A153

flyt

Golden Gateway

LOCAL STRUCTURE PLAN
MOVEMENT AND ACCESS STRATEGY

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PROJECT	Golden Gateway Local Structure Plan Movement and Access Strategy 81113-160			
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0	Issued for Review	MDR	CAS	07/12/16
1	Draft Report for Review	MDR	CAS	08/03/17
2	Revised Draft Report for Review	MDR	CAS	17/03/17
3	Final Draft Report for Review	MDR	CAS	26/03/17
4	Updated Final Draft Report for Review	MDR	CAS	07/04/17
5	Updated Final Report with Revised Road Network Structure	MDR	CAS	04/05/18
6	Updated Final Report with Revised LSP Images	MDR	CAS	17/06/18

Contents

1. INTRODUCTION

1.1 Movement and Access Strategy

This Movement and Access Strategy has been prepared by Flyt in support of the Local Structure Plan (LSP) which applies to the Golden Gateway Precinct in the City of Belmont. This Strategy has been prepared for the City of Belmont and Department of Planning (DoP) 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.

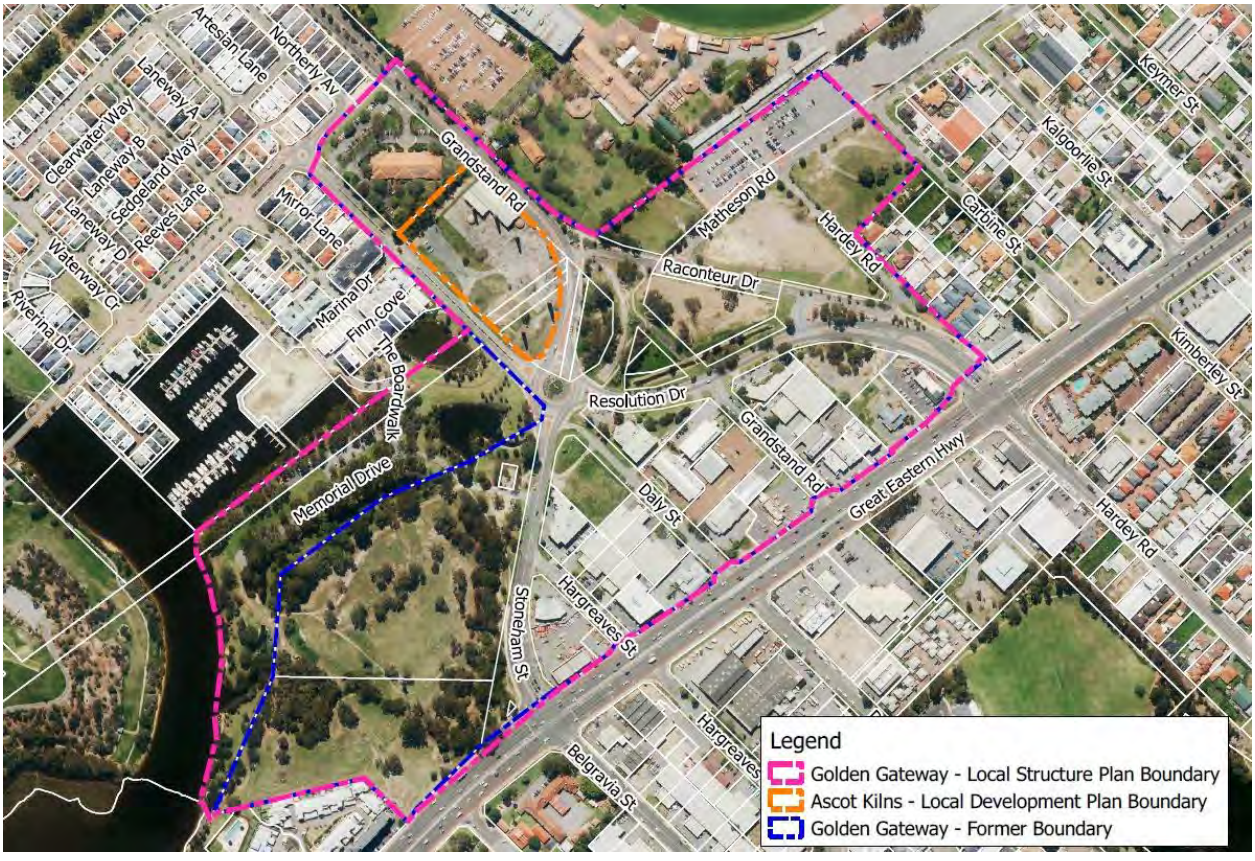
This form of guidance is the basis from which the WAPC and DoP assesses Structure Plans and therefore it should form the basis of this assessment which will result in the Movement and Access Strategy.

1.2 Structure Plan

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 to the west/northwest.

Figure 1 shows the Golden Gateway LSP boundary, as well as the former LSP boundary which was realigned in March 2016 to take into consideration the adjacent Metropolitan Regional Scheme (MRS) Reserve which contains water bodies associated with the Golden Gateway Precinct. In addition, Figure 1 shows the boundary of the Ascot Kilns Local Development Plan (LDP) area – traffic generated from the proposed Ascot Kilns LDP area has been considered within this assessment, however the form and function of vehicular access to this area was subject to consideration in the Ascot Kilns LDP reporting and not assessed within this report.

Figure 1 – Golden Gateway LSP Area (source: City of Belmont)



The Golden Gateway LSP has been developed by Taylor Burrell Barnett. As set out within the Structure Plan Report:

> *"The subject land encompasses a mix of uses comprising mixed business, retail (food and beverage), public uses associated with the Western Australian Turf Club, Ascot Racecourse and Ascot Kilns, Ascot Grove Farm Reserve and Swan River environs. The remainder of the subject land is largely undeveloped and devoid of vegetation".*

The details of the land uses proposed are set out in Table 1 with the Structure Plan shown in Figure 2.

Table 1 – Proposed Structure Plan Land Uses

Item	Data
Estimated Number of Dwellings	3,000 dwellings
Estimated Dwelling Type - multiple dwelling (75 m^2 apartment size) - single dwelling	 2,950 dwellings 50 dwellings
Commercial space	7,400 m^2 GFA
Retail space	1,500 m^2 GFA

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 impact of development based on existing and future transport networks in the Golden Gateway locality.

1.4 Background Information

This Movement and Access Strategy has been structured to conform to the requirements of the WAPC Transport Impact Assessment (TIA) Guidelines, and has been completed using information from a range of sources which are quoted throughout this report. Specific to the completion of the TIA, the background information for the form and structure of the proposed development has been extracted from the Golden Gateway Structure Plan Report (April 2018) produced by Taylor Burrell Barnett.

Figure 2 – Golden Gateway Structure Plan (source: Taylor Burrell Barnett)

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 situation;
- Internal transport networks;
- External transport networks;
- Integration with surrounding area;
- Analysis of internal transport networks;
- Analysis of external transport networks;
- Safer routes to schools analysis; and
- Conclusions.

Where referred to in the Movement and Access Strategy, appendices are provided as attachments.

2. STRUCTURE PLAN OUTLINE

2.1 Regional Context

The Golden Gateway LSP site is located in the City of Belmont and 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 to the west/northwest. The LSP site includes the Belmont Trust Land (formerly Ascot Grove Farm Reserve), which currently consists of open parkland with a foreshore along the Swan River. Figure 3 shows the location of the site.

The site is located to the east of Perth City, along the southern foreshore of the Swan River. The site is located approximately 8km from Perth City, 4km from Perth Airport Domestic Terminal (Qantas), 9km from Perth International/Domestic Terminals and 3.5km from Belmont Forum Shopping Centre.

The site 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 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 providing access west towards Perth City 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.

In addition, the site benefits from close proximity 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 City.

Ascot Racecourse is located immediately to the north/northeast of the site. The racecourse is regarded as Perth's premier racecourse and holds a number of featured Group Race meetings annually. These meetings attract crowds of varying sizes and on particular key race days (New Year's Day, Super Saturday in November etc.), vehicle access to the racecourse for spectators causes local parking issues and congestion.

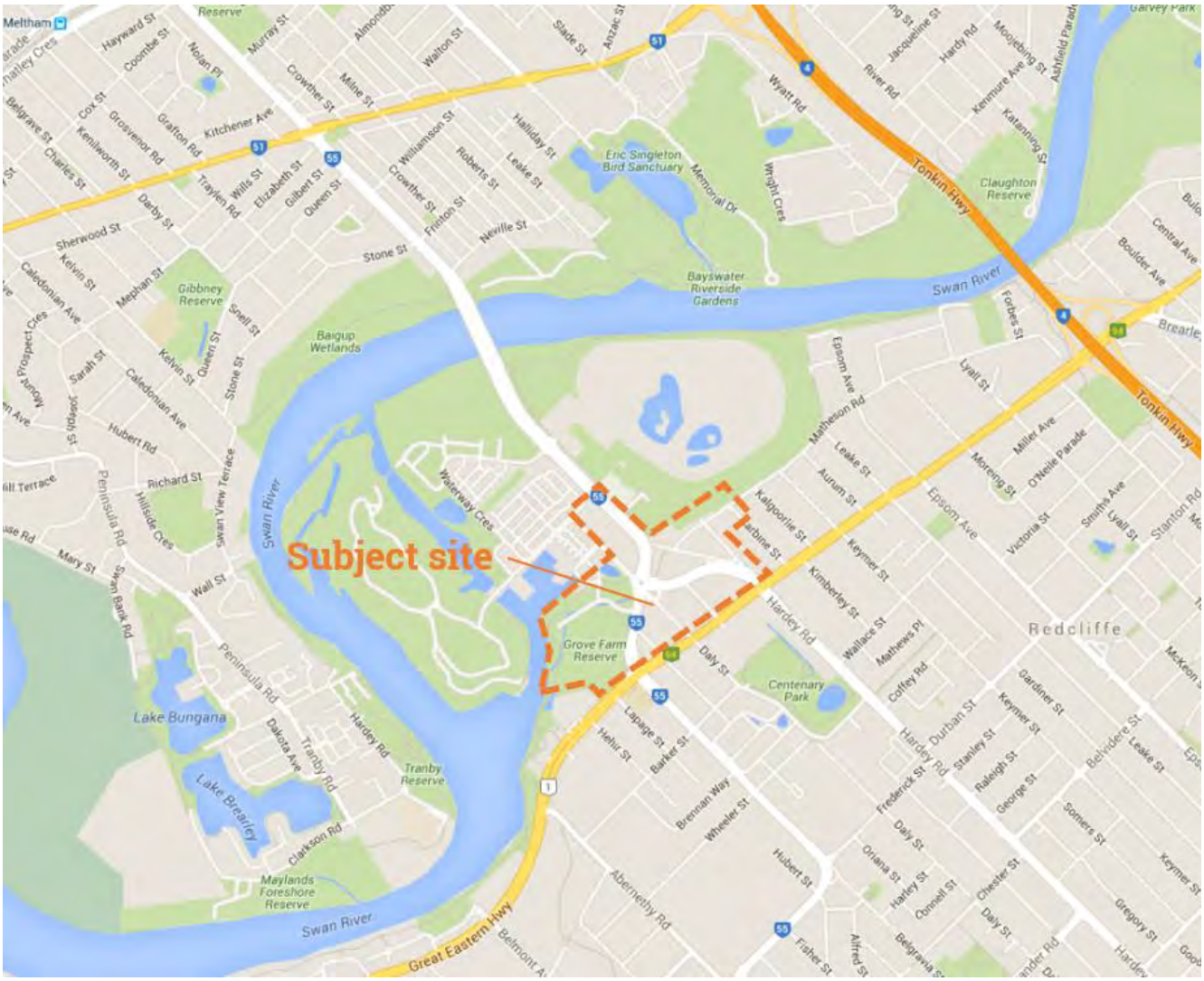
A number of existing shared path cycling connections run through the LSP site alongside Stoneham Street, Raconteur Drive and Grandstand Road. Both shared paths and local bicycle friendly routes run through the Ascot Waters development to the north of the LSP site. The site is located close to regional 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.

A number of existing bus routes operate close to or through the LSP site. These include the Circle Route 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, Curtin University.

In addition, existing bus routes operate along Great Eastern Highway providing connections east to destinations including Perth Airport, Guildford, Midland and to the west to destinations including Victoria Park Transfer Station and Perth City.

Additional information on the road network surrounding the site are discussed in more detail in Section 3.5, additional information on cycling connections in proximity to the site are discussed in more detail in Section 3.3, and additional information on public transport connections in proximity to the site are discussed in more detail in Section 3.4.

Figure 3 – Golden Gateway LSP Area Regional Context (source: nearmap.com)



2.2 Proposed Land Uses

The Golden Gateway LSP is comprised of three main 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

Item	Data
Estimated Number of Dwellings	3,000 dwellings
Estimated Dwelling Type - multiple dwelling (75 m^2 apartment size) - single dwelling	 2,950 dwellings 50 dwellings
Commercial space	7,400 m^2 GFA
Retail space	1,500 m^2 GFA

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 peoples connection to the Swan River;
- Create accessible, quality public realm within the precinct; and
- Identify appropriate uses/densities in conjunction with infrastructure improvements.

In order to achieve the above objectives, the project team identified a number of opportunities that the Golden Gateway site 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;
  - Generous existing road reserve dimensions provide ability for reconfigured pedestrian friendly streetscapes offering shade trees, soft landscaping and convenient on-street parking embayments;
  - Potential to consider alteration to the priority road network of Stoneham Street and Resolution Drive for the benefits of precinct consolidation and integration;
  - Opportunities to investigate alternative road alignments that celebrate key view lines of surrounding site characteristics and future gateway elements; and
  - Opportunities to investigate potential to downgrade priority of Stoneham Street for benefits to consolidation of development areas with existing foreshore open space.

3. EXISTING SITUATION

3.1 Existing Land Uses

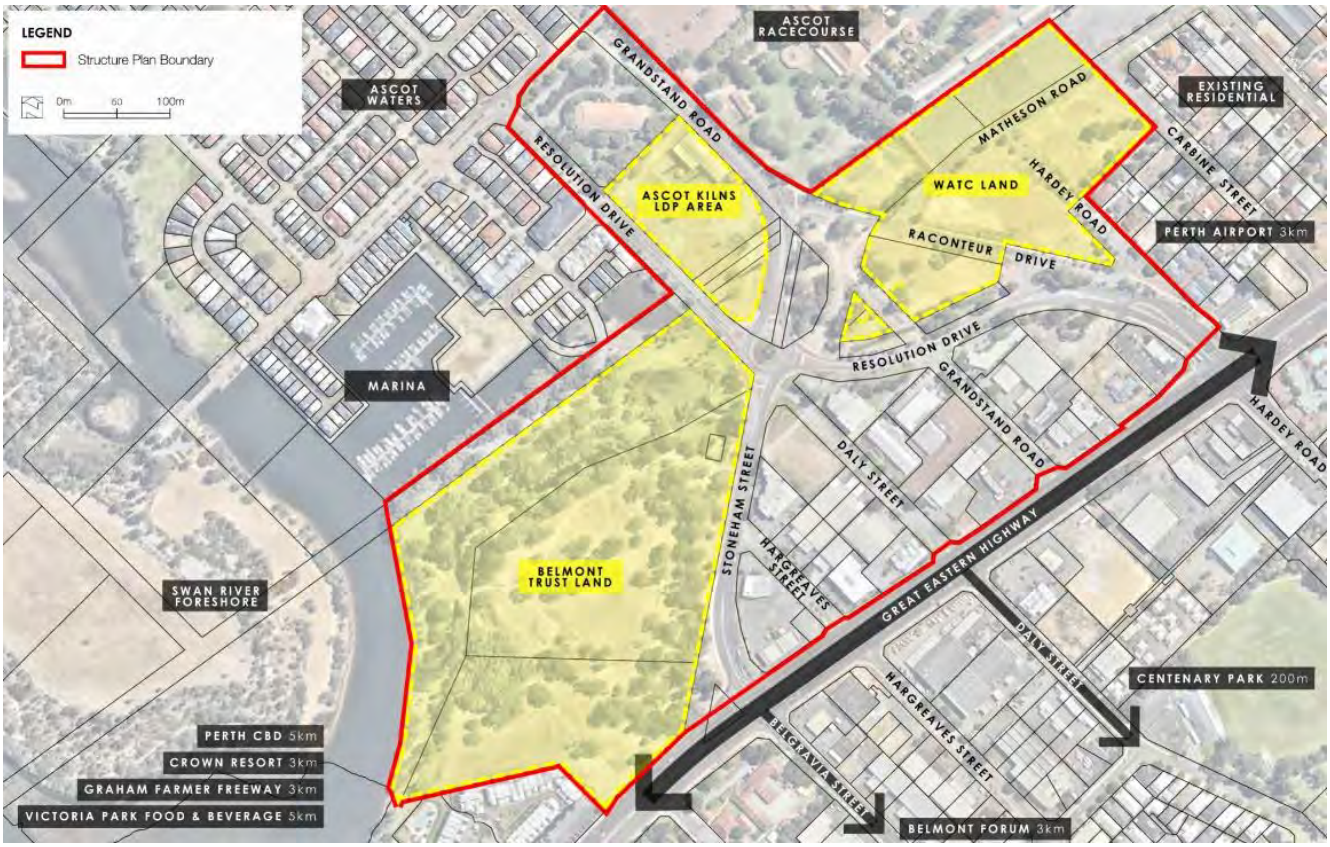
The site is bounded by Ascot Racecourse to the north/northeast, Hardey Road to the east, Great Eastern Highway to the south, Swan River to the west and Ascot Waters to the west/northwest, as shown in Figure 4.

The developed section of the LSP site, between Great Eastern Highway, Stoneham Street and Resolution Drive, consists of a range of light industrial/commercial units and various fast-food outlets fronting Great Eastern Highway. Other areas of the LSP site generally consists of undeveloped land.

As discussed in Section 1.2, the Ascot Kilns LDP area between Resolution Drive and Grandstand Road is subject to a separate LDP process, however traffic generated from the proposed Ascot Kilns LDP area has been considered within this assessment.

Immediately to the north of the Ascot Kilns site is the Perth Racing Headquarters building, which does form part of this assessment.

Figure 4 – Golden Gateway LSP Area in Context to Surrounding Development (source: Taylor Burrell Barnett)



3.2 Pedestrian Network

The extent and quality of the existing pedestrian infrastructure within and surrounding the Golden Gateway site is of a standard commensurate with the extent of existing development and form of land uses across the site, i.e. there are a number of 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 Road 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. The road corridor features three general traffic lanes, a bus lane and an on-street bike lane in either direction, as well as wide, good quality footpaths on both sides of the corridor. 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.

Each of the four major road corridors running through the Golden Gateway site (Grandstand Road, Raconteur Drive, Resolution Drive and Stoneham Street) all 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, Resolution Drive along the eastern side of the street adjacent to the Ascot Waters development and Stoneham Street along the western side of the street adjacent to the Belmont Trust Land.

3.2.2 Pedestrian Infrastructure along Minor Road Corridors

The minor roads within the LSP site are located between Great Eastern Highway and Resolution Drive/Stoneham Street, the three streets (Hargreaves Street, Daly Street and Grandstand Road - south section) provide access to the light industrial/commercial units in this area of the LSP.

None of these three streets have footpaths, which reinforces the fact that access to these land uses are primarily designed to be by private vehicle rather than on foot.

3.2.3 Pedestrian Accessibility

Walkscore is a commercial product that provides a geographical based rating score of a location based on availability of services within a walking catchment.

The Walkscore rating for a location central within the Golden Gateway LSP site is 43 out of 100 (the address used for the purposes of this analysis was 63 Daly Street). Walkscore measures the walkability of a location based on the distance to nearby places and pedestrian facilities, the overall scoring is ranked as follows:

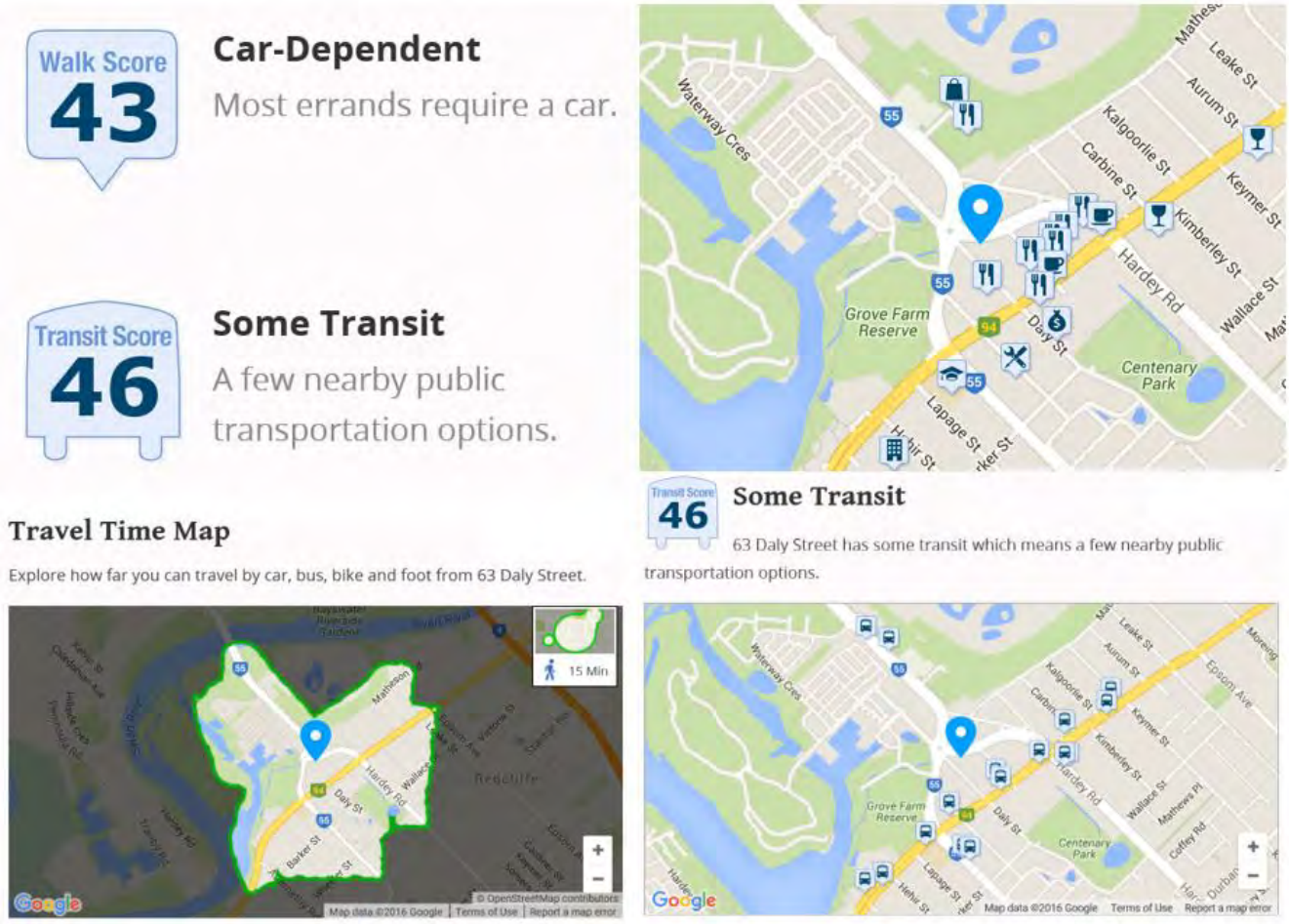
- 90–100 Walker's Paradise: Daily errands do not require a car
- 70–89 Very Walkable: Most errands can be accomplished on foot
- 50–69 Somewhat Walkable: Some errands can be accomplished on foot
- 25–49 Car-Dependent: Most errands require a car
- 0–24 Car-Dependent: Almost all errands require a car

As such the centre of the LSP site is considered on the Walkscore ranking system to be 'Car-Dependent – most errands require a car'. Whilst the site benefits from potentially good access to primary school education, parks/reserves and some food and beverage outlets, the site is less well situated to access groceries and retail outlets on foot.

The LSP site also scores an average 46 out of 100 in terms of access to transit services (public transport services). The bus network is focused on serving the Great Eastern Highway corridor, which provides access to the employment centres of Perth City and Perth Airport, in addition the Resolution Drive corridor which provides access to Bayswater Station and the retail hub of Belmont Forum Shopping Centre.

The Walkscore ratings for a central location within the LSP site are summarised in Figure 5.

Figure 5 - Walkscore Rating for Golden Gateway LSP Site (source: walkscore.com)



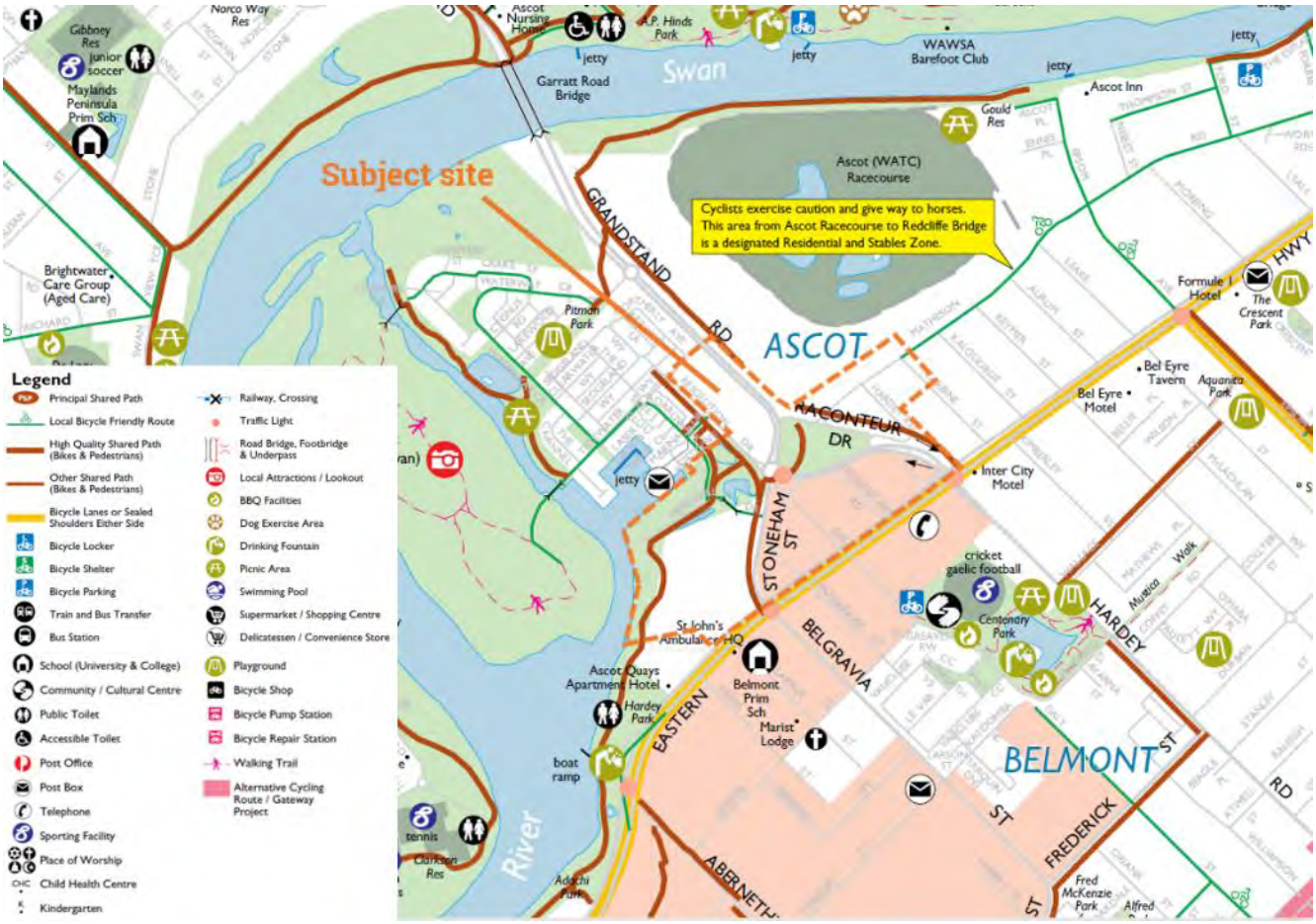
3.3 Cycling Network

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/confident cyclists have recently been provided adjacent to the Golden Gateway LSP site as part of the Great Eastern Highway upgrades. A number of high quality shared use paths providing connections within the LSP site along Stoneham Street, Raconteur Drive and Grandstand Road are provided.

In addition, high quality shared use paths from the LSP site are provided along the Swan River Foreshore (via Belmont Trust Land towards the Graham Farmer Freeway PSP to access Perth City), and along the shoreline within the Ascot Water development. Also streets within the Ascot Waters development are identified as local cycle friendly routes.

Figure 6 – Existing Cycling Network in Relation to the Golden Gateway LSP Site (source: DoT / City of Belmont)



3.4 Public Transport

Access to existing public transport facilities from the site is considered to be average at present, however there are options to make improvements to public transport access if land uses within the Golden Gateway site change over time to support additional public transport service provision.

As shown in Figure 7 the only bus routes that pass through the site are the recently re-numbered Circle Route bus service (98/99 became 998/999). The Circle Route buses operate through the LSP site along Grandstand Road and Resolution Drive. However, no bus stops for these services currently exist within the LSP site, the closest bus stops are located on Grandstand Road immediately to the north of the LSP area (close to the main pedestrian entry/exit to Ascot Racecourse).

Circle Route services provide a high frequency orbital public transport 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 Galleria.

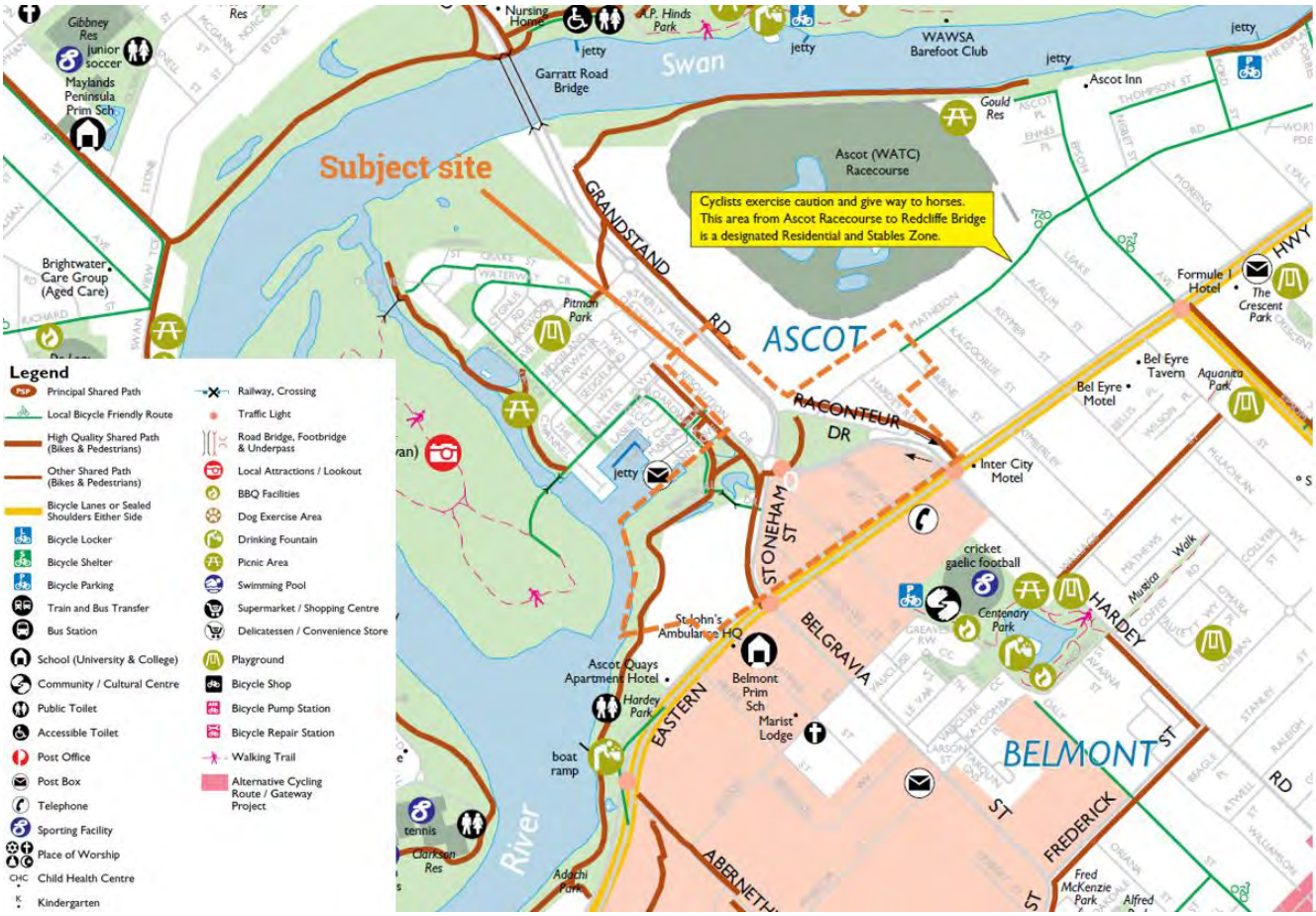
The Circle Route operates on weekdays between 7am-9pm, with a weekday frequency of 10 minutes during the peak periods/daytime and 15 minutes outside of those time. The Circle Route also operates on weekends between 7am-7pm, with a 30 minute frequency. In total 131 weekday bus services operate on the Circle Route through the site – 64 weekday bus services towards Bayswater Train Station and 67 weekday bus services towards Belmont Forum.
In addition, bus routes 36, 40, 295, 296 and 299 operate along Great Eastern Highway along the southern boundary of the site. All five of the bus routes serve Elizabeth Quay Bus Station, St Georges/Adelaide Terrace, Victoria Park

Transfer Station and Great Eastern Highway adjacent to the Golden Gateway LSP site. Additional details for each of the routes is provided below.

- Bus Route 36 – continues along Great Eastern Highway and serves Guildford and Midland (terminating at Midland Station). Weekdays buses operate every 30 mins during the day and hourly at other times.
- Bus Route 40 – continues along Great Eastern Highway and serves Perth Domestic Airport (Terminals 3 & 4) via Fauntleroy Avenue. Weekdays buses operate every 30 minutes.
- Bus Route 295, 296 and 299 – continues along Great Eastern Highway, Great Eastern Highway Bypass, Kalamunda Road or Gooseberry Hill Road, Canning Road to Kalamunda (terminating at Kalamunda Bus Depot). Weekdays buses operate hourly.

In total 205 weekday bus services operate along Great Eastern Highway past the Golden Gateway site – 99 weekday bus services from Elizabeth Quay Bus Station to the bus stop adjacent to the site (and onto destinations to the east of the site), and 106 weekday bus services from the bus stop adjacent to the site towards Elizabeth Quay Bus Station via St Georges/Adelaide Terrace.

Figure 7 – Existing Public Transport Network in Relation to the Golden Gateway LSP Site (source: Transperth / City of Belmont)



3.5 Road Network

The localised road network surrounding the Golden Gateway LSP site includes major regional through routes (Great Eastern Highway to Canning Highway) coupled with a network of local distributor and access roads on either side of the Great Eastern Highway corridor.

Great Eastern Highway is classified as a Primary Distributor under the MRWA Functional Road Hierarchy, the details of which are set out in Table 3. Grandstand Road, Resolution Drive and Stoneham Street are classified District Distributor A roads and all other roads are classified as Access Roads. The overall local road hierarchy is shown in Figure 8.

The posted speed limit for Great Eastern Highway, Grandstand Road, Resolution Drive, Stoneham Street and Raconteur Drive is 60km/h, with all other roads in the immediate area of the Golden Gateway LSP site having a posted speed limit of 50km/h.

In addition, a 40km/h School Zone speed limit is in force to the south of Great Eastern Highway on Belgravia Street and Lapage Street, which run either side of Belmont Primary School. The posted speed limits extracted from the MRWA Road Information Mapping System is shown in Figure 9.

Table 3 - MRWA Road Hierarchy Criteria (source: MRWA)

METROPOLITAN ROAD HIERARCHY
ROAD TYPES AND CRITERIA

		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 8 - Local Road Hierarchy in Relation to the Golden Gateway LSP Site (source: MRWA)

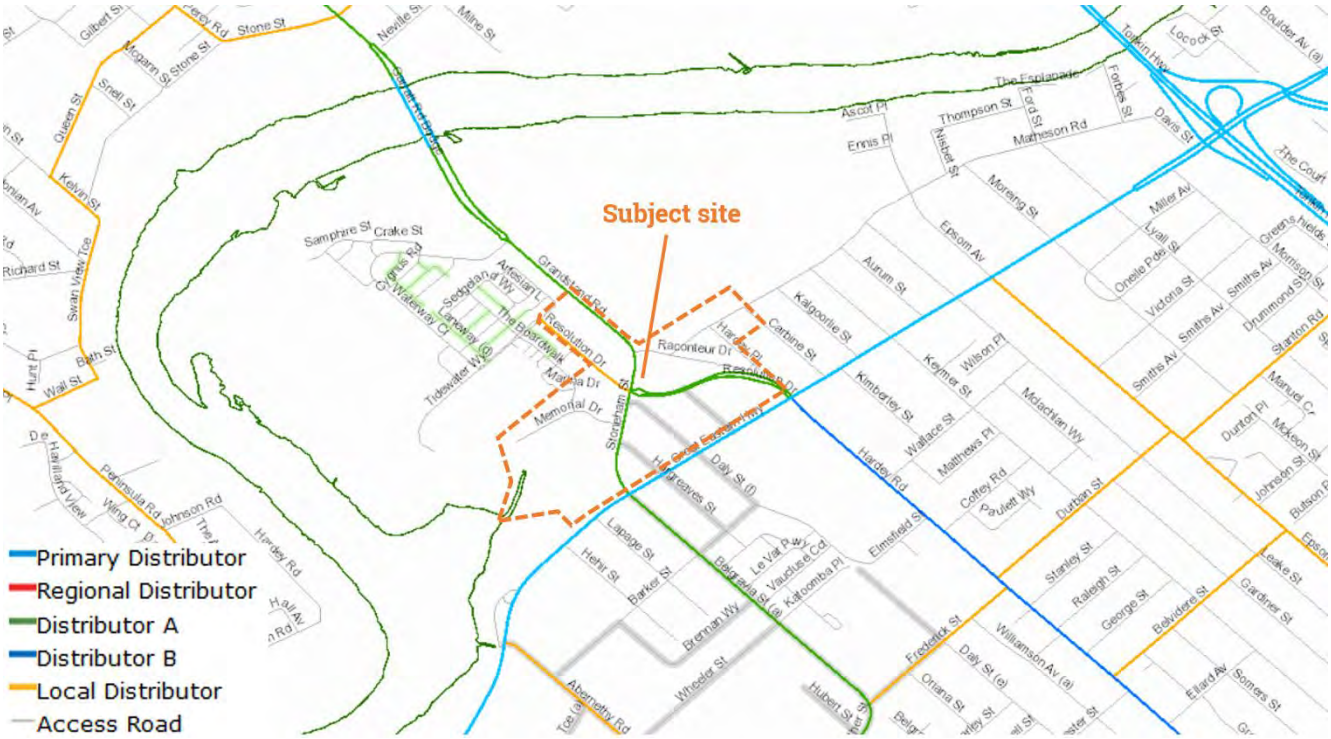
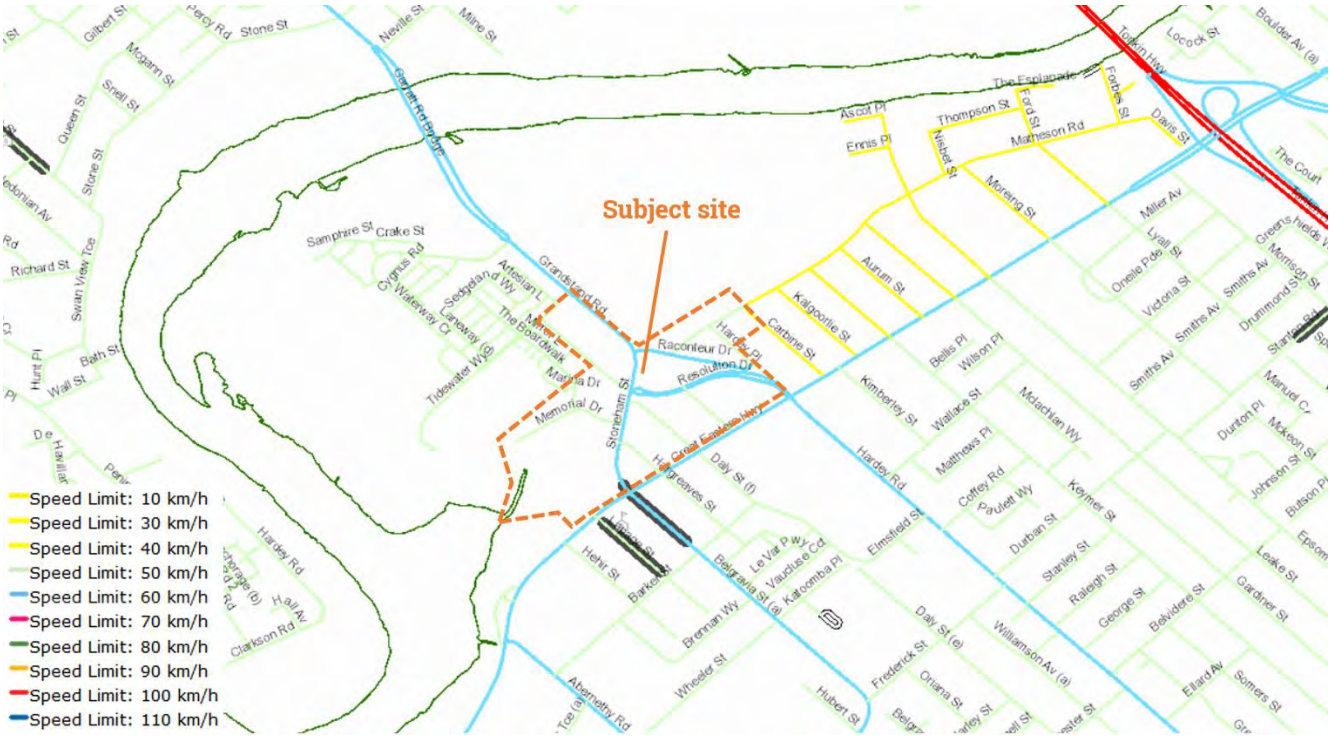


Figure 9 - Speed Limits in Relation to the Golden Gateway LSP Site (source: MRWA)



3.5.1 Regional Roads

The Golden Gateway site has Great Eastern Highway running along its southern boundary. Great Eastern Highway is one of the State's principal transport corridors carrying over 65,000 vehicles per day and is designated as a Primary Distributor under the control of MRWA.

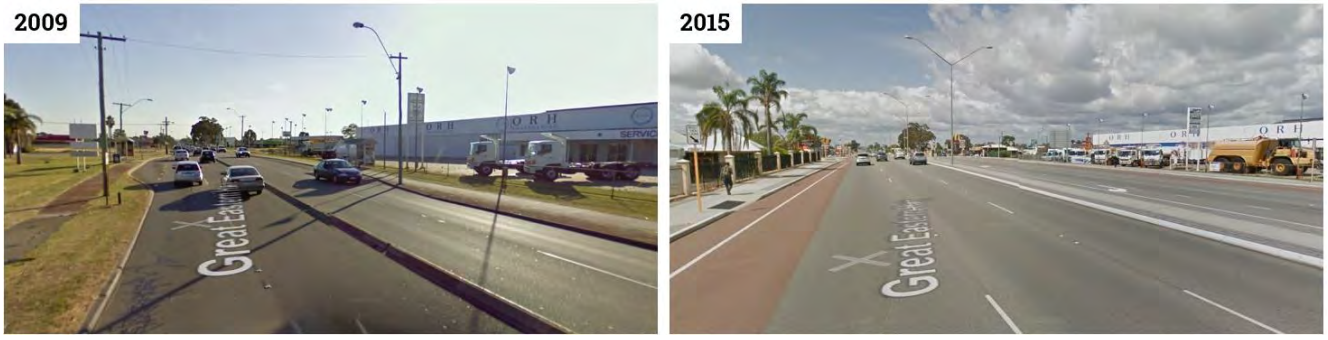
Great Eastern Highway connects Perth Airport, and suburbs to the east of the airport, to central Perth. Between June 2011 and February 2013 Great Eastern Highway, from Kooyong Road in Rivervale to Tonkin Highway in Redcliffe, was subject to significant upgrade works. These works included:

- Widening Great Eastern Highway, from four to six lanes, between Kooyong Road (Rivervale) and Tonkin Highway (Redcliffe) – a distance of 4.2km;
- 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 Great Eastern 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.

Figure 10 shows the upgrade works completed by Main Roads WA (MRWA) in 2013. Figure 11 shows the Great Eastern Highway corridor adjacent to the Golden Gateway site before and after the works.

Figure 10 - Great Eastern Highway Upgrades – June 2011 to February 2013 (source: MRWA)

Figure 11 - Great Eastern Highway corridor adjacent to Golden Gateway Site – 2009 and 2015 view eastbound prior to Daly Street intersection (source: Google Streetview)



3.5.2 District and Local Roads

The Golden Gateway site has a number of key district road connections running through the site, these include:

- Grandstand Road – a four lane road with a central median, running north-south within the site, connecting the Garratt Road crossing of the Swan River with Great Eastern Highway via Stoneham Street or Resolution Drive – see Figure 12;
- Stoneham Street – a four lane road without a central median, running north-south within the site, connecting Grandstand Road/Resolution Drive with Great Eastern Highway and Belgravia Street – see Figure 12; and
- Resolution Drive – a four lane with a central median, running east-west within the site, connecting Grandstand Road/Stoneham Street with Great Eastern Highway and Hardey Road – see Figure 12.

Grandstand Road, Stoneham Street, Resolution Drive and Belgravia Street are classified as District Distributor A roads, while Hardey Road is classified as a District Distributor B road. All of these roads are under the control of the City of Belmont.

Figure 12 - Typical Layout of District Roads within the Golden Gateway Site (source: Google Streetview)

The Golden Gateway site has a number of local road connections running through the site:

- Hargreaves Street – a two lane road without a central median, running northwest-southeast within the site, providing a connection between Stoneham Street (no right turn out) and Great Eastern Highway (left in/left out only) – see Figure 13;
- Daly Street – a two lane road without a central median, running northwest-southeast within the site, providing a connection between Stoneham Street (left out only onto Stoneham Street) and Great Eastern Highway (left in/left out only) – see Figure 13;
- Grandstand Road (south) – a two lane road without a central median, running northwest-southeast within the site, providing a connection between Resolution Drive and Great Eastern Highway (left in/left out only) – see Figure 13;
- Raconteur Drive – 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.

All of these roads are classified as Access Roads in Table 3 and are under the control of the City of Belmont.

Figure 13 - Typical Layout of District Roads within the Golden Gateway Site (source: Google Streetview)

3.6 Existing Traffic Volumes

A range of sources for traffic data have been examined in relation to the road network surrounding the Golden Gateway site, these were:

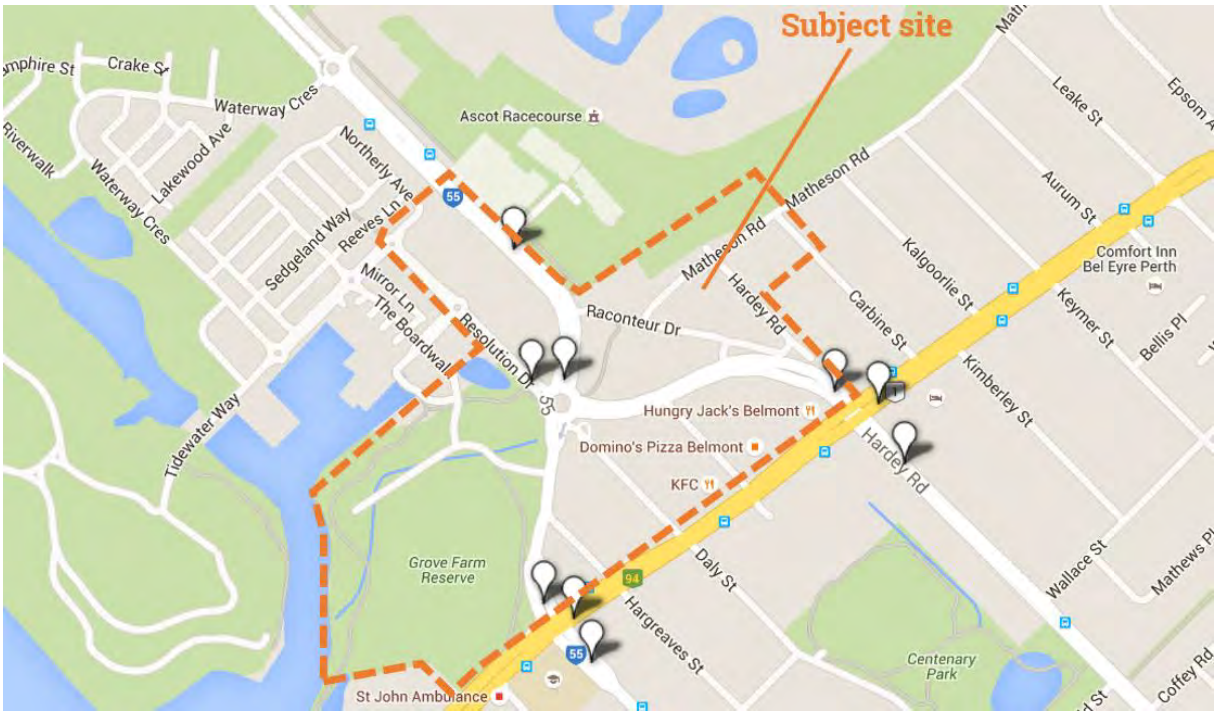
- MRWA online traffic counts map.
- MRWA online request for updated traffic digest information.
- MRWA online request for SCATS count data from the nearest traffic signal controlled intersections:
  - Great Eastern Highway/Stoneham Street/Belgravia Street Intersection; and
  - Great Eastern Highway/Resolution Drive/Hardey Road Intersection.
- City of Belmont traffic volume counts for the Golden Gateway local road network:
  - Hargreaves Street (north and south);
  - Daly Street (north and south); and
  - Grandstand Road (north and south).
- City of Belmont peak hour turning volume count for the following intersection:
  - Grandstand Road/Resolution Drive/Stoneham Street roundabout.

3.6.1 MRWA Traffic Counts Map

The MRWA online counts map was sourced through the MRWA Reporting Centre. Figure 14 sets out the count locations over the past decade where classified or volume counts have been collected by MRWA or others. The most recent two-way daily vehicle count volumes (vpd) for each count location within the Golden Gateway LSP site are provided below:

Garratt Road Bridge	2007/08	14,990 vpd
Grandstand Road (north of Raconteur Dr)	2008/09	8,670 vpd
Resolution Drive (north of Great Eastern Hwy)	2008/09	9,070 vpd
Stoneham Street (north of Great Eastern Hwy)	2004/05	12,850 vpd
Great Eastern Highway (east of Belgravia St)	2008/09	48,870 vpd
Great Eastern Highway (east of Hardey Rd)	2008/09	50,530 vpd

Figure 14 - MRWA Online Counts Map (source: MRWA)



3.6.2 MRWA Traffic Digest Information

Details from the MRWA online traffic digest were also reviewed to examine if any recent counts had been undertaken.

More recent counts than those displayed on the MRWA Online Counts Map are contained within the Traffic Digest Report for Resolution Drive, Stoneham Street and Great Eastern Highway (adjacent to the LSP site). The count details are displayed below:

- Resolution Drive (north of Great Eastern Hwy) 2013/14 9,020 vpd
- Stoneham Street (north of Great Eastern Hwy) 2013/14 15,170 vpd
- Great Eastern Highway (west of Grandstand Rd) 2014/15 64,860 vpd
- Great Eastern Highway (east of Hardey Rd) 2014/15 66,520 vpd

SCATS count data was also obtained from MRWA in order to verify the traffic volumes contained within the Traffic Digest Report (above). SCATS data is described in the following section.

3.6.3 SCATS Traffic Count Data

An online request for SCATS data was submitted to MRWA for recent volume count information for the traffic signals at the intersections of:

- Great Eastern Highway/Stoneham Street/Belgravia Street; and
- Great Eastern Highway/Resolution Drive/Hardey Road.

Week day data was provided by MRWA for an average November 2015 period (16.11.15-20.11.15) and March 2016 period (08.03.16-11.03.16 and 14.03.16). These data collection periods were outside of school holidays and no major works or disruptions to the local or regional road network were noted.

SCATS data provides hourly volume of vehicles using each traffic lane through the intersection. Vehicle turning movements at an intersection can be determined based on the allocation of a movement from each traffic lane. Whilst this approach is accurate if only a single turning movement is permitted from a traffic lane, however if a traffic lane permits shared turning movements then on-site observations are required to determine an accurate split between the permitted turning movements.

On-site observations were completed on Wednesday 27 April 2016 and Thursday 28 April 2016. The on-site data collection was used to determine the split in turning movements from shared lanes and general operation of the two traffic signal controlled intersections and the approaches to these intersections.

Table 4 and Table 5 shows the peak hour turning volumes and percentages at the Great Eastern Highway/Stoneham Street/Belgravia Street intersection and Table 6 and Table 7 shows the peak hour turning volumes and percentages at the Great Eastern Highway/Resolution Drive/Hardey Road intersection.

Turning volumes show that in total between 5,150-5,750 vehicles travel through the Great Eastern Highway/Stoneham Street/Belgravia Street intersection during the peak hours and between 4,650-5,050 vehicles travel through the Great Eastern Highway/Resolution Drive/Hardey Street intersection during peak hours.

Table 4 - Great Eastern Highway / Stoneham Street / Belgravia Street Intersection – 2016 Turning Volumes (source: MRWA SCATS Data)

Time Period	Stoneham Street				Great Eastern Highway (east)				Belgravia Street				Great Eastern Highway (west)				TOTAL
	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	
0800-0859	7	248	457	**712**	191	2,313	29	**2,532**	111	105	126	**341**	165	1,308	101	**1,574**	**5,159**
1600-1659	9	170	269	**448**	77	1,636	35	**1,747**	64	428	217	**710**	537	2,227	70	**2,834**	**5,739**

Table 5 - Great Eastern Highway / Stoneham Street / Belgravia Street Intersection – 2016 Turning Percentages (source: MRWA SCATS Data)

Time Period	Stoneham Street				Great Eastern Highway (east)				Belgravia Street				Great Eastern Highway (west)			
	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total
0800-0859	1%	35%	64%	**100%**	8%	91%	1%	**100%**	33%	30%	37%	**100%**	10%	83%	7%	**100%**
1600-1659	2%	38%	60%	**100%**	4%	94%	2%	**100%**	9%	60%	31%	**100%**	19%	79%	2%	**100%**

Table 6 - Great Eastern Highway / Resolution Drive / Hardey Street Intersection – 2016 Turning Volumes (source: MRWA SCATS Data)

Time Period	Resolution Drive				Great Eastern Highway (east)				Hardey Street				Great Eastern Highway (west)				TOTAL
	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	
0800-0859	137	131	61	**329**	106	2,425	132	**2,663**	88	138	89	**315**	22	1,271	66	**1,359**	**4,666**
1600-1659	127	125	29	**280**	139	1,650	163	**1,951**	53	141	144	**338**	37	2,289	143	**2,469**	**5,038**

Table 7 - Great Eastern Highway / Resolution Drive / Hardey Street Intersection – 2016 Turning Percentages (source: MRWA SCATS Data)

Time Period	Resolution Drive				Great Eastern Highway (east)				Hardey Street				Great Eastern Highway (west)			
	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total	Left	Ahead	Right	Total
0800-0859	42%	40%	18%	**100%**	4%	91%	5%	**100%**	28%	44%	28%	**100%**	2%	93%	5%	**100%**
1600-1659	45%	45%	10%	**100%**	7%	85%	8%	**100%**	16%	42%	42%	**100%**	1%	93%	6%	**100%**

3.6.4 City of Belmont Local Road Traffic Count Data

In order to gain a clear understanding of the level of traffic generated by existing land uses within the developed area of the Golden Gateway site, the City of Belmont collected traffic data for local roads during August 2016.

The City of Belmont utilised four traffic counters to collect volumetric traffic count data for six locations across two separate weeks. The following data was collected:

- Week 1: Daly Street and Grandstand Road
  - Traffic counters installed at the northern and southern entry/exit to the local roads
  - Traffic volume data collected for 3 weekdays: Tuesday 16 to Thursday 18 August 2016
- Week 2: Hargreaves Street
  - Traffic counters installed at the northern and southern entry/exit to the local road
  - Traffic volume data collected for 3 weekdays: Tuesday 23 to Thursday 25 August 2016

Figure 15 shows the location of the traffic counters, as well as showing the average weekday traffic volumes at each of the count locations - Table 8, Table 9, Table 10 and Table 11 also present the traffic count data collected. Traffic data for Daly Street and Grandstand Road were collected simultaneously to ensure that any traffic moving between the two streets was collected as both an inbound and outbound movement into and out of the Golden Gateway site.

Figure 15 - Local Road Network Traffic Count Locations and August 2016 Average Weekday Traffic Volumes (map source: City of Belmont)

Note: AWT = Annual Weekday Traffic / VPD = Vehicles Per Day

*Table 8 - **Hargreaves Street Traffic** – August Weekday Traffic Volumes (source: City of Belmont Traffic)*

Movement	Great Eastern Hwy	Stoneham St	TOTAL
IN	139	206	345
OUT	183	126	309
TOTAL	322	332	654

*Table 9 – **Daly Street Traffic** – August Weekday Traffic Volumes (source: City of Belmont Traffic)*

Movement	Great Eastern Hwy	Stoneham St	TOTAL
IN	288	104	392
OUT	178	365	543
TOTAL	466	469	935

*Table 10 – **Grandstand Road Traffic** – August Weekday Traffic Volumes (source: City of Belmont Traffic)*

Movement	Great Eastern Hwy	Resolution Dr	TOTAL
IN	410	641	1,051
OUT	428	517	945
TOTAL	838	1,158	1,996

Traffic data shows that Grandstand Road has approximately 2,000 daily traffic movements, this is double the number of daily traffic movements along Daly Street (approx. 950vpd) and three times more than the number of daily traffic movements along Hargreaves Street (approx. 650vpd).

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.

Hargreaves Street, Daly Street and Grandstand Road all have access to/from Great Eastern Highway to the south. To the north, Hargreaves Street and Daly Street have access to/from Stoneham Street and Grandstand Road has access to/from Resolution Drive. Table 10 shows that approx. 1,150 daily traffic movements access Grandstand Road to/from Resolution Drive, whilst Table 11 shows that approx. 800 daily traffic movements access Hargreaves Street and/or Daly Street to/from Stoneham Street.

This data shows that Grandstand Road carries higher volumes of traffic than Hargreaves Street and Daly Street combined. This is also true with total traffic to/from these local roads with Great Eastern Highway – Grandstand Road carries approx. 850vpd, whilst Hargreaves Street and Daly Street combined carry approx. 800vpd.

*Table 11 – **Traffic to/from Stoneham Street from Hargreaves St and Daly St** – August Weekday Traffic Volumes (source: City of Belmont Traffic)*

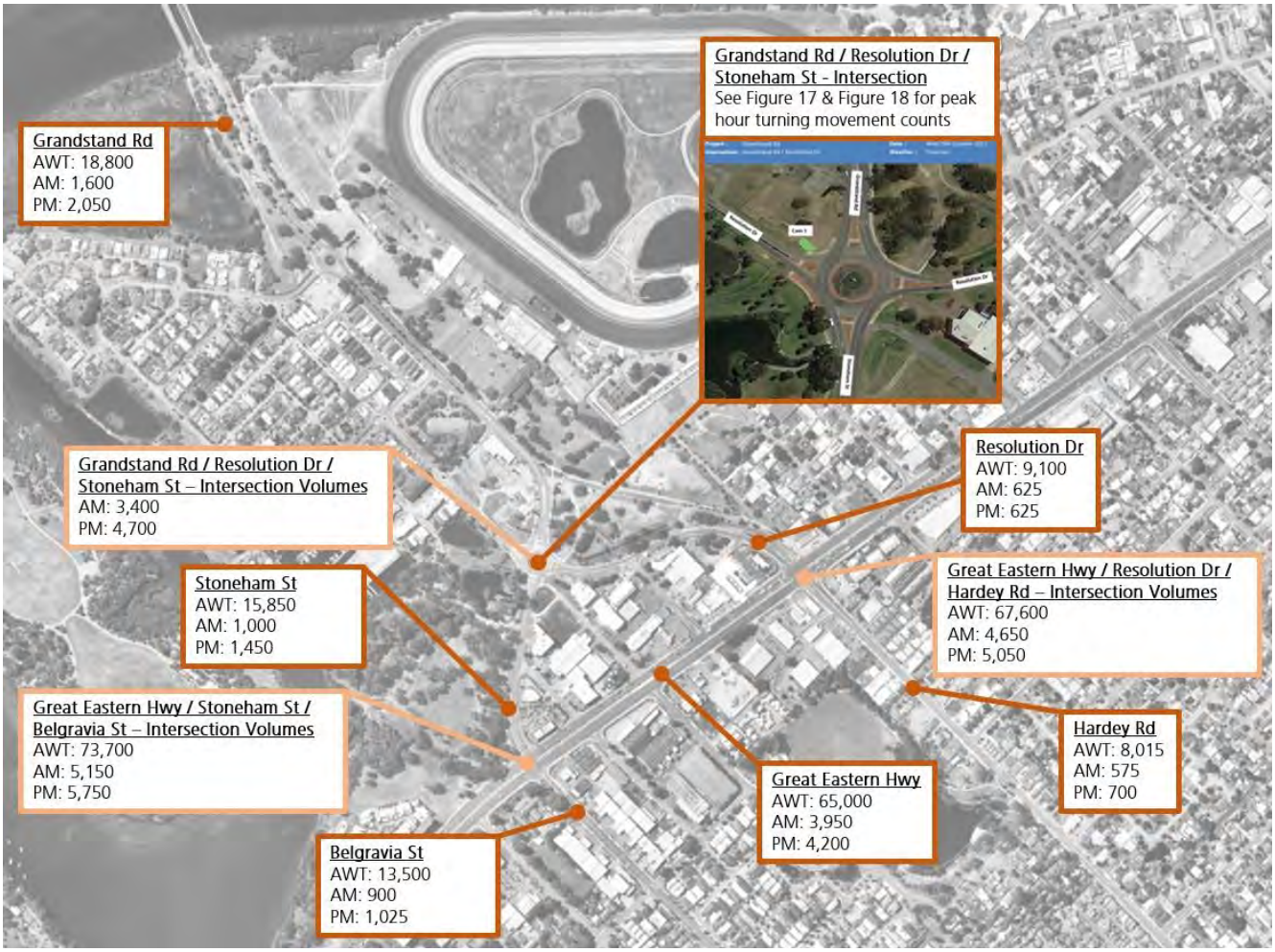
Movement	Great Eastern Hwy	Stoneham St	TOTAL
IN	427	310	737
OUT	361	491	852
TOTAL	788	801	1,589

3.6.5 Collated Link Count Data

Figure 16 shows the collated link flow volumes around the Golden Gateway Precinct, in each instance the figure shows the most recent link flow volume, which are all from 2017. The data has been collated from two sources; recent count data provided by the City of Belmont and count data from the online MRWA traffic counts map.

The existing traffic count data shows two-way link volume data for average weekday traffic (AWT), for the AM peak hour of 0800-0900 (AM) and the PM peak hour of 1600-1700 (PM).

Figure 16 - Two-way Link Volume Traffic Count Data (sources: City of Belmont and Main Roads WA)



3.6.6 City of Belmont Peak Hour Turning Movement Data

In order to assist with gaining an accurate understanding of the operation of the Grandstand Road/Resolution Drive/Stoneham Street roundabout, a peak period turning movement survey was also undertaken.

The turning movement survey was completed using a video camera erected on a mask located between the Grandstand Road (northern leg of the intersection) and Resolution Drive (western leg of the intersection) – on the edge of the Ascot Kilns site.

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.

The turning movement data was collected on Wednesday 25 October 2017 during the following peak periods:

- AM peak – 0745-0915; and
- PM peak – 1545-1715.

Figure 17 shows the turning movement data for the AM peak hour of 0800-0900, and Figure 18 shows the turning movement data for the PM peak hour of 1600-1700.

Figure 17 - Existing 2017 AM Peak Hour (0800-0900) Turning Volumes at Grandstand Road/Resolution Drive/Stoneham Street Intersection

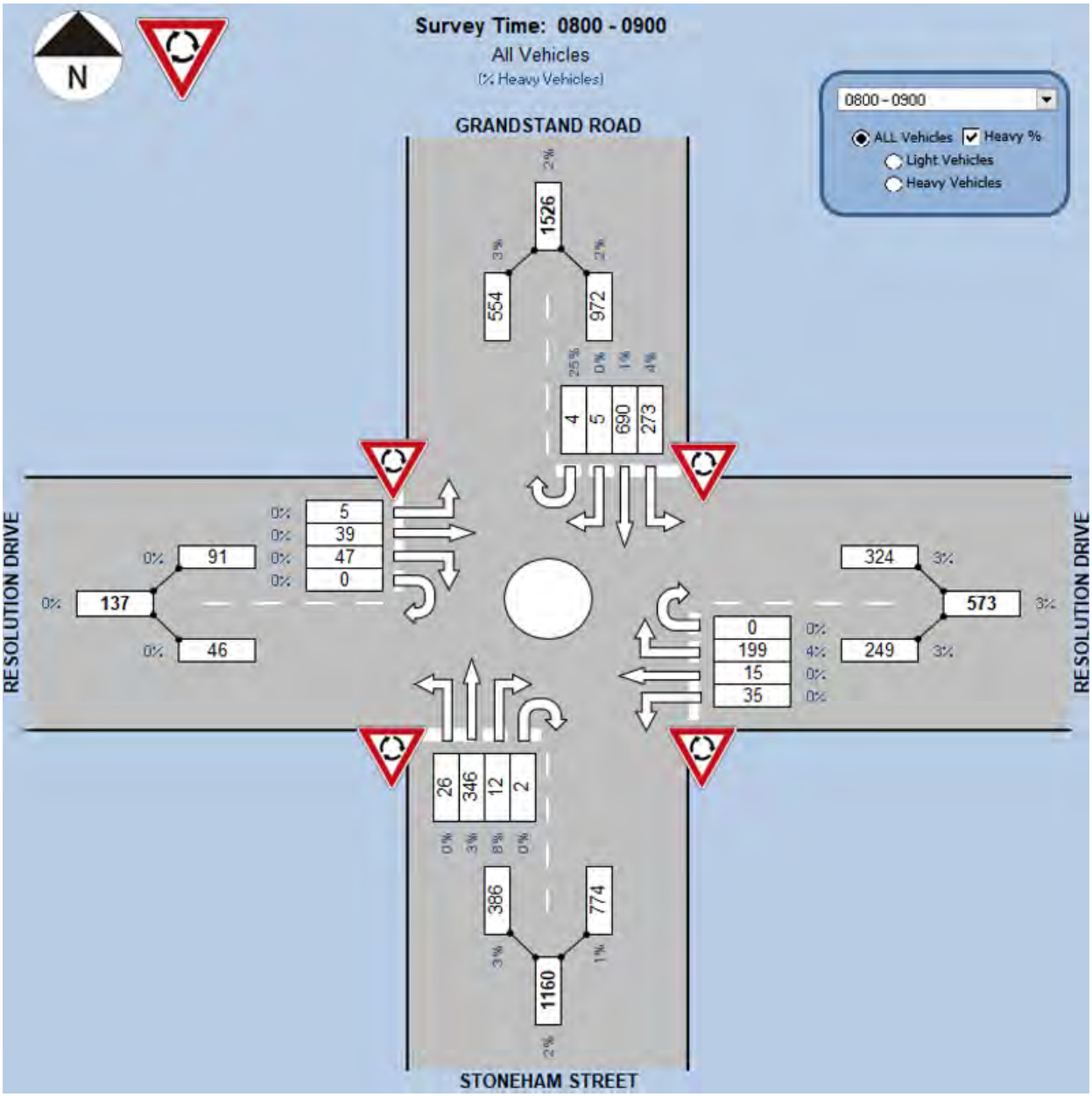
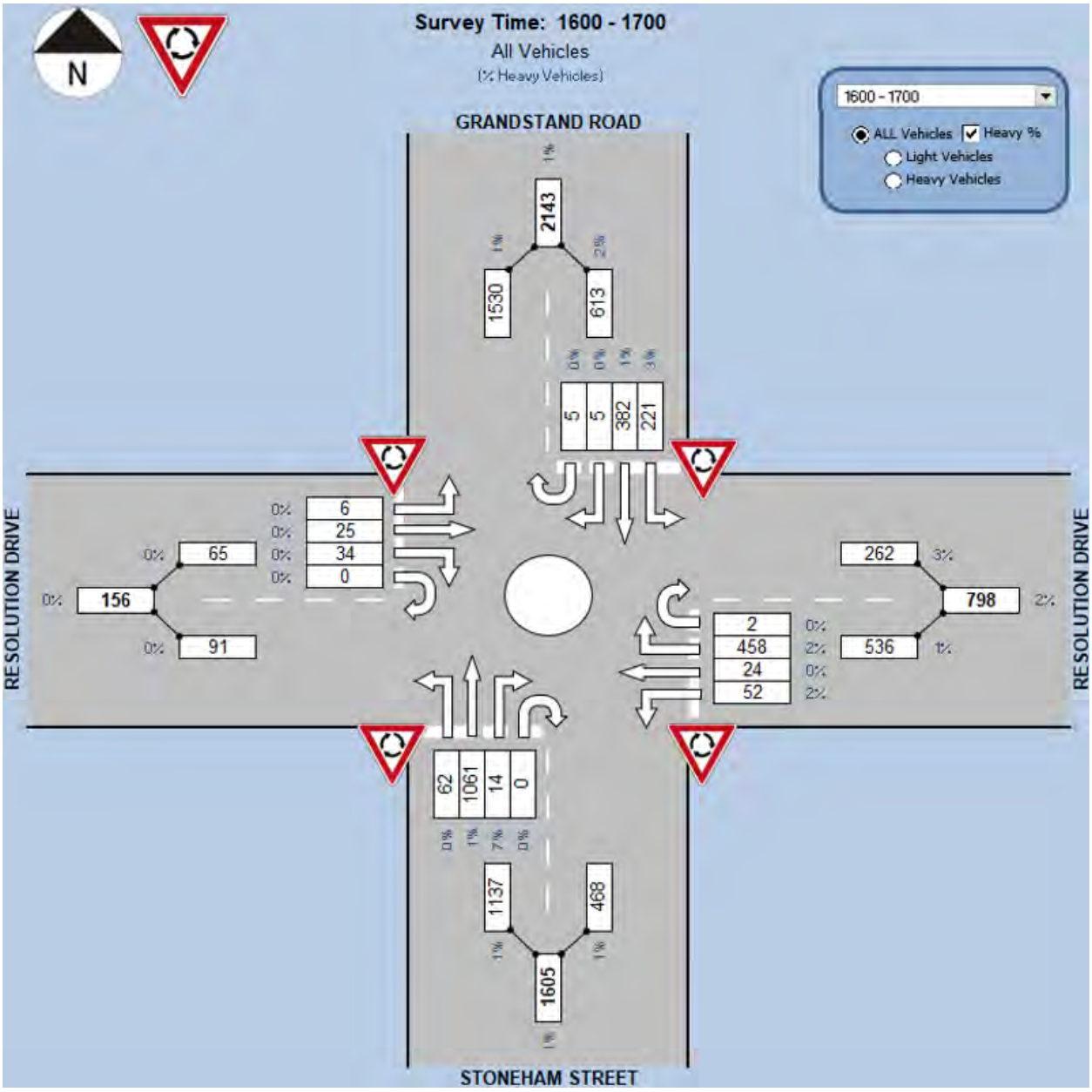


Figure 18 - Existing 2017 PM Peak Hour (1600-1700) Turning Volumes at Grandstand Road/Resolution Drive/Stoneham Street Intersection



A review of the video footage for the AM and PM peak hours shows that there was very limited queuing during these periods on the day of the survey.

Figure 19 shows a still image from the AM peak hour which shows two vehicles queuing on the Resolution Drive west arm (Ascot Waters access). During the AM peak hour on this approach to the intersection the queue did not exceed two vehicles and the maximum delay experienced was 20 seconds. The Resolution Drive east arm had a queue of 6 vehicles on two occasions in the peak hour and both times the queue cleared with a 15 second delay. At all other times the intersection operated with free flow conditions during the AM peak hour.

Figure 20 shows a still image from the PM peak hour which shows vehicles queuing on the Resolution Drive west arm (ascot Waters access). During a short 3 minute period within the peak hour this approach had a queue length of 6 vehicles with an average delay of 90 seconds. However, for the remaining 57 minutes of

the peak hour no queue exceeded 3 vehicles with maximum delays of 20 seconds. On occasions the Resolution Drive east arm and Stoneham Street south arm had queues of 6 vehicles (in the case of the Stoneham Street approach this was 6 vehicles in each of the two approach lanes), which cleared with a 15-20 second delay. At all other times the intersection operated with free flow conditions during the PM peak hour.

It should be noted that due to the viewing angle of the survey video camera, it is not possible to see the Grandstand Road approach to the intersection, and therefore it is not possible to comment on queueing on that approach to the roundabout.

Figure 19 - AM Peak Hour (0800-0900) Video Survey Image from 08:12

Figure 20 - PM Peak Hour (1600-1700) Video Survey Image from 16:51

4. INTERNAL TRANSPORT NETWORKS

4.1 Changes to Existing Road Network

As set out in the Structure Plan Report, the movement network proposals include retention of the broad framework of the existing road network and primacy of existing major traffic movements. Within this movement network the Golden Gateway Precinct will be developed as a livable mixed use area with high levels of amenity, access to local retail, food and beverage outlets, public open space and the Swan River foreshore.

Figure 21 shows the Golden Gateway Structure Plan and the following changes to the existing road network are evident:

- Resolution Drive: Resolution Drive currently connects between the Great Eastern Highway/Hardey Road traffic signal controlled intersection and the Grandstand Road/Resolution Drive/Stoneham Street roundabout. This section of Resolution Drive will be realigned via the historical Raconteur Drive alignment.
    - Resolution Drive will connect between the Great Eastern Highway/Hardey Road traffic signal controlled intersection and a relocated Grandstand Road/Resolution Drive/Stoneham Street roundabout – adjacent to the Ascot Kilns LDP area.
    - The Grandstand Road/Resolution Drive/Stoneham Street roundabout will be relocated approximately 125m to the northeast of its existing location, and will become a three arm roundabout.
    - 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 existing lane arrangement.
    - There will be a single intersection on the north side of Resolution Drive between Great Eastern Highway and the Grandstand Road/Resolution Drive/Stoneham Street roundabout. The intersection will be at a midway point along Resolution Drive and provide access to the northern area of the Golden Gateway Precinct and the Matheson Road corridor. Consequently, direct vehicle access onto Resolution Drive from future lots that abut the north side of Resolution Drive will not be permitted. The new intersection is expected to take the form of an all movements 'seagull' intersection with separate left turn/right turn lanes from the Golden Gateway Precinct and a right turn auxiliary lane from Resolution Drive into the Golden Gateway Precinct.
    - Any limitation on direct vehicle access onto Resolution Drive, between Great Eastern Highway and the Grandstand Road/Resolution Drive/Stoneham Street roundabout, from the existing lots that abut the south side of Resolution Drive, will be subject to further consideration and any changes to the land assembly.

- Stoneham Street: Stoneham Street currently connects between the Great Eastern Highway/Belgravia Street traffic signal controlled intersection and the Grandstand Road/Resolution Drive/Stoneham Street roundabout. This section of road will be retained along its existing alignment, in addition Stoneham Street will be continued through to the new location of the roundabout 125m to the northeast of its existing location.

- Stoneham Street will connect between Great Eastern Highway/Belgravia Street traffic signal controlled intersection and Grandstand Road/Resolution Drive/Stoneham Street roundabout – adjacent to the Ascot Kilns LDP area.
- The Grandstand Road/Resolution Drive/Stoneham Street roundabout will be relocated approximately 125m to the northeast of its existing location, and will become a three arm roundabout.
- The section of Resolution Drive that provides access to the Ascot Waters development and currently creates a four arm roundabout with Grandstand Road and Stoneham Street, will now form a four-way traffic signal controlled intersection with Stoneham Street. The northern section of Daly Street within the Golden Gateway Precinct will be realigned to create the four arm intersection.
- The existing lane arrangement along Stoneham Street will be retained. As such, the Stoneham Street configuration of a four lane undivided road (2 lanes in each direction) will be retained either side of the proposed four way traffic signal controlled intersection with Resolution Drive (Ascot Waters access road) and Daly Street.
- The existing lane arrangements along Resolution Drive (Ascot Waters access road) and Daly Street will be retained. As such, these two roads will remain as two lane divided roads (1 lane in each direction), with a short (15m) left turn slip lane at the traffic signal controlled intersection (with the left turn slip operating under give-way control).
- The traffic signal controlled intersection of Stoneham Street/Resolution Drive (Ascot Waters access road)/Daly Street, would feature signal controlled pedestrian crossing facilities across all four approaches at the intersection. This will provide safe pedestrian crossing facilities to connect the Golden Gateway Precinct with Ascot Waters and the amenity provided by the Swan River foreshore.
- The existing access arrangement at the Hargreaves Street and Stoneham Street intersection will be retained, as such this intersection will remain left-in/left-out only.
- The existing access arrangements from Stoneham Street to access the riverside car park within the Belmont Trust land will remain unchanged. As such the existing all movements access arrangements will remain and the access road to the riverside car park with remain unchanged as a single lane access road in each direction.

- Hargreaves Street, Daly Street and Grandstand Road (south): the minor roads of Hargreaves Street and Daly Street currently connect between Great Eastern Highway and Stoneham Street, whilst Grandstand Road (south) connects between Great Eastern Highway and Resolution Drive. It is proposed that Hargreaves Street and Daly Street will continue along their existing alignments and connect between Great Eastern Highway and Stoneham Street. Grandstand Road (south) will be realigned at a midway point to connect into Daly Street.
  - Hargreaves Street, Daly Street and Grandstand Road (south) intersections with Great Eastern Highway will be retained as per the existing left-in/left-out arrangement.
  - The existing access arrangement at the Hargreaves Street and Stoneham Street intersection will be retained, as such this intersection will remain left-in/left-out only.
  - Daly Street will form a four-way traffic signal controlled intersection with Stoneham Street and Resolution Drive (Ascot Waters). The northern section of Daly Street within the Golden Gateway Precinct will be realigned to create the four arm intersection.
  - The traffic signal controlled intersection of Stoneham Street/Resolution Drive (Ascot Waters access road)/Daly Street, would feature signal controlled pedestrian crossing facilities across all four approaches at the intersection. This will provide safe pedestrian crossing facilities to connect the Golden Gateway Precinct with Ascot Waters and the amenity provided by the Swan River foreshore.

- Grandstand Road (south) intersection with Daly Street would be priority controlled with Grandstand Road (south) being the minor leg of the intersection.
- Hargreaves Street, Daly Street and Grandstand Road (south) would take the form of two lane roads (1 lane in each direction). On-street parking will be provided along each street where appropriate.

- Matheson Road: Matheson Road provides access to residential/stable land holdings located between Ascot Racecourse and Great Eastern Highway. A connection between Matheson Road and Great Eastern Highway is made via a number of north-south connecting streets, and connection from Matheson Road to Resolution Drive is via a modified road connection.
  - Matheson Road will continue to connect through to a realigned Resolution Drive via a modified road network, which will provide access to new development Lots but not prioritise Matheson Road as a through route.
  - The form of intersection between Matheson Road and Resolution Drive will be subject to further detailed design. It is expected that this intersection would be priority controlled with Matheson Road being the minor leg of the intersection (in the form of a seagull intersection). This will ensure the Grandstand Road/Resolution Drive corridor is the primary route through the Golden Gateway Precinct.
  - Matheson Road and internal development roads would take the form of two lane roads (one lane in each direction). On-street parking will be provided along streets where appropriate.

Figure 21 – Golden Gateway Structure Plan Road Network and Built Form (source: Taylor Burrell Barnett)

4.2 Role and Function of Key Roads

4.2.1 Great Eastern Highway

The Great Eastern Highway corridor will present itself as a strong, unified commercial and mixed-use edge to the Golden Gateway development.

Commercial uses will be encouraged at ground-level and above with residential development to occupy upper storeys.

Building(s) at the junctions of Stoneham Street and Resolution Drive will feature a distinctive and iconic built form which mark an 'arrival' point to the Golden Gateway.

Great Eastern Highway will remain in its current form and no changes are proposed to the existing road connections with Great Eastern Highway nor the form of intersections between Great Eastern Highway and connecting roads.

4.2.2 Stoneham Street

Stoneham Street will be the primary interface between the Golden Gateway development 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. The form of Stoneham Street will be retained as a four lane divided road (two lanes in each direction) with a median strips on approaches to main intersections and a painted dividing line mid-block. Indented on-street parking may be considered adjacent to the Golden Gateway development at detailed design stage to support local ground floor commercial activities along the corridor.

The intersection of Stoneham Street/Resolution Drive (Ascot Waters access road)/Daly Street will operate as a traffic signal controlled intersection. The intersection would feature signal controlled pedestrian crossing facilities across all four approaches. This will provide safe pedestrian crossing facilities to connect the Golden Gateway Precinct with Ascot Waters and the amenity provided by the Swan River foreshore.

Development addressing Stoneham Street is to provide an appropriate interface to the Belmont Trust Land to ensure a high standard of visual amenity and surveillance within a mixed-use environment.

4.2.3 Resolution Drive

Resolution Drive is intended to accommodate primarily residential uses with the potential commercial uses at ground level. Ground level development on the south side may be residential or commercial but will be designed to accommodate non-residential use.

Resolution Drive will be realigned along the Raconteur Drive alignment and the existing Grandstand Road/Resolution Drive/Stoneham Street roundabout will be relocated approximately 125m to the northeast of its existing location, and will become a three arm roundabout.

The existing lane arrangements of Grandstand Road and Resolution Drive will remain unchanged with the same configuration of lanes on approach and exit to the relocated Grandstand Road/Resolution Drive/Stoneham Street roundabout.

Direct vehicle access onto Resolution Drive will not be permitted for future lots which abut the north side of Resolution Drive. However, any vehicle access restrictions for existing lots on the south side of Resolution Drive will be subject to further consideration and any changes to the land assembly.

Trees will line either side of Resolution Drive to create an attractive pedestrian environment connecting with the central open space area.

4.2.4 Daly Street (Main Street)

It is proposed that Daly Street will become the community centre for the development. The precinct is intended to perform a local centre function, anchored by a small supermarket and supported with local specialty shops, and restaurant/cafes. Retail development must present a 'Main Street' character, with active edges to the street.

It is proposed that a leafy boulevard will provide a shared vehicle pedestrian space, providing a pleasant public realm against an active street frontage.

Daly Street will take the form of two lane roads (one lane in each direction). On-street parking will be provided along each street within the Golden Gateway Precinct where appropriate.

4.3 Road Hierarchy

Figure 22 shows the proposed road hierarchy. This is also explained in more detail below.

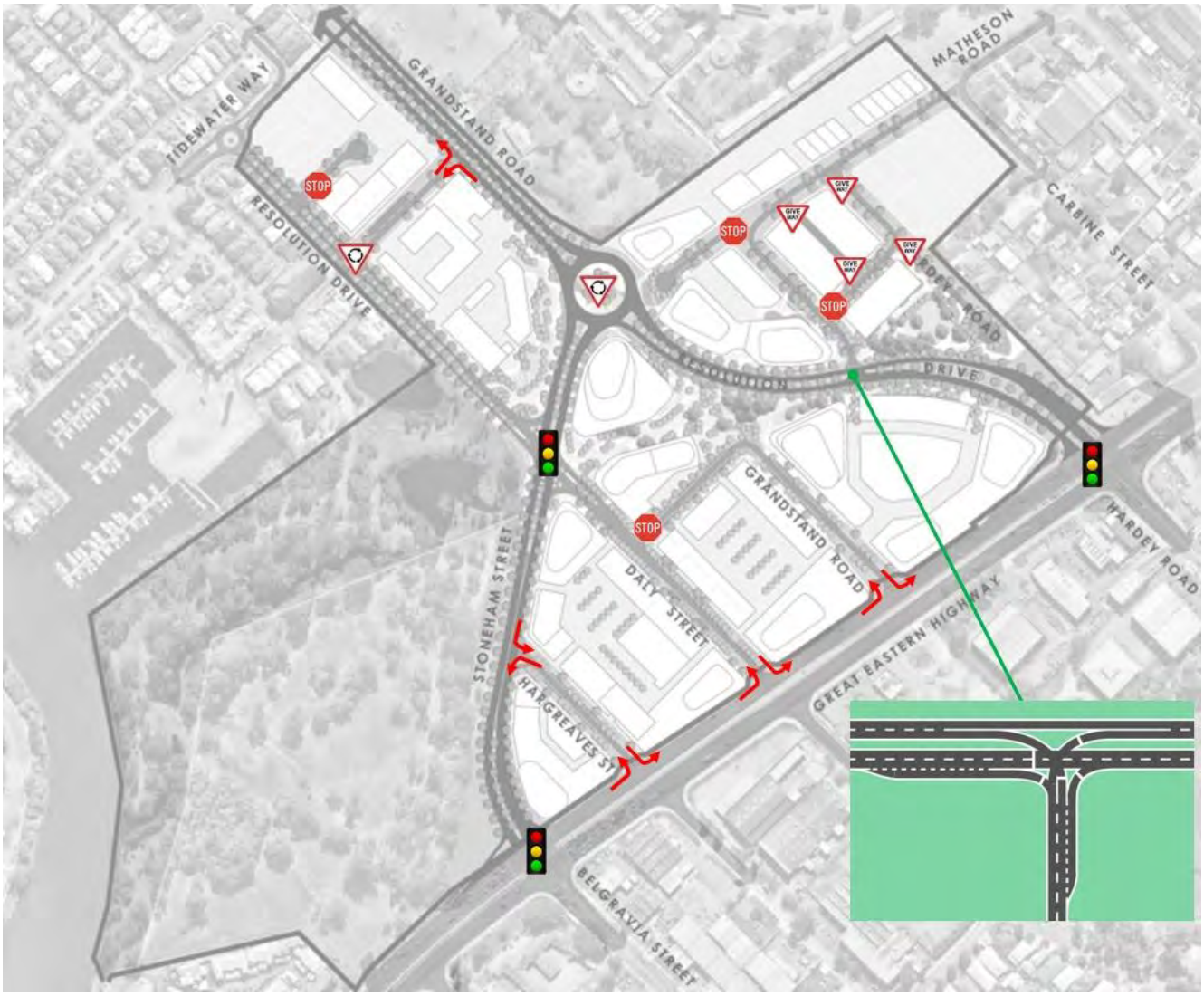
- Primary Distributor:
  - Great Eastern Highway would be retained as a Primary Distributor road
- Distributor A:
  - Stoneham Street would be retained as a Distributor A road
  - Resolution Drive/Grandstand Road would be retained as a Distributor A road
  - Belgravia Street would be retained as a Distributor A road
- Distributor B:
  - Hardey Road would be retained as a Distributor B road
- Local Distributor:
  - Resolution Drive (Ascot Waters access road) between Stoneham Street and Tidewater Way would be retained as a Local Distributor road
- Access Roads:
  - Hargreaves Street would be retained as an Access Road
  - Daly Street would be retained as an Access Road
  - Grandstand Road (south) would be retained as an Access Road
  - Matheson Road would be retained as an Access Road

Figure 22 – Golden Gateway Structure Plan Road Hierarchy (source: Taylor Burrell Barnett)

4.4 Intersection Controls

The forms of proposed intersection controls detailed in Section 4.1 are shown Figure 23.

Figure 23 - Proposed Intersection Controls for Golden Gateway Development



4.5 Pedestrian/Cycle Network and Crossing Facilities

4.5.1 Existing Pedestrian/Cycle Facilities

The extent and quality of the existing pedestrian infrastructure within and surrounding the Golden Gateway site is of a standard commensurate with the extent of existing development and form of land uses across the site, i.e. there are a number of existing undeveloped Lots and those that are developed primarily accommodate light industrial/commercial unit style development. The existing local pedestrian infrastructure is summarised as follows for the major road network and minor road network.

- Major Road Corridors:
  - Great Eastern Highway – within the vicinity of the LSP site, the 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.

- Grandstand Road, Raconteur Drive, Resolution Drive and Stoneham Street – all 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, Resolution Drive along the eastern side of the street adjacent to the Ascot Waters development and Stoneham Street along the western side of the street adjacent to the Belmont Trust Land.

- Minor Road Corridors:
  - Hargreaves Street, Daly Street and Grandstand Road (south) – provide access to the light industrial/commercial units in this area of the site. None of these three street have footpath, which reinforces the fact that access to these land uses are primarily designed to be by private vehicle rather than on foot.

The extents of the existing cycle network are set out in Section 3.3. 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 provided to the site. The local and regional cycling network is shown in Figure 6.

Good on road cycling routes for experienced/confident cyclists have recently been provided adjacent to the Golden Gateway LSP site as part of the Great Eastern Highway upgrades. A number of high quality shared use paths providing connections within the LSP site along Stoneham Street, Raconteur Drive and Grandstand Road are provided.

In addition, high quality shared use paths from the LSP site are provided along the Swan River Foreshore (via Belmont Trust Land towards the Graham Farmer Freeway PSP to access Perth City), and along the shoreline within the Ascot Water development. Also, streets within the Ascot Waters development are identified as local cycle friendly routes.

4.5.2 Proposed Pedestrian/Cycle Facilities

Figure 24 shows the proposed shared path connections through the Golden Gateway development. It should be noted that all existing shared paths surrounding and through the site will be maintained and many of these existing connections enhanced by additional shared path connectivity including:

- Retention of the shared path along the northern/western side of Stoneham Street.
- The Stoneham Street shared path will be enhanced with a formalised connection through to Matheson Road (Matheson Road is currently identified as a good road riding environment) – the form of crossing of Resolution Drive will be subject to further detailed design.
- Shared path connections will be provided along Hargreaves Street, Daly Street and Grandstand Road (south). These will provide connectivity between the Great Eastern Highway on-road bike lanes and the shared path network along Stoneham Street and through the public open space corridor running east-west through the Golden Gateway site.
- In addition to the existing pedestrian crossing facilities at the Great Eastern Highway intersections with Stoneham Street and Resolution Drive, it is proposed that a controlled mid-block shared pedestrian/bike crossing is provided. An at-grade signal controlled crossing would be the preferred form of crossing and provide connectivity between the Golden Gateway development and land uses and community facilities located to the south of Great Eastern Highway.
- An at-grade signal controlled crossing of Great Eastern Highway would require further investigation at the detailed design stage, but could take the form of the pedestrian crossing of Great Eastern Highway that is provided to the west of the Golden Gateway site.

Figure 24 – Golden Gateway Structure Plan Pedestrian and Cycle Facilities (source: Taylor Burrell Barnett)

The indicative cross sections shown in Figure 25, Figure 26 and Figure 27 show the internal road network within the Golden Gateway development and enhanced pedestrian and cycling environment, including opportunities to safely cross internal streets.

Figure 25 – Indicative Hargreaves Street Cross Section (source: EPCAD)

Figure 26 – Indicative Daly Street (Main Street) Cross Section (source: EPCAD)

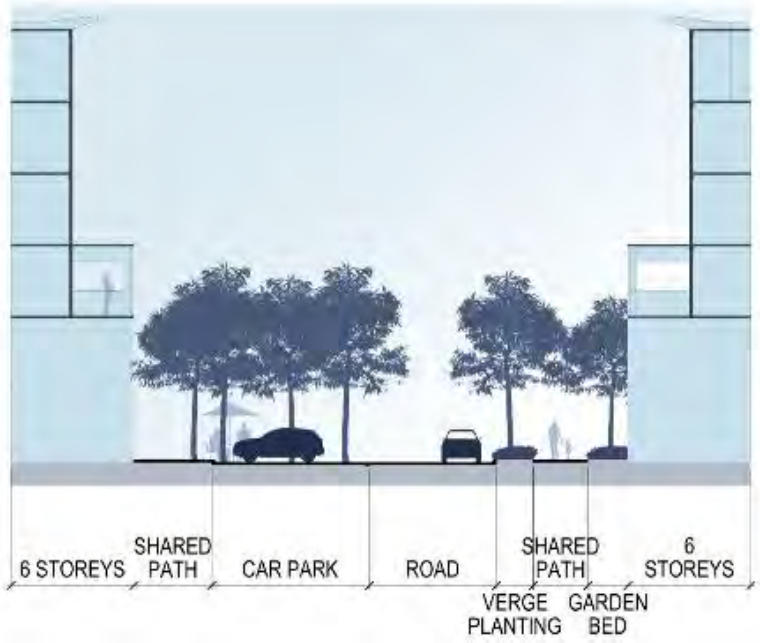
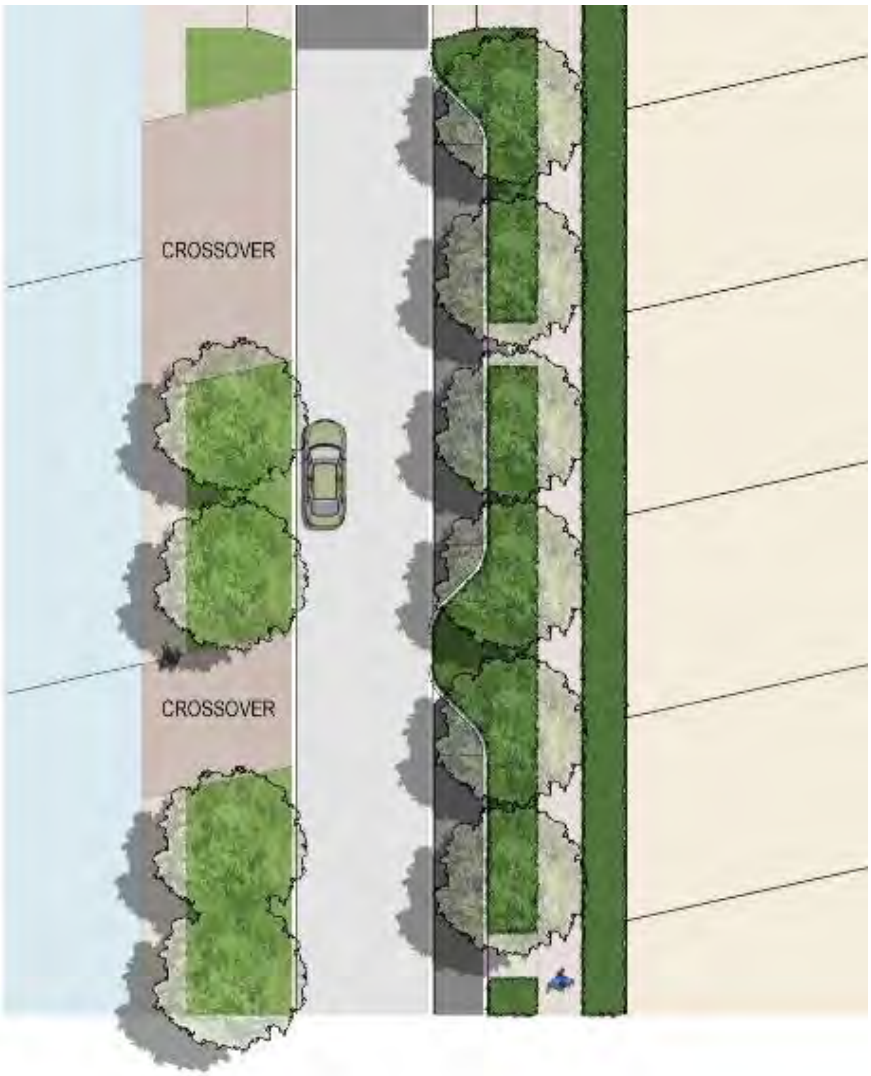
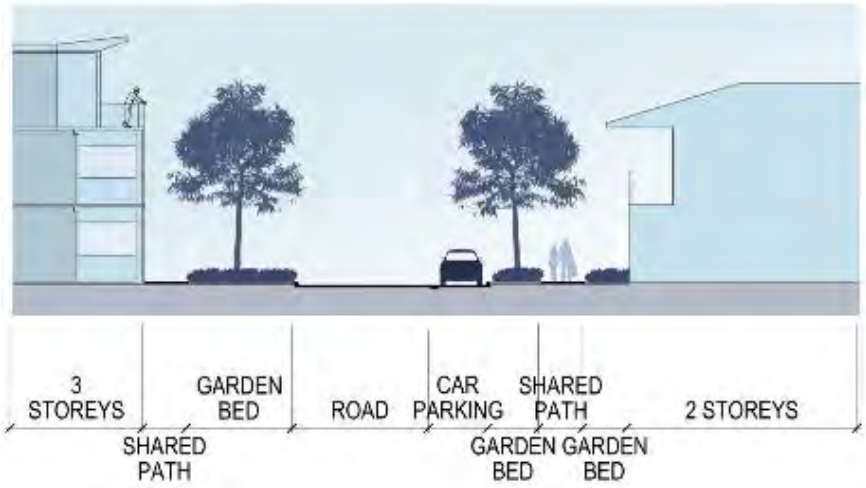


Figure 27 – Indicative Cross Section for Residential Area to the North East of Resolution Drive (source: EPCAD)





4.6 Public Transport Routes

4.6.1 Existing Public Transport

Access to existing public transport facilities from the Golden Gateway site is considered to be 'average' at present, however there are options to make improvements to public transport access if land uses within the Golden Gateway site change over time to support additional public transport service provision.

The Circle Route buses operate through the LSP site along Grandstand Road and Resolution Drive. However, no bus stops for these services currently exist within the LSP site, the closest bus stops are located on Grandstand Road immediately to the north of the LSP area (close to the main pedestrian entry/exit to Ascot Racecourse).

The Circle Route services provide a high frequency orbital public transport 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 Galleria.

In addition, bus routes 36, 40, 295, 296 and 299 operate along Great Eastern Highway along the southern boundary of the site. All five of the bus routes serve Elizabeth Quay Bus Station, St Georges/Adelaide Terrace, Victoria Park Transfer Station and Great Eastern Highway adjacent to the Golden Gateway LSP site.

4.6.2 Possible Future Public Transport

In order 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 and take up that opportunity.

High level discussions with the Public Transport Authority (PTA) Transperth Service Development Team has informed the information provided below.

It is currently anticipated by the PTA that the introduction of the Forrestfield Airport Link (FAL) rail connection from central Perth to Perth Airport and onto a park 'n' ride station at Forrestfield, will see the removal of four of the five existing bus routes operating along the Great Eastern Highway corridor (bus routes 36, 295, 296 and 299) and a renumbering and change of route for the remaining bus route (bus route 40).

Subject to consultation it is currently anticipated that the five existing bus routes will be rerouted as follows:

- Bus Route 36 – to be renumbered as Bus Route 303 and operate from Midland Station to the new Redcliffe Station;
- Bus Routes 295/296/299 – to feed into Forrestfield Station from Kalamunda and its surrounds; and
- Bus Route 40 – to be renumbered Bus Route 940 Superbus (details below).

It is currently anticipated that the 940 Superbus would initially operate as a first stage from Redcliffe Station to Elizabeth Quay Station via Great Eastern Highway (past the Golden Gateway development) and Victoria Park Transfer Station and Adelaide Terrace/St Georges Terrace.

It is anticipated that the first stage of the 940 Superbus route is funded as part of the FAL project.

In the longer term, it is anticipated that the Superbus would become a through routed service to Subiaco Station from Elizabeth Quay Bus Station via West Perth. This would be subject to funding, as well as the longer term infrastructure requirements from the PTA being in place, including bus lanes along Adelaide Terrace/St Georges Terrace and bus layover capacity at Subiaco Station.

The Superbus route would operate as a high frequency service and as such it is considered unlikely that the PTA would re-route this service through the Golden Gateway site and instead the service would operate along the Great Eastern Highway corridor between Redcliffe Station and Victoria Park Transfer Station.

The PTA has indicated that, if sufficient public transport demand was generated by large scale development of the Golden Gateway site, they would consider the option of operating a bus service which connected the Golden Gateway site and central Perth with a bus service that terminated/turned back from the Golden Gateway site – utilising the internal road network within the Golden Gateway site. However this would be contingent upon the Golden Gateway site generating the requisite public transport demand to warrant the investment in such a service.

5. EXTERNAL TRANSPORT NETWORKS

5.1 Changes to External Networks

Aside from the intersection controls proposed in section 4.4, there are no planned alterations to the external transport network.

The existing cycling, pedestrian and public transport networks are all within proximity of the site and there are no known major changes proposed that would impact the site. Where future improvements are being considered adjacent to the Structure Plan area, the City of Belmont should prioritise safe pedestrian and cyclist movements to tie-in with the proposed Golden Gateway networks.

6. INTEGRATION WITH SURROUNDING AREA

6.1 Major Attractors and Generators

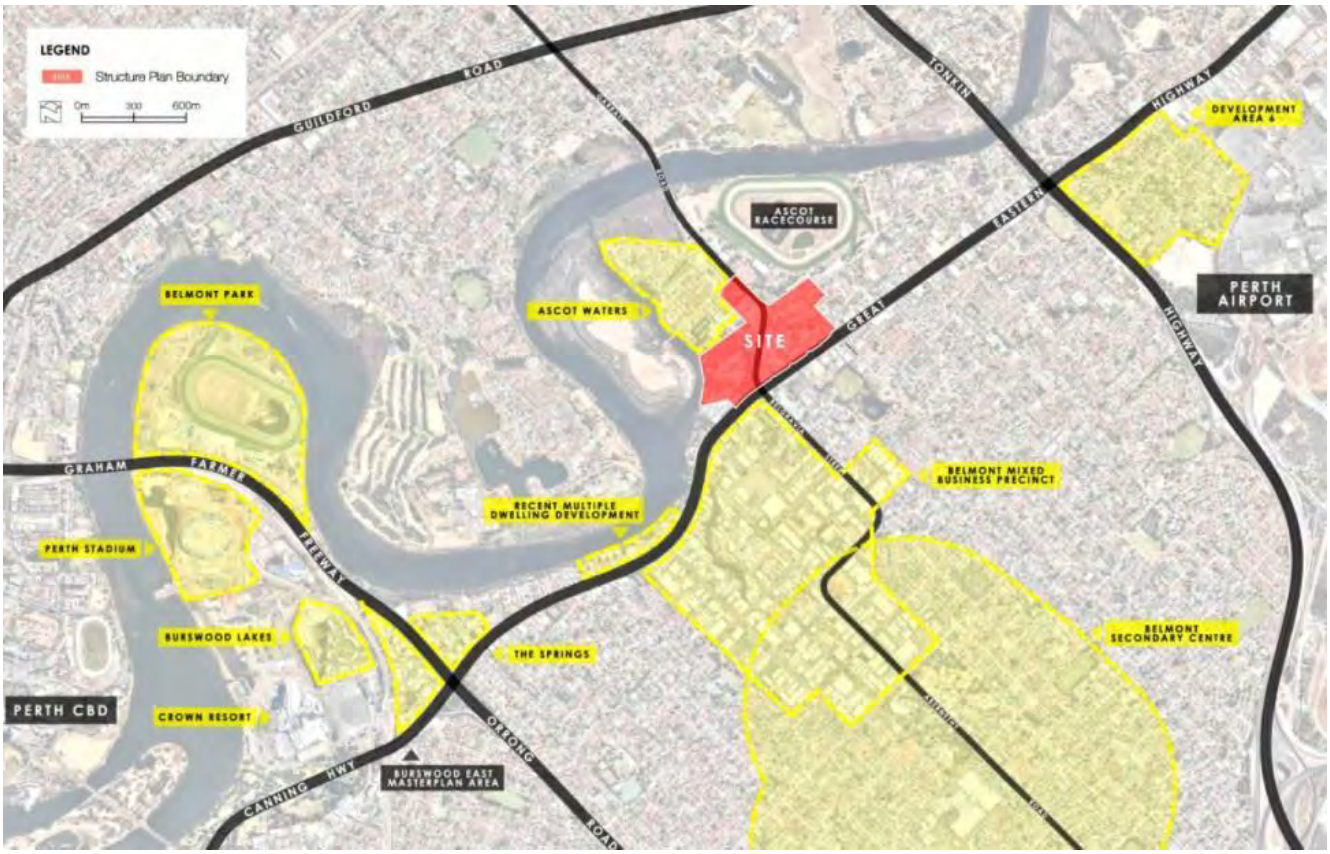
The Golden Gateway site is located at the axis of the key movement corridors of Great Eastern Highway, Stoneham Street, Grandstand Road and Resolution Drive and includes key strategic sites such as the Belmont Trust Land, Ascot Kilns and Western Australian Turf Club headquarters and associated land.

Figure 28 shows the location of the Golden Gateway site within a district context. The land is located approximately 5km south-east of the Perth central business district, 3km north of Belmont Forum Shopping Centre and mixed business area, and 5km northeast 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, Orrong Road, Canning Highway 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 deli located at Epsom Avenue approximately 2km south of the subject land provide local conveniences. However, the nearest supermarket (IGA) is located approximately 2.5km to the west of the subject land at Eastgate Commercial Centre, Kooyong Road (neighbourhood centre) or Belvidere Street (neighbourhood centre) 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 28 – Golden Gateway Site – District Context Plan (source: Taylor Burrell Barnett)



The City of Belmont is located in the inner middle ring of localities around Central Perth. It is bordered by Perth Airport, the Swan River, City of Canning to the south and Town of Victoria Park to the west. It is a major employment zone and has a residential population above 40,000.

The population of the City of Belmont was recorded as 30,333 in 2006, 35,209 in 2011 and 41,344 (estimate) in 2015. The population of the City of Belmont is getting younger, reflecting a move towards smaller household sizes, more medium and higher density development and attraction of the area to younger people working and choosing to live closer to central Perth.

The age profile of the City of Belmont point to this trend with key indicators being:

- The highest age grouping population increases were experienced in the 20-34 age bracket;
- There was also a significant increase in the number of babies in the City of Belmont which would also correlate with the number of young families choosing to move into the City of Belmont between the 2006 and 2011 Census periods; and
- There is a higher proportion of these age groups in the City of Belmont than Greater Perth indicating that the area is becoming more attractive for young families and professionals.

The majority of employed people in the City of Belmont travel to jobs outside of the Council boundaries. The 2011 Census statistics show that 22% of people recorded live and work in the City of Belmont.

Although the majority of employed people within the City of Belmont in 2011 travelled outside of the Council boundaries to reach jobs, the dispersal of people was relatively widespread. Jobs within the City of Belmont was the highest recorded number with the Perth Inner and Outer central business district locations being the next highest.

Employment in adjoining Town of Victoria Park and City of Canning were high, potentially reflecting the areas of Welshpool and Kewdale located within these authorities and significant amount of higher order commercial and retail centres.

At the 2011 Census, there were nearly 47,000 jobs located within the City of Belmont and this number has continued to rise with the expansion of development in the Kewdale/Welshpool area, increased development around Perth Domestic Airport and job growth in service, retail and commercial sectors. Within Belmont, there are more employees than residents with the majority of those employees coming from outside of the City to access jobs – less than 4,000 local residents lived and worked in the City of Belmont in 2011.

6.2 Strategic Deficiencies

As set out in this report, the Golden Gateway site has excellent access to the existing local and regional transport networks. Critically for this site, the future networks surrounding the site should cater for local trips via better cycling and pedestrian access so as to reduce the potential for vehicle trips to be generated by the development.

This could be accommodated by:

- A high quality pedestrian connection to cross Great Eastern Highway at a mid-point between the Stoneham Street and Resolution Drive intersections, in order to access Perth bound public transport services, as well as retail, commercial and recreational land uses to the south of Great Eastern Highway;
- Ensuring the interface between existing cycling infrastructure surrounding the site and new cycling infrastructure provided within the Golden Gateway development is well planned and designed to provide a seamless and safe transition between the two; and

- If sufficient public transport demand was generated by large scale development of the Golden Gateway site, which facilitated a bus service which connected the Golden Gateway site and central Perth with a bus service that terminated/turned back from the Golden Gateway site – the transition of buses into and out from the site as well as route through the site should be designed to ensure the highest number of residents and employees within the Golden Gateway site are within a 200m-400m walk distance of a bus stop to make the public transport services accessible and attractive to users.

7. ANALYSIS OF INTERNAL TRANSPORT NETWORKS

7.1 Form of Assessment

In order to ensure that there is relevant information assessed within this TIA, the assessment has been as comprehensive as possible in the use of data collected and observations and details relevant to the Golden Gateway site.

The traffic assessment has been undertaken using focused SIDRA assessment of the key intersections to understand the immediate and future impacts. The following intersections have been assessed:

- Stoneham Street, Great Eastern Highway and Belgravia Street traffic signal controlled intersection (existing year and future year operation);
- Resolution Drive, Great Eastern Highway and Hardey Road Street traffic signal controlled intersection (existing year and future year operation);
- Grandstand Road, Resolution Drive and Stoneham Street roundabout (existing year and future year operation); and
- Stoneham Street, Resolution Drive and Daly Street traffic signal controlled intersection (future year operation).

7.2 Assessment Years and Background Traffic

The assessment years for the Golden Gateway development have been for the base year (2016) and for the forecast year (2031), which represents a notional date by which full site buildout is delivered.

In order to determine forecast year traffic and understand the potential background growth, Main Roads WA provided strategic model outputs for the use in this study, to inform the Project Teams understanding of forecast traffic growth on the road network surrounding the Golden Gateway site.

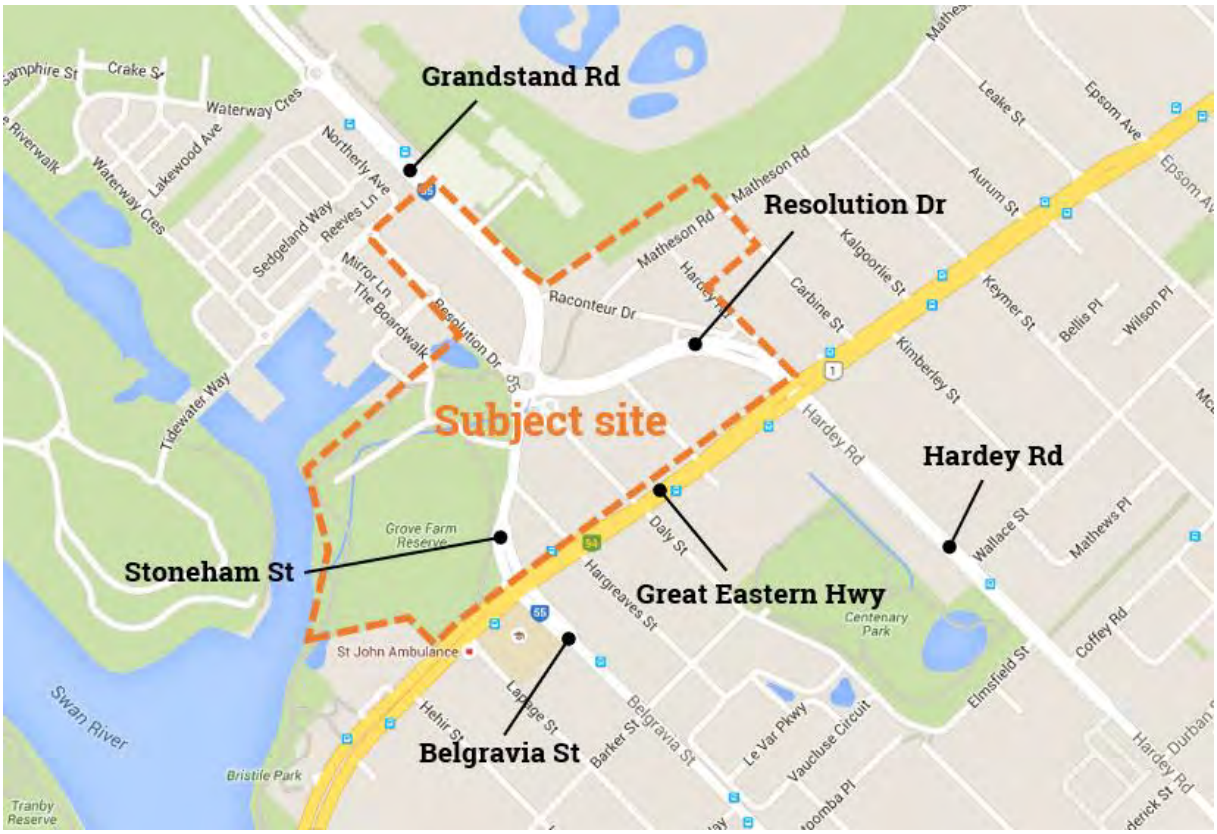
Main Roads WA strategic Regional Operations Model (ROM) encompasses metropolitan Perth and surrounds. Main Roads WA's current strategic model is called ROM24, which provides 24 hour time of day traffic assignment.

In order to assist with forecast traffic growth analysis for this study, Main Roads WA provided link volume plots (showing traffic volumes on each road) from the following ROM24 models:

- 2016 – all day model / AM peak (7am-9am) model / PM peak (4pm-6pm) model; and
- 2031 – all day model / AM peak (7am-9am) model / PM peak (4pm-6pm) model.

It has been found through previous experience working with ROM24 model outputs, that 2016 ROM24 traffic volumes are typically higher than recent observed traffic volumes (note: the source of data referred to in this report as 'recent observed traffic volumes' is the Main Roads WA Traffic Map: https://trafficmap.mainroads.wa.gov.au/). Figure 29 shows the data collection location for the recent observed traffic volumes data.

Figure 29 – Data Collection Locations for Recent Observed Traffic Volumes (map source: Google Maps)



The difference between 2016 ROM24 traffic volumes and recent observed traffic volumes varies from location to location across the geographical area of the ROM24 model, but it is typical that 2016 ROM24 traffic volumes are between 5%-25% higher than recent observed traffic volumes.

Table 12 shows the difference between the 2016 ROM24 traffic volumes and recent observed traffic volumes. The data shows that whilst volumes on Great Eastern Highway (GEH) are similar (2% difference), those on the surrounding roads vary considerably (20%-35% difference) and the flow on Grandstand Road has a 63% difference.

Table 12 – Recent Observed Traffic Volumes and 2016 ROM24 Traffic Volumes (All Day Two-Way Traffic)

Road	Section	Recent Observed	2016 ROM24	Difference (%)
Grandstand Rd	Waterway Cres-Raconteur Dr	18,400 (2014)	30,000	+63%
Resolution Dr	Grandstand Rd-GEH	9,100 (2014)	11,600	+27%
Hardey Rd	GEH-Wallace St	8,800 (2013)	11,100	+26%
Stoneham St	Grandstand Rd-GEH	15,200 (2014)	20,600	+35%
Belgravia St	GEH-Barker St	14,600 (2011)	17,600	+20%
GEH	Belgravia St-Hardey Rd	64,800 (2014)	66,100	+2%

Typically to address the issue of the 2016 ROM24 traffic volumes being higher than the observed traffic volumes, the 2016 ROM24 model data would be scaled back to the observed data to reflect a recast 2016 traffic volume. Then in each case the same level of annual growth between the 2016 ROM24 and 2031 ROM24 data, would be applied to the observed data to take the 2011, 2013 or 2014 observed data up to a recast 2031 traffic volume. The recast traffic volumes generated through this approach are shown in Table 13.

Table 13 – Recast 2016 and 2031 Traffic Volumes (All Day Two-Way Traffic)

Road	Section	Recast 2016	Recast 2031	Total Growth (Annual Growth)
Grandstand Rd	Waterway Cres-Raconteur Dr	19,300	26,500	37% (2.5%)
Resolution Dr	Grandstand Rd-GEH	9,500	12,500	32% (2.1%)
Hardey Rd	GEH-Wallace St	10,000	16,500	65% (4.3%)
Stoneham St	Grandstand Rd-GEH	16,200	23,800	47% (3.1%)
Belgravia St	GEH-Barker St	16,300	22,200	36% (2.4%)
GEH	Belgravia St-Hardey Rd	66,500	79,300	19% (1.3%)

However, whilst the recast ROM24 outputs would suggest that roads around the Golden Gateway site will experience significant growth in traffic volumes, between 1.3%-4.3% per annum between 2016 and 2031, a review of recent traffic growth trends presents no clear picture in relation to historic background traffic growth, as illustrated below:

- Great Eastern Highway – count sites adjacent to the Golden Gateway site show no growth or a slight decrease in traffic volumes until 2012/13. After this date, there has been significant growth in traffic volumes, but that would be a direct result of the widening of Great Eastern Highway after 2012/13;
- Stoneham Street – a count site adjacent to the Golden Gateway site shows a 20% decrease in traffic volumes between 2010/11 and 2013/14;
- Resolution Drive – a count site adjacent to the Golden Gateway site shows a 49% increase in traffic volumes between 2010/11 and 2013/14; and
- Grandstand Road (at the Garratt Road Bridge) – a count site adjacent at the Garratt Road Bridge shows a 6% increase in traffic volumes between 2012/13 and 2013/14.

The available historic traffic count data on the road network surrounding the Golden Gateway site suggests that the road network has been subject to significant fluctuations in traffic volumes as works have been completed in the local area – most notably the Great Eastern Highway upgrades.

Based on the fluctuations in historic traffic count data and therefore the limited reliability of this data to accurately reflect recent historic trends from which to base background traffic growth in the future, and the recast ROM24 outputs suggesting that there is to be significant year on year growth around the Golden Gateway site, far in excess of levels of annual growth that would be expected to be sustained and accommodated on the surrounding road network.

As such, for the purposes of this structure planning assessment we have applied 15% growth (1% growth per annum) for the Great Eastern Highway corridor and 25% growth (1.7% growth per annum) for all other road corridors around the Golden Gateway site.

7.3 Modelled Transport Networks and Land Use Data

The ROM24 model outputs provided by Main Roads for use in this study are from the 2016 Base Model and 2031 Base Model. Both models have consistent road network capacity within the vicinity of the Golden Gateway site. The capacity of the key links in relation to this study are:

- Grandstand Road = 2 lanes in each direction;
- Resolution Drive = 1 lane in each direction;
- Hardey Road = 1 lane in each direction;
- Stoneham Street = 2 lanes in each direction;
- Belgravia Street = 2 lanes in each direction; and
- Great Eastern Highway = 3 lanes in each direction.

Whilst the road network capacity within the vicinity of the Golden Gateway site is clearly understood and consistent across the 2016 ROM24 Base Model and 2031 ROM24 Base Model, the land use data within each of the models has not been made available to the Project Team.

Main Road WA's Traffic Modelling Team were contacted with a request to provide information relating to any significant land use change between the 2016 and 2031 ROM24 models in relation to the following most significant sites/locations:

- The Springs development;
- Golden Gateway structure plan area (including the Kilns site);
- DA6/Redcliffe Station area;
- Domestic Terminal area;
- Belmont Forum Shopping Centre area;
- Belmont Mixed Business Precinct; and
- Any other location of significance in the area that is likely to impact upon traffic volumes on the road network surrounding the Golden Gateway site.

The Project Team's land use data enquiry was passed onto the DoP by Main Roads WA. The following broad advice was provided by the DoP:

- *"The Metropolitan Land Use Forecasting System (MLUFS) is prepared by the Department and acts as an input into the Main Roads transport model.*
- *MLUFS is a small area forecasting model used to estimate the number and distribution of dwellings, population, employment and workforce within the Perth and Peel metropolitan area.*
- *For dwelling and population estimates, ABS data and WA Tomorrow population forecasts are used to determine underlying demand for dwellings across the Perth and Peel region. The distribution and development staging of these dwellings (and associated population growth) is then forecast based on growth trends, the capacity of sites available for development and other indicator data.*
- *The MLUFS process draws on data from a number of sources including: WA Tomorrow population forecasts; Australian Bureau of Statistics; Stock of undeveloped Region scheme and local planning scheme land; Development applications and subdivision activity; Developers' intentions; Availability of vacant lots; Capacity within developed areas for intensification of development; Proposed developments identified through other means; and Economic drivers.*
- *All zoning and associated amendments up to the period at which the forecast is produced are included as model inputs. Interventions that are identified after the preparation of the forecasts (such as Redcliffe Station) aren't explicitly reflected in the numbers.*
- *Preliminary outputs for MLUFS and WA Tomorrow are cross-referenced with Urban Land Development Outlook analysis to ensure alignment between outputs. The Urban Land Development Outlook identifies land in the Perth and Peel metropolitan area expected to be developed over the next 20 plus years.*
- *Forecasts are modelled based on the best available information at the time and it is expected that they will fall within an acceptable margin of error of actual growth."*

As such the information provided by DoP does not provide any clarity as to any specific land use changes between 2016 and 2031 within the vicinity of the Golden Gateway site.

7.4 Time Periods for Assessment

The time period for the modelling assessment was the AM peak hour (0800-0859) and PM peak hour (1600-1659) during an average weekday. As set out in Section 3.6, this is the period of time where there is most traffic on the surrounding road network and interaction between vehicles, cyclists and pedestrians.

7.5 Trip Generation Assumptions

The Golden Gateway LSP is comprised of three main 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 14.

Table 14 - Proposed Structure Plan Land Uses

Item	Data
Estimated Number of Dwellings	3,000 dwellings
Estimated Dwelling Type - multiple dwelling (75 m^2 apartment size) - single dwelling	 2,950 dwellings 50 dwellings
Commercial space	7,400 m^2 GFA (5,920 m^2 NLA)
Retail space	1,500 m^2 GFA (1,200 m^2 NLA)

It should be noted that this assessment also includes the traffic generated by the 200 dwellings on the Ascot Kilns site, which are subject to assessment as part of the Ascot Kilns Local Development Plan (LDP).

7.5.1 Residential Trip Generation

The assessment is based upon use of the New South Wales Roads and Traffic Authority (RTA) Guide to Traffic Generating Development (October 2002).

The RTA guide provides the following trip rates for 'medium density' residential development with average public transport accessibility (which is deemed to be representative of the future Golden Gateway development):

- Smaller units and flats (up to two bedrooms):
  - Daily vehicle trips 3.50 per dwelling
  - Weekday peak hour vehicle trips 0.35 per dwelling
- Larger units and town houses (three or more bedrooms):
  - Daily vehicle trips 4.00 per dwelling
  - Weekday peak hour vehicle trips 0.40 per dwelling

The traffic distribution was based on an industry accepted split between inbound and outbound vehicle trips as follows:

- Daily traffic distribution:
  - Inbound 50%
  - Outbound 50%
- AM peak hour traffic distribution:
  - Inbound 10%
  - Outbound 90%
- PM peak hour traffic distribution:
  - Inbound 80%
  - Outbound 20%

In addition to the above is was assumed that the proposed density of development across the Golden Gateway site would result in a step change in public transport service provision across the site/local area. It was assumed that there would be an uplift in public transport service provision as per Section 4.6.2. As a result of this, it was assumed that enhance public transport service provision would lead to increased public

transport use to/from the Golden Gateway site and this would result in a 20% reduction in residential vehicle trips to/from the site.

7.5.2 Commercial Trip Generation

The assessment was based upon a ratio of 30m^2 per employee, therefore 198 employees in 5,920m^2 (NLA) of commercial space.

Existing City of Belmont Town Planning Scheme allows for 1 car parking bay per employee. The assessment was based upon all 198 employees having access to a car parking bay within the Golden Gateway development (either in commercial car parks or in reciprocal access arrangement with residential car parking).

The traffic distribution was based on the following peak hour split between inbound and outbound vehicle trips as follows:

- AM peak hour traffic distribution:
  - Inbound 80% of daily commercial trips
  - Outbound 0% of daily commercial trips
- PM peak hour traffic distribution:
  - Inbound 0% of daily commercial trips
  - Outbound 80% of daily commercial trips

In addition to the above it was assumed that 10% of employees would live within the Golden Gateway development and as such total commercial vehicle trips were reduced by 10% (20 employees in total) to reflect an internal walk trip rather than an external vehicle trip.

7.5.3 Retail Trip Generation

The assessment is based on the assumption that all retail vehicle trips are existing vehicle trips on the network and no new vehicle trips would be generated by the retail land uses. As such it is assumed that retail vehicle trips would be a linked-trips as part of an existing journey through the network. Therefore, no new vehicle trips to the retail land uses were considered as part of the assessment.

7.6 Existing Golden Gateway Traffic Generation

Based on the City of Belmont loop counts of existing vehicle activity in to and out from the Golden Triangle site (as documented in Section 3.6.4), the following vehicle trips are generated by the existing land uses:

- Daily traffic:
  - Inbound 1,800 vehicles
  - Outbound 1,800 vehicles
  - TOTAL 3,600 vehicles
- AM peak hour traffic:
  - Inbound 140 vehicles
  - Outbound 140 vehicles
  - TOTAL 280 vehicles
- PM peak hour traffic:
  - Inbound 140 vehicles
  - Outbound 140 vehicles
  - TOTAL 280 vehicles

The assessment is based on the above existing traffic volumes being removed from the network to reflect the removal of the existing land uses on the site prior to redevelopment of the Golden Gateway site.

7.7 Future Golden Gateway Traffic Generation

Based on the assumptions set out in Section 7.2, Section 7.3, Section 7.4, Section 7.5 and Section 7.6, the following new vehicle trips would be generated by the future Golden Gateway development:

- Daily traffic:
  - Inbound 2,600 vehicles
  - Outbound 2,600 vehicles
  - TOTAL 5,200 vehicles
- AM peak hour traffic:
  - Inbound 97 vehicles
  - Outbound 697 vehicles
  - TOTAL 794 vehicles
- PM peak hour traffic:
  - Inbound 605 vehicles
  - Outbound 189 vehicles
  - TOTAL 794 vehicles

The intersection assessment is based on the above future traffic volumes being generated by the Golden Gateway development.

7.8 Future Golden Gateway Traffic Distribution

The generation of vehicle trips from the Golden Gateway site is split across five development precincts shown in Figure 30, Figure 31, Figure 32 and Figure 33. The distribution of vehicle trip generation across the five development precincts is based upon the overall split of development per precinct area, and is reflective of ultimate development buildout and may alter based on land release, availability to market and types of development progressed in the future.

The overall distribution of vehicles trips into and out from the Golden Gateway site onto the surrounding road network was based on a combination of MRWA traffic count data, MRWA SCATS data and City of Belmont traffic count data.

Figure 30 and Figure 31 show the indicative peak hour distribution of vehicle trips into and out from the Golden Gateway site. This reflects an even distribution of outbound trips during the AM peak between Great Eastern Highway east (towards Tonkin Highway), west (towards Perth city) and Grandstand Road north (towards Maylands). With a greater dominance during the PM peak of inbound trips from Great Eastern Highway west (from Perth city).

Figure 32 and Figure 33 show the indicative peak hour turning movements on the surround road network for the Golden Gateway development traffic only.

Figure 30 – Indicative AM Peak Hour Vehicle Trip Distribution for Golden Gateway Development Traffic

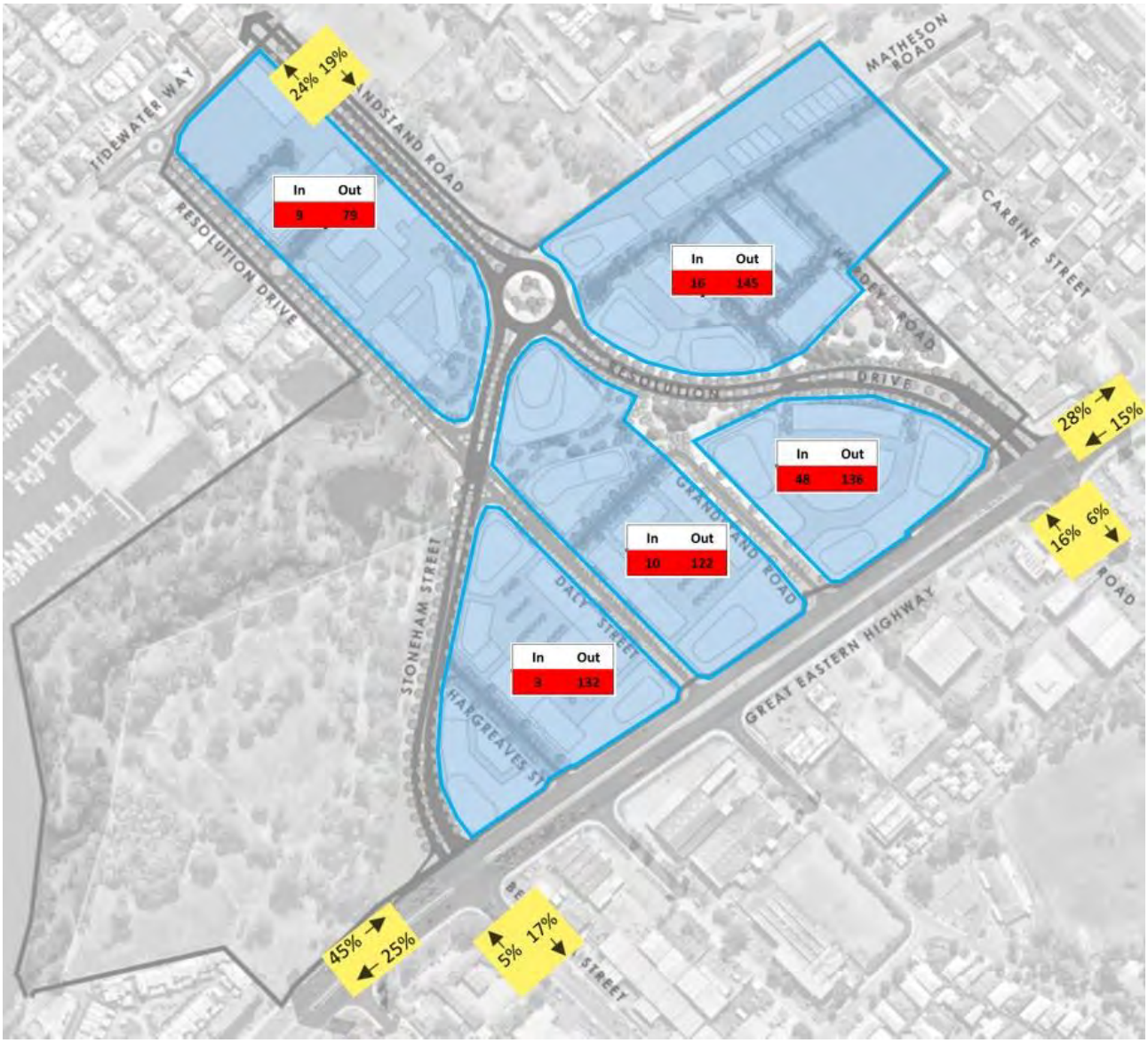


Figure 31 – Indicative PM Peak Hour Vehicle Trip Distribution for Golden Gateway Development Traffic

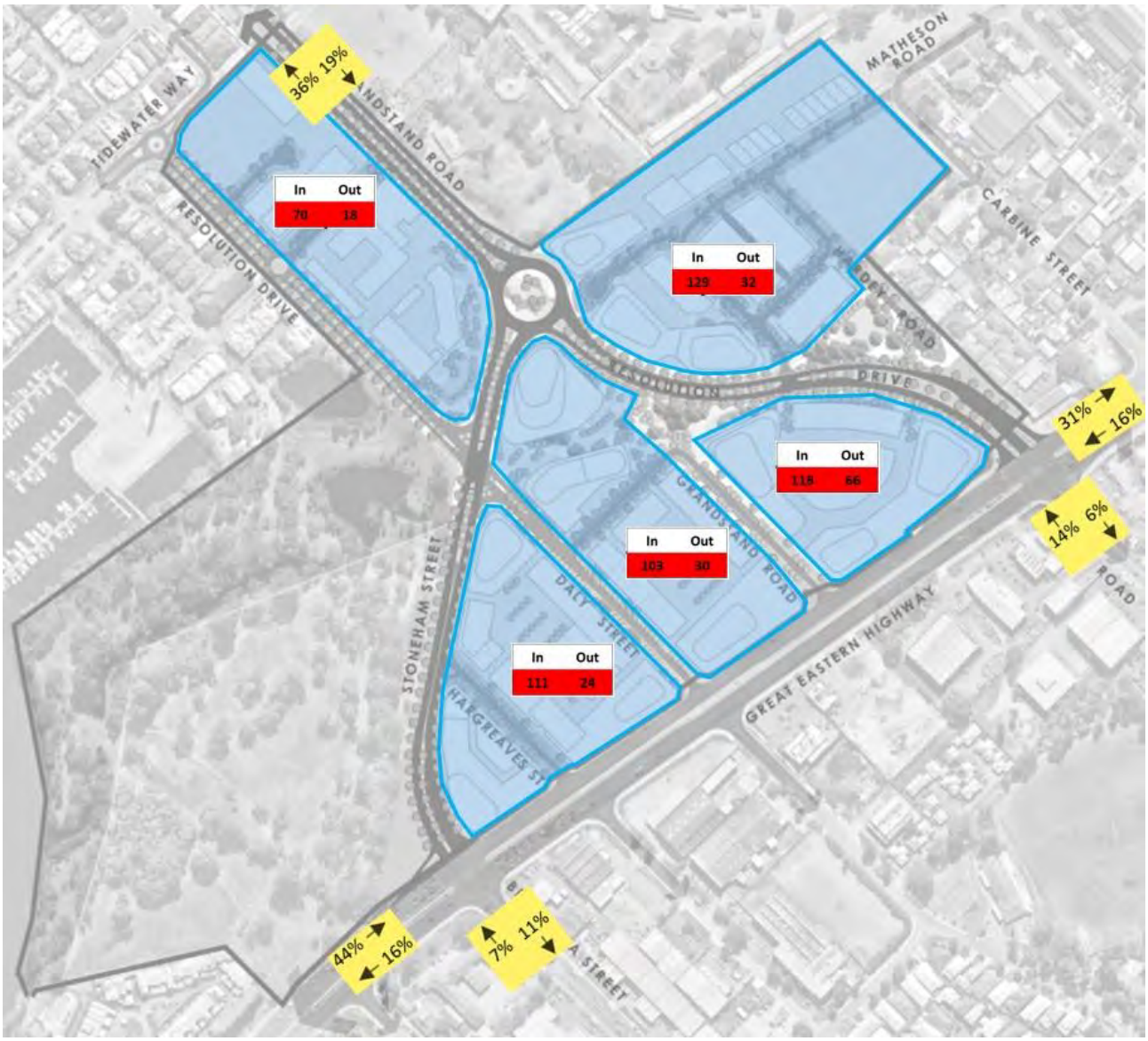


Figure 32 – Indicative AM Peak Hour Turning Movements for Golden Gateway Development Traffic

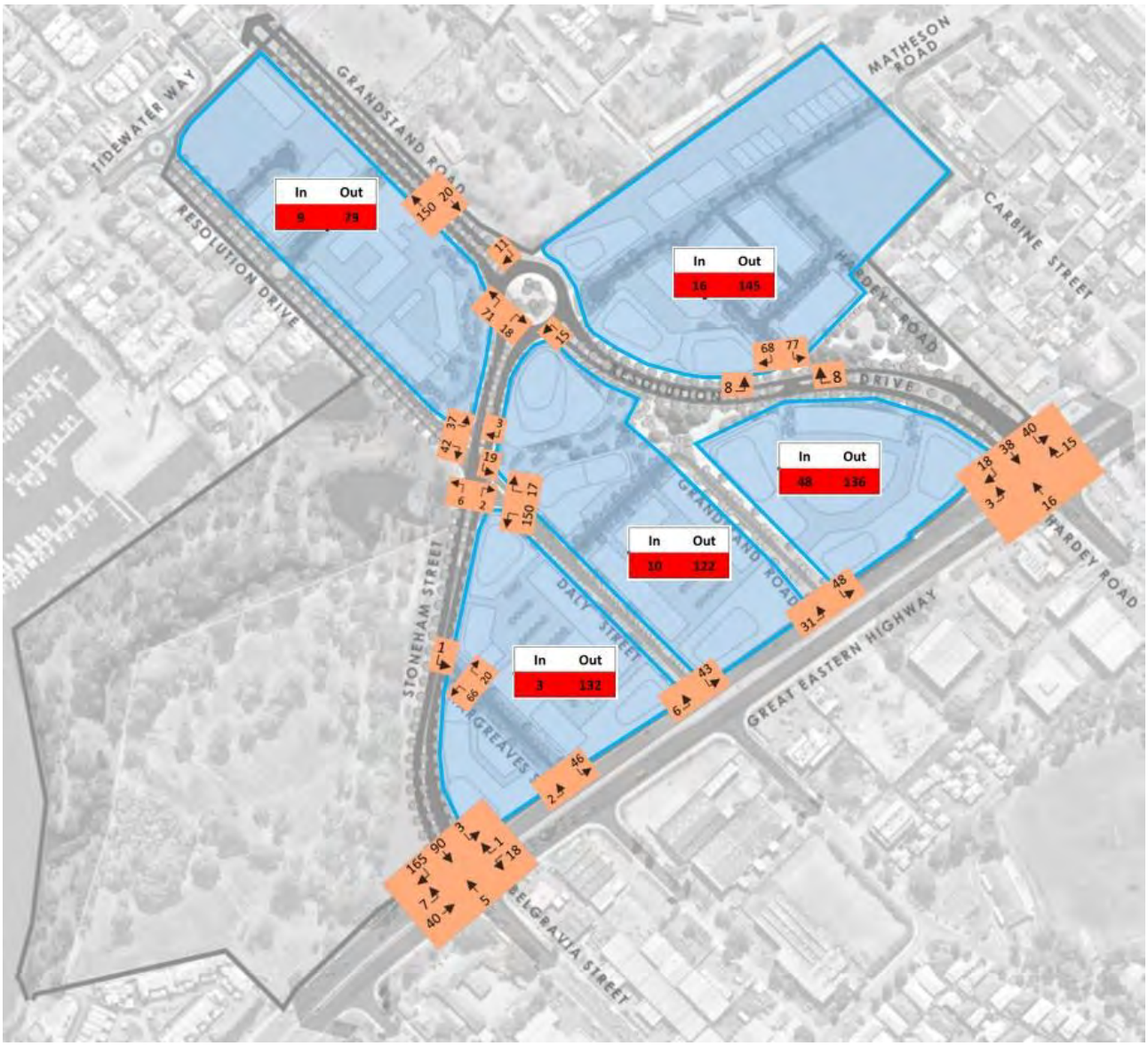
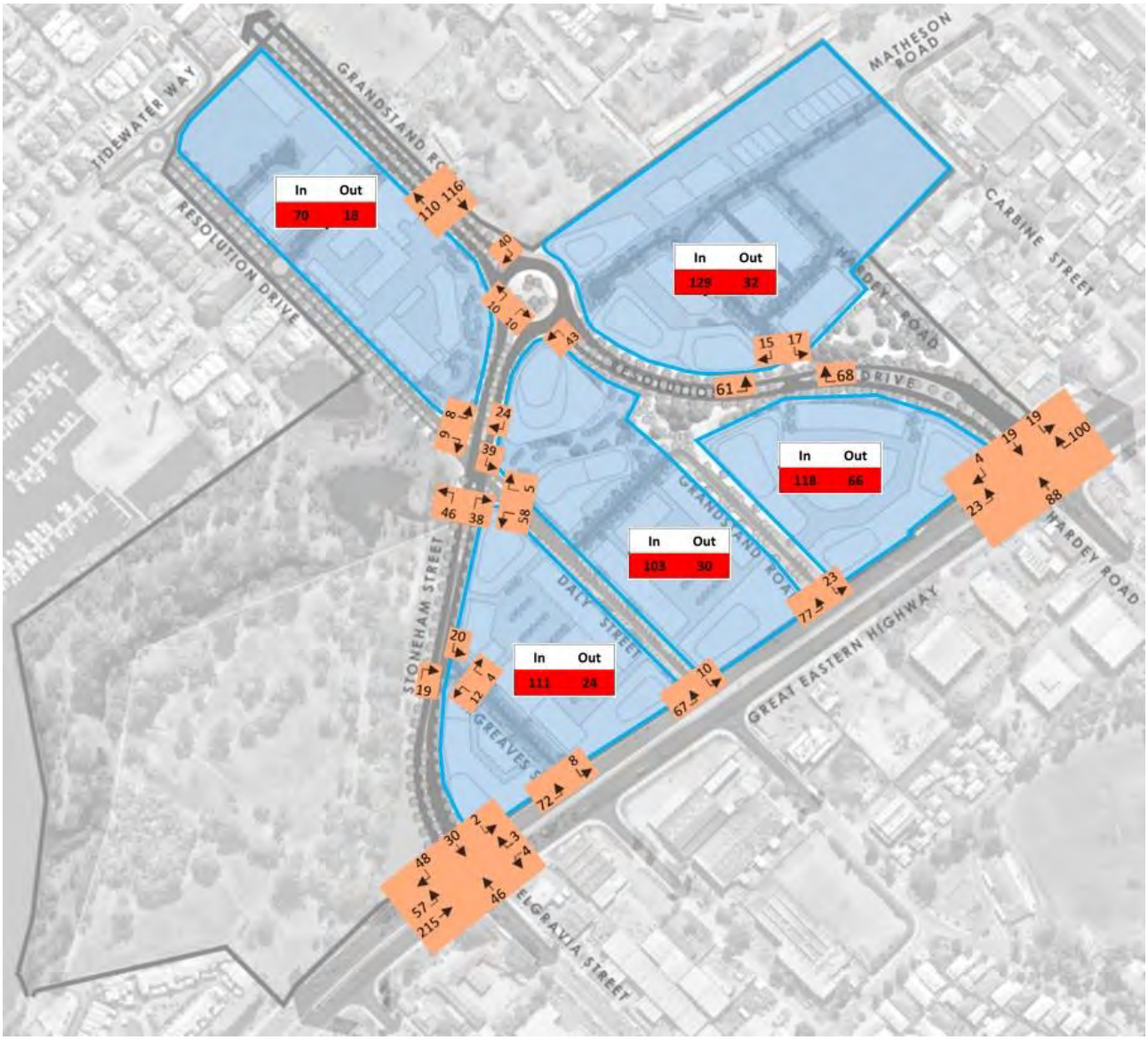


Figure 33 – Indicative PM Peak Hour Turning Movements for Golden Gateway Development Traffic



7.9 Intersection Assessment

The following intersections have been subject to SIDRA assessment:

- Stoneham Street/Great Eastern Highway intersection – 2016, 2031 and 2031 with development;
- Resolution Drive/Great Eastern Highway intersection – 2016, 2031 and 2031 with development;
- Grandstand Road/Resolution Drive/Stoneham Street intersection – 2031 and 2031 with development; and
- Stoneham Street/Daly Street/Resolution Drive intersection – 2031 and 2031 with development.

7.9.1 Stoneham Street-Great Eastern Highway Intersection

Headline SIDRA movement summaries for the Stoneham Street/Great Eastern Highway Intersection are presented in Table 15 (AM Peak hour) and Table 16 (PM peak hour). The SIDRA intersection geometry is shown in Figure 34. The full SIDRA movement summaries are presented in Figure 35, Figure 36 and Figure 37 (AM peak hour) as well as Figure 38, Figure 39 and Figure 40 (PM peak hour).

Overall the Stoneham Street/Great Eastern Highway Intersection SIDRA modelling results show that by 2031 under the base scenario that background growth would see the intersection operating during the AM peak with all approaches over capacity (other than Belgravia Street approach) and during the PM peak with all approaches with a degree of saturation greater than 0.95 (other than Great Eastern Highway (east)).

When Golden Gateway related development traffic is included in the SIDRA modelling results for the 2031 with development scenario, there is an increase in the degree of saturation on the Stoneham Street and Great Eastern Highway approaches leading to increases in average delay and LOS.

The AM peak hour modelling results show that the existing base year (2016) Stoneham Street/Great Eastern Highway Intersection performs with an overall intersection LOS D, with the Stoneham Street approach performing with a LOS F with an average delay of 87 seconds and the Belgravia Street approach performs with a LOS E with an average delay of 75 seconds.

The AM peak hour modelling results show the future base year 2031 scenario Stoneham Street/Great Eastern Highway Intersection performs with an overall LOS F, which is the same overall LOS as the 2031 plus Golden Gateway development scenario. However, the additional AM peak hour traffic generated by the Golden Gateway site that is predicted to use the Stoneham Street corridor, would place additional pressure on the Stoneham Street approach to the Great Eastern Highway intersection and there would be a significant increase in delay from 152 seconds (2031 base scenario) to 270 seconds (2031 with development scenario).

The PM peak hour modelling results show that the existing base year (2016) Stoneham Street/Great Eastern Highway Intersection performs with an overall intersection LOS C, with the Stoneham Street approach performing with a LOS E with an average delay of 70 seconds. The Belgravia Street approach performs with a LOS E with an average delay of 61 seconds.

The PM peak hour modelling results show the future base year 2031 scenario Stoneham Street/Great Eastern Highway Intersection performs with an overall LOS E and the 2031 plus Golden Gateway development scenario performs with an overall LOS F. The additional PM peak hour traffic generated by the Golden Gateway site that is predicted to use the Great Eastern Highway (west) and Stoneham Street approaches to the intersection would place additional pressure on the operation of the intersection and would see significant increases in intersection delay – Great Eastern Highway approach would increase in delay from 69 seconds (2031 base scenario) to 157 seconds (2031 with development scenario) and the Stoneham Street approach would increase in delay from 108 seconds (2031 base scenario) to 182 seconds (2031 with development scenario).

Table 15 – AM Peak Hour (0800-0859) Stoneham Street/Great Eastern Highway Intersection Assessment

Year	Stoneham St (north)			GEH (east)			Belgravia St (south)			GEH (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2016	0.87	87	F	0.85	38	D	0.50	75	E	0.83	31	C	0.87	45	D
2031	1.03	152	F	1.04	155	F	0.66	82	F	1.02	40	D	1.04	115	F
2031 + dev	1.15	270	F	1.14	303	F	0.65	84	F	1.15	59	E	1.15	211	F

Table 16 – PM Peak Hour (1600-1659) Stoneham Street/Great Eastern Highway Intersection Assessment

Year	Stoneham St (north)			GEH (east)			Belgravia St (south)			GEH (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2016	0.82	70	E	0.57	24	C	0.81	61	E	0.82	26	C	0.82	33	C
2031	0.96	108	F	0.64	30	C	0.96	99	F	0.99	69	E	0.99	64	E
2031 + dev	1.03	182	F	0.64	31	C	1.05	172	F	1.06	157	F	1.06	126	F

Figure 34 – Stoneham Street/Great Eastern Highway Intersection – SIDRA geometry

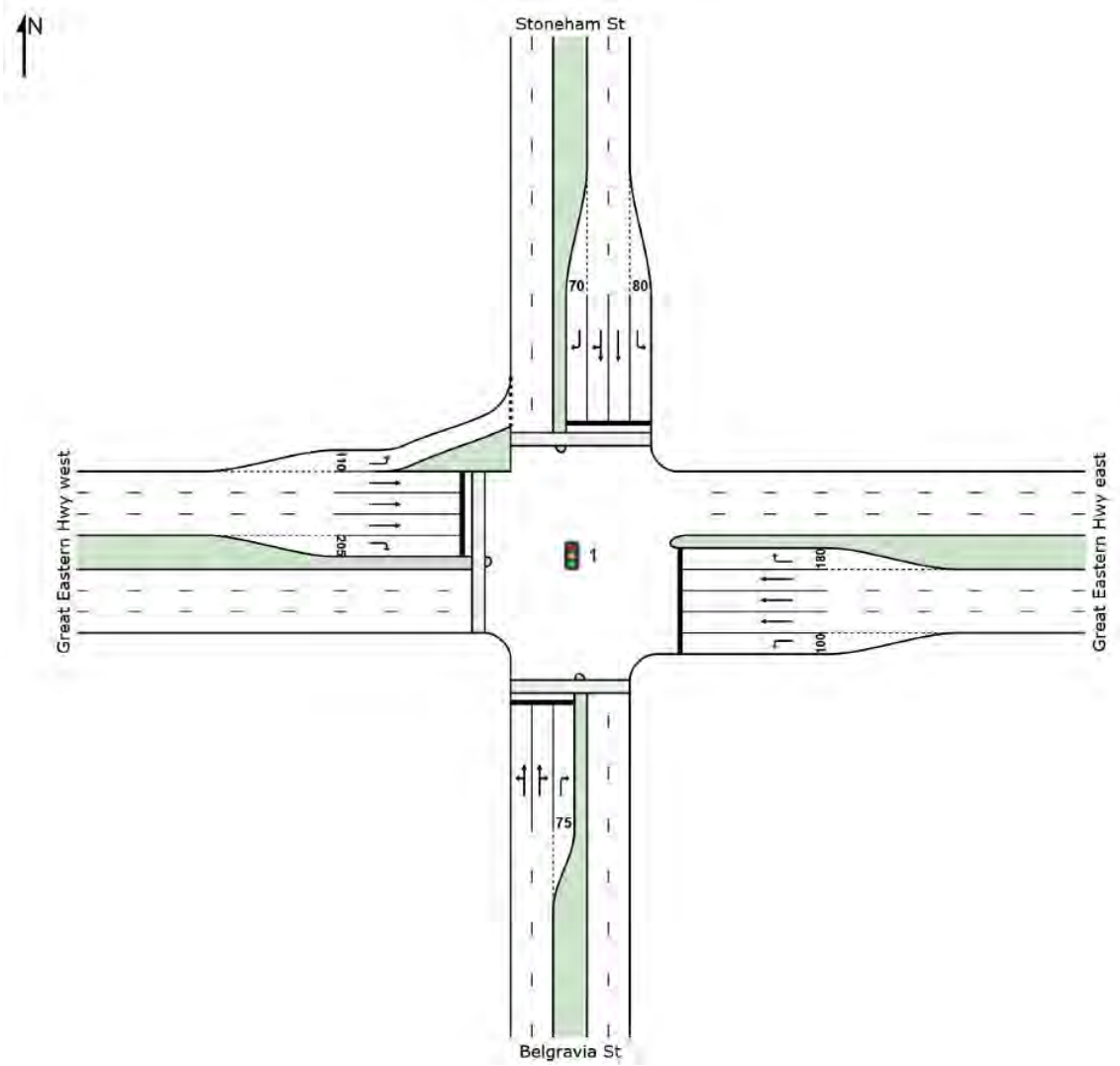


*Figure 35 – 2016 **AM Peak** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	111	3.0	0.438	76.4	LOS E	8.3	59.5	0.96	0.79	26.3
2	T1	105	3.0	0.394	70.2	LOS E	7.8	55.7	0.96	0.76	28.1
3	R2	126	3.0	0.497	77.2	LOS E	9.5	68.2	0.97	0.80	26.4
Approach		342	3.0	0.497	74.8	LOS E	9.5	68.2	0.96	0.78	26.9
East: Great Eastern Hwy east											
4	L2	191	3.0	0.211	30.1	LOS C	8.4	60.5	0.60	0.74	39.4
5	T1	2313	3.0	0.851	37.9	LOS D	55.7	400.2	0.92	0.85	37.1
6	R2	29	3.0	0.239	86.9	LOS F	2.3	16.4	0.98	0.72	24.7
Approach		2533	3.0	0.851	37.9	LOS D	55.7	400.2	0.89	0.84	37.0
North: Stoneham St											
7	L2	7	3.0	0.025	69.0	LOS E	0.5	3.4	0.88	0.67	27.7
8	T1	248	3.0	0.856	82.0	LOS F	21.2	152.0	1.00	0.97	25.8
9	R2	457	3.0	0.869	89.6	LOS F	19.8	142.1	1.00	0.95	24.3
Approach		712	3.0	0.869	86.8	LOS F	21.2	152.0	1.00	0.95	24.8
West: Great Eastern Hwy west											
10	L2	165	3.0	0.107	6.7	LOS A	1.4	10.1	0.16	0.59	53.3
11	T1	1308	3.0	0.459	28.5	LOS C	22.4	160.5	0.70	0.62	41.0
12	R2	101	3.0	0.833	96.6	LOS F	8.8	63.1	1.00	0.91	23.1
Approach		1574	3.0	0.833	30.5	LOS C	22.4	160.5	0.66	0.64	40.0
All Vehicles		5161	3.0	0.869	44.8	LOS D	55.7	400.2	0.84	0.79	34.6

*Figure 36 – **2031 AM Peak** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	139	3.0	0.582	83.5	LOS F	11.3	81.2	0.99	0.81	25.0
2	T1	131	3.0	0.521	77.1	LOS E	10.5	75.7	0.98	0.79	26.7
3	R2	157	3.0	0.657	84.6	LOS F	12.9	92.9	1.00	0.82	25.1
Approach		427	3.0	0.657	81.9	LOS F	12.9	92.9	0.99	0.81	25.5
East: Great Eastern Hwy east											
4	L2	219	3.0	0.254	34.4	LOS C	10.9	78.3	0.64	0.75	37.6
5	T1	2660	3.0	1.036	165.6	LOS F	136.5	979.8	1.00	1.46	16.1
6	R2	33	3.0	0.289	92.8	LOS F	2.8	20.0	0.99	0.73	23.7
Approach		2912	3.0	1.036	154.9	LOS F	136.5	979.8	0.97	1.40	16.9
North: Stoneham St											
7	L2	9	3.0	0.025	65.9	LOS E	0.6	4.4	0.84	0.67	28.4
8	T1	310	3.0	0.840	79.1	LOS E	27.0	194.0	1.00	0.95	26.3
9	R2	571	3.0	1.031	192.7	LOS F	40.7	292.6	1.00	1.27	14.3
Approach		890	3.0	1.031	151.8	LOS F	40.7	292.6	1.00	1.15	17.1
West: Great Eastern Hwy west											
10	L2	189	3.0	0.124	7.1	LOS A	2.0	14.6	0.18	0.60	53.0
11	T1	1505	3.0	0.560	34.5	LOS C	30.4	218.2	0.77	0.69	38.4
12	R2	116	3.0	1.015	168.8	LOS F	14.5	104.2	1.00	1.22	15.8
Approach		1810	3.0	1.015	40.3	LOS D	30.4	218.2	0.72	0.71	36.1
All Vehicles		6039	3.0	1.036	114.9	LOS F	136.5	979.8	0.90	1.12	20.7

*Figure 37 – **2031 AM Peak with Golden Gateway development** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	139	3.0	0.573	85.3	LOS F	11.6	83.2	0.99	0.81	24.7
2	T1	136	3.0	0.533	79.0	LOS E	11.2	80.7	0.98	0.79	26.3
3	R2	157	3.0	0.648	86.3	LOS F	13.2	95.1	1.00	0.82	24.8
Approach		432	3.0	0.648	83.7	LOS F	13.2	95.1	0.99	0.81	25.2
East: Great Eastern Hwy east											
4	L2	237	3.0	0.301	40.5	LOS D	13.3	95.2	0.70	0.77	35.4
5	T1	2660	3.0	1.136	329.1	LOS F	194.8	1398.9	1.00	2.03	9.3
6	R2	34	3.0	0.337	97.2	LOS F	3.0	21.5	1.00	0.73	23.1
Approach		2931	3.0	1.136	303.1	LOS F	194.8	1398.9	0.98	1.92	9.9
North: Stoneham St											
7	L2	12	3.0	0.027	60.0	LOS E	0.8	5.6	0.79	0.68	29.8
8	T1	400	3.0	0.867	77.7	LOS E	36.1	259.0	1.00	0.97	26.6
9	R2	736	3.0	1.151	377.6	LOS F	79.3	569.1	1.00	1.63	8.2
Approach		**1148**	**3.0**	**1.151**	**269.8**	**LOS F**	**79.3**	**569.1**	**1.00**	**1.39**	**10.9**
West: Great Eastern Hwy west											
10	L2	196	3.0	0.128	7.2	LOS A	2.2	15.8	0.18	0.60	52.9
11	T1	1545	3.0	0.638	41.7	LOS D	35.6	255.7	0.84	0.75	35.7
12	R2	116	3.0	1.148	372.5	LOS F	23.9	171.4	1.00	1.57	8.2
Approach		1857	3.0	1.148	58.8	LOS E	35.6	255.7	0.78	0.79	30.4
All Vehicles		6368	3.0	1.151	210.9	LOS F	194.8	1398.9	0.92	1.42	13.3

*Figure 38 – **2016 PM Peak** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	64	3.0	0.809	65.7	LOS E	15.5	111.6	1.00	0.94	29.6
2	T1	428	3.0	0.809	60.0	LOS E	15.7	113.0	1.00	0.94	30.3
3	R2	217	3.0	0.746	62.8	LOS E	13.3	95.4	1.00	0.87	29.5
Approach		709	3.0	0.809	61.4	LOS E	15.7	113.0	1.00	0.92	29.9
East: Great Eastern Hwy east											
4	L2	77	3.0	0.084	22.5	LOS C	2.4	17.1	0.55	0.70	42.9
5	T1	1636	3.0	0.566	22.8	LOS C	22.7	163.3	0.75	0.67	43.7
6	R2	35	3.0	0.401	72.3	LOS E	2.2	16.0	1.00	0.73	27.4
Approach		1748	3.0	0.566	23.8	LOS C	22.7	163.3	0.74	0.67	43.2
North: Stoneham St											
7	L2	9	3.0	0.052	61.8	LOS E	0.5	3.6	0.93	0.67	29.4
8	T1	170	3.0	0.822	66.9	LOS E	9.9	71.3	1.00	0.94	28.7
9	R2	269	3.0	0.822	72.8	LOS E	9.5	68.5	1.00	0.93	27.4
Approach		448	3.0	0.822	70.4	LOS E	9.9	71.3	1.00	0.93	27.9
West: Great Eastern Hwy west											
10	L2	537	3.0	0.388	9.2	LOS A	8.7	62.8	0.36	0.67	51.4
11	T1	2227	3.0	0.818	28.2	LOS C	40.6	291.8	0.88	0.82	41.1
12	R2	70	3.0	0.802	77.4	LOS E	4.7	33.9	1.00	0.89	26.3
Approach		2834	3.0	0.818	25.8	LOS C	40.6	291.8	0.79	0.79	42.1
All Vehicles		5739	3.0	0.822	33.1	LOS C	40.6	291.8	0.82	0.78	38.9

*Figure 39 – **2031 PM Peak** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	80	3.0	0.960	108.9	LOS F	32.1	230.2	1.00	1.21	22.0
2	T1	536	3.0	0.960	103.6	LOS F	32.1	230.2	1.00	1.21	22.3
3	R2	271	3.0	0.895	86.7	LOS F	22.8	163.7	1.00	0.98	24.7
Approach		887	3.0	0.960	98.9	LOS F	32.1	230.2	1.00	1.14	23.0
East: Great Eastern Hwy east											
4	L2	88	3.0	0.094	25.5	LOS C	3.3	23.6	0.54	0.70	41.4
5	T1	1881	3.0	0.643	28.5	LOS C	34.1	245.0	0.78	0.71	41.0
6	R2	40	3.0	0.487	88.4	LOS F	3.1	22.6	1.00	0.73	24.4
Approach		2009	3.0	0.643	29.5	LOS C	34.1	245.0	0.77	0.71	40.5
North: Stoneham St											
7	L2	12	3.0	0.064	73.7	LOS E	0.8	5.9	0.93	0.69	26.8
8	T1	213	3.0	0.956	105.2	LOS F	17.9	128.5	1.00	1.17	22.1
9	R2	336	3.0	0.956	111.6	LOS F	17.2	123.5	1.00	1.12	21.3
Approach		561	3.0	0.956	108.3	LOS F	17.9	128.5	1.00	1.13	21.7
West: Great Eastern Hwy west											
10	L2	617	3.0	0.451	11.0	LOS B	14.5	104.1	0.40	0.68	50.1
11	T1	2561	3.0	0.971	80.7	LOS F	95.5	685.9	0.95	1.13	25.9
12	R2	81	3.0	0.986	128.9	LOS F	8.2	58.6	1.00	1.15	19.2
Approach		3259	3.0	0.986	68.7	LOS E	95.5	685.9	0.85	1.05	28.3
All Vehicles		6716	3.0	0.986	64.3	LOS E	95.5	685.9	0.86	0.96	29.3

*Figure 40 – **2031 PM Peak with Golden Gateway development** Stoneham Street/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Belgravia St											
1	L2	80	3.0	1.045	200.6	LOS F	51.0	366.2	1.00	1.56	14.1
2	T1	582	3.0	1.045	196.8	LOS F	51.0	366.2	1.00	1.56	14.1
3	R2	271	3.0	0.950	109.8	LOS F	27.0	193.9	1.00	1.07	21.4
Approach		933	3.0	1.045	171.9	LOS F	51.0	366.2	1.00	1.42	15.7
East: Great Eastern Hwy east											
4	L2	92	3.0	0.097	26.4	LOS C	3.6	26.0	0.53	0.70	41.0
5	T1	1881	3.0	0.639	29.6	LOS C	36.0	258.5	0.77	0.70	40.5
6	R2	43	3.0	0.557	94.6	LOS F	3.6	26.0	1.00	0.75	23.5
Approach		2016	3.0	0.639	30.9	LOS C	36.0	258.5	0.77	0.70	39.9
North: Stoneham St											
7	L2	14	3.0	0.071	76.9	LOS E	1.0	7.3	0.93	0.69	26.2
8	T1	243	3.0	1.034	180.5	LOS F	28.5	204.6	1.00	1.42	15.1
9	R2	384	3.0	1.034	187.0	LOS F	27.4	196.4	1.00	1.33	14.7
Approach		641	3.0	1.034	182.2	LOS F	28.5	204.6	1.00	1.35	15.0
West: Great Eastern Hwy west											
10	L2	674	3.0	0.510	13.8	LOS B	20.6	148.0	0.47	0.71	48.3
11	T1	2776	3.0	1.056	190.9	LOS F	160.5	1152.3	1.00	1.62	14.5
12	R2	81	3.0	1.050	207.4	LOS F	11.2	80.1	1.00	1.28	13.4
Approach		3531	3.0	1.056	157.4	LOS F	160.5	1152.3	0.90	1.44	16.7
All Vehicles		7121	3.0	1.056	125.7	LOS F	160.5	1152.3	0.88	1.22	19.5

7.9.2 Resolution Drive/Great Eastern Highway Intersection

Headline SIDRA movement summaries for the Resolution Drive/Great Eastern Highway Intersection are presented in Table 17 (AM Peak hour) and Table 18 (PM peak hour). The SIDRA intersection geometry is shown in Figure 41. The full SIDRA movement summaries are presented in Figure 42, Figure 43 and Figure 44 (AM peak hour) as well as Figure 45, Figure 46 and Figure 47 (PM peak hour).

Overall the Resolution Drive/Great Eastern Highway Intersection SIDRA modelling results show that by 2031 base scenario that background growth would have marginally reduced the level of service of the intersection compared to the 2016 existing base year scenario. The intersection AM peak hour overall performance would have gone from LOS C with an average delay of 32 seconds in 2016 to a LOS D with an average delay of 40 seconds in 2031 base scenario. The intersection PM peak hour overall performance would have gone from LOS C with an average delay of 34 seconds in 2016 to a LOS D with an average delay of 41 seconds in 2031 base scenario.

The AM peak hour modelling results show that the existing base year (2016) Resolution Drive/Great Eastern Highway Intersection performs with an overall intersection LOS C, with the Resolution Drive approach performing with a LOS D with an average delay of 54 seconds and the Hardey Road approach performing with a LOS E with an average delay of 61 seconds.

The AM peak hour modelling results show the future base year 2031 scenario Resolution Drive/Great Eastern Highway Intersection performs with an overall LOS D, which is the same overall LOS as the 2031 plus Golden Gateway development scenario. The modelling results show that the additional AM peak hour traffic generated by the Golden Gateway site has a limited impact upon the operation of the Resolution Drive/Great Eastern Highway intersection – the average delay experienced on each approach to the intersection is predicted to increase marginally within the inclusion of the development related traffic, with the LOS to remain unchanged.

The PM peak hour modelling results show that the existing base year (2016) Resolution Drive/Great Eastern Highway Intersection performs with an overall intersection LOS C, with the Resolution Drive approach performing with a LOS D and an average delay of 50 seconds and the Hardey Road approach performing with a LOS D with an average delay of 54 seconds.

The PM peak hour modelling results show the future base year 2031 scenario Resolution Drive/Great Eastern Highway Intersection performs with an overall LOS D. The modelling results show that the additional PM peak hour traffic generated by the Golden Gateway site has a marginal impact upon the operation of the Resolution Drive/Great Eastern Highway intersection – the average delay experienced on each approach to the intersection is predicted to increase marginally within the inclusion of the development related traffic, however the Great Eastern Highway (west) is predicted to experience a more significant increase in average delay from 38 seconds (2031 base scenario) and 68 seconds (2031 with development scenario).

Table 17 – AM Peak Hour (0800-0859) Resolution Drive/Great Eastern Highway Intersection Assessment

Year	Resolution Dr (north)			GEH (east)			Hardey Rd (south)			GEH (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2016	0.83	54	D	0.83	30	C	0.36	61	E	0.41	24	C	0.83	32	C
2031	0.86	66	E	0.90	38	D	0.52	80	F	0.44	26	C	0.90	40	D
2031 + dev	0.95	75	E	0.92	46	D	0.55	80	F	0.50	27	C	0.95	46	D

Table 18 – PM Peak Hour (1600-1659) Resolution Drive/Great Eastern Highway Intersection Assessment

Year	Resolution Dr (north)			GEH (east)			Hardey Rd (south)			GEH (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2016	0.71	50	D	0.83	29	C	0.45	54	D	0.83	34	C	0.83	34	C
2031	0.90	75	E	0.86	32	C	0.66	78	E	0.87	38	D	0.90	41	D
2031 + dev	0.92	80	E	0.95	43	D	0.69	82	F	0.95	68	E	0.95	60	E

Figure 41 – Resolution Drive/Great Eastern Highway Intersection – SIDRA geometry

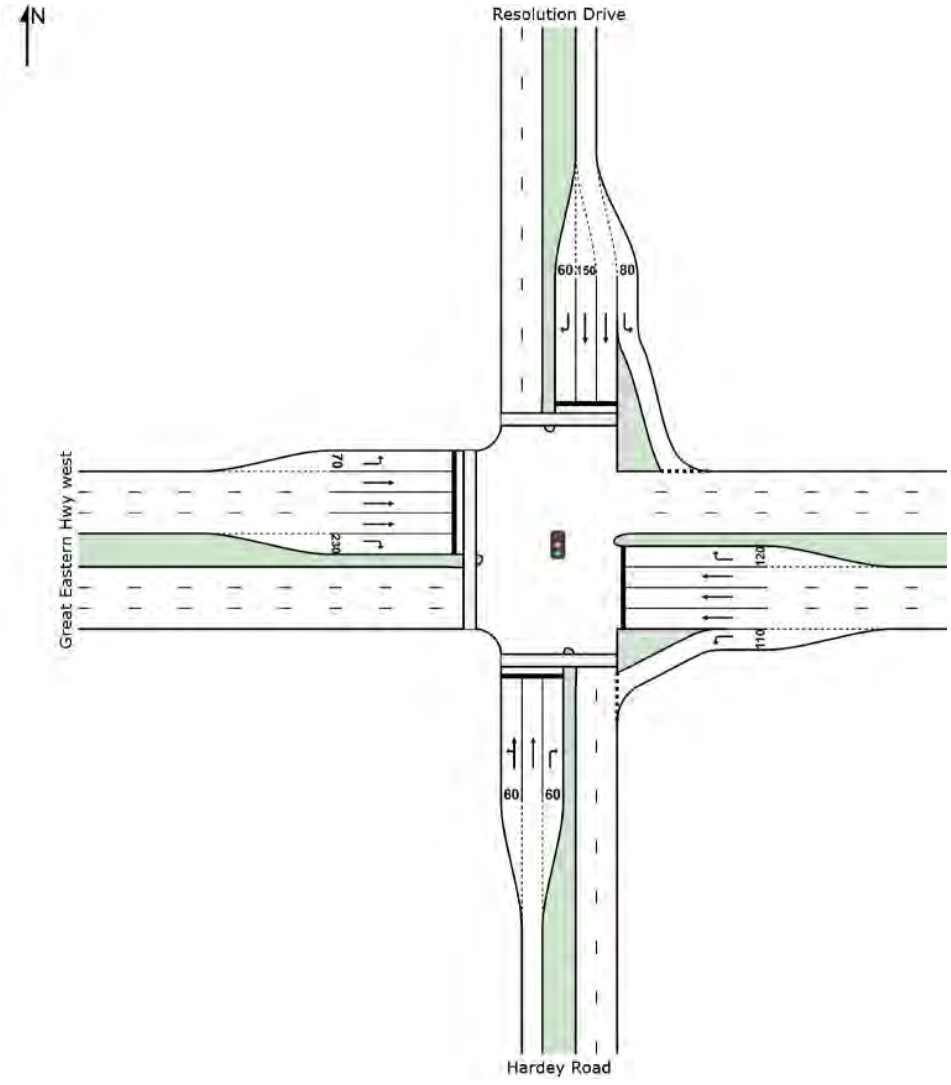


*Figure 42 – **2016 AM Peak** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	88	3.0	0.364	63.9	LOS E	7.0	50.4	0.93	0.78	29.2
2	T1	138	3.0	0.364	58.3	LOS E	7.3	52.4	0.93	0.75	30.7
3	R2	89	3.0	0.296	63.2	LOS E	5.6	40.0	0.92	0.77	29.4
Approach		315	3.0	0.364	61.3	LOS E	7.3	52.4	0.93	0.76	29.9
East: Great Eastern Hwy east											
4	L2	106	3.0	0.069	6.7	LOS A	0.9	6.1	0.16	0.59	53.3
5	T1	2425	3.0	0.827	28.4	LOS C	49.2	353.3	0.87	0.80	41.0
6	R2	132	3.0	0.810	82.5	LOS F	10.0	71.5	1.00	0.90	25.4
Approach		2663	3.0	0.827	30.2	LOS C	49.2	353.3	0.85	0.80	40.2
North: Resolution Drive											
7	L2	137	3.0	0.183	10.1	LOS B	2.5	18.2	0.33	0.65	50.8
8	T1	131	3.0	0.828	83.8	LOS F	5.1	36.7	1.00	0.90	25.5
9	R2	61	3.0	0.811	89.2	LOS F	4.8	34.2	1.00	0.88	24.3
Approach		329	3.0	0.828	54.1	LOS D	5.1	36.7	0.72	0.79	31.8
West: Great Eastern Hwy west											
10	L2	22	3.0	0.022	21.9	LOS C	0.7	5.1	0.49	0.66	43.2
11	T1	1271	3.0	0.412	20.9	LOS C	17.4	125.1	0.64	0.57	44.7
12	R2	66	3.0	0.405	75.0	LOS E	4.6	32.7	0.99	0.76	26.7
Approach		1359	3.0	0.412	23.6	LOS C	17.4	125.1	0.65	0.58	43.3
All Vehicles		4666	3.0	0.828	32.1	LOS C	49.2	353.3	0.79	0.73	39.3

*Figure 43 – **2031 AM Peak** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	110	3.0	0.521	82.9	LOS F	11.3	81.2	0.98	0.80	25.3
2	T1	172	3.0	0.521	77.2	LOS E	11.8	84.5	0.98	0.79	26.5
3	R2	112	3.0	0.426	81.7	LOS F	9.0	64.8	0.96	0.79	25.6
Approach		394	3.0	0.521	80.0	LOS F	11.8	84.5	0.97	0.80	25.9
East: Great Eastern Hwy east											
4	L2	122	3.0	0.079	7.1	LOS A	1.3	9.4	0.16	0.59	53.0
5	T1	2789	3.0	0.897	35.9	LOS D	75.3	540.8	0.90	0.85	37.9
6	R2	151	3.0	0.879	104.7	LOS F	14.5	104.3	1.00	0.95	22.0
Approach		3062	3.0	0.897	38.1	LOS D	75.3	540.8	0.88	0.85	37.0
North: Resolution Drive											
7	L2	171	3.0	0.260	13.2	LOS B	4.9	35.4	0.39	0.68	48.7
8	T1	164	3.0	0.857	102.3	LOS F	7.9	56.4	1.00	0.93	22.6
9	R2	76	3.0	0.836	107.0	LOS F	7.2	52.0	1.00	0.91	21.8
Approach		411	3.0	0.857	66.1	LOS E	7.9	56.4	0.75	0.82	28.8
West: Great Eastern Hwy west											
10	L2	25	3.0	0.024	22.4	LOS C	0.9	6.5	0.45	0.65	42.9
11	T1	1461	3.0	0.443	22.5	LOS C	23.7	170.4	0.61	0.55	43.9
12	R2	76	3.0	0.443	90.3	LOS F	6.4	46.3	0.99	0.77	24.0
Approach		1562	3.0	0.443	25.8	LOS C	23.7	170.4	0.63	0.56	42.2
All Vehicles		5429	3.0	0.897	39.7	LOS D	75.3	540.8	0.80	0.76	36.4

*Figure 44 – **2031 AM Peak with Golden Gateway development** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	110	3.0	0.550	83.2	LOS F	12.0	86.3	0.98	0.81	25.3
2	T1	188	3.0	0.550	77.6	LOS E	12.5	89.6	0.98	0.80	26.4
3	R2	112	3.0	0.426	81.7	LOS F	9.0	64.8	0.96	0.79	25.6
Approach		410	3.0	0.550	80.2	LOS F	12.5	89.6	0.97	0.80	25.9
East: Great Eastern Hwy east											
4	L2	122	3.0	0.080	7.3	LOS A	1.4	10.4	0.18	0.59	52.8
5	T1	2789	3.0	0.918	43.8	LOS D	82.6	593.4	0.92	0.91	35.0
6	R2	166	3.0	0.913	110.0	LOS F	16.6	119.0	1.00	1.00	21.4
Approach		3077	3.0	0.918	45.9	LOS D	82.6	593.4	0.90	0.90	34.3
North: Resolution Drive											
7	L2	211	3.0	0.324	15.8	LOS B	7.5	53.8	0.47	0.71	47.1
8	T1	202	3.0	0.950	117.6	LOS F	10.6	75.9	1.00	1.08	20.7
9	R2	94	3.0	0.931	117.9	LOS F	9.6	68.8	1.00	1.04	20.5
Approach		507	3.0	0.950	75.3	LOS E	10.6	75.9	0.78	0.92	26.9
West: Great Eastern Hwy west											
10	L2	28	3.0	0.027	23.4	LOS C	1.0	7.5	0.46	0.66	42.4
11	T1	1598	3.0	0.495	24.5	LOS C	27.6	198.3	0.65	0.59	42.9
12	R2	76	3.0	0.418	89.1	LOS F	6.4	45.9	0.98	0.77	24.2
Approach		1702	3.0	0.495	27.4	LOS C	27.6	198.3	0.66	0.60	41.4
All Vehicles		5696	3.0	0.950	45.5	LOS D	82.6	593.4	0.82	0.80	34.4

*Figure 45 – **2016 PM Peak** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	53	3.0	0.291	56.0	LOS E	5.3	38.1	0.91	0.75	31.5
2	T1	141	3.0	0.291	50.4	LOS D	5.5	39.2	0.91	0.73	32.7
3	R2	144	3.0	0.448	57.8	LOS E	8.3	59.4	0.94	0.80	30.7
Approach		338	3.0	0.448	54.4	LOS D	8.3	59.4	0.92	0.76	31.7
East: Great Eastern Hwy east											
4	L2	139	3.0	0.095	7.7	LOS A	1.5	10.9	0.23	0.61	52.6
5	T1	1650	3.0	0.593	25.7	LOS C	24.9	178.6	0.78	0.70	42.3
6	R2	163	3.0	0.832	74.8	LOS E	11.2	80.3	1.00	0.93	26.9
Approach		1952	3.0	0.832	28.5	LOS C	24.9	178.6	0.76	0.71	40.9
North: Resolution Drive											
7	L2	127	3.0	0.197	23.4	LOS C	4.4	31.5	0.62	0.72	42.9
8	T1	125	3.0	0.708	72.1	LOS E	4.3	30.6	1.00	0.82	27.7
9	R2	29	3.0	0.346	74.9	LOS E	1.9	13.7	1.00	0.72	26.9
Approach		281	3.0	0.708	50.4	LOS D	4.4	31.5	0.83	0.77	32.8
West: Great Eastern Hwy west											
10	L2	37	3.0	0.042	24.0	LOS C	1.2	8.6	0.55	0.68	42.1
11	T1	2289	3.0	0.831	32.4	LOS C	42.9	307.8	0.93	0.87	39.3
12	R2	143	3.0	0.730	70.1	LOS E	9.3	66.9	1.00	0.85	27.7
Approach		2469	3.0	0.831	34.4	LOS C	42.9	307.8	0.93	0.86	38.4
All Vehicles		5040	3.0	0.832	34.4	LOS C	42.9	307.8	0.86	0.79	38.4

*Figure 46 – **2031 PM Peak** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	110	3.0	0.521	82.9	LOS F	11.3	81.2	0.98	0.80	25.3
2	T1	172	3.0	0.521	77.2	LOS E	11.8	84.5	0.98	0.79	26.5
3	R2	112	3.0	0.426	81.7	LOS F	9.0	64.8	0.96	0.79	25.6
Approach		394	3.0	0.521	80.0	LOS F	11.8	84.5	0.97	0.80	25.9
East: Great Eastern Hwy east											
4	L2	122	3.0	0.079	7.1	LOS A	1.3	9.4	0.16	0.59	53.0
5	T1	2789	3.0	0.897	35.9	LOS D	75.3	540.8	0.90	0.85	37.9
6	R2	151	3.0	0.879	104.7	LOS F	14.5	104.3	1.00	0.95	22.0
Approach		3062	3.0	0.897	38.1	LOS D	75.3	540.8	0.88	0.85	37.0
North: Resolution Drive											
7	L2	171	3.0	0.260	13.2	LOS B	4.9	35.4	0.39	0.68	48.7
8	T1	164	3.0	0.857	102.3	LOS F	7.9	56.4	1.00	0.93	22.6
9	R2	76	3.0	0.836	107.0	LOS F	7.2	52.0	1.00	0.91	21.8
Approach		411	3.0	0.857	66.1	LOS E	7.9	56.4	0.75	0.82	28.8
West: Great Eastern Hwy west											
10	L2	25	3.0	0.024	22.4	LOS C	0.9	6.5	0.45	0.65	42.9
11	T1	1461	3.0	0.443	22.5	LOS C	23.7	170.4	0.61	0.55	43.9
12	R2	76	3.0	0.443	90.3	LOS F	6.4	46.3	0.99	0.77	24.0
Approach		1562	3.0	0.443	25.8	LOS C	23.7	170.4	0.63	0.56	42.2
All Vehicles		5429	3.0	0.897	39.7	LOS D	75.3	540.8	0.80	0.76	36.4

*Figure 47 – **2031 PM Peak with Golden Gateway development** Resolution Drive/Great Eastern Highway Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hardey Road											
1	L2	110	3.0	0.550	83.2	LOS F	12.0	86.3	0.98	0.81	25.3
2	T1	188	3.0	0.550	77.6	LOS E	12.5	89.6	0.98	0.80	26.4
3	R2	112	3.0	0.426	81.7	LOS F	9.0	64.8	0.96	0.79	25.6
Approach		410	3.0	0.550	80.2	LOS F	12.5	89.6	0.97	0.80	25.9
East: Great Eastern Hwy east											
4	L2	122	3.0	0.080	7.3	LOS A	1.4	10.4	0.18	0.59	52.8
5	T1	2789	3.0	0.918	43.8	LOS D	82.6	593.4	0.92	0.91	35.0
6	R2	166	3.0	0.913	110.0	LOS F	16.6	119.0	1.00	1.00	21.4
Approach		3077	3.0	0.918	45.9	LOS D	82.6	593.4	0.90	0.90	34.3
North: Resolution Drive											
7	L2	211	3.0	0.324	15.8	LOS B	7.5	53.8	0.47	0.71	47.1
8	T1	202	3.0	0.950	117.6	LOS F	10.6	75.9	1.00	1.08	20.7
9	R2	94	3.0	0.931	117.9	LOS F	9.6	68.8	1.00	1.04	20.5
Approach		507	3.0	0.950	75.3	LOS E	10.6	75.9	0.78	0.92	26.9
West: Great Eastern Hwy west											
10	L2	28	3.0	0.027	23.4	LOS C	1.0	7.5	0.46	0.66	42.4
11	T1	1598	3.0	0.495	24.5	LOS C	27.6	198.3	0.65	0.59	42.9
12	R2	76	3.0	0.418	89.1	LOS F	6.4	45.9	0.98	0.77	24.2
Approach		1702	3.0	0.495	27.4	LOS C	27.6	198.3	0.66	0.60	41.4
All Vehicles		5696	3.0	0.950	45.5	LOS D	82.6	593.4	0.82	0.80	34.4

7.9.3 Grandstand Road/Resolution Drive/Stoneham Street Intersection

Headline SIDRA movement summaries for the Grandstand Road/Resolution Drive/Stoneham Street Intersection are presented in Table 19 (AM Peak hour) and Table 20 (PM peak hour). The SIDRA intersection geometry is shown in Figure 48. The full SIDRA movement summaries are presented in Figure 49 and Figure 50 (AM peak hour) as well as Figure 51 and Figure 52 (PM peak hour).

Overall the Grandstand Road/Resolution Drive/Stoneham Street Intersection SIDRA modelling results show that this intersection would perform with LOS A across all approaches to the intersection during the AM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Overall the Grandstand Road/Resolution Drive/Stoneham Street Intersection SIDRA modelling results show that this intersection would perform with LOS A or B across all approaches to the intersection during the PM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Table 19 – AM Peak Hour (0800-0859) Grandstand Road/Resolution Drive/Stoneham Street Intersection Assessment

Year	Grandstand Rd (north)			Resolution Dr (south)			Stoneham St (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2031	0.39	7.0	A	0.38	7.9	A	0.20	5.5	A	0.39	6.8	A
2031 + dev	0.41	7.1	A	0.49	8.9	A	0.25	5.9	A	0.49	7.1	A

Table 20 – PM Peak Hour (1600-1659) Grandstand Road/Resolution Drive/Stoneham Street Intersection Assessment

Year	Grandstand Rd (north)			Resolution Dr (south)			Stoneham St (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2031	0.24	6.6	A	0.67	8.8	A	0.72	10.9	B	0.72	9.3	A
2031 + dev	0.29	6.5	A	0.79	11.8	B	0.80	14.4	B	0.80	11.5	B

Figure 48 – Grandstand Road/Resolution Drive/Stoneham Street Intersection – SIDRA geometry

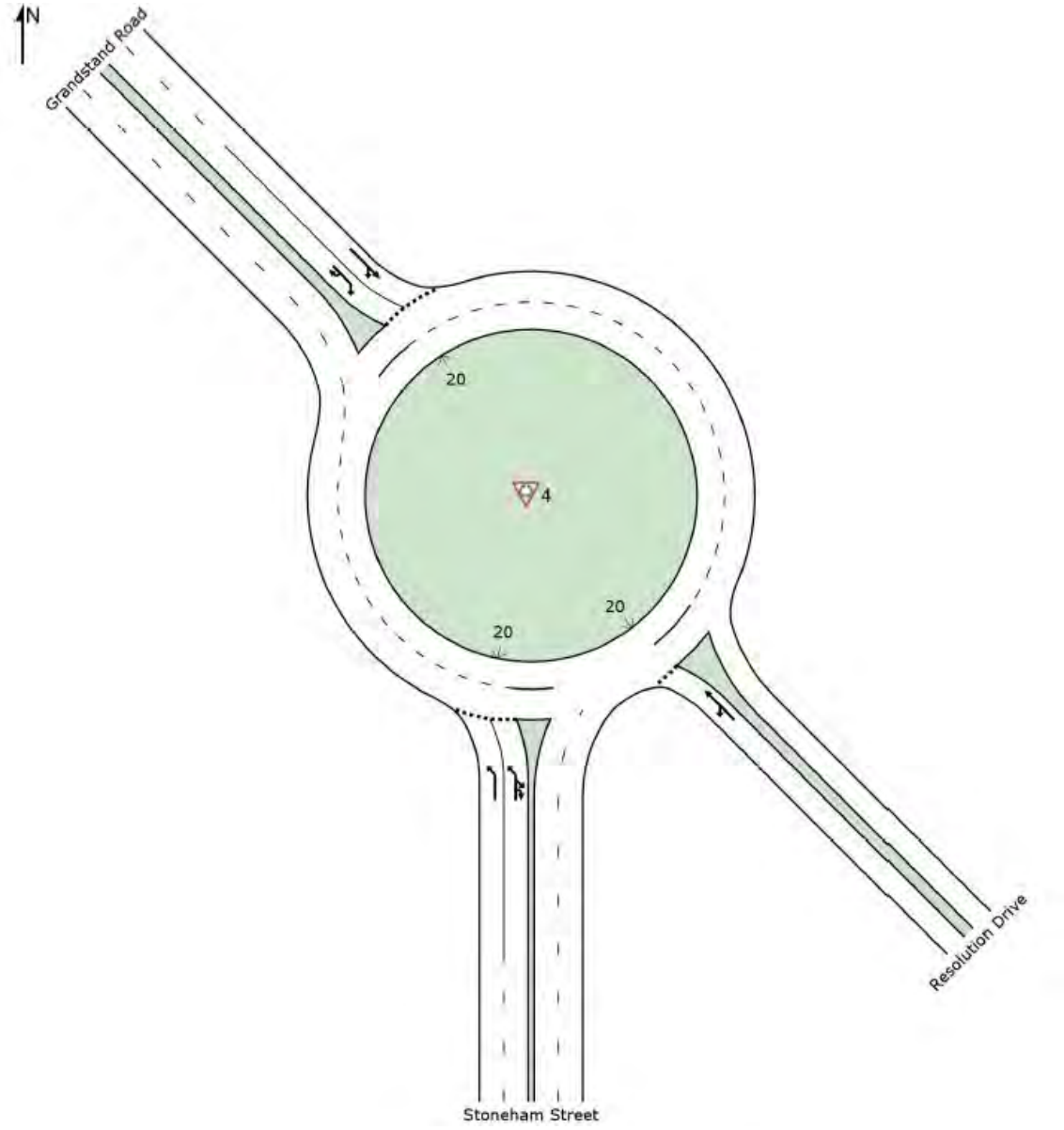


*Figure 49 – **2031 AM Peak** Grandstand Road/Resolution Drive/Stoneham Street Intersection*

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham Street											
1a	L1	404	3.0	0.201	4.7	LOS A	1.1	7.7	0.41	0.53	54.6
3b	R3	59	3.0	0.201	10.9	LOS B	1.1	7.6	0.41	0.57	54.9
Approach		463	3.0	0.201	5.5	LOS A	1.1	7.7	0.41	0.54	54.6
SouthEast: Resolution Drive											
21b	L3	58	3.0	0.376	7.7	LOS A	1.8	12.9	0.64	0.80	52.0
22	T1	229	3.0	0.376	7.9	LOS A	1.8	12.9	0.64	0.80	53.9
Approach		287	3.0	0.376	7.9	LOS A	1.8	12.9	0.64	0.80	53.5
NorthWest: Grandstand Road											
28	T1	314	3.0	0.388	4.4	LOS A	2.4	17.6	0.22	0.51	54.8
29a	R1	799	3.0	0.388	8.0	LOS A	2.4	17.6	0.23	0.56	53.2
Approach		1113	3.0	0.388	7.0	LOS A	2.4	17.6	0.22	0.54	53.6
All Vehicles		1863	3.0	0.388	6.8	LOS A	2.4	17.6	0.33	0.58	53.9

*Figure 50 – **2031 AM Peak with Golden Gateway development** Grandstand Road/Resolution Drive/Stoneham Street Intersection*

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham Street											
1a	L1	475	3.0	0.253	5.0	LOS A	1.4	10.3	0.48	0.57	54.3
3b	R3	77	3.0	0.253	11.2	LOS B	1.4	10.1	0.49	0.61	54.5
Approach		552	3.0	0.253	5.9	LOS A	1.4	10.3	0.48	0.58	54.3
SouthEast: Resolution Drive											
21b	L3	73	3.0	0.487	8.7	LOS A	2.8	19.8	0.70	0.88	51.4
22	T1	293	3.0	0.487	8.9	LOS A	2.8	19.8	0.70	0.88	53.2
Approach		366	3.0	0.487	8.9	LOS A	2.8	19.8	0.70	0.88	52.8
NorthWest: Grandstand Road											
28	T1	323	3.0	0.405	4.5	LOS A	2.7	19.1	0.27	0.51	54.6
29a	R1	810	3.0	0.405	8.1	LOS A	2.7	19.1	0.27	0.56	53.0
Approach		1133	3.0	0.405	7.1	LOS A	2.7	19.1	0.27	0.55	53.5
All Vehicles		2051	3.0	0.487	7.1	LOS A	2.8	19.8	0.40	0.61	53.6

*Figure 51 – **2031 PM Peak** Grandstand Road/Resolution Drive/Stoneham Street Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham Street											
1a	L1	1227	3.0	0.719	10.7	LOS B	8.4	60.4	0.90	1.00	51.3
3b	R3	45	3.0	0.719	17.2	LOS B	8.1	58.2	0.91	1.02	51.6
Approach		1272	3.0	0.719	10.9	LOS B	8.4	60.4	0.90	1.00	51.3
SouthEast: Resolution Drive											
21b	L3	87	3.0	0.667	8.7	LOS A	5.5	39.4	0.71	0.87	51.4
22	T1	527	3.0	0.667	8.9	LOS A	5.5	39.4	0.71	0.87	53.2
Approach		614	3.0	0.667	8.8	LOS A	5.5	39.4	0.71	0.87	53.0
NorthWest: Grandstand Road											
28	T1	254	3.0	0.245	4.3	LOS A	1.5	11.1	0.19	0.47	55.3
29a	R1	445	3.0	0.245	7.9	LOS A	1.5	11.1	0.20	0.55	53.3
Approach		699	3.0	0.245	6.6	LOS A	1.5	11.1	0.19	0.52	54.0
All Vehicles		2585	3.0	0.719	9.3	LOS A	8.4	60.4	0.67	0.84	52.4

*Figure 52 – **2031 PM Peak with Golden Gateway development** Grandstand Road/Resolution Drive/Stoneham Street Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham Street											
1a	L1	1237	3.0	0.796	14.2	LOS B	11.3	81.1	1.00	1.16	48.9
3b	R3	55	3.0	0.796	20.8	LOS C	10.8	77.2	1.00	1.18	49.1
Approach		1292	3.0	0.796	14.4	LOS B	11.3	81.1	1.00	1.16	48.9
SouthEast: Resolution Drive											
21b	L3	130	3.0	0.794	11.7	LOS B	9.1	65.2	0.85	1.05	49.4
22	T1	584	3.0	0.794	11.9	LOS B	9.1	65.2	0.85	1.05	51.0
Approach		714	3.0	0.794	11.8	LOS B	9.1	65.2	0.85	1.05	50.7
NorthWest: Grandstand Road											
28	T1	330	3.0	0.289	4.4	LOS A	2.0	14.1	0.23	0.45	55.3
29a	R1	485	3.0	0.289	8.0	LOS A	2.0	14.1	0.23	0.55	53.1
Approach		815	3.0	0.289	6.5	LOS A	2.0	14.1	0.23	0.51	54.0
All Vehicles		2821	3.0	0.796	11.5	LOS B	11.3	81.1	0.74	0.95	50.8

7.9.4 Stoneham Street/Daly Street/Resolution Drive Intersection

Headline SIDRA movement summaries for the Stoneham Street/Daly Street/Resolution Drive Intersection are presented in Table 21 (AM Peak hour) and Table 22 (PM peak hour). The SIDRA intersection geometry is shown in Figure 53. The full SIDRA movement summaries are presented in Figure 54 and Figure 55 (AM peak hour) as well as Figure 56 and Figure 57 (PM peak hour).

Overall the Stoneham Street/Daly Street/Resolution Drive Intersection SIDRA modelling results show that this intersection would perform with LOS B or C across all approaches to the intersection during the AM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Overall the Stoneham Street/Daly Street/Resolution Drive Intersection SIDRA modelling results show that this intersection would perform with LOS B or C across all approaches to the intersection during the PM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Table 21 – AM Peak Hour (0800-0859) Stoneham Street/Daly Street/Resolution Drive Intersection Assessment

Year	Stoneham St (north)			Daly St (east)			Stoneham St (south)			Resolution Dr (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2031	0.62	13.3	B	0.05	22.7	C	0.24	11.6	B	0.26	21.2	C	0.63	13.6	B
2031 + dev	0.65	14.0	B	0.19	15.1	B	0.89	23.1	C	0.45	21.8	C	0.89	17.4	C

Table 22 – PM Peak Hour (1600-1659) Stoneham Street/Daly Street/Resolutions Drive Intersection Assessment

Year	Stoneham St (north)			Daly St (east)			Stoneham St (south)			Resolution Dr (west)			All Vehicles		
	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS	Deg. Sat	Av. Del	LOS
2031	0.49	15.8	B	0.05	26.9	C	0.69	15.2	B	0.17	26.5	C	0.59	16.0	B
2031 + dev	0.73	18.9	B	0.09	19.4	B	0.87	29.2	C	0.22	23.8	C	0.89	25.2	C

Figure 53 – Stoneham Street/Daly Street/Resolution Drive Intersection – SIDRA geometry

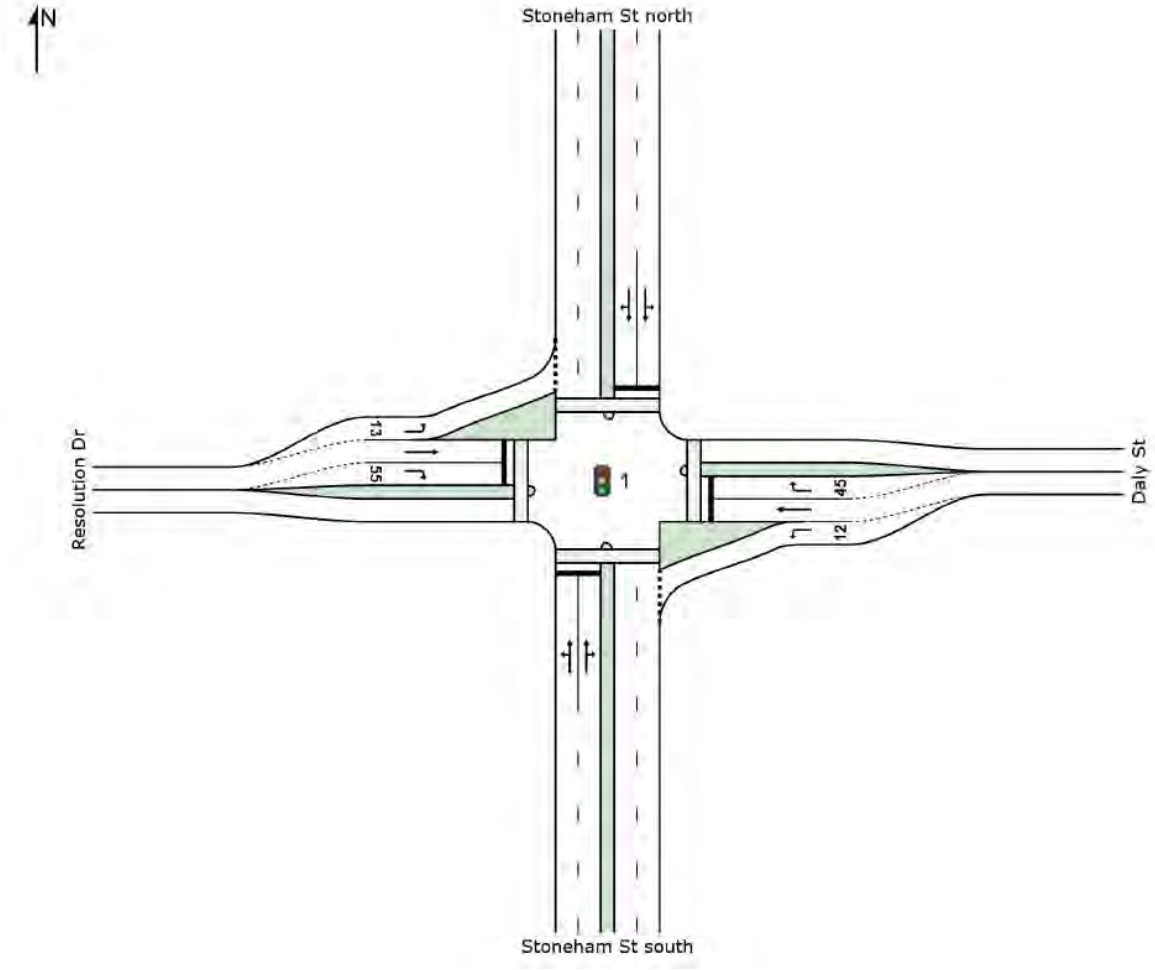


*Figure 54 – **2031 AM Peak** Stoneham Street/Daly Street/Resolution Drive Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham St south											
1	L2	32	3.0	0.244	16.0	LOS B	3.8	27.5	0.64	0.56	49.4
2	T1	363	3.0	0.244	11.1	LOS B	3.8	27.5	0.65	0.56	50.4
3	R2	9	3.0	0.244	17.3	LOS B	3.5	25.3	0.67	0.56	49.1
Approach		404	3.0	0.244	11.6	LOS B	3.8	27.5	0.65	0.56	50.3
East: Daly St											
4	L2	10	3.0	0.012	9.6	LOS A	0.1	0.7	0.45	0.61	51.1
5	T1	10	3.0	0.045	26.4	LOS C	0.3	1.9	0.87	0.59	41.9
6	R2	10	3.0	0.047	32.1	LOS C	0.3	2.0	0.91	0.67	38.4
Approach		30	3.0	0.047	22.7	LOS C	0.3	2.0	0.75	0.62	43.2
North: Stoneham St north											
7	L2	5	3.0	0.625	18.7	LOS B	12.5	89.5	0.81	0.71	48.1
8	T1	1049	3.0	0.625	13.2	LOS B	12.5	89.5	0.81	0.71	49.2
9	R2	28	3.0	0.625	18.8	LOS B	11.8	84.4	0.81	0.72	48.1
Approach		1082	3.0	0.625	13.3	LOS B	12.5	89.5	0.81	0.71	49.2
West: Resolution Dr											
10	L2	51	3.0	0.049	7.1	LOS A	0.3	2.0	0.31	0.62	52.9
11	T1	12	3.0	0.054	26.5	LOS C	0.3	2.2	0.88	0.60	41.8
12	R2	54	3.0	0.255	33.3	LOS C	1.5	11.0	0.95	0.74	37.9
Approach		117	3.0	0.255	21.2	LOS C	1.5	11.0	0.66	0.67	43.8
All Vehicles		1633	3.0	0.625	13.6	LOS B	12.5	89.5	0.76	0.67	48.9

*Figure 55 – **2031 AM Peak with Golden Gateway development** Stoneham Street/Daly Street/Resolution Drive Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham St south											
1	L2	38	3.0	0.457	17.4	LOS B	8.2	58.5	0.72	0.64	48.7
2	T1	368	3.0	0.457	11.8	LOS B	8.2	58.5	0.72	0.64	49.9
3	R2	174	3.0	0.887	48.4	LOS D	7.2	51.7	1.00	1.17	33.0
Approach		580	3.0	0.887	23.1	LOS C	8.2	58.5	0.81	0.80	43.2
East: Daly St											
4	L2	150	3.0	0.192	11.0	LOS B	1.9	13.3	0.55	0.70	50.1
5	T1	12	3.0	0.054	26.5	LOS C	0.3	2.2	0.88	0.60	41.8
6	R2	27	3.0	0.127	32.6	LOS C	0.8	5.4	0.93	0.71	38.2
Approach		189	3.0	0.192	15.1	LOS B	1.9	13.3	0.62	0.69	47.4
North: Stoneham St north											
7	L2	24	3.0	0.649	18.9	LOS B	13.1	94.3	0.82	0.73	47.9
8	T1	1053	3.0	0.649	13.7	LOS B	13.1	94.3	0.83	0.73	48.8
9	R2	31	3.0	0.649	19.7	LOS B	12.3	88.1	0.83	0.74	47.6
Approach		1108	3.0	0.649	14.0	LOS B	13.1	94.3	0.83	0.73	48.8
West: Resolution Dr											
10	L2	88	3.0	0.088	7.6	LOS A	0.6	4.3	0.35	0.63	52.5
11	T1	12	3.0	0.054	26.5	LOS C	0.3	2.2	0.88	0.60	41.8
12	R2	96	3.0	0.453	34.2	LOS C	2.8	20.3	0.97	0.77	37.6
Approach		196	3.0	0.453	21.8	LOS C	2.8	20.3	0.69	0.70	43.4
All Vehicles		2073	3.0	0.887	17.4	LOS B	13.1	94.3	0.79	0.75	46.4

*Figure 56 – **2031 PM Peak** Stoneham Street/Daly Street/Resolution Drive Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham St south											
1	L2	68	3.0	0.689	20.1	LOS C	18.7	134.5	0.81	0.74	46.9
2	T1	1262	3.0	0.689	14.9	LOS B	18.7	134.5	0.81	0.73	48.1
3	R2	9	3.0	0.689	20.8	LOS C	18.3	131.4	0.82	0.73	47.0
Approach		1339	3.0	0.689	15.2	LOS B	18.7	134.5	0.81	0.73	48.0
East: Daly St											
4	L2	10	3.0	0.012	10.4	LOS B	0.1	0.9	0.43	0.61	50.6
5	T1	10	3.0	0.044	32.4	LOS C	0.3	2.3	0.87	0.59	39.2
6	R2	10	3.0	0.046	38.0	LOS D	0.3	2.4	0.91	0.67	36.1
Approach		30	3.0	0.046	26.9	LOS C	0.3	2.4	0.74	0.62	41.1
North: Stoneham St north											
7	L2	19	3.0	0.493	18.1	LOS B	11.6	83.0	0.69	0.62	48.4
8	T1	653	3.0	0.493	15.0	LOS B	11.6	83.0	0.73	0.65	47.9
9	R2	45	3.0	0.493	27.0	LOS C	6.8	48.5	0.84	0.73	43.0
Approach		717	3.0	0.493	15.8	LOS B	11.6	83.0	0.74	0.65	47.5
West: Resolution Dr											
10	L2	34	3.0	0.054	11.1	LOS B	0.5	3.3	0.46	0.65	50.1
11	T1	11	3.0	0.048	32.4	LOS C	0.4	2.5	0.87	0.59	39.2
12	R2	37	3.0	0.170	39.0	LOS D	1.3	9.1	0.93	0.72	35.8
Approach		82	3.0	0.170	26.5	LOS C	1.3	9.1	0.73	0.68	41.2
All Vehicles		2168	3.0	0.689	16.0	LOS B	18.7	134.5	0.78	0.70	47.4

*Figure 57 – **2031 PM Peak with Golden Gateway development** Stoneham Street/Daly Street/Resolution Drive Intersection*

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stoneham St south											
1	L2	108	3.0	0.886	33.1	LOS C	28.1	201.4	0.98	1.11	40.2
2	T1	1300	3.0	0.886	28.8	LOS C	28.1	201.4	0.99	1.12	40.5
3	R2	27	3.0	0.886	35.8	LOS D	23.7	169.9	1.00	1.13	39.4
Approach		1435	3.0	0.886	29.2	LOS C	28.1	201.4	0.99	1.12	40.5
East: Daly St											
4	L2	58	3.0	0.083	13.5	LOS B	0.8	6.0	0.61	0.68	48.5
5	T1	20	3.0	0.090	26.8	LOS C	0.5	3.8	0.88	0.62	41.7
6	R2	15	3.0	0.071	32.3	LOS C	0.4	3.0	0.92	0.68	38.3
Approach		93	3.0	0.090	19.4	LOS B	0.8	6.0	0.72	0.67	45.0
North: Stoneham St north											
7	L2	58	3.0	0.731	20.7	LOS C	16.2	116.4	0.87	0.81	46.6
8	T1	673	3.0	0.731	17.0	LOS B	16.2	116.4	0.89	0.82	46.5
9	R2	69	3.0	0.731	36.3	LOS D	4.8	34.7	1.00	0.91	38.2
Approach		800	3.0	0.731	18.9	LOS B	16.2	116.4	0.89	0.83	45.6
West: Resolution Dr											
10	L2	42	3.0	0.068	13.0	LOS B	0.6	4.2	0.59	0.67	48.8
11	T1	11	3.0	0.049	26.5	LOS C	0.3	2.1	0.88	0.59	41.8
12	R2	46	3.0	0.217	33.1	LOS C	1.3	9.3	0.94	0.73	38.0
Approach		99	3.0	0.217	23.8	LOS C	1.3	9.3	0.79	0.69	42.4
All Vehicles		2427	3.0	0.886	25.2	LOS C	28.1	201.4	0.94	0.99	42.3

8. ANALYSIS OF EXTERNAL TRANSPORT NETWORKS

Impacts along Great Eastern Highway, Belgravia Street and Hardey Road are addressed in Section 7.

9. SAFE ROUTES TO SCHOOL

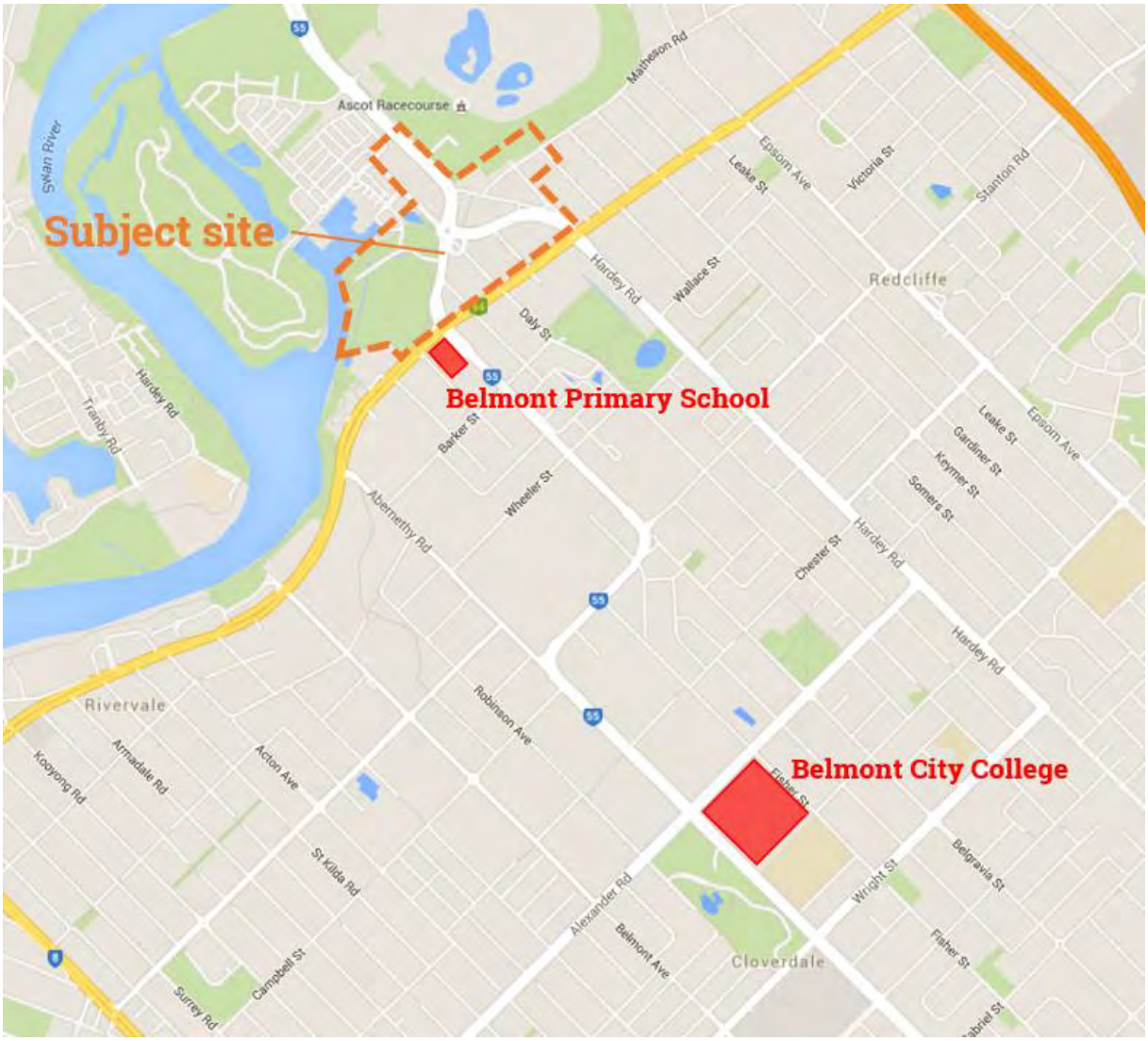
9.1 Schools Catchments

The Golden Gateway site is located within the following school catchments:

- Belmont Primary School (state primary school approx. 400m from the site); and
- Belmont City College (independent secondary school approx. 2.5km from the site).

Figure 58 shows the location of the above two schools in relation to the Golden Gateway site.

Figure 58 – Location of Schools in Relation to the Golden Gateway Site (source: Google Maps)



9.2 Walk and Cycle Routes to Schools

Belmont Primary School is located on the southwest corner of the traffic signal controlled intersection of Great Eastern Highway and Belgravia Street. The primary school is located approximately 400m from the centre of the Golden Gateway site, but a close as 50m-100m from the Belmont Trust Land portion of the site. The close proximity of Belmont Primary School to the site provides future residents with the ability to access a primary education facility via a short walk or cycle.

Belmont City College is located on Fisher Street, immediately to the south of Alexander Road and to the east of Abernethy Road (opposite Belmont Oasis Leisure Centre). The independent secondary school is located approximately 2.5km from the centre of the Golden Gateway site. The distance from the site to the secondary school means that walking and cycling trips will only be made by parents and students who are comfortable walking or cycling those distances along heavily trafficked routes.

Further details on the walk and cycle routes to Belmont Primary School and Belmont City College are provided below.

9.2.1 Belmont Primary School

The most direct pedestrian access route from the Golden Gateway LSP site to Belmont Primary School is via the pedestrian crossing across the western leg of the traffic signal controlled intersection of Great Eastern Highway and Belgravia Street.

Having crossed Great Eastern Highway, parents and students can walk along the footpath alongside the schools frontage with Great Eastern Highway to Lapage Street, where the pedestrian entry to the primary school is located.

It should be noted that prior to April 2016 legally in WA children aged 12 years old and under are able to ride on the footpath, in addition adults are legally able to ride on a footpath when accompanying a child under 12 years old. Since April 2016 it is now legal for anyone to ride on the footpath as long as they do so paying due care and attention to others users of the path.

As such the above pedestrian route can be legally used by parents and students to access the school. The direct pedestrian and cycle route from the LSP site to Belmont Primary School is shown in Figure 59.

Figure 59 - Walk to School Route – Belmont Primary School (source: Nearmap)

9.2.2 Belmont City College

The most direct pedestrian access route from the Golden Gateway LSP site to Belmont City College is via the pedestrian crossing across the western leg of the traffic signal controlled intersection of Great Eastern Highway, and then via Belgravia Street to Alexander Road, and along Alexander Road to Belmont City College located on Fisher Street.

The most direct pedestrian route between the LSP site and Belmont City College, requires crossing Great Eastern Highway via the signalised intersection with Belgravia Street, then walking along the footpath on the western side of Belgravia Street to Fairbrother Street, and then crossing Fairbrother Street to continue along the western side of Belgravia Street to Alexander Road. At Alexander Road you can walk along the footpath on the northern side of the street until you are opposite Belmont City College and then cross via the median island uncontrolled crossing to access the College site.

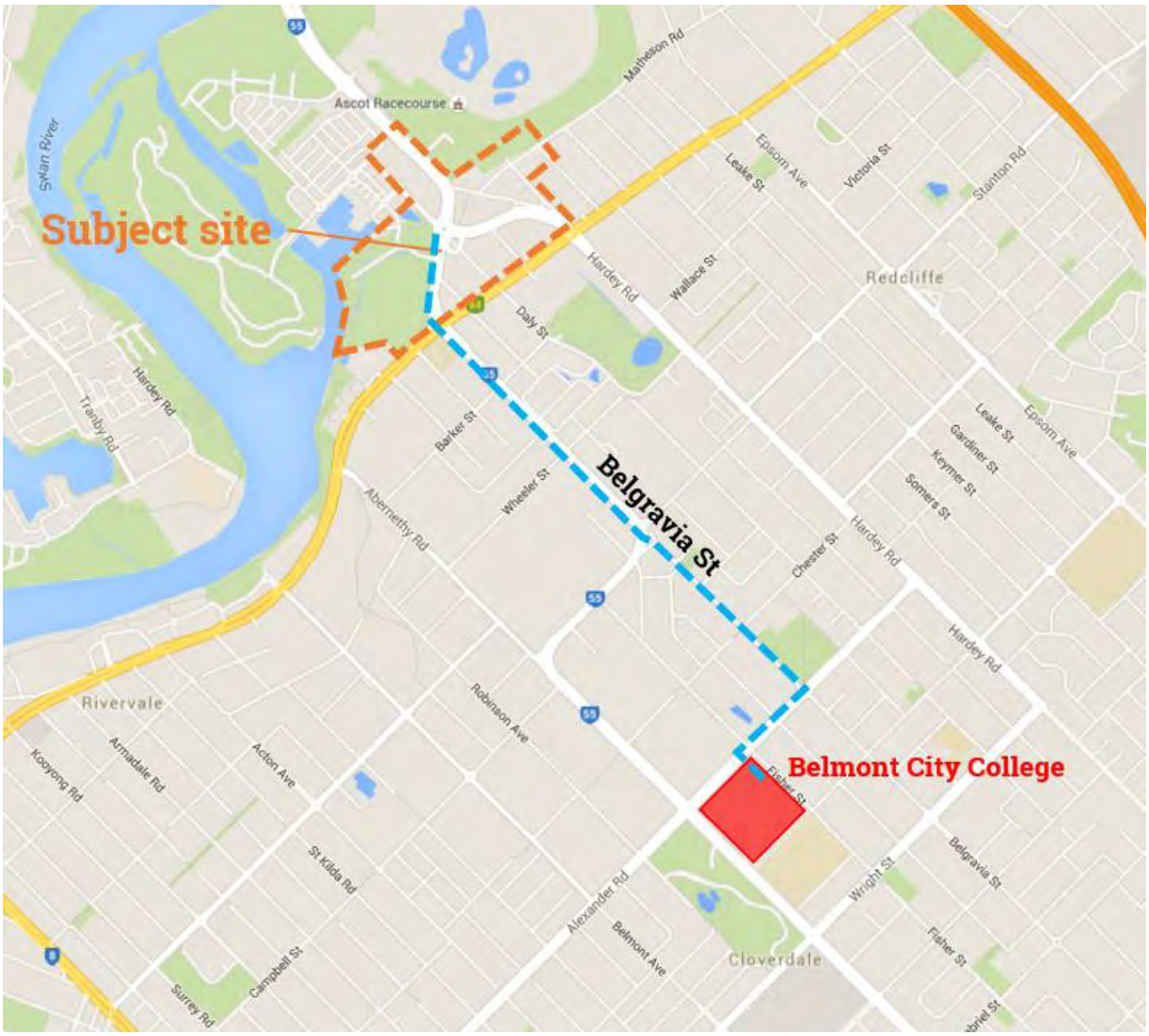
Similar to Belmont Primary School, students riding to Belmont City College can utilise the footpaths as it is now legal to do so. Older students that wish to ride on a shared path or on-road, could utilise the following route to access Belmont College from the LSP site; due to the dual traffic lanes in each direction along

Belgravia Street between Great Eastern Highway and Fairbrother Street, the on-road cycling environment through that corridor is very hostile for inexperienced or younger cyclists.

As such it is more likely that students would cross Great Eastern Highway at the Hardey Road signalised intersection and cycle along Hardey Road to Alexander Road (note: Alexander Road has on-street bike lanes to the west of Belgravia Street intersection).

Alternatively, cyclists may use the lower traffic volume corridor of Daly Street between Great Eastern Highway and Alexander Road. The direct pedestrian and cycle route from the LSP site to Belmont Primary School is shown in Figure 60.

Figure 60 - Walk to School Route – Belmont City College (source: Nearmap)



10. CONCLUSIONS

10.1 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 to the west/northwest.

The Golden Gateway LSP is comprised of three main land uses, residential dwellings (approximately 3,000 dwellings), commercial space (approximately 5,900m^2 NLA) and retail space (approximately 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 peoples connection to the Swan River;
- Create accessible, quality public realm within the precinct; and
- Identify appropriate uses/densities in conjunction with infrastructure improvements.

10.2 Conclusions

10.2.1 Background Growth in Traffic

The available historic traffic count data on the road network surrounding the Golden Gateway site suggests that the road network has been subject to significant fluctuations in traffic volumes as works have been completed in the local area – most notably the Great Eastern Highway upgrades.

Based on the fluctuations in historic traffic count data and therefore the limited reliability of this data to accurately reflect recent historic trends from which to base background traffic growth in the future, and the recast ROM24 outputs suggesting that there is to be significant year on year growth around the Golden Gateway site, far in excess of levels of annual growth that would be expected to be sustained and accommodated on the surrounding road network – for the purposes of this assessment we have applied 15% growth (1% growth per annum) for the Great Eastern Highway corridor and 25% growth (1.7% growth per annum) for all other road corridors around the Golden Gateway site.

10.2.2 Intersection Performance

Stoneham Street/Great Eastern Highway Intersection

The modelling results show that for the AM peak hour in the future base year 2031 scenario and 2031 with Golden Gateway development scenario, both have overall intersection LOS F. However, the modelling suggests that the additional AM peak hour traffic generated by the Golden Gateway site, that is predicted to use the Stoneham Street corridor, would place additional pressure on the Stoneham Street approach to the

Great Eastern Highway intersection and there would be a significant increase in delay from 152 seconds (2031 base scenario) to 270 seconds (2031 with development scenario).

The modelling results show that for the PM peak hour in the future base year 2031 scenario the Stoneham Street/Great Eastern Highway Intersection performs with an overall LOS E and in the 2031 plus Golden Gateway development scenario the intersection performs with an overall LOS F. The additional PM peak hour traffic generated by the Golden Gateway site, that is predicted to use the Great Eastern Highway (west) and Stoneham Street approaches to the intersection, would place additional pressure on the operation of the intersection and would see significant increases in intersection delay – Great Eastern Highway approach would increase in delay from 69 seconds (2031 base scenario) to 157 seconds (2031 with development scenario) and the Stoneham Street approach would increase in delay from 108 seconds (2031 base scenario) to 182 seconds (2031 with development scenario).

Resolution Drive/Great Eastern Highway Intersection

The modelling results show that for the AM peak hour in the future base year 2031 scenario and 2031 with Golden Gateway development scenario, both have an overall LOS D. The modelling results show that the additional AM peak hour traffic generated by the Golden Gateway site has a limited impact upon the operation of the Resolution Drive/Great Eastern Highway intersection.

The modelling results show that the PM peak hour in the future base year 2031 scenario the Resolution Drive/Great Eastern Highway Intersection performs with an overall LOS D. The modelling results show that the additional PM peak hour traffic generated by the Golden Gateway site has a marginal impact upon the operation of the Resolution Drive/Great Eastern Highway intersection – the average delay on each approach to the intersection is predicted to increase marginally within the inclusion of the development related traffic, however the Great Eastern Highway (west) is predicted to experience a more significant increase in average delay from 38 seconds (2031 base scenario) and 68 seconds (2031 with development scenario).

Grandstand Road/Resolution Drive/Stoneham Street Intersection

Overall the Grandstand Road/Resolution Drive/Stoneham Street Intersection modelling results show that this intersection would perform with LOS A across all approaches to the intersection during the AM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Overall the Grandstand Road/Resolution Drive/Stoneham Street Intersection modelling results show that this intersection would perform with LOS A or B across all approaches to the intersection during the PM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Stoneham Street/Daly Street/Resolution Drive Intersection

Overall the Stoneham Street/Daly Street/Resolution Drive Intersection modelling results show that this intersection would perform with LOS B or C across all approaches to the intersection during the AM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

Overall the Stoneham Street/Daly Street/Resolution Drive Intersection modelling results show that this intersection would perform with LOS B or C across all approaches to the intersection during the PM peak, both in the 2031 base scenario and 2031 with Golden Gateway development scenario.

10.2.3 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 development site, but also provide a resident population that could be the catalyst in a step change in public transport service provision across the site/local area. It is anticipated that

there would be an uplift in public transport service and possible bus service operating through the development site.

APPENDIX 1 - TRANSPORT IMPACT ASSESSMENT CHECKLIST

Item	Status	Comments/Proposals
Introduction/Background	✓	Section 1
Development proposal		
regional context	✓	Section 2
proposed land uses	✓	Section 2
table of land uses and quantities	✓	Section 2
major attractors/generators	✓	Section 2
Existing situation		
existing land uses within structure plan	✓	Section 3
existing land uses within 800 metres of structure plan area	✓	Section 3
existing road network within structure plan area	✓	Section 3
existing pedestrian / cycle networks within structure plan area	✓	Section 3
existing public transport services within structure plan area	✓	Section 3
existing road network within 2 (or 5) km of structure plan area	✓	Section 3
traffic flows on roads within structure plan area (PM and/or AM peak hours)	✓	Section 3
Traffic flows on roads within 2 (or 5) km of structure plan area	✓	Section 3
existing pedestrian/cycle networks within 800m of structure plan area	✓	Section 3
existing public transport networks within 800m of structure plan area	✓	Section 3
Proposed internal transport networks		
changes/additions to existing road network or proposed new road network.	✓	Section 4
road reservation widths	✓	Section 4
road cross sections & speed limits	✓	Section 4
intersection controls	✓	Section 4
pedestrian /cycle networks and crossing facilities	✓	Section 4

Item	Status	Comments/Proposals
public transport routes	✓	Section 4
Changes to external road networks		
road network	✓	Section 5
intersection controls	✓	Section 5
pedestrian/cycle networks and crossing facilities	✓	Section 5
public transport facilities	✓	Section 5
Integration with surrounding area		
trip attractors/generators within 800m	✓	Section 6
proposed changes to land uses within 800m	✓	Section 6
travel desire lines from structure plan to these attractors/generators	✓	Section 6
adequacy of external transport networks	✓	Section 6
deficiencies in external transport networks	✓	Section 6
remedial measures to address deficiencies	✓	Section 6
Analysis of internal transport networks		
assessment years and time period	✓	Section 7
structure plan generated traffic	✓	Section 7
extraneous (through) traffic	✓	Section 7
design traffic flows (i.e. total traffic)	✓	Section 7
road cross sections	✓	Section 7
intersection controls	✓	Section 7
access strategy	✓	All sections
pedestrian/cycle networks	✓	Section 7
safe routes to schools	✓	Section 9
pedestrian permeability & efficiency	✓	Section 7
access to public transport	✓	Section 7
Analysis of external transport networks		Combined within Section 7 of the TIA
extent of analysis	✓	Section 7
Base flows for assessment years	✓	Section 7
Total traffic flows	✓	Section 7

Item	Status	Comments/Proposals
Road cross sections	✓	Section 7
Intersection layouts and controls	✓	Section 7
Pedestrian/cycle networks	✓	Wider area connections discussed in Section 9 Safe Routes to School
Conclusions	✓	Section 10

Transport Assessors Name: Matthew Root

Company: Flyt Pty Ltd Date 17 June 2018