a parking demand assessment undertaken by a suitably qualified professional.

An integrated approach to parking provision will be encouraged within Mixed Use and Multiple Dwelling development, in order to make the most efficient use of parking provision and to encourage use of alternative (public) transport modes where appropriate. In this respect special provisions are proposed to challenge the 'business-as-usual' approach to car parking design. The proposed parking provision is consistent with State Planning Policy 7.3 Volume 2 – Apartment Design. The following specific requirements are to be applied:

a) For Mixed Use development, all residential parking in excess of 1 bay per dwelling, and at least 50% of the minimum required parking for non-residential uses shall be made available for general use of either residential or non-residential uses (these bays represent unallocated communal parking bays).

b) Mixed Use development that proposed parking as outlined in 2a) above should be required, as a condition of Development Approval, to prepare a Car Parking Strategy that addresses the management of the unallocated communal parking provision, including:

    I. The hours during which parking bays shall be made available for general public access; and

II. Location, signage and monitoring of usage of the unallocated communal parking bays.

c) The provision of car parking that is in excess of the minimum required for the site will only be approved where it is designed to be adaptable for future conversion into habitable floor space, or other useable space communal or private usage. In order for parking to be considered adaptable, it must be shown as located in a position that is suitable for an alternative use, not included in individual strata titles and constructed to comply with habitable floorspace standards.

This requirement may be waived if it can be demonstrated that complying with the requirement would not be practical or would result in a less desirable outcome.

3.3.7 PUBLIC OPEN SPACE

The total POS provision is commensurate with the composition of land uses and having regard to the surrounding site context.

It should be noted that the subject land is well located within an existing urban context comprising of significant public parkland associated with the Swan River and portion of the Belmont Charitable Trust Land provided for public recreational value. As the subject land is generally constrained from providing more functional POS, and as there is a significant existing provision, it is proposed that contributions be sought for the upgrade of POS already supplied within the Belmont Charitable Trust Land.

A POS calculation has been prepared in accordance with Liveable Neighbourhoods (LN), as detailed in **Table 5**, including applicable deductions. In accordance with LN, a total of 1.5186ha of Open Space is required to be provided (**Figure 16**).

In the case of mixed use development, there is no minimum requirement for the provision of POS under LN. LN states that the appropriate POS contribution for mixed use development will be determined by the WAPC on a case by case basis.

It is proposed that approximately 0.0525ha of local public open space be provided as result of the closure of Daly Street. The proposed provision is less than the standard POS requirement of 10% POS for residential development under LN, however the proposed provision is considered appropriate for a mixed-use precinct. Furthermore, the City's POS Strategy also sets out minimum standards of land area provision for POS based on current best practice and ease of accessibility to available open space for both residential and non-residential areas. The subject land falls within the Ascot study area of the Strategy which concludes that whilst active open space provision is considered low, the area is well equipped for passive recreational activities largely as a result of the Regional Open Space associated with the Swan River foreshore to service its local needs.

Consistent with the assessment provided in the City's POS Strategy, the subject land is well located within an existing urban context allowing the future residents to take advantage of a variety of established recreation and leisure opportunities associated with the nearby Swan River and environs.

There is also the potential for the cash-in-lieu to be collected for the upgrade of the Belmont Charitable Trust Land, subject to the approval of the Minister for Planning under s154(2)(c) of the *Planning and Development Act 2005*.

Although subject to a separate planning process, the Ascot Kilns LDP will identify and provide for 10% of gross subdivisible area as POS. There may also be opportunities for public open space on a portion of Perth Racing's landholdings. This may be investigated as part of the separate planning work they are undertaking.

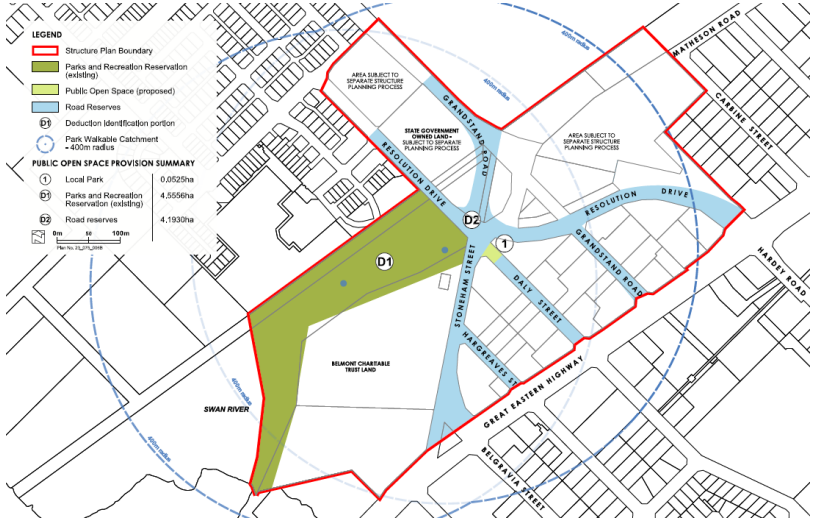


Figure 16 – Open Space Provision

TABLE 5: PUBLIC OPEN SPACE SCHEDULE

PUBLIC OPEN SPACE (ha)		
Gross Site Area		**23.9871**
DEDUCTIONS		
D1 Parks and Recreation Reservation (existing)	4.5556	
D2 Road reserves (existing)	4.1930	
Total Deductions		8.7486
Gross Subdivisible Area		**15.2385**
Creditable Public Open Space Required @ 10%		**1.52385**
PUBLIC OPEN SPACE PROVISION		
Unrestricted Public Open Space		
POS 1	0.0525	
Total Unrestricted Public Open Space		**0.0525**
Restricted Public Open Space		Nil
TOTAL CREDITED PUBLIC OPEN SPACE		**0.0525**
PERCENTAGE OF PUBLIC OPEN SPACE PROVIDED		**0.2%**

3.3.8 PUBLIC REALM PROVISION

A Public Realm Strategy was prepared in support of the Structure Plan (refer **Appendix E**) to develop a clear vision, principles and objectives to inform development of the public realm.

Existing local streetscapes are predominantly reflective of the commercial environment, particularly within the commercial 'triangle'. The standard of verge maintenance ranges from good quality reticulated lawns through to poorly maintained verges damaged by random, uncontrolled, overflow parking. The extent and quality of the existing pedestrian infrastructure within, and surrounding, the Structure Plan is of a standard commensurate with the nature of existing development across the Structure Plan area (i.e. primarily light industrial/commercial unit style development). The extent and quality of the existing cycling infrastructure within and surrounding the site is of a high standard, partly as a result of the Great Eastern Highway upgrades.

The Public Realm Strategy sets out to provide a high quality urban framework that promotes pedestrian circulation, accommodates vehicles in a safe and logical manner and is an environment that presents a desirable destination to live, work and recreate. Placemaking should inform the detailed design of spaces throughout the precinct. The spaces need to be able to facilitate and accommodate diverse uses that may emerge from community social investment. Places across the site will achieve a successful balance between physical attributes, the vehicle circulation and dynamic social, cultural and economic vitality. Its inherent qualities are strongly related to its proximity to the Swan River and its heritage related to the Ascot Kilns.

The key public realm areas are set out in the following pages.

Examples of Public Art, Rain Gardens & Swale Designs in an Urban Context (Jolimont Parkside Walk)

Road and street treatments

Road hierarchies and overall legibility of the subject land will be reinforced by the type of tree planting associated with the scale of the road. The paving treatments within all streets and roads will feature a consistent material palette to reinforce the distinctive character of the area.

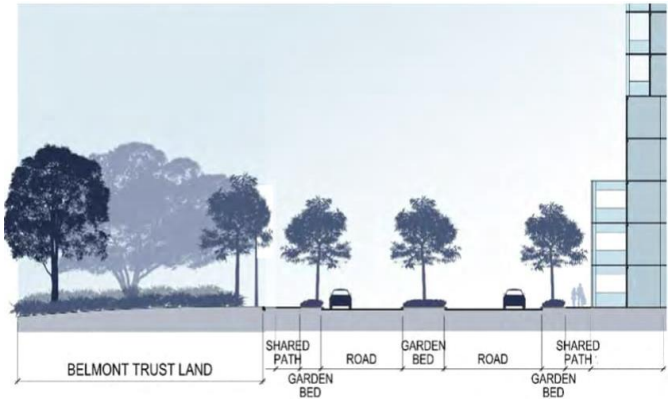
Resolution Drive and Stoneham Street.

Whilst Resolution Drive and Stoneham Street will be largely vehicle dominated, the landscape aesthetic will be dominated by tree planting of larger species, creating a canopy boulevard along its length. Verge and median planting will create a formalised sinuous corridor of canopy trees that are recognisably different to the scale and nature of other landscapes in the area (refer **Figure 17**). Street trees will be planted to create a boulevard aesthetic the length of the street, aiding in wayfinding.

Resolution Drive

Stoneham Street

Resolution Drive



Stoneham Street

Figure 17 – Resolution Drive and Stoneham Street (Plan Extract and Indicative Section

Central Streets

Hargreaves Street, Daly Street and Grandstand Road will comprise street tree planting that is not monoculture but uses a mix of street trees in varying combinations, to provide a dynamic and varied street tree canopy (refer to Section 10.3 of the Public Realm Strategy for proposed tree species). These streets will extend the overall public realm character established within the precinct but in a simpler manner. Street tree planting is proposed to create a canopied streetscape and to be positioned abutting the parallel parking embayments (refer to **Figure 18**).

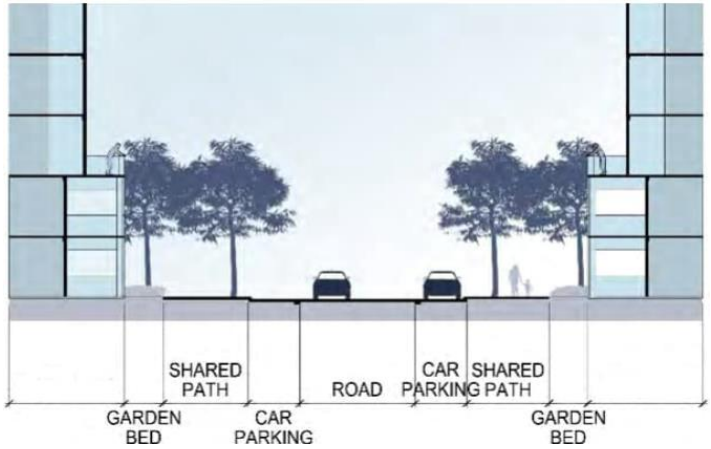


Figure 18 – Central Streets (Plan Extract and Indicative Section

3.3.9 LANDSCAPE DESIGN

3.3.9.1 DESIGN OBJECTIVES – AN URBAN LANDSCAPE

As a busy location, the public realm offers the opportunity to be transformative, linking uses and people to the nearby valued Swan River, its parklands and the heritage and interest of the Ascot Kilns.

The public realm spaces made up of streets and a park, combine to be a defining element of this location, that importantly the users, employees and residents will experiences and define the qualities of the public realm.

The overall landscape design objectives for the public spaces are set out below:

Identifiable character

- Create a contemporary urban environment that promotes safe and easy pedestrian experiences.
- Create new diverse urban landscapes that reflect the subject land's unique characteristics and close links to the river parklands.
- Create spaces that encourage and accommodate local community use and engagement.
- Establish an aesthetic that promotes positive development and investment in the location.
- Celebrate the heritage significance of the Ascot Kilns.

Valuable Landscapes

- Create a microclimate in public realm spaces and streets which encourages use and enjoyment.
- Provide key views and relationships that assist in orientation and legibility.
- Create highly utilised and valued public realm streets and spaces.

Environmental/Sustainability

- Create a durable urban landscape.
- Reduce urban heat sink characteristics.
- Create urban tree canopy (in compliance with the City of Belmont's Urban Forest Strategy 2014 and the The Canopy Plan 2019-2024).
- Retain vegetation wherever practical.
- Promote the use of low water demand plants.
- Pursue water harvesting, passive irrigation and integrated urban water management.

3.3.9.2 INTEGRATED DRAINAGE MANAGEMENT

The use and promotion of Water Sensitive Urban Design (WSUD) techniques and approaches are to be utilised wherever possible throughout the subject land. The space for nutrient stripping is limited. As the urban area is not producing a nutrient load, the focus is on slowing runoff and reducing hydrocarbons. The use of linear and incidental 'rain gardens' and 'nutrient sinks' can be implemented discretely within paving in streets and areas of open space. These devices should be fully integrated with the road drainage promoting passive irrigation of street tree vegetation and controlling hydrocarbon runoff.

Within the context of a dense inner urban area, the design of these WSUD devices need not be natural in appearance but can be incorporated within the urban public realm infrastructure as a contemporary feature.

It is intended that the POS space within the redundant portion of the Daly Street road reserve will contain soft landscape areas. These areas present an opportunity to accommodate local drainage that is managed through swale type structures that infiltrate water and passively irrigate trees and other vegetation used in the public realm. This will be subject to further investigation and more detailed design at a later stage.

The use of permeable pavements and porous asphalt treatments in key locations is recommended, possibly associated with lower level threshold treatments of road junctions, should be incorporated as a component of the approach to integrated drainage management.

In order to deliver wider environmental sustainability objectives, as well as providing attractive places in which residents and visitors can enjoy, consideration should be given to the conservation of water resources and quality of groundwater. The use of water efficiency measures is encouraged and should promote the investigation of best management practices for irrigation of public open space.

The availability and quality of groundwater within the LSP area is limited at this stage. This will affect the ability of the City of Belmont to irrigate the proposed vegetation within the public realm areas. Therefore, due to the limitation of groundwater for irrigation purposes, the future irrigation of vegetation within the POS and public realm areas will need to be supplied by other sources. This may include scheme water, stormwater, irrigation (by agreement) from the Western Australian Turf Club's (now operating as Perth Racing) artesian groundwater licence, a new irrigation lake or other irrigation strategies will need to be investigated in the future. The City may encourage developers to consider the irrigation of abutting verge vegetation and street trees to ensure the high quality natural amenity of the public realm is maintained. Alternatively, non-irrigated (dry) landscape may need to be considered for the public realm areas.

3.4 MOVEMENT NETWORK

A Movement and Access Strategy was prepared by Flyt in support of the Structure Plan (refer **Appendix C**). This Strategy has been prepared using the requirements set out within the WAPC Transport Impact Assessment Guidelines (August 2016) Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans.

3.4.1 ROAD NETWORK AND TRAFFIC MANAGEMENT DEVICES

As outlined within this report, the Structure Plan proposes to retain the broad framework of the existing road network and primary traffic flows in order to achieve the desired development outcome, apart from Daly Street that will become a cul-de-sac. The remainder of Daly Street will be identified as POS.

The proposed changes to the existing road network and associated road hierarchy are outlined in **Figure 19** overleaf**.**

3.4.2 TRAFFIC FORECASTS

As outlined in the Movement and Access Strategy, the following new vehicle trips are anticipated to be generated by the proposed development:

- **AM peak hour traffic:**
    - Inbound 259 vehicles
    - Outbound 480 vehicles
    - **TOTAL 739 vehicles**
- **PM peak hour traffic:**
    - Inbound 405 vehicles
    - Outbound 334 vehicles
    - **TOTAL 739 vehicles**

In summary, based on the application of standard assessment techniques as outlined in the report, the proposed development results in a slight reduction in road network performance in 2041 in the PM peak period at the Resolution Drive - Great Eastern Highway intersection.

The Stoneham Street - Great Eastern Highway modelling shows that by 2041 under the base scenario (i.e. without Golden Gateway development), all approaches (other than Belgravia Street approach) would operate over capacity during the AM peak and during the PM peak at all approaches. Factoring in the proposed Golden Gateway development, the degree of saturation on the Stoneham Street and Great Eastern Highway approach increases, however the level of service remains unchanged.

Acknowledging the current and existing background traffic growth rates the focus of the Structure Plan is to facilitate the enhancement of pedestrian and cycle connections. The increase in resident population can also serve as a catalyst in a step change in public transport use in the local area.

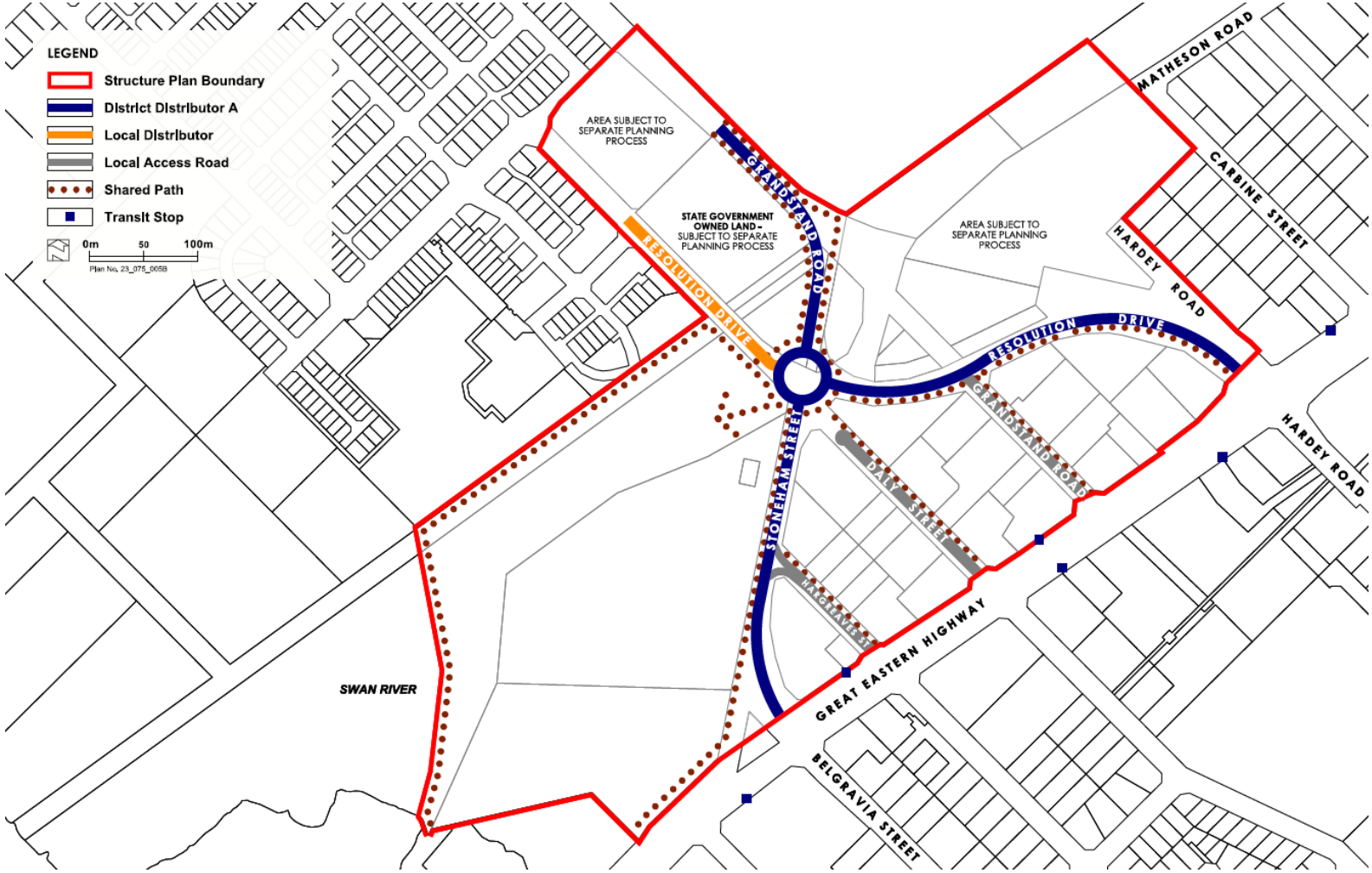


Figure 19 - Movement Network

3.4.3 PEDESTRIAN AND CYCLING NETWORK

All existing shared paths surrounding and through the subject land will be maintained, furthermore a 20% reduction in car driver and car passenger mode share is sought. Strategies to affect this change include:

- Implementation of a precinct wide 30km/h speed zone (excluding Grandstand and Stoneham Street as the main through route for traffic) to improve the environment for walking and cycling.
- Raised zebra crossings, with the crossing at footpath level creating a raised plateau speed hump for vehicles.
- Completing gaps in the shared path network and implementing the long term cycle network routes through the precinct.
- Increasing the tree canopy coverage along all roads within the precinct to create a pleasant environment for walking and cycling.
- Ensuring there are a variety of local amenities within a short and pleasant walking or biking distance.
- The introduction of a bike or electric scooter share scheme.
- The introduction of a car share scheme.
- The imposition of a parking cap for residential and commercial uses
- Lobby the Public Transport Authority to improve bus services to the Structure Plan area and explore the potential of other transit options such as a superbus of trackless tram.

3.4.4 PUBLIC TRANSPORT

High level discussions with the Public Transport Authority (PTA) has informed the proposed changes anticipated for the existing public transport network as discussed below. The introduction of the rail connection from central Perth to High Wycombe, including a park 'n' ride station at Redcliffe Train Station, resulted in the removal of four of the five existing bus routes operating along the Great Eastern Highway corridor. These were replaced with bus routes 293 and 940.

Currently the only bus routes that pass through the Structure Plan area are the circle route bus services 998 and 999 which are high frequency routes that travel along Grandstand Road and Resolution Drive, and then continue to Hardey Road. There are currently no bus stops for the circle route within the Structure Plan area, with the closest bus stops located on Grandstand Road immediately to the north of the Structure Plan area close to main pedestrian access for Ascot Racecourse.

High frequency bus route 940 operates along Great Eastern Highway which forms the southern boundary of the Structure Plan area and operates between Elizabeth Quay Bus Station and Redcliffe Station. Bus route 293 between Redcliffe Station and High Wycombe Station also travels along Great Eastern Highway (east of Belgravia Street) and along Belgravia Street.

The PTA has indicated that, if sufficient public transport demand was generated by large scale development of the subject land, they would consider the option of operating a bus service which connected the subject land and Perth CBD with a bus service that utilised the internal road network. However this would be contingent upon the proposed development generating the requisite public transport demand to warrant the investment in such a service.

3.5 WATER MANAGEMENT

3.5.1 STORMWATER MANAGEMENT

The key objectives for stormwater management are:

- Protection of wetlands and waterways (receiving environments) from the impacts of urban runoff.
- Protection of infrastructure and assets from flooding and inundation.

The following planning measures are adopted to achieve the above objectives:

- Residential, industrial or commercial premises in existing or proposed areas must maintain floor levels at 500 mm above the 100yr ARI in the Swan River and 300 mm above the 100yr ARI in the local drainage system.
- Runoff from events greater than the 1yr ARI interval event and up to the 5yr ARI event in residential areas and 10yr ARI event in commercial/industrial areas are to be managed in accordance with the serviceability requirements of Australian Rainfall and Runoff (Engineers Australia, 2001) minor/major system.
- Stormwater in excess of the capacity of on-site retention systems will be conveyed through the existing drainage system consisting of local road drainage, Central Belmont Main Drain Basin and compensating basin.
- Major flood runoff (1% AEP) will be conveyed via overland flow within the road reserve to the compensating basin and drain prior to discharging to the Swan River.

- The design of the redeveloped urban areas should incorporate current best practice in WSUD to mitigate the potential impacts on regional water quantity and quality from redevelopment and the legacy conditions within the catchment.
- Retrofitting of stormwater management systems to achieve improved water quality outcomes should be maximised through the installation of biofilters (raingardens), amended soils and the use of structural controls to address litter, sediment and vegetative materials at source.
- Modification of the existing Central Belmont Main Drain and local drainage systems to suit the urban form whilst maintaining drainage capacity and peak flow rates.
- WSUD and best management practices promoting on-site retention of the first 15mm of rainfall for small rainfall events.

3.5.2 GROUNDWATER MANAGEMENT

The key objectives for groundwater management are:

- Protecting infrastructure and assets from flooding and inundation by high seasonal groundwater levels, perching and/or soil moisture.
- Protecting groundwater dependent ecosystems from the impacts of urban runoff.
- Managing and minimising changes in groundwater levels and groundwater quality following redevelopment.

The following planning measures are adopted to achieve the above objectives:

- Retain existing surface levels as a minimum to ensure adequate separation.
- Limit basements in areas of shallow groundwater.
- Use of subsoil drainage below bio-retention areas, raingardens and tree pits to minimise local groundwater rise.

Groundwater levels provide potential clearance for basements to be installed, with two storey basements possible closer to Great Eastern Highway. Detailed designs of any infrastructure below the existing surface level (such as basements) may include tanking or other forms of damp-proofing. Any temporary lowering groundwater for construction, either for basements or sewer, may require dewatering licences from DWER.

3.6 EDUCATION FACILITIES

Existing education facilitates located within close proximity to the subject land include the following:

- Belmont Primary School is located at the intersection of Great Eastern Highway and Belgravia Street.
- Redcliffe Primary School is located approximately 3km to the east.
- St Maria Goretti's Catholic School is located approximately 2.5km to the east.
- Maylands Peninsula Primary School is located approximately 2.5km to the north.
- Belmont City College is located approximately 3km to the south.

Given the nature of the development and anticipated demographic it is anticipated that there will be limited additional demand for education facilities generated in the precinct. The Golden Gateway Precinct is well located within an existing urban context allowing future residents to take advantage of existing education facilities.

3.7 EMPLOYMENT

Given the subject land's strategic location close to existing employment opportunities in the Belmont mixed business area, proximity to Perth CBD and commercial land uses along Great Eastern Highway, the area already enjoys a high rate of employment self-sufficiency, therefore additional employment generating land uses are not considered necessary to improve local employment opportunity. The non-residential uses anticipated for the Golden Gateway Precinct will generate a small amount of locally-based employment; however, the main purpose of these uses is to provide local services and to optimise the value of its highly visible and connected location.

3.8 INFRASTRUCTURE COORDINATION, SERVICING AND STAGING

An Infrastructure Assessment Report was prepared by Cardno in support of the Structure Plan (refer **Appendix D**).

3.8.1 WATER SUPPLY

Water Corporation does not foresee any issues with servicing the proposed scheme with potable water. Initial advice from the Water Corporation has confirmed the following with regards to required upgrades:

- Water Corporation will upgrade the headworks, pipe equal to or greater than 300mm diameter and pump stations, as and when required.
- Water Corporation recommends a consolidated approach to the requesting and programming of works to minimise disruptions and maximise cost efficiencies. Water Corporation recommends any reticulation reinforcement or new work should be managed by the City of Belmont due to the fractured land ownership within the area. It is recommended that a working group between the City of Belmont and Water Corporation is set up in order to help plan and coordinate precinct development and staging with any Water Corporation trunk infrastructure capital works.

3.8.2 WASTEWATER

The proposed development will have significant impacts to the current wastewater infrastructure. It is not envisaged the existing Redcliffe Pump Station 5 will have sufficient capacity with a shortfall of 9.09 L/s to service the proposed development and will require a significant upgrade. This would require the upgrade of the existing pumping station to a larger type 40. A type 40 pumping station is a station capable of a 40 L/s service consisting of two pump-sets located in a common wet-well constructed from 2500mm internal diameter precast concrete pipes. Redcliffe Pump Station 2 will likely have capacity, however further planning should be coordinated with the Water Corporation to ascertain other timing of other developments in the area.

3.8.3 POWER SUPPLY

The Belmont substation servicing the subject land falls under the Cannington load area. Western Power's Annual Planning Report 2015/16 states "no substation capacity shortfall is forecast in the Cannington load area over the next five years." This takes into account committed, and most likely to occur, network expansion plans for the area. The Western Power Network Mapping Tool indicates that there is >30MVA spare capacity in the network until at least 2036 based on current and forecast demand.

3.8.4 GAS SUPPLY

Correspondence received from ATCO Gas advised that the existing infrastructure can support the proposed development.

3.8.5 TELECOMMUNICATIONS

The infrastructure within a development will be installed by the developer. Alternatively, Telstra can be engaged to install infrastructure within a development at the developer's expense.

Telstra's commercial pit and pipe service will generally not be offered in developments where NBN Co has confirmed agreement to install NBN Co fibre within a development stage.

3.8.6 WATER CORPORATION MAIN DRAIN

Stormwater in excess of the capacity of on-site retention systems will be conveyed through the existing drainage system consisting of local road drainage, Central Belmont Main Drain Basin and compensating basin. No changes to the Central Belmont Main Drain are proposed.

Future planning of the WATC land should provide for an appropriate interface with the Central Belmont Main Drain.

3.9 IMPLEMENTATION

3.9.1 SCHEME AMENDMENT TO FACILITATE STRUCTURE PLAN

An amendment to the City of Belmont's LPS 15 will be required to apply the R-AC0 density code over the subject land and to exclude land uses that would be permissible within the Mixed Use zone and identified in section 4.1.1.1. This Amendment will also need to provide for the 'Shop' land use as an additional use.

3.9.2 INFRASTRUCTURE FUNDING STRATEGY

The City of Belmont may establish an appropriate funding strategy for the Structure Plan Area. As part of the strategy, a Development Contribution Area (DCA) within LPS 15, under which a Development Contribution Plan (DCP) may be implemented to contribute to the funding of the public infrastructure requirements to facilitate development in the Structure Plan Area will be considered.

Infrastructure items that would be eligible to be funded under a DCP should be in accordance with State Planning Policy 3.6 Development Contributions for Infrastructure (SPP 3.6) and may include:

- Great Eastern Highway pedestrian crossing.
- Land for public open space and community facilities.
- Landscape treatment for all public realm areas, including local roads.

This Structure Plan will inform any future DCP, particularly in relation to the proposed upgrades to roads and intersection treatments as determined by the Movement and Access Strategy contained at **Appendix C** and the Public Realm Strategy contained at **Appendix E**.

3.9.3 LAND ASSEMBLY

There are various statutory processes required to deliver and facilitate development of the subject land, including amendments to LPS 15. Following adoption of the Structure Plan, subdivision and amalgamation applications can be lodged with the WAPC in the normal manner to assemble the land appropriately. Amalgamation is also likely to occur to enable land rationalisation. The subdivision/amalgamation process may be necessary to create some key elements of the project, primarily for the amalgamation of land parcels as shown on **Figure 20** overleaf.

Figure 20 – Implementation

APPENDIX A
BUSHFIRE MANAGEMENT PLAN

APPENDIX B
ENVIRONMENTAL ASSESSMENT REPORT

APPENDIX C
MOVEMENT AND ACCESS STRATEGY

APPENDIX D
INFRASTRUCTURE ASSESSMENT REPORT

APPENDIX E
PUBLIC REALM STRATEGY

A298

Golden Gateway Structure Plan

Bushfire Management Plan

Prepared for City of Belmont

By Urbaqua

June 2018

urbaqua
land and water solutions

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This report is a qualitative assessment only, based on the scope of services defined by the Client, budgetary and time constraints imposed by the Client, the information supplied by the Client (and its agents), and the method consistent with the preceding. Urbaqua has not attempted to verify the accuracy or completeness of the information supplied.

This Bushfire Management Plan provides strategic assessment of the subject site only. A subsequent Bushfire Management Plan and/or Bushfire Attack Level (BAL) Assessment may be required to support future development applications. The recommendations contained in this report are considered to be prudent minimum standards only, based on the author's experience as well as standards prescribed by relevant authorities. It is expressly stated that Urbaqua and the author do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Fire is an extremely unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire.

Further, the growth, planting or removal of vegetation; poor maintenance of any fire prevention measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the report. The achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Urbaqua has no control. If the proponent becomes concerned about changing factors then a Bushfire Management Plan should be requested.

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EXECUTIVE SUMMARY

This bushfire management plan has been undertaken to support structure planning for the Golden Gateway Precinct in the City of Belmont (Figure 1).

A small portion of the subject land is identified as a bush fire prone area, designated by the Fire and Emergency Services (FES) Commissioner. This report has been prepared to meet the requirements of *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) (2015) and the *Guidelines for Planning in Bushfire Prone Areas*, Version 1.1 (WAPC, 2017).

This plan provides advice consistent with the nature of a strategic proposal. Details in this report are consistent with *State Planning Policy 3.7: Planning for Bushfire Prone Areas* (WAPC, 2015) and the *Guidelines for Planning in Bush Fire Prone Areas* and associated appendices (V1.3, WAPC, 2017).

A vegetation class assessment was conducted for the subject land and adjacent areas for a minimum of 150 metres. As the road and lot layout is known, a bushfire attack level (BAL) assessment was undertaken and a BAL contour plan has been developed to show the indicative future BALs. This information may be used to guide the future development of the site, consistent with *AS3959 Construction of buildings in Bushfire Prone Areas*.

Bushfire risk to the areas proposed for future development is BAL-LOW. There is insufficient risk to warrant specific construction requirements.

The bushfire mitigation and management strategies outlined in this management plan comply with the acceptable solutions of control for each of the Bushfire Protection Criteria detailed in *Guidelines for Planning in Bushfire Prone Areas* (2017).

It is therefore considered that this bushfire management plan demonstrates compliance with the objectives and provisions of *State Planning Policy 3.7: Planning in Bushfire Prone Areas*.

This bushfire management plan is to be endorsed by the City of Belmont and is required to be reviewed and updated where necessary.

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Figures

Tables

1 INTRODUCTION

The City of Belmont has engaged Urbaqua to prepare a Bushfire management plan to support preparation of a local structure plan for the Golden Gateway project area (Figure 1) in the City of Belmont (Figure 2).

A portion of the subject land is identified as a bush fire prone area, designated by the Fire and Emergency Services (FES) Commissioner (Figure 3). This report has been prepared to meet the requirements of *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) (2015) and the *Guidelines for Planning in Bushfire Prone Areas* (V1.3, WAPC, 2017).

Any identified bushfire risk will be addressed as part of the future development approvals process, consistent with the requirements of *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) (2015), the Building Code of Australia and *Australian Standards (AS3959-2009): Construction of buildings in bushfire prone area* where these apply.

1.1 Proposal details

The subject land consists of approximately 31.8 hectares of land in the vicinity of Great Eastern Hwy, Resolution Dr, Grandstand Rd and Stoneham St in Ascot.

The Golden Gateway Precinct includes a large portion of 'Mixed use' land, which encompasses the historical Ascot's Bristle beehive kilns and chimney stacks and portions of the Ascot Racecourse. The precinct also contains approximately 5.3 ha of Parks and Recreation reserve which covers Belmont Trust Land. There is also a small portion of Parks and Recreation: water supply sewerage and drainage reserve, which is under the control of the Water Corporation.

The Golden Gateway Precinct will provide for a diverse range of land uses. The primary land use within the Structure Plan area is residential, supplemented by commercial uses and local open space

1.1.1 Planning background

The majority of the study area is zoned 'Urban' under the Metropolitan Region Scheme, with a portion zoned for 'Mixed use' and reserved for 'Parks and Recreation' under City of Belmont Local Planning Scheme No. 15.

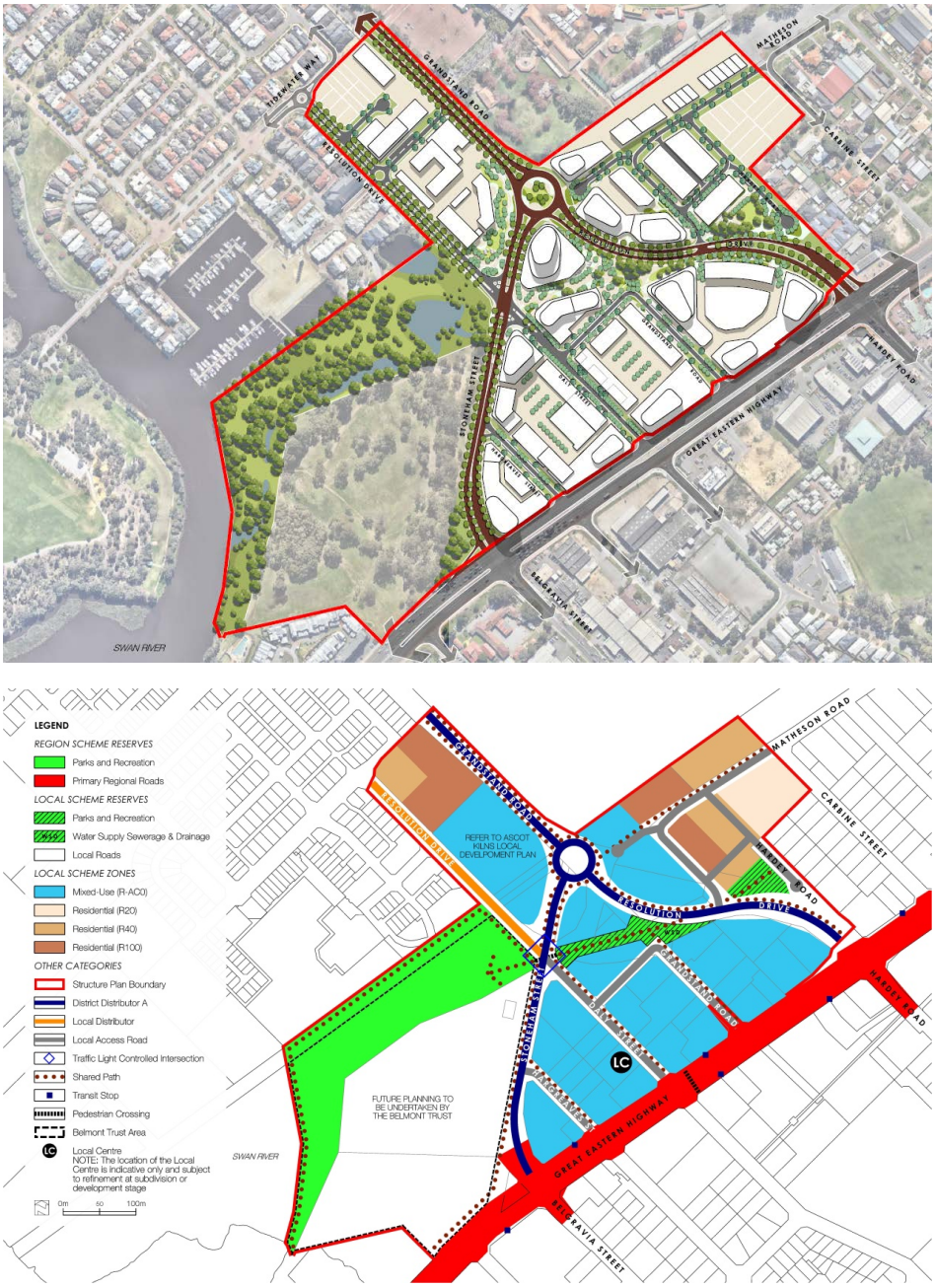

Figure 1: Development concept plan and proposed zoning (Source: TBB)

City of Belmont: Golden Gateway - Bushfire Management Plan

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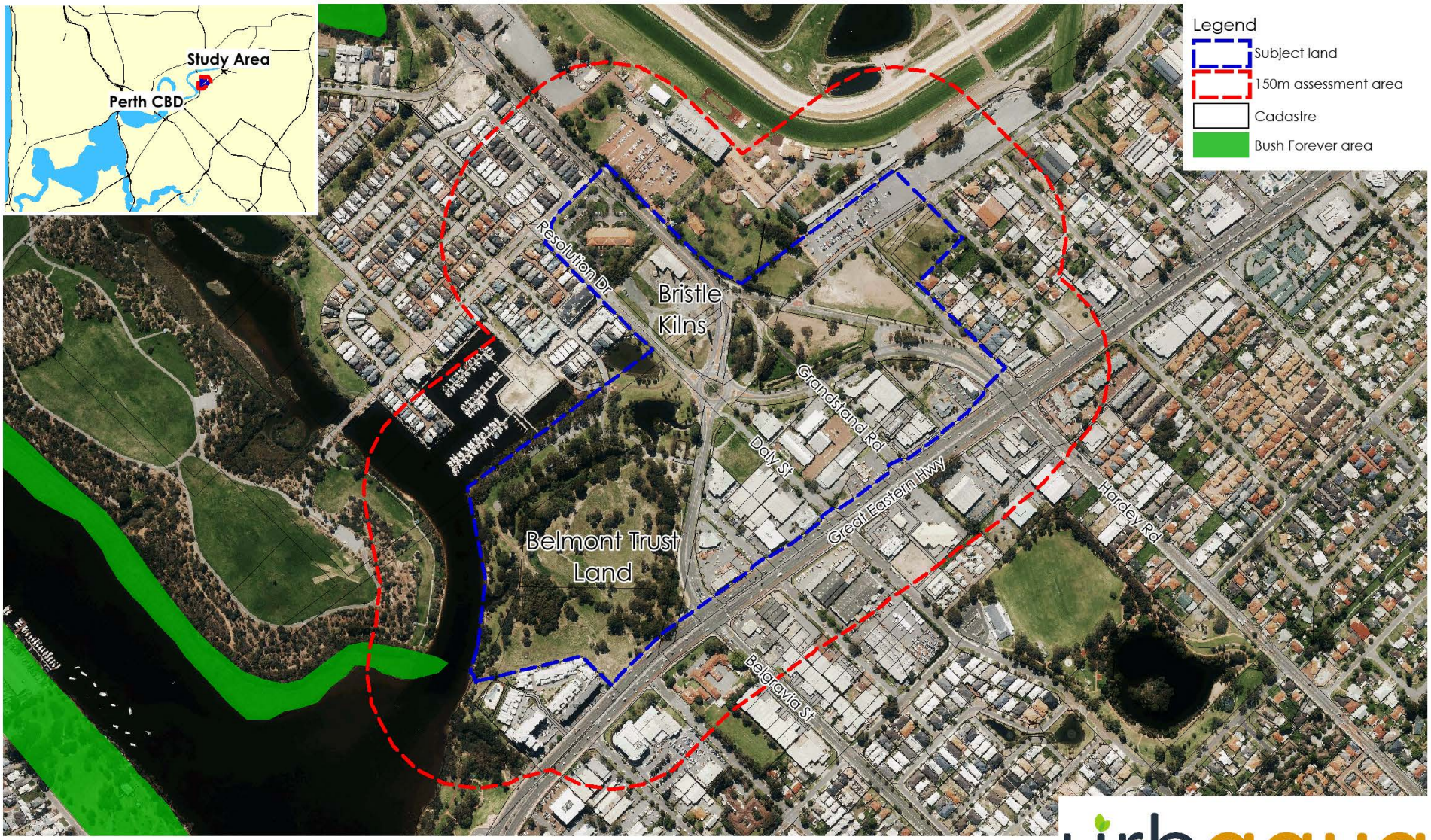
Figure 2: Subject land



Data source: CoB, Landgate. Created by: AT. Projection: MGA: zone 50.

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Figure 3: Map of Bushfire Prone Areas for the subject site (Source: DFES, 2018)

1.2 Bushfire management guidelines, specifications and minimum standards

Specifications or standards relevant to this bushfire management plan are derived from and consistent with:

- *Fire and Emergency Services Act 1998*
- *Bush Fires Act 1954*
- *Planning and Development (local planning Scheme amendment) Regulations 2015*
- State Planning Policy 3.7: Planning in Bushfire Prone Areas (WAPC, 2015);
- *Guidelines for Planning for Bushfire Prone Areas* and appendices, Version 1.3 (WAPC, 2017)
- Australian Standards (AS3959-2009): *Construction of buildings in bushfire prone areas*; and
- City of Belmont Fire Break Notice 2017-2018.

2 ENVIRONMENTAL CONSIDERATIONS

The subject land has been used predominantly for commercial purposes for over 50 years. The Golden Gateway Precinct includes the historical Ascot's Bristle beehive kilns and chimney stacks and portions of the Ascot Racecourse. The subject land also contains a large proportion of managed parkland which borders the Swan River. The Belmont Trust Land in the western portion of the study area was historically used for sporting purposes such baseball fields and is now maintained as parkland by the City. There are no significant environmental values located within the subject land.

Bush Forever site 313, Swan River Salt Marshes is located within the 150m assessment area. This area is separated from the subject land by the Swan River, which is approximately 70m wide at this point. The remaining areas within 150m of the subject land have no significant environmental values. They include Ascot Racecourse, Belmont Park Primary school, residential housing and commercial areas.

2.1 Native Vegetation – modification and clearing

The vegetation in the study area has been highly modified. Although mature trees remain in many parts of the subject land, the undergrowth has been cleared and is maintained in a modified landscaped, parkland state.

Although the grassland which covers the Belmont Trust land is managed and maintained by the City of Belmont, a small portion of regrowth exists where the tree trunks are too close together to permit mowing. This land is proposed to be developed in the future, although the development concept is not yet known. The City will continue to maintain the Belmont Trust Land in a low fire hazard state.

Some bushfire risk exists as a result of vegetation within and adjacent to Bush Forever Area 313 (Swan River Salt Marshes) located to the north west of the subject land. This vegetation is separated from the subject land; however, by a branch of the Swan River. It is also noted that the majority of vegetation on the island is maintained in a low fuel state. Where shrubs and trees exist, there is no understory and the fine fuel load is less than 2tonnes/ha.

Plate 1: Fine fuel load less than 2 tonnes/ha on the island adjacent the subject land

Vegetation also exists around a drain on the south-western side of the Ascot Quays Apartment Hotel. This vegetation is outside the subject land but within 150m of the structure plan area. The

vegetation is less than 20m in width on each side of the drain and the understory is managed (irrigated) grassland. This vegetation is not considered to represent a bushfire hazard.

2.2 Re-vegetation/Landscape Plans

No revegetation is proposed within the subject land.

Some landscaping of road reserves, open space and car parks is proposed. This will consist of individual trees without understory or managed parkland and as such is not considered to have the potential to create a fire hazard.

3 BUSHFIRE ASSESSMENT RESULTS

3.1 Assessment Inputs

In order to identify the potential bushfire risks, it is necessary to describe the bushfire problem associated with the subject land. The assessment takes into consideration the:

- the topography and slope of the subject land;
- type and classification of vegetation present on and adjacent to the subject land;
- distances between the classifiable vegetation; and
- current and proposed future land use.

3.1.1 Slope

The study area has generally flat topography and grades gently from 6mAHD in the south-east to 3mAHD in the west. The study area has a few low points of approximately 1-2mAHD through the centre of the study area, as shown in Figure 4.

The effective slope (that is the slope that will affect the behaviour of an approaching bushfire) underneath the vegetation across the River to the west is upslope.

Slope is therefore not considered to be a factor in terms of increasing bushfire hazard.

3.1.2 Current and future land use

The subject land comprises four key precincts:

- The area bounded by Great Eastern Highway, Stoneham Street and Resolution Drive is characterised by predominately mixed business development and small pockets of retail (food and beverage) uses along Great Eastern Highway;
- The western portion of the subject land encompassing the Belmont Trust Land (Grove Farm Reserve) is previously cleared with large mature trees sparsely located around the reserve. Grove Farm Reserve was historically used for recreation purposes, specifically a baseball field;
- The northern portion of the subject land is partially developed with the WA Turf Club Headquarters and Ascot kilns and chimney stacks; and
- The remainder of the subject land within the north-eastern corner is largely undeveloped and comprises a number of existing road reserves and WA Turf Club owned land used for overflow parking on racing event days.

The Golden Gateway Precinct will provide for a diverse range of land uses. The primary land use within the Structure Plan area is residential, supplemented by commercial uses and local open space.

3.1.3 Vegetation types

On the basis of a site visit on 13 March 2018, vegetation at the site and within 150m was assessed. Vegetation within 100m was classified according to the descriptions provided in AS 3959 – 2009, and includes the following three vegetation types:

- Class B Woodland – Low woodland (B7): Low trees and shrubs 2-10m high; foliage cover less than 10%. Dominated by eucalypts and Acacias. Often have a grassy understorey or low shrubs. Acacias and Casuarina woodlands grade to Atriplex shrublands in the arid and semi-arid zones.
- Low threat vegetation – AS3959 2.2.3.2(b) - Single area of vegetation less than 1ha and not within 100m of other areas of vegetation being classified.
- Low threat vegetation – AS3959 2.2.3.2(f) - grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

The vegetation within the subject land and 150m surrounding is shown in Table 1 and Figure 4.

Table 1: Vegetation classification

Photo point		Vegetation class	Vegetation type	Description
1 Plot 1		Low Threat Exclusion Clause 2.2.3.2 (f)	Ascot Racecourse	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
2 Plot 2		Low Threat Exclusion Clause 2.2.3.2 (f)	Ascot Racecourse	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
3 Plot 3		Low Threat Exclusion Clause 2.2.3.2 (f)	Managed parkland	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

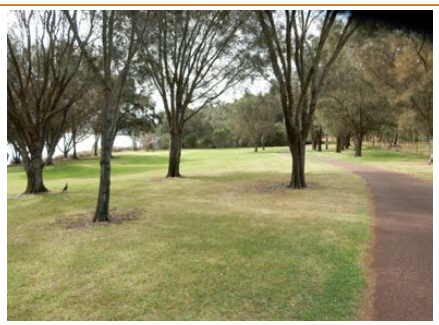
Photo point		Vegetation class	Vegetation type	Description
4 Plot 3		Low Threat Exclusion Clause 2.2.3.2 (f)	Managed parkland	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
5 Plot 3		Low Threat Exclusion Clause 2.2.3.2 (f)	Managed parkland	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
6 Plot 4		Low Threat Exclusion Clause 2.2.3.2 (f)	Public reserve maintained in low threat state	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
7 Plot 4		Low Threat Exclusion Clause 2.2.3.2 (f)		Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

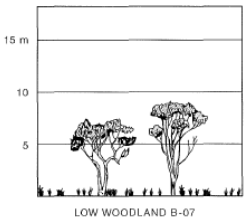
Photo point		Vegetation class	Vegetation type	Description
8 Plot 8		Low Threat Exclusion Clause 2.2.3.2(b)	Regrowth	Single area of vegetation less than 1ha and not within 100m of other areas of vegetation being classified
9 Plot 5		Class B: Woodland  LOW WOODLAND B-07	B07 - Low Woodland	Low trees and shrubs 2-10m high; foliage cover less than 10%. Dominated by eucalypts and Acacias. Often have a grassy understorey or low shrubs. Acacias and Casuarina woodlands grade to Atriplex shrublands in the arid and semi-arid zones.
10 Plot 6		Low Threat Exclusion Clause 2.2.3.2 (f)	Drain	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
11 Plot 6		Low Threat Exclusion Clause 2.2.3.2 (f)	Managed parkland	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

Photo point		Vegetation class	Vegetation type	Description
12 Plot 7		Low Threat Exclusion Clause 2.2.3.2 (f)	Commercial office landscaping	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks
13 Plot 8		Low Threat Exclusion Clause 2.2.3.2 (f)	Primary school	Grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

3.2 Assessment outputs

Consistent with Appendix Two of the *Guidelines for Planning in Bushfire Prone Areas* (V1.3, WAPC, 2017), as this bushfire management plan is to support an application where the indicative development footprint is known, a Bushfire Attack Level (BAL) assessment has been undertaken in accordance with Method 1 of AS3959: Construction of buildings in bushfire prone areas. Table 2 provides a summary of the assessment.

Table 2: BAL assessment summary

Plot	Vegetation Classification	Effective Slope	Separation Distance to the Classified Vegetation (m)	Hazard Level
6	Woodland (B)	Upslope	70m to the edge of the Parks and Recreation Reserve and 108m to the edge of the proposed development area (Belmont Trust Land)	BAL-LOW

A BAL contour map has been created for the proposed development which shows indicative BAL ratings for the site (Figure 5) consistent with Appendix 3 of the *Guidelines for Planning in Bushfire Prone Areas* (V1.3, WAPC, 2017). The BAL contour map was prepared on the basis of FDI 80; the vegetation classification shown in Table 1; and slope shown on Figure 4. An excerpt from AS3959 is provided in Table 3.

Table 3: Excerpt from AS 3959, Table 2.4.3, Distance (m) of the site from the predominant vegetation class

FDI 80 (1090 K)	Vegetation classification and slope
Bushfire attack levels (BALs)	Class B: Woodland - Upslope and flat land
BAL-FZ	<10 m
BAL-40	10-<14
BAL-29	14-<20
BAL-19	20-<29
BAL-12.5	29-<100
BAL-LOW	Beyond 100m

City of Belmont: Golden Gateway - Bushfire Management Plan

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Figure 4: Post-development vegetation classification

Data source: CoB, Landgate. Created by: AT. Projection: MGA: zone 50.

Scale 1: 7,000 @ A4

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City of Belmont: Golden Gateway - Bushfire Management Plan

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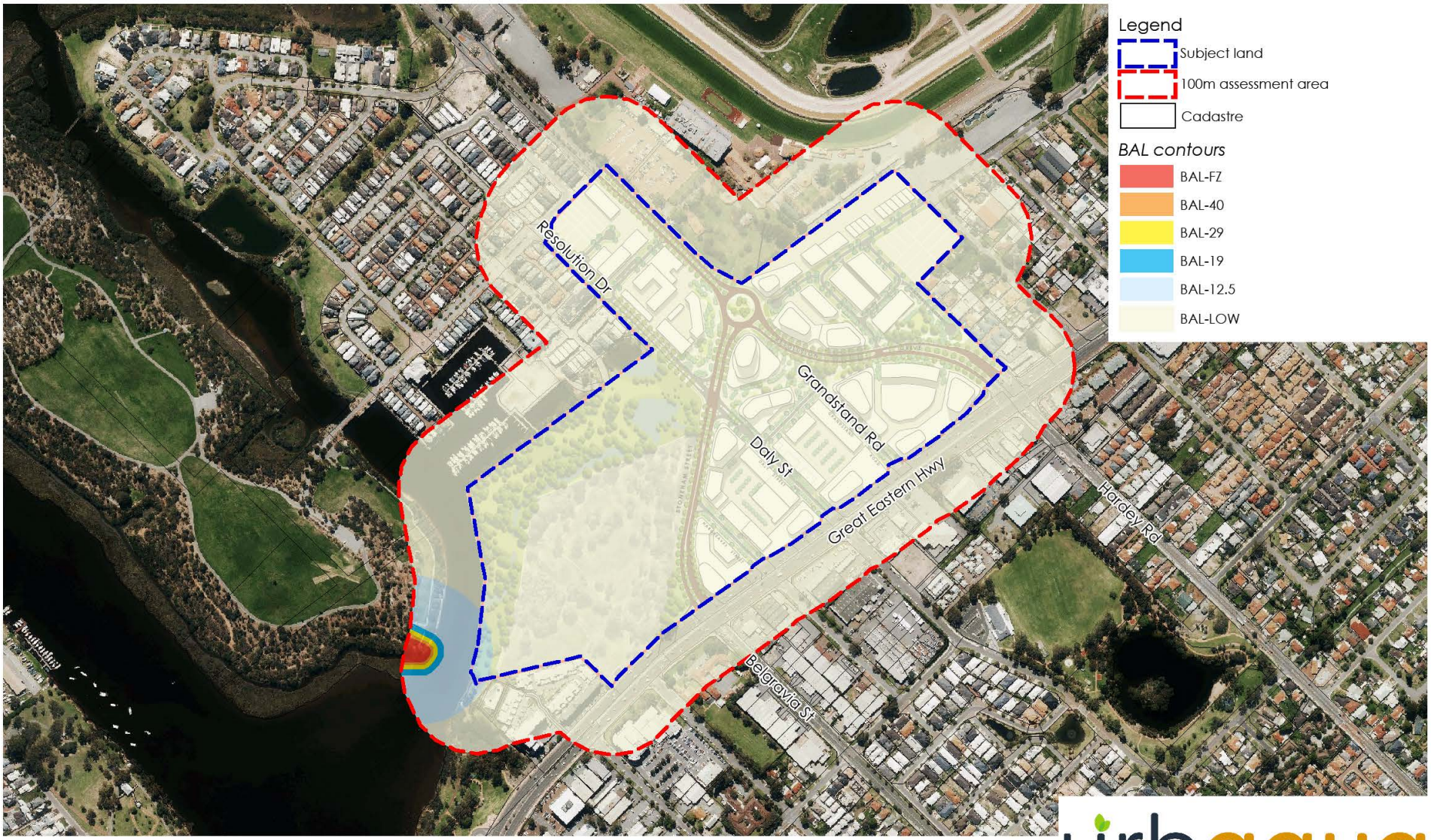
Figure 5: BAL contour map



Data source: CoB, Landgate, AS/NZS 3959-2009. Created by: AT. Projection: MGA: zone 50.

Scale 1: 7,000 @ A4

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4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The subject land is adjacent to an area of vegetation which has the potential to create a bushfire risk.

It is considered that the bushfire risk to the proposed development can be adequately managed through appropriate location and siting and design of development, as well as necessary vehicular access and water supply which will be provided to the development.

Bushfire hazard to the proposed development is therefore considered to be low. This conclusion is substantiated further below.

4.1 Location

After development, the subject land will not contain any vegetation that is considered to be a bushfire hazard.

Although fire risk exists from vegetation adjacent to the subject land, the subject land is not subject to BAL-40 or BAL-FZ and therefore this proposal does not result in the intensification of any development in areas that are subject to extreme hazard.

4.2 Siting and design of development

Bushfire risk from vegetation outside the subject land is likely to remain as this vegetation is associated with significant environmental values (Bush Forever Site 313). It is noted that the Swan River establishes sufficient separation between the bushfire hazard and the edge of subject land to achieve BAL ratings of BAL-12.5 and less, consistent with Method 1 of AS3959. It is noted that the public open space reserve provides a further separation such that the land to be developed in the future (the Belmont Trust Land) is rated at BAL-LOW.

As no proposed areas of development will be subject to BAL-40 or BAL-FZ, it is considered that development has been sited to avoid areas of extreme bushfire risk. All habitable dwellings will be constructed to meet the requirements of *AS3959 Construction of buildings in Bushfire Prone Areas* where necessary.

4.3 Vehicular access

The subject site is afforded excellent access from an integrated regional (existing and future) road network. The subject land is bounded by Great Eastern Highway to the south which provides access to the west towards the Perth CBD, Graham Farmer Freeway and onto South Perth, Melville and Fremantle via Canning Highway. To the east, Great Eastern Highway provides access to Perth Airport, Tonkin/Roe Highway and onto Guildford, Midland and the Swan Valley. These networks provide excellent access to and egress from the subject land.

The proposed local road network provides for at least two different access and egress routes to the proposed residential and commercial areas. The localised road network includes a network of local distributor and access roads providing access to key regional and district roads such as Great Eastern Highway and the Garret Road bridge which include Grandstand Road, Resolution Drive and Stoneham Street.

All roads and transport infrastructure will be designed and constructed to meet the requirements of the *Guidelines for Planning in Bushfire Prone Areas* (Version 1.3 WAPC, 2017) Appendix Four, Table 4, as replicated in Table 4 below.

Table 4: Vehicular access technical requirements (WAPC, 2017)

Technical Requirement	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access routes
Minimum trafficable surface (m)	6	6	4	6	6
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4	N/A	4.5	4.5	4.5
Maximum grade over <50m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum cross fall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
Additional specialist requirements					

4.4 Water

The proposed development is currently serviced by a reticulated water supply, together with fire hydrants, in accordance with the specifications of the Water Corporation and Department of Fire and Emergency Services (DFES).

Contractors or others carrying out building or other works at the site must not cover hydrants and/or the markings indicating their location. In the event activities occur that do result in hydrants or markings being covered, damaged, or removed, it will be the responsibility of the relevant contractor to rectify the situation.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

The subject land is adjacent to an area of bushfire risk. Bushfire risk mitigation and management measures have been identified to reduce bushfire risk to achieve the objectives of SPP3.7, as previously outlined in Section 3.

The bushfire risk mitigation strategies proposed comply with the acceptable solutions for each of the Bushfire Protection Criteria detailed in *Guidelines for Planning in Bushfire Prone Areas* (2017). They are summarised in Table 5.

5.1 Compliance Table

Table 5: Bushfire protection criteria assessment

Element	Acceptable solution	Compliance	
1. Location	A1.1 Development location	☑	No development is proposed in areas subject to BAL-40 or BAL-FZ.
2. Siting and design of development	A2.2 Asset Protection Zone	☑	No development will be subject to BAL-40 or BAL-FZ. Habitable buildings will be constructed in accordance with AS3959.
3. Vehicular Access	A3.1 Two access routes	☑	Short and long term public access is provided which ensures a minimum 2 access routes are provided at all times.
	A3.2 Public road	☑	All public roads meet the requirements of Table 4 of Appendix 4 of the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017)
	A3.3 Cul-de-sac	☑	N/A – no cul-de-sacs are proposed.
	A3.4 Battle-axe	☑	N/A - No battle-axe lots are proposed.
	A3.5 Private driveway longer than 50m	☑	N/A - No lots have driveways greater than 50m in length.
	A3.6 Emergency access way	☑	N/A – No emergency access ways are proposed
	A3.7 Fire service access routes	☑	The existing road network provides appropriate fire service access routes.
	A3.8 Firebreak widths	☑	N/A
4. Water	A4.1 Reticulated areas	☑	The development is currently serviced by reticulated water and fire hydrants which meet Water Corporation and DFES specifications
	A4.2 Non-reticulated areas	☑	N/A
	A4.3 Individual lots within non-reticulated areas	☑	N/A

5.2 Bushfire management strategies

As the area proposed for development is greater than 100m from any classifiable vegetation (due to the presence of the Parks and Recreation Reserve), no bushfire management strategies are considered necessary.

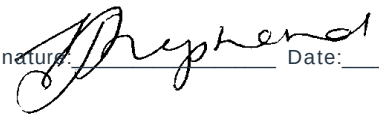
There is insufficient risk to warrant specific construction requirements.

It is noted that any new roads will be constructed to meet Main Roads and Local Government requirements and that water and hydrants are provided to DFES and Water Corporation standards.

5.3 Certification by Bushfire Consultant

I, Shelley Shepherd, certify that at the time of inspection, the BAL ratings contained within this BMP are correct.

The Bushfire Attack Level to the proposed development area is BAL-LOW. There is insufficient risk to warrant specific construction requirements and no specific management actions are required to mitigate bushfire risk to the proposed development area.

Signature:  Date: 2 May 2018

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Client: City of Belmont

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Draft report	V1	SSh	HBr	Electronic	2 May 2018
Final Report	V2	SSh	HBr	Electronic	21 June 2018

Urbaqua
land & water solutions
Suite 4/226 Carr Place
p: 08 9328 4663 | f: 08 6316 1431
e: info@urbaqua.org.au
www.urbaqua.org.au

A322

Environmental Report: Golden Gateway

Prepared for City of Belmont

By Essential Environmental

June 2018

Disclaimer and Limitation

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EXECUTIVE SUMMARY

The City of Belmont has engaged Essential Environmental to prepare an environmental report to support structure planning vicinity of Great Eastern Hwy, Resolution Dr, Grandstand Rd and Stoneham St, Ascot, within the City of Belmont.

This report provides an analysis of the environmental constraints and considerations to development and proposes broad approaches to mitigate any impacts and/or constraints on the basis of future land use.

The majority of the site has been historically cleared, although a number of significant trees have been established predominantly along driveways and boundaries and within the Grove Farm Reserve. The study area abuts a small section of the Swan River, which is a Bush Forever site, a conservation category wetland, and an environmentally sensitive area. Development of the study area will require adequate management of bushfire risk (the subject of a separate management plan) and potential impacts on fauna species.

In addition, a range of management strategies have been proposed to effectively manage or mitigate potential environmental impacts caused as a result of the development. Proposed management actions are summarised in the table below. It is considered that urban development of the site is an acceptable land use given the current environmental condition and lack of significance of the site, and in consideration of the proposed management strategies outlined in this report.

Issue	Action	Frequency	Responsibility
Preconstruction phase			
Contamination	Complete preliminary site investigation for contamination in accordance with Contaminated Sites Act 2003 should areas of known contamination be disturbed.	Once	Developer
Acid sulfate soils	Complete self-assessment checklist and consider need for a preliminary site assessment.	Once	Developer Consistent with DPLH and DWER guidelines
Vegetation and flora	Clearly delineate POS areas and trees to be retained.	Once	Licensed Surveyor (Developer)
Fauna and habitat	All site staff to participate in Environment, Health and Safety inductions which provide requirements for management of significant fauna and reporting procedures for environmental incidents.	Once	Developer and Construction contractor

Issue	Action	Frequency	Responsibility
Water management	Refer the local structure plan to the Department of Biodiversity, Conservation and Attractions as it contains a portion of land within and abutting the Swan River Trust Development Control Area. A Local water management strategy will be completed and used as the basis for detailed design. Following approval of the LWMS, UWMP(s) will be prepared prior to subdivision for approval by City of Belmont.	Once	Developer/City of Belmont Developer, in accordance with SPP 2.9: Water Resources
Bushfire	A Bushfire Management Plan will be prepared to support the LSP. The Bushfire Management Plan will be revised and implemented at subdivision.	Once	Developer, in accordance with SPP 3.7: Planning in Bushfire Prone Areas
Construction phase			
Soils and topography	Ground disturbing activities should be kept to a minimum and carried out 'as required' (in stages) immediately prior to lots being released for sale as part of a 'staged' development of the site.	Ongoing during construction phase.	Construction Contractor (Developer)
Contamination	Management of any identified contamination in accordance with the Contaminated Sites Act 2003.	Ongoing during construction phase.	Construction Contractor (Developer)
Acid sulfate soils	Management of any identified ASS consistent with DPLH and DWER guidelines.	Ongoing during construction phase.	Construction Contractor (Developer)
Vegetation and flora	Maintain markings and fencing around vegetation and trees to be retained. Cleared vegetation to be mulched and stored on site.	Ongoing during construction phase.	Construction Contractor (Developer)
Fauna and habitat	Undertake clearing in the direction of the river to allow fauna to escape.	Ongoing during construction phase.	Construction Contractor (Developer)
Water management	Manage sediment transport to waterways and drainage systems consistent with the LWMS.	Ongoing during construction phase.	Construction Contractor (Developer)

Issue	Action	Frequency	Responsibility
Aboriginal heritage	In the event a site is discovered, all work in the area will cease and the Department of Planning, Lands and Heritage will be contacted.	Ongoing during construction phase.	Construction Contractor (Developer)
Construction impacts	Ensure dust and sediment runoff is adequately managed. Ensure appropriate waste disposal of building materials.	Ongoing during construction phase.	Construction Contractor (Developer)
Post construction phase			
Soils and topography	Landscape or stabilise cleared areas immediately.	Once	Construction Contractor (Developer)
Vegetation and flora	Inspect fencing (if applicable) and replace if required. Ensure ongoing maintenance of retained vegetation and any revegetation areas / native landscaping prior to handover.	6 months Ongoing until handover.	Developer until hand over to City of Belmont

CONTENTS

Tables

Figures

1 INTRODUCTION

The City of Belmont has engaged Essential Environmental to prepare an environmental report to support structure planning in the vicinity of Great Eastern Hwy, Resolution Dr, Grandstand Rd and Stoneham St, Ascot, within the City of Belmont.

This report provides an analysis of the environmental constraints and considerations to development and proposes broad approaches to mitigate any impacts and/or constraints on the basis of likely future commercial, mixed use and residential land use.

1.1 Study area

The study area consists of approximately 31.8 hectares of land in the vicinity of Great Eastern Hwy, Resolution Dr, Grandstand Rd and Stoneham St in Ascot. The study area currently comprises of a mixture of commercial lots, the heritage listed Ascot Brick Works and public open space (Figure 1).

The study area has 4 distinct regions: (i) the south-eastern commercial area, bound by Great Eastern Hwy, Resolution Dr and Stoneham St; (ii) west where Grove Farm Reserve is bound by Great Eastern Hwy and public open space adjacent to the Swan River; (iii) largely undeveloped land, with exception of local distributor roads, through the centre of the study area; and (iv) most northern portion within which is located the Perth Racing Administration Office.

1.2 Methodology

This report considers the following environmental aspects of the study area to inform preparation of a local structure plan and the future development of the area:

- Topography, soils (including acid sulfate soils), contamination;
- Vegetation, flora and fauna and bushfire risk;
- Water resources; and
- Heritage.

The following information has been provided on the basis of a desktop investigation only, using data and information that is publically available. No attempt has been made to ground-truth the information at this stage.

1.3 Previous environmental assessments and key requirements

Limited environmental assessment has been undertaken for the site to date.

The following City of Belmont strategic and planning documents are considered relevant to this environmental report:

- City of Belmont Environmental Plan 2010-2016;
- City of Belmont Local Planning Scheme No. 15 scheme report supporting document: Environment;
- City of Belmont Local Planning Scheme No. 15 scheme report supporting document: Heritage.

- City of Belmont Local Planning Scheme No. 15 scheme report supporting document: Public Open Space.
- Belmont Foreshore Precinct Plan
- City of Belmont Street Trees Plan 2013.

There are a number of pieces of legislation, which govern management of the environment and have been considered as part of this assessment. These are listed in Table 1.

Table 1: Relevant environmental legislation

Legislation	Summary of relevant intent
Aboriginal Heritage Act 1972	Protects significant Aboriginal heritage, registered or unregistered.
Biosecurity and Agriculture Management Act 2007	Provides for the management of declared pests.
Contaminated Sites Act 2003	Requires the reporting of potential contaminated sites to the Department of Water and Environment Regulation.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act)	Provides protection for Matters of National Environmental Significance (MNES).
Environmental Protection Act 1986	Provides protection for the environment as well as the licencing of prescribed premises and regulation of the clearing of remnant vegetation.
Fire and Emergency Services Act 1998	Provides for the management of bushfire risk.
Heritage of Western Australia Act 1990	Protection of places listed by the Heritage Council of WA.
Swan and Canning Rivers Management Act 2006	Establishes the Swan Canning River park and provides for the assessment of planning proposals within this area by the Swan River Trust Board.
Wildlife Conservation Act 1950 (WC Act)	Protects species of flora & fauna and communities that are listed.

The following environmental policies are also considered relevant to the management of potential environmental impacts on the site:

- EPA Guidance Statement No. 33 – Environmental Guidance for Land Development (EPA, 2008);
- Better Urban Water Management (WAPC, 2008); and
- Liveable Neighbourhoods (WAPC, 2011).

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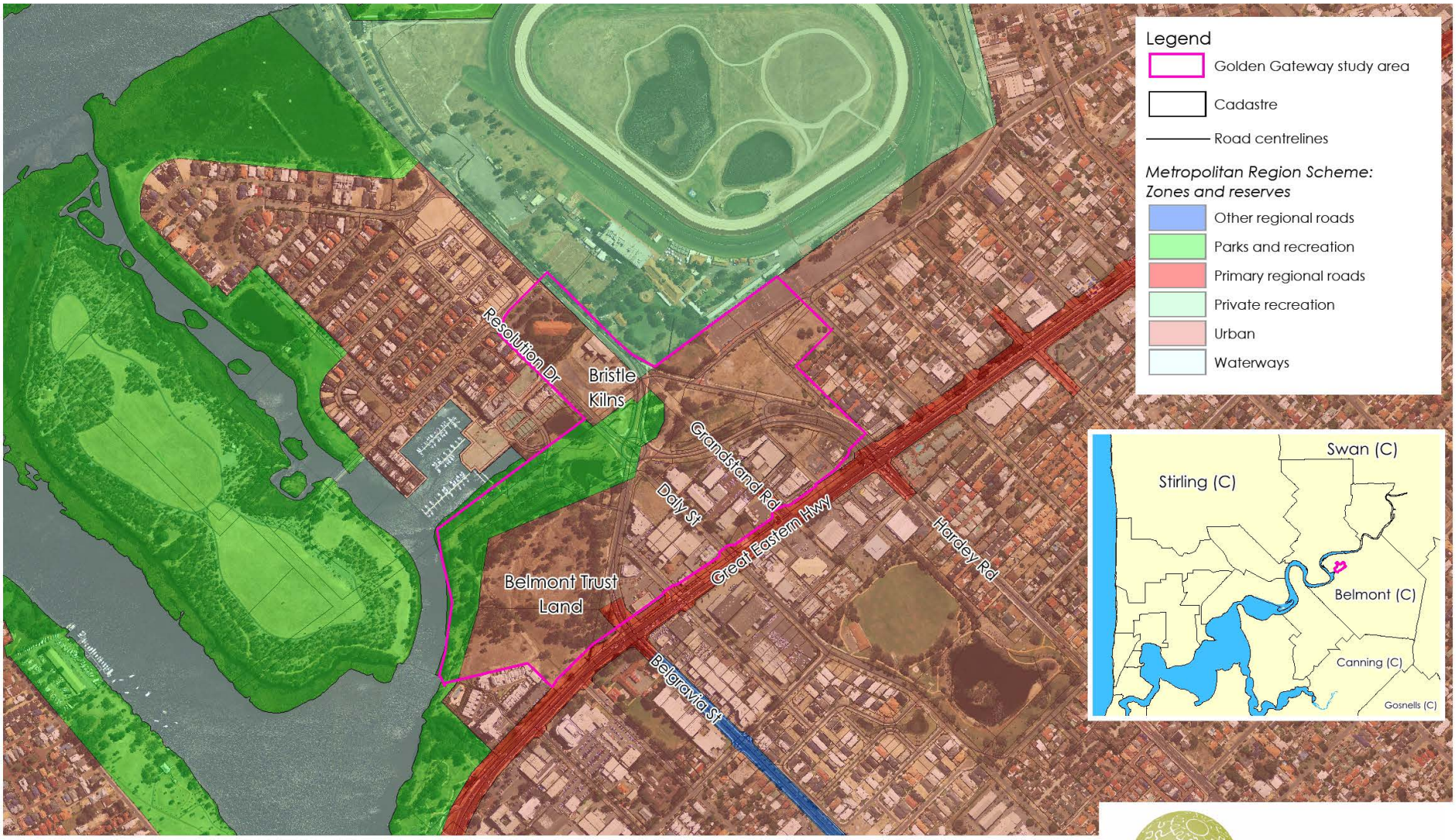
Figure 1: Study area location



Data source: DoP, CoB, Landgate. Created by: RM. Projection: MGA: zone 50.

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2 PROPOSED DEVELOPMENT

2.1 Planning context

The majority of the study area is zoned 'Urban' under the Metropolitan Region Scheme, with a portion zoned for 'Mixed use' and reserved for 'Parks and Recreation' under the City of Belmont Local Planning Scheme No. 15 (Figure **2**).

The City of Belmont Local Planning Scheme No. 15, adopted in December 2011, provides a district level framework to guide more detailed planning for the City. It requires local structure plans to be prepared to provide the level of detailed planning required to facilitate subdivision and development within the scheme area. The Western Australian Planning Commission and the City of Belmont are preparing a local structure plan to guide land use and development outcomes for the Golden Gateway precinct, the subject land.

The Golden Gateway Precinct includes a large portion of 'Mixed use' land, which encompasses the historical Ascot's Bristle beehive kilns and chimney stacks and portions of the Ascot Racecourse. The precinct also contains approximately 5.3 ha of Parks and Recreation reserve which covers the Belmont Trust Land. There is also a small portion of Parks and Recreation: water supply sewerage and drainage reserve, which is under the control of the Water Corporation.

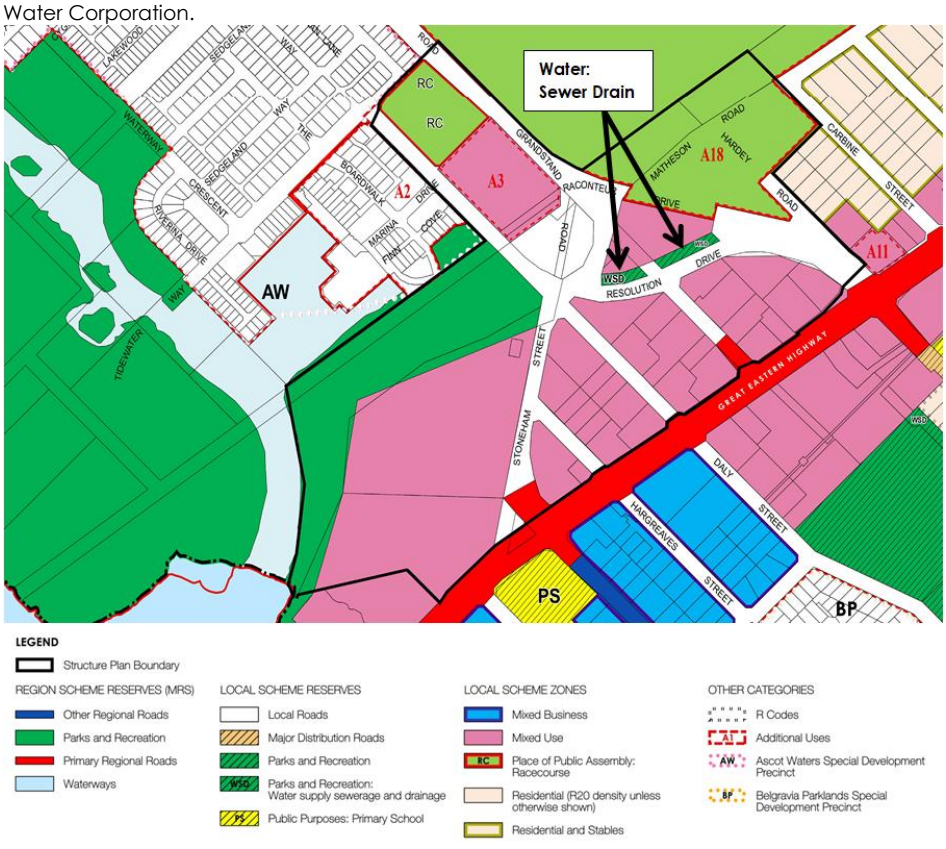

Figure 2: **Local Planning Scheme**

3 EXISTING ENVIRONMENT

A desktop environmental investigation of the study area has been undertaken, the findings of which are presented below.

3.1 Land use context

3.1.1 Historical land use

Historical aerial photography from Landgate suggests the land has been used for commercial purposes for over 50 years, with the majority of lots being approximately 1/3 hectare, accommodating warehouse facilities and such, predominantly adjacent to Great Eastern Hwy. The northern portion of the study area contains the Bristle kilns and Brick Works, which were established in 1929 and ceased operation in 1982 (Heritage Council, WA). The western portion of the study area, over the Belmont Trust Land, was historically used for sporting purposes such baseball fields (Clark, 1952), and more recently as a temporary worksite for development in the area, such as the widening of the Great Eastern Hwy.

3.1.2 Current land use

Commercial property still exists adjacent to Great Eastern Hwy south of Resolution Dr and Stoneham St. East of Stoneham St, the Belmont Trust Land is largely cleared and vacant with large mature trees sparsely located though the middle of the reserve. The perimeter of the reserve is lined with small to large mature trees such as *Brachychiton acerifolius* (Illawarra Flame Tree) and *Eucalyptus grandis* (Flooded Gum).

The north and east of Resolution Dr contains a parcel of land approximately 5 hectares in size that is largely vacant, with the exception of a few mature trees, used as overflow parking servicing the Ascot Racecourse. This portion of land, as shown in Figure **2**, also accommodates a 150 m Water Corporation open channel drain, which discharges via piped drainage under the Stoneham St/Resolution Drive roundabout into the Ascot Waters compensation basin on the north-western boundary of the study area. North of the Ascot Waters Compensation Basin is a second compensation basin servicing the Ascot Waters development. This compensation basin is herein referred to as 'Northern Drainage Lake'. The northern portion of the site contains the Perth Racing Administration Offices.

The Belmont Foreshore Precinct Plan (City of Belmont, 2014) was prepared to guide development and landuse within the river setting and ensure that the landscape values of the river system are conserved or enhanced. The study area, particularly Belmont Trust Land and public open space contains areas identified as parkland within the precinct plan, characterised by open lawns surrounding large individual trees. The precinct plan outlines strategic recommendations that will need to be incorporated into future planning of the Belmont Trust Land.

3.2 Topography, geology and soils

The study area has generally flat topography and grades gently from 6mAHD in the south-east to 3mAHD in the west. The study area has a few low points of approximately 1-2mAHD through the centre of the study area, as shown in Figure 3.

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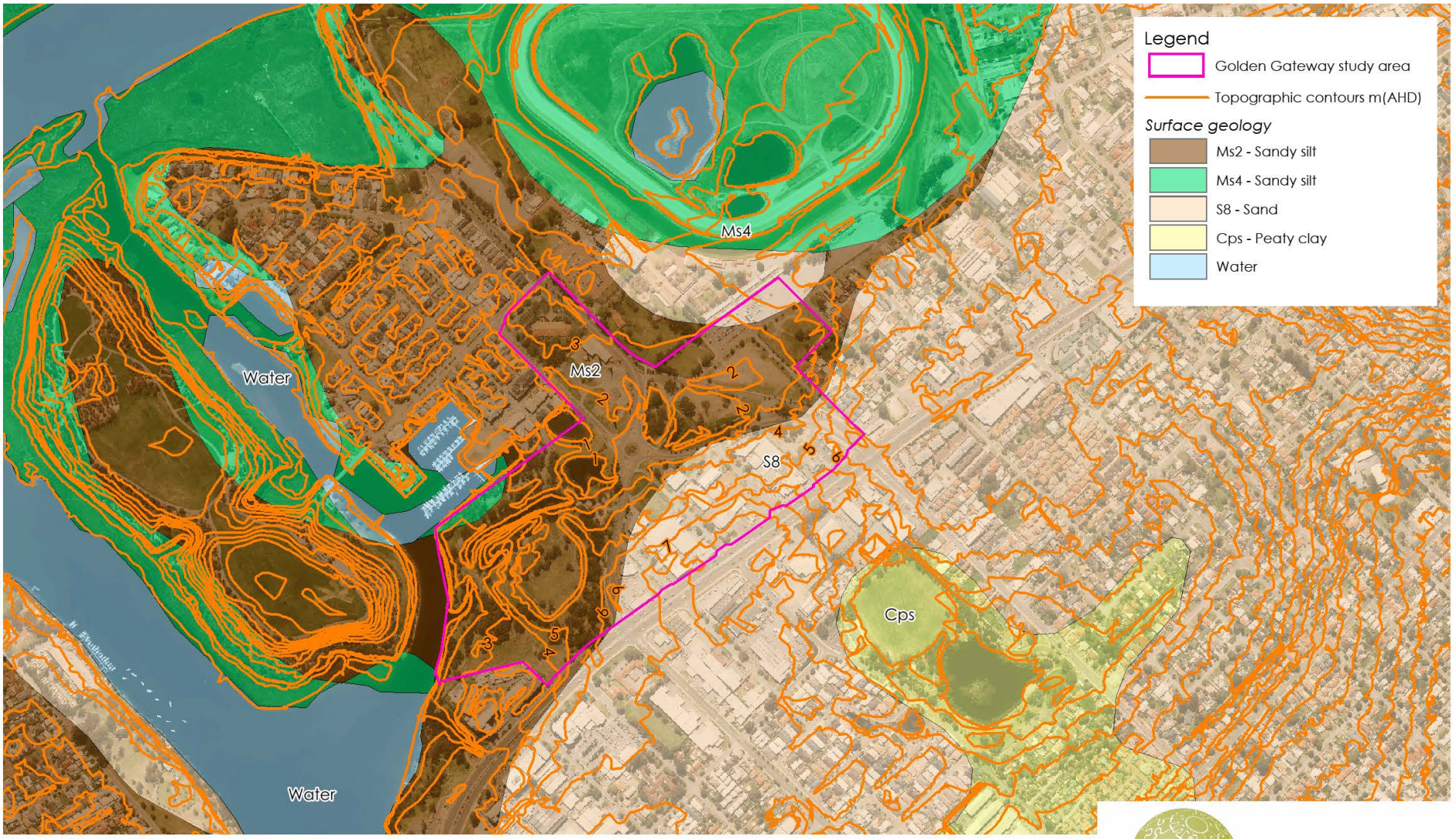
Figure 3: Topography and surface geology



Data source: DMP, Landgate. Created by: RM. Projection: MGA: zone 50.

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3.2.1 Geology

The surface geology is described broadly as Guildford formation: Alluvial sand and clay with shallow-marine and estuarine lenses and local basal conglomerate (WA surface geology 1:250,000 scale geological maps, Geological Survey of WA, and Geoscience Australia).

As shown in Figure 3, two-thirds of the north-western portion of the study area is classified as Ms2 – Sandy Silt, and the eastern third is classified as S8 – Sand, with a small portion of peaty clay adjacent to the Ascot Waters marina, described as follows:

- Ms2 – Sandy Silt: strong brown to mild grey, mottled, blocky, disseminated fine sand, hard when dry, variable clay content. This soil type is historically resourced for clay bricks and tile manufacture. It has a low permeability and low potential for erosion. Sandy Silt has a low shrink swell potential, however is prone to flooding.
- S8 – Sand: very light grey at surface, yellow at depth, fine to medium grained, sub rounded quartz, moderately well sorted. Sand of eolian origin is used for construction purposes with a high permeability and low erosion potential. Well drained given a low water table.
- Cps – Peaty Clay: dark grey and black with variable sand content of lacustrine origin. This soil has low permeability, high erosion potential, and is prone to flooding.

3.2.2 Acid sulfate soils

A review of Department of Water and Environmental Regulation acid sulfate soils (ASS) risk mapping identifies two-thirds of the study area, predominantly the area coinciding with surface geology Ms2-Sandy Silt (see 3.2.1), as containing a Class I 'high to moderate' risk of ASS and the remainder, coinciding with S8-Sand, classified as Class II 'moderate to low' risk occurring within 3 m of the natural soil surface (Figure 3).

In 2009, Douglas Partners undertook an Acid Sulfate Soil investigation and Waste Classification investigation to assess the soil conditions of the Ascot Water Compensation Basin because the City intended to increase the size of the basin. The results of the investigation indicate the basin contains ASS, which are generally located at and below the groundwater table (approximately 1.5 m below ground level) (Douglas Partners, 2009). Should the soil below the groundwater table be exposed or groundwater be lowered for future development, further investigation of ASS is likely to be required.

Consistent with Department of Water and Environmental Regulation guidelines, sites should be investigated for ASS if any of the following works are proposed:

- ASS disturbing subdivision or development that is subject to conditional approval requiring the investigation and management of ASS;
- soil or sediment disturbance of 100 m^3 or more in an area depicted on an ASS risk map as Class I 'high to moderate risk of ASS occurring within 3 m of natural soil surface' (e.g. construction of roads, foundations, installation of underground infrastructure, drainage works, land forming works, dams and aquaculture ponds or sand or gravel extraction);
- soil or sediment disturbance of 100 m^3 or more with excavation from below the natural watertable in an area depicted on an ASS risk map as Class II 'moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface';
- lowering of the watertable, whether temporary or permanent (e.g. for groundwater abstraction, dewatering, installation of new drainage, modification to existing drainage), in areas depicted in an ASS risk map as Class I 'high to moderate risk of

actual acid sulfate soils (AASS) or potential acid sulfate soils (PASS) occurrence' or Class II 'moderate to low risk of AASS or PASS occurrence within 3 m of natural soil surface';
- any dredging operations;
- extractive industry works (e.g. mineral sand mining) in any of the areas listed in Table 1 of the guidelines; and
- flood mitigation works, including construction of levees and flood gates in any of the areas listed in Table 1 of the guideline.

Given the Class I classification for ASS, it is recommended that a self-assessment checklist is completed for the study area. Some investigation for ASS will be required if any of the above works are proposed in Class 1 areas. Investigations should be undertaken consistent with Department of Water and Environmental Regulation guidelines: *Identification and investigation of acid sulfate soils and acidic landscapes* (DER, 2015).

If ASS is found to be present at the site, all site works must be carried out in accordance with a Department of Water and Environmental Regulation-approved ASS management plan.

3.2.3 Contaminated sites

DWER Contaminated sites database

A search of the Department of Water and Environmental Regulation Contaminated Sites database found no contaminated sites within the study area. Lot 5 Resolution Drive (160 Stoneham Street) is listed as "Possibly Contaminated, Investigation Required".

Ascot Water compensation basin

In 2009, Douglas Partners undertook a waste classification assessment at Lot 5 Stoneham St, corner of Resolution Dr and Stoneham St to assess the occurrence of acid sulphate soils; assess the nature and suitability of the soil for re-use; and assess the waste classification of the soil to be excavated, as the City of Belmont intended to increase the size of the current Ascot Waters Basin by approximately 4000 m^2.

A Preliminary and Detailed Site Investigation (PSI/DSI) was also undertaken in 2012 (GHD, 2013), and a subsequent Site Management Plan was developed. Soil and groundwater contamination were investigated to assess risk to ecological and human receptors in accordance with the Department of Water and Environment Regulation. A summary of the contamination issues identified through these investigations are as follows:

- Soil - Inorganic
  - Samples were tested for metals (As, Ca, Mn, Hg, Ni, Pb, Zn, Al, Fe). Exceedances of Ecological Investigation Levels (EIL, as per DER guidelines) were minimal, so metals were considered to be low risk to ecological receptors in the basin's current state. Metals were also below Health Investigation Levels (HIL-E), with the exception of lead. Further sampling indicated this was a localised test result.
  - Douglas Partners reported Asbestos Containing Materials (ACM) at several bores from 0 to 2 m below ground level (BGL). ACM was also found in samples collected at greater than 0.5 m BGL. However, no samples were taken near the surface profile (less than 0.3 m BGL) and the exposure pathway for the community or workers is considered incomplete. Overall, asbestos is considered low risk in its current state, however, further investigation needs to be undertaken.

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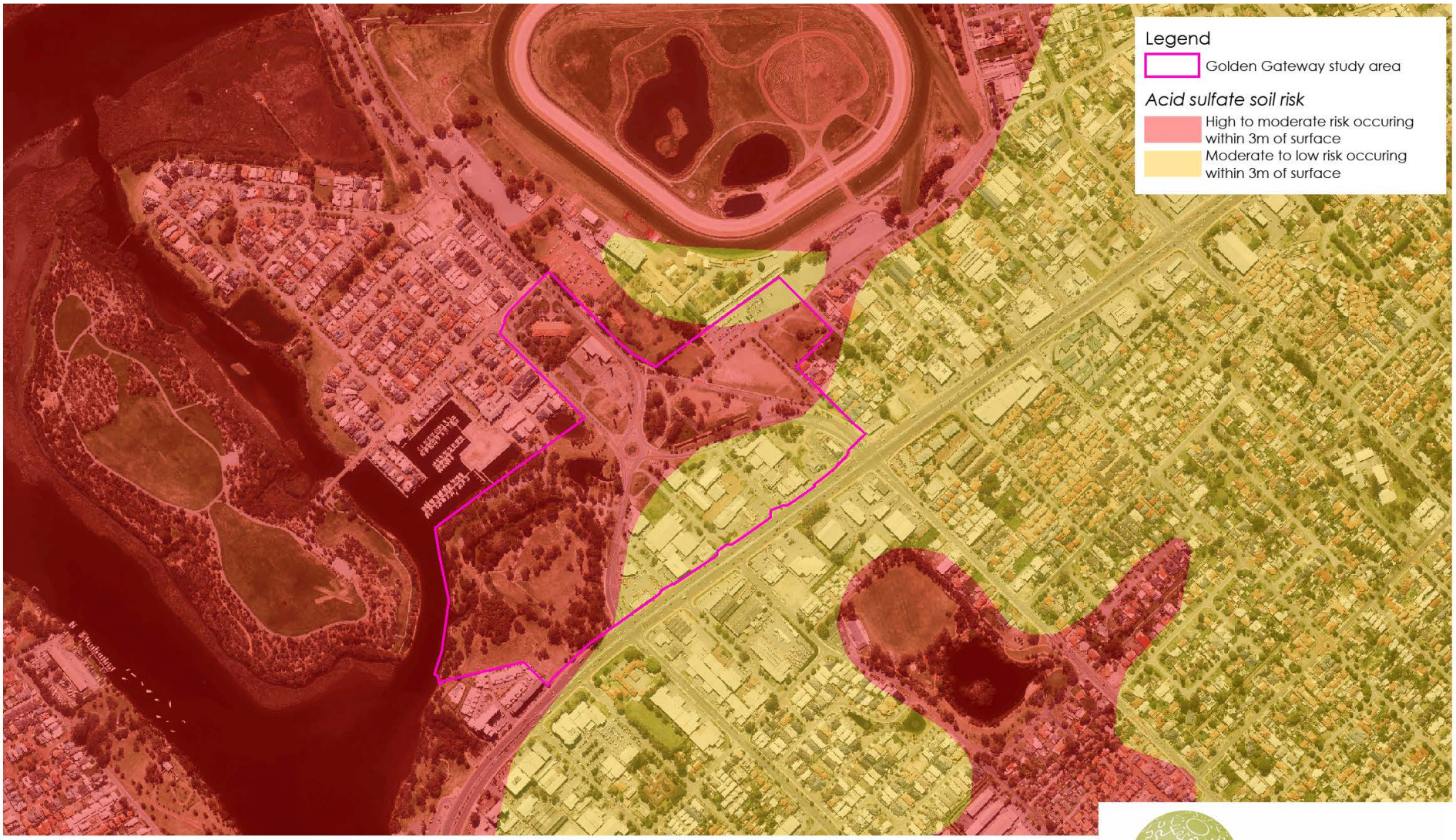
Figure 4: Acid sulfate soil risk



Data source: DEC, Landgate. Created by: RM. Projection: MGA: zone 50.

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  - Organic
    - Both Douglas Partners and GHD reports indicate that encountered hydrocarbons were localised in nature and not considered to pose a risk to ecological or human receptors. However, works such as excavation would increase risk, and appropriate precautions should be taken.
- Groundwater
  - Inorganic
    - Three groundwater bores were sampled to test for Fe, Zn, Ni, NH_3, NO_2, Total Nitrogen and Total Phosphorous. Concentrations of Zn, NH_3, and Ni were reported marginally above ANZECC guidelines in all bores, and Fe concentrations were recorded 20 times above ANZECC guidelines. The exceedances are considered characteristic of winter conditions in the Swan River and natural soils in the locality (e.g. iron). Therefore, these results are not considered to reflect any potential risk to ecological or human receptors.
  - Organic
    - All samples were analysed for BTEX, Total Recoverable Hydrocarbons (TRH) and Polycyclic Aromatic Hydrocarbons (PAH). These were all reported below the DER Domestic Non-potable water criteria (GHD, 2013).

Based on these results, it is understood that the basin in its current state does not propose a risk to ecological or human receptors. Management guidelines provided in the Site Management Plan are effectively for the management of the basin expansion works and the City of Belmont have not proceeded with increasing the basin size.

3.3 Flora, fauna and vegetation

3.3.1 Conservation areas

There are no Bush Forever sites within the study area.

Bush Forever site 313, Swan River Salt Marshes, exists to the north and west of the study area, as shown on Figure 5. The closest proximity of the Bush Forever site to the study area is adjacent to the Belmont Trust Land at the south-western boundary. Apart from this point, the study area is largely disconnected from the Bush Forever site.

An environmentally sensitive area, as mapped by the Department of Water and Environmental Regulation surrounds the Bush Forever site as described above. This area is described as 'Temperate Saltmarsh' and listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Temperate salt marshes are an important habitat for local and migratory bird species (Department of Environment, 2015).

3.3.2 Flora

Searches of the EPBC Protected Matters Search Tool and the former Department of Parks and Wildlife (now Department of Biodiversity, Conservation and Attractions) NatureMap database were undertaken to identify flora species of conservation significance potentially occurring within a 2 km buffer of the study area. Results are outlined in Table 2.

Table 2: Conservation significant flora likely to occur in the study area

Taxa	Common name	Conservation status	
		WC Act	EPBC Act
Dillwynia dillwynioides	-	Priority 3	
Johnsonia sericea	Waldjumi	Priority 4	
Caladenia huegelii	King Spider-orchid		Endangered
Darwinia foetida	Muchea Bell		Critically endangered
Lepidossperma rostratum	Beaked Lepidosperma		Endangered

3.3.3 Fauna

Searches of the EPBC Protected Matters Search Tool and the Department of Biodiversity, Conservation and Attractions NatureMap database were undertaken to identify fauna species of conservation significance potentially occurring within a 2 km buffer of the study area. Results are outlined in Table 3.

Table 3: Conservation significant fauna known or likely to occur in the study area

Taxa	Common name	Conservation status	
		WC Act	EPBC Act
Calyptorhynchus latirostris	Carnaby's Balck Cockatoo	Rare or likely to become extinct	Endangered
Calidris ferruginea	Curlew Sandpiper	Rare or likely to become extinct	-
Caretta caretta	Loggerhead Turtle	-	Endangered
Chelonia mydas	Green Turtle	-	Vunerable
Dermochelys coriacea	Leatherback Turtle	-	Endangered
Natator depressus	Flatback Turtle	-	Vunerable
Diomedea epomophora epomophora	Southern Royal Albatross	-	Vunerable
Dioedea exulans (sensu lato)	Wandering Albatross	-	Vunerable
Pachyptila turtur subantarctia	Fairy Prion	-	Vunerable
Thalassarche cauta steadi	White-capped Albatross	-	Vunerable
Dasyurus geoggroii	Chuditch	-	Vunerable
Actitis hypoleucos	Common Sandpiper	Protected under international agreement	-
Ardea modesta	Eastern Great Egret	Protected under international agreement	-
Merops ornatus	Rainbow Bee-eater	Protected under international agreement	-
Tringa nebularia	Common Greenshank	Protected under international agreement	-
Falco peregrinus	Peregrine Falcon	Specially protected fauna	-
Oxyura australis	Blue-billed Duck	Priority 4	

WC=Wildlife Conservation Act 1950
EPBC=Environmental Protection and Biodiversity Conservation 1999

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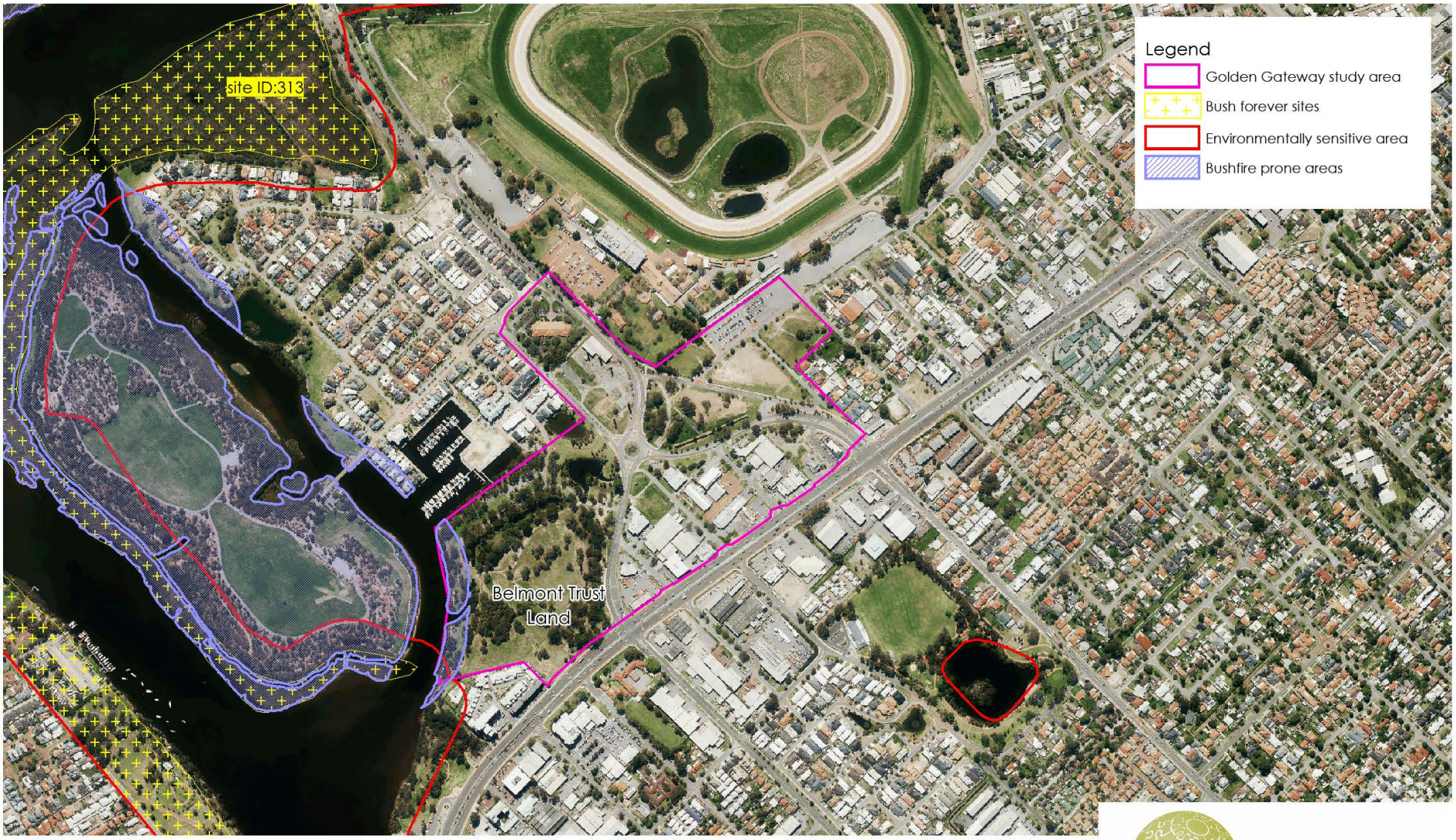
Figure 5: Vegetation



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3.3.4 Bushfire risk

A portion of the study area along the banks of the Swan River is identified as a Bush Fire Prone Area (Figure 5), as designated by the Fire and Emergency Services (FES) Commissioner. Accordingly, any planning and development in the area must consider bushfire risk and the requirements of *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) (2015).

The *Guidelines for Planning in Bushfire Prone Areas* (WAPC, 2015) refer to the need for a Bushfire Hazard Level assessment and Bushfire Attack Level Contour Map where possible to support strategic planning proposals in Bushfire Prone Areas. It is understood that this is being addressed separately from this report for the structure plan area.

3.4 Water resources

3.4.1 Public Drinking Water Source Area

There are no Public Drinking Water Source Areas within the study area.

3.4.2 Surface water resources

The Swan River is adjacent to the western portion of the study area (Belmont Trust Land). The Swan River holds significant ecological value because it provides habitat for local and migratory birds and other fauna, with the majority of the River being identified as a conservation category wetland and environmentally protected area. Furthermore, the Swan River provides important social value for visual amenity, and recreation on the river and its reserves. The Swan River also holds significant Aboriginal and European heritage values.

The Department of Water and Environmental Regulation Floodway mapping indicates that a large area in the northern portion of the study area lies within the Swan River 100 year average reoccurrence interval (ARI) flood fringe (Figure 6).

A Water Corporation open drain exists at the centre of the study area. The open drain is approximately 150 m in length and directs runoff flows from the eastern urban and industrial areas to piped drainage under the Stoneham St/Resolution Drive roundabout to the Ascot Waters compensation basin (Figure 6). The compensation basin allows for dissipation of energy, mixing of water for oxygenation and sediment control before flowing through a further 350 m of open drain to the Swan River. A contaminated sites investigation was conducted by GHD and a Site Management Plan was subsequently developed in 2013 for the expansion of the compensation basin. The investigation identified issues of leachable metals, PAH and TPH fractions, and asbestos (see section 3.2.4).

North of the Ascot Waters Compensation Basin is a second compensation basin servicing the Ascot Water development, the Northern Drainage Lake. The Northern Drainage Lake has experienced water quality issues in the past with two fish kill incidents occurring during July and September 2012. The first incident involved approximately 300 fish deaths and the latter 100-150 fish deaths. No incidents have occurred since 2012. No water quality monitoring was undertaken by the City (pers, comm. Nicole Davey – City of Belmont coordinator-environment, 1 August 2016). However, investigations were undertaken by the Swan River Trust in 2012 in response to the fish kills. Water quality testing indicated low concentrations of algae, and higher concentrations of organic matter resulting in oxygen-depleted water. In addition, it was identified that fish often become trapped in backwaters such as this lake. It was concluded

that a combination of the above factors resulted in the fish kill incidents (pers. comms. Swan River Trust: Rivers Systems Branch, 23 August 2016).

A portion of the site is located within the Swan River Trust Development Control area (Figure 6). Land use planning and development within the Development Control Area is subject to approval of the Department of Biodiversity, Conservation and Attractions under Part 5 of the *Swan and Canning Rivers Management Act 2006* and the *Swan and Canning Rivers Management Regulations 2007*. This area includes the waterways of the Swan and Canning rivers and the adjoining parks and recreation reserves.

All development plans and applications for this area should be referred to Parks and Wildlife for advice in accordance with Clause 30A of the Metropolitan Region Scheme.

3.4.3 Groundwater resources

The study area is within the Perth groundwater area and City of Belmont sub-area. The Department of Water and Environmental Regulation's Water Register shows no available allocation within the study area, as shown in Table 4.

Table 4: Groundwater resource allocation and availability (as of January 2016)

Management Area	Management Sub Area	Resource	Allocation Limit	Allocated Volume	Remaining Volume
Perth	City of Belmont	Perth - Superficial Swan	1,497,000	2,243,830	-746,830

The City of Belmont currently has a groundwater licence allocation of 1,171,200 kL (licence no. 157042) located south-west of the study area along the Swan River.

It can be inferred from the groundwater levels in the Department of Water and Environmental Regulation's Perth Ground Water Atlas that maximum groundwater levels are within 3 m of the natural surface through the northern and central portions of the study area, with groundwater flowing in a north-westerly direction toward the Swan River.

A search of the Department of Water and Environmental Regulation Water Information Network (WIN) bores showed a few bores located within the vicinity of the study area; however, none of the bores have current monitoring data. The most recently sampled bore was in 2011(ID: 616 71004) situated 500 m east and hydrologically upstream of the study area showing a groundwater level 4.5 m below ground level (BGL). Consideration of this information together with that of another bore closer to the study area (ID: 616 05266), which has last recorded data from 1999 of 4 m BGL, indicates that the groundwater level may be lower than the mapped groundwater atlas level. Two other bores located north of the study area (ID: 616 05225 and ID: 616 05224), which have data from 1996 record groundwater at approximately 3 m BGL. These bores are part of the Ascot Waters development, which topographically sits approximately 2 m higher than the northern section of the study area and has been built-up for the purposes of the development. Therefore, it is reasonable to conclude that the groundwater level of these bores is less likely to be representative of the groundwater level within the study area than the surrounding locations.

It is noted that water resources and urban water management will be specifically addressed by the local water management strategy, which is being prepared to support the structure plan.

City of Belmont: Golden Gateway - Desktop environmental report
Figure 6: Water resources

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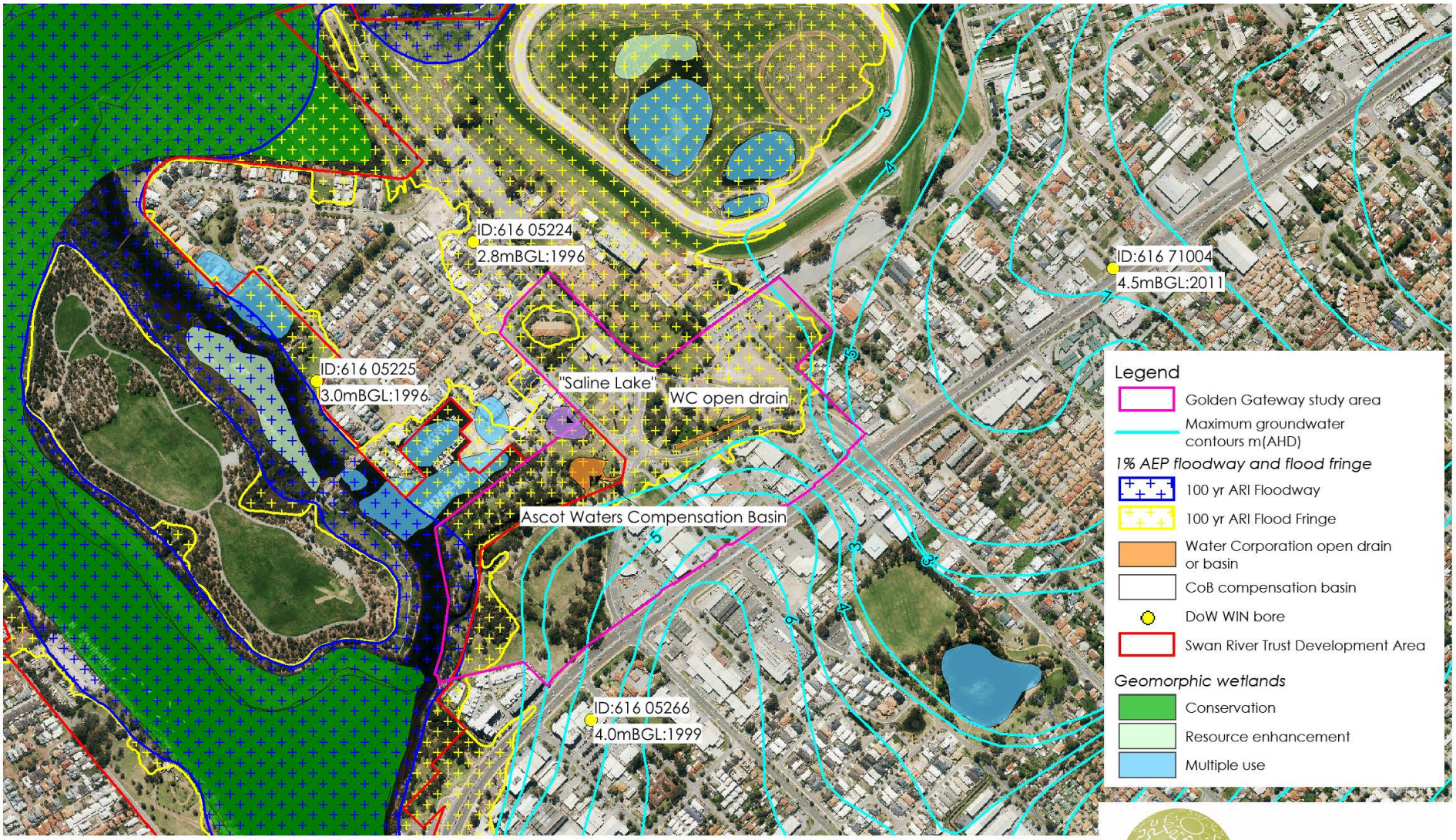

Data source: CoB, DEC, DPaW, Landgate. Created by: RM. Projection: MGA: zone 50.

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3.5 Heritage

3.5.1 Aboriginal heritage

A search of the Department of Planning, Lands and Heritage aboriginal heritage enquiry system showed one site overlaying the study area (Figure 7):

- Site ID 3753 – Registered site, Name: Perth, Type: Historical, mythological, hunting place, named place, natural feature.

One other site is adjacent to the study area, however not within the boundary, site ID 3536 - Registered site, Name: Swan River, Type: mythological.

3.5.2 European heritage

The Bristle Kilns are beehive and tunnel kilns, with associated chimney and floor ducts, located at 197 Grandstand Rd Ascot. The Kilns were first built in 1930, manufacturing terracotta, stoneware and steel products. Production ceased in 1982 (Heritage Council, 2012). The Kilns and chimneys remain and were placed on the State Heritage List in 2003. The Bristle Kilns are a visually striking feature of the area and are viewed as an asset for restoration by the community (Strutt, 2015).

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City of Belmont: Golden Gateway - Desktop environmental report
Figure 7: Heritage

Data source: DAA, Heritage Council, Landgate. Created by: RM. Projection: MGA: zone 50.

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4 FINDINGS AND RECOMMENDATIONS

The following section presents findings of the desktop environmental assessment of the study area. It highlights a number of environmental issues, which should be considered as part of the preparation of the local structure plan and future development of the site. These relate primarily to:

- A portion of the site being within the Swan River Trust Development Control Area;
- Proximity to the Swan River and potential for offsite impacts on values;
- Bushfire risk;
- Contamination and water quality management in the compensating basins; and
- Soils and acid sulfate soils.

Key recommendations to address these issues are provided below.

4.1 Soils and topography

The north-western portion, approximately two-thirds of the largely undeveloped area, is classified as Sandy Silt (Ms2), which has a low permeability and will need to be considered with regards to runoff and stormwater disposal.

In order to reduce the potential for erosion and sediment transport to drains and the River, ground disturbing activities should be kept to a minimum and carried out 'as required' (in stages) immediately prior to lots being released for sale as part of a 'staged' development of the site. Where land is cleared, the area should be stabilised (e.g. through landscaping/ stabilising materials/dust suppression) as soon as possible.

4.2 Acid Sulfate Soils

Approximately two-thirds of the study area is mapped as being High to Moderate ASS Risk (<3 m from the surface). The WAPC *Acid Sulfate Soils Planning Guidelines* (WAPC, 2008) indicates that "acid sulphate soils are technically manageable in the majority of cases".

It is recommended that a self-assessment checklist is completed for the study area. ASS Investigation and, if required, Management Plans should be prepared at subdivision stage once the detailed design of the site is finalised. This should be undertaken in accordance with the Acid Sulphate Soils Guideline Series: *Identification and Investigation of Acid Sulphate Soils and Acidic Landscapes* (DER, 2015a) and *Treatment and Management of Soils and Water in Acid Sulphate Soil Landscapes* (DER, 2015b).

4.3 Surrounding land use and buffer requirements

The Swan River is the most important environmental attribute in proximity to the study area. Protection of the environmental values associated with the River requires consideration of compatible adjacent land uses that limit impacts. The provision of a 50 m buffer to the banks of the Swan River consistent with its designation as an environmentally protected area and conservation category wetland is generally applied.

Any proposal within the Swan River Trust Development Control Area that is likely to impact on the water quality and/or values of the Swan River should be referred to the Department of Biodiversity, Conservation and Attractions. It is recommended that consultation occur with the

Department of Biodiversity, Conservation and Attractions, Rivers and Estuaries Branch as part of the preparation of the local structure plan.

4.4 Vegetation and flora

The vegetation on the site is degraded and the site does not contain any areas with an intact understorey. No Declared Rare Flora are likely to be on the site and no priority species are likely to be present. It is recommended that no further vegetation assessment of the site is required and therefore, protected flora is not an impediment to the development of the area.

It is recommended that, as part of the detailed design process, any trees that can be retained in street verges, landscaped areas, parking areas and in road/entry areas should be identified and included in the detailed design plans for the area. Mature trees to be retained must be identified and clearly marked prior to commencement of any pre-construction activities.

4.5 Fauna and habitat

Due to historic clearing, urbanisation activities, and lack of native remnant vegetation across the majority of the study area, particularly the understorey, any fauna habitat is considered of low value to native fauna. This is with the exception of the portion of the study area that abuts the Swan River, where the foreshore area may provide important habitat for local and migratory birds.

To minimise impacts to fauna resulting from any clearing activities, the following management strategies are proposed:

- During construction, the extent of authorised clearing will be clearly defined and demarcated to avoid accidental clearing;
- Loud noises (e.g. air horns) will be made just prior to commencement of clearing;
- Clearing works will occur in the direction of a conservation area where possible, to allow animals time to escape;
- If any injured or distressed fauna are encountered during site works the Site Supervisor will be instructed to immediately call the Department of Biodiversity, Conservation and Attractions' Wildcare Hotline (08) 9474 9055, to allow for the closest appropriate registered wildlife rehabilitator to attend the site; and
- Where possible, local native species will be planted along road verges and median strips in and near conservation areas and strategic ecological linkages to enhance the value of the linkage to fauna.

4.6 Flood protection, groundwater and water quality management

As the development is partly within the Swan River Trust Development Control Area, planning and development should consider Department of Biodiversity, Conservation and Attractions' *Corporate policy statement no. 42: Planning for land use, development and permitting affecting the Swan Canning Development Control Area* (June 2016) and other relevant policies. Development may be subject to a Part 5; Clause 30A(2)a or Clause 30A(2)b application process.

A portion of the study area is also within the 100 year ARI flood fringe. Any development in the flood fringe should not impact on the risk of upstream flooding.

Limited assessment of groundwater levels has been undertaken at this stage. As shown on Figure 6, the maximum groundwater contours from the Department of Water and Environmental Regulation's Perth Groundwater Atlas (2004) only extends to the southern portion of the study area and local groundwater bores have limited information. It is recommended to further investigate groundwater levels.

Surface water and groundwater management will be described in the Local Water Management Strategy and any future Urban Water Management Plans that will be prepared for each stage of development. Therefore, potential impacts on surface water and groundwater can be mitigated and managed in order to achieve the objectives of *State Planning Policy 2.9: Water Resources* (WAPC, 2006).

A Local Water Management Strategy is being prepared in accordance with *Better Urban Water Management* (WAPC, 2008) to address the following:

- Identification of the site's current hydrological regime and existing environment;
- Identification of the constraints within the development area which may affect the design of the development with respect to urban stormwater drainage and management of groundwater;
- A description of the stormwater management strategy for minor and major events, including details on the proposed management practices to be employed;
- Identification and description of mechanisms to protect the water regime, including water quality and water levels. This will include a discussion of the overarching engineering principles that will be employed to mitigate any impact from run-off, groundwater and water quality issues, and ensure that the environment and the development will not be adversely impacted upon;
- Identification of the proposed water supply (including irrigation requirements) and wastewater disposal;
- Identification of monitoring requirements and derivation of agreed performance criteria for the urban water management system; and
- Identification of contingency measures to be implemented in the event that the system is not achieving agreed performance targets.

4.7 Heritage

A buffer area of a site of Aboriginal heritage has been identified to cross the boundary of the study area. All contractors working on the development will need to be made aware of their responsibilities under the *Aboriginal Heritage Act 1972* with regard to finding potential archaeological sites. In the event that a site is discovered, all work in the area will cease and the Department of Planning, Lands and Heritage will be contacted.

The Bristle Kilns are on the State Heritage list and future land use planning will need to take this into consideration.

4.8 Construction impacts

Construction activities need to be managed to minimise the impact to nearby Swan River, surrounding residents and the retained vegetation on-site. Impacts can include:

- Nuisance dust generation during bulk earthworks;
- Disturbance of ASS during earthworks and/or installation of services;

- Silt and sediment runoff to waterways and drains from uncontrolled runoff during site works;
- Inadvertent damage to trees and other vegetation earmarked for retention;
- Impacts to new stormwater drainage systems and existing environmentally sensitive areas from wind- and water-borne sediment during construction; and
- Inappropriate disposal of waste building material and poor housekeeping on building sites leading to wind-blown litter.

All of these potential impacts are manageable through appropriate engineering design and/or good site management practices.

4.9 Conclusion, constraints and opportunities

Several significant environmental constraints to the proposed development have been identified as follows:

- risks associated with urban stormwater runoff to the Swan River (sections 3 and 4);
- contamination risks associated with Ascot Water Compensation Basin, which will need to be considered if future work on the basin is to be undertaken (section 3.2.4);
- contamination risks associated with the Northern Drainage Lake, which may need to be considered because of previous fish kills in the lake (section 3.4.2); and
- the associated bushfire risk of the north-western portion of the study area, which will need to consider the requirements of *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) (2015) (section 3).

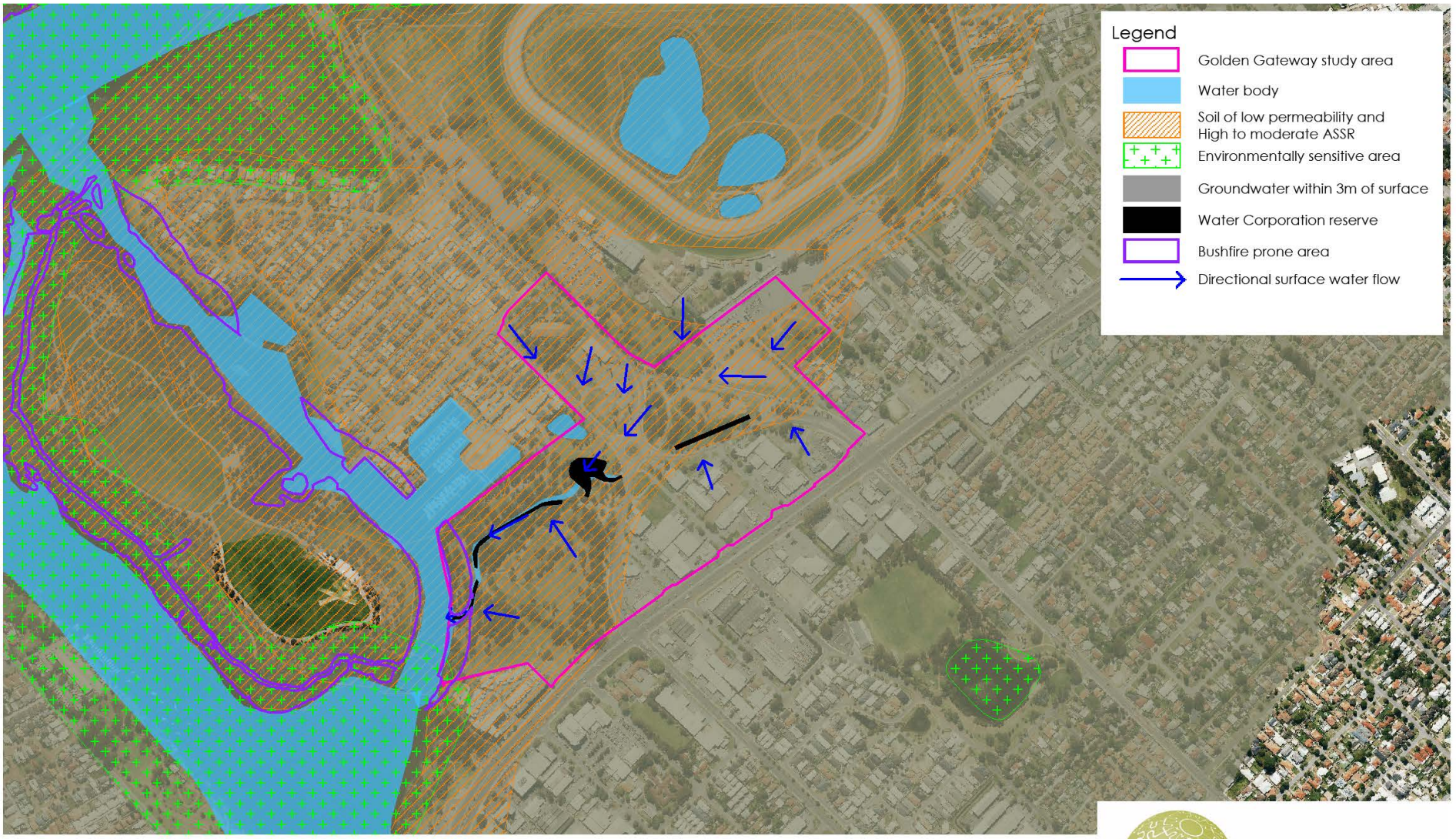
Two figures have been developed to show the environmental constraints (Figure 8) and environmental opportunities (Figure 9). As summarised above, the environmental constraints include soil of low permeability and ASS risk to the majority of the study area. Further to this, the geology of the site may have created a perched groundwater table, and in conjunction with the close proximity of the study area to the receiving water body, groundwater levels are inferred to be close to the surface. The topography of the study area generally directs surface water flows toward the centre and south-westerly toward the Swan River, an environmentally sensitive area and conservation category wetland.

Although the Swan River is identified as an environmental constraint due to its protection requirements, the opportunities the River provides to the study area are of exceptional significance. The Swan River has long been valued for its social, recreational and visual amenity and would provide a substantial opportunity for increased land value. This can also be said for the mature trees within the study area, which provide visual amenity and urban heat island mitigation. Furthermore, deep rooted trees help maintain hydraulic control of the groundwater table by reducing recharge and using groundwater via transpiration, and promote soil stability and erosion control, especially at the river banks and at any other points where a water body receives inundation. The compensation basins identified in Figure 9 are also an opportunity for rehabilitation for improved visual amenity, flora and fauna habitat and upstream pre-treatment of surface and/or groundwater before discharge to the Swan River.

City of Belmont: Golden Gateway - Desktop environmental report

A350

Figure 8: Environmental constraints



Data source: CoB, Landgate. Created by: RM. Projection: MGA: zone 50.

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essential environmental

City of Belmont: Golden Gateway - Desktop environmental report

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Figure 9: Environmental opportunities

Data source: CoB, Landgate. Created by: RM. Projection: MGA: zone 50.

Scale 1: 9,000 @ A4

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5 IMPLEMENTATION STRATEGY

Table 5 provides a preliminary schedule of activities, which should be undertaken at Preconstruction, Construction and Post-construction phases of the project to mitigate and manage potential impacts to the environment. This advice is based on the current predominantly desktop assessment contained within this report. More detailed management measures should be determined as part of more detailed investigation and planning as the proposed development progresses.

Table 5: Implementation strategy

Issue	Action	Frequency	Responsibility
Preconstruction phase			
Contamination	Complete preliminary site investigation for contamination in accordance with Contaminated Sites Act 2003 should areas of known contamination be disturbed.	Once	Developer
Acid sulfate soils	Complete self-assessment checklist and consider need for a preliminary site assessment.	Once	Developer - Consistent with DPLH and DWER guidelines
Vegetation and flora	Clearly delineate POS areas and trees to be retained.	Once	Licensed Surveyor (Developer)
Fauna and habitat	All site staff to participate in Environment, Health and Safety inductions, which provide requirements for management of significant fauna and reporting procedures for environmental incidents.	Once	Developer and Construction contractor
Water management	Refer the local structure plan to the Department of Biodiversity, Conservation and Attractions as it contains a portion of land within and abutting the Swan River Trust Development Control Area. A Local water management strategy will be completed and used as the basis for detailed design. Following approval of the LWMS, UWMP(s) will be prepared prior to subdivision for approval by City of Belmont.	Once	Developer/City of Belmont Developer, in accordance with SPP 2.9: Water Resources
Bushfire	A Bushfire Management Plan will be prepared to support the LSP. The Bushfire Management Plan will be revised and implemented at subdivision.	Once	Developer, in accordance with SPP 3.7: Planning in Bushfire Prone Areas

Issue	Action	Frequency	Responsibility
Construction phase			
Soils and topography	Ground disturbing activities should be kept to a minimum and carried out 'as required' (in stages) immediately prior to lots being released for sale as part of a 'staged' development of the site.	Ongoing during construction phase.	Construction Contractor (Developer)
Contamination	Management of any identified contamination in accordance with the Contaminated Sites Act 2003.	Ongoing during construction phase.	Construction Contractor (Developer)
Acid sulfate soils	Management of any identified ASS consistent with DPLH and DWER guidelines.	Ongoing during construction phase.	Construction Contractor (Developer)
Vegetation and flora	Maintain markings and fencing around vegetation and trees to be retained. Cleared vegetation to be mulched and stored on site.	Ongoing during construction phase.	Construction Contractor (Developer)
Fauna and habitat	Undertake clearing in the direction of the river to allow fauna to escape.	Ongoing during construction phase.	Construction Contractor (Developer)
Water management	Manage sediment transport to waterways and drainage systems consistent with the LWMS.	Ongoing during construction phase.	Construction Contractor (Developer)
Aboriginal heritage	In the event a site is discovered, all work in the area will cease and the Department of Planning, Lands and Heritage will be contacted.	Ongoing during construction phase.	Construction Contractor (Developer)
Construction impacts	Ensure dust and sediment runoff is adequately managed. Ensure appropriate waste disposal of building materials.	Ongoing during construction phase.	Construction Contractor (Developer)
Post construction phase			
Soils and topography	Landscape or stabilise cleared areas immediately.	Once	Construction Contractor (Developer)
Vegetation and flora	Inspect fencing (if applicable) and replace if required. Ensure ongoing maintenance of retained vegetation and any revegetation areas / native landscaping prior to handover.	6 months Ongoing until handover.	Developer until hand over to City of Belmont

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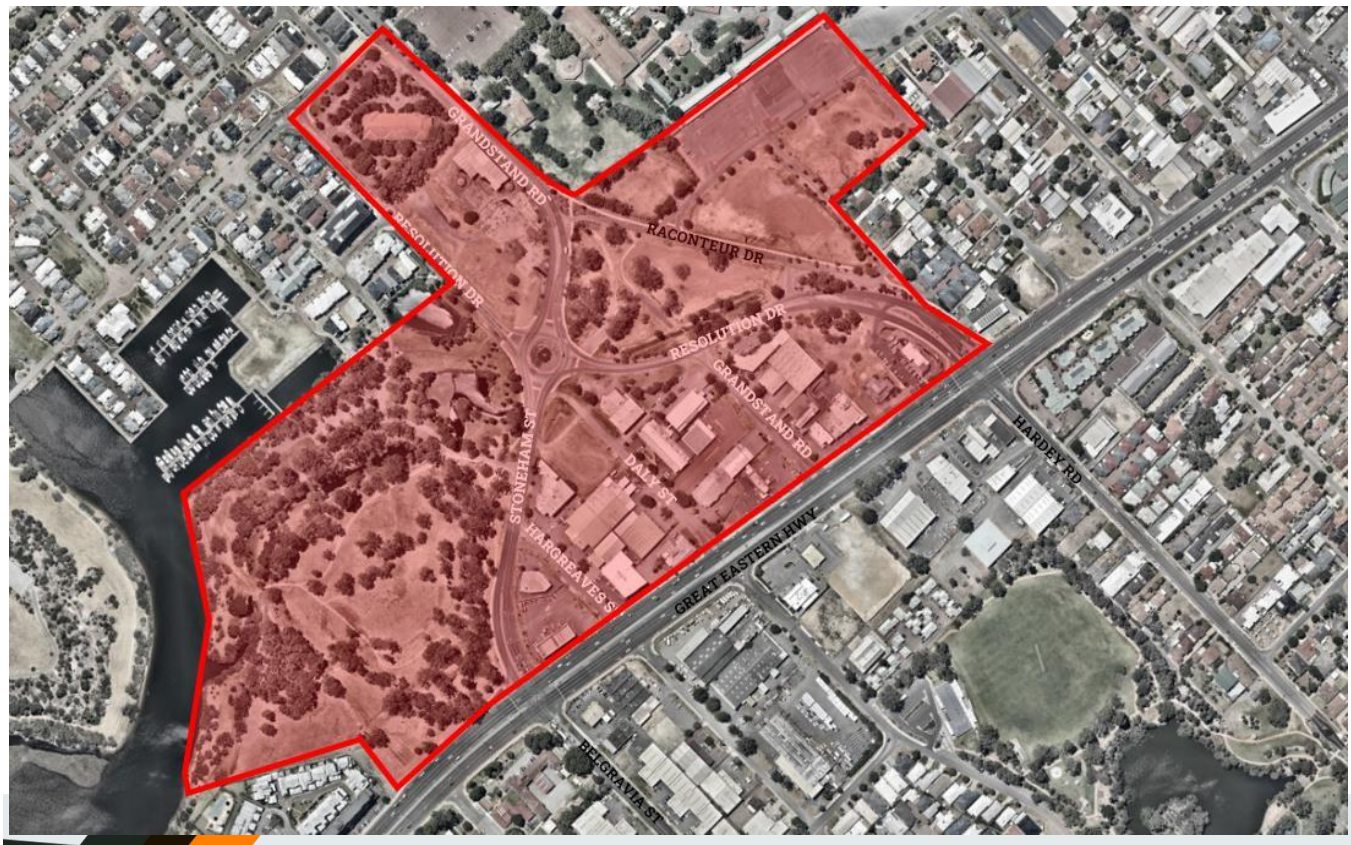
Client: City of Belmont

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Draft report	V1	RM	SSh	Electronic	2 March 2016
Draft – amendments to study area	V2	RM	SSh	Electronic	31 August 2016
Final	V3	SSh	HBr	Electronic	3 May 2018
Amended Final	V4	SSh	HBr	Electronic	21 May 2018
Final Amendments	V5	SSh	HBr	Electronic	25 June 2018

Essential Environmental
land & water solutions
622 Newcastle St Leederville 6007
p: 08 9328 4663 | f: 08 6316 1431
e: info@essentialenvironmental.com.au
www.essentialenvironmental.com.au



Golden Gateway Local Structure Plan
Movement and Access Strategy

FINAL REPORT

email: info@flyt.com.au twitter.com/flytplan web: www.flyt.com.au

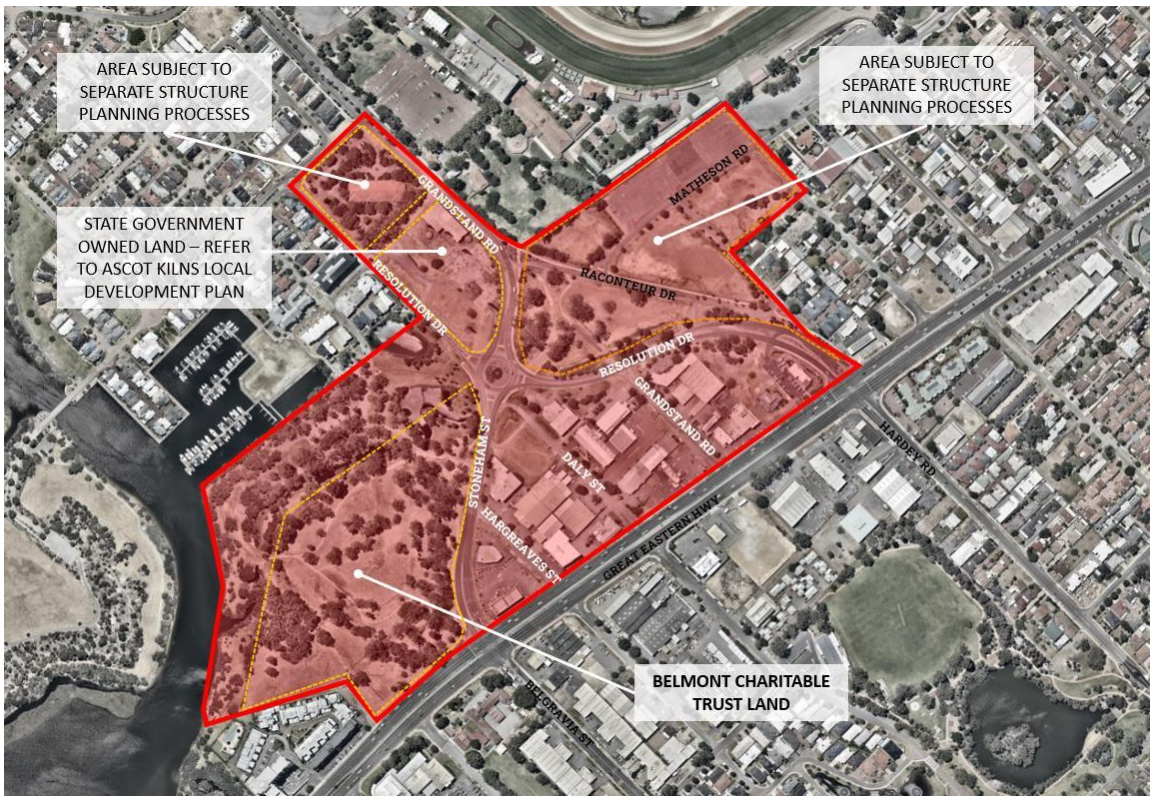
PROJECT	81113-581-FLYT-REP-0005 Modelling and Amendments to Golden Gateway LSP Movement and Access Strategy			
Revision	Description	Originator	Review	Date
0	Draft	CXS	MDR	24/11/2022
1	Issue	CXS	MDR	20/12/2022
2	Revised Structure Plan	CXS	MDR	1/07/2024
3	Addressed City of Belmont comments	CXS	MDR	2/08/2024

Contents

EXECUTIVE SUMMARY

This Movement and Access Strategy has been prepared by Flyt in support of a Local Structure Plan (LSP) which has been prepared for the Golden Gateway Precinct in the City of Belmont.

The Golden Gateway Precinct is bounded by Ascot Racecourse to the north/northeast, Hardey Road to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters residential estate to the west/northwest. The Local Structure Plan boundary includes Ascot Kilns and the Belmont Trust land and a portion of the Perth Racing landholdings.



Perth Racing commissioned PJA to prepare a Traffic Impact Assessment to support the Ascot Racecourse Local Structure Plan. Output from that report (including land uses, road network and forecast traffic volumes) has been used to inform this Movement and Access Strategy.

The Golden Gateway Precinct Movement Network retains the road alignment in its existing configuration apart from Daly Street which will become a cul-de-sac. The remainder of Daly Street will be identified as Public Open Space (POS).

Role and Performance of Key Roads

Great Eastern Highway

Great Eastern Highway will remain in its current form. No changes are proposed to the existing road connections with Great Eastern Highway nor the forms of intersections between Great Eastern Highway and connecting roads.

Stoneham Street

Stoneham Street will be the primary interface between the Golden Gateway precinct and the Swan River. Stoneham Street will continue to be a major district road corridor and provide for high capacity traffic movements. Stoneham Street will be retained as a four lane divided road (two lanes in each direction).

The intersection of Stoneham Street with Resolution Drive and Grandstand Road will remain as a two-lane roundabout. The intersection of Stoneham Street with Hargreaves Street will remain in its current configuration and there will be no intersection with Daly Street as it will become a cul-de-sac.

Resolution Drive

Resolution Drive will remain on its existing alignment. The form of Resolution Drive as a two lane divided road (one lane in each direction) will be retained, however additional lanes will develop on the approach and exit from the Great Eastern Highway intersection, as per the existing lane arrangement.

Grandstand Road (north)

Grandstand Road (north) will remain in its current alignment and configuration as a four lane divided road (with two lanes in each direction). The roundabout controlled intersection with Stoneham Street and Resolution Drive will remain.

Hargreaves Street

Hargreaves Street will continue along its existing alignment providing a connection between Great Eastern Highway (permitting left in left out movements only) and Stoneham Street. The intersection with Stoneham Street will remain.

Hargreaves Street is proposed as a two-lane road with on-street parking where appropriate. Its current width of 12.5m should be reduced to 7m, with embayed parking.

Daly Street

Daly Street will continue along its existing alignment however it will become a cul-de-sac south of Stoneham Street, with the remainder of Daly Street to be identified as Public Open Space. The intersection with Great Eastern Highway (permitting left in left out movements only) will remain.

Daly Street is proposed as a two-lane road with on-street parking where appropriate. Daly Street's current width is 8m; this could be reduced to 7m. On-street parking would need to be embayed. Daly Street has been identified as a secondary route under the Long Term Cycle Network, which could take the form of a shared path, protected bike path or safe active street. The bike path should continue through the public open space.

Grandstand Road (south)

Grandstand Road will continue along its existing alignment providing a connection between Great Eastern Highway (permitting left in left out movements only) and Resolution Drive where it has a full movement intersection.

Grandstand Road is proposed as a two-lane road with on-street parking where appropriate. It is currently 12.5m wide and should be reduced to 7m, with embayed parking.

Memorial Drive

Memorial Drive and its intersection with Stoneham Street will remain unchanged.

Road Network Performance

SIDRA modelling of the existing road network under existing traffic volumes demonstrates that the signalised intersections along the Great Eastern Highway corridor are congested in each of the peak hours. While Great Eastern Highway currently operates at a level of service C and D, the side roads, particularly Stoneham Street, Belgravia Street, and Hardey Road currently operate at a level of service E or F in the peak periods. The Resolution Drive approach currently operates at a level of service D. The side roads experience congestion as more than half of the traffic signal green time is allocated to Great Eastern Highway. This congestion is expected to continue as traffic volumes increase.

The SIDRA Network modelling for the road network demonstrates that the level of congestion in 2021 and 2031 is generally consistent with the congestion predicted for the 2021 and 2031 existing road network scenarios. The internal roads are predicted to operate well within their capacity.

Similarly, the SIDRA Network modelling for build out of the Golden Gateway precinct demonstrates that the level of congestion along Great Eastern Highway in 2041 is consistent with the congestion predicted for the 2041 existing road network scenarios. Congestion along the Resolution Drive approach to Great Eastern Highway is predicted to increase in the AM peak period, while congestion along the Stoneham Street approach to Great Eastern Highway will increase in the PM peak period. Internal roads and intersections are predicted to operate within their capacity.

To understand how the road network performs under an Ascot event, the existing road network was evaluated using 2021 traffic volumes plus Melbourne Cup event traffic. The proposed road network was tested using 2021 traffic volumes plus Melbourne Cup event traffic, 2031 traffic volumes with development traffic plus Melbourne Cup event traffic and 2041 traffic volumes with development traffic plus Melbourne Cup event traffic.

The addition of Ascot event traffic to this busy PM peak increases the congestion in this period. Traffic exiting an event at Ascot is predicted to cause local congestion where this traffic joins the external road network, at the intersection of Raconteur Drive and Resolution Drive.

1. INTRODUCTION

1.1 Movement and Access Strategy

This Movement and Access Strategy has been prepared by Flyt in support of a Local Structure Plan (LSP) which has been prepared for the Golden Gateway Precinct in the City of Belmont.

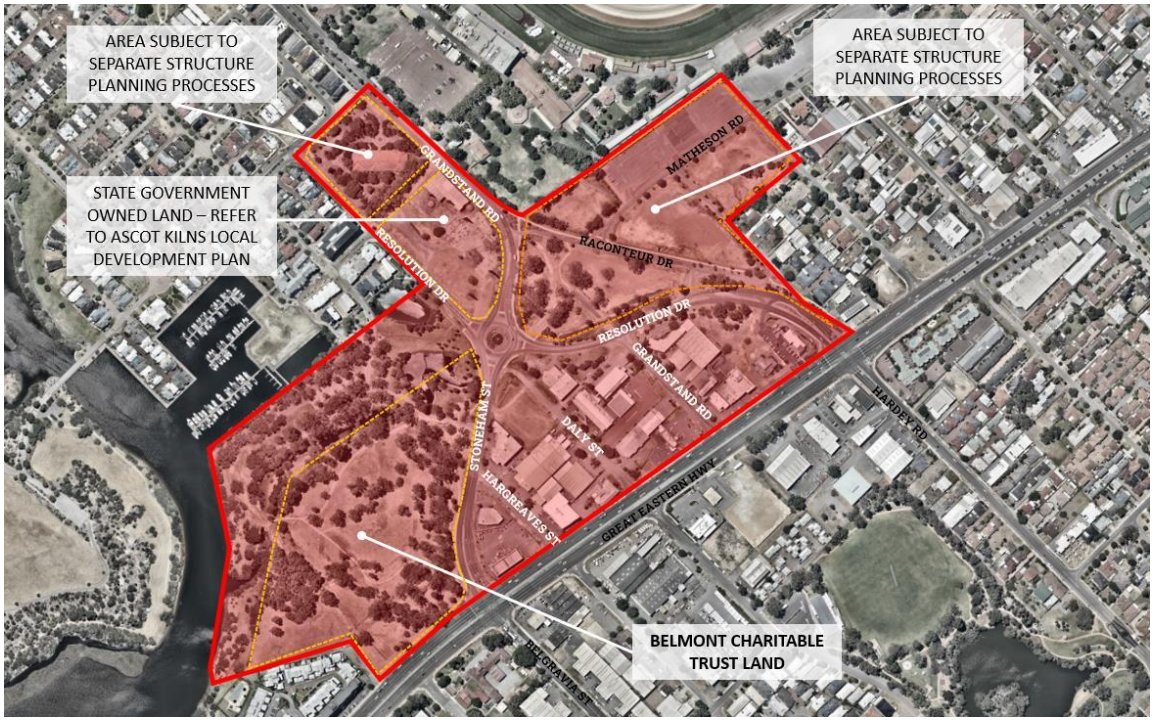
This Strategy has been prepared using the requirements set out within the Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines (August 2016) Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans.

The Local Structure Plan boundary includes the Belmont Trust land, Ascot Kilns and a portion of the Perth Racing landholdings. Ascot Kilns and the Perth Racing landholdings are subject to separate planning processes. Future traffic associated with redevelopment of the Perth Racing landholdings (as documented by PJA in their May 2024 Traffic Impact Assessment to support the Ascot Racecourse Local Structure Plan) has been considered in this Movement and Access Strategy.

1.2 Structure Plan

The Golden Gateway Precinct is located within the City of Belmont and the Local Structure Plan area is bounded by Ascot Racecourse to the north/northeast, Hardey Road to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters residential estate to the west/northwest. The Local Structure Plan boundary is shown in Figure 1 and includes Ascot Kilns, Belmont Trust land and a portion of the Perth Racing landholdings. The Golden Gateway Structure Plan doesn't include controls for land subject to separate planning processes. This Movement and Access Strategy has made a distinction between the structure plan area and the subject land area.

Figure 1 – Golden Gateway Structure Plan Area (source: City of Belmont)



The draft Local Structure Plan is shown in Figure 2, with the proposed land uses outlined in Table 1.

Figure 2 – Golden Gateway Structure Plan (source: City of Belmont)

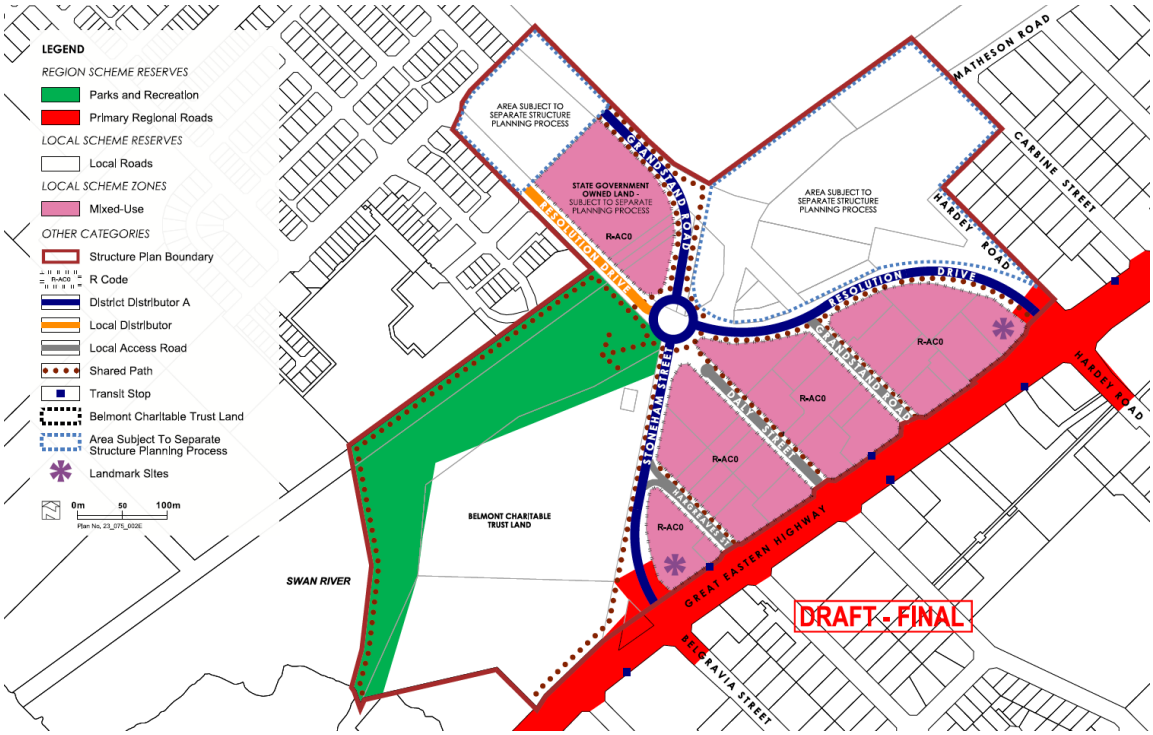


Table 1 – Proposed Structure Plan Land Uses

Land Use	Yield
Residential - Multiple dwelling	2,268 dwellings
Non Residential - Commercial	6,979 m^2 NLA
No Residential - Retail	1,200 m^2 NLA

This Structure Plan shall apply to the Golden Gateway Precinct, being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan map. The provisions of this Structure Plan apply to all land within this area, except for land designated as subject to a separate planning process.

1.3 Key Issues

The issues examined within this Movement and Access Strategy are:

- The impact of the Structure Plan on the local transport network based on the requirements set out in the Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines (August 2016) Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans.
- Addressing issues set out within the Structure Plan report and the form of development of the site; and
- Consideration of the impact of development based on existing and future transport networks in the Golden Gateway locality.

1.4 Background Information

In 2008, the Golden Gateway precinct was identified as a key strategic area due to its prominent position on Great Eastern Highway at the north-western 'gateway' to the City of Belmont. It was recognised this location had significant potential for high quality mixed commercial and residential development.

The precinct is impacted by access constraints and land fragmentation, making it apparent that coordinated planning was required. The draft Golden Gateway Local Structure Plan was therefore prepared to coordinate the future subdivision, zoning, and development of the area.

The draft Golden Gateway LSP was considered by the Belmont Council at an Ordinary Council Meeting held on June 23rd, 2020. In response to submissions received, Council resolved to require several modifications to the LSP, including to the road network.

1.5 Report Structure

This Movement and Access Strategy has been structured to conform to the requirements of the WAPC Transport Impact Assessment Guidelines for the assessment of Structure Plan proposals. This introduction section forms the first of nine sections in this Movement and Access Strategy. The remaining sections cover:

- Structure Plan Outline
- Existing Transport Environment.
- Movement Network
- Analysis of Transport Network
- Conclusions

2. STRUCTURE PLAN OUTLINE

2.1 Regional Context

The Golden Gateway Precinct is located within the City of Belmont and the Local Structure Plan area is bounded by Ascot Racecourse to the north/northeast, Hardey Road to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters residential estate to the west/northwest. The Local Structure Plan boundary is shown in Figure 3. The LSP site includes the Belmont Trust Land, which currently consists of open parkland with a foreshore along the Swan River and includes the Ascot Kilns Local Development Plan (LDP) area.

Figure 3 – Golden Gateway LSP Area Regional Context (source: Google Maps)

The site is located approximately 8km to the east of the Perth CBD, along the southern foreshore of the Swan River. It is 4km from Perth Airport Domestic Terminal (Qantas), 9km from Perth International/Domestic Terminals and 3.5km from Belmont Forum Shopping Centre.

The movement network surrounding the site features key regional road connections, a high frequency public transport corridor and high-quality shared path pedestrian and cycling links.

The site benefits from good access to the regional road network, with Great Eastern Highway along the southern boundary of the site. To the west Great Eastern Highway provides access to the Perth CBD and onto South Perth, Melville, and Fremantle via Canning Highway. To the east Great Eastern Highway provides access to Perth Airport and onto Guildford, Midland, and the Swan Valley. The site is close to the Garratt Road bridge crossing of the Swan River (approximately 1km north of the site), which provides access to Bayswater, Maylands, Mount Lawley, and suburbs north of Perth CBD.

Ascot Racecourse is located immediately to the northeast of the site. The racecourse is regarded as Perth's premier racecourse and holds several featured Group Race meetings annually. These race meetings attract crowds of varying sizes and on key race days such as the Melbourne Cup and Perth Cup, vehicle access to and from the racecourse can cause local congestion.

Existing shared path cycling connections run through the LSP site alongside Stoneham Street, Raconteur Drive and Grandstand Road. Both shared paths and local bicycle friendly routes run through the Ascot Waters development to the north of the LSP site. The site is located close to regional cycling connections with the Graham Farmer Freeway Principal Shared Path (PSP) easily accessed via the shared path along the southern side of the Swan River.

Existing bus routes operate close to or through the LSP site. These include the Circle Route (via Resolution Drive and Grandstand Road) providing connections north to destinations including Bayswater Station, Morley Bus Station/Shopping Centre and south to destinations including Belmont Forum Shopping Centre, Oats Street Station, and Curtin University. In addition, existing bus routes operate along Great Eastern Highway providing connections east to destinations including Redcliffe Station and High Wycombe Station and to the west to destinations including the Victoria Park Transfer Station and Elizabeth Quay Bus Station.

2.2 Proposed Land Uses

The Golden Gateway LSP is comprised of three overarching land uses, residential dwellings, commercial space, and retail space. It is proposed that the three land uses will primarily be provided in mixed-use development sites across the Golden Gateway LSP area. The split of the three land uses is shown in Table 2.

Table 2 - Proposed Structure Plan Land Uses

Land Use	Yield
Residential - Multiple dwelling	2,268 dwellings
Non Residential - Commercial	6,979 m^2 NLA
No Residential - Retail	1,200 m^2 NLA

As noted in the Structure Plan Report, the LSP has been formulated around the following vision:

> *"The development of the Golden Gateway will transform this degraded and fragmented area into a vibrant precinct of residential and mixed use development, with strengthened connections to the Swan River and Ascot Waters, with uses, density and built form that derive best value from these attributes while respecting the area's rich culture and heritage."*

The overarching objectives for the Golden Gateway Precinct as established by the project team and reinforced through stakeholder engagement include:

- Improve self-containment of facilities – reduce car dependence;
- Improve people's connection to the Swan River;
- Create accessible, quality public realm within the precinct; and
- Identify appropriate uses/densities in conjunction with infrastructure improvements.

To achieve the above objectives, the project team identified several opportunities that the Golden Gateway precinct presents, they include:

- Land use:
  - Opportunity for residential development to be accommodated in the precinct given the accessibility to high quality riverside amenity;
  - Opportunity for retail convenience and food and beverage land uses to be integrated into development outcomes;
  - Potential for higher density development given precinct location, proximity to high amenity open space destinations, Perth central business district, localised employment, and high frequency public transport;

- An existing primary school adjacent the precinct offers opportunity for family friendly dwelling diversity; and
- Opportunities to consider mixed use land use for development in core area to broaden activity opportunities and long term transition of the precinct.

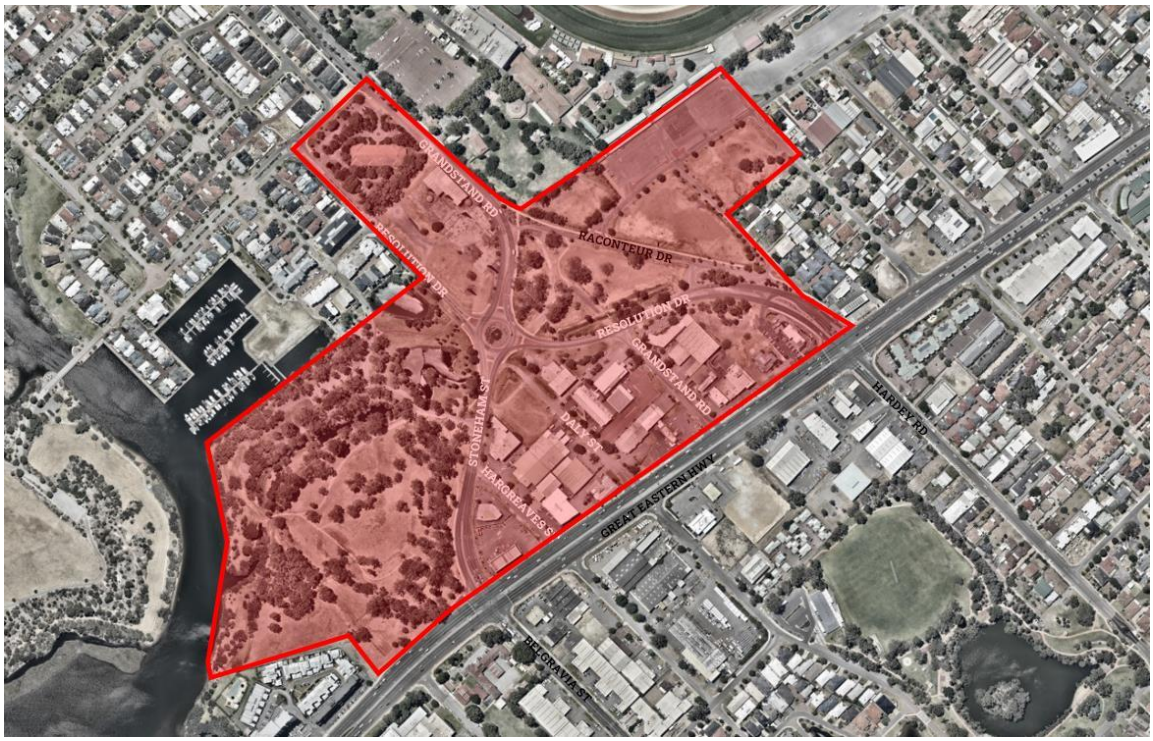
- Movement:
  - Opportunity to utilise existing local street network of Hargreaves Street, Daly Street and Grandstand Road (south) to deliver a robust structure for future development access and vehicle circulation; and
  - Generous existing road reserve dimensions provide ability for reconfigured pedestrian friendly streetscapes offering shade trees, soft landscaping, and convenient on-street parking embayments;

3. EXISTING TRANSPORT ENVIRONMENT

3.1 Existing Land Uses

The Golden Gateway Precinct is bounded by Ascot Racecourse to the north/northeast, Hardey Road and Carbine Street to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters residential estate to the west/northwest, as shown in Figure 4.

Figure 4 – Golden Gateway LSP Area in Context to Surrounding Development (source: Google Maps)



The developed section of the site, between Great Eastern Highway, Stoneham Street and Resolution Drive, consists of a range of light industrial and commercial units, and various fast-food outlets and service stations fronting Great Eastern Highway. Other areas of the precinct generally consist of undeveloped land.

The Ascot Kilns area between Resolution Drive and Grandstand Road is subject to a separate Local Development Plan (LDP) process, however traffic generated from the proposed Ascot Kilns LDP area has been considered within this assessment.

3.2 Pedestrian Network

The extent and quality of the existing pedestrian infrastructure within and surrounding the Golden Gateway precinct is of a standard commensurate with the extent of existing development and form of land uses across the site, i.e., there are several existing undeveloped lots and those that are developed primarily accommodate light industrial/ commercial unit style development. The existing local pedestrian infrastructure can be summarised as follows for the major road network and minor road network.

3.2.1 Pedestrian Infrastructure along Major Corridors

Great Eastern Highway runs along the southern boundary of the LSP area and is a significant regional road connection within the Perth metropolitan road network. There are 2.5m wide footpaths on both sides of Great Eastern Highway. Within the vicinity of the LSP site, crossing of Great Eastern Highway by pedestrians is facilitated via traffic signal controlled intersections at both Stoneham Street/Belgravia Street and Resolution Drive/Hardey Road intersections with Great Eastern Highway. At both signalised intersections, the protected crossing of Great Eastern Highway is only available on the western approach. Pedestrians wishing to cross Great Eastern Highway from the eastern approaches will have to cross 3 sides of the intersection in order to do so.

Three of the four major road corridors running through the Golden Gateway precinct (Grandstand Road, Raconteur Drive, and Stoneham Street) have footpaths along one side of the street – Grandstand Road along the eastern side of the street adjacent to the Ascot Racecourse, Raconteur Drive along the northern side of the street to connect to Grandstand Road, and Stoneham Street along the western side of the street adjacent to the Belmont Trust Land.

There is a footpath along some sections of Resolution Drive. The section adjacent to the Ascot Waters development has a footpath along the southwestern side, and the section immediately north of Great Eastern Highway has a footpath on each side. Between the roundabout controlled intersection of Stoneham Street, Grandstand Road, and Resolution Drive and 100m north of the signalised intersection with Great Eastern Highway, Resolution Drive has no footpaths on either side.

3.2.2 Pedestrian Infrastructure along Minor Road Corridors

The minor roads within the LSP site (Hargreaves Street, Daly Street, and the southern section of Grandstand Road) are located between Great Eastern Highway and Resolution Drive/Stoneham Street and provide access to the light industrial/commercial units in this area of the LSP.

Most of these minor streets do not have footpaths, which reinforces the dominance of the private car. Daly Street is the exception and has a footpath on the eastern side.

3.2.3 Pedestrian Accessibility

Walk Score is a commercial product that measures the walkability of a location based on the distance to nearby amenities and pedestrian facilities. The Walk Score walkability assessment tool considers the development site to be "car dependent" where most daily errands require a car, with a walk score ranging between 43-48 out of 100, as shown in Figure 5.

Figure 5 – Walk Score Rating for Golden Gateway LSP Site (source: walkscore.com)

3.3 Cycling Network

The extent and quality of the existing cycling infrastructure within and surrounding the Golden Gateway LSP site is of a high standard with local and regional links. The local and regional cycling network is shown in Figure 6.

Good on road cycling routes for experienced and confident cyclists are located along Great Eastern Highway adjacent to the Golden Gateway precinct. High quality shared use paths are located along one side of Stoneham Street, Raconteur Drive, and the northern section of Grandstand Road although there are gaps in the connectivity.

High quality shared use paths are also located along the Swan River Foreshore (via the Belmont Trust Land towards the Graham Farmer Freeway PSP to access Perth City), and along the shoreline within the Ascot Waters development. Some streets within the Ascot Waters development have been identified as local cycle friendly routes.

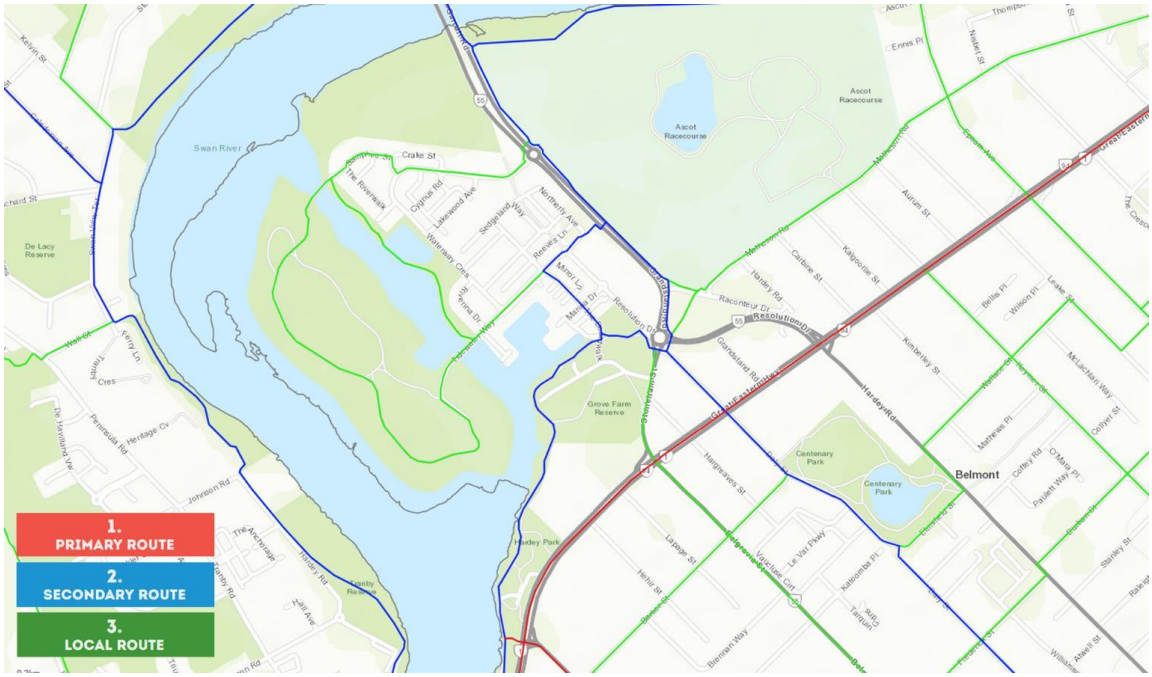
Figure 6 – Existing Cycling Network in Relation to the Golden Gateway LSP Site (source: DoT / City of Belmont)

The Long Term Cycle Network (LTCN) in the vicinity of the Golden Gateway precinct is shown in Figure 7. The LTCN identifies the function of a route (primary, secondary, or local) instead of dictating what form (shared paths, bicycle only lanes, protected on-street bicycle lane or safe active streets) it should take. Function considers the type of activities that take place along a route, and the level of existing and potential demand. A route's built form is based on the characteristics of the environment, including space availability, topography, traffic conditions (speed, volumes), primary users, and so on.

Primary routes form the spine of the cycle network, connecting major destinations of regional importance. Secondary routes are those with a moderate level of demand, providing connections between primary routes and major activity centres. Local Routes are located in local residential areas and provide access between higher order routes and local amenities).

Within the LSP site, Great Eastern Highway is identified as a future Primary Route, Daly Street and Grandstand Road north are both future Secondary Routes while Belgravia Street, Stoneham Street and Matheson Road form a future Local Route.

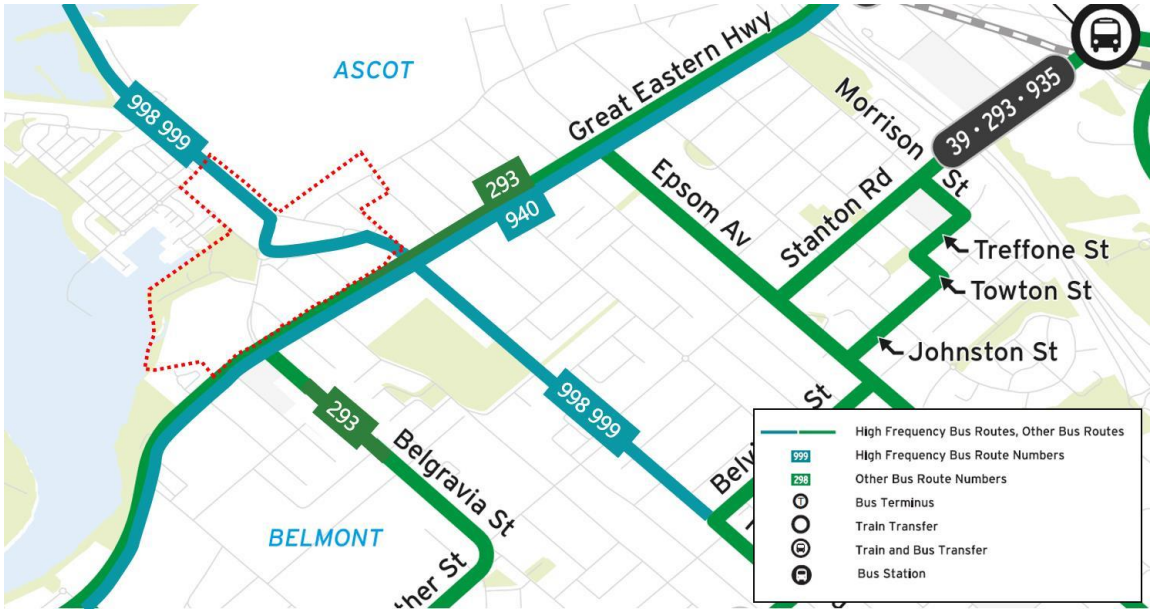
Figure 7 – Long Term Cycling Network in vicinity of Golden Gateway (source: DoT)



3.4 Public Transport

There is an average level of public transport accessibility for roads around the periphery of the Golden Gateway precinct. Great Eastern Highway and Grandstand Road/Resolution Drive are serviced by regular bus services, as shown in Figure 8. Additional bus services and stops along local roads may be implemented in the future if land uses within the Golden Gateway site intensify over time.

Figure 8 – Existing Public Transport Network in Relation to the Golden Gateway LSP Site (source: Transperth / City of Belmont)



Currently the only bus routes that pass through the site are the circle route bus services 998 and 999 which are high frequency routes that travel along Grandstand Road (northern section) and Resolution Drive, and then continue to Hardey Road. There are 128 circle route bus services per weekday which travel through the site. There are currently no bus stops for the circle route within the Golden Gateway precinct, with the closest bus stops located on Grandstand Road immediately to the north of the LSP area close to the main pedestrian access for Ascot Racecourse. Bus stops are also located on Hardey Road, 50m to the south of Great Eastern Highway.

Circle route services provide a high frequency orbital connection around Perth, linking inner suburbs, major activity centres, key land uses and public transport hubs including Belmont Forum, Oats Street Station, Curtin University, Murdoch Activity Centre, Fremantle, Cottesloe, Claremont, UWA, QEII Medical Centre, Stirling Station, and Morley.

High frequency bus route 940 operates along Great Eastern Highway which forms the southern boundary of the site, with a total of 101 daily services to Perth and 103 services to Redcliffe. This bus route operates between Elizabeth Quay Bus Station and Redcliffe Station, travelling along St Georges/Adelaide Terrace, Victoria Park Transfer Station, and Great Eastern Highway adjacent to the Golden Gateway LSP site.

Bus route 293 between Redcliffe Station and High Wycombe Station also travels along Great Eastern Highway (east of Belgravia Street) and along Belgravia Street. There are 18 services in each direction per day.

More detail of bus route services and frequencies is provided in Table 3.

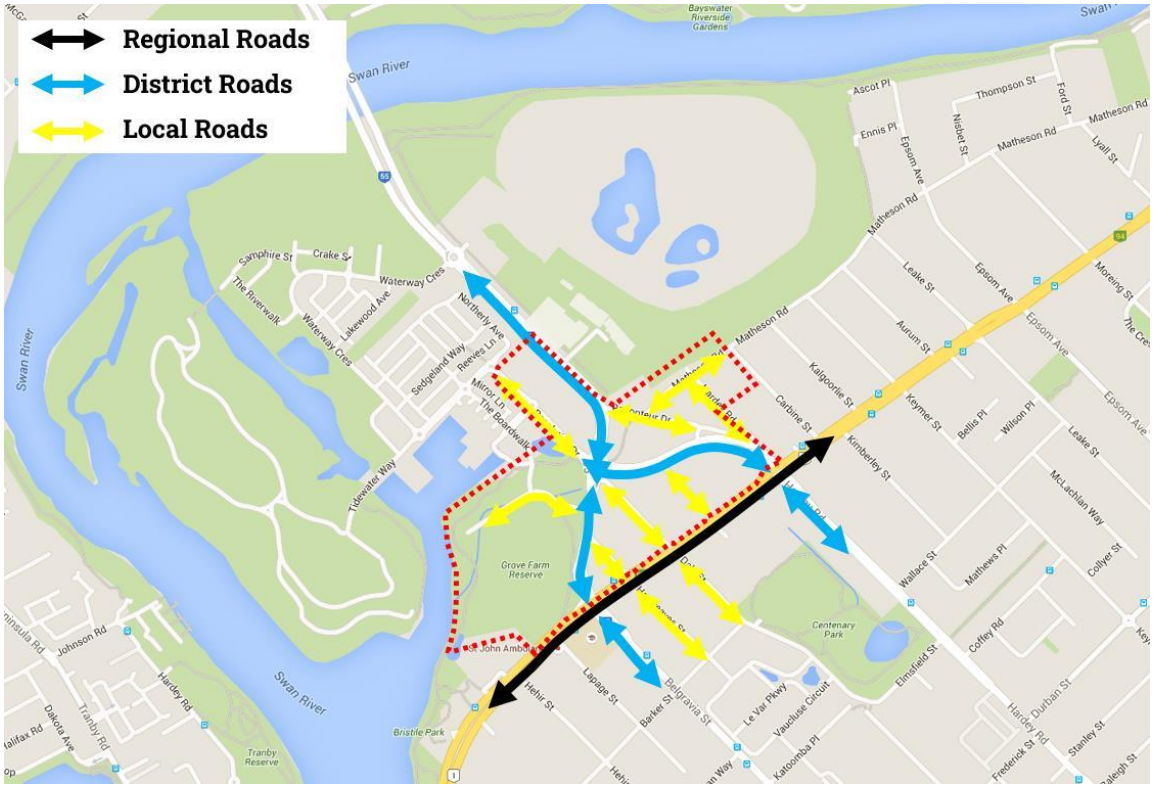
Table 3 – Bus frequency and service numbers (source: Transperth)

Weekday Summary					
Route	Direction	No. Services	AM / PM Peak Frequency	Saturday Summary	Sunday / Public Holiday Summary
998	CircleRoute - clockwise	64 services 6.06am to 10.11pm	AM peak every 12 mins PM peak every 15 mins	47 services, every 15 mins from 7.15am to 6.59pm	23 services, half hourly from 7.47am to 6.45pm
998	CircleRoute - anticlockwise	60 services 6.53am to 9.53pm	AM peak every 12 mins PM peak every 15 mins	43 services, every 15 mins from 7.40am to 5.37pm, then half hourly until 7.36pm	22 services, half hourly from 8.40am to 7.10pm
940	To Perth	101 services 4.54am to 11.37pm	AM peak every 10 mins PM peak every 10 mins	59 services, every 15 mins from 7.15am to 6.47pm, then half hourly	53 services, every 15 mins from 9.15am to 6.44pm, half hourly until 10.21
	To Redcliffe	103 services 5.25am to 11.51pm	AM peak every 10 mins PM peak every 10 mins	59 services, every 15 mins from 8.04am to 8.04pm, then half hourly	53 services, every 15 mins from 8.53am to 7.07pm, half hourly until 10.41
293	To High Wycombe	18 services 5.32am to 5.37pm	AM peak every 30 mins PM peak every 20 mins	No services	No services
	To Redcliffe	18 services 5.53am to 5.33pm	AM peak every 20 mins PM peak every 30 mins	No services	No services

3.5 Road Network

The road network in the vicinity of the Golden Gateway precinct includes the major regional through route of Great Eastern Highway and a network of district and local roads on either side of the Great Eastern Highway corridor, as shown in Figure 9.

Figure 9 – Road Network in vicinity of Golden Gateway Precinct (source: MRWA)



The Main Roads WA (MRWA) Functional Road Hierarchy surrounding the Golden Gateway precinct is shown in Figure 10. Details of each road hierarchy type are set out in Table 4. The speed zoning in the vicinity of the Golden Gateway precinct is shown in Figure 11.

Table 4 - MRWA Road Hierarchy Criteria (source: MRWA)

		ROAD TYPES				
	CRITERIA AND ACTIVITY	PRIMARY DISTRIBUTOR	DISTRICT DISTRIBUTOR CATEGORY "A"	DISTRICT DISTRIBUTOR CATEGORY "B"	LOCAL DISTRIBUTOR/ INDUSTRIAL ROAD	ACCESS ROAD
1	Predominant Activity	Major networks e.g. freeways	Important network	Less important network	Minor network	Limited access to traffic. Forms part of local distribution network
2	Intersections	Controlled with appropriate measures e.g. grade separation, high speed traffic management measures	Controlled with appropriate measures E.g. traffic signals	Controlled with appropriate Local Area Traffic Management	Controlled with minor Local Area Traffic Management	Self controlling with minor measures
3	Indicative Traffic Volume (except semi-rural areas)	Above 15 000 vehicles per day	Above 8000 vehicles per day	Above 6000 vehicles per day	Maximum desirable volume: 6000 vehicles per day	Maximum desirable volume: 3000 vehicles per day
4	Frontage Access Allowed	None on Controlled Access Hwys Limited on other routes	Prefer not to have residential access and limited commercial access, generally via service roads	Residential and commercial access due to its historic status Prefer to limit when and where possible	Yes, except at intersections where side entry is preferred and traffic signals are involved	Yes
5	Pedestrians Allowed	Preferably none at grade. Crossing should be controlled	With positive measures for control and safety e.g. pedestrian signals	With appropriate measures for control and safety e.g. median/islands refuges	With minor safety measures	Yes
6	Recommended Operating Speed	60 – 110 km/h (depending on design characteristics)	60 – 80 km/h	60 – 70 km/h	50 - 60 km/h	50 km/h (desired speed)
7	Buses Allowed	Yes	Yes	Yes	Yes	If required
8	Parking Allowed	No	Generally no. Clearways where necessary	Not preferred. Clearways where necessary	Yes	Yes
9	Truck Routes	Yes	Yes	Yes	Only to service properties	Only to service properties
10	Responsibility	Main Roads Western Australia	Local Government	Local Government	Local Government	Local Government

Ideally, every road should meet all the criteria of one RH type.
However, many roads meet some of the criteria appropriate to different road types and are difficult to define.
Where precise definition of the road type is difficult, comparison with roads of similar role in other local government areas may assist.

Figure 10 - Road Hierarchy in Vicinity of the Golden Gateway Precinct (source: MRWA)

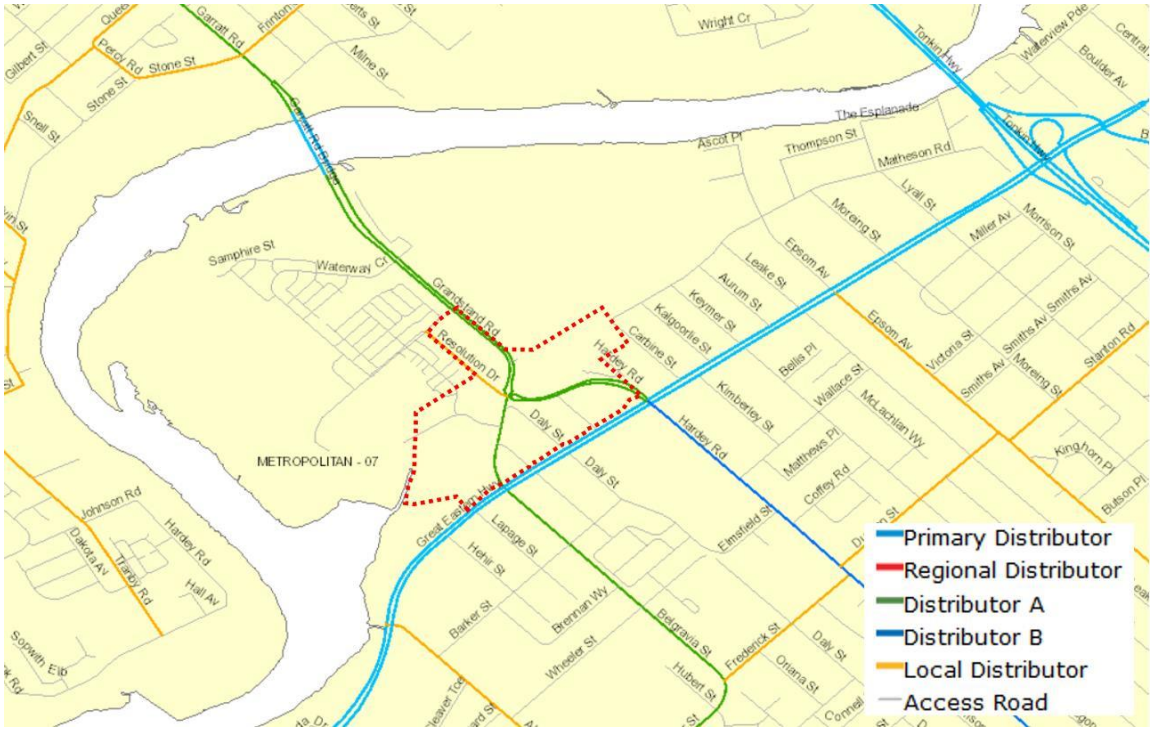
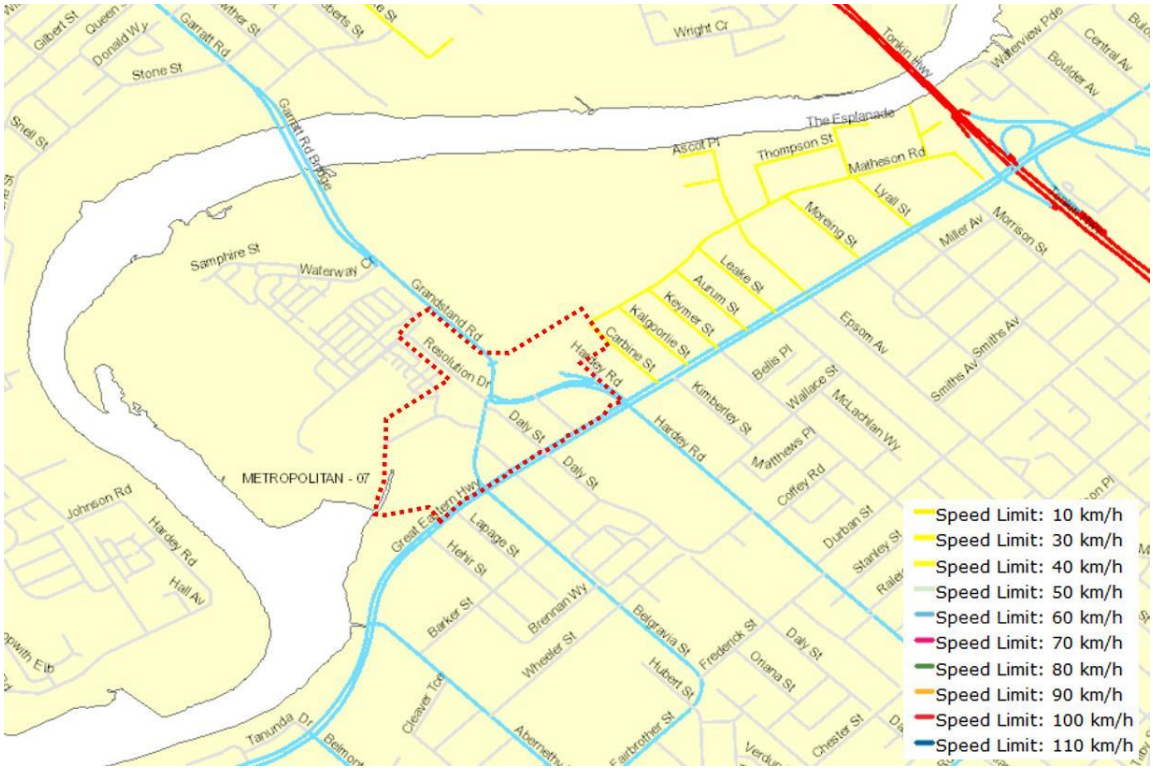


Figure 11 - Speed Limits in Vicinity of the Golden Gateway Precinct (source: MRWA)



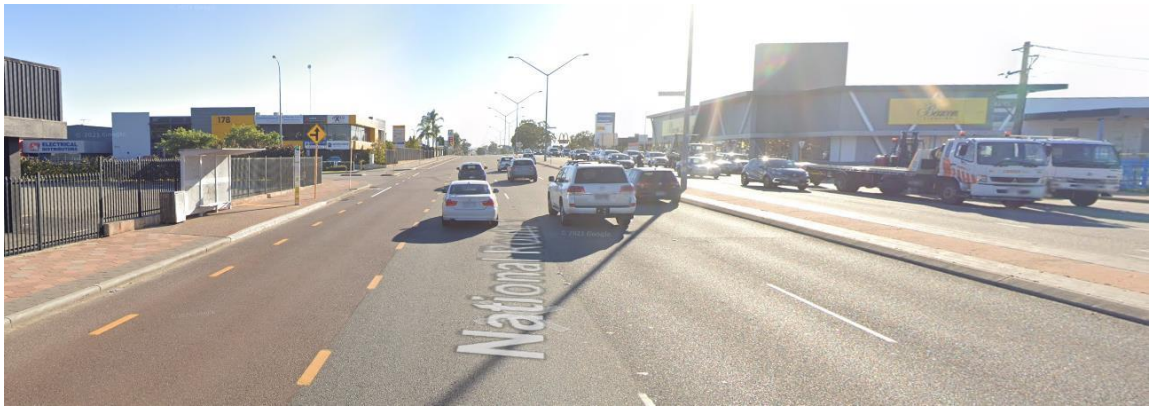
3.5.1 Regional Roads

Great Eastern Highway

Great Eastern Highway runs along the southern boundary of the Golden Gateway precinct. It is one of the State's principal transport corridors and is designated as a Primary Distributor under the control of MRWA. The most recent traffic counts for the section of Great Eastern Highway bordering the Golden Gateway precinct, collected by MRWA in 2018, reveal a two-way traffic volume of over 54,000 vehicles per day (vpd). The posted speed limit is 60km/h.

A typical cross section of Great Eastern Highway is shown in Figure 12.

Figure 12 – Cross section of Great Eastern Highway corridor– looking east, west of Hargreaves St (source: Google Street View)



Great Eastern Highway is constructed with an on-road cycle lane, a bus lane, and 3 general traffic lanes in each direction, separated by a median which varies in width between 2.5m and 6m (with the reduced width adjacent to right turning lanes), all within a road reserve width which varies between 40 and 45m.

The median reduces to 2.5m to accommodate right turning lanes in advance of the signalised intersections at Stoneham Street / Belgravia Street and Resolution Drive / Hardey Road. The bus lane is constant in the westbound carriageway, however within the eastbound carriageway there is a bus lane for 170m of the 500m total length between the signalised intersections with Stoneham Street / Belgravia Street and Resolution Drive / Hardey Road.

Garratt Road Bridge

The Garratt Road Bridge, located 1km to the north of the Golden Gateway precinct, is one of only 8 traffic bridges across the Swan River between Fremantle and Guildford. The section of Garratt Road along the bridge is designated as a Primary Distributor under the control of MRWA. The posted speed limit is 60km/h. In the most recent traffic counts, undertaken by MRWA in 2018, the bridge was found to carry approximately 16,700 vpd, with 8,800 vpd northbound and 7,900 vpd southbound.

3.5.2 District Roads

The Golden Gateway Precinct has three key district road connections running through the site: Grandstand Road, Stoneham Street and Resolution Drive. Belgravia Street is the continuation of Stoneham Street to the south of Great Eastern Highway and the Golden Gateway site, while Hardey Road is the continuation of Resolution Drive south of Great Eastern Highway.

Grandstand Road

Grandstand Road is a District Distributor A road, running north south within the site, connecting to the Garratt Road Swan River crossing in the north and to Great Eastern Highway (via either Stoneham Street or Resolution Drive) to the south. It is constructed as a four-lane dual carriageway, with a median of varying width between 2 and 4.5m, as shown in Figure 13. Grandstand Road is constructed within a 20m road reserve. The posted speed limit is 60km/h. The most recent two-way traffic count (collected by MRWA in 2018) at the Garratt Road Bridge was 16,700 vehicles per day (vpd).

Figure 13 – Cross section of Grandstand Road – looking southeast, south of Waterway Cr (source: Google Street View)

Stoneham Street

Stoneham Street is a District Distributor A road, running north-south within the site, between the roundabout controlled intersection of Grandstand Road with Resolution Drive and the signalised intersection of Great Eastern Highway with Belgravia Street. It is constructed as a four-lane undivided road, within a 20m road reserve, as shown in Figure 14. The posted speed limit is 60km/h. The most recent two-way traffic count for Stoneham Street (collected by MRWA in 2018) to the north of Great Eastern Highway was 14,270 vpd.

Figure 14 – Cross section of Stoneham Street – looking northeast, south of Memorial Dr (source: Google Street View)

Resolution Drive (Great Eastern Highway to Stoneham Street)

Resolution Drive is a District Distributor A road, running east-west within the site, connecting Grandstand Road and Stoneham Street with Great Eastern Highway and Hardey Road. Between the intersection of Stoneham Street / Grandstand Road and the intersection with Raconteur Drive, Resolution Drive is constructed as a single lane in each direction separated by a 2m median, as shown in Figure 15.

Figure 15 – Cross section of Resolution Drive– looking northeast, east of Grandstand Rd south (source: Google Street View)

Between Raconteur Drive and Great Eastern Highway, Resolution Drive is constructed with 2 lanes in each direction, separated by a 10m median. The cross section for this part of Resolution Drive is shown in Figure 16.

Figure 16 – Cross section of Resolution Drive– looking southeast, northwest of Great Eastern Highway (source: Google Street View)

The road reserve width varies between 22m and more than 60m.The posted speed limit is 60km/h. The most recent two-way traffic count for Resolution Drive to the north of Great Eastern Highway (collected by MRWA in 2022) was 7,860 vpd.

Belgravia Street

To the south of the Golden Gateway precinct, Belgravia Street is the southern approach to the signalised intersection of Great Eastern Highway with Stoneham Street. Belgravia Street is classified as a District Distributor A. The most recent two-way traffic count for Belgravia Street to the south of Great Eastern Highway (collected by MRWA in 2022) was 14,640 vpd.

Belgravia Street is constructed with 3 northbound lanes and 2 southbound lanes within a road reserve which varies between 24m (closest the signalised intersection) and 21m. Further to the south Belgravia Street has no median (or turning lanes) and the road reserve is 20m. Belgravia Street has a posted speed limit of 60km/h. The section of Belgravia Street to the south of Great Eastern Highway, adjacent to Belmont Primary School, is a school zone, where a 40kph speed limit applies between 7:30 and 9:00 AM and between 2:30 and 4:00 PM on weekdays.

Hardey Road (south of Great Eastern Highway)

To the south of the Golden Gateway precinct, Hardey Road is the southern approach to the signalised intersection of Great Eastern Highway with Resolution Drive. Hardey Road is constructed as 3 northbound lanes and 2 southbound lanes, separated by a painted median and within a 25m road reserve. Further to the south Hardy Road reduces to a kerb side parking lane and single traffic lane in each direction, separated by a 2m median and within a 20m road reserve. Hardey Road is classified as a District Distributor B, with a posted speed limit of 60km/h. The most recent two-way traffic count for Hardey Road to the south of Great Eastern Highway (collected by MRWA in 2019) was 8,270 vpd.

3.5.3 Local Roads

The Golden Gateway Precinct has seven local road connections running through the site: Hargreaves Street, Daly Street, Grandstand Road (south), Resolution Drive (northwest), Memorial Drive, Raconteur Drive and Matheson Road. These local roads are all classified as Access Streets (except for Resolution Drive which is a local distributor), with posted speed limits of 50km/h.

Hargreaves Street

Hargreaves Street is a 12.5m wide single carriageway road, within a 20m road reserve. Parking is permitted on both sides of the road. Hargreaves Street runs northwest-southeast between Stoneham Street and Great Eastern Highway. The intersection with Stoneham Street is restricted to left and right in, and left out only movements, while the intersection with Great Eastern Highway permits only left in left out movements. A cross section of Hargreaves Street is shown in Figure 17.

Figure 17 – Cross section of Hargreaves St, north of Great Eastern Hwy, looking south (source: Google Street View)

Daly Street

Daly Street is an 8m wide road, within a 20m road reserve. Parking is permitted on both sides of the road. Daly Street runs northwest-southeast between Stoneham Street and Great Eastern Highway. The intersection with Stoneham Street is restricted to left out only movements. The intersection with Great Eastern Highway permits only left in left out movements. A cross section of Daly Street is shown in Figure 18.

Figure 18 – Cross section of Daly St, north of Great Eastern Hwy, looking south (source: Google Street View)

Grandstand Road (south)

Grandstand Road (south) is a 12.5m wide single carriageway road, within a 20m road reserve. Parking is permitted on both sides of the road. Grandstand Road (south) runs northwest-southeast between Resolution Drive and Great Eastern Highway. All movements are permitted at the intersection with Resolution Drive, while the intersection with Great Eastern Highway permits only left in left out movements. A cross section of Grandstand Road (south) is shown in Figure 19.

Figure 19 – Cross section of Grandstand Rd (south), north of Great Eastern Hwy, looking south (source: Google Street View)

Resolution Drive

The section of Resolution Drive to the west of the roundabout intersection with Stoneham Street and Grandstand Road is classified as a local distributor, providing the main access for the Ascot Waters residential development. It is constructed as two 4.5m wide lanes separated by a 2m median, within a 20m road reserve. On-street parking is not permitted on either side of the road. Resolution Drive has three intersections along its 300m length, all full movement roundabouts. The Ascot Kilns area is immediately to the northeast of Resolution Drive. A cross section of Resolution Drive is shown in Figure 20.

Figure 20 – Cross section of Resolution Dr (northwest) north of Stoneham St, looking south (source: Google Street View)

Memorial Drive

Memorial Drive is a 6m wide road constructed through the Belmont Trust land at the western end of the Golden Gateway precinct. Memorial Drive provides a minor connection to the southern portion of the Ascot Waters development. Low fence posts either side of Memorial Drive prevent on-street parking. A cross section of Memorial Drive is shown in Figure 21.

Figure 21 – Cross section of Memorial Dr west of Stoneham St, looking east (source: Google Street View)

3.6 Existing Traffic Volumes

Traffic volume data was obtained from the following sources:

- SCATS traffic volumes and signal data from September 2021 for the two signal controlled intersections:
  - Great Eastern Highway/Stoneham Street/Belgravia Street Intersection
  - Great Eastern Highway/Resolution Drive/Hardey Road Intersection
- Peak hour and 12 hour intersection turning counts (derived from video surveys in February 2018) for the two signal controlled intersections:
  - Great Eastern Highway/Stoneham Street/Belgravia Street Intersection
  - Great Eastern Highway/Resolution Drive/Hardey Road Intersection
- Volume, classification, and speed data collected in September 2021 from midblock loop detectors for the following sites:
  - Daly Street near Great Eastern Highway
  - Daly Street near Stoneham Street
  - Hargreaves Street near Great Eastern Highway
  - Hargreaves Street near Stoneham Street
  - Grandstand Road near Great Eastern Highway
  - Grandstand Road near Resolution Drive
- Peak hour turning counts and queue length observations from a video survey collected in September 2021 at the roundabout intersection of Grandstand Road/Resolution Drive/Stoneham Street roundabout.
- Mid-block traffic counts for Great Eastern Highway, Stoneham Street, Resolution Drive, Belgravia Street, Hardey Road and Garratt Road Bridge collected by MRWA in 2018, 2019, 2020 and 2022 and obtained from Traffic Map.

3.6.1 SCATS Signal Data

All MRWA's traffic signals in the metropolitan area are connected to SCATS (Sydney Co-ordinated Adaptive Traffic System). This is an adaptive urban traffic management system that synchronises traffic signals to optimise traffic flow across a whole city, region, or corridor. SCATS can provide vehicle count data (through loop detectors in each lane) and traffic signal phase data (a record of green, amber, and red times for each signal phase).

SCATS signal data for the two signalised intersections was provided by Main Roads. This data included:

- SCATS monitor and timing screenshots,
- Phase and Signal Group history data, and
- Offset data between sites.

SCATS data was obtained for the 5 weekdays between Monday September 6th and Friday September 10th 2021, which coincided with the dates of the roundabout survey and the local road loop detector counts. These weekdays were outside of school holidays and no major works or disruptions to the local or regional road network were noted.

The AM and PM peak hours were found to occur between 7:45 and 8:45am, and between 16:15 and 17:15pm.

The SCATS graphics for each of the signalised intersections are shown in Figure 22 and Figure 23.

Figure 22 – Great Eastern Highway/Stoneham Street/Belgravia Street SCATS graphic (source: Main Roads WA)

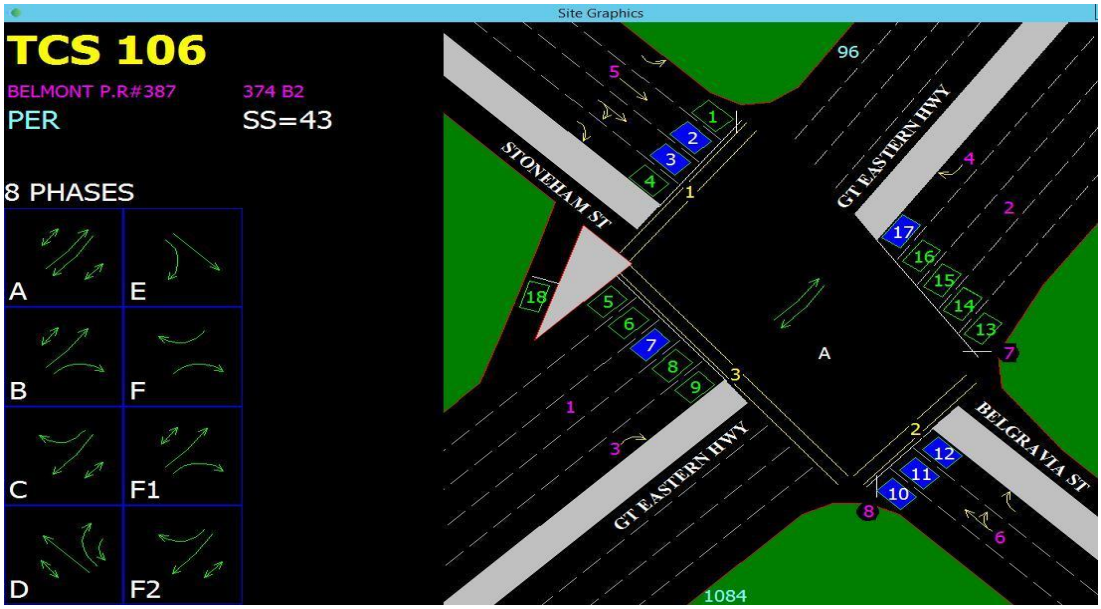


Figure 23 – Great Eastern Highway/Resolution Drive/Hardey Road SCATS graphic (source: Main Roads WA)

The relevant peak hour data was extracted and processed to calculate the average cycle time for each intersection.

The calculation set out in the Main Roads WA Guidelines *Appendix A – Signal Data Information for Modelling – Version 1.1, Section A.2.3* was used to calculate the average cycle time and phase lengths during the peak hours. The calculated green, amber and red timings for each signalised intersection are shown in Table 5.

Table 5 – Signalised Intersection peak hour phase times

Intersection	AM Phase Times (seconds)			PM Phase Times (seconds)		
	Green	Amber	Red	Green	Amber	Red
Great Eastern Hwy / Stoneham St / Belgravia St		134s			139s	
Signal Phase A (Great Eastern Highway)	62	4	2.5	56	4	2.5
Signal Phase D (Belgravia Street)	17	4	3	29	4	3
Signal Phase E (Stoneham Street)	19	4	3	14	4	3
Signal Phase F (GEH right turns)	9	4	3	13	4	3
Great Eastern Hwy / Resolution Dr / Hardey Rd		134s			139s	
Signal Phase A (Great Eastern Highway)	67	4	3	63	4	3
Signal Phase D (Hardey Road)	14	4	3.5	19	4	3.5
Signal Phase E (Resolution Drive)	10	4	3.5	8	4	3.5
Signal Phase F (GEH right turns)	13	4	3.5	19	4	3.5

The signal phase data reveals that each of the signalised intersections has four phases per signal cycle in the peak hours. Phase A is where the green time is allocated to Great Eastern Highway through and left turning traffic. Phase D is the next phase, with green time allocated to traffic movements from the southern intersection approach (Belgravia Street and Hardey Road). Phase E allocates green time to traffic movements from the northern intersection approach (Stoneham Street and Resolution Drive). Finally, Phase F allocates green time to the right turn movements from Great Eastern Highway.

These most recent signal cycle lengths are significantly longer than the cycle lengths recorded in November 2020 as part of an earlier assessment. The AM peak period average signal cycle time increased by 14s seconds from 120 to 134 seconds while the PM peak average signal cycle time increased by 19 seconds from 120 to 139 seconds. Most of the increased green time was given to phase A which is for Great Eastern Highway through and left turning traffic. These increases were most notable at the intersection of Great Eastern Highway with Hardey Road and Resolution Drive where over 95% of the additional green time in each peak hour was allocated to Great Eastern Highway traffic and not side roads.

3.6.2 Signalised Intersection Turn Counts

SCATS signal data provides traffic volumes at 15 minute intervals for each traffic lane through an intersection. Where a lane permits shared turning movements, on site observations are required to determine an accurate split between the permitted turning movements. For the intersections of Great Eastern Highway with Stoneham Street / Belgravia Street and Resolution Drive / Hardey Road there are multiple shared lanes.

SCATS traffic volume data was obtained for the 5 weekdays between Monday September 6th and Friday September 10th 2021, which coincides with the dates of the roundabout survey and the local road loop detector counts. The AM and PM peak hours were found to occur between 7:45 and 8:45am, and between 16:15 and 17:15pm.

For the shared lanes, the proportion of vehicles making each movement was determined from the video surveys undertaken by MRWA in February 2018.

Peak hour traffic turning volumes at the intersection of Great Eastern Highway / Stoneham Street / Belgravia Street are illustrated in Figure 24 (for the AM peak) and Figure 25 (for the PM peak).

Figure 24 – Great Eastern Highway/Stoneham Street/Belgravia Street AM Peak Hour Turn Counts (source: Main Roads WA)

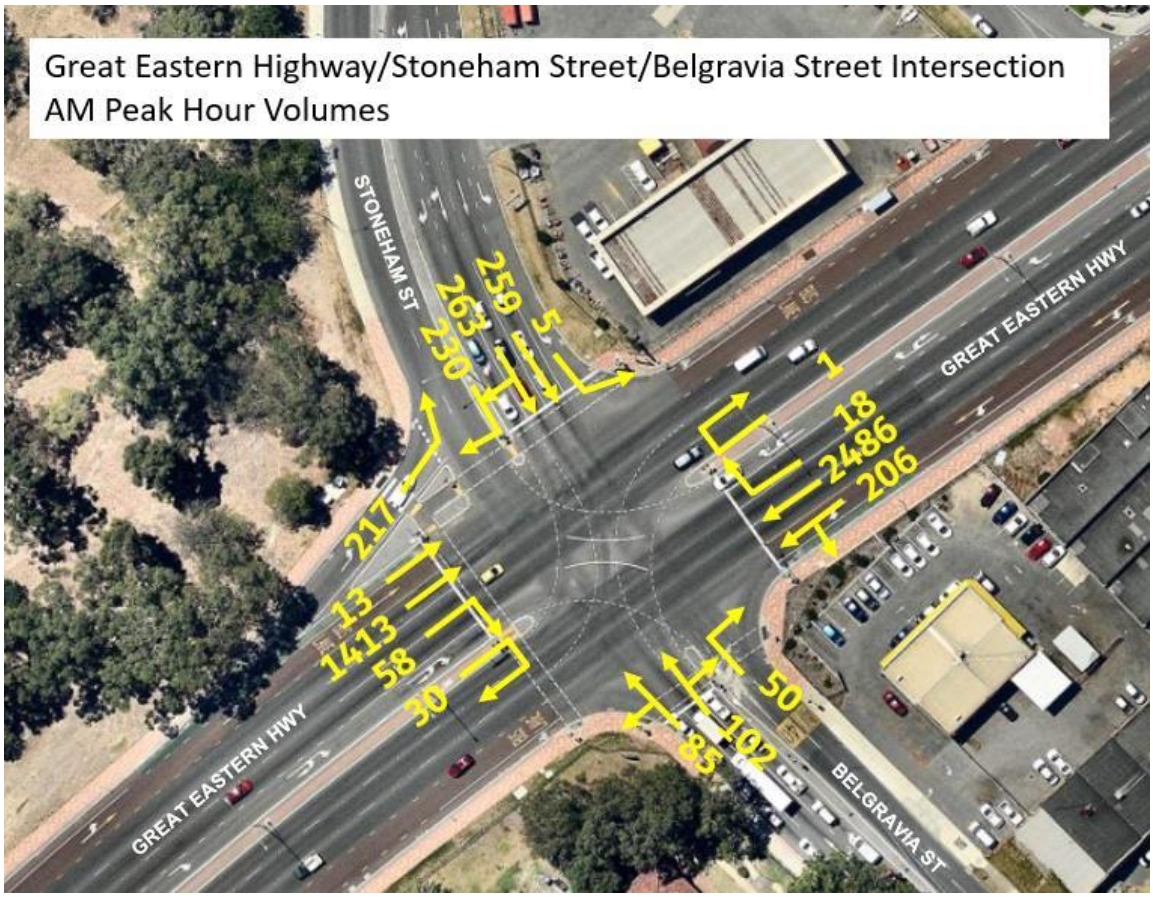
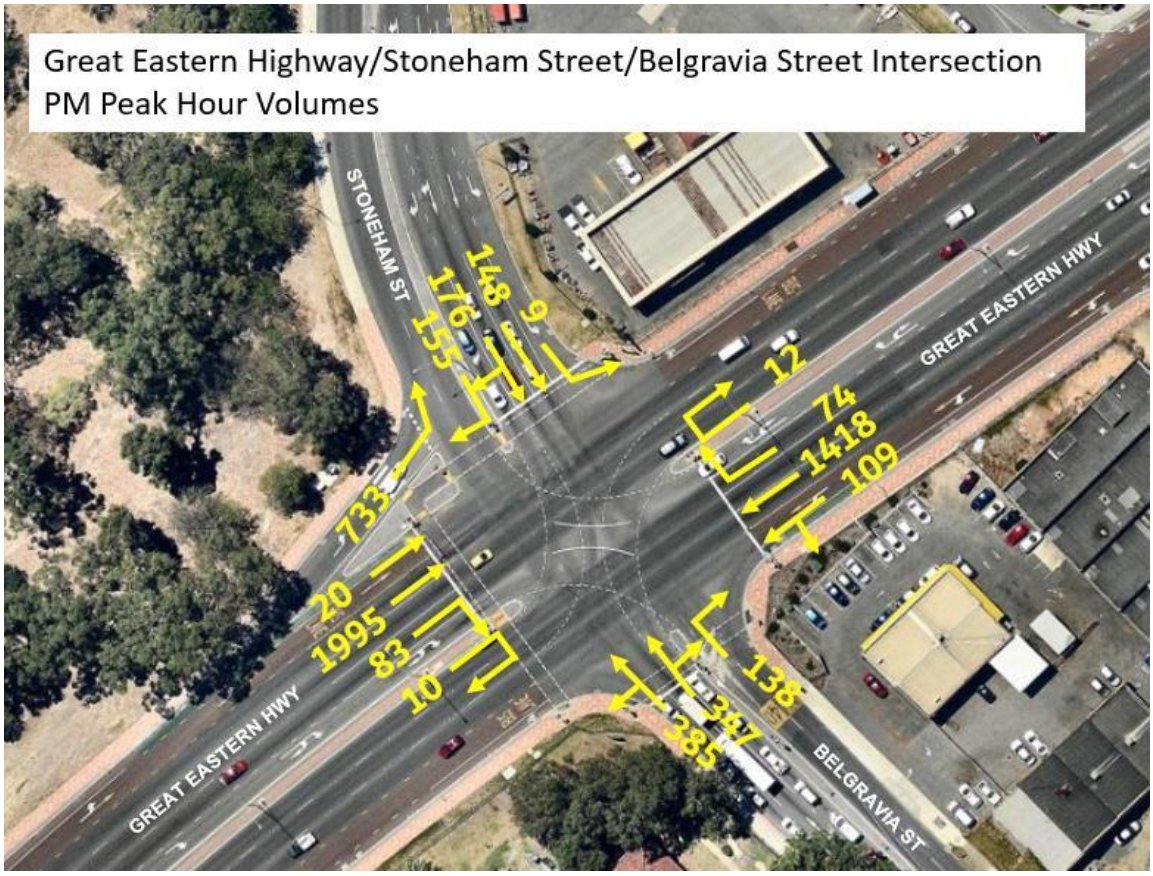


Figure 25 – Great Eastern Highway/Stoneham Street/Belgravia Street PM Peak Hour Turn Counts (source: Main Roads WA)



Peak hour traffic turning volumes at the intersection of Great Eastern Highway / Resolution Drive / Hardey Road are illustrated in Figure 26 (for the AM peak) and Figure 27 (for the PM peak).

Figure 26 – Great Eastern Highway/Resolution Drive/Hardey Road AM Peak Hour Turn Counts (source: Main Roads WA)

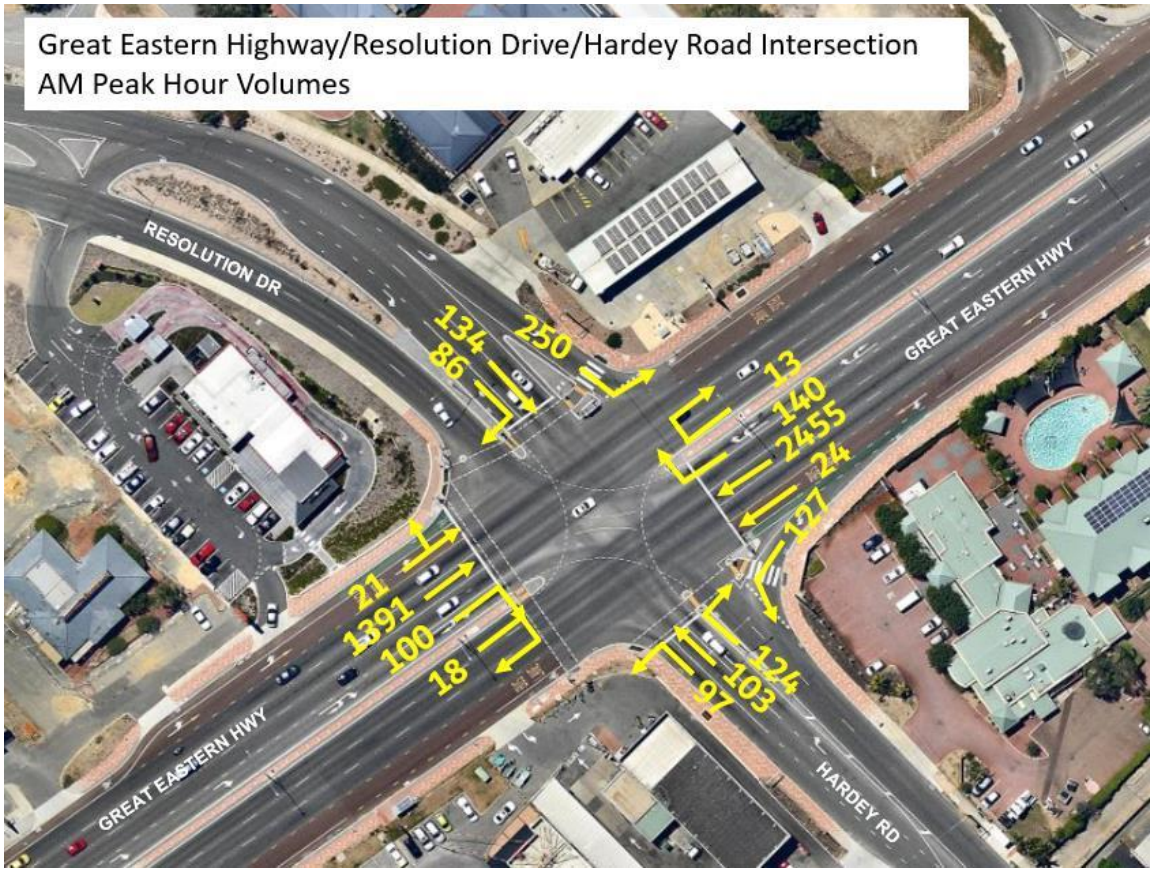
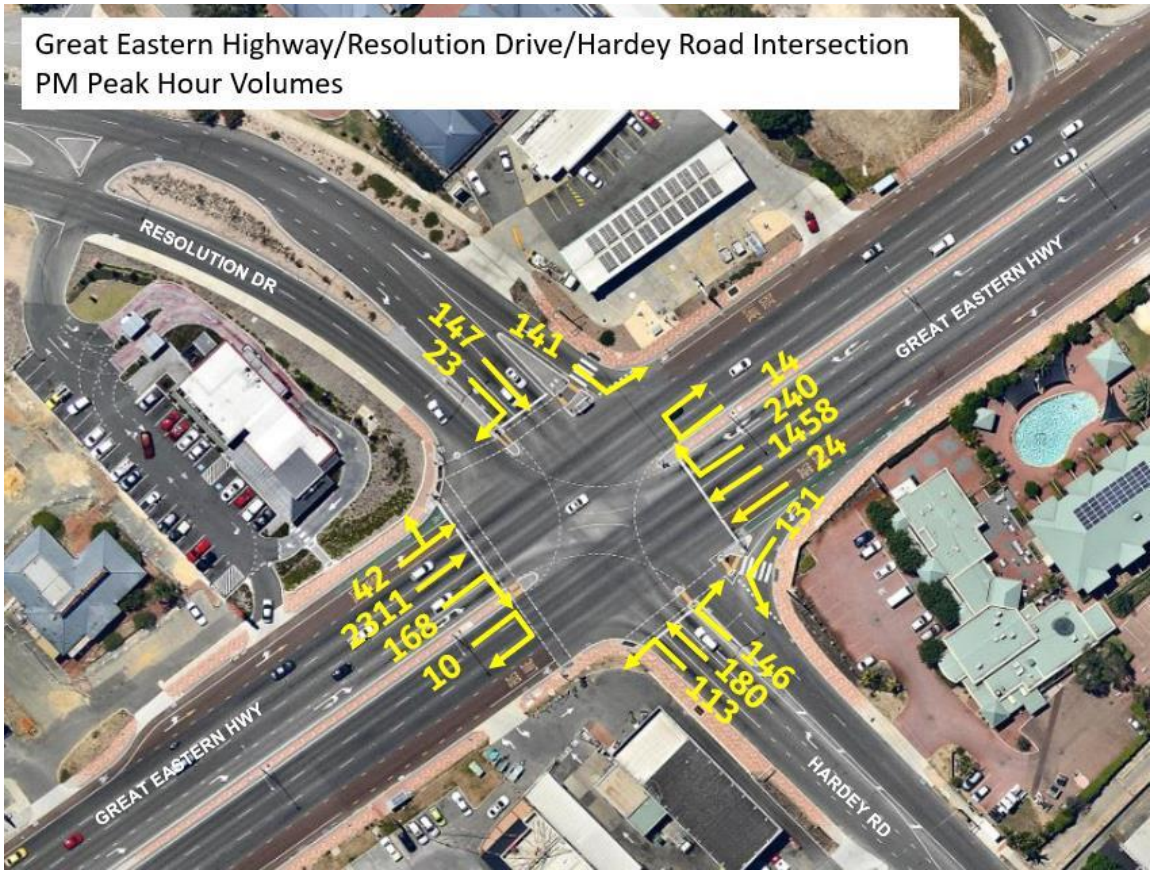


Figure 27 – Great Eastern Highway/Resolution Drive/Hardey Road PM Peak Hour Turn Counts (source: Main Roads WA)



3.6.3 City of Belmont Local Road Traffic Count Data

To gain an understanding of the level of traffic generated by existing land uses within the precinct, the City of Belmont collected mid-block traffic data for selected local roads between Wednesday September 8th and Friday September 10th, 2021.

The location of the traffic counters is shown in Figure 28. Weekday and peak hour traffic volumes by direction for each count site are summarised in Table 6.

Figure 28 - Local Road Network Traffic Count Locations

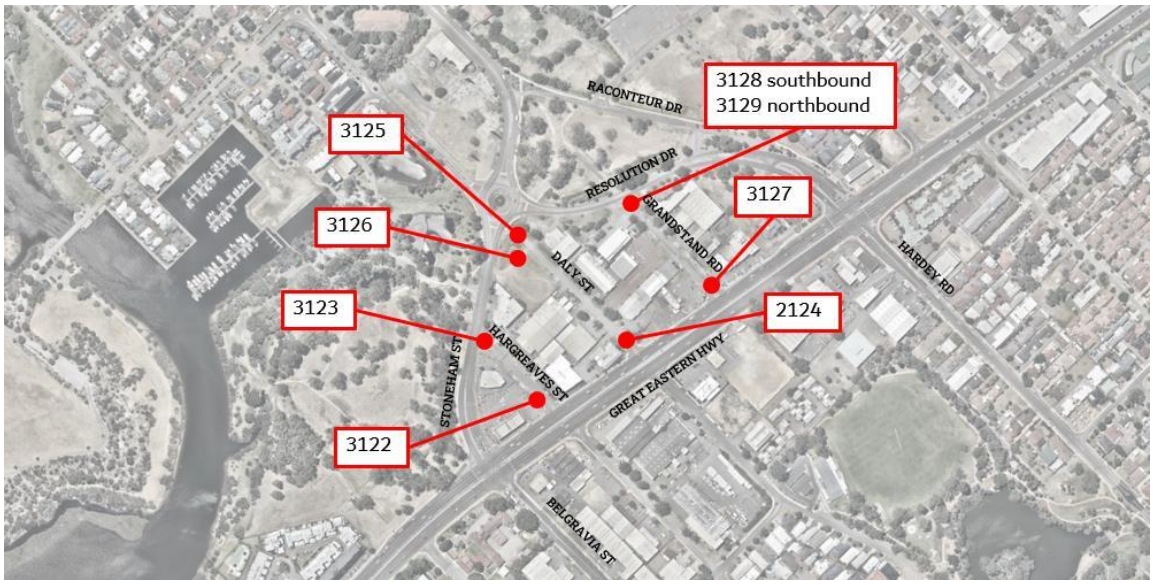


Table 6 – Local Road Network September 2021 Average Weekday Traffic Volumes (source: City of Belmont)

Road Name	Location	Average Weekday Volumes				
		Daily (vpd)	By Direction	Daily (vpd)	AM Peak (vph)	PM Peak (vph)
Hargreaves St	3122 North of GEH	278	Northbound	74	15	3
			Southbound	204	11	24
	3123 South of Stoneham St	330	Northbound	90	3	12
			Southbound	240	19	24
Daly St	3124 North of GEH	595	Northbound	375	18	17
			Southbound	220	5	18
	3125 South of Stoneham St	215	Northbound	188	4	25
Daly St link to Stoneham St	3126 East of Stoneham St		Eastbound	9	1	1
			Westbound	18	3	2
Grandstand Rd	3127 North of GEH	1,043	Northbound	323	20	20
			Southbound	720	30	50
	3128 South of Resolution Dr	1,482	Southbound	657	69	39
	3129 South of Resolution Dr		Northbound	825	40	90

The collected traffic data shows that Hargreaves Street carries higher traffic volumes at the northern end rather than the end closer to Great Eastern Highway, however the difference is within 20%. For Daly Street, the highest traffic volumes were observed at the Great Eastern Highway end, with volumes more than 2.5 times those recorded south of Stoneham Street. Grandstand Road was observed to carry higher traffic volumes south of Resolution Drive than to the north of Great Eastern Highway.

All existing traffic volumes are well within the capacity of local access roads, which is in the order of 3,000 vpd.

Grandstand Road carries the highest volumes of the local road network. The higher traffic volumes along Grandstand Road are primarily a result of the land uses at the southern end of Grandstand Road (fronting Great Eastern Highway), which are predominantly fast food outlets which generate a high volume of vehicle movements, particularly around lunch time and afternoon peak periods.

Not all the existing precinct traffic uses the local roads to access properties; there are 2 existing crossovers onto Stoneham Street (serving two properties, both of which also have access to Hargreaves Street) and 5 crossovers onto Resolution Drive (serving 4 properties where 2 also have access to Daly Street and one property which also has access to Great Eastern Highway). There are a further three properties with direct access to Great Eastern Highway (2 properties which also have access to Grandstand Road). There are only three properties which do not have any access to the local roads. Therefore, while the local road counts will not include all development traffic, it will provide a reasonable lower estimate of precinct traffic volumes.

A sum of precinct entry and exit traffic movements on local roads is presented in Table 7.

Table 7 – Existing Precinct Traffic Entry and Exit Movements to Local Roads September 2021 (source: City of Belmont)

Precinct Movements	Road	Average Weekday Volumes		
		Daily (vpd)	AM Peak (vph)	PM Peak (vph)
IN	From Great Eastern Hwy	772	53	40
	From Stoneham St	249	20	25
	From Resolution Dr	657	69	39
	Total	1,678	142	104
OUT	To Great Eastern Hwy	1,144	46	92
	To Stoneham St	296	10	39
	To Resolution Dr	825	40	90
	Total	2,265	96	221

The local road count data shows that the existing land uses within the precinct are generating at least 4,000 vpd, probably closer to 4,500 vpd, with 1,678 local road entry movements and 2,265 local road exit movements. The imbalance between entry and exit movements can be explained by there being several crossovers on Great Eastern Highway, Resolution Drive and Stoneham Street which allow direct entry and exit movements to the precinct which were not counted.

3.6.4 City of Belmont Peak Hour Turning Movement Data

Peak hour turning counts at the roundabout controlled intersection of Grandstand Road / Resolution Drive / Stoneham Street were obtained from a video survey undertaken Wednesday September 8th, 2021. Queue lengths were also observed.

The survey was completed using a video camera erected on a mast located between the southwest of the intersection.

The peak period turning movement survey collected full turning movement data at the roundabout (including u-turns), with the data collected for light and heavy vehicles in 15-minute time periods. To determine the actual peak hour, volumes were collected for a ninety minute period between:

- AM – 7:45am and 9:15am.
- PM – 3:45pm and 5:15pm.

Figure 29 shows the turning movement data for the AM peak hour of 7:45 am to 8:45am, and Figure 30 shows the turning movement data for the PM peak hour of 4pm to 5pm.

Figure 29 - September 2021 AM Peak Hour Turning Volumes at Grandstand Road/Resolution Drive/Stoneham Street Intersection

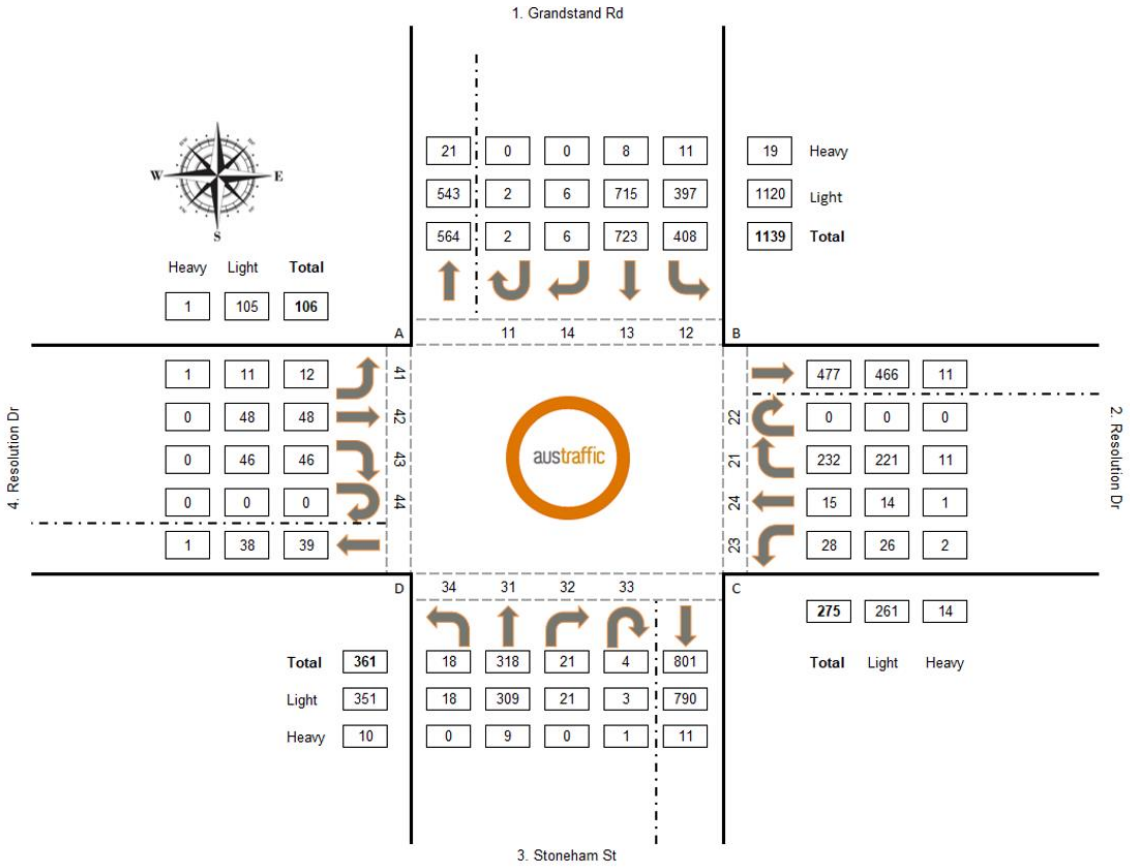
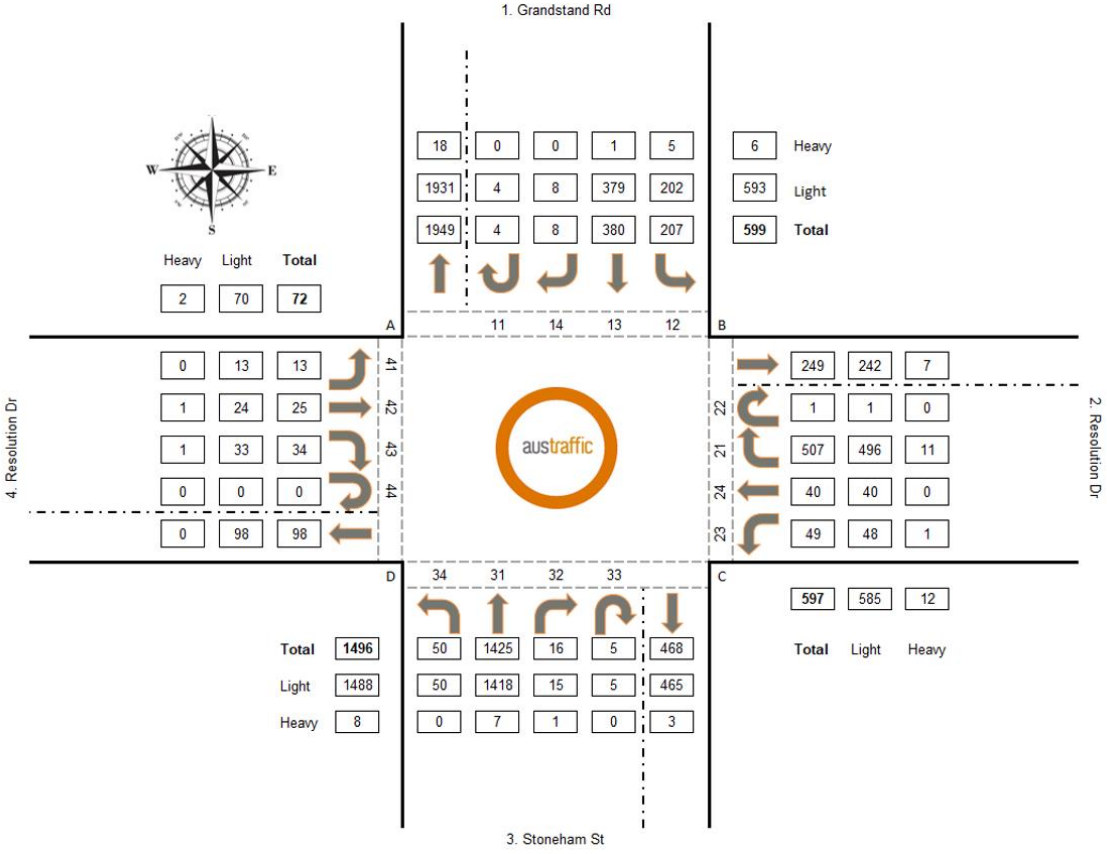


Figure 30 – September 2021 PM Peak Hour Turning Volumes at Grandstand Road / Resolution Drive / Stoneham Street Intersection



Observed queue lengths for the AM peak are presented in Figure 31. In the AM peak the longest queues were observed on the single lane Resolution Drive eastern approach to the roundabout, and on Grandstand Road. The video images also reveal the queue back along Stoneham Street from the signalised intersection of Great Eastern Highway/Stoneham Street/Belgravia Street sometimes reaches back to the roundabout. Still images from the AM peak video survey are shown in Figure 32, showing typical queuing and an instance of the queue back from the Great Eastern Highway/Stoneham Street/Belgravia intersection reaching back to the roundabout.

Figure 31 - September 2021 AM Peak Hour Observed Queues at Grandstand Road/Resolution Drive/Stoneham Street Intersection

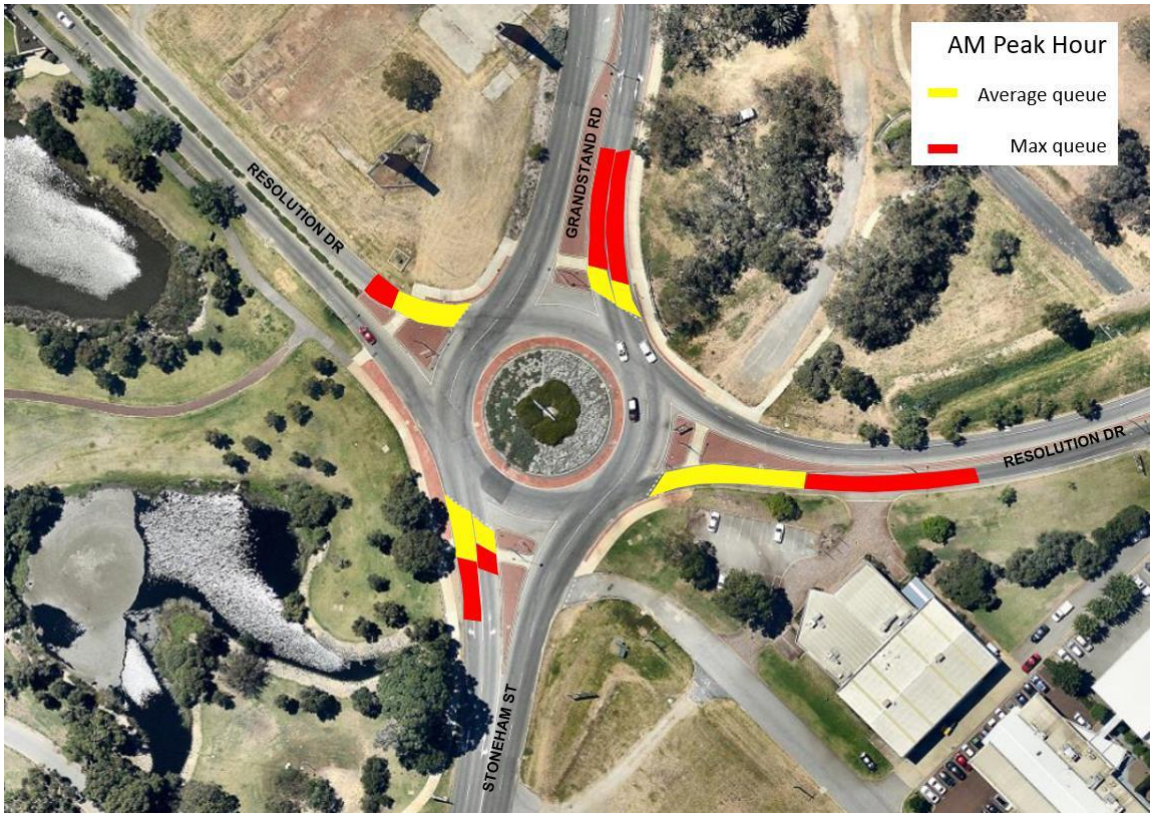
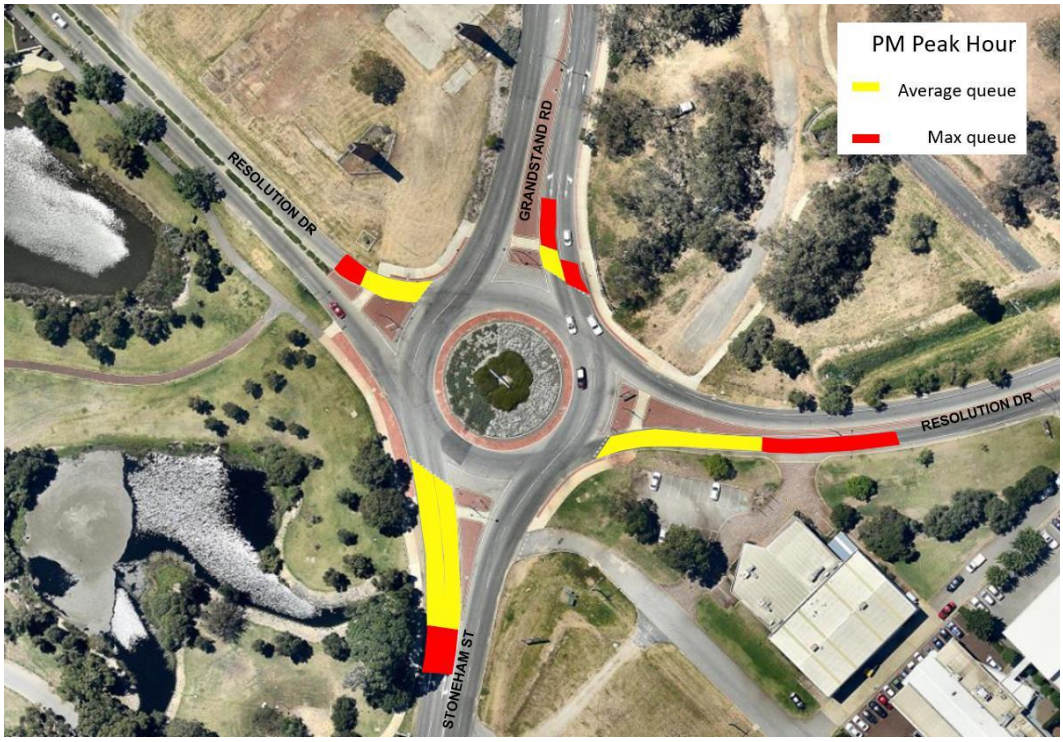


Figure 32 - September 2021 AM Peak Hour Still Images from Video Survey

Observed queue lengths for the PM peak are presented in Figure 33. In the PM peak the longest queues were observed on the single lane Resolution Drive eastern approach to the roundabout, and the two Stoneham Street approach lanes (from the south).

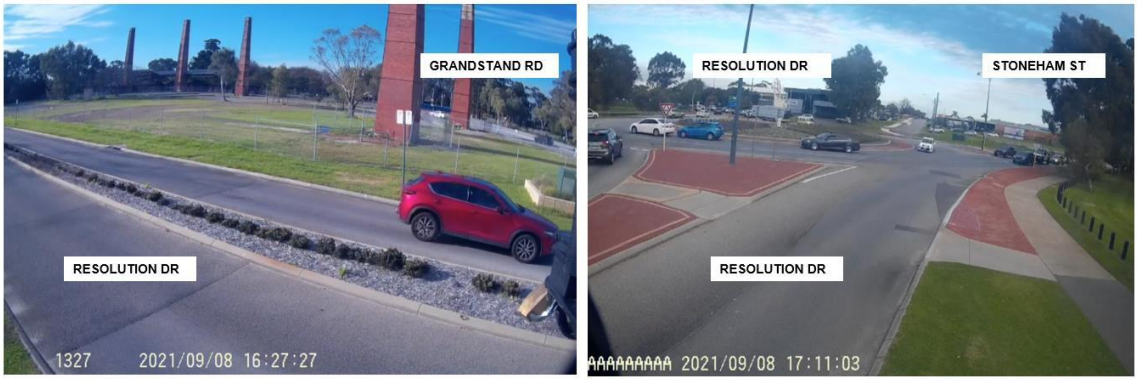
It should be noted that due to the viewing angle of the survey video camera, it is not possible to see the full extent of queuing on the Stoneham Street approach to the roundabout in the PM peak. The viewing angle only allowed the first 7 vehicles in the queue to be observed. The queue does not exceed this length in the AM peak hour, only in the PM peak.

Figure 33 - September 2021 PM Peak Hour Observed Queues at Grandstand Road/Resolution Drive/Stoneham Street Intersection



Still images from the PM peak video survey are shown in Figure 34, showing typical queuing.

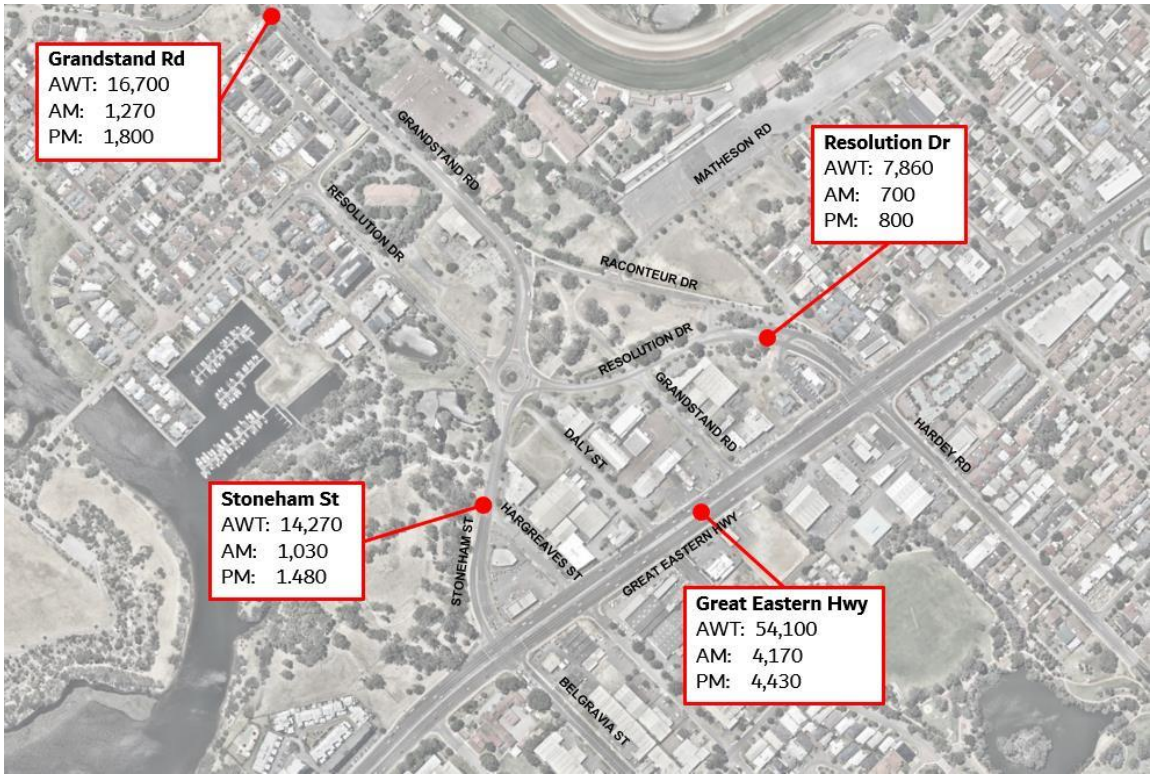
Figure 34 - September 2021 PM Peak Hour Still Images from Video Survey



3.6.5 Mid-block Traffic Volumes

Mid-block traffic counts for the regional and district level roads including Great Eastern Highway, Stoneham Street, Resolution Drive and Garratt Road Bridge (Grandstand Road) were sourced from Traffic Map. These counts are all from the 2018/2019 period, with the exception of Resolution Drive where the counts are from 2021/2022 and are presented in Figure 35.

Figure 35 – Two-way Mid-block Volumes (source: Main Roads WA)



3.6.6 Mid-block Great Eastern Highway Traffic Volumes

Traffic volumes at two sites along Great Eastern Highway (site 3404 north of Abernethy Road and site 7938 west of Aurum Street) were extracted from Traffic Map to determine historic growth trends. Between 2018 and 2020, traffic volumes along Great Eastern Highway reduced, as illustrated in Figure 36. The extent of the reduction is demonstrated in Table 8.

The 2020 counts are the most recent counts, and were undertaken in February 2020, before there was a temporary Covid-19 related reduction in traffic volumes.

Figure 36 – Great Eastern Highway Growth Trends (source: Main Roads WA)

Table 8 – Great Eastern Highway Traffic Volume Trends (source: Main Roads WA)

Site	Year	Northbound/Eastbound	Southbound/Westbound	Both Directions
3404	2018	29,295	29,400	58,695
	2020	28,132	27,897	56,029
	Change	-8.71%	-9.80%	-9.25%
7938.	2018	29,559	29,746	59,305
	2020	26,548	27,065	53,613
	Change	-10.19%	-9.01%	-9.6%

3.6.7 Key Considerations - Existing Traffic Volumes

Great Eastern Highway is a regional road carrying a high volume of traffic over the day and in each of the peak hours. The two signalised intersections within the precinct, of Great Eastern Highway with Stoneham Street / Belgravia Street and Great Eastern Highway with Resolution Drive / Hardey Road are congested, with peak hour signal cycle times of up to 139 seconds (this is the time taken for all required traffic signal phases to run once). This signal cycle time (of 2 minutes and 19 seconds) causes long queues to form.

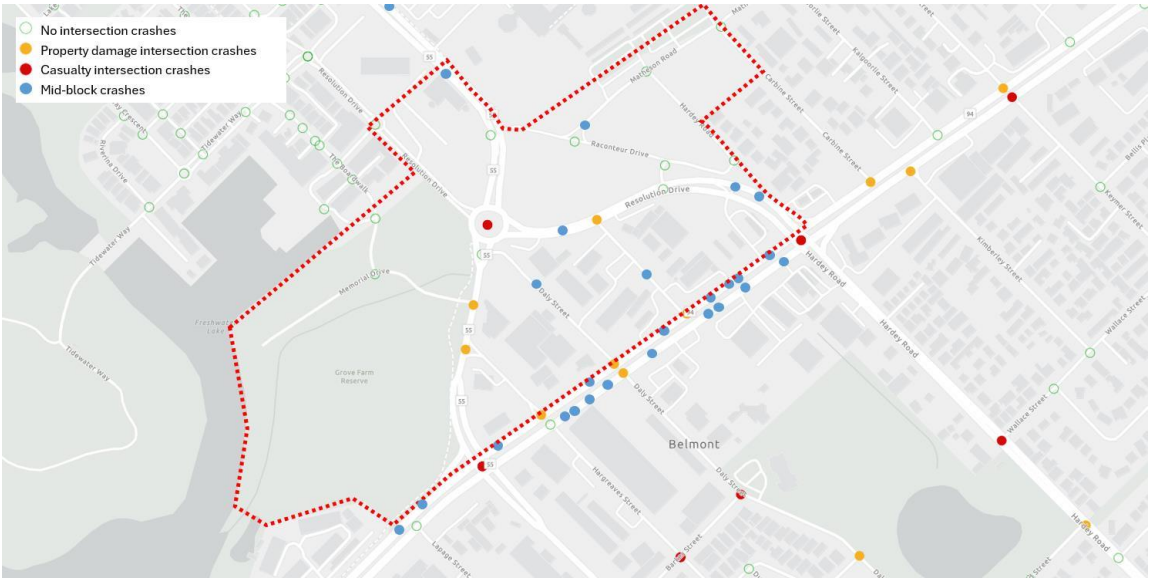
For the district level roads, Stoneham Street carries twice the amount of traffic as Resolution Drive, over the course of an entire day and in each peak period. This is partly due to signage to the north of the roundabout intersection of Grandstand Road / Resolution Drive / Stoneham Street which advises traffic destined for Midland and the Airport to use Resolution Drive to access Great Eastern Highway while traffic for Belmont is advised to use Stoneham Street.

Local roads within the precinct all carry low traffic volumes, well within their capacity. Of the local roads Grandstand Road carries the highest volumes.

3.7 Existing Crash Data

Intersection and mid-block crash history for the roads bordering and within the Golden Gateway precinct were obtained from Main Roads WA. The location of road crashes in the vicinity of the precinct is shown in Figure 37. This data is for the five-year period ending Friday June 28th, 2024.

Figure 37 - Location of road crashes (Source: Main Roads WA)



3.7.1 Intersection Crashes

In the five-year period there were 135 reported crashes at intersections within or adjacent to the Golden Gateway precinct, as summarised in Table 9. Crash types include:

- Rear end — where a vehicle collides with the rear of another vehicle.
- Right angle — where colliding vehicles approach from adjacent approaches of the intersection.
- Right turn through — where a vehicle turns right in front of an oncoming vehicle.
- Sideswipe — where a vehicle collides with the side of another vehicle.
- Hit object — where a single vehicle hits an object which is not a vehicle

Table 9 – Intersection crash summary for 5 years to June 2024 (source: Main Roads WA)

Intersection	Crash Type	Severity
Great Eastern Hwy / Stoneham St / Belgravia St – traffic signals	**49 reported crashes** 41 Rear end 5 Sideswipe 2 Right angle 1 Hit object	43% Property damage major 43% Property damage minor 12% Medical 2% Hospital
Great Eastern Hwy / Resolution Dr / Hardey Rd – traffic signals	**64 reported crashes** 50 Rear End 6 Right angle 4 Other 2 Sideswipe 2 Right turn through	47% Property damage major 38% Property damage minor 13% Medical 3% Hospital
Great Eastern Hwy / Hargreaves St – left in left out priority controlled intersection	1 Hit object	100% Property damage minor
Great Eastern Hwy / Daly St – left in left out priority controlled intersection	1 Rear End	100% Property damage major
Great Eastern Hwy / Grandstand Rd – left in left out priority controlled intersection	**4 reported crashes** 3 Right Angle 1 Rear End	75% Property damage major 25% Property damage minor
Stoneham St / Resolution Dr / Grandstand Rd – roundabout	**11 reported crashes** 4 Right angle 3 Rear end 2 Sideswipe 2 Other	55% Property damage minor 36% Property damage major 9% Medical
Stoneham St / Memorial Dr – Priority controlled T intersection	1 Sideswipe	100% Property damage minor
Stoneham St / Hargreaves St – Priority controlled T intersection	1 Rear End 1 Right turn through	100% Property damage major
Resolution Dr / Grandstand Rd – Priority controlled T intersection	1 Hit object 1 Rear End	50% Property damage minor 50% Property damage major

3.7.2 Midblock Crashes

In the same five-year period, there were 23 reported midblock crashes along the roads bordering and within the Golden Gateway precinct, as summarised in Table 10.

Table 10 – Mid-block crash summary for 5 years to June 2024 (source: Main Roads WA)

Road	Section	Crash Summary	Severity and Analysis
Great Eastern Highway	Stoneham St to Hargreaves St – eastbound carriageway	1 Sideswipe same direction	Low severity - property damage only
	Hargreaves St to Daly St – eastbound carriageway	1 Rear End	Crash required medical treatment
	Daly St to Grandstand Rd – eastbound carriageway	1 Rear End	Low severity - property damage only

Road	Section	Crash Summary	Severity and Analysis
Great Eastern Highway	Grandstand Rd to Resolution Dr – eastbound carriageway	2 Rear End 1 Right Angle 1 Sideswipe same direction	Low severity - property damage only
	Hardey Rd to Daly St – westbound carriageway	3 Rear End 2 Sideswipe same direction	80% property damage only 20% required medical treatment
	Daly St to Hargreaves St – westbound carriageway	4 Rear End	75% property damage only 25% required medical treatment
Grandstand Rd (north)	Resolution Dr to northern boundary of Golden Gateway precinct – northbound carriageway	1 Sideswipe same direction	Low severity - property damage only
	Resolution Dr to northern boundary of Golden Gateway precinct – southbound carriageway	1 Sideswipe same direction	Low severity - property damage only
Daly Street	Great Eastern Hwy to Stoneham St	1 Sideswipe same direction	Low severity - property damage only Crash involved parking
Grandstand Rd (south)	Great Eastern Hwy to Resolution Dr	1 Hit object	Low severity - property damage only Crash involved parking

3.7.3 Crash Summary

For the roads bordering and within the Golden Gateway precinct, the biggest road safety issue is rear end crashes at the two signalised intersections with Great Eastern Highway, where the crash rate is higher than expected for intersections of their nature. This is due in part to the high volume of traffic carried by Great Eastern Highway in comparison to the other streets, and because rear end crashes are often the most common crash type at signalised intersections.

Crashes at the intersections of Great Eastern Hwy / Stoneham St / Belgravia St and Great Eastern Hwy / Resolution Dr / Hardey Rd account for 71.5% of all crashes for the roads bordering and within the Golden Gateway precinct

This indicates that the precinct is bordered by a busy regional route. There is no safety issue within the precinct, with all mid-block and intersection crash rates well within the expected ranges.

4. MOVEMENT NETWORK

4.1 Original Movement Network

The original Movement Network for the Golden Gateway precinct LSP, as documented in Flyt's *Local Structure Plan Movement and Access Strategy Report* (dated June 2018), is reproduced as Figure 38. This included a portion of the Perth Racing landholding.

Figure 38 – Original Golden Gateway Precinct Movement Network (Source: City of Belmont)

Elements of original Movement Network included:

- The realignment of Resolution Drive along the historical Raconteur Drive alignment;
- Relocation of the existing Stoneham St/ Resolution Drive/ Grandstand Road roundabout to 125m northeast of its current location;
- Maintain Grandstand Road standard as four lane divided (two lanes in each direction) and realigned Resolution Drive as two lane divided (one lane in each direction);

- One intersection along Resolution Drive (between Great Eastern Highway and Grandstand Road) for access to northern area of precinct;
- Introduction of four-way traffic signal control at intersection of Stoneham Street with Resolution Drive and Daly Street, with controlled pedestrian / cycle crossings across all four intersection approaches;
- Maintain alignment of Hargreaves Street and Daly Street, realign Grandstand Road (south) at midway point to connect to Daly Street (no connection to Resolution Drive);
- Introduction of indirect connection of Matheson Road to realigned Resolution Drive;
- Stoneham Street to remain four lane divided road (with two lanes in each direction);
- Shared paths were proposed along Stoneham Street, Resolution Drive, Grandstand Road, Hargreaves Street, Daly Street and Matheson Road; and
- No changes proposed to Great Eastern Highway.

The draft Golden Gateway LSP was considered by the Belmont Council at an Ordinary Council Meeting held on June 23rd, 2020. In response to submissions received, Council resolved to require several modifications to the LSP, including to the road network to address the following issues raised in submissions:

- Matheson Road becoming a through road to provide access for Perth Racing.
- Access and egress associated with Ascot Waters.
- The extension of Grandstand Road through private property.

4.2 Revised Road Network

Many iterations of the road network have been produced and tested; however, the final option has been developed on the basis of the following directives from the City of Bemont:

- Road network to exclude Perth Racing land holdings.
- Resolution Drive link to be maintained (to service existing businesses and future development sites) within the existing road reserve and not Water Corporation land.
- Stoneham Street is to remain as the primary route through the precinct, rather than Raconteur Drive.
- Daly Street to terminate prior to the intersection with Stoneham Street, with creation of cul-de-sac. The remainder of Daly Street will be identified as Public Open Space (POS).

The proposed road network is displayed as Figure 39.

Figure 39 – Proposed Road Network

4.3 Proposed Pedestrian and Cycle Facilities

Reducing traffic speeds improves road safety for all and removes a major barrier to walking and cycling. A precinct wide 30km/h speed zone should be implemented (excluding Grandstand Road and Stoneham Street as the main through route for traffic) to improve the environment for walking and cycling.

All existing shared paths surrounding and through the Golden Gateway precinct should be maintained and additional shared paths should be provided along Hargreaves Street, Grandstand Road (south), and along the sections of Resolution Drive that currently don't have any paths. These will provide connectivity between the Great Eastern Highway on-road bike lanes and the shared path network along Stoneham Street.

Tree canopy coverage should be increased along all roads within the precinct to create a pleasant environment for walking and cycling.

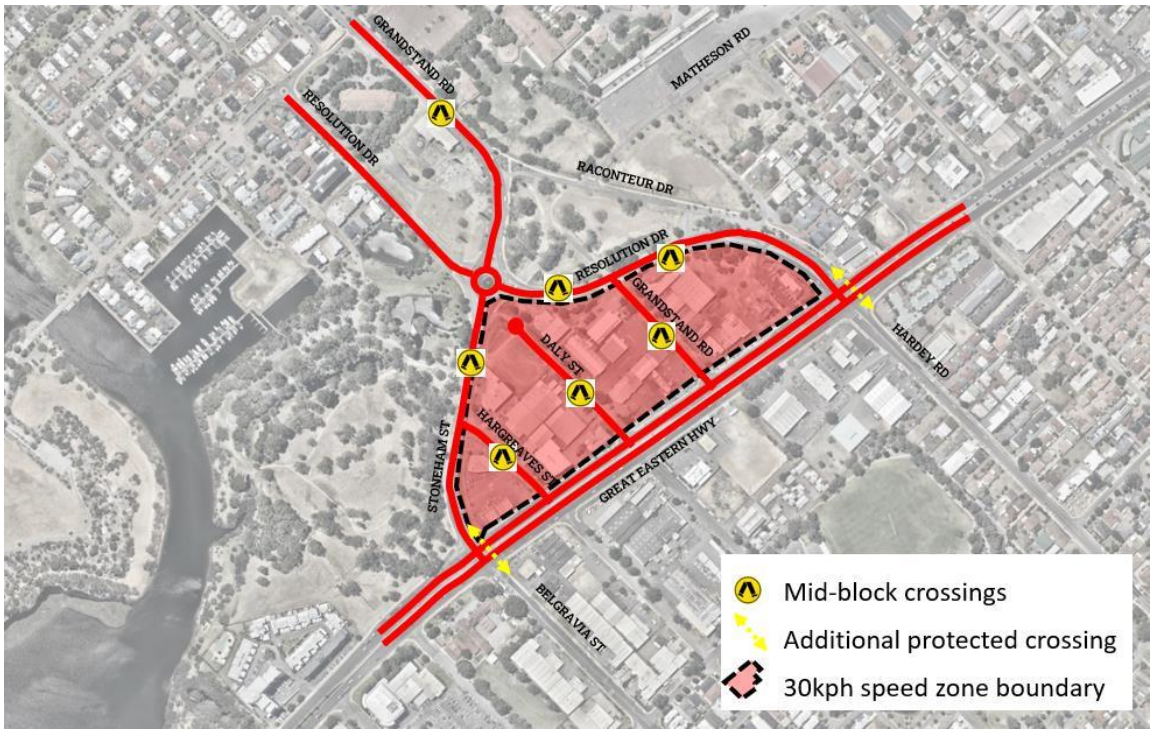
Other options to further encourage the use of active transport modes include the introduction of a bike or electric scooter share scheme.

Main Roads WA are responsible for the layout and signal phasing at traffic signal controlled intersections. At the signalised intersections of Great Eastern Highway with Resolution Drive/ Hardey Road and Stoneham Street/ Belgravia Street, protected pedestrian crossing of Great Eastern Highway is only available on the western intersection approach. The City should investigate the provision of protected pedestrian crossing of Great Eastern Highway on both sides of these intersections.

Roundabouts are generally good for cars, reducing crash severity and minimising delays, however they can present barriers for accessibility by pedestrians and cyclists. Crossing during peak periods can be a real issue as there is no interruption in the traffic stream as would occur at a signalised intersection. Mid-block crossing facilities should be

provided along Stoneham Street, Resolution Drive, Raconteur Drive and Grandstand Road (north), as shown in Figure 40.

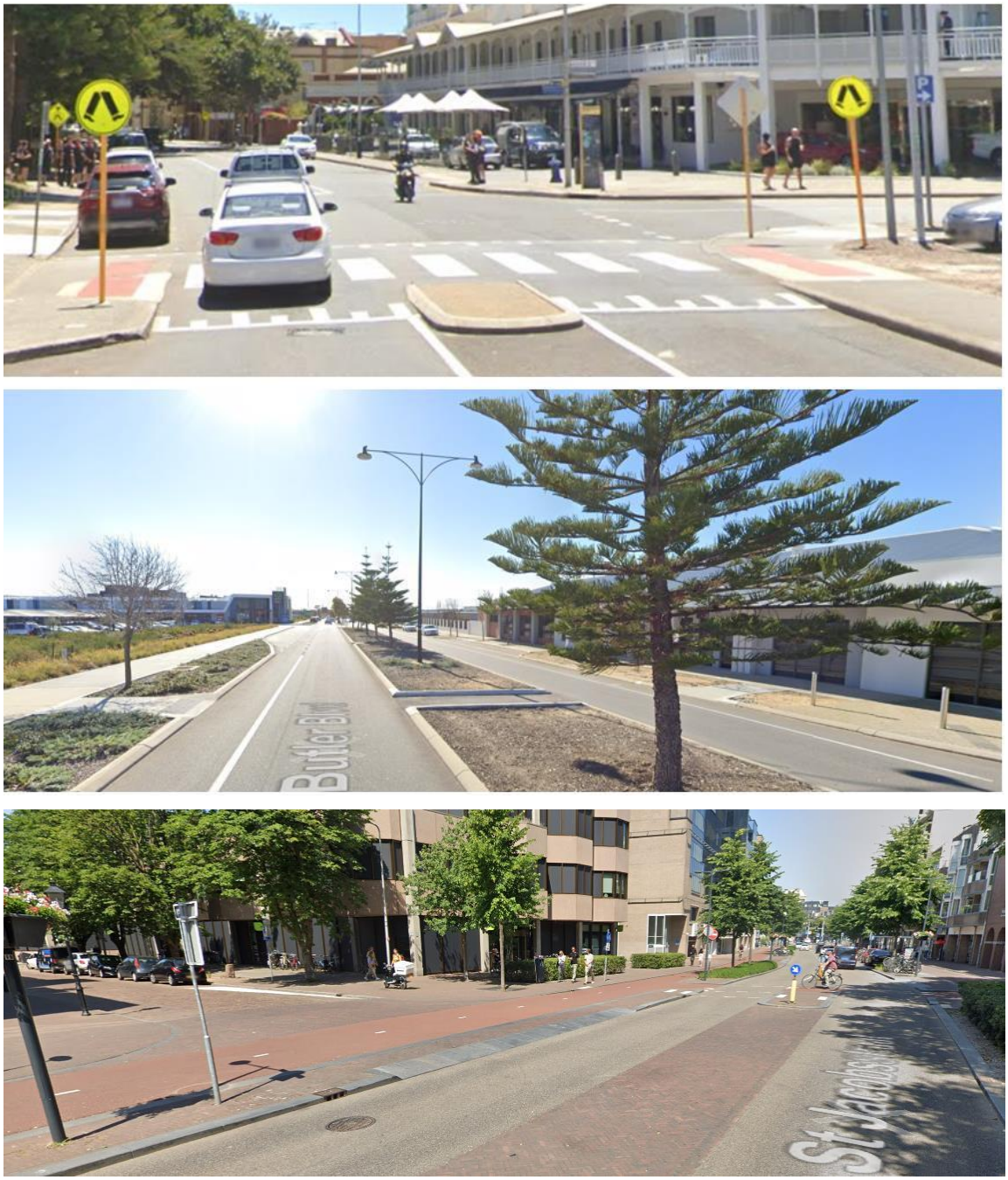
Figure 40 – Recommended Pedestrian and Cyclists Facilities



Possible types of pedestrian crossing treatments are shown in Figure 41. These include:

- Raised zebra crossings, with the crossing at footpath level creating a raised plateau speed hump for vehicles;
- Kerb ramps and median refuges or cut throughs; and
- Shared paths having continuity and priority at side street intersections.

Figure 41 – Possible Pedestrian Crossing Treatments

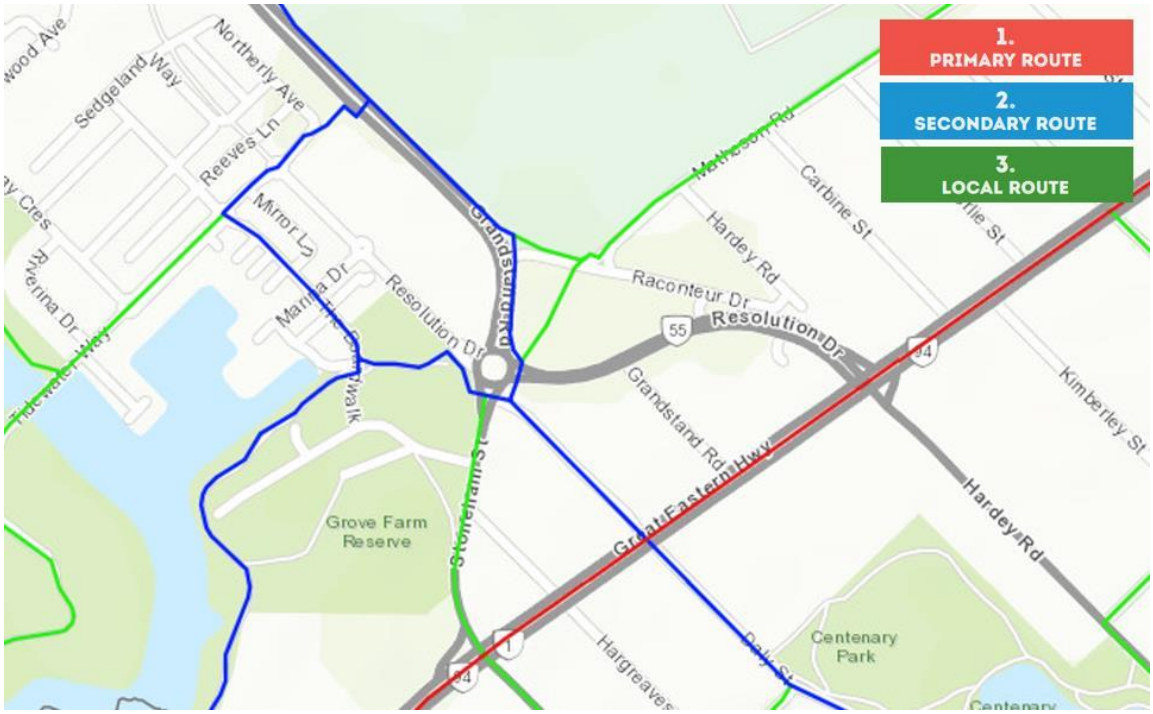


The planned pedestrian and cyclist network should be consistent with the long term cycle network (LTCN), as reproduced in Figure 42. The streets within the precinct which have been identified as LTCN routes, and the appropriate form of infrastructure are outlined in Table 11.

Table 11 – Form of LTCN within Precinct

Hierarchy	Road	Appropriate Form
Primary	Great Eastern Highway	• shared paths • separated bike and pedestrian paths • protected bicycle lanes (uni or bi-directional) • safe active streets
Secondary	Daly Street, Grandstand Road (north), path through Belmont Trust land	
Local	Stoneham Street, Matheson Road, section of Raconteur Drive, future route through triangle of land between Resolution Drive, Grandstand Road, and Raconteur Drive	

Figure 42 – Long Term Cycle Network Near Precinct (source: Department of Transport)



4.4 Proposed Public Transport

To facilitate higher density development in the Golden Gateway precinct, a step change in public transport provision and public transport use will be required to ensure residents, employees and visitors have the potential to travel to/from Golden Gateway by a sustainable form of transport.

The Public Transport Authority has indicated that, if sufficient public transport demand was generated by large scale development of the Golden Gateway precinct, they would consider the option of operating a bus service between the Golden Gateway precinct and central Perth – utilising the internal road network within the Golden Gateway precinct. The bus service would originate/terminate within the Golden Gateway precinct.

This would be contingent upon the Golden Gateway precinct generating the requisite public transport demand to warrant the investment in such a service.

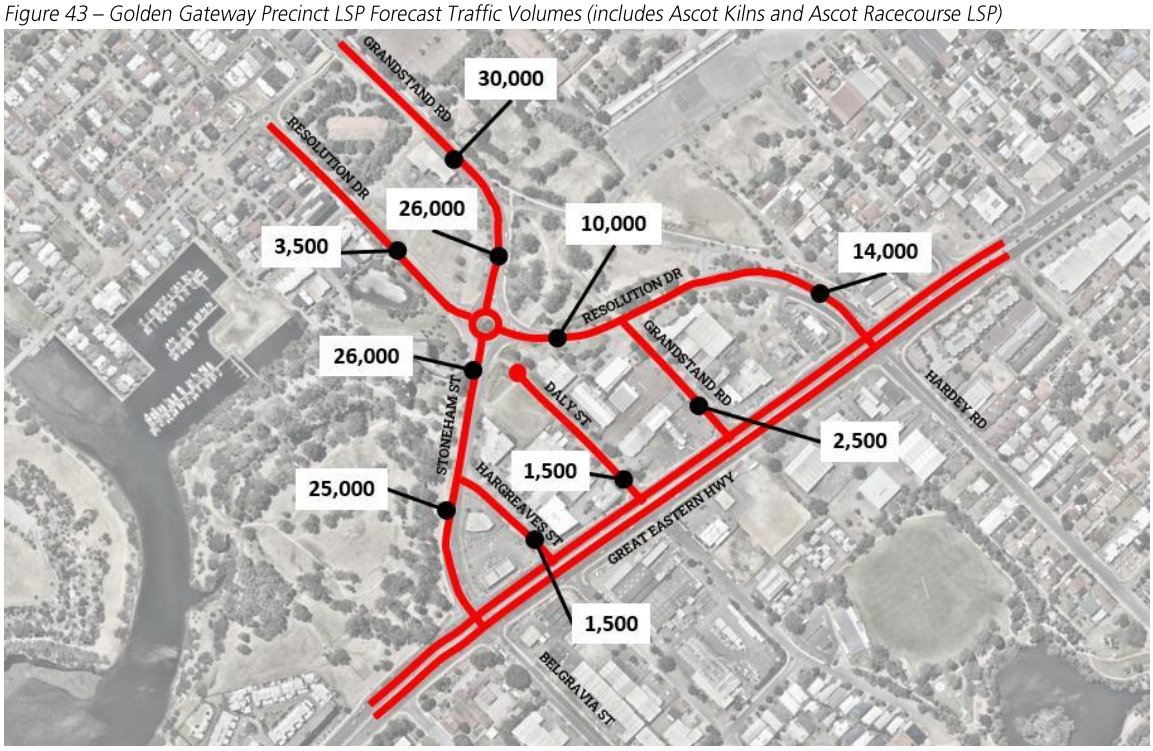
It is recommended that the City lobby the PTA to improve bus services to the precinct and explore the potential of other transit options such as a superbus or trackless tram.

4.5 Role and Function of Key Roads

4.5.1 Forecast Traffic Volumes

The forecast traffic volumes for 2041 are shown in Figure 43. These forecasts include through traffic (traffic that does not originate or terminate in the Golden Gateway precinct), as well as traffic generated by the development of the Ascot Kilns site and the Ascot Racecourse LSP area.

Figure 43 – Golden Gateway Precinct LSP Forecast Traffic Volumes (includes Ascot Kilns and Ascot Racecourse LSP)

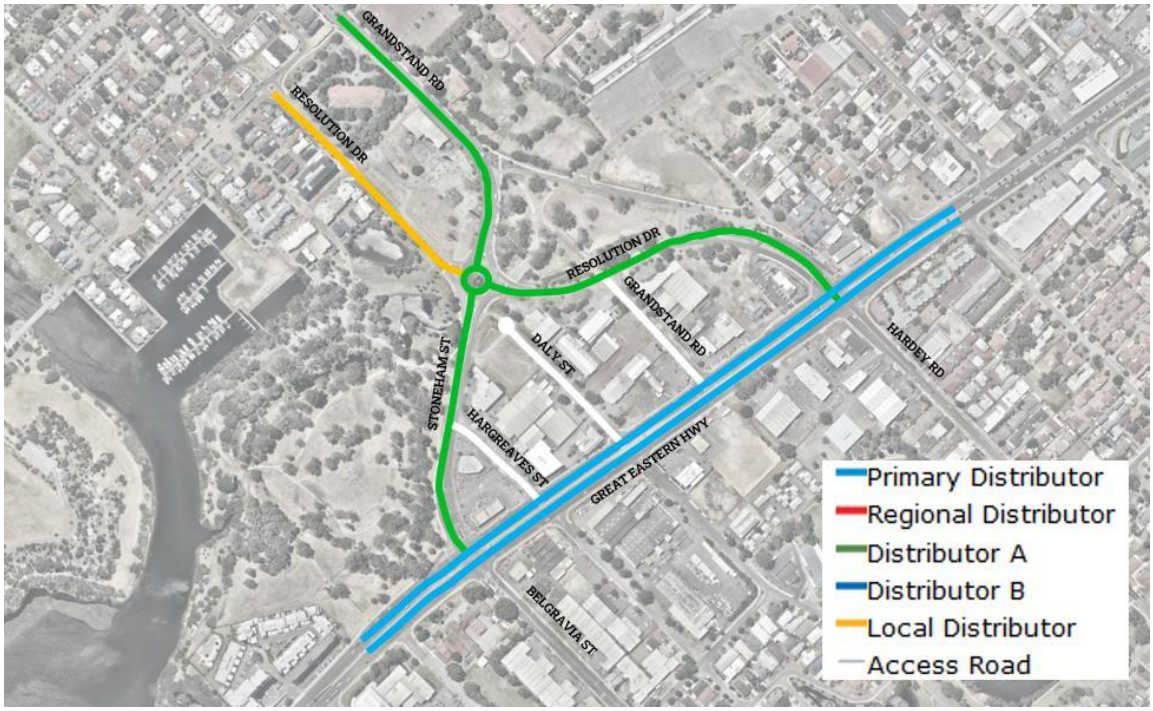


4.5.2 Road Hierarchy

The proposed road hierarchy is shown in Figure 44. This includes:

- Primary Distributor
  - Great Eastern Highway
- Distributor A
  - Stoneham Street
  - Grandstand Road (north)
  - Section of Resolution Drive immediately north of Great Eastern Highway
- Local Distributor
  - Northern section of Resolution Drive
- Access Roads
  - Hargreaves Street
  - Daly Street
  - Grandstand Road (south)
  - Matheson Road
  - Hardey Road (between Great Eastern Highway and Matheson Road)

Figure 44 – Golden Gateway Precinct LSP Road Hierarchy



4.5.3 Great Eastern Highway

The Great Eastern Highway corridor will present itself as a strong, unified commercial and mixed-use edge to the Golden Gateway precinct.

Great Eastern Highway will remain in its current form. No changes are proposed to the existing road connections with Great Eastern Highway nor the forms of intersections between Great Eastern Highway and connecting roads.

4.5.4 Stoneham Street

Stoneham Street will be the primary interface between the Golden Gateway precinct and the Swan River. It is proposed that future planning for the Belmont Trust Land, located to the west of Stoneham Street, should ensure strong physical links are maintained between the Swan River and future Golden Gateway population and workforce.

Stoneham Street will continue to be a major district road corridor and provide for high capacity traffic movements. Forecast traffic volumes for 2041 range between 25,000 vpd and 26,000 vpd, with the higher traffic volumes carried close to the intersection with Resolution Drive. The form of Stoneham Street will be retained as a four lane divided road (two lanes in each direction) with a median on approaches to main intersections and a painted dividing line mid-block.

The road reserve width is only 20m, which allows for four lanes at 3.3m wide, and 3.4m verges either side, or only 2.4m verges if a 2m median island is included. If Stoneham Street were being built as part of a new development, the minimum required road reserve would be at least 33m.

The intersection of Stoneham Street with Resolution Drive and Grandstand Road will remain as a two-lane roundabout. The intersection of Stoneham Street with Hargreaves Street will remain in its current configuration and there will be no intersection with Daly Street as it will become a cul-de-sac.

4.5.5 Resolution Drive

Resolution Drive will remain on its existing alignment. The form of Resolution Drive as a two lane divided road (one lane in each direction) will be retained, however additional lanes will develop on the approach and exit from the Great Eastern Highway intersection, as per the existing lane arrangement.

Forecast traffic volumes for 2041 range between 10,500 vpd (east of the roundabout controlled intersection with Grandstand Road) and 14,000 vpd (north of Great Eastern Highway).

4.5.6 Grandstand Road (north)

Grandstand Road (north) will remain in its current alignment and configuration as a four lane divided road (with two lanes in each direction). Grandstand Road is forecast to carry 30,000 vpd by 2041.

The roundabout controlled intersection with Stoneham Street and Resolution Drive will remain.

4.5.7 Hargreaves Street

Hargreaves Street will continue along its existing alignment providing a connection between Great Eastern Highway (permitting left in left out movements only) and Stoneham Street. The intersection with Stoneham Street will remain.

Hargreaves Street is forecast to carry 1,500 vpd by 2041. It is proposed as a two-lane road with on-street parking where appropriate. Its current width of 12.5m should be reduced to 7m, with embayed parking.

4.5.8 Daly Street

Daly Street will continue along its existing alignment however it will become a cul-de-sac south of Stoneham Street, with the remainder of Daly Street to be identified as Public Open Space. The intersection with Great Eastern Highway (permitting left in left out movements only) will remain.

Daly Street is forecast to carry 1,500 vpd by 2041. Daly Street is proposed as a two-lane road with on-street parking where appropriate. Daly Street's current width is 8m; this could be reduced to 7m. On-street parking would need to be embayed.

Daly Street has been identified as a secondary route under the Long Term Cycle Network, which could take the form of a shared path, protected bike path or safe active street. The treatment should continue through the public open space.

4.5.9 Grandstand Road (south)

Grandstand Road will continue along its existing alignment providing a connection between Great Eastern Highway (permitting left in left out movements only) and Resolution Drive where it has a full movement intersection.

Grandstand Road (south) is forecast to carry 2,500 vpd by 2041. Grandstand Road is proposed as a two-lane road with on-street parking where appropriate. It is currently 12.5m wide and should be reduced to 7m, with embayed parking.

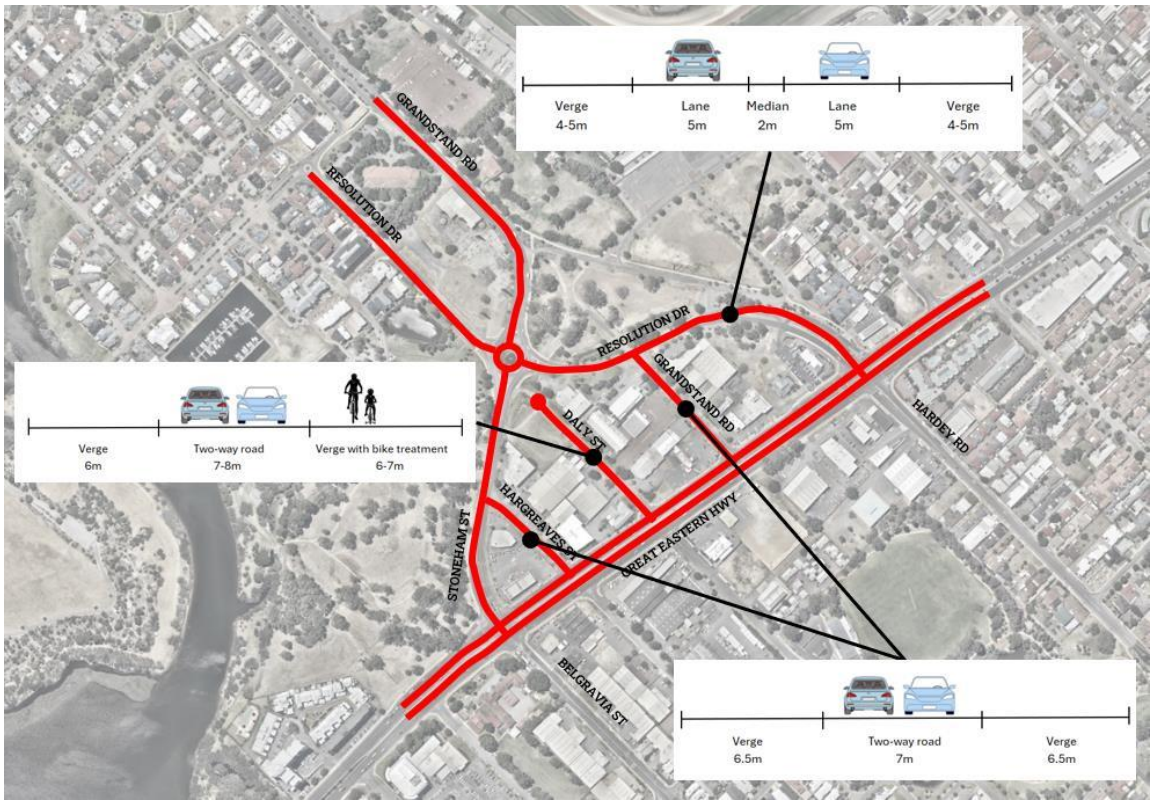
4.5.10 Memorial Drive

Memorial Drive and its intersection with Stoneham Street will remain unchanged.

4.6 Road Cross Sections

The proposed road cross sections are shown in Figure 45.

Figure 45 – Proposed Road Cross Sections Golden Gateway Development



4.7 Intersection Controls

The proposed intersection controls are shown in Figure 46.

In the AM peak hour, the intersection of Stoneham Street with Hargreaves Street will be impacted by queuing along Stoneham Street, back from the intersection with Great Eastern Highway It is recommended "KEEP CLEAR" pavement markings be applied to this intersection to ensure vehicles are able enter the Stoneham Street northbound and southbound traffic streams.

Figure 46 – Proposed Intersection Controls for Golden Gateway Development

4.8 Parking and Planning Controls

To reduce the car dependence of the Golden Gateway Precinct and to maximise the use of active transport modes, it is recommended the City consider the imposition of a parking cap.

The required residential parking outlined in the existing Structure Plan follows the recommendations of the Residential Design Codes Volume 2 – Apartments and provides minimum and maximum parking rates. Any parking proposed in excess of the minimum provision must be capable of potential future conversion into habitable floor space.

It is recommended that commercial parking also be subject to a maximum rate.

Other innovative approaches include the encouragement of reciprocal parking, possible car share schemes, bike and electric scooter hire schemes, and the mandatory provision of safe and secure parking for bikes, electric scooters, and other micro mobility devices (including charging stations).

The City is also able to impose an ambitious mode share target for this development. From 2021 Census data, the existing car driver and car passenger mode share for the journey to work from the Ascot area is estimated at 56%, with 11.8% using public transport and 1% using active modes. Approximately 13.3% worked from home and 9.6% did not work at all. The trip generation rates used in this assessment assumed a 20% reduction in car use. A more ambitious car driver and passenger mode share target would need to be supported by a comprehensive range of strategies to increase public transport ridership, and use of active modes and micro mobility devices.

5. ANALYSIS OF TRANSPORT NETWORK

The weekday peak hour performance of the existing and proposed movement networks has been assessed for the years 2021, 2031 (interim) and 2041 (ultimate).

Potential traffic associated with the Ascot Racecourse LSP and Ascot Kilns Local Development Plan has also been included. Land use and trip generation data for the Ascot Racecourse LSP area have been extracted from the Traffic Impact Assessment prepared by PJA in May 2024.

Traffic performance at an Ascot Racecourse weekday event day has also been investigated.

5.1 Form of Assessment

The traffic assessment has been undertaken using the SIDRA Network platform, which is able to model the operation of the entire Golden Gateway movement network and can consider the impact of congestion and queuing at adjacent intersections.

5.2 Assessment Scenarios

A SIDRA Network assessment has been undertaken for the AM and PM period in each of the following scenarios:

- Base year (2021) with existing road network;
- Base year (2021) with proposed road network;
- Interim forecast year (2031) with existing road network;
- Interim forecast year (2031) with proposed road network and 25% of Ascot Kilns and Golden Gateway development, 50% of Ascot Racecourse development complete;
- Ultimate forecast year (2041) with existing road network;
- Ultimate forecast year (2041) with proposed road network and 100% of development complete.

Seven scenarios for an Ascot Racecourse event day have been assessed for a single PM peak period:

- 2021 event day with existing road network;
- 2021 event day with proposed road network;
- 2031 event day with proposed road network and 25% of Ascot Kilns and Golden Gateway development, 50% of Ascot Racecourse development complete;
- 2041 event day with proposed road network and 100% of development complete.

5.3 Assessment Time Period

The assessment has been undertaken for an average weekday AM peak hour, found to occur from 7:30am to 8:30am, and the PM peak hour, between 4:30pm and 5:30pm.

For an event at Accost Racecourse, the 2021 calendar of events was reviewed. During 2021, 49 events were scheduled; 20 events on weekdays (mainly Wednesdays, with a single event on a Tuesday and another on a Friday), 28 events on Saturdays and a single event was scheduled on a Sunday. Events are held 9 months of the year, with no racing over the winter months of June, July, and August. The three busiest event days are the Melbourne Cup (held on a Tuesday), Railway Stakes and Perth Cup (both held on Saturdays).

Weekday and weekend traffic volumes were compared for Great Eastern Highway, Stoneham Street, Resolution Drive and Garratt Road. For all sites, weekend peak hour volumes are less than weekday volumes. For this reason, it was decided to assess a Melbourne Cup event at Ascot Racecourse during the regular PM peak hour (between 4:30pm and 5:30pm).

5.4 Background Traffic Growth

Background or through traffic is traffic that does not originate or terminate in the Golden Gateway precinct, but instead travels through the precinct, or adjacent to the precinct, on regional and district roads such as Great Eastern Highway, Stoneham Street, Resolution Drive and Grandstand Road (north).

To estimate the future growth of background traffic, historic traffic growth has been investigated. Traffic volumes along the section of Great Eastern Highway between Stoneham Street and Resolution Drive (site 1012) have reduced from 64,800 vpd in 2014 to 54,100 vpd in 2018, a reduction of 16.5% over the 4 year period. Similarly at sites 3404 and 7938 (along Great Eastern Highway to the west and east of the Golden Gateway precinct respectively), daily traffic volumes on Great Eastern Highway reduced by more than 9% over the two year period between 2018 and 2020. Despite these reductions, background traffic volumes are expected to increase over time.

Along road corridors where intersections currently operate close to capacity during peak hours, any traffic growth will see an increase in the duration of the peak period (as there is no capacity for this growth to occur during the existing peak hours). This phenomenon is called peak spreading. As daily traffic volumes continue to increase, the proportion of the total daily traffic occurring during the morning and afternoon peak hours reduces. This also results in the growth in peak hour traffic being less than the growth in daily traffic volumes.

Despite the recent reduction in traffic volumes along Great Eastern Highway, an annual peak hour growth rate of 0.5% has been assumed. This represents an increase of 5.1% between 2021 and 2031 and an increase of 10.5% between 2021 and 2041. The peak hour growth rate has been applied to all through traffic (excluding buses) travelling on regional and district roads such as Great Eastern Highway, Stoneham Street, Resolution Drive and Grandstand Road (north).

5.5 Trip Generation Assumptions

The proposed land uses within the Golden Gateway Local Structure Plan area are reproduced in Table 12. This table also includes land uses for the Ascot Kilns development site, and the Ascot Racecourse Local Structure Plan area.

Table 12 – Proposed Structure Plan Land Uses

Development Area	Yield
Golden Gateway	2,268 dwellings, 6,979 m^2 NLA commercial, 1,200 m^2 NLA retail
Ascot Kilns	250 dwellings, 512m^2 GFA commercial
Ascot Racecourse Area A	390 unit retirement village
Ascot Racecourse Area D	41 dwellings, 2,100m^2 childcare centre for up to 90 children
Ascot Racecourse Area E	3,400m^2 retail, 9,600m^2 commercial plus jockey heath Equine Centre

The traffic assessment has considered two different time periods for development of the Golden Gateway precinct: 2031 and 2041. By 2031 it is assumed that 25% of the total yield will be redeveloped, with 75% of the existing commercial development retained.

For the Ascot Racecourse Local Structure Plan area, the Transport Impact Assessment prepared by PJA stated that the redevelopment would be completed by 2036, therefore it is assumed that 50% would be completed by 2031.

By 2041 it is assumed that all redevelopment will be complete.

5.5.1 Residential

The WAPC's Transport Impact Assessment Guidelines Volume 5 – Technical Guidance suggest peak hour trip rates for residential land uses. The residential trip rates are based on the Perth and Regions Travel Surveys (PARTS) data averaged over the range of dwelling types. The recommended rate for residential land use is 0.8 vehicle trips per dwelling for the AM and PM peak hours.

These rates are considered high, given they represent an average of the entire Metropolitan area and include a high proportion of detached dwellings rather than dwellings in mixed use developments. Surveys of apartment developments undertaken by Flyt for the Department of Lands Planning and Heritage (DLPH) within inner and middle suburbs revealed peak hour vehicle trip rates of between 0.13 and 0.33 per dwelling, as shown in Table 13.

Table 13 also lists the Walk Score and Transit Score for each development surveyed so that the walkability and public transport accessibility of each site can be compared to that of the proposed development. The average peak hour trip rate for the 3 'middle suburb' apartment developments was found to be 0.27 trips per apartment, with the range between 0.23 and 0.33. The 3 surveyed middle suburb sites have a Walk Score range of 47 - 65 (compared to 43 - 48 for the Golden Gateway precinct) and a Transit Score range of 41 - 53 (compared to 47 for the Golden Gateway precinct). This would indicate residential development within the precinct would most likely generate a similar level of trips to the 3 surveyed middle suburb sites.

Table 13 – Apartment peak hour trip rates from DLPH surveys

Development	Address	Inner/ Middle	Walk Score	Transit Score	No. Apartments	No. Car Bays	Peak Hr Trip Rate (per unit)
Eastgate	76 Newcastle Street, Perth	Inner	96	99	53	65	0.23
x 2	143 Adelaide Terrace, Perth	Inner	86	81	200	328	0.13
Depot	65 Brewer Street, Highgate	Inner	91	93	35	39	0.31
Lakeside	134 Mounts Bay Road, Perth	Inner	57	92	30	31	0.13
Abode	6 Campbell Street, West Perth	Inner	94	86	86	76	0.13
Rivershores	2 Doepel Street, North Fremantle	Middle	65	53	58	122	0.33
Ceresa	12 Tanunda Drive, Rivervale	Middle	49	41	113	228	0.23
Westend	33 Blythe Avenue, Yokine	Middle	47	48	36	50	0.25
Average of all (inner/ middle) developments							**0.19**
Average of middle suburb developments							**0.27**

The nature of the development and the site's walkability and public transport accessibility has led to the adoption of a peak hour trip rate of 0.3 trips per multiple dwelling. The resulting peak hour trip rates are shown in Table 14.

Table 14 – Residential Peak hour trip rates

Land Use	AM Peak IN	AM Peak OUT	PM Peak IN	PM Peak OUT
Multiple dwelling	0.075	0.225	0.1875	0.1125

As discussed in Section 4.8, car parking controls can be used to reduce car dependency, in conjunction with safe and continuous routes for bikes, electric scooters and other micro mobility devices, and an increased provision of public transport services. A variety of local amenities within a short and pleasant walking or biking distance will also encourage trips by active transport modes and micro mobility devices.

A 20% reduction in residential vehicle trips to/from the site has been assumed given the proposed parking controls, improvements to the pedestrian and cyclist network and the enhanced public transport provision.

5.5.2 Non Residential

Trip rates for the non-residential (commercial and retail) land uses have been sourced from the WAPC Guidelines. The resulting peak hour trip rates for the retail and commercial land uses are shown in Table 15.

Table 15 – Commercial and Retail Peak hour trip rates (per 100m² NLA)

Land Use	AM Peak IN	AM Peak OUT	PM Peak IN	PM Peak OUT
Commercial	1.6	0.4	0.4	1.6
Retail	1.0	0.25	2.0	2.0

In addition to the above it was assumed that 10% of retail and commercial employees would live within the Golden Gateway precinct and as such total commercial and retail vehicle trips were reduced by 10% (approximately 20 employees) to reflect an internal walk trip rather than an external vehicle trip.

5.5.3 Ascot Special Event

As discussed in Section 5.3, the PM peak hour (between 4:30pm and 5:30pm) on Melbourne Cup Day was selected as the Ascot Racecourse special event to be modelled. This is because traffic leaving the event coincides with the regular PM peak hour.

On Melbourne Cup Days, Transperth operate bus services to and from Ascot, as shown in Table 16. This demonstrates that 9am to 2pm are the main times for travel to Ascot, while 3:15pm to 7pm are the main times for travel from Ascot.

Table 16 – Melbourne Cup Event Bus Services

Service	To Ascot	From Ascot
To / from Burswood Station	Every 10 minutes from 9am to 1:50pm	Every 10 minutes from 3:30pm to 7:45pm
To / from Fremantle Station	Every 30 minutes from 9:30am to 1pm	Every 30 minutes from 3:30pm to 6:30pm
To / from Meltham Station	Every 10 minutes from 9:30am to 1:50pm	Every 10 minutes from 3:15pm to 7pm

There are two main parking areas for event patrons, the northern car parks accessed from the north and the Matheson Road car parks (plus overflow parking areas) which are accessed from the south. It is estimated that the Matheson Road car parks and overflow parking areas have capacity for 880 vehicles. Assuming the vehicles leave in a constant stream between 3:30pm and 6:30pm, there would be 293 vehicle exiting movements per hour.

5.5.4 Existing Trip Generation

Based on the City of Belmont counts of existing vehicle activity along local streets (as documented in Section 3.6.3), the estimated vehicle trips generated by the existing land uses on a non-event day at Ascot are shown in Table 17.

Table 17 – Existing Precinct Estimated Traffic Generation

Time Period	Inbound	Outbound	Total
Daily traffic	1,700	2,300	4,000
AM Peak hour	142	104	246
PM Peak hour	96	221	317

For the 2031 forecast years, 25% of the existing precinct traffic volumes will be removed from the road network before the Golden Gateway Precinct volumes are added. For the 2041 forecast years, all of the existing precinct traffic volumes will be removed from the road network.

5.5.5 Ultimate Trip Generation

For the ultimate build out of the Golden Gateway precinct (including the Ascot Kilns development) assumed to occur by 2041, a total of 753 trips are forecast to be generated in the AM peak hour (270 trips to the site and 483 trips from the site) and 782 trips are forecast to be generated in the PM peak hour (426 trips to the site and 356 trips from the site), as summarised in Table 18.

The traffic generation for the Ascot Racecourse LSP area has been extracted from the Traffic Impact Assessment prepared by PJA in May 2024. A total of 300 AM peak hour trips and 623 PM peak hour trips are forecast for the ultimate development. The forecast Ascot Racecourse LSP traffic represents 28.5% of total forecast AM peak hour traffic volumes, and 44.3% of total forecast PM peak hour volumes.

Table 18 – Ultimate development land uses

Land Use	AM Peak IN	AM Peak OUT	PM Peak IN	PM Peak OUT
Golden Gateway	247	436	387	326
Ascot Kilns	22	47	39	30
Sub Total	270	483	426	356
Ascot Racecourse Area A	29	88	78	39
Ascot Racecourse Area D	28	44	33	23
Ascot Racecourse Area E	89	22	217	233
Ascot Sub Total	146	154	328	295
Total	**416**	**637**	**754**	**651**

5.5.6 10 Year Trip Generation

By 2031 it is assumed that 25% of Ascot Kilns and Golden Gateway development will be redeveloped, with 75% of the existing commercial uses retained. Based on the Ascot Racecourse LSP Traffic Impact Assessment, the Perth Racing Landholdings is expected to be fully developed by 2036, therefore it is assumed that by 2031 50% of the Ascot Racecourse LSP will be complete.

The 2031 forecast is for 185 trips to be generated in the AM peak hour (65 trips to the site and 120 trips from the site) with 185 trips forecast to be generated in the PM peak hour (101 trips to the site and 84 trips from the site), as summarised in Table 19.

Table 19 – 10-year development land uses

Land Use	AM Peak IN	AM Peak OUT	PM Peak IN	PM Peak OUT
Golden Gateway	62	109	97	82
Ascot Kilns	6	12	10	7
Ascot Racecourse	73	77	164	148
Total	**140**	**198**	**271**	**237**
Existing land uses (75% retained)	**106**	**78**	**72**	**166**

5.6 Trip Distribution

Trips to and from the Golden Gateway precinct were distributed according to the relative proportion of existing vehicle volumes travelling to and from the precinct along each route in each of the peak hours, with a slight reassignment of trips to/from Hardey Road south to Belgravia Street.

Regional through traffic is assigned to the existing major routes.

The AM peak distribution of trips to and from the precinct is shown in Figure 47, while the PM peak is shown in Figure 48.

Figure 47 – Distribution of AM Peak Trips to and from the Precinct Ultimate Development

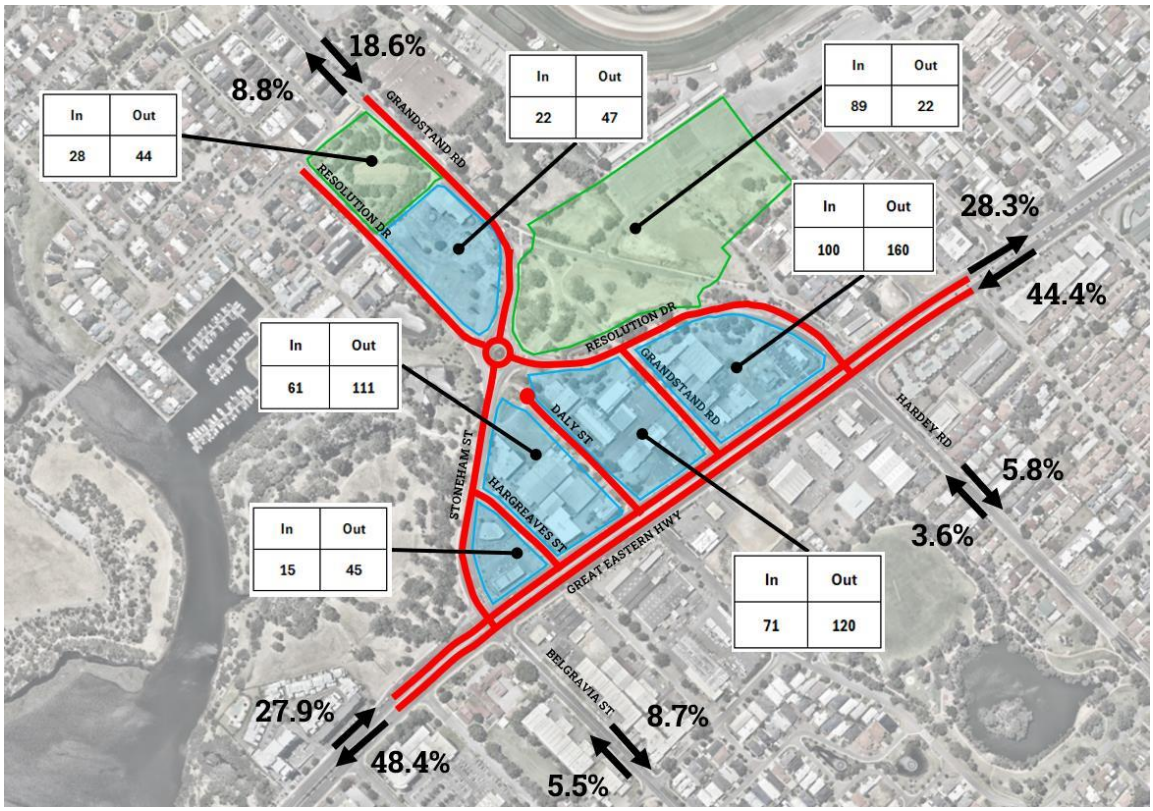
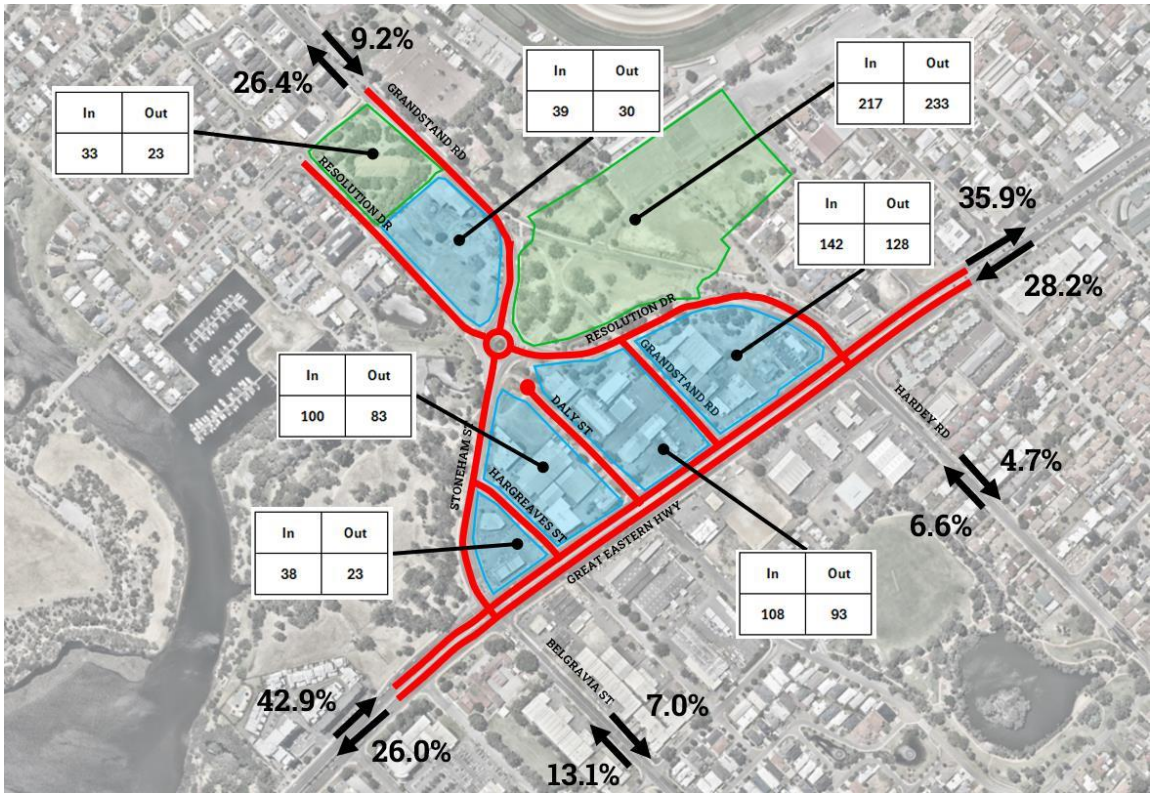


Figure 48 – Distribution of PM Peak Trips to and from the Precinct Ultimate Development



The existing peak hour traffic to and from Hargreaves Street, Daly Street and Grandstand Road will also be reduced by 25%, to reflect the traffic to and from the 75% of existing precinct land uses which are expected to be retained.

Forecast turning traffic volumes for the intersections within the precinct which have been derived from the traffic generation and distribution processes are outlined in Appendix 8.

5.7 SIDRA Network Modelling

SIDRA is a modelling tool that can be used to assess the performance of an individual intersection, or a network of intersections. The SIDRA models have been developed in accordance with Main Roads' Operational Modelling Guidelines.

The performance of the overall network and individual intersections is expressed as a level of service. Level of service ranges from A to F, where A is the highest level of performance (unimpeded traffic flow, minimal delay) and F is the lowest (high levels of congestion, extreme delays, demand exceeds capacity). The level of service designation is based on delay. The Highway Capacity Manual sets out the ranges of delay for each level of service, which differs slightly between signalised and non-signalised intersections, and is reproduced in Table 20.

Table 20 – Level of Service Ranges for Signalised, Roundabout and Priority Controlled Intersections

Ranges of Delay for each Level of Service and Intersection Type (seconds)			
LoS	Signalised	Roundabout	Give Way / Stop Sign
A	0 - 10	0 – 10	0 - 10
B	10 - 20	10 – 20	10 - 15
C	20 - 35	20 – 35	15 - 25
D	35 - 55	35 – 50	25 - 35
E	55 - 80	50 – 70	35 - 50
F	80+	70+	50+

5.7.1 Base Network Modelling

To gain an understanding of the existing performance of the road network, and the impact of continued traffic growth on this performance, the following three scenarios have been assessed for the AM and PM peak periods:

- Existing road network, with 2021 volumes (no Golden Gateway development);
- Existing road network, with 2031 volumes (no Golden Gateway development); and
- Existing road network, with 2041 volumes (no Golden Gateway development).

The SIDRA predicted AM peak hour performance of the existing network with 2021, 2031 and 2041 forecast volumes (without any Golden Gateway redevelopment traffic) is shown in Figure 49.

The SIDRA predicted PM peak hour performance of the existing network with 2021, 2031 and 2041 forecast volumes (without any Golden Gateway redevelopment traffic) is shown in Figure 50.

The SIDRA predicted queue storage ratios (showing the 95th percentile queues) of the existing network with 2021, 2031 and 2041 volumes is shown in Figure 51 for the AM peak hour and Figure 52 for the PM peak hour.

The SIDRA predicted level of service for the signalised intersections of Great Eastern Highway/Stoneham Street/ Belgravia Street, Great Eastern Highway/Resolution Drive/Hardey Road, and the roundabout controlled intersection of Stoneham Street/Grandstand Road/Resolution Drive for 2021, 2031 and 2041 volumes are summarised in Table 21.

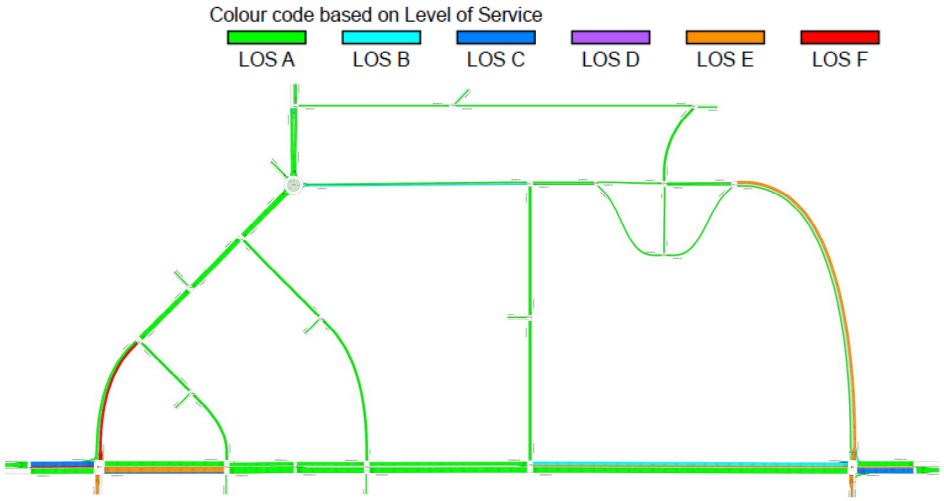
Detailed SIDRA Network output for these intersections is displayed in Appendix 1 (for 2021), Appendix 2 (for 2031) and Appendix 3 (for 2041).

Table 21 – SIDRA Predicted Intersection Approach Level of Service – Base Network

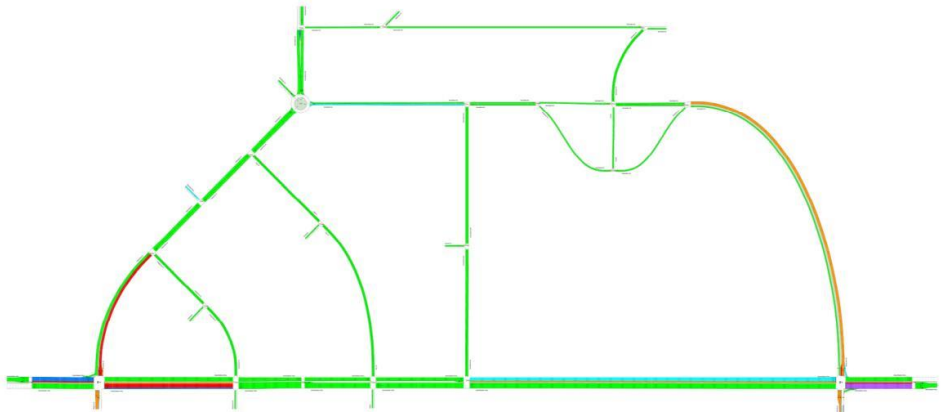
Approach	AM Peak			PM Peak		
	2021	2031	2041	2021	2031	2041
Great Eastern Hwy / Stoneham St / Belgravia St						
Belgravia St	E	E	E	E	E	E
Great Eastern Hwy east	D	F	F	D	D	D
Stoneham St	F	F	F	E	E	E
Great Eastern Hwy west	C	C	C	C	C	D
Great Eastern Hwy / Resolution Dr / Hardey Rd						
Hardey Rd	E	E	E	E	E	E
Great Eastern Hwy east	C	D	F	D	D	D
Resolution Dr	D	D	E	D	E	E
Great Eastern Hwy west	C	C	C	D	D	E
Stoneham St / Grandstand Rd / Resolution Dr						
Resolution Dr east	B	B	B	B	B	B
Grandstand Rd north	A	A	A	A	A	A
Resolution Dr west	A	A	A	B	B	B
Stoneham St south	A	A	A	A	B	B

The SIDRA Network base modelling demonstrates that the signalised intersections along the Great Eastern Highway corridor are congested in each of the peak hours. While the Great Eastern Highway approaches currently operate at a level of service C and D, the side roads, particularly Stoneham Street, Belgravia Street, and Hardey Street currently operate at a level of service E of F in the peak periods. The side roads experience congestion as more than half of the traffic signal green time is allocated to Great Eastern Highway. This congestion is expected to continue as volumes increase, with regional background traffic growth predicted to cause the Great Eastern Highway eastern approaches to operate at LOS F in the 2041 AM peak.

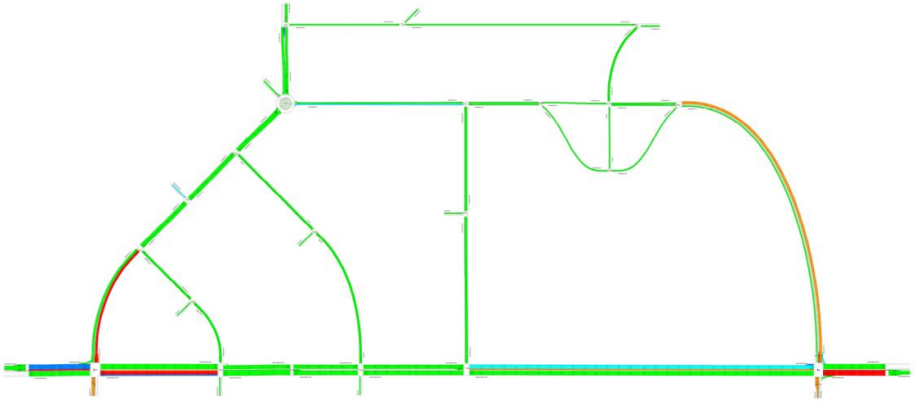
Figure 49 – SIDRA Output Network Level of Service AM Peak – Base Network



2021 Volumes

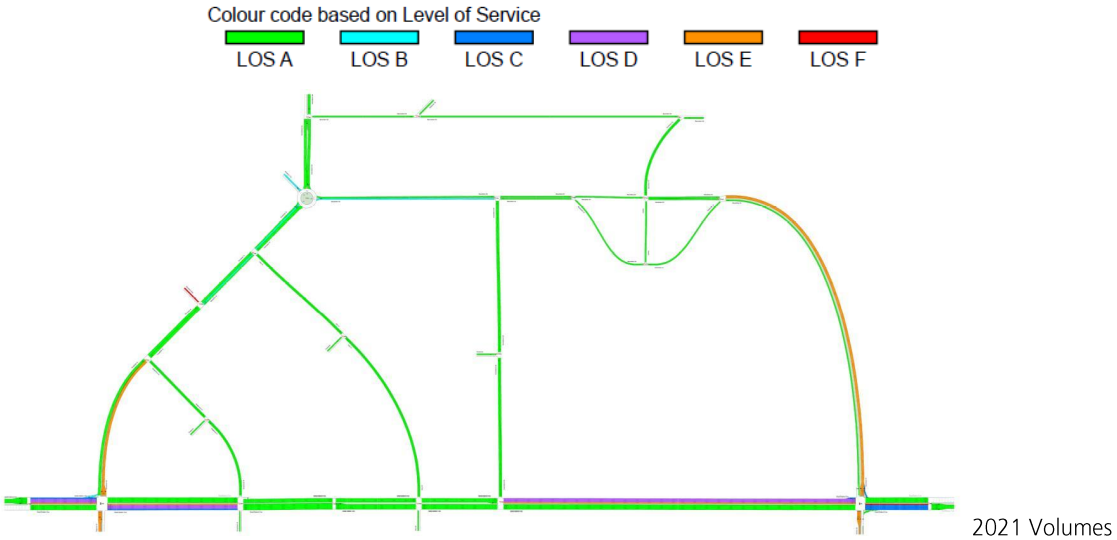


2031 Volumes

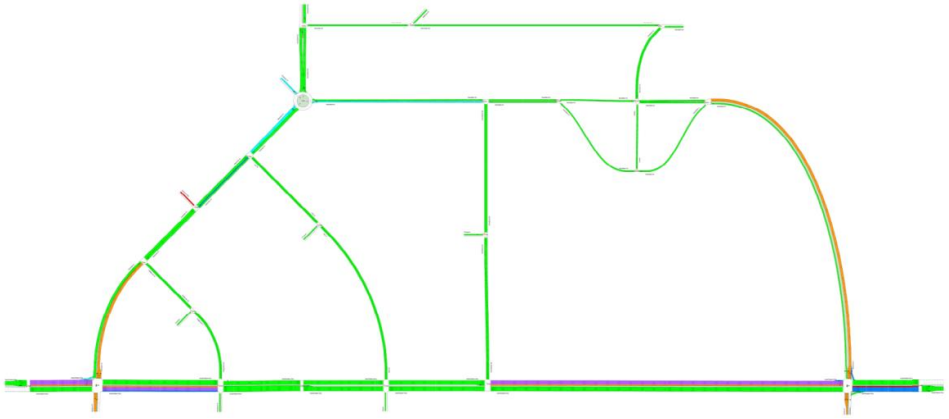


2041 Volumes

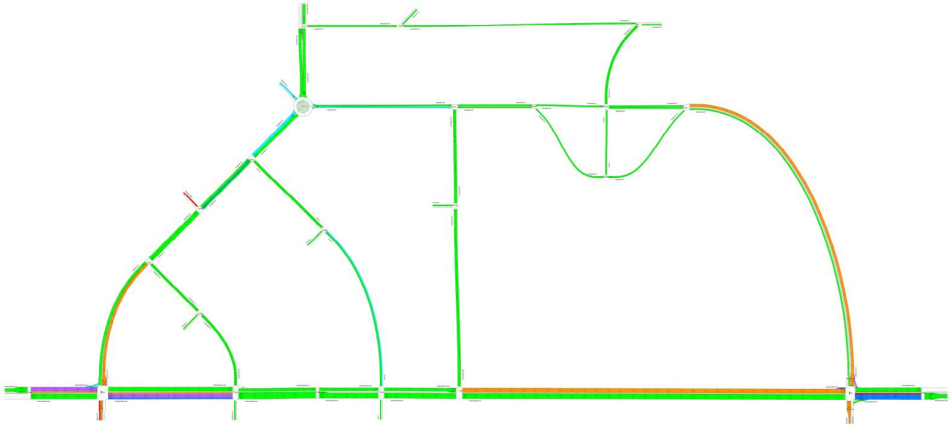
Figure 50 – SIDRA Output Network Level of Service PM Peak – Base Network



2021 Volumes

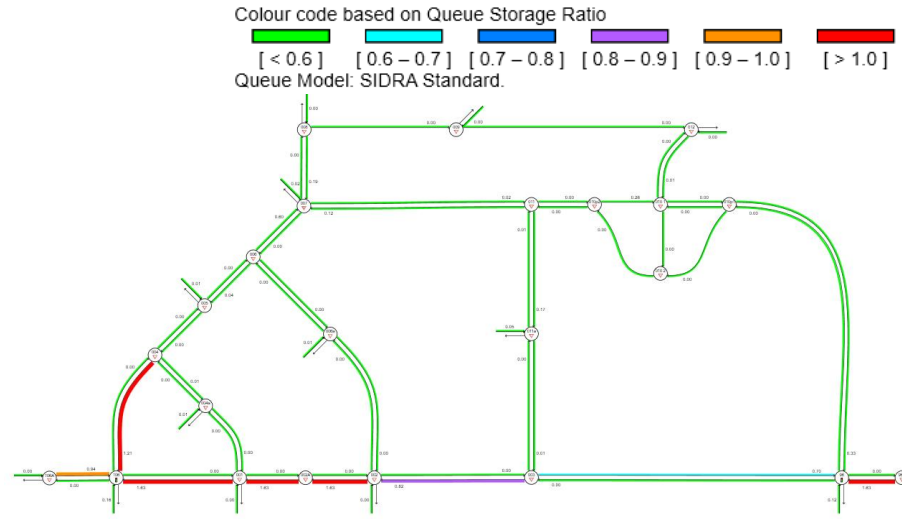


2031 Volumes

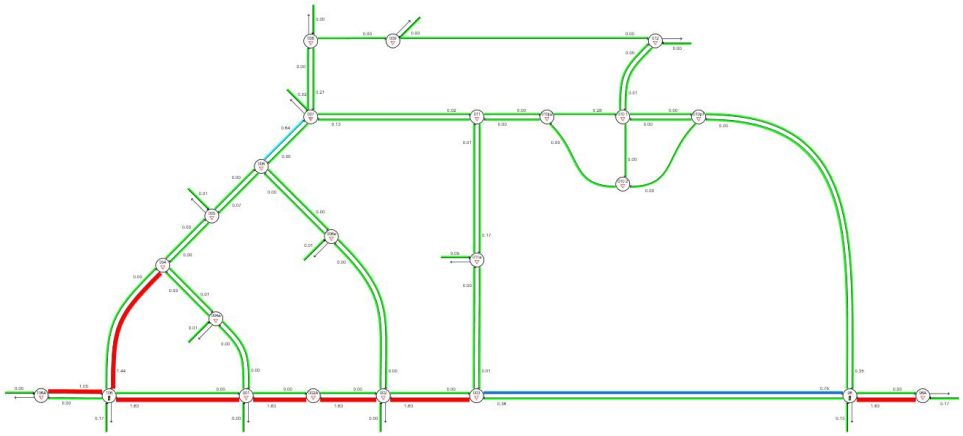


2041 Volumes

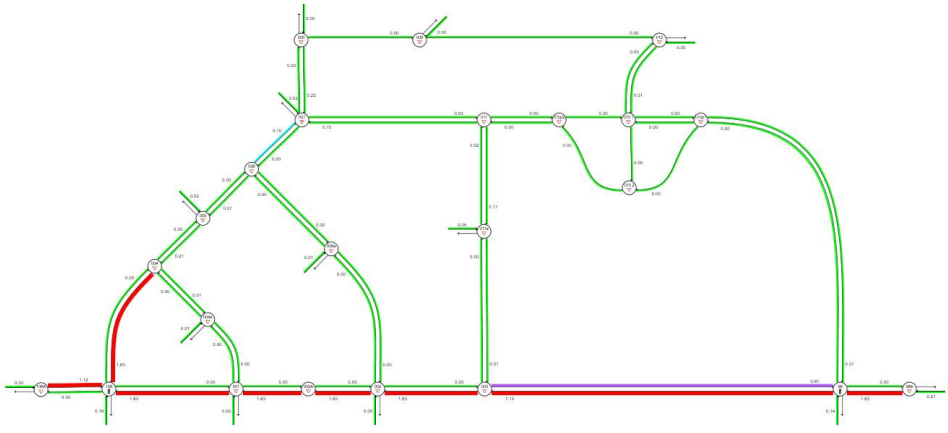
Figure 51 – SIDRA Output Network Queue Storage Ratio AM Peak – Base Network



2021 Volumes

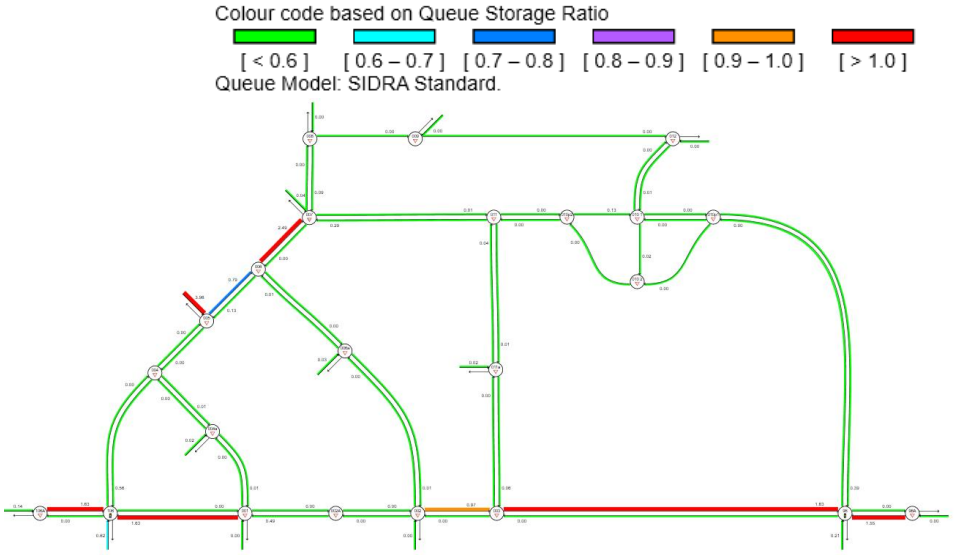


2031 Volumes

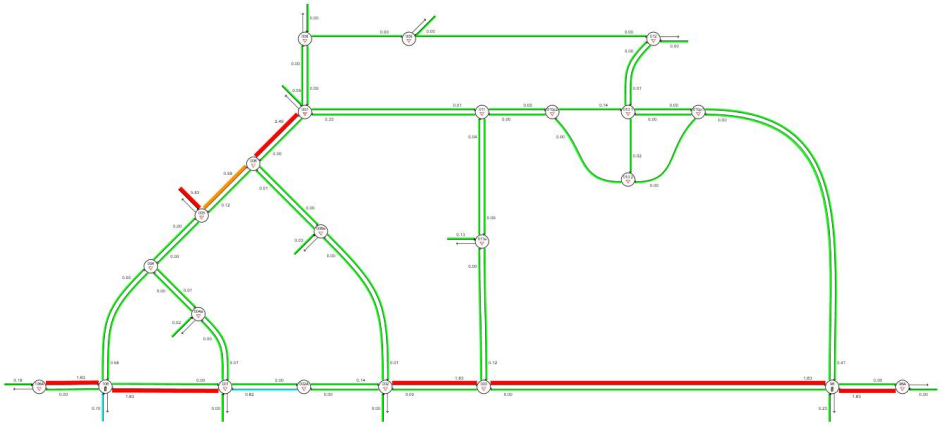


2041 Volumes

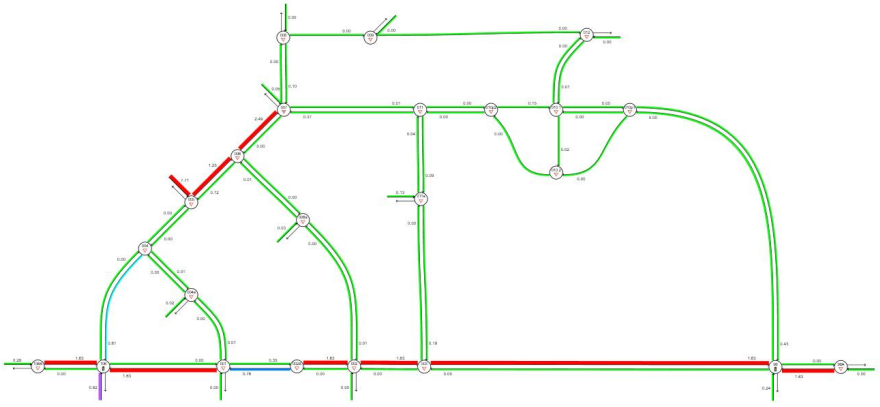
Figure 52 – SIDRA Output Network Queue Storage Ratio PM Peak – Base Network



2021 Volumes



2031 Volumes



2041 Volumes

5.7.2 Forecast Year - Proposed Road Network and Development

The proposed road network has been tested for three scenarios, as follows:

- Base year (2021) with proposed road network and no intensification of land use (existing traffic volumes);
- Forecast year (2031) with proposed road network and 25% of Ascot Kilns and Golden Gateway development, 50% of Ascot Racecourse development complete (and 75% of the existing commercial development retained);
- Forecast year (2041) with proposed road network and 100% of development complete.

The SIDRA predicted AM peak hour performance for the 2021, 2031 and 2041 land uses are shown in Figure 53, while the predicted PM peak hour performance for the 2021, 2031 and 2041 land uses are shown in Figure 54.

The SIDRA predicted queue storage ratios are shown in Figure 55 for the AM peak hour and Figure 56 for the PM peak hour.

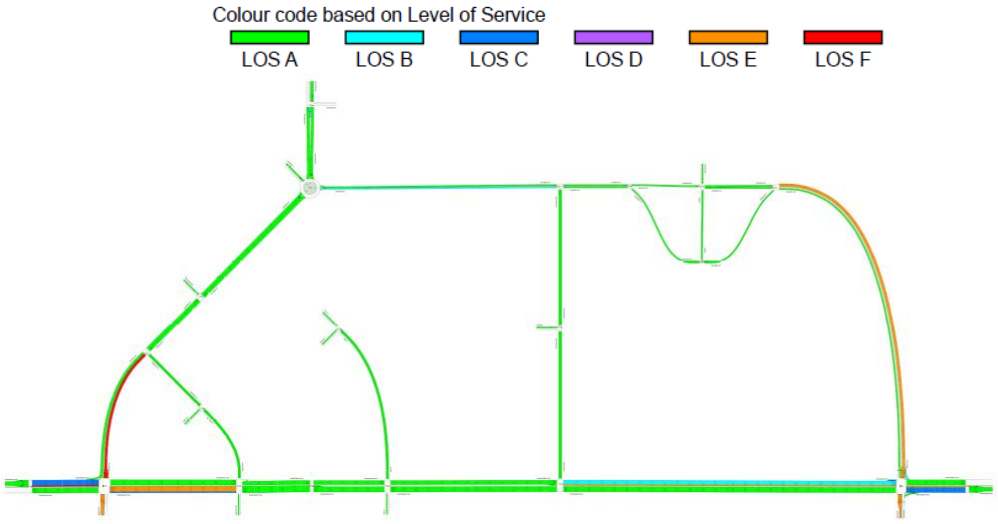
The SIDRA predicted level of service for the signalised and roundabout controlled intersections in the proposed road network are summarised in Table 22.

Detailed SIDRA Network output for these intersections is displayed in Appendix 4 (2021 Proposed Road Network), Appendix 5 (2031 land uses with proposed road network) and Appendix 6 (2041 land uses with proposed road network).

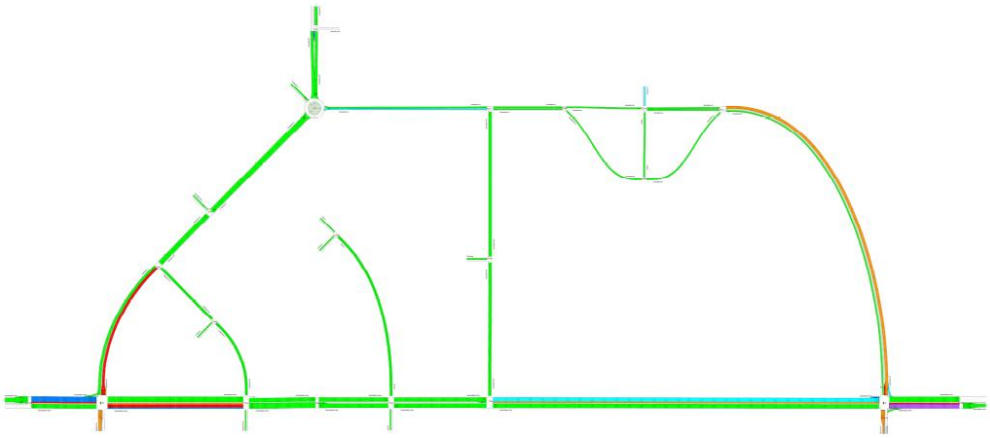
Table 22 – SIDRA Predicted Intersection Approach Level of Service

Approach	2021		2031		2041	
	AM	PM	AM	PM	AM	PM
Great Eastern Hwy / Stoneham St / Belgravia St						
Belgravia St	E	E	E	E	E	F
Great Eastern Hwy east	D	D	F	D	F	D
Stoneham St	F	E	F	F	F	F
Great Eastern Hwy west	C	C	C	C	C	D
Great Eastern Hwy / Resolution Dr / Hardey Rd						
Hardey Rd	E	E	E	E	E	E
Great Eastern Hwy east	C	D	E	F	F	F
Resolution Dr	D	D	D	D	E	E
Great Eastern Hwy west	C	D	C	D	C	E
Stoneham St / Grandstand Rd / Resolution Dr						
Resolution Dr east	B	B	B	B	F	B
Grandstand Rd north	A	A	A	A	B	A
Resolution Dr west	A	B	A	B	A	B
Stoneham St south	A	B	A	B	A	B

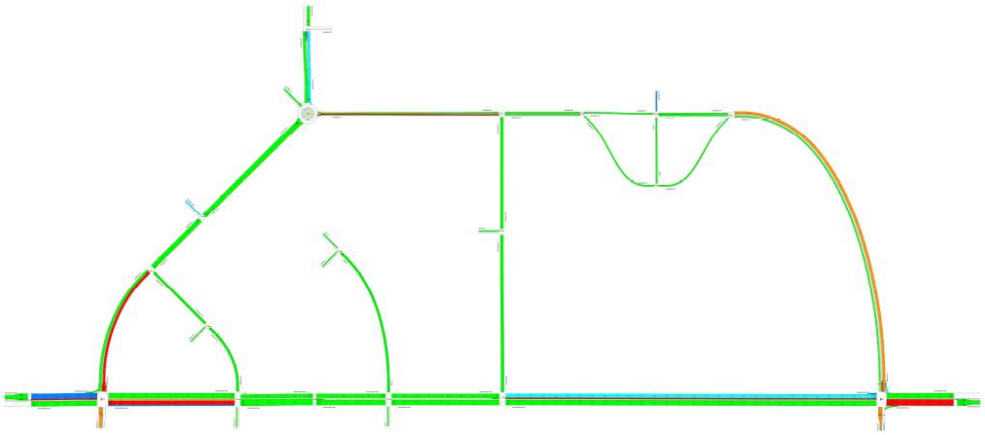
Figure 53 – SIDRA Output Network Level of Service AM Peak Proposed Road Network



2021 Land Uses

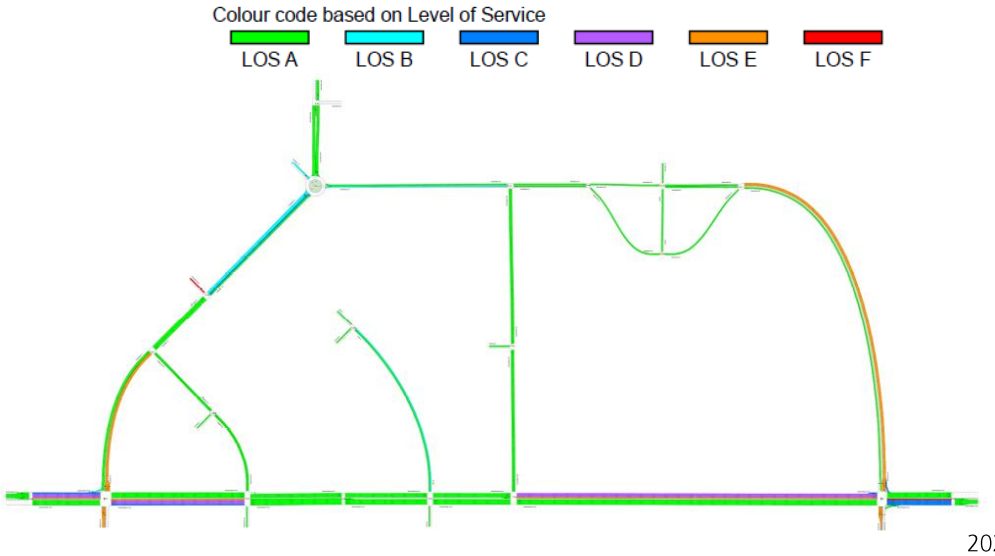


2031 Land Uses

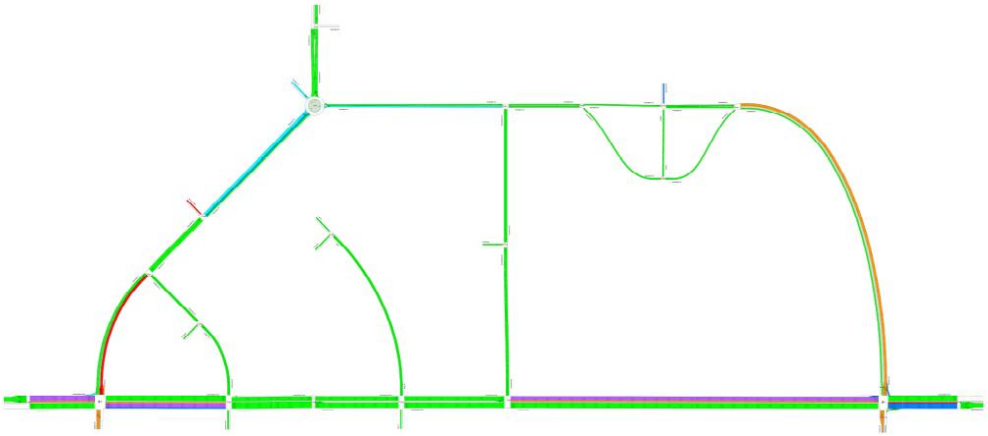


2041 Land Uses

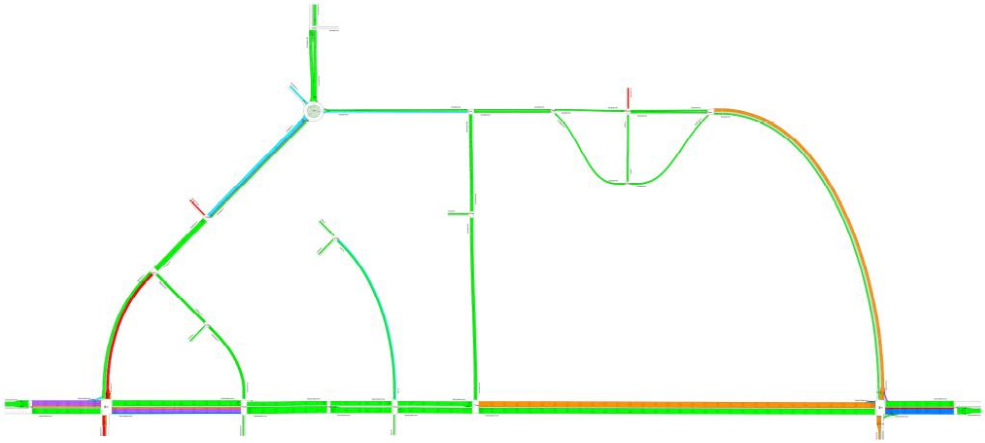
Figure 54 – SIDRA Output Network Level of Service PM Peak Proposed Road Network



2021 Land Uses

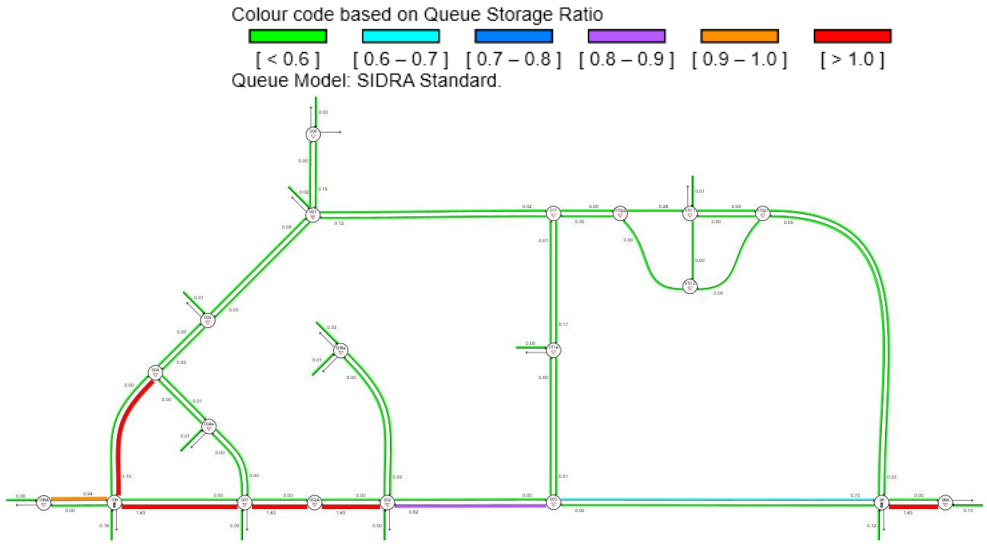


2031 Land Uses

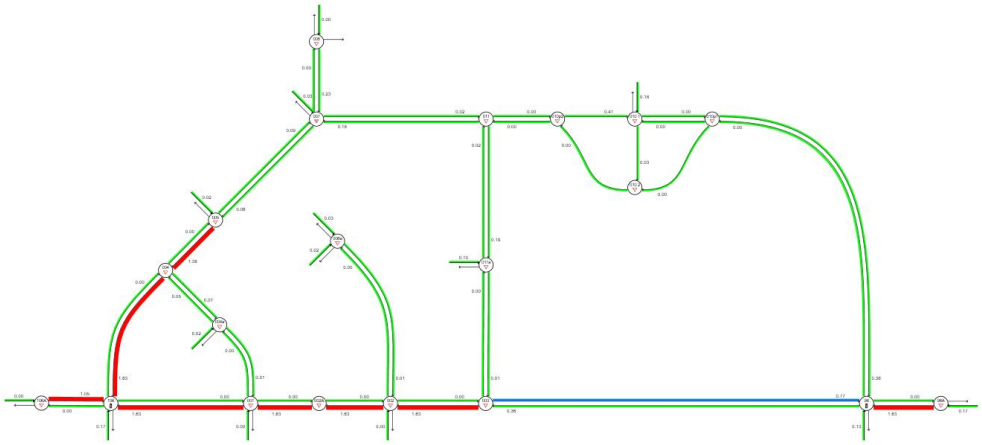


2041 Land Uses

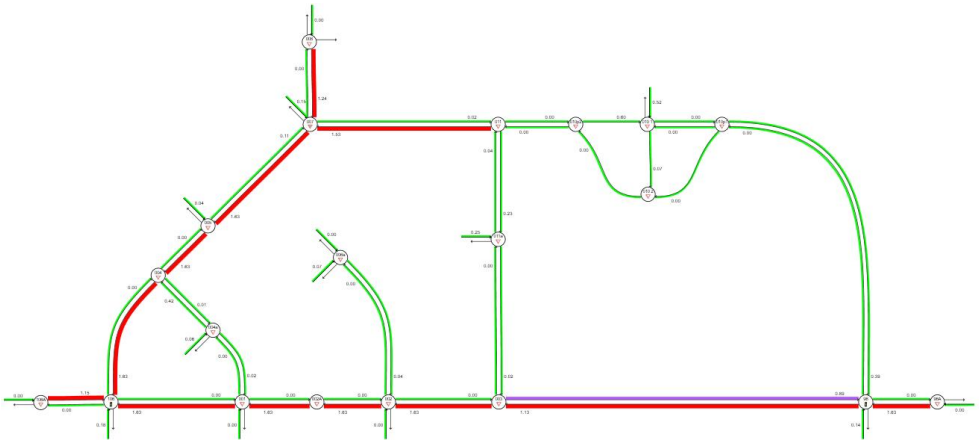
Figure 55 – SIDRA Output Network Queue Storage Ratio AM Peak Proposed Road Network



2021 Land Uses

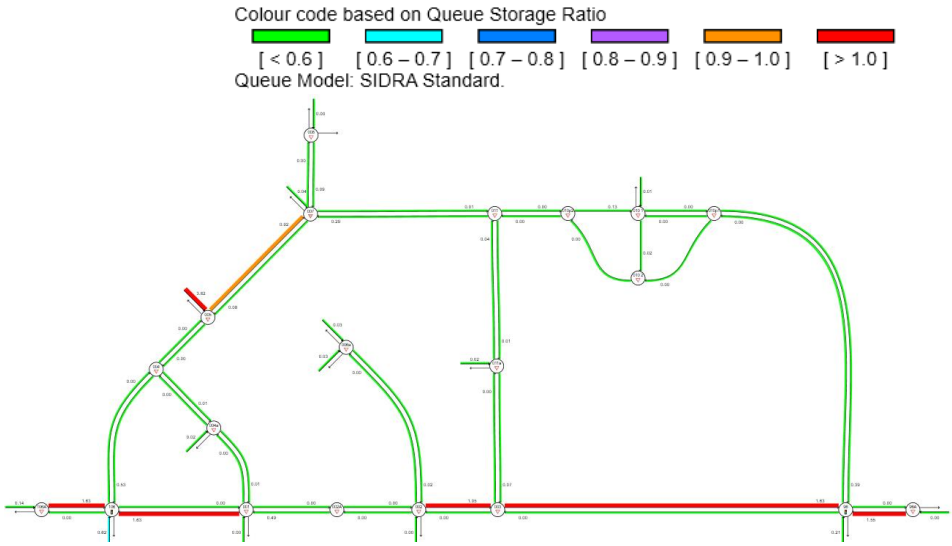


2031 Land Uses

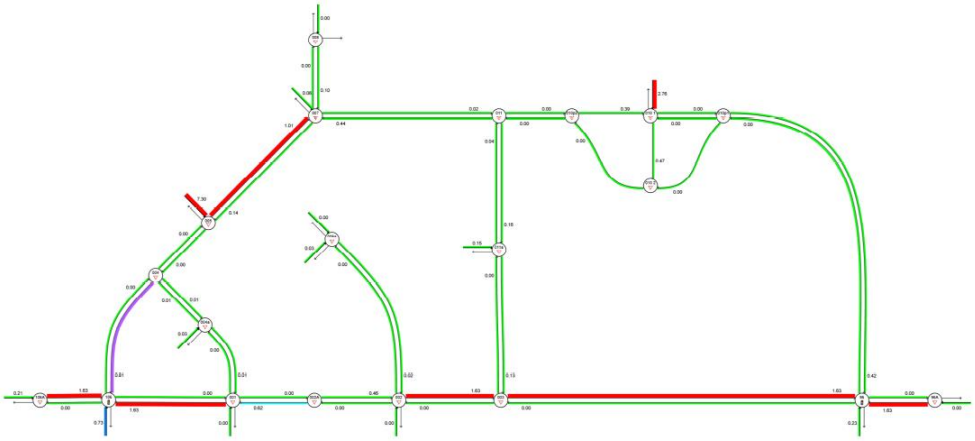


2041 Land Uses

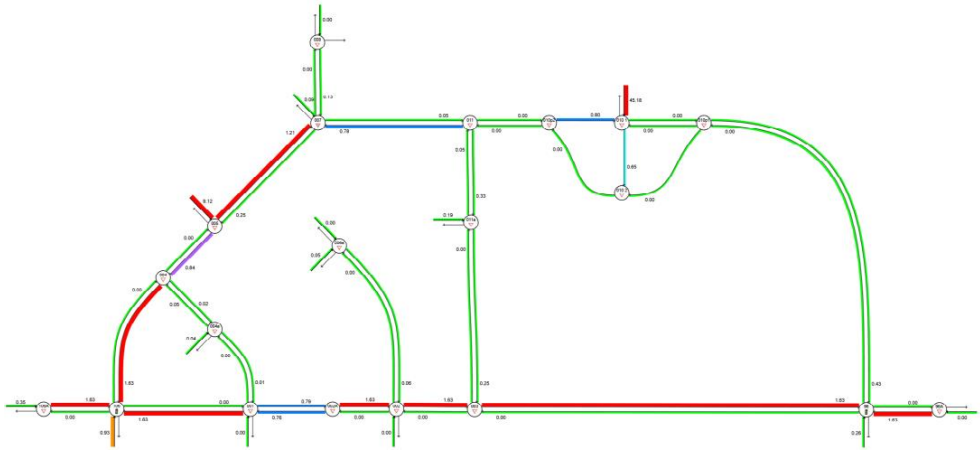
Figure 56 – SIDRA Output Network Queue Storage Ratio PM Peak Proposed Road Network



2021 Land Uses



2031 Land Uses



2041 Land Uses

The SIDRA Network modelling of the proposed road network demonstrates that the level of congestion in 2021 and 2031 is generally consistent with the congestion predicted for the 2021 and 2031 existing road network scenario. The internal roads are predicted to operate well within their capacity.

The SIDRA Network modelling of the proposed road network and full build out of the Golden Gateway precinct demonstrates that the level of congestion is 2041 is generally consistent with the congestion predicted for the 2041 existing road network scenario, with added congestion along Resolution Drive associated with the development of the Ascot Racecourse landholdings. Congestion along the Resolution Drive approach to Great Eastern Highway is predicted to increase in the AM peak period, while congestion along the Stoneham Street approach to Great Eastern Highway will increase in the PM peak period. The other internal roads are predicted to operate well within their capacity.

5.7.3 Ascot Event Modelling

To understand how the road network performs under as Ascot event, the following four scenarios have been assessed:

- Existing road network, 2021 PM peak volumes with Melbourne Cup event traffic;
- Proposed road network, 2021 PM peak volumes with Melbourne Cup event traffic;
- Proposed road network, 2031 PM peak background volumes and development traffic with Melbourne Cup event traffic;
- Proposed road network, 2041 PM peak background volumes and development traffic with Melbourne Cup event traffic.

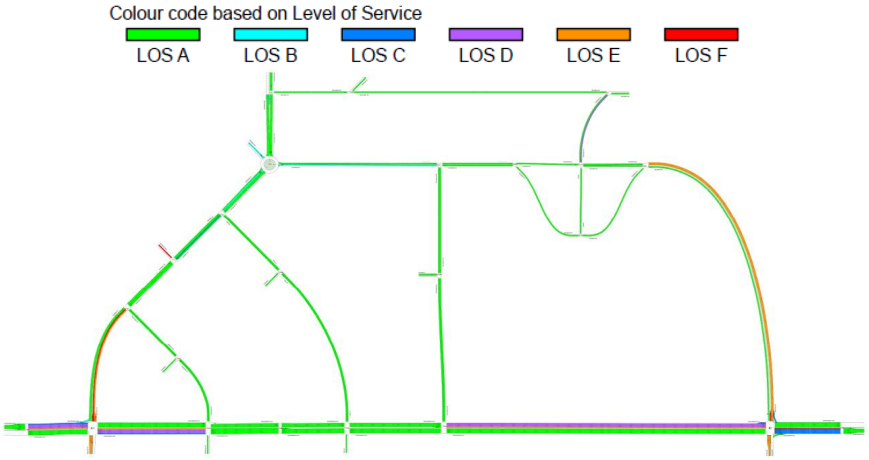
The SIDRA predicted PM peak hour performance of an Ascot Melbourne Cup event with 2021 volumes (existing network and proposed network) is shown in Figure 57. The SIDRA predicted PM peak hour performance of an Ascot Melbourne Cup event with the proposed network and 2031 and 2041 volumes are shown in Figure 58. The SIDRA predicted level of service for the signalised and roundabout controlled intersections in the existing network and proposed road network are summarised in Table 23.

Detailed SIDRA Network output for these intersections is displayed in Appendix 7.

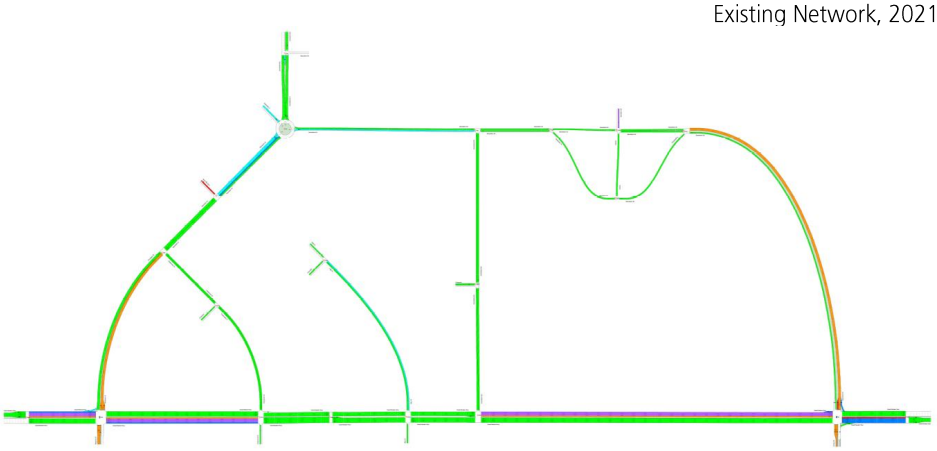
Table 23 – SIDRA Predicted Intersection Approach Level of Service – Ascot Event

Approach	Existing Network 2021 vols + event	Proposed Network 2021 vols + event	Proposed Network 2031 vols + event	Proposed Network 2041 vols + event
Great Eastern Hwy / Stoneham St / Belgravia St				
Belgravia St	E	E	E	F
Great Eastern Hwy east	D	D	D	D
Stoneham St	E	E	F	F
Great Eastern Hwy west	C	C	C	D
Great Eastern Hwy / Resolution Dr / Hardey Rd				
Hardey Rd	E	E	E	E
Great Eastern Hwy east	D	D	F	F
Resolution Dr	E	E	E	E
Great Eastern Hwy west	D	D	D	E
Stoneham St / Grandstand Rd / Resolution Dr				
Resolution Dr east	B	B	B	B
Grandstand Rd north	A	A	A	A
Resolution Dr west	B	B	B	B
Stoneham St south	A	B	B	B

Figure 57 – SIDRA Output Network Level of Service Ascot Event PM Peak with 2021 Volumes

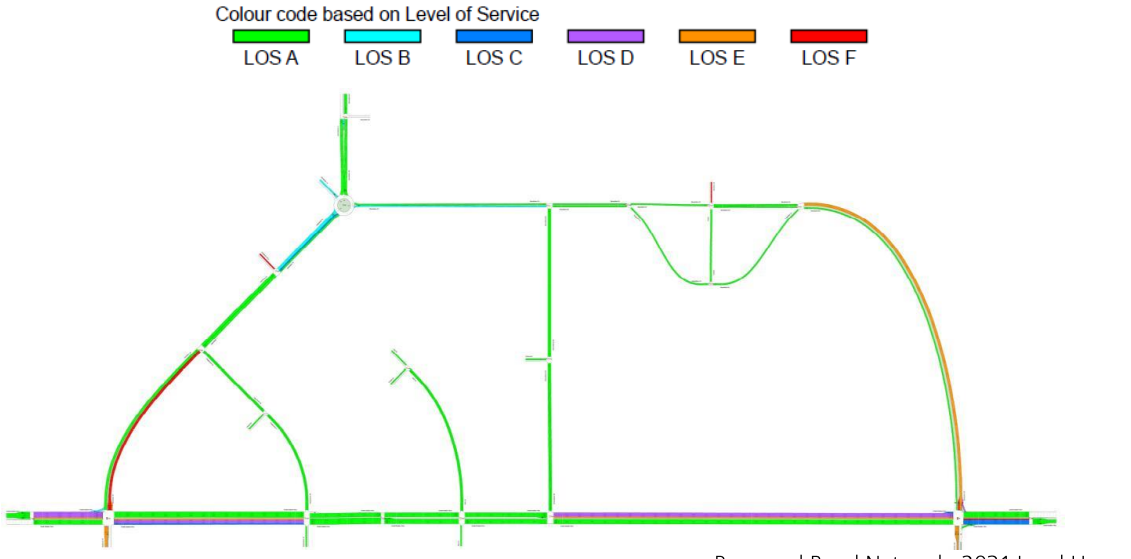


Existing Network, 2021 Volumes

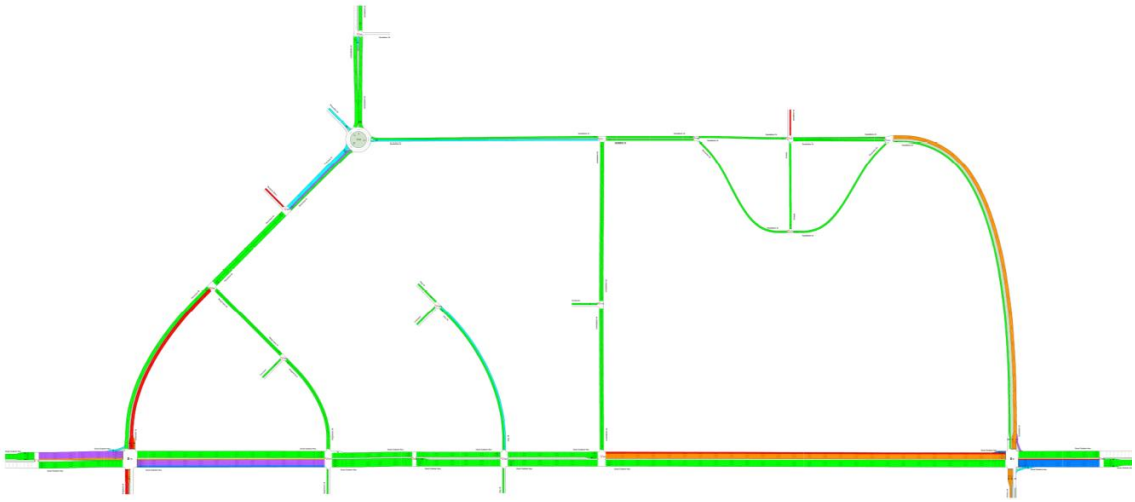


Proposed Network, 2021 Volumes

Figure 58 – SIDRA Output Network Level of Service Ascot Event PM Peak Proposed Network with Development Volumes



Proposed Road Network, 2031 Land Uses



Proposed Road Network, 2041 Land Uses

The SIDRA Network base modelling demonstrates that the signalised intersections along the Great Eastern Highway corridor are congested in each of the peak hours. While the Great Eastern Highway approaches currently operate at a level of service C and D, the side roads, particularly Stoneham Street, Belgravia Street, and Hardey Street currently operate at a level of service E of F in the peak periods. The side roads experience congestion as more than half of the traffic signal green time is allocated to Great Eastern Highway.

The addition of Ascot event traffic to this busy PM peak increases the congestion in this period. Traffic exiting an event at Ascot is predicted to cause local congestion where this traffic joins the external road network, at the intersection of Raconteur Drive and Resolution Drive.

6. CONCLUSIONS

6.1 Golden Gateway Local Structure Plan Context

The Golden Gateway Precinct is located within the City of Belmont and the LSP area is bounded by Ascot Racecourse to the north/northeast, Hardey Road to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters residential estate to the west/northwest.

The Golden Gateway LSP is comprised of three main land uses, residential dwellings (approximately 2,268 dwellings), commercial space (6,979m^2 NLA) and retail space (1,200m^2 NLA). It is proposed that the three land uses will primarily be provided in mixed-use development sites across the Golden Gateway LSP area.

As noted in the Structure Plan Report, the LSP has been formulated around the following vision:

> *"The development of the Golden Gateway will transform this degraded and fragmented area into a vibrant precinct of residential and mixed use development, with strengthened connections to the Swan River and Ascot Waters, with uses, density and built form that derive best value from these attributes while respecting the area's rich culture and heritage."*

The overarching objectives for the Golden Gateway Precinct as established by the project team and reinforced through stakeholder engagement include:

- Improve self-containment of facilities – reduce car dependence;
- Improve people's connection to the Swan River;
- Create accessible, quality public realm within the precinct; and
- Identify appropriate uses/densities in conjunction with infrastructure improvements.

6.2 Conclusions

The weekday peak hour performance of the existing, and proposed movement networks under a range of Golden Gateway land use scenarios has been assessed. Traffic performance at an Ascot Racecourse event day has also been investigated.

6.2.1 Background Growth in Traffic

Traffic volumes along the section of Great Eastern Highway between Stoneham Street and Resolution Drive (site 1012) have reduced from 64,800 vpd in 2014 to 54,100 vpd in 2018, a reduction of 16.5% over the 4 year period. Similarly at sites 3404 and 7938 (along Great Eastern Highway to the west and east of the Golden Gateway precinct respectively), daily traffic volumes on Great Eastern Highway reduced by between 1.4% and 4.3% over the two year period between 2018 and 2020. Despite these reductions, background traffic volumes are expected to increase over time.

As traffic volumes continue to increase, the proportion of total traffic occurring during the morning and afternoon peak hours reduces. This phenomenon is called peak spreading, and results in a lengthening of the peak period. This also results in the growth in peak hour traffic being less than the growth in daily traffic volumes.

An annual peak hour growth rate of 0.5% has been assumed. This represents an increase of 5.1% between 2021 and 2031 and an increase of 10.5% between 2021 and 2041. The peak hour growth rate has been applied to all through traffic (excluding buses) travelling on regional and district roads such as Great Eastern Highway, Stoneham Street, Resolution Drive and Grandstand Road (north). The growth in regional peak hour traffic, without any development traffic, is predicted to lead to the deterioration of signalised intersection operation to level of service F by 2041 in the AM peak hour.

6.2.2 Intersection Performance

Stoneham Street/Great Eastern Highway Intersection

This intersection currently operates at an overall level of service D in both the AM and PM peak. The Great Eastern Highway approaches operate at a level of service C/D, which is particularly good given the traffic volumes. Belgravia Street and Stoneham Street operate at a level of service E/F.

As traffic volumes increase over time (without the inclusion of traffic associated with the development of the Golden Gateway precinct) the performance of the intersection will decrease, particularly in the AM peak hour, where a level of service F is predicted by 2041 (the PM peak hour is still predicted to operate at a level of service D).

When traffic associated with the development of the Golden Gateway precinct and Ascot Racecourse landholdings is included, the performance of the Belgravia Street and Stoneham Street approaches decreases. The overall intersection level of service in 2041 is predicted to be F in the AM peak hour, and E in the PM peak hour.

Resolution Drive/Great Eastern Highway Intersection

This intersection currently operates at an overall level of service C in the AM and D in the PM peak. The Great Eastern Highway approaches operate at a level of service C in the AM peak hour and D in the PM peak hour, which is very good given the traffic volumes. Hardey Road and Resolution Drive operate at a level of service D/E.

As traffic volumes increase over time (without the inclusion of traffic associated with the development of the Golden Gateway precinct) the performance of the intersection will decrease, particularly in the AM peak hour, where a level of service F is predicted by 2041, while a level of service E is predicted for the PM peak hour.

When traffic associated with the development of the Golden Gateway precinct and Ascot Racecourse landholdings is included, the performance of the Resolution Drive approach decreases in the AM peak, as does the Great Eastern Highway east approach (westbound) in the PM peak hour. The overall intersection level of service in 2041 is predicted to be F in both the AM and PM peak hours.

Grandstand Road/Resolution Drive/Stoneham Street Intersection

This roundabout controlled intersection currently operates at an overall level of service A in both the AM and PM peak, with all approaches operating at a level of service A/B.

As traffic volumes increase over time (without the inclusion of traffic associated with the development of the Golden Gateway precinct) the performance of the intersection is predicted to maintain a level of service A by 2041 in the AM peak hour and decrease to a level of service B in the PM peak hour.

When traffic associated with the development of the Golden Gateway precinct and Ascot Racecourse landholdings is included, the performance of the Resolution Drive approach to the roundabout reduces, however the overall intersection level of service is predicted to be C in the AM peak hour and B in the PM peak hour in 2041. Traffic volumes along Resolution Drive are forecast to increase with the development of the Ascot Racecourse landholdings, with the most traffic intensive developments (Ascot Racecourse Area E) to be accessed via Resolution Drive.

6.2.3 Pedestrian, Cycle and Public Transport Networks

The future development of the Golden Gateway Structure Plan would not only transform the pedestrian and cycle connections throughout the precinct, but also provide a resident population that could be the catalyst in a step change in public transport service provision across the local area.

To achieve the 20% reduction in car driver and car passenger mode share, the following strategies are recommended:

- Implementation of a precinct wide 30km/h speed zone (excluding Grandstand Road and Stoneham Street as the main through route for traffic) to improve the environment for walking and cycling
- Completing gaps in the shared path network and implementing the long term cycle network routes through the precinct.
- Increasing the tree canopy coverage along all roads within the precinct to create a pleasant environment for walking and cycling.
- Ensuring there are a variety of local amenities within a short and pleasant walking or biking distance.
- The introduction of a bike or electric scooter share scheme.
- The introduction of a car share scheme.
- The imposition of a parking cap for residential and commercial uses.
- The City should lobby the PTA to improve bus services to the precinct and explore the potential of other transit options such as a superbus or trackless tram

Appendix 1 – SIDRA Network Output 2021 Existing Network

NETWORK SUMMARY

Network: N101 [2021 AM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS D					
Speed Efficiency	0.58					
Travel Time Index	5.34					
Congestion Coefficient	1.72					
Travel Speed (Average)	34.7	km/h			35.1	km/h
Travel Distance (Total)	10603.9	veh-km/h			16521.7	pers-km/h
Travel Time (Total)	305.4	veh-h/h			470.2	pers-h/h
Desired Speed (Program)	59.8	km/h				
Demand Flows (Total for all Sites)	47016	veh/h			75212	pers/h
Arrival Flows (Total for all Sites)	47016	veh/h			75212	pers/h
Demand Flows (Entry Total)	6526	veh/h				
Midblock Inflows (Total)	98	veh/h				
Midblock Outflows (Total)	-90	veh/h				
Percent Heavy Vehicles (Demand)	4.3	%				
Percent Heavy Vehicles (Arrival)	4.3	%				
Degree of Saturation	1.001					
Control Delay (Total)	127.01	veh-h/h			183.54	pers-h/h
Control Delay (Average)	9.7	sec			8.8	sec
Control Delay (Worst Lane)	109.3	sec				
Control Delay (Worst Movement)	109.6	sec			109.6	sec
Geometric Delay (Average)	0.6	sec				
Stop-Line Delay (Average)	9.1	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	10215	veh/h			19053	pers/h
Effective Stop Rate	0.22		0.96	per km	0.25	
Proportion Queued	0.20				0.18	
Performance Index	893.5				893.5	
Cost (Total)	15229.39	$/h	1.44	$/km	15229.39	$/h
Fuel Consumption (Total)	1348.6	L/h	127.2	mL/km		
Fuel Economy	12.7	L/100km				
Carbon Dioxide (Total)	3199.2	kg/h	301.7	g/km		
Hydrocarbons (Total)	0.280	kg/h	0.026	g/km		
Carbon Monoxide (Total)	3.288	kg/h	0.310	g/km		
NOx (Total)	7.463	kg/h	0.704	g/km		

Network Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.0% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	22,567,680	veh/y	36,101,960	pers/y
Delay	60,963	veh-h/y	88,101	pers-h/y
Effective Stops	4,903,093	veh/y	9,145,675	pers/y
Travel Distance	5,089,875	veh-km/y	7,930,398	pers-km/y
Travel Time	146,599	veh-h/y	225,674	pers-h/y
Cost	7,310,108	$/y	7,310,108	$/y
Fuel Consumption	647,308	L/y		
Carbon Dioxide	1,535,624	kg/y		
Hydrocarbons	135	kg/y		
Carbon Monoxide	1,578	kg/y		
NOx	3,582	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2021 (Site Folder: 2021 AM Peak)] **Network: N101 [2021 AM Peak (Network Folder: General)]**

GEH / Stoneham St / Belgravia St
Traffic signals
2021 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	60	5.0	60	5.0	0.371	65.2	LOS E	5.1	38.4	0.96	0.77	0.96	12.2
2	T1	107	8.4	107	8.4	* 0.371	59.6	LOS E	5.2	39.8	0.96	0.75	0.96	13.2
3	R2	70	10.0	70	10.0	0.334	65.2	LOS E	4.3	34.1	0.95	0.76	0.95	12.2
Approach		237	8.0	237	8.0	0.371	62.7	LOS E	5.2	39.8	0.96	0.76	0.96	12.6
East: Great Eastern Hwy														
4	L2	194	5.7	194	5.7	0.280	28.6	LOS C	8.7	66.7	0.65	0.73	0.65	24.3
5	T1	2486	4.5	2486	4.5	* 0.934	55.7	LOS E	17.8	130.6	1.00	1.06	1.18	6.0
6	R2	18	5.6	18	5.6	0.171	72.1	LOS E	1.2	9.6	0.98	0.70	0.98	4.9
6u	U	1	0.0	1	0.0	0.171	73.8	LOS E	1.2	9.6	0.98	0.70	0.98	4.9
Approach		2699	4.6	2699	4.6	0.934	53.9	LOS D	17.8	130.6	0.97	1.04	1.14	7.1
North: Stoneham St														
7	L2	6	16.7	6	16.7	0.031	60.2	LOS E	0.3	3.3	0.89	0.66	0.89	8.1
8	T1	293	4.1	293	4.1	* 1.001	108.2	LOS F	24.1	169.0	1.00	1.21	1.63	11.4
9	R2	459	0.4	459	0.4	1.001	109.6	LOS F	21.7	152.7	1.00	1.13	1.57	5.1
Approach		758	2.0	758	2.0	1.001	108.7	LOS F	24.1	169.0	1.00	1.16	1.59	7.8
West: Great Eastern Hwy														
10	L2	217	1.4	217	1.4	0.141	6.6	LOS A	1.6	11.0	0.18	0.60	0.18	31.6
11	T1	1426	5.3	1426	5.3	0.431	20.8	LOS C	12.7	94.5	0.55	0.48	0.55	15.8
12	R2	58	3.4	58	3.4	* 0.797	80.4	LOS F	6.3	44.6	1.00	0.89	1.27	12.9
12u	U	30	0.0	30	0.0	0.797	82.0	LOS F	6.3	44.6	1.00	0.89	1.27	5.1
Approach		1731	4.7	1731	4.7	0.797	22.0	LOS C	12.7	94.5	0.53	0.52	0.54	15.8
All Vehicles		5425	4.4	5425	4.4	1.001	51.8	LOS D	24.1	169.0	0.83	0.88	1.01	9.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2021 (Site Folder: 2021 AM Peak)] **Network: N101 [2021 AM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	97	2.1	97	2.1	0.514	67.8	LOS E	6.5	48.3	0.99	0.79	0.99	15.3
2	T1	108	5.6	108	5.6	0.514	61.7	LOS E	6.5	45.9	0.98	0.77	0.98	17.0
3	R2	124	4.0	124	4.0	* 0.626	69.2	LOS E	8.0	59.3	1.00	0.81	1.02	15.4
Approach		329	4.0	329	4.0	0.626	66.3	LOS E	8.0	59.3	0.99	0.79	1.00	15.9
East: Great Eastern Hwy														
4	L2	127	4.7	127	4.7	0.089	7.8	LOS A	1.3	9.1	0.22	0.61	0.22	45.2
5	T1	2479	4.8	2479	4.8	* 0.693	26.7	LOS C	22.2	163.2	0.81	0.73	0.81	13.0
6	R2	140	7.1	140	7.1	* 0.857	79.3	LOS E	11.0	83.1	1.00	0.95	1.30	5.2
6u	U	13	0.0	13	0.0	0.857	80.9	LOS F	11.0	83.1	1.00	0.95	1.30	5.2
Approach		2759	4.9	2759	4.9	0.857	28.8	LOS C	22.2	163.2	0.80	0.74	0.81	13.6
North: Resolution Dr														
7	L2	250	2.0	250	2.0	0.424	15.4	LOS B	7.2	51.8	0.53	0.73	0.53	21.5
8	T1	134	7.5	134	7.5	0.611	67.7	LOS E	5.7	40.0	1.00	0.77	1.02	19.1
9	R2	86	1.2	86	1.2	* 0.628	74.0	LOS E	5.7	40.4	1.00	0.79	1.04	6.3
Approach		470	3.4	470	3.4	0.628	41.0	LOS D	7.2	51.8	0.75	0.75	0.76	16.2
West: Great Eastern Hwy														
10	L2	8	0.0	8	0.0	0.030	23.8	LOS C	0.7	7.3	0.53	0.50	0.53	21.1
11	T1	1391	6.0	1391	6.0	0.495	18.3	LOS B	14.9	111.4	0.54	0.48	0.54	22.5
12	R2	100	1.0	100	1.0	0.638	70.3	LOS E	7.7	54.1	1.00	0.81	1.03	19.0
12u	U	18	0.0	18	0.0	0.638	71.9	LOS E	7.7	54.1	1.00	0.81	1.03	8.1
Approach		1517	5.6	1517	5.6	0.638	22.4	LOS C	14.9	111.4	0.58	0.51	0.58	21.4
All Vehicles		5075	4.9	5075	4.9	0.857	30.4	LOS C	22.2	163.2	0.74	0.68	0.75	16.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 AM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	28	7.1	28	7.1	0.358	6.8	LOS A	1.9	13.9	0.69	0.88	0.70	29.3
6a	R1	15	6.7	15	6.7	0.358	12.1	LOS B	1.9	13.9	0.69	0.88	0.70	39.3
6	R2	232	4.7	232	4.7	0.358	13.2	LOS B	1.9	13.9	0.69	0.88	0.70	29.3
Approach		275	5.1	275	5.1	0.358	12.5	LOS B	1.9	13.9	0.69	0.88	0.70	30.0
North: Grandstand Rd														
7	L2	408	2.7	408	2.7	0.405	3.9	LOS A	2.7	19.0	0.33	0.50	0.33	33.6
9a	R1	723	1.1	723	1.1	0.405	8.7	LOS A	2.7	19.0	0.34	0.57	0.34	31.0
9b	R3	6	0.0	6	0.0	0.405	11.2	LOS B	2.6	18.6	0.34	0.59	0.34	46.7
9u	U	2	0.0	2	0.0	0.405	12.4	LOS B	2.6	18.6	0.34	0.59	0.34	30.3
Approach		1139	1.7	1139	1.7	0.405	7.0	LOS A	2.7	19.0	0.34	0.54	0.34	31.9
NorthWest: Resolution Dr														
27b	L3	12	8.3	12	8.3	0.113	4.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
27a	L1	48	0.0	48	0.0	0.113	3.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
29	R2	46	0.0	46	0.0	0.113	9.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
Approach		106	0.9	106	0.9	0.113	6.0	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
SouthWest: Stoneham St														
30	L2	18	0.0	18	0.0	0.151	2.1	LOS A	0.8	6.0	0.42	0.43	0.42	47.1
30a	L1	318	2.8	318	2.8	0.151	2.2	LOS A	0.8	6.0	0.42	0.46	0.42	31.1
32a	R1	21	0.0	21	0.0	0.151	6.3	LOS A	0.8	5.8	0.43	0.49	0.43	30.3
32u	U	4	25.0	4	25.0	0.151	10.3	LOS B	0.8	5.8	0.43	0.49	0.43	30.3
Approach		361	2.8	361	2.8	0.151	2.5	LOS A	0.8	6.0	0.43	0.46	0.43	33.1
All Vehicles		1881	2.3	1881	2.3	0.405	6.9	LOS A	2.7	19.0	0.41	0.58	0.42	31.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK SUMMARY

Network: N101 [2021 PM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS D					
Speed Efficiency	0.51					
Travel Time Index	4.57					
Congestion Coefficient	1.96					
Travel Speed (Average)	30.5	km/h			31.5	km/h
Travel Distance (Total)	11447.1	veh-km/h			16730.4	pers-km/h
Travel Time (Total)	375.0	veh-h/h			531.8	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	50964	veh/h			75154	pers/h
Arrival Flows (Total for all Sites)	50628	veh/h			74750	pers/h
Demand Flows (Entry Total)	7292	veh/h				
Midblock Inflows (Total)	577	veh/h				
Midblock Outflows (Total)	-234	veh/h				
Percent Heavy Vehicles (Demand)	2.2	%				
Percent Heavy Vehicles (Arrival)	2.2	%				
Degree of Saturation	1.504					
Control Delay (Total)	182.04	veh-h/h			247.62	pers-h/h
Control Delay (Average)	12.9	sec			11.9	sec
Control Delay (Worst Lane)	490.9	sec				
Control Delay (Worst Movement)	531.6	sec			531.6	sec
Geometric Delay (Average)	0.7	sec				
Stop-Line Delay (Average)	12.2	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.59					
Total Effective Stops	14496	veh/h			20918	pers/h
Effective Stop Rate	0.29		1.27	per km	0.28	
Proportion Queued	0.23				0.22	
Performance Index	1146.1				1146.1	
Cost (Total)	16864.10	$/h	1.47	$/km	16864.10	$/h
Fuel Consumption (Total)	1394.0	L/h	121.8	mL/km		
Fuel Economy	12.2	L/100km				
Carbon Dioxide (Total)	3292.4	kg/h	287.6	g/km		
Hydrocarbons (Total)	0.309	kg/h	0.027	g/km		
Carbon Monoxide (Total)	3.462	kg/h	0.302	g/km		
NOx (Total)	4.021	kg/h	0.351	g/km		

Network Model Variability Index (Iterations 3 to N): 0.7 %
Number of Iterations: 6 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.4% 0.3% 0.2%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	24,462,720	veh/y	36,073,730	pers/y
Delay	87,379	veh-h/y	118,860	pers-h/y
Effective Stops	6,958,220	veh/y	10,040,540	pers/y
Travel Distance	5,494,583	veh-km/y	8,030,580	pers-km/y
Travel Time	179,984	veh-h/y	255,284	pers-h/y
Cost	8,094,768	$/y	8,094,768	$/y
Fuel Consumption	669,123	L/y		
Carbon Dioxide	1,580,361	kg/y		
Hydrocarbons	148	kg/y		
Carbon Monoxide	1,662	kg/y		
NOx	1,930	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	200	0.5	200	0.5	0.812	66.7	LOS E	21.8	154.2	1.00	0.91	1.11	12.2
2	T1	416	1.4	416	1.4	* 0.812	60.6	LOS E	21.8	154.2	1.00	0.92	1.11	13.0
3	R2	254	1.2	254	1.2	0.666	60.5	LOS E	16.0	113.7	0.98	0.84	0.98	12.9
Approach		870	1.1	870	1.1	0.812	62.0	LOS E	21.8	154.2	0.99	0.90	1.07	12.8
East: Great Eastern Hwy														
4	L2	102	3.9	102	3.9	0.195	34.3	LOS C	5.5	44.9	0.69	0.71	0.69	22.3
5	T1	1442	2.6	1442	2.6	0.617	35.6	LOS D	18.4	130.6	0.86	0.76	0.86	8.9
6	R2	74	2.7	74	2.7	0.525	72.3	LOS E	5.8	41.5	1.00	0.78	1.00	4.9
6u	U	12	0.0	12	0.0	0.525	74.0	LOS E	5.8	41.5	1.00	0.78	1.00	4.9
Approach		1630	2.6	1630	2.6	0.617	37.5	LOS D	18.4	130.6	0.85	0.76	0.85	9.6
North: Stoneham St														
7	L2	9	0.0	9	0.0	0.046	66.9	LOS E	0.5	3.7	0.93	0.67	0.93	7.4
8	T1	224	0.0	213	0.0	* 0.804	71.8	LOS E	11.3	79.1	1.00	0.90	1.18	15.6
9	R2	255	2.0	243	2.1	0.804	77.2	LOS E	10.7	76.2	1.00	0.89	1.16	7.1
Approach		488	1.0	465 N1	1.1	0.804	74.5	LOS E	11.3	79.1	1.00	0.89	1.17	11.3
West: Great Eastern Hwy														
10	L2	733	0.4	733	0.4	0.615	12.8	LOS B	19.7	138.8	0.52	0.73	0.52	21.9
11	T1	2015	3.2	2015	3.2	* 0.777	35.0	LOS C	22.7	163.2	0.84	0.75	0.85	10.5
12	R2	83	0.0	83	0.0	* 0.549	72.8	LOS E	6.3	43.8	1.00	0.78	1.00	14.0
12u	U	10	0.0	10	0.0	0.549	74.4	LOS E	6.3	43.8	1.00	0.78	1.00	5.6
Approach		2841	2.4	2841	2.4	0.777	30.5	LOS C	22.7	163.2	0.76	0.75	0.77	12.3
All Vehicles		5829	2.2	5806 N1	2.2	0.812	40.7	LOS D	22.7	163.2	0.84	0.78	0.87	11.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2021 (Site Folder: 2021 PM Peak)] **Network: N101 [2021 PM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	113	0.0	113	0.0	0.488	66.4	LOS E	8.0	55.7	0.97	0.79	0.97	15.6
2	T1	180	2.8	180	2.8	*0.644	62.5	LOS E	11.1	79.4	1.00	0.82	1.00	16.8
3	R2	146	2.7	146	2.7	0.591	67.7	LOS E	9.5	68.7	0.99	0.81	0.99	15.7
Approach		439	2.1	439	2.1	0.644	65.2	LOS E	11.1	79.4	0.99	0.81	0.99	16.1
East: Great Eastern Hwy														
4	L2	131	0.0	131	0.0	0.092	9.0	LOS A	1.8	12.4	0.26	0.62	0.26	45.5
5	T1	1482	3.0	1482	3.0	0.451	27.4	LOS C	18.1	128.8	0.73	0.64	0.73	12.8
6	R2	240	0.4	240	0.4	*0.967	100.7	LOS F	22.1	155.4	1.00	1.08	1.50	4.2
6u	U	15	0.0	15	0.0	0.967	102.3	LOS F	22.1	155.4	1.00	1.08	1.50	4.2
Approach		1868	2.4	1868	2.4	0.967	36.1	LOS D	22.1	155.4	0.73	0.70	0.80	12.0
North: Resolution Dr														
7	L2	141	3.5	141	3.5	0.265	30.0	LOS C	5.8	42.3	0.70	0.75	0.70	13.4
8	T1	147	3.4	147	3.4	*0.738	73.1	LOS E	6.7	46.7	1.00	0.81	1.10	18.2
9	R2	23	0.0	23	0.0	0.191	74.5	LOS E	1.5	10.6	0.96	0.71	0.96	6.3
Approach		311	3.2	311	3.2	0.738	53.7	LOS D	6.7	46.7	0.86	0.77	0.91	16.0
West: Great Eastern Hwy														
10	L2	22	0.0	22	0.0	0.063	28.9	LOS C	1.6	15.5	0.59	0.58	0.59	17.8
11	T1	2331	2.8	2331	2.8	*0.894	38.3	LOS D	36.4	261.1	0.92	0.90	1.00	13.4
12	R2	168	1.8	168	1.8	0.746	70.6	LOS E	13.0	91.3	1.00	0.86	1.09	18.9
12u	U	22	0.0	22	0.0	0.746	72.2	LOS E	13.0	91.3	1.00	0.86	1.09	8.1
Approach		2543	2.7	2543	2.7	0.894	40.6	LOS D	36.4	261.1	0.92	0.90	1.00	14.1
All Vehicles		5161	2.6	5161	2.6	0.967	41.9	LOS D	36.4	261.1	0.86	0.81	0.92	13.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2021 (Site Folder: 2021 PM Peak)] — **Network: N101 [2021 PM Peak (Network Folder: General)]**

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 PM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	49	2.0	49	2.0	0.610	6.9	LOS A	4.9	35.2	0.70	0.87	0.83	29.1
6a	R1	40	0.0	40	0.0	0.610	12.0	LOS B	4.9	35.2	0.70	0.87	0.83	40.0
6	R2	507	2.2	507	2.2	0.610	13.4	LOS B	4.9	35.2	0.70	0.87	0.83	29.1
Approach		596	2.0	596	2.0	0.610	12.7	LOS B	4.9	35.2	0.70	0.87	0.83	30.0
North: Grandstand Rd														
7	L2	207	2.4	207	2.4	0.208	3.6	LOS A	1.2	8.6	0.24	0.48	0.24	34.5
9a	R1	380	0.3	380	0.3	0.208	8.4	LOS A	1.2	8.6	0.24	0.55	0.24	31.8
9b	R3	8	0.0	8	0.0	0.208	10.9	LOS B	1.2	8.3	0.25	0.57	0.25	47.5
9u	U	4	0.0	4	0.0	0.208	12.1	LOS B	1.2	8.3	0.25	0.57	0.25	31.1
Approach		599	1.0	599	1.0	0.208	6.8	LOS A	1.2	8.6	0.24	0.52	0.24	32.9
NorthWest: Resolution Dr														
27b	L3	13	0.0	13	0.0	0.190	9.7	LOS A	1.0	7.3	0.87	0.93	0.87	28.8
27a	L1	25	4.0	25	4.0	0.190	9.0	LOS A	1.0	7.3	0.87	0.93	0.87	28.8
29	R2	34	2.9	34	2.9	0.190	15.0	LOS B	1.0	7.3	0.87	0.93	0.87	28.8
Approach		72	2.8	72	2.8	0.190	11.9	LOS B	1.0	7.3	0.87	0.93	0.87	28.8
SouthWest: Stoneham St														
30	L2	50	0.0	47	0.0	0.756	8.7	LOS A	3.5	24.9	0.95	1.03	1.29	34.2
30a	L1	1425	0.5	1338	0.5	0.756	9.4	LOS A	3.5	24.9	0.95	1.05	1.31	14.2
32a	R1	16	6.2	15	6.6	0.756	14.3	LOS B	3.5	24.9	0.95	1.08	1.34	13.7
32u	U	5	0.0	5	0.0	0.756	17.9	LOS B	3.5	24.9	0.95	1.08	1.34	13.7
Approach		1496	0.5	1404 N1	0.6	0.756	9.5	LOS A	3.5	24.9	0.95	1.05	1.31	15.4
All Vehicles		2763	1.0	2671 N1	1.0	0.756	9.7	LOS A	4.9	35.2	0.74	0.89	0.95	24.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 2 – SIDRA Network Output 2031 Existing Network

NETWORK SUMMARY

Network: N101 [2031 AM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS D					
Speed Efficiency	0.51					
Travel Time Index	4.58					
Congestion Coefficient	1.95					
Travel Speed (Average)	30.6	km/h			31.6	km/h
Travel Distance (Total)	11123.4	veh-km/h			17145.1	pers-km/h
Travel Time (Total)	363.3	veh-h/h			542.6	pers-h/h
Desired Speed (Program)	59.8	km/h				
Demand Flows (Total for all Sites)	49353	veh/h			78017	pers/h
Arrival Flows (Total for all Sites)	49329	veh/h			77988	pers/h
Demand Flows (Entry Total)	6820	veh/h				
Midblock Inflows (Total)	89	veh/h				
Midblock Outflows (Total)	-30	veh/h				
Percent Heavy Vehicles (Demand)	4.2	%				
Percent Heavy Vehicles (Arrival)	4.2	%				
Degree of Saturation	1.052					
Control Delay (Total)	175.44	veh-h/h			244.61	pers-h/h
Control Delay (Average)	12.8	sec			11.3	sec
Control Delay (Worst Lane)	138.6	sec				
Control Delay (Worst Movement)	138.9	sec			138.9	sec
Geometric Delay (Average)	0.6	sec				
Stop-Line Delay (Average)	12.2	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	11920	veh/h			21255	pers/h
Effective Stop Rate	0.24		1.07	per km	0.27	
Proportion Queued	0.21				0.19	
Performance Index	1039.4				1039.4	
Cost (Total)	17614.30	$/h	1.58	$/km	17614.30	$/h
Fuel Consumption (Total)	1505.3	L/h	135.3	mL/km		
Fuel Economy	13.5	L/100km				
Carbon Dioxide (Total)	3569.9	kg/h	320.9	g/km		
Hydrocarbons (Total)	0.321	kg/h	0.029	g/km		
Carbon Monoxide (Total)	3.619	kg/h	0.325	g/km		
NOx (Total)	8.302	kg/h	0.746	g/km		

Network Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.0% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	23,689,440	veh/y	37,448,070	pers/y
Delay	84,210	veh-h/y	117,415	pers-h/y
Effective Stops	5,721,724	veh/y	10,202,420	pers/y
Travel Distance	5,339,232	veh-km/y	8,229,638	pers-km/y
Travel Time	174,372	veh-h/y	260,425	pers-h/y
Cost	8,454,863	$/y	8,454,863	$/y
Fuel Consumption	722,563	L/y		
Carbon Dioxide	1,713,534	kg/y		
Hydrocarbons	154	kg/y		
Carbon Monoxide	1,737	kg/y		
NOx	3,985	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2031 (Site Folder: 2031 AM Peak)] **Network: N101 [2031 AM Peak (Network Folder: General)]**

GEH / Stoneham St / Belgravia St
Traffic signals
2031 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	63	4.8	63	4.8	0.387	65.4	LOS E	5.4	40.1	0.96	0.77	0.96	12.2
2	T1	112	8.0	112	8.0	* 0.387	59.7	LOS E	5.5	41.7	0.96	0.76	0.96	13.2
3	R2	73	9.6	73	9.6	0.347	65.3	LOS E	4.5	35.4	0.96	0.77	0.96	12.1
Approach		248	7.7	248	7.7	0.387	62.8	LOS E	5.5	41.7	0.96	0.76	0.96	12.6
East: Great Eastern Hwy														
4	L2	204	5.9	204	5.9	0.297	29.4	LOS C	9.3	71.0	0.67	0.74	0.67	23.9
5	T1	2612	4.5	2612	4.5	* 0.998	87.4	LOS F	17.8	130.6	1.00	1.24	1.40	4.0
6	R2	19	5.3	19	5.3	0.179	72.2	LOS E	1.3	10.1	0.98	0.71	0.98	4.9
6u	U	1	0.0	1	0.0	0.179	73.9	LOS E	1.3	10.1	0.98	0.71	0.98	4.9
Approach		2836	4.6	2836	4.6	0.998	83.1	LOS F	17.8	130.6	0.97	1.20	1.34	4.8
North: Stoneham St														
7	L2	5	0.0	5	0.0	0.019	59.0	LOS E	0.3	2.0	0.88	0.65	0.88	8.2
8	T1	308	4.2	308	4.2	* 1.052	137.4	LOS F	28.9	202.2	1.00	1.33	1.82	9.2
9	R2	482	0.4	482	0.4	1.052	138.9	LOS F	26.1	183.6	1.00	1.23	1.77	4.0
Approach		795	1.9	795	1.9	1.052	137.8	LOS F	28.9	202.2	1.00	1.27	1.78	6.2
West: Great Eastern Hwy														
10	L2	228	1.3	228	1.3	0.149	6.7	LOS A	1.8	12.6	0.19	0.61	0.19	31.3
11	T1	1496	5.3	1496	5.3	0.463	21.9	LOS C	14.1	104.6	0.58	0.51	0.58	15.2
12	R2	61	3.3	61	3.3	* 0.842	82.6	LOS F	6.8	48.0	1.00	0.93	1.35	12.6
12u	U	32	0.0	32	0.0	0.842	84.3	LOS F	6.8	48.0	1.00	0.93	1.35	5.0
Approach		1817	4.7	1817	4.7	0.842	23.1	LOS C	14.1	104.6	0.55	0.54	0.57	15.3
All Vehicles		5696	4.4	5696	4.4	1.052	70.7	LOS E	28.9	202.2	0.84	0.98	1.14	6.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2031 (Site Folder: 2031 AM Peak)] **Network: N101 [2031 AM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	102	2.0	102	2.0	0.538	68.0	LOS E	6.8	50.7	0.99	0.79	0.99	15.3
2	T1	113	5.3	113	5.3	0.538	61.9	LOS E	6.8	50.7	0.99	0.78	0.99	16.9
3	R2	130	3.8	130	3.8	* 0.655	69.7	LOS E	8.5	62.5	1.00	0.82	1.04	15.3
Approach		345	3.8	345	3.8	0.655	66.7	LOS E	8.5	62.5	0.99	0.80	1.01	15.8
East: Great Eastern Hwy														
4	L2	133	4.5	133	4.5	0.094	8.0	LOS A	1.4	10.1	0.23	0.61	0.23	45.0
5	T1	2605	4.8	2605	4.8	* 0.881	42.5	LOS D	22.2	163.2	0.94	0.95	1.06	8.9
6	R2	147	7.5	147	7.5	* 0.905	85.1	LOS F	12.2	92.0	1.00	1.01	1.41	4.9
6u	U	14	0.0	14	0.0	0.905	86.7	LOS F	12.2	92.0	1.00	1.01	1.41	4.9
Approach		2899	4.9	2899	4.9	0.905	43.3	LOS D	22.2	163.2	0.91	0.94	1.04	9.8
North: Resolution Dr														
7	L2	262	1.9	262	1.9	0.459	16.7	LOS B	8.2	58.8	0.57	0.74	0.57	20.4
8	T1	140	7.1	140	7.1	0.636	68.0	LOS E	5.9	41.9	1.00	0.78	1.03	19.1
9	R2	90	1.1	90	1.1	* 0.851	81.5	LOS F	6.5	46.1	1.00	0.91	1.31	5.8
Approach		492	3.3	492	3.3	0.851	43.1	LOS D	8.2	58.8	0.77	0.78	0.84	15.6
West: Great Eastern Hwy														
10	L2	8	0.0	8	0.0	0.030	23.9	LOS C	0.7	7.3	0.53	0.50	0.53	21.1
11	T1	1459	6.0	1459	6.0	0.520	18.6	LOS B	16.0	119.9	0.55	0.49	0.55	22.3
12	R2	105	1.0	105	1.0	0.700	71.9	LOS E	8.3	58.0	1.00	0.84	1.09	18.7
12u	U	19	0.0	19	0.0	0.700	73.5	LOS E	8.3	58.0	1.00	0.84	1.09	8.0
Approach		1591	5.6	1591	5.6	0.700	22.8	LOS C	16.0	119.9	0.59	0.52	0.60	21.2
All Vehicles		5327	4.9	5327	4.9	0.905	38.6	LOS D	22.2	163.2	0.81	0.79	0.89	13.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 AM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	29	6.9	29	6.9	0.382	7.2	LOS A	2.1	15.5	0.72	0.91	0.76	28.8
6a	R1	16	6.3	16	6.3	0.382	12.5	LOS B	2.1	15.5	0.72	0.91	0.76	38.9
6	R2	242	4.5	242	4.5	0.382	13.6	LOS B	2.1	15.5	0.72	0.91	0.76	28.8
Approach		287	4.9	287	4.9	0.382	12.9	LOS B	2.1	15.5	0.72	0.91	0.76	29.6
North: Grandstand Rd														
7	L2	426	2.6	426	2.6	0.425	3.9	LOS A	2.9	20.5	0.34	0.51	0.34	33.4
9a	R1	759	1.1	759	1.1	0.425	8.7	LOS A	2.9	20.5	0.36	0.57	0.36	30.9
9b	R3	6	0.0	6	0.0	0.425	11.2	LOS B	2.8	20.0	0.36	0.59	0.36	46.5
9u	U	2	0.0	2	0.0	0.425	12.5	LOS B	2.8	20.0	0.36	0.59	0.36	30.2
Approach		1193	1.6	1193	1.6	0.425	7.0	LOS A	2.9	20.5	0.35	0.55	0.35	31.8
NorthWest: Resolution Dr														
27b	L3	13	7.7	13	7.7	0.120	4.4	LOS A	0.5	3.5	0.51	0.61	0.51	35.5
27a	L1	50	0.0	50	0.0	0.120	3.4	LOS A	0.5	3.5	0.51	0.61	0.51	35.5
29	R2	48	0.0	48	0.0	0.120	9.4	LOS A	0.5	3.5	0.51	0.61	0.51	35.5
Approach		111	0.9	111	0.9	0.120	6.1	LOS A	0.5	3.5	0.51	0.61	0.51	35.5
SouthWest: Stoneham St														
30	L2	19	0.0	19	0.0	0.160	2.1	LOS A	0.9	6.4	0.43	0.44	0.43	47.0
30a	L1	334	2.7	334	2.7	0.160	2.3	LOS A	0.9	6.4	0.44	0.47	0.44	30.9
32a	R1	22	0.0	22	0.0	0.160	6.4	LOS A	0.9	6.3	0.44	0.50	0.44	30.1
32u	U	4	25.0	4	25.0	0.160	10.4	LOS B	0.9	6.3	0.44	0.50	0.44	30.1
Approach		379	2.6	379	2.6	0.160	2.6	LOS A	0.9	6.4	0.44	0.47	0.44	32.9
All Vehicles		1970	2.2	1970	2.2	0.425	7.0	LOS A	2.9	20.5	0.43	0.59	0.44	31.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK SUMMARY

Network: N101 [2031 PM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.45					
Travel Time Index	3.90					
Congestion Coefficient	2.22					
Travel Speed (Average)	26.9	km/h			28.5	km/h
Travel Distance (Total)	11965.4	veh-km/h			18550.5	pers-km/h
Travel Time (Total)	444.0	veh-h/h			650.6	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	53437	veh/h			85765	pers/h
Arrival Flows (Total for all Sites)	52906	veh/h			85106	pers/h
Demand Flows (Entry Total)	7638	veh/h				
Midblock Inflows (Total)	391	veh/h				
Midblock Outflows (Total)	-23	veh/h				
Percent Heavy Vehicles (Demand)	2.1	%				
Percent Heavy Vehicles (Arrival)	2.1	%				
Degree of Saturation	1.937					
Control Delay (Total)	241.83	veh-h/h			330.15	pers-h/h
Control Delay (Average)	16.5	sec			14.0	sec
Control Delay (Worst Lane)	875.1	sec				
Control Delay (Worst Movement)	912.1	sec			912.1	sec
Geometric Delay (Average)	0.7	sec				
Stop-Line Delay (Average)	15.7	sec				
Ave. Queue Storage Ratio (Worst Lane)	2.35					
Total Effective Stops	16273	veh/h			27080	pers/h
Effective Stop Rate	0.31		1.36	per km	0.32	
Proportion Queued	0.24				0.21	
Performance Index	1320.4				1320.4	
Cost (Total)	20345.79	$/h	1.70	$/km	20345.79	$/h
Fuel Consumption (Total)	1528.9	L/h	127.8	mL/km		
Fuel Economy	12.8	L/100km				
Carbon Dioxide (Total)	3609.7	kg/h	301.7	g/km		
Hydrocarbons (Total)	0.344	kg/h	0.029	g/km		
Carbon Monoxide (Total)	3.718	kg/h	0.311	g/km		
NOx (Total)	4.218	kg/h	0.353	g/km		

Network Model Variability Index (Iterations 3 to N): 0.6 %
Number of Iterations: 9 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.1% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	25,649,760	veh/y	41,167,300	pers/y
Delay	116,076	veh-h/y	158,471	pers-h/y
Effective Stops	7,811,153	veh/y	12,998,270	pers/y
Travel Distance	5,743,401	veh-km/y	8,904,247	pers-km/y
Travel Time	213,118	veh-h/y	312,269	pers-h/y
Cost	9,765,982	$/y	9,765,982	$/y
Fuel Consumption	733,861	L/y		
Carbon Dioxide	1,732,659	kg/y		
Hydrocarbons	165	kg/y		
Carbon Monoxide	1,785	kg/y		
NOx	2,025	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	210	0.5	210	0.5	0.866	71.9	LOS E	24.7	174.2	1.00	0.96	1.19	11.4
2	T1	437	1.4	437	1.4	* 0.866	65.9	LOS E	24.7	174.2	1.00	0.98	1.20	12.2
3	R2	267	1.1	267	1.1	0.700	61.3	LOS E	17.0	121.0	0.98	0.85	0.99	12.7
Approach		914	1.1	914	1.1	0.866	65.9	LOS E	24.7	174.2	1.00	0.94	1.14	12.2
East: Great Eastern Hwy														
4	L2	107	3.7	107	3.7	0.201	34.4	LOS C	5.8	46.6	0.69	0.72	0.69	22.3
5	T1	1514	2.4	1514	2.4	0.648	36.2	LOS D	18.4	130.6	0.87	0.77	0.87	8.8
6	R2	78	2.6	78	2.6	0.555	72.5	LOS E	6.1	44.0	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.555	74.3	LOS E	6.1	44.0	1.00	0.78	1.00	4.9
Approach		1712	2.5	1712	2.5	0.648	38.0	LOS D	18.4	130.6	0.87	0.77	0.87	9.4
North: Stoneham St														
7	L2	9	0.0	8	0.0	0.044	66.9	LOS E	0.5	3.6	0.93	0.67	0.93	7.4
8	T1	234	0.0	218	0.0	* 0.822	72.8	LOS E	11.7	81.6	1.00	0.92	1.21	15.5
9	R2	267	1.9	249	2.0	0.822	78.0	LOS E	11.1	78.6	1.00	0.90	1.19	7.0
Approach		510	1.0	475 N1	1.1	0.822	75.4	LOS E	11.7	81.6	1.00	0.91	1.19	11.2
West: Great Eastern Hwy														
10	L2	770	0.4	770	0.4	0.649	13.5	LOS B	22.2	155.9	0.55	0.74	0.55	21.2
11	T1	2115	3.2	2115	3.2	* 0.819	37.5	LOS D	22.7	163.2	0.87	0.80	0.90	9.9
12	R2	87	0.0	87	0.0	* 0.579	73.0	LOS E	6.6	46.3	1.00	0.78	1.00	14.0
12u	U	11	0.0	11	0.0	0.579	74.7	LOS E	6.6	46.3	1.00	0.78	1.00	5.5
Approach		2983	2.3	2983	2.3	0.819	32.5	LOS C	22.7	163.2	0.79	0.79	0.81	11.7
All Vehicles		6119	2.1	6084 N1	2.1	0.866	42.4	LOS D	24.7	174.2	0.86	0.81	0.91	11.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2031 (Site Folder: 2031 PM Peak)] **Network: N101 [2031 PM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	119	0.0	119	0.0	0.511	66.7	LOS E	8.4	58.6	0.98	0.80	0.98	15.6
2	T1	188	2.7	188	2.7	*0.675	63.1	LOS E	11.7	84.0	1.00	0.83	1.02	16.7
3	R2	153	2.6	153	2.6	0.618	68.0	LOS E	10.0	72.2	0.99	0.81	0.99	15.6
Approach		460	2.0	460	2.0	0.675	65.6	LOS E	11.7	84.0	0.99	0.82	1.00	16.0
East: Great Eastern Hwy														
4	L2	138	0.0	138	0.0	0.098	9.3	LOS A	2.0	13.7	0.27	0.62	0.27	45.3
5	T1	1557	2.9	1557	2.9	0.474	27.7	LOS C	19.3	137.4	0.74	0.65	0.74	12.7
6	R2	251	0.4	251	0.4	*1.013	122.4	LOS F	23.2	163.2	1.00	1.16	1.66	3.5
6u	U	16	0.0	16	0.0	1.013	124.1	LOS F	23.2	163.2	1.00	1.16	1.66	3.5
Approach		1962	2.3	1962	2.3	1.013	39.3	LOS D	23.2	163.2	0.74	0.72	0.83	11.1
North: Resolution Dr														
7	L2	147	3.4	146	3.4	0.281	33.9	LOS C	6.5	47.0	0.74	0.76	0.74	12.2
8	T1	154	3.2	153	3.3	*0.769	73.7	LOS E	7.0	49.1	1.00	0.82	1.12	18.1
9	R2	24	0.0	24	0.0	0.199	74.6	LOS E	1.6	11.0	0.96	0.71	0.96	6.3
Approach		325	3.1	324 N1	3.1	0.769	55.8	LOS E	7.0	49.1	0.88	0.79	0.94	15.6
West: Great Eastern Hwy														
10	L2	23	0.0	23	0.0	0.064	28.9	LOS C	1.6	15.8	0.59	0.59	0.59	17.8
11	T1	2444	2.7	2443	2.7	*0.938	48.4	LOS D	36.4	261.1	0.97	1.01	1.13	11.1
12	R2	176	1.7	176	1.7	0.721	69.6	LOS E	12.6	88.7	1.00	0.85	1.06	19.1
12u	U	11	0.0	11	0.0	0.721	71.2	LOS E	12.6	88.7	1.00	0.85	1.06	8.2
Approach		2654	2.6	2653 N1	2.6	0.938	49.7	LOS D	36.4	261.1	0.97	1.00	1.12	12.0
All Vehicles		5401	2.5	5399 N1	2.5	1.013	47.7	LOS D	36.4	261.1	0.88	0.87	0.99	12.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 PM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	51	2.0	51	2.0	0.642	7.4	LOS A	5.5	39.5	0.74	0.91	0.89	28.5
6a	R1	42	0.0	42	0.0	0.642	12.6	LOS B	5.5	39.5	0.74	0.91	0.89	39.4
6	R2	529	2.1	527	2.1	0.642	13.9	LOS B	5.5	39.5	0.74	0.91	0.89	28.5
Approach		622	1.9	619 N1	1.9	0.642	13.3	LOS B	5.5	39.5	0.74	0.91	0.89	29.4
North: Grandstand Rd														
7	L2	217	2.3	217	2.3	0.219	3.7	LOS A	1.3	9.2	0.25	0.48	0.25	34.4
9a	R1	398	0.3	398	0.3	0.219	8.4	LOS A	1.3	9.2	0.25	0.55	0.25	31.8
9b	R3	8	0.0	8	0.0	0.219	10.9	LOS B	1.3	8.9	0.25	0.57	0.25	47.4
9u	U	4	0.0	4	0.0	0.219	12.1	LOS B	1.3	8.9	0.25	0.57	0.25	31.0
Approach		627	1.0	627	1.0	0.219	6.8	LOS A	1.3	9.2	0.25	0.53	0.25	32.8
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.212	10.2	LOS B	1.1	8.2	0.88	0.93	0.88	28.3
27a	L1	26	3.8	26	3.8	0.212	9.5	LOS A	1.1	8.2	0.88	0.93	0.88	28.3
29	R2	36	2.8	36	2.8	0.212	15.5	LOS B	1.1	8.2	0.88	0.93	0.88	28.3
Approach		76	2.6	76	2.6	0.212	12.5	LOS B	1.1	8.2	0.88	0.93	0.88	28.3
SouthWest: Stoneham St														
30	L2	53	0.0	48	0.0	0.794	10.4	LOS B	3.5	24.9	1.00	1.11	1.44	32.0
30a	L1	1498	0.5	1366	0.5	0.794	11.1	LOS B	3.5	24.9	1.00	1.13	1.46	12.5
32a	R1	17	5.9	16	6.4	0.794	16.2	LOS B	3.5	24.9	0.99	1.16	1.48	12.0
32u	U	5	0.0	5	0.0	0.794	19.7	LOS B	3.5	24.9	0.99	1.16	1.48	12.0
Approach		1573	0.5	1434 N1	0.6	0.794	11.2	LOS B	3.5	24.9	1.00	1.13	1.46	13.6
All Vehicles		2898	1.0	2757 N1	1.0	0.794	10.7	LOS B	5.5	39.5	0.76	0.94	1.04	23.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 3 – SIDRA Network Output 2041 Existing Network

NETWORK SUMMARY

Network: N101 [2041 AM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.38					
Travel Time Index	3.07					
Congestion Coefficient	2.66					
Travel Speed (Average)	22.5	km/h			23.7	km/h
Travel Distance (Total)	11607.3	veh-km/h			17725.7	pers-km/h
Travel Time (Total)	515.8	veh-h/h			749.4	pers-h/h
Desired Speed (Program)	59.8	km/h				
Demand Flows (Total for all Sites)	51917	veh/h			81094	pers/h
Arrival Flows (Total for all Sites)	51745	veh/h			80887	pers/h
Demand Flows (Entry Total)	7152	veh/h				
Midblock Inflows (Total)	217	veh/h				
Midblock Outflows (Total)	-156	veh/h				
Percent Heavy Vehicles (Demand)	4.2	%				
Percent Heavy Vehicles (Arrival)	4.2	%				
Degree of Saturation	1.158					
Control Delay (Total)	315.01	veh-h/h			435.33	pers-h/h
Control Delay (Average)	21.9	sec			19.4	sec
Control Delay (Worst Lane)	224.8	sec				
Control Delay (Worst Movement)	224.8	sec			224.8	sec
Geometric Delay (Average)	0.6	sec				
Stop-Line Delay (Average)	21.3	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	15104	veh/h			25604	pers/h
Effective Stop Rate	0.29		1.30	per km	0.32	
Proportion Queued	0.21				0.20	
Performance Index	1291.3				1291.3	
Cost (Total)	23857.12	$/h	2.06	$/km	23857.12	$/h
Fuel Consumption (Total)	1811.6	L/h	156.1	mL/km		
Fuel Economy	15.6	L/100km				
Carbon Dioxide (Total)	4293.3	kg/h	369.9	g/km		
Hydrocarbons (Total)	0.415	kg/h	0.036	g/km		
Carbon Monoxide (Total)	4.242	kg/h	0.365	g/km		
NOx (Total)	9.748	kg/h	0.840	g/km		

Network Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.0% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	24,920,160	veh/y	38,924,930	pers/y
Delay	151,205	veh-h/y	208,960	pers-h/y
Effective Stops	7,249,894	veh/y	12,289,960	pers/y
Travel Distance	5,571,491	veh-km/y	8,508,312	pers-km/y
Travel Time	247,562	veh-h/y	359,700	pers-h/y
Cost	11,451,420	$/y	11,451,420	$/y
Fuel Consumption	869,555	L/y		
Carbon Dioxide	2,060,780	kg/y		
Hydrocarbons	199	kg/y		
Carbon Monoxide	2,036	kg/y		
NOx	4,679	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2041 (Site Folder: 2041 AM Peak)] **Network: N101 [2041 AM Peak (Network Folder: General)]**

GEH / Stoneham St / Belgravia St
Traffic signals
2041 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	66	4.5	66	4.5	0.408	65.5	LOS E	5.7	42.4	0.97	0.77	0.97	12.2
2	T1	118	8.5	118	8.5	* 0.408	59.9	LOS E	5.7	44.1	0.97	0.76	0.97	13.1
3	R2	78	10.3	78	10.3	0.373	65.6	LOS E	4.8	38.3	0.96	0.77	0.96	12.1
Approach		262	8.0	262	8.0	0.408	63.0	LOS E	5.7	44.1	0.96	0.77	0.96	12.6
East: Great Eastern Hwy														
4	L2	214	5.6	214	5.6	0.309	29.5	LOS C	9.7	74.3	0.67	0.74	0.67	23.8
5	T1	2744	4.4	2744	4.4	* 1.048	119.5	LOS F	17.8	130.6	1.00	1.41	1.61	3.0
6	R2	20	5.0	20	5.0	0.187	72.2	LOS E	1.4	10.6	0.98	0.71	0.98	4.9
6u	U	1	0.0	1	0.0	0.187	73.9	LOS E	1.4	10.6	0.98	0.71	0.98	4.9
Approach		2979	4.5	2979	4.5	1.048	112.7	LOS F	17.8	130.6	0.97	1.36	1.54	3.6
North: Stoneham St														
7	L2	6	0.0	6	0.0	0.023	59.1	LOS E	0.3	2.4	0.89	0.66	0.89	8.2
8	T1	323	4.0	323	4.0	* 1.103	173.8	LOS F	32.6	228.5	1.00	1.46	2.03	7.5
9	R2	506	0.4	506	0.4	1.103	175.7	LOS F	31.3	219.8	1.00	1.34	1.97	3.2
Approach		835	1.8	835	1.8	1.103	174.1	LOS F	32.6	228.5	1.00	1.38	1.99	4.9
West: Great Eastern Hwy														
10	L2	239	1.3	239	1.3	0.157	6.7	LOS A	1.9	13.3	0.19	0.61	0.19	31.3
11	T1	1568	5.2	1568	5.2	0.487	22.1	LOS C	15.1	112.2	0.59	0.52	0.59	15.0
12	R2	64	3.1	64	3.1	* 0.877	85.3	LOS F	7.2	51.1	1.00	0.96	1.42	12.3
12u	U	33	0.0	33	0.0	0.877	86.9	LOS F	7.2	51.1	1.00	0.96	1.42	4.8
Approach		1904	4.6	1904	4.6	0.877	23.5	LOS C	15.1	112.2	0.56	0.55	0.58	15.1
All Vehicles		5980	4.3	5980	4.3	1.103	90.7	LOS F	32.6	228.5	0.84	1.08	1.27	5.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2041 (Site Folder: 2041 AM Peak)] **Network: N101 [2041 AM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	107	1.9	107	1.9	0.562	68.2	LOS E	7.2	53.1	0.99	0.79	0.99	15.3
2	T1	118	5.1	118	5.1	0.562	62.1	LOS E	7.2	53.1	0.99	0.78	0.99	16.9
3	R2	136	3.7	136	3.7	* 0.684	70.3	LOS E	9.0	65.8	1.00	0.83	1.06	15.2
Approach		361	3.6	361	3.6	0.684	67.0	LOS E	9.0	65.8	0.99	0.81	1.02	15.8
East: Great Eastern Hwy														
4	L2	141	5.0	141	5.0	0.101	8.4	LOS A	1.7	11.8	0.25	0.61	0.25	44.5
5	T1	2736	4.8	2736	4.8	* 1.099	165.0	LOS F	22.2	163.2	1.00	1.65	1.92	2.5
6	R2	153	7.2	153	7.2	* 0.936	91.2	LOS F	13.2	99.3	1.00	1.05	1.50	4.6
6u	U	14	0.0	14	0.0	0.936	92.8	LOS F	13.2	99.3	1.00	1.05	1.50	4.6
Approach		3044	4.9	3044	4.9	1.099	153.7	LOS F	22.2	163.2	0.97	1.57	1.82	3.1
North: Resolution Dr														
7	L2	274	1.8	274	1.8	0.494	18.1	LOS B	9.3	66.4	0.61	0.76	0.61	19.3
8	T1	147	6.8	147	6.8	0.666	68.3	LOS E	6.3	44.2	1.00	0.79	1.05	19.0
9	R2	95	1.1	95	1.1	* 1.158	224.8	LOS F	12.7	89.8	1.00	1.29	2.35	2.2
Approach		516	3.1	516	3.1	1.158	70.5	LOS E	12.7	89.8	0.79	0.87	1.06	10.4
West: Great Eastern Hwy														
10	L2	9	0.0	9	0.0	0.032	23.9	LOS C	0.7	7.5	0.53	0.51	0.53	20.9
11	T1	1531	6.0	1531	6.0	0.547	18.9	LOS B	17.3	129.5	0.57	0.51	0.57	22.1
12	R2	110	0.9	110	0.9	0.775	74.6	LOS E	9.0	62.8	1.00	0.89	1.18	18.3
12u	U	20	0.0	20	0.0	0.775	76.2	LOS E	9.0	62.8	1.00	0.89	1.18	7.7
Approach		1670	5.6	1670	5.6	0.775	23.3	LOS C	17.3	129.5	0.60	0.54	0.62	20.9
All Vehicles		5591	4.8	5591	4.8	1.158	101.5	LOS F	22.2	163.2	0.84	1.15	1.34	5.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 AM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	31	6.5	31	6.5	0.413	7.8	LOS A	2.4	17.6	0.74	0.93	0.82	28.2
6a	R1	16	6.3	16	6.2	0.413	13.0	LOS B	2.4	17.6	0.74	0.93	0.82	38.3
6	R2	254	4.7	254	4.7	0.413	14.2	LOS B	2.4	17.6	0.74	0.93	0.82	28.2
Approach		301	5.0	301	5.0	0.413	13.5	LOS B	2.4	17.6	0.74	0.93	0.82	28.9
North: Grandstand Rd														
7	L2	446	2.7	446	2.7	0.449	4.0	LOS A	3.1	22.4	0.36	0.51	0.36	33.2
9a	R1	797	1.1	797	1.1	0.449	8.8	LOS A	3.1	22.4	0.38	0.57	0.38	30.7
9b	R3	7	0.0	7	0.0	0.449	11.3	LOS B	3.1	21.8	0.38	0.60	0.38	46.3
9u	U	2	0.0	2	0.0	0.449	12.5	LOS B	3.1	21.8	0.38	0.60	0.38	30.0
Approach		1252	1.7	1252	1.7	0.449	7.1	LOS A	3.1	22.4	0.37	0.55	0.37	31.6
NorthWest: Resolution Dr														
27b	L3	13	7.7	13	7.7	0.129	4.5	LOS A	0.5	3.8	0.52	0.62	0.52	35.4
27a	L1	53	0.0	53	0.0	0.129	3.5	LOS A	0.5	3.8	0.52	0.62	0.52	35.4
29	R2	51	0.0	51	0.0	0.129	9.5	LOS A	0.5	3.8	0.52	0.62	0.52	35.4
Approach		117	0.9	117	0.9	0.129	6.2	LOS A	0.5	3.8	0.52	0.62	0.52	35.4
SouthWest: Stoneham St														
30	L2	20	0.0	20	0.0	0.171	2.2	LOS A	1.0	7.0	0.45	0.45	0.45	46.9
30a	L1	351	2.8	351	2.8	0.171	2.3	LOS A	1.0	7.0	0.46	0.48	0.46	30.6
32a	R1	23	0.0	23	0.0	0.171	6.5	LOS A	0.9	6.8	0.46	0.51	0.46	29.8
32u	U	4	25.0	4	25.0	0.171	10.4	LOS B	0.9	6.8	0.46	0.51	0.46	29.8
Approach		398	2.8	398	2.8	0.171	2.6	LOS A	1.0	7.0	0.46	0.48	0.46	32.6
All Vehicles		2068	2.3	2068	2.3	0.449	7.1	LOS A	3.1	22.4	0.45	0.60	0.46	31.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK SUMMARY

Network: N101 [2041 PM Peak (Network Folder: General)]

New Network
Network Category: (None)

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.38					
Travel Time Index	3.10					
Congestion Coefficient	2.64					
Travel Speed (Average)	22.7	km/h			24.5	km/h
Travel Distance (Total)	12510.3	veh-km/h			19071.6	pers-km/h
Travel Time (Total)	552.2	veh-h/h			777.8	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	56031	veh/h			87878	pers/h
Arrival Flows (Total for all Sites)	55259	veh/h			86914	pers/h
Demand Flows (Entry Total)	8011	veh/h				
Midblock Inflows (Total)	431	veh/h				
Midblock Outflows (Total)	-44	veh/h				
Percent Heavy Vehicles (Demand)	2.1	%				
Percent Heavy Vehicles (Arrival)	2.1	%				
Degree of Saturation	2.596					
Control Delay (Total)	340.05	veh-h/h			448.22	pers-h/h
Control Delay (Average)	22.2	sec			18.6	sec
Control Delay (Worst Lane)	1466.0	sec				
Control Delay (Worst Movement)	1499.0	sec			1499.0	sec
Geometric Delay (Average)	0.7	sec				
Stop-Line Delay (Average)	21.4	sec				
Ave. Queue Storage Ratio (Worst Lane)	3.10					
Total Effective Stops	18075	veh/h			28702	pers/h
Effective Stop Rate	0.33		1.44	per km	0.33	
Proportion Queued	0.24				0.22	
Performance Index	1566.8				1566.8	
Cost (Total)	24160.01	$/h	1.93	$/km	24160.01	$/h
Fuel Consumption (Total)	1722.5	L/h	137.7	mL/km		
Fuel Economy	13.8	L/100km				
Carbon Dioxide (Total)	4065.9	kg/h	325.0	g/km		
Hydrocarbons (Total)	0.394	kg/h	0.031	g/km		
Carbon Monoxide (Total)	4.064	kg/h	0.325	g/km		
NOx (Total)	4.660	kg/h	0.373	g/km		

Network Model Variability Index (Iterations 3 to N): 20.6 %
Number of Iterations: 7 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.9% 0.7% 0.3%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	26,894,880	veh/y	42,181,630	pers/y
Delay	163,225	veh-h/y	215,145	pers-h/y
Effective Stops	8,675,784	veh/y	13,776,860	pers/y
Travel Distance	6,004,929	veh-km/y	9,154,381	pers-km/y
Travel Time	265,053	veh-h/y	373,325	pers-h/y
Cost	11,596,800	$/y	11,596,800	$/y
Fuel Consumption	826,816	L/y		
Carbon Dioxide	1,951,608	kg/y		
Hydrocarbons	189	kg/y		
Carbon Monoxide	1,951	kg/y		
NOx	2,237	kg/y		

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	221	0.5	221	0.5	0.927	83.3	LOS F	29.1	205.6	1.00	1.04	1.32	10.1
2	T1	460	1.5	460	1.5	* 0.927	77.5	LOS E	29.1	205.6	1.00	1.07	1.34	10.7
3	R2	280	1.1	280	1.1	0.758	63.4	LOS E	18.4	130.8	0.99	0.87	1.05	12.4
Approach		961	1.1	961	1.1	0.927	74.7	LOS E	29.1	205.6	1.00	1.01	1.25	11.0
East: Great Eastern Hwy														
4	L2	112	3.6	112	3.6	0.208	34.5	LOS C	6.0	48.3	0.70	0.72	0.70	22.2
5	T1	1591	2.5	1591	2.5	0.682	36.9	LOS D	18.4	130.6	0.89	0.79	0.89	8.6
6	R2	82	2.4	82	2.4	0.578	72.7	LOS E	6.4	46.0	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.578	74.4	LOS E	6.4	46.0	1.00	0.78	1.00	4.9
Approach		1798	2.5	1798	2.5	0.682	38.7	LOS D	18.4	130.6	0.88	0.79	0.88	9.3
North: Stoneham St														
7	L2	10	0.0	9	0.0	0.048	67.0	LOS E	0.6	3.9	0.93	0.67	0.93	7.3
8	T1	246	0.0	224	0.0	* 0.848	74.4	LOS E	12.2	85.5	1.00	0.94	1.25	15.2
9	R2	280	2.1	256	2.3	0.848	79.5	LOS E	11.6	82.3	1.00	0.92	1.22	6.9
Approach		536	1.1	489 N1	1.2	0.848	76.9	LOS E	12.2	85.5	1.00	0.93	1.23	11.0
West: Great Eastern Hwy														
10	L2	810	0.4	810	0.4	0.686	14.3	LOS B	23.2	163.2	0.59	0.76	0.59	20.4
11	T1	2220	3.2	2220	3.2	* 0.866	42.2	LOS D	22.7	163.2	0.90	0.87	0.98	9.0
12	R2	92	0.0	92	0.0	* 0.608	73.4	LOS E	7.0	48.9	1.00	0.79	1.02	13.9
12u	U	11	0.0	11	0.0	0.608	75.1	LOS E	7.0	48.9	1.00	0.79	1.02	5.5
Approach		3133	2.3	3133	2.3	0.866	36.0	LOS D	23.2	163.2	0.83	0.84	0.88	10.7
All Vehicles		6428	2.1	6381 N1	2.1	0.927	45.7	LOS D	29.1	205.6	0.88	0.86	0.96	10.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2041 (Site Folder: 2041 PM Peak)] **Network: N101 [2041 PM Peak (Network Folder: General)]**

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	125	0.0	125	0.0	0.536	66.9	LOS E	8.8	61.6	0.98	0.80	0.98	15.6
2	T1	197	2.5	197	2.5	*0.708	64.0	LOS E	12.4	89.1	1.00	0.85	1.05	16.5
3	R2	161	2.5	161	2.5	0.650	68.5	LOS E	10.6	76.5	1.00	0.82	1.01	15.5
Approach		483	1.9	483	1.9	0.708	66.2	LOS E	12.4	89.1	0.99	0.83	1.02	15.9
East: Great Eastern Hwy														
4	L2	145	0.0	145	0.0	0.104	9.5	LOS A	2.1	15.0	0.28	0.62	0.28	45.0
5	T1	1636	2.9	1636	2.9	0.500	28.1	LOS C	20.6	146.9	0.75	0.66	0.75	12.5
6	R2	263	0.4	263	0.4	*1.062	152.7	LOS F	23.2	163.2	1.00	1.25	1.85	2.8
6u	U	17	0.0	17	0.0	1.062	154.3	LOS F	23.2	163.2	1.00	1.25	1.85	2.8
Approach		2061	2.3	2061	2.3	1.062	43.7	LOS D	23.2	163.2	0.75	0.74	0.87	10.1
North: Resolution Dr														
7	L2	155	3.9	154	3.9	0.305	38.7	LOS D	7.3	53.6	0.80	0.77	0.80	10.9
8	T1	160	3.1	159	3.1	*0.798	74.4	LOS E	7.3	51.4	1.00	0.84	1.15	18.0
9	R2	25	0.0	25	0.0	0.207	74.7	LOS E	1.6	11.4	0.96	0.71	0.96	6.3
Approach		340	3.2	338[N1]	3.3	0.798	58.1	LOS E	7.3	53.6	0.90	0.80	0.97	15.1
West: Great Eastern Hwy														
10	L2	24	0.0	24	0.0	0.066	28.9	LOS C	1.6	16.0	0.59	0.59	0.59	17.7
11	T1	2564	2.7	2563	2.7	*0.985	68.2	LOS E	36.4	261.1	1.00	1.15	1.29	8.4
12	R2	185	1.6	185	1.6	0.755	70.8	LOS E	13.4	94.4	1.00	0.87	1.10	18.9
12u	U	11	0.0	11	0.0	0.755	72.4	LOS E	13.4	94.4	1.00	0.87	1.10	8.1
Approach		2784	2.6	2783[N1]	2.6	0.985	68.1	LOS E	36.4	261.1	0.99	1.12	1.27	9.3
All Vehicles		5668	2.5	5665[N1]	2.5	1.062	58.5	LOS E	36.4	261.1	0.90	0.94	1.08	10.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 PM Peak
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	54	1.9	53	1.9	0.672	8.0	LOS A	6.1	43.9	0.77	0.95	0.96	27.8
6a	R1	44	0.0	43	0.0	0.672	13.2	LOS B	6.1	43.9	0.77	0.95	0.96	38.7
6	R2	554	2.2	542	2.2	0.672	14.5	LOS B	6.1	43.9	0.77	0.95	0.96	27.8
Approach		652	2.0	638 N1	2.0	0.672	13.9	LOS B	6.1	43.9	0.77	0.95	0.96	28.7
North: Grandstand Rd														
7	L2	230	3.5	230	3.5	0.232	3.7	LOS A	1.4	9.9	0.26	0.48	0.26	34.3
9a	R1	417	0.2	417	0.2	0.232	8.4	LOS A	1.4	9.9	0.26	0.55	0.26	31.7
9b	R3	9	0.0	9	0.0	0.232	10.9	LOS B	1.4	9.5	0.26	0.58	0.26	47.3
9u	U	4	0.0	4	0.0	0.232	12.2	LOS B	1.4	9.5	0.26	0.58	0.26	30.9
Approach		660	1.4	660	1.4	0.232	6.8	LOS A	1.4	9.9	0.26	0.53	0.26	32.8
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.230	10.7	LOS B	1.2	9.0	0.89	0.94	0.89	27.8
27a	L1	28	3.6	28	3.6	0.230	10.1	LOS B	1.2	9.0	0.89	0.94	0.89	27.8
29	R2	37	2.7	37	2.7	0.230	16.1	LOS B	1.2	9.0	0.89	0.94	0.89	27.8
Approach		79	2.5	79	2.5	0.230	13.0	LOS B	1.2	9.0	0.89	0.94	0.89	27.8
SouthWest: Stoneham St														
30	L2	55	0.0	49	0.0	0.833	12.6	LOS B	3.5	24.9	1.00	1.18	1.58	29.3
30a	L1	1575	0.5	1398	0.6	0.833	13.4	LOS B	3.5	24.9	1.00	1.20	1.61	10.7
32a	R1	18	5.6	16	6.2	0.833	18.7	LOS B	3.5	24.9	1.00	1.23	1.63	10.3
32u	U	6	0.0	5	0.0	0.833	22.1	LOS C	3.5	24.9	1.00	1.23	1.63	10.3
Approach		1654	0.5	1469 N1	0.6	0.833	13.5	LOS B	3.5	24.9	1.00	1.20	1.61	11.7
All Vehicles		3045	1.1	2845 N1	1.2	0.833	12.0	LOS B	6.1	43.9	0.77	0.98	1.13	21.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 4 – SIDRA Network Output 2021 Proposed Road Network

NETWORK SUMMARY

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

Proposed Network
2021 Traffic Volumes
Network Category: Proposed Design 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS D					
Speed Efficiency	0.58					
Travel Time Index	5.37					
Congestion Coefficient	1.71					
Travel Speed (Average)	34.9	km/h			35.3	km/h
Travel Distance (Total)	10611.7	veh-km/h			16520.4	pers-km/h
Travel Time (Total)	304.0	veh-h/h			468.2	pers-h/h
Desired Speed (Program)	59.8	km/h				
Demand Flows (Total for all Sites)	45822	veh/h			73780	pers/h
Arrival Flows (Total for all Sites)	45822	veh/h			73780	pers/h
Demand Flows (Entry Total)	6528	veh/h				
Midblock Inflows (Total)	104	veh/h				
Midblock Outflows (Total)	-77	veh/h				
Percent Heavy Vehicles (Demand)	4.3	%				
Percent Heavy Vehicles (Arrival)	4.3	%				
Degree of Saturation	0.986					
Control Delay (Total)	125.39	veh-h/h			181.56	pers-h/h
Control Delay (Average)	9.9	sec			8.9	sec
Control Delay (Worst Lane)	101.2	sec				
Control Delay (Worst Movement)	101.5	sec			101.5	sec
Geometric Delay (Average)	0.6	sec				
Stop-Line Delay (Average)	9.2	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	10175	veh/h			19002	pers/h
Effective Stop Rate	0.22		0.96	per km	0.26	
Proportion Queued	0.20				0.18	
Performance Index	893.5				893.5	
Cost (Total)	15191.53	$/h	1.43	$/km	15191.53	$/h
Fuel Consumption (Total)	1355.4	L/h	127.7	mL/km		
Fuel Economy	12.8	L/100km				
Carbon Dioxide (Total)	3215.4	kg/h	303.0	g/km		
Hydrocarbons (Total)	0.283	kg/h	0.027	g/km		
Carbon Monoxide (Total)	3.308	kg/h	0.312	g/km		
NOx (Total)	7.476	kg/h	0.705	g/km		

Network Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.0% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	21,994,560	veh/y	35,414,210	pers/y
Delay	60,188	veh-h/y	87,151	pers-h/y
Effective Stops	4,883,829	veh/y	9,120,820	pers/y
Travel Distance	5,093,591	veh-km/y	7,929,785	pers-km/y
Travel Time	145,919	veh-h/y	224,734	pers-h/y
Cost	7,291,933	$/y	7,291,933	$/y
Fuel Consumption	650,606	L/y		
Carbon Dioxide	1,543,384	kg/y		
Hydrocarbons	136	kg/y		
Carbon Monoxide	1,588	kg/y		

NOx	3,589 kg/y

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 AM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	60	5.0	60	5.0	0.371	65.2	LOS E	5.1	38.4	0.96	0.77	0.96	12.2
2	T1	107	8.4	107	8.4	* 0.371	59.6	LOS E	5.2	39.8	0.96	0.75	0.96	13.2
3	R2	70	10.0	70	10.0	0.334	65.2	LOS E	4.3	34.1	0.95	0.76	0.95	12.2
Approach		237	8.0	237	8.0	0.371	62.7	LOS E	5.2	39.8	0.96	0.76	0.96	12.6
East: Great Eastern Hwy														
4	L2	194	5.7	194	5.7	0.280	28.6	LOS C	8.7	66.7	0.65	0.73	0.65	24.3
5	T1	2486	4.5	2486	4.5	* 0.934	55.7	LOS E	17.8	130.6	1.00	1.06	1.18	6.0
6	R2	18	5.6	18	5.6	0.171	72.1	LOS E	1.2	9.6	0.98	0.70	0.98	4.9
6u	U	1	0.0	1	0.0	0.171	73.8	LOS E	1.2	9.6	0.98	0.70	0.98	4.9
Approach		2699	4.6	2699	4.6	0.934	53.9	LOS D	17.8	130.6	0.97	1.04	1.14	7.1
North: Stoneham St														
7	L2	7	14.3	7	14.3	0.035	60.2	LOS E	0.4	3.7	0.89	0.67	0.89	8.1
8	T1	293	4.1	293	4.1	* 0.986	100.4	LOS F	22.9	160.3	1.00	1.18	1.57	12.1
9	R2	452	0.4	452	0.4	0.986	101.5	LOS F	20.6	144.6	1.00	1.10	1.52	5.5
Approach		752	2.0	752	2.0	0.986	100.7	LOS F	22.9	160.3	1.00	1.13	1.53	8.3
West: Great Eastern Hwy														
10	L2	217	1.4	217	1.4	0.141	6.6	LOS A	1.6	11.0	0.18	0.60	0.18	31.6
11	T1	1426	5.3	1426	5.3	0.431	20.8	LOS C	12.7	94.5	0.55	0.48	0.55	15.8
12	R2	58	3.4	58	3.4	* 0.797	80.4	LOS F	6.3	44.6	1.00	0.89	1.27	12.9
12u	U	30	0.0	30	0.0	0.797	82.0	LOS F	6.3	44.6	1.00	0.89	1.27	5.1
Approach		1731	4.7	1731	4.7	0.797	22.0	LOS C	12.7	94.5	0.53	0.52	0.54	15.8
All Vehicles		5419	4.4	5419	4.4	0.986	50.6	LOS D	22.9	160.3	0.83	0.87	1.00	9.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 AM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	97	2.1	97	2.1	0.514	67.8	LOS E	6.5	48.3	0.99	0.79	0.99	15.3
2	T1	108	5.6	108	5.6	0.514	61.7	LOS E	6.5	45.9	0.98	0.77	0.98	17.0
3	R2	124	4.0	124	4.0	* 0.626	69.2	LOS E	8.0	59.3	1.00	0.81	1.02	15.4
Approach		329	4.0	329	4.0	0.626	66.3	LOS E	8.0	59.3	0.99	0.79	1.00	15.9
East: Great Eastern Hwy														
4	L2	127	4.7	127	4.7	0.089	7.9	LOS A	1.4	9.6	0.23	0.61	0.23	45.0
5	T1	2479	4.8	2479	4.8	* 0.693	26.7	LOS C	22.2	163.2	0.81	0.73	0.81	13.0
6	R2	140	7.1	140	7.1	* 0.857	79.3	LOS E	11.0	83.1	1.00	0.95	1.30	5.2
6u	U	13	0.0	13	0.0	0.857	80.9	LOS F	11.0	83.1	1.00	0.95	1.30	5.2
Approach		2759	4.9	2759	4.9	0.857	28.8	LOS C	22.2	163.2	0.80	0.74	0.81	13.6
North: Resolution Dr														
7	L2	250	2.0	250	2.0	0.425	15.4	LOS B	7.2	51.8	0.53	0.73	0.53	21.5
8	T1	134	7.5	134	7.5	0.611	67.7	LOS E	5.7	40.0	1.00	0.77	1.02	19.1
9	R2	86	1.2	86	1.2	* 0.628	74.0	LOS E	5.7	40.4	1.00	0.79	1.04	6.3
Approach		470	3.4	470	3.4	0.628	41.0	LOS D	7.2	51.8	0.75	0.75	0.76	16.2
West: Great Eastern Hwy														
10	L2	8	0.0	8	0.0	0.030	23.8	LOS C	0.7	7.3	0.53	0.50	0.53	21.1
11	T1	1395	6.0	1395	6.0	0.497	18.3	LOS B	15.0	112.0	0.54	0.48	0.54	22.5
12	R2	104	1.0	104	1.0	0.658	70.7	LOS E	8.0	56.2	1.00	0.82	1.05	19.0
12u	U	18	0.0	18	0.0	0.658	72.3	LOS E	8.0	56.2	1.00	0.82	1.05	8.1
Approach		1525	5.6	1525	5.6	0.658	22.5	LOS C	15.0	112.0	0.58	0.51	0.58	21.4
All Vehicles		5083	4.9	5083	4.9	0.857	30.5	LOS C	22.2	163.2	0.74	0.68	0.75	16.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 AM Peak with proposed road network
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	28	7.1	28	7.1	0.358	6.8	LOS A	1.9	13.9	0.69	0.88	0.70	29.3
6a	R1	15	6.7	15	6.7	0.358	12.1	LOS B	1.9	13.9	0.69	0.88	0.70	39.3
6	R2	232	4.7	232	4.7	0.358	13.2	LOS B	1.9	13.9	0.69	0.88	0.70	29.3
Approach		275	5.1	275	5.1	0.358	12.5	LOS B	1.9	13.9	0.69	0.88	0.70	30.0
North: Grandstand Rd														
7	L2	408	2.7	408	2.7	0.405	3.9	LOS A	2.7	19.0	0.33	0.50	0.33	33.6
9a	R1	723	1.1	723	1.1	0.405	8.7	LOS A	2.7	19.0	0.34	0.57	0.34	31.0
9b	R3	6	0.0	6	0.0	0.405	11.2	LOS B	2.6	18.6	0.34	0.59	0.34	46.7
9u	U	2	0.0	2	0.0	0.405	12.4	LOS B	2.6	18.6	0.34	0.59	0.34	30.3
Approach		1139	1.7	1139	1.7	0.405	7.0	LOS A	2.7	19.0	0.34	0.54	0.34	31.9
NorthWest: Resolution Dr														
27b	L3	12	8.3	12	8.3	0.113	4.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
27a	L1	48	0.0	48	0.0	0.113	3.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
29	R2	46	0.0	46	0.0	0.113	9.3	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
Approach		106	0.9	106	0.9	0.113	6.0	LOS A	0.5	3.3	0.50	0.60	0.50	35.7
SouthWest: Stoneham St														
30	L2	18	0.0	18	0.0	0.151	3.8	LOS A	0.8	6.0	0.42	0.43	0.42	44.8
30a	L1	318	2.8	318	2.8	0.151	3.5	LOS A	0.8	6.0	0.42	0.46	0.42	35.2
32a	R1	21	0.0	21	0.0	0.151	8.7	LOS A	0.8	5.8	0.43	0.49	0.43	34.6
32u	U	4	25.0	4	25.0	0.151	12.6	LOS B	0.8	5.8	0.43	0.49	0.43	34.6
Approach		361	2.8	361	2.8	0.151	3.9	LOS A	0.8	6.0	0.43	0.46	0.43	36.0
All Vehicles		1881	2.3	1881	2.3	0.405	7.1	LOS A	2.7	19.0	0.41	0.58	0.42	32.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NETWORK SUMMARY

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

Proposed Network
2021 Traffic Volumes
Network Category: Proposed Design 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS D					
Speed Efficiency	0.51					
Travel Time Index	4.59					
Congestion Coefficient	1.95					
Travel Speed (Average)	30.7	km/h			31.6	km/h
Travel Distance (Total)	11461.9	veh-km/h			16737.6	pers-km/h
Travel Time (Total)	373.8	veh-h/h			530.1	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	48965	veh/h			72755	pers/h
Arrival Flows (Total for all Sites)	48738	veh/h			72482	pers/h
Demand Flows (Entry Total)	7296	veh/h				
Midblock Inflows (Total)	587	veh/h				
Midblock Outflows (Total)	-225	veh/h				
Percent Heavy Vehicles (Demand)	2.3	%				
Percent Heavy Vehicles (Arrival)	2.3	%				
Degree of Saturation	1.475					
Control Delay (Total)	180.62	veh-h/h			245.88	pers-h/h
Control Delay (Average)	13.3	sec			12.2	sec
Control Delay (Worst Lane)	464.6	sec				
Control Delay (Worst Movement)	504.4	sec			504.4	sec
Geometric Delay (Average)	0.8	sec				
Stop-Line Delay (Average)	12.5	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.54					
Total Effective Stops	14517	veh/h			20940	pers/h
Effective Stop Rate	0.30		1.27	per km	0.29	
Proportion Queued	0.24				0.23	
Performance Index	1167.5				1167.5	
Cost (Total)	16827.04	$/h	1.47	$/km	16827.04	$/h
Fuel Consumption (Total)	1395.6	L/h	121.8	mL/km		
Fuel Economy	12.2	L/100km				
Carbon Dioxide (Total)	3296.1	kg/h	287.6	g/km		
Hydrocarbons (Total)	0.311	kg/h	0.027	g/km		
Carbon Monoxide (Total)	3.464	kg/h	0.302	g/km		
NOx (Total)	4.031	kg/h	0.352	g/km		

Network Model Variability Index (Iterations 3 to N): 0.2 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.3% 0.2% 0.2%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	23,503,200	veh/y	34,922,310	pers/y
Delay	86,698	veh-h/y	118,024	pers-h/y
Effective Stops	6,968,119	veh/y	10,051,170	pers/y
Travel Distance	5,501,712	veh-km/y	8,034,062	pers-km/y
Travel Time	179,401	veh-h/y	254,466	pers-h/y
Cost	8,076,979	$/y	8,076,979	$/y
Fuel Consumption	669,870	L/y		
Carbon Dioxide	1,582,124	kg/y		
Hydrocarbons	149	kg/y		
Carbon Monoxide	1,663	kg/y		

NOx	1,935 kg/y

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	200	0.5	200	0.5	0.812	66.7	LOS E	21.8	154.2	1.00	0.91	1.11	12.2
2	T1	416	1.4	416	1.4	*0.812	60.6	LOS E	21.8	154.2	1.00	0.92	1.11	13.0
3	R2	254	1.2	254	1.2	0.666	60.5	LOS E	16.0	113.7	0.98	0.84	0.98	12.9
Approach		870	1.1	870	1.1	0.812	62.0	LOS E	21.8	154.2	0.99	0.90	1.07	12.8
East: Great Eastern Hwy														
4	L2	102	3.9	102	3.9	0.195	34.3	LOS C	5.5	44.9	0.69	0.71	0.69	22.3
5	T1	1442	2.6	1442	2.6	0.617	35.6	LOS D	18.4	130.6	0.86	0.76	0.86	8.9
6	R2	74	2.7	74	2.7	0.525	72.3	LOS E	5.8	41.5	1.00	0.78	1.00	4.9
6u	U	12	0.0	12	0.0	0.525	74.0	LOS E	5.8	41.5	1.00	0.78	1.00	4.9
Approach		1630	2.6	1630	2.6	0.617	37.5	LOS D	18.4	130.6	0.85	0.76	0.85	9.6
North: Stoneham St														
7	L2	9	0.0	9	0.0	0.046	66.9	LOS E	0.5	3.7	0.93	0.67	0.93	7.4
8	T1	211	0.0	201	0.0	*0.762	70.1	LOS E	10.5	73.5	1.00	0.87	1.13	15.9
9	R2	242	2.1	231	2.2	0.762	75.6	LOS E	10.0	70.8	1.00	0.86	1.11	7.2
Approach		462	1.1	440 N1	1.1	0.762	72.9	LOS E	10.5	73.5	1.00	0.86	1.12	11.5
West: Great Eastern Hwy														
10	L2	733	0.4	733	0.4	0.615	12.8	LOS B	19.7	138.8	0.52	0.73	0.52	21.9
11	T1	2015	3.2	2015	3.2	*0.777	35.0	LOS C	22.7	163.2	0.84	0.75	0.85	10.5
12	R2	83	0.0	83	0.0	*0.549	72.8	LOS E	6.3	43.8	1.00	0.78	1.00	14.0
12u	U	10	0.0	10	0.0	0.549	74.4	LOS E	6.3	43.8	1.00	0.78	1.00	5.6
Approach		2841	2.4	2841	2.4	0.777	30.5	LOS C	22.7	163.2	0.76	0.75	0.77	12.3
All Vehicles		5803	2.2	5781 N1	2.2	0.812	40.4	LOS D	22.7	163.2	0.84	0.78	0.86	11.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	113	0.0	113	0.0	0.488	66.4	LOS E	8.0	55.7	0.97	0.79	0.97	15.6
2	T1	180	2.8	180	2.8	* 0.644	62.5	LOS E	11.1	79.4	1.00	0.82	1.00	16.8
3	R2	146	2.7	146	2.7	0.591	67.7	LOS E	9.5	68.7	0.99	0.81	0.99	15.7
Approach		439	2.1	439	2.1	0.644	65.2	LOS E	11.1	79.4	0.99	0.81	0.99	16.1
East: Great Eastern Hwy														
4	L2	131	0.0	131	0.0	0.093	9.2	LOS A	1.9	13.0	0.27	0.62	0.27	45.3
5	T1	1482	3.0	1482	3.0	0.451	27.4	LOS C	18.1	128.8	0.73	0.64	0.73	12.8
6	R2	240	0.4	240	0.4	* 0.967	100.7	LOS F	22.1	155.4	1.00	1.08	1.50	4.2
6u	U	15	0.0	15	0.0	0.967	102.3	LOS F	22.1	155.4	1.00	1.08	1.50	4.2
Approach		1868	2.4	1868	2.4	0.967	36.1	LOS D	22.1	155.4	0.73	0.70	0.80	12.0
North: Resolution Dr														
7	L2	141	3.5	141	3.5	0.265	30.0	LOS C	5.8	42.3	0.70	0.75	0.70	13.4
8	T1	147	3.4	147	3.4	* 0.738	73.1	LOS E	6.7	46.7	1.00	0.81	1.10	18.2
9	R2	23	0.0	23	0.0	0.191	74.5	LOS E	1.5	10.6	0.96	0.71	0.96	6.3
Approach		311	3.2	311	3.2	0.738	53.7	LOS D	6.7	46.7	0.86	0.77	0.91	16.0
West: Great Eastern Hwy														
10	L2	22	0.0	22	0.0	0.063	28.9	LOS C	1.6	15.5	0.59	0.58	0.59	17.8
11	T1	2345	2.8	2345	2.8	* 0.899	39.2	LOS D	36.4	261.1	0.92	0.91	1.01	13.1
12	R2	182	1.6	182	1.6	0.798	73.1	LOS E	14.4	100.9	1.00	0.89	1.15	18.5
12u	U	22	0.0	22	0.0	0.798	74.7	LOS E	14.4	100.9	1.00	0.89	1.15	7.9
Approach		2571	2.6	2571	2.6	0.899	41.9	LOS D	36.4	261.1	0.93	0.91	1.02	13.8
All Vehicles		5189	2.5	5189	2.5	0.967	42.5	LOS D	36.4	261.1	0.86	0.82	0.93	13.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 PM Peak with proposed road network
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	49	2.0	49	2.0	0.610	6.9	LOS A	4.9	35.2	0.70	0.87	0.83	29.1
6a	R1	40	0.0	40	0.0	0.610	12.0	LOS B	4.9	35.2	0.70	0.87	0.83	40.0
6	R2	507	2.2	507	2.2	0.610	13.4	LOS B	4.9	35.2	0.70	0.87	0.83	29.1
Approach		596	2.0	596	2.0	0.610	12.7	LOS B	4.9	35.2	0.70	0.87	0.83	30.0
North: Grandstand Rd														
7	L2	207	2.4	207	2.4	0.209	3.6	LOS A	1.2	8.6	0.24	0.48	0.24	34.5
9a	R1	380	0.3	380	0.3	0.209	8.4	LOS A	1.2	8.6	0.24	0.55	0.24	31.8
9b	R3	8	0.0	8	0.0	0.209	10.9	LOS B	1.2	8.3	0.25	0.57	0.25	47.5
9u	U	4	0.0	4	0.0	0.209	12.1	LOS B	1.2	8.3	0.25	0.57	0.25	31.1
Approach		599	1.0	599	1.0	0.209	6.8	LOS A	1.2	8.6	0.24	0.52	0.24	32.9
NorthWest: Resolution Dr														
27b	L3	13	0.0	13	0.0	0.191	9.7	LOS A	1.0	7.3	0.87	0.93	0.87	28.8
27a	L1	25	4.0	25	4.0	0.191	9.0	LOS A	1.0	7.3	0.87	0.93	0.87	28.8
29	R2	34	2.9	34	2.9	0.191	15.0	LOS B	1.0	7.3	0.87	0.93	0.87	28.8
Approach		72	2.8	72	2.8	0.191	12.0	LOS B	1.0	7.3	0.87	0.93	0.87	28.8
SouthWest: Stoneham St														
30	L2	50	0.0	47	0.0	0.759	10.6	LOS B	10.4	73.2	0.96	1.03	1.30	36.4
30a	L1	1425	0.5	1343	0.5	0.759	10.8	LOS B	10.4	73.2	0.96	1.06	1.32	23.8
32a	R1	16	6.3	15	6.6	0.759	16.8	LOS B	9.8	68.8	0.96	1.08	1.35	23.0
32u	U	5	0.0	5	0.0	0.759	20.3	LOS C	9.8	68.8	0.96	1.08	1.35	23.0
Approach		1496	0.5	1410 N1	0.6	0.759	10.8	LOS B	10.4	73.2	0.96	1.06	1.32	24.5
All Vehicles		2763	1.0	2677 N1	1.0	0.759	10.4	LOS B	10.4	73.2	0.74	0.89	0.96	27.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 5 – SIDRA Network Output 2031 Proposed Road Network

NETWORK SUMMARY

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

Proposed Network
25% of Ascot Kilns and Golden Gateway development
50% of Ascot Racecourse development
Network Category: Future Conditions 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.46					
Travel Time Index	3.98					
Congestion Coefficient	2.18					
Travel Speed (Average)	27.4	km/h			28.9	km/h
Travel Distance (Total)	11381.5	veh-km/h			18343.7	pers-km/h
Travel Time (Total)	415.3	veh-h/h			634.8	pers-h/h
Desired Speed (Program)	59.8	km/h				
Demand Flows (Total for all Sites)	49837	veh/h			87594	pers/h
Arrival Flows (Total for all Sites)	49582	veh/h			86309	pers/h
Demand Flows (Entry Total)	7118	veh/h				
Midblock Inflows (Total)	82	veh/h				
Midblock Outflows (Total)	-86	veh/h				
Percent Heavy Vehicles (Demand)	4.2	%				
Percent Heavy Vehicles (Arrival)	4.2	%				
Degree of Saturation	1.201					
Control Delay (Total)	220.28	veh-h/h			311.22	pers-h/h
Control Delay (Average)	16.0	sec			13.0	sec
Control Delay (Worst Lane)	259.0	sec				
Control Delay (Worst Movement)	260.5	sec			260.5	sec
Geometric Delay (Average)	0.7	sec				
Stop-Line Delay (Average)	15.3	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	12962	veh/h			26984	pers/h
Effective Stop Rate	0.26		1.14	per km	0.31	
Proportion Queued	0.22				0.19	
Performance Index	1201.3				1201.3	
Cost (Total)	20328.28	$/h	1.79	$/km	20328.28	$/h
Fuel Consumption (Total)	1612.2	L/h	141.7	mL/km		
Fuel Economy	14.2	L/100km				
Carbon Dioxide (Total)	3821.2	kg/h	335.7	g/km		
Hydrocarbons (Total)	0.352	kg/h	0.031	g/km		
Carbon Monoxide (Total)	3.836	kg/h	0.337	g/km		
NOx (Total)	8.452	kg/h	0.743	g/km		

Network Model Variability Index (Iterations 3 to N): 0.0 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.0% 0.0% 0.0%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	23,921,760	veh/y	42,045,120	pers/y
Delay	105,733	veh-h/y	149,385	pers-h/y
Effective Stops	6,221,603	veh/y	12,952,480	pers/y
Travel Distance	5,463,101	veh-km/y	8,804,996	pers-km/y
Travel Time	199,334	veh-h/y	304,696	pers-h/y
Cost	9,757,576	$/y	9,757,576	$/y
Fuel Consumption	773,852	L/y		
Carbon Dioxide	1,834,172	kg/y		

Hydrocarbons	169	kg/y
Carbon Monoxide	1,842	kg/y
NOx	4,057	kg/y

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MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	63	4.8	63	4.8	0.396	65.4	LOS E	5.5	41.1	0.96	0.77	0.96	12.2
2	T1	116	7.8	116	7.8	* 0.396	59.8	LOS E	5.6	42.6	0.96	0.76	0.96	13.2
3	R2	76	9.2	76	9.2	0.360	65.4	LOS E	4.7	36.8	0.96	0.77	0.96	12.1
Approach		255	7.5	255	7.5	0.396	62.9	LOS E	5.6	42.6	0.96	0.77	0.96	12.6
East: Great Eastern Hwy														
4	L2	204	5.9	204	5.9	0.297	29.4	LOS C	9.3	71.0	0.67	0.74	0.67	23.9
5	T1	2612	4.5	2612	4.5	* 0.998	87.4	LOS F	17.8	130.6	1.00	1.24	1.40	4.0
6	R2	19	5.3	19	5.3	0.179	72.2	LOS E	1.3	10.1	0.98	0.71	0.98	4.9
6u	U	1	0.0	1	0.0	0.179	73.9	LOS E	1.3	10.1	0.98	0.71	0.98	4.9
Approach		2836	4.6	2836	4.6	0.998	83.1	LOS F	17.8	130.6	0.97	1.20	1.34	4.8
North: Stoneham St														
7	L2	6	0.0	6	0.0	0.023	59.1	LOS E	0.3	2.4	0.89	0.66	0.89	8.2
8	T1	325	4.0	325	4.0	* 1.190	243.5	LOS F	32.6	228.5	1.00	1.68	2.38	5.5
9	R2	570	0.4	570	0.4	1.190	246.2	LOS F	32.5	228.5	1.00	1.52	2.34	2.3
Approach		901	1.7	901	1.7	1.190	244.0	LOS F	32.6	228.5	1.00	1.57	2.35	3.5
West: Great Eastern Hwy														
10	L2	250	1.2	250	1.2	0.164	6.7	LOS A	2.0	14.0	0.19	0.61	0.19	31.3
11	T1	1500	5.3	1500	5.3	0.466	21.9	LOS C	14.2	105.6	0.58	0.51	0.58	15.2
12	R2	61	3.3	61	3.3	* 0.842	82.6	LOS F	6.8	48.0	1.00	0.93	1.35	12.6
12u	U	32	0.0	32	0.0	0.842	84.3	LOS F	6.8	48.0	1.00	0.93	1.35	5.0
Approach		1843	4.6	1843	4.6	0.842	22.9	LOS C	14.2	105.6	0.55	0.54	0.57	15.4
All Vehicles		5835	4.3	5835	4.3	1.190	88.1	LOS F	32.6	228.5	0.84	1.03	1.23	5.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	102	2.0	102	2.0	0.538	68.0	LOS E	6.8	50.7	0.99	0.79	0.99	15.3
2	T1	116	5.2	116	5.2	0.538	62.0	LOS E	7.0	49.7	0.99	0.78	0.99	16.9
3	R2	130	3.8	130	3.8	* 0.655	69.7	LOS E	8.5	62.5	1.00	0.82	1.04	15.3
Approach		348	3.7	348	3.7	0.655	66.7	LOS E	8.5	62.5	0.99	0.80	1.01	15.8
East: Great Eastern Hwy														
4	L2	133	4.5	133	4.5	0.094	8.2	LOS A	1.5	10.6	0.24	0.61	0.24	44.8
5	T1	2605	4.8	2605	4.8	* 0.881	42.5	LOS D	22.2	163.2	0.94	0.95	1.06	8.9
6	R2	205	5.4	205	5.4	* 1.201	258.9	LOS F	22.0	163.2	1.00	1.53	2.48	1.6
6u	U	14	0.0	14	0.0	1.201	260.5	LOS F	22.0	163.2	1.00	1.53	2.48	1.6
Approach		2957	4.8	2957	4.8	1.201	57.0	LOS E	22.2	163.2	0.91	0.98	1.13	7.6
North: Resolution Dr														
7	L2	283	1.8	283	1.8	0.488	16.6	LOS B	9.0	64.2	0.58	0.75	0.58	20.5
8	T1	144	6.9	144	6.9	0.653	68.2	LOS E	6.1	43.2	1.00	0.79	1.04	19.1
9	R2	90	1.1	90	1.1	* 0.851	81.5	LOS F	6.5	46.1	1.00	0.91	1.31	5.8
Approach		517	3.1	517	3.1	0.851	42.2	LOS D	9.0	64.2	0.77	0.79	0.84	15.8
West: Great Eastern Hwy														
10	L2	29	0.0	29	0.0	0.053	24.1	LOS C	1.4	12.2	0.54	0.60	0.54	19.7
11	T1	1481	5.9	1481	5.9	0.528	18.7	LOS B	16.5	123.2	0.56	0.50	0.56	22.2
12	R2	114	0.9	114	0.9	0.746	73.2	LOS E	9.0	63.2	1.00	0.86	1.14	18.5
12u	U	19	0.0	19	0.0	0.746	74.8	LOS E	9.0	63.2	1.00	0.86	1.14	7.9
Approach		1643	5.4	1643	5.4	0.746	23.3	LOS C	16.5	123.2	0.60	0.53	0.61	21.0
All Vehicles		5465	4.8	5465	4.8	1.201	46.1	LOS D	22.2	163.2	0.81	0.82	0.94	11.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	92	2.2	86	2.0	0.473	8.3	LOS A	3.0	21.9	0.77	0.96	0.91	28.1
6a	R1	25	4.0	23	3.7	0.473	13.6	LOS B	3.0	21.9	0.77	0.96	0.91	38.9
6	R2	254	4.3	235	4.3	0.473	14.9	LOS B	3.0	21.9	0.77	0.96	0.91	28.1
Approach		371	3.8	344 N1	3.7	0.473	13.1	LOS B	3.0	21.9	0.77	0.96	0.91	29.1
North: Grandstand Rd														
7	L2	447	2.5	447	2.5	0.459	4.2	LOS A	3.2	22.8	0.42	0.54	0.42	32.7
9a	R1	783	1.0	783	1.0	0.459	9.0	LOS A	3.2	22.8	0.43	0.60	0.43	30.3
9b	R3	6	0.0	6	0.0	0.459	11.5	LOS B	3.1	22.2	0.43	0.62	0.43	45.9
9u	U	2	0.0	2	0.0	0.459	12.8	LOS B	3.1	22.2	0.43	0.62	0.43	29.6
Approach		1238	1.5	1238	1.5	0.459	7.3	LOS A	3.2	22.8	0.42	0.58	0.42	31.1
NorthWest: Resolution Dr														
27b	L3	13	7.7	13	7.7	0.154	4.5	LOS A	0.6	4.6	0.52	0.63	0.52	35.2
27a	L1	61	0.0	61	0.0	0.154	3.4	LOS A	0.6	4.6	0.52	0.63	0.52	35.2
29	R2	67	0.0	67	0.0	0.154	9.5	LOS A	0.6	4.6	0.52	0.63	0.52	35.2
Approach		141	0.7	141	0.7	0.154	6.4	LOS A	0.6	4.6	0.52	0.63	0.52	35.2
SouthWest: Stoneham St														
30	L2	26	0.0	26	0.0	0.172	3.9	LOS A	1.0	7.1	0.44	0.44	0.44	44.6
30a	L1	339	2.7	339	2.7	0.172	3.5	LOS A	1.0	7.1	0.45	0.47	0.45	34.6
32a	R1	37	0.0	37	0.0	0.172	8.7	LOS A	1.0	6.9	0.45	0.51	0.45	33.8
32u	U	4	25.0	4	25.0	0.172	12.7	LOS B	1.0	6.9	0.45	0.51	0.45	33.8
Approach		406	2.5	406	2.5	0.172	4.1	LOS A	1.0	7.1	0.45	0.47	0.45	35.6
All Vehicles		2156	2.0	2129 N1	2.1	0.473	7.6	LOS A	3.2	22.8	0.49	0.62	0.51	31.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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NETWORK SUMMARY

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

Proposed Network
25% of Ascot Kilns and Golden Gateway development
50% of Ascot Racecourse development
Network Category: Future Conditions 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.37					
Travel Time Index	2.96					
Congestion Coefficient	2.73					
Travel Speed (Average)	21.9	km/h			23.3	km/h
Travel Distance (Total)	12303.7	veh-km/h			20451.0	pers-km/h
Travel Time (Total)	562.7	veh-h/h			877.0	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	54040	veh/h			106812	pers/h
Arrival Flows (Total for all Sites)	52903	veh/h			102661	pers/h
Demand Flows (Entry Total)	8051	veh/h				
Midblock Inflows (Total)	393	veh/h				
Midblock Outflows (Total)	-21	veh/h				
Percent Heavy Vehicles (Demand)	2.1	%				
Percent Heavy Vehicles (Arrival)	2.1	%				
Degree of Saturation	2.581					
Control Delay (Total)	351.88	veh-h/h			517.73	pers-h/h
Control Delay (Average)	23.9	sec			18.2	sec
Control Delay (Worst Lane)	1454.1	sec				
Control Delay (Worst Movement)	1490.4	sec			1490.4	sec
Geometric Delay (Average)	0.8	sec				
Stop-Line Delay (Average)	23.1	sec				
Ave. Queue Storage Ratio (Worst Lane)	2.94					
Total Effective Stops	17637	veh/h			41732	pers/h
Effective Stop Rate	0.33		1.43	per km	0.41	
Proportion Queued	0.26				0.25	
Performance Index	1633.8				1633.8	
Cost (Total)	26843.04	$/h	2.18	$/km	26843.04	$/h
Fuel Consumption (Total)	1713.5	L/h	139.3	mL/km		
Fuel Economy	13.9	L/100km				
Carbon Dioxide (Total)	4043.5	kg/h	328.6	g/km		
Hydrocarbons (Total)	0.395	kg/h	0.032	g/km		
Carbon Monoxide (Total)	4.018	kg/h	0.327	g/km		
NOx (Total)	4.326	kg/h	0.352	g/km		

Network Model Variability Index (Iterations 3 to N): 2.2 %
Number of Iterations: 10 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 7.1% 0.7% 0.6%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	25,939,200	veh/y	51,269,760	pers/y
Delay	168,904	veh-h/y	248,512	pers-h/y
Effective Stops	8,465,573	veh/y	20,031,340	pers/y
Travel Distance	5,905,771	veh-km/y	9,816,458	pers-km/y
Travel Time	270,083	veh-h/y	420,966	pers-h/y
Cost	12,884,660	$/y	12,884,660	$/y
Fuel Consumption	822,470	L/y		
Carbon Dioxide	1,940,881	kg/y		

Hydrocarbons	190	kg/y
Carbon Monoxide	1,929	kg/y
NOx	2,077	kg/y

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MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	210	0.5	210	0.5	0.883	74.3	LOS E	25.8	182.0	1.00	0.98	1.22	11.1
2	T1	447	1.3	447	1.3	* 0.883	68.3	LOS E	25.8	182.0	1.00	1.01	1.23	11.8
3	R2	272	1.1	272	1.1	0.713	61.7	LOS E	17.4	124.1	0.99	0.85	1.01	12.7
Approach		929	1.1	929	1.1	0.883	67.8	LOS E	25.8	182.0	1.00	0.96	1.16	11.9
East: Great Eastern Hwy														
4	L2	107	3.7	107	3.7	0.201	34.4	LOS C	5.8	46.6	0.69	0.72	0.69	22.3
5	T1	1514	2.4	1514	2.4	0.648	36.2	LOS D	18.4	130.6	0.87	0.77	0.87	8.8
6	R2	78	2.6	78	2.6	0.555	72.5	LOS E	6.1	44.0	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.555	74.3	LOS E	6.1	44.0	1.00	0.78	1.00	4.9
Approach		1712	2.5	1712	2.5	0.648	38.0	LOS D	18.4	130.6	0.87	0.77	0.87	9.4
North: Stoneham St														
7	L2	10	0.0	9	0.0	0.048	67.0	LOS E	0.6	3.9	0.93	0.67	0.93	7.3
8	T1	240	0.0	215	0.0	* 0.967	95.7	LOS F	16.2	113.3	1.00	1.11	1.55	12.6
9	R2	366	1.4	333	1.5	0.967	99.4	LOS F	15.1	107.3	1.00	1.08	1.51	5.6
Approach		616	0.8	557 N1	0.9	0.967	97.4	LOS F	16.2	113.3	1.00	1.08	1.52	8.5
West: Great Eastern Hwy														
10	L2	819	0.4	819	0.4	0.687	13.9	LOS B	23.2	163.2	0.58	0.76	0.58	20.7
11	T1	2132	3.1	2132	3.1	* 0.829	38.4	LOS D	22.7	163.2	0.88	0.82	0.92	9.7
12	R2	87	0.0	87	0.0	* 0.579	73.0	LOS E	6.6	46.3	1.00	0.78	1.00	14.0
12u	U	11	0.0	11	0.0	0.579	74.7	LOS E	6.6	46.3	1.00	0.78	1.00	5.5
Approach		3049	2.3	3049	2.3	0.829	32.9	LOS C	23.2	163.2	0.80	0.80	0.83	11.5
All Vehicles		6306	2.0	6247 N1	2.0	0.967	45.3	LOS D	25.8	182.0	0.87	0.84	0.95	10.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	119	0.0	119	0.0	0.523	66.8	LOS E	8.6	60.0	0.98	0.80	0.98	15.6
2	T1	195	2.6	195	2.6	* 0.690	63.5	LOS E	12.0	86.3	1.00	0.84	1.03	16.6
3	R2	153	2.6	153	2.6	0.618	68.0	LOS E	10.0	72.2	0.99	0.81	0.99	15.6
Approach		467	1.9	467	1.9	0.690	65.8	LOS E	12.0	86.3	0.99	0.82	1.01	16.0
East: Great Eastern Hwy														
4	L2	138	0.0	138	0.0	0.099	9.5	LOS A	2.0	14.3	0.28	0.62	0.28	45.0
5	T1	1557	2.9	1557	2.9	0.474	27.7	LOS C	19.3	137.4	0.74	0.65	0.74	12.7
6	R2	367	0.3	367	0.3	* 1.442	464.7	LOS F	23.2	163.2	1.00	1.91	3.18	0.9
6u	U	16	0.0	16	0.0	1.442	466.4	LOS F	23.2	163.2	1.00	1.91	3.18	0.9
Approach		2078	2.2	2078	2.2	1.442	107.1	LOS F	23.2	163.2	0.76	0.88	1.16	4.5
North: Resolution Dr														
7	L2	187	2.7	186	2.7	0.348	34.7	LOS C	8.5	61.1	0.77	0.77	0.77	11.9
8	T1	159	3.1	158	3.2	* 0.793	74.2	LOS E	7.3	50.9	1.00	0.83	1.15	18.0
9	R2	24	0.0	24	0.0	0.198	74.6	LOS E	1.6	10.9	0.96	0.71	0.96	6.3
Approach		370	2.7	368 N1	2.7	0.793	54.3	LOS D	8.5	61.1	0.88	0.80	0.94	15.3
West: Great Eastern Hwy														
10	L2	39	0.0	39	0.0	0.083	29.2	LOS C	2.2	20.1	0.60	0.63	0.60	17.3
11	T1	2454	2.7	2453	2.7	* 0.945	51.0	LOS D	36.4	261.1	0.98	1.03	1.15	10.7
12	R2	191	1.6	191	1.6	0.777	71.8	LOS E	14.0	98.5	1.00	0.88	1.12	18.8
12u	U	11	0.0	11	0.0	0.777	73.4	LOS E	14.0	98.5	1.00	0.88	1.12	8.0
Approach		2695	2.6	2694 N1	2.6	0.945	52.2	LOS D	36.4	261.1	0.97	1.02	1.14	11.6
All Vehicles		5610	2.4	5607 N1	2.4	1.442	73.8	LOS E	36.4	261.1	0.89	0.93	1.12	8.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	171	0.6	153	0.6	0.721	8.9	LOS A	7.5	53.2	0.81	0.98	1.07	27.3
6a	R1	55	0.0	48	0.0	0.721	14.1	LOS B	7.5	53.2	0.81	0.98	1.07	38.5
6	R2	550	2.0	483	2.2	0.721	15.4	LOS B	7.5	53.2	0.81	0.98	1.07	27.3
Approach		776	1.5	684 N1	1.7	0.721	13.9	LOS B	7.5	53.2	0.81	0.98	1.07	28.4
North: Grandstand Rd														
7	L2	252	2.0	252	2.0	0.247	3.9	LOS A	1.4	10.0	0.31	0.50	0.31	34.0
9a	R1	409	0.2	409	0.2	0.247	8.6	LOS A	1.4	10.0	0.32	0.57	0.32	31.1
9b	R3	8	0.0	8	0.0	0.247	11.1	LOS B	1.4	9.7	0.32	0.59	0.32	46.8
9u	U	4	0.0	4	0.0	0.247	12.4	LOS B	1.4	9.7	0.32	0.59	0.32	30.5
Approach		673	0.9	673	0.9	0.247	6.9	LOS A	1.4	10.0	0.32	0.54	0.32	32.3
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.251	9.8	LOS A	1.4	9.7	0.88	0.94	0.88	28.7
27a	L1	32	3.1	32	3.1	0.251	9.1	LOS A	1.4	9.7	0.88	0.94	0.88	28.7
29	R2	47	2.1	47	2.1	0.251	15.1	LOS B	1.4	9.7	0.88	0.94	0.88	28.7
Approach		93	2.2	93	2.2	0.251	12.2	LOS B	1.4	9.7	0.88	0.94	0.88	28.7
SouthWest: Stoneham St														
30	L2	62	0.0	56	0.0	0.784	11.0	LOS B	11.5	80.6	0.98	1.06	1.36	35.8
30a	L1	1511	0.5	1341	0.5	0.784	11.2	LOS B	11.5	80.6	0.98	1.08	1.38	23.1
32a	R1	53	1.9	51	2.0	0.784	17.1	LOS B	10.7	75.7	0.98	1.11	1.40	22.2
32u	U	5	0.0	4	0.0	0.784	20.8	LOS C	10.7	75.7	0.98	1.11	1.40	22.2
Approach		1631	0.5	1453 N1	0.6	0.784	11.4	LOS B	11.5	80.6	0.98	1.08	1.38	23.8
All Vehicles		3173	0.9	2903 N1	1.0	0.784	11.0	LOS B	11.5	80.6	0.79	0.93	1.04	27.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 6 – SIDRA Network Output 2041 Proposed Road Network

NETWORK SUMMARY

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

Proposed Network
100% of Ascot Kilns, Golden Gateway and Ascot Racecourse development
Network Category: Future Conditions 2

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS F					
Speed Efficiency	0.28					
Travel Time Index	1.94					
Congestion Coefficient	3.64					
Travel Speed (Average)	16.4	km/h			18.9	km/h
Travel Distance (Total)	12315.3	veh-km/h			21191.1	pers-km/h
Travel Time (Total)	750.1	veh-h/h			1121.4	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	55967	veh/h			113744	pers/h
Arrival Flows (Total for all Sites)	54666	veh/h			106097	pers/h
Demand Flows (Entry Total)	7968	veh/h				
Midblock Inflows (Total)	216	veh/h				
Midblock Outflows (Total)	-185	veh/h				
Percent Heavy Vehicles (Demand)	3.9	%				
Percent Heavy Vehicles (Arrival)	3.9	%				
Degree of Saturation	1.793					
Control Delay (Total)	528.98	veh-h/h			733.22	pers-h/h
Control Delay (Average)	34.8	sec			24.9	sec
Control Delay (Worst Lane)	769.5	sec				
Control Delay (Worst Movement)	771.1	sec			771.1	sec
Geometric Delay (Average)	0.8	sec				
Stop-Line Delay (Average)	34.1	sec				
Ave. Queue Storage Ratio (Worst Lane)	1.00					
Total Effective Stops	19512	veh/h			43399	pers/h
Effective Stop Rate	0.36		1.58	per km	0.41	
Proportion Queued	0.23				0.20	
Performance Index	1919.1				1919.1	
Cost (Total)	34790.18	$/h	2.82	$/km	34790.18	$/h
Fuel Consumption (Total)	2211.6	L/h	179.6	mL/km		
Fuel Economy	18.0	L/100km				
Carbon Dioxide (Total)	5234.0	kg/h	425.0	g/km		
Hydrocarbons (Total)	0.531	kg/h	0.043	g/km		
Carbon Monoxide (Total)	4.978	kg/h	0.404	g/km		
NOx (Total)	10.187	kg/h	0.827	g/km		

Network Model Variability Index (Iterations 3 to N): 50.4 %
Number of Iterations: 10 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 54.0% 40.5% 31.8%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	26,864,160	veh/y	54,597,310	pers/y
Delay	253,909	veh-h/y	351,946	pers-h/y
Effective Stops	9,365,632	veh/y	20,831,730	pers/y
Travel Distance	5,911,321	veh-km/y	10,171,720	pers-km/y
Travel Time	360,062	veh-h/y	538,271	pers-h/y
Cost	16,699,290	$/y	16,699,290	$/y
Fuel Consumption	1,061,558	L/y		
Carbon Dioxide	2,512,333	kg/y		
Hydrocarbons	255	kg/y		

Carbon Monoxide	2,390 kg/y
NOx	4,890 kg/y

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MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	66	4.5	66	4.5	0.428	65.7	LOS E	6.0	44.8	0.97	0.78	0.97	12.2
2	T1	127	7.9	127	7.9	* 0.428	60.1	LOS E	6.1	46.4	0.97	0.77	0.97	13.1
3	R2	92	8.7	92	8.7	0.428	66.0	LOS E	6.1	46.4	0.97	0.78	0.97	12.0
Approach		285	7.4	285	7.4	0.428	63.3	LOS E	6.1	46.4	0.97	0.77	0.97	12.5
East: Great Eastern Hwy														
4	L2	214	5.6	214	5.6	0.309	29.5	LOS C	9.7	74.3	0.67	0.74	0.67	23.8
5	T1	2744	4.4	2744	4.4	* 1.048	119.5	LOS F	17.8	130.6	1.00	1.41	1.61	3.0
6	R2	20	5.0	20	5.0	0.187	72.2	LOS E	1.4	10.6	0.98	0.71	0.98	4.9
6u	U	1	0.0	1	0.0	0.187	73.9	LOS E	1.4	10.6	0.98	0.71	0.98	4.9
Approach		2979	4.5	2979	4.5	1.048	112.7	LOS F	17.8	130.6	0.97	1.36	1.54	3.6
North: Stoneham St														
7	L2	6	0.0	6	0.0	0.023	59.1	LOS E	0.3	2.4	0.89	0.66	0.89	8.2
8	T1	376	3.5	369	3.3	1.388	410.7	LOS F	32.6	228.5	1.00	2.12	3.08	3.4
9	R2	806	0.2	777	0.2	* 1.589	589.2	LOS F	32.5	228.5	1.00	2.16	3.62	1.0
Approach		1188	1.3	1151 N1	1.2	1.589	529.3	LOS F	32.6	228.5	1.00	2.14	3.43	1.6
West: Great Eastern Hwy														
10	L2	286	1.0	286	1.0	0.188	6.9	LOS A	2.5	17.5	0.21	0.61	0.21	30.9
11	T1	1584	5.2	1584	5.2	0.495	22.3	LOS C	15.6	115.4	0.59	0.52	0.59	15.0
12	R2	64	3.1	64	3.1	* 0.877	85.3	LOS F	7.2	51.1	1.00	0.96	1.42	12.3
12u	U	33	0.0	33	0.0	0.877	86.9	LOS F	7.2	51.1	1.00	0.96	1.42	4.8
Approach		1967	4.4	1967	4.4	0.877	23.2	LOS C	15.6	115.4	0.56	0.56	0.58	15.2
All Vehicles		6419	4.0	6382 N1	4.0	1.589	158.1	LOS F	32.6	228.5	0.85	1.23	1.56	3.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	107	1.9	107	1.9	0.562	68.2	LOS E	7.2	53.1	0.99	0.79	0.99	15.3
2	T1	123	4.9	123	4.9	0.562	62.3	LOS E	7.5	53.0	0.99	0.79	0.99	16.9
3	R2	136	3.7	136	3.7	* 0.684	70.3	LOS E	9.0	65.8	1.00	0.83	1.06	15.2
Approach		366	3.6	366	3.6	0.684	67.0	LOS E	9.0	65.8	1.00	0.81	1.02	15.8
East: Great Eastern Hwy														
4	L2	141	5.0	141	5.0	0.103	8.9	LOS A	1.9	13.0	0.26	0.62	0.26	44.0
5	T1	2736	4.8	2736	4.8	* 1.098	164.5	LOS F	22.2	163.2	1.00	1.65	1.92	2.5
6	R2	321	3.4	321	3.4	* 1.793	769.5	LOS F	22.5	163.2	1.00	2.35	4.13	0.6
6u	U	14	0.0	14	0.0	1.793	771.1	LOS F	22.5	163.2	1.00	2.35	4.13	0.6
Approach		3212	4.6	3212	4.6	1.793	220.8	LOS F	22.5	163.2	0.97	1.68	2.07	2.1
North: Resolution Dr														
7	L2	315	1.6	315	1.6	0.567	19.7	LOS B	11.8	84.0	0.67	0.78	0.67	18.2
8	T1	155	6.5	155	6.5	0.700	68.8	LOS E	6.7	46.9	1.00	0.80	1.07	18.9
9	R2	95	1.1	95	1.1	* 1.158	224.8	LOS F	12.7	89.8	1.00	1.29	2.35	2.2
Approach		565	2.8	565	2.8	1.158	67.6	LOS E	12.7	89.8	0.82	0.87	1.06	10.7
West: Great Eastern Hwy														
10	L2	94	0.0	94	0.0	0.123	24.9	LOS C	3.6	28.2	0.56	0.68	0.56	18.6
11	T1	1608	5.7	1608	5.7	0.577	19.5	LOS B	19.2	143.1	0.59	0.53	0.59	21.6
12	R2	135	0.7	135	0.7	0.902	84.8	LOS F	11.7	82.0	1.00	1.00	1.41	16.7
12u	U	20	0.0	20	0.0	0.902	86.5	LOS F	11.7	82.0	1.00	1.00	1.41	6.9
Approach		1857	5.0	1857	5.0	0.902	25.3	LOS C	19.2	143.1	0.63	0.58	0.66	19.9
All Vehicles		6000	4.5	6000	4.5	1.793	136.5	LOS F	22.5	163.2	0.85	1.21	1.48	4.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	272	0.7	230	0.5	1.040	74.4	LOS F	26.3	188.0	1.00	2.63	5.60	7.4
6a	R1	40	2.5	33	1.8	1.040	79.8	LOS F	26.3	188.0	1.00	2.63	5.60	13.0
6	R2	288	4.2	231	4.0	1.040	81.1	LOS F	26.3	188.0	1.00	2.63	5.60	7.4
Approach		600	2.5	494 N1	2.2	1.040	77.9	LOS F	26.3	188.0	1.00	2.63	5.60	7.8
North: Grandstand Rd														
7	L2	481	2.5	481	2.5	0.887	9.2	LOS A	9.2	65.7	0.60	0.78	0.84	25.9
9a	R1	841	1.1	841	1.1	0.887	15.5	LOS B	17.5	124.0	0.55	0.83	0.85	23.7
9b	R3	7	0.0	7	0.0	0.887	19.2	LOS B	17.5	124.0	0.52	0.87	0.86	37.0
9u	U	2	0.0	2	0.0	0.887	20.4	LOS C	17.5	124.0	0.52	0.87	0.86	22.6
Approach		1331	1.6	1331	1.6	0.887	13.2	LOS B	17.5	124.0	0.57	0.81	0.85	24.5
NorthWest: Resolution Dr														
27b	L3	13	7.7	13	7.7	0.337	4.7	LOS A	3.7	26.3	0.56	0.68	0.56	34.7
27a	L1	84	0.0	84	0.0	0.337	3.6	LOS A	3.7	26.3	0.56	0.68	0.56	34.7
29	R2	103	0.0	103	0.0	0.337	9.7	LOS A	3.7	26.3	0.56	0.68	0.56	34.7
Approach		200	0.5	200	0.5	0.337	6.8	LOS A	3.7	26.3	0.56	0.68	0.56	34.7
SouthWest: Stoneham St														
30	L2	37	0.0	37	0.0	0.198	3.9	LOS A	1.2	8.7	0.47	0.45	0.47	44.3
30a	L1	361	2.8	361	2.8	0.198	3.5	LOS A	1.2	8.7	0.48	0.48	0.48	34.0
32a	R1	53	0.0	53	0.0	0.198	8.8	LOS A	1.1	8.2	0.48	0.52	0.48	33.1
32u	U	4	25.0	4	25.0	0.198	12.7	LOS B	1.1	8.2	0.48	0.52	0.48	33.1
Approach		455	2.4	455	2.4	0.198	4.3	LOS A	1.2	8.7	0.48	0.48	0.48	35.3
All Vehicles		2586	1.9	2480 N1	1.9	1.040	23.9	LOS C	26.3	188.0	0.64	1.10	1.70	17.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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NETWORK SUMMARY

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

Proposed Network
100% of Ascot Kilns, Golden Gateway and Ascot Racecourse development
Network Category: Future Conditions 2

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS F					
Speed Efficiency	0.21					
Travel Time Index	1.24					
Congestion Coefficient	4.73					
Travel Speed (Average)	12.6	km/h			9.0	km/h
Travel Distance (Total)	13290.8	veh-km/h			23661.1	pers-km/h
Travel Time (Total)	1053.8	veh-h/h			2637.6	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	60977	veh/h			147359	pers/h
Arrival Flows (Total for all Sites)	57804	veh/h			128564	pers/h
Demand Flows (Entry Total)	9017	veh/h				
Midblock Inflows (Total)	462	veh/h				
Midblock Outflows (Total)	-28	veh/h				
Percent Heavy Vehicles (Demand)	1.9	%				
Percent Heavy Vehicles (Arrival)	2.0	%				
Degree of Saturation	5.150					
Control Delay (Total)	816.98	veh-h/h			2187.72	pers-h/h
Control Delay (Average)	50.9	sec			61.3	sec
Control Delay (Worst Lane)	3771.4	sec				
Control Delay (Worst Movement)	3805.1	sec			3805.1	sec
Geometric Delay (Average)	0.9	sec				
Stop-Line Delay (Average)	50.0	sec				
Ave. Queue Storage Ratio (Worst Lane)	18.18					
Total Effective Stops	21877	veh/h			110223	pers/h
Effective Stop Rate	0.38		1.65	per km	0.86	
Proportion Queued	0.27				0.34	
Performance Index	2552.0				2552.0	
Cost (Total)	76466.39	$/h	5.75	$/km	76466.39	$/h
Fuel Consumption (Total)	2437.1	L/h	183.4	mL/km		
Fuel Economy	18.3	L/100km				
Carbon Dioxide (Total)	5745.3	kg/h	432.3	g/km		
Hydrocarbons (Total)	0.593	kg/h	0.045	g/km		
Carbon Monoxide (Total)	5.158	kg/h	0.388	g/km		
NOx (Total)	5.053	kg/h	0.380	g/km		

Network Model Variability Index (Iterations 3 to N): 32.1 %
Number of Iterations: 10 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 8.3% 7.3% 6.2%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	29,268,960	veh/y	70,732,220	pers/y
Delay	392,152	veh-h/y	1,050,106	pers-h/y
Effective Stops	10,501,030	veh/y	52,906,890	pers/y
Travel Distance	6,379,566	veh-km/y	11,357,320	pers-km/y
Travel Time	505,843	veh-h/y	1,266,068	pers-h/y
Cost	36,703,870	$/y	36,703,870	$/y
Fuel Consumption	1,169,816	L/y		
Carbon Dioxide	2,757,749	kg/y		
Hydrocarbons	285	kg/y		
Carbon Monoxide	2,476	kg/y		

NOx	2,426 kg/y

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	221	0.5	221	0.5	0.964	95.6	LOS F	32.8	231.9	1.00	1.11	1.42	9.0
2	T1	480	1.5	480	1.5	* 0.964	90.0	LOS F	32.8	231.9	1.00	1.15	1.45	9.4
3	R2	300	1.0	300	1.0	0.884	74.5	LOS E	22.1	157.1	1.00	0.97	1.25	10.9
Approach		1001	1.1	1001	1.1	0.964	86.6	LOS F	32.8	231.9	1.00	1.08	1.38	9.7
East: Great Eastern Hwy														
4	L2	112	3.6	112	3.6	0.208	34.5	LOS C	6.0	48.3	0.70	0.72	0.70	22.2
5	T1	1591	2.5	1591	2.5	0.682	36.9	LOS D	18.4	130.6	0.89	0.79	0.89	8.6
6	R2	82	2.4	82	2.4	0.578	72.7	LOS E	6.4	46.0	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.578	74.4	LOS E	6.4	46.0	1.00	0.78	1.00	4.9
Approach		1798	2.5	1798	2.5	0.682	38.7	LOS D	18.4	130.6	0.88	0.79	0.88	9.3
North: Stoneham St														
7	L2	10	0.0	9	0.0	0.046	66.9	LOS E	0.5	3.7	0.93	0.67	0.93	7.4
8	T1	284	0.0	241	0.0	1.225	273.8	LOS F	32.6	228.5	1.00	1.64	2.50	4.9
9	R2	575	1.0	473	1.3	* 1.283	326.9	LOS F	32.2	228.5	1.00	1.67	2.68	1.7
Approach		869	0.7	723 N1	0.8	1.283	306.2	LOS F	32.6	228.5	1.00	1.65	2.60	2.7
West: Great Eastern Hwy														
10	L2	912	0.3	912	0.3	0.768	15.7	LOS B	23.2	163.2	0.67	0.79	0.67	19.1
11	T1	2288	3.1	2288	3.1	* 0.900	47.8	LOS D	22.7	163.2	0.94	0.94	1.06	8.1
12	R2	92	0.0	92	0.0	* 0.608	73.4	LOS E	7.0	48.9	1.00	0.79	1.02	13.9
12u	U	11	0.0	11	0.0	0.608	75.1	LOS E	7.0	48.9	1.00	0.79	1.02	5.5
Approach		3303	2.2	3303	2.2	0.900	39.8	LOS D	23.2	163.2	0.86	0.89	0.95	9.9
All Vehicles		6971	1.9	6824 N1	2.0	1.283	74.5	LOS E	32.8	231.9	0.90	0.97	1.17	6.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	125	0.0	125	0.0	0.560	67.2	LOS E	9.3	64.8	0.98	0.80	0.98	15.6
2	T1	212	2.4	212	2.4	*0.740	64.9	LOS E	13.2	94.4	1.00	0.86	1.07	16.3
3	R2	161	2.5	161	2.5	0.650	68.5	LOS E	10.6	76.5	1.00	0.82	1.01	15.5
Approach		498	1.8	498	1.8	0.740	66.6	LOS E	13.2	94.4	1.00	0.83	1.03	15.9
East: Great Eastern Hwy														
4	L2	145	0.0	145	0.0	0.105	10.1	LOS B	2.3	16.1	0.30	0.63	0.30	44.4
5	T1	1636	2.9	1636	2.9	0.500	28.1	LOS C	20.6	146.9	0.75	0.66	0.75	12.5
6	R2	583	0.2	583	0.2	*2.247	1174.9	LOS F	23.3	163.2	1.00	2.66	4.70	0.4
6u	U	17	0.0	17	0.0	2.247	1176.5	LOS F	23.3	163.2	1.00	2.66	4.70	0.4
Approach		2381	2.0	2381	2.0	2.247	316.0	LOS F	23.3	163.2	0.79	1.16	1.72	1.6
North: Resolution Dr														
7	L2	231	2.6	206	2.9	0.389	40.3	LOS D	10.2	73.5	0.83	0.79	0.83	10.6
8	T1	165	3.0	158	3.2	*0.794	74.3	LOS E	7.3	51.1	1.00	0.83	1.15	18.0
9	R2	25	0.0	25	0.0	0.205	74.6	LOS E	1.6	11.3	0.96	0.71	0.96	6.3
Approach		421	2.6	389 N1	2.8	0.794	56.3	LOS E	10.2	73.5	0.91	0.80	0.97	14.6
West: Great Eastern Hwy														
10	L2	88	0.0	88	0.0	0.141	29.9	LOS C	4.2	34.0	0.62	0.69	0.62	16.5
11	T1	2564	2.7	2563	2.7	*1.002	78.5	LOS E	36.4	261.1	1.00	1.20	1.35	7.4
12	R2	204	1.5	204	1.5	0.825	74.7	LOS E	15.4	108.1	1.00	0.91	1.18	18.3
12u	U	11	0.0	11	0.0	0.825	76.3	LOS E	15.4	108.1	1.00	0.91	1.18	7.7
Approach		2867	2.5	2866 N1	2.5	1.002	76.7	LOS E	36.4	261.1	0.99	1.16	1.32	8.4
All Vehicles		6167	2.3	6134 N1	2.3	2.247	167.5	LOS F	36.4	261.1	0.90	1.11	1.43	4.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	403	0.2	282	0.3	0.856	14.2	LOS B	13.2	94.1	0.97	1.22	1.60	22.8
6a	R1	79	0.0	58	0.0	0.856	19.4	LOS B	13.2	94.1	0.97	1.22	1.60	33.8
6	R2	581	2.1	439	2.6	0.856	20.8	LOS C	13.2	94.1	0.97	1.22	1.60	22.8
Approach		1063	1.2	779 N1	1.6	0.856	18.3	LOS B	13.2	94.1	0.97	1.22	1.60	23.9
North: Grandstand Rd														
7	L2	318	2.5	318	2.5	0.301	4.2	LOS A	1.8	12.8	0.40	0.53	0.40	33.4
9a	R1	440	0.2	440	0.2	0.301	9.0	LOS A	1.8	12.8	0.41	0.61	0.41	30.3
9b	R3	9	0.0	9	0.0	0.301	11.5	LOS B	1.8	12.3	0.42	0.63	0.42	46.0
9u	U	4	0.0	4	0.0	0.301	12.8	LOS B	1.8	12.3	0.42	0.63	0.42	29.7
Approach		771	1.2	771	1.2	0.301	7.1	LOS A	1.8	12.8	0.41	0.58	0.41	31.6
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.357	11.2	LOS B	2.0	14.5	0.90	0.98	0.99	27.3
27a	L1	46	2.2	46	2.2	0.357	10.5	LOS B	2.0	14.5	0.90	0.98	0.99	27.3
29	R2	67	1.5	67	1.5	0.357	16.5	LOS B	2.0	14.5	0.90	0.98	0.99	27.3
Approach		127	1.6	127	1.6	0.357	13.7	LOS B	2.0	14.5	0.90	0.98	0.99	27.3
SouthWest: Stoneham St														
30	L2	79	0.0	72	0.0	0.828	12.1	LOS B	13.8	97.1	1.00	1.09	1.44	34.5
30a	L1	1601	0.5	1388	0.6	0.828	12.3	LOS B	13.8	97.1	1.00	1.12	1.47	21.8
32a	R1	90	1.1	88	1.1	0.828	18.3	LOS B	12.9	91.3	1.00	1.15	1.50	20.9
32u	U	6	0.0	5	0.0	0.828	22.0	LOS C	12.9	91.3	1.00	1.15	1.50	20.9
Approach		1776	0.5	1553 N1	0.6	0.828	12.7	LOS B	13.8	97.1	1.00	1.12	1.47	22.6
All Vehicles		3737	0.9	3230 N1	1.0	0.856	12.7	LOS B	13.8	97.1	0.85	1.01	1.23	24.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 7 – SIDRA Network Output Ascot Event

NETWORK SUMMARY

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

Proposed Network
2021 Traffic Volumes with Ascot Weekday Event
Network Category: Proposed Design 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.49					
Travel Time Index	4.33					
Congestion Coefficient	2.04					
Travel Speed (Average)	29.2	km/h			24.6	km/h
Travel Distance (Total)	11825.6	veh-km/h			18838.1	pers-km/h
Travel Time (Total)	404.7	veh-h/h			764.6	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	50952	veh/h			97205	pers/h
Arrival Flows (Total for all Sites)	50676	veh/h			96874	pers/h
Demand Flows (Entry Total)	7697	veh/h				
Midblock Inflows (Total)	587	veh/h				
Midblock Outflows (Total)	-306	veh/h				
Percent Heavy Vehicles (Demand)	2.5	%				
Percent Heavy Vehicles (Arrival)	2.5	%				
Degree of Saturation	1.646					
Control Delay (Total)	205.18	veh-h/h			441.88	pers-h/h
Control Delay (Average)	14.6	sec			16.4	sec
Control Delay (Worst Lane)	617.1	sec				
Control Delay (Worst Movement)	656.8	sec			656.8	sec
Geometric Delay (Average)	0.8	sec				
Stop-Line Delay (Average)	13.8	sec				
Ave. Queue Storage Ratio (Worst Lane)	5.61					
Total Effective Stops	15837	veh/h			53953	pers/h
Effective Stop Rate	0.31		1.34	per km	0.56	
Proportion Queued	0.25				0.36	
Performance Index	1333.1				1333.1	
Cost (Total)	23442.75	$/h	1.98	$/km	23442.75	$/h
Fuel Consumption (Total)	1482.2	L/h	125.3	mL/km		
Fuel Economy	12.5	L/100km				
Carbon Dioxide (Total)	3502.1	kg/h	296.1	g/km		
Hydrocarbons (Total)	0.338	kg/h	0.029	g/km		
Carbon Monoxide (Total)	3.678	kg/h	0.311	g/km		
NOx (Total)	4.318	kg/h	0.365	g/km		

Network Model Variability Index (Iterations 3 to N): 0.5 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 0.4% 0.7% 0.2%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	24,456,960	veh/y	46,658,310	pers/y
Delay	98,486	veh-h/y	212,104	pers-h/y
Effective Stops	7,601,861	veh/y	25,897,650	pers/y
Travel Distance	5,676,289	veh-km/y	9,042,264	pers-km/y
Travel Time	194,267	veh-h/y	366,984	pers-h/y
Cost	11,252,520	$/y	11,252,520	$/y
Fuel Consumption	711,444	L/y		
Carbon Dioxide	1,681,014	kg/y		
Hydrocarbons	162	kg/y		
Carbon Monoxide	1,765	kg/y		

NOx	2,073 kg/y

MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	200	0.5	200	0.5	0.812	66.7	LOS E	13.4	94.5	1.00	0.91	1.11	12.2
2	T1	416	1.4	416	1.4	* 0.812	60.6	LOS E	13.4	94.5	1.00	0.92	1.11	13.0
3	R2	254	1.2	254	1.2	0.666	60.5	LOS E	9.8	69.7	0.98	0.84	0.98	12.9
Approach		870	1.1	870	1.1	0.812	62.0	LOS E	13.4	94.5	0.99	0.90	1.07	12.8
East: Great Eastern Hwy														
4	L2	118	3.4	118	3.4	0.233	34.9	LOS C	4.1	33.9	0.71	0.72	0.71	22.2
5	T1	1507	3.0	1507	3.0	0.642	36.1	LOS D	11.3	80.0	0.87	0.77	0.87	8.8
6	R2	74	2.7	74	2.7	0.525	72.3	LOS E	3.5	25.4	1.00	0.78	1.00	4.9
6u	U	12	0.0	12	0.0	0.525	74.0	LOS E	3.5	25.4	1.00	0.78	1.00	4.9
Approach		1711	3.0	1711	3.0	0.642	37.8	LOS D	11.3	80.0	0.86	0.77	0.86	9.6
North: Stoneham St														
7	L2	9	0.0	8	0.0	0.045	66.9	LOS E	0.3	2.2	0.93	0.67	0.93	7.4
8	T1	211	0.0	199	0.0	* 0.843	74.1	LOS E	7.4	51.9	1.00	0.94	1.24	15.3
9	R2	292	1.7	278	1.8	0.843	79.3	LOS E	7.0	49.6	1.00	0.92	1.22	6.9
Approach		512	1.0	486 N1	1.0	0.843	76.9	LOS E	7.4	51.9	1.00	0.92	1.22	10.6
West: Great Eastern Hwy														
10	L2	741	1.5	741	1.5	0.625	12.8	LOS B	12.4	87.8	0.52	0.73	0.52	21.8
11	T1	2015	3.2	2015	3.2	* 0.778	35.0	LOS C	13.9	100.0	0.84	0.75	0.85	10.5
12	R2	83	0.0	83	0.0	* 0.549	72.8	LOS E	3.8	26.8	1.00	0.78	1.00	14.0
12u	U	10	0.0	10	0.0	0.549	74.4	LOS E	3.8	26.8	1.00	0.78	1.00	5.6
Approach		2849	2.7	2849	2.7	0.778	30.5	LOS C	13.9	100.0	0.76	0.75	0.77	12.3
All Vehicles		5942	2.4	5916 N1	2.4	0.843	41.0	LOS D	13.9	100.0	0.84	0.79	0.88	11.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	113	0.0	113	0.0	0.488	66.4	LOS E	4.9	34.1	0.97	0.79	0.97	15.6
2	T1	180	2.8	180	2.8	* 0.644	62.5	LOS E	6.8	48.7	1.00	0.82	1.00	16.8
3	R2	146	2.7	146	2.7	0.591	67.7	LOS E	5.8	42.1	0.99	0.81	0.99	15.7
Approach		439	2.1	439	2.1	0.644	65.2	LOS E	6.8	48.7	0.99	0.81	0.99	16.1
East: Great Eastern Hwy														
4	L2	131	0.0	131	0.0	0.094	9.5	LOS A	1.2	8.3	0.28	0.62	0.28	45.0
5	T1	1482	3.0	1482	3.0	0.451	27.4	LOS C	11.1	78.9	0.73	0.64	0.73	12.8
6	R2	240	0.4	240	0.4	* 0.967	100.7	LOS F	13.5	95.2	1.00	1.08	1.50	4.2
6u	U	15	0.0	15	0.0	0.967	102.3	LOS F	13.5	95.2	1.00	1.08	1.50	4.2
Approach		1868	2.4	1868	2.4	0.967	36.1	LOS D	13.5	95.2	0.73	0.70	0.80	12.0
North: Resolution Dr														
7	L2	287	1.7	287	1.7	0.533	34.0	LOS C	8.4	60.2	0.81	0.81	0.81	12.1
8	T1	170	2.9	170	2.9	0.851	76.1	LOS E	4.9	34.4	1.00	0.87	1.21	17.7
9	R2	104	7.7	104	7.7	* 0.912	90.6	LOS F	5.0	37.2	1.00	0.99	1.47	5.3
Approach		561	3.2	561	3.2	0.912	57.3	LOS E	8.4	60.2	0.90	0.86	1.06	12.9
West: Great Eastern Hwy														
10	L2	22	0.0	22	0.0	0.063	28.9	LOS C	1.0	9.5	0.59	0.58	0.59	17.8
11	T1	2345	2.8	2345	2.8	* 0.899	39.2	LOS D	22.3	160.0	0.92	0.91	1.01	13.1
12	R2	182	1.6	182	1.6	0.798	73.1	LOS E	8.8	61.8	1.00	0.89	1.15	18.5
12u	U	22	0.0	22	0.0	0.798	74.7	LOS E	8.8	61.8	1.00	0.89	1.15	7.9
Approach		2571	2.6	2571	2.6	0.899	41.9	LOS D	22.3	160.0	0.93	0.91	1.02	13.8
All Vehicles		5439	2.6	5439	2.6	0.967	43.4	LOS D	22.3	160.0	0.86	0.82	0.95	13.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	99	1.0	99	1.0	0.667	7.5	LOS A	2.4	17.6	0.75	0.91	0.92	28.5
6a	R1	40	0.0	40	0.0	0.667	12.7	LOS B	2.4	17.6	0.75	0.91	0.92	39.6
6	R2	513	3.3	513	3.3	0.667	14.1	LOS B	2.4	17.6	0.75	0.91	0.92	28.5
Approach		652	2.8	652	2.8	0.667	13.0	LOS B	2.4	17.6	0.75	0.91	0.92	29.4
North: Grandstand Rd														
7	L2	207	2.4	207	2.4	0.208	3.6	LOS A	0.5	3.5	0.24	0.48	0.24	34.5
9a	R1	380	0.3	380	0.3	0.208	8.4	LOS A	0.5	3.5	0.24	0.55	0.24	31.8
9b	R3	8	0.0	8	0.0	0.208	10.9	LOS B	0.5	3.4	0.25	0.57	0.25	47.5
9u	U	4	0.0	4	0.0	0.208	12.1	LOS B	0.5	3.4	0.25	0.57	0.25	31.1
Approach		599	1.0	599	1.0	0.208	6.8	LOS A	0.5	3.5	0.24	0.52	0.24	32.9
NorthWest: Resolution Dr														
27b	L3	13	0.0	13	0.0	0.193	9.8	LOS A	0.4	3.0	0.87	0.93	0.87	28.7
27a	L1	25	4.0	25	4.0	0.193	9.1	LOS A	0.4	3.0	0.87	0.93	0.87	28.7
29	R2	34	2.9	34	2.9	0.193	15.1	LOS B	0.4	3.0	0.87	0.93	0.87	28.7
Approach		72	2.8	72	2.8	0.193	12.1	LOS B	0.4	3.0	0.87	0.93	0.87	28.7
SouthWest: Stoneham St														
30	L2	50	0.0	46	0.0	0.769	11.0	LOS B	4.3	30.8	0.97	1.06	1.35	35.7
30a	L1	1433	1.0	1334	1.1	0.769	11.2	LOS B	4.3	30.8	0.97	1.08	1.37	23.2
32a	R1	16	6.3	15	6.7	0.769	17.3	LOS B	4.1	28.7	0.97	1.11	1.39	22.4
32u	U	5	0.0	5	0.0	0.769	20.8	LOS C	4.1	28.7	0.97	1.11	1.39	22.4
Approach		1504	1.1	1400[N 1]	1.1	0.769	11.3	LOS B	4.3	30.8	0.97	1.08	1.37	23.8
All Vehicles		2827	1.5	2723[N 1]	1.5	0.769	10.8	LOS B	4.3	30.8	0.76	0.91	1.00	27.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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NETWORK SUMMARY

Network: N101 [2031 PM Peak Proposed Networkand Land Use Ascot Weekday Event (Network Folder: General)]

Proposed Network
25% of Ascot Kilns and Golden Gateway development
50% of Ascot Racecourse development
Network Category: Future Conditions 1

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS E					
Speed Efficiency	0.32					
Travel Time Index	2.49					
Congestion Coefficient	3.08					
Travel Speed (Average)	19.3	km/h			5.4	km/h
Travel Distance (Total)	12505.2	veh-km/h			22006.4	pers-km/h
Travel Time (Total)	646.3	veh-h/h			4045.4	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	55958	veh/h			130718	pers/h
Arrival Flows (Total for all Sites)	54150	veh/h			124681	pers/h
Demand Flows (Entry Total)	8372	veh/h				
Midblock Inflows (Total)	415	veh/h				
Midblock Outflows (Total)	-44	veh/h				
Percent Heavy Vehicles (Demand)	2.3	%				
Percent Heavy Vehicles (Arrival)	2.4	%				
Degree of Saturation	2.781					
Control Delay (Total)	430.97	veh-h/h			3617.80	pers-h/h
Control Delay (Average)	28.7	sec			104.5	sec
Control Delay (Worst Lane)	1634.5	sec				
Control Delay (Worst Movement)	1670.6	sec			1670.6	sec
Geometric Delay (Average)	0.8	sec				
Stop-Line Delay (Average)	27.8	sec				
Ave. Queue Storage Ratio (Worst Lane)	42.18					
Total Effective Stops	20603	veh/h			196336	pers/h
Effective Stop Rate	0.38		1.65	per km	1.57	
Proportion Queued	0.26				0.38	
Performance Index	2048.7				2048.7	
Cost (Total)	114524.00	$/h	9.16	$/km	114524.00	$/h
Fuel Consumption (Total)	1871.5	L/h	149.7	mL/km		
Fuel Economy	15.0	L/100km				
Carbon Dioxide (Total)	4417.5	kg/h	353.2	g/km		
Hydrocarbons (Total)	0.453	kg/h	0.036	g/km		
Carbon Monoxide (Total)	4.322	kg/h	0.346	g/km		
NOx (Total)	4.760	kg/h	0.381	g/km		

Network Model Variability Index (Iterations 3 to N): 4.3 %
Number of Iterations: 10 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 9.5% 1.0% 0.7%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	26,859,840	veh/y	62,744,830	pers/y
Delay	206,865	veh-h/y	1,736,543	pers-h/y
Effective Stops	9,889,336	veh/y	94,241,200	pers/y
Travel Distance	6,002,488	veh-km/y	10,563,090	pers-km/y
Travel Time	310,212	veh-h/y	1,941,774	pers-h/y
Cost	54,971,540	$/y	54,971,540	$/y
Fuel Consumption	898,303	L/y		
Carbon Dioxide	2,120,378	kg/y		

Hydrocarbons	217	kg/y
Carbon Monoxide	2,075	kg/y
NOx	2,285	kg/y

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MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2031 Ascot Event (Site Folder: 2031 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2031 PM Peak Proposed Networkand Land Use Ascot Weekday Event (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	210	0.5	210	0.5	0.883	74.3	LOS E	15.8	111.5	1.00	0.98	1.22	11.1
2	T1	447	1.3	447	1.3	* 0.883	68.3	LOS E	15.8	111.5	1.00	1.01	1.23	11.8
3	R2	272	1.1	272	1.1	0.713	61.7	LOS E	10.7	76.1	0.99	0.85	1.01	12.7
Approach		929	1.1	929	1.1	0.883	67.8	LOS E	15.8	111.5	1.00	0.96	1.16	11.9
East: Great Eastern Hwy														
4	L2	123	3.3	119	3.4	0.214	34.6	LOS C	3.8	30.5	0.70	0.72	0.70	22.2
5	T1	1579	2.8	1562	2.8	0.673	36.7	LOS D	11.2	80.0	0.88	0.79	0.88	8.7
6	R2	78	2.6	78	2.6	0.555	72.5	LOS E	3.8	27.0	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.555	74.3	LOS E	3.8	27.0	1.00	0.78	1.00	4.9
Approach		1793	2.8	1771 N1	2.8	0.673	38.4	LOS D	11.2	80.0	0.88	0.78	0.88	9.4
North: Stoneham St														
7	L2	10	0.0	9	0.0	0.047	66.9	LOS E	0.3	2.3	0.93	0.67	0.93	7.3
8	T1	240	0.0	212	0.0	* 1.017	119.1	LOS F	11.7	82.2	1.00	1.21	1.72	10.5
9	R2	416	1.2	364	1.4	1.017	122.6	LOS F	10.9	77.7	1.00	1.16	1.69	4.6
Approach		666	0.8	585 N1	0.8	1.017	120.5	LOS F	11.7	82.2	1.00	1.17	1.69	6.9
West: Great Eastern Hwy														
10	L2	827	1.3	827	1.3	0.697	14.0	LOS B	14.1	100.0	0.59	0.76	0.59	20.6
11	T1	2132	3.1	2132	3.1	* 0.830	38.5	LOS D	13.9	100.0	0.88	0.82	0.92	9.7
12	R2	87	0.0	87	0.0	* 0.579	73.0	LOS E	4.1	28.4	1.00	0.78	1.00	14.0
12u	U	11	0.0	11	0.0	0.579	74.7	LOS E	4.1	28.4	1.00	0.78	1.00	5.5
Approach		3057	2.6	3057	2.6	0.830	33.0	LOS C	14.1	100.0	0.80	0.80	0.83	11.5
All Vehicles		6445	2.2	6342 N1	2.3	1.017	47.7	LOS D	15.8	111.5	0.87	0.85	0.97	10.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2031 Ascot Event (Site Folder: 2031 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2031 PM Peak Proposed Networkand Land Use Ascot Weekday Event (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	119	0.0	119	0.0	0.523	66.8	LOS E	5.3	36.8	0.98	0.80	0.98	15.6
2	T1	195	2.6	195	2.6	* 0.690	63.5	LOS E	7.4	52.9	1.00	0.84	1.03	16.6
3	R2	153	2.6	153	2.6	0.618	68.0	LOS E	6.1	44.2	0.99	0.81	0.99	15.6
Approach		467	1.9	467	1.9	0.690	65.8	LOS E	7.4	52.9	0.99	0.82	1.01	16.0
East: Great Eastern Hwy														
4	L2	138	0.0	138	0.0	0.099	9.8	LOS A	1.3	9.0	0.29	0.62	0.29	44.7
5	T1	1557	2.9	1557	2.9	0.474	27.7	LOS C	11.8	84.2	0.74	0.65	0.74	12.7
6	R2	367	0.3	367	0.3	* 1.442	464.7	LOS F	14.2	100.0	1.00	1.91	3.18	0.9
6u	U	16	0.0	16	0.0	1.442	466.4	LOS F	14.2	100.0	1.00	1.91	3.18	0.9
Approach		2078	2.2	2078	2.2	1.442	107.1	LOS F	14.2	100.0	0.76	0.88	1.16	4.5
North: Resolution Dr														
7	L2	333	1.5	276	1.8	0.513	37.2	LOS D	8.4	59.7	0.83	0.81	0.83	11.3
8	T1	182	2.7	168	2.4	* 0.838	75.6	LOS E	4.8	33.6	1.00	0.86	1.19	17.8
9	R2	105	7.6	83	7.7	0.729	80.1	LOS F	3.6	27.2	1.00	0.84	1.15	5.9
Approach		620	2.9	527 N1	2.9	0.838	56.2	LOS E	8.4	59.7	0.91	0.83	1.00	13.3
West: Great Eastern Hwy														
10	L2	39	0.0	39	0.0	0.083	29.2	LOS C	1.4	12.3	0.60	0.63	0.60	17.3
11	T1	2454	2.7	2453	2.7	* 0.945	51.0	LOS D	22.3	160.0	0.98	1.03	1.15	10.7
12	R2	191	1.6	191	1.6	0.777	71.8	LOS E	8.6	60.3	1.00	0.88	1.12	18.8
12u	U	11	0.0	11	0.0	0.777	73.4	LOS E	8.6	60.3	1.00	0.88	1.12	8.0
Approach		2695	2.6	2694 N1	2.6	0.945	52.2	LOS D	22.3	160.0	0.97	1.02	1.14	11.6
All Vehicles		5860	2.4	5766 N1	2.5	1.442	73.4	LOS E	22.3	160.0	0.89	0.93	1.12	8.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2031 Ascot Event (Site Folder: 2031 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2031 PM Peak Proposed Networkand Land Use Ascot Weekday Event (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	221	0.5	180	0.5	0.743	9.3	LOS A	3.3	23.3	0.83	1.01	1.12	27.0
6a	R1	55	0.0	47	0.0	0.743	14.5	LOS B	3.3	23.3	0.83	1.01	1.12	38.2
6	R2	556	3.1	477	3.1	0.743	15.9	LOS B	3.3	23.3	0.83	1.01	1.12	27.0
Approach		832	2.2	703 N1	2.2	0.743	14.1	LOS B	3.3	23.3	0.83	1.01	1.12	27.9
North: Grandstand Rd														
7	L2	253	2.0	253	2.0	0.247	3.9	LOS A	0.6	4.0	0.31	0.50	0.31	34.0
9a	R1	409	0.2	409	0.2	0.247	8.6	LOS A	0.6	4.0	0.32	0.57	0.32	31.1
9b	R3	8	0.0	8	0.0	0.247	11.1	LOS B	0.6	3.9	0.32	0.59	0.32	46.8
9u	U	4	0.0	4	0.0	0.247	12.4	LOS B	0.6	3.9	0.32	0.59	0.32	30.5
Approach		674	0.9	674	0.9	0.247	6.9	LOS A	0.6	4.0	0.32	0.54	0.32	32.3
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.252	9.8	LOS A	0.5	3.9	0.88	0.94	0.88	28.7
27a	L1	32	3.1	32	3.1	0.252	9.1	LOS A	0.5	3.9	0.88	0.94	0.88	28.7
29	R2	47	2.1	47	2.1	0.252	15.1	LOS B	0.5	3.9	0.88	0.94	0.88	28.7
Approach		93	2.2	93	2.2	0.252	12.2	LOS B	0.5	3.9	0.88	0.94	0.88	28.7
SouthWest: Stoneham St														
30	L2	62	0.0	56	0.0	0.784	11.0	LOS B	4.6	32.7	0.98	1.06	1.36	35.8
30a	L1	1519	1.0	1341	1.1	0.784	11.2	LOS B	4.6	32.7	0.98	1.08	1.38	23.2
32a	R1	53	1.9	51	2.0	0.784	17.0	LOS B	4.3	30.5	0.99	1.11	1.40	22.3
32u	U	5	0.0	4	0.0	0.784	20.7	LOS C	4.3	30.5	0.99	1.11	1.40	22.3
Approach		1639	1.0	1452 N1	1.1	0.784	11.4	LOS B	4.6	32.7	0.98	1.08	1.38	23.9
All Vehicles		3238	1.3	2923 N1	1.4	0.784	11.0	LOS B	4.6	32.7	0.79	0.93	1.06	27.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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NETWORK SUMMARY

Network: N101 [2041 PM Peak Proposed Network and Land Use Ascot Weekday Event (Network Folder: General)]

Proposed Network
100% of Ascot Kilns, Golden Gateway and Ascot Racecourse development
PLUS Ascot Weekday Event
Network Category: Future Conditions 2

Network Performance - Hourly Values						
Performance Measure	**Vehicles**		**Per Unit Distance**		**Persons**	
Network Level of Service (LOS)	LOS F					
Speed Efficiency	0.18					
Travel Time Index	0.90					
Congestion Coefficient	5.53					
Travel Speed (Average)	10.8	km/h			1.9	km/h
Travel Distance (Total)	13387.1	veh-km/h			24751.5	pers-km/h
Travel Time (Total)	1241.6	veh-h/h			12827.9	pers-h/h
Desired Speed (Program)	59.7	km/h				
Demand Flows (Total for all Sites)	62890	veh/h			171847	pers/h
Arrival Flows (Total for all Sites)	58430	veh/h			148809	pers/h
Demand Flows (Entry Total)	9453	veh/h				
Midblock Inflows (Total)	456	veh/h				
Midblock Outflows (Total)	-253	veh/h				
Percent Heavy Vehicles (Demand)	2.1	%				
Percent Heavy Vehicles (Arrival)	2.3	%				
Degree of Saturation	5.264					
Control Delay (Total)	1001.38	veh-h/h			12266.10	pers-h/h
Control Delay (Average)	61.7	sec			296.7	sec
Control Delay (Worst Lane)	3874.2	sec				
Control Delay (Worst Movement)	3907.8	sec			3907.8	sec
Geometric Delay (Average)	0.9	sec				
Stop-Line Delay (Average)	60.8	sec				
Ave. Queue Storage Ratio (Worst Lane)	91.45					
Total Effective Stops	26132	veh/h			360279	pers/h
Effective Stop Rate	0.45		1.95	per km	2.42	
Proportion Queued	0.28				0.43	
Performance Index	3244.5				3244.5	
Cost (Total)	358181.80	$/h	26.76	$/km	358181.80	$/h
Fuel Consumption (Total)	2720.9	L/h	203.2	mL/km		
Fuel Economy	20.3	L/100km				
Carbon Dioxide (Total)	6415.3	kg/h	479.2	g/km		
Hydrocarbons (Total)	0.708	kg/h	0.053	g/km		
Carbon Monoxide (Total)	5.649	kg/h	0.422	g/km		
NOx (Total)	5.577	kg/h	0.417	g/km		

Network Model Variability Index (Iterations 3 to N): 31.4 %
Number of Iterations: 10 (Maximum: 10)
Largest change in Lane Degrees of Saturation or Queue Storage Ratios for the last three Network Iterations: 8.3% 5.9% 4.5%
Network Level of Service (LOS) Method: SIDRA Speed Efficiency.
Software Setup used: Standard Left.

Network Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total for all Sites)	30,187,200	veh/y	82,486,660	pers/y
Delay	480,662	veh-h/y	5,887,729	pers-h/y
Effective Stops	12,543,320	veh/y	172,933,700	pers/y
Travel Distance	6,425,829	veh-km/y	11,880,740	pers-km/y
Travel Time	595,962	veh-h/y	6,157,413	pers-h/y
Cost	171,927,200	$/y	171,927,200	$/y

Fuel Consumption	1,306,047	L/y
Carbon Dioxide	3,079,337	kg/y
Hydrocarbons	340	kg/y
Carbon Monoxide	2,712	kg/y
NOx	2,677	kg/y

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MOVEMENT SUMMARY

Site: 106 [GEH Stoneham Belgravia PM 2041 Ascot Event (Site Folder: 2041 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2041 PM Peak Proposed Network and Land Use Ascot Weekday Event (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Belgravia St														
1	L2	221	0.5	221	0.5	0.964	95.6	LOS F	20.1	142.1	1.00	1.11	1.42	9.0
2	T1	480	1.5	480	1.5	* 0.964	90.0	LOS F	20.1	142.1	1.00	1.15	1.45	9.4
3	R2	300	1.0	300	1.0	0.884	74.5	LOS E	13.5	96.2	1.00	0.97	1.25	10.9
Approach		1001	1.1	1001	1.1	0.964	86.6	LOS F	20.1	142.1	1.00	1.08	1.38	9.7
East: Great Eastern Hwy														
4	L2	128	3.1	119	3.4	0.229	34.8	LOS C	4.0	33.0	0.70	0.72	0.70	22.2
5	T1	1656	2.8	1621	2.7	0.693	37.1	LOS D	11.3	80.0	0.89	0.80	0.89	8.6
6	R2	82	2.4	82	2.4	0.578	72.7	LOS E	3.9	28.2	1.00	0.78	1.00	4.9
6u	U	13	0.0	13	0.0	0.578	74.4	LOS E	3.9	28.2	1.00	0.78	1.00	4.9
Approach		1879	2.8	1836 N1	2.7	0.693	38.8	LOS D	11.3	80.0	0.89	0.79	0.89	9.3
North: Stoneham St														
7	L2	10	0.0	9	0.0	0.046	66.9	LOS E	0.3	2.3	0.93	0.67	0.93	7.4
8	T1	284	0.0	236	0.0	1.199	252.8	LOS F	20.0	140.0	1.00	1.59	2.41	5.3
9	R2	625	1.0	481	1.2	* 1.303	344.6	LOS F	19.7	140.0	1.00	1.70	2.76	1.6
Approach		919	0.7	725 N1	0.8	1.303	311.5	LOS F	20.0	140.0	1.00	1.65	2.62	2.7
West: Great Eastern Hwy														
10	L2	920	1.2	920	1.2	0.778	15.9	LOS B	14.1	100.0	0.68	0.79	0.68	19.0
11	T1	2288	3.1	2288	3.1	* 0.901	48.0	LOS D	13.9	100.0	0.94	0.94	1.07	8.0
12	R2	92	0.0	92	0.0	* 0.608	73.4	LOS E	4.3	30.0	1.00	0.79	1.02	13.9
12u	U	11	0.0	11	0.0	0.608	75.1	LOS E	4.3	30.0	1.00	0.79	1.02	5.5
Approach		3311	2.4	3311	2.4	0.901	39.9	LOS D	14.1	100.0	0.87	0.90	0.96	9.8
All Vehicles		7110	2.1	6873 N1	2.2	1.303	75.0	LOS E	20.1	142.1	0.91	0.98	1.18	6.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 96 [GEH Resolution Hardey PM 2041 Ascot Event (Site Folder: 2041 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2041 PM Peak Proposed Network and Land Use Ascot Weekday Event (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardey Rd														
1	L2	125	0.0	125	0.0	0.560	67.2	LOS E	5.7	39.7	0.98	0.80	0.98	15.6
2	T1	212	2.4	212	2.4	*0.740	64.9	LOS E	8.1	57.9	1.00	0.86	1.07	16.3
3	R2	161	2.5	161	2.5	0.650	68.5	LOS E	6.5	46.9	1.00	0.82	1.01	15.5
Approach		498	1.8	498	1.8	0.740	66.6	LOS E	8.1	57.9	1.00	0.83	1.03	15.9
East: Great Eastern Hwy														
4	L2	145	0.0	145	0.0	0.105	10.1	LOS B	1.4	9.9	0.30	0.63	0.30	44.4
5	T1	1636	2.9	1636	2.9	0.500	28.1	LOS C	12.6	90.0	0.75	0.66	0.75	12.5
6	R2	583	0.2	583	0.2	*2.247	1174.9	LOS F	14.3	100.0	1.00	2.66	4.70	0.4
6u	U	17	0.0	17	0.0	2.247	1176.5	LOS F	14.3	100.0	1.00	2.66	4.70	0.4
Approach		2381	2.0	2381	2.0	2.247	316.0	LOS F	14.3	100.0	0.79	1.16	1.72	1.6
North: Resolution Dr														
7	L2	373	1.6	235	2.5	0.444	41.1	LOS D	7.3	52.4	0.85	0.80	0.85	10.4
8	T1	188	2.7	159	1.9	*0.793	74.2	LOS E	4.5	31.2	1.00	0.83	1.14	18.0
9	R2	106	7.5	60	8.1	0.530	77.2	LOS E	2.5	19.1	1.00	0.76	1.00	6.1
Approach		667	2.8	455 N1	3.1	0.793	57.5	LOS E	7.3	52.4	0.92	0.81	0.97	13.5
West: Great Eastern Hwy														
10	L2	88	0.0	88	0.0	0.141	29.9	LOS C	2.6	20.9	0.62	0.69	0.62	16.5
11	T1	2564	2.7	2563	2.7	*1.002	78.4	LOS E	22.3	160.0	1.00	1.20	1.35	7.4
12	R2	204	1.5	204	1.5	0.825	74.7	LOS E	9.4	66.2	1.00	0.91	1.18	18.3
12u	U	11	0.0	11	0.0	0.825	76.3	LOS E	9.4	66.2	1.00	0.91	1.18	7.7
Approach		2867	2.5	2866 N1	2.5	1.002	76.7	LOS E	22.3	160.0	0.99	1.16	1.32	8.4
All Vehicles		6413	2.3	6200 N1	2.4	2.247	166.4	LOS F	22.3	160.0	0.90	1.11	1.42	4.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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MOVEMENT SUMMARY

Site: 007 [Stoneham Grandstand Resolution PM 2041 Ascot Event (Site Folder: 2041 PM Peak Proposed Network and Land Uses ASCOT TEST)]

Network: N101 [2041 PM Peak Proposed Network and Land Use Ascot Weekday Event (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Resolution Dr														
4a	L1	453	0.2	281	0.3	0.846	13.6	LOS B	5.1	36.1	0.96	1.20	1.55	23.2
6a	R1	79	0.0	54	0.0	0.846	18.9	LOS B	5.1	36.1	0.96	1.20	1.55	34.3
6	R2	587	3.1	432	3.2	0.846	20.3	LOS C	5.1	36.1	0.96	1.20	1.55	23.2
Approach		1119	1.7	768 N1	1.9	0.846	17.7	LOS B	5.1	36.1	0.96	1.20	1.55	24.2
North: Grandstand Rd														
7	L2	318	2.5	318	2.5	0.301	4.2	LOS A	0.7	5.2	0.40	0.53	0.40	33.4
9a	R1	440	0.2	440	0.2	0.301	9.0	LOS A	0.7	5.2	0.41	0.61	0.41	30.3
9b	R3	9	0.0	9	0.0	0.301	11.5	LOS B	0.7	5.0	0.42	0.63	0.42	46.0
9u	U	4	0.0	4	0.0	0.301	12.8	LOS B	0.7	5.0	0.42	0.63	0.42	29.7
Approach		771	1.2	771	1.2	0.301	7.1	LOS A	0.7	5.2	0.41	0.58	0.41	31.6
NorthWest: Resolution Dr														
27b	L3	14	0.0	14	0.0	0.359	11.3	LOS B	0.8	5.9	0.91	0.98	0.99	27.3
27a	L1	46	2.2	46	2.2	0.359	10.5	LOS B	0.8	5.9	0.91	0.98	0.99	27.3
29	R2	67	1.5	67	1.5	0.359	16.5	LOS B	0.8	5.9	0.91	0.98	0.99	27.3
Approach		127	1.6	127	1.6	0.359	13.8	LOS B	0.8	5.9	0.91	0.98	0.99	27.3
SouthWest: Stoneham St														
30	L2	79	0.0	71	0.0	0.824	11.8	LOS B	5.4	38.7	1.00	1.08	1.43	34.9
30a	L1	1609	1.0	1395	1.1	0.824	12.0	LOS B	5.4	38.7	1.00	1.11	1.45	22.1
32a	R1	90	1.1	88	1.1	0.824	18.0	LOS B	5.1	36.2	1.00	1.14	1.48	21.2
32u	U	6	0.0	5	0.0	0.824	21.6	LOS C	5.1	36.2	1.00	1.14	1.48	21.2
Approach		1784	1.0	1559 N1	1.1	0.824	12.4	LOS B	5.4	38.7	1.00	1.11	1.45	22.9
All Vehicles		3801	1.2	3225 N1	1.5	0.846	12.4	LOS B	5.4	38.7	0.84	1.00	1.21	25.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

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Appendix 8 – Forecast Turning Volumes

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

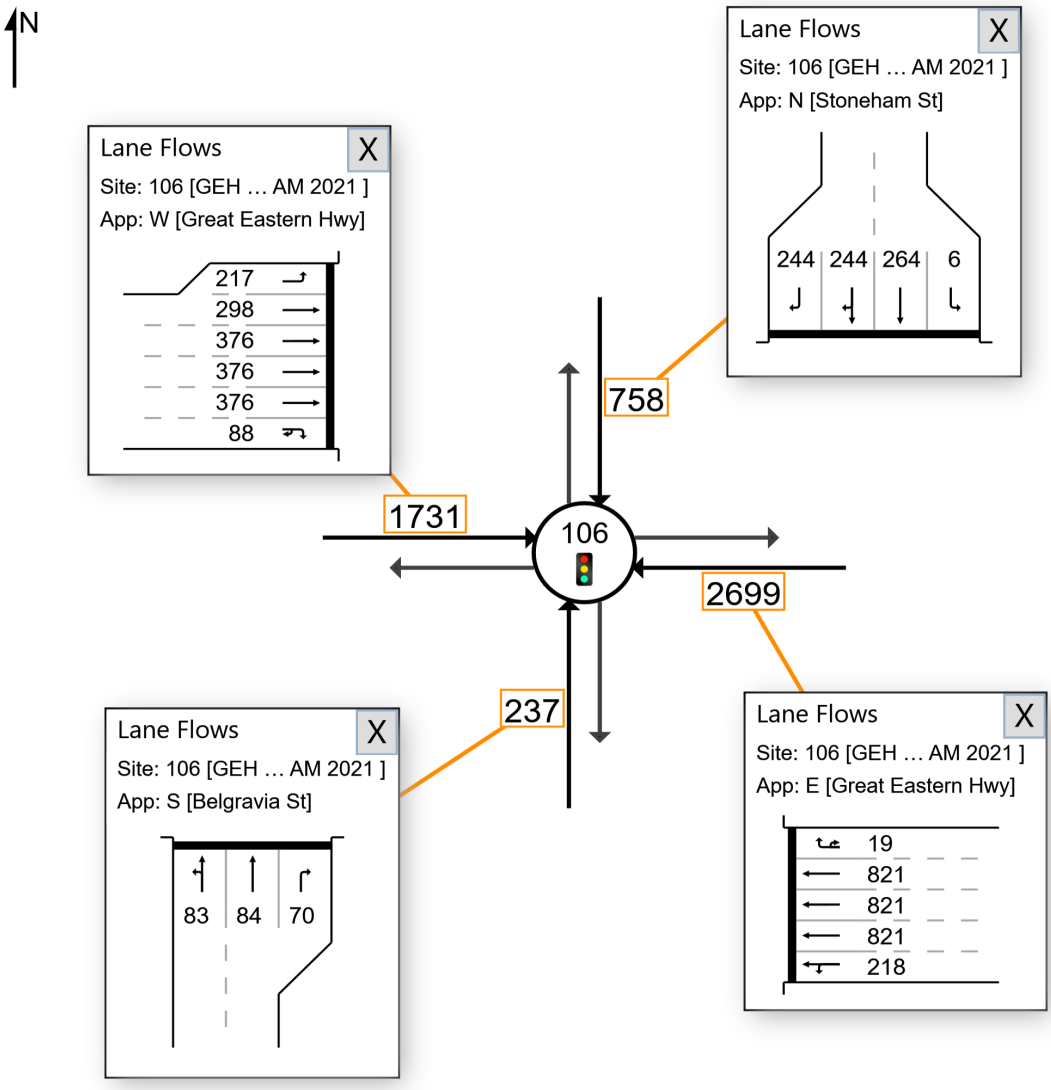
Site: 106 [GEH Stoneham Belgravia AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

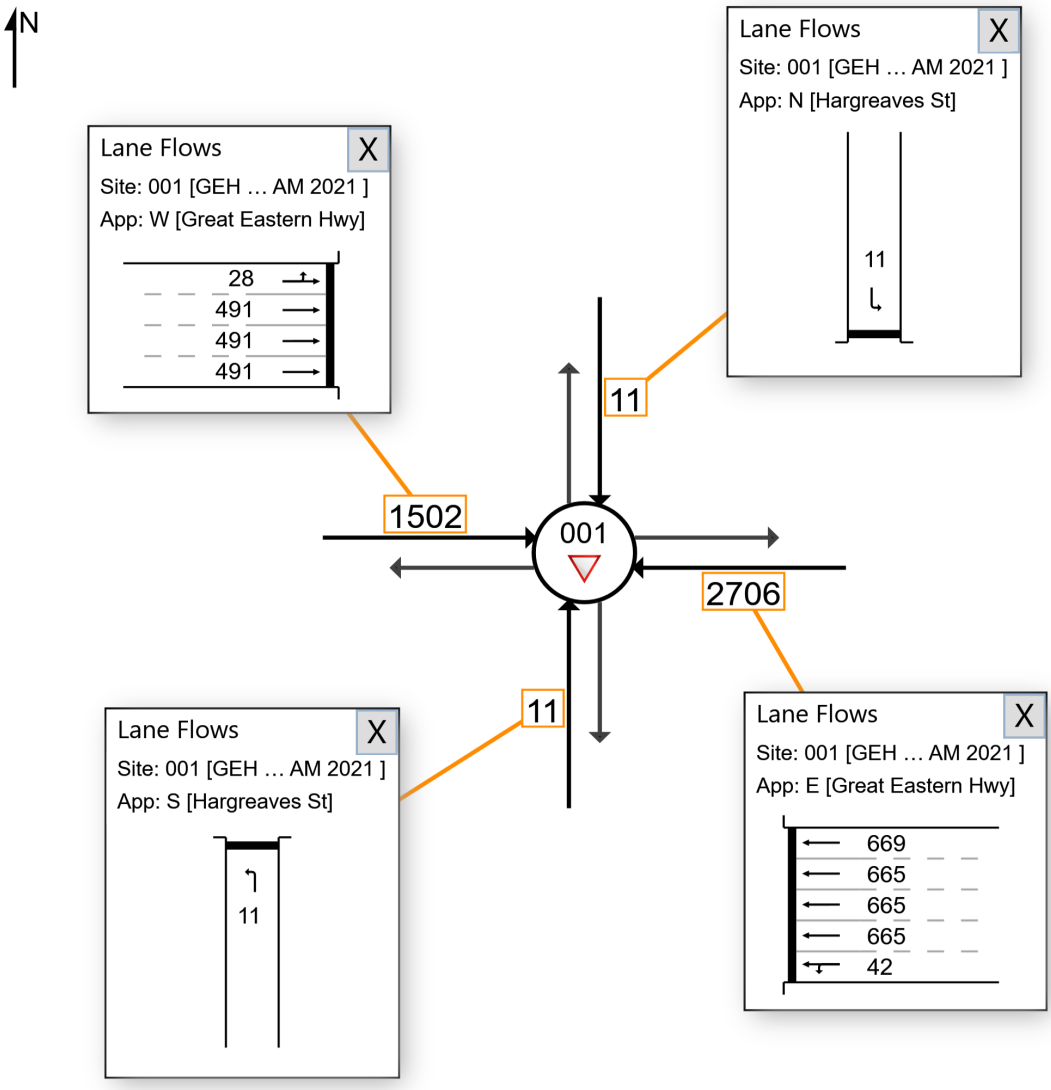
Site: 001 [GEH Hargreaves AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

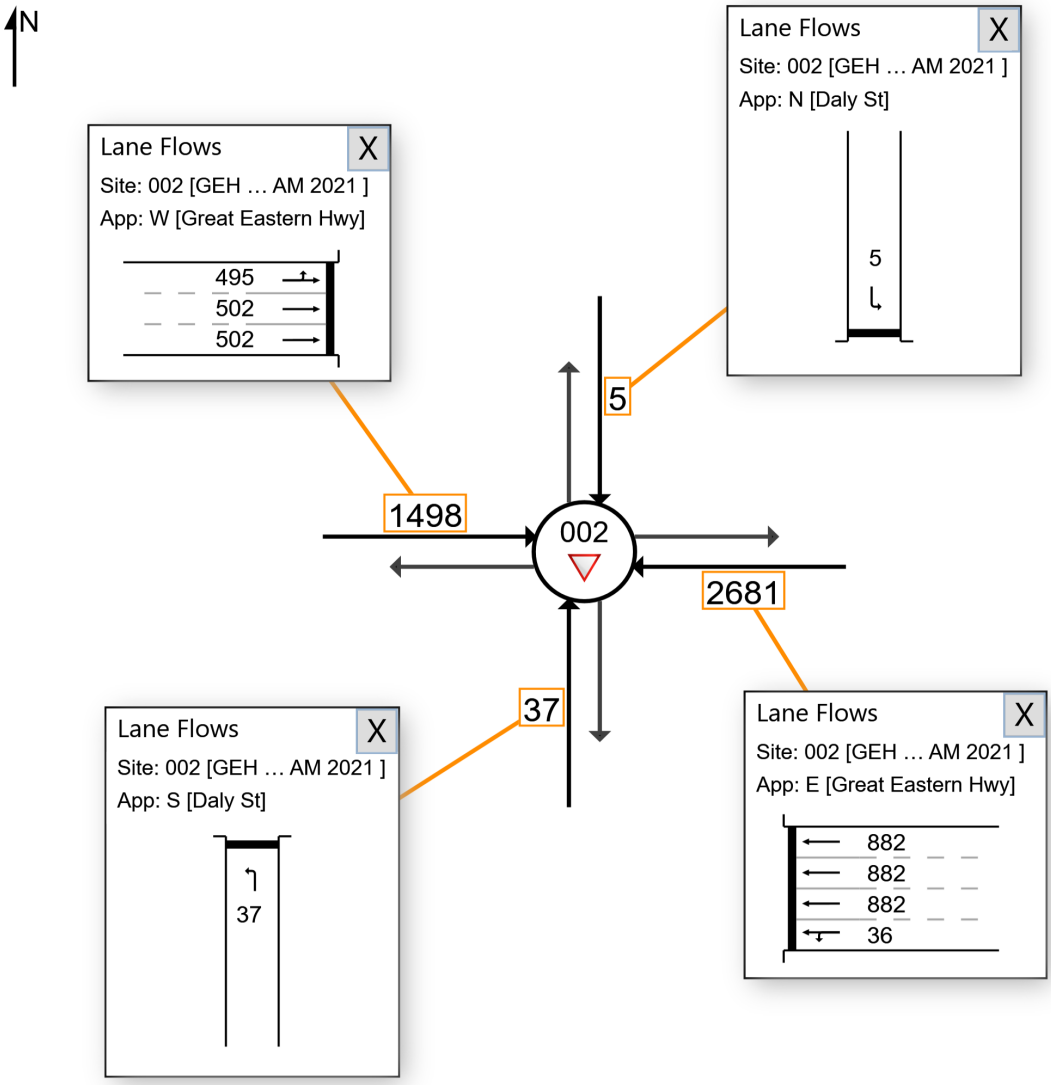
Site: 002 [GEH Daly AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

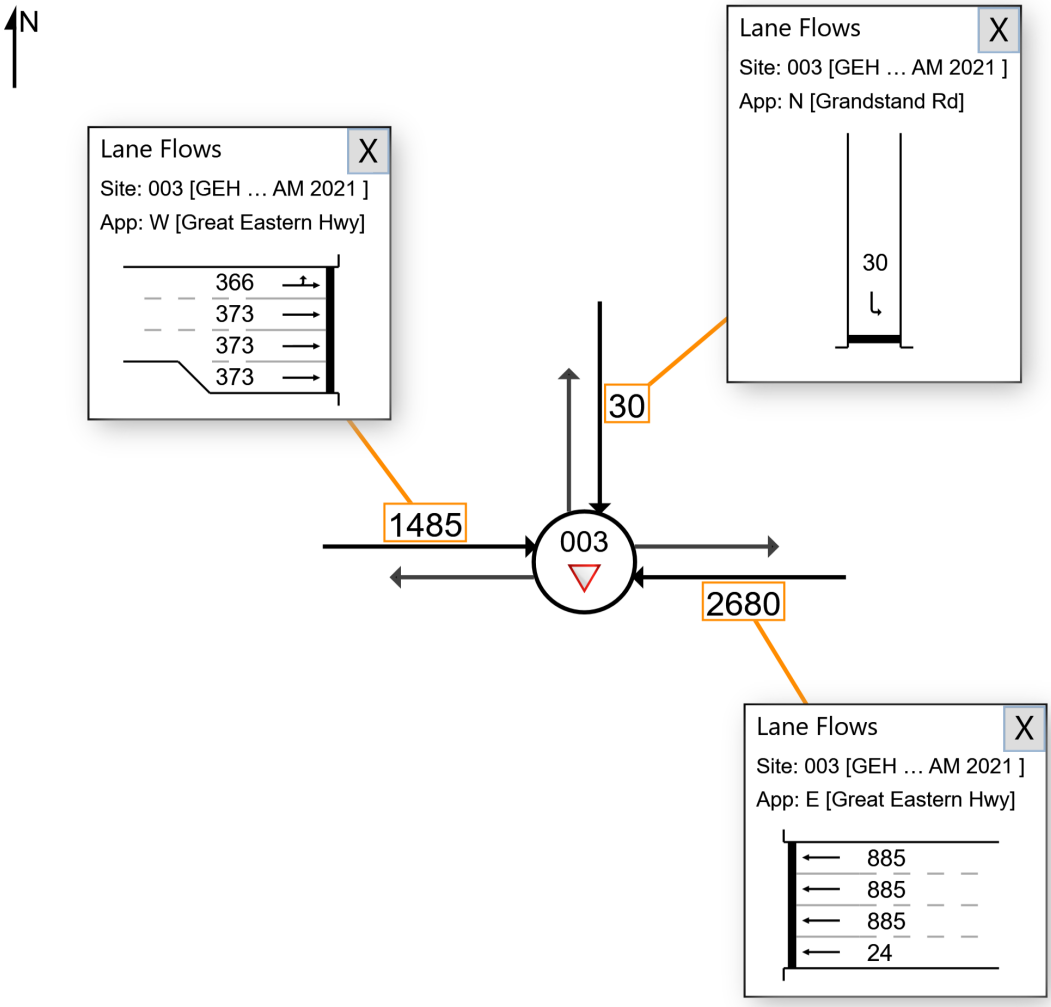
Site: 003 [GEH Grandstand AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

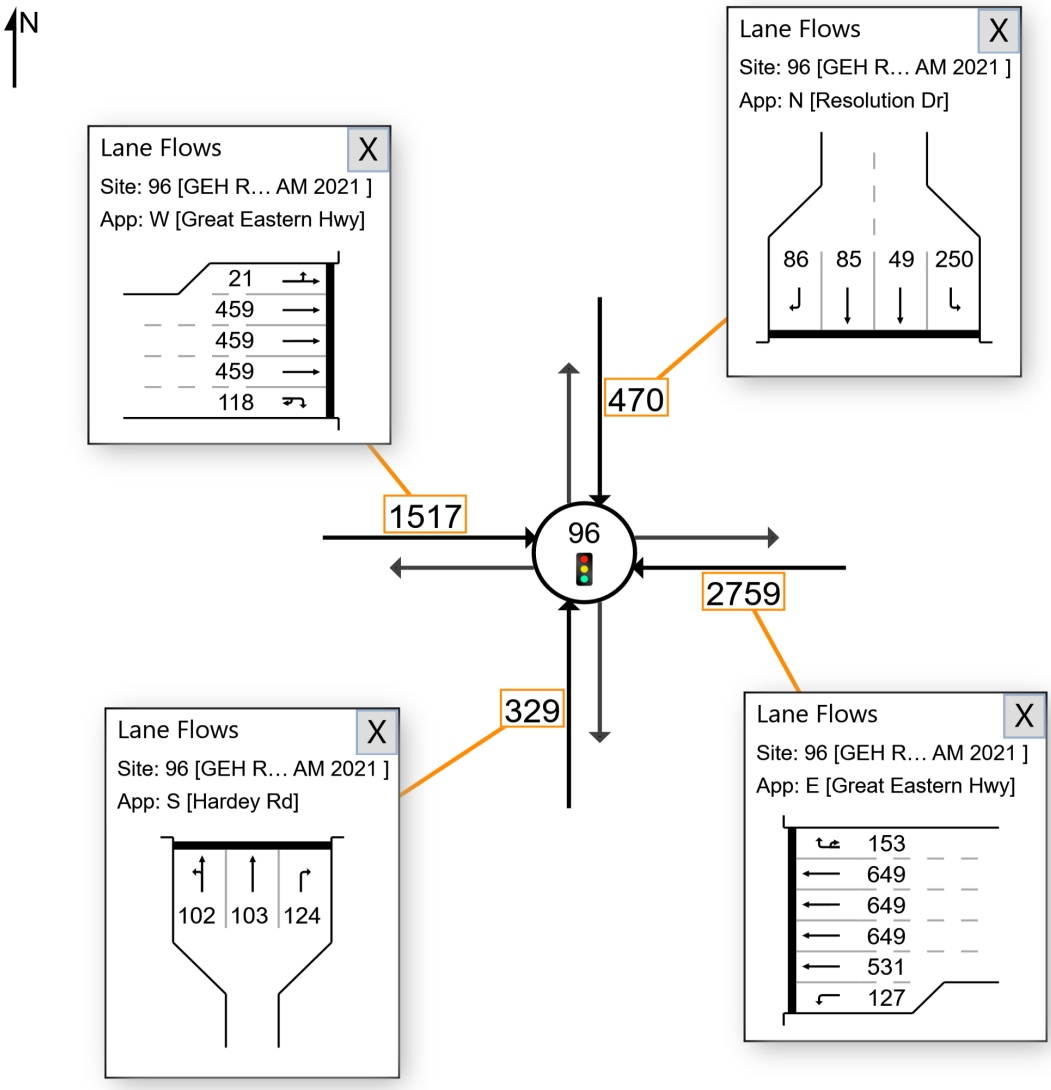
Site: 96 [GEH Resolution Hardey AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

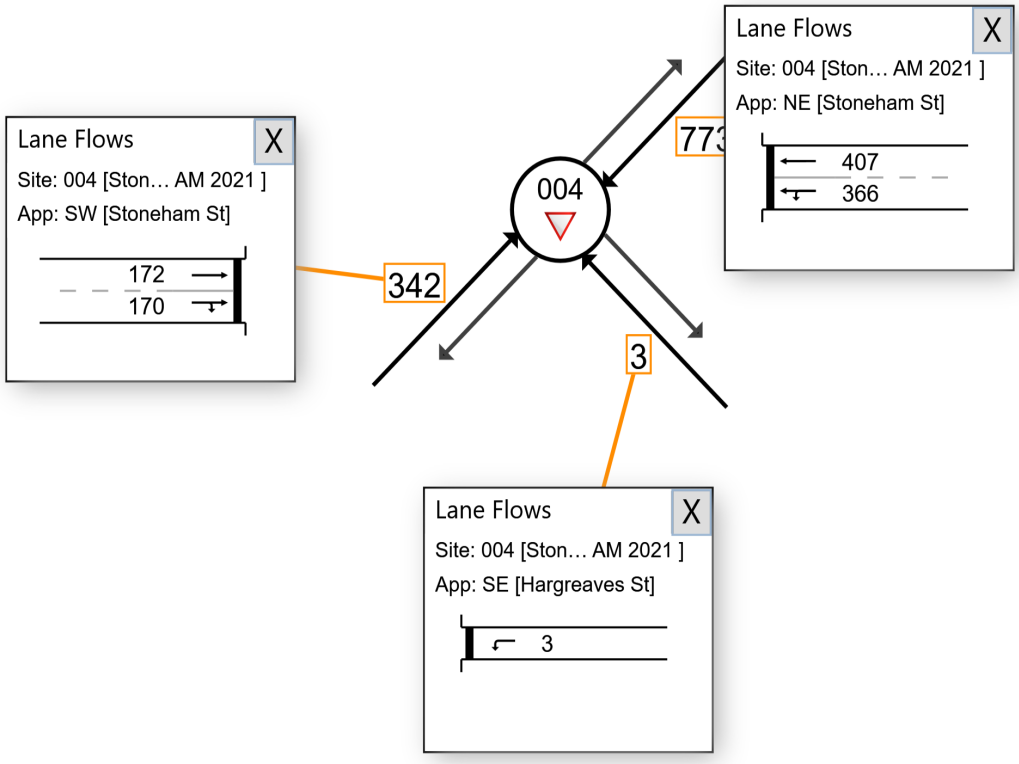
Site: 004 [Stoneham Hargreaves AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

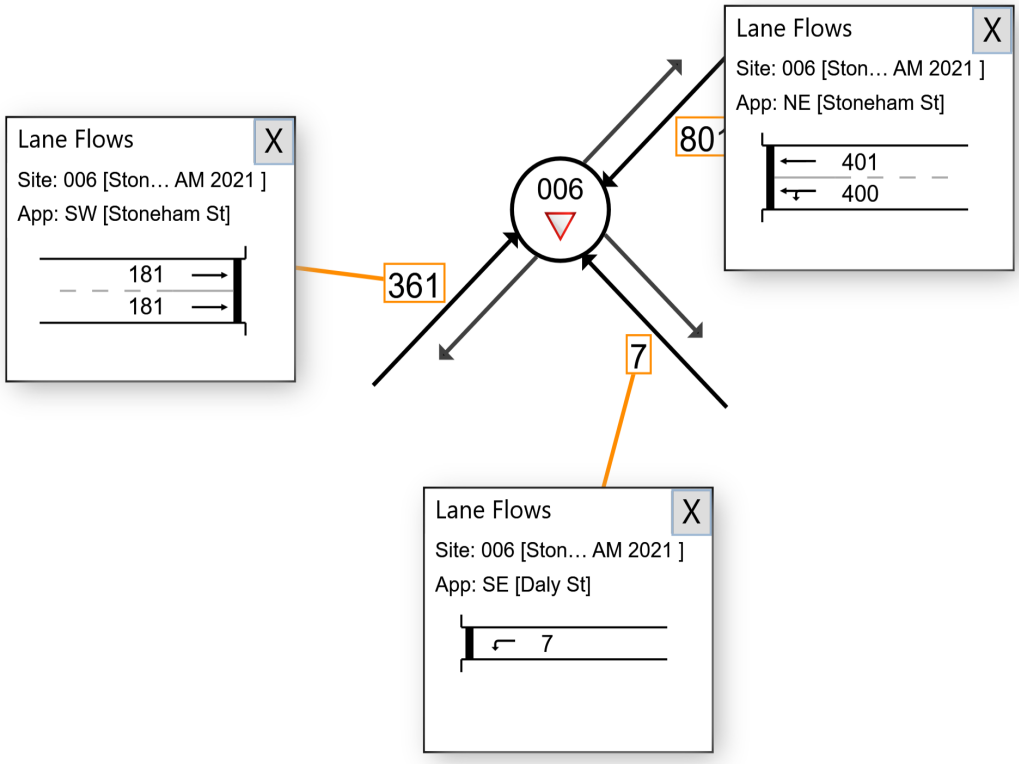
Site: 006 [Stoneham Daly AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

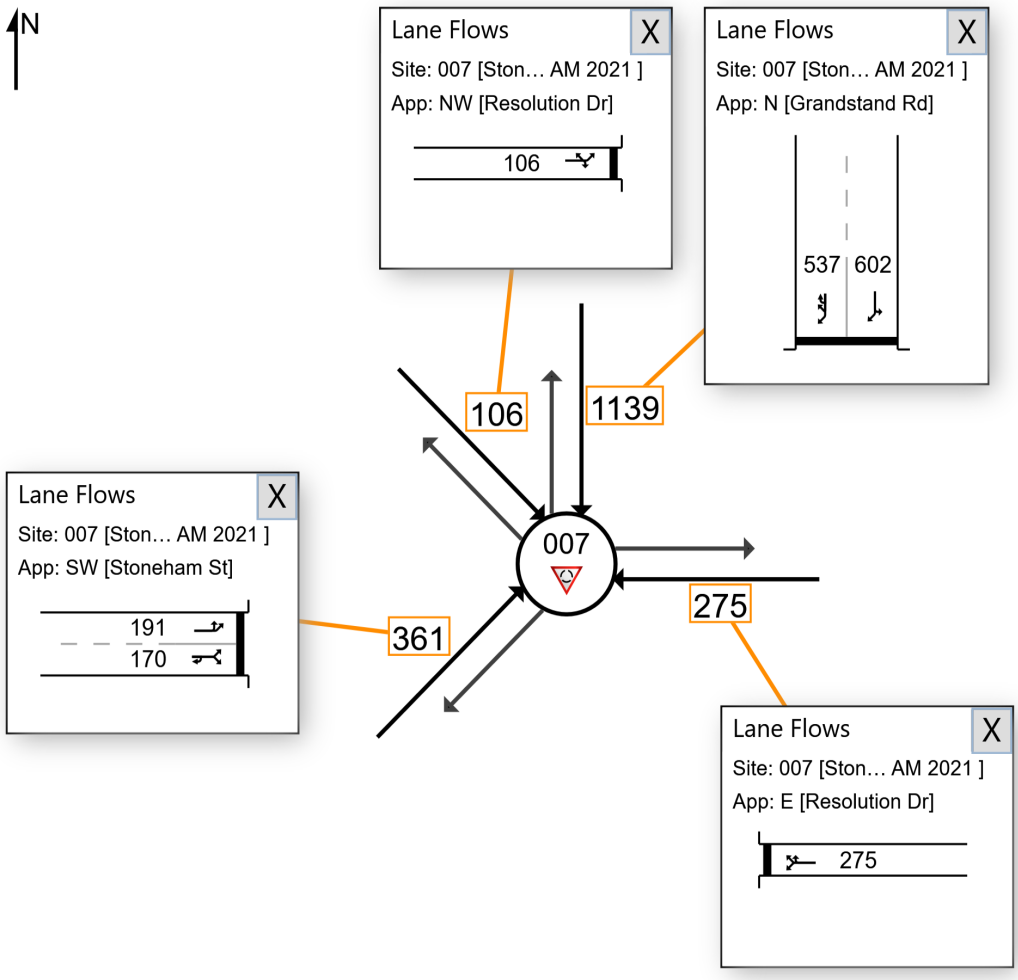
Site: 007 [Stoneham Grandstand Resolution AM 2021 (Site Folder: 2021 AM Peak)]

Network: N101 [2021 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 AM Peak
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

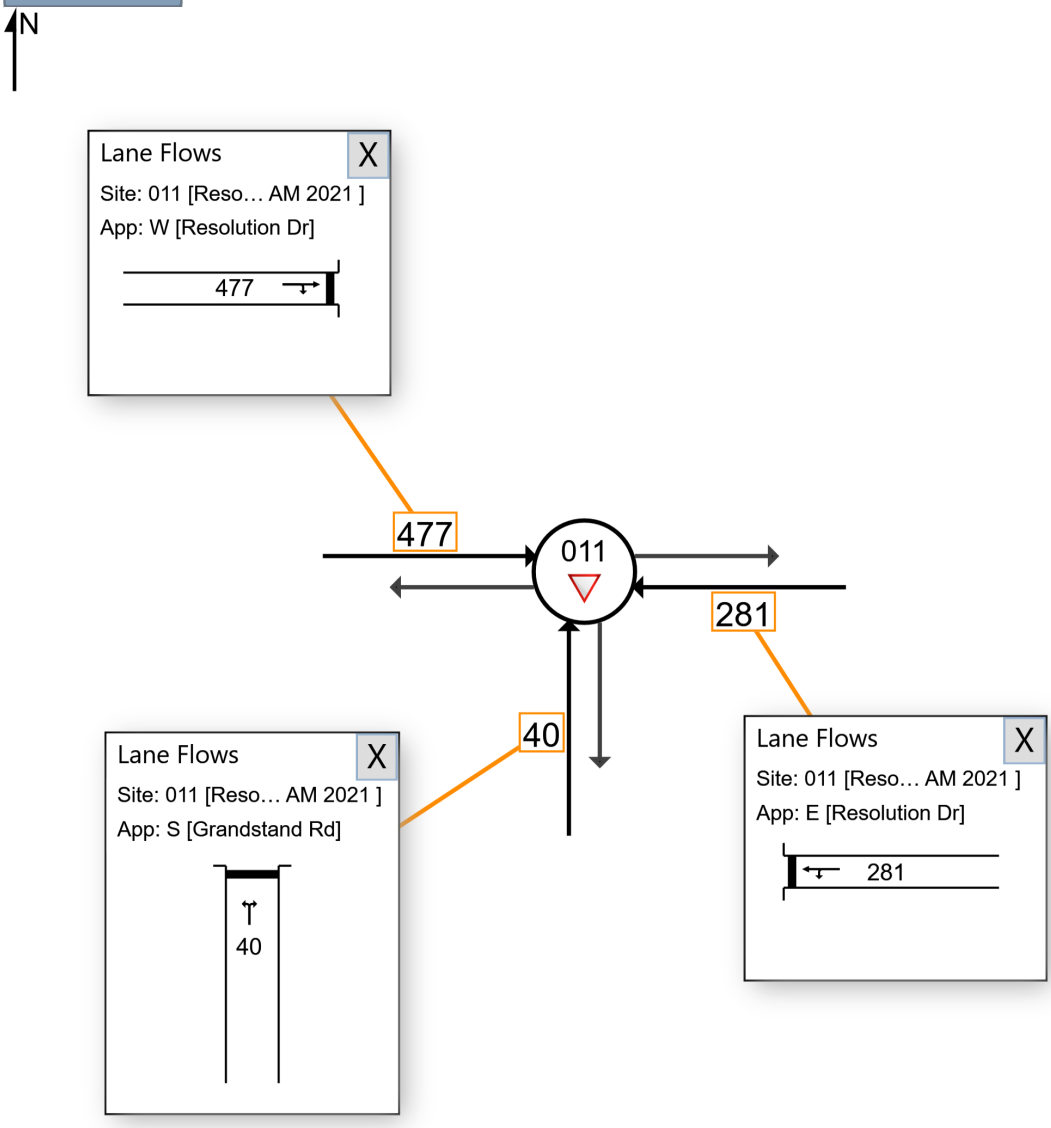
All Movement Classes

Site: 011 [Resolution Grandstand AM 2021 (Site Folder: 2021 AM Peak)] **Network: N101 [2021 AM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2021 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

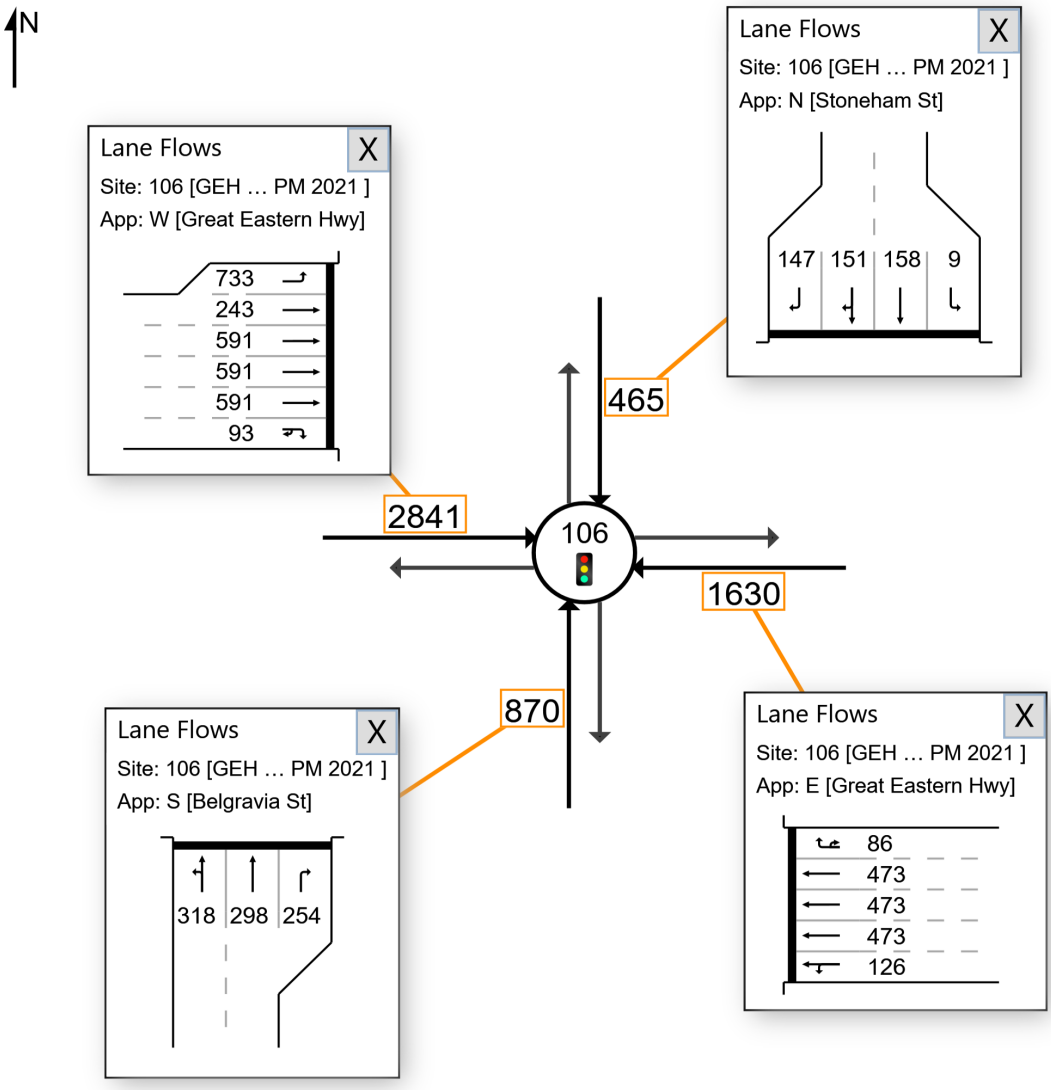
Site: 106 [GEH Stoneham Belgravia PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

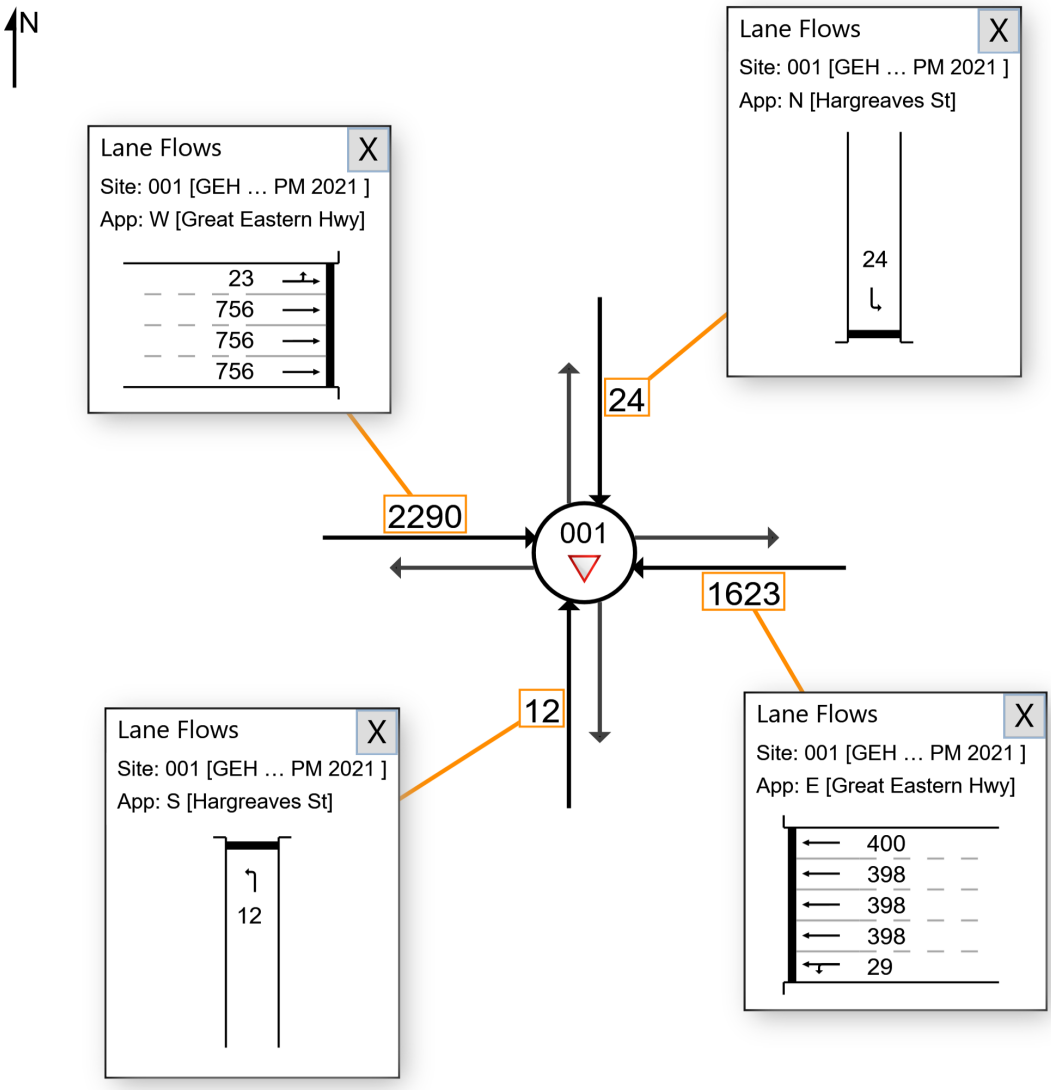
Site: 001 [GEH Hargreaves PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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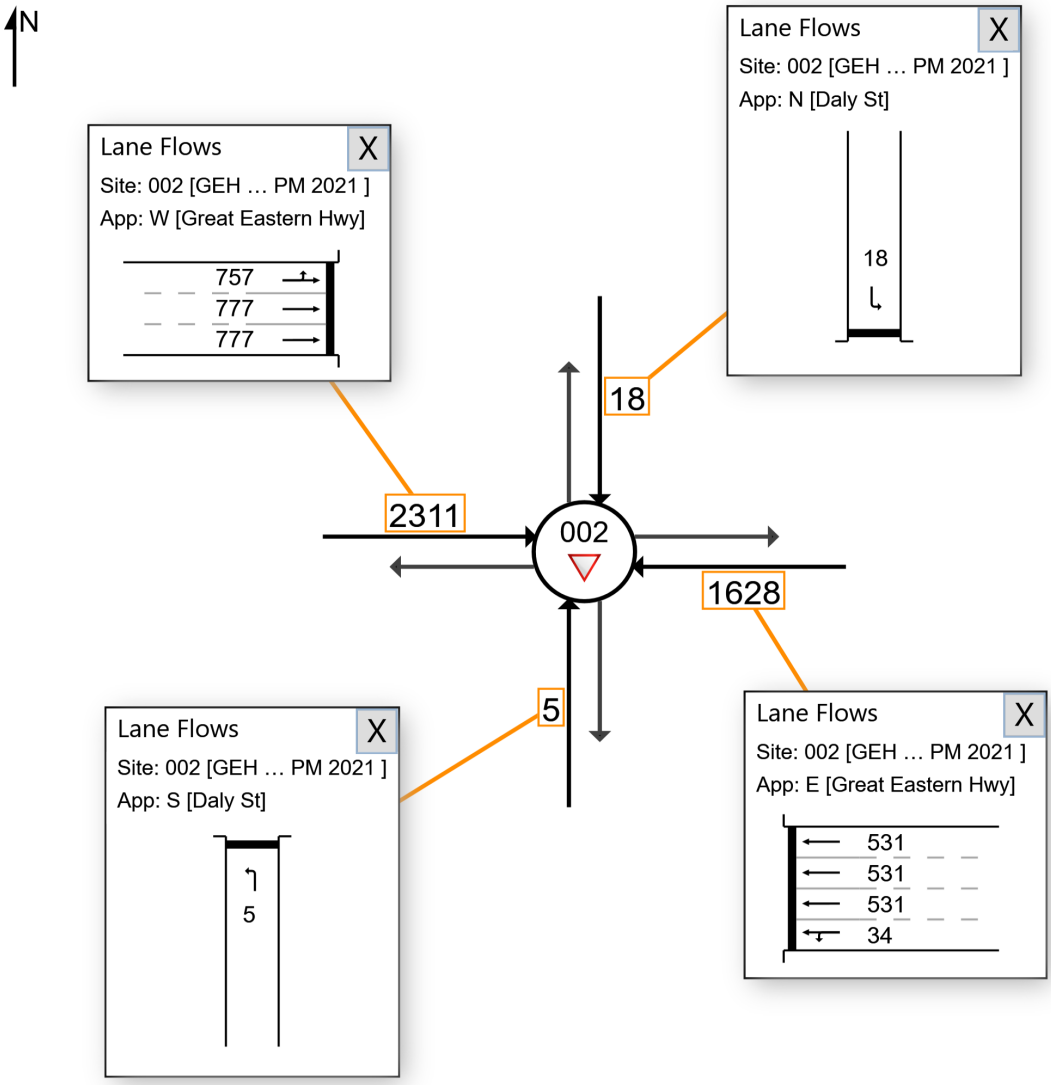

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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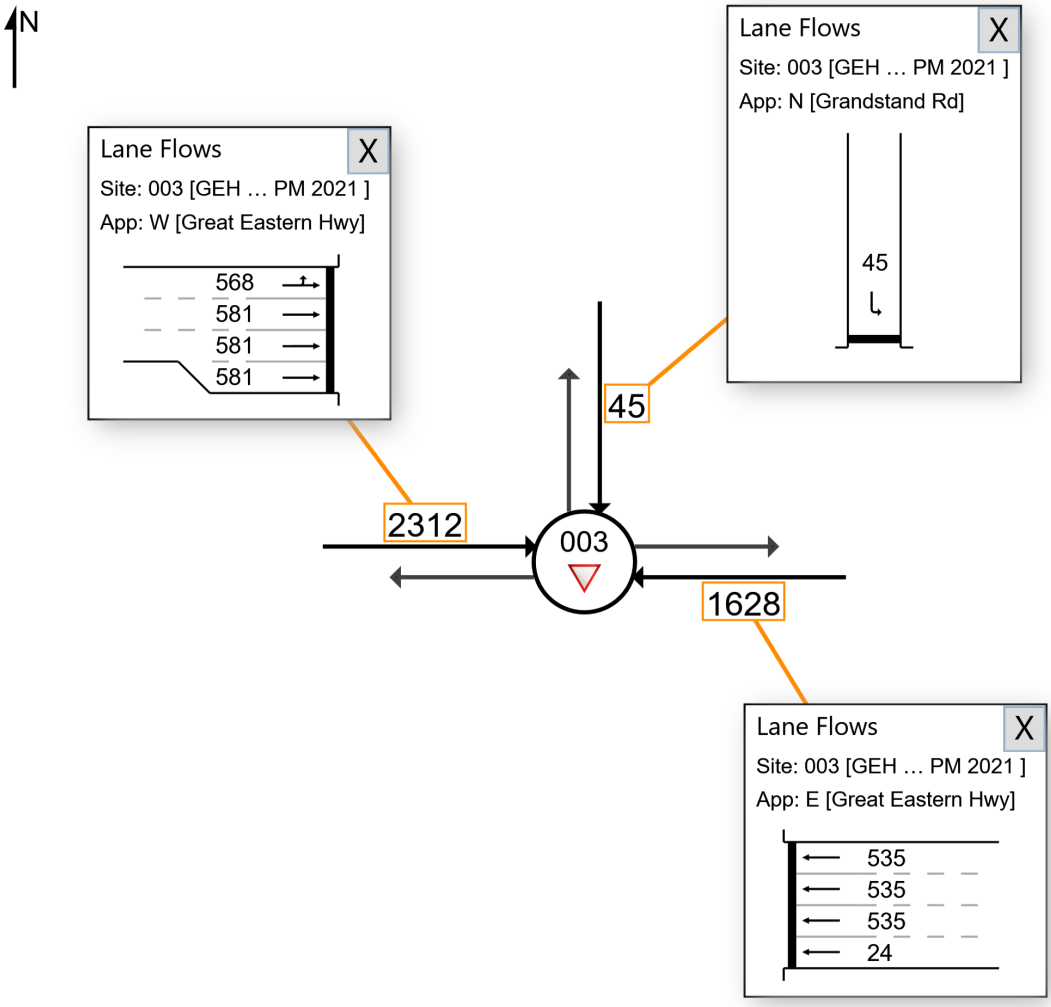

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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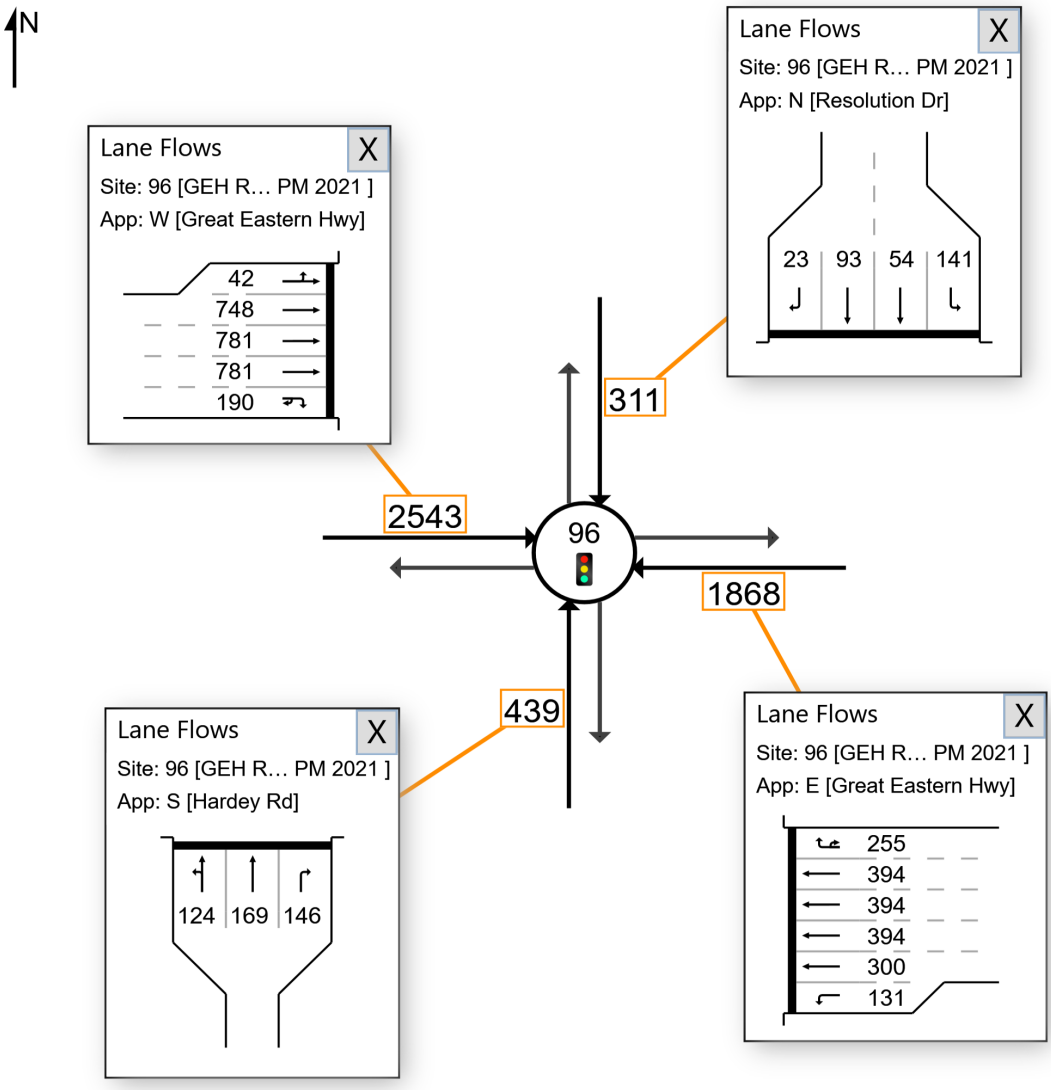

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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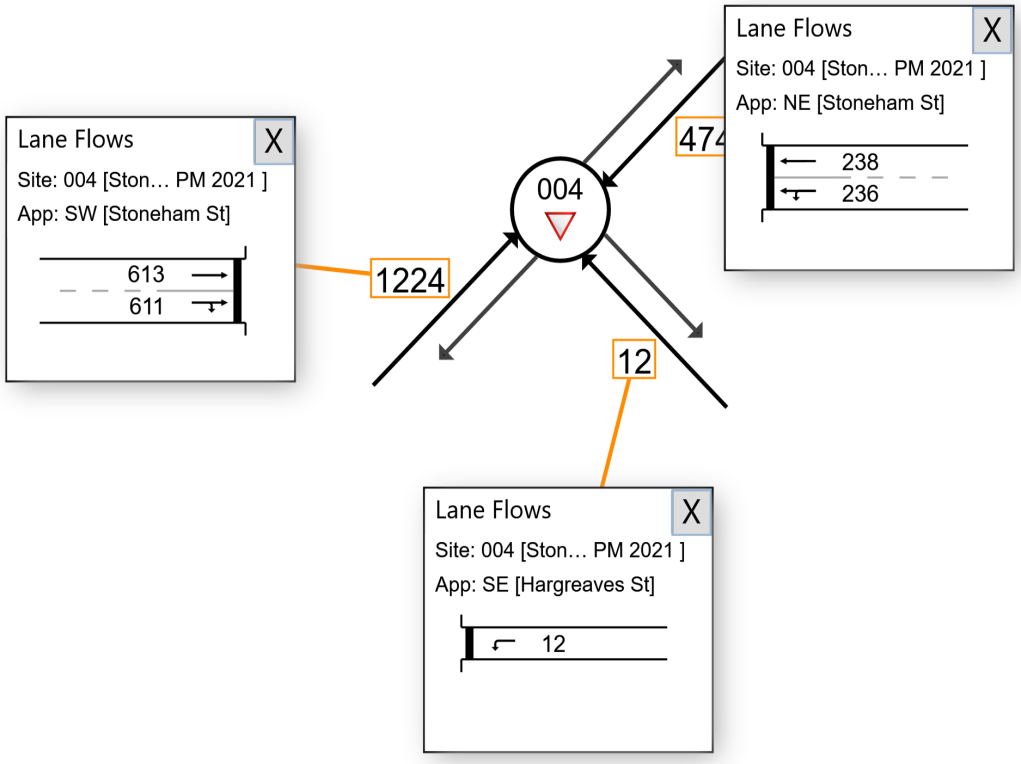

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 006 [Stoneham Daly PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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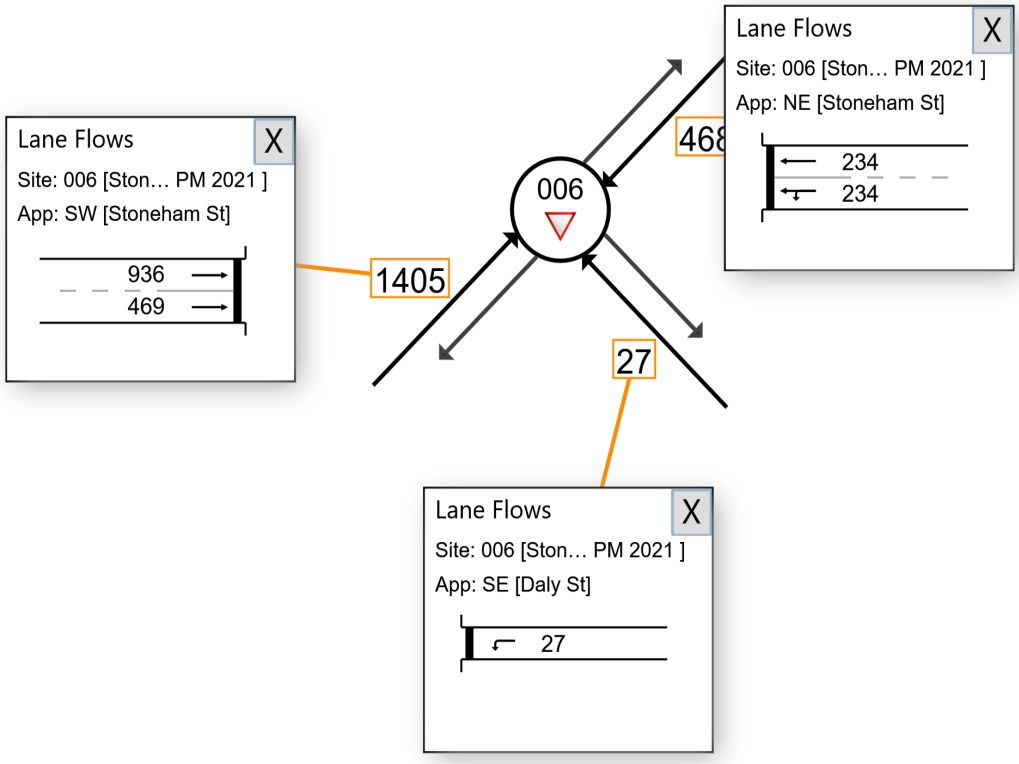

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution PM 2021 (Site Folder: 2021 PM Peak)]

Network: N101 [2021 PM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 PM Peak
Site Category: Existing Design
Roundabout

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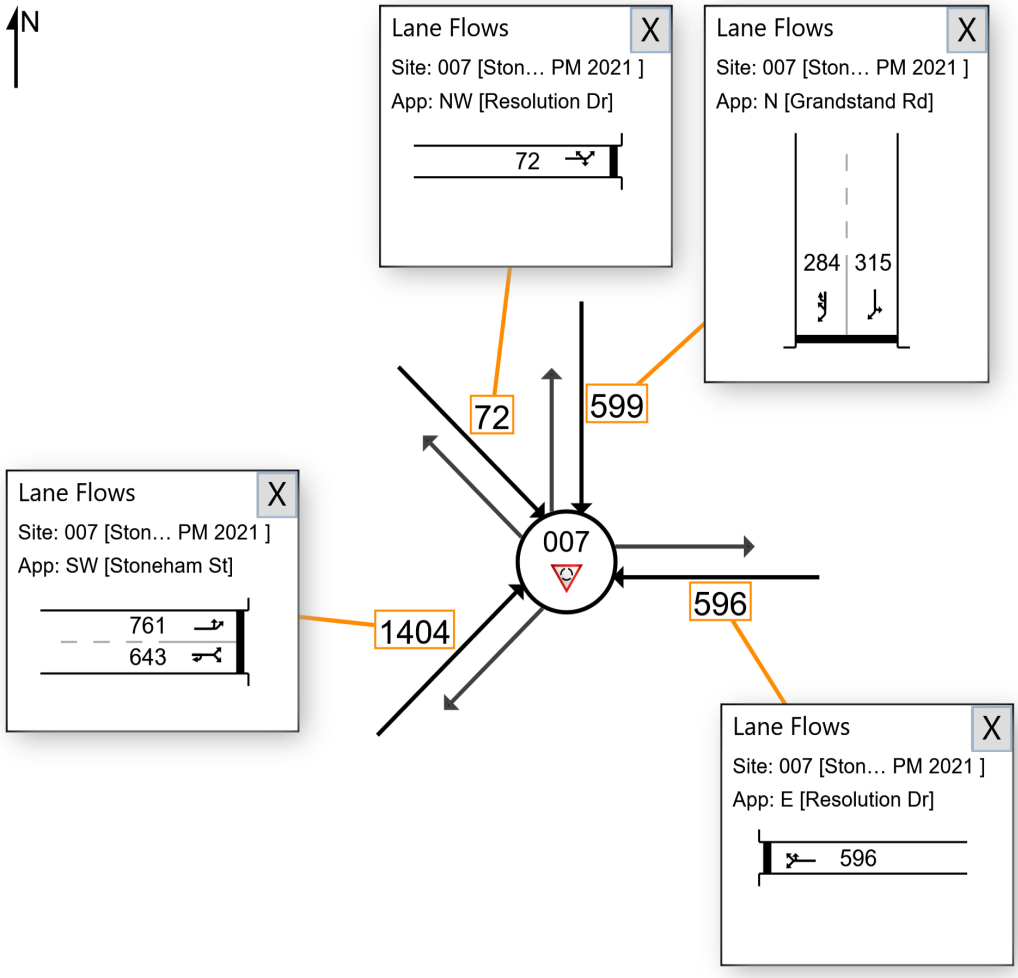

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand PM 2021 (Site Folder: 2021 PM Peak)] **Network: N101 [2021 PM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2021 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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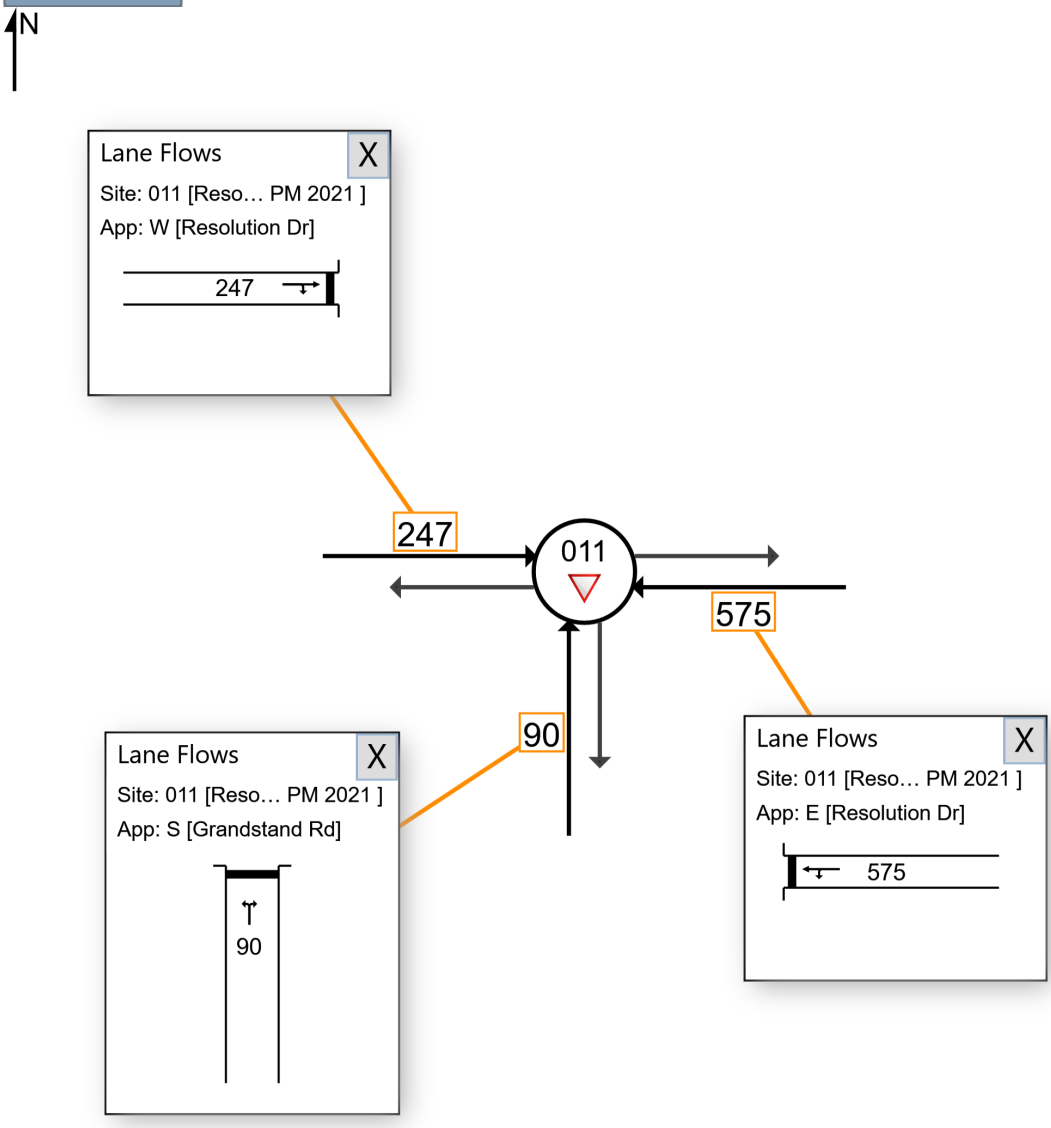

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia AM 2031 (Site Folder: 2031 AM Peak)] **Network: N101 [2031 AM Peak (Network Folder: General)]**

GEH / Stoneham St / Belgravia St
Traffic signals
2031 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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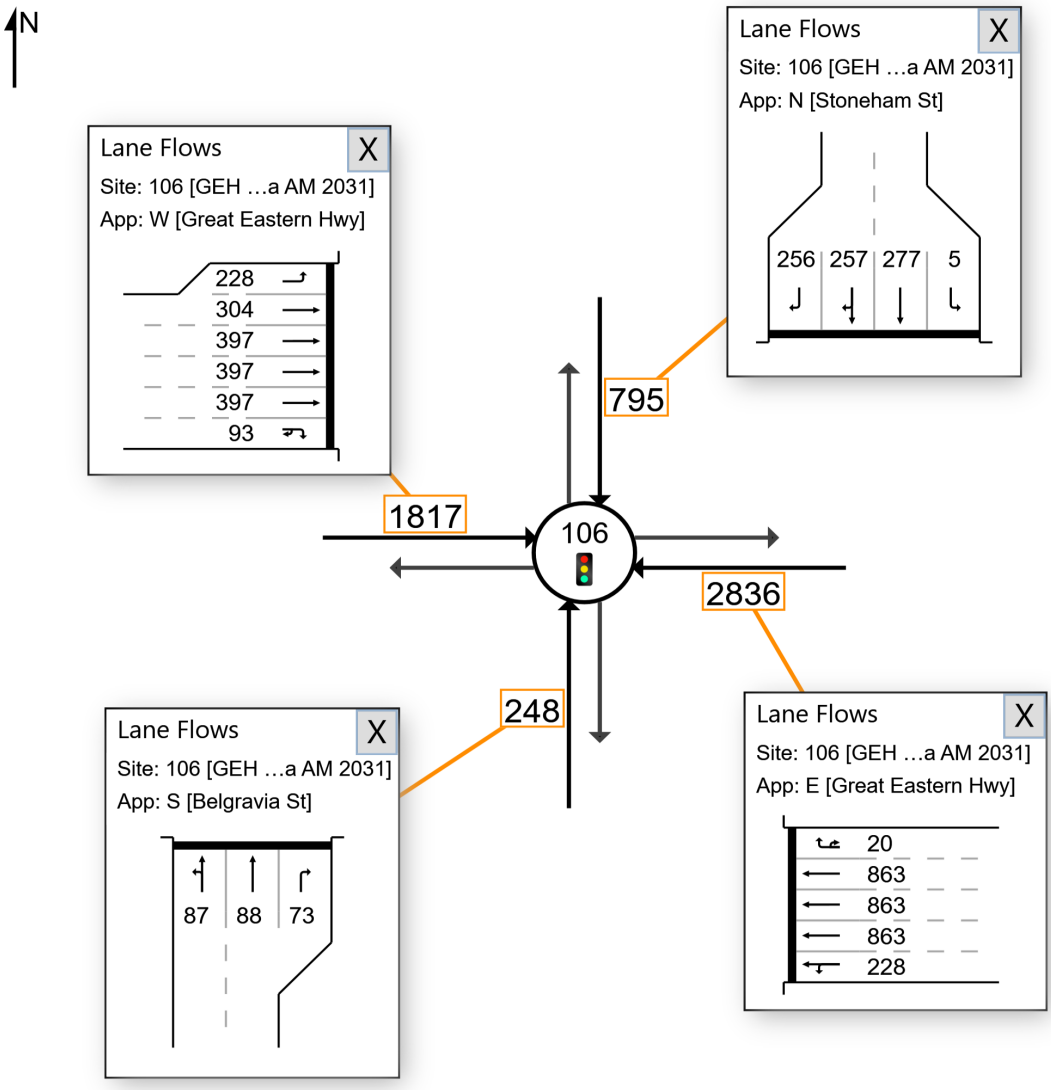

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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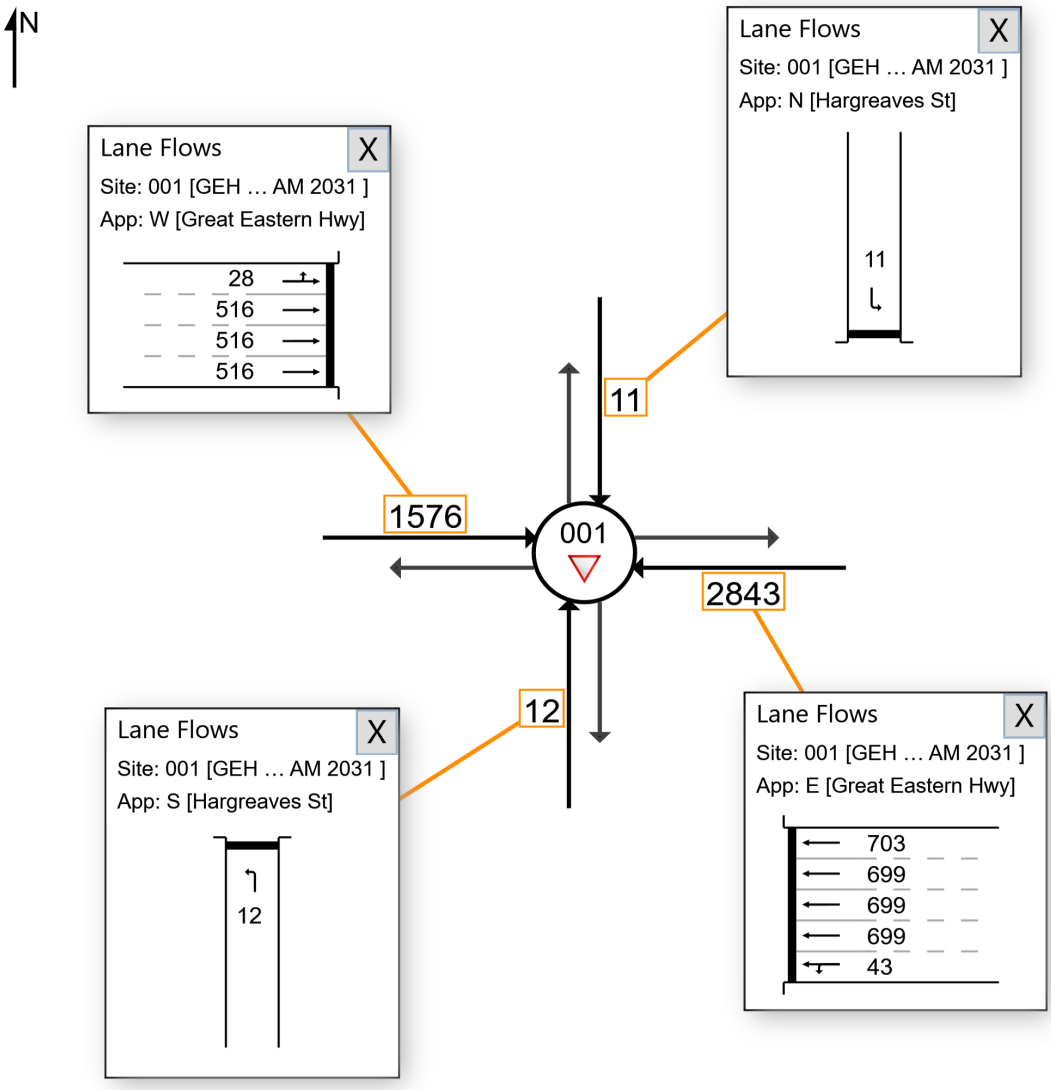

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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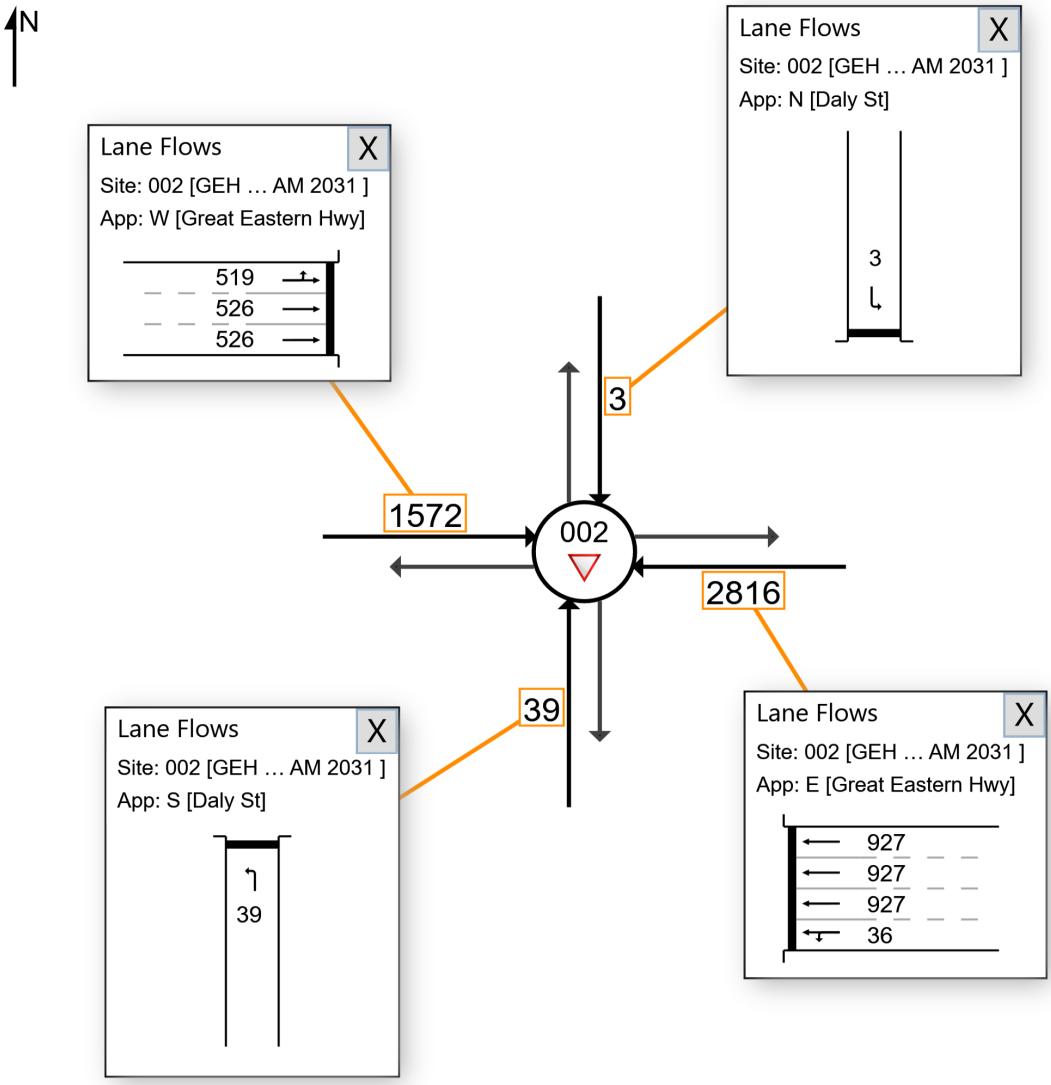

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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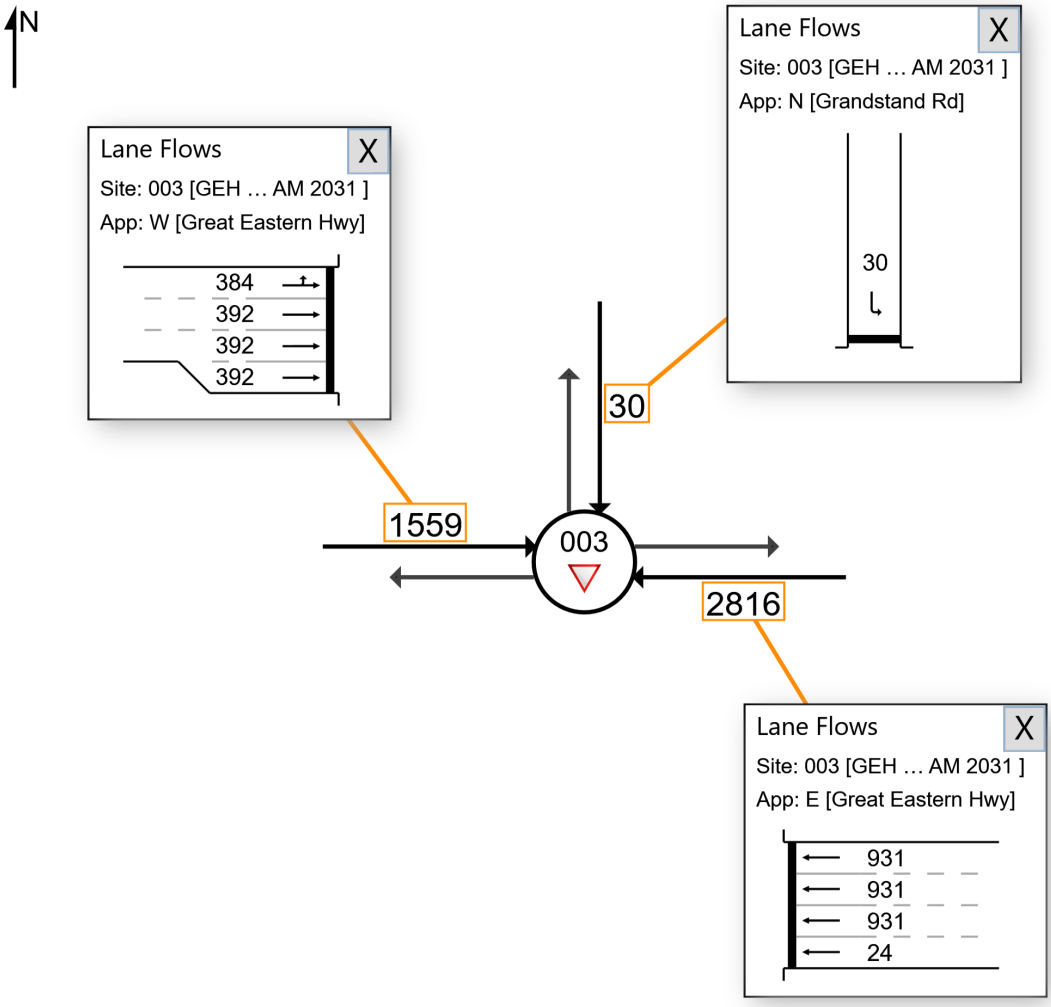

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

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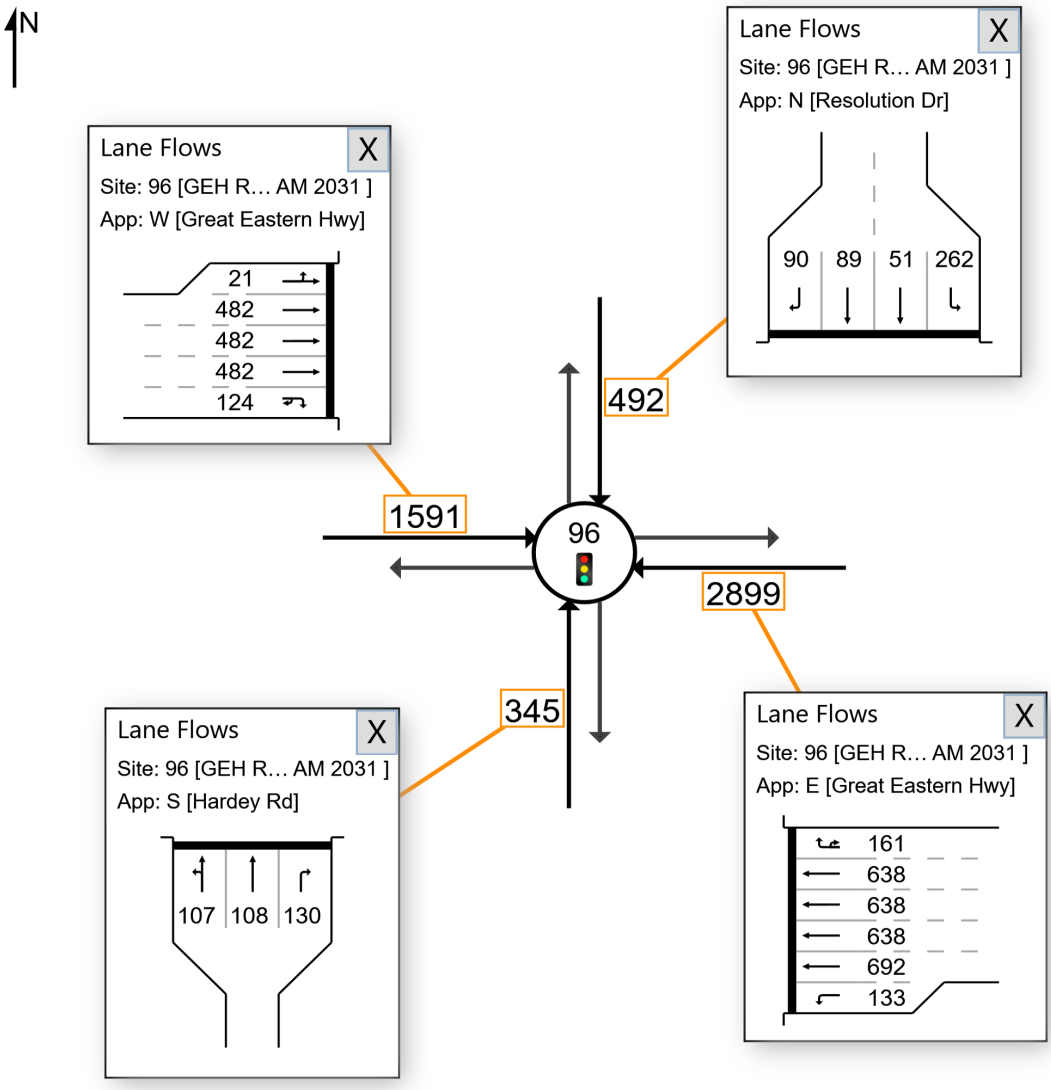

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves AM 2031 (Site Folder: 2031 AM Peak)] **Network: N101 [2031 AM Peak (Network Folder: General)]**

Stoneham St / Hargreaves St
All in Left out, Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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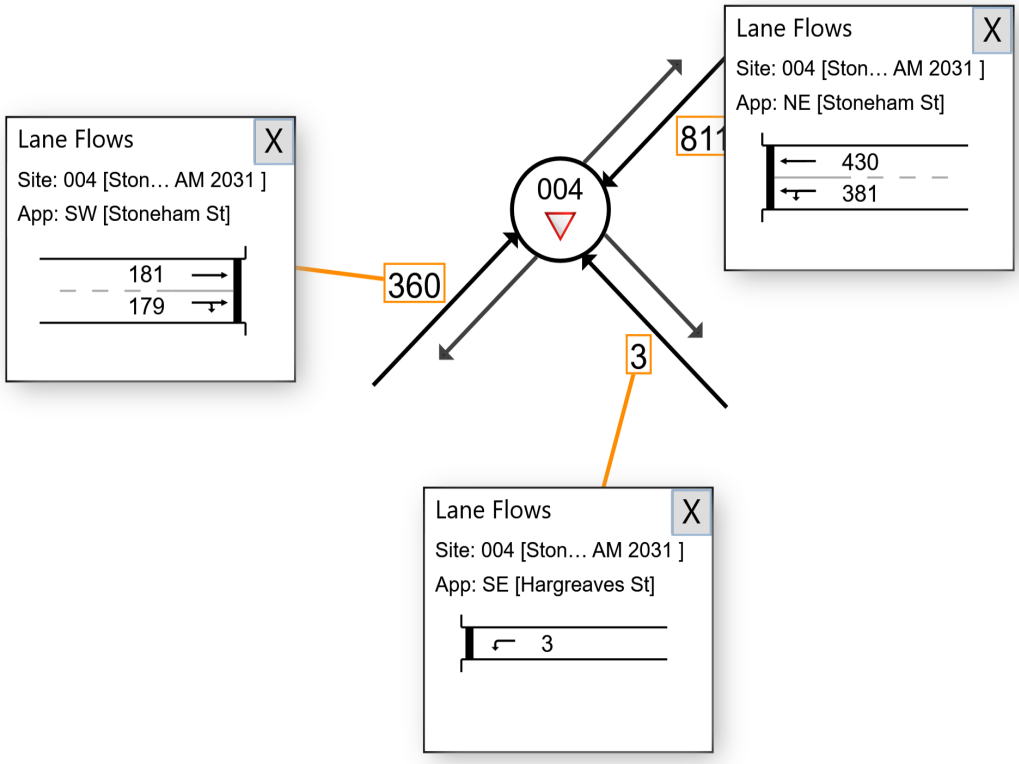

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 006 [Stoneham Daly AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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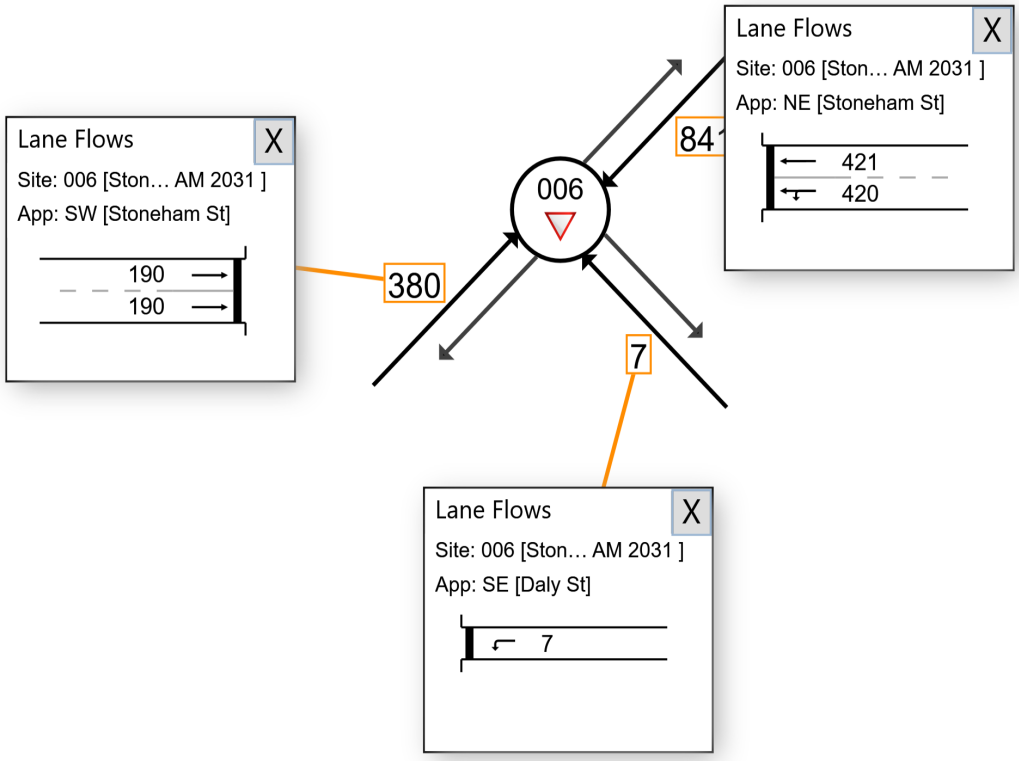

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution AM 2031 (Site Folder: 2031 AM Peak)]

Network: N101 [2031 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 AM Peak
Site Category: Existing Design
Roundabout

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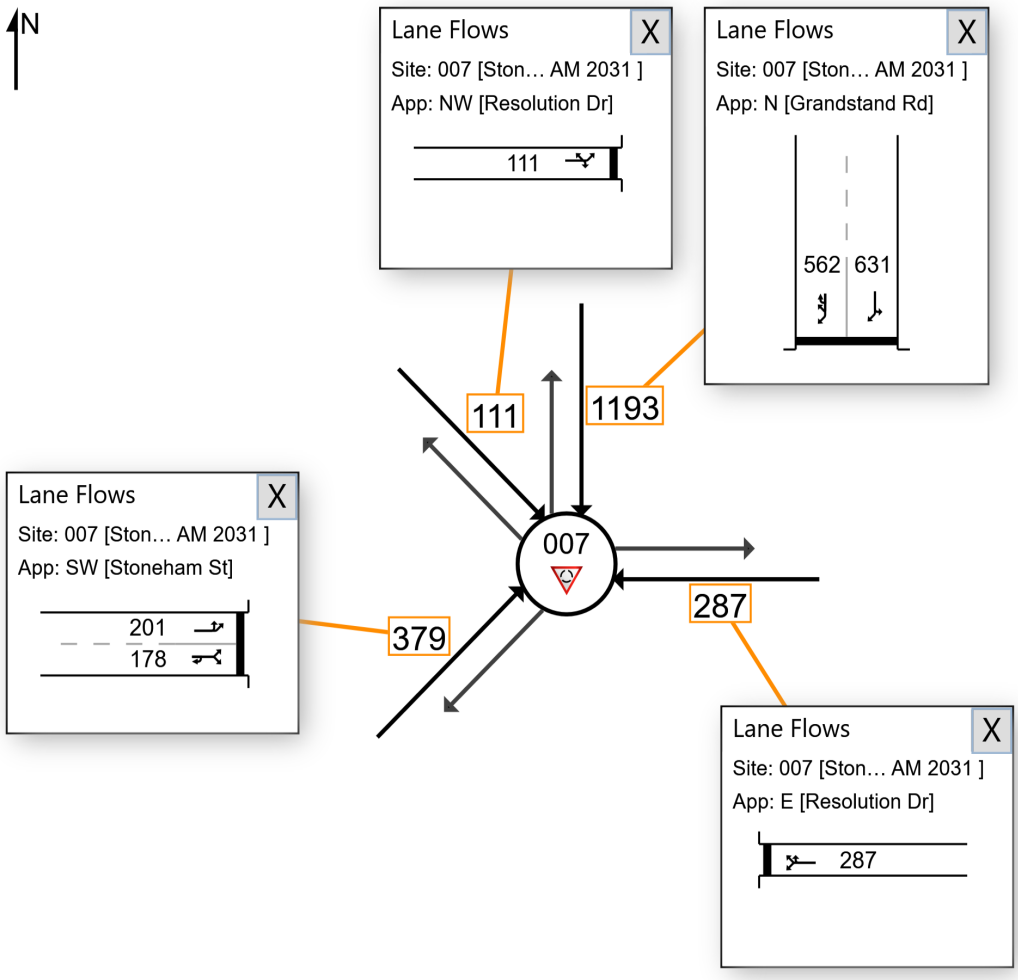

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand AM 2031 (Site Folder: 2031 AM Peak)] **Network: N101 [2031 AM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2031 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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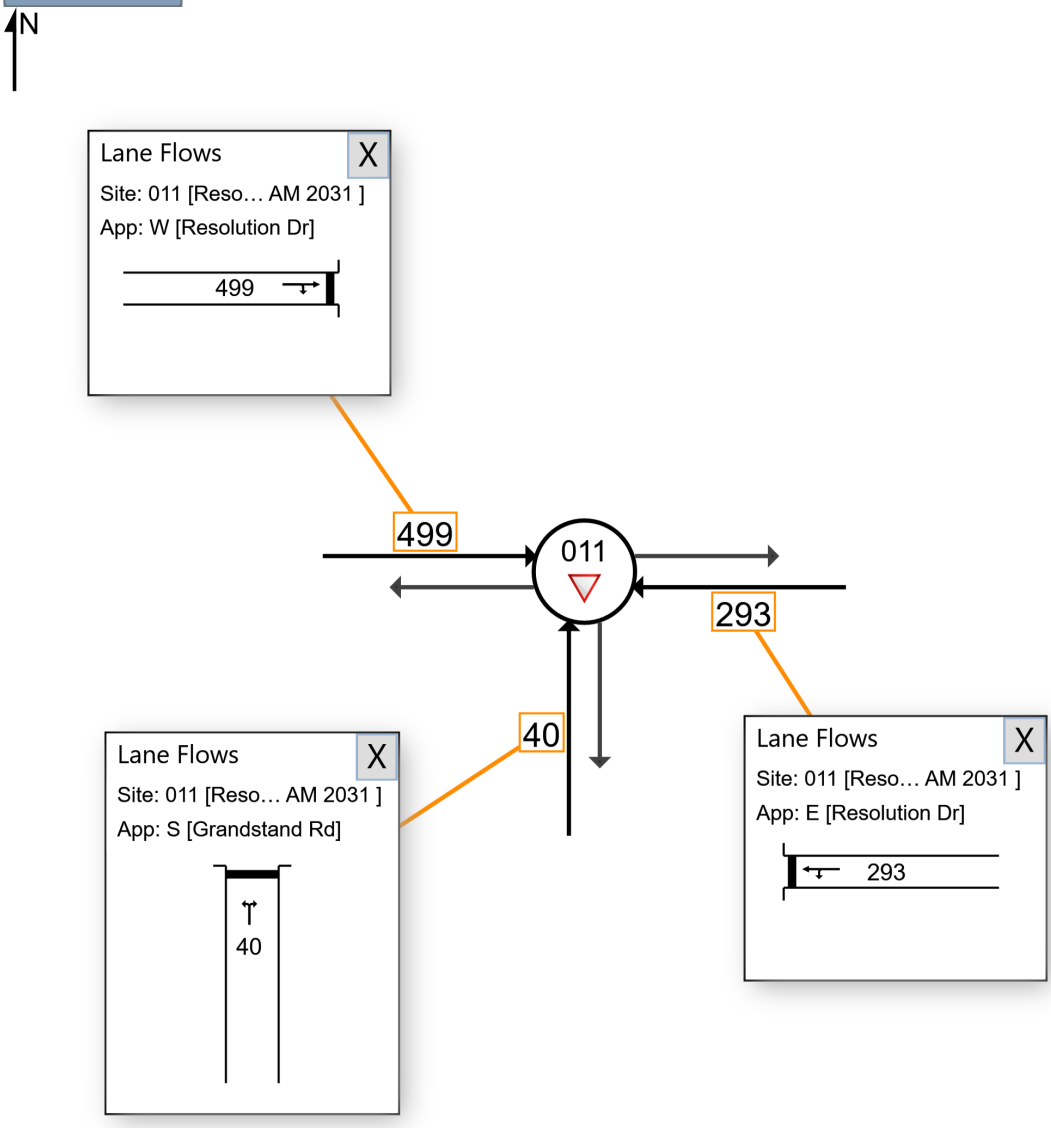

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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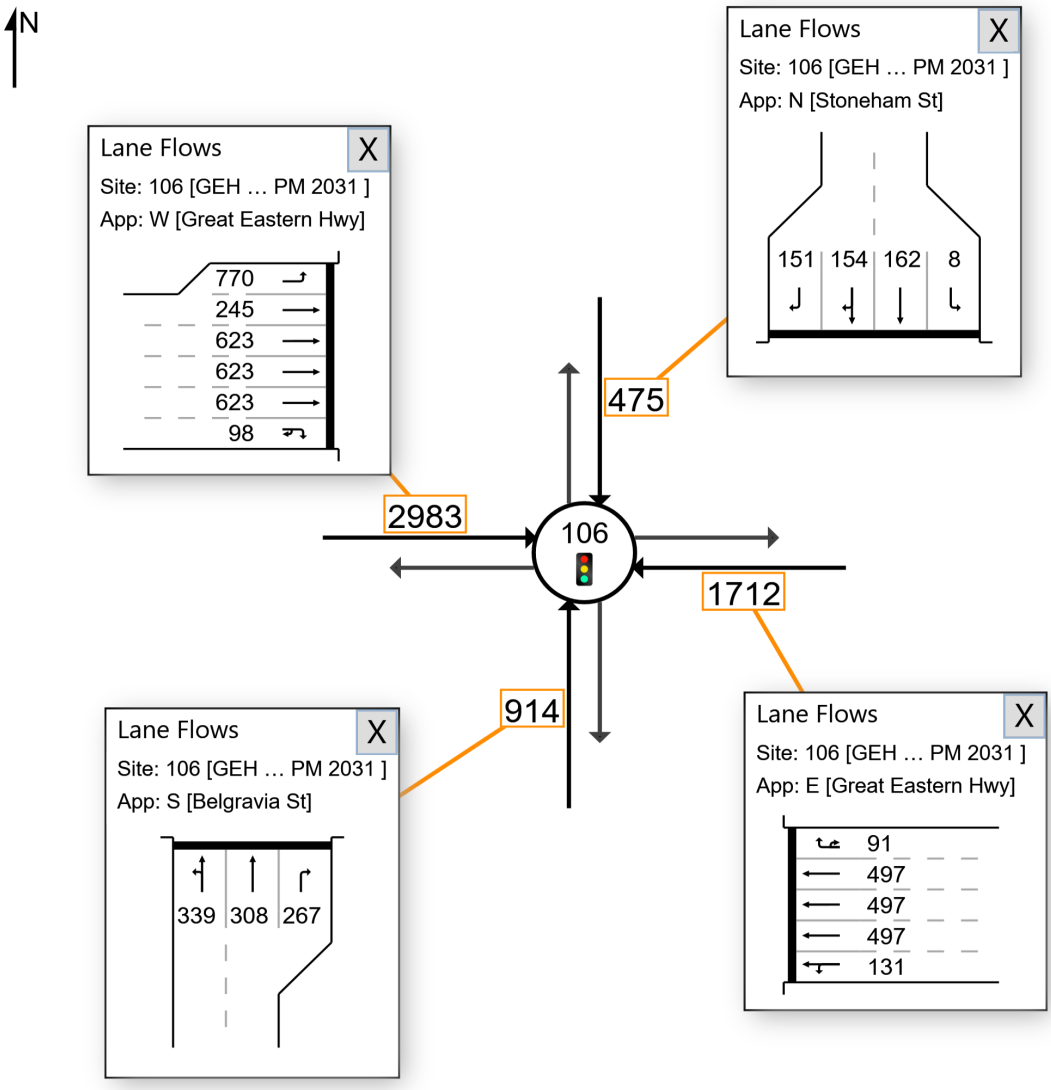

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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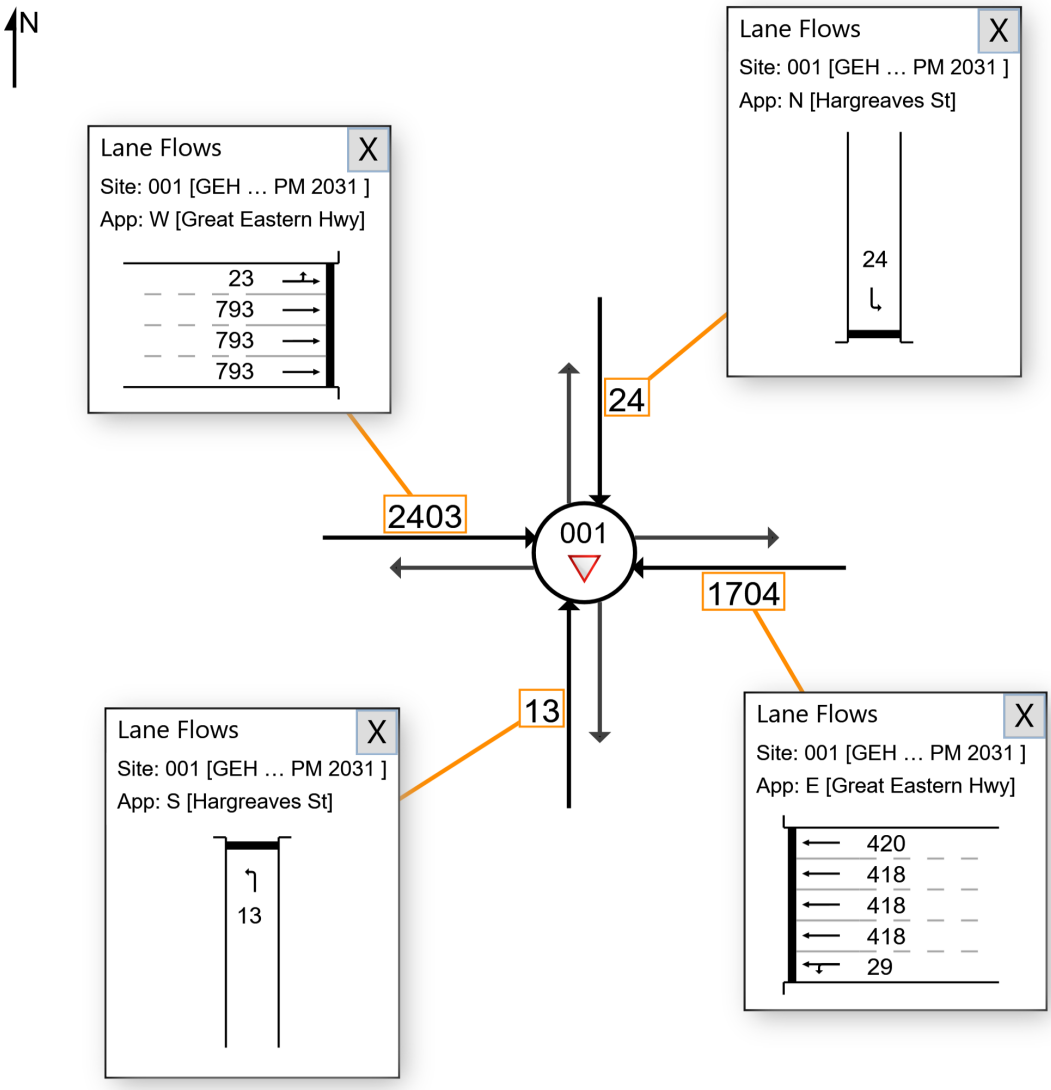

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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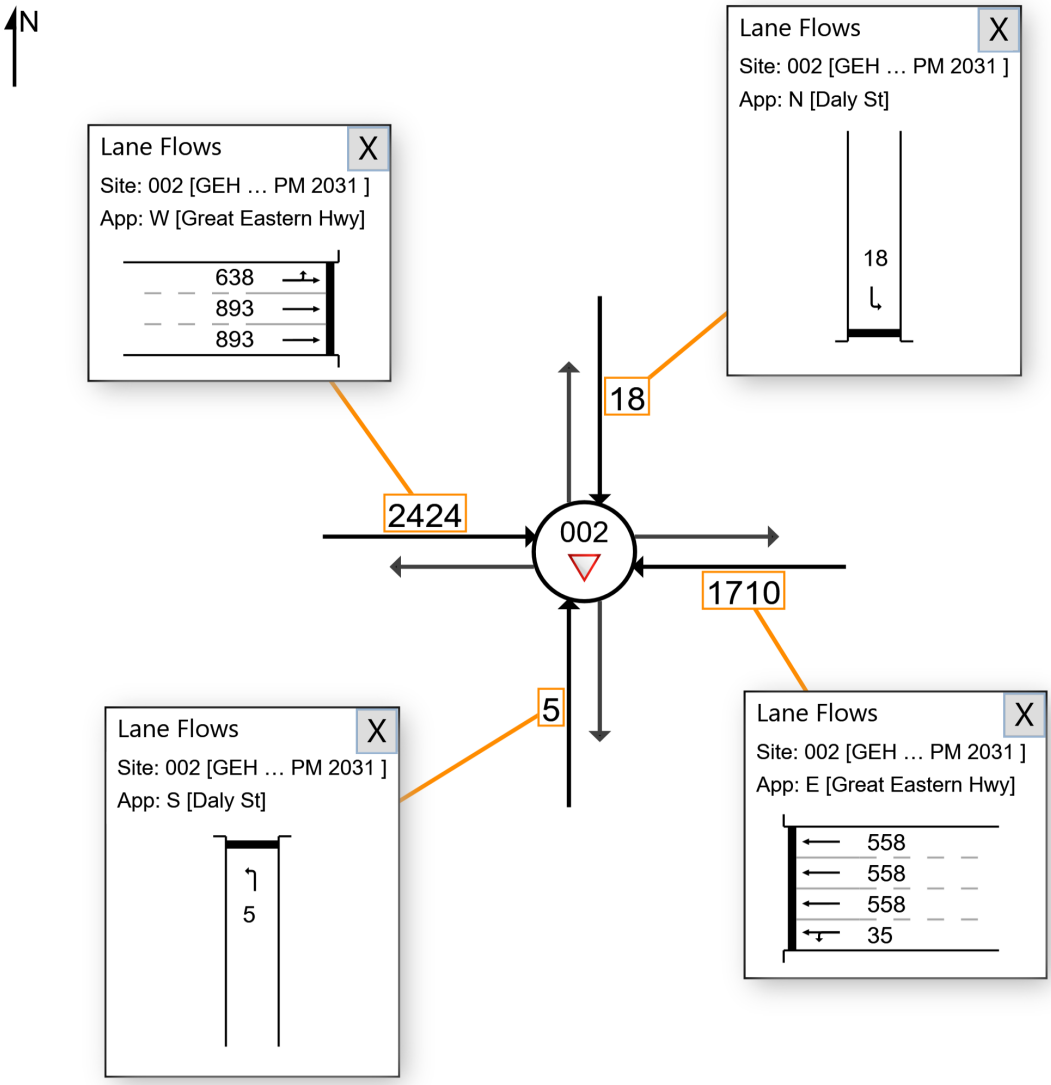

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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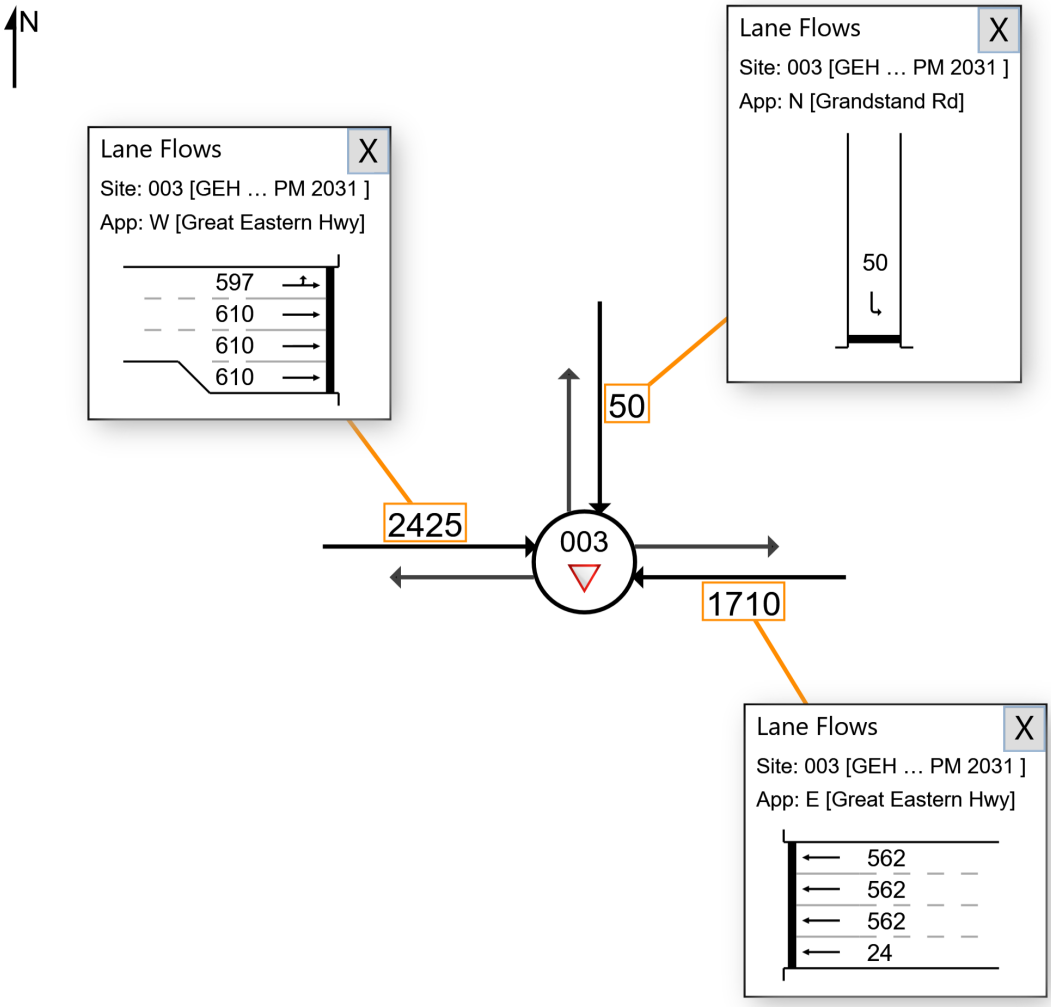

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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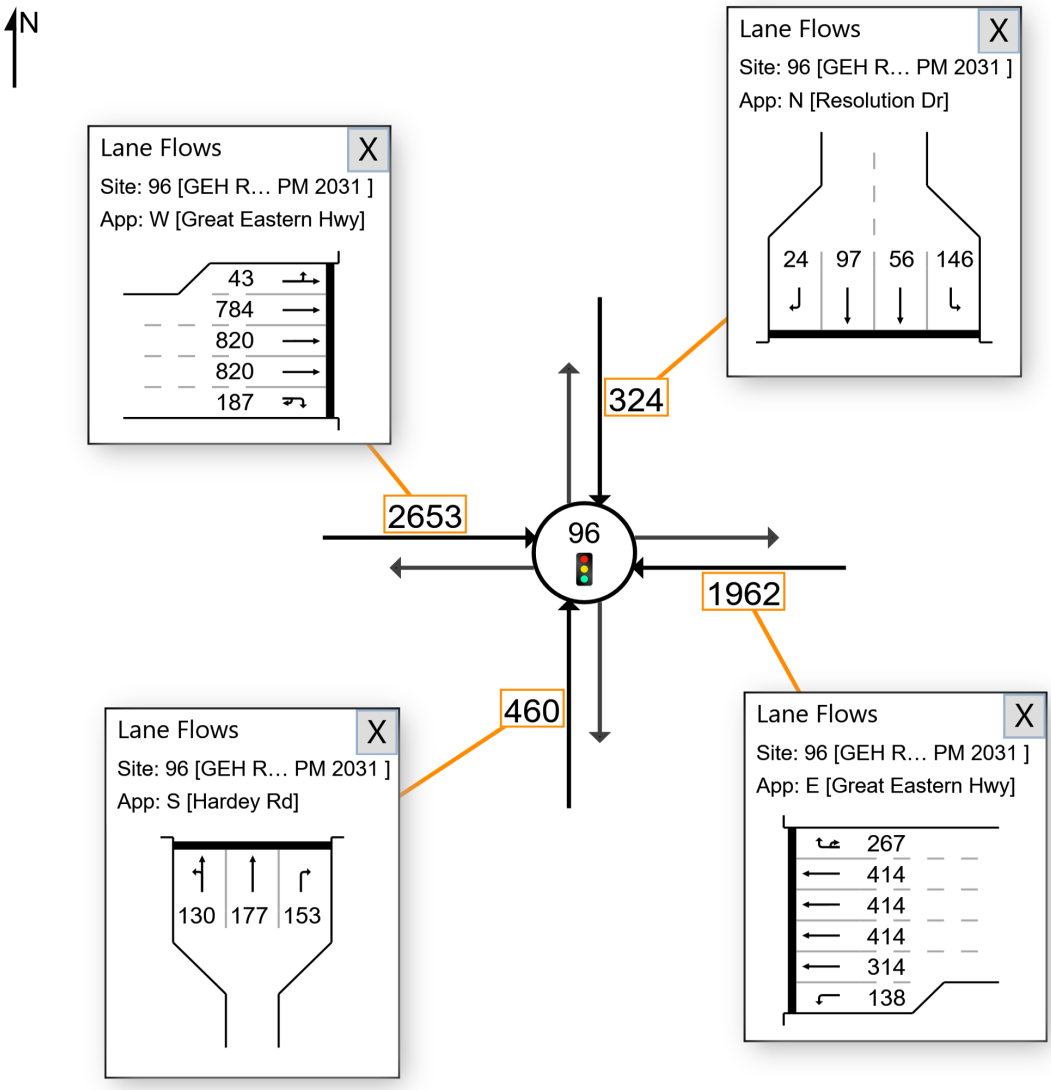

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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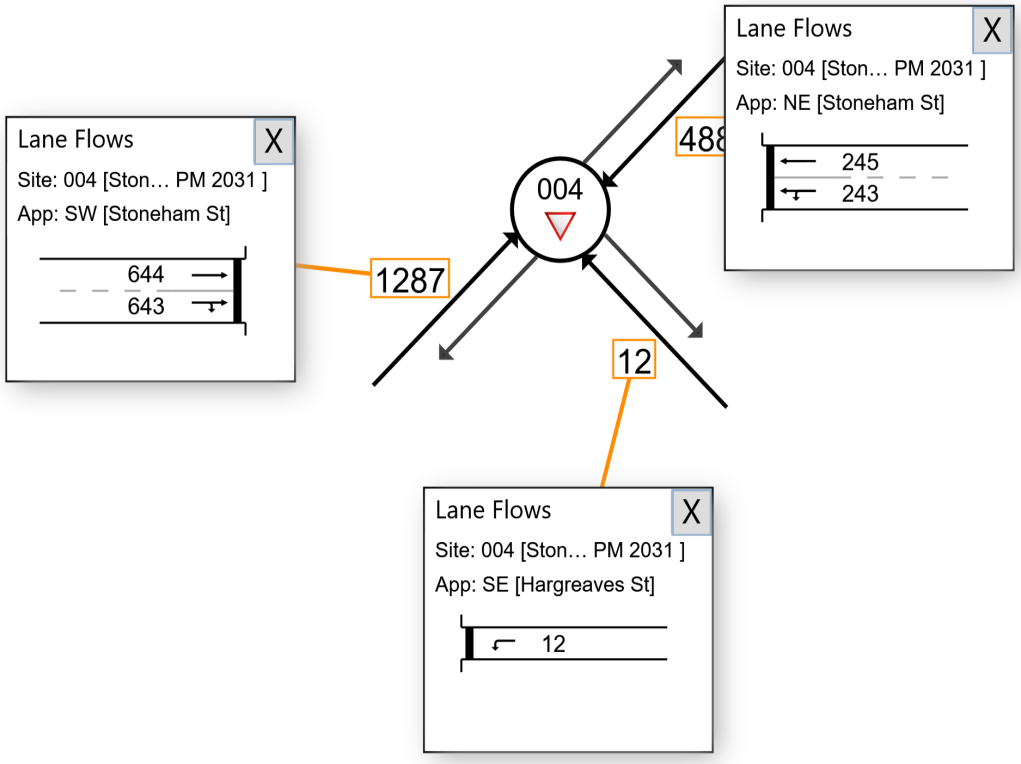

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 006 [Stoneham Daly PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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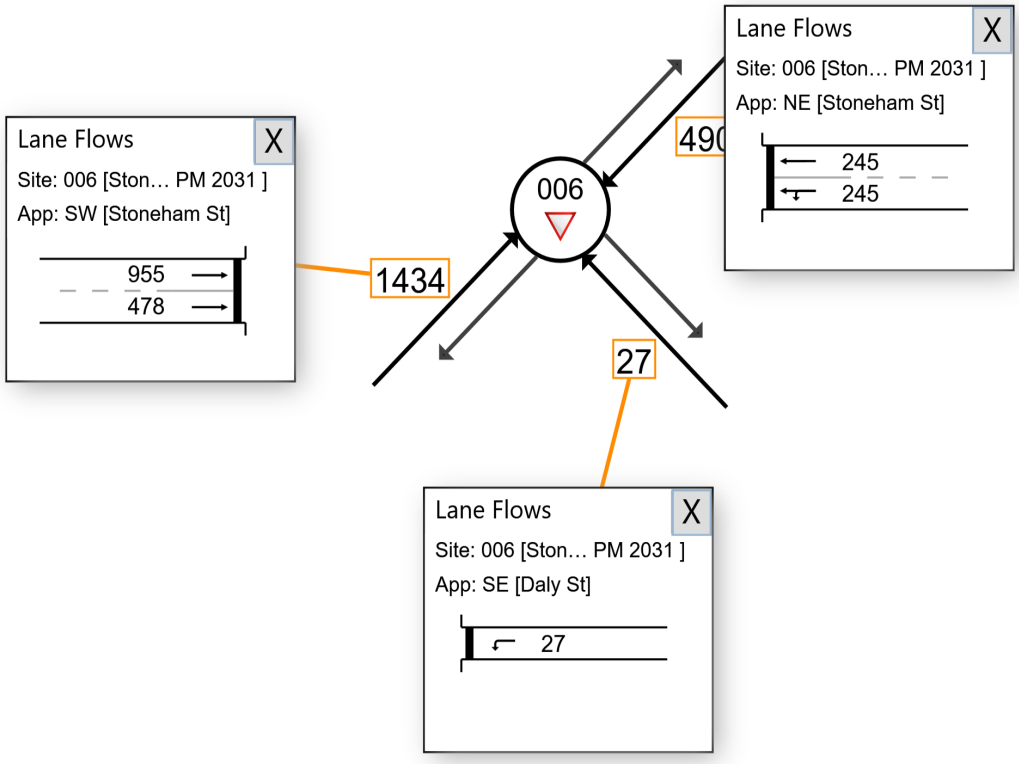

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution PM 2031 (Site Folder: 2031 PM Peak)]

Network: N101 [2031 PM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 PM Peak
Site Category: Existing Design
Roundabout

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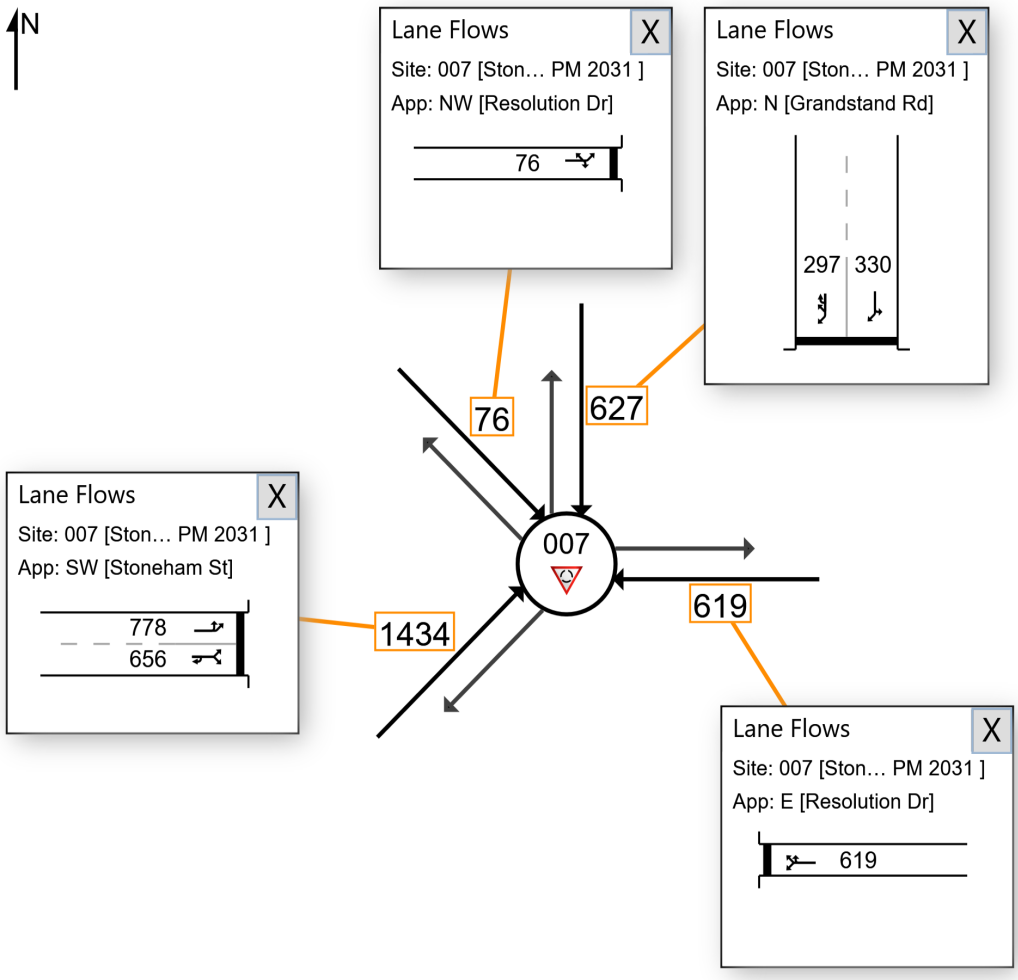

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

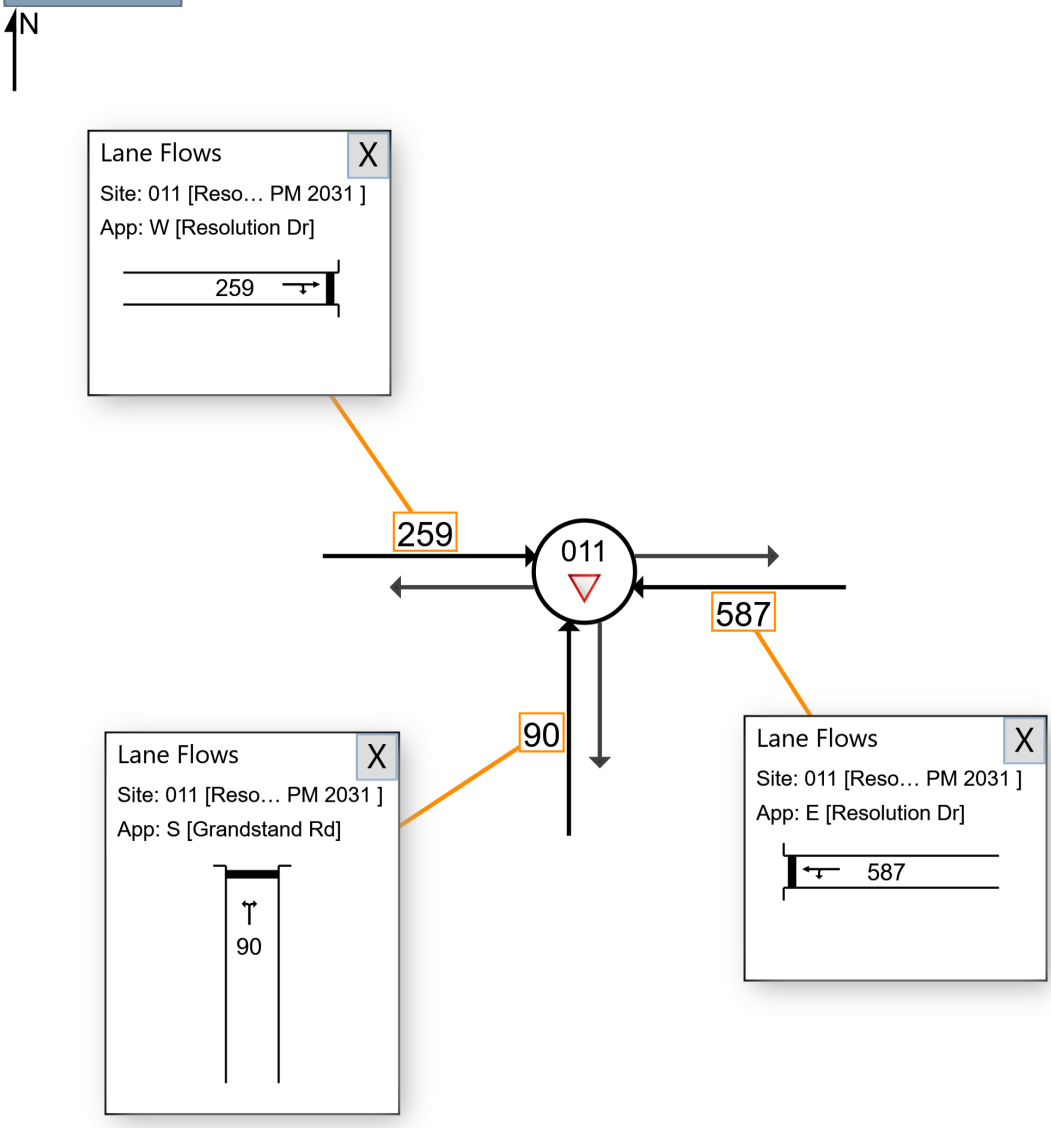
All Movement Classes

Site: 011 [Resolution Grandstand PM 2031 (Site Folder: 2031 PM Peak)] **Network: N101 [2031 PM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2031 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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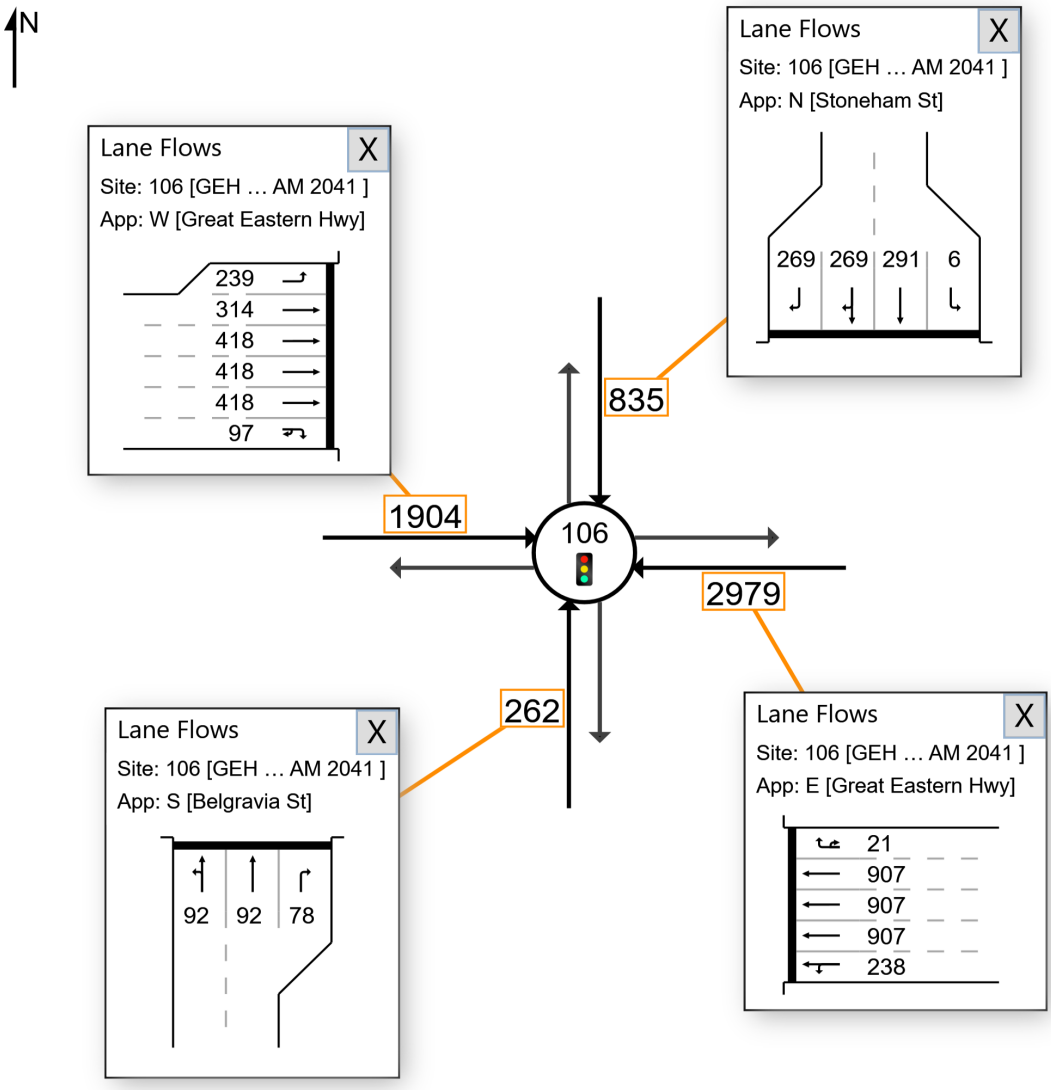


Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

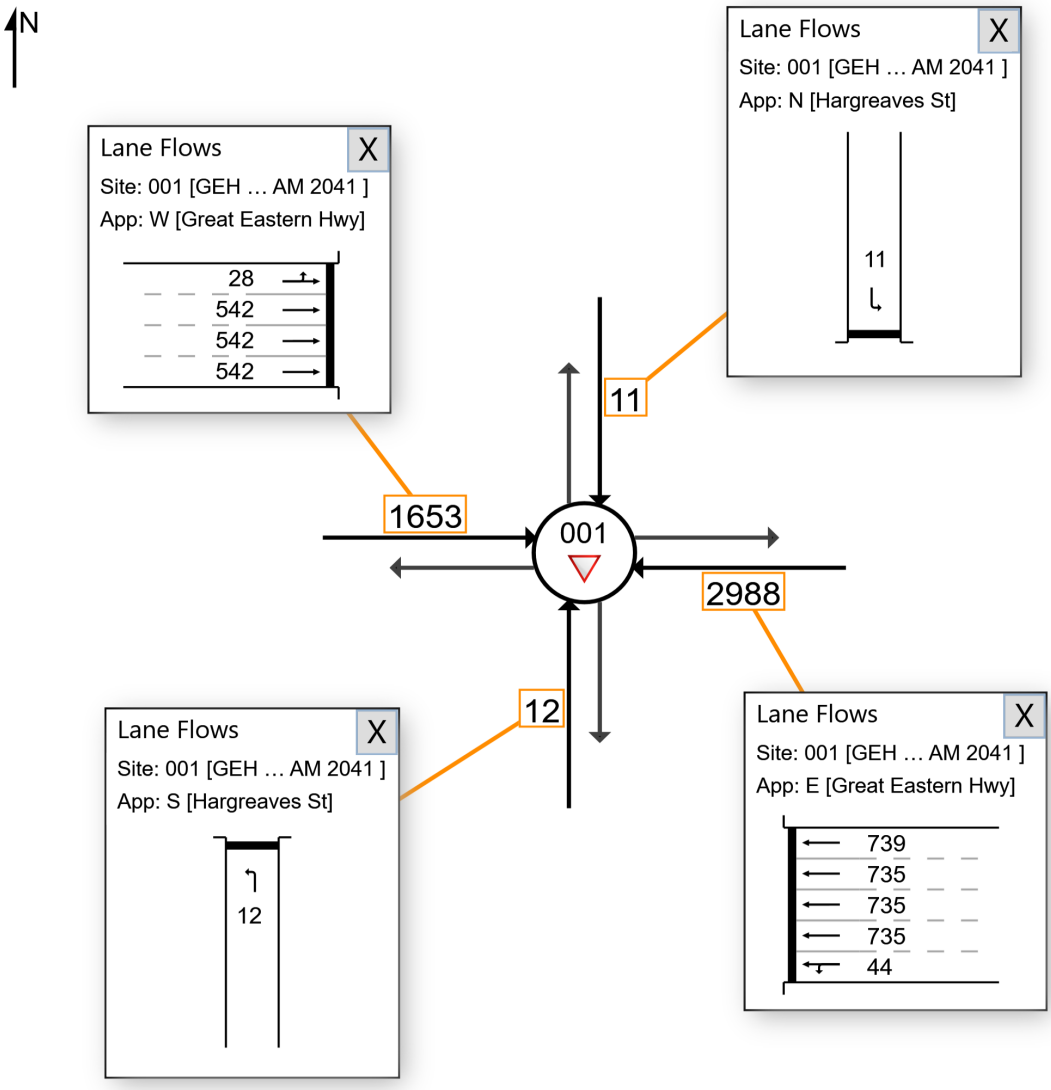
Site: 001 [GEH Hargreaves AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

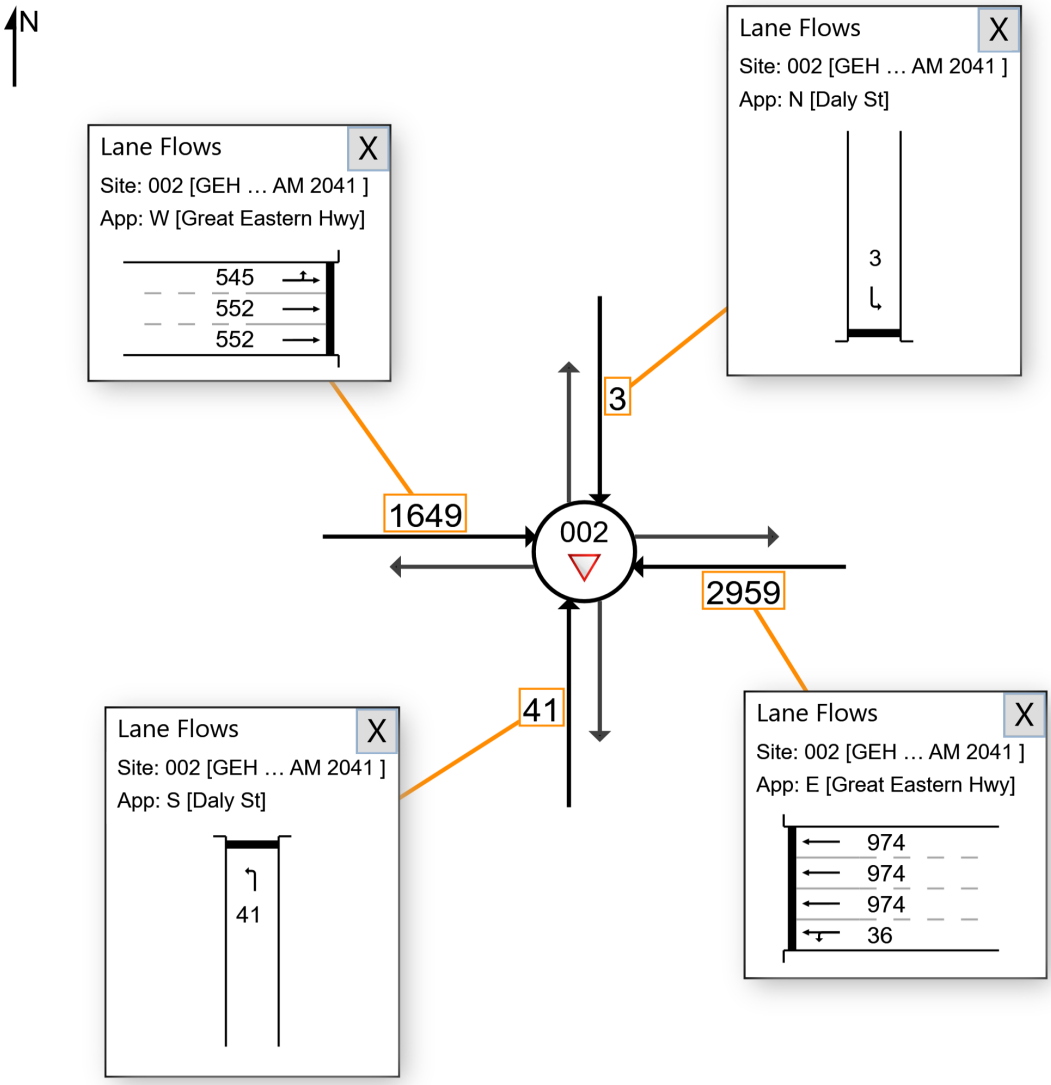
Site: 002 [GEH Daly AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

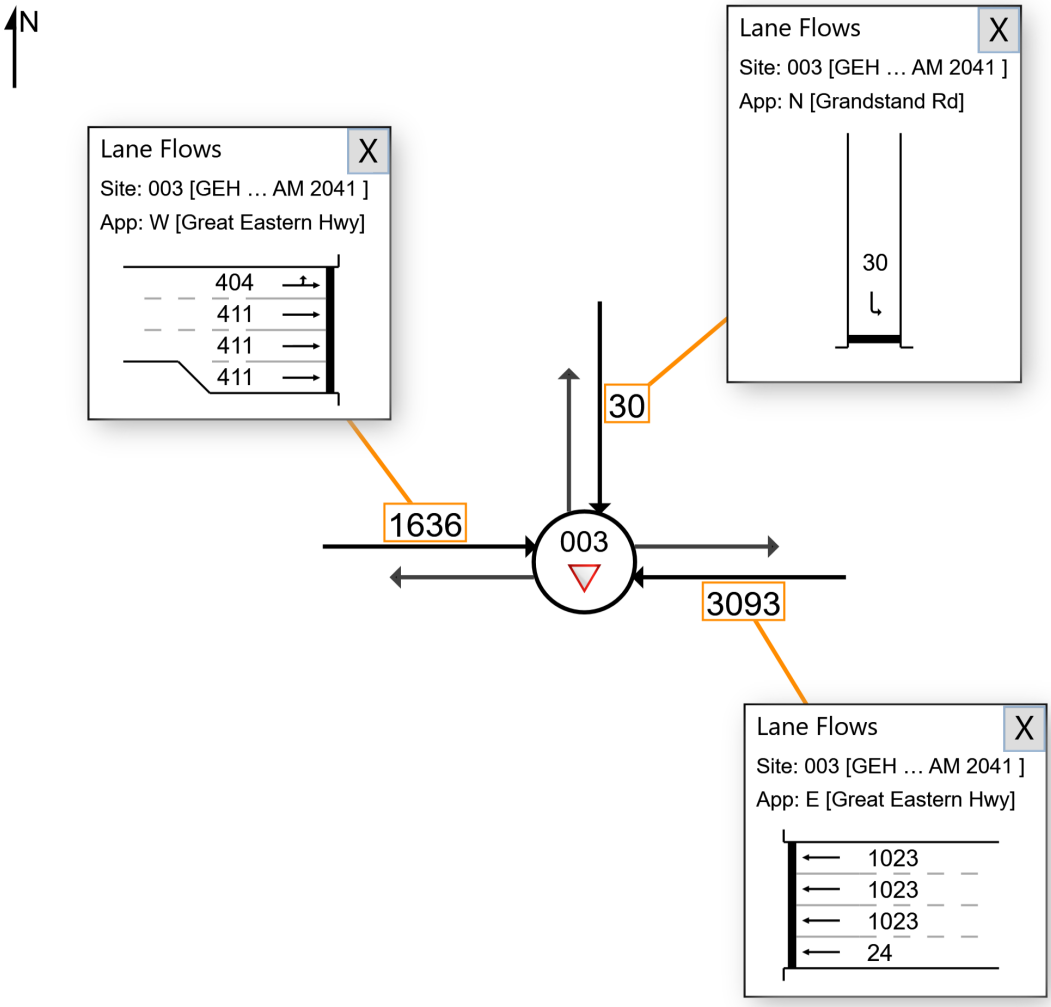
Site: 003 [GEH Grandstand AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 AM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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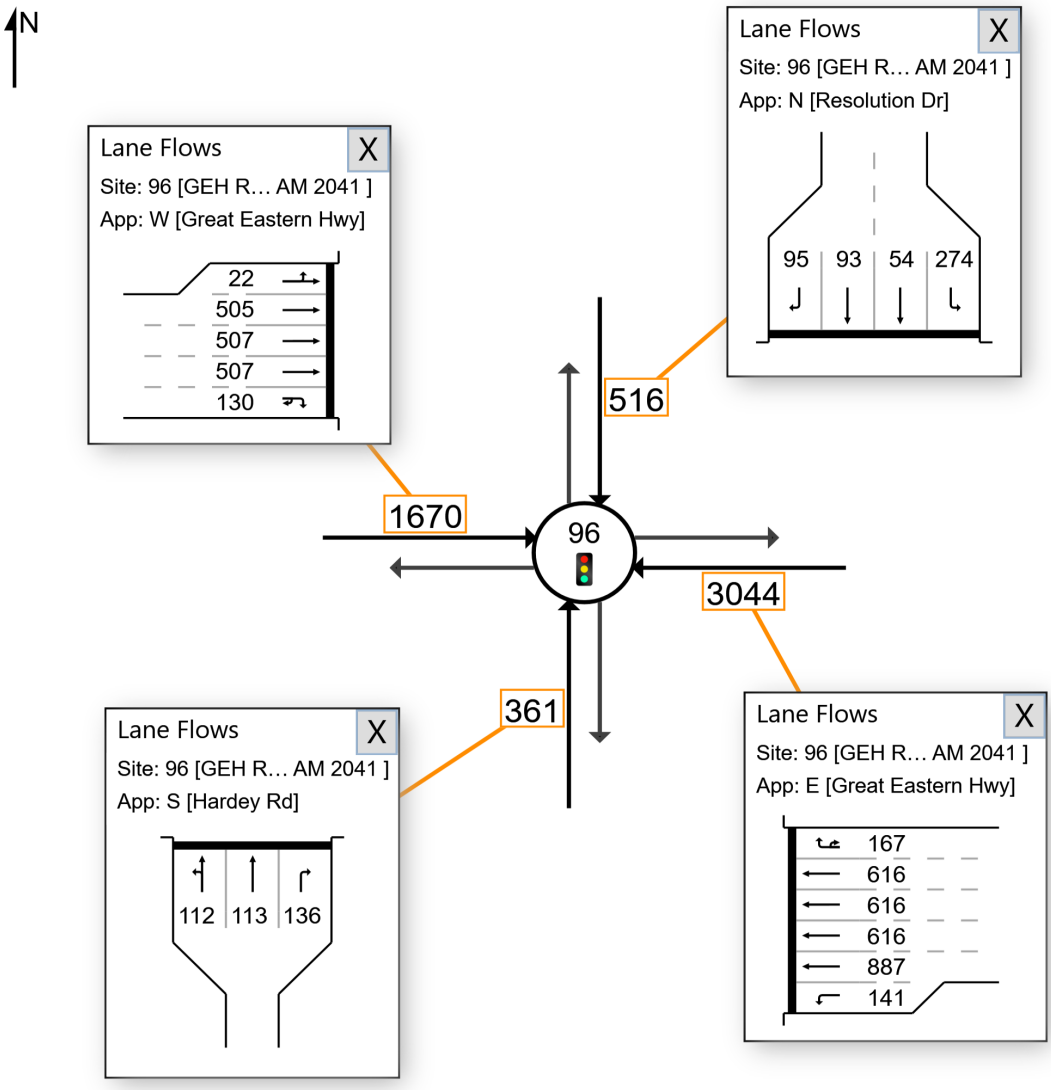


Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

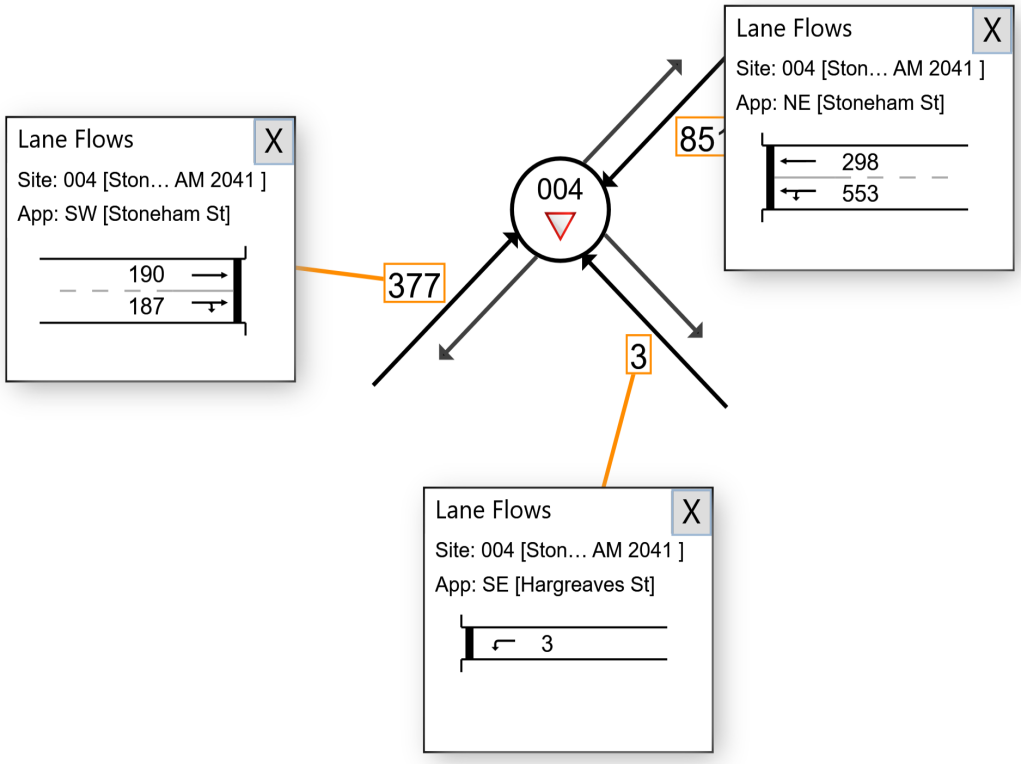
Site: 004 [Stoneham Hargreaves AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 006 [Stoneham Daly AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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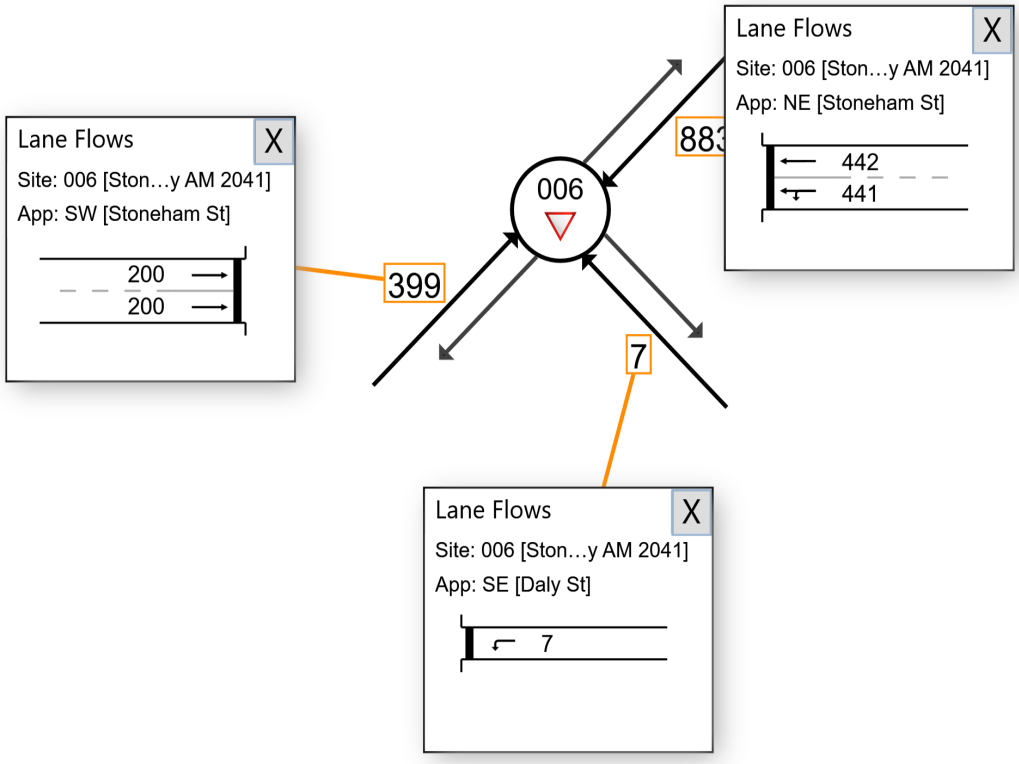

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution AM 2041 (Site Folder: 2041 AM Peak)]

Network: N101 [2041 AM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 AM Peak
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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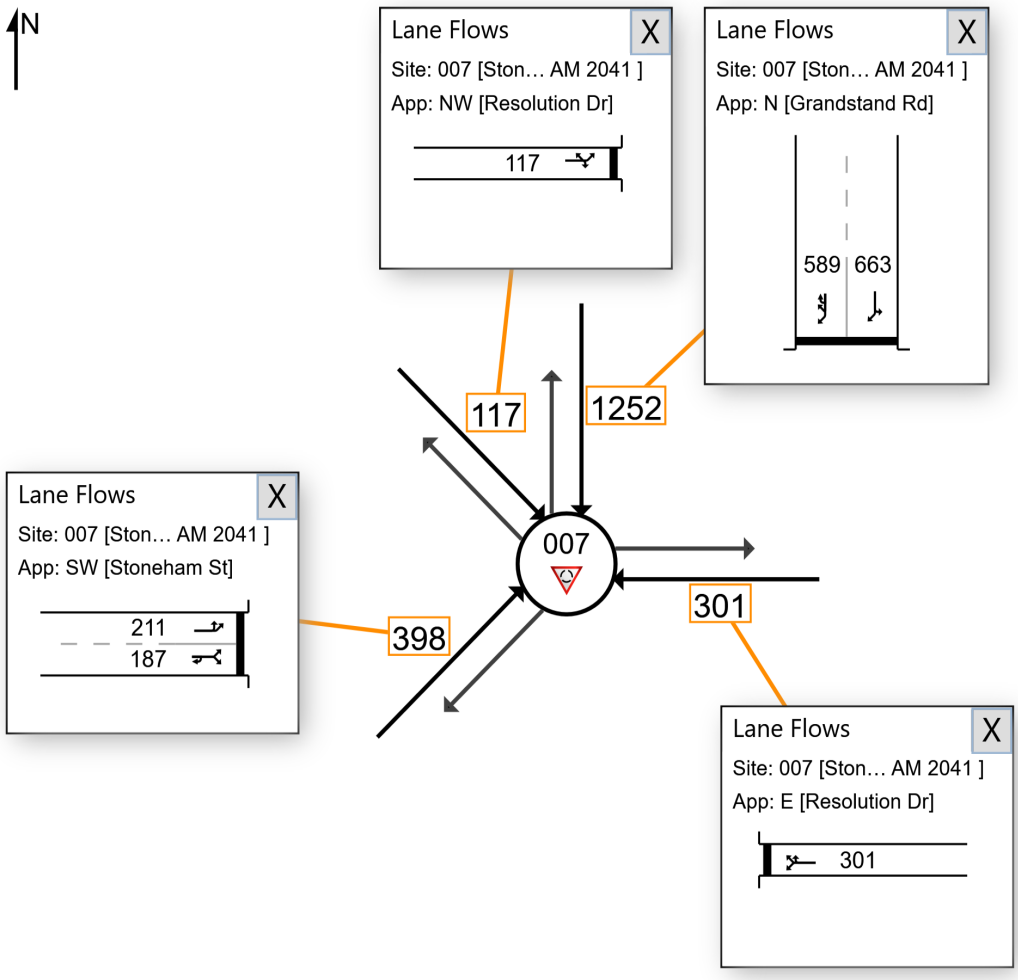

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand AM 2041 (Site Folder: 2041 AM Peak)] **Network: N101 [2041 AM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2041 AM Peak
Site Category: Existing Design
Give-Way (Two-Way)

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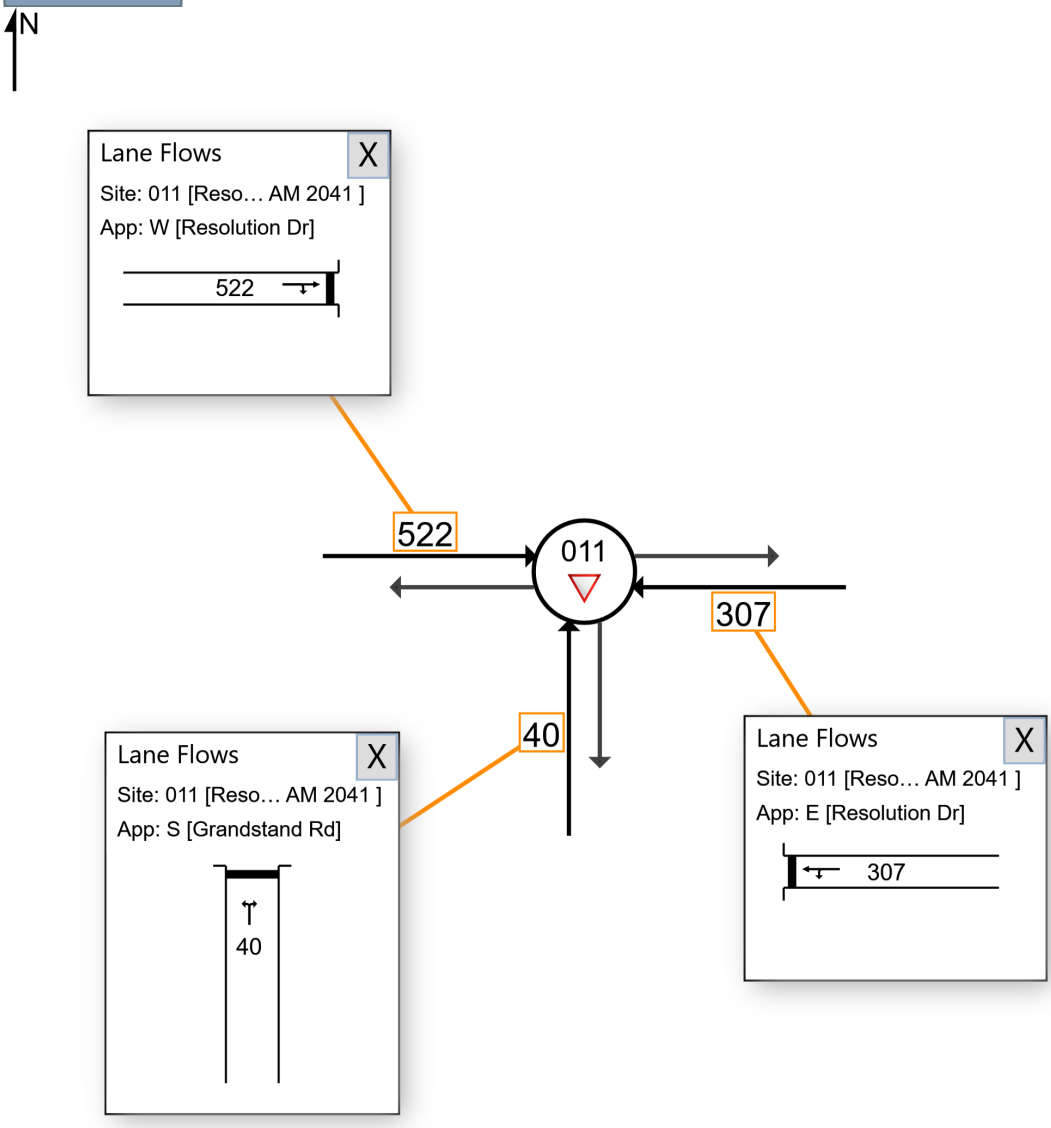

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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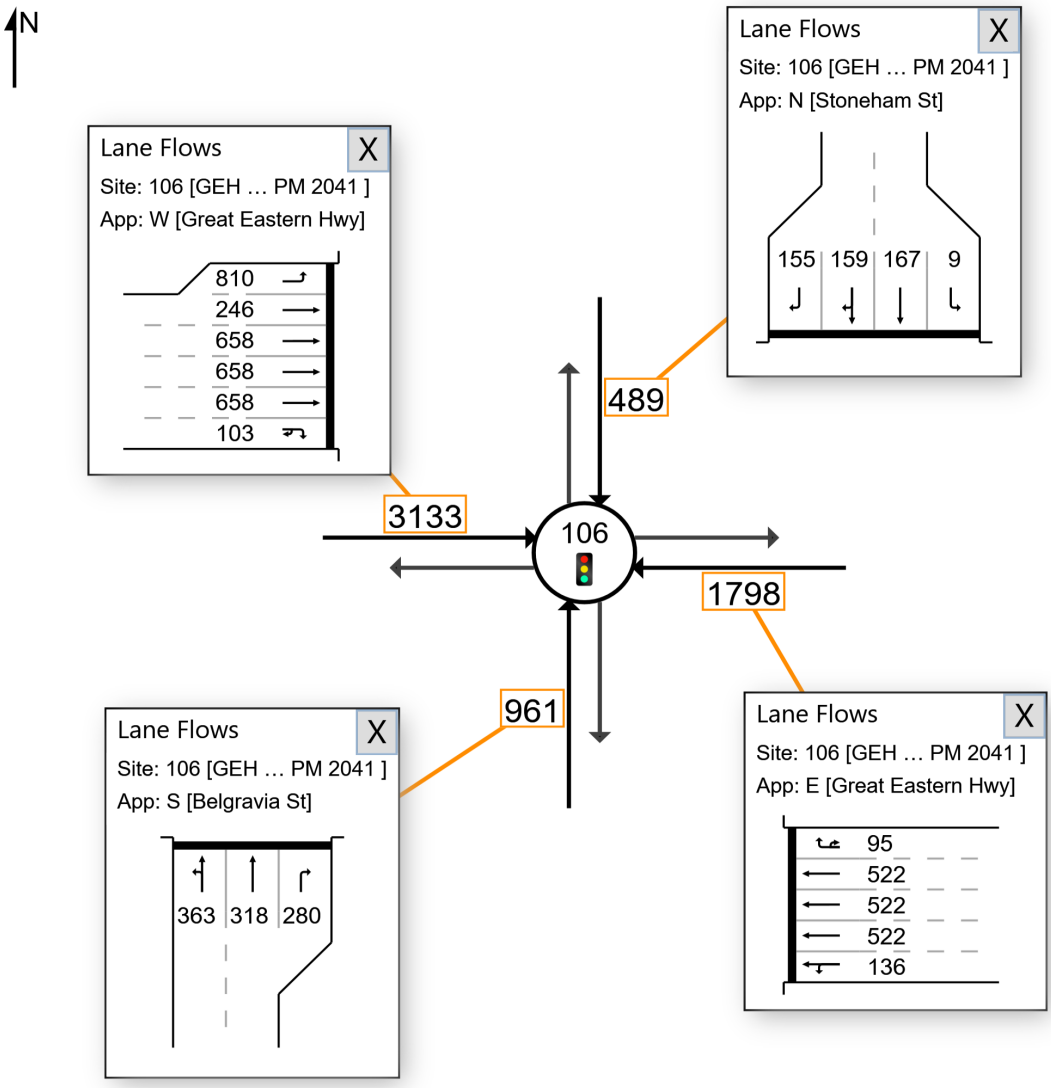

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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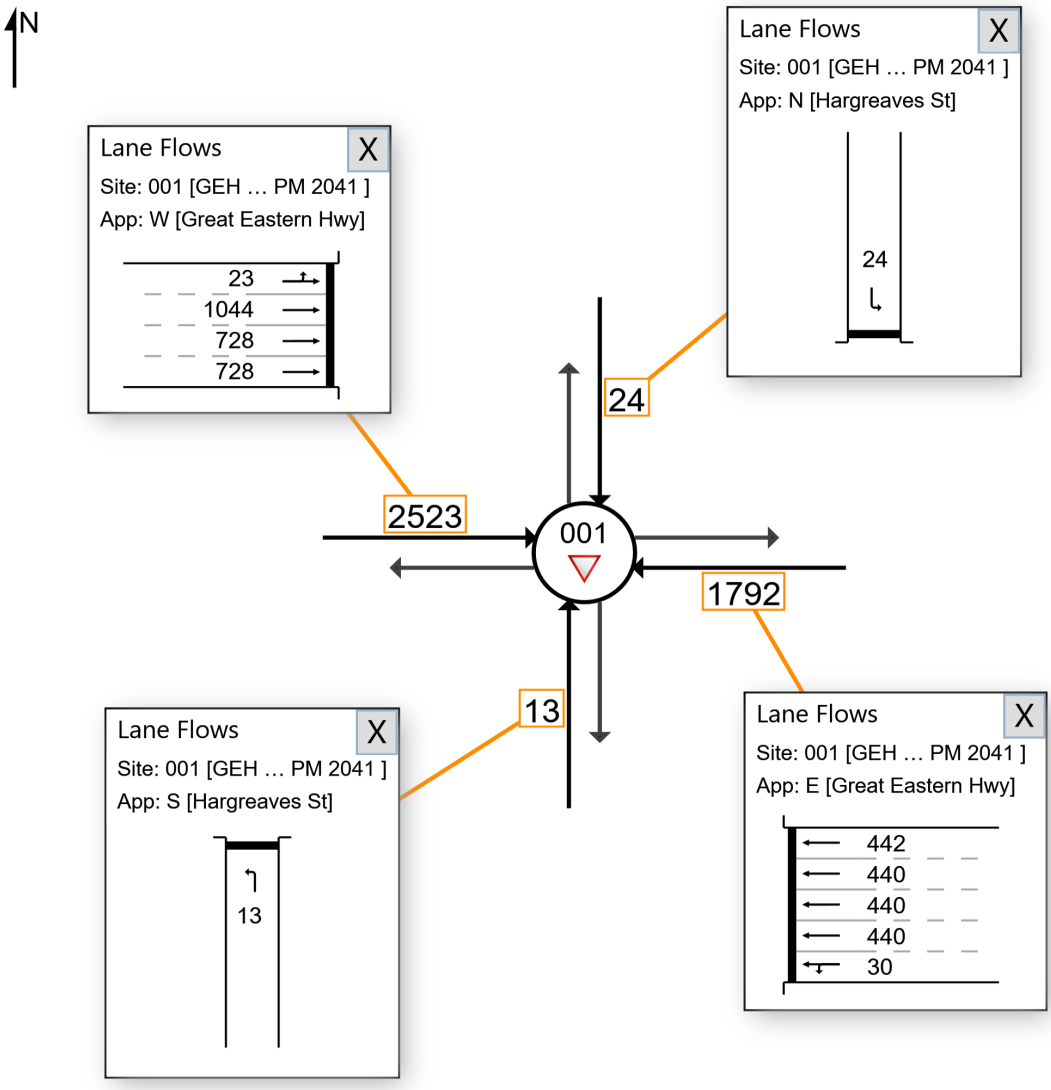

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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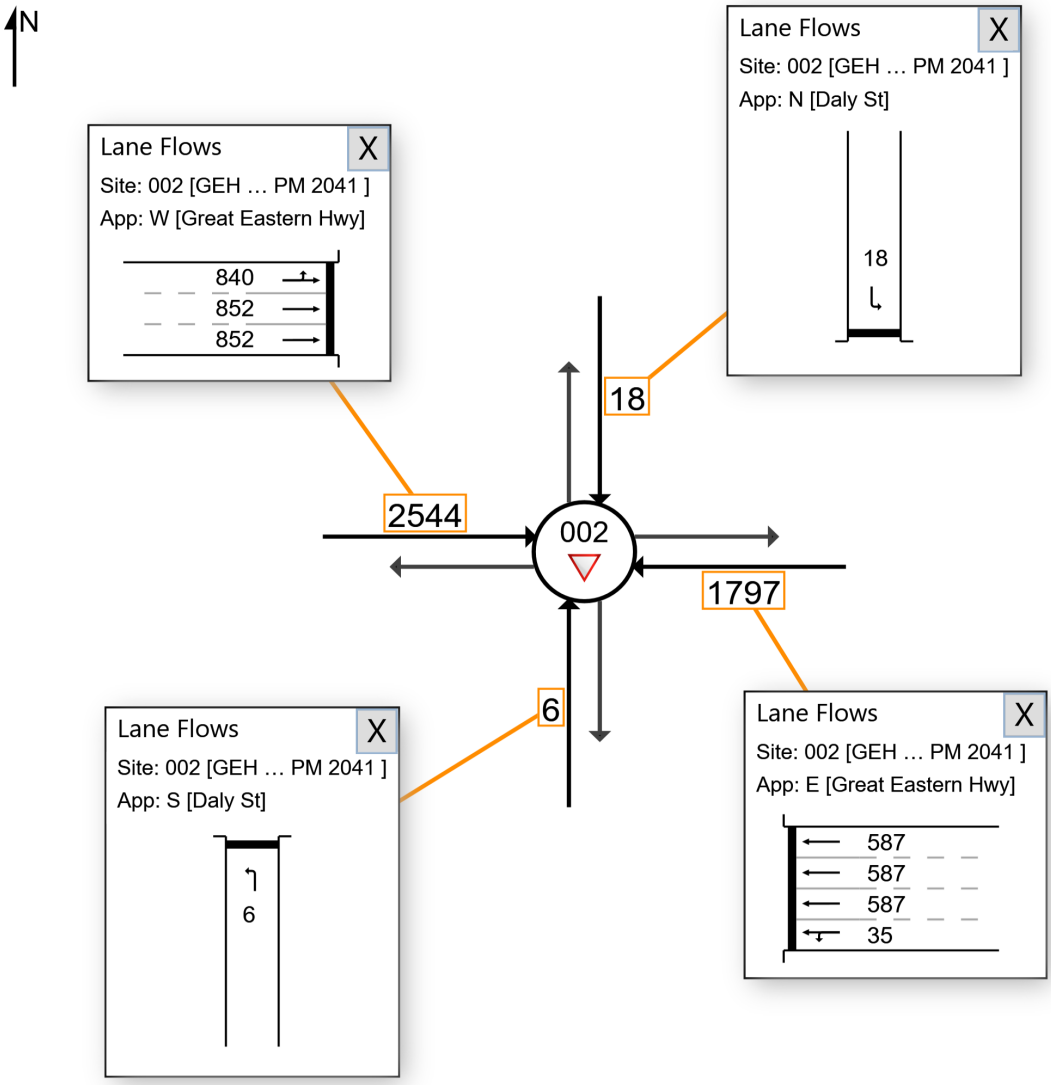

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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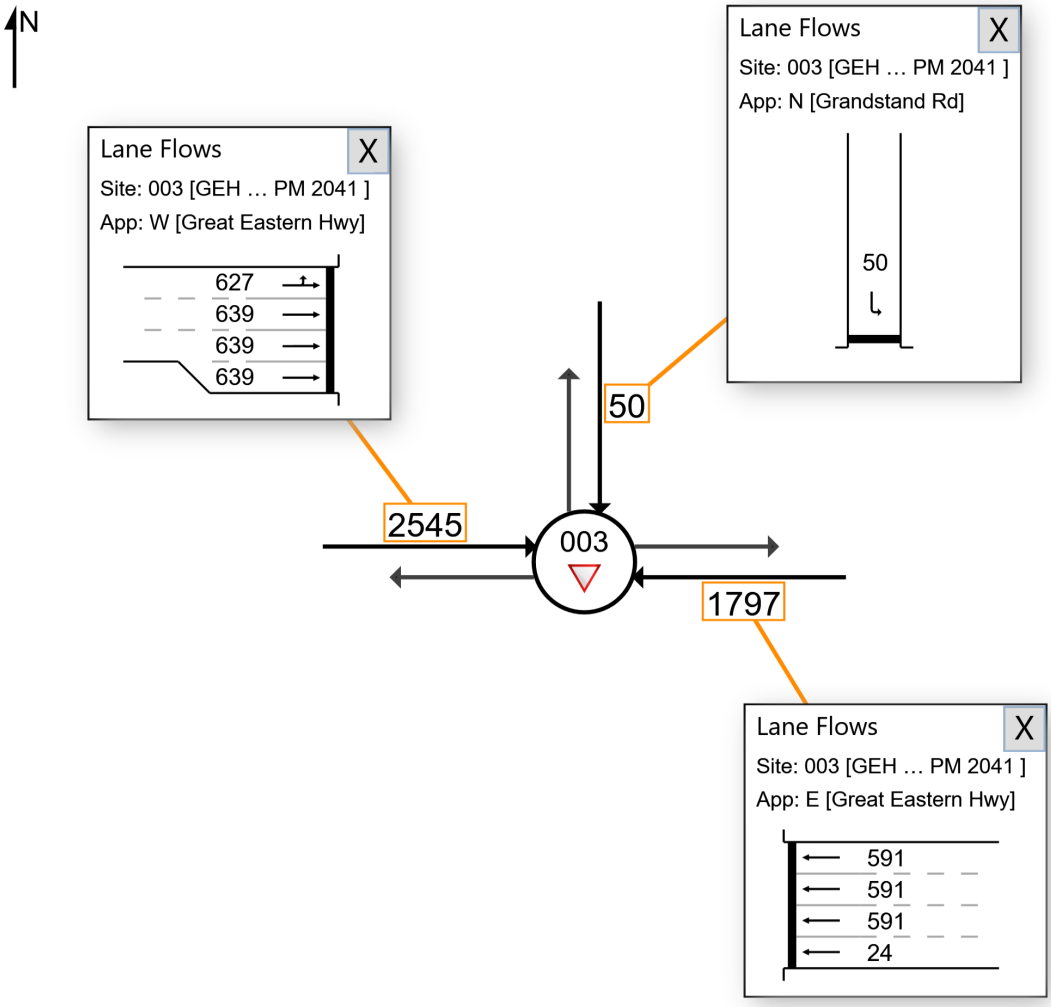
Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 PM Peak
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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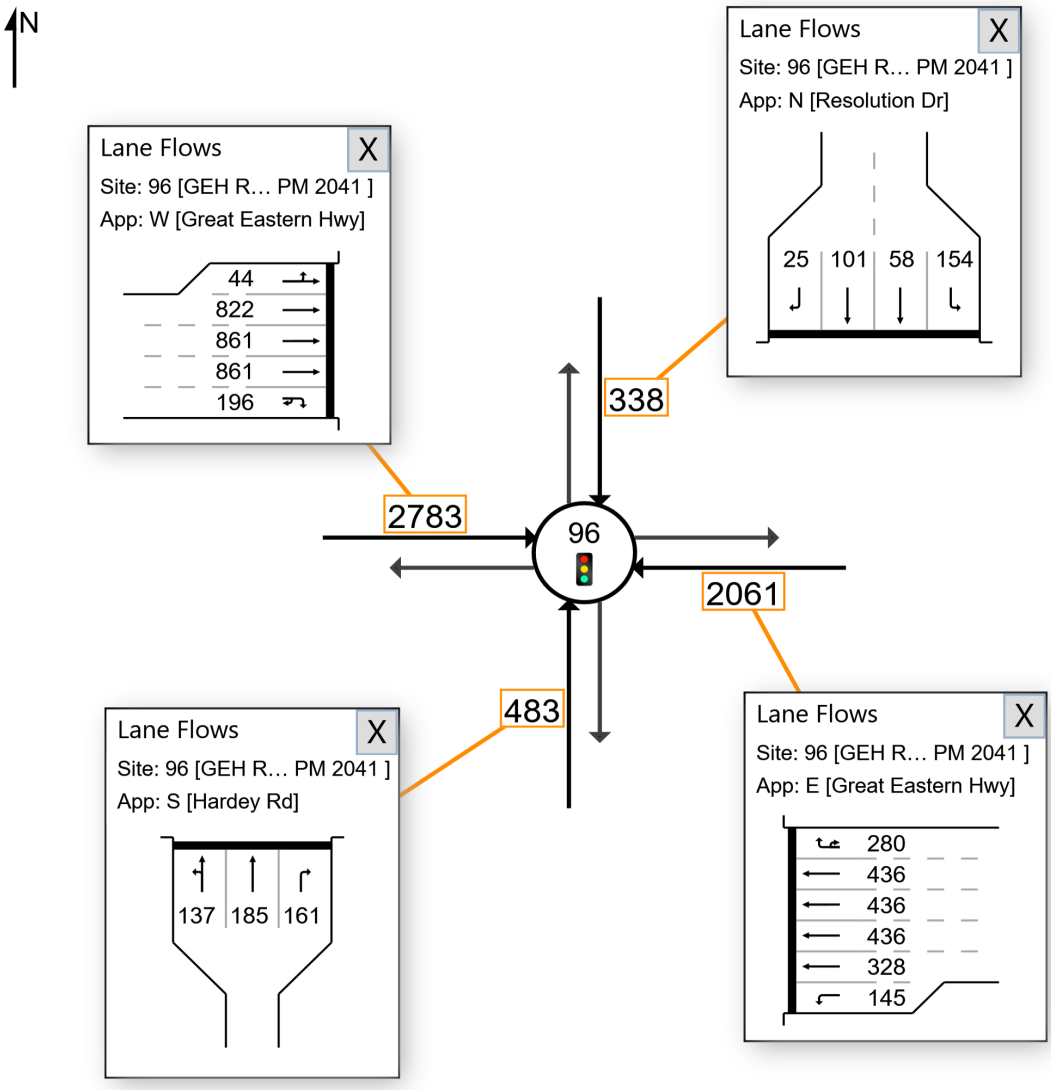

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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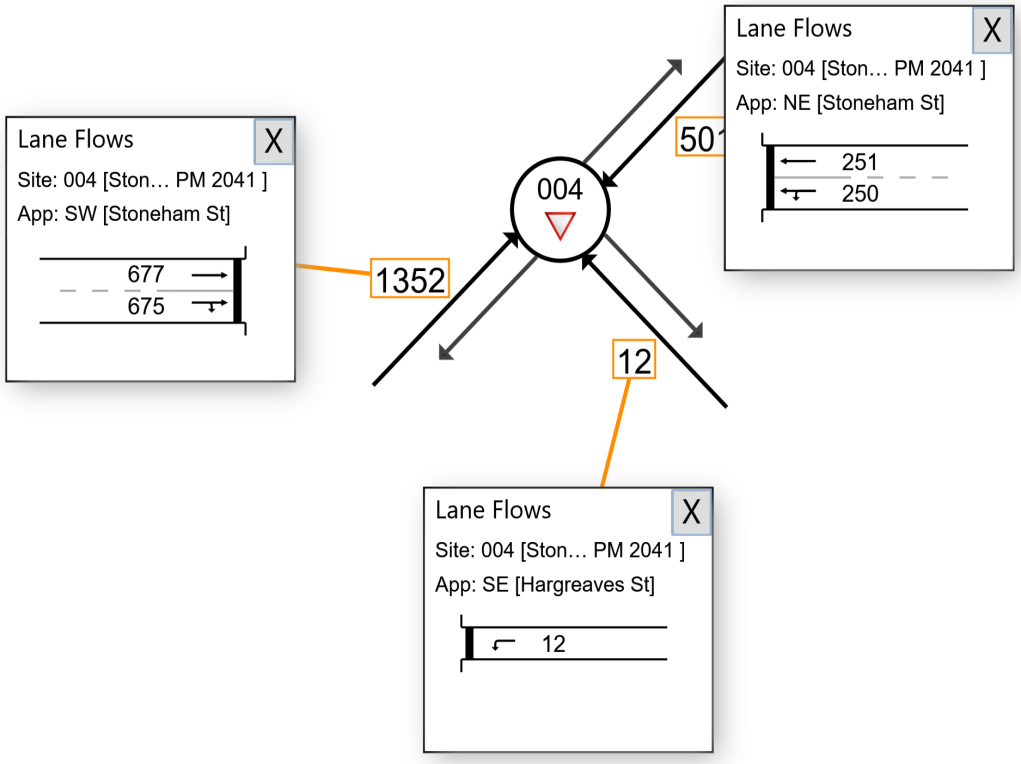

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 006 [Stoneham Daly PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

Stoneham St / Daly St
Left out only, Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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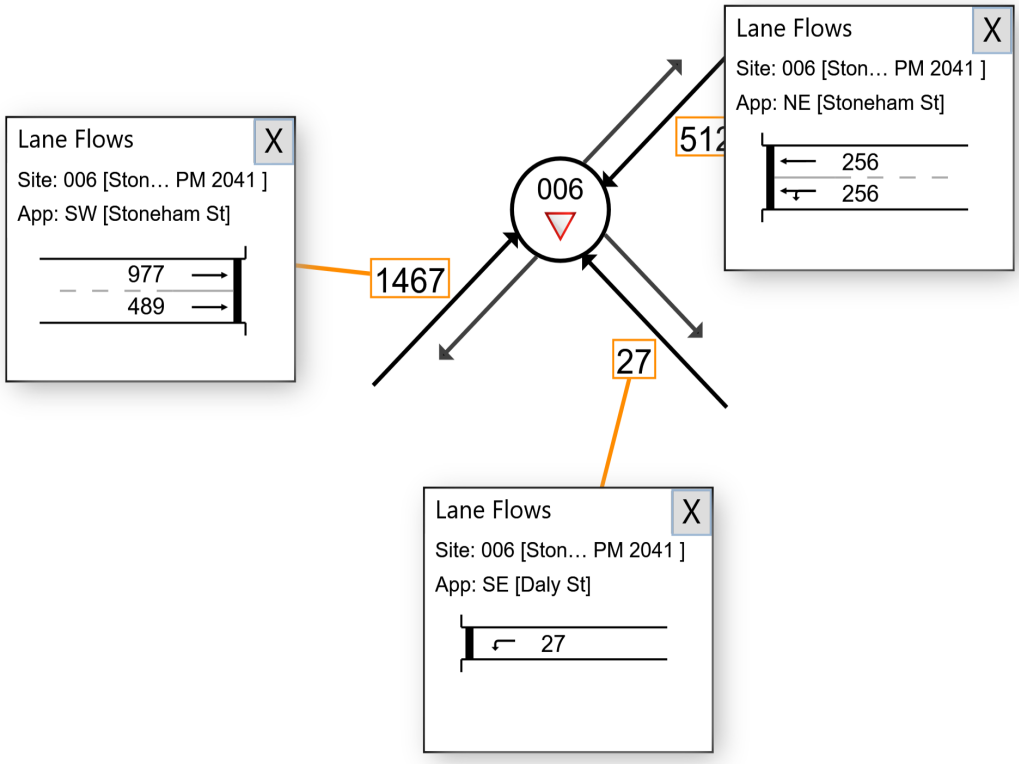

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution PM 2041 (Site Folder: 2041 PM Peak)]

Network: N101 [2041 PM Peak (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 PM Peak
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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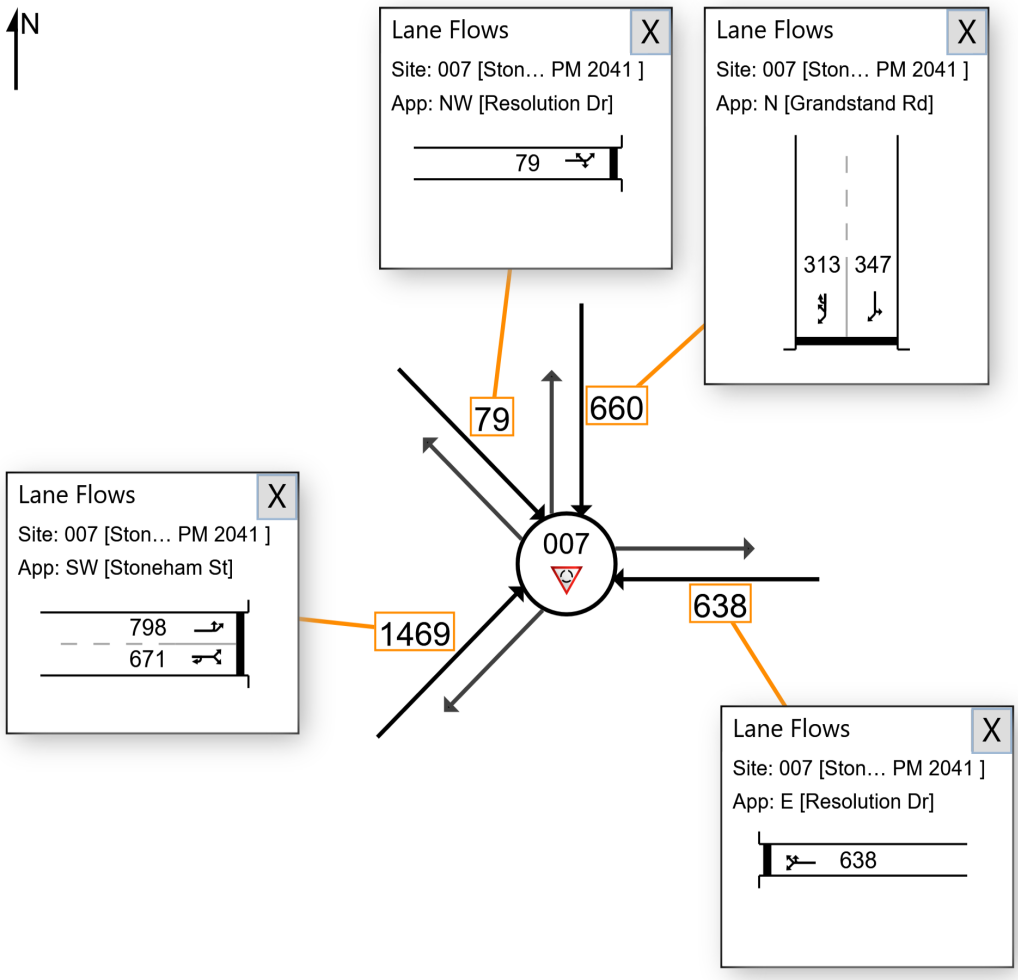

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand PM 2041 (Site Folder: 2041 PM Peak)] **Network: N101 [2041 PM Peak (Network Folder: General)]**

Resolution Dr / Grandstand Rd
Give Way
2041 PM Peak
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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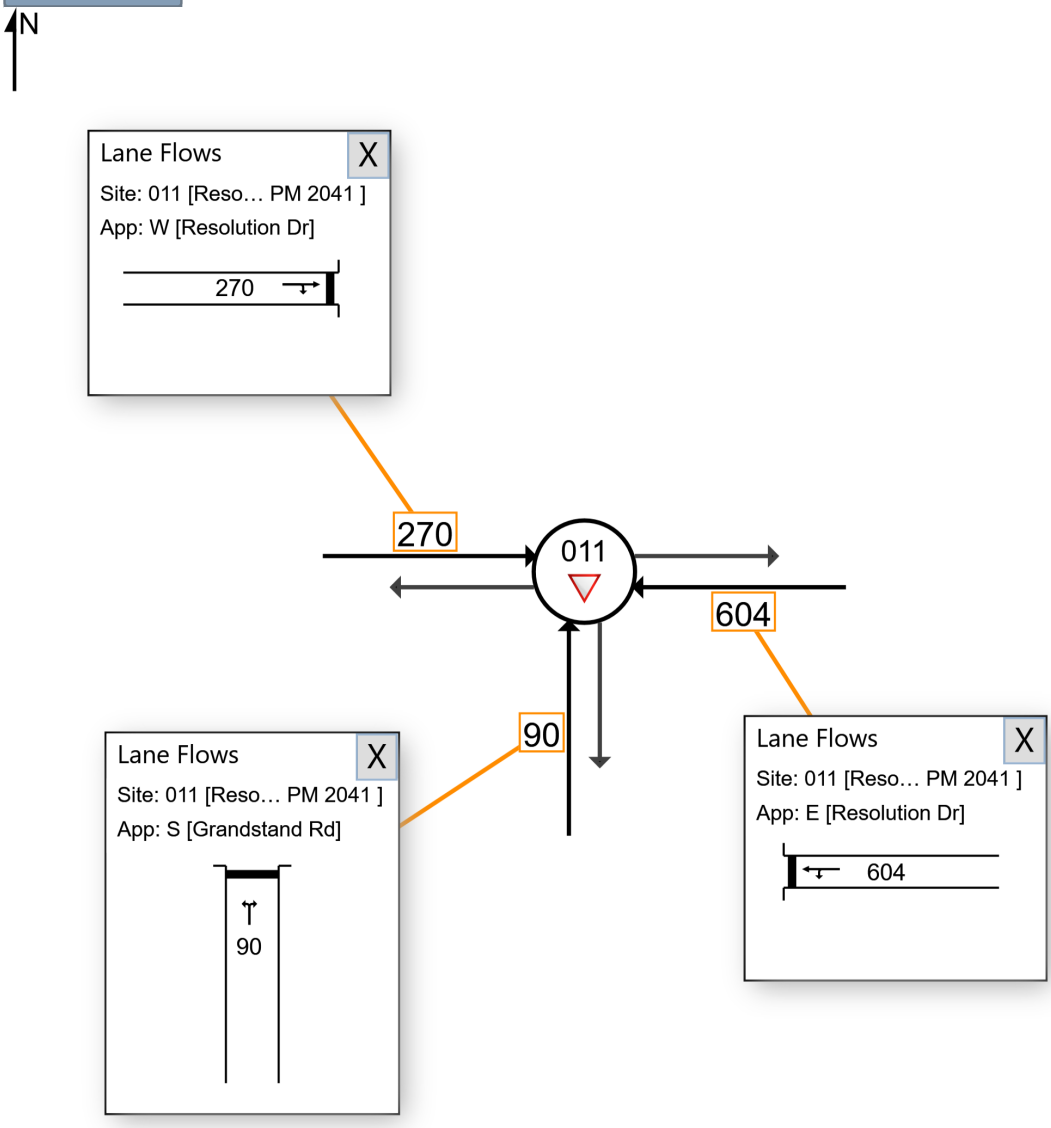

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 AM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

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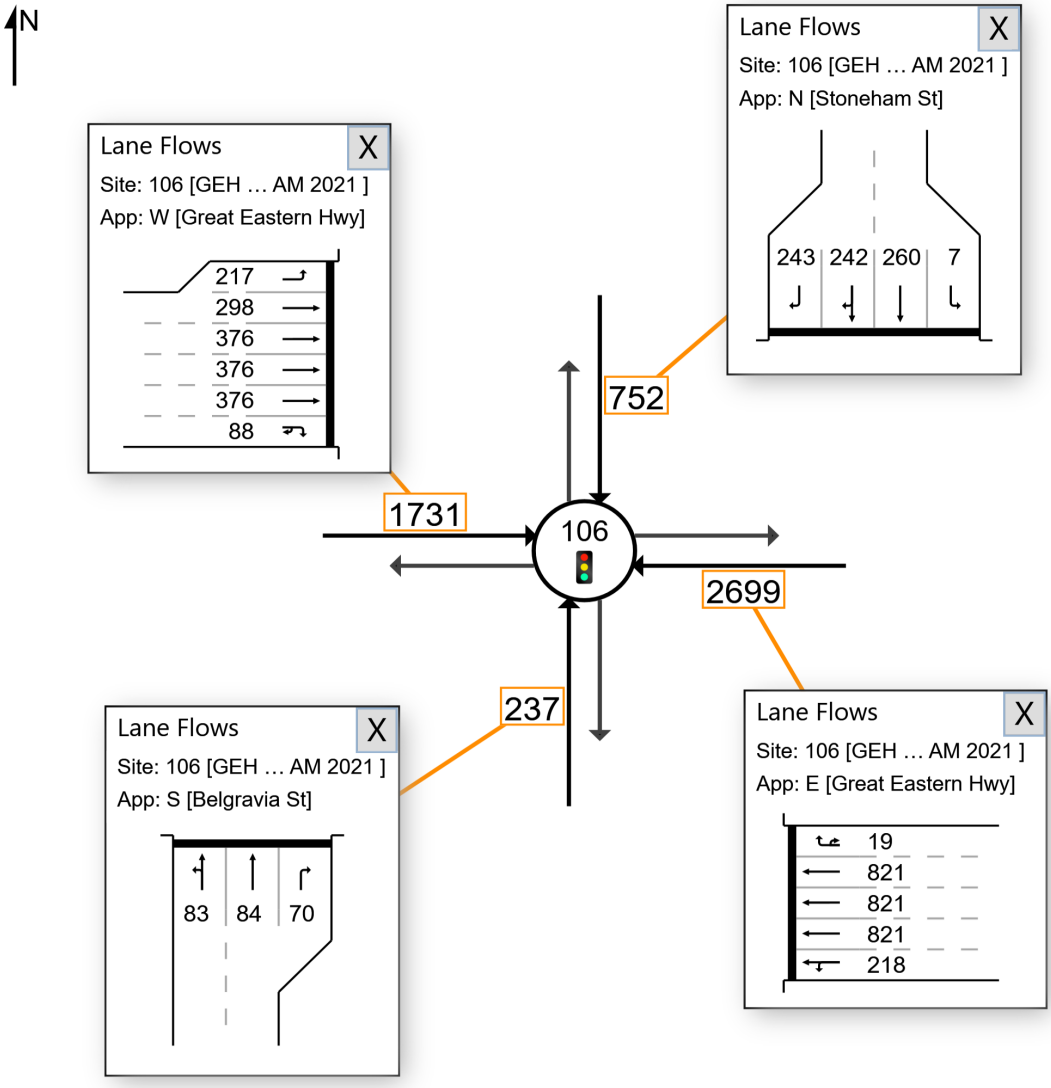

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2021 AM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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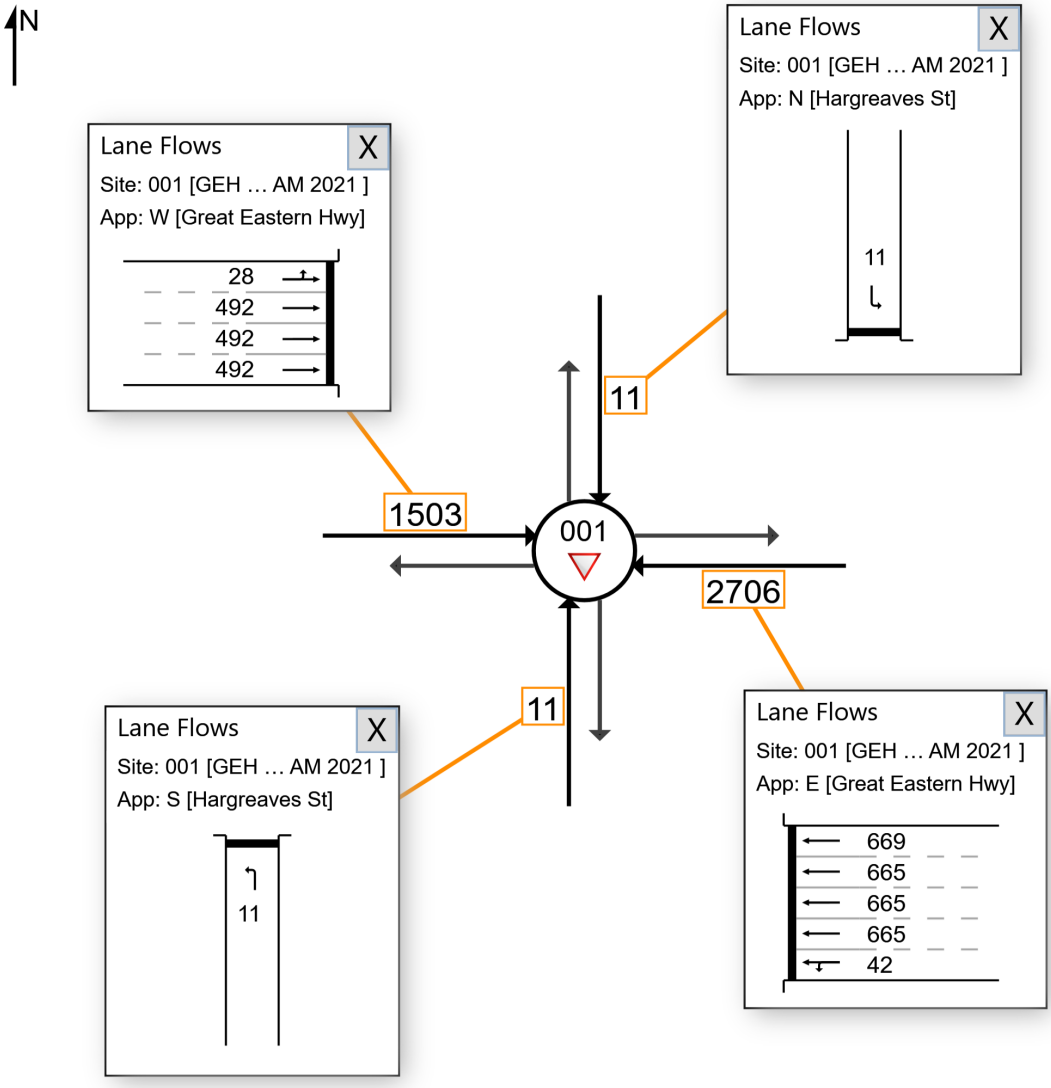

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2021 AM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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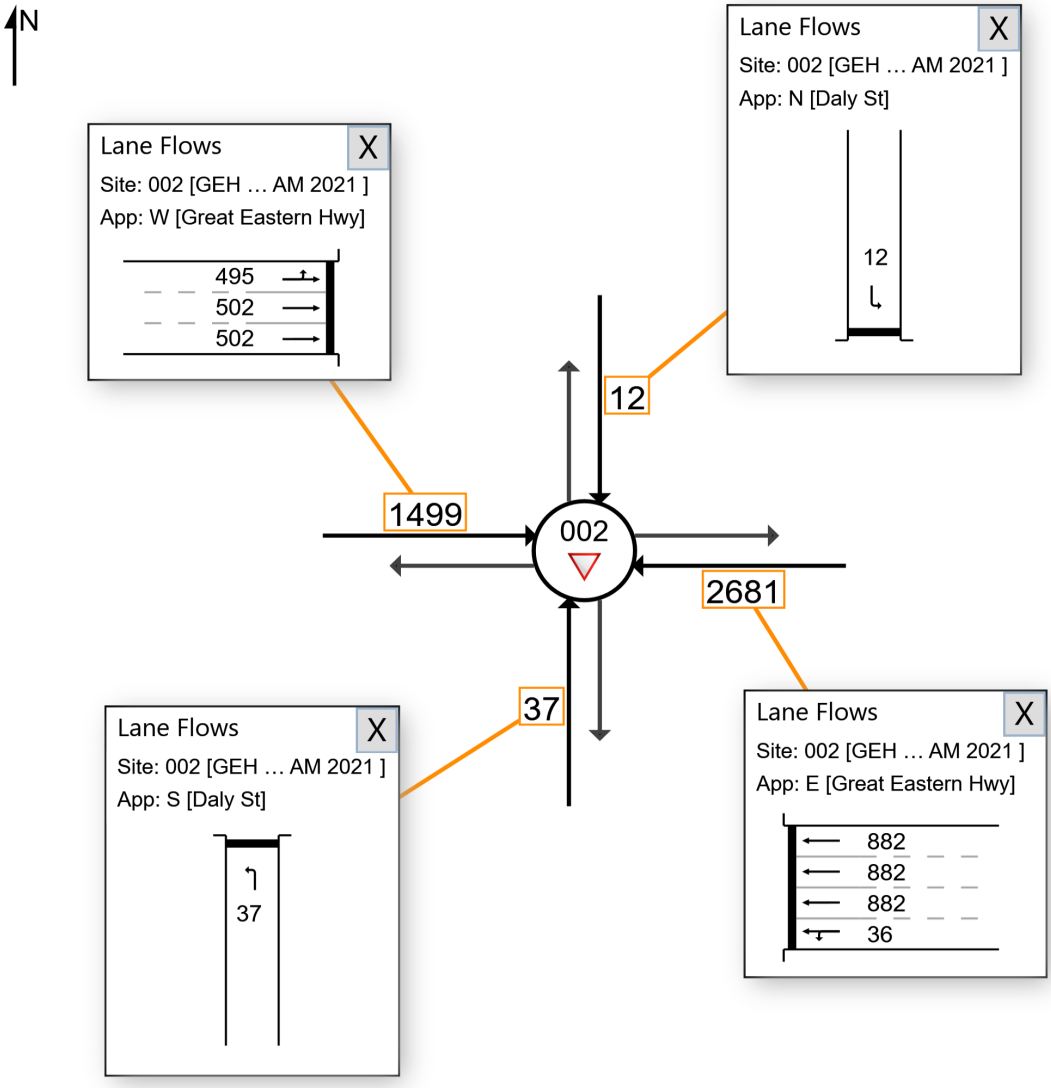

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2021 AM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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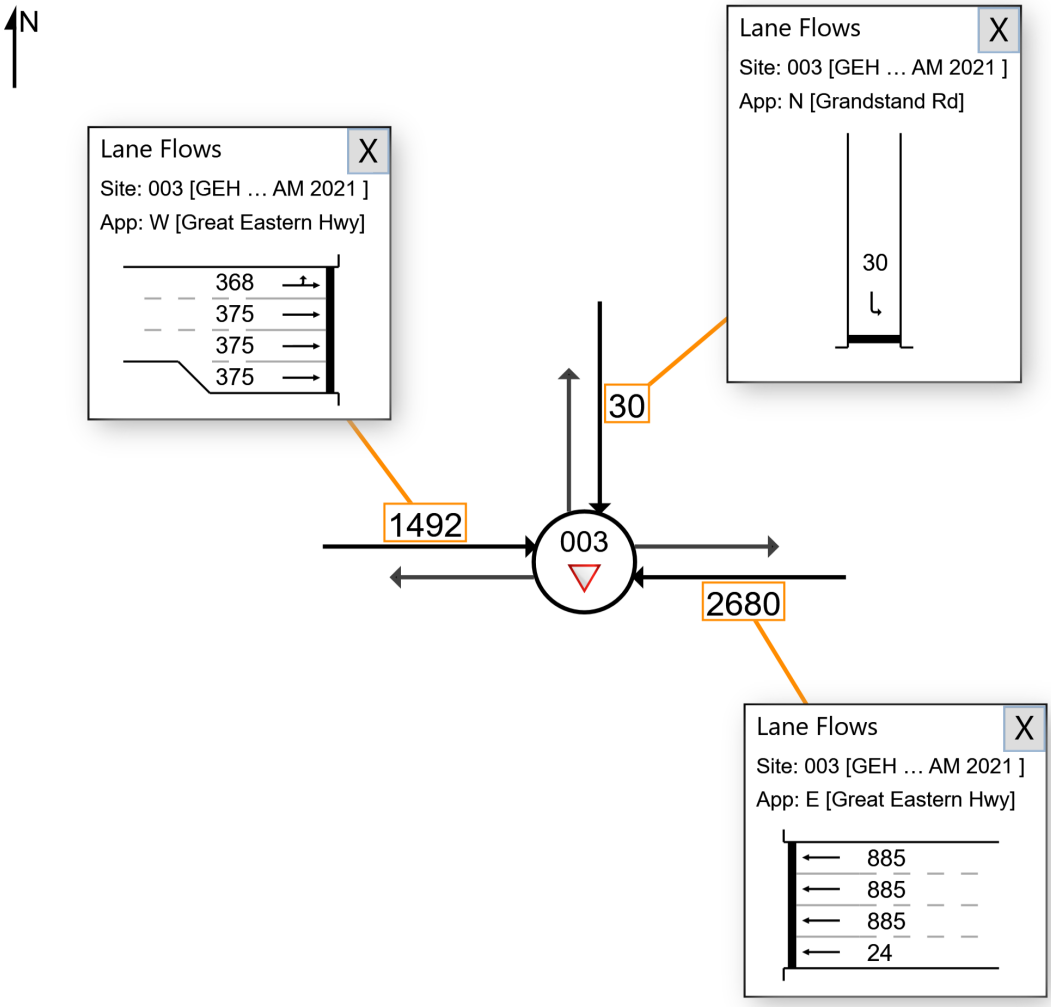

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 AM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

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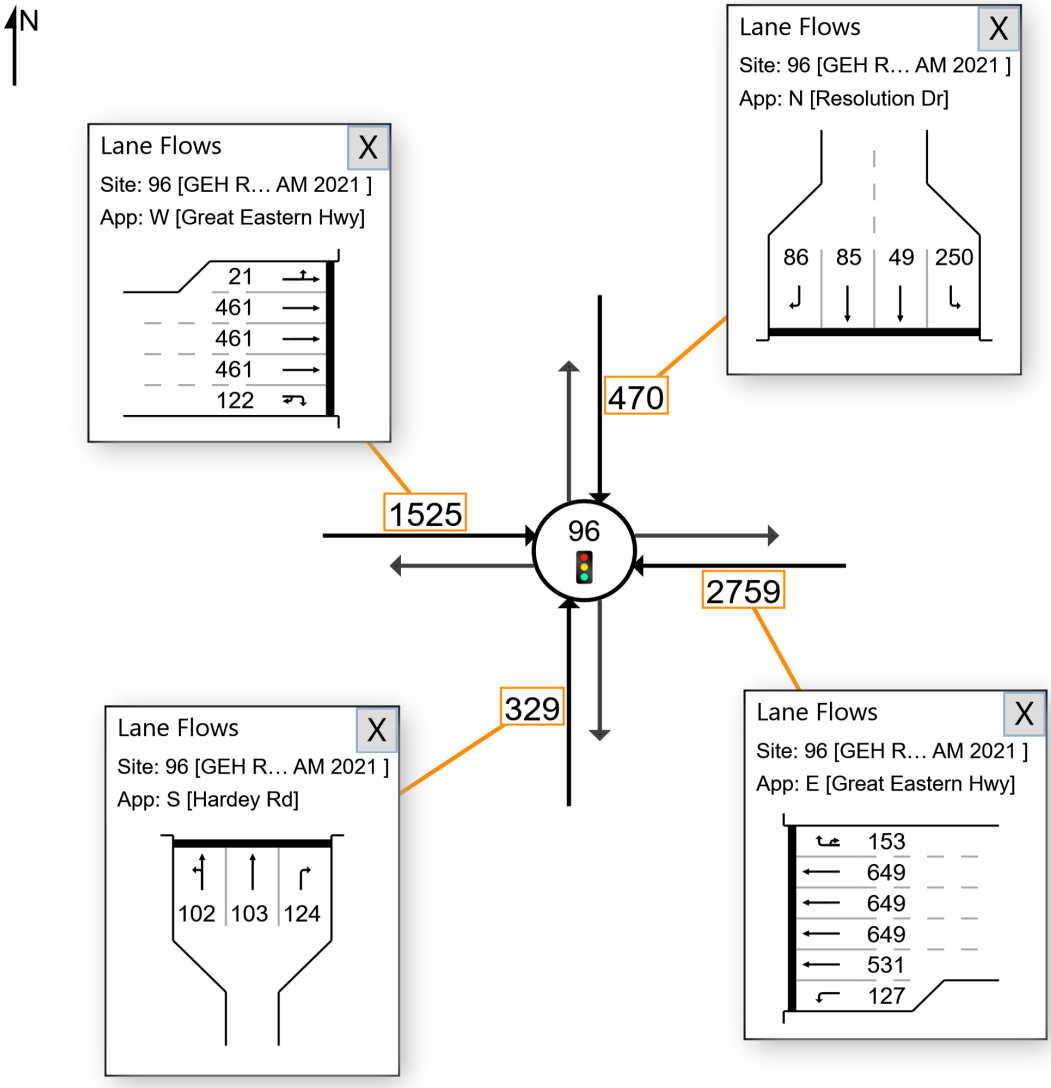

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2021 AM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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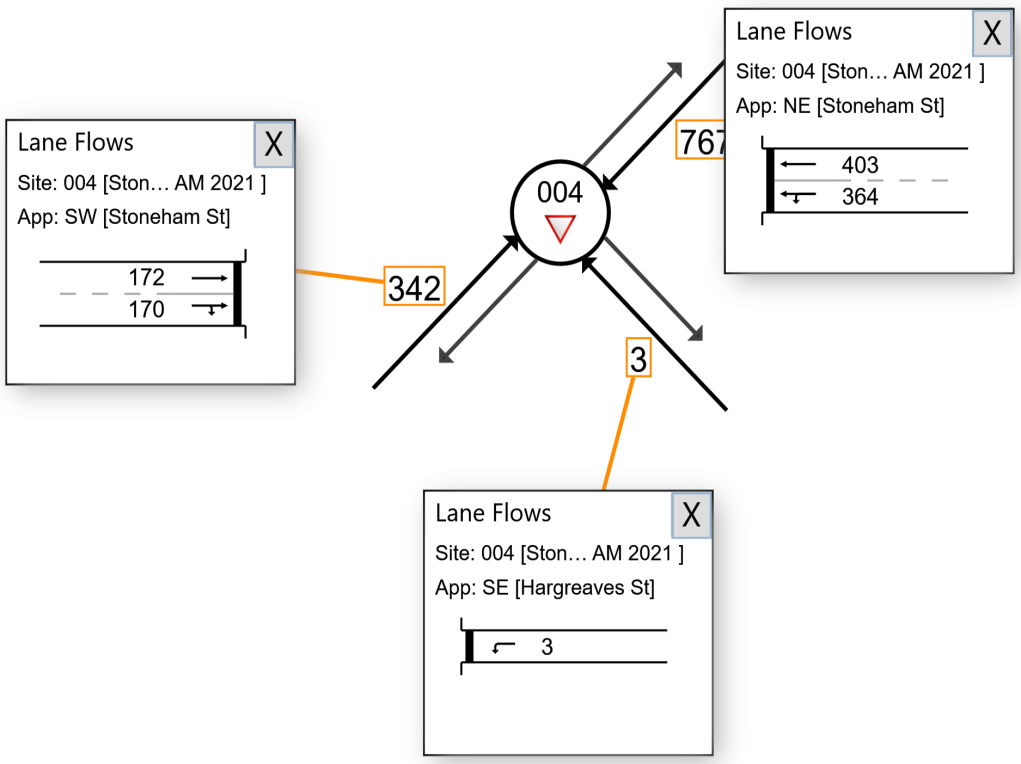

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 AM Peak with proposed road network
Site Category: Existing Design
Roundabout

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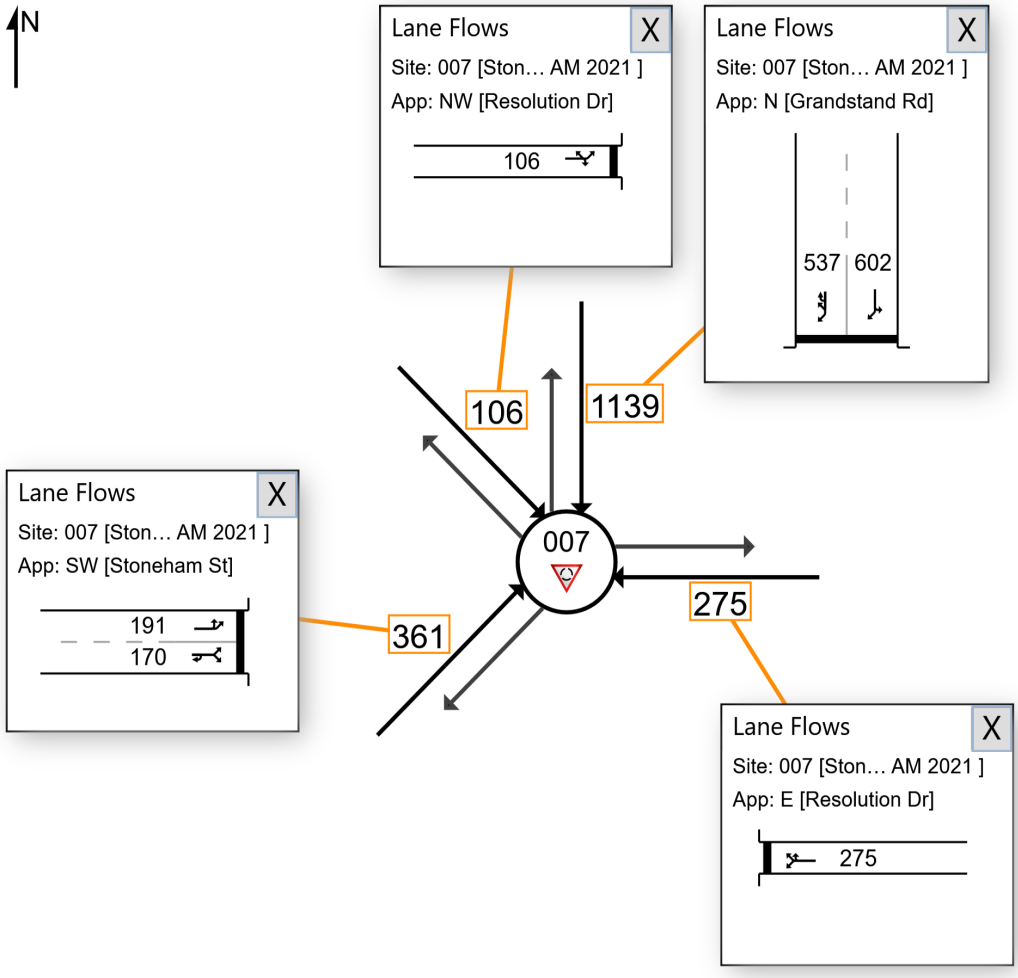
Close All Popups



APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand AM 2021 (Site Folder: 2021 AM Peak Proposed Network)]

Network: N101 [2021 AM Peak Proposed Network (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2021 AM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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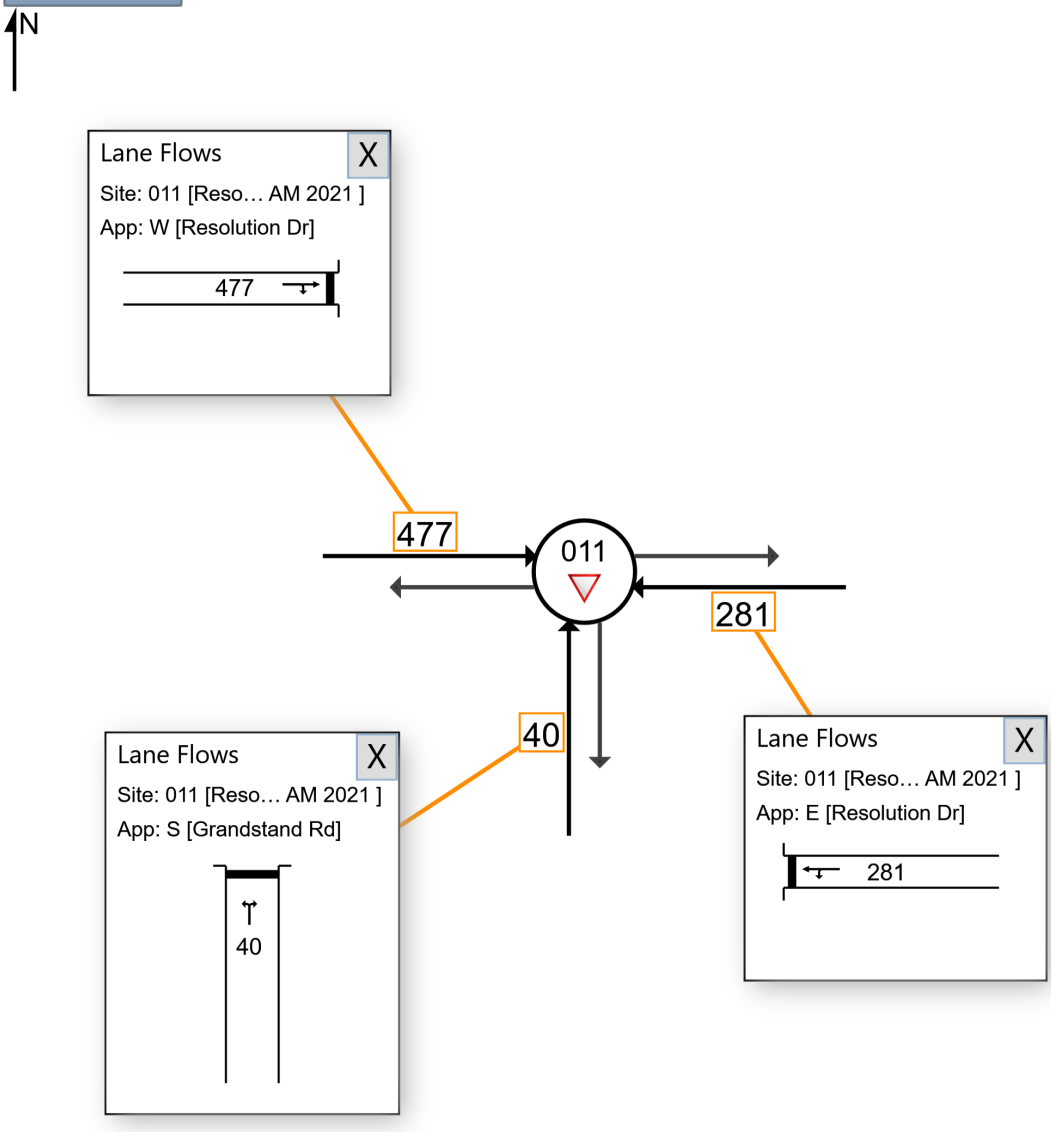

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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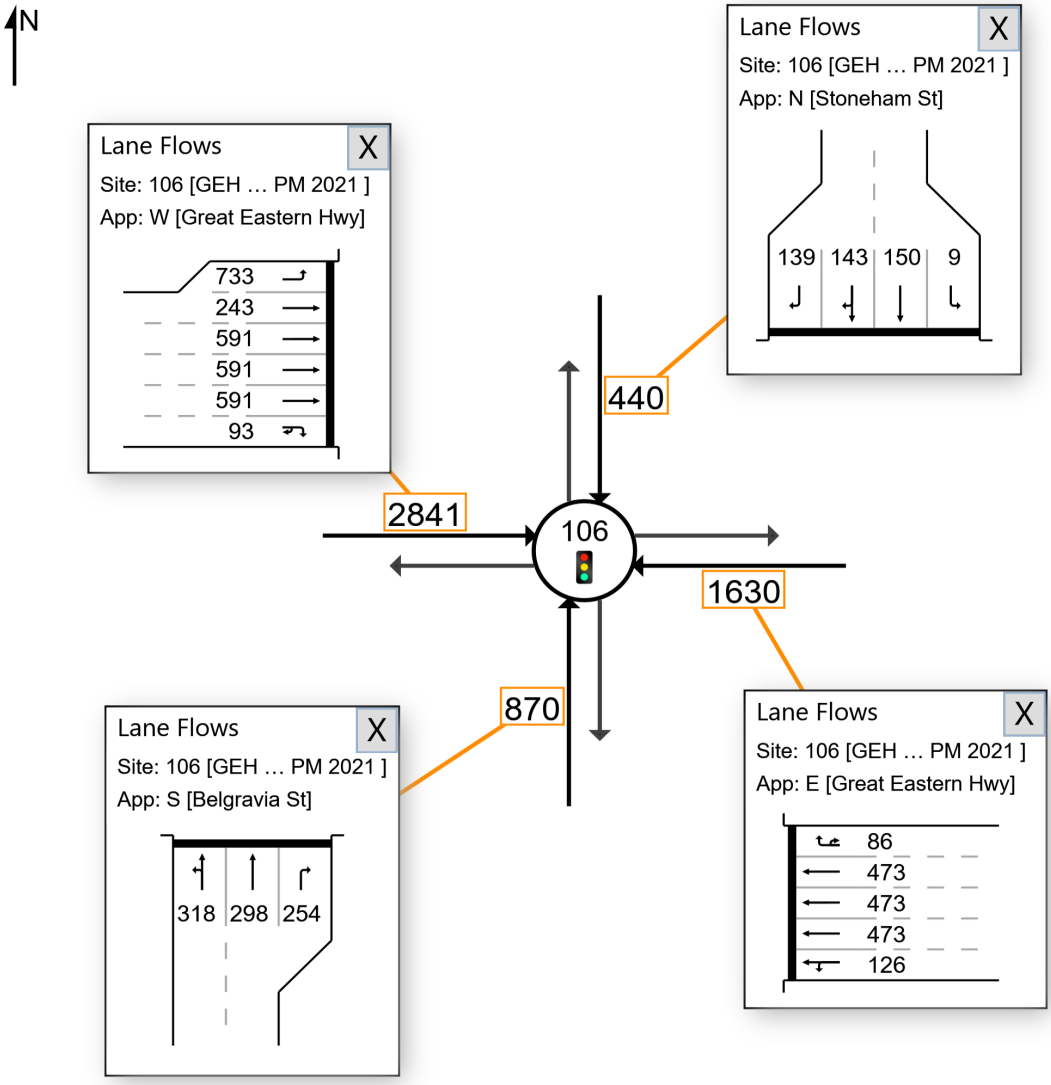

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2021 PM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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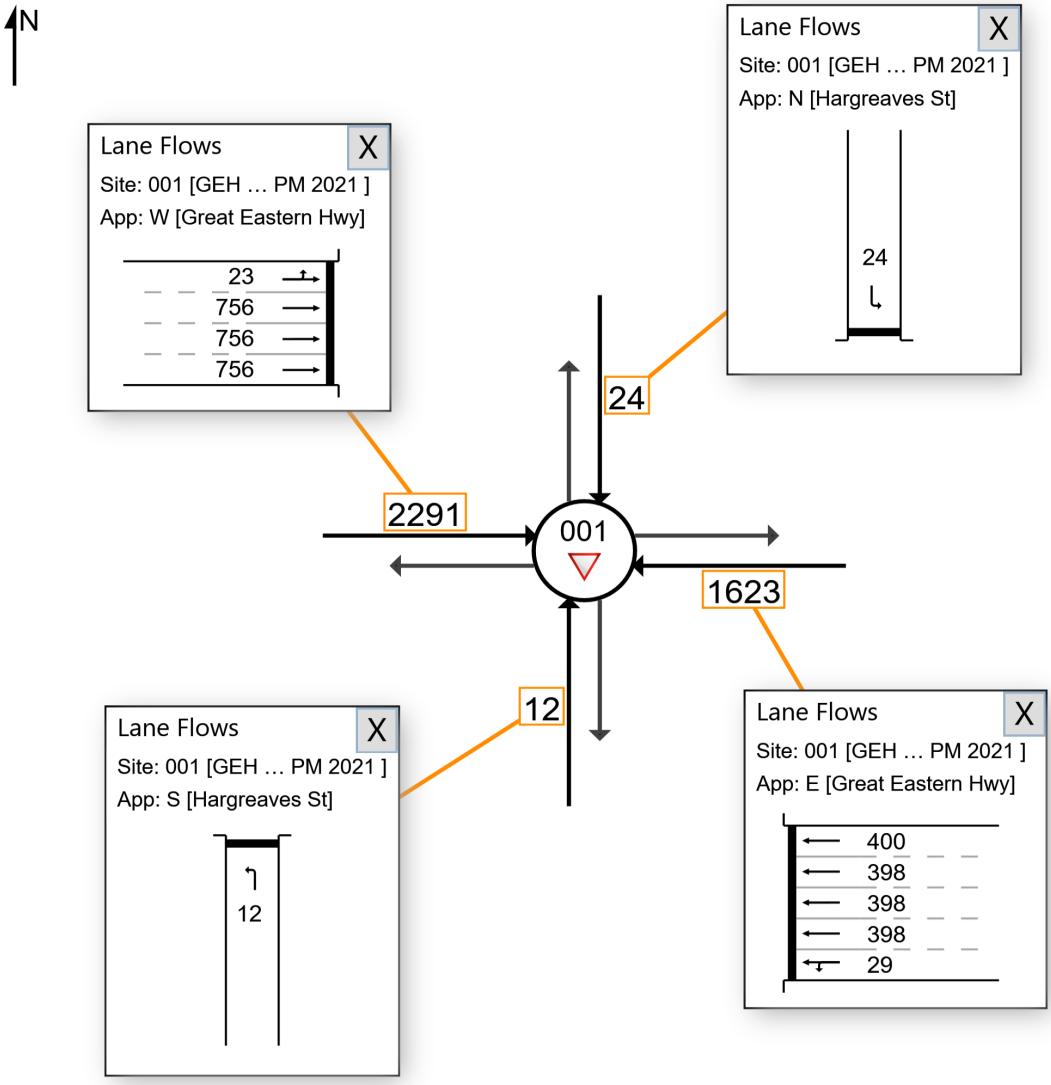

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2021 PM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

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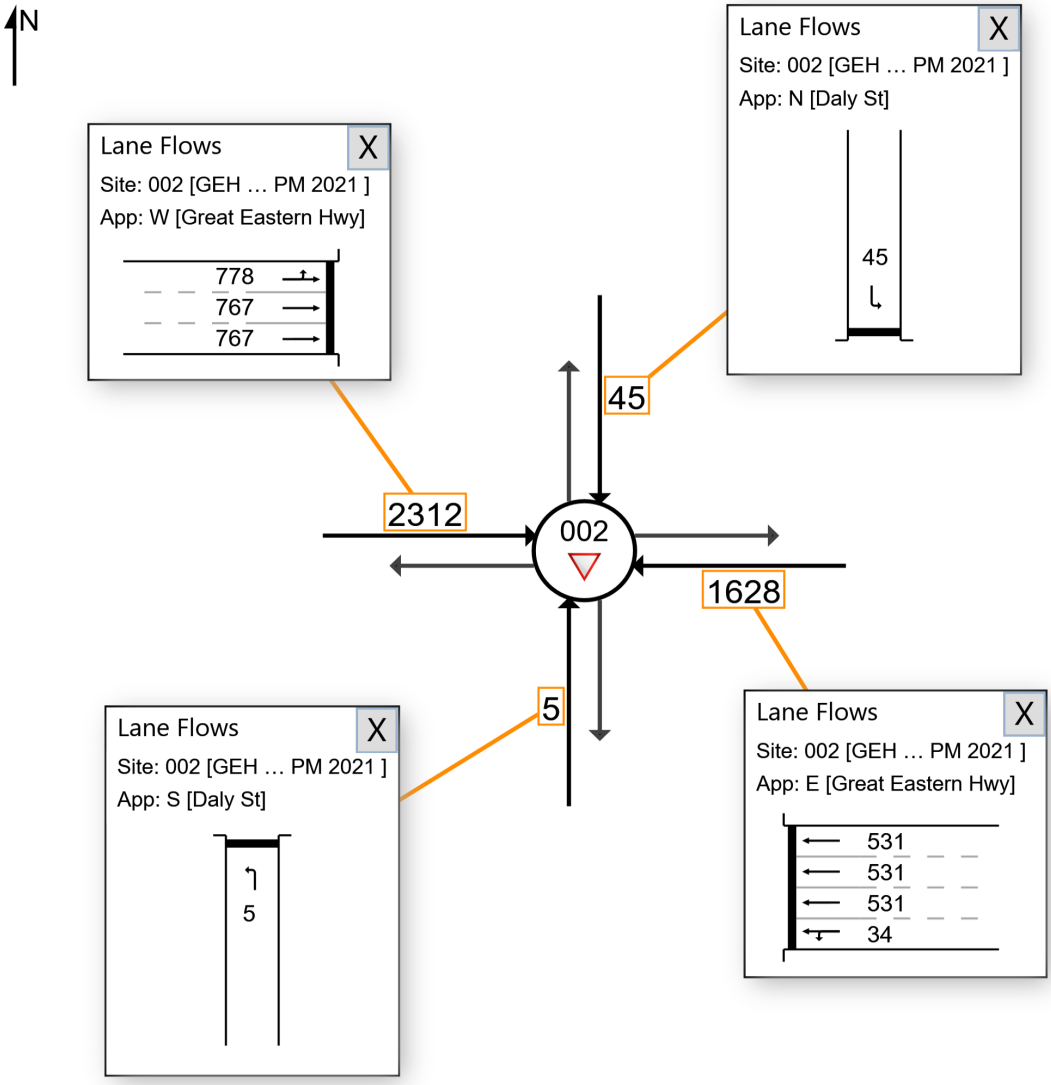

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2021 PM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

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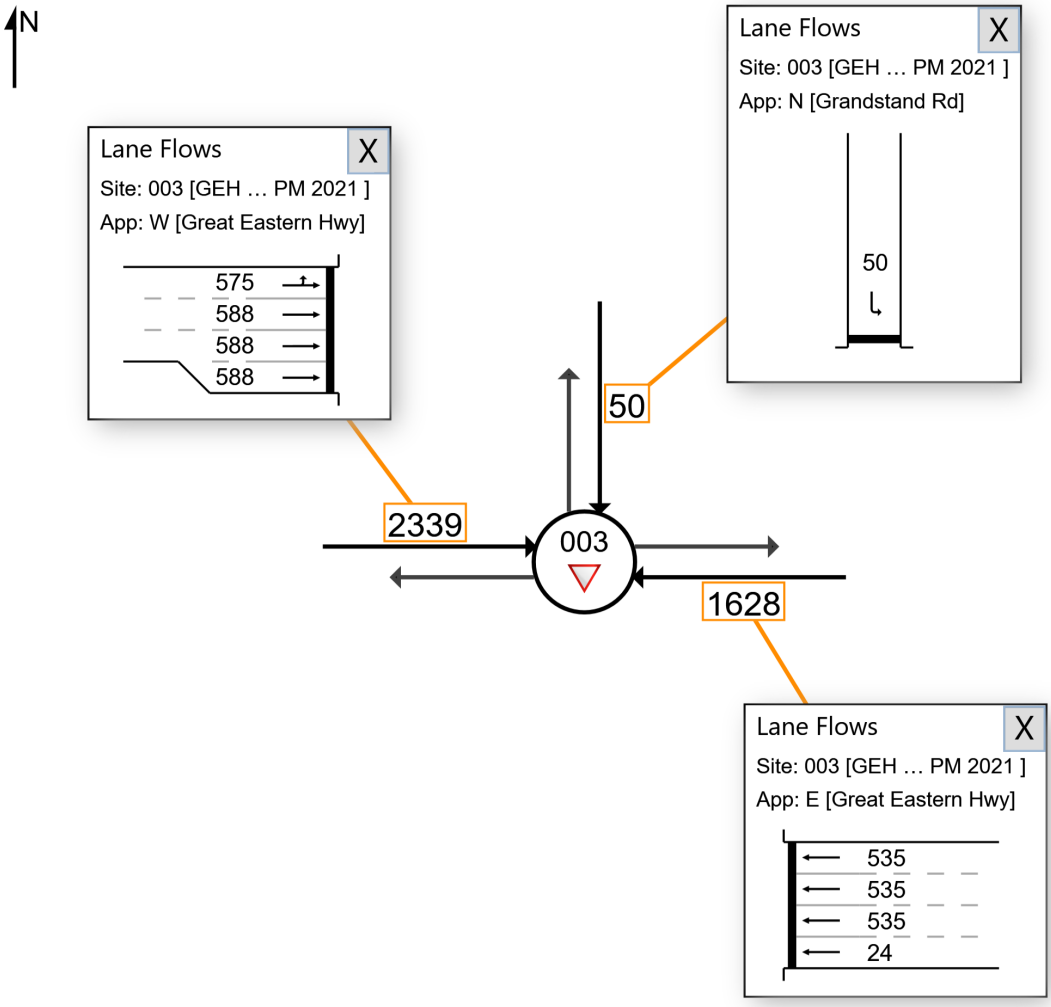

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak with proposed road network
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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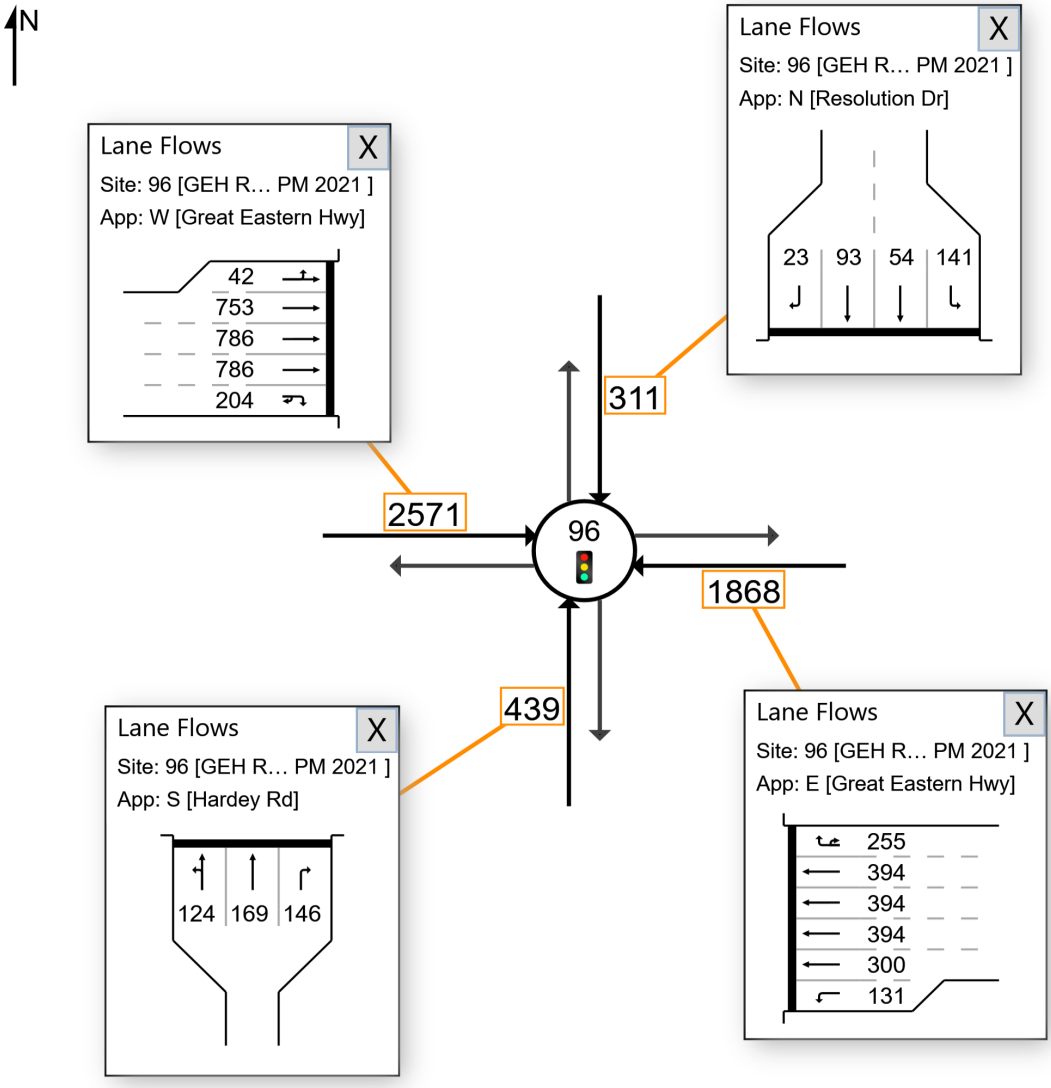

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2021 PM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

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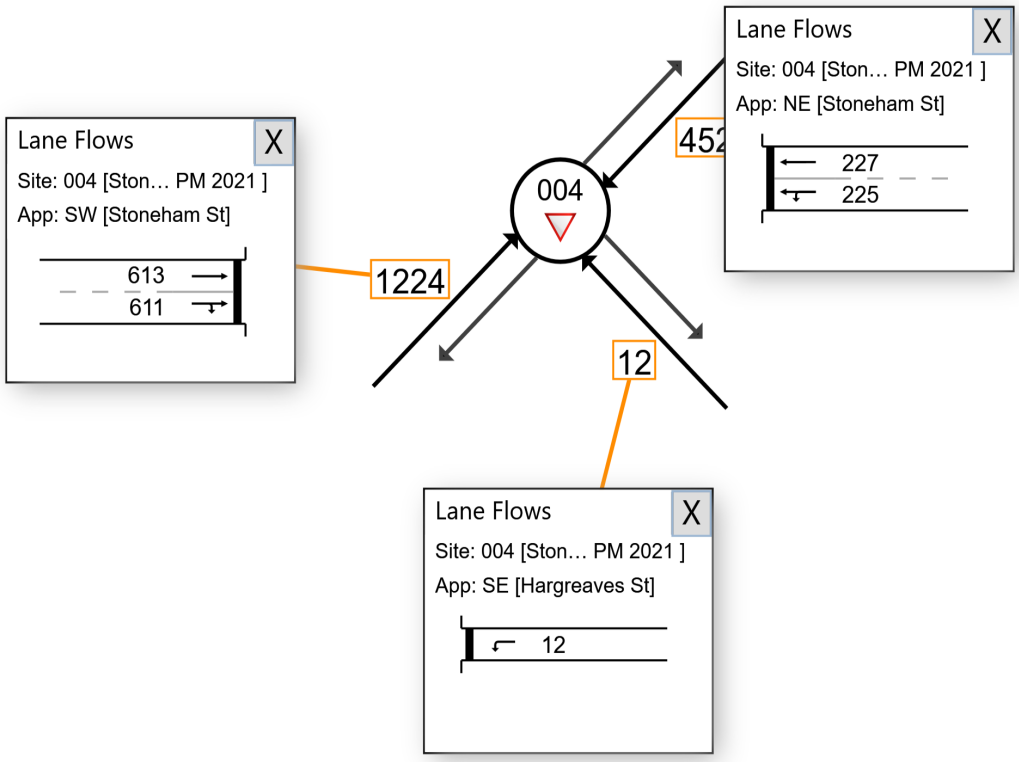

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2021 PM Peak with proposed road network
Site Category: Existing Design
Roundabout

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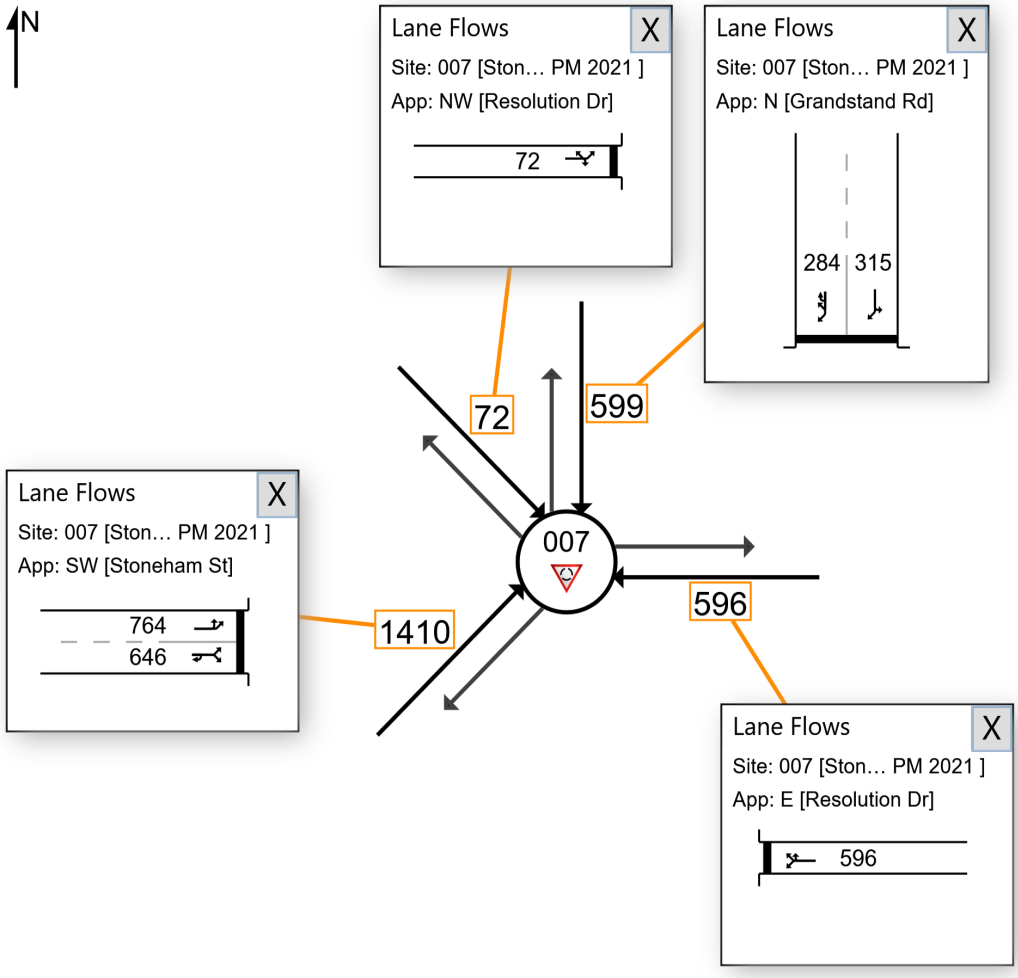

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand PM 2021 (Site Folder: 2021 PM Peak Proposed Network)]

Network: N101 [2021 PM Peak Proposed Network (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2021 PM Peak with proposed road network
Site Category: Existing Design
Give-Way (Two-Way)

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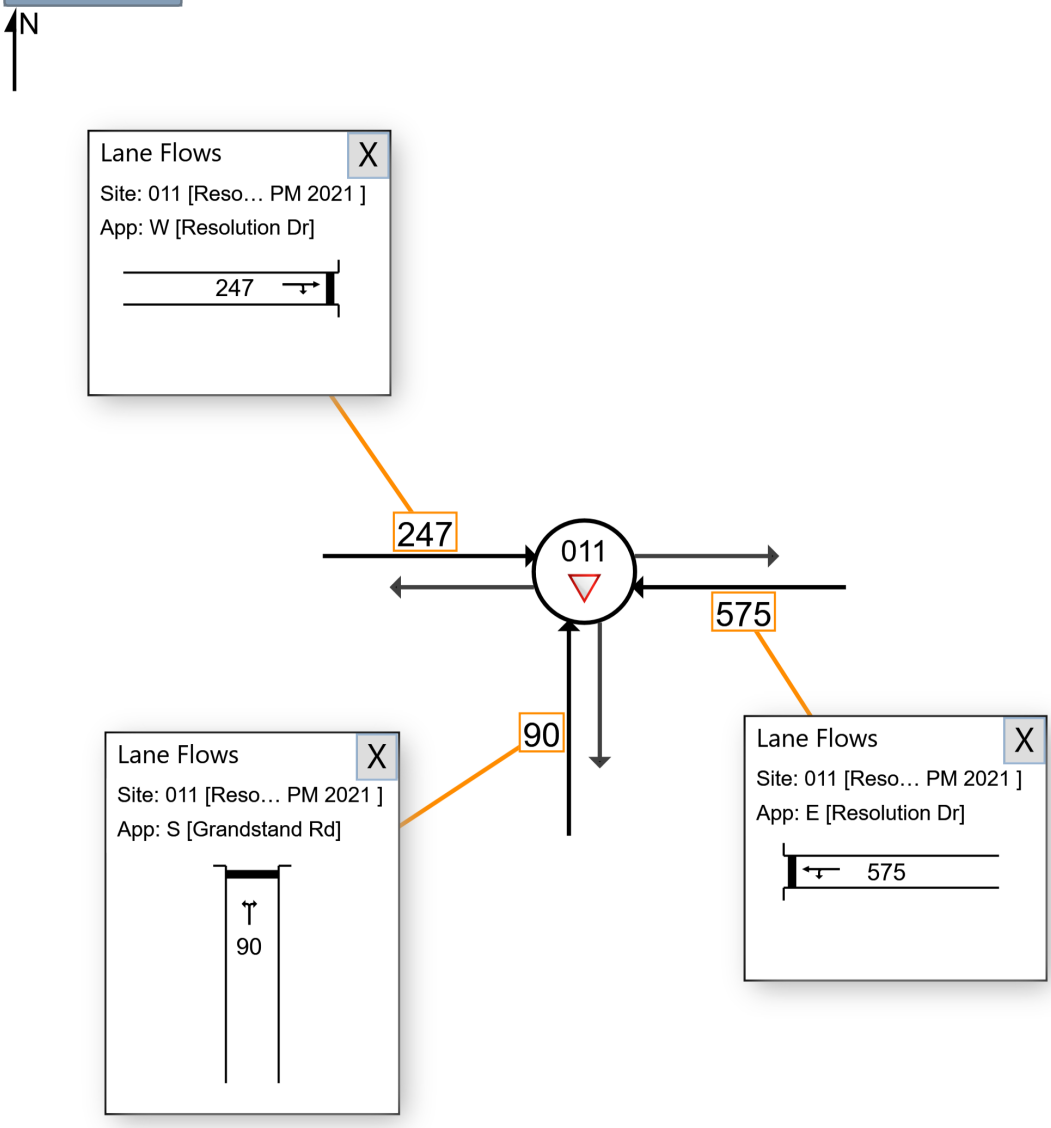

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

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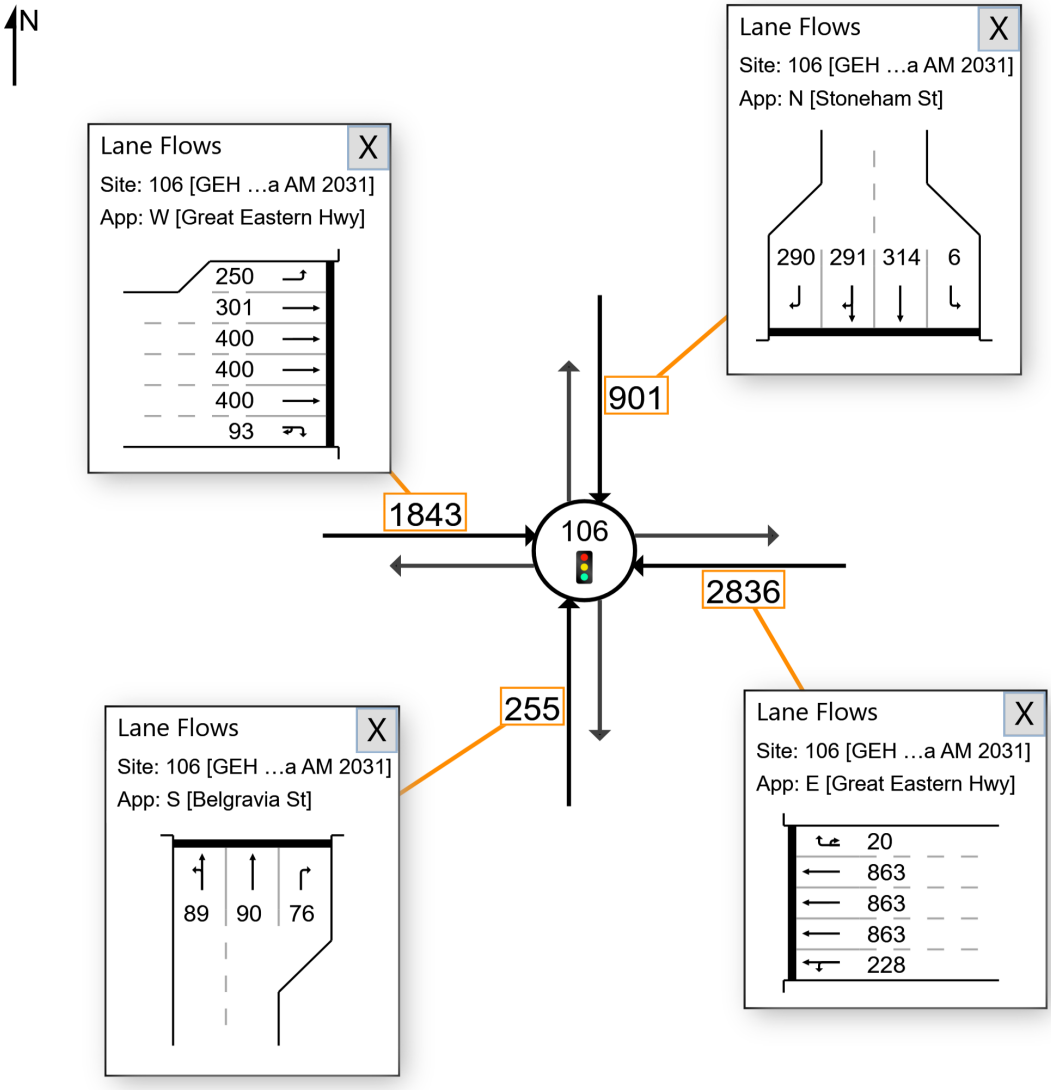

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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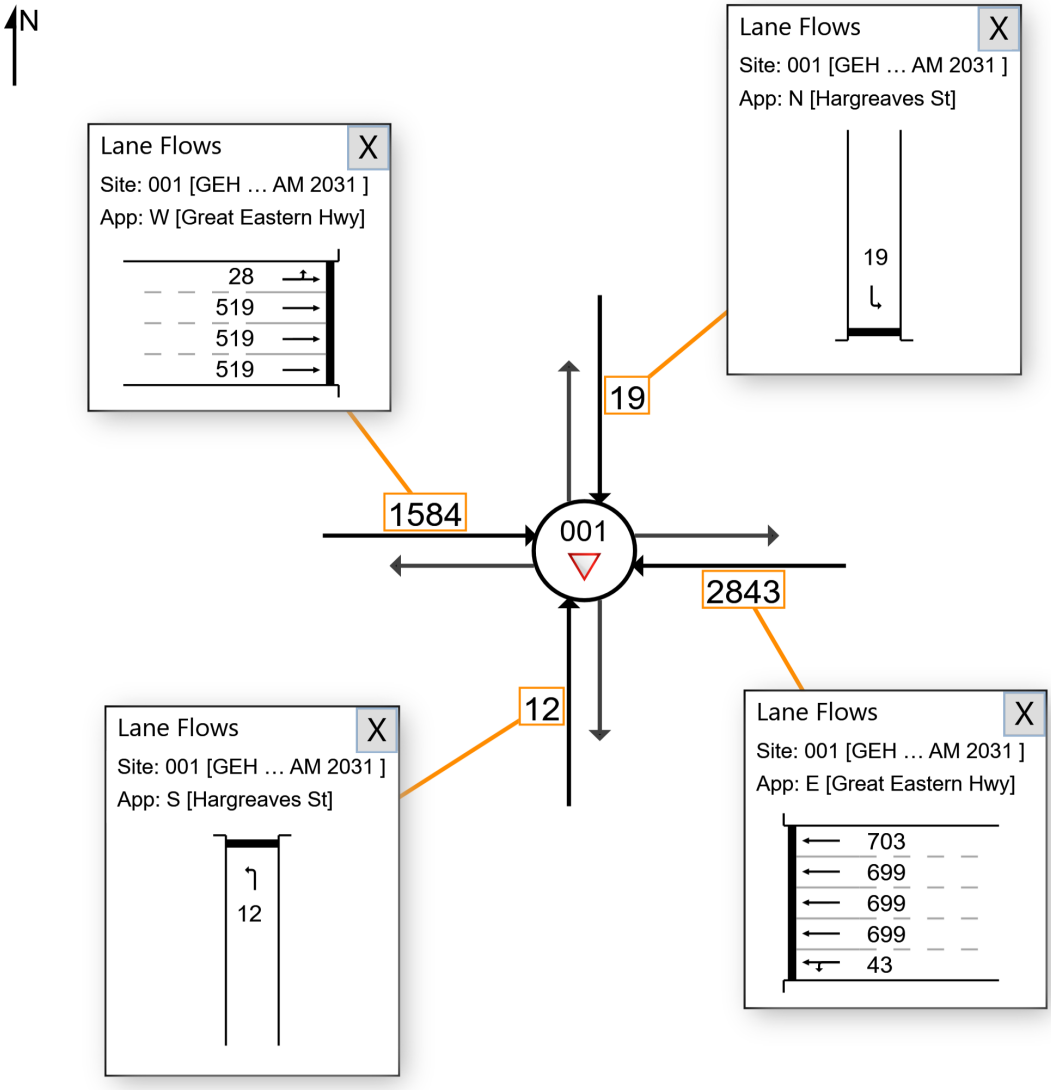

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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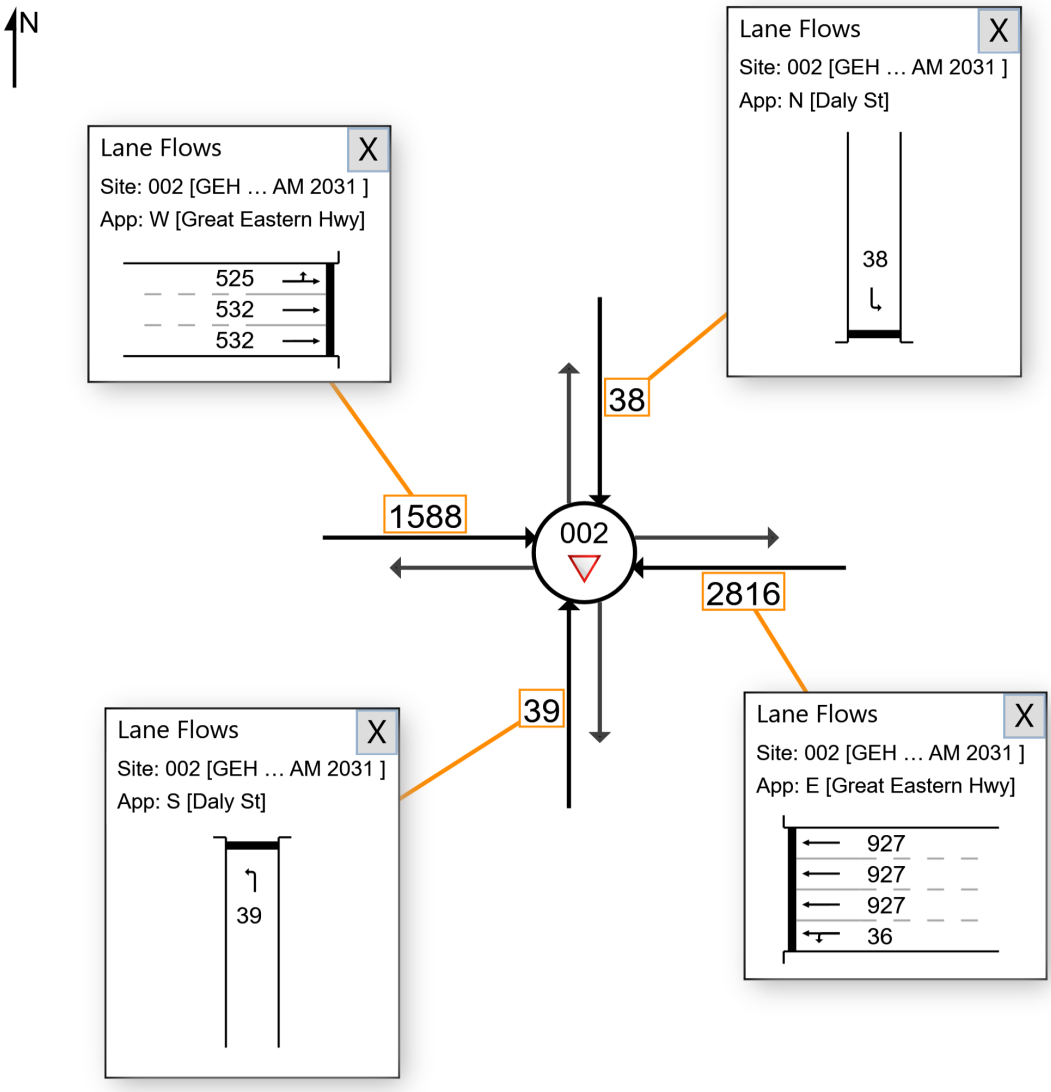

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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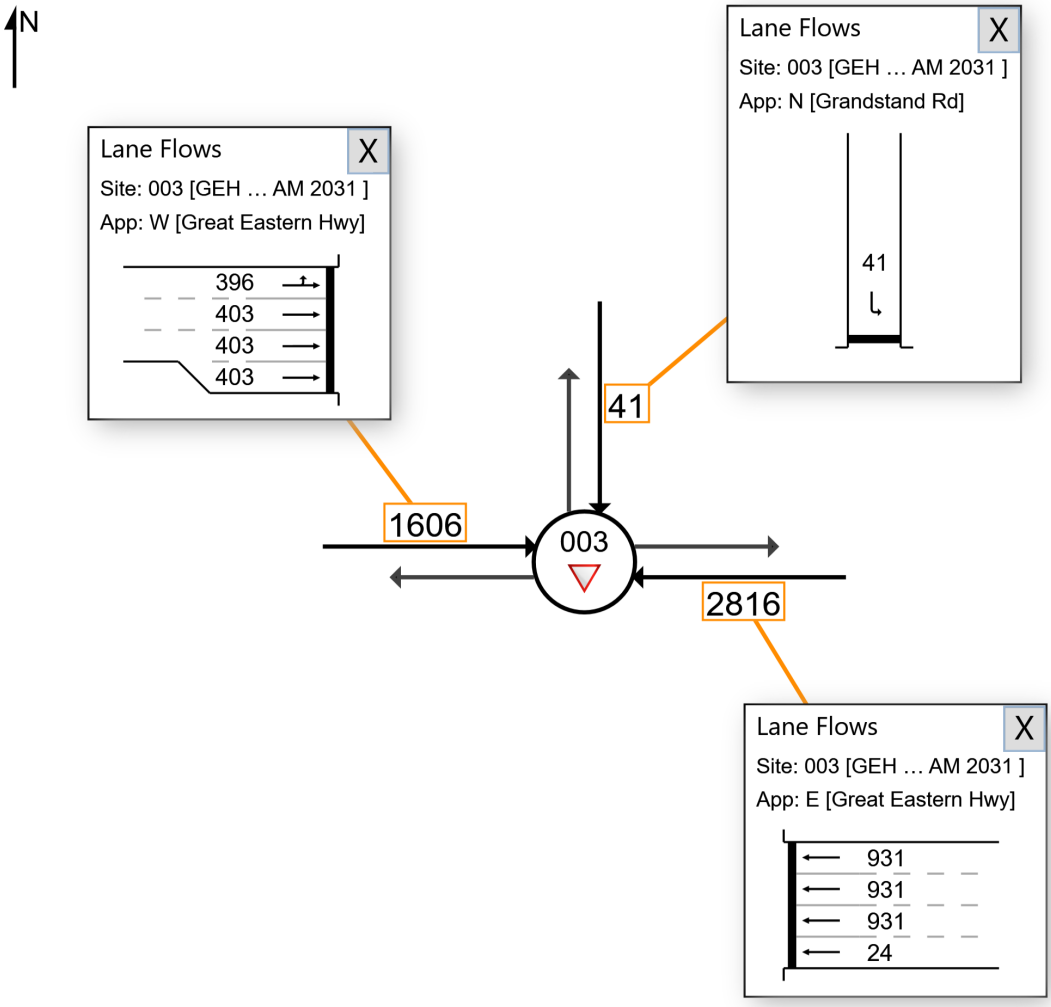

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

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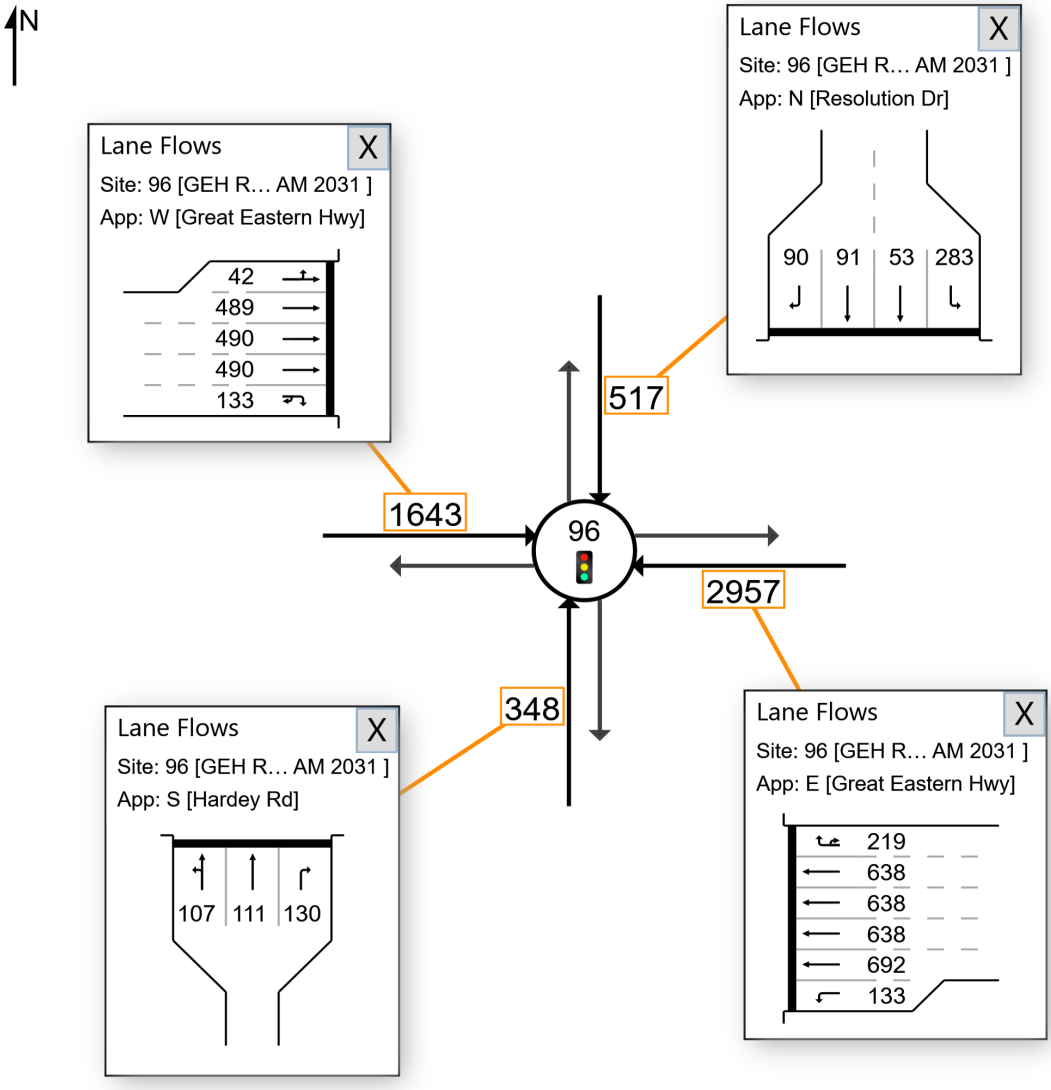

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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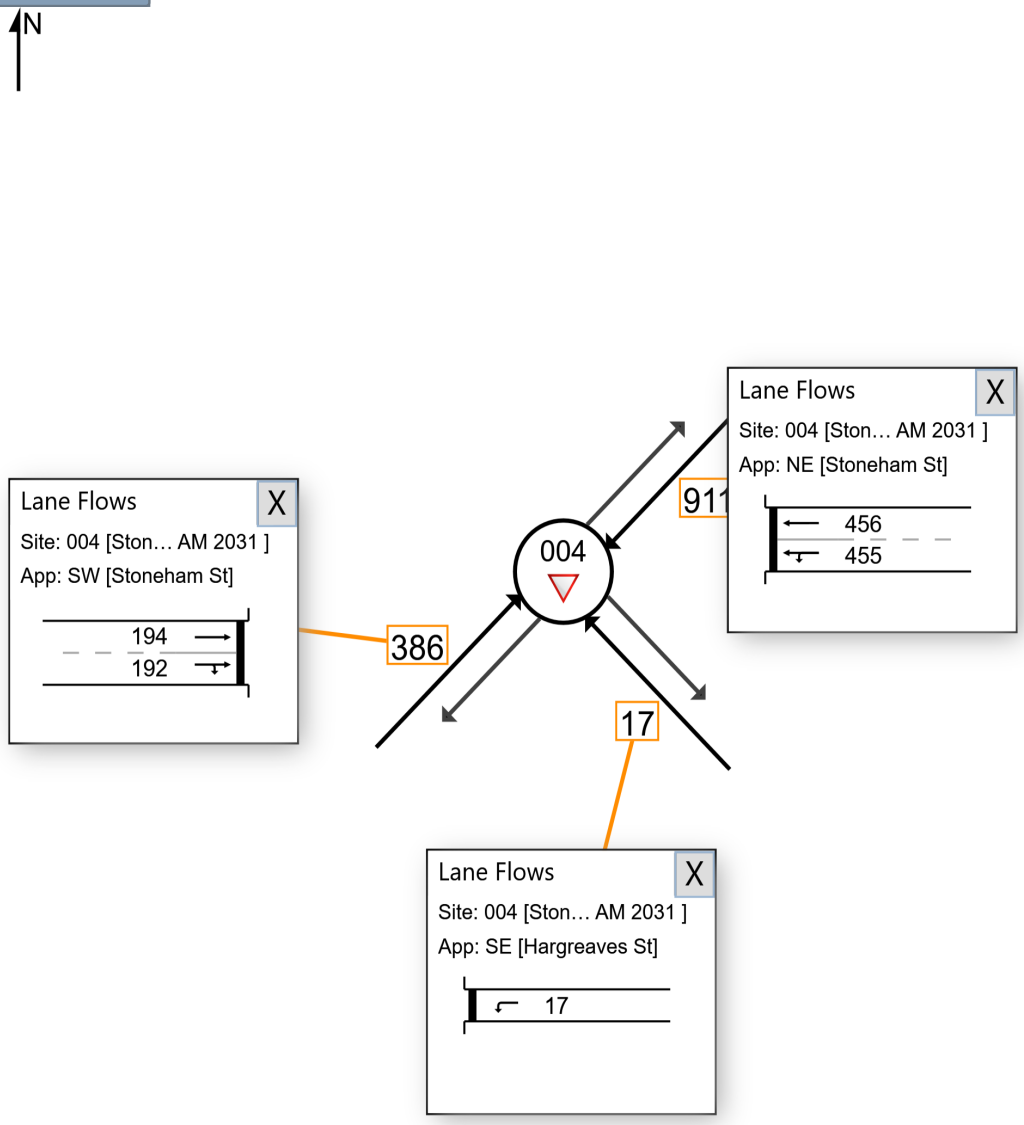

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

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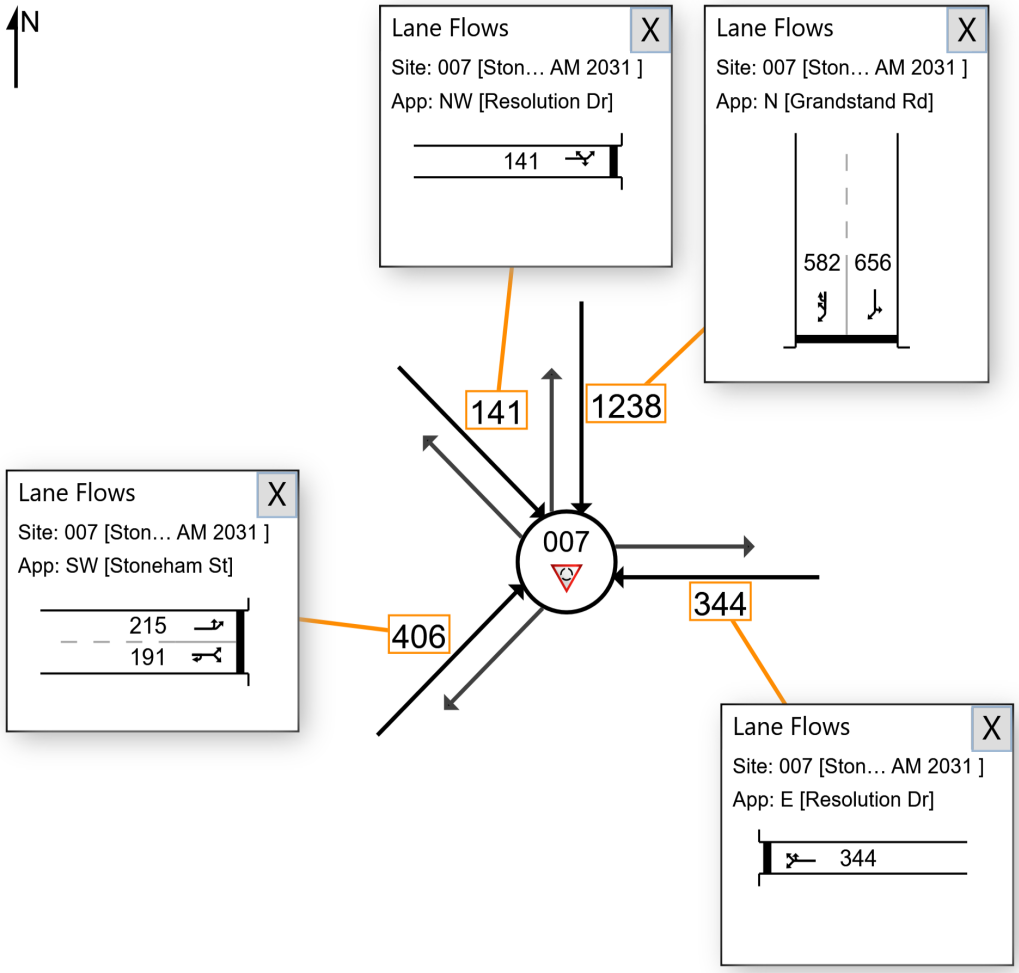

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand AM 2031 (Site Folder: 2031 AM Peak Proposed Network and Land Uses)]

Network: N101 [2031 AM Peak Proposed Network and Land Use (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2031 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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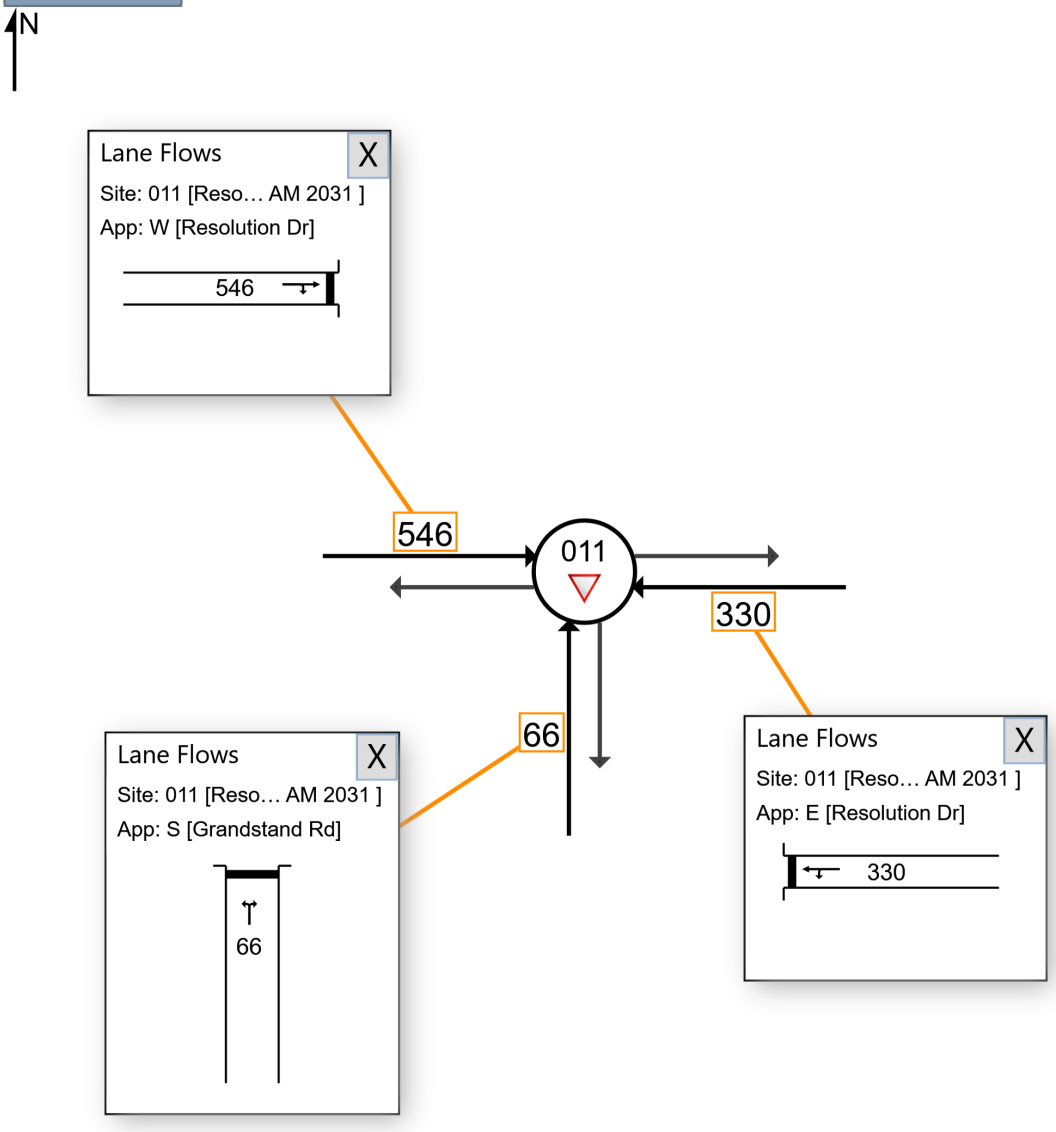

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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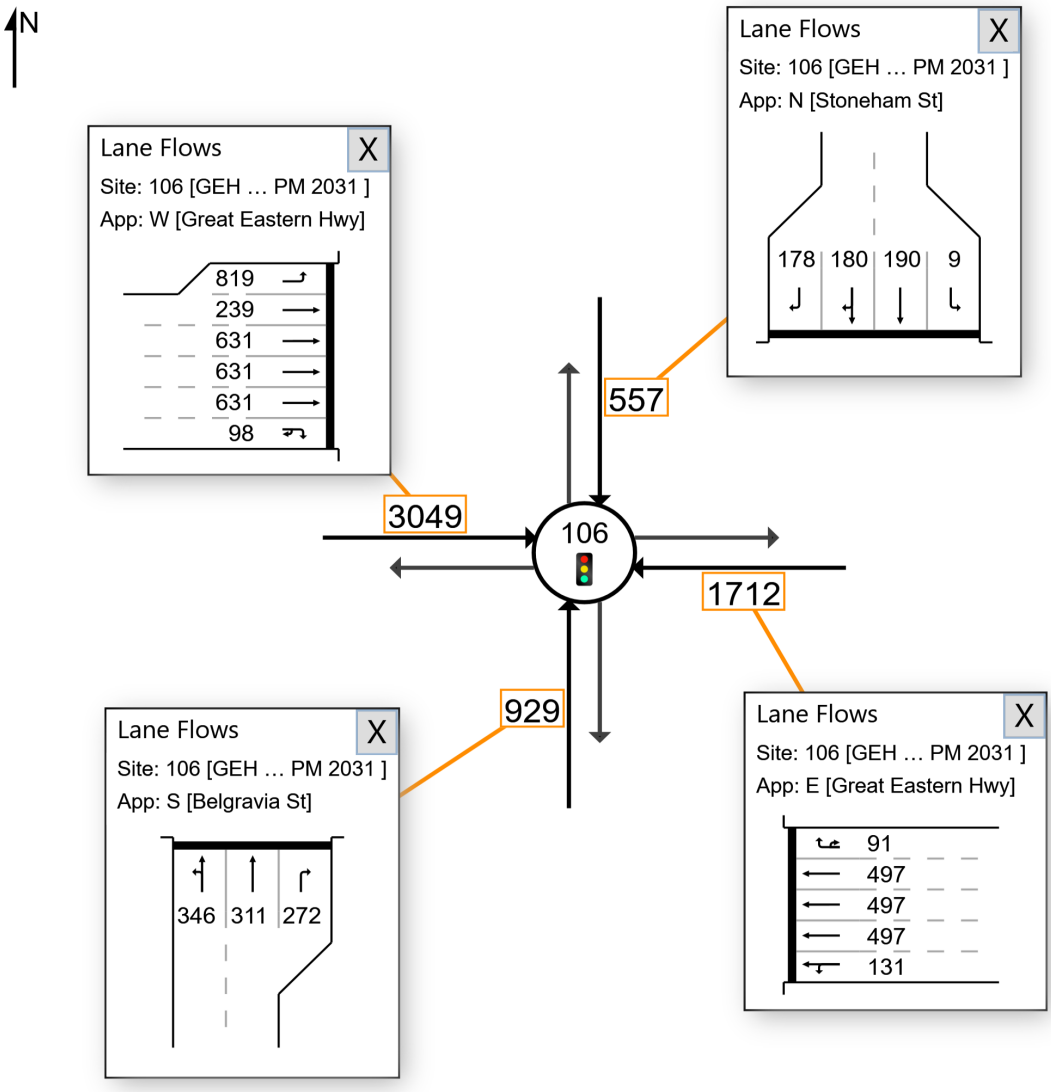

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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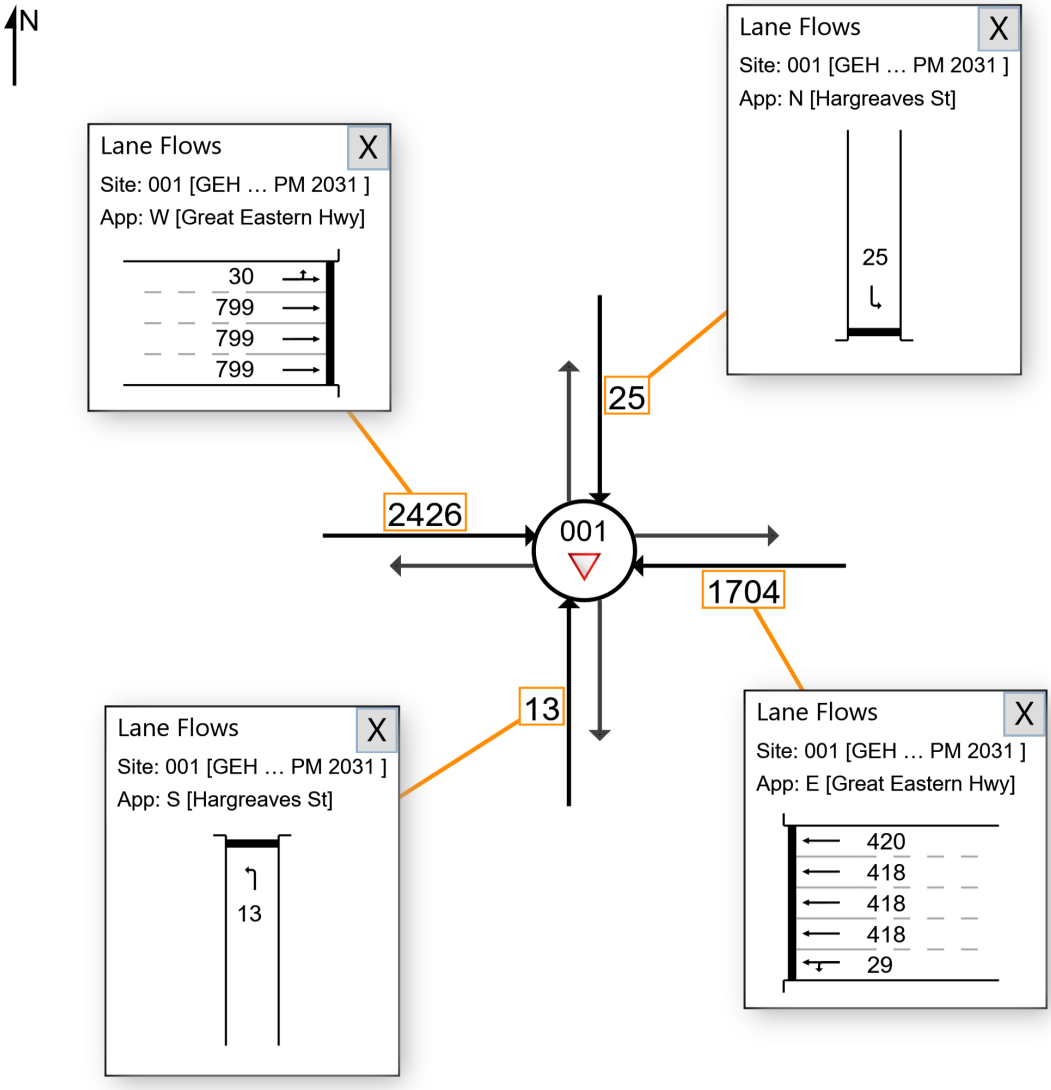

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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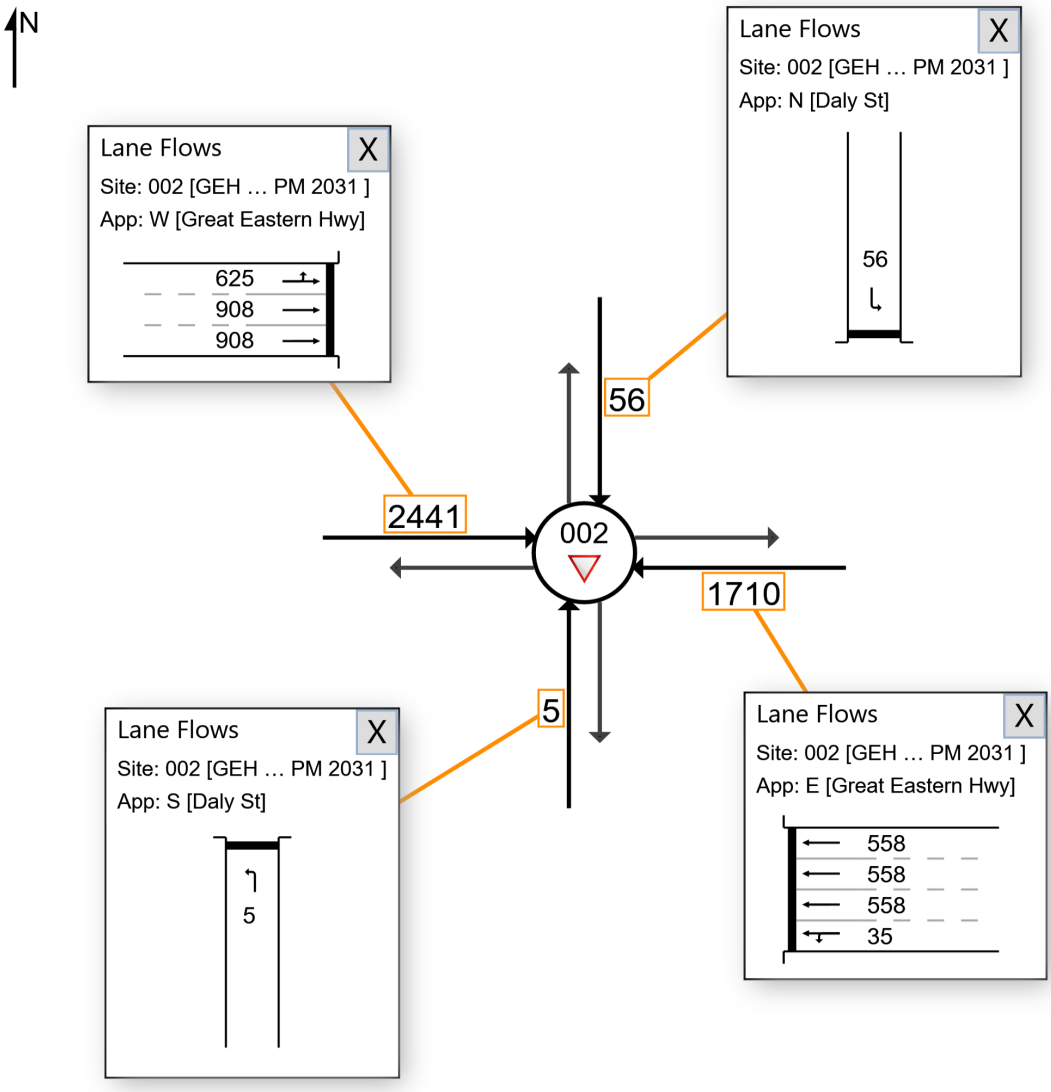

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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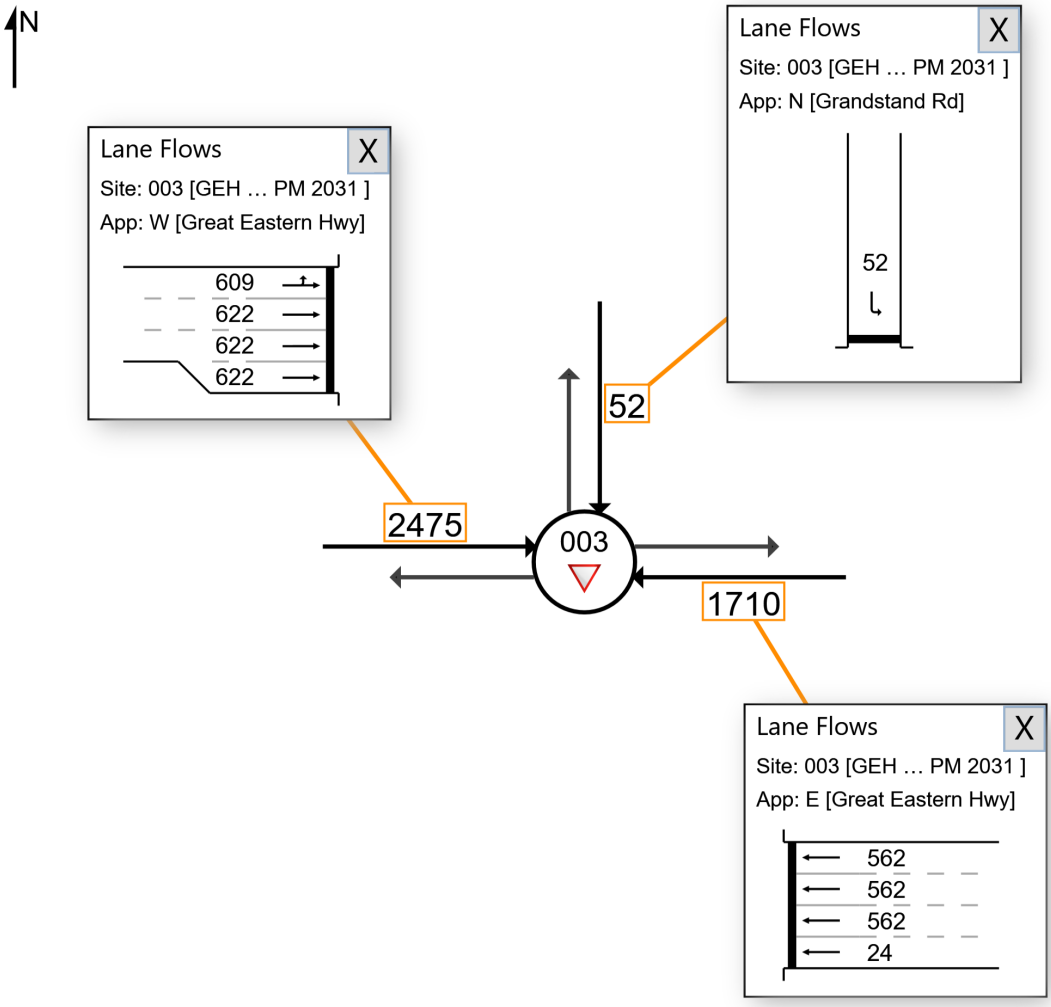

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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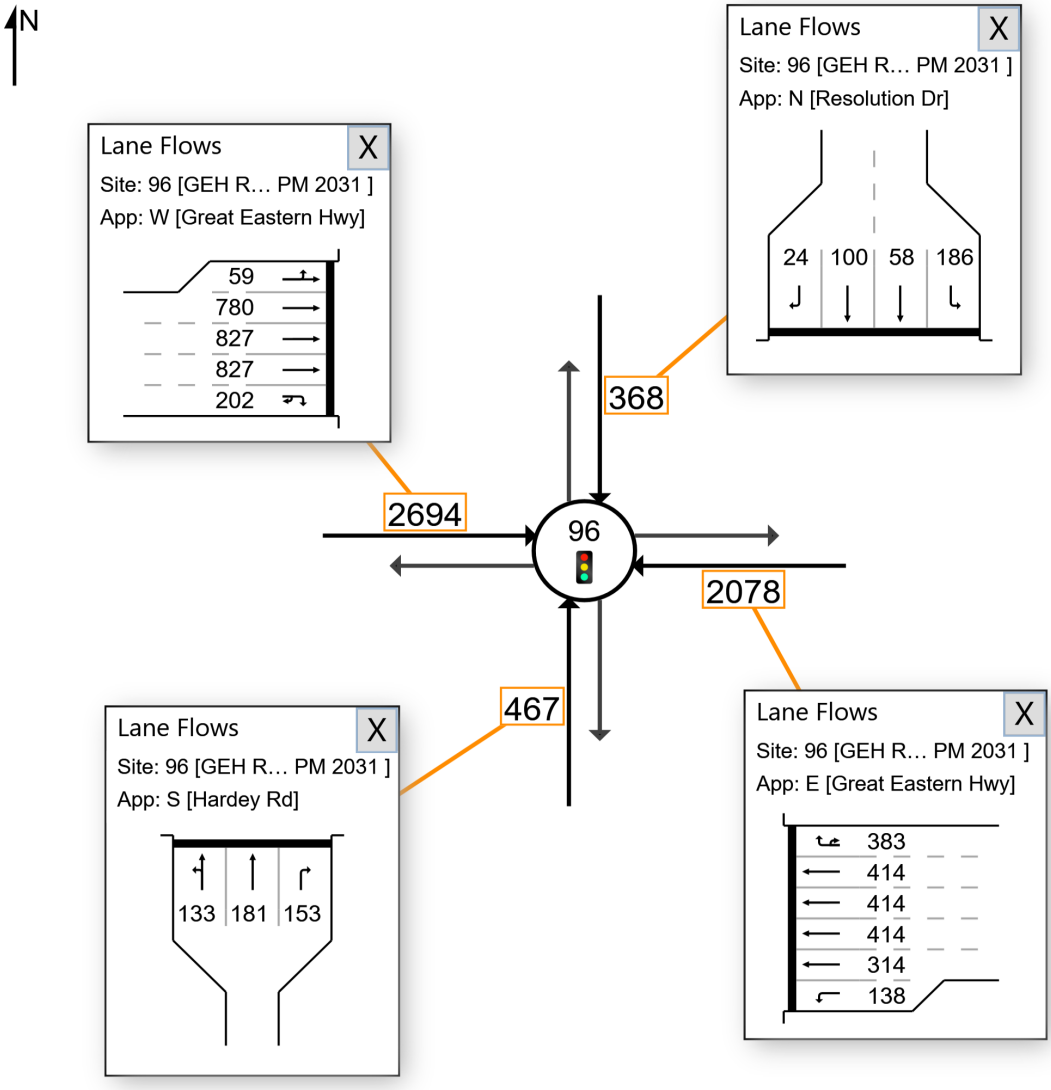

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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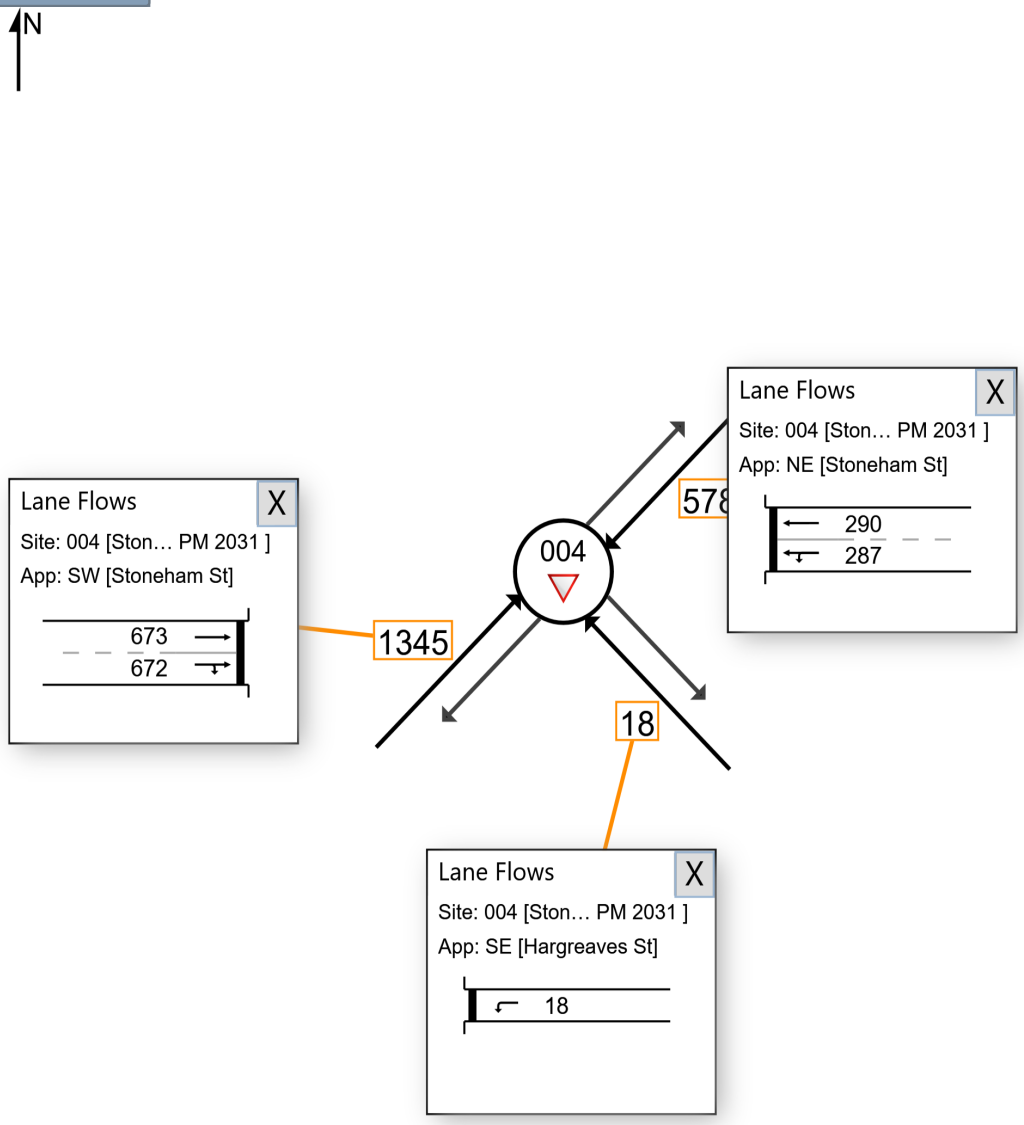

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

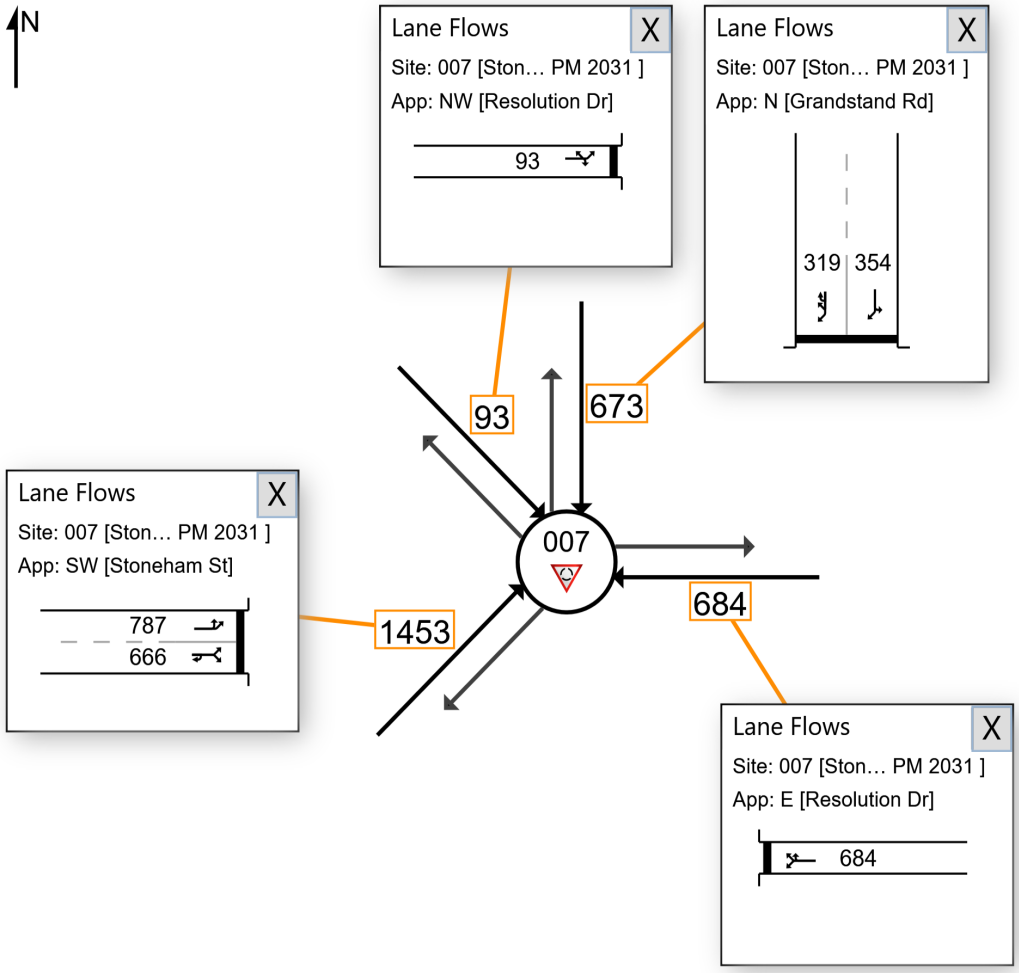
Site: 007 [Stoneham Grandstand Resolution PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

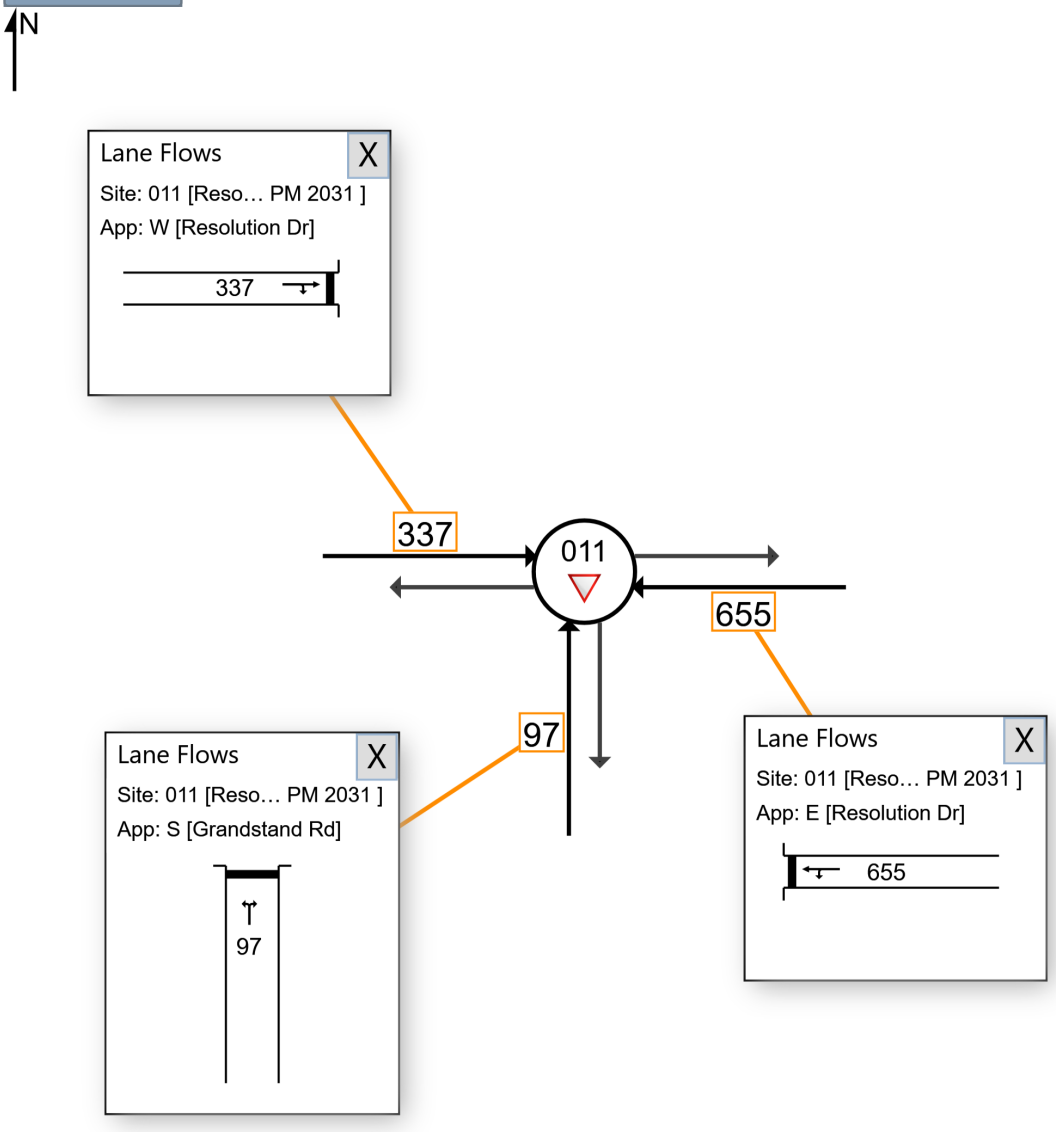
Site: 011 [Resolution Grandstand PM 2031 (Site Folder: 2031 PM Peak Proposed Network and Land Uses)]

Network: N101 [2031 PM Peak Proposed Network and Land Use (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2031 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

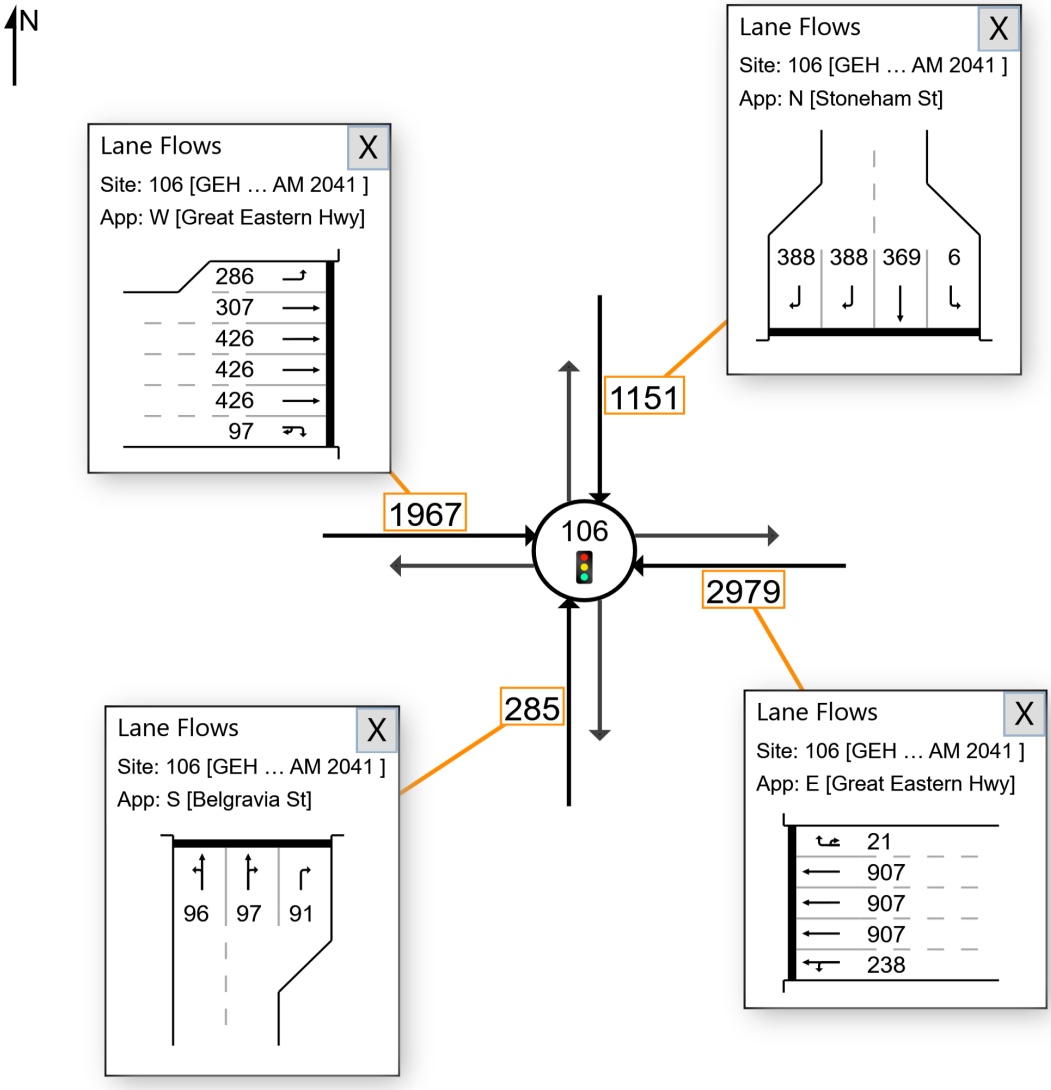
Site: 106 [GEH Stoneham Belgravia AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 135 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

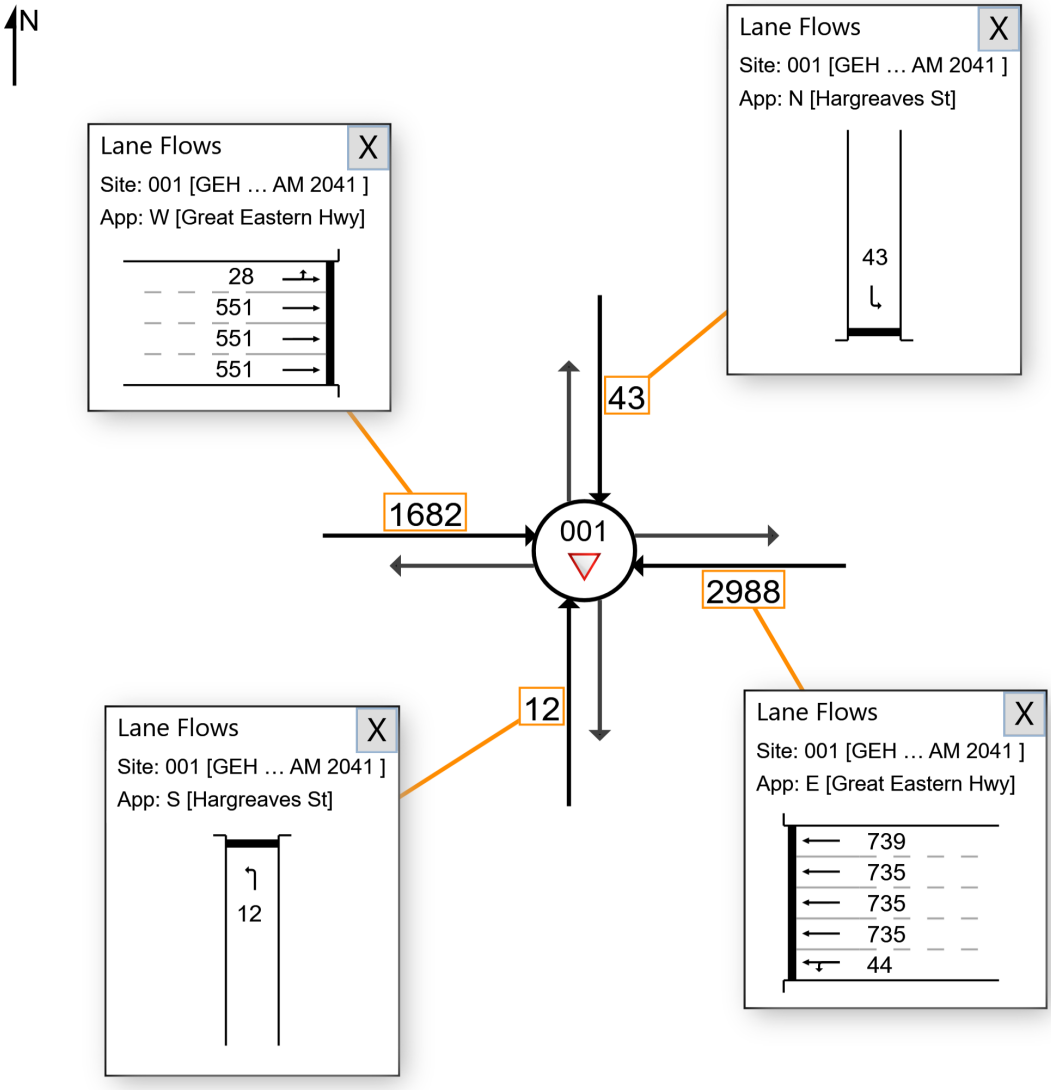
Site: 001 [GEH Hargreaves AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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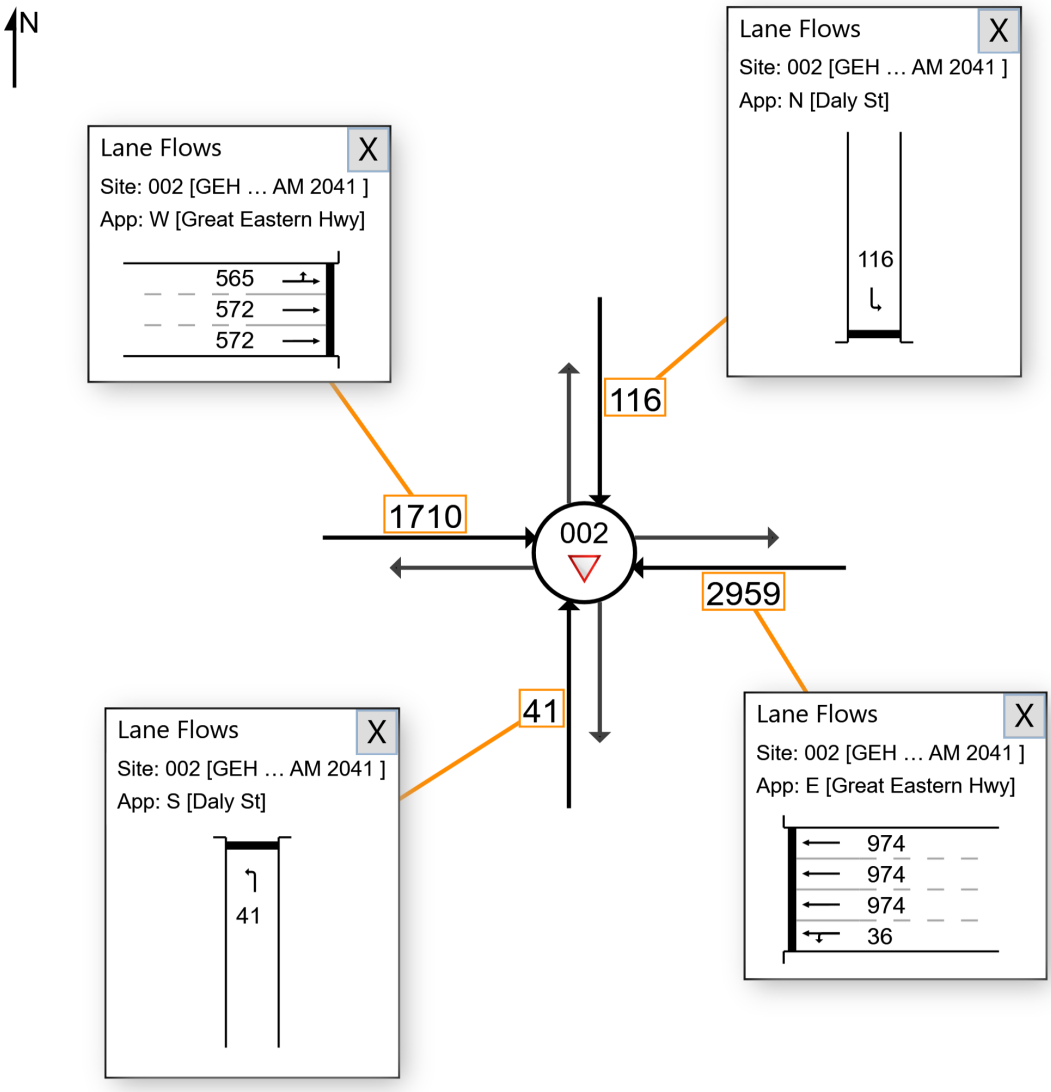
Close All Popups



Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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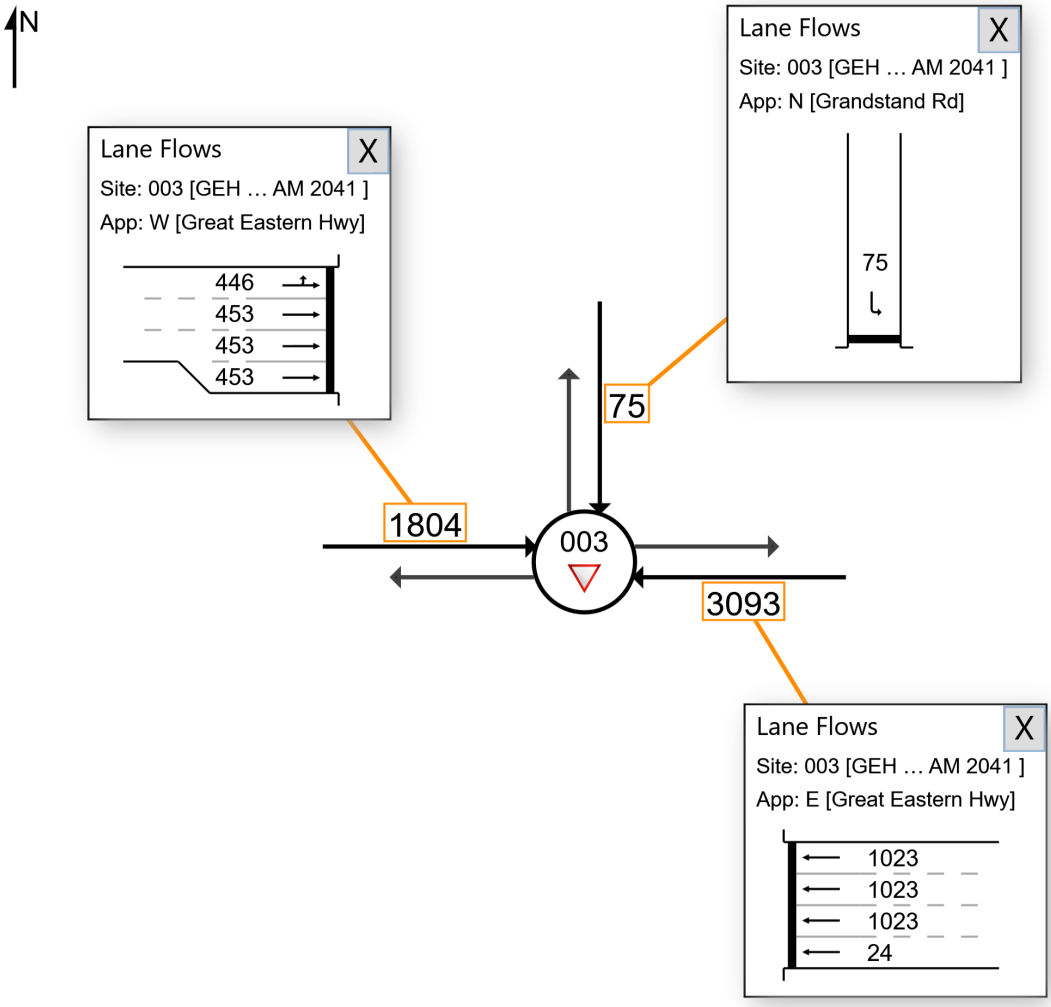

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 134 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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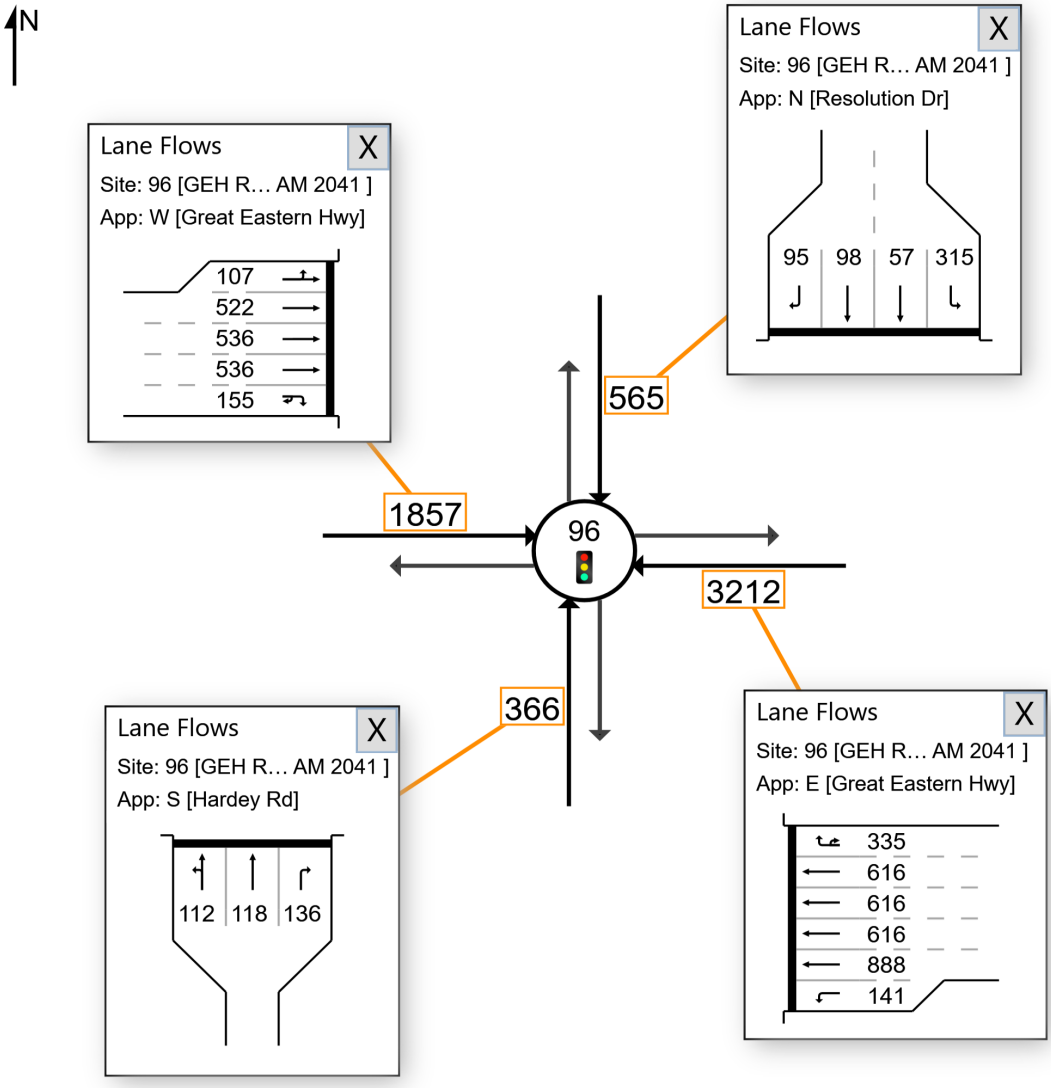

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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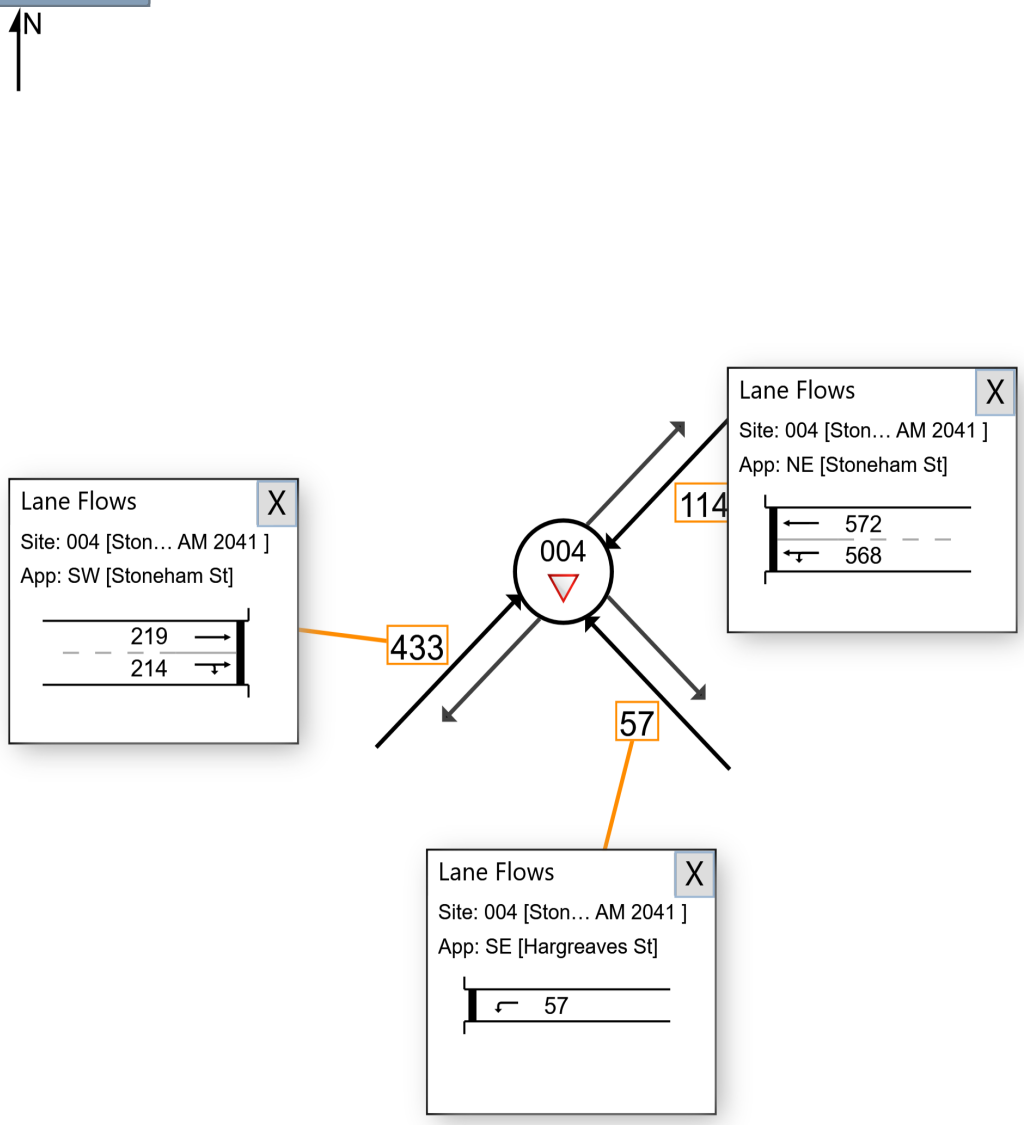

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 007 [Stoneham Grandstand Resolution AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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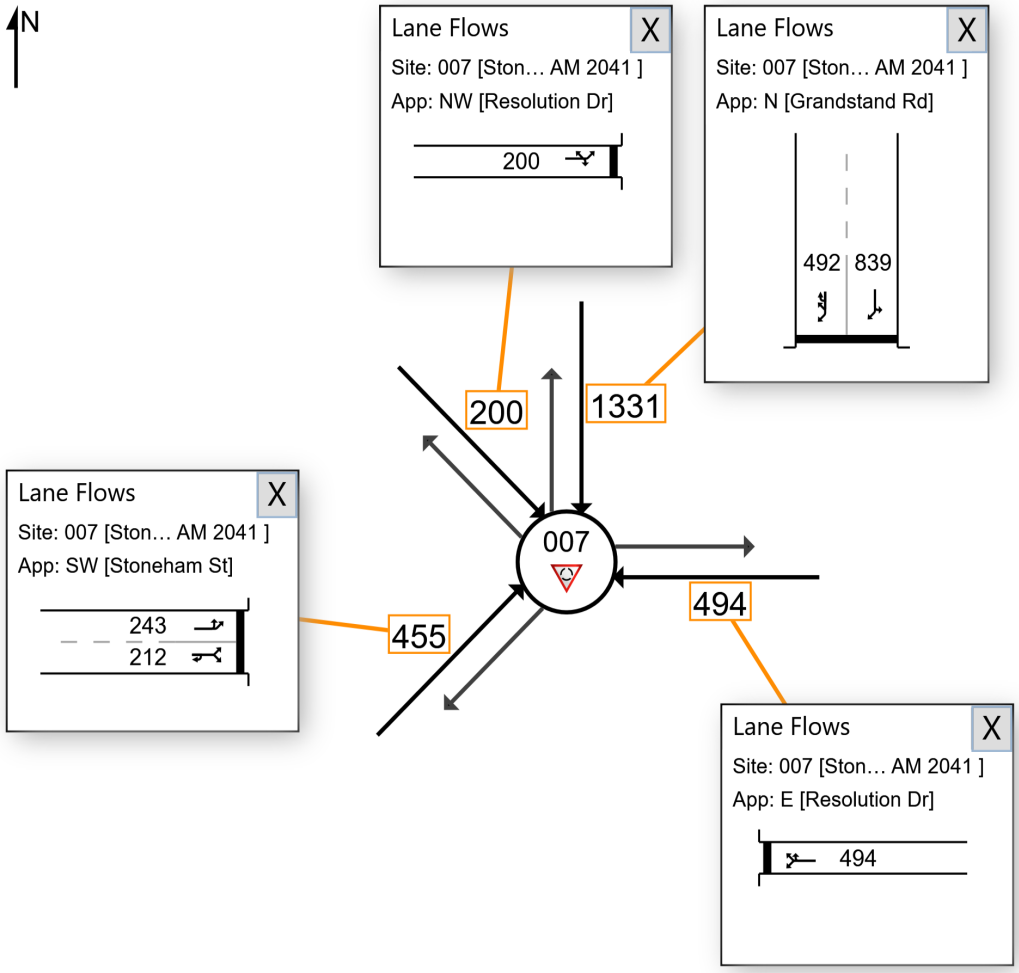
Close All Popups



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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand AM 2041 (Site Folder: 2041 AM Peak Proposed Network and Land Uses)]

Network: N101 [2041 AM Peak Proposed Network and Land Use (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2041 AM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

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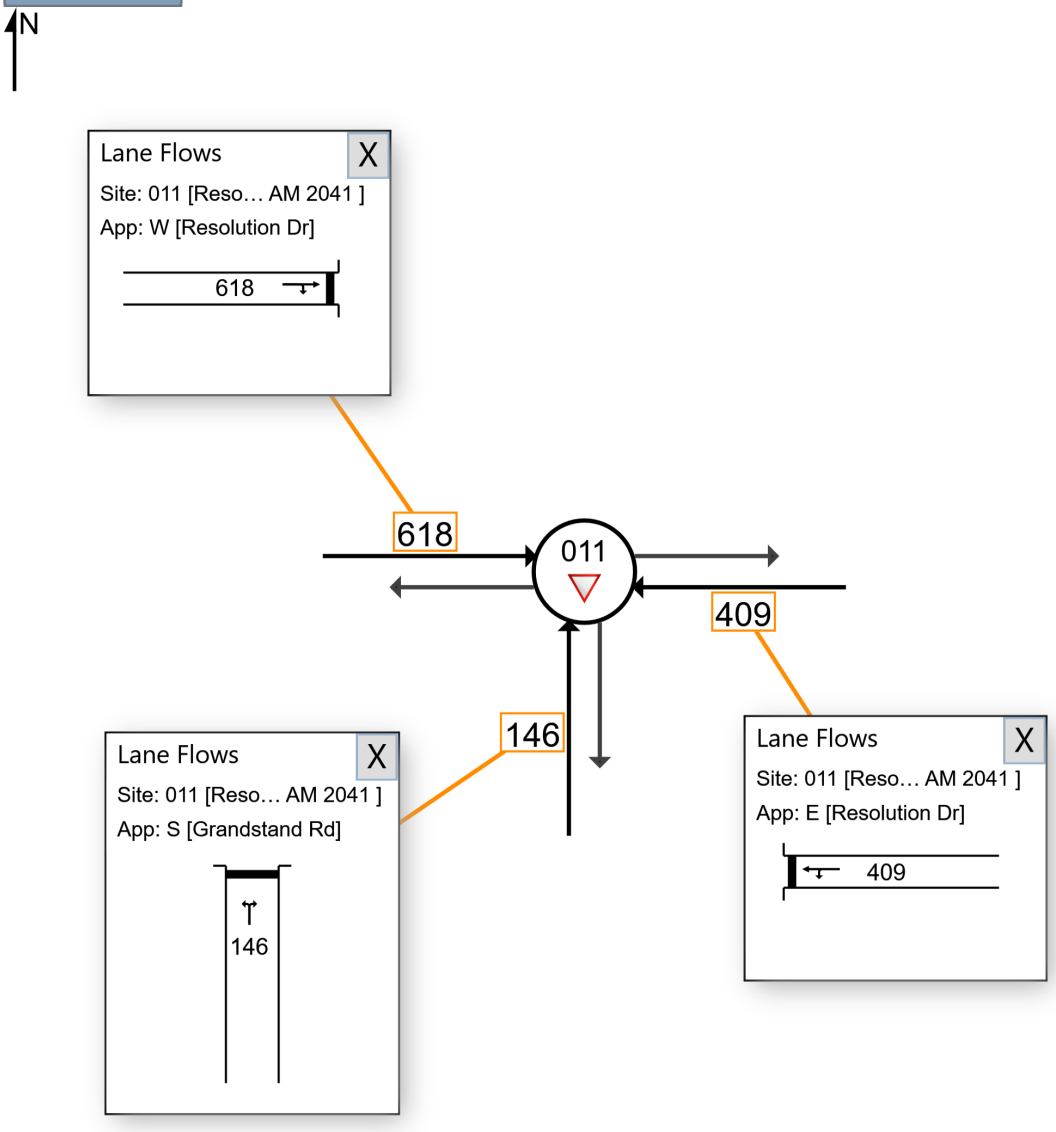

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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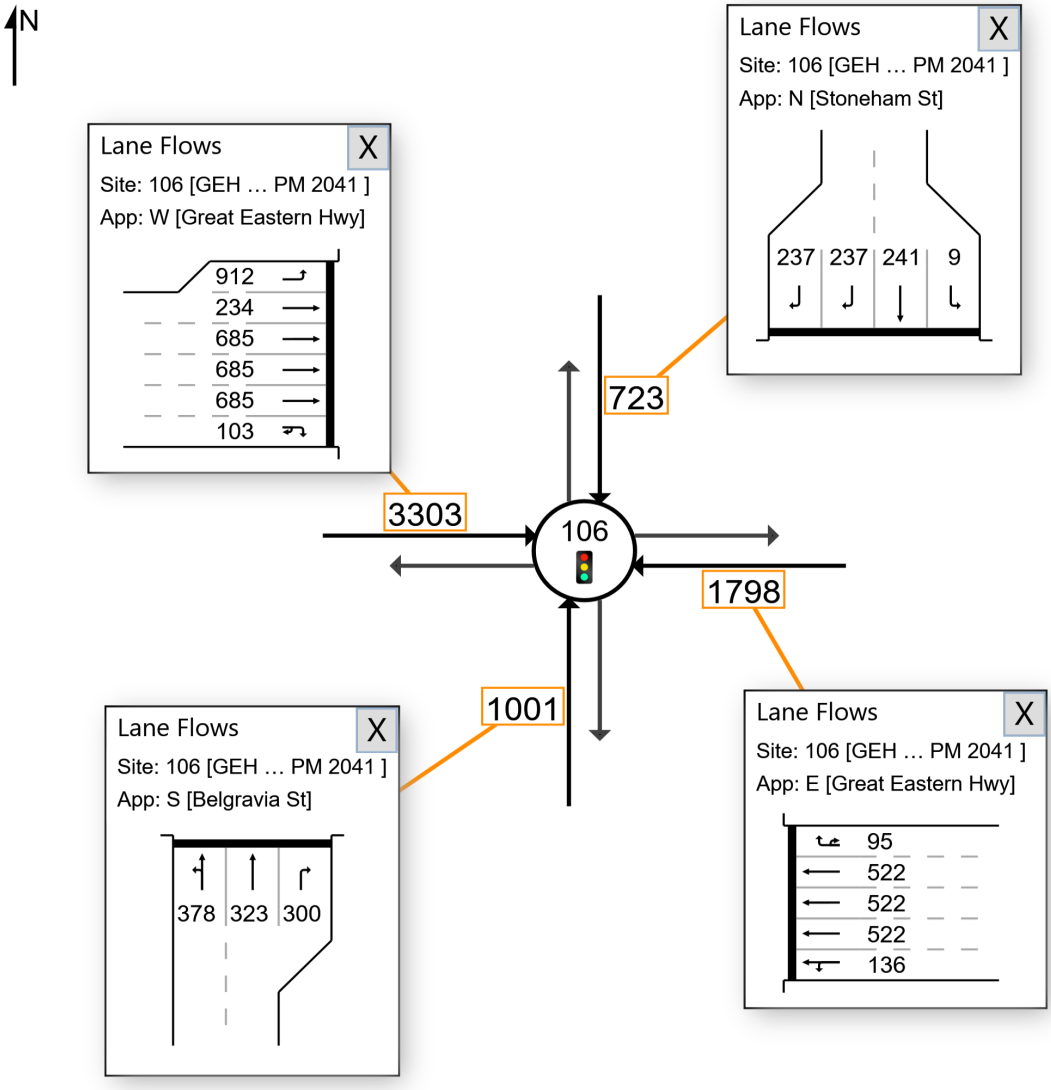

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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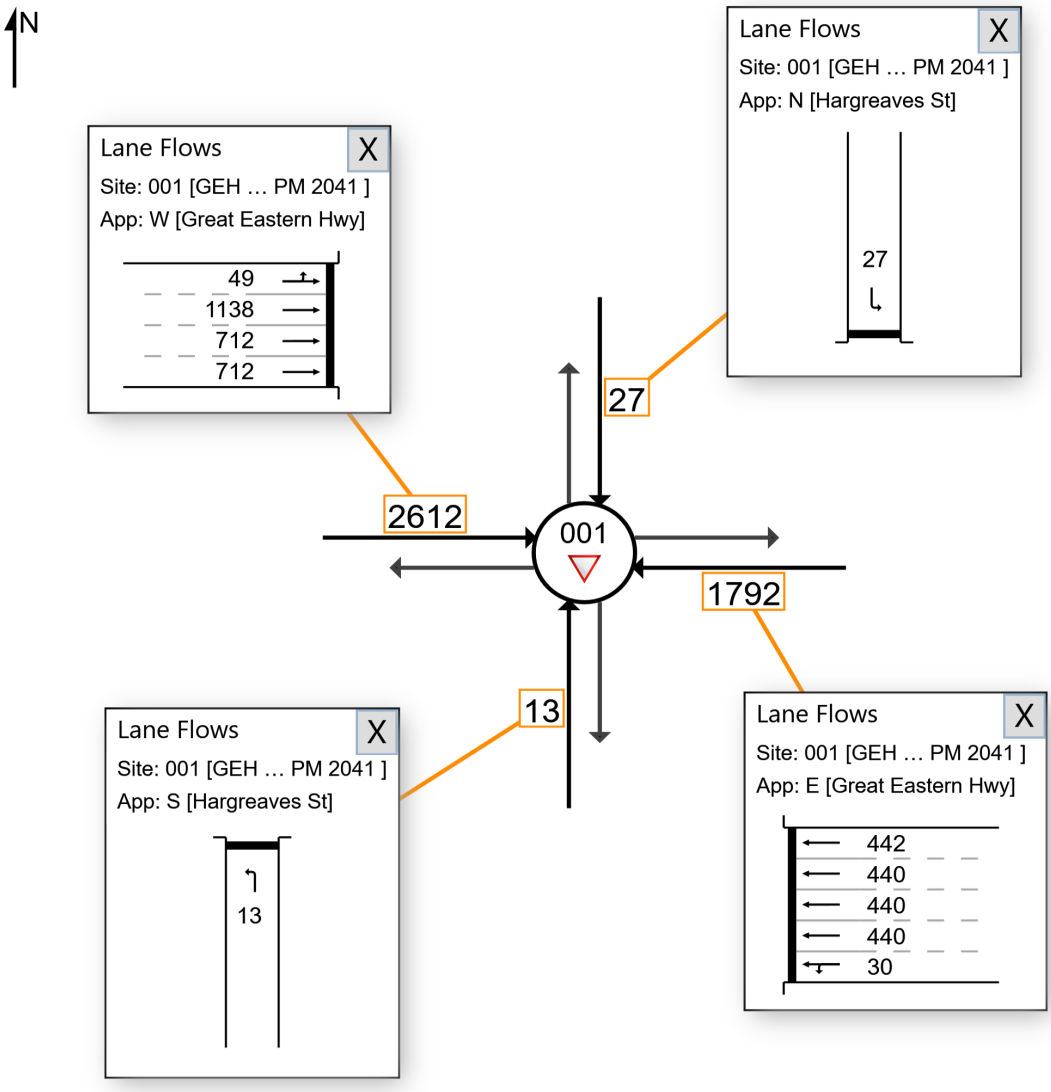

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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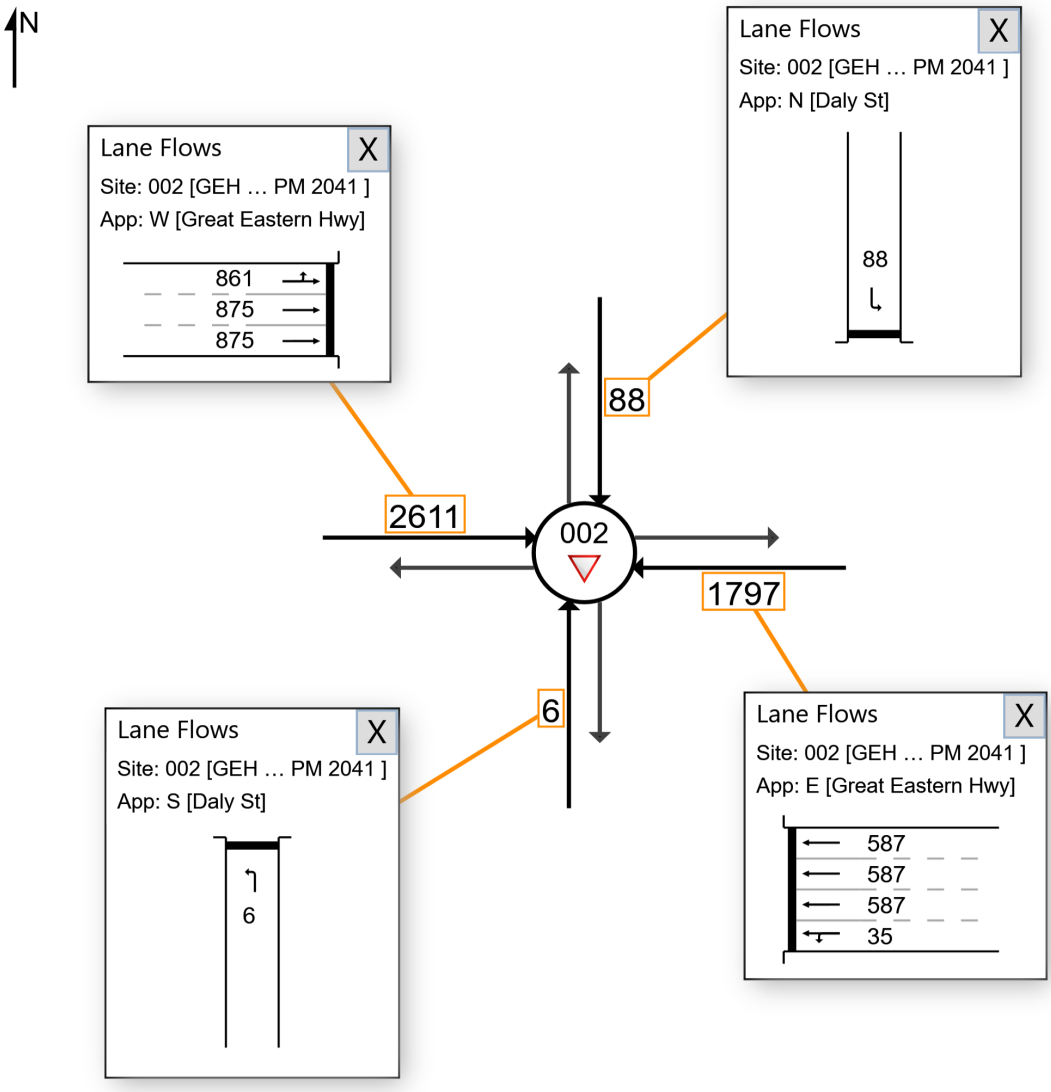
Close All Popups



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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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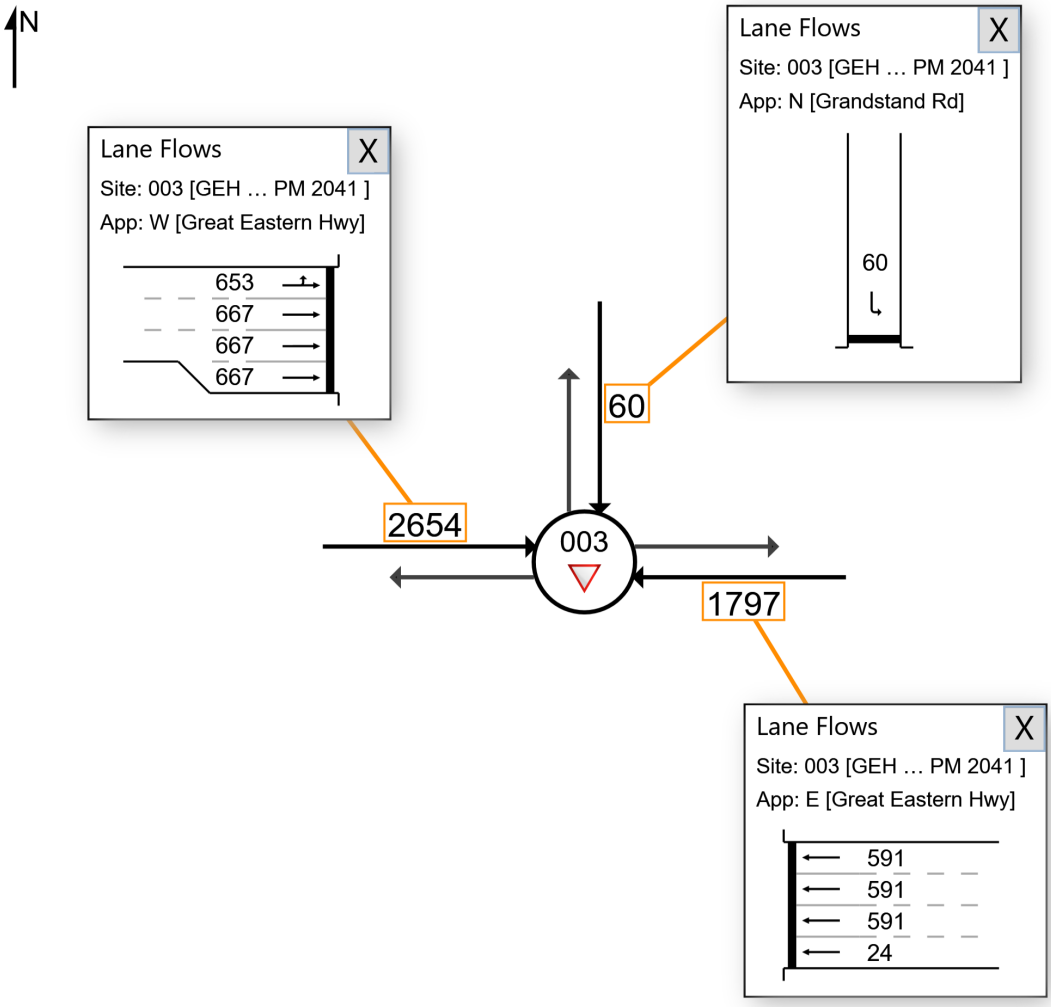

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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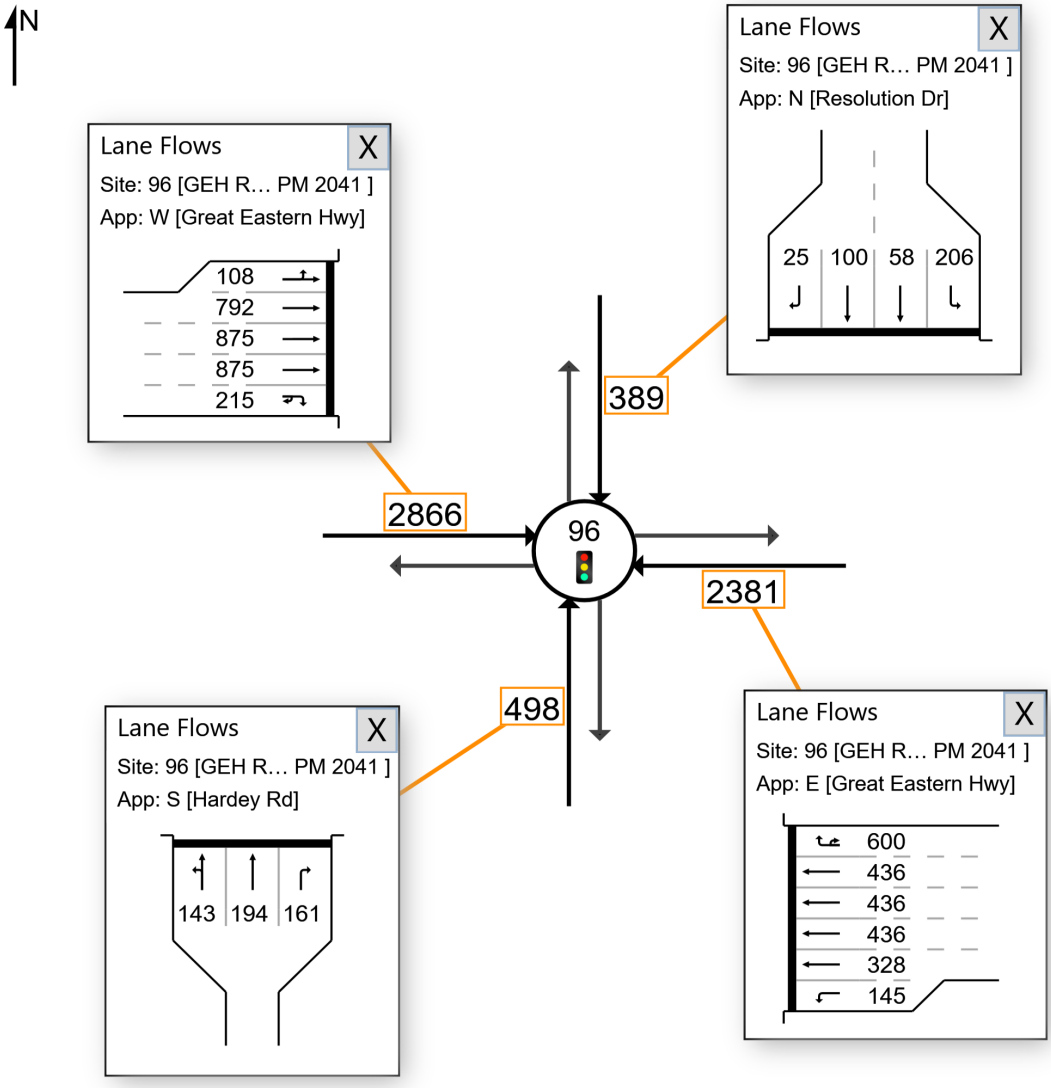

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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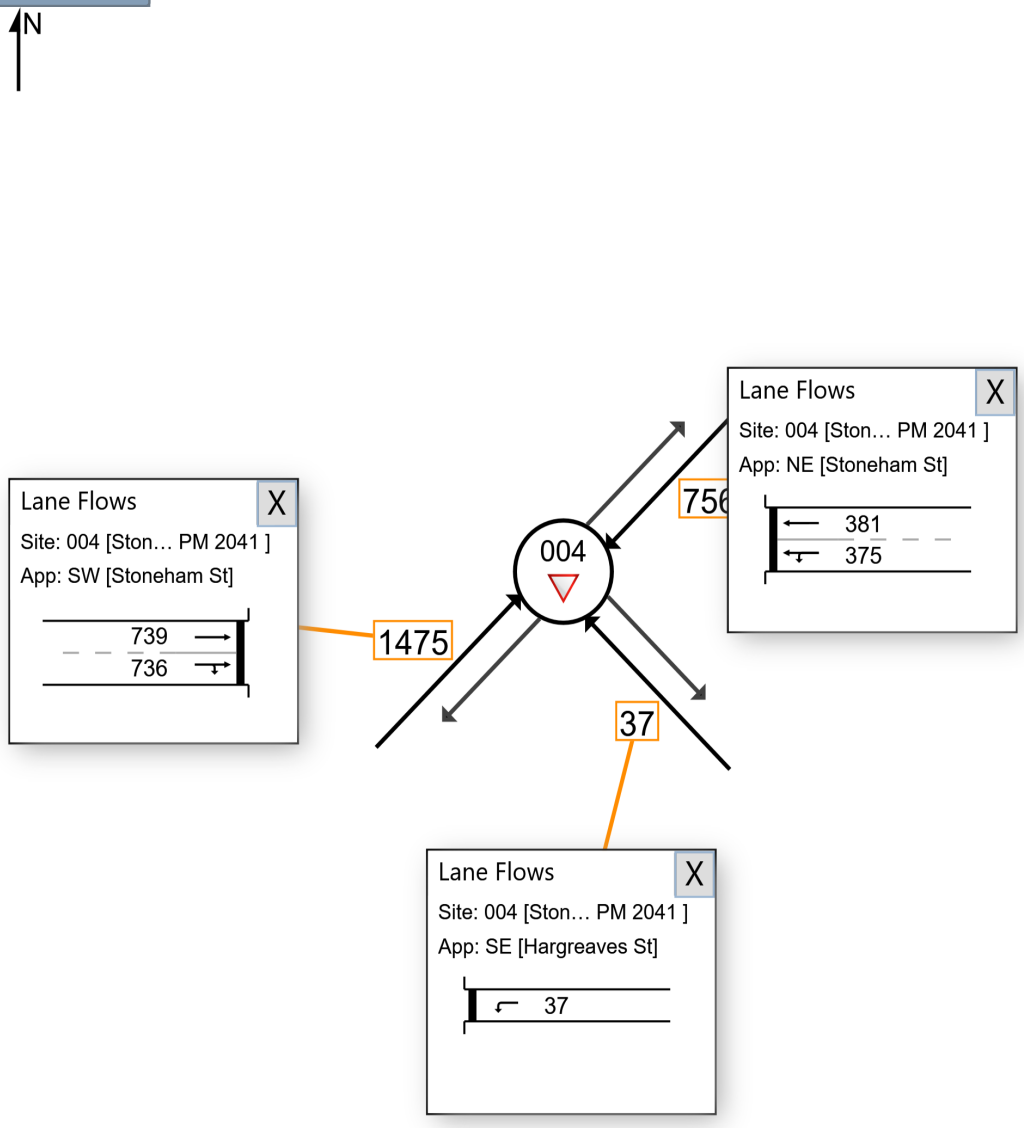

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

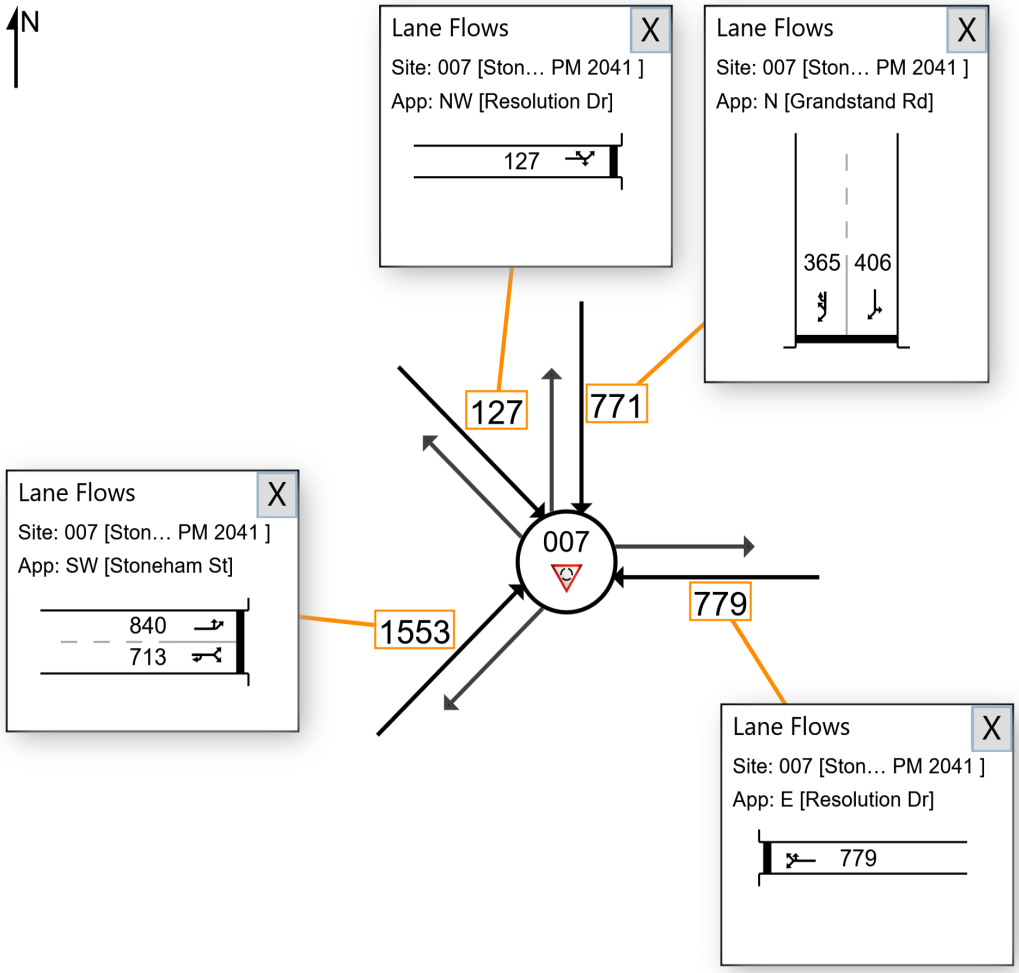
Site: 007 [Stoneham Grandstand Resolution PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

Stoneham St / Grandstand Rd / Resolution Dr
Roundabout
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 011 [Resolution Grandstand PM 2041 (Site Folder: 2041 PM Peak Proposed Network and Land Uses)]

Network: N101 [2041 PM Peak Proposed Network and Land Use (Network Folder: General)]

Resolution Dr / Grandstand Rd
Give Way
2041 PM Peak with proposed road network and land uses
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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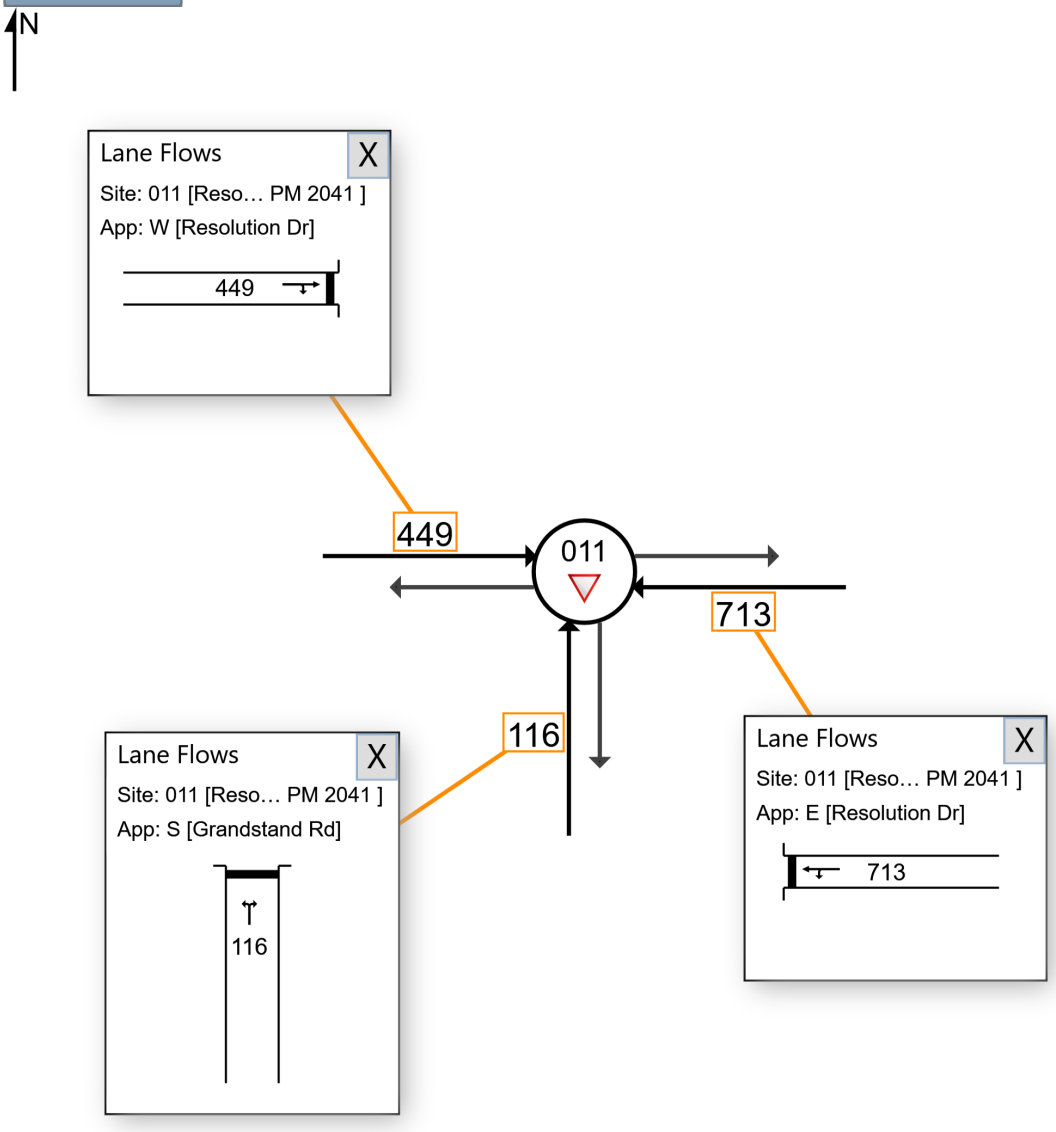

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 106 [GEH Stoneham Belgravia PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Stoneham St / Belgravia St
Traffic signals
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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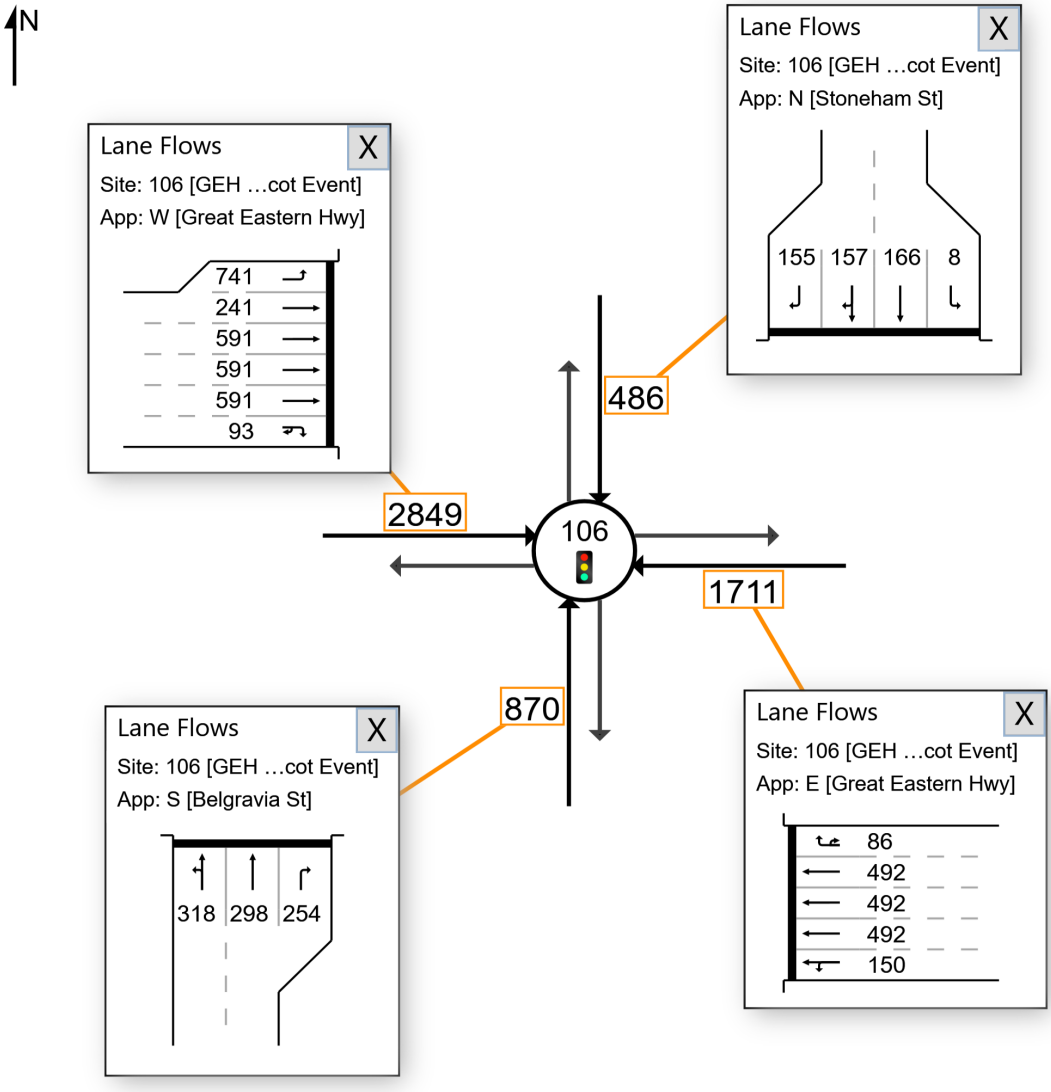

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 001 [GEH Hargreaves PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Hargreaves St
Left in Left out, Give Way
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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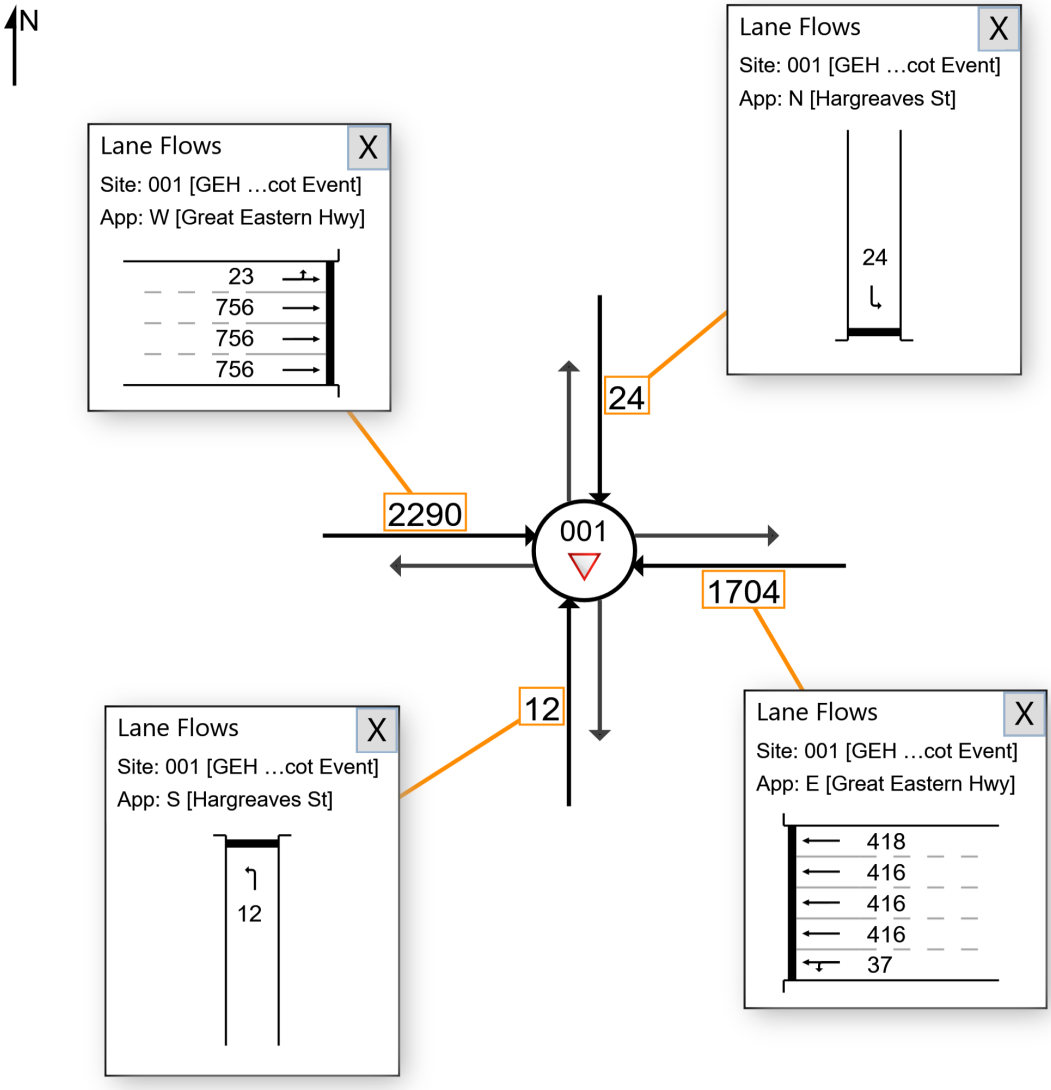

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 002 [GEH Daly PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Daly St
Left in Left out, Give Way
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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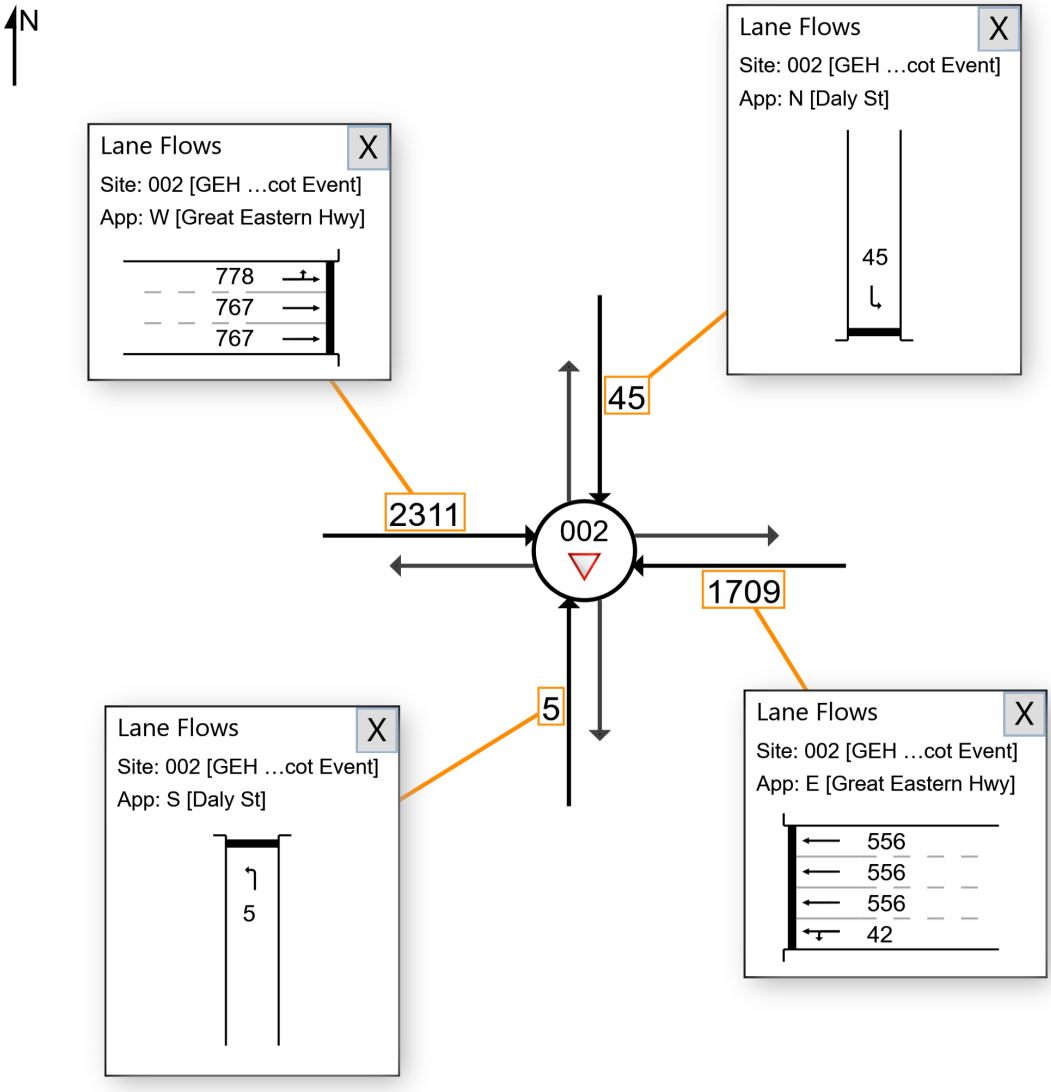

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 003 [GEH Grandstand PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Grandstand Rd
Left in Left out, Give Way
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Give-Way (Two-Way)

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
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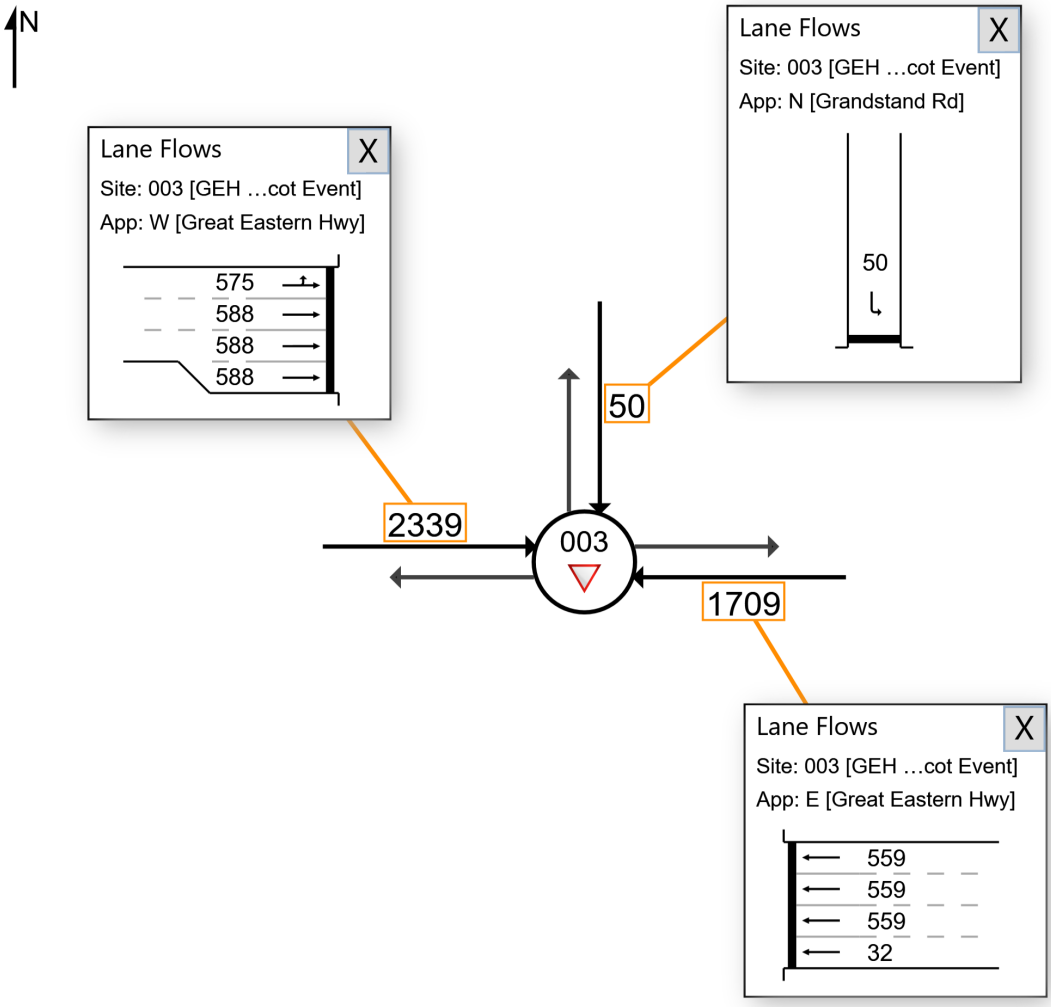

Some reduced upstream exit flow rates exist due to capacity constraint applied to oversaturated approach lanes. See Arrival Flows in Lane Summary reports.

APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 96 [GEH Resolution Hardey PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

GEH / Resolution Dr / Hardey Rd
Traffic signals
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 139 seconds (Site User-Given Phase Times)

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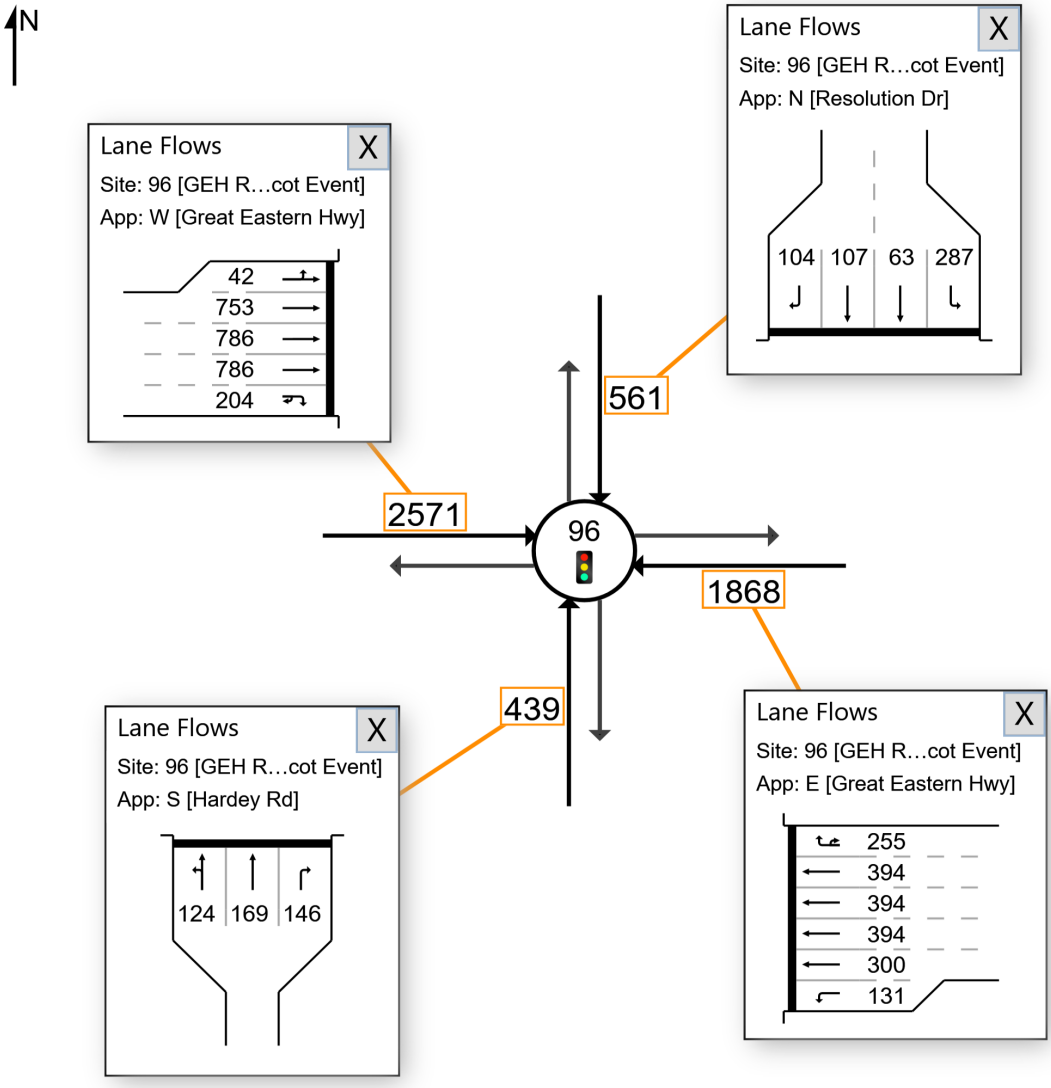

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APPROACH LANE FLOWS

Lane flow rates based on arrival flows including the effect of capacity constraint in Site analysis (veh/h)

All Movement Classes

Site: 004 [Stoneham Hargreaves PM 2021 Ascot Event (Site Folder: 2021 PM Peak Proposed Network ASCOT TEST)]

Network: N101 [2021 PM Peak Proposed Network Ascot Weekday Event (Network Folder: General)]

Stoneham St / Hargreaves St
All in Left out, Give Way
2021 PM Peak with proposed road network Ascot Event
Site Category: Existing Design
Give-Way (Two-Way)

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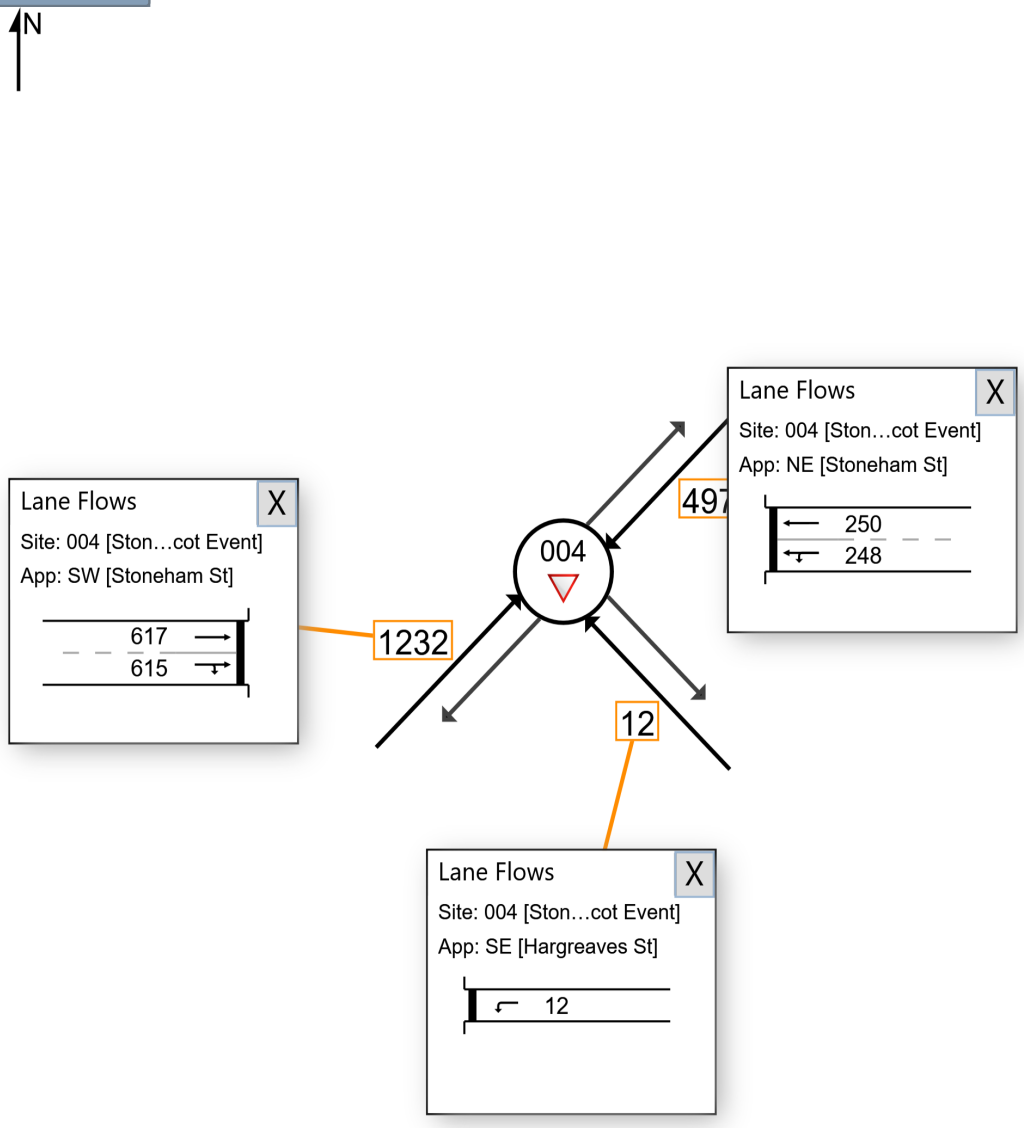

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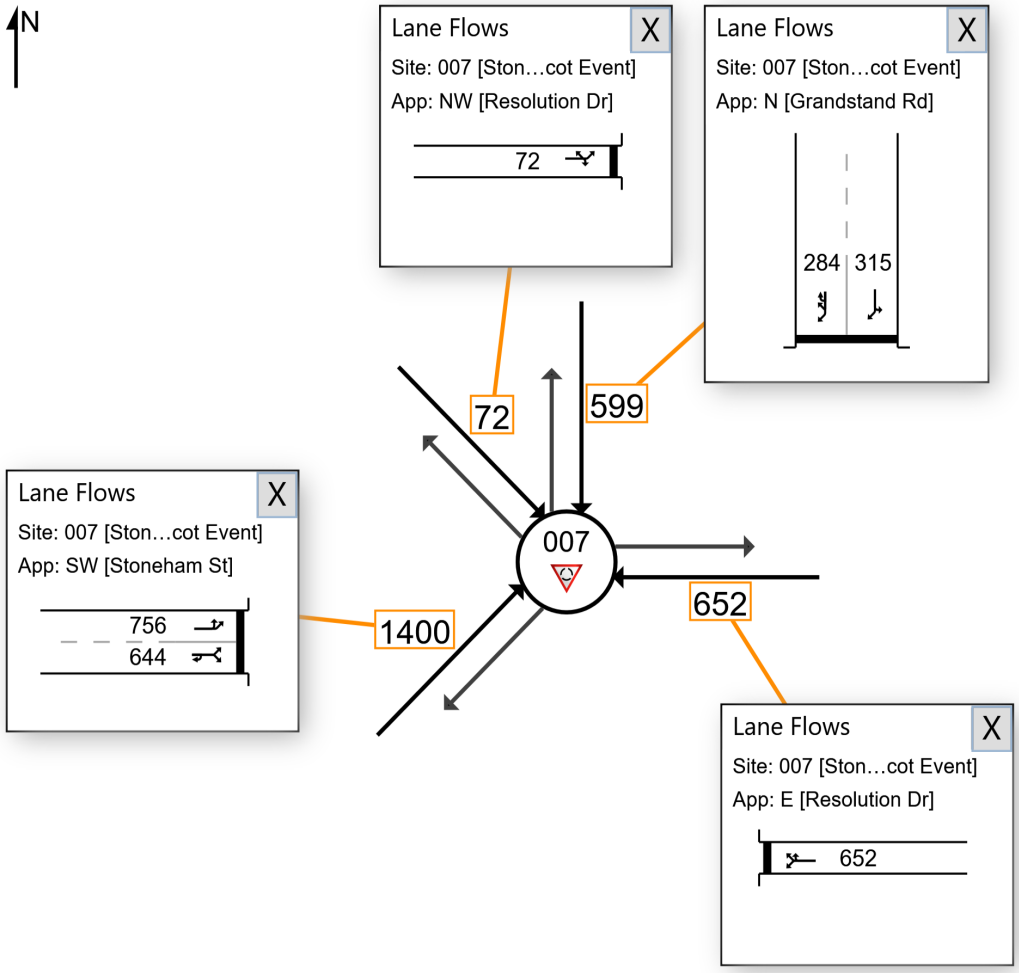

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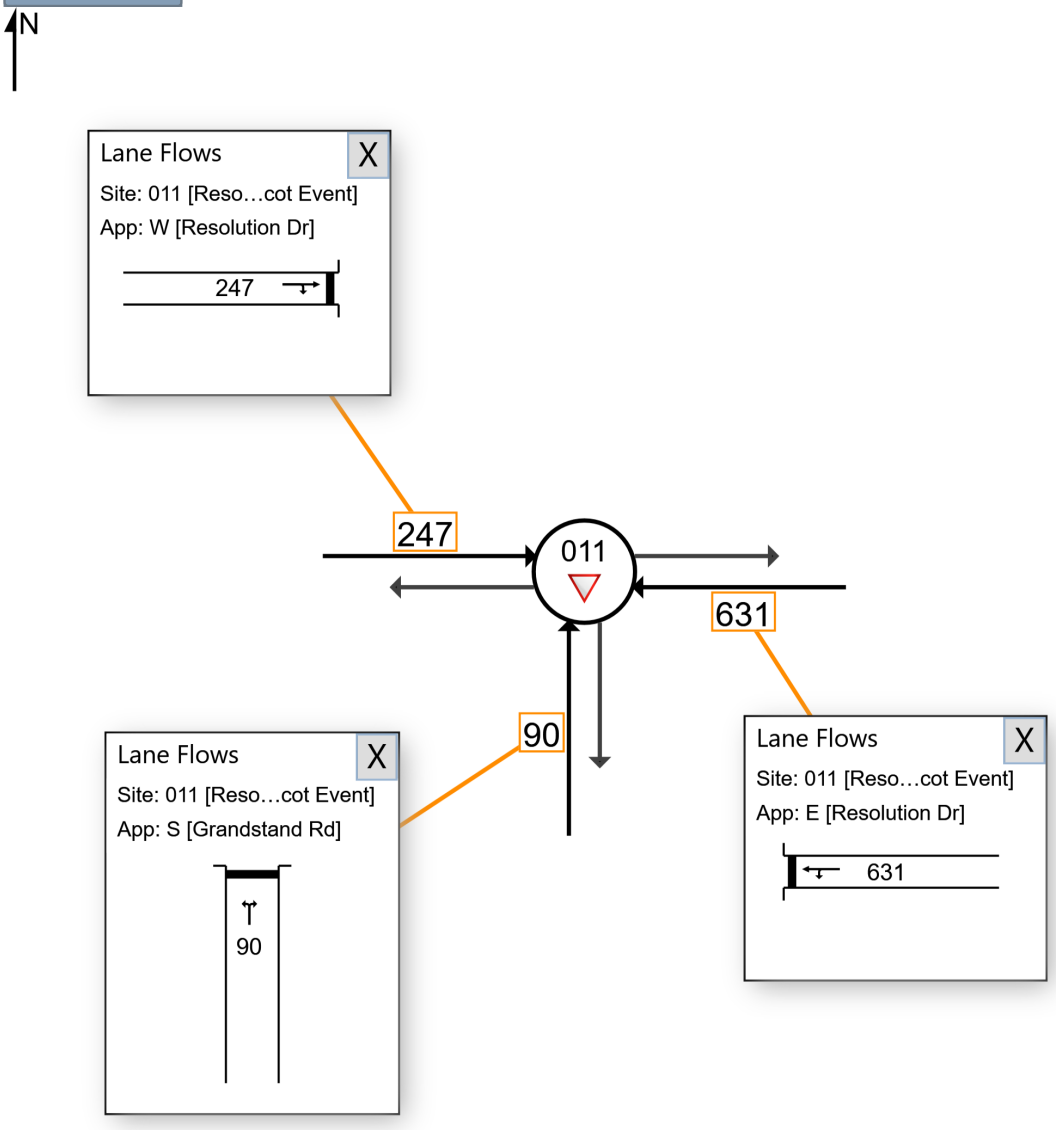

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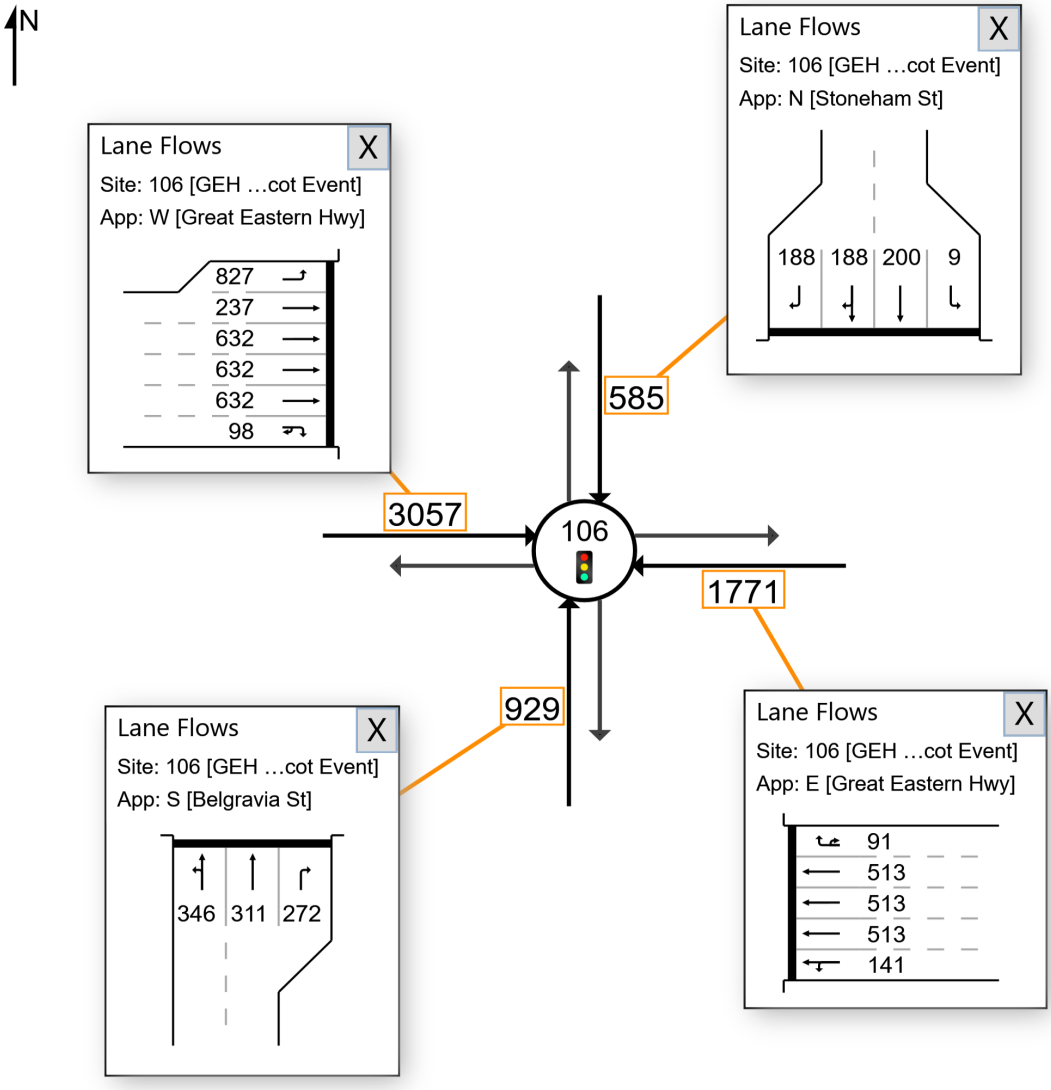

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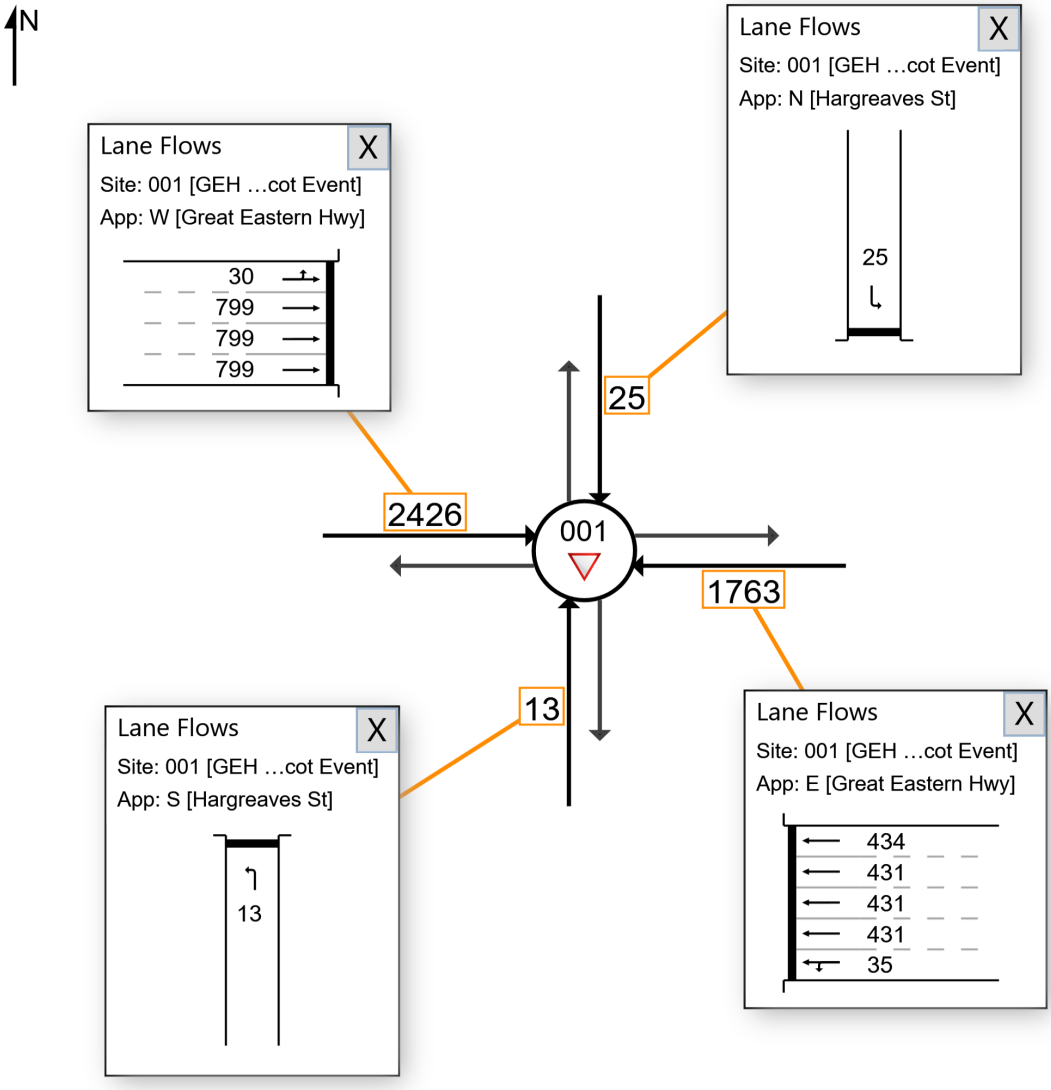

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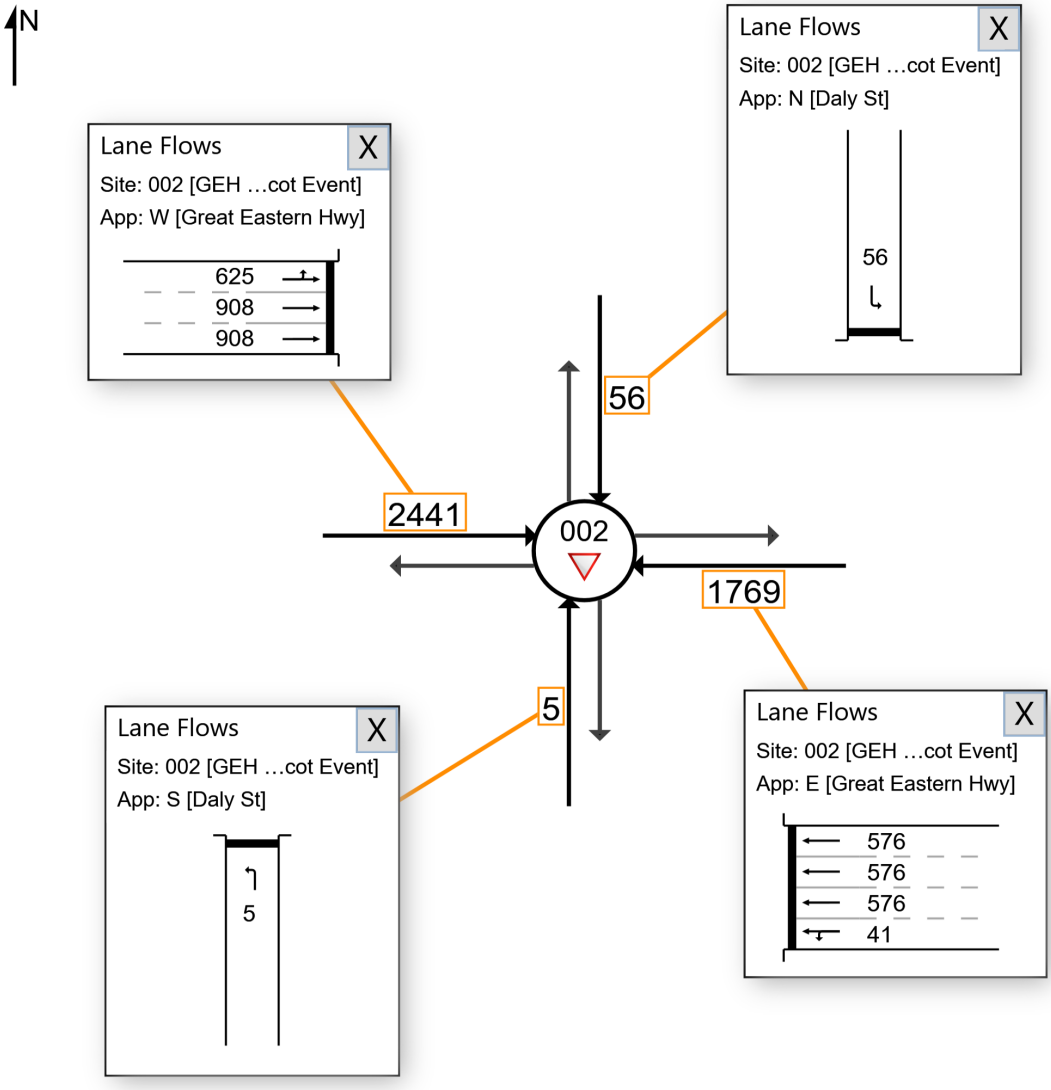

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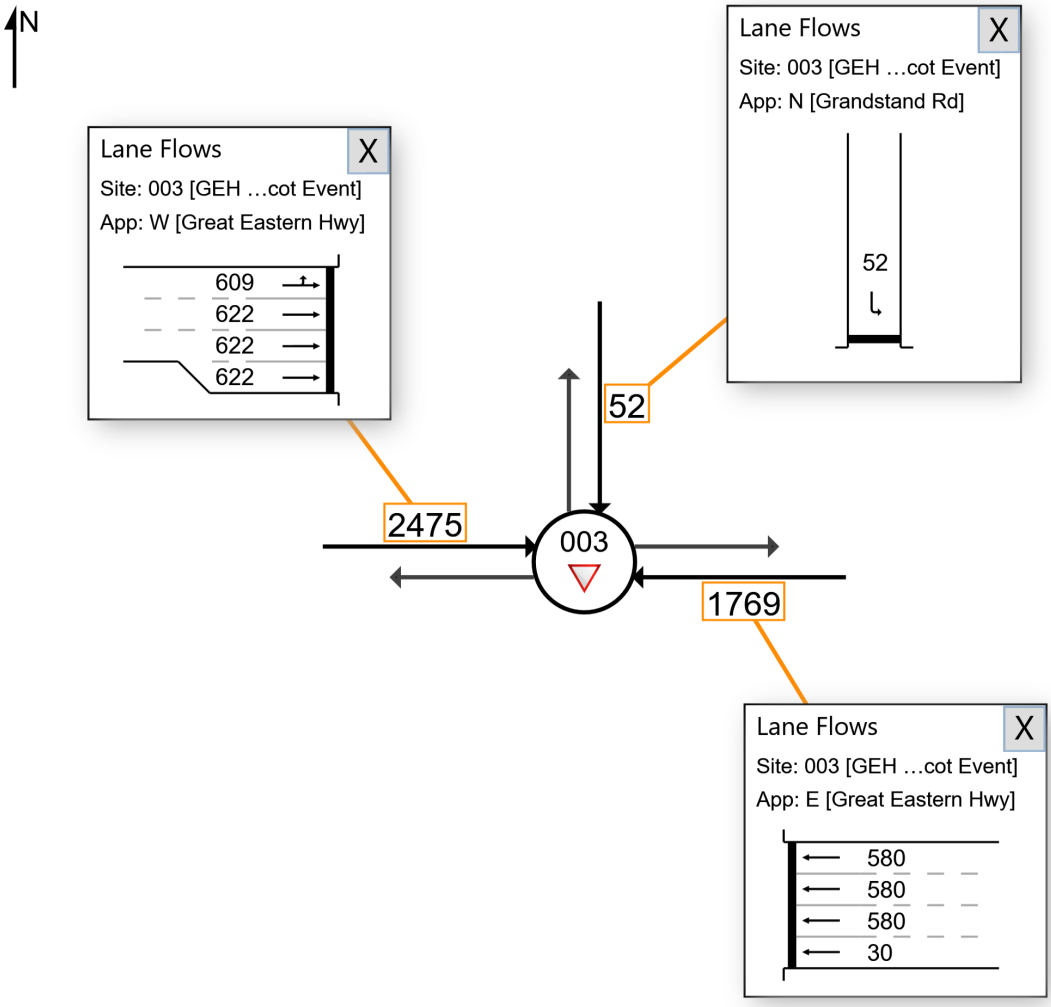

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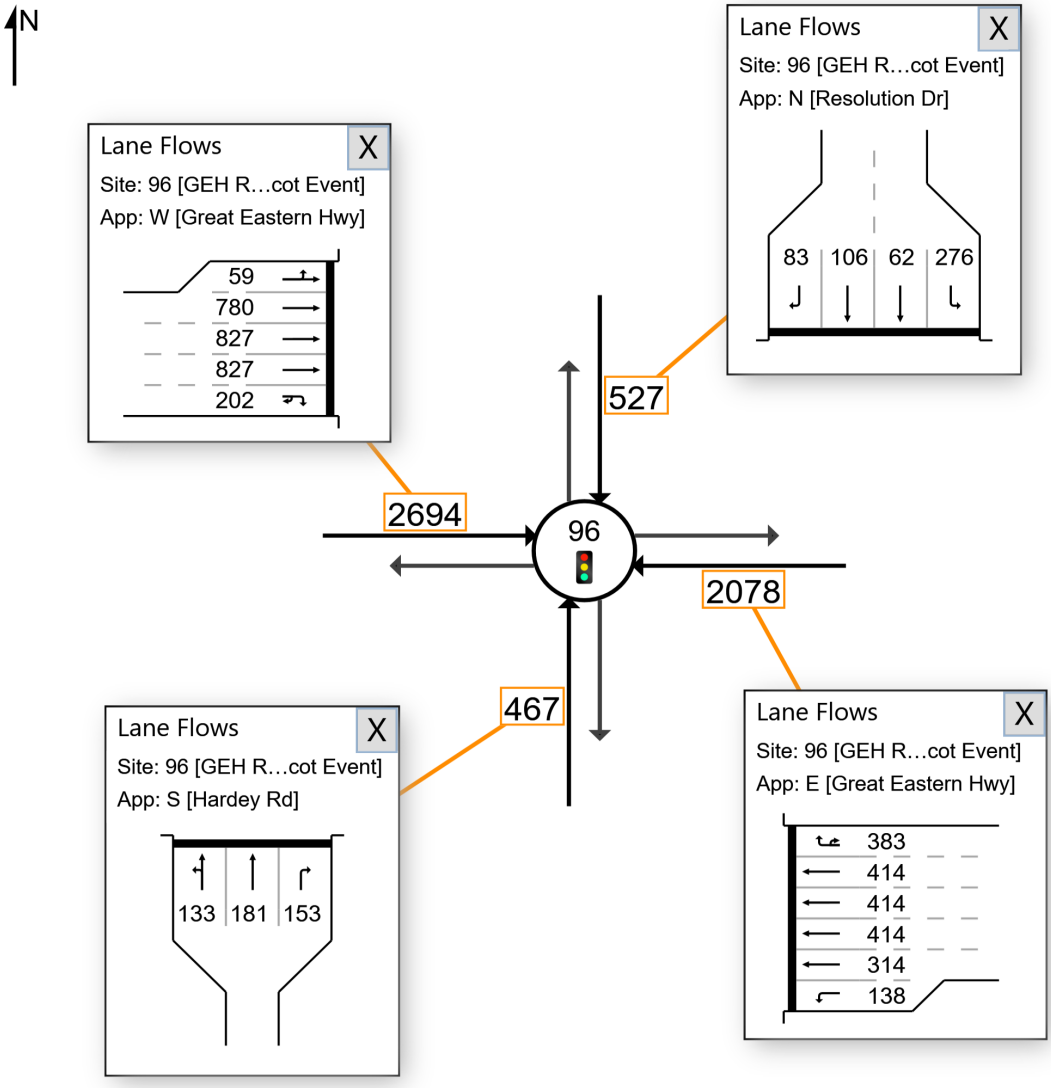

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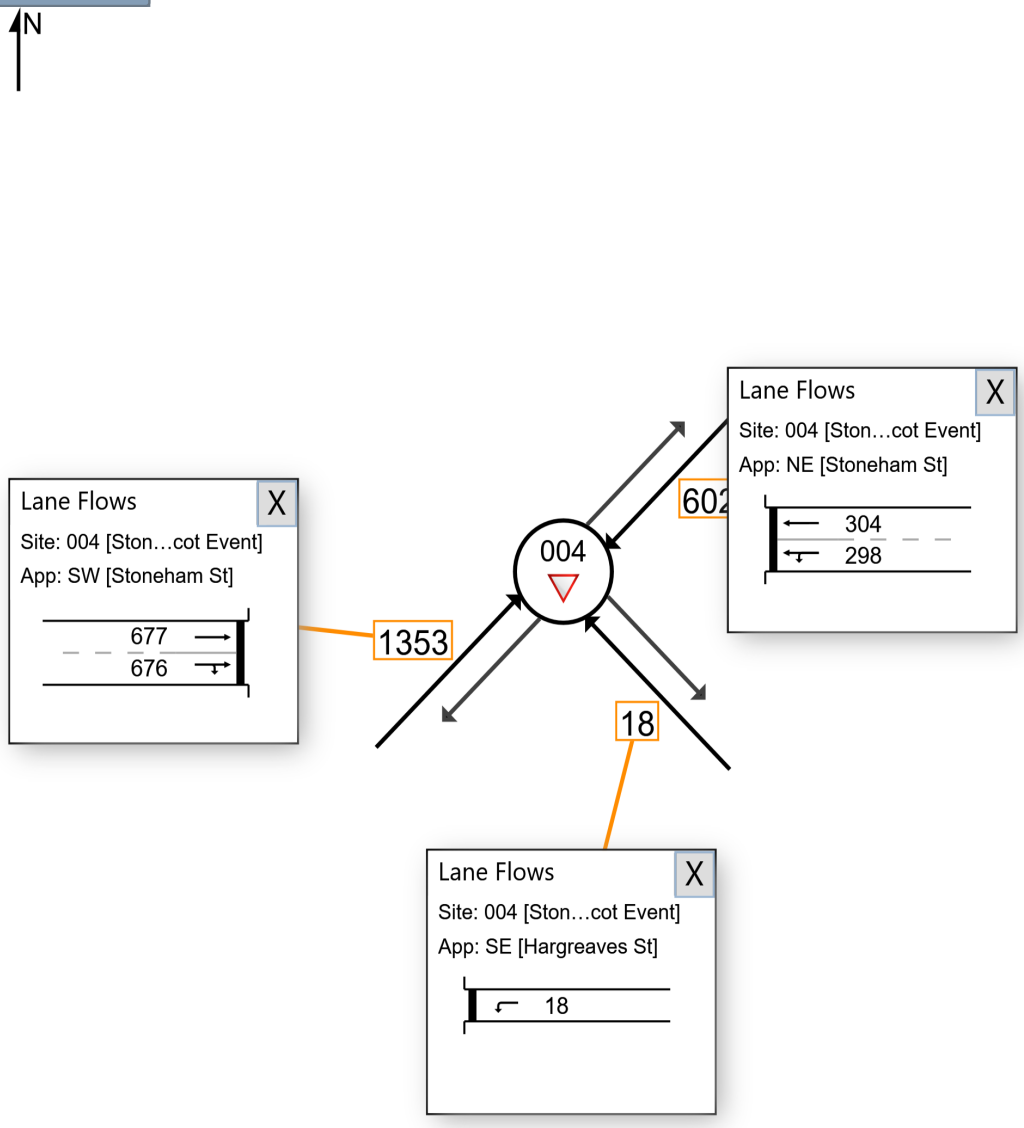

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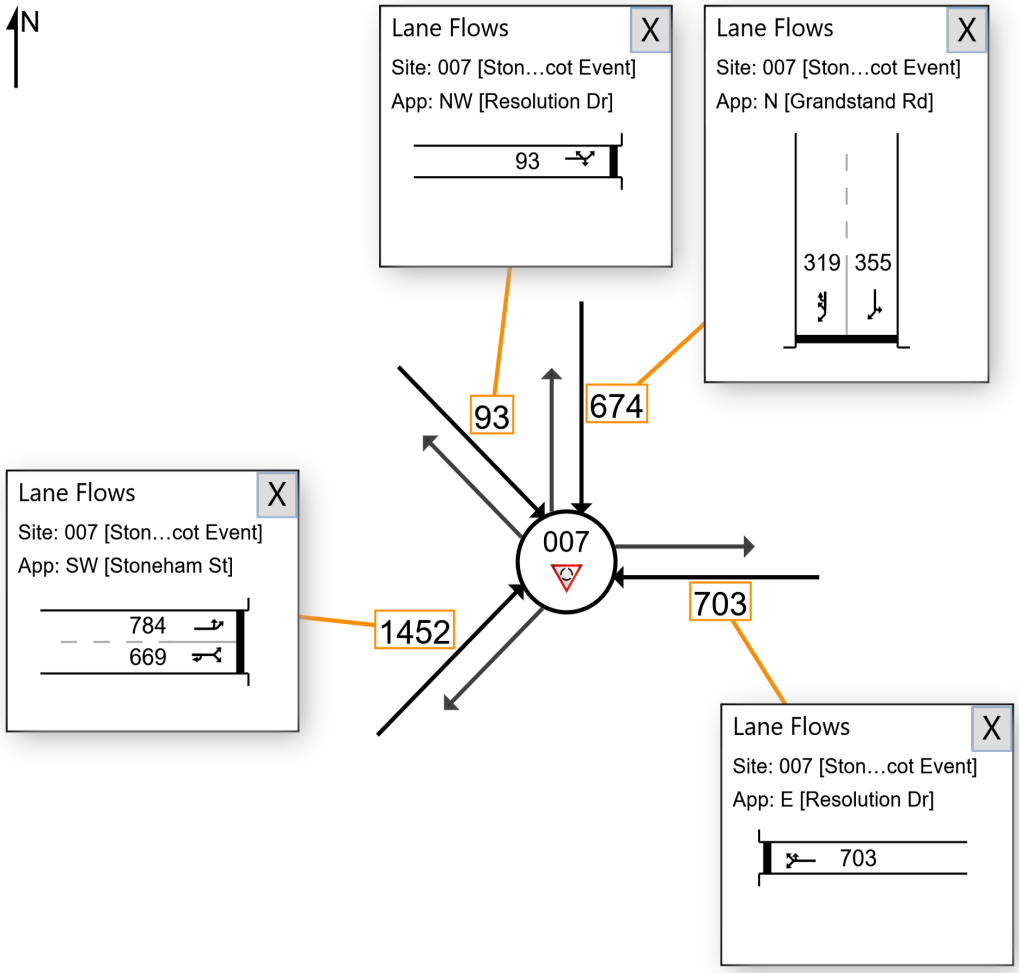

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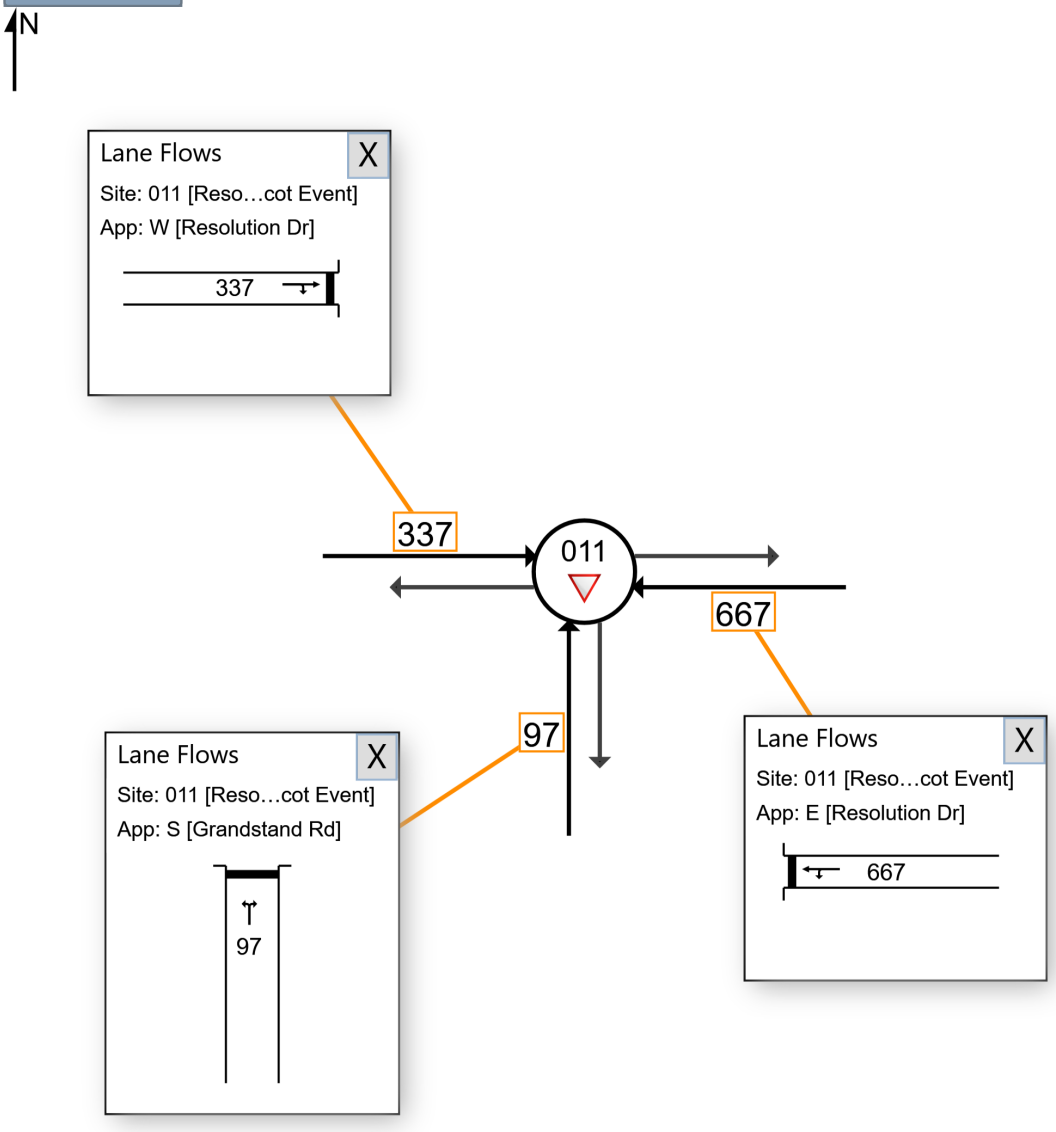

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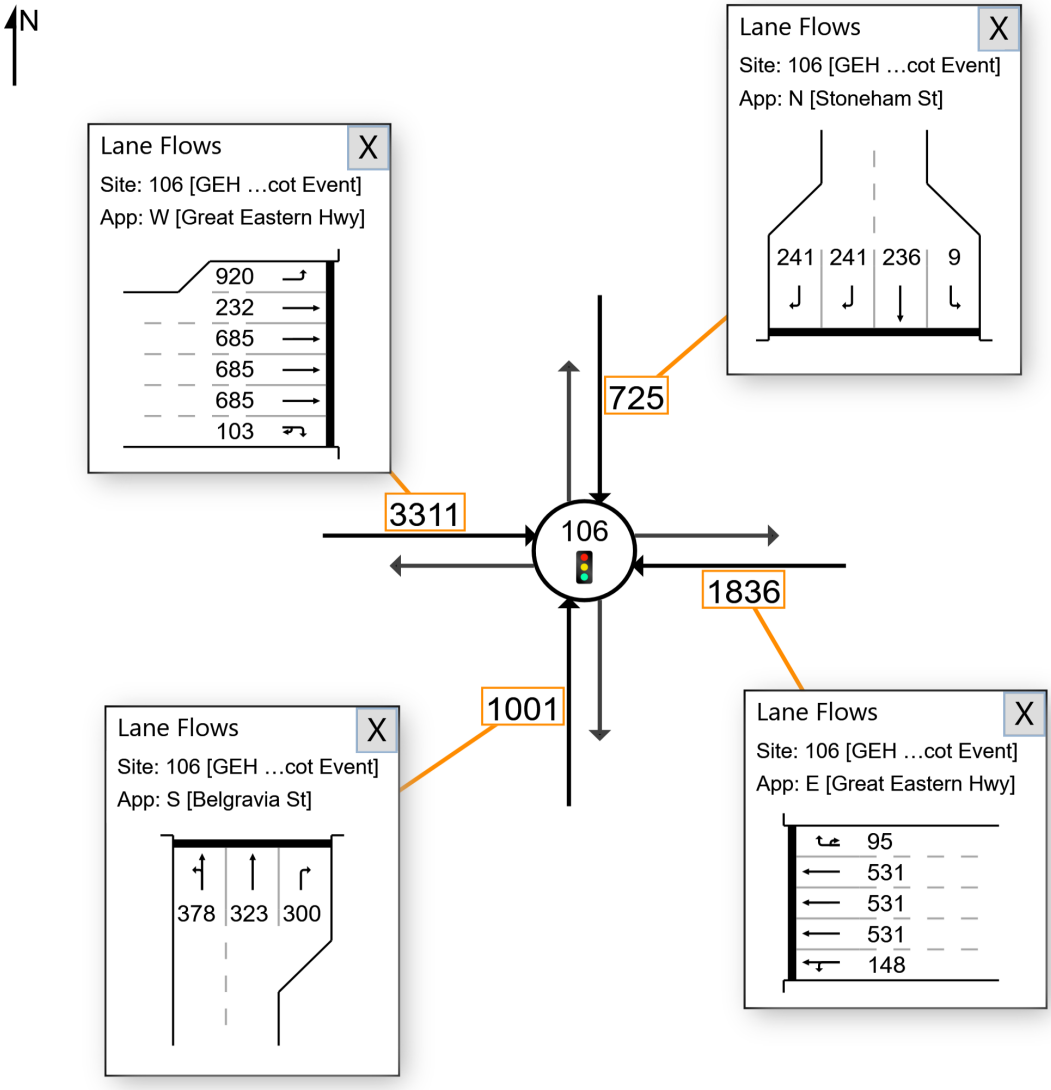

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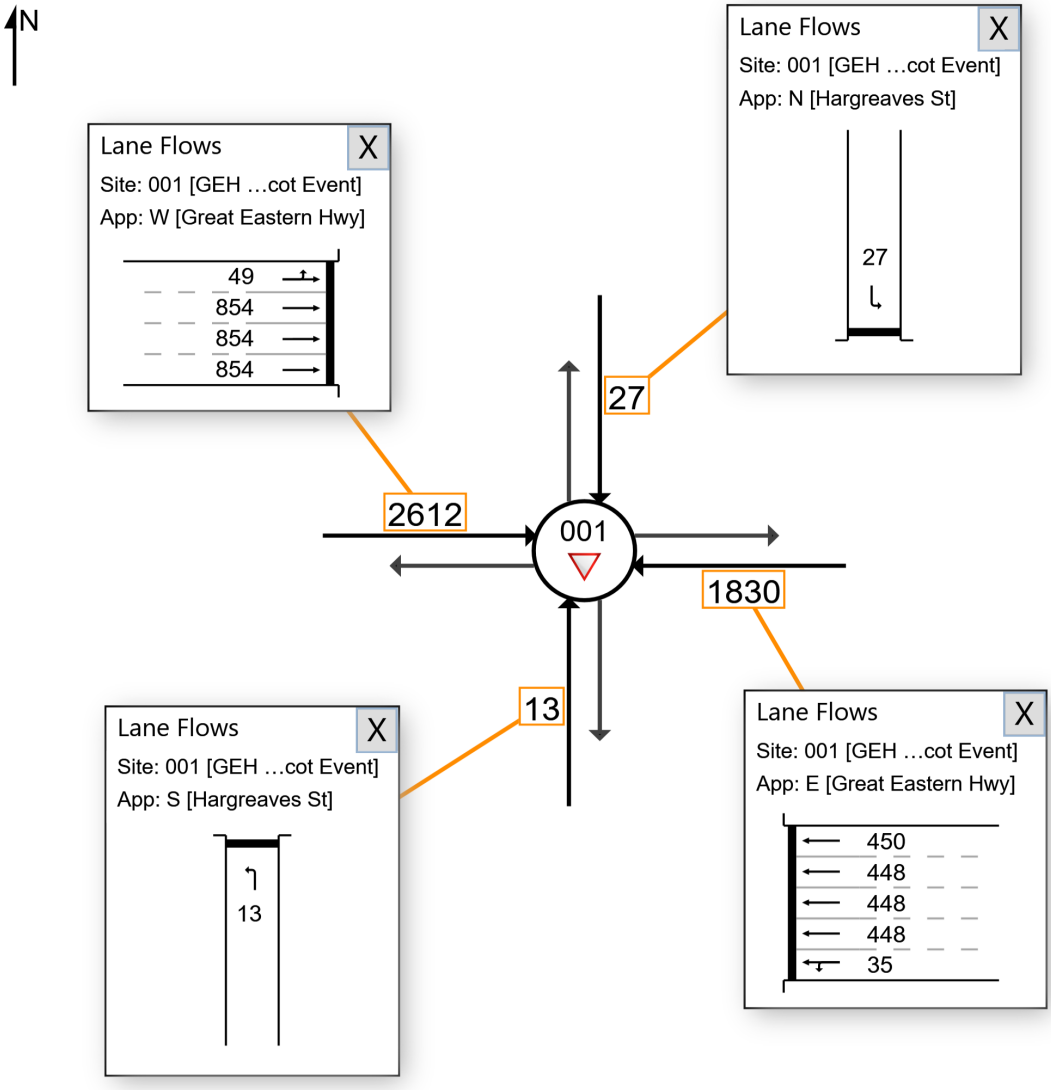

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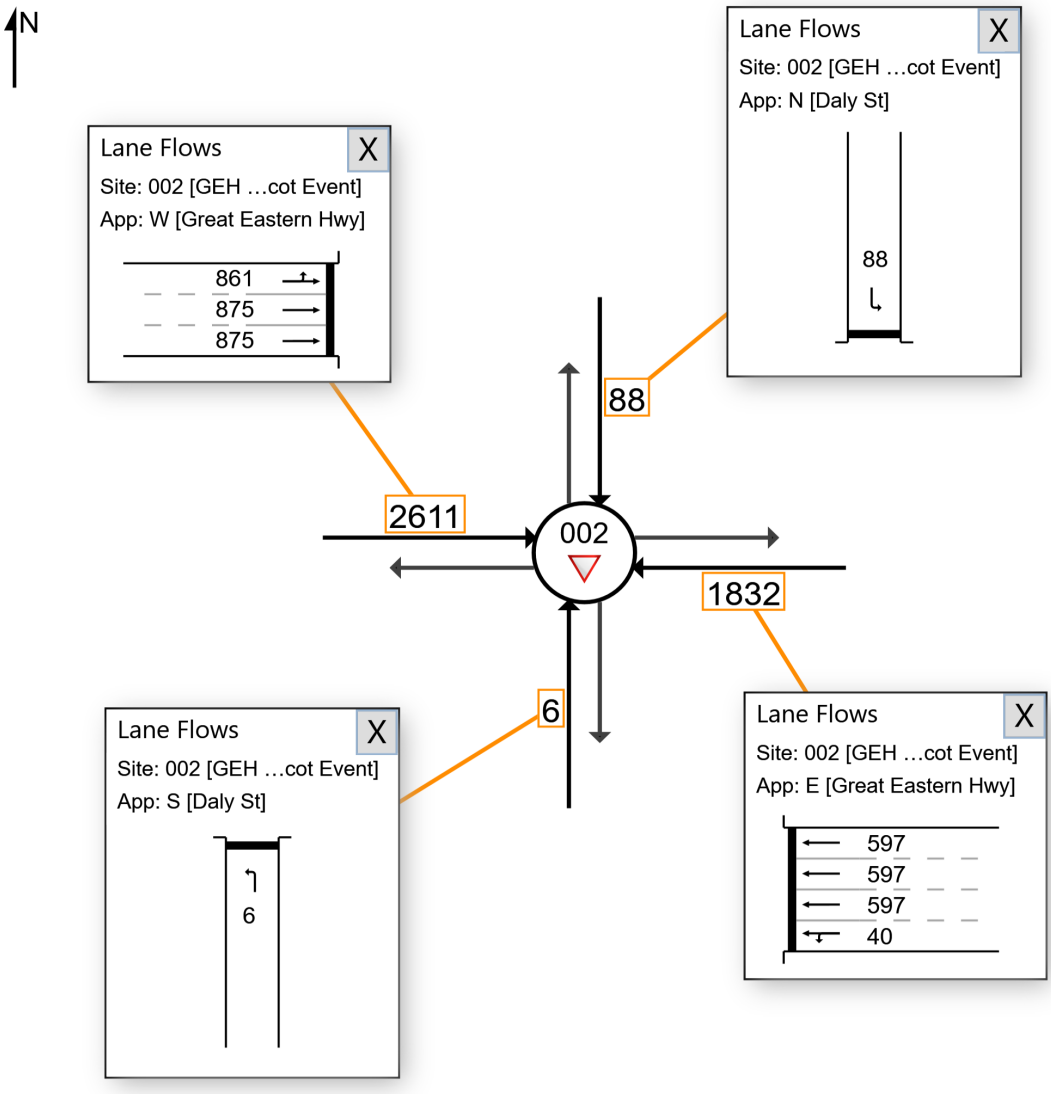

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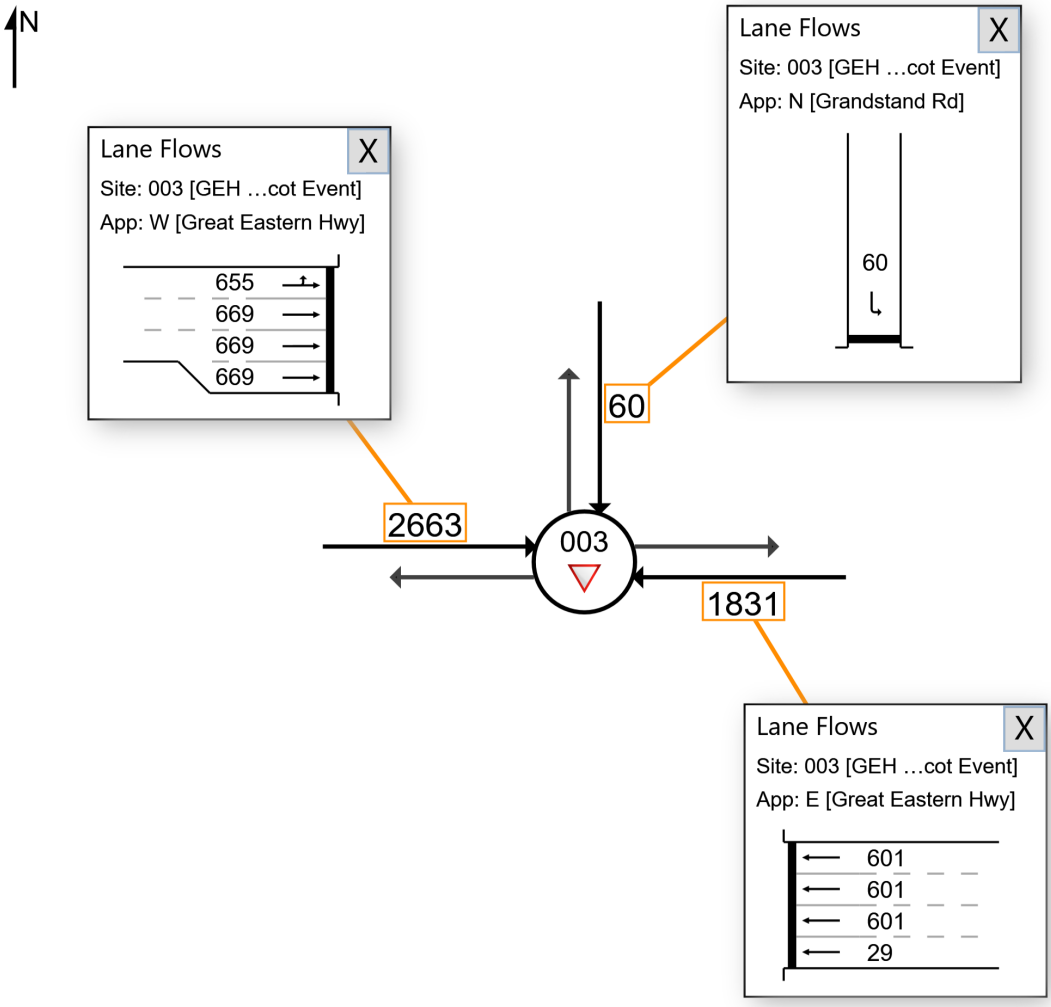

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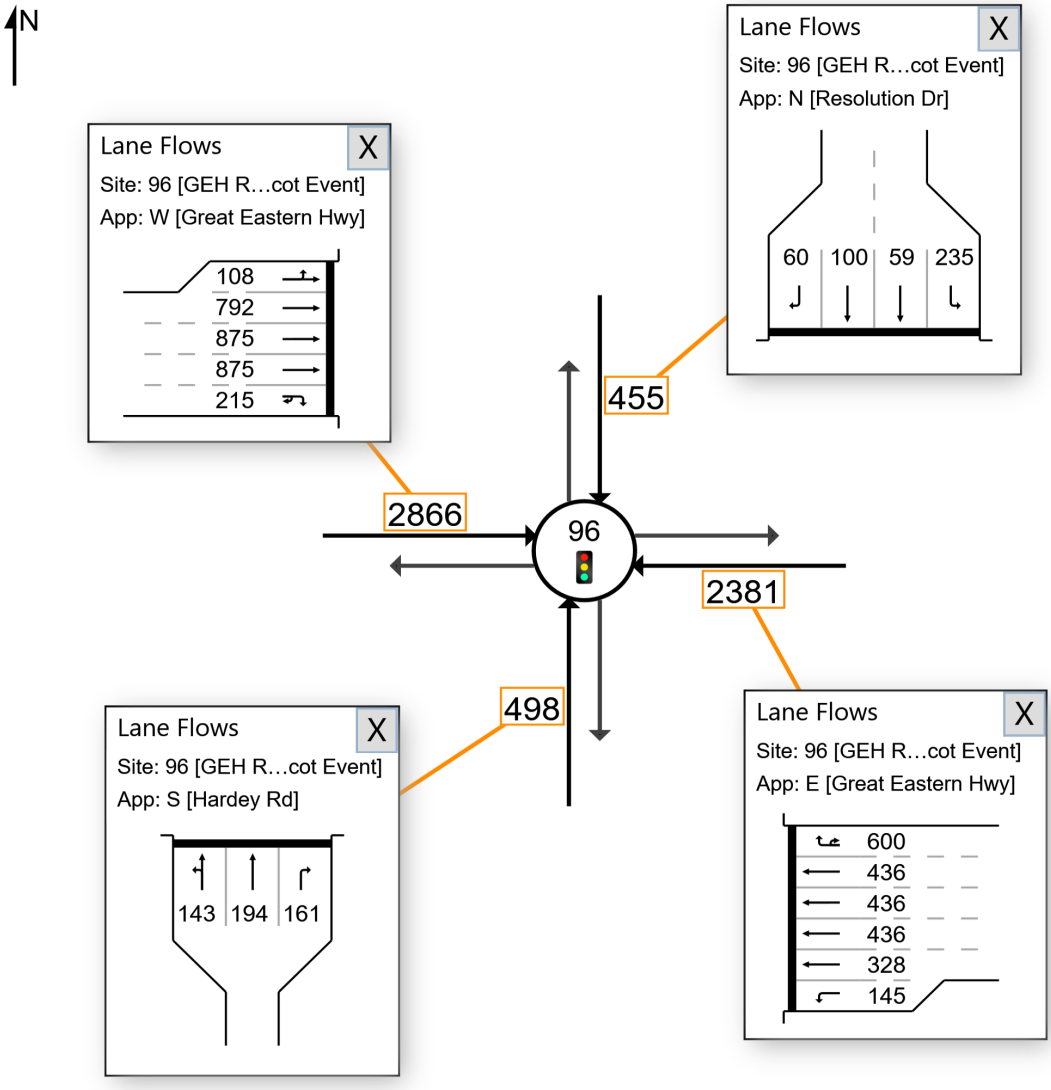

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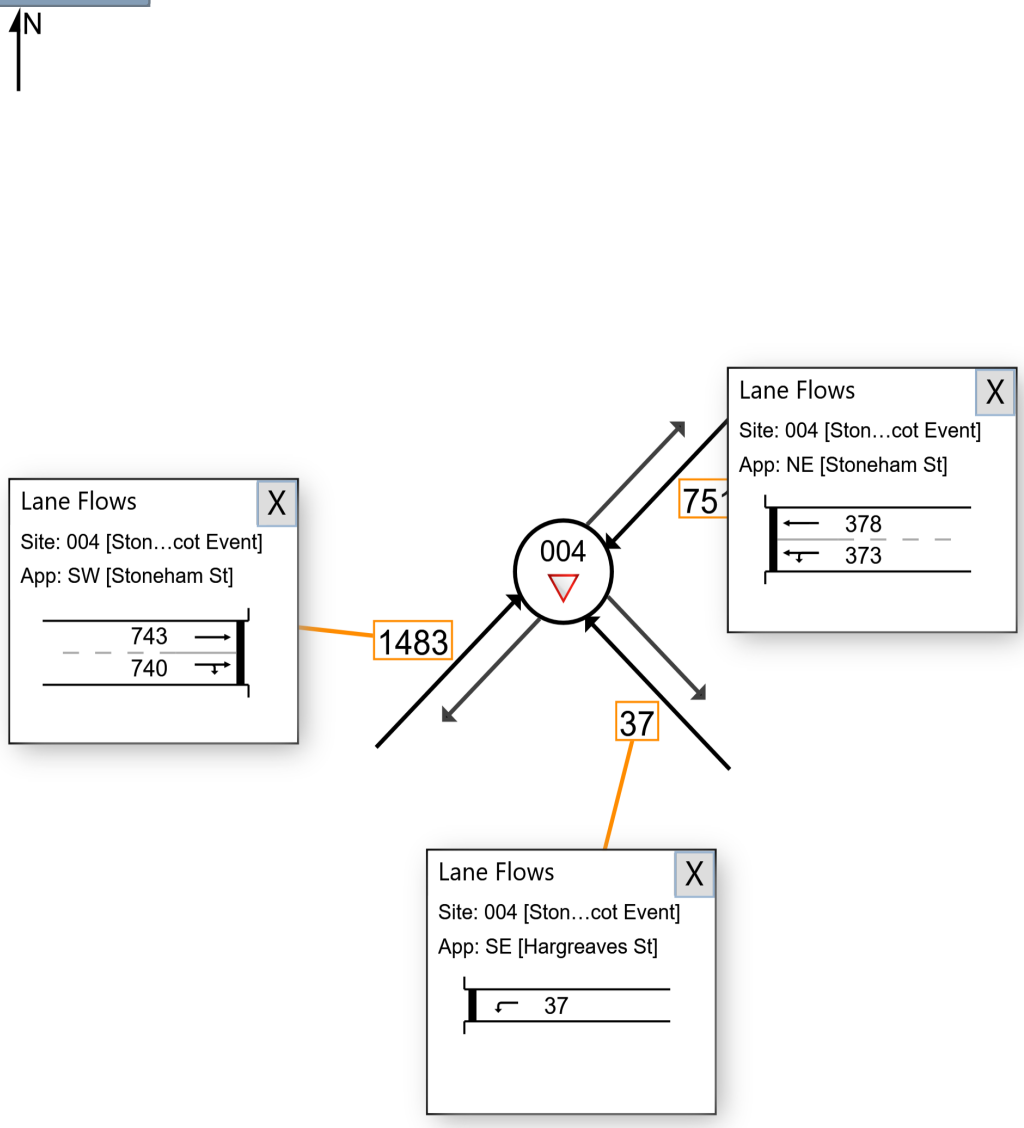

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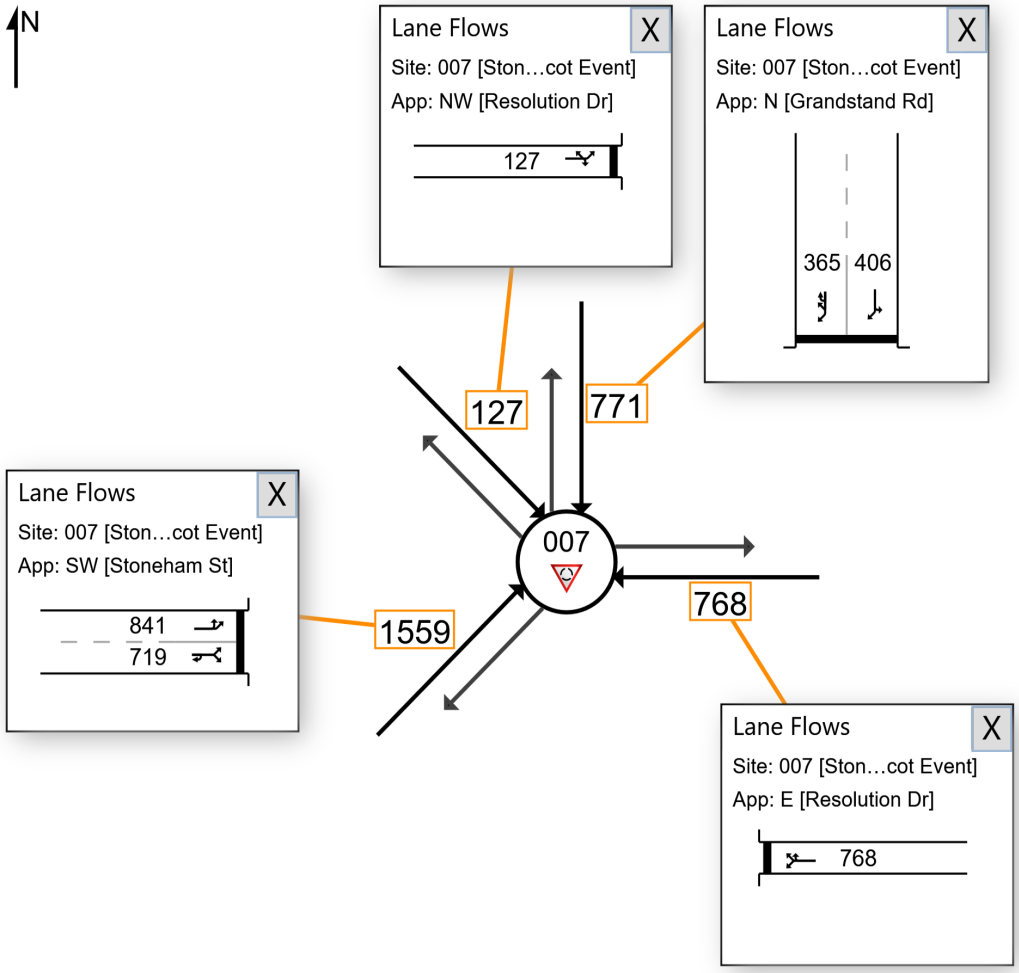

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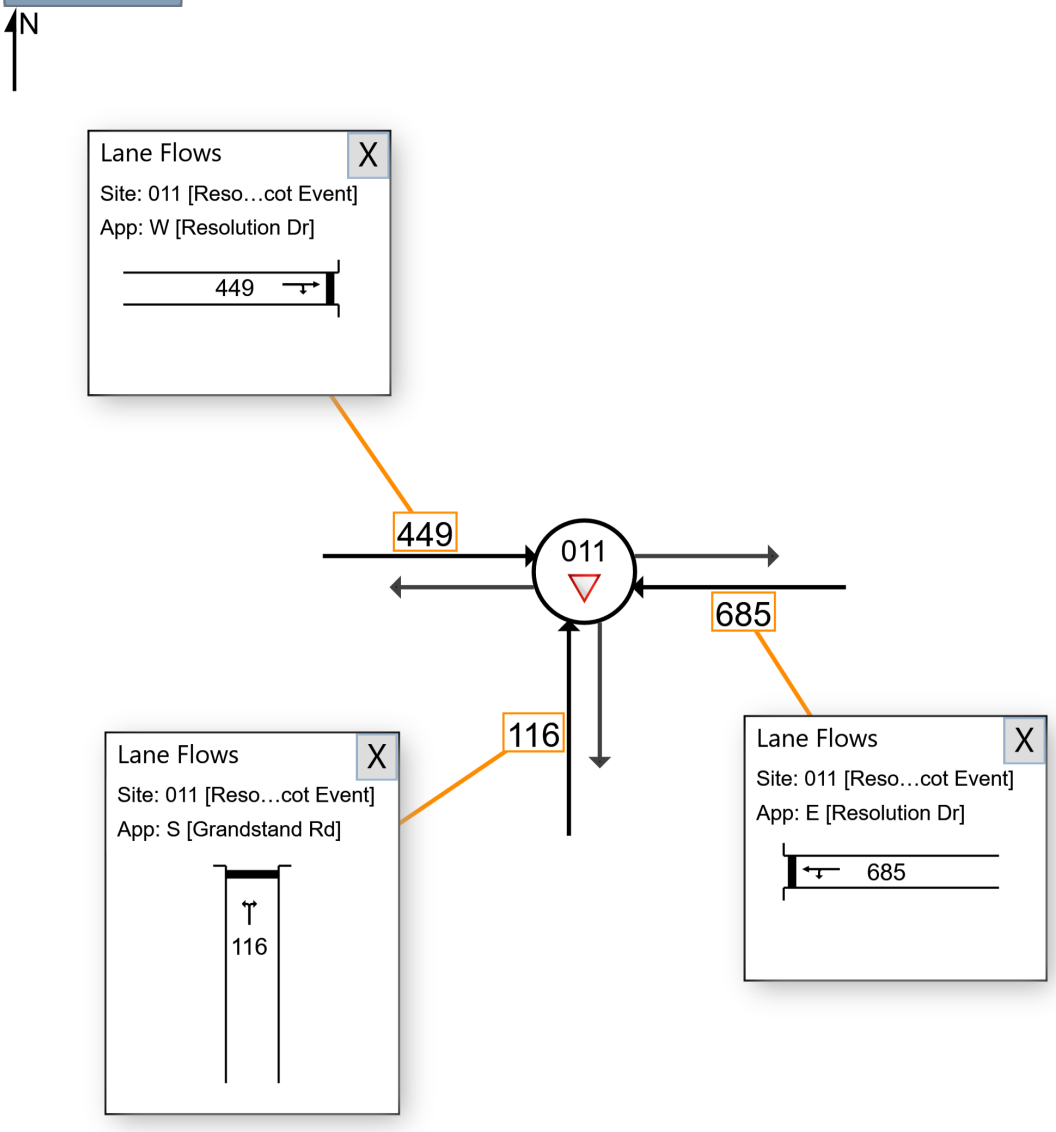

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A501

Infrastructure Assessment Report

Golden GatewayPrecinct

Prepared for
City of Belmont

5 May 2017

Cardno
Shaping the Future

Contact Information

Cardno (WA) Pty Ltd
Trading as Cardno
ABN 77 009 119 000

11 Harvest Terrace, West Perth WA 6005

Telephone: 08 9273 3888
Facsimile: 08 9486 8664
International: +61 8 9273 3888

wa@cardno.com.au
www.cardno.com

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Steven Hecker
Civil Engineer

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Senior Civil Engineer

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Executive Summary

The Golden Gateway Structure Plan provides a framework for the redevelopment of the Golden Gateway Precinct area into a “major growth area by 2031”.

Through close liaison with the relevant service providers, Cardno has researched and reported on the current capacity of the infrastructure and services within the Golden Gateway area. Cardno has also provided detailed findings and recommendations regarding the future infrastructure and servicing requirements that are needed to accommodate the redevelopment of the area as proposed by the Structure Plan.

In summary, Cardno’s assessment of the Golden Gateway Precinct in terms of required infrastructure for the Golden Gateway Structure Plan area is as follows:

- The Golden Gateway Precinct area faces a shortage in wastewater infrastructure to service the proposed increase in residential and commercial activity.
- There is currently capacity in the existing HV feeders to supply the proposed development with power. However, Western Power advise power capacity cannot be reserved, and that subject to other developments in the area, a new HV feeder may be required to fully support the development.
- Upgrades other than the required major infrastructure upgrades as outlined in this report infrastructure will be rolled out in response to new development within the subject area.
- It is recommended that a working group between the City of Belmont and Water Corporation is set up in order to help plan and coordinate precinct development and staging with any Water Corporation trunk infrastructure capital works.
- National Broadband Network (NBN) Co. has not yet rolled their infrastructure across the Golden Gateway Precinct. It is recommended that the City of Belmont liaise with NBN Co. as per the *Best practice guide for Councils when initially dealing with NBN Co* document.

In conclusion, based on advice received by Cardno from the relevant service authorities, there should be no reason from a servicing point of view that the Golden Gateway Precinct Structure Plan could not be implemented with the proposed infrastructure upgrades outlined in this report.

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Appendices

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1 Background

1.1 Introduction

Cardno was engaged to assist the City of Belmont, in conjunction with the Department of Planning to undertake an infrastructure and services strategy for the Golden Gateway precinct, Ascot. The strategy will help guide the preparation of a Local Structure Plan over the area.

The scope of works includes:

- Review of planned growth area;
- Provide analysis of existing services infrastructure, including;
  - Water;
  - Sewer;
  - Power;
  - Gas; and
  - Telecommunications
- Identification of future service demands;
- Liaison and engagement of services providers; and
- Development of reports.

Cardno assessed the infrastructure to inform the City on decisions around the long-term provision of electrical energy, natural gas, potable water, wastewater disposal, along with high speed data /telecommunications for the growth areas.

The findings and advice presented in this report is based on Cardno's observations, experience from similar projects and responses from various service providers and stakeholders.

The investigations and preparation of this report have largely been based on preliminary advice from the various Service Authorities. The information is current as of April 2017 and is subject to change as development proceeds.

1.2 Location

The subject area is located in Ascot, and is generally bounded by Great Eastern Highway, Stoneham Street, Grandstand Road and Resolution Drive. It includes the Belmont Trust Land, a portion of the Ascot Racecourse site as well as the Western Australian Turf Club headquarters and Ascot Kilns. The extent of the subject area is shown in **Figure 1-1**.

Figure 1-1 Golden Gateway Subject Area

2 Water

Water Corporation Western Australia is the state authority regulating the distribution infrastructure for water reticulation in the area.

2.1 Existing Infrastructure

The Serpentine Trunk Main runs along Grandstand Road and Daly Street. There is also a 915 steel distribution main running along Grandstand Road through the subject area. The existing lots are well serviced with a mixture of 100, 150 and 200 dia reticulation pipes made of asbestos cement, cast iron, PVC and steel.

Cardno Drawing *CW942300-CI-SK2* in **Appendix A** shows the location of the existing power infrastructure within and adjacent to the subject area.

2.2 Required Infrastructure

The Golden Gateway Precinct is located in the Supply Scheme area. It is difficult to ascertain exactly what capacity the current infrastructure network has without full water network modelling carried out by Water Corporation. However, Water Corporation does not foresee any issues with servicing the proposed scheme with potable water at the time of this report.

Exact water infrastructure upgrades will be determined when Water Corporation carries out full water network modelling. Water Corporation has advised that water reticulation planning and modelling will be done after Structure Plan and rezoning is confirmed, effectively at development application phase. The Water Corporation provided initial advice to Cardno and in their advice; they offered the following key points.

- Water Corporation will upgrade the headwork's, pipe equal to or greater than 300mm diameter and pump stations, as and when required. However, headwork's charges will be charged to the developer. Minor reticulation works, typically pipework less than 300mm diameter, are to be funded directly by the developer.
- All temporary works associated with any development within the Golden Gateway Precinct is to be funded directly by the developer.
- Redevelopment areas within the Golden Gateway Precinct need to integrate water efficiency technology and design approaches into the area and buildings in line with Water Corporation's 'Water Forever 2009" document. This will require a local water management strategy that includes local scale water balancing and identifying water efficiency measures such as; rainwater reuse, appropriate fittings, irrigation smart systems, planting and soil types and drainage collection and reuse.
- Water Corporation advises that a Development Area Plan be commissioned to support development in the Golden Gateway Precinct and submitted to Water Corporation once the Structure Plan has been finalised. This should include a plan identifying the proposed development, densities and likely staging and timeframe. Accompanying this should be a water management strategy outlining how water efficiencies are to be met along with engineering plans detailing proposed works and estimates. The water efficiency targets are to be determined by the City of Belmont in consultation with Water Corporation. Water Corporation runs a Waterwise Development Program that enables developments that have applied water efficient principles to be recognised and endorsed by Water Corporation.
- Water Corp recommends a consolidated approach to the requesting and programming of works to minimise disruptions and maximise cost efficiencies. Water Corporation recommends any reticulation reinforcement or new work should be managed by the City of Belmont due to the fractured land ownership within the area. It is recommended that a working group between the City of Belmont and Water Corporation is set up in order to help plan and coordinate precinct development and staging with any Water Corporation trunk infrastructure capital works.

Additionally, Water Corporation have advised that some existing cast iron water mains will need to be replaced as they are ageing and to increase capacity necessitated by increased demand arising from the proposed higher density development. These may need to be replaced by the developer or alternatively a request can be put to the Water Corporation cast iron replacement program.

Identification of required infrastructure upgrades requires detailed water modelling and more specific demand inputs. Water reticulation planning will be done after Structure Plan and rezoning is confirmed.

3 Wastewater

The Water Corporation (WC) of Western Australia is the main service provider regulating the distribution, storage and disposal infrastructure for wastewater in the Ascot area.

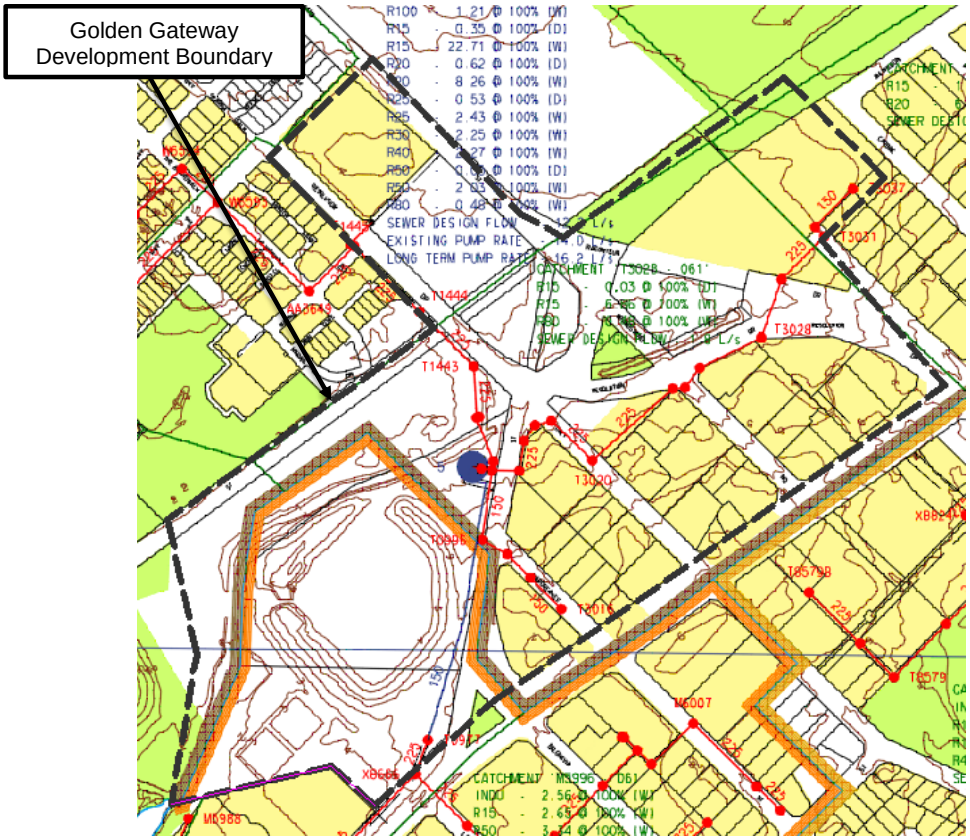
Wastewater infrastructure general to Ascot area is serviced by gravity style wastewater drainage infrastructure. A mixture of concrete and plastic arterial pipes on grade service all areas to local pump stations throughout the City of Belmont.

3.1 Existing Infrastructure

Lots within and surrounding the proposed Golden Gateway Structure plan are serviced by two main arterial sewer routes; a 225mm collector flowing north to south and a 225mm collector flowing east to west. Both collectors flow to the Redcliffe Pump Station 5 located on Stoneham Street. The Redcliffe P.S 5 collects all sewerage west of the Ascot raceway within the Ascot Suburb and discharges it to the Redcliffe Pump Station 2 located on Abernethy Road.

Refer to Cardno Drawing *CW942300-CI-SK1* in **Appendix A** for further details and drawings for the wastewater infrastructure in this area.

Figure 3-1 Existing Sewer Infrastructure



3.2 Future Demand

Table 3-1 identifies the additional sewer demand estimated for the proposed Golden Gateway re-zoning structure plan.

Table 3-1 Local Scheme Zone Sewer Demand

Local Scheme Zones	Area (ha)	Additional Dwellings (No.)*	Additional Sewer Demand (L/s)**
Mixed-Use (R-AC0)	10.3	1648	9.15
Residential (R20)	0.88	18	0.19
Residential (R40)	1.73	70	0.61
Residential (R100)	1.57	157	1.34
Total		**1893**	**11.29**

* Refer Table 4.4 of DS 50 for Design & Construction Requirements for Gravity Sewers DN150 to DN600

**Capacity based on Water Corporation DS50 Table 4.1.

3.2.2 Service Capacity

Service Capacity has been analysed for Redcliffe P.S 5 and Redcliffe P.S 2 to determine if the stations have adequate capacity to service the proposed Golden Gateway development

Table 3-2 Pump Station Service Capacity

Pumping Station	Additional Flow (L/s)	P.S Existing Sewer Flow (L/s)	Long Term P.S. Capacity (L/s)	Future Capacity / [Shortfall] (L/s)
Redcliffe PS 5	11.29	14.0	16.2	[9.09 L/s]
Redcliffe PS 2	11.29	20.1	37.0	5.61 L/s

As per **Table 3-2** the proposed development will have significant impacts to the current wastewater infrastructure. It is not envisaged the existing Redcliffe PS5 will have sufficient capacity with a shortfall of 9.09 L/s to service the proposed development and will require a significant upgrade. Redcliffe PS 2 will likely have capacity however further planning should be co-ordinated with the Water Corporation to ascertain other timing of other developments in the area.

3.3 Required Infrastructure

Due to wastewater flows increasing due to the high density development, a number of upgrades will be required to headworks infrastructure in the area. These include increasing the capacity of the Stoneham Street Wastewater Pump Station as well as a number of sewer mains. These will be scheduled in the Water Corporation Capital Investment Program at the appropriate time.

4 Power Supply

4.1 Existing Infrastructure

Power distribution and production is managed by Western Power. Data obtained from the Western Power *Network Mapping Tool* indicates that the area is serviced by the Belmont Substation and the forecast network capacity for 2015 is >30MVA, as shown in **Figure 4-1**. There are High and Low Voltage power lines in the vicinity of the site.

Figure 4-1 Existing Power Network Capacity
(Source: http://ncmt.westernpower.com.au/index.cfm)

Cardno Drawing *CW942300-CI-SK6* in **Appendix A** shows the location of the existing power infrastructure within and adjacent to the subject area.

4.2 Required Infrastructure

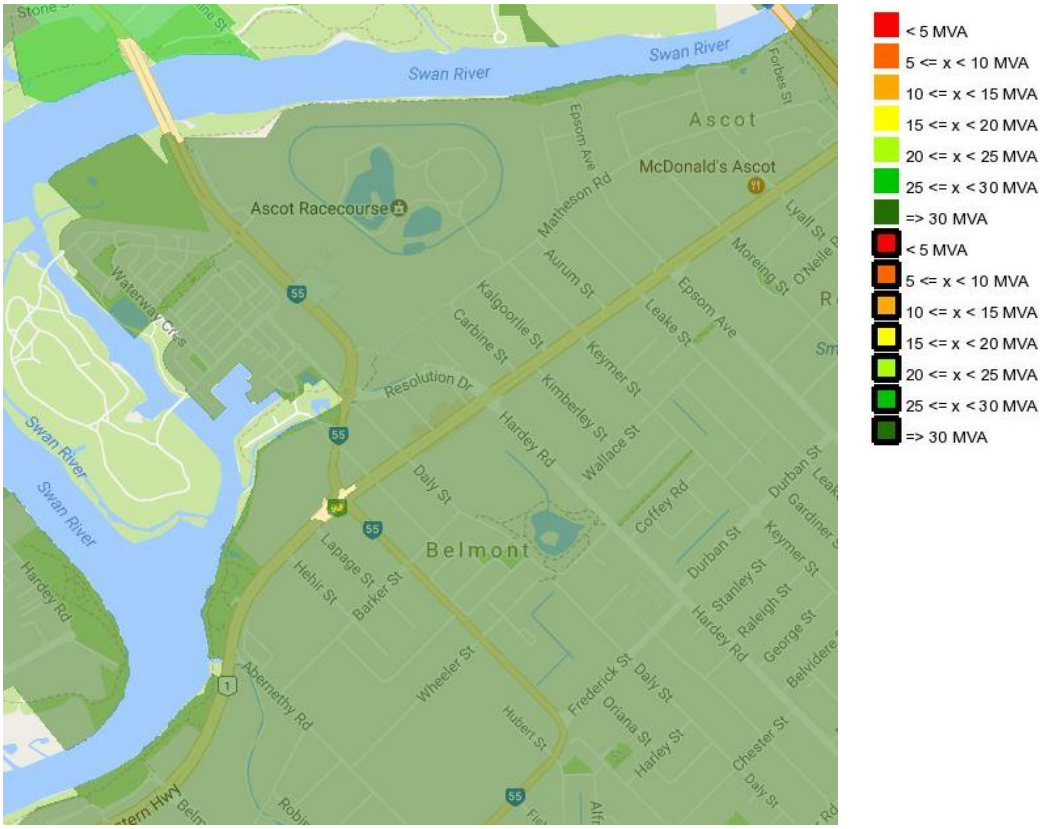
Maximum power requirement for the development has been calculated using Western Power's online Design Maximum Demand calculator. The estimated demand for the development is shown in **Table 4-1** below.

Table 4-1 Estimated Maximum Power Demand

Proposed Lot Use	Number of Units/Dwellings	Max. Demand/Unit (kVA)	Approx. Estimated Demand (kVA)
Single Dwelling Units	18	4.7	84.6
Grouped Residential (5-10 Units)	70	3.5	245
Grouped Residential (Over 10 Units)	1805	3.1	5,596
Mixed Use Commercial	1	2,400kVA	2,400
Total Development			**8,325.6**

Belmont substation falls under the Cannington load area. Western Power's *Annual Planning Report 2015/16* states "no substation capacity shortfall is forecast in the Cannington load area over the next five years." This takes into account committed and most likely to occur network expansion plans for the area. The Western Power *Network Mapping Tool* indicates that there is >30MVA spare capacity in the network until at least 2036 based on current and forecast demand (see **Figure 4-2**).

Figure 4-2 Forecast Power Network Capacity 2036
(Source: http://ncmt.westernpower.com.au/index.cfm)

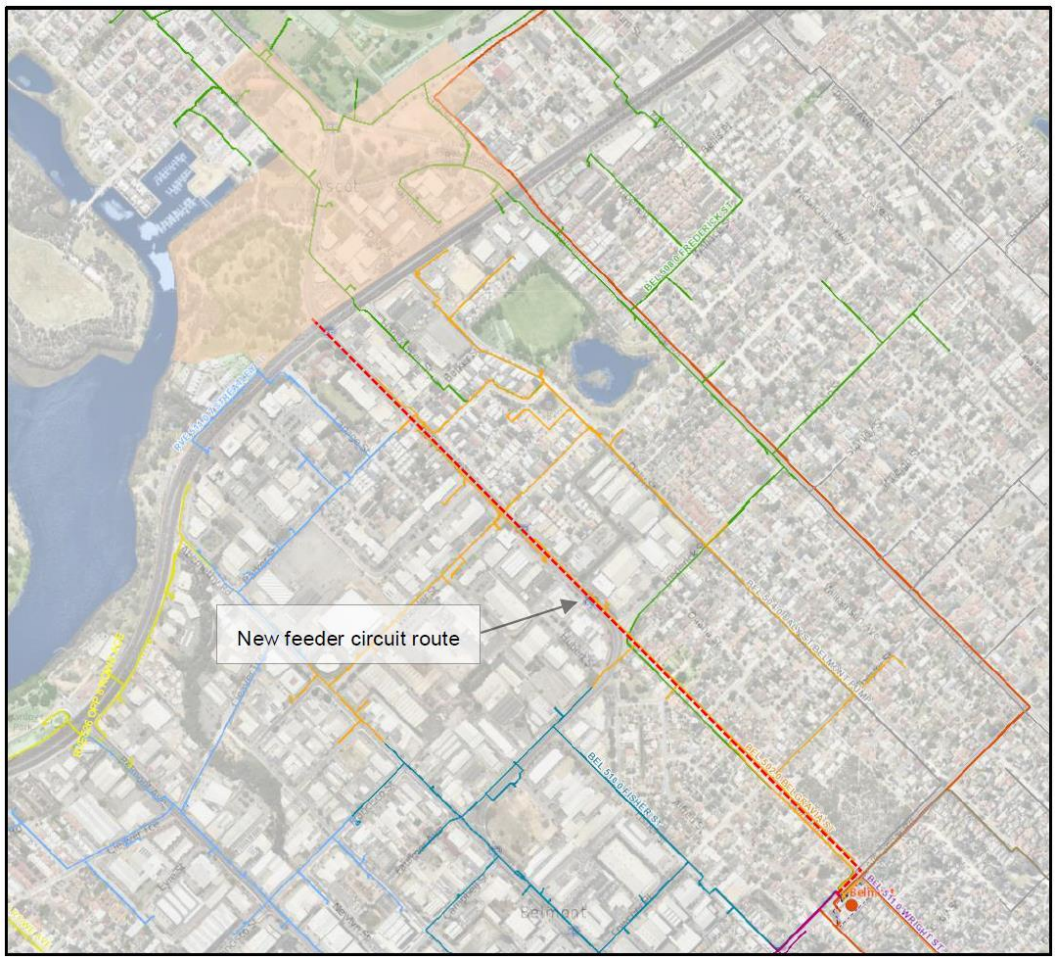


Western Power has completed a feasibility report for the proposed development, which is attached in Appendix B. Western Power has advised the following:

"Network analysis has identified that there sufficient capacity on the present configured network, and new feeder circuit would not be required as there are adequate spare capacity available on the BEL508 and surrounding feeders (BEL502 & RVE526) to fully accommodate the 8.325MVA total load. However, as the load growth to the redevelopment area is not expected till 2031, it is deemed reasonable that the provision to install a new 2km long feeder from BEL to entirely supply the 8.325MVA load may be required."

The proposed route of a new feeder from the Belmont Substation is shown in **Figure 4-3**.

Figure 4-3 Proposed Western Power Feeder Route
(Source: Western Power Feasibility Report – MF010862 – Golden Gateway Precinct, May 2017)



5 Gas

5.1 Existing Infrastructure

Gas infrastructure and distribution in Western Australia is managed by ATCO Gas Australia.

Correspondence from ATCO Gas identifies Medium Pressure gas mains (pressure indicated at 70kPa) along most roads within the subject site.

Cardno Drawing *CW942300-CI- SK4* in **Appendix A** contains information on gas infrastructure in the vicinity of the area.

5.2 Required Infrastructure

Correspondence received from Atco Gas advised that the existing infrastructure can support the proposed development as outlined in the Structure Plan.

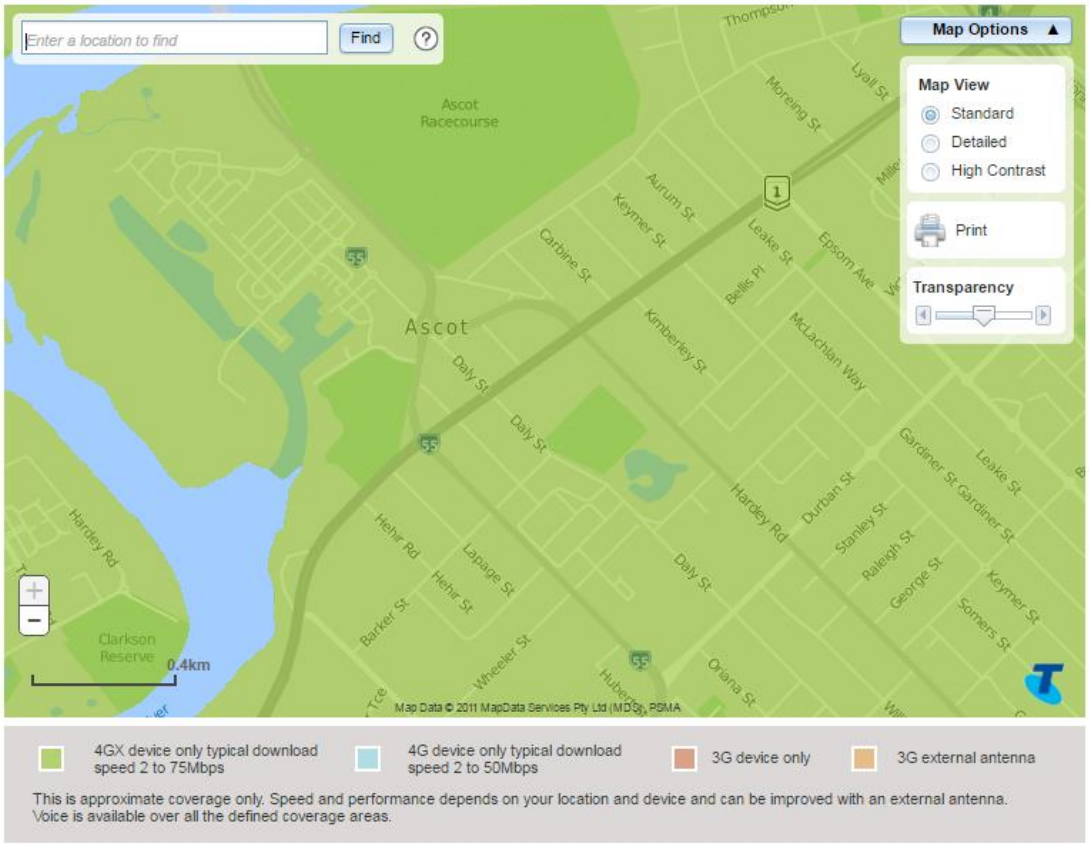
6 Communications

6.1 Existing Infrastructure

The subject area is well serviced by telecommunications infrastructure with optical fibre running in or adjacent to all precincts. This infrastructure is owned by various telecommunications providers including Telstra, Optus and others.

Refer to Cardno Drawing *CW942300-CI-SK5* in **Appendix A** for a detailed plan of the fibre optic cable locations.

Figure 6-1 Telstra Mobile Network Coverage
(Source: www.telstra.com.au/coverage-networks/our-coverage)



Mobile network coverage in the area is well serviced with 4G covering the entire subject area under the Telstra network (as shown in **Figure 6-1**); other network providers may vary.

The National Broadband Network (NBN) has yet to be rolled out in the subject area. However, NBN Co have advised that fibre to the node (FTTN) technology rollout has been planned for October-December 2017.

6.2 Required Infrastructure

6.2.1 Telstra

Should a developer wish to register a development with Telstra smart communities; this must be done twelve weeks prior to construction.

The infrastructure within a development will be installed by the developer. Alternatively, Telstra can be engaged to install infrastructure within a development at the developer's expense.

Telstra's commercial pit and pipe service will generally not be offered in developments where NBN Co has confirmed agreement to install NBN Co fibre within a development stage.

6.2.2 NBN

As NBN is still in the planning phase, it is recommended that the City of Belmont liaise with NBN Co as per the *Best practice guide for Councils when initially dealing with NBN Co* document published by the Australian Local Government Association and NBN Co.

In line with the new *Telecommunications Infrastructure in New Developments* policy, NBN is required to recover part of the cost of deploying network infrastructure by applying a deployment contribution charge. These deployment charges only apply to developers and builders.

- A charge of $400 per premises in multi dwelling units (MDUs).
- A charge of $600 per premises within a single dwelling unit (SDU).

A backhaul contribution charge may also apply to the development, NBN will clarify this requirement when the developer submits his application.

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APPENDIX A

EXISTING INFRASTRUCTURE

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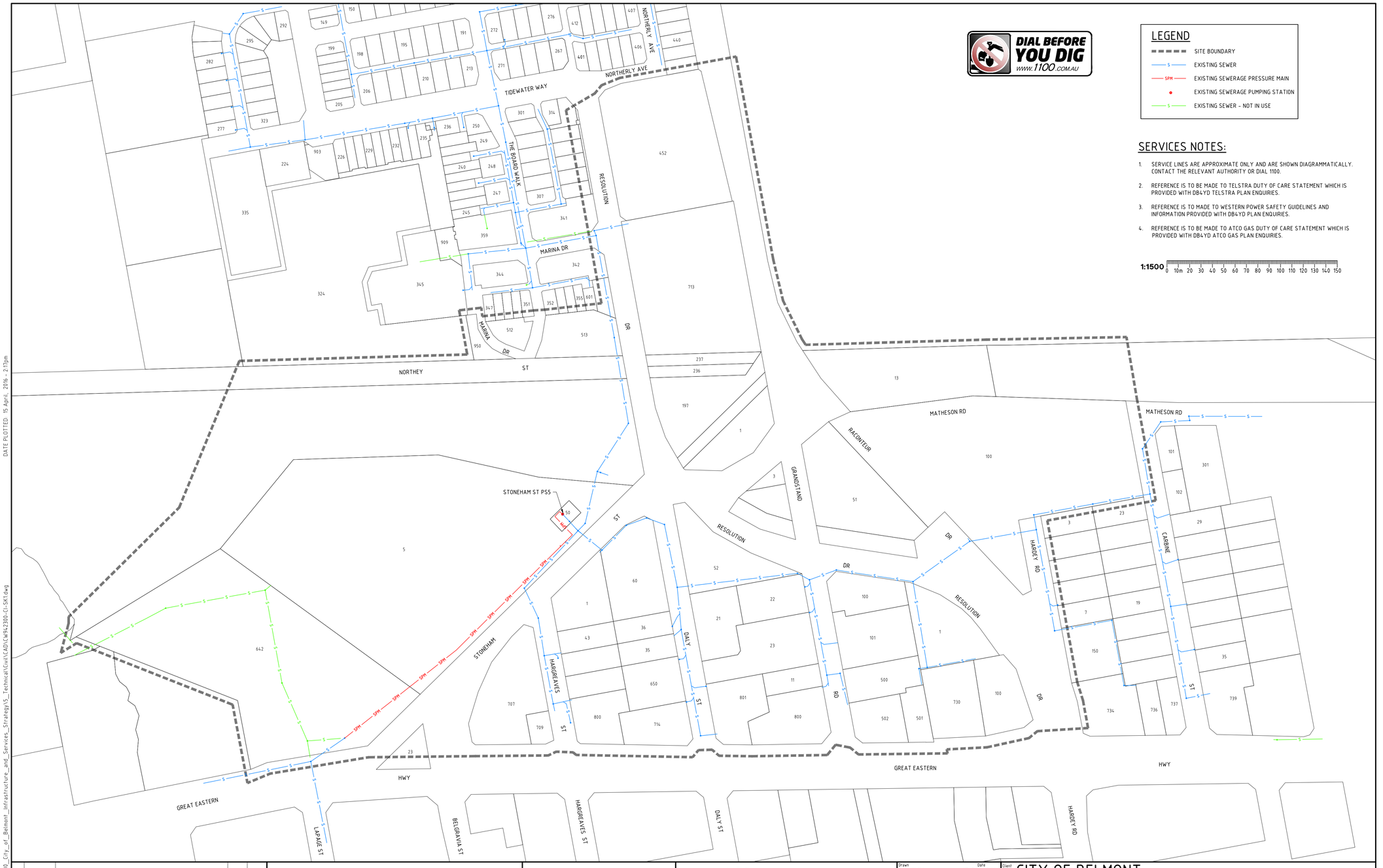

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South West Regional Office
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Phone (08) 9781 1444 Fax (08) 9752 2471

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THE BOARD WALK
RESOLUTION
MARINA DR
NORTHEY ST
915S-10
1065S SERPENTINE TRUCK MAIN
MATHESON RD
RACONTEUR
GRANDSTAND DR
HARDEY RD
CARBINE ST
STONEHAM RD
HARGREAVES ST
DALY ST
LAPAGE ST
BELGRAVIA ST
GREAT EASTERN HWY

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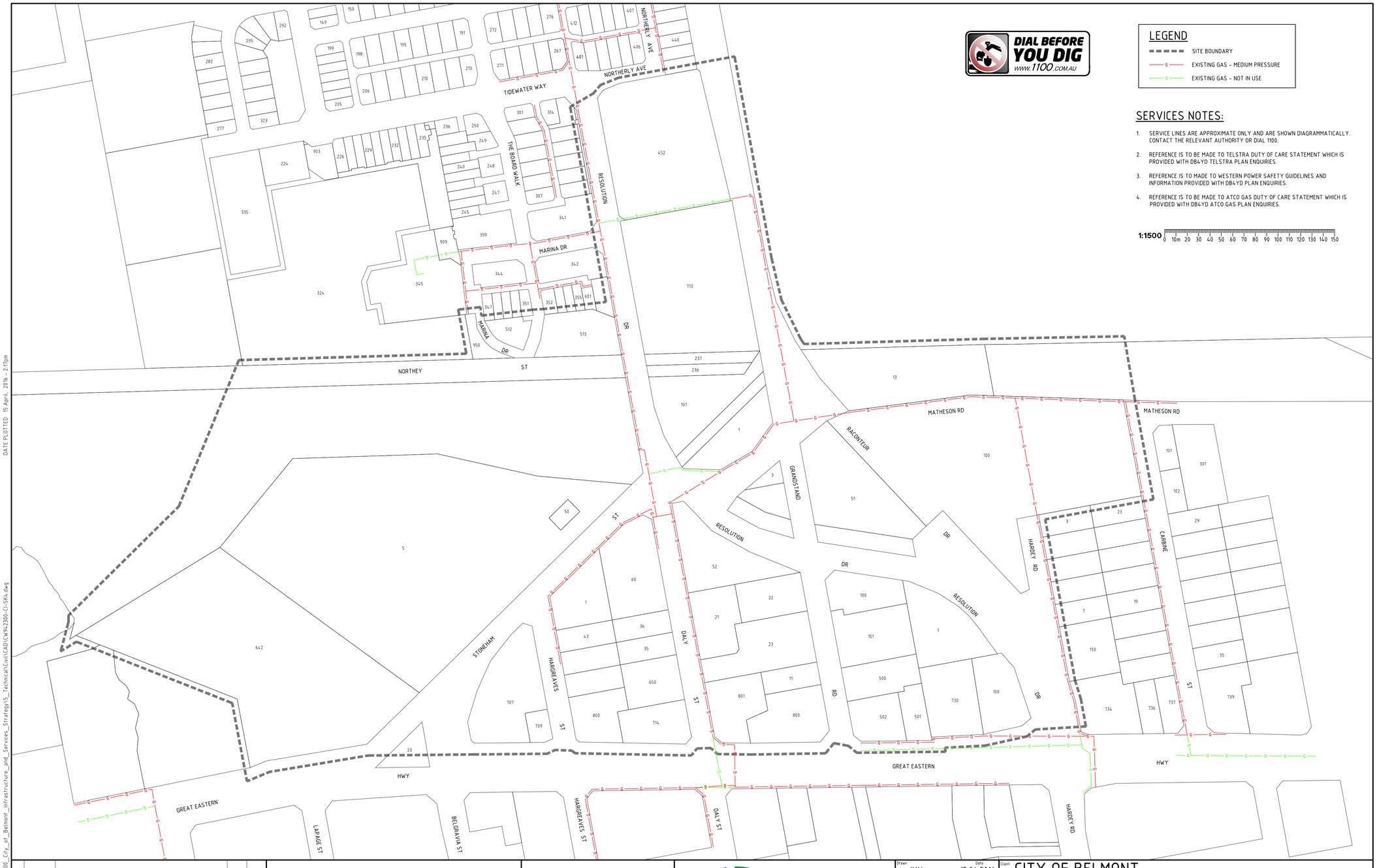

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GRANDSTAND
RACONTEUR
MATHESON RD
MATHESON RD
HARDEY RD
CARBINE ST
RESOLUTION DR
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DALY ST
STONEHAM
HARGREAVES ST
HARGREAVES ST
DALY ST
LAPAGE ST
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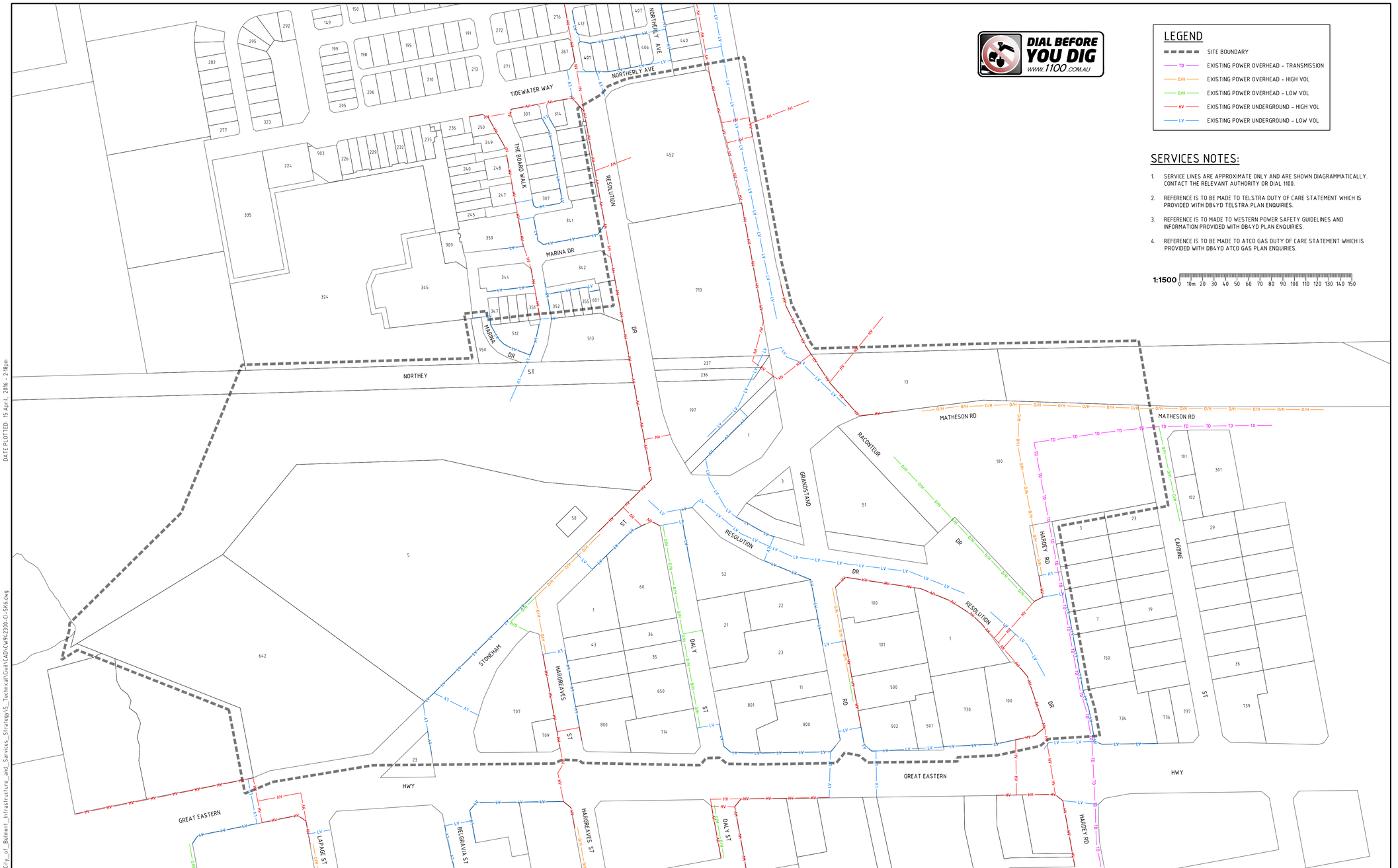

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APPENDIX

B

WESTERN POWER FEASIBILITY STUDY

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Feasibility Report

MF010862 – Golden Gateway Precinct

Large Mixed-Use Development – 8.325MVA Supply Options

5/05/2017

A525

Document release information

Client	Cardno (WA)
Project name	MF010862
Document number	DM#42663988
Document title	Golden Gateway Precinct
Revision status	A

Document prepared by:

Western Power
ABN 18540492861

85 Prinsep Rd, Jandakot 6164

Prepared by:

Aden Hoddy

Distribution Network Design Officer

A526

Table of contents

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1 Introduction

1.1 Background

Cardno has submitted a feasibility study on behalf of the City of Belmont, in conjunction with the Department of Planning to undertake an infrastructure and services strategy for the Golden Gateway Precinct in Ascot. The strategy will help guide the preparation for the Local Structure Plan over the area. Cardno is seeking information on the available network capacity to supply the Golden Gateway Precinct.

1.2 Purpose

The proposed outcomes from the feasibility study are;

- Desktop network assessment on the nearby distribution HV networks to determine the available capacity from these networks.
- Network planning capacity assessment (Distribution & Transmission) to determine available capacity from zone substations within proximity to the development.
- High level scope of works for the transmission and distribution works required to provide up to 8.325MVA of capacity (if reinforcement or extension is required).

1.3 Scope of Study

The activities that will be undertaken to achieve the specified outcomes are;

1. Network Configuration Assessment
2. Network Impact Assessment
3. Western Power Scope of Works

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2 Study Activities

2.1 Activity 1 – Network Configuration Assessment

The proposed development are is set amongst the BEL508 22kV feeder network emanating from the Belmont zone substation (BEL) located approximately 2.0km south. The BEL508 22kV feeder along with three other HV feeder networks (BEL502, RVE511 & RVE526) are the only networks within close proximity to the redevelopment (figure 1).

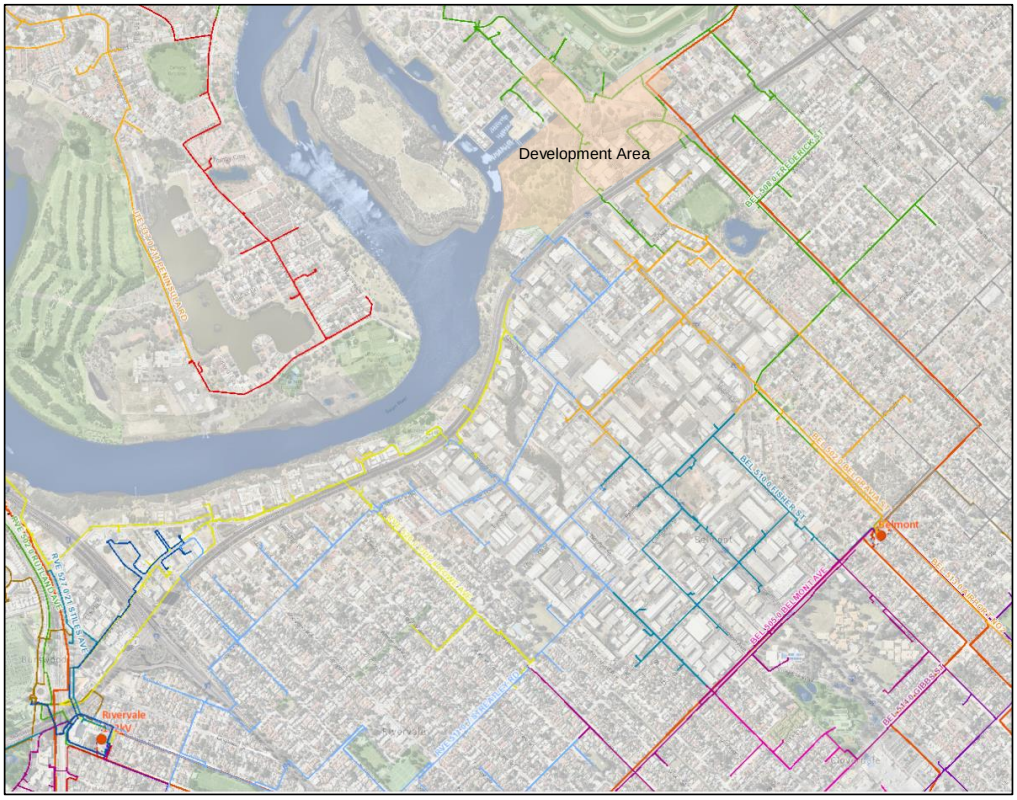

Figure 1 - Existing Distribution HV Network

2.2 Activity 2 – Network Impact Assessment

2.2.1 Transmission

Network analysis was carried out on the closet zone substation to the redevelopment area. It has been identified that there is sufficient spare NCR capacity available from BEL to cater for this 8.325MVA undiversified load. The load forecast chart for BEL is provided in figure 2.

Currently, BEL is supplied from the Cannington Terminal via BEL-KDL 81 line and BEL-RVE/WE 81 line (with the pre-contingency being BEL-NT/EP 81 line open). In connecting this load, it is not expected for the affected 132 kV transmission lines to experience the issue relating to the thermal over-loading or under-voltage, during the N-1 contingency. As well, connection of this customer load is not expected to trigger any voltage instability issues in the load area, hence this load is cleared to connect to the Western Power BEL network.

A529

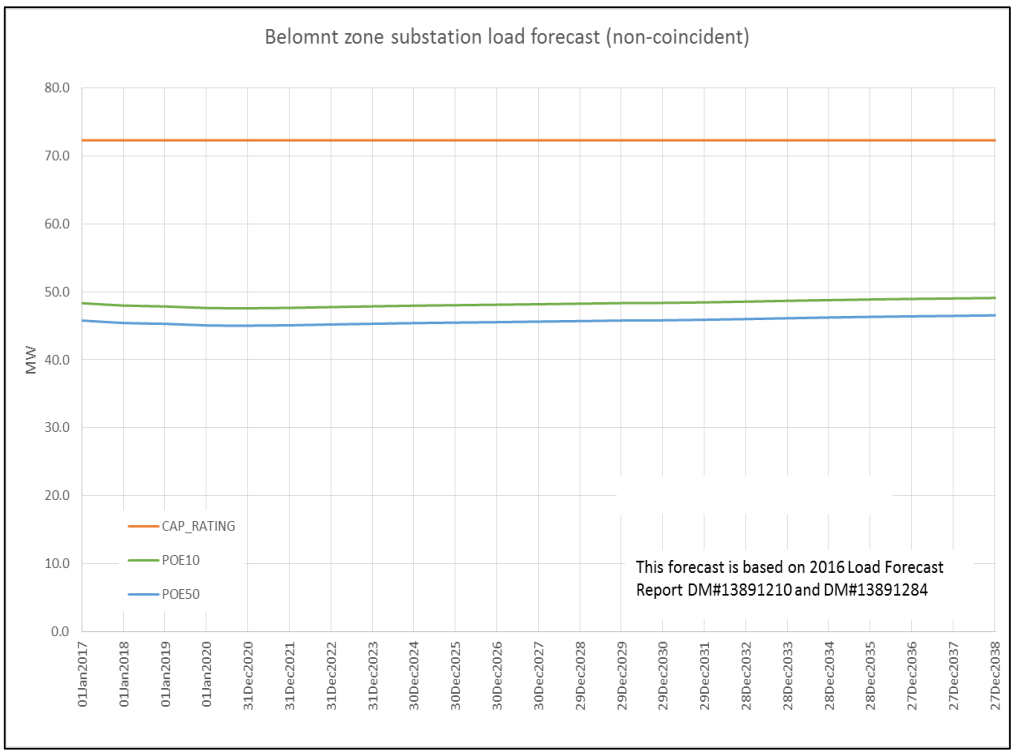

Figure 2 - BEL Zone Substation Forecast

2.2.2 Distribution

The entire redevelopment area is currently supplied by the BEL508 Frederick St feeder, including three other feeder networks (BEL502, RVE511 and RVE526) within close proximity. Based on the BEL508 feeder load readings (figure 3), there is approx. 3MVA of spare capacity available at this point of time that can be directly connected into. Additional network capacity can also be made available by network reconfiguration or extension, provided that there are significant spare capacity available on the nearby feeders at the time of connection. Hence, it is likely that the first few stages of development area can via supplied without any major network extension or reconfiguration.

Due to the expected timing of the power uptake, there is no certainty what spare capacity will still be available on the BEL508 feeder and other feeders around the proposed redevelopment area. Hence, it is not feasible to estimate what network extension will be required to create sufficient network capacity to supply the 8.325MVA load. An alternative option is to install of a new feeder from BEL to the proposed development boundary, near the intersection between Great Eastern Hwy and Stoneham St, to supply the entire 8.325MVA load. The new feeder circuit is likely to be installed along Belgravia St which will require approximately 2km of 400mm2 Al XLPE 22kV cable. Although there is no spare feeder circuits available at BEL, arrangement can be made (such as double feeders termination) to allow new feeder connections to the BEL.

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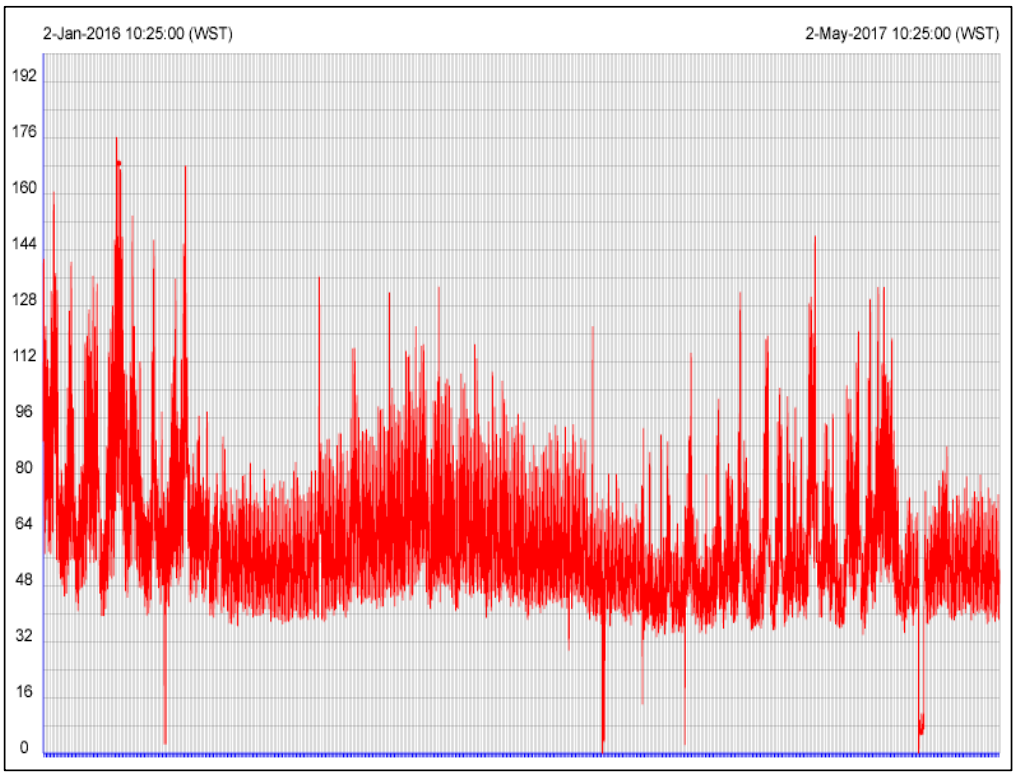

Figure 3 - BEL508 Feeder Utilisation

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3 Technical Evaluation

3.1 Supply Options

3.1.1 Overview

As stated in section 2.2.2 of this report, there is approximately 3MVA of spare capacity available on the BEL508 Frederick St feeder with the opportunity to utilise the surrounding feeders (BEL502 & RVE526) to fully accommodate the total 8.325MVA load until either exhausted by the customer's development or other competing applications. A new feeder circuit can be provided for further capacity beyond the existing HV networks capacity limitations.

Considering the above information, there are two design options which have been identified to meet the customers' requirements;

1. Utilise the remaining capacity available on the BEL508 feeder and other nearby HV networks until exhausted. The scope of works for this option cannot be defined due to the unknown load uptake and location of connections to the redevelopment area.

2. Once depleted, install approximately 2.0km of new underground cable from the BEL to the redevelopment area expected along Belgravia St.

3.1.2 Site Map

Figure 4 - Proposed Western Power Scope of Works

3.1.3 Western Power Scope of Works

With reference to the site map in section 3.1.2 of the document, the Western Power scope of works for the new feeder extension is as follows;

- The connection of the new circuit into the BEL zone substation.
- Cable installation by a combination of open trenching and directional drilling from the BEL to the corner of Great Eastern Hwy and Stoneham St.
- Cable jointing, including testing and commissioning.

3.1.4 Third Party Approvals

If any of the surrounding HV feeders are to be extended or a new feeder circuit is installed from BEL then it is likely that the proposed cable route will need to cross under the Great Eastern Fwy. This instalment of new cable will require the approval from Main Roads. The underground cable route will be determined when a formal application has been received and detailed planning studies have been conducted.

3.1.5 Assumptions

The customer contribution and scope of works are dependent on the following assumptions;

- No other connection requests and changes to network conditions prior to the formal application for this connection.
- The proposed design solution, estimated cost (non-binding) is based on the desktop information only & is subject to detailed design investigation.
- All new underground cables are assumed to be installed in at the Western Power standard depth (i.e. 850mm deep from finished level) and in the Western Power standard alignment (0-500m from property boundaries) apart from road crossings.
- Drilling depth of electrical cables under roadways must be between 1000 and 1500mm of ground level.
- Allowance of polypipe included for the proposed cable route where cable is crossing under roadway or deemed rock ground conditions.
- Main Roads approval is granted for works associated on Great Eastern Hwy
- The proposed works receive no objection from all involved parties (which may include local authorities, private land owners and/or other utilities).
- The interconnection works required within the development site boundary are not considered in the study.
- The load assessment on the submission of the formal application will support the customers load request.
- Environmental studies have not been undertaken for the purpose of this report.
- Detailed Load Flow and Power Quality studies have not been undertaken for this study.

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4 Conclusions and Recommendations

Network analysis has identified that there sufficient capacity on the present configured network, and new feeder circuit would not be required as there are adequate spare capacity available on the BEL508 and surrounding feeders (BEL502 & RVE526) to fully accommodate the 8.325MVA total load. However, as the load growth to the redevelopment area is not expected till 2031, it is deemed reasonable that the provision to install a new 2km long feeder from BEL to entirely supply the 8.325MVA load may be required.

Applicants need to be aware that the information herein is provided in good faith and is accurate at the time of issue. Power systems are dynamic in nature, due to the connection of new users and changes in consumer behaviour. As such, Western Power's distribution electricity networks will change over time - this may have a bearing on the amount of reinforcement required to accommodate new developments.

As capacity cannot be reserved, it is possible that requirements will also be altered resulting in a variation in power infrastructure requirements. There may be other competing applications for new loads or upgrades which may use the available spare capacity.

Please be aware that Western Power's response may become out-of-date, resulting in a significant variation in power infrastructure requirements. To provide a firm connection proposal and cost, a formal application to Western Power will need to be made, in accordance with current connection policies.

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About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Contact

West Perth

11 Harvest Terrace
West Perth WA 6005

PO Box 447
West Perth WA 6872

Phone +61 8 9273 3888
Fax +61 8 9486 8664

wa@cardno.com.au
www.cardno.com

Cardno®
Shaping the Future

Golden Gateway
PUBLIC REALM STRATEGY

July 2024

DOCUMENT HISTORY AND STATUS

Golden Gateway - Public Realm Strategy

THIS REPORT WAS ORIGINALLY PRODUCED BY TAYLOR BURRELL BARNETT (TBB) ON BEHALF OF THE CITY OF BELMONT (COB). THIS HAS SINCE BEEN AMENDED BY THE CITY OF BELMONT.

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EXECUTIVE SUMMARY

This Public Realm Strategy has been prepared as part of the suite of detailed strategies and studies supporting the Local Structure Plan (LSP) for the Golden Gateway precinct in Belmont.

The purpose of this Strategy is to develop a clear vision, principles and objectives to inform development of the public realm. The design intent and functional requirements for elements of the public realm as articulated in this overarching framework will inform further detailed planning, design and management. Any graphical representations included in this Strategy are indicative only and demonstrate how the public realm could be developed.

The strategy creates an approach to the public realm that will create a distinctive urban character. The public realm will accommodate pedestrians and vehicles in a safe uncluttered manner and the streets and spaces will be shaded by trees that will form a strong visual landscape framework.

Existing local streetscapes are predominantly reflective of the commercial environment, particularly within the commercial 'triangle'. The standard of verge maintenance ranges from good quality reticulated lawns through to poorly maintained verges damaged by random, uncontrolled, overflow parking.

The extent and quality of the existing pedestrian infrastructure within, and surrounding, the site is of a standard commensurate with the nature of existing development across the subject land (i.e. primarily light industrial/commercial unit style development). Each of the major road corridors running through the precinct (Grandstand Road, Resolution Drive and Stoneham Street) include footpaths along one side of the street. The extent and quality of the existing cycling infrastructure within and surrounding the site is of a high standard, partly as a result of the Great Eastern Highway upgrades.

The Strategy sets out to provide a high quality urban framework that promotes pedestrian circulation, accommodates vehicles in a safe and logical manner and is an environment that presents a desirable destination to live, work and recreate. Placemaking should inform the detailed design of spaces throughout the precinct. The spaces need to be able to facilitate and accommodate diverse uses that may emerge from community social investment.

Places across the site will achieve a successful balance between physical attributes, the vehicle circulation and dynamic social, cultural and economic vitality. Its inherent qualities are strongly related to its proximity to the Swan River and its heritage related to the Ascot Kilns.

In accordance with best practice, the public realm should be designed to maximise universal access for all members of the community. Designs will need to comply with prevailing legislation but should also strive to safely accommodate ease of safe use encouraging full accessibility through all areas.

The strategy for the site comprises a number of different public realm space types ranging from the public open space (POS) area in the redundant portion of the Daly Street road reserve, boulevard high-use roads, and small streets. A cohesive approach across the public realm will consist of an urban landscape that reinforces a fluid and flowing spatial arrangement starting from the river parklands and extending this character throughout the subject land.

In terms of implementation, under normal circumstances, the development of the public realm is typically undertaken by a private developer/s as part of their private land subdivision process; however, given that the majority of the public realm already exists in the form of Crown Reserves (e.g. existing road reserves and Parks and Recreation reserved land) and the private land is under fragmented ownership, the City of Belmont will need to assume responsibility for implementing the Public Realm Strategy. The cost of this work and any mechanism to recover cost from private landowners through a Developer

Contribution Plan or alternative funding mechanism to be determined by the City will require further consideration.

It is not anticipated that public realm improvements will be implemented at once, rather it should be progressively rolled out commensurately with the delivery of other key infrastructure particularly the modification of Daly Street into a cul-de-sac and subdivision works that may be required to create the environment for private redevelopment.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 PURPOSE

This Public Realm Strategy has been prepared as part of the suite of detailed strategies and studies supporting the Local Structure Plan (LSP) for the Golden Gateway precinct in Belmont (refer **Figure 1**). The Public Realm Strategy does not apply to land designated as subject to further detailed planning by the Structure Plan. It is expected that the public realm for these land parcels will be carefully considered through further detailed planning.

The creation of a high quality and functional public realm, in the streets and open spaces, is a pivotal element in planning for a more intensified urban environment to create a liveable and well connected community.

The Public Realm Strategy has been developed in conjunction with the Golden Gateway Development Concept Plan that ultimately forms the cornerstone of the Golden Gateway LSP.

This document summarises the main issues/opportunities and design outcomes for the creation of a public realm, similar to the concept of an urban village. The purpose of this report is to inform the LSP and should be read in conjunction with it.

Figure 1 - Local Structure Plan (Plan 1)

1.2 SITE CONTEXT

The subject land is located approximately 5 kilometres (km) north east of the Perth Central Business District (CBD), 3 km north of Belmont Forum and 5 km north east of Victoria Park entertainment precinct (refer **Figure 2**). It is close to the Swan River and Ascot Racecourse and forms a triangular land parcel that is well connected to the regional roads. Further details on the planning context and background can be found in the LSP Part Two, Section 1 Planning Background.

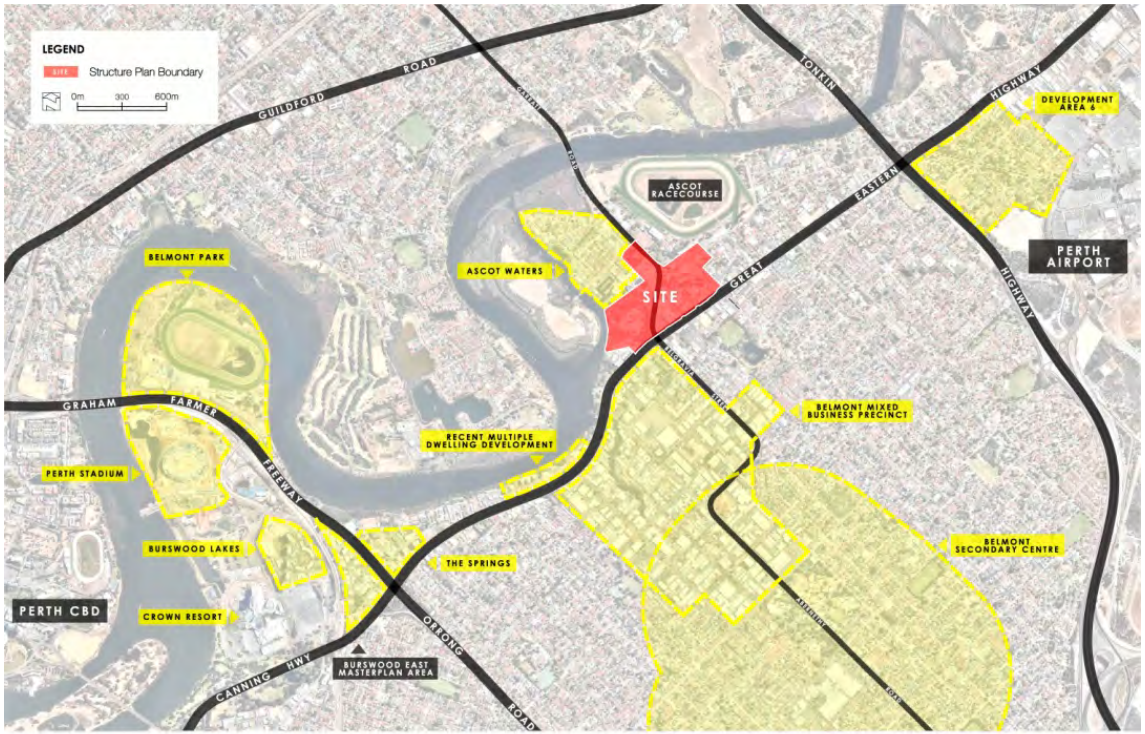

Figure 2 - Site Context Plan

2. SITE ANALYSIS

2.1 URBAN FORM

The existing urban form of the site is very much influenced by its strategic location at the axis of a number of key movement corridors, dominated by Great Eastern Highway, Stoneham Street and Resolution Drive. The 'triangle' of land bounded by these roads contains a mix of office and commercial uses, including some more intensive retail/food and beverage outlets towards the eastern edge at Resolution Drive and Great Eastern Highway.

Outside of the 'triangle', the remainder of the LSP area consists of a number of different sub-precincts with very diverse functions and characteristics. These include a mix of land uses, including the administration headquarters of the WA Turf Club (WATC), the Ascot Kilns, overflow parking for the Ascot Racecourse, a substantial riverfront area held by the Belmont Trust, and a patchwork of residual government landholdings created by the past realignment of Resolution Drive and Stoneham Street.

While the existing urban form is largely unremarkable, the key features that are notable, in terms of future planning, include:

1. The Ascot Kilns, in particular the chimneys, which present an important visual and historical reference point in the precinct (refer **Figure 3**); and

2. The Belmont Trust land, which presents an opportunity for a strong public link to the Swan River, albeit presently isolated by Stoneham Street (refer **Figure 4**).

2.2 STREETSCAPE

Existing local streetscapes are predominantly reflective of the commercial environment, particularly within the commercial 'triangle' (refer **Figure 5**). The existing road reserves are typically 20m wide with wide carriageways to accommodate commercial vehicle movement as well as on-street parking. The standard of verge maintenance ranges from good quality reticulated lawns through to poorly maintained verges damaged by uncontrolled overflow parking.

Figure 3 - The Ascot Kilns Chimneys

Figure 4 - Belmont Trust Land

Figure 5 - Typical 'Commercial' Streetscape

In 2014 Great Eastern Highway was widened/upgraded to improve regional traffic movement. The result is a heavily engineered, highly efficient arterial road, with four lanes of through-traffic, increasing to 6-7 lanes in places where there are long turning pockets and bus/cycle lanes at the intersections.

The footpath is approximately 3m wide and occupies the whole verge from kerb to boundary, with no street trees or other landscaping, as illustrated in **Figure 6**. This combined with the significant traffic activity immediately adjacent, presents an unappealing environment for pedestrians.

Resolution Drive and Stoneham Street are also heavily engineered arterial roads that offer little attraction to the pedestrian, although the Stoneham Street environment is somewhat softened by its interface with heavy vegetation along the periphery of the Belmont Trust land and the landscaped drainage area to the north.

Figure 6 - Great Eastern Highway

2.3 MOVEMENT AND ACCESS

2.3.1 VEHICLE MOVEMENT

The LSP report provides a detailed analysis of the existing and proposed vehicle movement network. From a public realm perspective the key factors are as follows:

- The regional road system, comprising Great Eastern Highway, Stoneham Street, Resolution Drive and Grandstand Road, offer excellent connections in all directions; however, they also serve to segregate parts of the precinct, and isolate the site from the most attractive existing public realm asset, being the Swan River foreshore.
- The local road system, particularly through the commercial 'triangle', provide a high level of access and permeability for both vehicles and pedestrians, and offers an effective framework for future development of the site; and
- The local road system features wide (20m) road reserves, which, if retained, offer opportunities to design high standard streetscapes, with generous space available to devote to landscaping, pedestrians, street parking etc.
- Local access streets (Hargreaves Street and Grandstand Road (southern section) providing access in a northerly direction from Great Eastern Highway with poor pedestrian amenity and no existing footpaths present.

2.3.2 PEDESTRIAN NETWORK

The extent and quality of the existing pedestrian infrastructure within, and surrounding, the site (with the exception of Great Eastern Highway) is poor and of a standard commensurate with the nature of existing development across the subject land (i.e. primarily light industrial/commercial unit style development).

However, Great Eastern Highway bordering the site to the south features good quality footpaths on both sides of the corridor, although as previously mentioned, it is not a particularly appealing environment for pedestrians.

Within the vicinity of the site, the safe crossing of Great Eastern Highway by pedestrians is facilitated via traffic signal controlled intersections at both Stoneham Street/Belgravia Street and Resolution Drive/Hardey Road intersections with Great Eastern Highway.

Each of the major road corridors running through the precinct (Grandstand Road, Resolution Drive and Stoneham Street) include footpaths along one side of the street – Grandstand Road along the eastern side adjacent to the Ascot Racecourse, Raconteur Drive along the northern side to connect to Grandstand Road, Resolution Drive along the eastern side adjacent to the Ascot Waters development and Stoneham Street along the western side adjacent to the Belmont Trust land.

2.3.3 CYCLING

The extent and quality of the existing cycling infrastructure within and surrounding the site is of a high standard, partly as a result of the Great Eastern Highway upgrades.

A number of existing shared paths and cycling connections are located along primary routes, including Stoneham Street, Raconteur Drive and Grandstand Road providing local connections. There is demand to upgrade facilities on Stoneham Street and Resolution Drive. Protected bicycle lanes and a shared path on Resolution Drive is essential.

A number of shared paths are also located within the Ascot Waters development directly to the north-west of the site. The Graham Farmer Freeway Principal Shared Path (PSP) provides regional cycling connections and can be accessed via the shared path along the southern side of the Swan River.

3. DESIGN OBJECTIVES

3.1 AN URBAN LANDSCAPE

The site forms an important gateway announcing the City of Belmont when approached from the south-west and north-east. The site is traversed with major roads and as discussed, its triangular form presents challenges in vehicular circulation and pedestrian accessibility. This location currently presents as a transient place that is passed through, however the design of the public realm will result in the creation of a cohesive network of spaces enabling the locality to be an identifiable place.

As a busy location, the public realm offers the opportunity to be transformative, linking uses and people to the nearby valued Swan River, its parklands and the heritage and interest of the Ascot Kilns.

The public realm spaces made up of streets and a park, combine to be a defining element of this location, that importantly the users, employees and residents will experience and define the qualities of the public realm.

The overall landscape design objectives for the public spaces are set out below:

3.2 IDENTIFIABLE CHARACTER

- Create a contemporary urban environment that promotes safe and easy pedestrian experiences.
- Create new diverse urban landscapes that reflect the subject land's unique characteristics and close links to the river parklands.
- Create spaces that encourage and accommodate local community use and engagement.
- Establish an aesthetic that promotes positive development and investment in the location.
- Celebrate the heritage significance of the Ascot Kilns.

3.3 VALUABLE LANDSCAPES

- Create a microclimate in public realm spaces and streets which encourages use and enjoyment.
- Provide key views and relationships that assist in orientation and legibility.
- Create highly utilised and valued public realm streets and spaces.

3.4 ENVIRONMENTAL/SUSTAINABILITY

- Create a durable urban landscape.
- Reduce urban heat sink characteristics.
- Create urban tree canopy (in compliance with The City of Belmont's Urban Forest Strategy 2014 and The Canopy Plan 2019-2024).
- Retain vegetation wherever practical.
- Promote the use of low water demand plants.
- Pursue water harvesting, passive irrigation and integrated urban water management.

4. PUBLIC REALM OVERALL APPROACH

The site comprises a number of different public realm space types ranging from the POS area in the redundant portion of the Daly Street road reserve, boulevard high-use roads, and small streets.

A cohesive approach across the public realm will consist of an urban landscape that reinforces a fluid and flowing spatial arrangement starting from the river parklands and extending this character throughout the subject land. The creation of smaller pockets of activity and open space will be defined by street trees, tree groups and sinuous tree lines. Pedestrian spaces will be sheltered by a substantial tree canopy and vehicular routes flanked by boulevard plantings. A unified paving design and materials for pedestrian areas will extend throughout the subject land. This will both unify and delineate the different pedestrian and vehicular spaces.

Placemaking should inform the detailed design of spaces throughout the precinct. The spaces need to be able to facilitate and accommodate diverse activities that may emerge from community social investment. The location and development of the public spaces will be achieved through the successful balance between physical attributes, the vehicle circulation and dynamic social, cultural and economic vitality. The site's inherent qualities are strongly related to its proximity to the Swan River and its heritage related to the Ascot Kilns. It is the intention that distinctive physical spaces will be encouraged to evolve beyond the design, responding to the growing community and social and commercial opportunities. Spaces will consolidate a strong identity and character that is easily recognised by local users and visitors.

In accordance with best practice, the public realm should be designed to maximise universal access for all members of the community. Designs will need to comply with prevailing legislation but should also strive to safely accommodate ease of safe use encouraging full accessibility through all areas.

To reduce maintenance and water consumption, where possible, consideration should be made as to the use of hard surfaces or low water alternatives instead of turf. Water harvesting of hard surfaces is also exploited where possible using swales, channels and ground amendments to reduce the need for overall water consumption.

5. PARKS

POS is to be provided generally in accordance with the development Concept Plan included as **Figure 7** and should be vested in the Crown and managed by the local government. The development of land included within the Swan River Trust Development Control Area will be subject to the approval of the Department of Biodiversity, Conservation and Attractions (DBCA). The POS is to provide for both informal active and passive recreation uses. These uses will not utilise large spaces for sports but provide activities for the community that may include a children's play area, walking paths, and grassed spaces for recreation purposes. The POS areas may accommodate stormwater generated from the proposed development of the site and this will be designed in such a manner that its function as local open space is not compromised.

Figure 7 - Development Concept Plan

5.1 FORESHORE RESERVE

The 'Foreshore Reserve' creates a valued open space adjacent to the Swan River. The nature of the space, its future and development, is controlled largely by the Belmont Trust and is not the subject of this Public Realm Strategy but will be addressed by a separate study.

5.2 DALY STREET PARK

Daly Street is proposed to be converted into a cul-de-sac, in line with the Main Roads Western Australia vehicle access strategy for this section of Great Eastern Highway. This change presents a unique opportunity to create a POS area over the now redundant road reserve, as depicted in **Figure 7** on the previous page.

The new park will establish a vital connection to the Foreshore Reserve, enhancing the recreational space available to residents. This area may consist of native planting, walkways, children's play areas, and space for recreational activities. This transformation will not only improve local amenities but also strengthen the integration between the residential area and the natural beauty and POS function of the Foreshore Reserve.

6. ROADS AND STREET TREATMENTS

6.1 GENERAL

Road hierarchies and overall legibility of the subject land will be reinforced by the type of tree planting associated with the scale of the road. The paving treatments within all streets and roads will feature a consistent material palette to reinforce the distinctive character of the area.

The scale and robust nature of proposed street tree species relate to the potential scale and height of built form. Street trees have an important role in the urban environment, improving microclimate and urban heat sink characteristics, reducing storm runoff rates and contributing to the character and qualities of neighbourhoods. The detailed design of roads will need to ensure the provision of adequate soil volumes within road reserves to ensure sufficient root development for street trees.

6.2 ROAD TREATMENTS

Road hierarchies and overall legibility of the precinct can be enhanced with the use of varied road and footpath paving treatments. Consideration should be given to the use of block pavers at road junctions or to create varying precincts within the development.

The selected paving treatments of local streets should emphasise the overall precinct character. All paving detailing at junctions and associated with pedestrian circulation should address both the need to reduce traffic speeds, manage drainage and create a distinctive character. Raised tables can be used to provide traffic calming and to add texture to the urban streetscape reinforcing a character that promotes pedestrian safety.

Cycle lanes throughout the site will be red asphalt except where they are incorporated into areas of feature pedestrian paving where colour differentials will relate to paving patterns, and if necessary, lanes defined by studs. Paving material changes will be used to accentuate areas such as major pedestrian road crossings, civic areas and hazards. Parking bays should be differentiated from the road reserve through the use of alternative paving treatments as shown in **Figure 8**.

The materials used for road pavement can assist with drainage management within the area. This may include the use of permeable paving and/or porous brick paving and/or porous asphalt. These materials can play a significant role in managing drainage in a water sensitive manner and where 'soft' open space is not an extensive feature of this location.

Figure 8 - Material Palette (illustration of indicative paving material palette, colour, type)

6.3 RESOLUTION DRIVE AND STONEHAM STREET

Whilst Resolution Drive and Stoneham Street will be largely vehicle dominated, the landscape aesthetic will be dominated by tree planting of larger species, creating a canopy boulevard along its length. Verge and median planting will create a formalised sinuous corridor of canopy trees that are recognisably different to the scale and nature of other landscapes in the area (refer **Figure 9**). Street trees will be planted to create a boulevard aesthetic the length of the street, aiding in wayfinding (refer to section 10.2 for proposed tree species).

Figure 9 - Resolution Drive and Stoneham Street (Plan Extract and Indicative Section)

6.4 CENTRAL STREETS

Hargreaves Street, Daly Street and Grandstand Road will comprise street tree planting that is not a monoculture but uses a mix of street trees (refer **Figure 10**) in varying combinations, to provide a dynamic and varied street tree canopy (refer to section 10.3 for proposed tree species). These streets will extend the overall public realm character established within the precinct but in a simpler manner. Street tree planting is proposed to create a canopied streetscape and to be positioned abutting the parallel parking embayments.

6.5 GATEWAYS

In key locations within the streetscape and public realm, highlight tree species will be used to create a visual accent. This can aid in creating distinctive spaces, and provide physical cues within a legible street network. These highlight species will be used to create gateways, focal points or to emphasise uses. The specific location for these gateways will be subject to more detailed investigation and planning at a later stage. Refer to section 10.4 for proposed tree species.

Figure 10 - Central Streets (Plan Extract and Indicative Section)

7. INTEGRATED DRAINAGE MANAGEMENT

The use and promotion of Water Sensitive Urban Design (WSUD) techniques and approaches are to be utilised wherever possible throughout the site. The space for nutrient stripping is limited. As the urban area is not producing a nutrient load, the focus is on slowing runoff and reducing hydrocarbons. The use of linear and incidental 'rain gardens' and 'nutrient sinks' as demonstrated below and overleaf can be implemented discretely within paving in streets and areas of open space. These devices should be fully integrated with the road drainage promoting passive irrigation of street tree vegetation and controlling hydrocarbon runoff.

Within the context of a dense inner urban area, the design of these WSUD devices need not be natural in appearance but can be incorporated within the urban public realm infrastructure as a contemporary feature as demonstrated below and overleaf.

It is intended that the POS space within the redundant portion of the Daly Street road reserve will contain soft landscape areas. These areas present an opportunity to accommodate local drainage that is managed through swale type structures that infiltrate water and passively irrigate trees and other vegetation used in the public realm. This will be subject to further investigation and more detailed design at a later stage.

The use of permeable pavements and porous asphalt treatments in key locations is recommended, possibly associated with lower level threshold treatments of road junctions, should be incorporated as a component of the approach to integrated drainage management.

Examples of Rain Gardens & Swale Designs in an Urban Context (Jolimont Parkside Walk)

Source: https://watersensitivecities.org.au/content/evolving-concept-wsud-statutory-land-planning/

Source: http://www.water.wa.gov.au/urban-water/urban-development/urban-water-design

Source: http://tclf.org/sites/default/files/microsites/landscape-patronage/riverbank-park.html

Source: https://landscapeperformance.org/case-study-briefs/randall-childrens-hospital

Source: http://www.landezine.com/index.php/2012/10/edinburgh-gardens-raingarden-by-ghd-pty-ltd/edinburgh-gardens-raingarden-by-ghd-pty-ltd-01/

Source: http://www.sfestuary.org/projects/detail.php?projectID=41

Examples of Rain Gardens and Swale Designs in an Urban Context

8. STREET FURNISHING

Street furniture should be a selected single suite of items that are consistent across the site. The furniture should be reflective of the heritage and character of the area and located where it can function as more than a single use. For example, seats and benches should be located in a manner to restrict undesired errant access to protect and guide pedestrians as well as performing their obvious use. All furnishing will be from the same suite so that bicycle storage, seats and bollards are seen as one cohesive design style.

Source : EPCAD image library – Public access way by Hassel

Source : EPCAD image library

Source : EPCAD image library

Source : EPCAD image library – artwork by Marcus Canning and Christian de Vietri

9. PUBLIC ART

Public art enhances spaces, makes places, adds to the community enjoyment of space and has a significant role to play within the Precinct. Public art can be of a scale that in itself is a focal point of interest, defining character and being a reason for space. Public art can also be an intimate smaller installation that relates to people when using areas of rest and repose, such as seating areas. The creation of 'place' can be enhanced through a sense of identity provided by the artworks. The creation of identifiable landmarks that can be observed and experienced as both a pedestrian and vehicle user can aid in legibility of the development. Importantly, in this location, creative installations could interpret the cultural and historic narrative of the area and enable strong connections with its context.

Source: EPCAD image library – Jolimont Parkside Walk


Source : EPCAD image library – Public access way by Hassel


Source : EPCAD image library


Source : EPCAD image library – artwork by Marcus Canning and Christian de Vietri


Source : EPCAD image library

10. GOLDEN GATEWAY TREE SPECIES

10.1 PARK AND CIVIC SPACE SPECIES

Corymbia calophylla: Marri (large fruiting nuts) 30m+H	
Eucalyptus sideroxylon "Rosea" : Red Ironbark 15 -25m H	
Pheonix canariensis: Canary Palm 15m+	
Platanus x acerifolia: Spanish or London Plane 20 – 30m	
Tipuana tipu: South American Rosewood 7m	

10.2 STONEHAM STREET AND RESOLUTION DRIVE

Angophora costata: Smooth barked apple 15 – 25m high	
Eucalyptus sideroxylon "Rosea" : Red Ironbark 15 - 25m H	
Corymbia calophylla: Marri (large fruiting nuts) 30m+H	

10.3 CENTRAL STREETS

American Sweetgum or Liquidambar 12 – 18m high	
Eucalyptus torquate:	
Corymbia ficifolia: Red flowering Gum 8-15m	
Eucalyptus caesia	
Jacaranda mimosaefolia: Jacaranda	

10.4 HIGHLIGHT SPECIES (GATEWAYS)

Lophostemon confertus: Queensland Box	
Pheonix canariensis: Canary Palm 15m+	
Platanus x acerifolia: Spanish or London Plane 20 – 30m	
Tipuana tipu: South American Rosewood 7m	

11. IMPLEMENTATION

11.1 LANDSCAPE CONSTRUCTION AND MANAGEMENT

The public realm areas in the Golden Gateway area, will primarily be in government ownership; consequently, the City of Belmont will need to assume responsibility for implementing the Public Realm Strategy. However, given the significant potential for private redevelopment that is to be generated through the Golden Gateway LSP, it may be possible to recover some or all of the implementation cost from private development through development contributions or other funding mechanisms.

The LSP states that the City of Belmont could establish a funding strategy for the LSP Area. As part of the strategy, a Development Contribution Area (DCA) within LPS 15, under which a Development Contribution Plan (DCP) may be implemented to contribute to the funding of the public infrastructure requirements to facilitate development in the LSP Area would be considered.

Infrastructure items that would be eligible to be funded under a DCP should be in accordance with State Planning Policy 3.6 Development Contributions for Infrastructure (SPP 3.6) and may include:

- Land for POS and community facilities; and
- Landscape treatment for all public realm areas, including local roads.

Furthermore, detailed design of spaces throughout the precinct is encouraged through placemaking opportunities that emerge from community social investment.

11.2 WATER MANAGEMENT

Further to the recommendations of Section 7, in order to deliver wider environmental sustainability objectives, as well as providing attractive places in which residents and visitors can enjoy, consideration should be given to the conservation of water resources and quality of groundwater. The use of water efficiency measures is encouraged and should promote the investigation of best management practices for irrigation of POS.

The availability and quality of groundwater within the LSP area is limited at this stage. This will affect the ability of the City of Belmont to irrigate the proposed vegetation within the public realm areas. Therefore, due to the limitation of groundwater for irrigation purposes, the future irrigation of vegetation within the POS and public realm areas will need to be supplied by other sources. This may include scheme water, stormwater, irrigation (by agreement) from the Western Australian Turf Club's (now operating as Perth Racing) artesian groundwater licence, a new irrigation lake or other irrigation strategies will need to be investigated in the future. The City may encourage developers to consider the irrigation of abutting verge vegetation and street trees to ensure the high quality natural amenity of the public realm is maintained. Alternatively, non-irrigated (dry) landscape may need to be considered for the public realm areas.

11.3 STAGING

It is not anticipated that the entire landscape masterplan be implemented at once. It is anticipated that the work will be undertaken in stages and progressively rolled out commensurately with the delivery of other key infrastructure, particularly the various road realignments and subdivision works that are required to create the environment for private redevelopment.

These works would create the framework enabling the public realm works to be implemented. Priority should be given to establishing Daly Street as a cul-de-sac and developing the redundant portion of the road reserve as POS. Following that, streetscape upgrades should occur to set the scene for future redevelopment.

The Golden Gateway LSP includes an indicative staging strategy. The public realm delivery should work in parallel with this program.

A Landscape Management Plan will be prepared at each stage of the infrastructure works. Each Landscape Management Plan will address the landscape design, implementation and ongoing maintenance of landscape elements within the site, and should reflect the public realm principles contained in this Strategy.

12.2 DRAFT GOLDEN GATEWAY LOCAL STRUCTURE PLAN

BUILT BELMONT

ATTACHMENT DETAILS

Attachment No	Details
Attachment 2 – Item 12.2 refers	**Draft Golden Gateway Local Structure Plan Report (Excluding Attachments)**
Attachment 3 – Item 12.2 refers	**Bushfire Management Plan**
Attachment 4 – Item 12.2 refers	**Environmental Assessment Report**
Attachment 5 – Item 12.2 refers	**Movement and Access Strategy**
Attachment 6 – Item 12.2 refers	**Local Water Management Strategy**
Attachment 7 – Item 12.2 refers	**Infrastructure Assessment Report**
Attachment 8 – Item 12.2 refers	**Public Realm Strategy**
Attachment 9 – Item 12.2 refers	**Draft Golden Gateway Local Structure Plan Overview**
Attachment 10 – Item 12.2 refers	**Schedule of Submissions**
Attachment 11 – Item 12.2 refers	**Analysis of Annotatable Building Height Plans**
Attachment 12 – Item 12.2 refers	**List of Proposed Amendments**

Voting Requirement	:	Simple Majority
Subject Index	:	116/113–Golden Gateway Precinct
Location / Property Index	:	Various Lots
Application Index	:	N/A
Disclosure of any Interest	:	N/A
Previous Items	:	28 August 2018 Ordinary Council Meeting Item 12.1 26 February 2019 Ordinary Council Meeting Item 12.6
Applicant	:	City of Belmont
Owner	:	State Government, Local Government and Various Private Landowners
Responsible Division	:	Development and Communities Division

Item 12.2 Continued

COUNCIL ROLE

☐	**Advocacy**	*When Council advocates on its own behalf or on behalf of its community to another level of government/body/agency.*
☐	**Executive**	*The substantial direction setting and oversight role of the Council eg adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.*
☒	**Legislative**	*Includes adopting local laws, local planning schemes and policies.*
☐	**Review**	*When Council reviews decisions made by Officers.*
☐	**Quasi-Judicial**	*When Council determines an application/matter that directly affect a person's right and interests. The judicial character arises from the obligation to abide by the principles of natural justice. Examples of quasi-judicial authority include local planning applications, building licences, applications for other permits/licences (eg under Health Act, Dog Act or Local Laws) and other decisions that may be appealable to the State Administrative Tribunal.*

PURPOSE OF REPORT

For Council to consider the draft Golden Gateway Local Structure Plan (LSP) following the conclusion of public consultation.

SUMMARY AND KEY ISSUES

- The draft Golden Gateway LSP has been prepared to coordinate the future subdivision, zoning and development of land generally bound by Great Eastern Highway (GEH) to the south, the Swan River to the west, the Ascot Waters precinct to the north, and the Ascot Racecourse/Residential and Stables precinct to the east.

- Council adopted the draft Golden Gateway LSP for advertising on 26 February 2019. The draft LSP was subsequently advertised from 3 October 2019 to 31 October 2019 (28 days), and a total of 127 submissions and a petition with 109 signatories were received.

- The key issues raised by submissions relate to traffic, built form, public open space (POS), land use, car parking and the future of the Ascot Kilns and Belmont Trust sites.

- In light of the submissions received, a number of modifications are proposed to the Golden Gateway LSP, primarily relating to zoning, density and the movement network. In addition, administrative amendments are also proposed to provide additional clarity on certain aspects of the draft LSP.

- It is recommended that Council support the proposed modifications and require re-advertising of the draft Golden Gateway LSP.

Item 12.2 Continued

LOCATION

The draft Golden Gateway LSP encompasses land generally bound by GEH, the Swan River, Resolution Drive (north), Grandstand Road (north), the south-eastern boundary of Ascot Racecourse, Carbine Street and Hardey Road (Figure 1).

Figure 1: Golden Gateway Local Structure Plan area

CONSULTATION

The draft Golden Gateway LSP was advertised for a period of 28 days (from 3 October 2019 to 31 October 2019), in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015* – Schedule 2 – Deemed Provisions (the *Regulations*) and the Golden Gateway Community Engagement Strategy which was previously endorsed by Council. Advertising was undertaken by way of:

- Letters being sent to landowners and occupiers within and surrounding the precinct, including all properties within Ascot Waters Estate and the Residential and Stables Area.
- Letters being sent to government agencies.
- Placing a public notice in the 3 October 2019 edition of the Southern Gazette newspaper.
- A community information session hosted at the City of Belmont Civic Centre on 9 October 2019.
- A community information booth held in Ascot Waters Park (Figure 2) on 19 October 2019.

Item 12.2 Continued

Figure 2: Information Booth location

- Erecting two advertising signs (one on Epsom Avenue and one along Stoneham Street).

- Displaying a notice and information on the City's website and Belmont Connect webpage.

- Posting information on the City's Facebook page

At the conclusion of the advertising period, a total of 127 submissions were received, with 10 being received from government bodies and agencies and 117 from landowners and/or occupiers. In addition to these submissions, a petition was received with 109 signatories.

A map identifying the extent of the consultation area and the origin of submissions received from the referral area follows (Figure 3). It should be noted however that 19 submissions received were from outside of the referral area. A summary of the submissions received and comments thereon are included in the Schedule of Submissions contained as Attachment 10.

Item 12.2 Continued

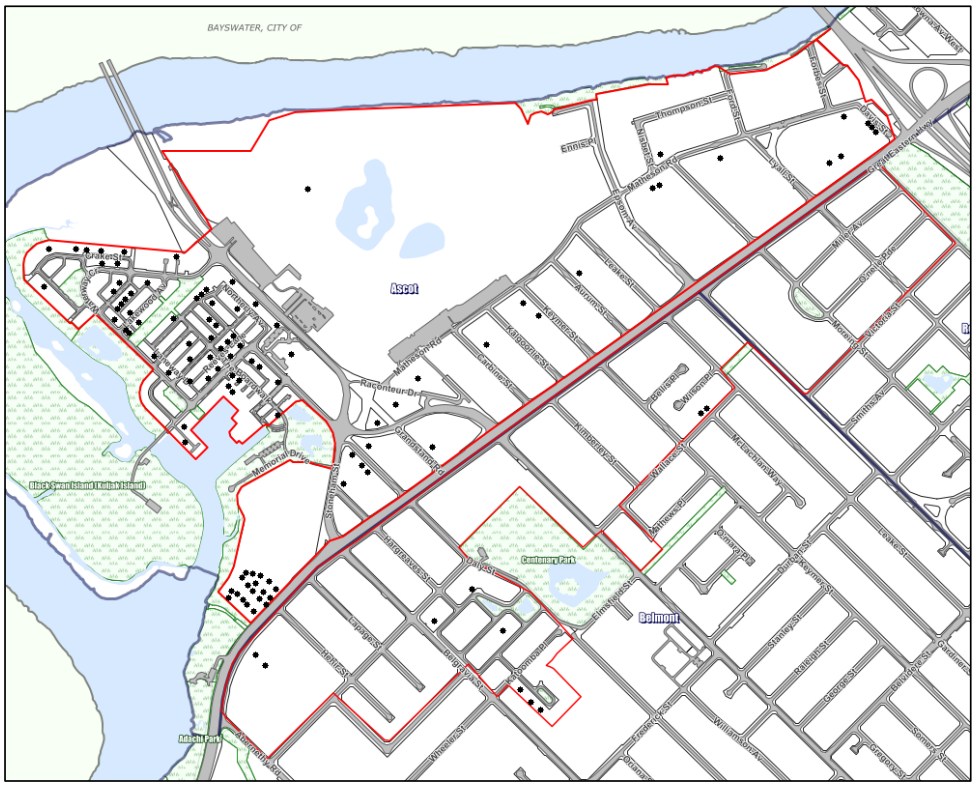

Figure 3: Referral area and origin of submissions

The key concerns raised in the submissions relate to:

- The proposed building heights and whether these are appropriate for the area.
- The appropriateness of certain land uses within the mixed use zone.
- Whether the amount of POS proposed to be provided within the precinct is adequate.
- Potential built form outcomes and whether these will create visual privacy and overshadowing impacts.
- An increase in traffic and the capacity of the existing road network to support the redevelopment of the area.
- The proposed design of the movement network.
- Whether the proposed car parking requirements will be adequate for the precinct.
- Whether public transport options in the area are adequate to support redevelopment.
- The future use of the Ascot Kilns and Belmont Trust sites.

The abovementioned concerns are further discussed in the Officer Comment section of this report.

Item 12.2 Continued

STRATEGIC COMMUNITY PLAN IMPLICATIONS*

In accordance with the Strategic Community Plan Key Result Area: Natural Belmont.

Objective: Protect and enhance our natural environment.

Strategy: Develop quality POS in accordance with community needs.

In accordance with the Strategic Community Plan Key Result Area: Built Belmont

Objective: Achieve a planned City that is safe and meets the needs of the community.

Strategy: Encourage a wide choice and consistent implementation of development approaches.

Objective: Provide a safe, efficient and well maintained transport network.

Strategy: Encourage a broad range of transport alternatives and provide adequate management of traffic, density, parking, congestion and safety of the transport network, in and surrounding the City of Belmont.

In accordance with the Strategic Community Plan Key Result Area: Business Belmont.

Objective: Maximise business development opportunities.

Strategy: Attract and support high quality business development and the sustainable use of land in Belmont, including Perth Airport, by providing information and assistance to businesses seeking to establish operations in the City.

*Note: The Strategic Community Plan Implications outlined are reflective of the City of Belmont Strategic Community Plan 2016 – 2036. Council recently endorsed the City of Belmont 2020 – 2040 Strategic Community Plan which, as a result of COVID-19 administrative implications, is yet to be implemented across the City.

POLICY IMPLICATIONS

There are no policy implications associated with this report. It should be noted however that the draft Golden Gateway LSP proposes that a Local Planning Policy (LPP) be prepared to assist with the future implementation of the LSP and to guide future development in the precinct.

STATUTORY ENVIRONMENT

Strategic Planning Framework

Perth and Peel @ 3.5 Million

The State strategic framework documented under the Western Australian Planning Commission (WAPC) 'Perth and Peel @ 3.5 million' impacts upon the statutory direction for the City.

Item 12.2 Continued

The Perth and Peel region will need to accommodate significant population growth by 2050 with an additional 1.5 million people requiring approximately 800,000 new homes. The 'Perth and Peel @ 3.5 million' strategic planning framework requires that a substantial amount of this growth (i.e. 47%) be delivered through infill developments. It identifies that the City of Belmont population will increase from 37,360 to 60,260 people by 2050 and to accommodate that increase an additional 10,410 dwellings will be required.

Perth and Peel @ 3.5 million promotes the concept of 'urban corridors' as a way of achieving integrated land use and transport outcomes. Great Eastern Highway is identified as an 'urban corridor' because it provides a connection between the Burswood and Perth Airport Activity Centres. Great Eastern Highway abuts the Golden Gateway LSP area. Grandstand Road/Resolution Drive is identified as a 'high frequency public transit' route and Belgravia Street (being the extension of Stoneham Street) is identified as an 'integrator arterial' road. The framework suggests that the focus should be given to investigating increased residential densities and mixed land uses around urban corridors.

City of Belmont Local Planning Strategy

The City of Belmont Local Planning Strategy (2011) is the strategic planning document that broadly sets out the long-term planning direction for the City and informed the preparation of Local Planning Scheme No. 15 (LPS 15). It recognises that GEH, which abuts the LSP area, is the only major regional road within the City that is designated as an 'urban corridor'. The key objectives of the Local Planning Strategy and its supporting sub-strategies, as relevant to the Golden Gateway precinct, are as follows:

- Enhance the north-west entrance to the City.
- Encourage landmark development.
- Produce a Structure Plan and Implementation Plan for the locality.
- Utilise the development process to rationalise and improve traffic access to commercial properties along GEH.
- Provide more frequent and safe pedestrian crossing points along GEH.
- Provide for higher density residential development along GEH, in addition to mixed use, landmark buildings that create an entry statement and a high standard of urban amenity.
- Encourage a new local convenience centre within Ascot Waters, but Lot 713 Grandstand Road (Ascot Kilns site) should no longer form part of any commercial strategy.
- Acknowledge that Ascot Racecourse and the Swan River are 'strategic tourism sites' of state significance to benefit future tourism development.
- Recognise the importance of the river for transport, commerce, tourism and leisure as well as its conservation values.

Item 12.2 Continued

Draft Great Eastern Highway Urban Corridor Strategy

The GEH Urban Corridor Strategy is a draft planning document that establishes a 'vision' for the GEH corridor and proposes a series of implementation strategies to ensure that the vision is realised. The Strategy will be implemented through Scheme provisions, structure planning and local planning policies.

The Strategy identifies four precincts along GEH and aims to provide area-specific guidance on their future growth and development in accordance with the urban design framework. Precinct 2 of the Strategy includes the section of GEH between Belmont Avenue and Hardey Road, of which the northern side of GEH falls within the Golden Gateway precinct. The Strategy identifies this area as an 'activity node' for a range of commercial land uses, offices, professional and technical services, cafés/restaurants and improved civic spaces to support the local workforce and high density residential development capitalising on the proximity of the Swan River.

The draft Golden Gateway LSP is consistent with the draft GEH Urban Corridor Strategy.

Statutory Planning Framework

Planning and Development (Local Planning Schemes) Regulations 2015

Part 4, Schedule 2 – Deemed Provisions of the *Regulations* outlines the procedure for the preparation, advertising and consideration of a structure plan. The key requirements under Part 4 of the *Regulations* are as follows:

- The local government must advertise a structure plan for at least 14 days but not more than 28 days, unless otherwise approved by the WAPC, within 28 days of a structure plan being accepted for assessment and advertising.

- Following the conclusion of the advertising period, the local government must, within 60 days from the last day for making submissions, consider all submissions made on the proposed structure plan and prepare a report to the WAPC which includes the following:

  - A list of the submissions considered by the local government;

  - Any comments by the local government in respect of those submissions;

  - A schedule of any proposed modifications to address issues raised in the submissions;

  - The local government's assessment of the proposal based on appropriate planning principles; and

  - A recommendation by the local government on whether the proposed structure plan should be approved by the WAPC.

- If the WAPC is not given a report on a proposed structure plan they may make a decision on the proposed structure plan in the absence of a report. In making a decision, the WAPC may request technical advice or further information from the local government and if the local government fails to provide this, the WAPC may obtain the information themselves. If the WAPC incur any costs during this process, they may seek to recover these from the local government.

Item 12.2 Continued

- The local government may advertise any modifications proposed to the structure plan to address issues raised by submissions; however it cannot advertise modifications on more than one occasion without approval from the WAPC.

- On receipt of a report on a proposed structure plan from the local government, the WAPC must within 120 days, consider the plan and determine whether to approve the structure plan, require the structure plan to be modified or refuse the structure plan.

- The WAPC may direct the local government to readvertise the structure plan where it considers that major modifications have been made however; it cannot direct the local government to readvertise the structure plan on more than one occasion.

State Planning Policies

State Planning Policy 7.3 – Residential Design Codes

The Residential Design Codes (R-Codes) establish built form controls for all residential development within Western Australia (WA). It is premised on the allocation of residential densities that correlate to specific built form requirements under Volume 1 or Volume 2 of the R-Codes. Volume 1 of the R-Codes establishes standards for single houses and grouped dwellings, as well as multiple dwellings at densities up to R30. Volume 2 of the R-Codes specifically relates to multiple dwelling developments including mixed use development, at the R40 density and above.

Liveable Neighbourhoods

Liveable Neighbourhoods is an operational policy that guides planning in greenfield and large urban infill areas. It provides guidance on the design of movement networks, activity centres, subdivision design and POS provision.

BACKGROUND

Golden Gateway Precinct

The Golden Gateway precinct comprises of approximately 24 ha of land generally bound by GEH, the Swan River, Resolution Drive (north), Grandstand Road (north), Ascot Racecourse (southern boundary), Carbine Street and Hardey Road. The precinct is located north of the Belmont Business Park, west of the Residential and Stables area and south of Ascot Racecourse and the Ascot Waters residential estate. The Garret Road bridge is located approximately 900 metres north of the site which serves a key north-south link between Guilford Road and GEH across the Swan River.

The area is characterised by fragmented land ownership, and contains a range of existing land uses including; offices, warehouses, service stations and fast food outlets. There are also several parcels of vacant and/or underutilised land within the precinct, including land owned by Perth Racing. The Ascot Kilns site is located within the Golden Gateway precinct; having regard for its State heritage significance and previous planning work initiated for the site, the draft LSP requires that development be undertaken in accordance with an adopted Local Development Plan (LDP).

Item 12.2 Continued

The Belmont Trust land, formerly occupied by the 'Parry Fields' baseball field, is also located within the Golden Gateway precinct. This land is controlled by the 'Belmont Trust' and is subject to a Declaration of Trust requiring the land to be provided for public enjoyment and recreation. This land has been included within the precinct on the basis that any future use/development of the land for public enjoyment and recreation would have implications for the wider Golden Gateway precinct. It also serves as a connection between the Swan River and the wider area, including the Residential and Stables zone and the southern side of GEH, via the Golden Gateway precinct.

Figure 4 shows the location of the precinct in relation to the surrounding area.

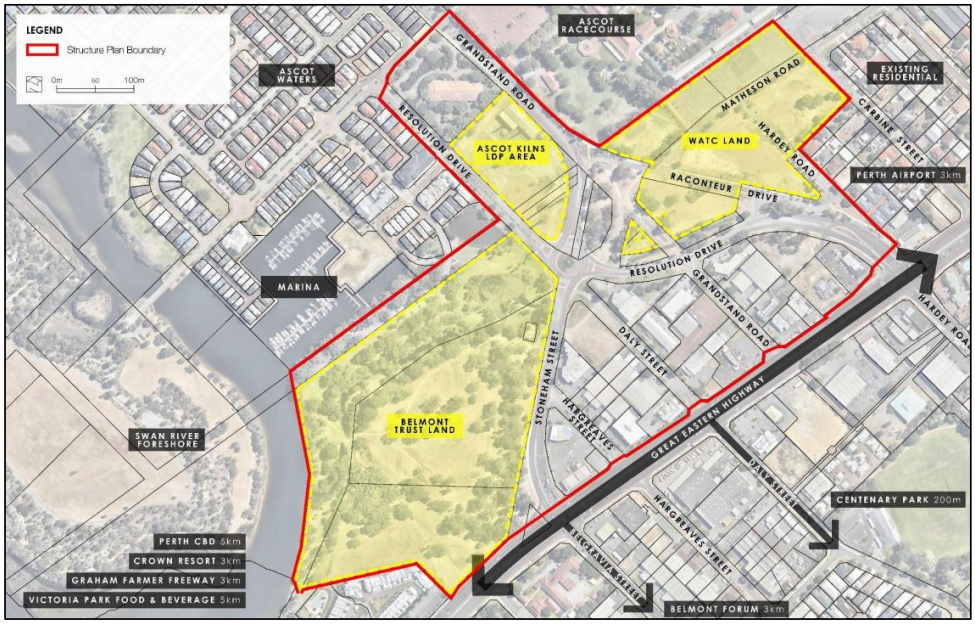

Figure 4: Location Plan

Under the Metropolitan Region Scheme (MRS), the area is primarily zoned 'Urban', with a portion of land abutting the Swan River being reserved for 'Parks and Recreation', and located within the Swan River Development Control Area. Great Eastern Highway, which abuts the precinct, is reserved as a 'Primary Regional Road' under the MRS and is controlled by Main Roads Western Australia (MRWA). Figure 5 below illustrates the LPS 15 and MRS zonings and reservations of the precinct and surrounding area.

Item 12.2 Continued

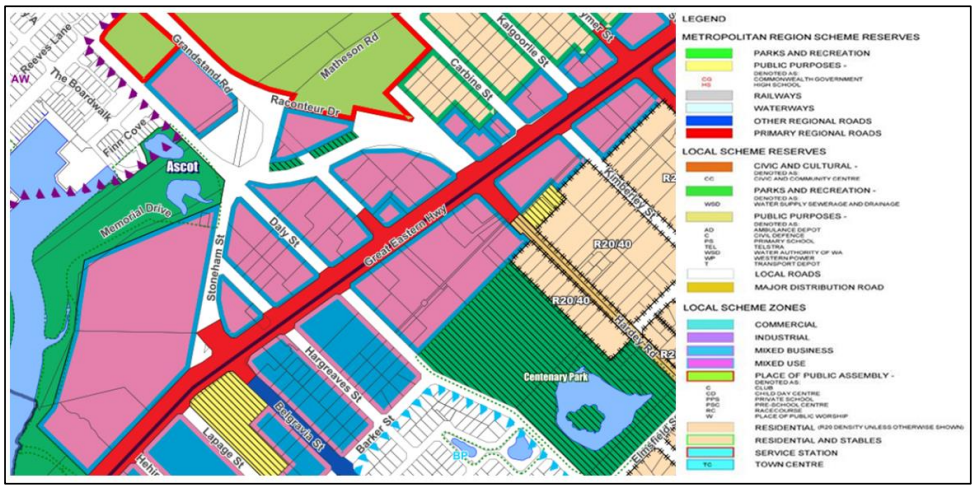

Figure 5: Zoning

Private landholdings within the precinct are predominantly zoned 'Mixed Use' under LPS 15, with parcels of Perth Racing land zoned 'Place of Public Assembly'. In addition, the open drain abutting Resolution Drive is reserved as 'Parks and Recreation' and various parcels of crown land and road reserves are reserved as 'Local Roads' under LPS 15.

In 2008, the Golden Gateway precinct was identified as a key strategic area due to its prominent position on GEH and at the north-western 'gateway' of the City of Belmont. It was recognised that there was significant potential for high quality mixed commercial and residential development in the location, however existing site access constraints and land fragmentation made it apparent that coordinated planning was required. It was also considered necessary to provide precinct-specific planning controls and that a 'one-size-fits-all' approach to development within the precinct would not be conducive to desirable outcomes.

Draft Golden Gateway Local Structure Plan

The draft Golden Gateway LSP has been prepared to coordinate future redevelopment of the precinct. More specifically it addresses:

- The proposed zoning, reservation and density coding of land within the precinct, and prescribes the suitability of certain land uses.
- Built form controls premised on precinct areas, including plot ratio, minimum and maximum building height, setbacks and car parking requirements.
- The provision of POS and public realm improvements.
- The identification of a road hierarchy and movement network for vehicles, pedestrians and cyclists, as well as the consideration of street design and traffic management.
- Strategies for the management and treatment of stormwater runoff within the precinct.

Item 12.2 Continued

- The identification of infrastructure and serving requirements required for the redevelopment of the precinct.

- The requirements to facilitate implementation of the draft LSP.

A copy of the draft Golden Gateway LSP is contained as Attachment 2, with the associated Technical Appendices being contained as Attachment 3, Attachment 4, Attachment 5, Attachment 6, Attachment 7 and Attachment 8. A summary of the key elements of the draft LSP is provided in Attachment 9.

OFFICER COMMENT

Procedural Considerations

The draft Golden Gateway LSP is a planning document that has been prepared to provide a basis for the zoning, subdivision and development of the precinct. The draft LSP is required to be progressed in accordance with the *Regulations*, which includes requirements for the advertising, consideration and determination of structure plans. The *Regulations* also establish processing timeframes which can only be varied subject to WAPC approval.

As outlined previously in this report, following the conclusion of the advertising period, the City is required to consider all the submissions made on the draft LSP and prepare a report to the WAPC with its assessment and a recommendation for its determination. The *Regulations* require that the report be provided to the WAPC within 60 days from the close of advertising (i.e. 30 December 2019), however given the complexity of the draft LSP and the issues raised, the WAPC has granted an extension of time to 26 June 2020. Should no decision be made on how to progress the draft LSP, the WAPC may make a decision without the City's assessment and recommendation, and any costs incurred by the WAPC to enable this can be recovered from the City.

Notwithstanding the above, should Council resolve to require modifications and readvertising of the draft LSP, the requirement to prepare a report to the WAPC is effectively deferred and reset at the conclusion of readvertising. It should be noted that the *Regulations* stipulate that a local government can only readvertise a structure plan once, unless otherwise approved by the WAPC.

Proposed Activity Centre and Retail Floorspace

The draft LSP seeks to facilitate the redevelopment of the Golden Gateway precinct as an 'activity centre' with mixed commercial and residential development. The draft LSP proposes to establish a 'Local Centre' with approximately 1,200m^2 of net lettable area (NLA) of retail floor space to provide local conveniences and amenities to support a future residential and business population. This is intended to be focussed around Daly Street as a 'main street', as well as some limited retail uses along GEH.

One of the submissions received during the advertising period raised the following concerns in relation to the provision of retail uses within the precinct:

- The provision of retail floor space is premised on an analysis undertaken in 2016 for the Ascot Kilns site, rather than a more recent precinct-specific analysis, which if inaccurate, could undermine future planning and the City's activity centres hierarchy.

Item 12.2 Continued

- The absence of any control over retail development within the precinct having implications for other activity centres within the City of Belmont.

- The identification of GEH as being suitable for retail development being inconsistent with the recommendations of the City's Local Commercial Strategy.

- A lack of clarity and general inconsistencies in the terminology used to describe the proposed provision of retail floor space within the precinct.

Having regard for the matters raised in this submission, it is noted that City's Local Commercial Strategy (2008) does not currently identify a 'Local Centre' within the Golden Gateway precinct. The establishment of any new activity centre requires consideration of any potential economic effects from a local community access or benefit perspective. This involves ascertaining the retail needs of an area and determining the appropriate distribution of retail floor space such that it does not impact the viability of existing activity centres. In considering this, the following points are relevant:

- Contemporary planning practice supports the provision of local convenience amenities within walkable distances to housing. This has the benefit of reducing the overall need to travel and promoting public transport, cycling and walking.

- There is currently no activity centre located within close proximity to the precinct, meaning that existing residents of the Ascot Waters Estate, the Residential and Stables area and the Belgravia Estate are required to travel in excess of 1 kilometre to access their closest centre.

- The City's Local Commercial Strategy identifies a future 'Local Centre' within Ascot Waters Estate. This centre however has never eventuated and it is considered that there may be barriers to providing retail development in this location, such as limited available floor space, passing trade and car parking.

- The GEH Urban Corridor Strategy identifies a future 'activity node' in the Golden Gateway precinct. This activity node is intended to provide conveniences for residents to the north and south, as well as the Belmont Business Park.

- The Local Commercial Strategy is currently being reviewed as a precursor to a review of LPS 15, whereby a more contemporary Activity Centres Planning Strategy is being prepared in its place. This will involve an assessment of the existing activity centres hierarchy, and in doing so modelling will be undertaken of the wider retail needs within the City of Belmont.

- The demand for retail floors pace in an area is directly correlated to population, therefore any increase in population would typically increase the retail need in an area.

- A Retail Needs Analysis undertaken in 2016 to support the proposed Ascot Kilns LDP identified that retail floor space demand increased by 80m^2 for every 250 apartments delivered in the area. On this basis, the provision of 3,400 dwellings in the area could support approximately 1,100m^2 of retail floor space.

Item 12.2 Continued

- The WAPC's Land Use and Employment Survey indicate that the precinct and surrounding land on the southern side of GEH currently accommodates 4,286m^2 of retail floor space. This is comprised of predominantly car/highway-oriented retail (i.e. fast food outlets, service stations) rather than serving the daily/weekly needs of the local residential population.

- In undertaking modelling to inform the preparation of the Activity Centres Planning Strategy and the review of LPS 15, early findings suggest that by 2036, the Golden Gateway Precinct could accommodate some 7,000m^2 of retail floor space. This is based on a conservative estimate of the population increasing by only 1,031 people, and as such the retail demand could in fact be greater depending on the uptake of development in the precinct.

- Given the small scale nature of the proposed Local Centre and the absence of any nearby centre, it is considered that any retail development in the precinct can be developed without specific control on floor space and any supporting residential development in the first instance.

In light of the above, it is considered that the establishment of a Local Centre with the provision of 1,200m^2 retail floor space would be acceptable in the Golden Gateway precinct. Notwithstanding, it is acknowledged that the draft LSP should be modified to address inconsistencies between terminology and provide clarity on the provision of retail floor space within the precinct (Modification 1).

Belmont Trust Land

The Belmont Trust Land falls within the Golden Gateway precinct, as identified by the draft LSP. Submissions received during the advertising period raised concerns that the Belmont Trust Land was included in the draft LSP, and subsequently requested that it be removed and retained as POS by being developed as gardens and parkland with community facilities. In considering this, the following points are relevant:

- The land is controlled by the 'Belmont Trust' as opposed to the Crown.

- The City of Belmont manages the Belmont Trust to accord with the provisions of the *Charitable Trusts Act 1962* and a Declaration of Trust which applies to the land.

- The Declaration of Trust in essence:

  - Results in the Elected Members of the City of Belmont acting as Trustees of the Belmont Trust; and

  - Requires the land to be provided for public enjoyment and recreation.

- This means that:

  - The role of the City's Elected Members as Trustees of the Belmont Trust is mutually exclusive from their role as Councillors of the City of Belmont; and

  - Regardless of the planning provisions over the land, the Trustees have the role of the Trust Board, and are obliged to administer the requirements of the Declaration of Trust.

- The land is currently zoned 'Mixed Use' under LPS 15.

Item 12.2 Continued

- The draft LSP does not prescribe any zoning or development provisions for the land. Rather, it identifies that further planning is required to be undertaken, which is discrete to the requirements of the Declaration of Trust.

- The land provides a connection between the Swan River, the Golden Gateway Precinct and the wider area, including the Residential and Stables area and the southern side of GEH.

- The future use/development of the land for public enjoyment and recreation would have implications for the wider Golden Gateway precinct, such as POS, access and traffic. It would be appropriate to consider these matters holistically rather than in isolation, which could be achieved by way of a later amendment to the LSP.

For the reasons mentioned above, it is considered appropriate for the Belmont Trust land to form part of the Golden Gateway precinct and be identified as requiring further planning.

Zoning and Reservation

The draft Golden Gateway LSP proposes the following zoning and reservation of land under LPS 15:

- Rezoning Lot 452 Grandstand Road (Lee-Steere House) located in the north-western portion of the precinct and owned by Perth Racing, from 'Place of Public Assembly' to 'Residential'.

- Rezoning various lots owned by Perth Racing in the north-eastern portion of the precinct from 'Place of Public Assembly' to 'Mixed Use'.

- Maintaining the existing 'Mixed Use' zoning on all other properties within the precinct, including the Ascot Kilns site.

- For land proposed to be zoned 'Mixed Use', certain land uses are proposed to be restricted.

- The reservation of land identified for POS as 'Parks and Recreation' reserve.

A number of submissions were received during advertising of the draft LSP that raised concerns regarding the proposed zoning of land within the precinct. More specifically:

- The appropriateness, necessity and compatibility of the 'Mixed Use' zone in the precinct, particularly in regard to its surrounding context and the land uses afforded by that zoning.

- The zoning of Perth Racing's landholdings, namely Lot 452 Grandstand Road located in the north-western portion of the precinct and various lots in the north-eastern portion of the precinct, directly adjacent to Ascot Waters estate and the Residential and Stables area, respectively.

- The inclusion of the Ascot Kilns site within the draft LSP area, and the appropriateness of maintaining the existing 'Mixed Use' zoning over the precinct in light of community sentiment regarding the future use of the site as POS.

Item 12.2 Continued

Discussion on these elements follows.

Appropriateness of Mixed Use Zone

The draft Golden Gateway LSP proposes to zone a majority of the precinct 'Mixed Use' but with restrictions on certain land uses that are considered inappropriate for the precinct. The purpose of the 'Mixed Use' zone is to facilitate the development of a mix of varied, but compatible, land uses, particularly residential and commercial uses. As outlined previously, concerns have been raised about the appropriateness of this zoning, including whether it is necessary in this area and compatible with its setting. In considering this matter, the following points are relevant:

- The Golden Gateway precinct is strategically located on the GEH urban corridor. Facilitating infill development along urban corridors aligns with the State's Perth and Peel @ 3.5 million strategic planning framework and will contribute to the City meeting its infill housing targets.

- It is widely accepted that high density residential and mixed use development within walkable catchments to major transport nodes has the potential to reduce car dependence, increase accessibility for those without access to private cars, and therefore reduce road congestion and infrastructure demand.

- Encouraging high density residential development within the precinct provides for housing diversity and opportunities for more affordable living within areas that are well connected with services, employment and public transport.

- A majority of the precinct, including the Ascot Kilns site, is currently zoned 'Mixed Use' under LPS 15. This zoning currently allows for a wide variety of uses, including residential, commercial, light industrial, service, community and entertainment uses. Some of these land uses could be considered incompatible with residential development, particularly light industrial type uses which are more likely to produce heavy vehicle traffic, noise, and other emissions.

- In recognition of the existing commercial and light industrial nature of the precinct, it is considered unreasonable and impractical to transform this area into a purely residential estate. Similarly, it is considered that a pure commercial/industrial estate does not represent best use of the land given its strategic location and proximity to other residential areas.

- Roads often form logical boundaries between zones as they can provide physical separation between differing land uses and built form, thereby mitigating land use conflict.

- The expansion of the 'Mixed Use' zone to the northern side of the realigned Resolution Drive, comprising vacant land owned by Perth Racing adjacent to Ascot Racecourse, could be viewed as encroachment into the Residential and Stables area. Consideration of this issue is discussed later in this report.

- Whilst the lots currently zoned Mixed Use contain development and uses that are relatively small scale, of a low intensity and somewhat benign, there is potential under the existing Mixed Use zoning for more intensive development and land uses to be undertaken. The proposed LSP introduces controls to restrict certain uses which would typically be allowed in a 'Mixed Use' zone. This will limit potential land use conflict both within the precinct and the surrounding area.

Item 12.2 Continued

- The proposed restriction of land uses within the precinct will address the proliferation of Fast Food Outlet and Service Station land uses along GEH, as envisioned by the draft GEH Urban Corridor Strategy.

- Whilst the restriction of land uses will prohibit light industrial type uses, any existing operation will be afforded non-conforming use rights thereby providing for their continued operation albeit limit their ability to expand their operations.

For the reasons outlined above, it is considered that the 'Mixed Use' zone, with its proposed restrictions on particular land uses, is appropriate for the Golden Gateway precinct. Notwithstanding, as highlighted above, careful consideration is required on:

1. The interface between zones, particularly between the proposed 'Mixed Use' and 'Residential' zones, as well as Ascot Waters Estate to the north-west and the Residential and Stables area to the north-east, so as to avoid future land use conflicts.

2. The expansion of the 'Mixed Use' zone to the northern side of the realigned Resolution Drive, adjacent to Ascot Racecourse and the Residential and Stables area, as this could result in land use conflicts with existing stabling and racecourse operations.

The above issues are considered relevant to land on the periphery of the precinct as identified by Figure 6 below, which includes land owned by Perth Racing and the Ascot Kilns owned by the WAPC. This is discussed in greater detail in the next section of the report.

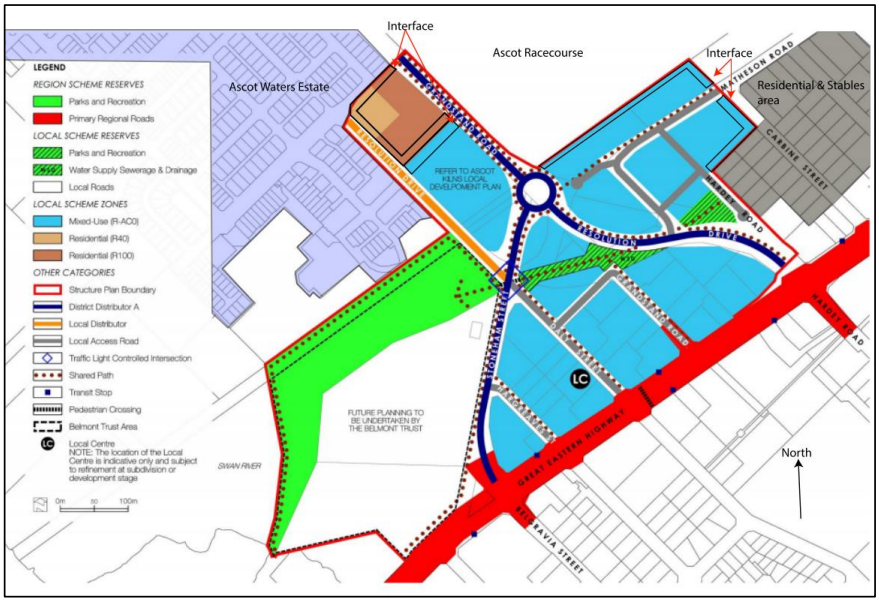

Figure 6: Interface between different zones and existing residential areas

Item 12.2 Continued

Perth Racing Landholdings

Perth Racing own approximately 5.7 ha of land within the Golden Gateway precinct which can be distinguished by two distinct areas as shown in Figure 7 below.

Figure 7: Perth Racing's landholdings

The land parcel adjacent to Ascot Waters to the north (Lot 452 Grandstand Road) encompasses 'Lee-Steere House', which is used by the WA Turf Club as an administration building.

The area adjacent to the Residential and Stables zone to the east comprises a total of five lots with a combined area of approximately 4.555 ha. This land is predominantly vacant, with the exception of land on the northern side of Matheson Road which contains an existing car park associated with Ascot Racecourse.

As outlined previously, the draft LSP proposes to rezone Lot 452 Grandstand Road from 'Place of Public Assembly' to 'Residential'. The other Perth Racing landholdings are proposed to be zoned 'Mixed Use' under the draft LSP. Whilst the future development intentions of Perth Racing are unknown, they have indicated a desire for flexibility in any future development controls that apply to their land. This is discussed further below along with the relevant planning considerations.

<u>Lot 452 Grandstand Road</u>

In response to advertising, Perth Racing have requested that the draft LSP be modified to zone a portion of Lot 452, fronting Grandstand Road, to 'Mixed Use' with the balance maintaining the proposed 'Residential' zone, as shown in Figure 8 below. This request has been made on the basis that the site would be conducive to commercial development fronting Grandstand Road, across from the main Ascot Racecourse entry, with the balance of the lot providing a residential interface to the adjacent Ascot Waters Estate.

Item 12.2 Continued

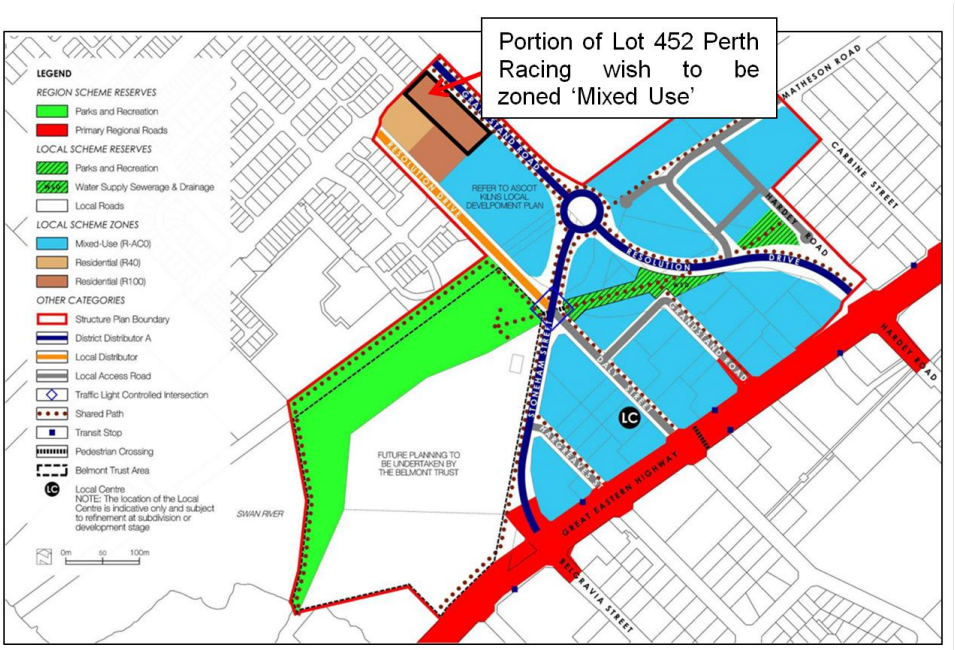

Figure 8: Portion of Lot 452 Perth Racing wish to be zoned 'Mixed Use' (Option A)

In light of Perth Racing's submission, the following zoning options for Lot 452 have been identified:

- *Option A (Perth Racing's request):* Zoning the portion of the site fronting Grandstand Road 'Mixed Use' and zoning the remainder of the site 'Residential'.
- *Option B (Currently Proposed under the draft LSP):* Zoning the entire site 'Residential'.
- *Option C:* Zoning the entire site 'Residential' but with additional land uses that provide for limited non-residential uses.
- *Option D (Existing zoning under LPS 15):* Zoning the entire site 'Place of Public Assembly'.

In considering the above, the following points are relevant:

- The site's frontage to Grandstand Road is likely to be attractive for commercial development due to its exposure to passing trade.
- The 'Mixed Use' zone provides for a wide variety of land uses, some of which could be considered incompatible with residential development. As Lot 452 is located directly adjacent to existing housing within the Ascot Waters Estate, the introduction of the 'Mixed Use' zoning and additional uses as per Options A and C, respectively, could result in land use conflict and amenity impacts for existing residents.

Item 12.2 Continued

- A 'Residential' zoning over the entirety of Lot 452, as per Option B, would provide an appropriate interface to adjacent development within the Ascot Waters Estate, however in the absence of knowing Perth Racing's future development intentions for the site, it is not considered practical to apply this zoning over the lot, as they may not intend to undertake residential development on the land.

- The existing building on the site (Lee Steere House) is proposed to be assessed for historical significance in the next review of the Municipal Heritage Inventory. Options B to D would maintain this building within one zoning, thereby supporting its ongoing use and retention, as opposed to Option A where the existing building would straddle the 'Mixed Use' and 'Residential' zones, which may make its retention impractical due to differing land use and development controls.

- In the absence of knowing the future of the adjacent Ascot Kilns site, there is a risk that any future uses on Lot 452 may not be compatible or provide an appropriate interface to the Ascot Kilns.

- A 'Place of Public Assembly' zoning is intended to allow for special places of assembly such as private schools, halls, showgrounds, sporting grounds and racecourses. Maintaining this zoning over Lot 452, as per Option D, would provide Perth Racing with an opportunity to determine their future intentions for the site prior to the draft LSP recommending an alternative zoning and associated controls for the land, having regard to the adjacent Ascot Waters Estate.

In light of the above, Option D, being to maintain the existing 'Place of Public Assembly' zoning over Lot 452, is the preferred option and it is therefore recommended that the draft LSP be amended accordingly (Modification 2).

Remainder of Perth Racing Landholdings

Perth Racing own several lots on the northern side of the realigned Resolution Drive, adjacent to Ascot Racecourse and the Residential and Stables area, which are proposed to be zoned 'Mixed Use' under the draft LSP. There is a concern that this zoning could give rise to a range of non-residential land uses that are incompatible with the adjacent Residential and Stables zone, ultimately eroding the amenity of the area and resulting in land use conflict. In considering this concern in the context of the draft LSP, the following points are relevant:

- The Residential and Stables area is low density in nature with single houses on larger lots of around 900m^2 in area.

- The road network within the Residential and Stables area carries low traffic volumes and at slower speeds for the safety of horses being walked through the area.

- The Residential and Stables area could produce noise, dust and odour impacts which may be unacceptable to future residents within Golden Gateway precinct.

- A 'Mixed Use' zoning provides for a range of non-residential land uses and higher intensity residential development (e.g. multiple dwellings), that may produce a number of vehicle trips and a level of noise that has the potential to impact on the amenity of the Residential and Stables area.

Item 12.2 Continued

- The proposed zoning of land under the draft LSP does not currently provide for a transition between lower intensity development within the Residential and Stables area and more intensive development within the 'core' of the Golden Gateway precinct.

- Unlike other Perth Racing landholdings located to the north of Resolution Drive, a portion of Lot 100 Raconteur Drive, Ascot, bound by Hardey Road, Matheson Road and Carbine Street, is located adjacent to land within the Residential and Stables area. It is considered that a 'Mixed Use' zoning over this land is encroaching into the Residential and Stables area and provides an opportunity for land use conflict to occur (Figure 9).

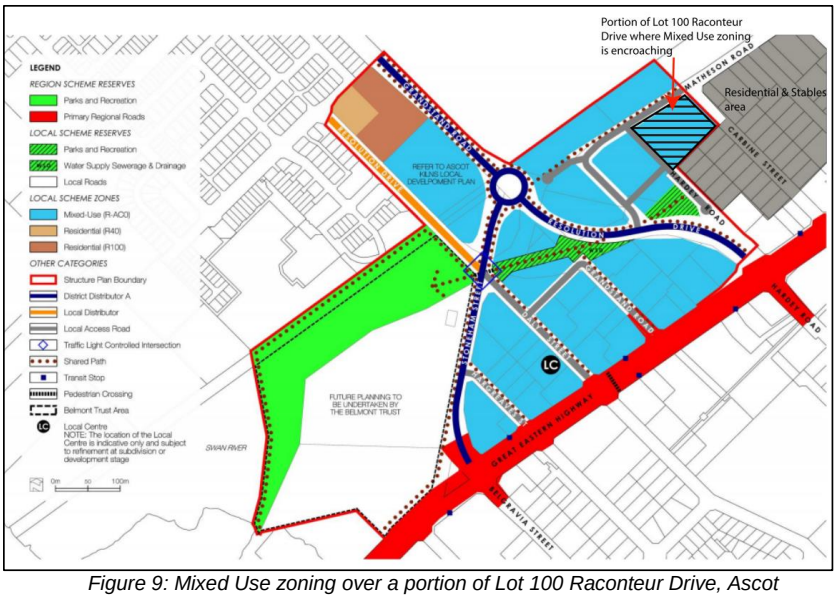

Figure 9: Mixed Use zoning over a portion of Lot 100 Raconteur Drive, Ascot

- A 'Mixed Use' zoning is considered appropriate adjacent to Resolution Drive as this land is located in close proximity to the 'core' of the Golden Gateway precinct and setback from existing land within the Residential and Stables area (Figure 10).

Item 12.2 Continued

Figure 10: Mixed Use zoning adjacent to Resolution Drive

- Matheson Road provides a physical separation between Ascot Racecourse and the remainder of land within the Golden Gateway precinct. It is considered that a 'Mixed Use' zoning in this location is encroaching into the Residential and Stables area and has the potential to impact on existing Ascot Racecourse operations (Figure 11).

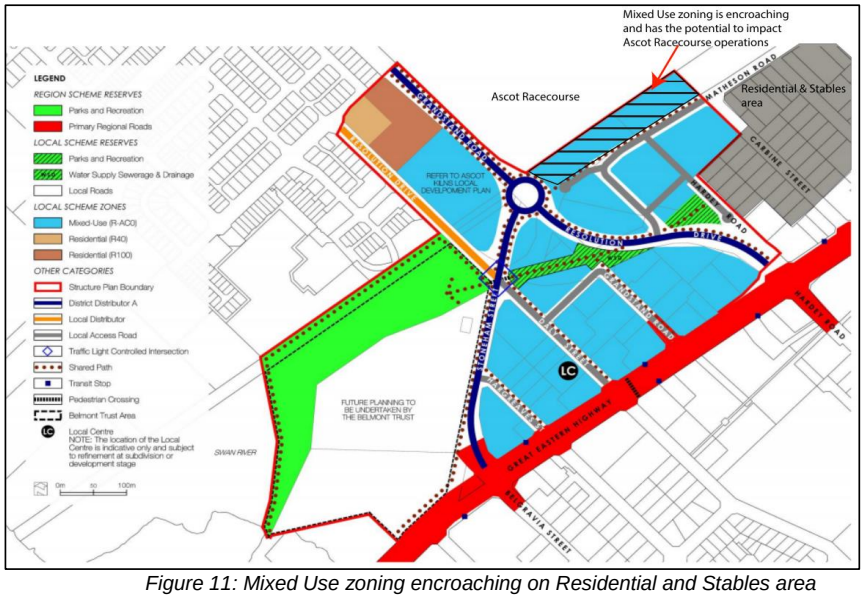

Figure 11: Mixed Use zoning encroaching on Residential and Stables area and Ascot Racecourse

Item 12.2 Continued

In light of the above, it is considered that the draft LSP should be modified to provide for a more appropriate transition from the more intensive land uses within the 'core' of the Golden Gateway precinct, to the more sensitive uses in the Residential and Stables area. This would include:

- Maintaining the 'Mixed Use' zoning on land immediately fronting Resolution Drive on the basis that this land is located in close proximity to the centre of the Golden Gateway precinct and provides for future development to be highly visible to passing trade and directly accessed, without the need for vehicles to traverse through the Residential and Stables area (Figure 12).

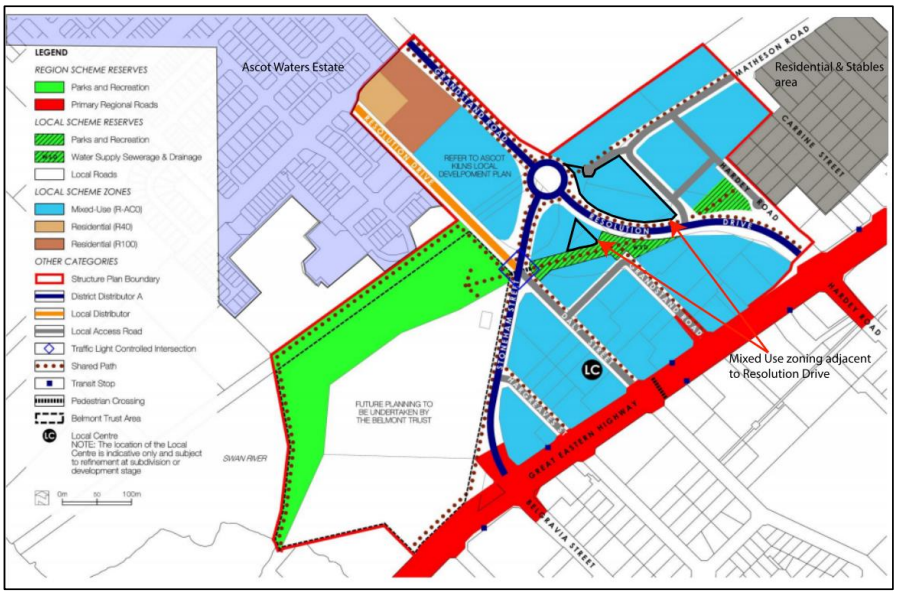

Figure 12: Location of Mixed Use zoning adjacent to Resolution Drive

- For the north-eastern portion of Lot 100 Raconteur Drive, bound by Matheson Road, Carbine Street and Hardey Road, apply either:

  1. A 'Residential and Stables' zone on the basis that the subject site forms part of a wider cell of properties zoned 'Residential and Stables' and would therefore provide an appropriate interface to existing development within the area; or

  2. A 'Place of Public Assembly' zone which represents the existing zoning arrangement under LPS 15 which could ultimately be reconsidered should Perth Racing form a position on its future development intentions.

  Option 1 is preferred on the basis that it would be more compatible with the adjacent 'Residential and Stables' zone, thereby limiting opportunities for land use conflict to occur (Figure 13).

Item 12.2 Continued

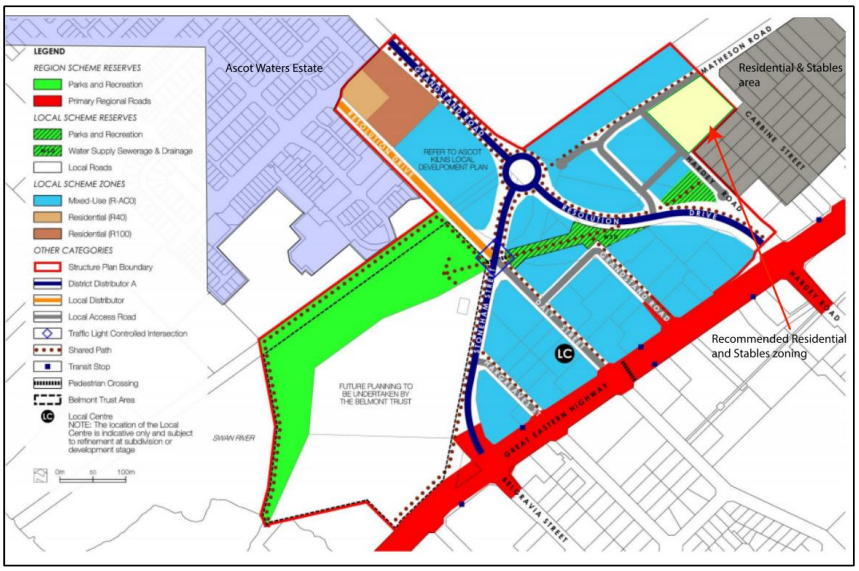

Figure 13: Recommended Residential and Stables zoning over a portion of Lot 100 Raconteur Drive

- Maintaining the existing 'Place of Public Assembly' zoning over land on the northern side of Matheson Road (Figure 14). This is proposed on the basis that Matheson Road forms a logical boundary between racecourse operations and the surrounding area. Furthermore it is acknowledged that this area currently accommodates car parking for Ascot Racecourse and directly abuts an area where horses are kept on race days. It is therefore not considered appropriate for an alternative zoning to apply to this land in the absence of knowing Perth Racing's future development intentions.

Figure 14: Recommended Place of Public Assembly zoning

Item 12.2 Continued

- Applying a 'Residential' zoning over the portion of Lot 100 Raconteur Drive that is bound by Hardey Road and the realigned Matheson Road (Figure 15). This is on the basis that this land is located between two areas that are recommended to be zoned 'Mixed Use' and 'Residential and Stables' respectively. It is therefore considered that a 'Residential' zoning in this location could act as an appropriate transition area between the two zones.

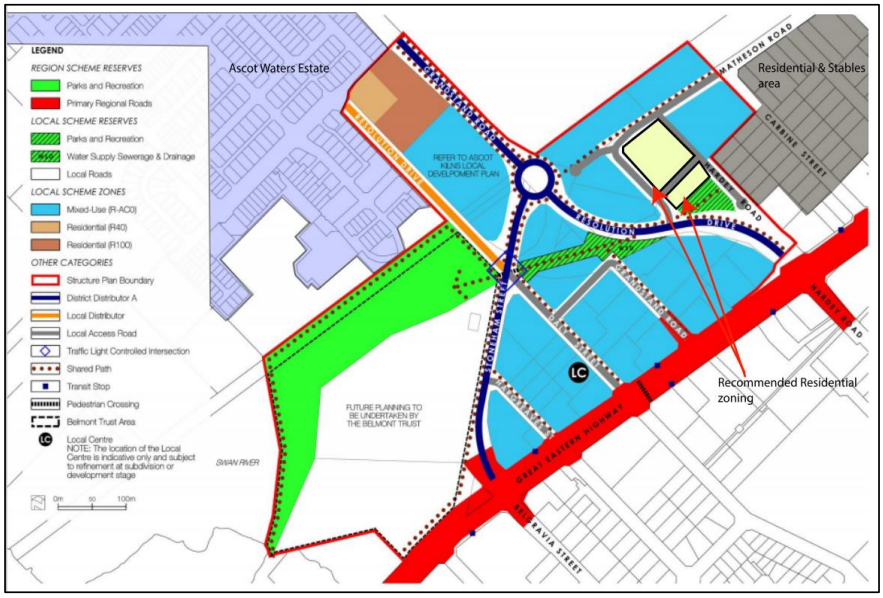

Figure 15: Recommended Residential zoning

The above recommended changes are illustrated by Figure 16 below and reflected as Modification 3 in Attachment 12. Notwithstanding the above recommendations Perth Racing may provide further comment on a draft modified LSP as part of readvertising or alternatively apply later to modify the adopted LSP to align with its future development intentions.

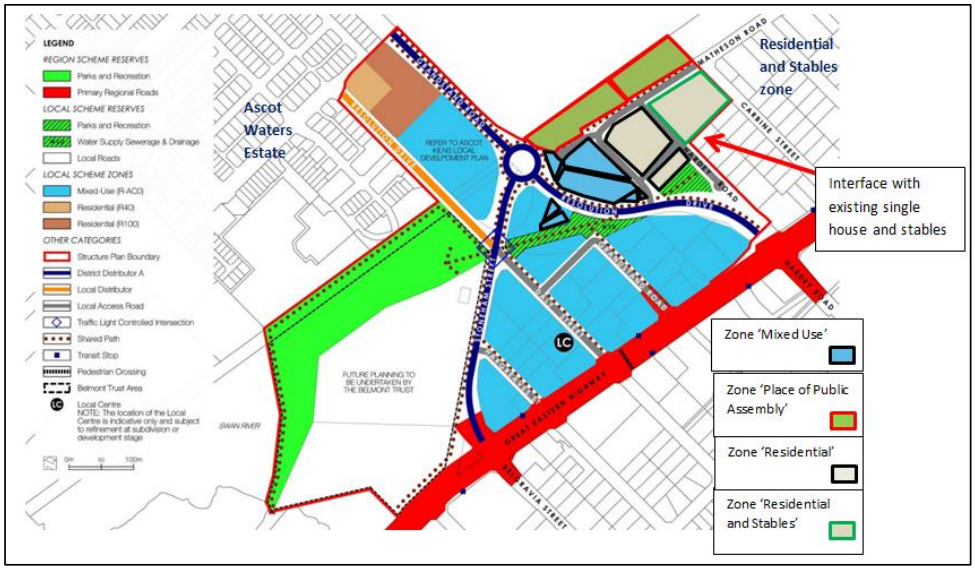

Figure 16: Recommended zoning for Perth Racing landholding's located to the north-east of the precinct

Item 12.2 Continued

Ascot Kilns Site

The draft LSP proposes to retain the existing 'Mixed Use' zoning over the Ascot Kilns site, which is currently owned in freehold by the WAPC. By way of background, the Department of Planning, Lands and Heritage (DPLH) prepared a draft LDP for the site to facilitate mixed use development and the restoration of the heritage structures. Council at its meeting on 12 December 2017 (Item 12.2) considered the draft LDP and resolved to require modifications to limit building height. The draft LDP has never been finalised by the DPLH, however, advice received from the Minister for Planning indicates that its redevelopment is essential to pay for the restoration of the site and will be re-evaluated upon the return of more favourable market conditions.

Submissions raised concerns in relation to the Ascot Kilns site being included in the draft LSP precinct and subsequently requested that it be removed. Submissions also requested that the Ascot Kilns site be upgraded and preserved, with surrounding land used for the purpose of POS.

In terms of the inclusion of the Ascot Kiln's site within the LSP, given its location near the centre of the Golden Gateway precinct, its inclusion is considered logical. Notwithstanding, there are two options that can be considered in relation to how the Ascot Kilns site is reflected in the draft LSP including:

- Option 1: Maintain the existing 'Mixed Use' zoning over the Ascot Kilns site.
- Option 2: Apply a 'Parks and Recreation' reserve over the Ascot Kilns site.

Whilst Option 1 could facilitate the development of the site and the restoration of the Ascot Kilns, there is no requirement under a 'Mixed Use' zoning to provide POS for use by the wider community, as requested in submissions. Whilst Option 2 aims to provide POS for the wider community, proceeding with this option presents several issues including:

- The land would need to be acquired from the WAPC or transferred to the State to become Crown Land, in order for it to be converted into POS.
- In order to acquire the land, negotiations with the WAPC would need to be undertaken, which has not occurred to-date.
- If the City was to attempt to acquire the land without consent from the WAPC, it would be necessary for the Minister for Lands to be agreeable to the acquisition. It is likely that the Minister for Lands would not agree to take land for a public work without evidence of attempted negotiations with the landowner first (i.e. the WAPC).
- If the land was to be transferred to the State as Crown Land, there would likely be a Management Order imposed that requires the City of Belmont to maintain the land.
- Acquiring the land or a Management Order over the land may result in the City of Belmont becoming responsible for funding the stabilisation and restoration of the Ascot Kilns and Stacks, and being liable for any claims should the structures fail and damage property or injure a person.
- The land may contain areas of potential contamination due to past industrial functions and processes undertaken on the site and may require remediation prior to conversion to POS.

Item 12.2 Continued

- Applying a 'Parks and Recreation' reservation would not provide for adaptive reuse of the site to fund the restoration of the Ascot Kilns and Stacks.

For the above reasons, proceeding in accordance with Option 1 is preferred. Whilst Option 1 provides for a 'Mixed Use' zoning over the land, as mentioned above the WAPC have advised that they do not intend on progressing the draft LDP for the site at this stage. This presents an opportunity to require further detailed planning to be undertaken for the site by the WAPC, which incorporates a level of POS as requested by the community. This could be achieved by modifying the draft LSP to require the following:

1. A LDP to be prepared prior to any subdivision or development on the site; and

2. A minimum 10% POS to be provided on the site, as specified by an LDP approved by the City of Belmont.

Whilst it is considered that the amount of POS proposed within the precinct is acceptable for the reasons discussed later in this report, providing some POS on this site would allow for the wider community to access and interact with the heritage structures. The provision of 10% POS on the site would be consistent with the requirements of the WAPC's Liveable Neighbourhoods and Development Control Policy 2.3 – POS in Residential Areas. It should be noted that the ceding of 10% POS to the Crown will not trigger any compensation requirement.

In light of the above, it is recommended that the draft LSP retain the existing 'Mixed Use' zoning over the Ascot Kilns site and be modified to identify the requirement for a LDP and a minimum 10% POS on the site (Modification 4).

Residential Density and Built Form Control

The application of a residential density code over land provides control over the scale and bulk of development through the plot ratio and building height requirements established by the R-Codes. The precinct is not currently assigned a density code under LPS 15, and therefore the draft LSP is proposing to apply the following:

- An 'R40' and 'R100' density code over Lot 452 Grandstand Road, which is located adjacent to Ascot Waters Estate and is proposed to be zoned 'Residential'.

- An 'R-AC0' density coding has been allocated over land proposed to be zoned 'Mixed Use'.

It should be noted that in the case of apartment development at the 'R-AC0' coding, the R-Codes do not specify plot ratio and building height; rather these controls are to be established by an LSP. It is intended that planning instruments such as a LSP can vary certain elements of the R-Codes for the purposes of facilitating design appropriate for the context of an area.

Item 12.2 Continued

For the purposes of responding to locational aspirations, the draft LSP divides the Golden Gateway area into eight precincts, each with a unique intent and built form control. For the purpose of analysis, the precincts have been consolidated into four areas, with a summary of the plot ratio and building height standards proposed by the draft LSP provided in Table 1 below.

Location	Density Code	Plot Ratio	Maximum Building Height
Great Eastern Highway	R-AC0	No limit	15 storeys
Precinct Core (Stoneham Street, Main Street, Resolution Drive Precincts)	R-AC0	No limit	10 storeys
Interface with Ascot Waters Estate (Ascot Kilns and Racecourse Interface (West) Precincts).	R40, R100 or subject to future planning	As per the R-Codes (0.6 for R40, 1.3 for R100)	3 storey (R40) 6 storey (R100)
Interface with Residential and Stables Area (Racecourse Interface (East) and Hardey Road (East) Precincts)	R-AC0	No limit	2 – 6 storeys

Table 1: Summary of Proposed Density and Built Form Controls

As part of the advertising process, the City sought specific feedback from the community on the proposed building heights, which was provided by way of submitters annotating a plan with building heights they considered appropriate for the precinct (Attachment 11). A number of submissions raised concerns regarding the density and built form proposed by the draft LSP. Concerns were also raised regarding large scale development adjacent to Ascot Waters Estate and the Residential and Stables area. The submissions varied in opinion over what the preferred building height should be.

These matters are discussed below along with other relevant technical considerations.

Great Eastern Highway

As outlined above, the draft LSP proposes a maximum building height of 15-storeys and no plot ratio limits for future development along GEH. A majority of the submissions received supported more intensive development fronting GEH. In considering this, it should be noted the building heights proposed would align with the recommendations of the draft GEH Urban Corridor Strategy. It should also be recognised that there are several other larger developments that have been approved and/or constructed along GEH, including the development of a 16-storey building on the corner of GEH and Belgravia Street (opposite the Golden Gateway precinct) which has not yet been constructed. Given this, the proposed maximum building height of 15-storeys is considered appropriate.

Notwithstanding building height, there is concern that the draft LSP does not provide adequate control over building bulk by virtue of its proposed 'R-AC0' coding. It is therefore considered appropriate to apply a density code that includes more specific standards to address the context and achieve the intended built form outcome. In this regard, the R-Codes identify three density codes that are appropriate for activity centre locations, as summarised below in Table 2 below and illustrated by Figure 17.

Item 12.2 Continued

Context/Character	Density Code	Plot Ratio	Maximum Building Height
Mid-Rise Urban Centres: Characterised by mid-rise buildings of approximately 6 storeys and pedestrian friendly street frontages that include some activation.	R-AC3	2	6 storeys
High Density Urban Centres: Characterised by podium and tower development that support highly activated and pedestrianised street frontages.	R-AC2 R-AC1	2.5 3	7 storeys 9 storeys

Table 2: Summary of Activity Centre R-Coding

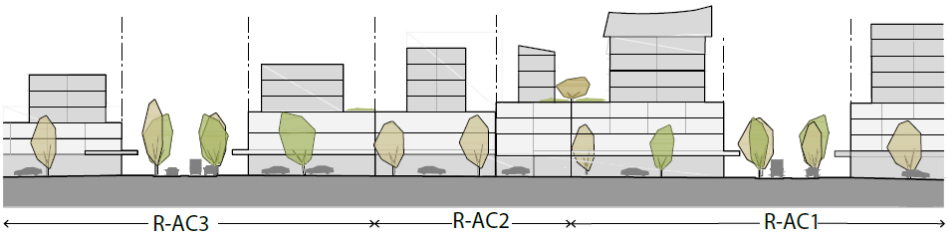

Figure 17: Illustration of Activity Centre R-Coding

Having regard for the R-AC density codes, it is considered that a 'high density urban centre' context would appropriately represent the future desired character for development along GEH. While it is considered acceptable for buildings to extend to 15-storeys in the GEH precinct, the R-AC1 density code provides for a maximum building height of only nine-storeys. It is appropriate for the LSP to vary this standard to allow for a 15-storey building in the context of the GEH precinct. In the same instance the R-AC1 density coding provides a plot ratio control that aligns with the desired context for the location. It will therefore be recommended that the draft LSP be amended to apply an R-AC1 coding to the GEH Precinct, but with a modified standard to permit building heights up to 15-storeys (Modification 5).

Precinct Core

The 'Precinct Core' is referred to as the area encompassing the Stoneham Street Main Street and Resolution Drive precinct areas. This represents the central area within the Golden Gateway Precinct. The draft LSP proposes to establish an R-AC0 coding over this area and provides for building heights up to 10-storeys; however, no plot ratio limits are specified. The submissions received on building heights varied substantially in this location. For comparison, the responses in submissions have been grouped and summarised in Table 3 below.

Scale	Maximum Building Height Range	Responses
Low	2 – 3 storeys	11
Medium	4 – 8 storeys	20
High	10 – 20 storeys	21

Table 3: Summary of Maximum Building Height responses

As indicated above, there appears to be a greater preference for medium to high built form within the Precinct Core. On this basis, it is considered that the proposed maximum building height of 10-storeys represents a reasonable balance. It is anticipated that it would deliver a medium scale built form outcome as it is unlikely that all development would seek to achieve this 10-storey maximum height. It is also considered that this height would represent an appropriate transition between built form on GEH and low scale areas adjacent to Ascot Waters Estate and the Residential and Stables area.

Item 12.2 Continued

In terms of the density coding, it is considered that applying an R-AC2 coding to this area represents an appropriate graduation in density and would establish a desired context and maximum plot ratio for the area. It is therefore recommended that the draft LSP be amended to apply an R-AC2 coding to the Precinct Core, but maintain standards to permit building heights up to 10-storeys (Modification 6).

Interface with Ascot Waters Estate

For the purpose of analysis, the interface with Ascot Waters Estate relates to the Ascot Kilns and Perth Racing's administration building (Lee Steere House) on Lot 452 Grandstand Road. Having regard for the heritage considerations associated with the Ascot Kilns site, the draft LSP does not propose any standards to control built form, rather these standards are proposed to be established through an LDP. For Lot 452, the draft LSP proposes to graduate the density and building height with an 'R40' density code with a maximum height of three-storeys fronting Northerly Avenue and a portion of Resolution Drive, and an 'R100' density code with a maximum height of six-storeys for the remainder of the site (Figure 18).

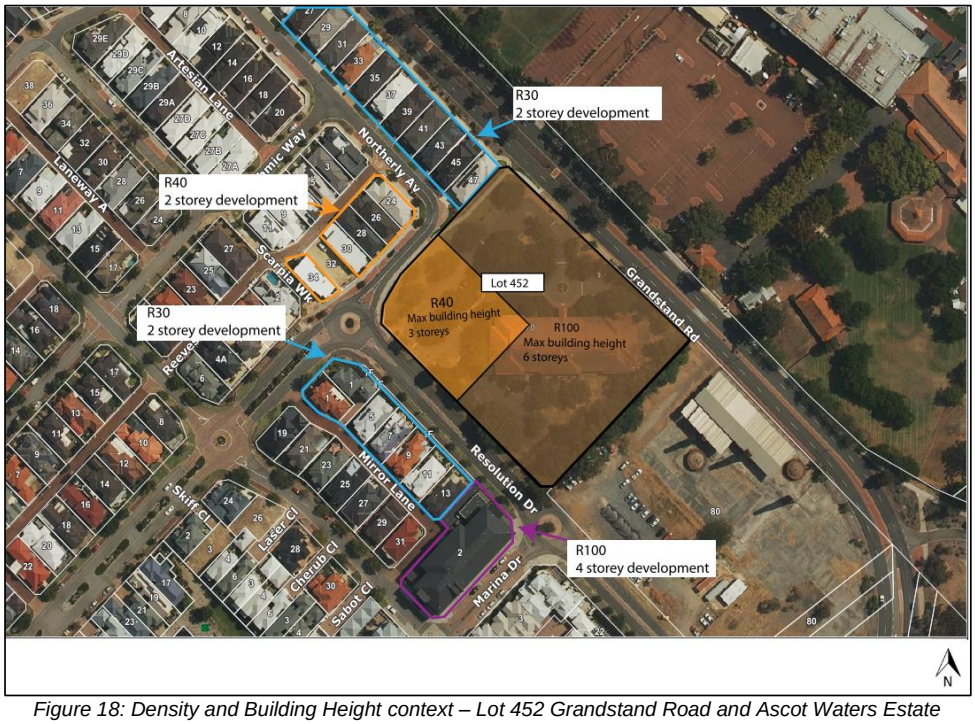

Figure 18: Density and Building Height context – Lot 452 Grandstand Road and Ascot Waters Estate

The draft LSP proposes that Lot 452 maintains its existing 'Place of Public Assembly' zoning under LSP 15. This zoning does not provide for any residential development, it is therefore not necessary or appropriate to apply a density code to this land (Modification 7). It is however still appropriate to maintain standards for maximum building height for the purposes of guiding any potential development considered under the 'Place of Public Assembly' zoning.

Item 12.2 Continued

In determining an appropriate maximum building height for Lot 452, it should be noted that the community feedback received generally favoured low scale development of two to three-storeys immediately fronting Northerly Avenue and Resolution Drive. The feedback received for the remainder of Lot 452 varied, with approximately half of the responses similarly favouring low-scale development, whereas all other responses favoured medium-scale development of four-storeys and above. In considering this further, the following points are relevant:

- Nearby developments within Ascot Waters Estate range between two-storeys and four-storeys in height and at a scale equivalent to the 'R30', 'R40' and 'R100' density codes.

- The portion of Lot 452 with a proposed maximum building height of three-storeys interfaces with existing two-storey residential development that backs onto Resolution Drive and two-storey development fronting onto Northerly Avenue.

- The portion of Lot 452 with a proposed maximum building height of six-storeys interfaces with the following:

  - Two-storey and four-storey residential development that abut Resolution Drive, respectively, along Lot 452's south-western boundary.

  - A two-storey single house on Lot 442 Northerly Avenue immediately abuts Lot 452's north-western boundary.

  - The Ascot Kilns immediately abutting Lot 452's south-eastern boundary.

  - Grandstand Road and Ascot Racecourse to Lot 452's north-eastern boundary.

- Council at its meeting on 12 December 2017 considered a draft LDP for the Ascot Kilns site and resolved to restrict building height for any development to five storeys or less.

- The setback requirements for the 'Place of Public Assembly' zone under LPS 15 are 15 metres to the primary street, 7.5 metres to a secondary street and 4 metres to side boundaries adjoining residential land. Based on these requirements, development on Lot 452 could be setback 4 metres from Lot 442 Northerly Avenue and at least 24 metres and 30 metres from existing houses fronting Northerly Avenue and Resolution Drive, respectively.

- Overshadowing from any development on Lot 452 at a maximum building height of six-storeys would comply with the R-Codes requirements and would not extend onto any surrounding properties at midday 21 June.

In light of the above, the proposed maximum building heights on Lot 452 can be supported on the basis that they will provide an appropriate transition between low scale development in Ascot Waters Estate and medium to high-scale development in the remainder of the Golden Gateway precinct. Notwithstanding, there are concerns in relation to the location of building height on Lot 452, specifically:

Item 12.2 Continued

- Along the north-western boundary, abutting the existing two-storey house on Lot 442 Northerly Avenue, it is considered that the maximum building height should be modified to be no greater than three-storeys.

- For the south-western boundary abutting Resolution Drive, the maximum building height allowance of three-storeys should be extended to encompass the portions of the site which are directly opposite existing two-storey development.

- For the remaining portion of Lot 452, the maximum building height should be reduced from six-storeys to five-storeys to align with Council's previous decision in relation to the adjacent Ascot Kilns.

It is considered that the above modifications, reflected in Figure 19 below, would provide a more appropriate transition between existing and future development, and are reflected as Modification 7 in Attachment 12.

Figure 19: Building Height recommendations – Lot 452 Grandstand Road

Interface with Residential and Stables Area

For the purpose of analysis, the interface with the Residential and Stables area is identified as the land within the Racecourse Interface (east) (Precinct 7) and Hardey Road (east) (Precinct 8), located on the northern side of Resolution Drive and immediately adjacent to Ascot Racecourse (Figure 20).

Item 12.2 Continued

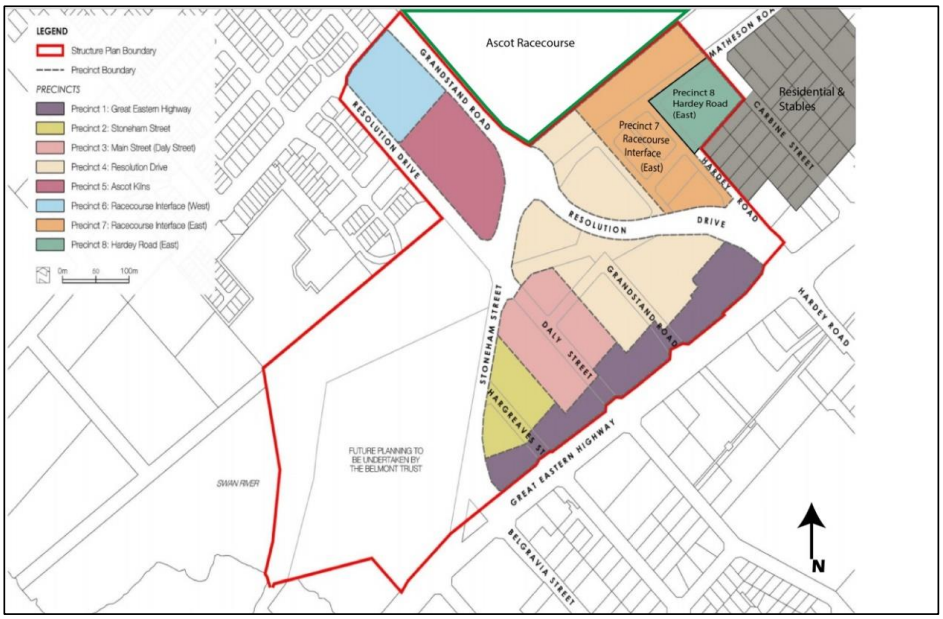

Figure 20: Location of Racecourse Interface (east) and Hardey Road (east) precincts

The draft LSP proposes to establish an R-AC0 coding over this area with no specified maximum plot ratio. The maximum building height in the area graduates between two to six-storeys, with the two-storey maximum provided immediately abutting Residential and Stables properties and increasing in height to six-storeys towards Resolution Drive.

In terms of the building height, there was some variation in opinions from community submissions however they were mostly supportive of the building heights as proposed by the draft LSP. On this basis, it is considered that the building heights in this area should remain as proposed.

The modifications to the zoning of land within this precinct (discussed earlier in this report) have implications on the application of a residential density code. A number of changes are recommended to address this, as illustrated in Figure 21 and detailed below:

- The north-eastern portion of Lot 100 Raconteur Drive, bound by Matheson Road, Carbine Street and Hardey Road is recommended to be zoned 'Residential and Stables'. To align with the surrounding area, it is considered appropriate that a density code of 'R10' is applied to this land.

- The northern portion of Lot 100 Raconteur Drive, bound by Hardey Road and the realigned Matheson Road, is recommended to be zoned 'Residential'. To provide a graduation in density between the Residential and Stables area and the wider Golden Gateway precinct, it is considered appropriate that an 'R50' and 'R100' density code be applied to the north and southern portions of this cell.

- Lot 13 Grandstand Road and Lot 7705 Matheson Road, located to the north of Matheson Road are recommended to be zoned 'Place of Public Assembly'. As this zoning does not provide for any residential development, it is not necessary or appropriate to apply an R-Coding to the land.

Item 12.2 Continued

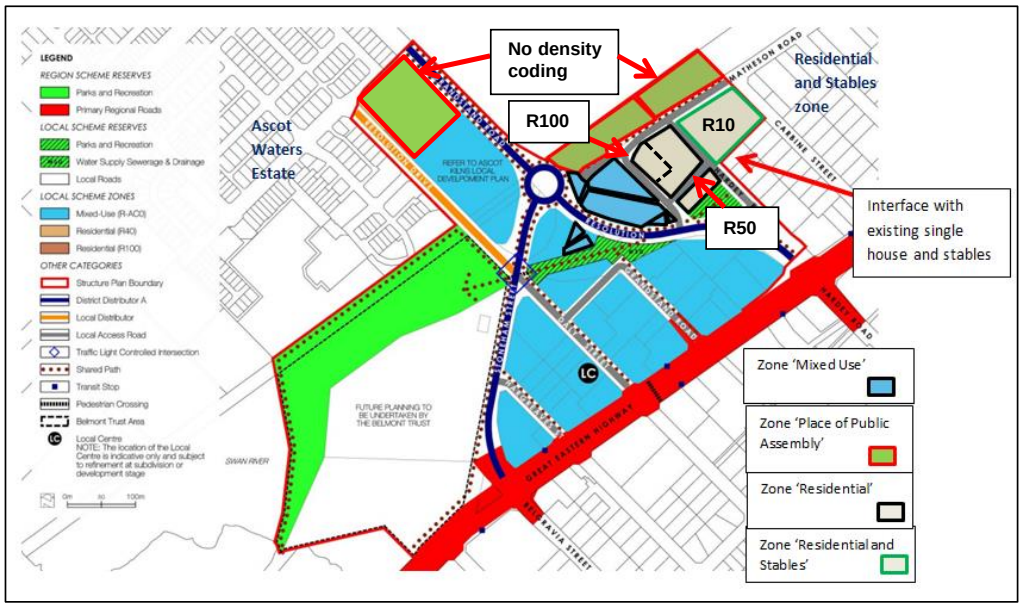

Figure 21: Proposed density modifications to Perth Racing landholdings

It is therefore recommended that the draft LSP be modified to adjust the density coding for the interface to the Residential and Stables area (Modifications 8 – 10). It is considered that these recommended changes would more appropriately support the desired context and built form outcome for this area.

Landmark Sites

The draft LSP proposes various landmark sites where additional building height (up to a maximum of five-storeys) can be supported where design excellence is achieved. The landmark sites have been selected based on urban design principles of demarcating prominent intersections which provide public vistas with views upon approach. A number of submissions questioned the appropriateness and necessity for these landmark sites, and in one instance a submission suggested that:

- The landmark sites are not consistent with community support for tapering down building heights from GEH into the precinct;
- The proposed landmark site in close proximity to the relocated roundabout would result in the removal of significant trees; and
- The landmark sites on GEH would impact on the adjacent intersections.

Notwithstanding the above concerns, it is important to note that some submissions were supportive of the draft LSP identifying landmark sites. One of those submissions also requested that No. 5 Stoneham Street situated on the eastern corner of Stoneham Street and Hargreaves Street (Figure 22) be designated as a landmark site on the basis that:

- Hargreaves Street and Stoneham Street having the potential to become a key intersection that warrants a landmark site development to respond to view lines and public vistas;
- The site being located opposite future development land (Belmont Trust);

Item 12.2 Continued

- To create a gradual transition in building height from GEH to the Belmont Trust area; and

- To provide additional opportunities for short-term redevelopment within the precinct.

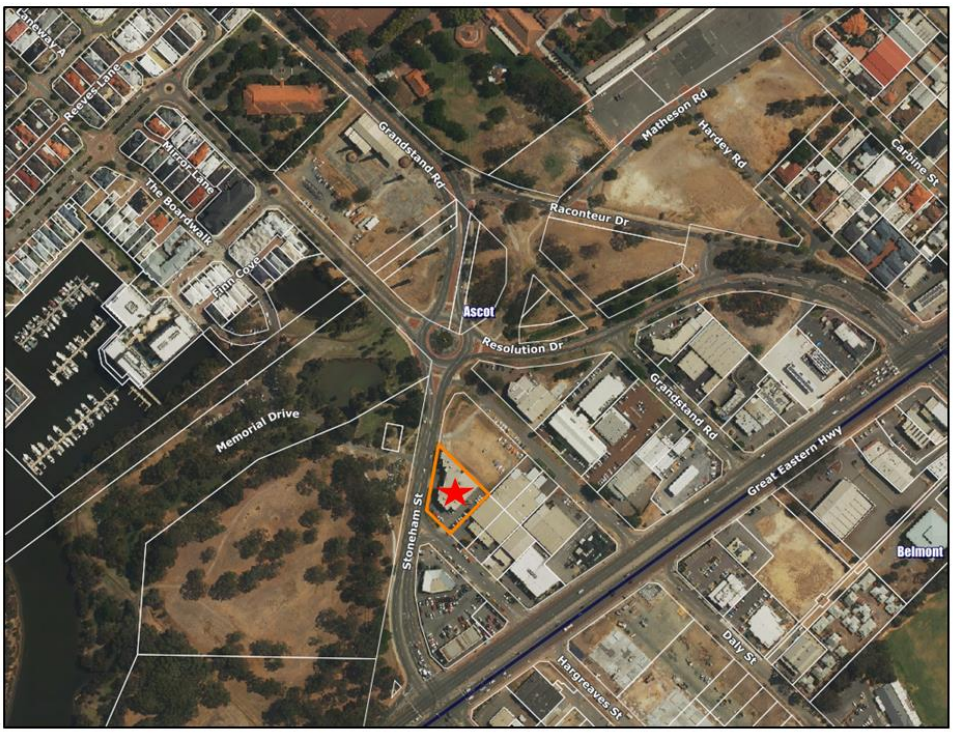

Figure 22: No. 5 Stoneham Street, Ascot

In considering the above concerns and suggestions, it is important to acknowledge the following:

- The landmark sites have been selected taking into consideration overshadowing impacts and amenity considerations and are not located adjacent to existing residential development.

- The sites are proposed to act as key nodes that are located at the termination of important view lines and along significant pedestrian movement corridors to facilitate in wayfinding.

- The development of a landmark site will not impact on existing trees more than a standard development could. It is important to note that a key objective of Volume 2 of the R-Codes is for site planning to maximise retention of existing healthy and appropriate trees. Therefore any future 'Apartment' or 'Mixed Use' developments undertaken within the precinct would be required to take this into consideration.

- Designating properties as 'landmark sites' provides an opportunity to achieve unique high quality development outcomes within the precinct, as additional height considerations at landmark sites can only be approved if a proposal meets design excellence requirements contained within a future local planning policy.

Item 12.2 Continued

- It is not considered that identifying landmark sites will directly impact on adjacent intersections. Notwithstanding, the impact of the draft LSP on intersections is later discussed in the movement network section of this report.

In light of the above, it is considered that there is merit to retaining the landmark sites in the draft LSP. In terms of the suggested designation of No. 5 Stoneham Street as a landmark site, it is considered that it will not attract any significant view lines based on the current proposed configuration of the precinct. Notwithstanding, the site is located opposite the Belmont Trust land which is for public enjoyment and recreation. As such, there may be some merit in the suggestion that it become a landmark site, however in the absence of information in relation to any improvements to facilitate recreation activities on the Belmont Trust land, designating No. 5 Stoneham Street as a landmarks site is premature.

Development Controls

Future development within the precinct will need to accord with the standards and requirements of LPS 15, relevant State and local planning policies and the provisions contained within the draft LSP. A number of submissions raised concerns in relation to the quality of future development within the precinct and the car parking requirements stipulated in the draft LSP. These concerns are discussed below.

Quality of Future Development

Various submissions raised concerns in relation to the quality of future development within the precinct, in particular in relation to apartment style development resulting in amenity, overshadowing and overlooking impacts.

In considering these concerns, it is important to note that the requirements of the R-Codes specify standards to address overlooking and overshadowing. In addition, the State Government introduced a new assessment framework for apartment developments titled State Planning Policy 7.3 – Residential Design Codes – Volume 2 – Apartments (R-Codes) in 2019. The R-Codes require apartment developments to address a range of elements that were not previously required to be addressed, to facilitate in achieving high quality development outcomes. Some of these elements include:

- Tree retention and deep soil areas
- Communal open space
- Façade design
- Public interface
- Orientation and ventilation
- Size and layout of dwellings
- Energy efficiency
- Water management and conservation
- Waste management.

Item 12.2 Continued

To further ensure that high quality development outcomes are achieved, it is proposed that a local planning policy is prepared to guide development within the precinct. It is anticipated that the local planning policy will address matters including:

- Dwelling diversity
- Building envelopes, height, built form and typology
- Setbacks
- Activation and interface between buildings and the public realm
- Public art
- Vehicular access, parking and service areas.

Furthermore, all applications for development within the precinct will be referred to the City's Design Review Panel for review. This Panel comprises technical experts in the fields of architecture, urban design, engineering, transport, landscape architecture and sustainability. The purpose of the panel is to facilitate high quality design outcomes through providing objective review and feedback to proponents on their development proposals.

Car Parking

The draft LSP stipulates that car parking is generally to be provided in accordance with LPS 15. Notwithstanding, the draft LSP contains specific car parking requirements for 'mixed use' and multiple dwelling developments. Furthermore, the draft LSP outlines that innovative approaches to car parking provision, such as reciprocity and car-pooling programs, may allow for a reduced car parking provision to be considered, where appropriate.

Submissions raised the following key concerns in relation to car parking:

- That the car parking requirements stipulated in the draft LSP are not adequate, in particular for dwellings that contain two or more bedrooms.
- That future development within the precinct will increase demand for on-street parking, due to the number of vehicles per dwelling often exceeding the number of car parking bays provided.
- That the draft LSP allowing for consideration of innovative approaches to car parking within the precinct is inappropriate, due to not being accommodating of the elderly, families and those who cannot rely on public transport to commute to and from work.

In considering these concerns, the following points are relevant:

- The residential car parking requirements outlined in the draft LSP are consistent with Volume 2 of the R-Codes.
- The stipulated car parking standards are a minimum requirement only. There is therefore an opportunity for developments to provide additional car parking, subject to complying with the other requirements of the draft LSP.

Item 12.2 Continued

- Car parking required for a development site will generally be required to be contained within the lot boundaries of that site.

- The precinct is located adjacent to GEH which is identified in Perth and Peel @ 3.5 million as a high frequency public transit corridor. This therefore provides an opportunity for future residents and employees to utilise public transport, opposed to a private motor vehicle.

- Not all developments within the precinct may seek or be eligible for a reduction in the minimum car parking requirements.

- In the context of a 'mixed use' development, there will likely be opportunities for reciprocity of car parking, due to commercial development generating a different peak period demand to residential development.

- Increasing car parking requirements would have a direct impact on housing affordability.

- The provision of on-street car parking will be investigated at detailed design stage for road upgrades in the precinct.

In light of the above it is considered that the proposed car parking standards applicable to development within the Golden Gateway Precinct are appropriate.

Movement Network

The Golden Gateway Precinct is bound by GEH along its southern boundary which serves as a major east-west connection across the Perth metropolitan area. Resolution Drive, Stoneham Street and Grandstand Road all traverse the precinct area, connecting GEH and Guildford Road as a key crossing point across the Swan River. These roads perform a regional function for traffic, public transport and cyclists, but also serve Ascot Waters Estate, Ascot Racecourse and the Residential and Stables area, as well as businesses within the precinct area itself.

The draft LSP proposes various modifications to the existing movement network, a detailed summary of which is provided within Attachment 9. A significant proportion of the submissions received raised some concern in relation to traffic and access, as well as the adequacy of existing public transport and pedestrian and cyclist connectivity within the precinct. These concerns are discussed below.

Road Network

The draft LSP proposes various changes to the road network, with the key changes being the realignment of Resolution Drive and modifications to the Resolution Drive/Stoneham Street/Daly Street and Grandstand Road intersections. The preparation of the draft LSP has been informed by a Movement and Access Strategy, contained as Attachment 5, which assesses the performance of the existing and proposed movement network and identifies any potential impacts that may arise from the redevelopment of the precinct.

Item 12.2 Continued

A number of submissions raised concerns regarding the proposed road network, particularly in relation to:

- Increases in traffic volumes and potential impacts on intersections to GEH.
- The future design of Stoneham Street and Resolution Drive and its potential to encourage vehicles to utilise Resolution Drive and Hardey Road to access Belmont Forum and the Belmont Business Park.
- Matheson Road becoming a through road to provide access for Perth Racing.
- Access and egress associated with Ascot Waters.
- The extension of Grandstand Road through private property.

In addition, submissions raised concerns in relation to the traffic surveys and modelling that was undertaken for the Golden Gateway Precinct and that it did not take into consideration Ascot Racecourse event days and recent development within the area.

These concerns are discussed below.

Traffic Volumes and Intersection Performance

A number of submissions highlighted existing traffic issues within the area and suggested that the redevelopment of the precinct would exacerbate these problems, exhaust the capacity of the existing road network and impact the performance of the Stoneham Street and Resolution Drive intersections with GEH. The following points summarise the findings of the Movement and Access Strategy and provide context to the existing and future performance of the road network:

- Great Eastern Highway and Grandstand Road (north) serve as the primary access points into the Golden Gateway Precinct. Full movement access is available to GEH via a signalised intersection from Stoneham Street and Resolution Drive, with left-in/left-out access provided from Hargreaves Street, Daly Street and Grandstand Road (south).
- Great Eastern Highway is classified as a 'Primary Distributor' road under the Functional Road Hierarchy on the basis that it is a major regional road that carries large volumes of traffic. Main Roads Western Australia is responsible for the management of GEH.
- Great Eastern Highway currently accommodates around 60,000 vehicles per day (vpd) which is forecast to increase to up to 80,000 vpd by 2031. Modelling indicates that the redevelopment of the precinct will have minimal impact on peak hour traffic volumes along GEH.
- Grandstand Road (north), Stoneham Street and Resolution Drive (between GEH and Grandstand Road) are all classified as 'District Distributor A' roads on the basis that they carry large traffic volumes between GEH and Guildford Road, across the Swan River.
- The precinct currently generates approximately 3,600 vpd, which is expected to increase to approximately 5,200 vpd upon the redevelopment of the precinct.

Item 12.2 Continued

- Traffic counts indicate that Grandstand Road (north) carries approximately 18,000 vpd whereas Stoneham Street and Resolution Drive carry up to 14,000 vpd and 6,500 vpd, respectively. Modelling indicates that by 2031, traffic volumes along Grandstand Road, Stoneham Street and Resolution Drive will increase to 26,500 vpd, 23,800 vpd and 12,500 vpd, respectively.

- Stoneham Street is a four-lane road and Resolution Drive is a two-lane road (i.e. one lane in each direction), with both roads widening at their approach to GEH. The abovementioned traffic counts and modelling indicate that Stoneham Street currently carries and will continue to carry the majority of the traffic through the precinct.

- An assessment of the Stoneham Street/GEH/Belgravia Street intersection indicates existing performance issues for right-turn movements to GEH and through movements to Belgravia Street from Stoneham Street, during the AM peak period. Modelling indicates that the performance of this intersection is expected to fail by 2031 in the AM peak period, irrespective of the redevelopment of this precinct, with significant delays anticipated for vehicles access/egressing GEH to/from Stoneham Street and Belgravia Street.

- An assessment of the Resolution Drive/GEH/Hardey Road intersection similarly indicates existing performance issues for right-turn movements to GEH and through movements to Hardey Road from Resolution Drive, during the AM peak period. Modelling indicates that this issue will continue to worsen over time and extend into the PM peak period by 2031, irrespective of the redevelopment of this precinct.

- An assessment of the existing roundabout at the intersection of Resolution Drive/Stoneham Street/Grandstand Road indicates that there are no existing performance issues.

- Modelling indicates that the proposed roundabout at the intersection of Grandstand Road/Stoneham Street/Resolution Drive and the proposed traffic signals at the intersection of Resolution Drive/Stoneham Street/Daly Street will perform at acceptable levels at 2031.

In considering the above, it is acknowledged that traffic volumes will increase in the area and ultimately impact the performance of intersections to GEH. Notwithstanding, it is important to note the following:

- The increase in traffic volume is not simply attributed to the redevelopment of the precinct, but also largely a consequence of regional growth in the wider area.

- The precinct is inherently difficult to plan due to the access constraints presented by the existing road network and its regional traffic function.

- The responsibility for monitoring traffic flows and associated queuing for GEH and undertaking improvements to address issues to improve performance rests with MRWA.

- All roads will continue to perform their intended function.

Item 12.2 Continued

- Significant development potential currently exists within the precinct and the draft LSP has the role of coordinating development rather than providing for increased development.

- The amount of vehicle trips expected to be generated from the redevelopment of the precinct will increase from the existing situation, however this increase is considered to be marginal in the context of the overall traffic volumes that the road network is expected to accommodate by 2031.

For the reasons mentioned above, whilst concerns regarding traffic volumes in the area are substantiated, it is considered that they are representative of a wider issue that may need to be addressed separately by MRWA and the City of Belmont at a future point in time. The issue cannot be rectified through this draft LSP and therefore should not deter establishing an appropriate planning framework for the precinct.

Design of Resolution Drive and Stoneham Street

The draft LSP proposes that Resolution Drive and Stoneham Street be designed as follows:

- Modifying the alignment of Resolution Drive to follow the historical Raconteur Drive alignment to create a more consolidated precinct area.

- Proposing a new roundabout at the connection of Resolution Drive, Grandstand Road and Stoneham Street.

- Converting the existing roundabout at the intersection of Stoneham Street, Grandstand Road and Resolution Drive to traffic signals.

- Maintaining Stoneham Street as a four lane road.

- Widening Resolution Drive, between Grandstand Road and GEH, to a four lane road.

Submissions raised concerns that the new design would discourage traffic along Stoneham Street and Belgravia Street, resulting in increases in traffic utilising Resolution Drive and Hardey Road to access the Belmont Business Park and Belmont Forum. In considering these concerns, the following points are relevant:

- The proposed roundabout provides for traffic to be 'split' between Resolution Drive and Stoneham Street, as per the existing road layout. This arrangement allows traffic to choose between travelling on Resolution Drive or Stoneham Street and for traffic to access either Belgravia Street or Hardey Road.

- Belgravia Street is a four-lane road that is classified as a 'District Distributor A' road on the basis that it carries high volumes of traffic between GEH and the Belmont Business Park, Belmont Forum and Kewdale Industrial Area, via Fairbrother Street and Abernethy Road.

Item 12.2 Continued

- Hardey Road is designed as a two-lane road (i.e. one lane in each direction) and includes traffic calming devices and space for on-street parking. It is classified as a 'District Distributor B' road[1] on the basis that it carries traffic between GEH and the wider Belmont, Cloverdale and Redcliffe residential areas.

- Belgravia Street and Hardey Road currently accommodate in the order of 12,500 vpd and 8,200 vpd, respectively on a week day, and modelling indicates that this could increase to 22,200 vpd and 16,500 vpd by 2031.

- Whilst traffic signals may delay travel along Stoneham Street, it will still remain a more direct route for those seeking to travel westbound on GEH or access the Belmont Business Park, Belmont Forum and Kewdale Industrial Area.

- Given that Resolution Drive currently connects and will continue to connect to Hardey Road, it is reasonable to assume that some traffic from the Golden Gateway precinct will utilise Hardey Road to access the wider Belmont, Cloverdale and Redcliffe residential area. This would align with is classification as a 'District Distributor B' road.

- Significant development potential currently exists within the precinct and is not proposed to be increased by way of the draft LSP.

In light of the above, it is considered that the proposed modifications to the road network are unlikely to influence travel behaviour such that more traffic would utilise Hardey Road instead of Belgravia Street. Nonetheless, given that traffic volumes will increase over time, irrespective of the redevelopment of the precinct, it is reasonable to expect some level of traffic on Hardey Road given its classification as a 'District Distributor B' road.

Matheson Road Extension

The draft LSP proposes to extend Matheson Road to connect to Resolution Drive (south), providing public access to Ascot Racecourse, the adjacent Perth Racing landholdings and the Residential and Stables area. This would involve removing Perth Racing's current private access roads from Grandstand Road, Hardey Road and Matheson Road (refer to Figure 23).

[1] *In accordance with the Main Roads WA Functional Road Hierarchy, the 'District Distributor A' and 'District Distributor B' classifications are relatively similar in terms of function, with the key difference being that roads with an 'A' classification accommodate slightly more vehicles and the road design should reflect this accordingly.*

Item 12.2 Continued

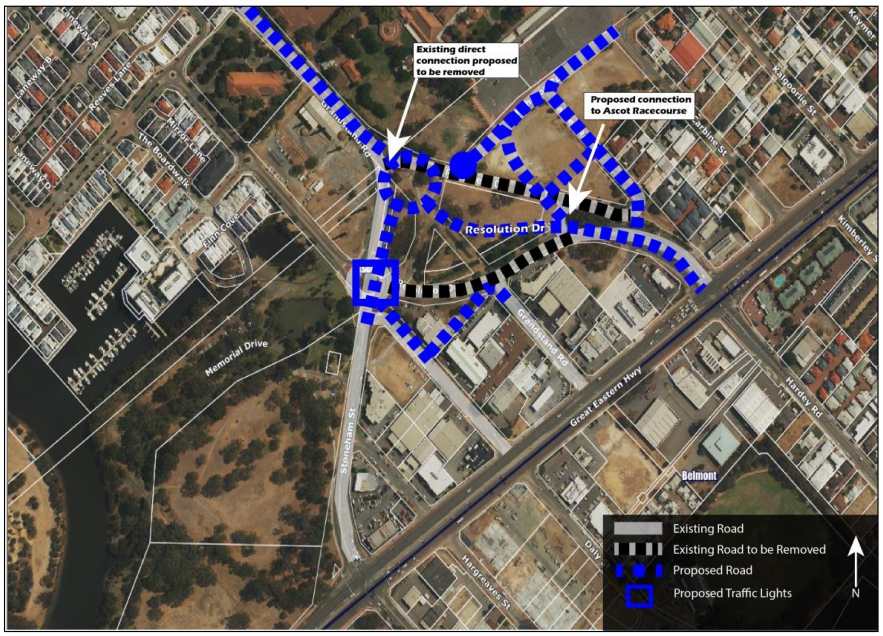

Figure 23: Existing and proposed access to Perth Racing landholdings

Various submissions raised concerns that this extension would result in an increase in traffic through the Residential and Stables area, impacting the safety of pedestrians and horses in the area. Perth Racing also raised concerns about the loss of direct access between Ascot Racecourse and Grandstand Road. They have suggested that Matheson Road could be extended to connect to the proposed roundabout as a fourth leg to provide more direct access to Ascot Racecourse.

In considering concerns regarding potential for increased traffic through the Residential and Stables area, it should be noted that the modelling undertaken was unclear on the distribution of eastbound vehicle trips on Matheson Road. It is reasonable to assume however that by extending Matheson Road to Resolution Drive, some vehicles, particularly local traffic, will utilise this connection to access the Residential and Stables area. This however requires further analysis along with consideration of any implications that future development on the northern side of Resolution Drive may have on traffic utilising Matheson Road.

In terms of Perth Racing's suggestion, it is considered appropriate for further investigations to be undertaken into potential road network options for this location. In considering any future road network design for the area, it will be important to balance Perth Racing's request for adequate access to their landholdings with the concerns of other landowners in relation to additional vehicles traversing the Residential and Stables area. Some options that could be investigated include:

- Connecting Matheson Road to the relocated roundabout in a form that does not encourage vehicles to continue through to the Residential and Stables area.

- Providing a road network within the area that restricts certain vehicle movements to discourage through-movements (i.e. 'rat-running').

Item 12.2 Continued

It is therefore recommended that alternative road network options for the area be investigated, with subsequent modifications then undertaken to the draft LSP (Modification 11).

Ascot Waters Access and Egress

The draft LSP proposes to replace the existing roundabout at the intersection of Resolution Drive (north), Stoneham Street and Daly Street with traffic signals to facilitate safer pedestrian access to the Swan river foreshore. Submissions queried the rationale for the proposed traffic signals and raised concerns that they would impact on traffic movements in the area, particularly access and egress into the Ascot Waters Estate. Furthermore, submissions also raised concerns in relation to future traffic volumes impacting on access and egress to the Ascot Waters Estate.

In considering the concerns relating to future traffic volumes impacting access and egress to Ascot Waters, it should be noted that modelling indicates that the Stoneham Street/Daly Street/Resolution Drive intersection would operate satisfactorily across all approaches during the AM and PM peak periods.

In considering the concerns in relation to the proposed traffic signals, it is noted that MRWA outlined in their submission that they are not supportive of the proposed traffic signals due to:

- Their location being too close to the existing intersection of Stoneham Street and GEH.
- The potential impact they may have on the proposed relocated roundabout.
- Any additional demand on Daly Street having the potential to result in queuing and blockage of traffic along GEH.
- The signals being inconsistent with MRWA Vehicle Access Policy Plan which identifies Daly Street as a cul-de-sac.

In light of the above, an alternative layout and control will need to be investigated for this intersection. It is considered that maintaining a roundabout in this location could be acceptable, provided it is designed appropriately and located far enough from the proposed new roundabout and GEH to prevent issues relating to traffic queuing. This however would require further analysis and it is therefore recommended that alternative road network options for the area be investigated, with subsequent modifications then undertaken to the draft LSP (Modification 11).

Grandstand Road Realignment and Extension

The draft LSP proposes to realign Grandstand Road through closing its access to Resolution Drive, and extending it to connect to Daly Street via private property (Lot 52 Daly Street) (refer to Figure 24 below).

Item 12.2 Continued

Figure 24: Proposed Grandstand Road realignment and extension

This connection would facilitate the creation of the linear POS and provide for residents/businesses to access GEH both east and westbound. The landowner of Lot 52 Daly Street, Ascot objected to this change based on the following reasons:

- The extension is contrary to the City's Strategic Community Plan key result area Business Belmont.
- The extension having the potential to jeopardise the future business operations at the site.
- The proposal being illogical and not sufficiently justified.
- The extension disproportionately and unreasonably burdening the landowner.

Taking into consideration the abovementioned concerns, it may be appropriate for an alternative layout to be investigated that does not require Grandstand Road to be extended through private property, whilst still maintaining POS provision for the precinct. It is considered that the following alternative options could be investigated:

- Grandstand Road connecting to the realigned Resolution Drive; or
- Grandstand Road connecting to Daly Street along the former Resolution Drive (south) alignment.

It is therefore recommended that alternative road network options for the area be investigated, with subsequent modifications being undertaken to the draft LSP (Modification 11).

Item 12.2 Continued

Traffic Surveys and Modelling

Submissions raised a number of concerns in relation to the traffic surveys and modelling that was undertaken as part of the Movement and Access Strategy (Attachment 5), particularly relating to:

- The age of the traffic data used
- The modelling not taking into consideration an Ascot Racecourse event scenario
- Not all trip generation rates referencing source data
- Limited justification being provided for trip generation rates
- Modelling not being undertaken for all intersections
- Modelling being undertaken that uses incorrect intersection configurations
- The Strategy not taking into consideration development at 16 Marina Drive, Ascot (Multiple Dwellings and Café) and 52 Grandstand Road, Ascot (Nursing Home).

The abovementioned concerns are justified, with the exception of submitters concerns in relation to the Strategy not taking into consideration developments at 16 Marina Drive, Ascot and 52 Grandstand Road, Ascot. It should be noted that the traffic volumes associated with these developments would be insignificant in the context of the overall volumes that the road network accommodates, and therefore would unlikely influence the ultimate planning for the area.

It is recommended that the Movement and Access Strategy be modified to address the remainder of the abovementioned concerns (Modification 11).

Public Transport

A number of submissions raised concerns in relation to the adequacy of public transport within close proximity to the Golden Gateway Precinct and the future bus routes and frequency of routes that will operate along GEH once the Redcliffe Train Station is operational. In considering this, the following should be noted:

- The Circle Route (998/999) is a high frequency bus route that travels along Resolution Drive and Grandstand Road however the nearest stop is located outside the precinct along Grandstand Road, near the main entry to Ascot Racecourse.
- Bus routes 36, 40, 295, 296 and 299 currently all operate to form a high frequency bus corridor along GEH. These routes provide services to key destinations including the Perth CBD, Perth Airport, Victoria Park, Midland, Guilford, Burswood and Kalamunda.
- When Redcliffe Station becomes operational, a number of changes will be made to the existing bus routes whereby only high frequency route (the 940 Superbus) will operate along GEH, between Redcliffe and Elizabeth Quay Stations, via the Victoria Park Transfer Station.

Item 12.2 Continued

In light of the above, it is considered that the Golden Gateway Precinct is adequately serviced by bus routes to and from key destinations. Whilst there are currently no bus stops located within the precinct, with the exception of along GEH, there are opportunities for the Public Transport Authority to make improvements to public transport access overtime.

Pedestrian and Cyclist Connections

Submissions raised concerns in relation to pedestrian and cyclist connectivity within the Golden Gateway Precinct, particularly in relation to crossing GEH and Stoneham Street. Submissions also raised concerns in relation to the safety of pedestrians along Grandstand Road, Resolution Drive and Stoneham Street and suggested that various overpasses be constructed. In considering these concerns, the following points are relevant:

- Signalised pedestrian access across GEH is available at its intersections with Stoneham Street/Belgravia Street and Resolution Drive/Hardey Road. In addition, pedestrian access across GEH is provided through a mid-block crossing to the east of Daly Street, which currently performs at acceptable levels.

- The draft LSP currently proposes a signal-controlled crossing of GEH in close proximity to Daly Street. Main Roads Western Australia have advised however that they are not supportive of this on the basis that it is too close to existing traffic signals and would disrupt the flow of traffic, and should therefore be removed from the draft LSP (Modification 12).

- The draft LSP proposes traffic signals at the intersection of Stoneham Street, Daly Street and Resolution Drive (north) to facilitate in the safe crossing of pedestrians between the Precinct and the Swan River. Notwithstanding, MRWA are not supportive of traffic signals in this location, therefore an alternative layout will need to be considered that supports pedestrian access.

- To facilitate in pedestrian and cyclist safety within the precinct shared path connections are proposed to be retained/constructed along roads including Grandstand Road, Resolution Drive and Stoneham Street.

In light of the above it is considered that pedestrian and cyclist connections will be acceptable within the Precinct, however further investigation is required for pedestrian access across Stoneham Street.

Public Open Space

The assessment criteria for POS provision is set out in the WAPC's Development Control Policy 2.3 – POS in Residential Areas and the Liveable Neighbourhoods document. The usual requirement is that 10% of land to be subdivided is to be set aside for POS. Notwithstanding, in the case of mixed use development; there is no minimum requirement for the provision of POS. Instead, Liveable Neighbourhoods outlines that POS contribution is to be determined by the WAPC on a case by case basis having regard to:

- The amount of mixed uses proposed and the potential number of residents;

- The amount of POS available in 300 metres of the mixed use area;

Item 12.2 Continued

- The proportion of the mixed use area likely to be used for non-residential purposes; and

- The level of innovation and quality of the resultant urban form in neighbourhood and town centres.

The draft LSP proposes 6,974m^2 of land to be reserved for POS, which is to be provided as two separated areas of 4,536m^2 and 2,438m^2 in area. This represents a POS provision of 3.47% of the total developable area within the precinct.

A number of submissions received during the advertising period raised concerns in relation to the amount of POS proposed to be provided, and requested that provision be made for additional POS within the precinct. In considering these concerns, the following is relevant:

- The City's POS Strategy outlines that the suburb of Ascot is overprovided with POS, particularly in terms of land area to population ratio. Notwithstanding, Ascot relies to a large extent on Regional Open Space and has a shortfall of active space.

- It is anticipated that future development within the precinct will predominantly be in the form of mixed residential and commercial development. It is therefore considered that there will be different peak period demands for POS.

- The Belmont Trust Land currently acts as an area of POS. Whilst not formally reserved for the purposes of POS, there is a deed that applies to the land requiring it to be developed for public recreation and enjoyment.

- Development could currently occur within the precinct under the existing zoning however there would be no opportunity to establish any POS. The draft LSP therefore provides an opportunity for POS to be provided within the area, through the realignment/closure of roads.

- Additional POS could be achieved within the precinct, however depending on the reconfiguration of the road network, this would likely be at the expense of privately-owned land.

- The precinct is located in close proximity to the Swan River Foreshore Reserve, which provides for direct access to active water based recreational and sporting activities.

In light of the above, it is considered that the amount of POS proposed to be provided within the Precinct is acceptable. Notwithstanding, as discussed previously in this report, it is considered beneficial that some additional POS be provided on the Ascot Kilns site to allow for the wider community to access and interact with the heritage structures. It should be noted however that the exact design and configuration of POS on the Ascot Kilns site requires further planning through an LDP, and in the case of the wider precinct, the amount and configuration of POS may change as a result of required modifications to the road network, as outlined above in the Road Network section of the report.

Item 12.2 Continued

Water Management

A Local Water Management Strategy (LWMS) has been prepared for the precinct to provide a broad drainage strategy that addresses the management of additional quantities of stormwater created from development. The LWMS was prepared in accordance with the WAPC's Better Urban Water Management (2008) document and has been endorsed by the Department of Water and Environmental Regulation (DWER).

A key aspect of the draft LSP is the piping of the Central Belmont Main Drain, an existing open drain that traverses the precinct and carries water from the wider Belmont area to the Swan River. This is premised on a Water Corporation report from 2009 that proposed the drain be piped to improve safety. The piping of this drain represents an opportunity to establish the POS area to provide useable recreational space within the precinct.

In advertising the draft LSP, the Department of Biodiversity, Conservation and Attractions (DBCA) advised that they are not supportive of the proposal to pipe the drain on the basis that it would not maintain or improve ecological values or water quality of the Swan Canning river system. Whilst the Water Corporation did not raise any concerns with the piping of the drain as part of their submission, subsequent correspondence received advised that they supported the DBCA's position on the matter, despite their report from 2009 proposing the piping of the drain.

In considering the DBCA and Water Corporation's concerns, the following points are relevant:

- If the subject portion of the Central Belmont Main Drain was to be piped, it would still flow into the Ascot Waters Compensation Basin prior to entering the Swan River. The Ascot Waters Compensation Basin controls flow rates and allows for sediment to settle before it is discharged into the river.

- The side slopes to a living stream should have a gradient of 1:8 or flatter to facilitate in safe pedestrian access to the water's edge. Where side slopes with a gradient steeper than 1:6 are proposed, any living stream is required to be fenced for safety reasons.

- Converting the Central Belmont Main Drain into a living stream would require additional land and may require the acquisition of a portion of surrounding properties.

- A living stream would reduce the amount of POS proposed to be provided within the Precinct.

- The subject section of the Central Belmont Main Drain is only approximately 150 metres in length and flows into a pipe that runs under Stoneham Street, prior to entering the Ascot Waters Compensation Basin. It is therefore not considered that transforming this section of the drain into a living stream will substantially improve the ecological values of the Swan River.

In light of the above, whilst a living stream may have some benefit, it is not considered to be appropriate or practical in this location. Notwithstanding, it is considered that further liaison with the Water Corporation, DWER and DBCA is required to resolve this matter.

Item 12.2 Continued

Conclusion

The draft Golden Gateway LSP will ultimately facilitate the coordination of future subdivision and development within the precinct. Notwithstanding, to address a number of concerns raised in the submissions, it is recommended that several modifications to the draft LSP be undertaken, as outlined in Attachment 12 , with key modifications relating to the zoning of land, building height and the movement network.

In terms of zoning, the proposed 'Mixed Use' zone is considered to be appropriate for a majority of the Golden Gateway precinct, however to mitigate conflict with the adjacent Ascot Waters Estate to the west and the Residential and Stables area to the east of the precinct, alternative zoning has recommended for properties adjacent to these areas. This includes applying the 'Residential and Stables', 'Residential' and the 'Place of Public Assembly' zonings to align with existing or adjacent zoning or to form as a transitional zone. In the case of the 'Place of Public Assembly' zoning, it should be noted that this is proposed to be applied to land containing Perth Racing's existing administration building and the Ascot Racecourse car park, which could be modified should Perth Racing consider redeveloping or changing the use of this land.

In response to advertising, consideration has been given to the proposed maximum building heights and modifications are recommended to align with community expectations. Given that LPS 15 currently provides limited restrictions on building heights in this location, it is considered entirely appropriate that this be addressed through the draft LSP. This will enable future development to occur in a manner that is both coordinated and considerate of its surrounding context.

The recommended changes to zoning and building heights have triggered reconsideration of other elements of the draft LSP, including residential density and the allocation of precinct areas. In addition, consideration has been given to improving clarity and consistency in the draft LSP, including with existing planning frameworks such as the R-Codes and other planning work being undertaken such as the review of LPS 15. It is considered that enhancing such aspects of the draft LSP will improve legibility and efficiency of this future framework.

This report has outlined various issues associated with the proposed movement network that became apparent through the feedback received during the public consultation period. It is evident that the precinct's location adjacent to GEH, and dissection by the key distributor roads of Resolution Drive and Stoneham Street, presents a significant constraint to planning in the precinct. To resolve these issues, it is necessary to undertake further investigations and analysis, and in particular seek further input from, and collaboration with MRWA as the custodian of GEH.

It is recommended that Council support the proposed modifications to the draft LSP and endorse re-advertising in accordance with the *Regulations*. It is considered crucial that Council make a decision on this matter to comply with the requirements under the *Regulations*. This will also ensure that the draft LSP is progressed in a matter that is acceptable to Council and the community, whilst also balancing relevant technical considerations to support orderly and proper planning.

Item 12.2 Continued

FINANCIAL IMPLICATIONS

- All costs associated with the preparation and advertising of the draft LSP to date have been met by the Planning Services operational budget.
- There are costs associated with undertaking modifications and re-advertising the draft LSP. These costs will be covered by the Planning Services operational budget.

ENVIRONMENTAL IMPLICATIONS

Environmental implications associated with the draft LSP are outlined in Attachment 4 Environmental Assessment Report. There are no environmental implications associated with undertaking modifications to and re-advertising the draft LSP.

SOCIAL IMPLICATIONS

- There are currently limited planning controls that apply to the Golden Gateway precinct, which may result in development that does not align with community expectations. The draft LSP will provide more certainty to the community in relation to how the precinct can be developed.
- The draft LSP proposes to establish a Local Centre within the precinct to provide local convenience and amenities to both future and existing residents and businesses in the area.
- The draft LSP proposes a number of upgrades to the public realm which is intended to improve the overall amenity of the area.

OFFICER RECOMMENDATION

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan.
2. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*
3. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.
4. Write to those who made a submission advising them of Council's decision.
5. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Item 12.2 Continued

Note:

Cr Davis put forward the following Alternative Motion.

ALTERNATIVE COUNCILLOR MOTION

DAVIS MOVED, SEKULLA SECONDED

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan, subject to the following amendments:

    a. Modify the text relating to the Belmont Trust Land, reflected on Plan 1 Structure Plan, Plan 2 Precinct Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure and Figure 24 Implementation, to read 'Belmont Charitable Trust Land' (Modification 40).

    b. Include text within the draft Local Structure Plan that explains that the Belmont Trust land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties (Modification 41)

    c. Modify the text relating to the Ascot Kilns site, reflected on Plan 1 Structure Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure, Figure 15 Open Space Provision, Figure 23 Movement Network and Figure 24 Implementation, to read 'State Government Owned Land' (Modification 42).

    d. Amend Modification 6 to apply an R-AC3 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.

    e. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 1: Great Eastern Highway to be a maximum height of 9 storeys (Modification 43).

    f. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 2: Stoneham Street, Precinct 3: Main Street and Precinct 4: Resolution Drive to be a maximum height of 6 storeys (Modification 44).

    g. Amend Plan 3 – Building Height Plan to delete the landmark site designations and associated height bonus provisions applicable to land within Precinct 3: Main Street (Daly Street) and Precinct 4: Resolution Drive (Modification 45).

    h. Amend Modification 15 to include modifications maximum building height in Table 2 – Precinct Development Table for Precincts 1, 2, 3 and 4 to align with the R-Coding of these properties.

    i. Amend Modification 11 to remove investigating and analysing road network options pertaining to access to Perth Racing's landholdings and Ascot Racecourse, and access and egress on Matheson Road.

Item 12.2 Continued

j. Modify the draft Local Structure Plan to reflect Matheson Road as requiring further planning to be undertaken at a later date (Modification 46).

2. Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.

3. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

4. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.

5. Write to those who made a submission advising them of Council's decision.

6. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Reason:

- To clarify the community perception and concern over the future of the Ascot Kilns and Belmont Trust sites.
- To ensure the revised road network does not cause rat running in the Residential and Stables precinct.
- To ensure that the height of development in the precinct is not excessive.

8.52pm **The Presiding Member requested a mover and seconder to adjourn the meeting for a short period.**

8.52pm ***ROSSI MOVED, SEKULLA SECONDED, that the meeting be adjourned for a short period to enable discussion of the process relevant to the Standing Orders Local Law 2017.***

CARRIED 8 VOTES TO 0

Note:

The Presiding Member reconvened the meeting at 9.05pm with a previously proposed amendment motion and incomplete procedural motion being withdrawn. Debate on Cr Davis's Alternative Councillor Motion continued.

4 VOTES TO 4

For: Cayoun, Davis, Ryan, Sekulla
Against: Marks, Powell, Ryan, Wolff

(In accordance with s5.21 of the Local Government Act 1995, the Mayor used his casting vote in the negative)

LOST 4 VOTES TO 5

For: Cayoun, Davis, Ryan, Sekulla
Against: Marks, Powell, Ryan, Wolff

Item 12.2 Continued

Note:

Cr Powell put forward the following Foreshadowed Councillor Motion.

FORESHADOWED COUNCILLOR MOTION

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan, subject to the following amendments:

    a. Modify the text relating to the Belmont Trust Land, reflected on Plan 1 Structure Plan, Plan 2 Precinct Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure and Figure 24 Implementation, to read 'Belmont Charitable Trust Land' (Modification 40).

    b. Include text within the draft Local Structure Plan that explains that the Belmont Trust land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties (Modification 41)

    c. Modify the text relating to the Ascot Kilns site, reflected on Plan 1 Structure Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure, Figure 15 Open Space Provision, Figure 23 Movement Network and Figure 24 Implementation, to read 'State Government Owned Land' (Modification 42).

    d. Amend Modification 6 to apply an R-AC3 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.

    e. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 1: Great Eastern Highway to be a maximum height of 9 storeys (Modification 43).

    f. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 2: Stoneham Street, Precinct 3: Main Street and Precinct 4: Resolution Drive to be a maximum height of 6 storeys (Modification 44).

    g. Amend Plan 3 – Building Height Plan to delete the landmark site designations and associated height bonus provisions applicable to land within Precinct 3: Main Street (Daly Street) and Precinct 4: Resolution Drive (Modification 45).

    h. Amend Modification 15 to include modifications maximum building height in Table 2 – Precinct Development Table for Precincts 1, 2, 3 and 4 to align with the R-Coding of these properties.

    i. Amend Modification 11 to remove investigating and analysing road network options pertaining to access to Perth Racing's landholdings and Ascot Racecourse, and access and egress on Matheson Road.

    j. Modify the draft Local Structure Plan to reflect Matheson Road as requiring further planning to be undertaken at a later date (Modification 46).

Item 12.2 Continued

k. Apply a Residential and Mixed Use zone over Lot 452 Grandstand Road by:

- Deleting Modification 2 that proposed to apply a 'Place of Public Assembly' zone over Lot 452 Grandstand Road.
- Modifying Plan 1 – Structure Plan to apply a 'Mixed Use' zoning over the north-eastern portion of Lot 452, fronting Grandstand Road and a 'Residential' zoning over the south-western portion of Lot 452, fronting Resolution Drive (and inserting this as an additional modification to the List of Proposed Amendments).
- Modifying Plan 1 – Structure Plan to identify the requirement for a Local Development Plan for Lot 452 Grandstand Road that addresses the interface to adjoining residential development, access arrangements and the composition of any future development, prior to any subdivision and/or development of the site (and inserting this as an additional modification to the List of Proposed Amendments).
- Amending Modification 7 such that the 'R40' and 'R100' density coding over Lot 452 Grandstand Road remains.

l. Apply a Residential zone over Lot 7705 Matheson Road by:

- Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 7705 Matheson Road and substituting it with a 'Residential' zoning.
- Amending Modification 9 to include applying an 'R50' density coding to Lot 7705 Matheson Road.

m. Apply a Mixed Use zone over Lot 13 Grandstand Road by:

- Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 13 Grandstand Road.

n. Amend modifications relating to Precinct areas and land use permissibility as follows:

- Amend Modification 14 relating to modifications to Plan 2 – Precinct Plan by:
  - Deleting the proposed modification to reduce the size of Precinct 4 (Resolution Drive) to exclude Lot 13 Grandstand Road.
  - Including a modification to adjust the boundaries of Precinct 4 (Resolution Drive) to encompass Lot 13 Grandstand Road in its entirety, and adjusting the boundaries of the adjacent Precinct 7 (Racecourse Interface (East)) to reflect this change.
  - Deleting the proposed modifications to Precinct 7 (Racecourse Interface (East)).

Item 12.2 Continued

- Deleting the modification which proposes the creation of a new Precinct 9, bound by Hardey Road and the realigned Matheson Road.

- Delete Modification 24 to allow for Single Houses to be permissible within Precinct 7.

2. Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.

3. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

4. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.

5. Write to those who made a submission advising them of Council's decision.

6. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Reason:

- To clarify the community perception and concern over the future of the Ascot Kilns and Belmont Trust sites.

- To ensure the revised road network does not cause rat running in the Residential and Stables precinct.

- To ensure that the height of development in the precinct is not excessive.

- To apply appropriate zoning over Perth Racing's landholdings that reflects their future development aspirations.

Item 12.2 Continued

Note:

Cr Sekulla put forward the following Amendment to the Foreshadowed Councillor Motion.

AMENDMENT TO THE FORESHADOWED COUNCILLOR MOTION

SEKULLA MOVED, ROSSI SECONDED

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan, subject to the following amendments:

    a. Modify the text relating to the Belmont Trust Land, reflected on Plan 1 Structure Plan, Plan 2 Precinct Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure and Figure 24 Implementation, to read 'Belmont Charitable Trust Land' (Modification 40).

    b. Include text within the draft Local Structure Plan that explains that the Belmont Trust land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties (Modification 41)

    c. Modify the text relating to the Ascot Kilns site, reflected on Plan 1 Structure Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure, Figure 15 Open Space Provision, Figure 23 Movement Network and Figure 24 Implementation, to read 'State Government Owned Land' (Modification 42).

    d. Amend Modification 6 to apply an R-AC3 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.

    e. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 1: Great Eastern Highway to be a maximum height of 9 storeys (Modification 43).

    f. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 2: Stoneham Street, Precinct 3: Main Street and Precinct 4: Resolution Drive to be a maximum height of 6 storeys (Modification 44).

    g. Amend Plan 3 – Building Height Plan to delete the landmark site designations and associated height bonus provisions applicable to land within Precinct 3: Main Street (Daly Street) and Precinct 4: Resolution Drive (Modification 45).

    h. Amend Modification 15 to include modifications maximum building height in Table 2 – Precinct Development Table for Precincts 1, 2, 3 and 4 to align with the R-Coding of these properties.

    i. Amend Modification 11 to remove investigating and analysing road network options pertaining to access to Perth Racing's landholdings and Ascot Racecourse, and access and egress on Matheson Road.

Item 12.2 Continued

j. Modify the draft Local Structure Plan to reflect Matheson Road as requiring further planning to be undertaken at a later date (Modification 46).

~~k. Apply a Residential and Mixed Use zone over Lot 452 Grandstand Road by:~~

- ~~Deleting Modification 2 that proposed to apply a 'Place of Public Assembly' zone over Lot 452 Grandstand Road.~~
- ~~Modifying Plan 1 – Structure Plan to apply a 'Mixed Use' zoning over the north-eastern portion of Lot 452, fronting Grandstand Road and a 'Residential' zoning over the south-western portion of Lot 452, fronting Resolution Drive (and inserting this as an additional modification to the List of Proposed Amendments).~~
- ~~Modifying Plan 1 – Structure Plan to identify the requirement for a Local Development Plan for Lot 452 Grandstand Road that addresses the interface to adjoining residential development, access arrangements and the composition of any future development, prior to any subdivision and/or development of the site (and inserting this as an additional modification to the List of Proposed Amendments).~~
- ~~Amending Modification 7 such that the 'R40' and 'R100' density coding over Lot 452 Grandstand Road remains.~~

l. Apply a Residential zone over Lot 7705 Matheson Road by:

- Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 7705 Matheson Road and substituting it with a 'Residential' zoning.
- Amending Modification 9 to include applying an 'R50' density coding to Lot 7705 Matheson Road.

~~m. Apply a Mixed Use zone over Lot 13 Grandstand Road by:~~

- ~~Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 13 Grandstand Road.~~

~~n. Amend modifications relating to Precinct areas and land use permissibility as follows:~~

- ~~Amend Modification 14 relating to modifications to Plan 2 – Precinct Plan by:~~
  - ~~Deleting the proposed modification to reduce the size of Precinct 4 (Resolution Drive) to exclude Lot 13 Grandstand Road.~~
  - ~~Including a modification to adjust the boundaries of Precinct 4 (Resolution Drive) to encompass Lot 13 Grandstand Road in its entirety, and adjusting the boundaries of the adjacent Precinct 7 (Racecourse Interface (East)) to reflect this change.~~

Item 12.2 Continued

- ~~Deleting the proposed modifications to Precinct 7 (Racecourse Interface (East)).~~
- ~~Deleting the modification which proposes the creation of a new Precinct 9, bound by Hardey Road and the realigned Matheson Road.~~

- ~~Delete Modification 24 to allow for Single Houses to be permissible within Precinct 7.~~

2. Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.

3. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

4. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.

5. Write to those who made a submission advising them of Council's decision.

6. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Reason

To allow for the inclusion of all considerations, though enable the zoning to be considered further as part of the consultation.

9.48pm **The Presiding Member requested a mover and seconder to adjourn the meeting for a short period to allow the Manager Planning Services to consider the consequences of the proposed changes.**

9.48pm ***CAYOUN MOVED, ROSSI SECONDED that the meeting be adjourned for a short period for consideration of the implication of the proposed amendment.***

CARRIED 8 VOTES TO 0

Item 12.2 Continued

Note:

The Presiding Member reconvened the meeting at 10.01 pm. There was an explanation by the Manager Planning Services relevant to the removal of Item "n" in Cr Sekulla's proposed amendment.

4 VOTES TO 4

For: Cayoun, Davis, Rossi, Sekulla
Against: Marks, Powell, Ryan, Wolff

(In accordance with s5.21 of the Local Government Act 1995, the Mayor used his casting vote in negative)

LOST 4 VOTES TO 5

For: Cayoun, Davis, Rossi, Sekulla
Against: Marks, Powell, Ryan, Wolff

Note:

The Foreshadowed Councillor Motion was put as the Substantive Motion.

FORESHADOWED COUNCILLOR MOTION

POWELL MOVED, WOLFF SECONDED

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan, subject to the following amendments:

a. Modify the text relating to the Belmont Trust Land, reflected on Plan 1 Structure Plan, Plan 2 Precinct Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure and Figure 24 Implementation, to read 'Belmont Charitable Trust Land' (Modification 40).

b. Include text within the draft Local Structure Plan that explains that the Belmont Trust land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties (Modification 41)

c. Modify the text relating to the Ascot Kilns site, reflected on Plan 1 Structure Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure, Figure 15 Open Space Provision, Figure 23 Movement Network and Figure 24 Implementation, to read 'State Government Owned Land' (Modification 42).

d. Amend Modification 6 to apply an R-AC3 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.

e. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 1: Great Eastern Highway to be a maximum height of 9 storeys (Modification 43).

Item 12.2 Continued

f. Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 2: Stoneham Street, Precinct 3: Main Street and Precinct 4: Resolution Drive to be a maximum height of 6 storeys (Modification 44).

g. Amend Plan 3 – Building Height Plan to delete the landmark site designations and associated height bonus provisions applicable to land within Precinct 3: Main Street (Daly Street) and Precinct 4: Resolution Drive (Modification 45).

h. Amend Modification 15 to include modifications maximum building height in Table 2 – Precinct Development Table for Precincts 1, 2, 3 and 4 to align with the R-Coding of these properties.

i. Amend Modification 11 to remove investigating and analysing road network options pertaining to access to Perth Racing's landholdings and Ascot Racecourse, and access and egress on Matheson Road.

j. Modify the draft Local Structure Plan to reflect Matheson Road as requiring further planning to be undertaken at a later date (Modification 46).

k. Apply a Residential and Mixed Use zone over Lot 452 Grandstand Road by:

- **Deleting Modification 2 that proposed to apply a 'Place of Public Assembly' zone over Lot 452 Grandstand Road.**
- **Modifying Plan 1 – Structure Plan to apply a 'Mixed Use' zoning over the north-eastern portion of Lot 452, fronting Grandstand Road and a 'Residential' zoning over the south-western portion of Lot 452, fronting Resolution Drive (and inserting this as an additional modification to the List of Proposed Amendments).**
- **Modifying Plan 1 – Structure Plan to identify the requirement for a Local Development Plan for Lot 452 Grandstand Road that addresses the interface to adjoining residential development, access arrangements and the composition of any future development, prior to any subdivision and/or development of the site (and inserting this as an additional modification to the List of Proposed Amendments).**
- **Amending Modification 7 such that the 'R40' and 'R100' density coding over Lot 452 Grandstand Road remains.**

l. Apply a Residential zone over Lot 7705 Matheson Road by:

- **Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 7705 Matheson Road and substituting it with a 'Residential' zoning.**
- **Amending Modification 9 to include applying an 'R50' density coding to Lot 7705 Matheson Road.**

Item 12.2 Continued

m. Apply a Mixed Use zone over Lot 13 Grandstand Road by:

- **Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 13 Grandstand Road.**

n. Amend modifications relating to Precinct areas and land use permissibility as follows:

- **Amend Modification 14 relating to modifications to Plan 2 – Precinct Plan by:**
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  - **Deleting the proposed modifications to Precinct 7 (Racecourse Interface (East)).**
  - **Deleting the modification which proposes the creation of a new Precinct 9, bound by Hardey Road and the realigned Matheson Road.**
- **Delete Modification 24 to allow for Single Houses to be permissible within Precinct 7.**

2. Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.

3. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

4. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.

5. Write to those who made a submission advising them of Council's decision.

6. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Item 12.2 Continued

Reason:

- To clarify the community perception and concern over the future of the Ascot Kilns and Belmont Trust sites.
- To ensure the revised road network does not cause rat running in the Residential and Stables precinct.
- To ensure that the height of development in the precinct is not excessive.
- To apply appropriate zoning over Perth Racing's landholdings that reflects their future development aspirations.

4 VOTES TO 4

For: Marks, Powell, Ryan, Wolff
Against: Cayoun, Davis, Rossi, Sekulla

(In accordance with s5.21 of the Local Government Act 1995, the Mayor used his casting vote in affirmative)

CARRIED 5 VOTES TO 4

For: Marks, Powell, Ryan, Wolff
Against: Cayoun, Davis, Rossi, Sekulla

10.10pm The Manager Planning Services departed the meeting and did not return.

Item 12.2 Continued

Note:

The Presiding Member reconvened the meeting at 10.01 pm. There was an explanation by the Manager Planning Services relevant to the removal of Item "n" in Cr Sekulla's proposed amendment.

4 VOTES TO 4

For: Cayoun, Davis, Rossi, Sekulla
Against: Marks, Powell, Ryan, Wolff

(In accordance with s5.21 of the Local Government Act 1995, the Mayor used his casting vote in negative)

LOST 4 VOTES TO 5

For: Cayoun, Davis, Rossi, Sekulla
Against: Marks, Powell, Ryan, Wolff

Note:

The Foreshadowed Councillor Motion was put as the Substantive Motion.

FORESHADOWED COUNCILLOR MOTION

POWELL MOVED, WOLFF SECONDED

That Council:

1. Adopt the modifications detailed in Attachment 12 to the draft Golden Gateway Local Structure Plan, subject to the following amendments:

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- **Deleting Modification 2 that proposed to apply a 'Place of Public Assembly' zone over Lot 452 Grandstand Road.**
- **Modifying Plan 1 – Structure Plan to apply a 'Mixed Use' zoning over the north-eastern portion of Lot 452, fronting Grandstand Road and a 'Residential' zoning over the south-western portion of Lot 452, fronting Resolution Drive (and inserting this as an additional modification to the List of Proposed Amendments).**
- **Modifying Plan 1 – Structure Plan to identify the requirement for a Local Development Plan for Lot 452 Grandstand Road that addresses the interface to adjoining residential development, access arrangements and the composition of any future development, prior to any subdivision and/or development of the site (and inserting this as an additional modification to the List of Proposed Amendments).**
- **Amending Modification 7 such that the 'R40' and 'R100' density coding over Lot 452 Grandstand Road remains.**

l. Apply a Residential zone over Lot 7705 Matheson Road by:

- **Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 7705 Matheson Road and substituting it with a 'Residential' zoning.**
- **Amending Modification 9 to include applying an 'R50' density coding to Lot 7705 Matheson Road.**

Item 12.2 Continued

m. Apply a Mixed Use zone over Lot 13 Grandstand Road by:

- **Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 13 Grandstand Road.**

n. Amend modifications relating to Precinct areas and land use permissibility as follows:

- **Amend Modification 14 relating to modifications to Plan 2 – Precinct Plan by:**
  - **Deleting the proposed modification to reduce the size of Precinct 4 (Resolution Drive) to exclude Lot 13 Grandstand Road.**
  - **Including a modification to adjust the boundaries of Precinct 4 (Resolution Drive) to encompass Lot 13 Grandstand Road in its entirety, and adjusting the boundaries of the adjacent Precinct 7 (Racecourse Interface (East)) to reflect this change.**
  - **Deleting the proposed modifications to Precinct 7 (Racecourse Interface (East)).**
  - **Deleting the modification which proposes the creation of a new Precinct 9, bound by Hardey Road and the realigned Matheson Road.**
- **Delete Modification 24 to allow for Single Houses to be permissible within Precinct 7.**

2. Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.

3. Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

4. Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.

5. Write to those who made a submission advising them of Council's decision.

6. Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.

Item 12.2 Continued

Reason:

- To clarify the community perception and concern over the future of the Ascot Kilns and Belmont Trust sites.
- To ensure the revised road network does not cause rat running in the Residential and Stables precinct.
- To ensure that the height of development in the precinct is not excessive.
- To apply appropriate zoning over Perth Racing's landholdings that reflects their future development aspirations.

4 VOTES TO 4

For: Marks, Powell, Ryan, Wolff
Against: Cayoun, Davis, Rossi, Sekulla

(In accordance with s5.21 of the Local Government Act 1995, the Mayor used his casting vote in affirmative)

CARRIED 5 VOTES TO 4

For: Marks, Powell, Ryan, Wolff
Against: Cayoun, Davis, Rossi, Sekulla

10.10pm The Manager Planning Services departed the meeting and did not return.

	Council Resolution	Officer Comment
Resolution		
1a	Modify the text relating to the Belmont Trust Land, reflected on Plan 1 Structure Plan, Plan 2 Precinct Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure and Figure 24 Implementation, to read 'Belmont Charitable Trust Land' (Modification 40).	Text on plans changed to 'Belmont Charitable Trust Land'.
1b	Include text within the draft Local Structure Plan that explains that the Belmont Trust land is for public recreation and enjoyment, and further planning work needs to be undertaken at a later date to ensure adequate access to the site, and an appropriate interface with the surrounding properties (Modification 41)	Text included to explain that Belmont Trust Land will be used for public recreation
1c	Modify the text relating to the Ascot Kilns site, reflected on Plan 1 Structure Plan, Plan 3 Building Height Plan, Figure 4 Land Tenure, Figure 15 Open Space Provision, Figure 23 Movement Network and Figure 24 Implementation, to read 'State Government Owned Land' (Modification 42)	Text on plans clarifying that the Ascot Kilns site is owned by the State Government.
1d	Amend Modification 6 to apply an R-AC3 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.	At the September 2023 Ordinary Council Meeting, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate building scales to ensure these align with current market conditions and future trends. Following these investigations and to facilitate viable development within the precinct, an R-ACO density code is proposed to be applied to the land. This allows for development to be guided by controls contained within the draft Structure Plan.
1e	Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 1: Great	At the September 2023 Ordinary Council Meeting, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate

	Eastern Highway to be a maximum height of 9 storeys (Modification 43).	building scales to ensure these align with current market conditions and future trends. The draft Corridor Strategy includes land subject to the Golden Gateway Structure Plan. Therefore, officers investigated the building scales within the Golden Gateway precinct at the same time. Following these investigations and to facilitate viable development within the precinct, a building height limit of 15 storeys (with potential for an additional 5 storeys subject to meeting particular amenity and sustainability criteria) is proposed to be applied to land within this precinct. Refer to Development Feasibility heading in the report item.
1f	Amend Plan 3 – Building Height Plan to adjust the maximum building heights applicable to land within Precinct 2: Stoneham Street, Precinct 3: Main Street and Precinct 4: Resolution Drive to be a maximum height of 6 storeys (Modification 44)	At the September 2023 Ordinary Council Meeting, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate building scales to ensure these align with current market conditions and future trends. Therefore, officers investigated the building scales within the Golden Gateway precinct at the same time. Following these investigations and to facilitate viable development within the precinct, a building height limit of 10 storeys (with potential for an additional 5 storeys subject to meeting particular amenity and sustainability criteria) is proposed to be applied to land within this precinct. Refer to Development Feasibility heading in the report item.
1g	Amend Plan 3 – Building Height Plan to delete the landmark site designations and associated height bonus provisions	Landmark sites are no longer identified for these precincts.

	applicable to land within Precinct 3: Main Street (Daly Street) and Precinct 4: Resolution Drive (Modification 45).	
1h	Amend Modification 15 to include modifications to maximum building height in Table 2 – Precinct Development Table for Precincts 1, 2, 3 and 4 to align with the R-Coding of these properties.	As per response to modifications 1e and 1f.
1I	Amend Modification 11 to remove investigating and analysing road network options pertaining to access to Perth Racing's landholdings and Ascot Racecourse, and access and egress on Matheson Road.	Officers liaised with Perth Racing who advised they are seeking to progress a planning framework for their landholdings to guide future development. Accordingly, their landholdings have been shown as subject to a separate planning process. Refer to Area to which Structure Plan applies heading in the report item.
1j	Modify the draft Local Structure Plan to reflect Matheson Road as requiring further planning to be undertaken at a later date (Modification 46).	As per response to modification 1i.
1k	Apply a Residential and Mixed Use zone over Lot 452 Grandstand Road by: • Deleting Modification 2 that proposed to apply a 'Place of Public Assembly' zone over Lot 452 Grandstand Road. • Modifying Plan 1 – Structure Plan to apply a 'Mixed Use' zoning over the north-eastern portion of Lot 452, fronting Grandstand Road and a 'Residential' zoning over the south-western portion of Lot 452, fronting Resolution Drive (and inserting this as an additional modification to the List of Proposed Amendments). • Modifying Plan 1 – Structure Plan to identify the requirement for a Local Development Plan for Lot 452 Grandstand Road that addresses the interface to adjoining residential development, access arrangements and the composition of any future	This site is owned by Perth Racing. As per response to modification 1i.

	development, prior to any subdivision and/or development of the site (and inserting this as an additional modification to the List of Proposed Amendments). • Amending Modification 7 such that the 'R40' and 'R100' density coding over Lot 452 Grandstand Road remains.	
1l	Apply a Residential zone over Lot 7705 Matheson Road by: • Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 7705 Matheson Road and substituting it with a 'Residential' zoning. • Amending Modification 9 to include applying an 'R50' density coding to Lot 7705 Matheson Road.	This site is owned by Perth Racing. As per response to modification 1i.
1m	Apply a Mixed Use zone over Lot 13 Grandstand Road by: • Amending Modification 3 relating to the zoning of Perth Racing's landholdings on the northern side of Resolution Drive to delete the proposed 'Place of Public Assembly' zoning over Lot 13 Grandstand Road.	This site is owned by Perth Racing. As per response to modification 1i.
1n	Amend modifications relating to Precinct areas and land use permissibility as follows: • Amend Modification 14 relating to modifications to Plan 2 – Precinct Plan by: • Deleting the proposed modification to reduce the size of Precinct 4 (Resolution Drive) to exclude Lot 13 Grandstand Road. • Including a modification to adjust the boundaries of Precinct 4 (Resolution Drive) to encompass Lot 13	These land parcels are owned by Perth Racing. As per response to modification 1i. No changes are proposed to the precinct boundaries within the portion of the Golden Gateway precinct that the City officers are progressing the planning for.

	Grandstand Road in its entirety, and adjusting the boundaries of the adjacent Precinct 7 (Racecourse Interface (East)) to reflect this change. • Deleting the proposed modifications to Precinct 7 (Racecourse Interface (East). • Deleting the modification which proposes the creation of a new Precinct 9, bound by Hardey Road and the realigned Matheson Road. • Delete Modification 24 to allow for Single Houses to be permissible within Precinct 7.	
2	Write to Perth Racing requesting that the gate providing access between Raconteur Drive and Matheson Road is retained and controlled into the future to prevent traffic rat-running through the Residential and Stables precinct.	As per response to modification 1i.
3	Endorse the re-advertising of the draft modified Golden Gateway Local Structure Plan in accordance with Schedule 2, Part 4, Clause 19(1)(d) and Schedule 2, Part 4, Clause 19(2) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*	Draft Structure Plan is proposed to be re-advertised following Council endorsement. Refer to Consultation section of report item.
4	Notify the Western Australian Planning Commission of the Council's resolution on the draft Golden Gateway Local Structure Plan.	Officers have met with the Department of Planning, Lands and Heritage who are aware of the next steps for advertising the draft Structure Plan.
5	Write to those who made a submission advising them of Council's decision.	Submitters were sent a letter regarding Council's resolution.
6	Collaborate with Main Roads Western Australia in considering alternative road network options for the precinct.	Officers liaised with Main Roads Western Australia regarding the road network.

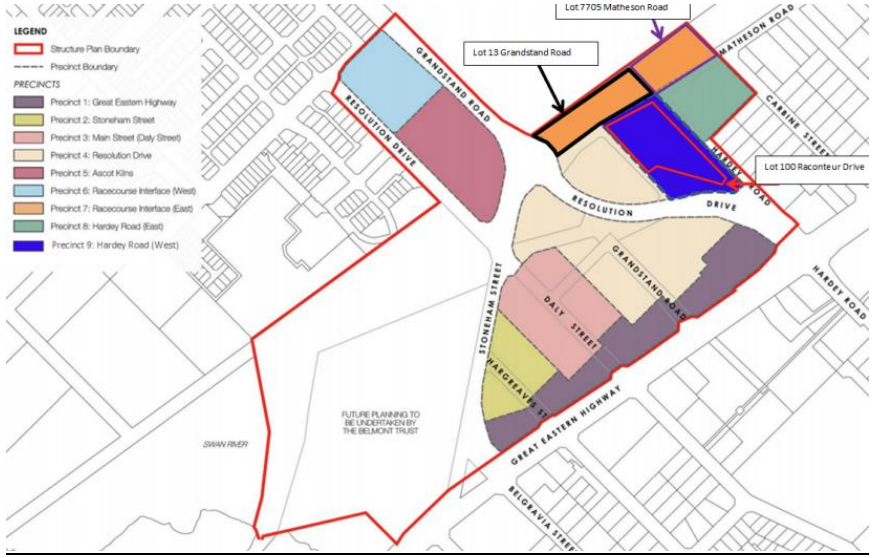
The below Schedule of Modifications were included in the 23 June 2020 Ordinary Council Meeting report as Attachment 12. The corresponding officer comment column has been included to state how the modifications have been addressed.

	Council Resolution	Officer Comment
Schedule of Modifications		
1	Address inconsistencies between terminology and provide clarity on the provision of retail floorspace within the precinct	Following Council's adoption of the Activity Centre Planning Strategy, the draft Structure Plan has been updated to provide further information regarding retail floorspace within the precinct. Refer to Local Centre heading within the report item.
2	Zone Lot 452 Grandstand Road, Ascot 'Place of Public Assembly'.	Superseded by point 1k) of Council's resolution
3	Zone the north-eastern portion of Lot 100 Raconteur Drive, Ascot, bound by Matheson Road, Carbine Street and Hardey Road 'Residential and Stables'.	This land is owned by Perth Racing. As per response to modification 1i.
	Zone the portion of Lot 100 Raconteur Drive, Ascot bound by Hardey Road, public open space 2 and the realigned Matheson Road 'Residential'.	This land is owned by Perth Racing. As per response to modification 1i.
	Zone Lot 13 Grandstand Road, Ascot and Lot 7705 Matheson Road, Ascot 'Place of Public Assembly'.	Superseded by points 1l) and 1m) of Council's resolution
4	Reflect the Ascot Kilns site as requiring a Local Development Plan to be prepared and to identify the requirement for a minimum 10% public open space on the site.	Modification has been made. Refer to Public Open Space and Central Belmont Main Drain section of the report item.
5	Apply an R-AC1 density coding to land within the Great Eastern Highway Precinct.	At the September 2023 Ordinary Council Meeting, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate building scales to ensure these align with current market conditions and future trends. Therefore, officers investigated the building scales within the Golden Gateway precinct at the same time.

		Following these investigations and to facilitate viable development within the precinct, an R-ACO density code is proposed to be applied to the land.
6	Apply an R-AC2 coding to land within the Stoneham Street, Main Street and Resolution Drive Precincts.	Modified by point 1d) of Council's resolution.
7	Remove density coding's of R40 and R100 over Lot 452 Grandstand Road, Ascot (Precinct 6). Amend the building heights that apply to Lot 452 Grandstand Road, Ascot as illustrated in the image below. 	Modified by point 1k) of Council's resolution. This site is owned by Perth Racing. As per response to modification 1i.
8	Apply an R10 density coding to the north-eastern portion of Lot 100 Raconteur Drive, which is bound by Matheson Road, Carbine Street and Hardey Road and suggested to be zoned 'Residential and Stables' under the draft LSP.	This site is owned by Perth Racing. As per response to modification 1i.
9	Apply an R50 and R100 density coding to the northern portion of Lot 100 Raconteur Drive, which is bound by Hardey Road and the	This site is owned by Perth Racing. As per response to modification 1i.

	realigned Matheson Road and recommended to be zoned 'Residential' under the draft LSP.	
10	Remove the R-AC0 density coding over Lot 13 Grandstand Road, Ascot and Lot 7705 Matheson Road, Ascot.	This site is owned by Perth Racing. As per response to modification 1i.
11	Investigate and analyse road network options pertaining to: • Access to Perth Racing's Landholdings and Ascot Racecourse • Access and agress on Matheson Road • The intersection of Resolution Drive (north), Stoneham Street and Daly Street. • The alignment of Grandstand Road (south). Following investigations and analysis, the draft LSP and relevant technical reports shall be modified accordingly. This includes modifying the Movement and Access Strategy as follows: • Undertake modelling using up-to-date data sets. • Provide further justification and explanation in relation to trip generation rates. • Appropriately reference source data for trip generation rates. • Undertake modelling that takes into consideration traffic from Ascot Racecourse. • Assess traffic movements along Matheson Road, including the anticipated trip distribution on the northern side of Resolution Drive.	As per response to modification 1I. Road network options have been investigated and analysed and the Movement and Access Strategy has been updated accordingly. Refer to Road Network section of the report item.

	• Undertake modelling for all intersections and bus lanes along Great Eastern Highway. • Undertake amended modelling for the intersection of Stoneham Street/Belgravia Street/Great Eastern Highway that reflects the existing configuration of the road network and includes the correct phasing. • Undertake amended modelling for the Resolution Drive/Hardey Road/Great Eastern Highway intersection that reflects the existing configuration of the road network and includes the correct phasing.	
12	Remove reference to the proposed signal controlled mid-block shared pedestrian/bike crossing at the Stoneham Street/Daly Street intersection and across Great Eastern Highway.	This change has been made.
13	Remove the following text from dot point 3: 'It is expected that the Stoneham Street/Daly Street/Resolution Drive signalised intersection will include a priority controlled pedestrian crossing phase across all four approaches.'	This change has been made.
14	Amend Plan 2 – Precinct Plan in response to recommended modifications to zoning as follows: <u>Precinct 4</u> Reduce the size of precinct 4 to no longer incorporate Lot 13 Grandstand Road, Ascot in light of it being recommended that this lot be zoned 'Place of Public Assembly' and remaining land within this precinct being zoned 'Mixed Use'. <u>Precinct 7</u> Include Lot 13 Grandstand Road, Ascot in precinct 7 as it is recommended that this lot, in addition to Lot 7705 Matheson Road, Ascot be zoned 'Place of Public Assembly'.	Modified by point 1n) of Council's resolution

	Remove the portion of Lot 100 Raconteur Drive, Ascot bound by Hardey Road and the realigned Matheson Road from precinct 7 in light of it being recommended that this lot be zoned 'Residential' and remaining land within this precinct being zoned 'Place of Public Assembly'. <u>New Precinct – Precinct 8</u> Create a new precinct that incorporates the portion of Lot 100 Raconteur Drive, Ascot bound by Hardey Road and the realigned Matheson Road that is recommended to be zoned 'Residential'. 	

15	Amend the development controls relating to setbacks, R-Code and plot ratio for precincts 5, 6, 7 and 8 in light of recommended modifications to zoning and density. Amend the building heights and R-Code relating to Precinct 6, Racecourse Interface (West)in light of the recommended modifications to building height and density stipulated in Modification 7. Amend the R-Code and plot ratio controls relating to precincts 1, 2, 3 and 4 in light of modifications proposed to the R-Coding of these properties outlined in Modifications 5 and 6.	This site is owned by Perth Racing. As per response to modification 1i. At the September 2023 Ordinary Council Meeting, Council reviewed the draft Great Eastern Highway Corridor Strategy and directed officers to investigate building scales to ensure these align with current market conditions and future trends. Therefore, officers investigated the building scales within the Golden Gateway precinct at the same time. Following these investigations and to facilitate viable development within the precinct, an R-ACO density code is proposed to be applied to the land.
16	Amend the statements and notes that relate to Precinct 5 – Ascot Kilns in light of the recommendation to require a Local Development Plan to be prepared and to identify the requirement for a minimum 10% public open space on the site.	This change has been made. Refer to Public Open Space and Central Belmont Main Drain section of the report item.
17	Amend text in light of recommended modifications to zoning, density and precinct areas.	Text has been amended throughout document to ensure consistent references to zoning, density and precinct areas.
18	Amend the colour of the 'Mixed Use' and 'Residential' zones illustrated in Figure 1 - Structure Plan to align with the colours used in LPS 15.	A portion of land is owned by Perth Racing. As per response to modification 1i. The 'Mixed Use' zone colour has been amended to be consistent with local Planning Scheme No. 15.

19	Remove reference to Apartment Design Guidelines and replace with reference to the Residential Design Codes	These changes have been made.
	Replacing reference to State Planning Policy 3.1 with reference to State Planning Policy 7.3.	
	Remove reference to the draft Design WA 'Apartment Design' (Draft for public comment – WAPC, October 2016. Replace with State Planning Policy 7.3 – Residential Design Codes – Volume 2 – Apartments.	
20	Amend the maximum podium height able to be considered for Precinct 4 (Resolution Drive) within Table 2 from 3-5 storeys to 3 storeys.	This change has been made.
21	Remove the road illustrated on Lot 452 Grandstand Road. Remove the laneway running parallel to Matheson Road and Hardey Road on Lot 100 Raconteur Drive.	These sites are owned by Perth Racing. As per response to modification 1i.
22	Amend paragraph four to remove reference to there being no minimum podium height that applies to development within the precinct.	This change has been made.
	Amend paragraph four to clarify that a maximum podium height of 5 storeys applies to development at landmark sites and along Great Eastern Highway.	This change has been made.
23	Include 'Industry - Service' as an unacceptable land use in the Mixed Use zone.	This change has been made.
24	Remove reference to Single Houses within Precinct 7 and outline that Single Houses can be considered within Precinct 9.	Modified by point 1d) of Council's resolution.
25	Replace the existing text with the following: 'Correspondence from ATCO Gas identifies Medium Pressure gas mains (pressure indicated at 70kPa) along the majority of roads within the subject land.'	This change has been made.
26	Include the following text: '5.7 Design Review Panel Any application for development within the Golden Gateway Precinct will be referred to the City of Belmont Design Review Panel for evaluation.'	This change has been made.
27	Modify the associated text to read as follows: 'Development within the subject precinct shall be generally in accordance with the standards and requirements of LPS 15 and any relevant State	This change has been made.

	Planning Policy and LPP, having regard to the provisions contained within this LSP. Proposed variations to the standards and requirements of LPS 15, any relevant State Planning Policy and Local Planning Policy or the provisions of this LSP are to be outlined within a development application and will be considered by the Responsible Authority with due regard to the intent and purpose of the standards.'	
28	Modify the first sentence of the associated text to read as follows: 'Car parking should be provided in accordance with LPS 15 and/or State Planning Policy 7.3 – Residential Design Codes, subject to the following variations:…'	This change has been made.
29	Amend the first sentence to read as follows: 'The streetscapes of the areas to the north and east of Resolution Drive will have a character that is dominated by street tree planting, creating a heavy canopy, with local native plant species used wherever possible and deciduous trees not to be planted (refer Figure 22).'	This land is owned by Perth Racing. As per response to modification 1i.
30	Amend the last dot point to read as follows: 'WSUD and best management practices promoting on-site retention of the run-off generated from the first 15mm of rainfall for small rainfall events.'	This change has been made.
31	Amend the fourth dot point to read as follows: 'The existing lane arrangements along the Grandstand Road and Resolution Drive corridors will be retained. As such, the Grandstand Road configuration of a four lane divided road (2 lanes in each direction) will be retained and the Resolution Drive two lane divided road (1 lane in each direction) will be retained – with additional lanes on the approach and exit from the Great Eastern Highway intersection, as per the existing lane arrangement.'	This section of the road network is not proposed to be amended and the structure plan reflects this.
32	Amend section in response to recommended modifications to zoning.	Changes have been made as required.
33	Amend as required in response to updated Movement and Access Strategy.	Modifications have been made to the Movement and Access Strategy.
34	Amend the third paragraph to read as follows: 'The subject land also abuts the Swan Canning Development Control Area. The Department of Biodiversity, Conservation and Attractions' Corporate Policy 49:	This change has been made.

	Planning For Stormwater Affecting The Swan Canning Development Control Area provides further planning provisions to improve the water quality, habitat, community benefits and amenity of the river system through stormwater management.'	
35	Further investigate heritage aspects within the precinct and where appropriate, modify the draft Local Structure Plan accordingly to reference these aspects.	The draft document references places within the precinct that are on the Local Heritage Survey, Local Heritage List and State Register of Heritage Places.
36	Update images and text where necessary to reflect all existing pedestrian/cyclist paths that are proposed to be retained within the Golden Gateway Precinct.	The document clearly references existing paths and proposed upgrades to paths.
37	Replace the existing text with the following: 'Gas infrastructure and distribution in Western Australia is managed by ATCO Gas Australia. Correspondence from ATCO Gas identifies Medium Pressure gas mains (pressure indicated at 70kPa) along most roads within the subject site. Cardno Drawing CW942300-CI-SK4 in Appendix A contains information on gas infrastructure in the vicinity of the area.'	This change has been made.
38	Add the following text: 'Some existing cast iron water mains will need to be replaced as they are ageing and to increase capacity necessitated by increased demand arising from the proposed higher density development. These may need to be replaced by the developer or alternatively a request can be put to the Water Corporation cast iron replacement program.'	This change has been made.
39	Amend the text to read as follows: 'Due to wastewater flows increasing due to the high density development, a number of upgrades will be required to headworks infrastructure in the area. These include increasing the capacity of the Stoneham Street Wastewater Pump Station as well as a number of sewer mains. These will be scheduled in the Water Corporation Capital Investment Program at the appropriate time.'	This change has been made.

12.3 Club Night Lights Program - Grant Application - Centenary Park

Voting Requirement	:	Simple Majority
Subject Index	:	57/002
Location/Property Index	:	Centenary Park
Application Index	:	NA
Disclosure of any Interest	:	Nil
Previous Items	:	NA
Applicant	:	NA
Owner	:	NA
Responsible Division	:	Infrastructure Services

Council role

Executive The substantial direction setting and oversight role of the Council e.g. adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.

Purpose of report

To seek endorsement for the submission of an application to the Department of Local Government, Sport and Cultural Industries (DLGSC) Club Night Lights Program (CNLP) Small Grant 2024-25.

Summary and key issues

The CNLP is administered by the DLGSC and provides financial assistance to community groups and local governments to develop infrastructure for sport and recreation. CNLP Small Grants are capped at 50% (to a maximum of $200,000) of the total project cost (excluding GST).

Local governments are required to review, rank, prioritise and submit CNLP grant applications to the DLGSC, upon approval by Council.

No applications have been received from local sport and recreation clubs for this CNLP Small Grants round, however the City intends to submit an application to fund Sports Lighting Upgrades at Centenary Park.

Officer Recommendation

That Council:

1. Approves the Club Night Lights Program grant application be submitted to the Department of Local Government, Sport and Cultural Industries for the 2024-25 Small Grants funding round, for the Centenary Park Sports Light Upgrades.
2. Authorises the Chief Executive Officer to accept funding through the Club Night Lights Program, should the grant application be successful.
3. Approves the allocation of $300,000 as a contribution towards the Centenary Park Sports Lighting Upgrade in the 2025-26 Council budget, should the grant application for the maximum amount of $200,000 be successful.
4. Approves funding up to the total project cost of $500,000 in the 2025-26 Council budget in the event the grant application proves unsuccessful, or the grant awarded is less than the maximum amount of $200,000.

Location

Daly Street, Cloverdale

Consultation

Officers have liaised with:

- The Perth Irish Rugby Club
- Rugby WA
- Ascot Cricket Club
- Ascot Eagles Junior Cricket Club
- West Australian Cricket Association (WACA).

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: People

Outcome 1: A safe, healthy community.

Outcome 3: People of all ages and abilities feel connected and supported.

Policy implications

The report is in accordance with Council Policy: Donations and Applications for Financial Assistance.

Statutory environment

There are no specific statutory requirements in respect to this matter.

Background

The Club Night Lights Program (CNLP) Small Grants 2024-25 are available for projects where the total project cost does not exceed $500,000. Grants awarded in this category must be claimed in the financial year following the date of approval. There are two rounds per year which coincide with the summer and winter sporting seasons.The maximum grant offered for small grant applications is 50% of the project cost, capped at $200,000.

The CNLP requires all grant applications to be assessed and prioritised by local governments prior to submission. Local governments are to base assessments on the need for a planned approach, which takes into account justified needs, existing facilities and the social and financial impact of investing in new facilities.

Each submission is to be assessed against the following criteria:

RATE	DESCRIPTION
A	Well planned and needed by the municipality
B	Well planned and needed by the applicant
C	Needed by the municipality, more planning required
D	Needed by the applicant, more planning required
E	Idea has merit, more preliminary work needed
F	Not recommended

Grant applications will be considered by the CNLP Small Grants Committee and recommendations to be announced in November 2024.

The City has prepared one (1) grant application for assessment: City of Belmont Centenary Park Sports Lighting Upgrades.

Report

The City plays a pivotal role in ensuring that community spaces are designed to facilitate equitable access and are conducive to broadcommunity participation. City owned community facilities are to be inclusive for all genders, differing abilities and cultural needs, allowing and promoting use for all . .

In 2022, the City undertook the development of Sporting Facility Needs Analysis which identified the need to upgrade various facilities across the City, to ensure they are inclusive and support the growing demand and expectations for local sporting clubs.

Centenary Park has been identified as a facility which would benefit from a sports lighting upgrade. The current sports lights are outdated and no longer compliant with the required standards for training and night matches.

The addition of new lights will also provide the City with the ability to expand the useful playing surface to areas of the field which are currently poorly lit and under utilised. This will reduce the dependence on the main playing area and protect it from excessive wear and tear.

Specific feedback (below) from the primary sporting club, Perth Irish Rugby Club highlights the need for the upgrade:

- Perth Irish Rugby Club have experienced a positive growth in numbers across its men’s, women’s and junior sides. This has increased the need for viable training and match space, which is currently limited by the existing lighting provision at the ground.

- The club has medium to long term goals to expand further to be considered for the Rugby WA Premiership competition which requires quality training and match level lighting.
- Lighting is currently limited to one side of the playing pitch which results in training happening on one side of the ground. This results in the area becoming worn down which impacts on training and matches.
- Higher quality lighting will improve training at a basic level by increasing the level of light and opening up a larger area of the ground to train on.
- Rugby is a heavy contact sport with health and safety currently a concern due to the existing low quality of lighting. An upgrade in lighting is crucial to ensure players are able to participate in a safe and well lit environment to avoid heavy impacts where possible.
- The club has an issue with the number of teams and the available changeroom space on match days. By providing match level lighting it will allow the club to spread its fixtures by hosting matches on Friday and Saturday nights, thus reducing the existing changeroom congestion on a Saturday afternoon. This is also a big benefit for the fixturing of men's and women's matches on different days.
- The club has missed out on opportunities from Rugby WA previously where the club has been asked to host night matches between regional development girl's sides. Being able to host these events will boost the club's profile and highlight the opportunities available for girls to participate in rugby in Belmont and WA more widely.

Financial implications

The CNLP application for the Centenary Park Sports Lighting Upgrade has a total estimated project cost of $496,000.00 (ex GST). This cost estimate is based on two quotes.

A capped funding contribution towards the project cost is requested from DLGSC in the CNLP grant application ($200,000).

Should the City's CNLP application be successful, the City will be required to fund the remaining estimated project cost of $296,000.00 (ex GST). It is proposed that these funds are considered as part of the 2025-26 capital works budget.

The funding breakdown is summarised in the table below:

Contribution Towards Project	Cost (ex GST)
City of Belmont	$296,000
CNLP Grant	$200,000
Total project cost	$496,000

Should the funding application from the CNLP be unsuccessful or less than the funding requested, it is proposed that the City of Belmont will fund the outstanding costs to complete the project.

Notwithstanding, the City will also consider this project for appropriate funding opportunities that may arise through the State or Federal Government.

Environmental implications

There are no environmental implications associated with this report.

Social implications

The proposed upgrade for Centenary Park Sports Lighting will:

- Ensure that the community has access to the services and facilities it needs.
- Support local sporting groups to increase participation by meeting the needs of the community.
- Enhance a sense of community and the image of Belmont.

Attachment details

Attachment No and title
Nil

12.4 Internal Audit Report

Voting Requirement	:	Simple Majority
Subject Index	:	19/006
Location/Property Index	:	N/A
Application Index	:	N/A
Disclosure of any Interest	:	N/A
Previous Items	:	N/A
Applicant	:	N/A
Owner	:	N/A
Responsible Division	:	Executive Services

Council role

Executive The substantial direction setting and oversight role of the Council e.g. adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.

Purpose of report

To submit three completed internal audit reports to Council. These audits have been completed in accordance with the Council approved 2023 -2024 internal audit plan.

Summary and key issues

The Standing Committee (Audit and Risk) reviewed these reports at their meeting on Monday, 29 July 2024. Findings for the completed audits are detailed below.

Infrastructure Services Division – Buildings Maintenance (report issued 11 March 2024)

Findings:

- Asset Management Plans have historically been reviewed and updated by the Asset Custodians, however not formally approved by Directors. The Facilities, Structures & Equipment Asset Management Plan has no

evidence of approval and this is considered to be an opportunity for improvement.

- The current approach to the City Facilities' Preventative Maintenance Plan (PMP) using MS Excel format relies heavily on manual input, leading to duplicated efforts in data handling. This method is not only time-consuming for monitoring and updating but also susceptible to human errors. The City will review options for a system approach so as to transition away from MS Excel.

- The risk register included in the Facilities, Structures & Equipment Asset Management Plan requires alignment with the risk register in RMSS.

- Internal audit testing reviewed two invoices submitted by the City's cleaning contractor. Both invoices were authorised for payment by the Facilities Administration Officer. SP23 requires the authorisation to be made by the Contract Administrator. While the payment has been delegated to the Facilities Administration Officer, it is considered that future payments should only be authorised by the Contract Administrator.

- The City's risk based portable appliance testing and tagging schedule requires review and updating. This will be part of the systems review discussed above.

- The Tenderer Evaluation – The current Consensus Scorecard form does not have provision for the Coordinator Procurement & Contracts signature and only includes those of the evaluators. The Coordinator Procurement & Contracts plays an active role in the review process, and it is considered appropriate that the form be modified to include sign off by the Coordinator Procurement & Contracts.

Executive Services Division – Internal Audit Quality Assurance – (report issued 10 June 2024)

Findings:

- As a result of the release of the new Global Internal Audit Standards there is a requirement to develop and implement a strategy for the internal audit function that supports the strategic objectives and success of the organisation and aligns with the expectations of the board, senior management, and other key stakeholders.

- Internal audit must establish methodologies to guide the internal audit function in a systematic and disciplined manner to implement the internal audit strategy, develop the internal audit plan, and conform with the Standards. Transitioning to the new Standards by January 2025 will be a priority.

Infrastructure Services Division – Roads, Footpaths & Drains Maintenance & Construction (report issued 7 June 2024)

Findings:

- Three Asset Management Plans previously reviewed and updated by the Asset Custodians (i.e. Roads, Drainage, Paths) did not record evidence of approvals from the Director Infrastructure Services. This is seen as an opportunity for improvement and should be implemented in future.

- A review of the process for approving increased project costs due to variations should be undertaken to ensure project costs are monitored and validated in accordance with contract provisions.

- To ensure the City captures and documents Contract obligations these should be included in risk registers.

- In accordance with SP23 it is recommended that only Contract Administrators should check and approve invoices and this should not be delegated to other officers.

Committee Recommendation

That Council:

1. Receives the report (Confidential Attachment 12.4.1) titled Internal Audit – Building Maintenance.
2. Receives the report (Confidential Attachment 12.4.2) titled Internal Audit Quality Assurance).
3. Receives the report (Confidential Attachment 12.4.3) titled Roads, Footpaths & Drains Maintenance and Construction.
4. Notes the City of Belmont's management comments in Confidential Attachments 12.4.1, 12.4.2 and 12.4.3 and actions to be undertaken in response to the internal audit recommendations.

Committee Notes

A series of questions were asked and responded to as follows:

- Asset Management is usually the responsibility of each directorate, and it is their responsibly to have asset plans for different assets such as roads and footpaths. These asset plans are reviewed on an annual basis to determine what maintenance is required; these are approved by Managers. The previous Senior Internal Auditor, saw the possibility for this process to be reviewed and recommended that the Director sign-off the Asset Management Plans.
- The City has a lot of processes in place and the internal audit team can recommend improvements.
- Risk should be included in the risk register; this is a process issue. The contract Manager is responsible for the management of specific tenders and contracts.
- The City will determine once the assessment is completed whether new software for City buildings is justified.
- Officers will investigate other possible systems before deciding on the most appropriate system.
- The Internal Audit Report does not need updating before going to Council as the audits were undertaken before Council adopted the new Strategic Community Plan.

Location

Not applicable.

Consultation

All draft internal audit reports were reviewed by relevant staff, Managers, Directors and the CEO before being issued for action.

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: Performance
Outcome: 10. Effective leadership, governance and financial management.

Policy implications

There are no policy implications associated with this report.

Statutory environment

Local Government Act 1995 (WA)

7.1A. Audit committee

(1) A local government is to establish an audit committee of 3 or more persons to exercise the powers and discharge the duties conferred on it.

Local Government (Audit) Regulations 1996 (WA)

16. Functions of audit committee

An audit committee has the following functions —

(a) to guide and assist the local government in carrying

out —

(i) its functions under Part 6 of the Act; and

(ii) its functions relating to other audits and other matters related to financial management.

(b) to guide and assist the local government in carrying out the local government's functions in relation to audits conducted under Part 7 of the Act;

(c) to review a report given to it by the CEO under regulation 17(3) (the CEO's report) and is to —

(i) report to the council the results of that review; and

(ii) give a copy of the CEO's report to the council.

(d) to monitor and advise the CEO when the CEO is carrying out functions in relation to a review under —

(i) regulation 17(1); and

(ii) the Local Government (Financial Management) Regulations 1996 regulation 5(2)(c);

(e) to support the auditor of the local government to conduct an audit and carry out the auditor's other duties under the Act in respect of the local government;

(f) to oversee the implementation of any action that the local government —

(i) is required to take by section 7.12A(3); and

(ii) has stated it has taken or intends to take in a report prepared under section 7.12A(4)(a); and

(iii) has accepted should be taken following receipt of a report of a review conducted under regulation 17(1); and

(iv) has accepted should be taken following receipt of a report of a review conducted under the Local Government (Financial Management) Regulations 1996 regulation 5(2)(c);

(g) to perform any other function conferred on the audit committee by these regulations or another written law.

[Regulation 16 inserted: Gazette 26 Jun 2018 p. 2386-7.]

17. CEO to review certain systems and procedures

(1) The CEO is to review the appropriateness and effectiveness of a local government's systems and procedures in relation to —

(a) risk management; and

(b) internal control; and

(c) legislative compliance.

(2) The review may relate to any or all of the matters referred to in sub regulation (1)(a), (b) and (c), but each of those matters is to be the subject of a review not less than once in every 3 financial years.

(3) The CEO is to report to the audit committee the results of that review.

[Regulation 17 inserted: Gazette 8 Feb 2013 p. 868;

amended: Gazette 26 Jun 2018 p. 2387.]

Local Government (Financial Management) Regulations 1996 (WA)

(2) CEO's duties as to financial management

(c) undertake reviews of the appropriateness and effectiveness of the financial management systems and procedures of the local government regularly (and not less than once in every 3 financial years) and report to the local government the results of those reviews.

Background

The internal audit function operates in accordance with Council approved Terms of reference (TOR) and Council approved annual internal audit plans.

The TOR requires the Senior Internal Auditor to be functionally accountable to the CEO and Council via the Standing Committee (Audit and Risk).

The TOR also requires final engagement audit reports to be issued to the CEO and Council via the Standing Committee (Audit and Risk).

Report

Infrastructure Services Division – Buildings Maintenance (report issued 11 March 2024)

The audit objective was to ensure building maintenance was timely and effective.

The scope of the audit included the following functional areas / documents:

- Department: City Facilities & Property Department.
- Section: City Facilities.
- Function: Buildings Maintenance.
- Acts of Parliament:
  - *Local Government Act 1995 (WA)*.
  - *Local Government (Functions and General) Regulations 1996 (WA)*.
  - *Work Health and Safety Act 2020 (WA)*
  - *Work Health and Safety (General) Regulations 2022 (WA)*.
  - *Environmental Protection Act 1986 (WA)*
- AS ISO 55000 2014 Asset Management.
- Asset Management Strategy.
- Asset Management Plan.
- Policy: CP01 Asset Management Policy.
- Programs: progress against programs and performance reporting.
- Risk: RMSS Risk Register.
- Procedures, Process Maps, Work Instructions.
- Two tenders and contract awards tested to ensure compliance with contracts.

Focus of the audit included:

- Review implementation of SP23 - Contract Management.
- Determine if contract obligations were included in the risk registers.

- Review effectiveness of the three lines of defence. The first line is staff and area management, the second line is corporate oversight functions e.g. procurement, risk, WHS and the third line is internal audit.

Findings and Management Responses

- As detailed above, Asset Management Plans have historically been reviewed and updated by Asset Custodians. The Facilities, Structures & Equipment Asset Management Plan has no evidence of approval from the Director Infrastructure Services and this has been identified as an opportunity for improvement.

  Management has agreed to review the Asset Management Plan's format and content and obtain Director approval.

  The current approach to the City Facilities' Preventative Maintenance Program (PMP) using MS Excel format relies heavily on manual input, leading to duplicated efforts in data handling. This method is not only time-consuming for monitoring and updating but also susceptible to human errors.

  Management has agreed MS Excel is not the most effective tool for managing a preventative maintenance program and will investigate costs and benefits of a new software system in 2024-25.

- The risk register included in the Facilities, Structures & Equipment Asset Management Plan requires alignment with the risk register in RMSS.

  Management has agreed to consolidate all risks in the RMSS risk register.

- Internal audit testing reviewed two invoices submitted by the City's cleaning contractor. Both invoices were authorised for payment by the Facilities Administration Officer instead of the Contract Administrator, as required by SP23.

  Management has acknowledged SP 23 is a key control and will ensure all invoices are approved by the Contract Administrator in accordance with SP23.

- The City's risk based portable appliance testing and tagging schedule requires review and updating.

Management has agreed to risk rate portable appliance testing schedules to identify frequency of testing, and update the schedule as required.

- The Tenderer Evaluation - Consensus Scorecard form has no provision for the Coordinator Procurement & Contracts signature and only included those of the evaluators.

  Management has since updated the form to provide for the Coordinator Procurement & Contracts signature.

Executive Services Division – Internal Audit Quality Assurance – (report issued10 June 2924)

The audit objective was to ensure the City identifies gaps between current internal audit activities and new "Global Internal Audit Standards" and has a plan to meet the new requirements by 9 January 2025.

The scope of the audit included the following functional areas / documents:

- Division: Executive Services.
- Section: Internal Audit.
- Function: Compliance with Internal Audit Standards.
- Institute of Internal Auditors – Global Internal Audit Standards (new) – which take effect from 9 January 2025.

Focus of the audit included:

- Identifying the gap between current internal audit activities and new Global Internal Audit Standard requirements.

Findings and Management Responses

- With the release of the new Standards there is a requirement for the Internal Audit to develop and implement a strategy for the internal audit function that supports the strategic objectives and success of the organization and aligns with the expectations of the board, senior management, and other key stakeholders.

  Management has agreed to develop and implement an Internal Audit Strategy for the organisation to ensure compliance with the new Standards.

- Internal Audit is required to review and establish methodologies to guide the internal audit function in a systematic and disciplined manner to implement the internal audit strategy, develop the internal audit plan, and conform with the Standards.

  Management has agreed to review, develop and update methodologies to ensure compliance with the new Standards.

Infrastructure Services Division – Roads, Footpaths & Drains Maintenance & Construction (report issued 7 June 2024)

The audit objectives were to ensure maintenance and construction work programs were managed effectively.

The scope of the audit included reviewing:

- Department: Works Department.
- Section: Works.
- Function: Roads, Footpaths & Drains Maintenance and Construction.
- Acts of Parliament:
  Local Government Act 1995 (WA).
  Work Health and Safety Act 2020 (WA).
  Environmental Protection Act 1986 (WA)
  Swan and Canning Rivers Management Act 2006 (WA).
  Road Traffic Act 1974 (WA)
  Main Roads Act 1930 (WA)
- Policy: CP01 Asset Management Policy
- Plans: Corporate Business Plan, Asset Management Plans (Roads, Paths, Drainage).
- Programs: Related Works Programs, progress against programs and performance reporting.
- Risk Register: RMSS Corporate Risk Register.
- Procedures: System Procedure 23 – Contract Management.
- Process Maps.
- Tenders: 4 tender awards and 7 related invoice payments checked.
- Quotations: 4 quotation awards and 6 related invoice payments checked.

Focus of the audit included:

- Review implementation of SP23 - Contract Management.
- Determine if contract obligations were included in the risk registers.
- Review effectiveness of the three lines of defence. The first line is staff and area management, the second line is corporate oversight functions e.g. procurement, risk, WHS and the third line is internal audit.

Findings and Management Responses

- Asset Management Plans have historically been reviewed and updated by Asset Custodians. Three Asset Management Plans (i.e. Roads, Drainage, Paths) did not record evidence of approvals by the Director Infrastructure.

  Management has agreed to update the plans to require Director's approval.

- A review of the process for approving increased project costs due to variations should be undertaken to ensure project costs are monitored and validated in accordance with contract provisions.

  Management has agreed to review the documented processes for project variations and approvals to ensure project expenditure is monitored and approved.

- To ensure the City captures and documents Contract obligations these should be included in risk registers.

- Management has agreed to record contract obligations in risk registers.

- Contract Administrators should be responsible for the checking and the approval of invoices in accordance with SP23.

  Management has agreed that Contract Administrators will check and approve invoices.

Financial implications

There are no financial implications evident at this time.

Environmental implications

There are no environmental implications associated with this report.

Social implications

There are no social implications associated with this report.

Attachment details

Attachment No and title
1. CONFIDENTIAL REDACTED - Internal Audit Report Building Maintenance SCAR (Confidential matter in accordance with Local Government Act 1995 (WA) section 5.23(2)(h)) [**12.4.1** - 7 pages]
2. CONFIDENTIAL REDACTED - Internal Audit Report Internal Audit Quality Assurance SCAR (Confidential matter in accordance with Local Government Act 1995 (WA) section 5.23(2)(h)) [**12.4.2** - 6 pages]
3. CONFIDENTIAL REDACTED - Internal Audit Report Roads Footpaths Drains SCAR (Confidential matter in accordance with Local Government Act 1995 (WA) section 5.23(2)(h)) [**12.4.3** - 7 pages]

12.5 Opportunity Award Nominations 2024

Voting Requirement	:	Simple Majority
Subject Index	:	51/003
Location/Property Index	:	N/A
Application Index	:	N/A
Disclosure of any Interest	:	Nil
Previous Items	:	N/A
Applicant	:	N/A
Owner	:	N/A
Responsible Division	:	Corporate and Governance

Council role

Executive The substantial direction setting and oversight role of the Council e.g. adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.

Purpose of report

To determine the recipients of the 2024 Opportunity Awards to be presented at the Mayoral Dinner on Saturday 12 October 2024.

Summary and key issues

The Opportunity Awards were established as part of the City's Marketing Strategy in 1998 to recognise individuals, groups or organisations that have made a significant contribution to City of Belmont during the past year.

The Executive Leadership Team makes recommendations in relation to the Opportunity Awards for endorsement by Council, in accordance with a Council resolution passed in August 1998.

Officer Recommendation
That Council endorses the recipients of the 2024 Opportunity Awards identified in Confidential Attachment 12.5.1 and that the nominations remain confidential until presented at the Mayoral Dinner scheduled for Saturday, 12 October 2024.

Location

Not applicable.

Consultation

There has been no specific consultation undertaken in respect to this matter.

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: Performance
Outcome: 10. Effective leadership, governance and financial management.

Policy implications

There are no policy implications associated with this report.

Statutory environment

There are no specific statutory requirements in respect to this matter.

Background

Opportunity Awards were introduced in 1998 as part of the City of Belmont Marketing Strategy 1998-99.

At that time (25 August 1998) Council by resolution introduced two new concepts:

"A visual presentation to support the Mayor's speech.

The presentation of Opportunity Awards to stakeholders in recognition of their contribution to a significant/outstanding project within the City over the past twelve months demonstrating that the project has enhanced the amenity and quality of life in the City, or has greatly assisted the organisation in achieving its objective."

The process requires the Executive Leadership Team to confidentially make a recommendation on worthy projects or stakeholders for endorsement by Council.

Projects are to be recommended on the basis that the stakeholder has assisted in the development and enhancement of the City of Belmont. An exemplary level of co-operation must also have been displayed, that has resulted in everyone's objectives being achieved.

A list of the previous winners of the Opportunity Awards since its inaugural presentation in 1998 is detailed in Attachment 12.5.1.

Each winner receives an award and a certificate detailing the stakeholder's contribution.

Report

The Executive Leadership Team in consultation with the Operational Leadership Team sought nominations that would fit the criteria including:

- contribution to a significant/outstanding project within the City of Belmont, and
- contribution being within the last 12 months, and
- the contribution has enhanced the amenity and quality of life in the City of Belmont, or the contribution has greatly assisted the organisation in achieving its objectives.

The Executive Leadership Team has considered the nominations for the 2024 Opportunity Awards and has agreed on the nominations detailed in Confidential Attachment 12.5.2.

It is recommended that the nominations remain confidential until presented at the Mayoral Dinner scheduled for Saturday 12 October 2024.

Financial implications

There are no financial implications evident at this time.

Environmental implications

There are no environmental implications associated with this report.

Social implications

The Opportunity Awards enhance a sense of community and recognise important City partnerships.

Attachment details

Attachment No and title
1. Previous Opportunity Award Winners [**12.5.1** - 2 pages]
2. CONFIDENTIAL REDACTED - Opportunity Awards 2024 (Confidential matter in accordance with Local Government Act 1995 (WA) section 5.23(2)(b)(e)) [**12.5.2** - 4 pages]

Previous Opportunity Award Winners

Year	Recipients
1998	• Secureforce International • The Western Australian Turf Club • The Satterley Group.
1999	• The Belmont Business Enterprise Centre • Ascot Waters Consortium • Eldercare and the Faulkner Park Retirement Estate Board of Management.
2000	• The Perron Group • Main Roads Department • Ministry of Housing.
2001	• Western Power and Office of Energy • The Reading Group • Mell-Fin Securities Pty Ltd.
2002	• The Sister City Association • The Belmont Rotary Club.
2003	No Mayoral Dinner was held as a result of the refurbishment of the Civic Centre.
2004	The 2004 Mayoral Dinner concentrated on launching the rebranding and repositioning of the City of Opportunity Marketing Strategy.
2005	• Maxicom Construction Group • People Solutions • South Eastern Metropolitan District Office of the WA Police.
2006	• Lotterywest • Strategic Leadership Consulting Pty Ltd • St John Ambulance.
2007	• McLeods Barristers and Solicitors • Motor Trade Association of Western Australia (Inc) • Belmont / Victoria Park State Emergency Service Unit • Western Australian Planning Commission.
2008	• Reginald Fernandes • Matthew Lyford – Watchtower • Richard Campbell – CMS Events.
2009	• Local Government Insurance Services (LGIS) • Peter Coxon – Coxon Group of Companies.
2010	• The Property Council of Australia • Laraine Wheller – Wheller Consulting/Rubis.
2011	• Perth Airport • Eastern Metropolitan Regional Council • Western Australian Local Government Association.
2012	• South East Metro Crime Prevention and Diversity Unit.
2013	• Main Roads Western Australia - City East Alliance Group • Belmont Forum Shopping Centre.
2014	• Finbar Group Limited – Spring View Towers Residential Apartments • Swan River Trust - Foreshore Partnership • Consulate-General of Japan – Support of Sister City Relationship.
2015	• YMCA.
2016	• Landcorp – The Springs Development • Main Roads WA – Gateway Project – Perth Airport Entry.
2017	No Awards were presented in 2017.
2018	• Zenien.

Year	Recipients
2019	• Mr Bryce Hellmrich • Tavolo Café • Belmont Forum/Perron Group
2020	No Awards were presented in 2020 – No Mayoral Dinner as a result of COVID
2021	• Mr Noel Nannup • Mr Cameron Aitkenhead – author of Belmonsters books • The Big Picture Factory
2022	• Constable Care Foundation • Ruah Community Services • Dr Ian MacLeod • Gott Health
2023	• Belmont Police Station • Centre for Accessibility Australia • Tomra Recycling Centres (WA)

12.6 Accounts for Payment July 2024

Voting Requirement	:	Simple Majority
Subject Index	:	54/007 - Creditors Payment Authorisations
Location/Property Index	:	N/A
Application Index	:	N/A
Disclosure of any Interest	:	Nil
Previous Items	:	N/A
Applicant	:	N/A
Owner	:	N/A
Responsible Division	:	Corporate and Governance

Council role

Executive The substantial direction setting and oversight role of the Council e.g. adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.

Purpose of report

To present to Council the list of expenditure paid for the period 1 July 2024 to 31 July 2024 under delegated authority.

Summary and key issues

A list of payments is presented to the Council each month for confirmation and endorsement in accordance with the *Local Government (Financial Management) Regulations 1996 (WA)*.

Officer Recommendation
That the Authorised Payment Listing for July 2024 as provided under Attachment 12.6.1 be received.

Location

Not applicable.

Consultation

There has been no specific consultation undertaken in respect to this matter.

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: Performance
Outcome: 10. Effective leadership, governance and financial management.
Outcome: 11. A happy, well informed and engaged community.

Policy implications

There are no policy implications associated with this report.

Statutory environment

Regulation 13(1) of the *Local Government (Financial Management) Regulations 1996 (WA)* states:

> "If the local government has delegated to the CEO the exercise of its power to make payments from the municipal fund or the trust fund, a list of accounts paid by the CEO is to be prepared each month showing for each account paid since the last such list was prepared:
>
> (a) the payee's name;
>
> (b) the amount of the payment;
>
> (c) the date of the payment; and
>
> (d) sufficient information to identify the transaction."

(3) A list prepared under sub regulation (1) is to be presented to Council at the next ordinary meeting of Council after the list is prepared; and recorded in the minutes of that meeting.

Regulation 13A of the *Local Government (Financial Management) Regulations 1996 (WA)* effective from 1 September 2023 states:

(1) If a local government has authorised an employee to use a credit, debit or other purchasing card, a list of payments made using the card must be

prepared each month showing the following for each payment made since the last such list was prepared —

(a) the payee's name;

(b) the amount of the payment;

(c) the date of the payment;

(d) sufficient information to identify the payment.

(2) A list prepared under subregulation (1) must be —

(a) presented to the council at the next ordinary meeting of the council after the list is prepared; and

(b) recorded in the minutes of that meeting.

Background

Council has delegated to the Chief Executive Officer under Delegation 1.1.18 to make payment from the Municipal and Trust Fund account. In accordance with Regulation 13(1) of the *Local Government (Financial Management) Regulations 1996 (WA),* where this power has been delegated, a list of payments each month is to be compiled and presented to Council.

Report

The following summary of payments are recommended for confirmation and endorsement.

Payment type	Payment reference	$
Municipal Fund Cheques	788885	41,643.40
Municipal Fund EFTs	EF091098-EF091601	6,424,105.31
Municipal Fund Payroll	July 2024	1,895,956.89
Trust Fund EFT	EF091174-EF091176, EF091426	30,598.68
Total Payments for July 2024		**8,392,304.28**

A copy of the Authorised Payment Listing is included as Attachment 12.6.1.

Financial implications

All expenditure included in the Authorised Payment Listing is in accordance with Council's Annual budget.

Environmental implications

There are no environmental implications associated with this report.

Social implications

There are no social implications associated with this report.

Attachment details

Attachment No and title
1. July 2024 payments [**12.6.1** - 8 pages]

City of Belmont

Accounts for Payment - July 2024

Compiled : 02/08/24 13:11

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
Contractors					
EF091101	05/07/24	00390	Landgate	2,720.97	Title Searches - GRV's Metro & Fesa
EF091102	05/07/24	00707	LoGo Appointments	9,931.78	Labour/Personnel Hire
EF091103	05/07/24	00760	Alison M Barrett, Art Consultant	500.50	Public Art Project Consultancy
EF091104	05/07/24	00972	Repco Auto Parts	419.27	Plant Parts & Repairs
EF091105	05/07/24	01002	RAC Businesswise Vehicle Breakdowns	685.80	Plant Parts & Repairs
EF091106	05/07/24	01149	The Lifting Company Pty Ltd	363.00	Plant Parts & Repairs
EF091108	05/07/24	01243	WARP Pty Ltd	665.28	Traffic Control - Various Locations
EF091112	05/07/24	01507	The Pressure King	6,979.50	Graffiti Removal - Various Location
EF091117	05/07/24	02425	Prestige Alarms	429.00	Security Services
EF091119	05/07/24	02958	Yoshino Sushi	194.26	Catering/Catering Supplies
EF091120	05/07/24	03392	Investigative Solutions WA Pty Ltd	562.00	Professional Fees - Debt Collection
EF091122	05/07/24	03504	Classic Tree Services	31,929.79	Tree Pruning Within CoB
EF091127	05/07/24	04161	Play Check	495.00	Playground Audit
EF091128	05/07/24	04400	The Freedom Fairies	3,047.00	Music/Entertainment Expenses - Carols in the Park
EF091129	05/07/24	04454	FM Contract Solutions Pty Ltd	892.62	Professional Fees - Audit May 2024
EF091133	05/07/24	05190	Mark Foote	4,658.50	Building Maintenance - Install & Supply Racking
EF091134	05/07/24	05283	IRP Pty Ltd	4,322.56	Labour/Personnel Hire
EF091137	05/07/24	05558	BlueFit Pty Ltd	14,772.46	Oasis Expenses
EF091138	05/07/24	05642	Steve's Sand Sifting for Playground Services	4,853.20	Sand Sifting - Various Parks
EF091139	05/07/24	05819	Ritz Drycleaners	395.45	Cleaning Services
EF091141	05/07/24	05840	Commercial Aquatics Australia Pty Ltd	2,841.66	Oasis Expenses - Monthly Maintenance
EF091143	05/07/24	06130	Amalgam Recruitment	2,537.48	Labour/Personnel Hire
EF091144	05/07/24	06231	Paragon Construction Solutions Pty Ltd	4,180.00	Building Construction - Oasis Pool
EF091145	05/07/24	06276	Efficient Site Services (WA)	5,962.00	Gardening Maintenance - Various Parks
EF091147	05/07/24	06283	defiNET Pty Ltd	13,200.00	Computer Software Maintenance - GIS Support
EF091148	05/07/24	06293	Freo Fire Maintenance Services Pty Ltd	550.00	Fire Equipment/Service
EF091149	05/07/24	06304	Prestige Property Maintenance	2,431.33	Building Maintenance - COB
EF091150	05/07/24	06362	Marjan Partitions Pty Ltd t/as M & M Interiors	10,445.00	Building Construction - Library Offices
EF091151	05/07/24	06528	Diplomatik Pty Ltd	4,624.02	Professional Fees - Recruitment Services
EF091152	05/07/24	06592	Grosvenor Engineering Group	12,288.55	Electrical Contractor - Monthly Maintenance
EF091153	05/07/24	06608	Robert Walters Pty Ltd	2,217.60	Labour/Personnel Hire
EF091154	05/07/24	06623	Glen Flood Group Pty Ltd T/as GFG Consulting	5,416.95	FOGO Customer Service Officer
EF091155	05/07/24	06635	West to West Group	43,130.76	Building Maintenance - ILU Refurbishment and Oasis Sliding Doors
EF091156	05/07/24	06691	Wood Recruitment Pty Ltd	6,236.27	Labour/Personnel Hire
EF091160	05/07/24	06751	HFM Asset Management	1,518.00	Building Maintenance
EF091161	05/07/24	06773	Evolve Talent	5,659.21	Labour/Personnel Hire
EF091162	05/07/24	06833	First Choice Gates (WA)	2,755.00	Fencing - Op Centre
EF091178	12/07/24	00118	Australia Post	11,077.02	Postage
EF091179	12/07/24	00280	Butt Out Australia Pty Ltd	325.00	Rubbish Removals
EF091183	12/07/24	00501	Infor Global Solutions (ANZ) Pty Ltd	5,247.00	Computer Software Maintenance - Pathway
EF091186	12/07/24	00707	LoGo Appointments	5,397.14	Labour/Personnel Hire
EF091188	12/07/24	01188	Transcore Pty Ltd	22,000.00	Professional Fees - Redcliffe Traffic Modelling Analysis
EF091195	12/07/24	01507	The Pressure King	7,699.31	Graffiti Removal - Various Location
EF091197	12/07/24	02172	Miss Maud	76.70	Catering/Catering Supplies
EF091198	12/07/24	02216	Western Australia Police	34.00	Volunteer National Police Check - May 2024
EF091199	12/07/24	02290	Belmont Potters Group Inc	800.00	Art Awards/Exhibition - Workshop
EF091200	12/07/24	02424	Neylor	181.50	Window Treatments
EF091202	12/07/24	02844	Chandler Macleod Group Ltd	8,374.56	Labour/Personnel Hire
EF091204	12/07/24	03419	Gott Health	1,925.00	Community Exercise Classes
EF091205	12/07/24	03504	Classic Tree Services	9,864.28	Tree Pruning Within CoB
EF091207	12/07/24	03593	Philip Swain	706.20	Labour/Personnel Hire
EF091210	12/07/24	04146	JB Hi-Fi Group Commercial Account, Osborne Park	1,842.56	Electrical Goods
EF091212	12/07/24	04565	Heritage Conservation Solutions - Dr Ian MacLeod	1,475.74	Professional Fees - Analysis
EF091214	12/07/24	04974	Turf Care WA Pty Ltd	31,657.65	Turf Maintenance - Various Parks
EF091216	12/07/24	05133	Nami Osaki t/as namisartroom	600.00	Library Presenation - Hands on History Worldshop
EF091217	12/07/24	05181	Aloft Hotel Perth	2,400.00	Catering/Catering Supplies - Adachi Lunch
EF091218	12/07/24	05240	Otium Planning Group Pty Ltd	13,640.00	Club Room Redevelopment - Wilson & Peet Park
EF091219	12/07/24	05283	IRP Pty Ltd	4,873.44	Labour/Personnel Hire
EF091221	12/07/24	05336	West-Sure Group Pty Ltd	494.29	Security Services
EF091222	12/07/24	05346	Kevin Fitzgerald	1,000.00	Music/Entertainment Expenses
EF091223	12/07/24	05377	Encyclopaedia Britannica Australia Ltd	3,280.20	Computer Software Maintenance - Annual Subscription
EF091225	12/07/24	05502	United in Diversity WA Inc	3,300.00	Library Presenation - Food Safari
EF091226	12/07/24	05576	NPB Security Australia	755.48	Security Services
EF091227	12/07/24	05588	Stay Sharp Program	3,500.00	Community Exercise Classes
EF091228	12/07/24	05809	Specialized Cleaning Group t/as Clean Sweep	24,421.10	Sweeping Services - Belmont Carparks
EF091229	12/07/24	05911	Cherished Cherubs Pty Ltd	936.00	Music/Entertainment Expenses - Crèche
EF091230	12/07/24	05985	Wairua Tipuna Indigenous Performing Arts	600.00	Music/Entertainment Expenses
EF091232	12/07/24	06094	Boyan Electrical Services	613.75	Electrical Contractor
EF091233	12/07/24	06130	Amalgam Recruitment	2,378.89	Labour/Personnel Hire
EF091234	12/07/24	06160	SEEK Limited	1,385.12	Advertising
EF091235	12/07/24	06213	Culture Care WA Inc	330.00	Library Presenation - Bilingual Rhyme Time
EF091236	12/07/24	06286	Hi Voltage Entertainment	675.00	Music/Entertainment Expenses
EF091239	12/07/24	06335	Hatch Pty Ltd	4,312.00	Professional Fees - Art Awards
EF091243	12/07/24	06522	Kieran Togher T/as Toppo Digital	1,650.00	Computer Software Maintenance - GIS Consulting
EF091244	12/07/24	06528	Diplomatik Pty Ltd	5,615.19	Professional Fees - Recruitment Services
EF091245	12/07/24	06575	Tomato Lake Cafe	38.00	Catering/Catering Supplies
EF091246	12/07/24	06608	Robert Walters Pty Ltd	2,217.60	Labour/Personnel Hire
EF091247	12/07/24	06623	Glen Flood Group Pty Ltd T/as GFG Consulting	11,896.37	Professional Fees - Sump Reactivation & Labour Hire
EF091248	12/07/24	06635	West to West Group	15,767.40	Building Maintenance - ILU Refurbishment and OP Centre Shed
EF091250	12/07/24	06761	Artistic Disorder	575.00	Library Presenation - Hands on History Music and Time
EF091251	12/07/24	06773	Evolve Talent	3,283.57	Labour/Personnel Hire
EF091252	12/07/24	06790	Site Architecture Studio Pty Ltd	4,262.50	Professional Fees - Hub Entry Canopy
EF091253	12/07/24	06829	Fenix Structural Engineers Pty Ltd	6,300.00	Professional Fees - Oasis Structural Inspection

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091255	12/07/24	06865	Ricochet Circus & Entertainment Pty Ltd	5,000.00	Library Presenation - Kidzfest
EF091256	12/07/24	06868	Marcia D'Souza	1,000.00	Art Awards/Exhibition
EF091257	12/07/24	06875	Jimbu4J	47.30	Catering/Catering Supplies
EF091259	12/07/24	06878	Perth Paint Solutions	1,430.00	Building Maintenance - Hub Painting
EF091278	19/07/24	00412	Dowsing Group Pty Ltd	15,693.66	Concrete Contractor - Profiling and Concrete Various Locations
EF091283	19/07/24	00707	LoGo Appointments	5,539.30	Labour/Personnel Hire
EF091284	19/07/24	00717	Main Roads Western Australia	25,093.02	Road Building Contractor - Line Marking
EF091287	19/07/24	00910	The Poster Girls - Flyer Distribution Co	176.00	Labour/Personnel Hire
EF091291	19/07/24	01507	The Pressure King	10,557.87	Graffiti Removal - Various Location
EF091292	19/07/24	01712	Donegan Enterprises Pty Ltd	16,159.00	Various Parks Repairs and Maintenance
EF091293	19/07/24	02040	SCAPE-ISM Pty Ltd - Rees Family Trust	55,000.00	Public Art Work Commission - Acknowledgement of Country Artwork
EF091294	19/07/24	02107	Mercer (Australia) Pty Ltd	8,580.00	Professional Fees - Annual Remuneration Review
EF091296	19/07/24	02172	Miss Maud	635.20	Catering/Catering Supplies
EF091301	19/07/24	02672	Ruah Community Services	16,962.73	Labour/Personnel Hire
EF091302	19/07/24	02844	Chandler Macleod Group Ltd	3,573.92	Labour/Personnel Hire
EF091304	19/07/24	03142	Redfish Technologies Pty Ltd	15,101.54	Electrical Contractor - Annual Support & Chamber Cameras
EF091306	19/07/24	04120	Randstad Pty Ltd	6,602.21	Labour/Personnel Hire
EF091307	19/07/24	04584	ThinkProject Australia Pty Ltd	14,681.58	RAMM Transport Asset Annual Support
EF091308	19/07/24	04783	Tetra Tech Coffey Pty Ltd (Prev Coffey Services Australia)	5,495.60	Professional Fees - Civic Centre IAQ Assessment
EF091309	19/07/24	04963	Centigrade	231.00	Airconditioning/Refrigeration Maintenance
EF091310	19/07/24	04967	Cockburn Party Hire	3,760.75	Plant/Equipment Hire
EF091311	19/07/24	05016	Cyclus Pty Ltd	413.60	Labour/Personnel Hire
EF091312	19/07/24	05127	Champion Music	830.50	Music/Entertainment Expenses
EF091313	19/07/24	05190	Mark Foote	715.00	Building Maintenance - Screens Repairs
EF091314	19/07/24	05283	IRP Pty Ltd	2,648.80	Labour/Personnel Hire
EF091315	19/07/24	05447	Bollywood Dance Studio	275.00	Music/Entertainment Expenses
EF091316	19/07/24	05471	Sideshow Amusements Pty Ltd	5,500.00	Plant/Equipment Hire - Kidz Fest
EF091317	19/07/24	05493	Dapth	2,007.50	Computer Software Maintenance - Website Support
EF091318	19/07/24	05855	Rock-n Boptots - Candice Watson	300.00	Library Presenation - Intergenerational Music and Movement
EF091319	19/07/24	06104	Flick Anticimex Pty Ltd	2,556.05	Pest Control
EF091320	19/07/24	06146	SpacetoCo Pty Ltd	2,198.90	Space Management Audit
EF091321	19/07/24	06283	defiNET Pty Ltd	14,652.00	Computer Software Maintenance - GIS Support
EF091322	19/07/24	06334	Foodbank WA	671.04	Community Nutrition Classes
EF091327	19/07/24	06528	Diplomatik Pty Ltd	6,399.53	Professional Fees - Recruitment Services
EF091328	19/07/24	06587	Brayco Commercial	688.00	Office Chairs
EF091329	19/07/24	06592	Grosvenor Engineering Group	4,665.58	Electrical Contractor - Monthly Maintenance
EF091330	19/07/24	06635	West to West Group	37,430.14	Building Maintenance - ILU Refurbishment and OP Centre Shed
EF091333	19/07/24	06691	Wood Recruitment Pty Ltd	2,261.49	Labour/Personnel Hire
EF091335	19/07/24	06723	Minaxi May	3,375.00	Artwork - Belvidere Street
EF091336	19/07/24	06726	PJA Holdings (Australia) Pty Ltd	7,700.00	Audit Fee - RSA
EF091337	19/07/24	06778	Bilya Booladarlung	1,000.00	Library Presenation - Naidoc Week Activities at Ruth Faulkner
EF091338	19/07/24	06791	New Zealand Helath and Medical Services	148.50	Medical Examinations
EF091339	19/07/24	06826	Birds of the Perth Hills T/A Talitha Huston	350.00	Library Presenation - June Speaker Series Presenter
EF091341	19/07/24	06863	Kleen Slate Services	5,916.00	Cleaning Service
EF091342	19/07/24	06892	Joseph-Kirirangi Jinan Dodd	1,150.00	Community Art Classes - YMCA Workshop
EF091355	26/07/24	00221	John Hughes Group	31,444.35	Plant Purchase
EF091356	26/07/24	00251	Catalyse Pty Ltd	11,000.00	Corporate Business Plan Fee
EF091359	26/07/24	00346	Action Couriers	47.03	Courier Service
EF091360	26/07/24	00350	Veolia Environmental Services	1,589.61	Rubbish Removals
EF091361	26/07/24	00375	D4 Data Pty Ltd	225.50	Plant Parts & Repairs
EF091365	26/07/24	00608	Programmed Skilled Workforce Ltd	2,363.02	Labour/Personnel Hire
EF091366	26/07/24	00707	LoGo Appointments	8,524.74	Labour/Personnel Hire
EF091367	26/07/24	00736	McLeods	3,647.38	Legal Expenses
EF091368	26/07/24	00815	New Town Toyota	3,988.10	Plant Parts & Repairs
EF091369	26/07/24	00989	PAV Perth Audiovisual - Royal Pride Pty Ltd	231.00	Plant/Equipment Hire
EF091371	26/07/24	01353	Aurion Corporation Pty Ltd	16,452.09	Computer Software Maintenance-Aurion 2024/2025
EF091372	26/07/24	01507	The Pressure King	15,369.40	Graffiti Removal - Various Location
EF091373	26/07/24	01713	M P Rogers and Associates	45,127.14	Professional Fees - Garvey Park Foreshore
EF091376	26/07/24	02290	Belmont Potters Group Inc	1,600.00	Art Awards/Exhibition - Workshop
EF091377	26/07/24	02711	CPG Research and Advisory Pty Ltd	1,558.33	Professional Fees - Advisory Fee June 2024
EF091378	26/07/24	02844	Chandler Macleod Group Ltd	6,449.33	Labour/Personnel Hire
EF091380	26/07/24	03197	West Coast Turf	15,503.05	Turf Installation - COB
EF091382	26/07/24	03537	Mackay Urban Design	1,440.00	Professional Fees - Planning
EF091383	26/07/24	03599	Donald Cant Watts Corke (WA) Pty Ltd	3,888.50	Professional Fees - Building
EF091384	26/07/24	03897	Genesis Accounting Pty Ltd	3,795.00	Subscription - GST Add in Cloud Application
EF091385	26/07/24	04020	Noongar Media Enterprises Pty Ltd	1,672.00	Sponsorship - First Nations Strategy
EF091386	26/07/24	04120	Randstad Pty Ltd	2,395.36	Labour/Personnel Hire
EF091387	26/07/24	04259	Urbis Pty Ltd	22,995.50	Professional Fees - Planning - Abernethy Road Zone 2
EF091388	26/07/24	04580	Brenda Greenfield	1,000.00	Music/Entertainment Expenses - Naidoc
EF091391	26/07/24	05283	IRP Pty Ltd	5,265.48	Labour/Personnel Hire
EF091392	26/07/24	05382	McGees Property - Sullivan Commercial Pty Ltd	3,025.00	Valuation Expense
EF091394	26/07/24	05758	Branch Arboriculture	1,120.00	Gardening Contractor - Plants Inspection
EF091395	26/07/24	05776	Level 5 Design Pty Ltd	600.00	Professional Fees - Planning
EF091396	26/07/24	05778	Stephen Carrick Architects Pty Ltd	2,160.00	Professional Fees - Design Review
EF091397	26/07/24	05819	Ritz Drycleaners	311.80	Cleaning Services
EF091398	26/07/24	06017	Sharon Giltrow - Giltrow Family Trust	1,885.00	Library Presenation - Creative Writing Workshops
EF091399	26/07/24	06130	Amalgam Recruitment	7,510.76	Labour/Personnel Hire
EF091401	26/07/24	06203	Ngala Boodja Aboriginal Land Care	13,351.80	Maintenance of Natural Areas COB
EF091402	26/07/24	06337	MowScape Pty Ltd	5,344.16	Gardening Contractor - Turf Maintenance
EF091403	26/07/24	06339	Focus Consulting WA Pty Ltd	4,400.00	Electrical Contractor - Redcliffe Park Lights
EF091404	26/07/24	06362	Marjan Partitions Pty Ltd t/as M & M Interiors	500.00	Building Construction - Hub Arts Storeroom
EF091405	26/07/24	06367	Linearity Pty Ltd t/as CCA Productions	176.00	Building Maintenance
EF091406	26/07/24	06573	Orikan Australia Pty Ltd	64,922.00	Computer Software Maintenance - Pinforce Support
EF091407	26/07/24	06582	AKT Constructions (WA) Pty Ltd	2,198.33	Belmont Hub Basement Waste Removal
EF091408	26/07/24	06608	Robert Walters Pty Ltd	2,235.20	Labour/Personnel Hire
EF091409	26/07/24	06637	Black Label Events Pty Ltd	1,886.50	Plant/Equipment Hire - Pioneers Lunch
EF091410	26/07/24	06687	SJC Building Group	4,970.46	Building Maintenance Oasis
EF091411	26/07/24	06691	Wood Recruitment Pty Ltd	1,644.72	Labour/Personnel Hire

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091412	26/07/24	06696	The Collab Effect	880.00	Professional Fees - training Video
EF091414	26/07/24	06718	Empire Roofing Services	1,500.00	Building Maintenance
EF091415	26/07/24	06773	Evolve Talent	5,028.89	Labour/Personnel Hire
EF091416	26/07/24	06795	AMPAC Debt Recovery (WA) Pty Ltd	3,654.75	Professional Fees - Debt Collection
EF091417	26/07/24	06815	Deborah Anne Eldridge	500.00	Music/Entertainment Expenses
EF091418	26/07/24	06835	Bureau Veritas Australia	24,970.00	Audit Fee - ISO External Audit
EF091419	26/07/24	06841	Andrew Quilty	1,000.00	Art Awards/Exhibition - Selection Panel Member
EF091420	26/07/24	06842	Mark Parfitt	1,000.00	Art Awards/Exhibition - Selection Panel Member
EF091422	26/07/24	06847	Trayd Australia Pty Ltd	1,000.38	Building Maintenance - COB
EF091423	26/07/24	06851	Aimee Dodds	1,000.00	Art Awards/Exhibition - Selection Panel Member
EF091427	30/07/24	00027	ABB Australia Pty Limited	1,375.00	Reticulation Parts & Repairs
EF091429	30/07/24	00195	Bin Bath Australia Pty Ltd	4,068.35	Cleaning Services
EF091431	30/07/24	00221	John Hughes Group	8,526.50	Plant Parts & Repairs
EF091432	30/07/24	00230	Jackson McDonald	43,552.30	Legal Expenses
EF091436	30/07/24	00247	CAI Fences	10,087.00	Fencing
EF091437	30/07/24	00251	Catalyse Pty Ltd	40,370.00	Strategic Community Plan Fee
EF091440	30/07/24	00294	City of Canning	450.00	Rubbish Removals
EF091441	30/07/24	00295	Capital Recycling	67,971.20	Rubbish Removals
EF091443	30/07/24	00350	Veolia Environmental Services	546,413.67	Rubbish Removals
EF091444	30/07/24	00391	Chemistry Centre (WA) t/as ChemCentre	2,838.75	Professional Fees - Testing
EF091446	30/07/24	00412	Dowsing Group Pty Ltd	58,940.97	Concrete Contractor - Profiling and Concrete Various Locations
EF091447	30/07/24	00496	Garrards Pty Ltd	11,384.67	Pest Control
EF091448	30/07/24	00557	City Subaru	54,327.00	Plant Purchase
EF091449	30/07/24	00585	Hydroquip Pumps	32,494.00	Pump Maintenance - Various Parks
EF091451	30/07/24	00699	Marketforce Pty Ltd	41,106.68	Advertising & Printing
EF091452	30/07/24	00718	Major Motors Pty Ltd	239.95	Vehicle Inspection
EF091453	30/07/24	00726	T-Quip	273.63	Plant Parts & Repairs
EF091454	30/07/24	00734	McIntosh and Son WA	2,228.17	Plant Parts & Repairs
EF091455	30/07/24	00736	McLeods	9,984.10	Legal Expenses
EF091456	30/07/24	00748	Midland Brick Pty Ltd	1,830.89	Bricks/Bricklaying
EF091459	30/07/24	00830	Canon Production Printing Australia Pty Ltd	430.57	Photocopy Expenses
EF091461	30/07/24	00858	Park Motor Body Builders	115.50	Plant Parts & Repairs
EF091462	30/07/24	00917	Positive Auto Electrics	289.20	Plant Parts & Repairs
EF091464	30/07/24	00931	Sonic HealthPlus Pty Ltd	1,124.20	Pre Employment Medicals
EF091465	30/07/24	00988	Reece Australia Pty Ltd	2,183.01	Plumbing Maintenance/Supplies
EF091467	30/07/24	01090	St John Ambulance Australia Inc	610.50	First Aid Service - Events
EF091468	30/07/24	01112	Sunny Industrial Brushware	686.40	Plant Parts & Repairs
EF091469	30/07/24	01186	ZircoDATA Pty Ltd	1,833.19	Records Storage
EF091471	30/07/24	01233	Stihl Shop Redcliffe	5,675.00	Tools/Tool Repairs
EF091472	30/07/24	01243	WARP Pty Ltd	123,414.99	Traffic Control - Various Locations
EF091473	30/07/24	01251	Wurth Australia Pty Ltd	148.05	Plant Parts & Repairs
EF091475	30/07/24	01255	Wattleup Tractors	308.82	Plant Parts & Repairs
EF091477	30/07/24	01358	Kevrek Australia Pty Ltd	498.80	Plant Parts & Repairs
EF091479	30/07/24	01409	BCA Consultants Pty Ltd	1,650.00	Airconditioning/Refrigeration Maintenance
EF091481	30/07/24	01499	Porter Consulting Engineers	495.00	Professional Fees - Design
EF091482	30/07/24	01533	WC Convenience Management	5,462.61	Building Maintenance
EF091486	30/07/24	01712	Donegan Enterprises Pty Ltd	90,036.32	Various Parks Repairs and Maintenance
EF091487	30/07/24	01731	Charter Plumbing and Gas	16,722.02	Plumbing Maintenance/Supplies
EF091488	30/07/24	01735	Air Roofing Co Pty Ltd	3,080.00	Building Construction - Roof Tile Repairs
EF091490	30/07/24	01976	Ecoscape Australia Pty Ltd	32,296.00	Landscaping - Wilson Park Precinct
EF091491	30/07/24	02023	YMCA of Perth Youth and Community Services Inc	80,752.93	Provision of Youth Services - June 2024
EF091494	30/07/24	02207	Wilson Security	134,696.85	Security Services
EF091495	30/07/24	02210	Macri Partners	6,468.00	Audit Fee - Belmont Hub Variable Outgoings
EF091496	30/07/24	02298	Pelican Linemarking	1,100.00	Line Marking
EF091497	30/07/24	02303	Ultimo Catering and Events	4,073.20	Catering/Catering Supplies
EF091501	30/07/24	02387	Triton Electrical Contractors Pty Ltd	12,793.00	Electrical Contractor - COB
EF091502	30/07/24	02410	System Maintenance T/A Systems By Ballantyne	1,020.15	Plumbing Maintenance/Supplies
EF091504	30/07/24	02425	Prestige Alarms	11,002.20	Security Services
EF091506	30/07/24	02589	Zenien	165,391.37	Security Services - Camera Upgrades & CCTV Maintenance
EF091507	30/07/24	02779	Natural Area Holdings Pty Ltd	31,192.37	Gardening Maintenance
EF091508	30/07/24	02837	GLG Greenlife Group	27,463.19	Verge Mowing - Various Parks
EF091509	30/07/24	02844	Chandler Macleod Group Ltd	3,841.76	Labour/Personnel Hire
EF091511	30/07/24	03366	Daimler Trucks Perth	1,056.05	Plant Parts & Repairs
EF091512	30/07/24	03464	Bridgestone Australia Ltd	3,403.60	Plant Parts & Repairs
EF091513	30/07/24	03504	Classic Tree Services	44,582.78	Tree Pruning Within CoB
EF091514	30/07/24	03567	Gardner Autos Pty Ltd t/as Gardner Isuzu	874.30	Plant Parts & Repairs
EF091515	30/07/24	03593	Philip Swain	1,372.50	Labour/Personnel Hire
EF091517	30/07/24	03684	Univerus Software Pty Ltd	10,373.00	Computer Software Maintenance
EF091518	30/07/24	03707	Access Unlimited International Pty Ltd	1,359.47	Plant Parts & Repairs
EF091519	30/07/24	03824	Konica Minolta	4,468.11	Photocopy Expenses
EF091521	30/07/24	04105	Cleanflow Environmental Solutions	4,230.16	Drainage Maintenance
EF091522	30/07/24	04120	Randstad Pty Ltd	1,916.29	Labour/Personnel Hire
EF091526	30/07/24	04256	CT63 Hydraulics	120.00	Plant Parts & Repairs
EF091527	30/07/24	04302	Southern Cross Housing Ltd	7,560.07	Independent Living Units - Management Fess
EF091528	30/07/24	04320	ABM Landscaping	3,163.38	Bricks/Bricklaying
EF091529	30/07/24	04467	Rent a Fence Pty Ltd	55.24	Fencing
EF091530	30/07/24	04496	Azure Painting Pty Ltd	13,200.00	Painting Contractor - Oasis Gym Wall
EF091531	30/07/24	04529	Southern Cross Care (WA) Inc	6,103.01	Independent Living Units - Management Fees
EF091533	30/07/24	04693	Allwest Plant Hire Australia Pty Ltd	11,887.85	Plant/Equipment Hire - June 2024
EF091535	30/07/24	04894	Terravac Pty Ltd	6,348.38	Gardening Maintenance
EF091536	30/07/24	04917	Environmental Industries Pty Ltd	18,945.85	Landscape Maintenance - Ascot Waters
EF091537	30/07/24	04963	Centigrade	5,129.72	Airconditioning/Refrigeration Maintenance
EF091538	30/07/24	04974	Turf Care WA Pty Ltd	50,965.30	Turf Maintenance - Various Parks
EF091539	30/07/24	05083	Dent Dismissal	275.00	Plant Parts & Repairs
EF091541	30/07/24	05283	IRP Pty Ltd	5,552.80	Labour/Personnel Hire
EF091542	30/07/24	05294	Bardfield Engineering	5,720.00	Goals Supply - Selby Park
EF091544	30/07/24	05427	Horizon West Landscape & Irrigation Pty Ltd	28,188.05	Gardening Maintenance - Various Locations
EF091546	30/07/24	05523	Go Doors Pty Ltd	17,385.37	Building Maintenance - Various Locations

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EF091547	30/07/24	05612	ASCON Survey and Drafting Pty Ltd	536.80	Survey Expenses - COB
EF091548	30/07/24	05623	Tree Planting and Watering - Baroness Holdings	378,273.60	Street Tree Watering Services for CoB
EF091549	30/07/24	05684	Hungry Sky Pty Ltd	6,160.00	Computer Software Maintenance - Cadastral Map Update
EF091550	30/07/24	05692	Newground Water Services Pty Ltd	98,549.00	Redcliffe Bore Renewal
EF091551	30/07/24	05771	Alsco Pty Ltd	184.26	Cleaning Services
EF091553	30/07/24	05809	Specialized Cleaning Group t/as Clean Sweep	13,829.20	Sweeping Services - Belmont Carparks
EF091554	30/07/24	05840	Commercial Aquatics Australia Pty Ltd	3,148.16	Oasis Expenses - Monthly Maintenance
EF091556	30/07/24	05944	Delron Cleaning Pty Ltd - Ventia	96,381.00	Cleaning Services - Various Locations
EF091560	30/07/24	06067	TK Elevator Australia Pty Ltd	1,014.24	Building Maintenance
EF091562	30/07/24	06094	Boyan Electrical Services	54,496.65	Electrical Contractor
EF091563	30/07/24	06104	Flick Anticimex Pty Ltd	2,878.83	Pest Control
EF091564	30/07/24	06269	Hidrive Group Pty Ltd	30,271.36	Plant Purchase
EF091565	30/07/24	06276	Efficient Site Services (WA)	38,010.50	Gardening Maintenance - Various Parks
EF091566	30/07/24	06282	Dell Financial Services Pty Ltd	26,745.04	Plant/Equipment Hire - June 2024
EF091567	30/07/24	06293	Freo Fire Maintenance Services Pty Ltd	15,875.44	Fire Equipment/Service
EF091568	30/07/24	06295	Savana Environmental	242.00	Rubbish Removals
EF091569	30/07/24	06304	Prestige Property Maintenance	148,619.85	Streetscape Enhancement Landscaping and Building Maintenance
EF091570	30/07/24	06345	SoCo Studios - Travis Hayto Photography	3,547.50	Photography/Framing Expenses
EF091571	30/07/24	06377	Choiceone Pty Ltd	3,508.12	Labour/Personnel Hire
EF091572	30/07/24	06389	Netstar Australia Pty Ltd	405.90	Security Services
EF091573	30/07/24	06458	ES2 Pty Ltd	144.38	Computer Software Maintenance
EF091574	30/07/24	06472	Overall Perth Gutter Cleaning	1,800.00	Cleaning Services - Various Location
EF091576	30/07/24	06528	Diplomatic Pty Ltd	4,231.76	Professional Fees - Recruitment Services
EF091577	30/07/24	06580	Omnicom Media Group	8,766.63	Advertising
EF091579	30/07/24	06591	Blue Tang (WA) T/A The Reef Unit Trust	99,000.00	Professional Fees - Faulkner Park Precinct
EF091580	30/07/24	06592	Grosvenor Engineering Group	359,906.22	Civic Cnt HVAC - Chiller Replacement
EF091581	30/07/24	06608	Robert Walters Pty Ltd	2,314.61	Labour/Personnel Hire
EF091584	30/07/24	06662	Tool Kit Depot	790.24	Tools/Tool Repairs
EF091586	30/07/24	06691	Wood Recruitment Pty Ltd	605.40	Labour/Personnel Hire
EF091588	30/07/24	06697	Common Ground Trails Pty Ltd	16,046.80	Professional Fees - Garvey Park Trial Development
EF091589	30/07/24	06773	Evolve Talent	13,760.05	Labour/Personnel Hire
EF091590	30/07/24	06776	Easy Access Lifts	10,319.00	Plant Parts & Repairs - Oasis Lift
EF091592	30/07/24	06805	Shamrock Electrics WA Pty Ltd	6,963.00	Electrical Contractor - Forster Park Lights
EF091593	30/07/24	06833	First Choice Gates (WA)	3,872.00	Fencing - Oasis
EF091595	30/07/24	06840	Landscape Elements	111,730.39	Gardening Maintenance
EF091596	30/07/24	06857	Arion Service	20,218.00	Building Maintenance - Civic Centre Painting
EF091598	30/07/24	06882	Barbara Anne Moore	250.00	Music/Entertainment Expenses
EF091599	30/07/24	06883	Norma Morrison	250.00	Music/Entertainment Expenses
	Contractors Total			**4,669,317.54**	
Councillor Payments					
EF091111	05/07/24	01369	Philip Marks	3,038.34	Councillor Sitting Fee
EF091115	05/07/24	02145	Robert Rossi	12,192.92	Councillor Sitting Fee
EF091125	05/07/24	03916	Bernard Ryan	3,038.34	Councillor Sitting Fee
EF091131	05/07/24	05084	Jenny Davis	3,038.34	Councillor Sitting Fee
EF091132	05/07/24	05085	George Sekulla	3,038.34	Councillor Sitting Fee
EF091140	05/07/24	05828	Deborah Sessions	5,152.34	Councillor Sitting Fee
EF091157	05/07/24	06704	Christopher John Kulczycki	3,038.34	Councillor Sitting Fee
EF091158	05/07/24	06738	Tamaki Vijay(Vijay Vijay)	3,038.34	Councillor Sitting Fee
EF091390	26/07/24	05084	Jenny Davis	60.00	Membership Fee
	Councillor Payments Total			**35,635.30**	
Credit Card 2310					
EF091269	18/07/24	03526	Google GSUITE	11.09	Subscription
	Credit Card 2310 Total			**11.09**	
Credit Card 4739					
EF091272	18/07/24	06409	Crown Plaza Hotel	1,460.39	Accommodation-ALGA Conference
EF091272	18/07/24	06409	Dept of Justice	171.70	Court Fee
EF091272	18/07/24	06409	Intertek Inform	44.86	Copyright
EF091272	18/07/24	06409	JCS Online Resources	1,444.21	Subscription
EF091272	18/07/24	06409	Crown Plaza Hotel	366.84	Accommodation-ALGA Conference
EF091272	18/07/24	06409	Crown Plaza Hotel	366.84	Accommodation-ALGA Conference
EF091272	18/07/24	06409	News Pty Ltd	28.00	Subscription
EF091272	18/07/24	06409	Chat GPT	30.94	Membership Fee
EF091272	18/07/24	06409	Chat GPT	30.94	Membership Fee
EF091272	18/07/24	06409	Google GSUITE	11.09	Subscription
	Credit Card 4739 Total			3,955.81	
Credit Card 7996					
EF091270	18/07/24	05121	Walga Events	1,295.80	Registration- Walga Event
EF091270	18/07/24	05121	The Hatchery	2,968.90	Registration- Conference
EF091270	18/07/24	05121	The Reject Shop	8.00	Employee Gratuity Card
EF091270	18/07/24	05121	Wilson Parking	27.00	Parking-Meeting
	Credit Card 7996 Total			4,299.70	
Credit Card 8380					
EF091271	18/07/24	06342	Kmart Australia Limited	60.00	Printing
EF091271	18/07/24	06342	Facebook	1,250.00	Advertising
EF091271	18/07/24	06342	Eventbrite	5.00	Advertising
EF091271	18/07/24	06342	Campaign Monitors	1,373.90	Subscription
EF091271	18/07/24	06342	Adobe Systems	39.59	Subscription
EF091271	18/07/24	06342	Microsoft	1,734.46	Subscription
EF091271	18/07/24	06342	Twilio SendGrid	30.87	Subscription
EF091271	18/07/24	06342	ORG Sub Fee	29.00	Subscription
EF091271	18/07/24	06342	Facebook	955.18	Advertising
	Credit Card 8380 Total			**5,478.00**	
Credit Card 8670					
EF091273	18/07/24	06849	M&D Suspension	187.90	Motor Vehicle Inspection
EF091273	18/07/24	06849	The Institute of E Barton	612.00	Membership Fee
EF091273	18/07/24	06849	8 Yolks	26.48	Catering-Team Meeting
	Credit Card 8670 Total			**826.38**	
Fuels and Utilities					

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091098	05/07/24	00042	Alinta Energy	135.05	Light, Power, Gas
EF091109	05/07/24	01252	Water Corporation	610.69	Water, Annual & Excess
EF091110	05/07/24	01274	Synergy	7,751.93	Light, Power, Gas
EF091190	12/07/24	01252	Water Corporation	2,755.95	Water, Annual & Excess
EF091193	12/07/24	01274	Synergy	41,318.62	Light, Power, Gas
EF091201	12/07/24	02471	Western Power	296.00	Light, Power, Gas
EF091238	12/07/24	06322	Code Research Pty Ltd t/as PWD	71.50	Phone/Internet expenses
EF091241	12/07/24	06424	Telstra Limited	3,938.90	Phone/Internet expenses
788885	19/07/24	00392	Department of Transport - Fleet Licensing	41,643.40	Vehicle Licences 2024/2025
EF091289	19/07/24	01274	Synergy	109,712.23	Light, Power, Gas
EF091300	19/07/24	02631	Ampol - Caltex	17,775.45	Fuel, Oil, Additives
EF091324	19/07/24	06424	Telstra Limited	13,393.03	Phone/Internet expenses
EF091350	26/07/24	00042	Alinta Energy	8,666.40	Light, Power, Gas
EF091358	26/07/24	00323	John Christie	405.00	Phone/Internet expenses
EF091370	26/07/24	01252	Water Corporation	1,146.32	Water, Annual & Excess
EF091413	26/07/24	06707	Motorpass - 1617 - Coles Express Kewdale	45.88	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5911 - Coles Express Bunbury	135.21	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0085 - Coles Express Perth	170.68	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0591 - BP Express	407.87	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6934 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 9327 - BP Welshpool	245.99	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6978 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2466 - BP Bibra Lake	308.55	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5578 - Puma Burswood	649.51	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5523 - Coles Express Cloverdale	482.02	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4232 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1411 - 7 Eleven Carlisle	224.87	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1611 - Coles Express Cloverdale	591.22	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2823 - Ampol Morley	83.19	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1178 - BP Express Carlisle	203.42	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5974 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7657 - Coles Express Cloverdale	107.85	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 9084 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2681 - Coles Express Cloverdale	222.13	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7944 - Coles Express Cloverdale	121.14	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2065 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3289 - United Southern River	52.03	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5561 - BP Carlisle	148.90	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5103 - Coles Kewdale	117.79	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5818 - BP Greenwood	399.06	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 9157 - Caltex Mount Lawley	89.59	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1893 - Ampol Midvale	391.68	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3239 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7149 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5173 - Coles Express Cloverdale	468.98	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3748 - BP Carlisle	432.66	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1754 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5447 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2710 - BP Attadale	192.59	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 9603 - Atlas Fuel Ascot	297.62	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1917 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6284 - Caltex Mount Lawley	232.44	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 9357 - Ampol Forrestdale	389.98	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1615 - Coles Express Bull creek	256.91	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3839 - Ampol Belmont	97.87	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3847 - BP Mindarie	165.97	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2474 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2516 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4361 - Liberty Gosnells	370.01	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3567 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6390 - Ampol Bentley	289.86	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4083 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5625 - Coles Express Cloverdale	205.47	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4201 - Ampol Ascot	305.02	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7886 - Ampol Kingsley	298.36	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5490 - Ampol Bunbury	423.53	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5997 - BP Cannington	221.17	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0034 - Ampol Murdoch	123.30	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0091 - Ampol Applecross	276.37	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4565 - Ampol Willetton	263.70	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3741 - Ampol Belmont	208.34	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0327 - B Express Carlisle	121.83	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0177 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1658 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6153 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7033 - Ampol Belmont	593.63	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 7872 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5317 - Atlas Fuel Ascot	154.21	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6117 - Coles Express Cloverdale	328.73	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4903 - Better Choice Stratton	173.88	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 2562 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3517 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4060 - BP Connect North Perth	169.48	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 0387 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 1187 - Puma Burswood	117.02	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 6973 - Ampol Murdoch	98.50	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 3142 - Coles Express Banksia Grove	321.71	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 5189 - 7-Eleven Alkimos	62.81	Fuel, Oil, Additives

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091413	26/07/24	06707	Motorpass - 9357 - Caltex Kalamunda	127.58	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4878 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091413	26/07/24	06707	Motorpass - 4886 - WEX Card Fee	3.00	Fuel, Oil, Additives
EF091474	30/07/24	01252	Water Corporation	225.12	Water, Annual & Excess
EF091503	30/07/24	02422	Connect Call Centre Services	682.00	Phone/Internet expenses
EF091583	30/07/24	06614	Oracle Customer Management Solutions	4,134.44	Phone/Internet expenses
	Fuels and Utilities Total			**267,722.14**	
Materials					
EF091099	05/07/24	00185	Benara Nurseries	1,783.38	Gardening - Assorted Tress
EF091100	05/07/24	00231	Bunnings Group Ltd	118.60	Hardware
EF091107	05/07/24	01183	Total Packaging (WA) Pty Ltd	8,053.76	Cleaning Products
EF091113	05/07/24	01906	Frazzcon Enterprises	2,645.59	Street & Parking Sign Maintenance
EF091118	05/07/24	02862	James Bennett Pty Ltd	330.14	Books/CDs/DVDs
EF091123	05/07/24	03660	Safe T Card Australia Pty Ltd	107.80	Safety Clothing/Equipment
EF091126	05/07/24	04053	Totally Workwear TWW	364.41	Safety Clothing/Equipment
EF091130	05/07/24	04491	Woolworths Group - Functions/Catering only	267.94	Groceries
EF091135	05/07/24	05432	Bloomin Boxes	150.00	Flowers
EF091136	05/07/24	05465	QBD Books	276.41	Books/CDs/DVDs
EF091142	05/07/24	06084	Asphaltech Pty Ltd	31,086.63	Asphalt - COB
EF091177	12/07/24	00009	Cafe Corporate	300.00	Groceries
EF091180	12/07/24	00317	Coles Supermarkets Aust Pty Ltd	1,127.72	Groceries
EF091185	12/07/24	00664	Kmart Australia Limited	347.00	Stationery & Printing
EF091187	12/07/24	01073	Spotlight Pty Ltd	94.30	Craft/Display Materials
EF091191	12/07/24	01263	West Australian Newspapers Ltd	293.37	Publications/Newspapers
EF091192	12/07/24	01265	Westbooks	413.53	Books/CDs/DVDs
EF091203	12/07/24	02862	James Bennett Pty Ltd	829.21	Books/CDs/DVDs
EF091206	12/07/24	03539	Environment Essentials Pty Ltd, Victoria	4,796.00	Publications/Newspapers - Annual Directories Renewal
EF091208	12/07/24	03856	SEM Distribution - newspaper delivery	119.70	Publications/Newspapers
EF091209	12/07/24	04027	Koori Mail	1,247.40	Publications/Newspapers
EF091211	12/07/24	04394	JB Hi-Fi Belmont Forum - Library purchases	3,894.18	Books/CDs/DVDs
EF091213	12/07/24	04759	StrataGreen	4,770.48	Gardening Maintenance
EF091224	12/07/24	05432	Bloomin Boxes	75.00	Flowers
EF091231	12/07/24	06084	Asphaltech Pty Ltd	2,971.83	Asphalt - COB
EF091240	12/07/24	06365	Spice Digital Imaging Pty Ltd	8,178.50	Art Installation - Belvidere Street
EF091275	19/07/24	00185	Benara Nurseries	21,186.62	Gardening - Assorted Tress
EF091276	19/07/24	00203	BOC Gases Australia Ltd	138.20	Welding Equipment/Supplies
EF091277	19/07/24	00317	Coles Supermarkets Aust Pty Ltd	347.73	Groceries
EF091281	19/07/24	00480	Forestvale Trees Pty Ltd	2,882.00	Gardening - Assorted Plants
EF091285	19/07/24	00778	Modern Teaching Aids Pty Ltd	57.04	Books/CDs/DVDs
EF091288	19/07/24	01261	Wesfarmers Kleenheat Gas Pty Ltd	84.22	Welding Equipment/Supplies
EF091295	19/07/24	02168	Ergolink	1,695.70	Office Chairs
EF091299	19/07/24	02431	ASB Branded Merchandise - ASB Marketing Pty Ltd	11,071.50	Promotional Items
EF091305	19/07/24	03856	SEM Distribution - newspaper delivery	229.70	Publications/Newspapers
EF091323	19/07/24	06385	Belmont Liquor Store (Cellarbrations at Belmont)	174.00	Beverages
EF091331	19/07/24	06681	Prefet Pty Ltd T/A Minuteman Press Perth	242.00	Stationery & Printing
EF091352	26/07/24	00148	Bladon WA Pty Ltd	701.25	Promotional Items
EF091354	26/07/24	00220	Burswood Trophies	478.50	Door Signs & Plaques
EF091357	26/07/24	00317	Coles Supermarkets Aust Pty Ltd	559.38	Groceries
EF091375	26/07/24	02021	RSEA Pty Ltd	119.57	Safety Clothing/Equipment
EF091379	26/07/24	02862	James Bennett Pty Ltd	241.29	Books/CDs/DVDs
EF091389	26/07/24	05082	Accidental Health and Safety Perth	2,050.00	Medical/First Aid Supplies
EF091393	26/07/24	05701	Bing Technologies Pty Ltd	7,946.29	Stationery & Printing - Mails
EF091400	26/07/24	06157	Fix8 Systems	994.81	Craft/Display Materials
EF091428	30/07/24	00185	Benara Nurseries	165,783.28	Gardening - Assorted Tress
EF091433	30/07/24	00231	Bunnings Group Ltd	3,524.63	Hardware
EF091434	30/07/24	00233	Bunzl Limited	4,323.41	Cleaning Products
EF091438	30/07/24	00278	Chefmaster Australia	387.15	Cleaning Products
EF091439	30/07/24	00285	City of Armadale	1,577.80	Stationery & Printing
EF091442	30/07/24	00307	Clean Cloth Cotton Traders	526.68	Cleaning Products
EF091445	30/07/24	00406	Domus Nursery	31,884.01	Gardening - Assorted Plants
EF091460	30/07/24	00850	Pacific Safety Wear Malaga	337.54	Safety Clothing/Equipment
EF091463	30/07/24	00923	Pope Packaging	506.00	Cleaning Products
EF091466	30/07/24	01083	SERCUL South East Regional Centre for Urban Landcare	3,156.05	Gardening Maintenance
EF091470	30/07/24	01206	Access Icon Pty Ltd t/a Cascada	13,959.00	Concrete Products
EF091476	30/07/24	01325	Poolegrave Signs and Engraving	38.50	Signs
EF091478	30/07/24	01398	Winc Australia Pty Ltd	1,789.07	Stationery & Printing
EF091483	30/07/24	01570	Blackwoods	1,430.32	Hardware
EF091489	30/07/24	01955	Image Extra - Starmix Holdings Pty Ltd	1,204.50	Building Material - Bollard
EF091492	30/07/24	02088	Lock Stock & Farrell Locksmith	131.35	Hardware
EF091493	30/07/24	02168	Ergolink	1,713.27	Stationery - Sit & Stand Desk
EF091499	30/07/24	02320	Ambius Indoor Plants	1,239.34	Gardening - Assorted Plants
EF091505	30/07/24	02498	City of South Perth	5,777.02	Impound Cats & Dogs - May 24 & Jun 24
EF091510	30/07/24	03144	COS Complete Office Supplies Pty Ltd	1,680.95	Stationery & Printing
EF091516	30/07/24	03630	Direct Trades Supply Pty Ltd	915.20	Hardware
EF091520	30/07/24	04053	Totally Workwear TWW	1,731.85	Safety Clothing/Equipment
EF091524	30/07/24	04145	T J Depiazzi and Sons	18,597.15	Gardening Maintenance
EF091534	30/07/24	04759	StrataGreen	965.04	Gardening Maintenance
EF091540	30/07/24	05124	ASP Products - Alloy & Stainless Products Pty Ltd	1,446.64	Metal Goods
EF091545	30/07/24	05465	QBD Books	2,332.16	Books/CDs/DVDs
EF091552	30/07/24	05786	Bolinda Digital Pty Ltd	3,520.54	Books/CDs/DVDs
EF091555	30/07/24	05890	Living Turf	836.00	Gardening - Soil Testing
EF091557	30/07/24	05980	Finishing WA	968.00	Stationery & Printing
EF091558	30/07/24	05992	Corsign WA	13,399.10	Signs - Bollards & Signage
EF091559	30/07/24	06005	MDM Entertainment Pty Ltd	532.76	Books/CDs/DVDs
EF091561	30/07/24	06084	Asphaltech Pty Ltd	159,865.38	Asphalt - COB
EF091575	30/07/24	06521	Lucindas Everlastings	1,200.00	Gardening - Plants/Supplies
EF091578	30/07/24	06589	OverDrive Australia Pty Ltd	1,389.23	Books/CDs/DVDs
EF091585	30/07/24	06681	Prefet Pty Ltd T/A Minuteman Press Perth	3,595.60	Stationery & Printing - Various Events

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091587	30/07/24	06694	Grasstrees Australia (WA) Pty Ltd	847.00	Gardening Maintenance - Various Locations
EF091591	30/07/24	06800	The Aivish Family Trust T/as Fruit Break	2,259.20	Groceries
EF091594	30/07/24	06837	Sound Text Media	3,358.13	Books/CDs/DVDs
EF091597	30/07/24	06873	City Rubber Stamps & Trophies	190.30	Badges & Pendants
	Materials Total			**584,761.83**	
Other					
EF091146	05/07/24	06279	Ginnetta Boliver	2,510.00	Membership Fee
EF091159	05/07/24	06745	Alex Bott	717.00	Membership Fee
EF091163	05/07/24	06872	Strike Australia	300.00	Sister City Expenses
EF091165	05/07/24	99998	Inside Reality	524.38	Rates Refund
EF091166	05/07/24	99998	Jean Senior	370.73	Vendor Pension Refund
EF091167	05/07/24	99998	Troy and Jacinta Thompson	400.00	Sports Donation
EF091168	05/07/24	99998	Tammy Casey	800.00	Sports Donation
EF091169	05/07/24	99998	Tammy Casey	800.00	Sports Donation
EF091170	05/07/24	99998	Ben & Kellie Tomasini	400.00	Sports Donation
EF091171	05/07/24	99998	Ben & Kellie Tomasini	400.00	Sports Donation
EF091172	05/07/24	99998	Yukie & Rancall Clayton	400.00	Sports Donation
EF091173	05/07/24	99998	Leanne Mayne	174.13	Rates Refund
EF091181	12/07/24	00337	Constable Care Child Safety Foundation Inc	48,345.00	Constable Care Foundation Services
EF091182	12/07/24	00441	Records & Information Management Professionals Australasia	676.50	Subscription
EF091184	12/07/24	00610	ID Consulting Pty Ltd	15,290.00	Subscription 2024/2025
EF091189	12/07/24	01244	Western Australian Treasury Corporation	41,276.42	Govt Guarantee Fee June 2024
EF091194	12/07/24	01280	Perth Airport Pty Ltd	588.81	Drainage Licence - Airport Land Rental
EF091220	12/07/24	05285	Chamber of Arts and Culture WA Inc	660.00	Membership Fee
EF091237	12/07/24	06287	The Grants Hub Pty Ltd	313.20	Subscription
EF091242	12/07/24	06477	Bruce Mentz	87.65	Staff Reimbursement
EF091249	12/07/24	06735	Sarah Wallrodt	22.00	Staff Reimbursement
EF091258	12/07/24	06877	Bus Hire Comparison	5,923.99	Sister City Expenses Bus Hire
EF091263	12/07/24	99998	NJ Vollrath-Hake	400.00	Sports Donation
EF091264	12/07/24	99998	Tuhimate Taingahue	800.00	Sports Donation
EF091265	12/07/24	99998	Richard Bellis	800.00	Sports Donation
EF091266	12/07/24	99998	Suresh Akkinipilli	400.00	Sports Donation
EF091268	17/07/24	01236	Department of Fire and Emergency Services	46,090.38	Emergency Services Levy June 2024
EF091286	19/07/24	00795	LGISWA	2,225.93	Insurance Premiums
EF091290	19/07/24	01309	Youth Affairs Council of WA	300.00	Subscription
EF091303	19/07/24	03071	Department of Transport - Vehicle Owner Searches	567.60	Vehicle Ownership Searches
EF091332	19/07/24	06683	Mike Hayward	648.36	Staff Reimbursement
EF091334	19/07/24	06716	Steven Reeves	214.87	Staff Reimbursement
EF091343	19/07/24	99998	Bruce Bellis	800.00	Sports Donation
EF091344	19/07/24	99998	Stephanie Mathys	100.00	Cloth Nappy Rebate
EF091345	19/07/24	99998	S & B T Broadbridge	100.00	Cloth Nappy Rebate
EF091346	19/07/24	99998	Jessie Elma Grey	46.94	Cloth Nappy Rebate
EF091347	19/07/24	99998	M & K Scott	450.00	Sports Donation
EF091348	19/07/24	99998	M & K Scott	450.00	Sports Donation
EF091349	26/07/24	167275	Firm Fencing	1,800.00	Bond Payment/Refund
EF091353	26/07/24	00177	Belmont Park Tennis Club Inc	9,456.00	Grants General - Election Pledge Shade Sale Project
EF091362	26/07/24	00530	Natasha Griggs	360.00	Membership Fee
EF091374	26/07/24	01761	Royal WA Historical Society Inc	110.00	Membership Fee
EF091381	26/07/24	03375	Belmont Villa Soccer Club	350.00	Community Contribution Fund - Line Marking
EF091421	26/07/24	06845	Roger Steiner	56.00	Staff Reimbursement
EF091424	26/07/24	06872	Strike Australia	700.00	Sister City Expenses
EF091425	26/07/24	99998	Zonta House Refuge Association	556.75	Rates Refund
EF091435	30/07/24	00242	Cabcharge Australia Pty Ltd	247.80	Taxi Fares
EF091457	30/07/24	00793	LGIS Insurance Broking - JLT	5,169.42	Insurance Premiums
EF091458	30/07/24	00795	LGISWA	603,986.55	Insurance Premiums
EF091485	30/07/24	01711	Irrigation Australia Ltd	858.00	Membership Fee
EF091500	30/07/24	02377	Faulkner Park Board Management	14,842.39	Faulkner Park Board Management Monthly Contribution
EF091532	30/07/24	04595	Copyright Agency Limited	5,887.13	Subscription - Annual Copyright Licence
EF091543	30/07/24	05311	Australian Airports Association Ltd	3,630.00	Membership Fee
EF091582	30/07/24	06613	Host Tel	145.00	State Emergency Services Expense
EF091484	30/07/24	01609	First 5 Minutes Pty Ltd	1,840.47	Evacuation Diagrams - COB
EF091600	30/07/24	99998	Complete Approvals	147.00	Application Fee
EF091601	30/07/24	99998	Complete Approvals	147.00	Application Fee
	Other Total			**825,663.40**	
Property, Plant & Equipment					
EF091114	05/07/24	02071	DS Agencies Pty Ltd	12,237.50	Street Furniture - Belmont Hub Cafe Furniture
EF091116	05/07/24	02310	Exteria Pty Ltd - Landmark Engineering	8,453.50	Cantilever Park Shelter & Drink Fountain - Various Parks
EF091121	05/07/24	03424	The Chair Doctor WA Pty Ltd	606.00	Office Furniture - Chair
EF091196	12/07/24	02099	Public Transport Authority of W A	17,701.50	Street FurnitureB - us Stop Shelter
EF091297	19/07/24	02254	PLE Computers	49.00	Computer Hardware
EF091298	19/07/24	02310	Exteria Pty Ltd - Landmark Engineering	23,122.00	Cantilever Park Shelter & Drink Fountain - Various Parks
EF091498	30/07/24	02310	Exteria Pty Ltd - Landmark Engineering	7,858.40	Street Furniture - Seats and Tables
EF091523	30/07/24	04132	Castledex Pty Ltd	1,386.00	Office Furniture - Trolley
	Property, Plant & Equipment Total			**71,413.90**	
Salaries/Wages					
WG000407	04/07/24	COB	City of Belmont Payroll	714,495.64	Salaries/Wages
EF091164	05/07/24	06876	Shire of Gingin	12,236.95	Long Service Leave Payment
WG100724	11/07/24	COB	City of Belmont Payroll	153,474.10	Salaries/Wages
EF091260	12/07/24	99952	Child Support Agency	1,093.40	Salaries/Wages
EF091261	12/07/24	99954	City of Belmont Social Club	400.00	Salaries/Wages
EF091262	12/07/24	99962	LGRCEU - WA Shire Councils Union	154.00	Salaries/Wages
EF091267	15/07/24	99971	SuperChoice	148,229.86	Superannuation Contribution
WG001807	18/07/24	COB	City of Belmont Payroll	719,432.80	Salaries/Wages
WG002507	25/07/24	COB	City of Belmont Payroll	146,440.14	Salaries/Wages
	Salaries/Wages Total			**1,895,956.89**	
Training and Conferences					
EF091124	05/07/24	03760	Wilmot Loh	337.62	Conference Expenses
EF091215	12/07/24	04977	WARP Training Australia Pty Ltd	450.00	Training

Pmnt Ref	Date	CR Code	Supplier	Pmnt Amnt	Description
EF091254	12/07/24	06859	Pretty Dardy T/A Acknowledge This	11,000.00	Training
EF091274	19/07/24	00110	Australian Institute of Management	1,292.00	Training
EF091279	19/07/24	00429	Economic Development Australia Ltd	990.00	Training
EF091280	19/07/24	00475	Saferight Pty Ltd	2,120.00	Training
EF091282	19/07/24	00602	Local Government Professionals Australia WA	560.00	Membership Fee
EF091325	19/07/24	06513	Australian Institute of Management Education and Training	780.00	Training
EF091326	19/07/24	06517	Clarity Communications	6,875.00	Training
EF091340	19/07/24	06832	Samphire Rottnest	586.00	Training
EF091351	26/07/24	00107	Environmental Health Australia (WA)	2,646.00	Subscription
EF091363	26/07/24	00571	Melissa Stretch	458.40	Conference Expenses
EF091364	26/07/24	00602	Local Government Professionals Australia WA	1,860.00	Conference Expenses
EF091430	30/07/24	00199	Events Industry Association (WA) Incorporated	700.00	Conference Expenses
EF091450	30/07/24	00602	Local Government Professionals Australia WA	4,600.00	Conference Expenses
EF091480	30/07/24	01413	Parks & Leisure Australia	2,992.00	Conference Expenses
EF091525	30/07/24	04212	Leila Timol	60.00	Conference Expenses
	Training and Conferences Total			38,307.02	
MUNI Total				**8,403,349.00**	
Trust Funds					
EF091174	09/07/24	150748	Building and Construction Industry Training Fund	1,713.50	Building and Construction Industry Training Fund
EF091175	09/07/24	154102	Building and Energy - Building Services Levy	28,550.83	Building and Energy - Building Services Levy
EF091176	09/07/24	164040	Department of Planning DAP fees	254.00	Department of Planning DAP fees
EF091426	30/07/24	154102	Building and Energy - Building Services Levy	80.35	Building and Energy - Building Services Levy
	Trust Funds Total			30,598.68	
TRUST Total				**30,598.68**	
Grand Total				**8,433,947.68**	
				8,433,947.68	
			Breakdown - Cheques :	41,643.40	
			EFT :	8,392,304.28	

12.7 Monthly Financial Report for July 2024

Voting Requirement	:	Simple Majority
Subject Index	:	32/009 Financial Operating System
Location/Property Index	:	N/A
Application Index	:	N/A
Disclosure of any Interest	:	N/A
Previous Items	:	N/A
Applicant	:	N/A
Owner	:	N/A
Responsible Division	:	Corporate and Governance

Council role

Executive The substantial direction setting and oversight role of the Council e.g. adopting plans and reports, accepting tenders, directing operations, setting and amending budgets.

Purpose of report

To provide Council with relevant monthly financial information for the 2024-25 financial year.

Summary and key issues

The following report includes a concise list of material variances for the month ending 31 July 2024

Officer Recommendation
That the Monthly Financial Reports as at 31 July 2024 as included in Attachment 12.7.1 be received.

Location

Not applicable.

Consultation

There has been no specific consultation undertaken in respect to this matter.

Strategic Community Plan implications

In accordance with the 2024–2034 Strategic Community Plan:

Key Performance Area: Performance
Outcome: 10. Effective leadership, governance and financial management.

Policy implications

There are no policy implications associated with this report.

Statutory environment

Section 6.4 of the *Local Government Act 1995 (WA) in conjunction with Regulations 34 (1) of the Local Government (Financial Management) Regulations 1996* requires monthly financial reports to be presented to Council.

Regulation 34(1) requires a monthly Statement of Financial Activity reporting on revenue and expenditure.

Regulation 34(5) determines the mechanism required to ascertain the definition of material variances which are required to be reported to Council as a part of the monthly report.

Background

Local Government (Financial Management) Regulations 1996 (WA) prescribe that a Local Government is to prepare each month a Statement of Financial Activity.

Regulation 34(2) requires the Statement of Financial Activity to be accompanied by documents containing:

1. Explanation for each material variance identified between year to date budgets and actuals
2. Any other supporting information considered relevant by the Local Government.

Local Government (Financial Management) Regulations 1996 (WA) - Regulation 34 (5) states "Each financial year, a Local Government is to adopt a percentage

or value, calculated in accordance with the Australian Accounting Standards, to be used in statements of financial activity for reporting material variances."

This regulation requires Council to annually set a materiality threshold for the purpose of disclosing budget variances within monthly financial reporting.

The materiality threshold has been set by Council at $100,000 for the 2024-25 financial year.

Report

At the June 2024 Ordinary Council Meeting, Council adopted the materiality threshold for the 2024-25 financial year as $100,000. The below table provides a summary of significant variances based on this materiality threshold. The detailed financial activity report is included at Attachment 12.7.1.

Report Section	Budget YTD	Actual YTD	Report Comments
Operating Activities			
Expenditure from operating activities			
Employee costs			
Parks, Leisure & Environment	(386,826)	(273,450)	Salaries are below budget due to vacancies which are currently being recruited by the City.
Materials and contracts			
Information Technology	(637,852)	(117,852)	TechOne annual license costs budgeted in July however not incurred until August.
Works	(234,371)	(92,337)	Timing of invoices – not received for works completed.
Parks, Leisure & Environment	(590,929)	(110,696)	
City Facilities & Property	(284,948)	(47,157)	
Economic & Community Development	(227,111)	(45,253)	Timing of invoices – not received for renewal of service contracts.
Insurance Expenses			
Works	(145,671)	Nil	Annual insurance allocations to be processed.
City Facilities & Property	(171,857)	Nil	
Investing Activities			

Report Section	Budget YTD	Actual YTD	Report Comments
Inflows from investing activities			
Capital grants, subsidies and contributions			
Parks, Leisure & Environment	122,126	Nil	SCRUF grant funding to be received.
Proceeds from disposal of asset			
Outflows from investing activities			
Payments for property, plant and equipment			
City Facilities & Property	Nil	(156,651)	Part payment for works completed in advance of schedule for Belmont Oasis fire hydrant works.
Payments for construction of infrastructure			
City Projects	(125,183)	(16,028)	Various expenses below budget by amounts below variance threshold.

Financial implications

The presentation of these reports to Council ensures compliance with the *Local Government Act 1995 (WA)* and associated Regulations, and also ensures that Council is regularly informed as to the status of its financial position.

Environmental implications

There are no environmental implications associated with this report.

Social implications

There are no social implications associated with this report.

Attachment details

Attachment No and title
1. Monthly Financial Statements for July 2024 [**12.7.1** - 10 pages]

CITY OF BELMONT

MONTHLY FINANCIAL REPORT
For the period ended 31 July 2024

LOCAL GOVERNMENT ACT 1995
LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATIONS 1996

TABLE OF CONTENTS

Statements required by regulation

CITY OF BELMONT
STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 31 JULY 2024

	Supplementary Information	Adopted Budget Estimates (a)	YTD Budget Estimates (b)	YTD Actual (c)	Variance* $ (c) - (b)	Variance* % ((c) - (b))/(b)	Var.
		$	$	$	$	%	
OPERATING ACTIVITIES							
Revenue from operating activities							
Rates		59,790,869	46,451,040	**46,414,622**	(36,418)	(0.08%)	
Grants, subsidies and contributions		2,425,280	60,111	**156,578**	96,467	160.48%	
Fees and charges		10,432,111	7,290,067	**7,428,340**	138,273	1.90%	▲
Interest revenue		6,763,202	406,092	**347,740**	(58,352)	(14.37%)	
Other revenue		592,353	47,279	**124,472**	77,193	163.27%	
Profit on asset disposals		87,469	7,289	**0**	(7,289)	(100.00%)	
Fair value adjustments to financial assets at fair value through profit or loss		4,203	0	**0**	0	0.00%	
		80,095,487	**54,261,878**	**54,471,752**	209,874	0.39%	
Expenditure from operating activities							
Employee costs		(29,084,855)	(2,536,491)	**(2,043,584)**	492,907	19.43%	▲
Materials and contracts		(36,674,146)	(2,565,601)	**(753,269)**	1,812,332	70.64%	▲
Utility charges		(2,392,835)	(15,645)	**(64,650)**	(49,005)	(313.23%)	
Depreciation		(12,935,924)	(1,077,994)	**(1,078,000)**	(6)	(0.00%)	
Finance costs		(520,949)	0	**0**	0	0.00%	
Insurance		(940,842)	(1,012,979)	**(553,780)**	459,199	45.33%	▲
Other expenditure		(1,543,703)	(164,826)	**(83,765)**	81,061	49.18%	
		(84,093,254)	**(7,373,536)**	**(4,577,048)**	2,796,488	37.93%	
Non-cash amounts excluded from operating activities	Note 2(b)	12,829,160	1,070,705	**1,079,118**	8,413	0.79%	
Amount attributable to operating activities		**8,831,393**	**47,959,047**	**50,973,822**	3,014,775	6.29%	
INVESTING ACTIVITIES							
Inflows from investing activities							
Proceeds from capital grants, subsidies and contributions		3,566,506	126,293	**0**	(126,293)	(100.00%)	▼
Proceeds from disposal of assets		672,140	0	**0**	0	0.00%	
		4,238,646	**126,293**	**0**	(126,293)	(100.00%)	
Outflows from investing activities							
Payments for property, plant and equipment	2	(4,115,144)	(39,260)	**(224,517)**	(185,257)	(471.87%)	▼
Payments for construction of infrastructure	2	(13,964,329)	(213,134)	**(97,718)**	115,416	54.15%	▲
Amount attributable to investing activities		**(13,840,827)**	**(126,101)**	**(322,235)**	(196,134)	(155.54%)	
FINANCING ACTIVITIES							
Inflows from financing activities							
Transfer from reserves	1	11,309,790	0	**0**	0	0.00%	
		11,309,790	**0**	**0**	0	0.00%	
Outflows from financing activities							
Repayment of borrowings		(641,885)	0	**0**	0	0.00%	
Payments for principal portion of lease liabilities		(105,427)	0	**0**	0	0.00%	
Transfer to reserves	1	(11,360,386)	0	**0**	0	0.00%	
		(12,107,698)	**0**	**0**	0	0.00%	
Amount attributable to financing activities		**(797,908)**	**0**	**0**	0	0.00%	
MOVEMENT IN SURPLUS OR DEFICIT							
Surplus or deficit at the start of the financial year		6,304,342	6,304,342	**15,112,371**	8,808,029	139.71%	▲
Amount attributable to operating activities		8,831,393	47,959,047	**50,973,822**	3,014,775	6.29%	▲
Amount attributable to investing activities		(13,840,827)	(126,101)	**(322,235)**	(196,134)	(155.54%)	▼
Amount attributable to financing activities		(797,908)	0	**0**	0	0.00%	
Surplus or deficit after imposition of general rates		**497,000**	**54,137,288**	**65,763,958**	11,626,670	21.48%	▲

KEY INFORMATION

▲▼ Indicates a variance between Year to Date (YTD) Budget and YTD Actual data as per the adopted materiality threshold.

* Refer to Note 3 for an explanation of the reasons for the variance.

This statement is to be read in conjunction with the accompanying Financial Statements and Notes.

CITY OF BELMONT
STATEMENT OF FINANCIAL POSITION
FOR THE PERIOD ENDED 31 JULY 2024

	Supplementary Information	30 June 2024	31 July 2024
		$	$
CURRENT ASSETS			
Cash and cash equivalents		18,105,527	11,334,943
Trade and other receivables		25,057,962	85,366,583
Other financial assets		40,704,180	41,706,130
Inventories		262,339	265,102
Other assets		2,743,237	3,019,541
TOTAL CURRENT ASSETS		86,873,245	141,692,299
NON-CURRENT ASSETS			
Trade and other receivables		384,023	352,953
Other financial assets		21,135,546	21,135,546
Property, plant and equipment		340,667,210	340,559,145
Infrastructure		295,235,323	294,415,348
Right-of-use assets		158,975	158,975
Intangible assets		176,613	176,613
TOTAL NON-CURRENT ASSETS		657,757,690	656,798,580
TOTAL ASSETS		744,630,935	798,490,879
CURRENT LIABILITIES			
Trade and other payables		7,629,985	2,265,477
Other liabilities		1,253,343	10,881,360
Lease liabilities		105,428	105,428
Borrowings		641,884	641,884
Employee related provisions		4,332,804	4,287,601
TOTAL CURRENT LIABILITIES		13,963,444	18,181,750
NON-CURRENT LIABILITIES			
Other liabilities		62,747	62,747
Lease liabilities		57,042	57,042
Borrowings		10,976,367	10,976,367
Employee related provisions		366,690	366,690
TOTAL NON-CURRENT LIABILITIES		11,462,846	11,462,846
TOTAL LIABILITIES		25,426,290	29,644,596
NET ASSETS		**719,204,645**	**768,846,283**
EQUITY			
Retained surplus		206,744,959	256,386,597
Reserve accounts	1	60,635,191	60,635,191
Revaluation surplus		451,824,495	451,824,495
TOTAL EQUITY		**719,204,645**	**768,846,283**

This statement is to be read in conjunction with the accompanying notes.

NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 31 JULY 2024

1 BASIS OF PREPARATION AND SIGNIFICANT ACCOUNTING POLICIES

BASIS OF PREPARATION

This prescribed financial report has been prepared in accordance with the *Local Government Act 1995* and accompanying regulations.

Local Government Act 1995 requirements
Section 6.4(2) of the Local Government Act 1995 read with the *Local Government (Financial Management) Regulations 1996,* prescribe that the financial report be prepared in accordance with the *Local Government Act 1995* and, to the extent that they are not inconsistent with the Act, the Australian Accounting Standards. The Australian Accounting Standards (as they apply to local governments and not-for-profit entities) and Interpretations of the Australian Accounting Standards Board were applied where no inconsistencies exist.

The *Local Government (Financial Management) Regulations 1996* specify that vested land is a right-of-use asset to be measured at cost, and is considered a zero cost concessionary lease. All right-of-use assets under zero cost concessionary leases are measured at zero cost rather than at fair value, except for vested improvements on concessionary land leases such as roads, buildings or other infrastructure which continue to be reported at fair value, as opposed to the vested land which is measured at zero cost. The measurement of vested improvements at fair value is a departure from AASB 16 which would have required the City to measure any vested improvements at zero cost.

Local Government (Financial Management) Regulations 1996, regulation 34 prescribes contents of the financial report. Supporting information does not form part of the financial report.

Accounting policies which have been adopted in the preparation of this financial report have been consistently applied unless stated otherwise. Except for cash flow and rate setting information, the financial report has been prepared on the accrual basis and is based on historical costs, modified, where applicable, by the measurement at fair value of selected non-current assets, financial assets and liabilities.

THE LOCAL GOVERNMENT REPORTING ENTITY
All funds through which the City controls resources to carry on its functions have been included in the financial statements forming part of this financial report.

All monies held in the Trust Fund are excluded from the financial statements.

Judgements and estimates
The preparation of a financial report in conformity with Australian Accounting Standards requires management to make judgements, estimates and assumptions that effect the application of policies and reported amounts of assets and liabilities, income and expenses.

The estimates and associated assumptions are based on historical experience and various other factors believed to be reasonable under the circumstances; the results of which form the basis of making the judgements about carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

The balances, transactions and disclosures impacted by accounting estimates are as follows:
- estimated fair value of certain financial assets
- impairment of financial assets
- estimation of fair values of land and buildings, infrastructure and investment property
- estimation uncertainties made in relation to lease accounting
- estimated useful life of intangible assets

MATERIAL ACCOUNTING POLICES
Significant acccounting policies utilised in the preparation of these statements are as described within the 2023-24 Annual Budget. Please refer to the adopted budget document for details of these policies.

PREPARATION TIMING AND REVIEW
Date prepared: All known transactions up to 31 July 2024

CITY OF BELMONT
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 31 JULY 2024

2 STATEMENT OF FINANCIAL ACTIVITY INFORMATION

(a) Net current assets used in the Statement of Financial Activity

	Note	Adopted Budget Opening 30 June 2024	Last Year Closing 30 June 2024	Year to Date 31 July 2024
Current assets		**$**	**$**	**$**
Cash and cash equivalents		17,777,674	18,105,527	11,334,943
Trade and other receivables		23,613,744	25,057,962	85,366,583
Other financial assets		29,118,043	40,704,180	41,706,130
Inventories		276,212	262,339	265,102
Other assets		3,316,206	2,743,237	3,019,541
		74,101,879	86,873,245	141,692,299
Less: current liabilities				
Trade and other payables		(4,956,993)	(7,629,985)	(2,265,477)
Other liabilities		(2,082,606)	(1,253,343)	(10,881,360)
Lease liabilities		(39,341)	(105,428)	(105,428)
Borrowings		(666,573)	(641,884)	(641,884)
Employee related provisions		(4,273,584)	(4,332,804)	(4,287,601)
		(12,019,097)	(13,963,444)	(18,181,750)
Net current assets		**62,082,782**	**72,909,801**	**123,510,549**
Less: Total adjustments to net current assets	2(c)	(61,585,782)	(57,797,430)	(57,746,591)
Closing funding surplus / (deficit)		**497,000**	**15,112,371**	**65,763,958**

(b) Non-cash amounts excluded from operating activities

The following non-cash revenue and expenditure has been excluded from operating activities within the Statement of Financial Activity in accordance with *Financial Management Regulation 32* .

Non-cash amounts excluded from operating activities	Adopted Budget	YTD Budget (a)	YTD Actual (b)
	$	**$**	**$**
Adjustments to operating activities			
Less: Profit on asset disposals	(87,469)	(7,289)	0
Less: Fair value adjustments to financial assets at fair value through profit and loss	(4,203)	0	0
Add: Depreciation	12,935,924	1,077,994	1,078,000
Movement in current employee provisions associated with restricted cash	(15,092)	0	0
- Pensioner deferred rates	0	0	(31,070)
- Employee provisions	0	0	32,188
Total non-cash amounts excluded from operating activities	**12,829,160**	**1,070,705**	**1,079,118**

(c) Current assets and liabilities excluded from budgeted deficiency

The following current assets and liabilities have been excluded from the net current assets used in the Statement of Financial Activity in accordance with *Financial Management Regulation 32* to agree to the surplus/(deficit) after imposition of general rates.

		Adopted Budget Opening 30 June 2024	Last Year Closing 30 June 2024	Year to Date 31 July 2024
		$	**$**	**$**
Adjustments to net current assets				
Less: Reserve accounts		(64,831,110)	(60,635,191)	(60,635,191)
Add: Financial assets at amortised cost		0	20,927,619	20,927,619
- EMRC receivable		0	(20,927,619)	(20,927,619)
Add: Current liabilities not expected to be cleared at the end of the year:				
- Current portion of borrowings		666,573	641,884	641,884
- Current portion of lease liabilities		39,341	105,428	105,428
- Current portion of employee benefit provisions held in reserve		2,539,414	2,090,449	2,141,288
Total adjustments to net current assets	2(a)	**(61,585,782)**	**(57,797,430)**	**(57,746,591)**

CURRENT AND NON-CURRENT CLASSIFICATION

In the determination of whether an asset or liability is current or non-current, consideration is given to the time when each asset or liability is expected to be settled. Unless otherwise stated assets or liabilities are classified as current if expected to be settled within the next 12 months, being the City's operational cycle.

CITY OF BELMONT
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
FOR THE PERIOD ENDED 31 JULY 2024

3 EXPLANATION OF MATERIAL VARIANCES

The material variance thresholds are adopted annually by Council as an indicator of whether the actual expenditure or revenue varies from the year to date actual materially.
The material variance adopted by Council for the 2024-25 year is $100,000.

Description	Var. $	Var. %	
	$	%	
Revenue from operating activities			
Fees and charges	138,273	1.90%	▲
Various fees and charges amounts below budget by amounts below variance threshold.		Timing	
Expenditure from operating activities			
Employee costs	492,907	19.43%	▲
Salaries are below budget due to vacancies currently being recruited by the City		Permanent	
Materials and contracts	1,812,332	70.64%	▲
Information Technology - TechOne annual license costs (~$500k) budgeted in July however not incurred until August - $520,000		Timing	
Economic & Community Development - Youth programs costs not yet incurred as budgeted - $181,859		Timing	
Various material and contracts expenses below budget by amounts below variance threshold		Timing	
Insurance	459,199	45.33%	▲
Annual insurance allocations to be processed		Timing	
Proceeds from capital grants, subsidies and contributions	(126,293)	(100.00%)	▼
Parks, Leisure & Enviroment - SCRUF grant funding to be received - ($122,126)		Timing	
Outflows from investing activities			
Payments for property, plant and equipment	(185,257)	(471.87%)	▼
City Facilities & Property - Part payment for works completed in advance of schedule for Belmont Oasis fire hydrant works - ($156,651)		Timing	
		Timing	
Payments for construction of infrastructure	115,416	54.15%	▲
City Projects - Various expenses below budget by amounts below variance threshold		Timing	
Surplus or deficit at the start of the financial year	8,808,029	139.71%	▲
Various underspends in prior year. Figure remains subject to finalisation of end of year adjustments and end of financial year audit.		Permanent	
Surplus or deficit after imposition of general rates	11,626,670	21.48%	▲
Due to variances described above			

CITY OF BELMONT

SUPPLEMENTARY INFORMATION

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CITY OF BELMONT
SUPPLEMENTARY INFORMATION
FOR THE PERIOD ENDED 31 JULY 2024

1 RESERVE ACCOUNTS

Reserve name	Budget Opening Balance	Budget Interest Earned	Budget Transfers In (+)	Budget Transfers Out (-)	Budget Closing Balance	Actual Opening Balance	Actual Interest Earned	Actual Transfers In (+)	Actual Transfers Out (-)	Actual YTD Closing Balance
	$	$	$	$	$	$	$	$	$	$
Restricted by Council										
Administration building Reserve	257,768	11,264	0	0	269,032	246,141	0	0	0	246,141
Aged Accommodation - Homeswest Reserve	980,051	42,501	8,583	0	1,031,135	928,711	0	0	0	928,711
Aged Community Care Reserve	239,107	10,449	0	0	249,556	228,321	0	0	0	228,321
Aged persons housing Reserve	467,246	32,618	0	(309,374)	190,490	712,757	0	0	0	712,757
Aged Services Reserve	1,163,138	50,828	0	0	1,213,966	1,110,671	0	0	0	1,110,671
Ascot Waters Marina Maintenance & Restoration	1,057,555	48,399	0	(50,000)	1,055,954	1,057,596	0	0	0	1,057,596
Belmont District Band Reserve	51,297	2,242	0	0	53,539	48,983	0	0	0	48,983
Belmont Oasis Refurbishment Reserve	4,521,127	197,568	0	0	4,718,695	4,317,189	0	0	0	4,317,189
Belmont Trust Reserve	1,707,597	74,620	0	(216,324)	1,565,893	1,630,571	0	0	0	1,630,571
Building maintenance Reserve	5,022,812	233,538	0	(200,000)	5,056,350	5,103,194	0	0	0	5,103,194
Capital Projects Reserve	3,801,763	0	7,844,987	(705,161)	10,941,589	0	0	0	0	0
Car Parking Reserve	67,645	2,956	0	0	70,601	64,594	0	0	0	64,594
Carry Forward Projects Reserve	3,508,977	0	(25,166)	(2,738,320)	745,491	0	0	0	0	0
District valuation Reserve	108,999	1,049	95,000	0	205,048	22,916	0	0	0	22,916
Election expenses Reserve	43,723	6,412	75,000	0	125,135	140,105	0	0	0	140,105
Environment Reserve	928,453	69,281	0	0	997,734	1,513,903	0	0	0	1,513,903
Faulkner Park Retirement Village Buy Back Reserve	2,590,287	112,319	0	0	2,702,606	2,454,347	0	0	0	2,454,347
Faulkner Park Retirement Village Owners Maintenance Reserve	532,453	31,613	0	0	564,066	690,804	0	0	0	690,804
History Reserve	181,622	7,937	0	0	189,559	173,429	0	0	0	173,429
Information Technology Reserve	1,448,239	65,908	0	0	1,514,147	1,440,206	0	0	0	1,440,206
Land acquisition Reserve	11,047,425	467,902	0	0	11,515,327	10,224,436	0	0	0	10,224,436
Long Service Leave Reserve - Salaries	1,520,081	86,855	0	(143,273)	1,463,663	1,897,921	0	0	0	1,897,921
Long Service Leave Reserve - Wages	231,924	11,137	0	(5,753)	237,308	243,367	0	0	0	243,367
Miscellaneous Entitlements Reserve	802,501	35,942	0	0	838,443	785,400	0	0	0	785,400
Plant replacement Reserve	1,482,390	75,365	587,126	(323,278)	1,821,603	1,646,845	0	0	0	1,646,845
Property development Reserve	21,754,992	703,244	0	(5,347,558)	17,110,678	15,367,065	0	0	0	15,367,065
Public Art Reserve	417,826	18,870	0	(30,000)	406,696	412,347	0	0	0	412,347
Ruth Faulkner library Reserve	50,154	2,192	0	0	52,346	47,892	0	0	0	47,892
Streetscapes Reserve	537,345	23,481	0	0	560,826	513,107	0	0	0	513,107
Urban Forest Strategy Management Reserve	126,892	5,545	0	0	132,437	121,168	0	0	0	121,168
Waste Management Reserve	5,481,809	282,028	0	(1,240,749)	4,523,088	6,162,778	0	0	0	6,162,778
Workers Compensation/Insurance Reserve	1,301,180	60,793	0	0	1,361,973	1,328,427	0	0	0	1,328,427
	73,434,378	**2,774,856**	**8,585,530**	**(11,309,790)**	**73,484,974**	**60,635,191**	**0**	**0**	**0**	**60,635,191**

CITY OF BELMONT **INVESTING ACTIVITIES**
SUPPLEMENTARY INFORMATION
FOR THE PERIOD ENDED 31 JULY 2024

2 CAPITAL ACQUISITIONS

Capital acquisitions	Adopted Budget	YTD Budget	YTD Actual	YTD Actual Variance
	$	$	$	$
Buildings - non-specialised	1,766,674	2,593	160,312	157,719
Furniture and equipment	1,015,181	32,500	0	(32,500)
Plant and equipment	1,283,289	0	64,205	64,205
Other property, plant and equipment	50,000	4,167	0	(4,167)
Acquisition of property, plant and equipment	**4,115,144**	**39,260**	**224,517**	**185,257**
Infrastructure - Roads	4,377,589	96,190	18,519	(77,671)
Infrastructure - Reserves Improvements	7,999,940	113,327	69,342	(43,985)
Infrastructure - Footpath Network	870,175	3,617	3,600	(17)
Infrastructure - Drainage Network	716,625	0	6,257	6,257
Acquisition of infrastructure	**13,964,329**	**213,134**	**97,718**	**(115,416)**
Total capital acquisitions	**18,079,473**	**252,394**	**322,235**	**69,841**
Capital Acquisitions Funded By:				
Capital grants and contributions	3,566,506	126,293	0	(126,293)
Other (disposals & C/Fwd)	672,140	0	0	0
Reserve accounts				
Belmont Trust Reserve	216,324	0	0	0
Building maintenance Reserve	200,000	0	0	0
Capital Projects Reserve	705,161	0	0	0
Carry Forward Projects Reserve	2,738,320	0	0	0
Long Service Leave Reserve - Wages	5,753	0	0	0
Plant replacement Reserve	323,278	0	0	0
Property development Reserve	5,347,558	0	0	0
Public Art Reserve	30,000	0	0	0
Contribution - operations	9,981,022	126,101	322,235	196,134
Capital funding total	**23,786,062**	**252,394**	**322,235**	**69,841**

MATERIAL ACCOUNTING POLICIES

Each class of fixed assets within either plant and equipment or infrastructure, is carried at cost or fair value as indicated less, where applicable, any accumulated depreciation and impairment losses.

Assets for which the fair value as at the date of acquisition is under $5,000 are not recognised as an asset in accordance with *Financial Management Regulation 17A (5)* . These assets are expensed immediately.

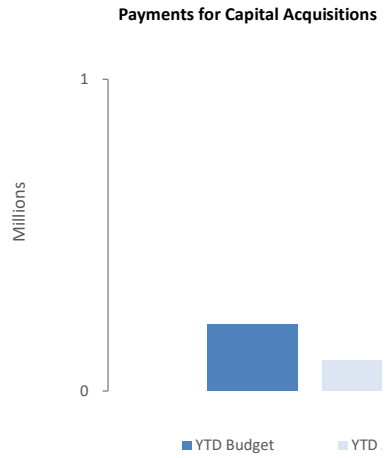
Where multiple individual low value assets are purchased together as part of a larger asset or collectively forming a larger asset exceeding the threshold, the individual assets are recognised as one asset and capitalised.

Initial recognition and measurement for assets held at cost

Plant and equipment including furniture and equipment is recognised at cost on acquisition in accordance with *Financial Management Regulation 17A.* Where acquired at no cost the asset is initially recognise at fair value. Assets held at cost are depreciated and assessed for impairment annually.

Initial recognition and measurement between mandatory revaluation dates for assets held at fair value

In relation to this initial measurement, cost is determined as the fair value of the assets given as consideration plus costs incidental to the acquisition. For assets acquired at zero cost or otherwise significantly less than fair value, cost is determined as fair value at the date of acquisition. The cost of non-current assets constructed by the City includes the cost of all materials used in construction, direct labour on the project and an appropriate proportion of variable and fixed overheads.



CITY OF BELMONT
SUPPLEMENTARY INFORMATION
FOR THE PERIOD ENDED 31 JULY 2024

2 CAPITAL ACQUISITIONS - DETAILED

Capital expenditure total
Level of completion indicators

- 0%
- 20%
- 40%
- 60%
- 80%
- 100%
- Over 100%

Percentage Year to Date Actual to Annual Budget expenditure where the expenditure over budget highlighted in red.

Level of completion indicator, please see table at the end of this note for further detail.

Account Description	Adopted Budget	YTD Budget	YTD Actual	Variance (Under)/Over
	$	$	$	$
City Projects	3,799,162	125,184	16,032	(109,152)
Parks and Environment	4,392,452	25,000	56,971	31,971
Buildings and facilities	1,575,000	0	156,651	156,651
Infrastructure Capital Works	5,964,389	99,807	28,376	(71,431)
Furniture and equipment	1,015,181	32,500	0	(32,500)
Plant and equipment	1,283,289	0	64,205	64,205
Other	50,000	4,167	0	(4,167)
	18,079,473	**286,658**	**322,235**	**35,577**

13 Reports by the Chief Executive Officer

13.1 Request for leave of absence

13.2 Notice of motion

Nil.

14 Matters for which the meeting may be closed

14.1 Code of Conduct Matter

This report is included in the Ordinary Council Meeting – Confidential Matters Agenda Part 1 in accordance with Section 5.23(2) of the *Local Government Act 1995 (WA)*, which permits the meeting to be closed to the public for business relating to the following:

Section 5.23(2)

(h) such other matters as may be prescribed.

14.2 Staff Matter Chief Executive Officer Annual Performance Appraisal 2023-24

This report is included in the Ordinary Council Meeting – Confidential Matters Agenda Part 2 in accordance with Section 5.23(2) of the *Local Government Act 1995 (WA)*, which permits the meeting to be closed to the public for business relating to the following:

Section 5.23(2)

(a) a matter affecting an employee or employees;

15 Closure