

PTG/01054

Rivermark Area 4 Stage 1 Local Scheme Amendment and Structure Plan - Transport Impact Assessment

9th October 2025 | Revision A

Prepared for Hesperia Pty Ltd

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REPORT DETAILS

Unique Document Identification

Document Title	Transport Impact Assessment – Rivermark Area 4 Stage 1 Local Scheme Amendment and Structure Plan
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1 INTRODUCTION

1.1 Background

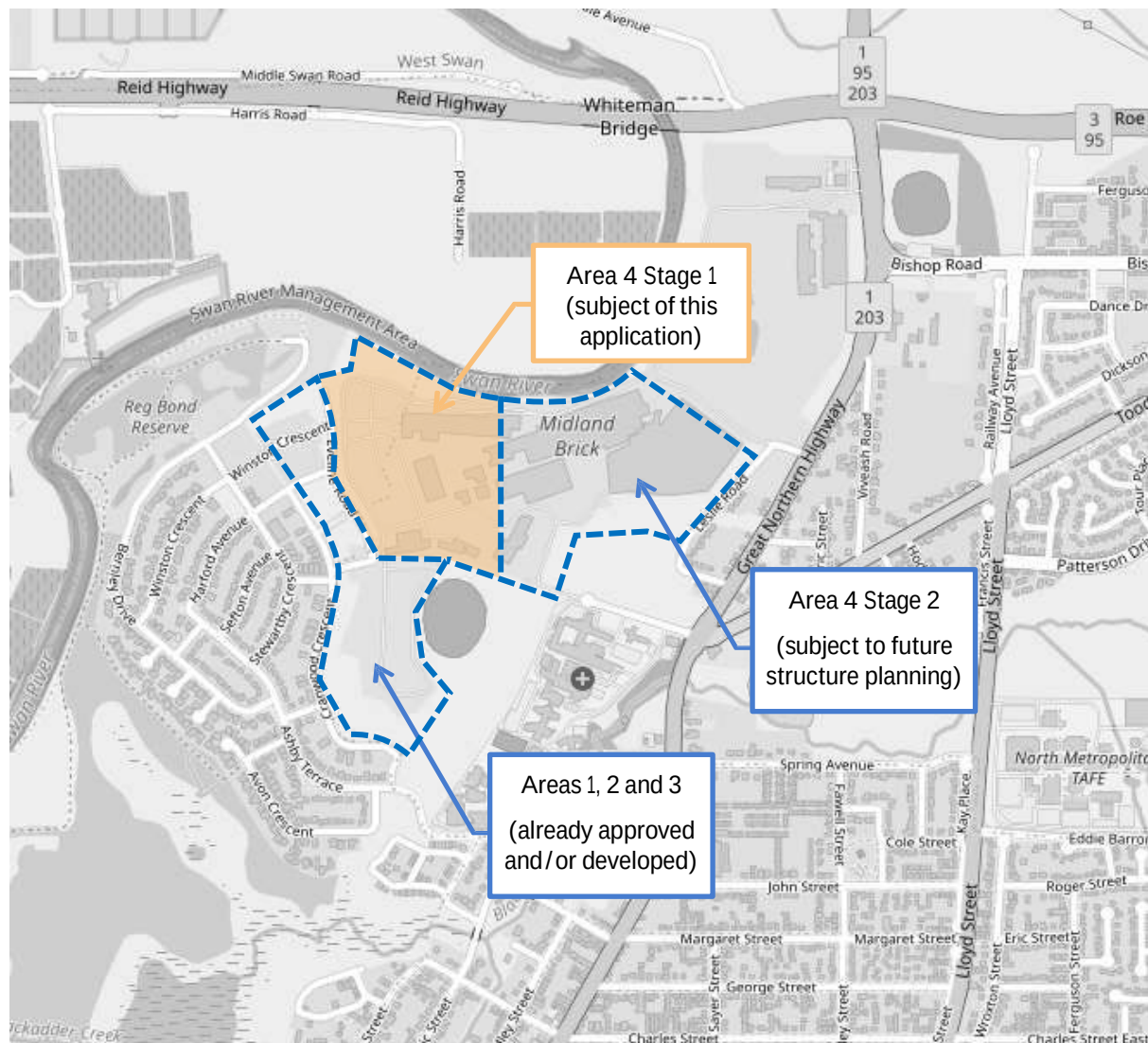
PTG Consulting Pty Ltd (PTG) was commissioned by Hesperia ('Client', 'Applicant') to prepare a Transport Impact Assessment ('TIA') for the Rivermark Area 4 Stage 1 Local Scheme Amendment and Structure Plan ('the Site', 'Area 4 Stg 1'). The Site is located at 44 Eveline Road, Viveash and is within the broader Rivermark development area that is earmarked to be redeveloped into commercial and residential dwelling lots.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans* (2016).

1.2 Site Location

The Site (Area 4 Stage 1) is located in the suburb of Viveash, City of Swan, located approximately 2km north of the Midland Town Centre. Figure 1 shows the location of Area 4 Stage 1 within the broader redevelopment area, which partially occupies the Midland Brick operations. The broader redevelopment area and Area 4 Stage 1 is predominantly zoned as industrial under the City of Swan's Local Planning Scheme.

Figure 1 – Location of the Proposed Structure Plan Amendment Area (Area 4 Stage 1)

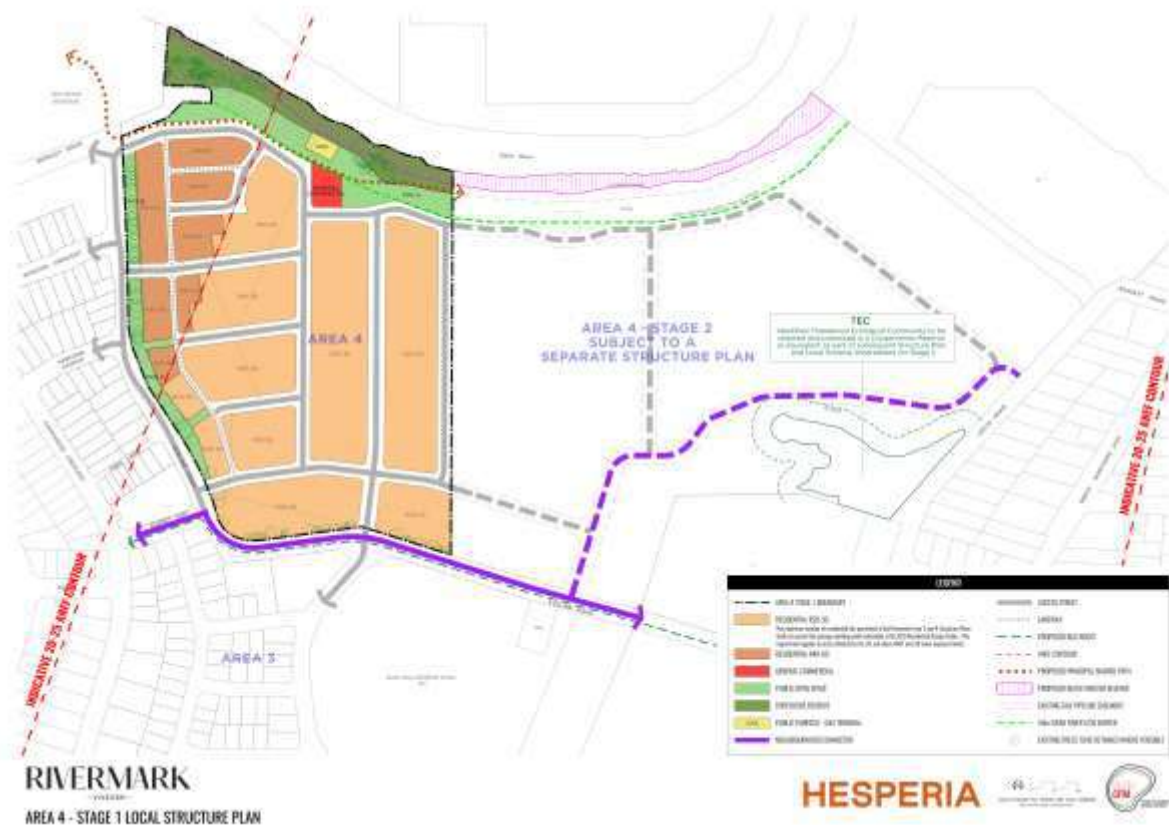


2 PROPOSED LOCAL SCHEME AMENDMENT AND STRUCTURE PLAN

Figure 2 shows an indicative Local Structure Plan layout for the proposed rezoning of Area 4 Stage 1 from General Industrial to Residential and Commercial. (see also Appendix A).

Only the Stage 1 of Area 4 is included within this Local Scheme Amendment and Structure Plan. Stage 2 is subject to a separate structure plan to be developed in the future.

Figure 2 – Proposed Structure Plan Layout



Source: Hesperia

The indicative yields in Table 1 have been adopted for the purposes of this transport assessment.

Table 1 – Area 4 Stage 1 Land Use Yields

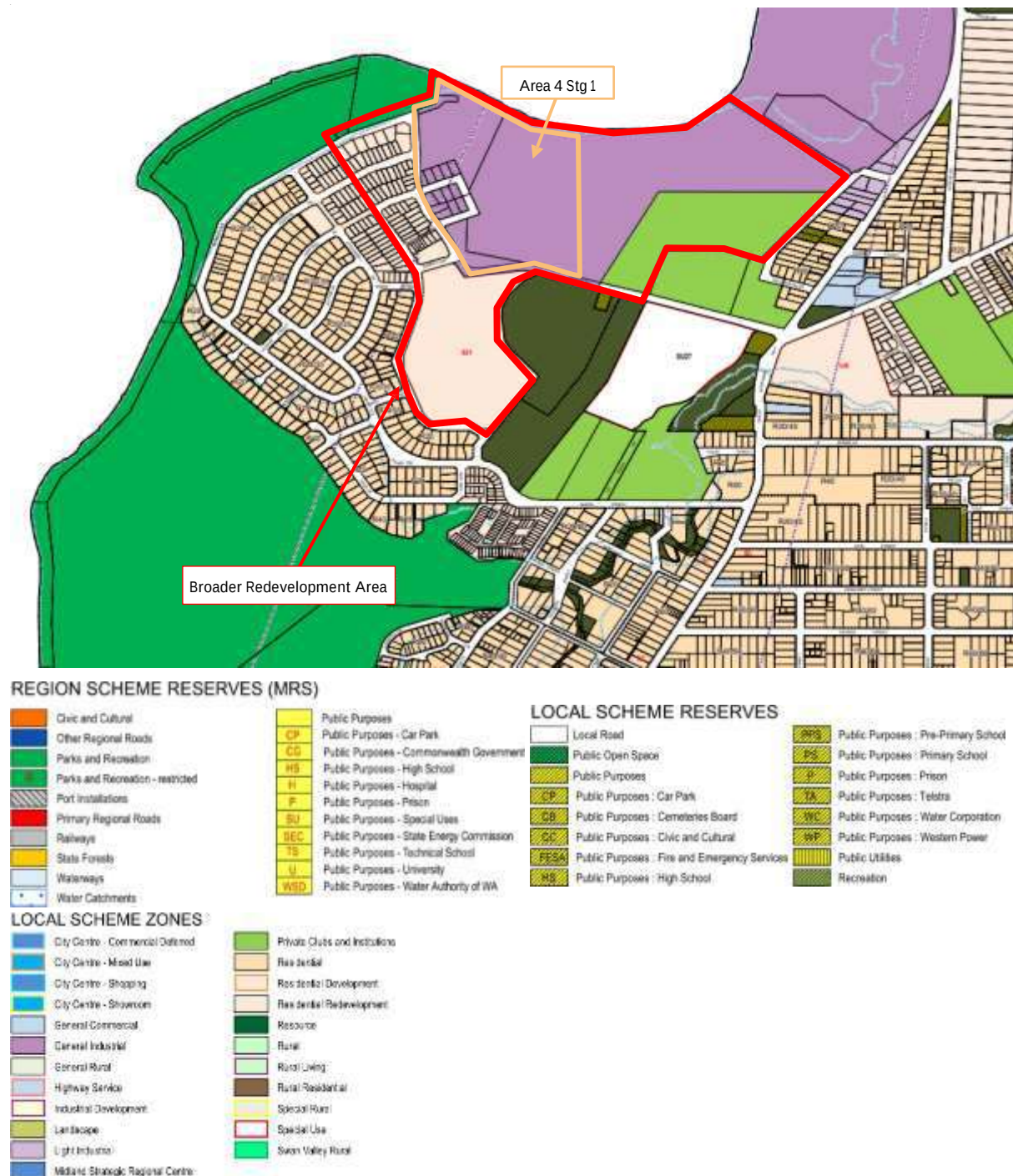
Land Use	Yield
Residential	219 dwellings
Commercial	2260 m ² (assumed 678 m ² GFA)

3 EXISTING SITUATION

3.1 Existing Land Uses

The land within the broader redevelopment area, including Area 4 Stage 1 is mostly occupied by Midland Brick and is primarily zoned as “General Industrial”, with a small portion to the east zoned as ‘Private Club and Institutions’. The remainder of the surrounding area is mostly zoned “Residential Development”. Figure 3 shows the existing zoning as presented in City of Swan Local Planning Scheme No. 17.

Figure 3 – Existing Zoning



Source: City of Swan Local Planning Scheme No.17

3.2 Existing Road Network

The existing road network hierarchy within and surrounding the Site is shown in Figure 4. The road classifications as defined in the Main Roads Functional Hierarchy are shown below in Table 2.

Table 2 – Main Roads WA Road Hierarchy

Road Hierarchy	Description
Primary Distributor	Form the regional and inter-regional grid of MRWA traffic routes and carry large volumes of fast-moving traffic. Some are strategic freight routes, and all are National or State roads. They are managed by Main Roads.
Regional Distributors	Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by Local Government.
District Distributor A	These carry traffic between industrial, commercial, and residential areas and connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by Local Government.
District Distributor B	Perform a similar function to “District Distributor A” but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and not through them, forming a grid that would ideally be around 1.5 kilometres apart. They are managed by Local Government.
Local Distributor	Carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. They are managed by Local Government.
Access Road	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by Local Government.

Figure 4 – Existing Road Network



Source: Main Roads WA

Table 3 below summarises the characteristics of key roads within and surrounding the proposed structure plan.

Table 3 – Key Roads within and Surrounding the Structure Plan

Road Name	Hierarchy	Jurisdiction	Configuration	Speed Limit (km/h)
Great Northern Highway	• Distributor A (South of Reid Highway) • Primary Distributor (North of Reid Highway)	• City of Swan (South of Reid Highway) • Main Roads WA (North of Reid Highway)	• South of Bishop Road Two-way, two-lane, single carriageway road, with some sections having solid or painted medians • North of Bishop Road Two-way, two-lane, dual carriageway road.	60
Reid Highway	Primary Distributor	Main Roads WA	Two-way, four-lane, dual carriageway road	90
Roe Highway	Primary Distributor	Main Roads WA	Two-way, four-lane, dual carriageway road	90
Toodyay Road	Distributor B	City of Swan (East of Roe Highway)	Two-way, two-lane, single carriageway road, with some sections having painted and solid median	60
Eveline Road	Access Road	City of Swan	Two-way, two-lane, single carriageway road	50
Bassett Road	Access Road	City of Swan	Two-way, two-lane, single carriageway road	50
Leslie Road	Access Road	City of Swan	Two-way, two-lane, single carriageway road	50

3.3 Existing Traffic Volumes

Existing traffic volumes near the Site are presented in Table 4.

Table 4 – Existing Traffic Volumes

Location	Source	Year	AM Peak (two-way)	PM Peak (two-way)	Average Weekday Traffic (%HV)
Great Northern Highway (South of Reid Highway)	MRWA Traffic Map	2021/22	2,203	2,053	19,973 (9.7%)
Great Northern Highway (North of Morrison Road)	MRWA Traffic Map	2021/22	1,312	1,366	14,834 (8.7%)
Toodyay Road (East of Llyod Street)	MRWA Traffic Map	2021/22	682	712	5,832 (9.6%)
Eveline Road (West of Great Northern Highway)	Traffic Survey	2024	144	170	1,491 (5%)

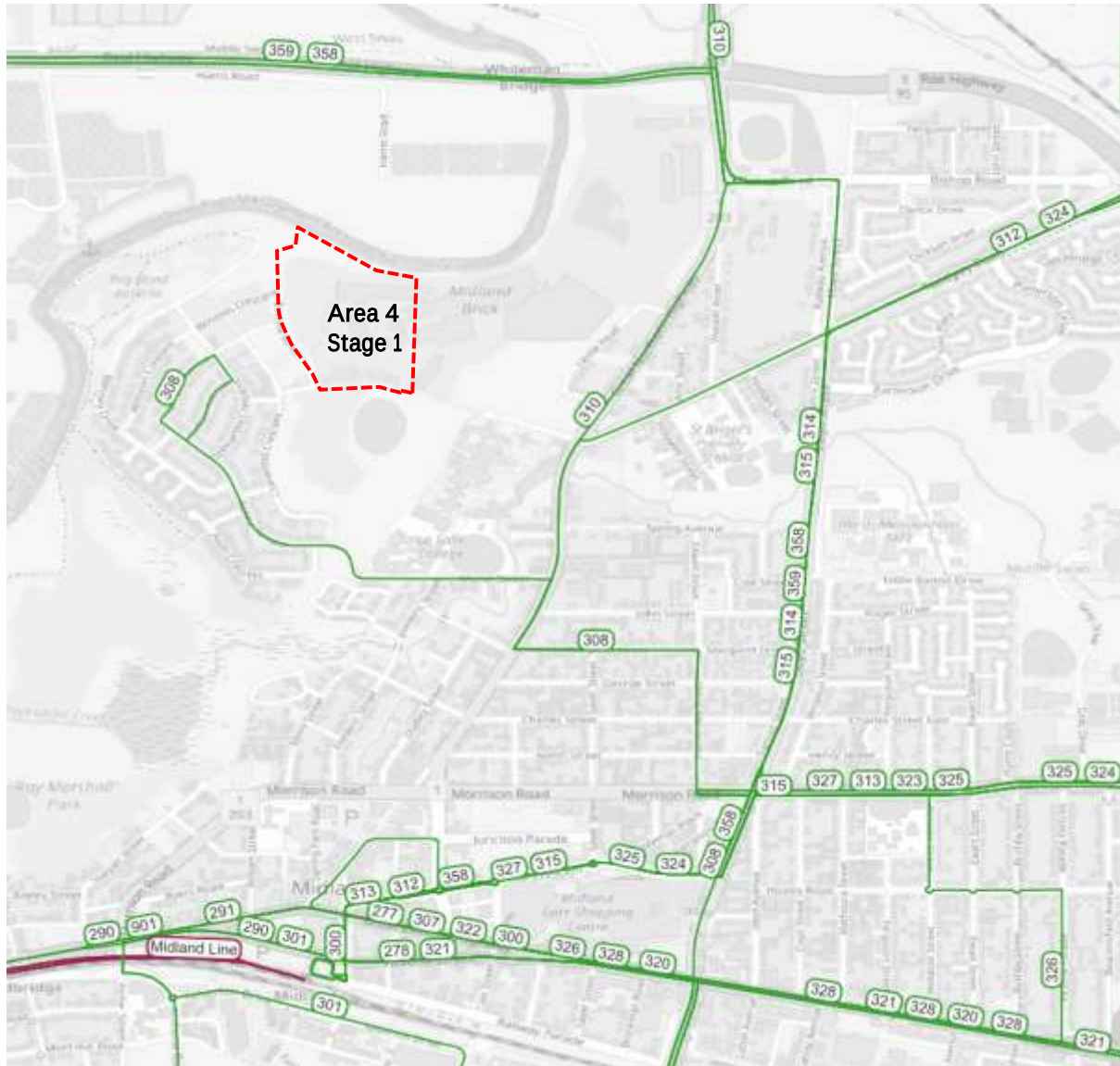
Peak period traffic surveys were undertaken on Wednesday 4th December 2024 for the Great Northern Highway / Toodyay Road / Eveline Road intersection. The traffic surveys have been used for the SIDRA assessment in Section 6.6.

3.4 Existing Public Transport Services

Bus routes within close vicinity of the Site are shown in Figure 5. The closest bus routes run along Great Northern Highway and through Viveash as shown in Figure 5. The bus routes are listed in Table 5.

All of the bus routes link to the Midland train station where passengers can switch to trains and travel to Perth CBD.

Figure 5 – Bus Routes in the Vicinity of the Site



Source: Transperth

Table 5 – Bus Routes

Bus Route	Route Description	Weekday Peak Frequency	Saturday Frequency	Sunday and Holiday Frequency
308	Midland Stn (Circular Route) via Viveash	20 - 60 mins	No Service	No Service
310	Midland Stn - Ellenbrook Stn via Great Northern Hwy & Millhouse Rd	Every 30 - 60 minutes	60 - 120 mins	60 - 120 mins
312	Midland Stn (Circular Route) via Baskerville and Millendon	6 services per day	No Service	No Service

3.5 Existing Pedestrian/Cycling Network

Existing pedestrian and cycling facilities in the vicinity of the Site are illustrated in Figure 6. The area is currently not served by dedicated cycling facilities. The nearest cycling facility to the Site are shared paths on the Swan River Foreshore.

In addition, paths are provided along Eveline Road as summarised below:

- » A 1.6m wide path between Winston Crescent and Surrey Way along the western verge.
- » A newly constructed 2.5m shared path along the northern verge between Surrey Way and the Former Swan Hospital

Figure 6 – Pedestrian and Cycling Facilities



Source: Department of Transport

3.6 Crash Data

A review of the existing crash data from Main Roads WA Traffic Map for the period between 1st January 2020 to 31 December 2024 was conducted and summarised in Table 6 through Table 8 and illustrated on Figure 7.

Table 6 – Summary of Crash Data on Great Northern Highway/Bishop Road Intersection

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	2	4	2	8
Right Angle	-	-	-	5	1	6
Sideswipe Same Dirn	-	-	-	-	2	2
Non Collision	-	1	-	-	-	1
Not Specified	-	1	-	-	-	1
Total	0	2	2	9	5	18

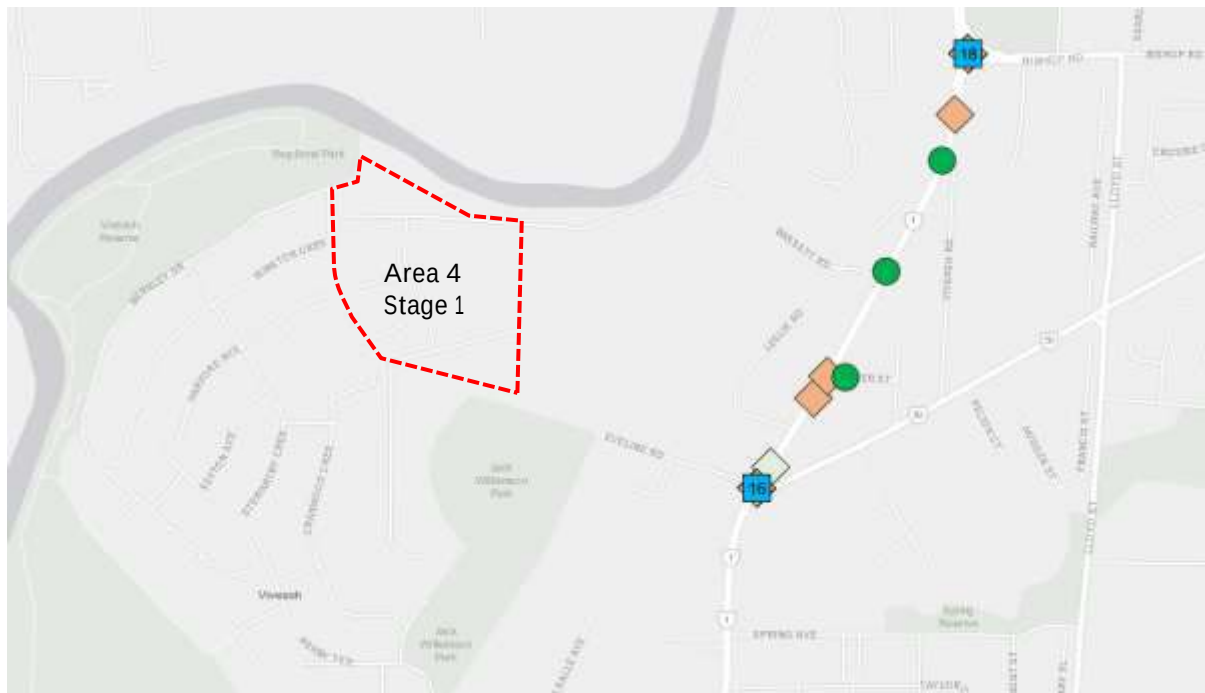
Table 7 – Summary of Crash Data on Great Northern Highway/Eveline Road/Toodyay Road

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	2	-	1	3
Hit Pedestrian	-	1	-	-	-	1
Hit Object	-	-	-	-	1	1
Right Turn Thru	-	1	2	1	1	5
Right Angle	-	1	1	1	-	3
Sideswipe Same Dirn	-	-	-	2	1	3
Total	0	3	5	4	4	16

Table 8 – Summary of Midblock Crash Data Along Great Northern Highway

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Rear End	-	-	1	1	-	2
Right Turn Thru	-	-	-	1	-	1
Right Angle	-	-	-	1	-	1
Non Collision	-	-	1	-	-	1
Not Specified	-	-	1	-	1	2
Total	0	0	3	3	1	7

Figure 7 – Crash Map



Source: Main Roads WA Crash Map

A summary of the crash data are as follows:

- » Most of the crashes that occurred on along this section of Great Northern Highway were rear end crashes with most of them occurring at the intersections.
- » 16 total crashes were recorded at the Great Northern Highway/Eveline Road/Toodyay Road intersection with 8 of these being casualty crashes (3 hospital and 5 medical). Right turn thru crashes appears to be overrepresented accounting for almost a third of the crashes that occurred at this intersection. The frequency of these types of crashes may potentially be attributed to the filter right turn movements having to contend with high volume through traffic.
This intersection meets the crash criteria for both federal and state blackspot programmes.
- » 18 total crashes were recorded at the Great Northern Highway/Bishop Road intersection with 4 of these being casualty crashes (2 hospital and 2 medical). The most common type of crash at this intersection are rear end crashes which is typical of urban roundabouts.

4 PROPOSED CHANGES TO TRANSPORT NETWORKS

4.1 Internal Road Network

The indicative internal road network for Area 4 Stage 1 is shown in Figure 8. Most roads within this area are classified as Access Street D. In addition, there is also a single Access Street C and laneway within the structure plan. All lots adjacent to a laneway are expected to have vehicular access from the laneway.

Provision has been made for connectivity to Stage 2 which is subject to a separate future structure plan.

Figure 8 – Proposed Internal Road Network



4.1.1 Cross-Sections

Most Access Street D roads within the Site will have a 15m road reserve width with a small number of wider road reserves (18m to 20m) along the public open space frontages. Figure 9 shows the indicative cross section for a standard 15m road reserve. The wider road reserves do not contain any significant differences other than wider verge sections with the exception of the section of road that contains the proposed high quality shared path (Figure 10).

The singular Access Street C will have a road reserve width of 18m respectively as shown in Figure 11 while Laneways will have 6m wide reserve as shown in Figure 12.

Figure 9 – Indicative Cross Section for a 15m Road Reserve (Access Street D)



Source: Streetsketch

Figure 10 – Indicative Cross Section for a 20m Road Reserve (Access Street D with HQSP)



Source: Streetsketch

Figure 11 – Indicative Cross Section for a 18m Road Reserve (Access Street C)



Source: Streetsketch

Figure 12 – Indicative Cross Section for a 6m Road Reserve (Laneway)



Source: Streetsketch

4.1.2 Intersection Controls and Traffic Management

All intersections within the Site will be priority control.

Some roads are proposed to have traffic calming installed in the form of lane narrowing, blister islands, or slow points. Threshold treatments or entry statements are also proposed.

4.2 External Road Network

Known road projects in the vicinity of the Site are listed below:

» Proposed Great Northern Highway, Reid Highway, and Roe Highway Interchange

Main Roads are currently in the planning stages of upgrading this intersection to an interchange. This upgrade forms part of the broader EastLink WA project where Main Roads is planning to construct a new highway east from Roe Highway towards Northam in order to provide improved access for freight traffic to/from the Wheatbelt region. Timing of this project is yet to be confirmed.

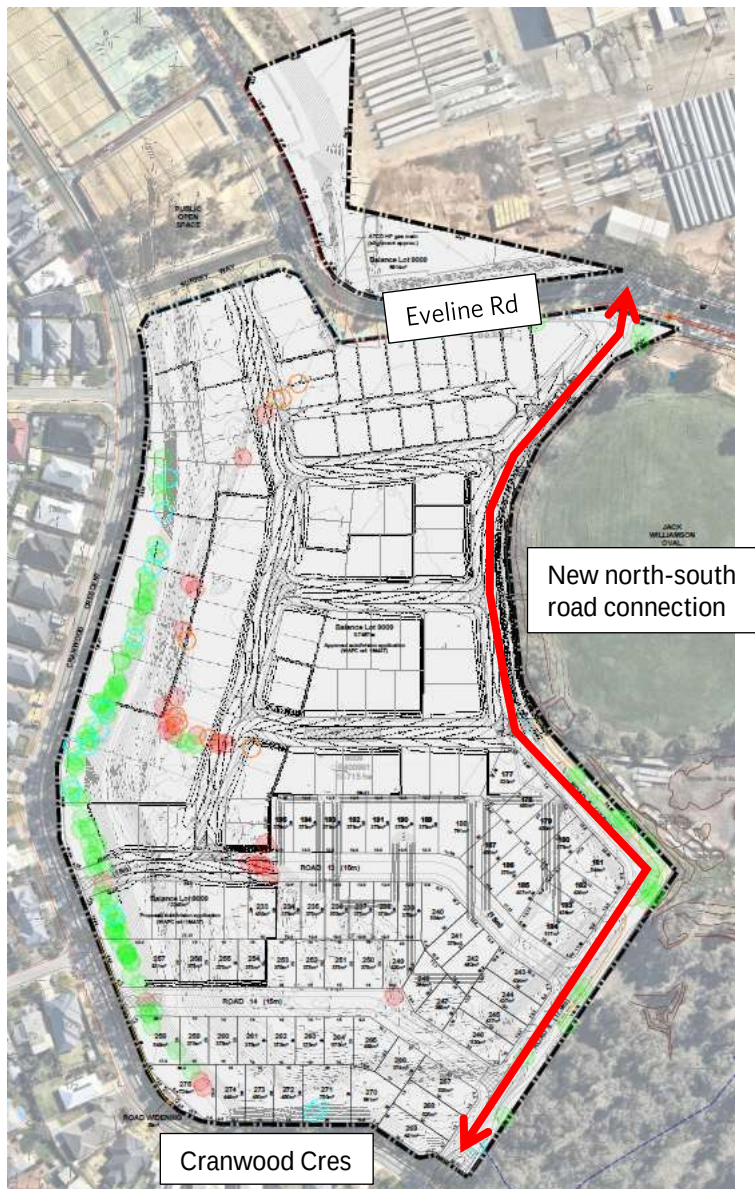
» Proposed Toodyay Road and Roe Highway Interchange

As part of the Eastlink WA project, Toodyay Road and Roe Highway intersection is proposed to be upgraded to an interchange, with Toodyay Road disconnected from Roe Highway. Timing of this project is yet to be confirmed.

» Area 3

Figure 13 below shows the indicative road network of the Area 3 subdivision relative to the surrounding area. This includes additional access road connections to the residential lots in this area as well as a new north-south road which runs adjacent to Jack Williamson Park connecting Eveline Road and Cranwood Crescent.

Figure 13 – Indicative Road Network within the Area 3



4.3 Pedestrian and Cycling Network

To provide good pedestrian and cycling connectivity, footpaths should be provided on at least one side of every street within the Site, except for laneways.

A high-quality shared path is proposed along the northern border of the Site running alongside Swan River as well as a pedestrian promenade located to the northwest of the Site and connects to the proposed shared path. Refer to Figure 14 below for indicative path network within the Site.

Figure 14 – Indicative Path Network



The City of Swan has indicated that there will be no changes to the pedestrian and cycling network surrounding the Site. A shared path was constructed along Eveline Road in 2023 and the Department of Transport (DoT) has long term plans for continuous shared path networks along both sides of the Swan River.

4.4 Public Transport Network

Proposed changes to the surrounding public transport network are as follows:

» Midland Station Relocation

The State Government is currently undertaking the relocation of the Midland Station to east of Helena Street as shown below in Figure 15. The project will also include the following:

- New bus interchange
- New multi-storey car park
- Shared path connections
- Cale Street level crossing and extension to Centennial Place
- Pedestrian overpass
- Removal of level crossing on Helena Street

The station relocation project is currently underway with the multi-storey car park component completed and opened in late January. The Public Transport Authority also indicates that the bus routes in the surrounding area will undergo changes due to the station relocation, however the details are still to be confirmed.

Figure 15 – Proposed Midland Station Relocation



Source: <https://www.metronet.wa.gov.au>

» Future Bellevue Station

Following the completion of the Midland Station relocation, the Midland train line is proposed to be extended to the east and a new station to be built in the suburb of Bellevue. The location, design, and timing of construction are still to be determined.

» Rivermark Broader Redevelopment Area

The PTA were consulted as part of planning for the Broader Redevelopment Area. Provision has been made in the design of the Eveline Road Extension for the operation of Transperth bus services in the future. The PTA has agreed, in-principle, to the adoption of this route for a bus service but is unable to commit to a timeframe due to funding uncertainty.

5 INTEGRATION WITH SURROUNDING AREA

5.1 Surrounding Attractors and Generators

Major trip attractors where residents of the Site would be attracted to are shown in Figure 16 and include:

- » Schools (e.g., La Salle College, St Brigid's Primary School, Governor Stirling Senior High School).
- » Midland City Centre, including Midland Gate shopping centre.
- » Employment, retail, and educational institutions within Midland Redevelopment Area.
- » Recreational areas such as Swan Park Leisure Centre and Reg Bond Reserve.

Figure 16 – Nearby Trip Attractors



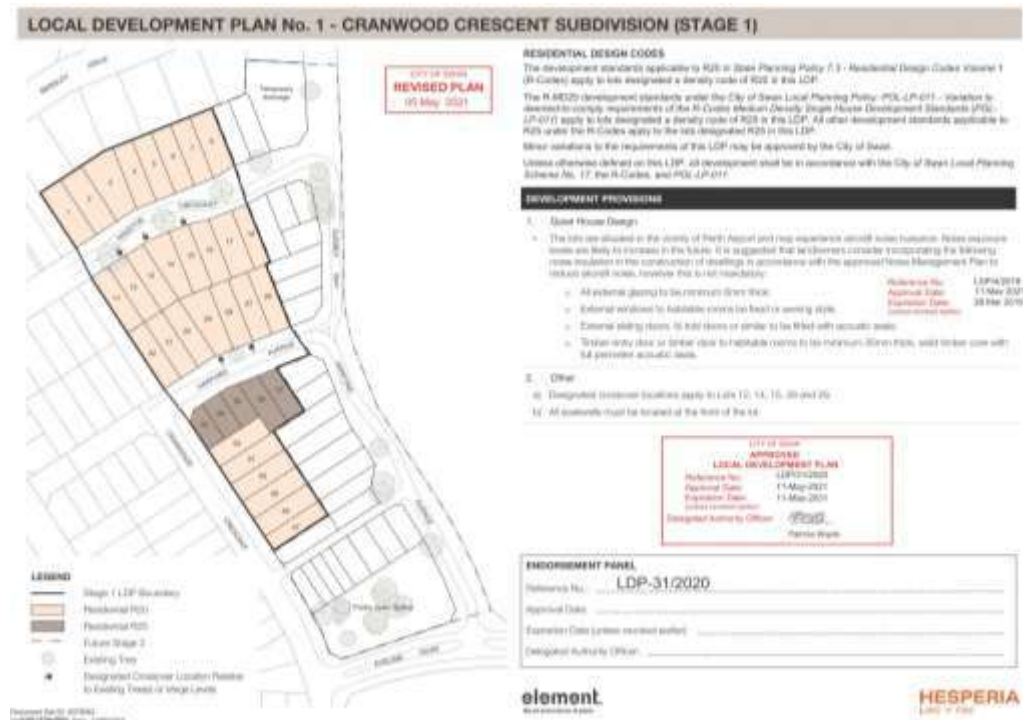
5.2 Proposed Changes to the Surrounding Area

Below is a list of known changes to the areas in the vicinity of Area 4 Stage 1:

- » Area 1 & 2 of the Broader Redevelopment Area (Approved Cranwood Crescent Subdivision LDP/31/2020)

The west of Area 4 Stage 1 is a residential subdivision which is almost complete. The proposed subdivision is planned to yield 60 dwellings and includes the extension of Eveline Road to connect into Cranwood Crescent (now complete). Figure 17 below shows the approved subdivision layout, with Stage 1 construction consisting of 34 lots.

Figure 17 – Approved Residential Subdivision



- » Old Swan District Hospital site

With the opening of the new Midland Public Hospital, the Swan District Hospital has been decommissioned. The area is zoned as 'Special Use', and it is expected to be redeveloped in the future, however no plans have been prepared.

Negotiations to transfer the site as part of the South West Native Title Settlement with the Whadjuk Aboriginal Corporation are currently ongoing.

The City of Swan has indicated to Cardno (author of previous TIA) that a portion of the site would likely be redeveloped as residential dwellings.

- » Retirement Village and Aged Care Centre

The overall facility, as currently proposed, will consist of:

- Aged care facility: 124 licensed beds
- Retirement village: 69 individual dwellings, 72 apartment units, and supporting amenities.

The aged care facility was completed in 2023 located on the corner of Great Northern Highway and Eveline Road as shown in Figure 18. The retirement village component is part of a future development application.

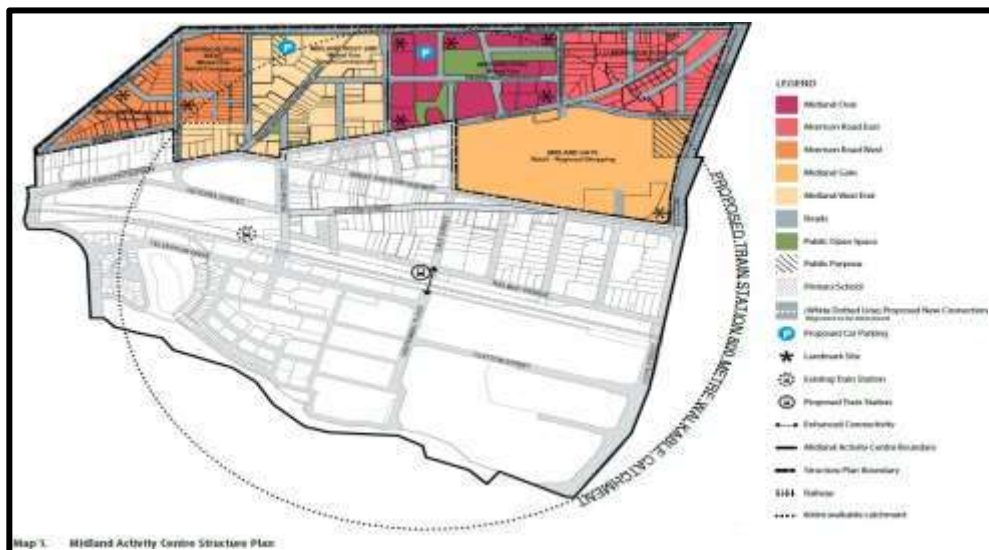
Figure 18 – Future Retirement Village and Aged Care Facility



» Midland Activity Centre Structure Plan

The Midland Activity Centre Structure Plan (MACSP) was approved by the Western Australian Planning Commission on January 30, 2018. It provides for the long-term growth and development of Midland, addressing key activity centre considerations. MACSP details land use and infrastructure requirements as well as environmental assets, residential density and plot ratios, built form, and movement arrangements for all modes of transport and pedestrian accessibility. Figure 19 below illustrates the Midland Activity Centre Structure Plan boundary.

Figure 19 – Midland Activity Centre Structure Plan



Source: City of Swan

» Midland Redevelopment Project

The redevelopment area is defined in the Midland Master Plan (2015) and is shown below in Figure 20. The redevelopment is still ongoing with some significant milestones achieved on the southern side of the rail line, such as the new Midland Public Hospital, new dwellings and a new university.

The redevelopment will continue with additional residential/office mixed used development in the vicinity of the Midland Town Centre. Additional residential are planned in the vicinity of the former railway workshops area and a more commercial and showrooms are planned in the southeast section of the area, adjacent to Lloyd Street.

Figure 20 – Midland Master Plan



Source: Development WA

» Area 4 Stage 2

The second stage of Area 4 is the section east of Stage 1 as shown in Figure 1. Stage 2 will be subject to a separate structure plan to be developed in the future and has not been included as part of this assessment.

5.3 Transport Connectivity to Surrounding Areas

The surrounding road network provides adequate connectivity between the Site and the major attractors in the area such as Midland Town Centre. The Eveline Road extension has significantly improved connectivity for the existing Viveash residential area, providing a second access routes to the surrounding road network.

Bus stops are located on Great Northern Highway, which provide connectivity to the Midland Gate shopping centre and the Midland train station, which connects the wider Midland area to the Perth CBD and beyond. Route 308 services Viveash and the stops along Ashby Terrace and Stewartby Crescent will be comfortable walking distance for many of the future residents of the Site. There is an opportunity for these services to be diverted via Eveline Road, instead of doubling back along Muriel Street.

Pedestrian and cycling links to the wider network are provided via the shared path along Eveline Road and a shared path alongside Jack Williamson Oval which will be constructed as part of Area 3 development. These paths would link with existing paths along Great Northern Highway and Frederic Street. The proposed shared path along Swan River would provide a continuation of the recreational route that currently ends at Reg Bond Reserve.

6 ANALYSIS OF TRANSPORT NETWORK

6.1 Assessment Years and Time Periods

The adopted assessment years are as follows:

- » Year 2024 – Existing traffic conditions
- » Year 2034 – Assumed completion year of Area 4 Stage 1 site

Year 2024 was selected for ‘Existing Traffic Conditions’ as extensive traffic surveys and analysis were undertaken in late 2024 (less than 12 months prior to this TIA update). Year 2034 was selected for the assumed Area 4 Stage 1 completion.

The peak hour assessed will be at the following AM and PM peak hours, which is the surrounding road network peak.

- » AM Peak: 7:45 – 8:45
- » PM Peak: 15:00 – 16:00

The peak hours were determined from aggregating traffic data of 3 different signalised intersections along Great Northern Highway at Reid Highway / Roe Highway, Toodyay Road / Eveline Road, and Morrison Road / Keane Street.

Note that the Site (a residential development) PM peak does not typically occur at 15:00 – 16:00 but is assumed to occur at the same time as the road network peak for the purposes of robust assessment.

6.2 Development Trip Generation and Distribution

6.2.1 Trip Generation

Trip generation for the proposed structure plan area has been estimated using the following sources:

- » Transport for NSW Guide to Transport Impact Assessment
- » WAPC Transport Impact Assessment Guidelines Vol 5 – Technical Guidance
- » Institute of Transportation Engineers (ITE) “Trip Generation” 11th Edition (for residential trip directionality only)

Trip rates and directionality adopted are shown in Table 9 and

Table 10. The estimated trip generation is shown in Table 11. For the purpose of the assessment, it is assumed that the LSP will be fully built out by the year 2034.

Table 9 – Trip Generation Rates

Land Use Category	Source	Yield	AM Peak	PM Peak	Daily
Residential	TfNSW (Low Density Residential)	219 dwellings	0.68 per dwelling	0.77 per dwelling	8.12 per dwelling
Commercial	WAPC (Food Retail); TfNSW (Restaurants)	678m ² GFA	10.00 per 100m ² GFA*	10.00 per 100m ² GFA	60.00 per 100m ² GFA*

Table 10 – Trip Distribution

Land Use	AM Peak		PM Peak		Daily	
	IN	OUT	IN	OUT	IN	OUT
Residential	26%	74%	64%	36%	50%	50%
Commercial	50%*	50%*	50%	50%	50%	50%

Table 11 – Trip Generation Summary

Land Use	Yield	AM Peak		PM Peak		Daily	
		IN	OUT	IN	OUT	IN	OUT
Residential	434 dwellings	39	111	108	61	890	890
Commercial	678 m ² GFA	34	34	34	34	204	204
Total		218		237		2,188	

* The AM peak hour trip generation rate does not completely represent the proposed commercial development planned (café). Therefore, for the purposes of this assessment, the PM peak hour trip generation rate and distribution was applied to the AM peak to provide a robust assessment. The daily trip generation rate was obtained from Transport for NSW (TfNSW) trip generation rates for restaurants as WAPC do not provide daily trips for this land use.

The volume of traffic generated by the proposed LSP is estimated to be 218 trips in the AM peak, 237 trips in the PM peak and 2,188 trips daily.

6.3 Structure Plan Traffic Distribution

The trip distribution from Area 4 has been split into two components, residential and commercial.

Overall trip distribution is consistent with previous transport assessments for Area 3 and the broader redevelopment area, with traffic routing adjusted to reflect the currently proposed access routes.

For the purpose of assessment, it is assumed that the residential and commercial component will be primarily passing through Eveline Road to the Great Northern Highway / Eveline Road / Toodyay Road intersection along with few trips through the new connection along Area 3.

Figure 21 – Area 4 Stg 1 Inbound Traffic Distribution (Residential)

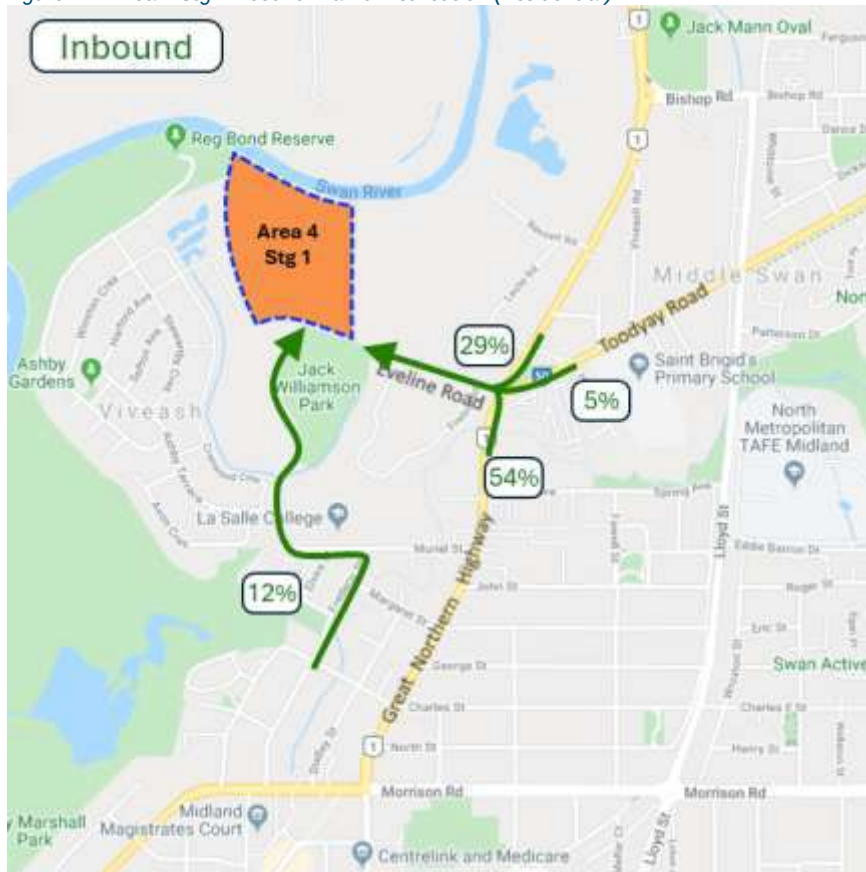


Figure 22 – Area 4 Stg 1 Outbound Traffic Distribution (Residential)

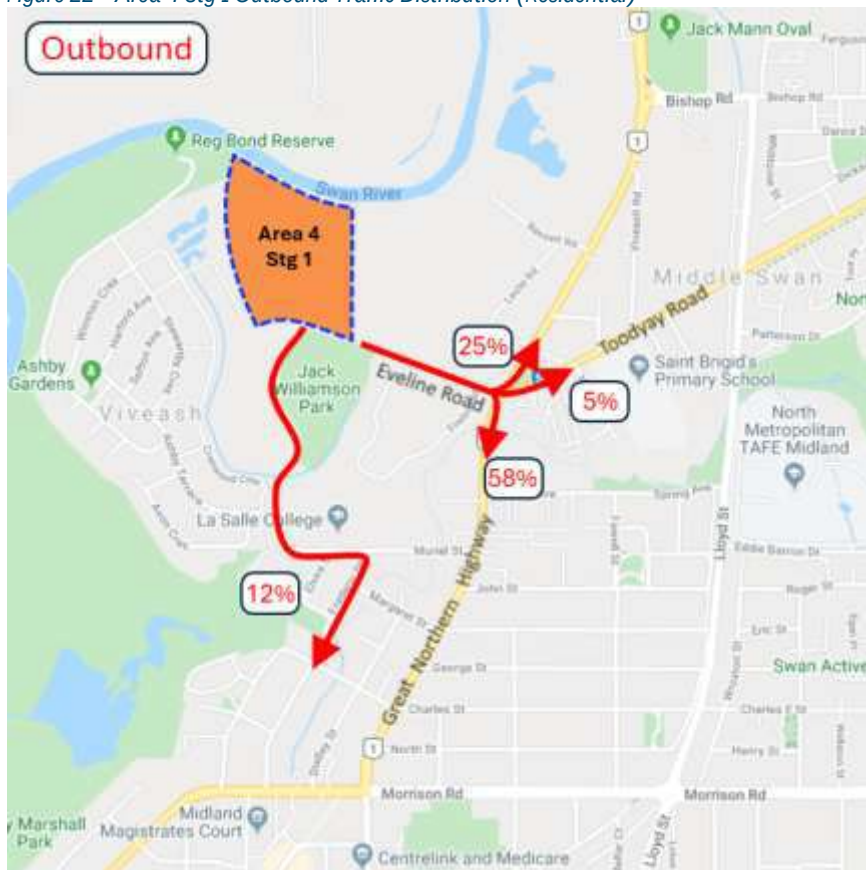


Figure 23 – Area 4 Stg 1 Inbound Traffic Distribution (Commercial)

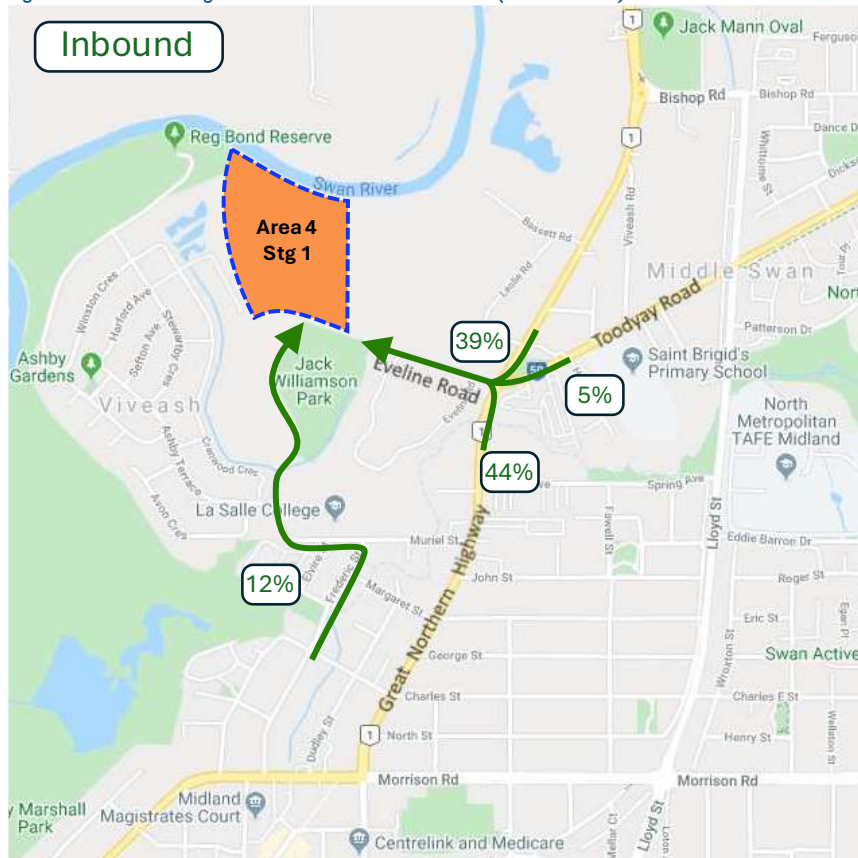


Figure 24 – Area 4 Stg 1 Outbound Traffic Distribution (Commercial)



6.4 Background Traffic

Background traffic flow for the existing conditions was sourced from traffic counts undertaken in December 2024 while background traffic for future years was derived from Main Roads WA ROM 24 strategic model outputs. Assumptions for the background traffic are summarised in Section 6.5.4 while corresponding traffic volume plots are provided in Appendix C.

6.4.1 Other Developments

As mentioned in Section 5.2, other nearby developments are in various stages of planning and construction.

The estimated yield of these proposed developments and the traffic generation are as follows and summarised in Table 12 and Table 13:

- » Area 1 & 2 (Approved Cranwood Crescent Subdivision)
 - 60 residential dwellings
 - Extension of Eveline Road to Cranwood Crescent (complete)
 - The residential dwellings are almost completely built, and construction traffic has been captured in the background traffic surveys.
 - No additional traffic is therefore added for this area.
- » Area 3
 - 154 residential dwellings
 - Assumed to be completed by 2034
- » Retirement village and aged care facility
 - Aged care facility: 124 licensed beds – complete and captured in background traffic.
 - Retirement village: 69 individual dwellings, 72 apartment units, and supporting amenities- assumed to be completed by 2034.
- » Old Swan District Hospital
 - Negotiations to transfer the site as part of the South West Native Title Settlement with the Whadjuk Aboriginal Corporation are currently ongoing. For the purposes of this assessment, it is assumed that the hospital will be developed into residential dwellings with similar density as the existing residential dwellings in Viveash. Based on the zoning changes being proposed by the City of Swan, the total development area is approximately 8.1 Ha and applying similar density to Viveash, it would yield approximately 100 dwellings. This development is assumed to be completed by 2034.
- » Area 4 Stage 2
 - Not included as part of this assessment as it is subject to future planning.

Table 12 – Other Developments Land Use Yields

Land Use	Yield	Notes
Cranwood Subdivision (Areas 1 & 2)	• 60 dwellings	Included in 2024 background traffic.
Area 3	• 154 dwellings	Assumed completion in 2034
Retirement Village and Aged Care Facility	• Aged care facility: 124 licensed beds • Retirement Village: 69 individual dwellings, 72 apartment units, and supporting amenities.	• Included in 2024 background traffic • Assumed completion in 2034
Swan District Hospital Redevelopment	• 100 Dwellings	Assumed completion in 2034

Table 13 – Other Developments Trip Generation

Year of Completion	Land Use	AM Peak		PM Peak		Daily	
		IN	OUT	IN	OUT	IN	OUT
2034	Retirement Village	11	20	23	16	282	282
2034	Area 3	31	87	99	56	727	727
2034	Swan District Hospital Redevelopment	20	56	64	36	472	472

6.5 Key Intersection Analysis

6.5.1 Subject Intersections

The intersection(s) listed below have been analysed using SIDRA intersection analysis software.

» Great Northern Highway / Eveline Road / Toodyay Road

6.5.2 Peak Hour Total Traffic

Peak hour traffic volumes for each scenario are presented in Appendix B.

6.5.3 Analysis Scenario Summary

The subject intersections will be analysed under the analysis scenarios listed in Table 14.

Table 14 – Scenario Summary

Land Use	Year	Description
Scenario 1	Existing Year 2024	Existing background traffic only to establish a baseline.
Scenario 2	Opening Year 2034	To assess traffic impact at the completion year of Area 4: • Annual traffic growth as summarised in Section 6.5.4. • Other Developments traffic included as per Section 6.4.1.

6.5.4 Analysis Assumptions

The following assumptions adopted for the intersection assessments are summarised below:

- » For the purposes of this assessment, only Stage 1 of the overall Area 4 development is considered. This assessment reflects the road network connections anticipated to be available upon the completion of Stage 1 and does not account for potential future connections to the north that could be developed through Stage 2. Consequently, it is assumed that the majority of development-generated traffic will primarily utilise Eveline Road for access and egress and therefore the Great Northern Highway/Eveline Road/Toodyay Road intersection is assessed as the primary access to the site.
- » Background traffic growth was initially derived from Main Roads WA ROM 24 strategic model (job no. #43063) however due to the strategic nature of the model it was not considered suitable for use as part of this assessment of local road intersection(s). While ROM 24 does account for the traffic from the Midland Brick broader development area, the location of zones and centroid connectors is not adequate to enable credible estimates of traffic growth to be calculated for certain intersections. Attempting to extract the broader redevelopment area traffic volumes from the wider network to obtain just pure network growth results in negative growth for key roads such as Great Northern Highway which suggests that growth within the surrounding area is primarily from this development area. Table 15 provides a summary of the approach that was adopted to estimate the future growth applied to each leg of the intersection.
- » The trips generated from the commercial area (café) are assumed to comprise 60% external trips distributed via Eveline Road, and 40% internal trips to the broader redevelopment area, particularly Areas 2 and 3, as well as the surrounding Viveash residential area. The internal trip share reflects its anticipated function as a local amenity primarily catering to residents and visitors within this area, thereby generating less demand from the external road network.
- » The existing signal phasing and timing have been retained (where practical) for the assessment of the signalised intersections for all scenarios. The modification that are applied to the signal phasing and timings have been specified for the intersections and scenarios where they apply.

Table 15 – Summary of Background Traffic Growth Assumptions

Intersection	Background Traffic Growth Assumptions	BG Growth % per Year
Great Northern Hwy/Eveline Rd/Toodyay Rd	• A conservative 1% per annum growth rate was applied for the traffic along Great Northern Highway. This is similar to the growth rate adopted for previous transport assessments of Area 3 and the broader Rivermark development area. • The ROM 24 model shows that traffic volumes along Toodyay Road will reduce by around 50% at 2031, likely as a result of the EastLink WA project which includes reconfiguring the Roe Highway/Toodyay Road intersection resulting in a large proportion of traffic being redirected away from Toodyay Road. No growth has been applied for the Toodyay Road approach which is considered to be very conservative. • Traffic growth along Eveline Road is exclusively development traffic from Area 3, Area 4, Swan District Hospital Redevelopment and the Retirement Village.	• GNH (N) – 1% • GNH (S) – 1% • Eveline Rd (W) – 0% • Toodyay Rd (E) – 0%

6.5.5 SIDRA Results Definition

The subject intersections have been analysed using the SIDRA analysis program. This program calculates the performance of intersections based on input parameters, including geometry and traffic volumes. As an output SIDRA provides values for the Degree of Saturation (DOS), queue lengths, delays, level of service, and 95th Percentile Queue. These parameters are defined as follows:

- » Degree of Saturation (DOS) is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The theoretical intersection capacity is exceeded for a signalized intersection where $DOS > 0.90$;
- » 95% Queue is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected;
- » Average Delay is the average of all travel time delays for vehicles through the intersection. A signalised intersection can be considered to be operating at capacity where the average delay exceeds 55 seconds for any movement; and
- » Level of Service (LOS) is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. The different levels of service can generally be described as shown in Table 16.

Table 16 – Level of Service (LoS) Performance Criteria

LOS	Description	Signalised Intersection
A	Free-flow operations (best condition)	≤ 10 sec
B	Reasonable free-flow operations	10-20 sec
C	At or near free-flow operations	20-35 sec
D	Decreasing free-flow levels	35-55 sec
E	Operations at capacity	55-80 sec
F	A breakdown in vehicular flow (worst condition)	≥ 80 sec

A LOS exceeding these values indicates that the road section is exceeding its practical capacity. Above these values, users of the intersection are likely to experience unsatisfactory queueing and delays during the peak hour periods.

6.5.6 Great Northern Highway/Eveline Road/Toodyay Road

The SIDRA layout of Great Northern Highway/Eveline Road/Toodyay Road is shown in Figure 25 and the analysis results for intersection are presented in

Table 17 and Table 18.

The results show that the intersection would operate satisfactorily for Scenario 1. However, under Scenario 2 volumes, the intersection was found to exceed practical capacity based on the existing phasing.

By modifying the signal phasing (introducing an additional phase, rearranging the phase order and increasing the phase times for through movements on GNH), the DOS reduced to 0.96 and LOS to D in the AM Peak Hour and a DOS of 0.89 and LOS C in the PM peak. With these modifications the intersection can continue to operate satisfactorily to and beyond 2034 based on the projected traffic growth.

Figure 25 – Great Northern Highway/Eveline Road/Toodyay Road SIDRA Layout

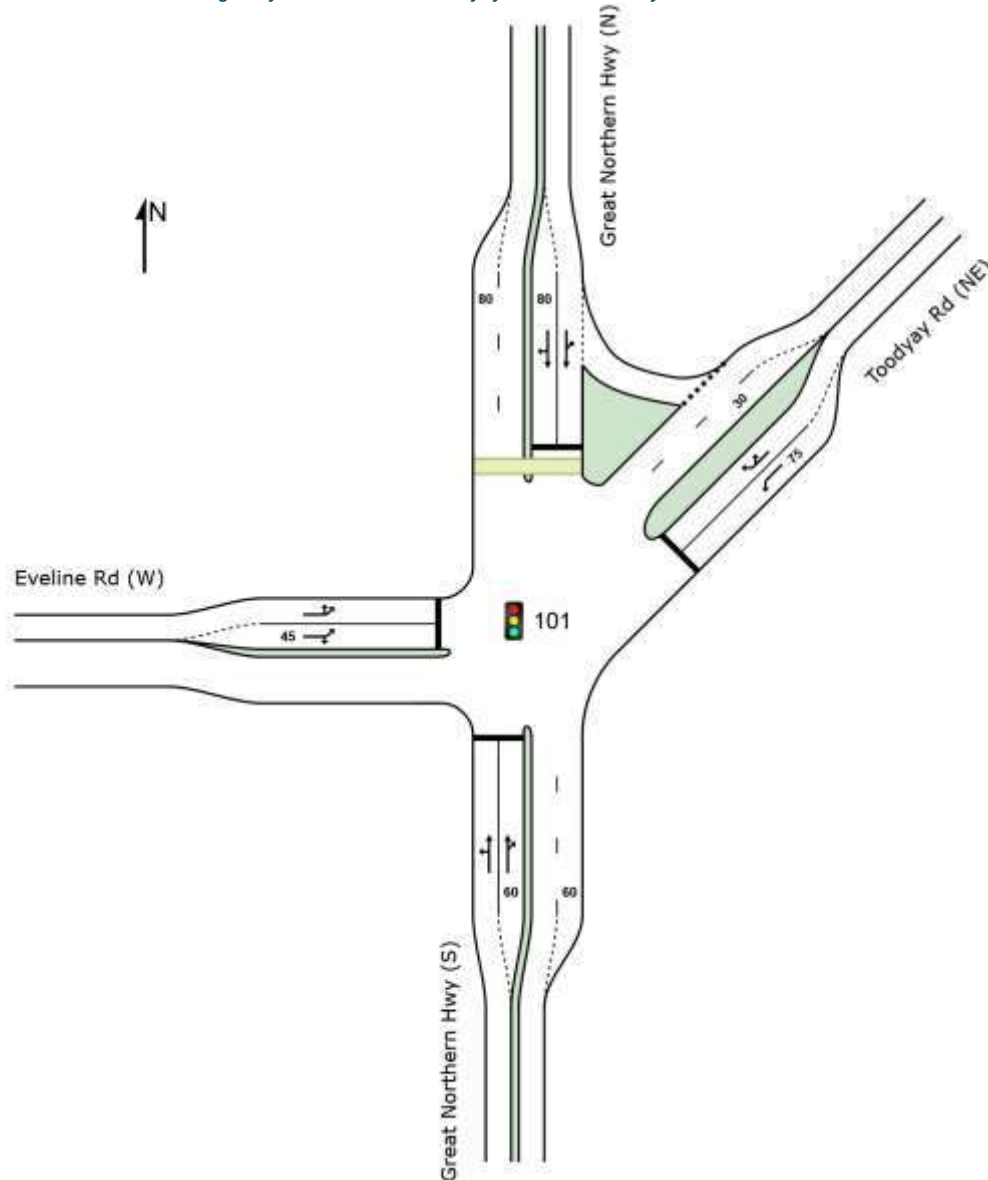


Table 17 – Scenario 1 Results – Great Northern Highway/Eveline Road/Toodyay Road

Great Northern Highway/Eveline Road/Toodyay Road Scenario 1 – Existing Year 2024									
Intersection Approach		AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Great Northern Highway – S	L	0.23	8.6	A	27.5	0.236	9.1	A	28.5
	T	0.498	3.6	A	38.3	0.511	4.3	A	42.3
	R	0.498	22.5	C	38.3	0.511	14.2	B	42.3
Toodyay Road – E	L	0.549	32.5	C	74.1	0.194	17.2	B	26.7
	T	0.572	38.1	D	26.4	0.456	34.7	C	20.7
	R	0.572	47.9	D	26.4	0.456	45.5	D	20.7
Great Northern Highway – N	L	0.291	9.9	A	43.5	0.249	8.5	A	28.4
	T	0.784	19.1	B	169.1	0.672	21.1	C	94.7
	R	0.784	69.3	E	169.1	0.672	48.9	D	94.7
Eveline Road – W	L	0.284	44.3	D	13.4	0.399	43.5	D	20.6
	T	0.284	34.1	C	13.4	0.399	33.4	C	20.6
	R	0.077	34.8	C	4.9	0.108	32.8	C	6.9
All vehicles		0.78	20.5	C	169.1	0.67	16.7	B	94.7

Table 18 – Scenario 2 Results – Great Northern Highway/Eveline Road/Toodyay Road

Great Northern Highway/Eveline Road/Toodyay Road Scenario 2 – 2034 with Area 4 Stage 1									
Intersection Approach		AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Great Northern Highway – S	L	0.444	21.9	C	40.9	0.395	16.1	B	80.5
	T	0.963	42.6	D	151	0.855	15.3	B	116.1
	R	0.963	63.8	E	151	0.855	35.6	D	116.1
Toodyay Road – E	L	0.47	33.4	C	76	0.253	28.1	C	42.1
	T	0.416	42.6	D	28.9	0.559	51.7	D	31.9
	R	0.416	44.7	D	28.9	0.559	53.9	D	31.9
Great Northern Highway – N	L	0.34	14.8	B	58.9	0.329	9.4	A	57.8
	T	0.918	39.2	D	275.7	0.889	29.7	C	152.6
	R	0.918	51.7	D	275.7	0.889	80.6	F	152.6
Eveline Road – W	L	0.384	13.5	B	25.7	0.581	40.9	D	46.6
	T	0.384	46.5	D	25.7	0.581	58.6	E	46.6
	R	0.558	44.7	D	35.5	0.655	54.9	D	33.4
All vehicles		0.96	39.6	D	275.7	0.89	31.2	C	152.6

6.6 Pedestrian and Cycling Network

The pedestrian and cycling networks are described in Section 4.3. Footpaths and/or shared paths will likely be required on streets within Area 4, with appropriate linkages between the residential and industrial components to facilitate walking and cycling.

6.7 Safe Walk and Cycling to School

The nearest schools within walking distance are Saint Brigid's Primary School on Toodyay Road and La Salle College on Muriel Street as shown in Figure 26.

Students would be able to walk or cycle to Saint Brigid's Primary School via the footpath along Eveline Road. A pedestrian crossing facility is located at the intersection of Great Northern Highway/Eveline Road/Toodyay Road, which would assist students to cross the intersection towards Toodyay Road. La Salle College can be accessed through the internal roads within Area 3 adjacent to Jack Williamson Oval linking into Cranwood Crescent and Muriel Street.

Governor Stirling Senior High School is located 3km from the LSP. A continuous shared path along the Swan River foreshore will enable future residents to comfortably cycle to/from this school.

Figure 26 – Nearby Schools

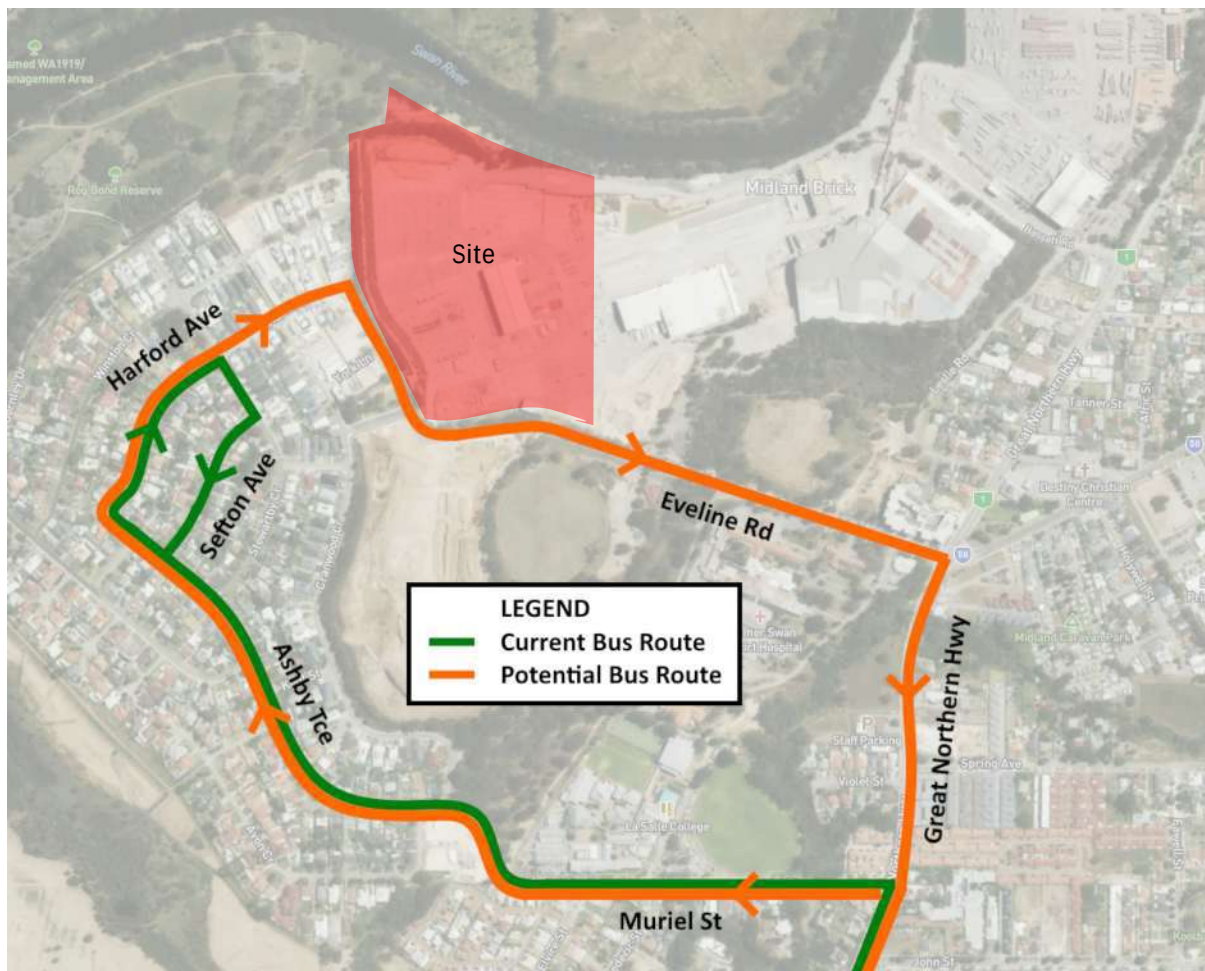


6.8 Public Transport Access

Bus stops are located on Great Northern Highway, which provide connectivity to the Midland Gate shopping centre and the Midland train station, which connects the wider Midland area to the Perth CBD and beyond. The bus stops would be accessible from Area 4 by new paths linking into the extension of Eveline Road, Bassett Road and Richardson Road.

As noted in Section 3.4, bus route 308 currently travels through the Viveash residential area to serve school children and the general residential catchment. With the extension of Eveline Road and the additional residential catchment provided by the broader redevelopment area, there is the potential for this service to take a much more efficient route without having to double back along Muriel Street. The proposed route modification is illustrated in Figure 27 and shows the route continuing along Harford Avenue, then onto Eveline Road before joining back onto its original route along Great Northern Highway. This expands the catchment area and significantly improves public transport accessibility for the broader development area.

Figure 27 – Potential Bus Route Modification



7 SUMMARY

This Transport Impact Assessment (TIA) outlines the transport aspects of the proposed Area 4 Stage 1 Local Scheme Amendment and Structure Plan. This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans* (2016).

The following conclusions have been made in regard to the proposed LSP:

- » The proposed Area 4 Stage 1 LSP consists of 219 residential dwellings and a commercial lot (café).
- » The LSP is estimated to generate 218 trips in the AM Peak Hour, 237 trips in the PM Peak Hour, and 2,188 daily trips.
- » Public transport within the surrounding area is considered to be average with a handful of low frequency bus services that travel to and from Midland Train Station. From Midland Station more public transport options are available.
- » Walking and cycling amenity within the surrounding area is developing in line with the conversion from industrial to residential uses in the surrounding area. As the surrounding area transitions to be more residential in nature, pedestrian and cycling facilities will improve.
- » A summary of the SIDRA analysis of key intersections is as follows:
 - Great Northern Highway/Eveline Road/Toodyay Road – The results show that the intersection would operate satisfactorily for Scenario 1. However, under Scenario 2 volumes, the intersection was found to exceed practical capacity based on the existing phasing. By modifying the signal phasing (introducing an additional phase, rearranging the phase order and increasing the phase times for through movements on GNH), the intersection can continue to operate satisfactorily up to 2034.

Overall, the transport impacts of the proposed Local Structure Plan can be managed satisfactorily based on the projected traffic volumes.

Appendix A

WAPC Checklist



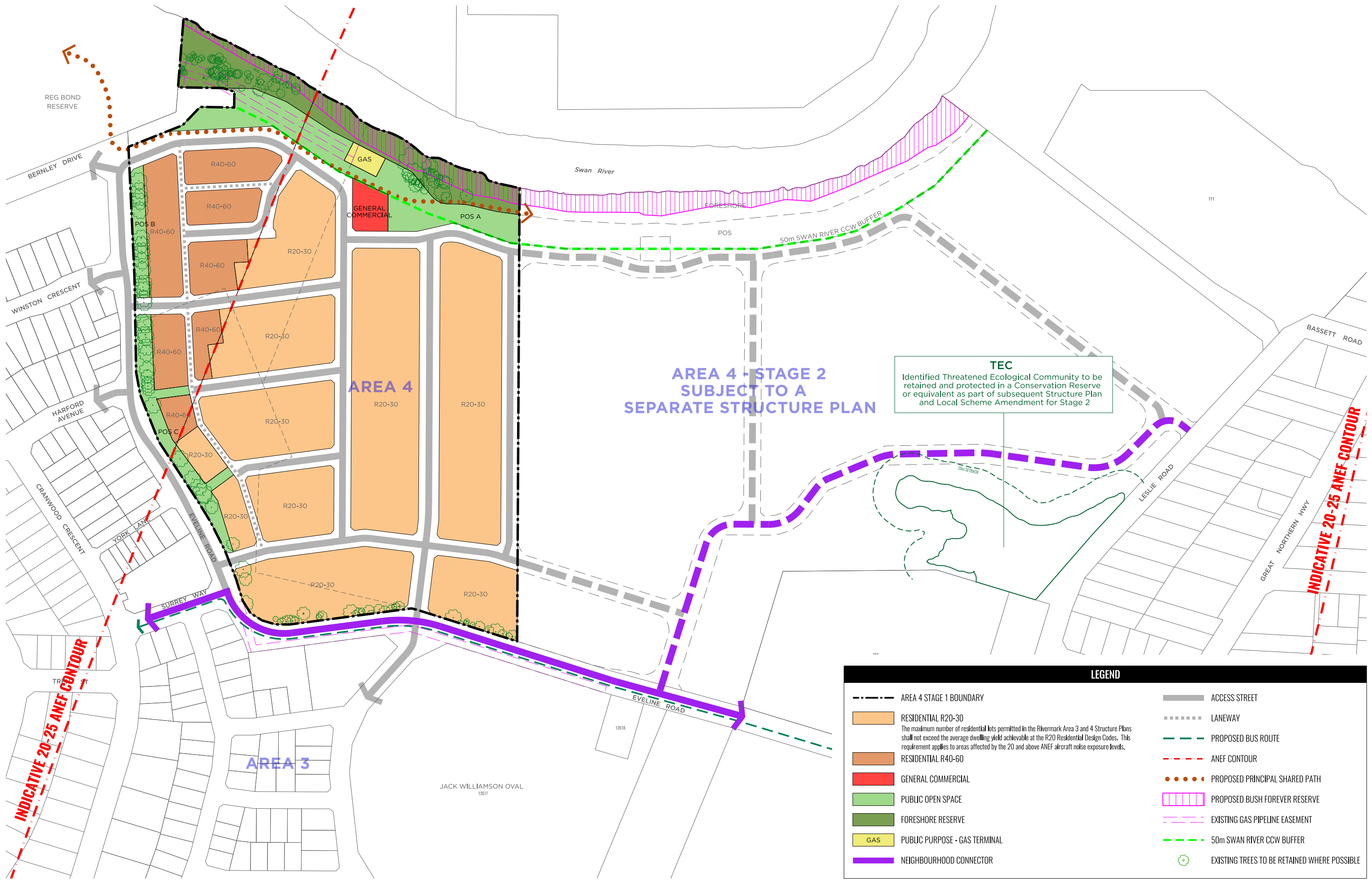
Item	Provided	Comments/Proposals
Summary		
Introduction/Background		
Name of Applicant and Consultant	Section 1	
Development Location and Context	Section 1	
Brief Description of Development Proposal	Section 1	
Key Issues	N/A	
Background Information	Section 1	
Existing Situation		
Existing Site Uses (If Any)	Section 3	
Existing Parking and Demand (If Appropriate)	N/A	
Existing Access Arrangements	Section 3	
Existing Site Traffic	Section 3	
Surrounding Land Uses	Section 3	
Surrounding Road Network	Section 3	
Traffic Management on Frontage Roads	Section 3	
Traffic Flows on Surrounding Roads (Usually AM and PM Peak Hours)	Section 3	
Traffic Flows at Major Intersections (Usually AM and PM Peak Hours)	Section 3	
Operation of Surrounding Intersections	Section 3	
Existing Pedestrian/Cycle Networks	Section 4	
Existing Public Transport Services Surrounding the Development	Section 4	
Crash Data	Section 3	
Development Proposal		
Regional Context	Section 3	
Proposed Land Uses	Section 3	
Table of Land Uses and Quantities	Section 3	
Access Arrangements	Section 3	
Parking Provision	N/A	
End of Trip Facilities	Section 3	
Any Specific Issues	Section 6	
Road Network	Section 3	
Intersection Layouts and Controls	Section 3	
Pedestrian/Cycle Networks and Crossing Facilities	Section 3	
Public Transport Services	Section 3	
Integration With Surrounding Area		
Surrounding Major Attractors/Generators	Section 5	

Item	Provided	Comments/Proposals
Committed Developments and Transport Proposals	Section 5	
Proposed Changes to Land Uses Within 1200 Metres	Section 5	
Travel Desire Lines from Development to These Attractors/Generators	Section 5	
Adequacy of Existing Transport Networks	Section 5	
Deficiencies in Existing Transport Networks	Section 5	
Remedial Measures to Address Deficiencies	Section 5	
Analysis Of Transport Networks		
Assessment Years	Section 6	
Time Periods	Section 6	
Development Generated Traffic	Section 6	
Distribution of Generated Traffic	Section 6	
Parking Supply & Demand	Section 6	
Base and "With Development" Traffic Flows	Section 6	
Analysis of Development Accesses	Section 6	
Impact on Surrounding Roads	Section 6	
Impact on Intersections	Section 6	
Impact on Neighbouring Areas	Section 6	
Traffic Noise and Vibration	N/A	
Road Safety	Section 3	
Public Transport Access	Section 4	
Pedestrian Access/Amenity	Section 4	
Cycle Access/Amenity	Section 3	
Analysis of Pedestrian/Cycle Networks	Section 4	
Safe Walk/Cycle to School (For Residential and School Site Developments Only)	N/A	
Traffic Management Plan (Where Appropriate)	N/A	
Conclusions	Section 7	

Appendix B

Area 4 Stage 1 Structure Plan





Appendix C

Traffic Volume Plots



SCENARIO 1



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Amendment No. (TBC) To City of Swan Local Planning Scheme No.17

To Rezone Lots 72, 160–169, 195–198, 9002, 9010 Eveline Road, Viveash To 'Urban Development' Zone
Stage 1 of Area 4 Rivermark Residential Estate