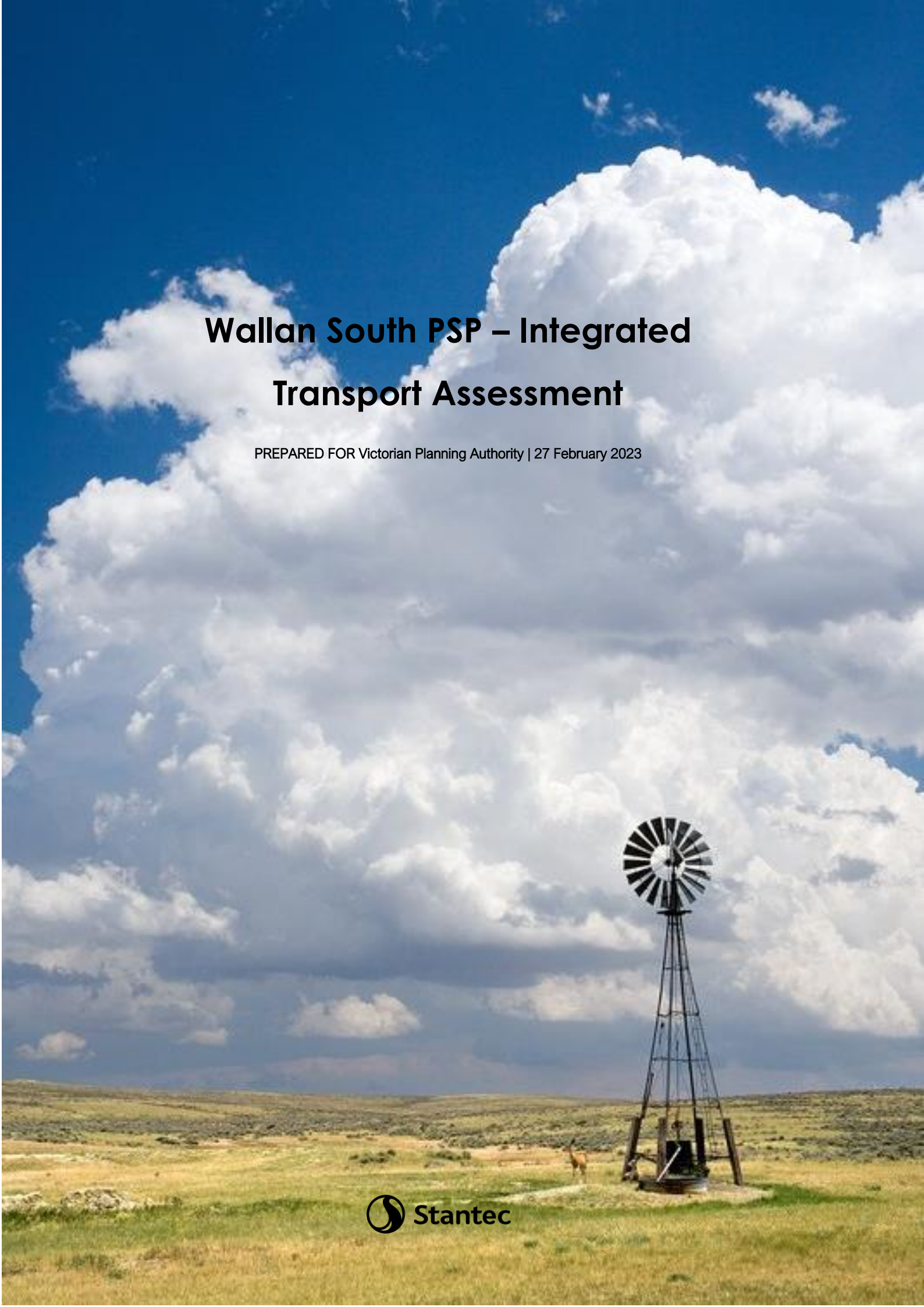
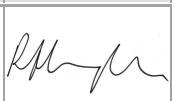
Wallan South PSP – Integrated Transport Assessment

PREPARED FOR Victorian Planning Authority | 27 February 2023



Stantec

Revision schedule

Rev No	Date	Description	Signature of Typed Name			
			Prepared by	Checked by	Reviewed by	Approved by
A	22/6/2022	Draft	MR	RH	RH	RH
B	30/8/2022	Draft - Final	MR	RH	RH	RH
C	27/02/2023	Final	EI	RH	RH	

Quality statement

Project manager	Project technical lead
Reece Humphreys	Reece Humphreys

PREPARED BY

Matthew Raisbeck ..... 16 / 08 / 2022

CHECKED BY

Reece Humphreys ..... 08 / 02 / 2023

REVIEWED BY

Reece Humphreys ..... 08 / 02 / 2023

APPROVED FOR ISSUE BY

Reece Humphreys 27/02/2023

Level 25, 55 Collins Street Melbourne VIC 3000 AUSTRALIA

Tel: +61 3 9851 9600

STATUS: FINAL | Project No 301400552

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Glossary

Enter Term	Enter Definition
BIFT	Beveridge Intermodal Freight Terminal
BNW	Beveridge North West
DoT	Department of Transport, Victoria (including the former agency VicRoads)
M&P	Movement and Place
NGC	North Growth Corridor
PSP	Precinct Structure Plan
PPTN	Principal Public Transport Network
RRV	Regional Roads Victoria
VPA	Victorian Planning Authority
UGZ	Urban Growth Zone

1 Introduction

Stantec has been engaged by the Victorian Planning Authority (VPA) to undertake the preparation of an Integrated Transport Assessment (ITA) to support the approval of the Wallan South Precinct Structure Plan (PSP) located in the North Growth Corridor.

The PSP sits immediately south of the existing Wallan township and covers an area of approximately 800 hectares. Old Sydney Road forms the western boundary of the site and the Hume Freeway the eastern boundary, Beveridge North West forms the southern boundary. When complete, the PSP is expected to have a residential focus with supported facilities including town centres, schools, community centres and parks.

The location of the Wallan South PSP, in orange, in relation to the North Growth Corridor is provided in Figure 1.

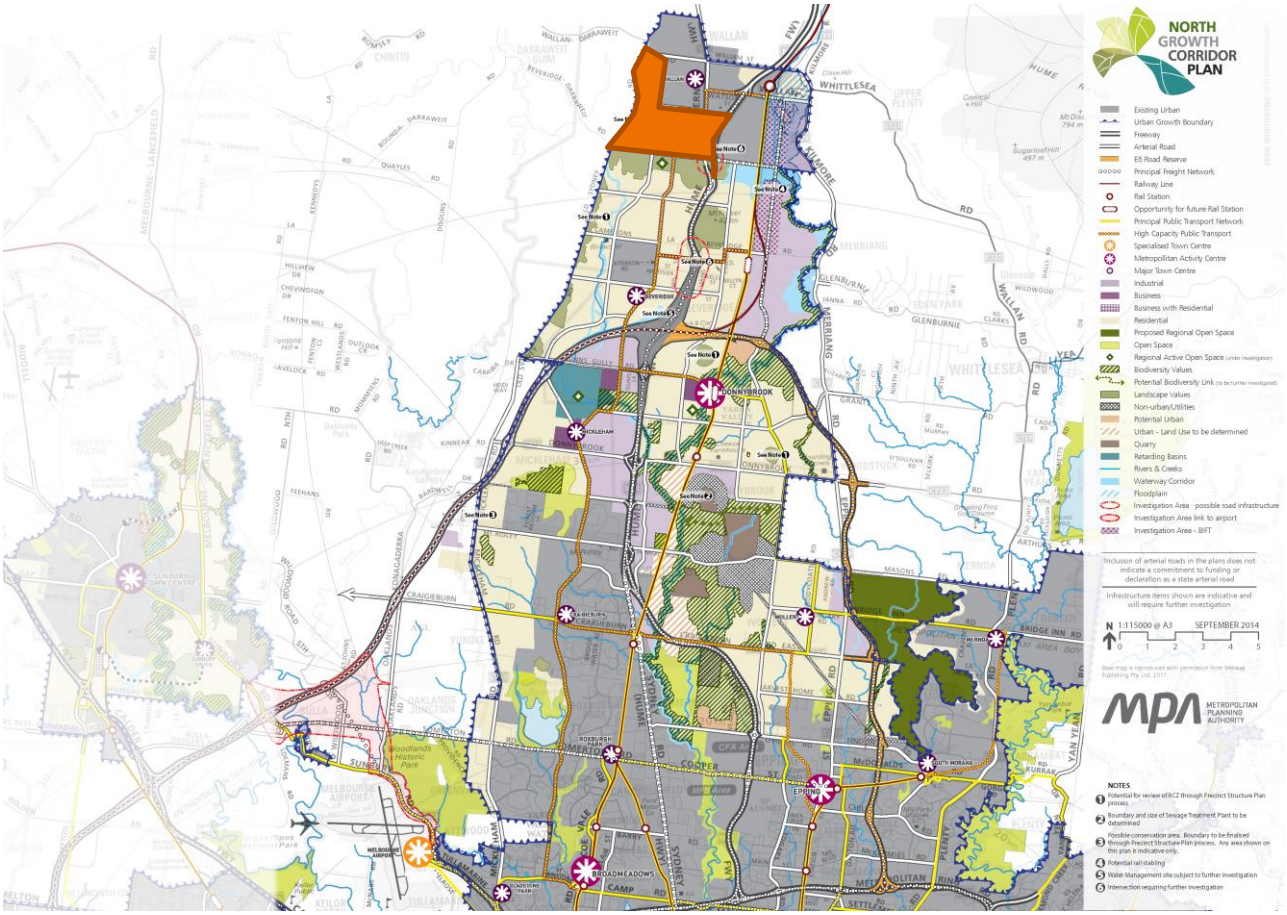


Figure 1: Wallan South PSP as part of the North Growth Corridor Plan

1.1 Study Purpose

The purpose of this study is to assess the traffic and transport planning elements of the PSP and the network's suitability to support the proposed land uses. The study relies upon transport modelling to inform and support the preparation of the PSP.

An overview of the key tasks associated with this engagement are provided in Figure 2.

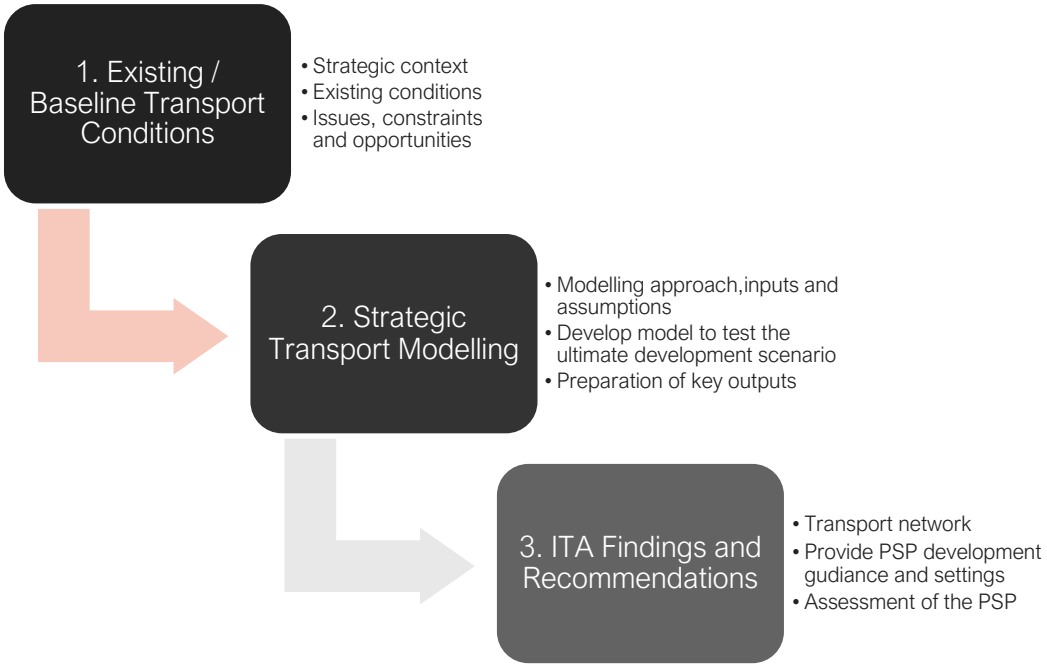


Figure 2: Project Process Overview – Key Tasks

The process has been iterative between the transport centric activities and the development of other aspects of the PSP, such as land use, open space and built form. As such, all the information provided in this report has been tested and revised through the precinct planning process in collaboration with the VPA.

2 Planning Context

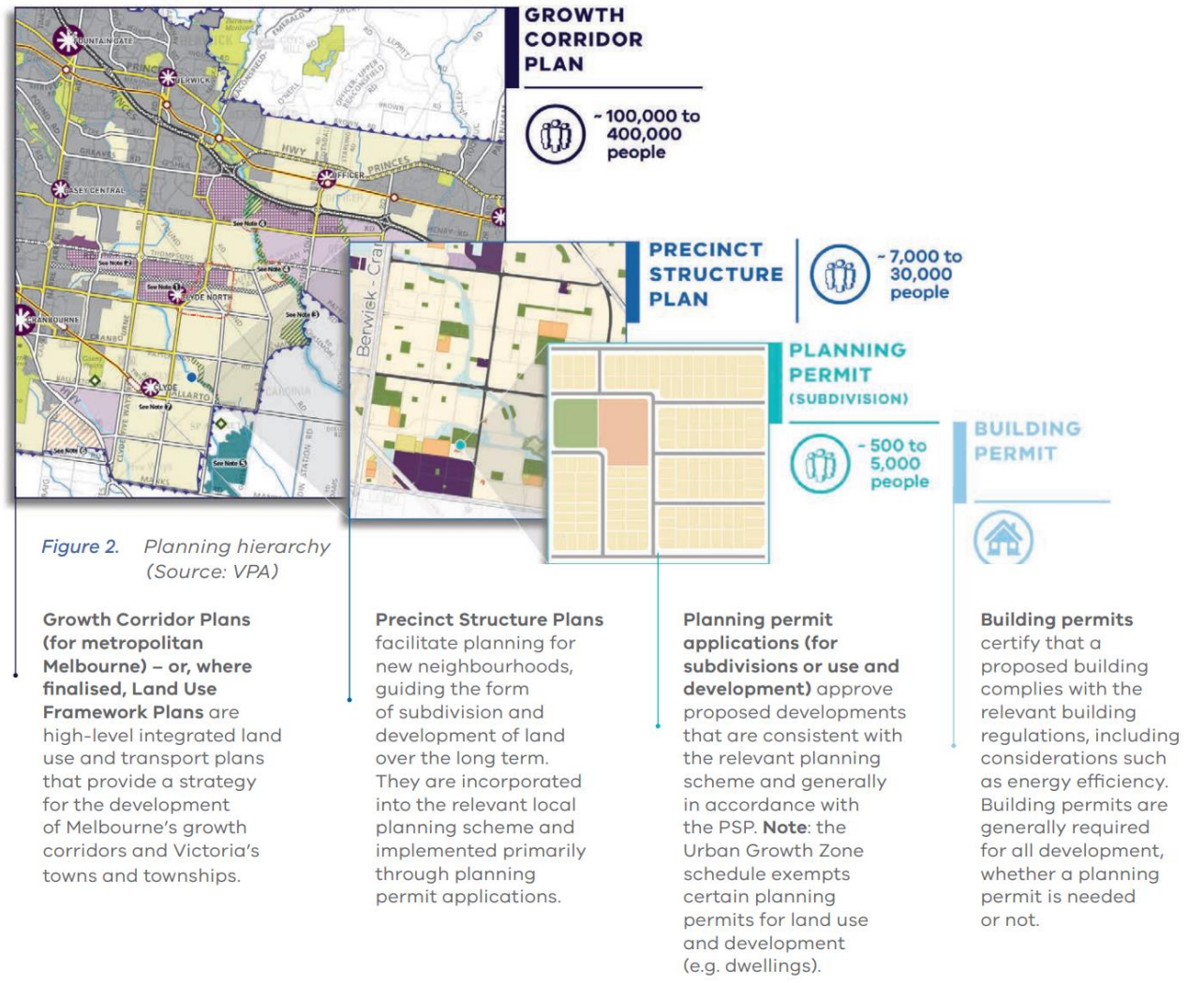
2.1 Precinct Planning

The preparation of the ITA for Wallan South forms part of the broader precinct structure planning process, which is undertaken by the VPA in accordance with the Precinct Structure Planning Guidelines: New Communities in Victoria (2021). The Guidelines are based on planning for 20-minute neighbourhoods, a principle in Plan Melbourne 2017-2050 that advocates for living locally to ensure accessible, safe and attractive local communities.

The undertaking of the ITA for the Wallan South PSP forms part of the broader precinct planning process, which in Greenfield areas adopts the PSP2.0 guidelines. The purpose of the guidance is to set out what should be addressed in preparing or assessing a PSP and sets aspirational targets to streamline and optimise how it delivers on government policy.

2.2 Corridor Planning

The Wallan South Precinct Structure Plan (PSP) is located within and towards the northern extent of the North Growth Corridor (NGC). The NGC, as with the other Growth Corridor Plans, are carefully thought out strategic integrated land use and transport plans. The NGC, which is one of the four Growth Corridor Plans prepared by the VPA (formerly Metropolitan Planning Authority and Growth Areas Authority), originally extended as far north as Hadfield Road. A subsequent Urban Growth Zone (UGZ) extension included the Wallan township and adjacent areas, such as the Wallan South PSP that is located between the existing Wallan township and Hadfield Road which covers the northern boundary of the Beveridge North West (BNW) PSP. Figure 3 provides the relationship between the Corridor Plans and Precinct Structure Plans.



Source: VPA, Precinct Structure Planning Guidelines: New Communities in Victoria, October 2021

Figure 3: The Planning Hierarchy

3 Strategic Planning Context

There is a range of preceding and parallel planning activities that have occurred in the area that have informed the development of the Wallan South PSP. Table 1 provides an overview of those activities most relevant to the development of the Wallan South PSP and this ITA.

Table 1: Planning and Transport Activities

Activity	Description	Implications
Plan Melbourne	Plan Melbourne is the Victorian Government's long-term planning strategy, guiding the way the city will grow and change to 2050.	Key transport related policies relating to the NGC and Wallan South PSP include: • Supporting major transport gateways as important locations for employment and economic activity • Supporting the development of a network of activity centres, linked by transport • Facilitating investment in Melbourne's outer areas to increase local access to employment • Creating a city of 20-minute neighbourhoods • Requiring development in growth areas to be sequenced and staged to better link infrastructure delivery to land release • Providing guidance and certainty for land use and transport development through the Principal Public Transport Network and the Principal Freight Network
North Growth Corridor Plan	The North Growth Corridor plan sets the regional framework for its urban growth based on the strategic directions of Melbourne 2030.	It shows broad land use patterns, committed and proposed transport networks and regional open space, significant waterways and areas of potential environmental sensitivity.
Mitchell Shire Council Integrated Transport Strategy (in development)	The strategy aims to establish a vision across Mitchell's Growth Corridor for transport actions that will encourage vibrant and liveable communities for residents.	At this time only the outputs from strategic transport modelling activities have been provided, and they highlight the following: • Significant change expected in the NGC • A 'business as usual' approach to transport is not expected to achieve the aims of the strategy – north-south roads will be highly congested Focus on supporting more local living within the NGC than accessing other regional areas.
Beveridge North West PSP	Beveridge North West (BNW) PSP is located immediately south of the Wallan South PSP. The PSP has been through two Planning Panels in 2019 and 2022 and is currently awaiting a minister report.	A number of key transport outcomes have occurred through the development of the PSP that relate to Wallan South, including: • Determining the need for two north-south arterial roads (Patterson Road being part of the PPTN). • The alignment of Hadfield Road, and • The status of Old Sydney Road as a connector street is appropriate and reflects its intended function as the PSP area is developed Strategic transport modelling assumptions adopted for this assessment are consistent with the inputs used for the Beveridge North West PSP assessment.

Activity	Description	Implications
Watson Street duplication and Hume Highway ramps assessments	The Federal Government announced in 2021 the funding for the upgrade of the Hume Freeway interchange with Watson Street.	Preliminary designs of the interchange upgrade indicate it will become a full diamond interchange with southern on and off-ramps. It also includes the grade separation of Watson Street over the Melbourne – Sydney Railway Line (as part of the Inland Rail Project) as well as the upgrade of the Watson Street connection into the Wallan township.
Northern Highway Duplication Project	The Department of Transport is investigating options for the duplication of the Northern Highway to two or three lanes in each direction.	The need and viability of duplicating the Northern Highway is dependent on the timing of other major projects, including the delivery of the PSPs, the Watson Street interchange, Hadfield Road and proposed parallel north-south arterials through the BNW and Wallan South PSPs. Each of these other projects will help reduce the reliance of the Northern Highway. However, duplication at some point in the future is expected given the level of development in the area, and its continued key network role.
Beveridge Intermodal Freight Terminal (BIFT)	BIFT is an 1,100-hectare site in the north-east growth corridor of Melbourne	BIFT will be an import-export (IMEX) rail terminal and an interstate rail terminal that is expected to handle up to 2 million TEU (twenty-foot equivalent units) per annum at completion. This will have implications to the way people travel in the area, especially in terms of employment generation and freight movement.
Other major projects	There are a number of major projects expected in the area that are at early planning phase, i.e. no committed option, funding and/or timing. Consideration of these projects may still be required as part of the Wallan South PSP given its 2051 ultimate time horizon.	The key major projects in early planning phase in the area are the following: • Wallan, Beveridge and Donnybrook Stations and metro line electrification • Inland Rail, ARTC, Very Fast Rail, V/Line • NGC PPTN alignment and service arrangements • NGC bus network and service frequencies • Hume Freeway improvements • Outer Metropolitan Ring and E6 Transport Corridors • Strategic Cycling Corridor
Wallan South Precinct Vision and Purpose co-design workshop	A Co-Design workshop that built on the previous stakeholder engagement was held to achieve the following: • Understand the vision for the Wallan South PSP and how it will relate with the broader catchment area. • Validate the outcomes of the previous stakeholder engagement • Better define the issues for the Wallan South PSP and ideate a way forward.	Resulting key themes for Wallan South were: • Completing the future City of Wallan • Boosting the community • Attracting new economies • Creating diverse 20-minute neighbourhoods • Connecting people to places • Maximise value from water and landscape In terms of the key transport related themes, the following most common vision statements emerged: • Act as the northern gateway • Enhance transport connections • Provide active transport options • Promote and enhance pedestrian and cycling through appropriate cross section design and streetscape amenity

4 Existing Transport Conditions

4.1 Existing Modal Priorities

The existing modal priorities are classified in the Movement and Place Framework. Transport planning has undergone many evolutions over the years, from only focusing on the movement of vehicles within the carriageway, to including consideration and integration of other modes (SmartRoads), to now the interaction with the adjacent land use and associated activities. This latest evolution is referred to as the Movement and Place Framework, which has been adopted by the State Government, and is beginning to be applied industry wide.

Movement and Place classifications have been generated through an automatic mapping process by the DoT across Victoria. It is noted that the associated Movement and Place classifications should not be considered as being fixed. Rather, they provide an initial starting point and understanding of some of the key directions that should be targeted in the planning and development of the transport network.

An ongoing iterative process is expected, especially within greenfield growth areas, as precinct and major project planning activities occur and resolve and integrate the various elements in more detail.

The current generated Movement and Place modal classifications for the Wallan South PSP and surrounds are shown in Figure 4 (place classifications in the area are low, except for the Wallan Township which has a P3 classification).

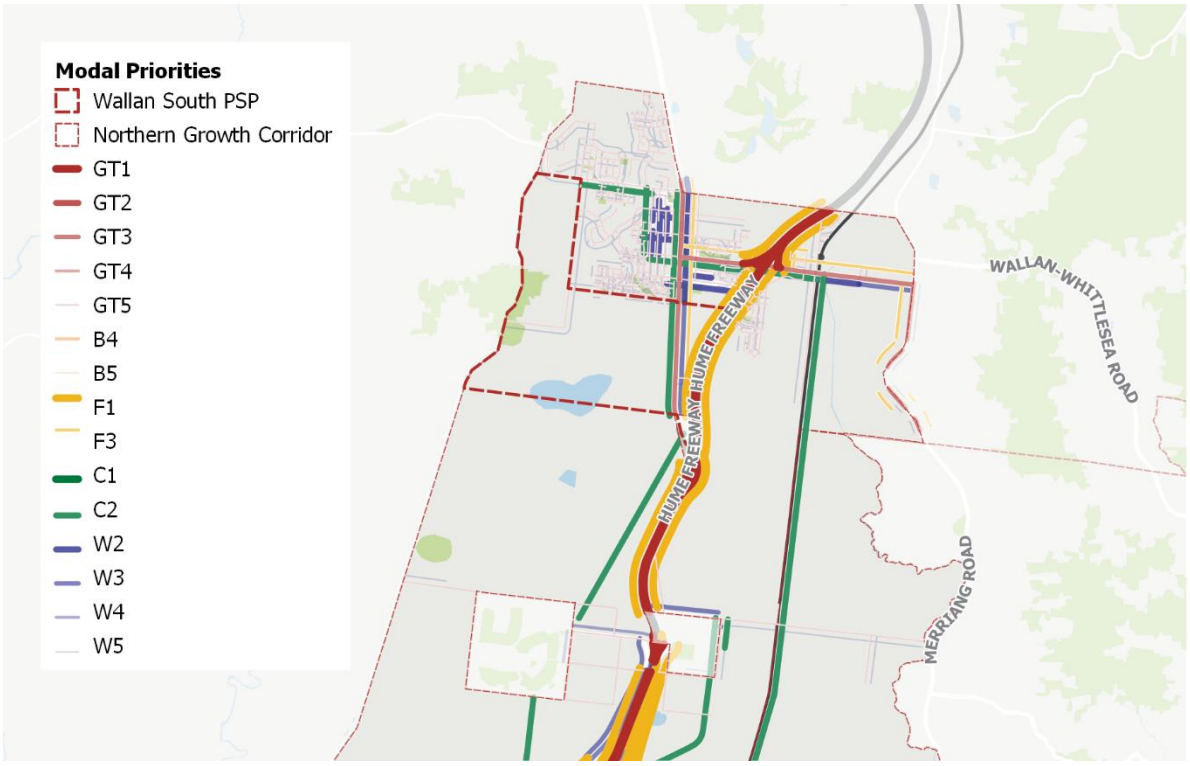


Figure 4: Wallan South and Surrounds PSP – Movement and Place Modal Classifications

(Source: vMaps)

Figure 4 shows that only the existing transport network currently has Movement and Place modal classifications. Of those roads connecting to the Wallan South PSP, it is noted that:

- The Hume Freeway is a priority traffic and freight route of national importance (GT1, F1)
- The Northern Highway is a moderate priority traffic, freight, cycling and walking route (GT3 F3, C2, W3). Supporting all these modes in a priority fashion will have its difficulties. As such, consideration of alternative parallel options through the NGC planning and development process is expected.
- There are currently no on-road public transport based priority routes. This is expected to change with the PPTN within the NGC and increased services on the bus network.

4.2 Road Network

The existing road network within and proximate to the Wallan South PSP is outlined in Figure 4,

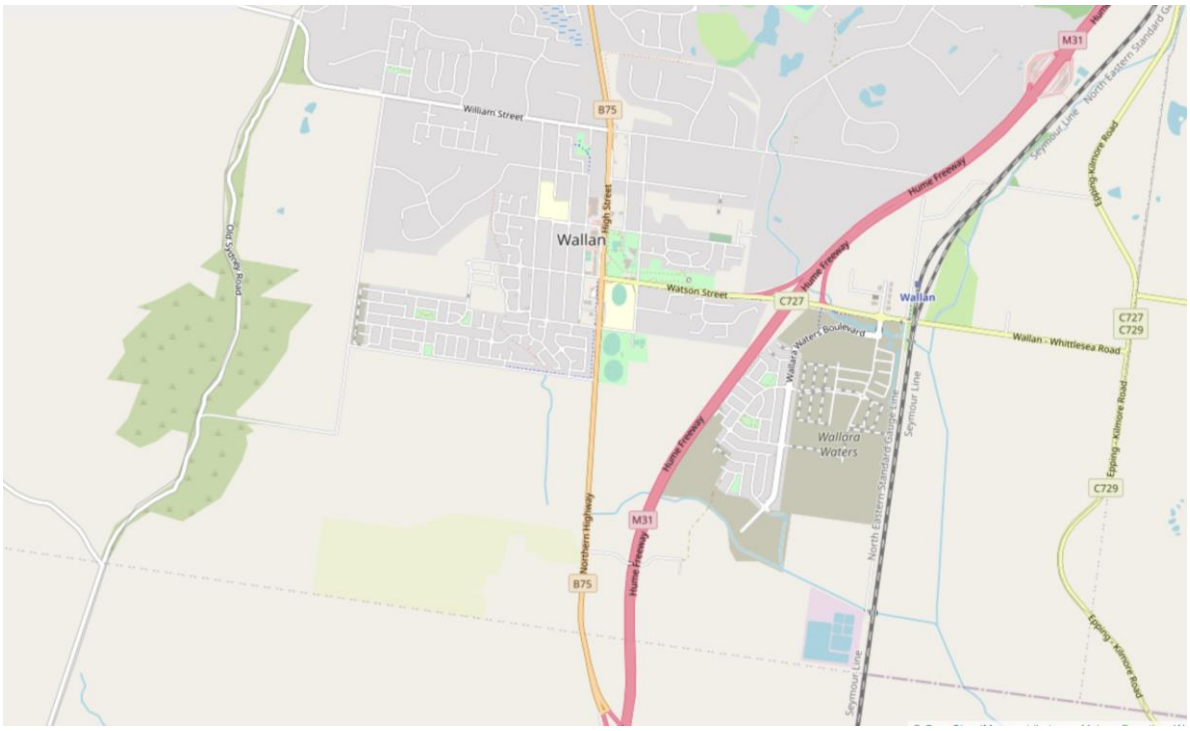


Figure 5: Existing Transport Network in Wallan South

Within Wallan South, there is a limited to no road network in and through it. The key characteristics of the road network are summarised in Table 2, noting that the classifications differ from the PSP / VPA classifications.

Table 2: Existing Road Characteristics

Road Name	Classification[1]	Carriageway / configuration	Road Reserve Width	Speed Zone	Daily Volumes[2]
Hume Freeway	Freeway	Divided with 4-lanes	80m	100-110km/h	35,000
Northern Highway	Arterial	Undivided with 2-lanes	60m	60-80km/h	23,000
Old Sydney Road	Municipal	Undivided with 2-lanes	60m	Not posted	<1,000
Darraweit – Wallan Road	Arterial	Undivided with 2-lanes	20m	60km/h	n/a
Rowes Lane	Municipal	Undivided with 2-lanes	20m	60km/h	n/a

[1] https://www.vicroads.vic.gov.au/traffic-and-road-use/road-network-and-performance/victorias-road-network

[2] Two-Way-AADT, DoT, https://vicroadsopendata-vicroadsmaps.opendata.arcgis.com/datasets/traffic-volume Accessed: 15/8/22

Road Name	Classification[1]	Carriageway / configuration	Road Reserve Width	Speed Zone	Daily Volumes[2]
Taylors Lane	Municipal	Undivided with 2-lanes	20m	60km/h	n/a
Macsfield Road	Municipal	Undivided with 1-lane	20m	Not posted	n/a

4.3 Safety

A review of the reported casualty collisions history for the roads and intersections internal to and adjoining the Wallan South PSP has been sourced from VicRoads CrashStats accident database.

This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victoria Police) and categorises these accidents as follows:

- Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.
- Serious injury: at least one person was sent to hospital as a result of the accident.
- Other injury: at least one person required medical treatment as a result of the accident.

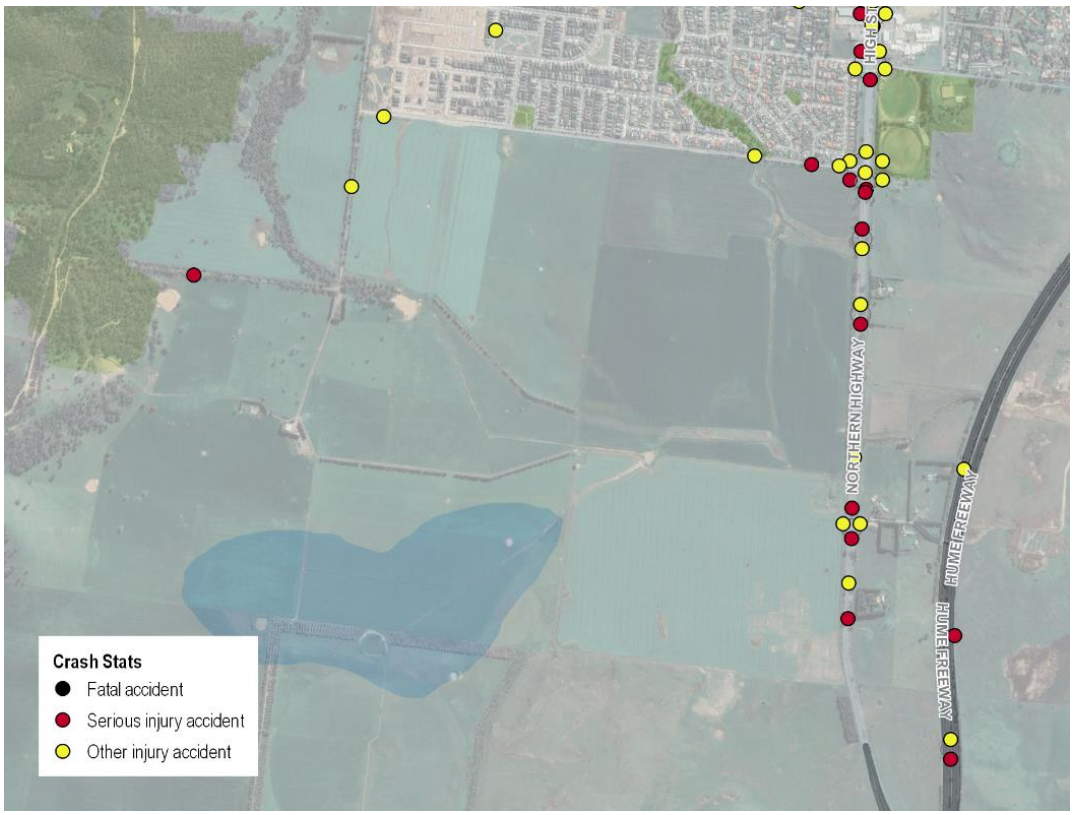


Figure 6: Accidents in the vicinity of Wallan South

A summary of the accidents in the vicinity of the site for the last available five year period (2015-2019) inclusive is presented in Table 3.

Table 3: Accidents in the vicinity of Wallan South

Road Name	Fatality	Serious Injury	Other Injury
Roads			
Northern Highway near Macsfield Road		2	4
Northern Highway near Taylors Lane		3	3
Old Sydney Road near Darraweit Road			1
Rowes Lane near Old Sydney Road		1	
Rowes Lane near Taylors Lane			1
Taylors Lane near Northern Highway			1
Taylors Lane near Wyatt Way			1
Intersections			
Northern Highway and Macsfield Road		1	
Northern Highway and Taylors Lane		2	4
Rowes Lane and Taylors Lane			1
Taylors Lane and Wyatt Way		1	

As expected, the crash analysis does not include any incidents within the PSP however there are some collisions that have occurred on the Northern Highway at Macsfield Road and Taylors Lane. These safety issues will not only be addressed with the intersection upgrades provided by the PSP, they will also be addressed with the planned upgrade of the Northern Highway that will be delivered by the Department of Transport (subject to funding).

4.4 Public Transport

Figure 6 and Figure 7 show the Wallan South PSP in relation to the existing public transport services. Table 3 summarises their service characteristics (service descriptions and frequency).

Figure 7: Wallan South and Surrounds – Existing Public Transport Network (Route 1, 2 and 3)

Figure 8: Wallan South and Surrounds – Existing Transport Network (Link Route A and B)

Table 4: Existing Public Transport Service Characteristics

Service	Description	Frequency (peak, off peak)
Bus	1 – Wallan Station - Wallan Central	30-60mins, 1 hr off-peak, connecting with V/Line trains to Melbourne. PM Peak service covered by Link Bus A
	2 – Wallan Station - Springridge	30-40mins. 1 hr off-peak, connecting with V/Line trains to Melbourne. PM Peak service covered by Link Bus A
	3 / Link Bus B – Wallan Station - Wallara Waters Shuttle	30-40mins. None interpeak. PM Peak Services waits up to 20 mins if the V/Line train is running late
	Link Bus A – Wallan Station - Wallan Station via Wallan Central	PM Peak only 30-60mins connecting with V/Line trains from Melbourne. Services waits up to 20 mins if the V/Line train is running late
Train	Wallan Station – V-Line Seymour	2-3 services / peak
Coach	High Street / Main Road bus stop: Deniliquin via Heathcote & Echuca Barmah via Shepparton & Heathcote Barham via Heathcote	1 service / day 1 service / day 1 service / day

The existing public transport services provide no access to Wallan South or allow Wallan South residents access to the wider public transport network.

4.5 Active Transport

Within the Wallan South PSP there are no existing active transport facilities. There are, however some facilities in the broader area including:

- Footpaths within the road reserves with kerb and channel
- A number of shared paths within the adjacent residential suburbs, including on the north side of Taylors Lane to the west of Edwardes Street, and High Street between Taylors Lane and Watson Street
- Shared path on the southern side of Watson Street between Windham Street and Station Street.

As part of the Movement and Place classification for the existing network in the area, as shown in Section 4.1, there are the various cycling priority routes. Movement and Place classifications for cycling are not an indication of current infrastructure. The cycling priority routes are expected to be of a high quality and suitable for a wide range of potential users. They are also expected to provide connections between key activity centres, business precincts and transport interchanges (such as Wallan Station).

5 The PSP

5.1 Site Context

The Wallan South PSP is located approximately 40km north of the Melbourne CBD and covers an area of 806 hectares. The precinct is bounded by the Hume Freeway to the east, Hadfield Road to the south, Old Sydney Road to the west, and Darraweit Road, Bowes Lane and Taylors Lane to the north. The PSP is expected to deliver approximately 7,000 dwellings for a population of around 22,000 residents, as well as some local town centres, schools, open space and other community facilities.

Access to the PSP is anticipated to be via each of the boundary roads, except the Hume Freeway, and the Northern Highway. Two north-south arterials are planned to continue from the BNW PSP on the southern side of Hadfield Road. Of these two north-south arterial roads, Patterson Road (the Eastern Arterial) has been identified as being part of the Principal Public Transport Network (PPTN), which will help connect people in these PSPs with the Wallan township and Wallan station.

The transport network for the Wallan South PSP is shown in Figure 9.

Figure 9: Wallan South PSP transport network

5.2 Urban Structure (Placed Based Plan)

Wallan South PSP covers an area of 806 hectare, and is bound by Old Sydney Road to the West, Hume Freeway to the east and Wallan Township to the north/north-east. The draft Place Based Place is reproduced in Figure 10.

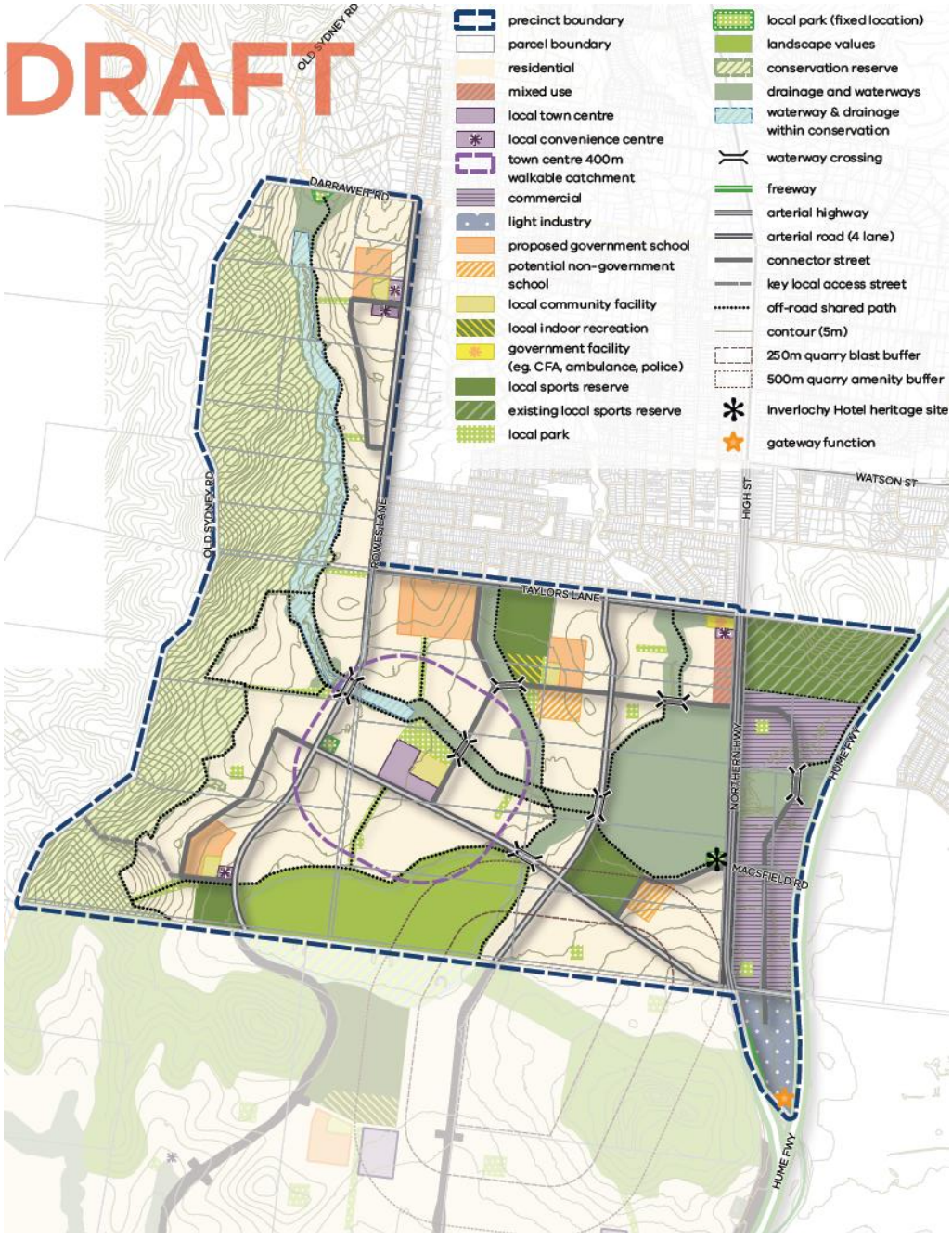


Figure 10: Wallan South PSP Place Based Plan

The PSP is expected to deliver approximately 7,000 dwellings for a population of around 21,600 residents, one local town centre, five primary schools and one secondary school. On the southern boundary of the precinct and extending into the adjoining Beveridge North West precinct is the burrung buluk (former Hanna Swamp) Investigation Area and buffers to a proposed time restricted quarry (as per Works Authority 1473).

5.3 Internal Road Network

The internal road network for Wallan South follows the natural features within the PSP and is shown in Figure 9 in Section 5.1. It will be supported by a series of local streets that will connect future residents to the network. When constructed, the network will include the following:

- A realigned Hadfield Road, travelling in a north-west to south-east direction. This alignment has been developed primarily to avoid the burrung buluk (former Hanna Swamp).
- A proposed Western Arterial Road travelling in a north south direction through the PSP which is generally 1.2 kilometres west of Patterson Road/Eastern Arterial and 1 kilometre east of Old Sydney Road. The Western Arterial will intersect with Darraweit Road at the northern extent of the PSP.
- Patterson Road/Eastern Arterial is a north south arterial within the PSP that will be situated between the Northern Highway and the Western Arterial. The road intersects with Taylors Lane and is identified as part of the future Principal Public Transport Network (PPTN) and as a proposed High-Capacity Public Transport (HCPT) Route. For the modelling it is assumed as one lane each way for general traffic and one lane each way for bus services.
- Both the Western and Eastern Arterial Roads are consistent with the alignments recommended in the Beveridge North West PSP 2020 Panel Report, which supports two arterials.
- One new local connector loop road from and to the west of Western Arterial at the southern end of the PSP intersecting with Hadfield Road.
- A second local connector loop road from and to the west of Western Arterial between Taylors Lane and Darraweit Road.
- One north-south local connector between Eastern Arterial and the Western Arterial, linking Hadfield Road and Taylors Lane.
- One east-west local connector between the new north-south local connector mentioned in the dot point above and the Northern Highway.
- One north-south local connector intersecting with the new east-west local connector at the Northern Highway which travels south parallel to the Northern Highway and the Hume Freeway intersecting with Hadfield Road in the form of a left in / left out intersection. To ensure access and egress to adjoining parcels, a loop road, in the form of an access road, will travel underneath the Hadfield Road overpass.
- An extension of Macsfield Road west of the Northern Highway to connect with Hadfield Road.

Taylors Lane between the Eastern Arterial and Northern Highway is proposed to accommodate the planned PPTN. The road network will be bus capable, noting that the planning and operation of the bus network (including the routes) is provided by the DoT.

An assessment of the suitability of the transport network is provided in Section 6.

6 Strategic Transport Modelling

6.1 Introduction

The strategic transport modelling has been undertaken to provide an understanding of the traffic and transport performance of the PSP and the broader North Growth Corridor. Strategic transport modelling uses population, employment and land use data to model the impact of land use changes on road and public transport networks.

The Victorian Integrated Transport Model (VITM) is developed by the Department of Transport (DoT) to assist in the planning of road and public transport infrastructure and contains all major freeways, main arterials and connector roads within Victoria. The model is a link-based traffic model that uses a range of metrics to determine how traffic is assigned to the transport network. In assigning traffic to the network, the model uses the capacity and speed of the links to assign the shortest and quickest route for trips based on the link capacities.

It is not uncommon in strategic models that the capacity of the route be exceeded, in these cases the travel time for the link becomes so congested that alternate paths (or routes) are calculated and determined.

The purpose of the strategic modelling for the Wallan South PSP is to provide a traffic assessment to understand:

- Whether the internal road network of the PSP adequately serves the development planned
- Whether the road network surrounding the PSP is able to adequately accommodate the development planned

6.1.1 Limitation of Strategic Transport Modelling

It is important to note the limitations that a strategic transport model has. Principally, it is a tool used to evaluate the performance of a transport network based on the travel decisions that people make on a day to day basis. Travel demand is generated in a strategic model based on demographic information including the households, education, retail and employment-based trips.

They are not generally used to predict exact volumes on roads (or patronage on public transport) rather they are used to analyse the travel demand for a specific scenario (and to compare against it). They can be used for corridor studies, wide area impact studies, major road projects, major public transport projects, different land use change scenarios, travel demand change / mode shift assessments and policy settings (i.e. public transport fares, parking charges, toll charges etc.).

This project used the model to determine the impacts of the introduction of the Wallan South PSP in the context of the North Growth Corridor.

6.2 Refined Strategic Model for Wallan

The Victorian Integrated Transport Model (VITM) was prepared in 2018 by the Department of Transport (DoT) and was also used to inform work completed by Stantec (formerly GTA) for Regional Roads Victoria (RRV, which is a part of DoT) for the Wallan South PSP and the Northern Highway upgrade project (previously referred to as the Northern Highway Model).

This is an updated model structure than what has been used for a number of previous PSP's in the North Growth Corridor. A number of the assumptions that underpin these models are aligned, however there are some that differ. In particular, these include broader land use and network changes outside of Wallan South and Beveridge North West that influence travel patterns and behaviour. In consultation with the VPA, it was agreed that the latest version of VITM should be updated to reflect the latest DoT model and networks for the North Growth Corridor. All of the work has been completed for 2051 which assumes a full build out or delivery of the North Growth Corridor and the broader transport network.

6.2.1 Calibration and Validation

The model used for the Wallan South PSP was calibrated and validated to a satisfactory level for the Northern Highway study, commissioned by RRV, with the report dated June 2019.

6.3 Wallan South Inputs and Assumptions

6.3.1 Land Use

The population, households, employment and enrolment projections used for the Wallan South are outlined in Table 5.

Table 5: Wallan South PSP Land Use Inputs

Model	Population (People)	Household (Dwellings)	Employment (jobs)	Enrolment (no. of Students)
Wallan South PSP	21,644	6,982	3,785	3,819

The spatial distribution of population within the Wallan South PSP is shown in Figure 11 and the spatial distribution of employment is shown in Figure 12.

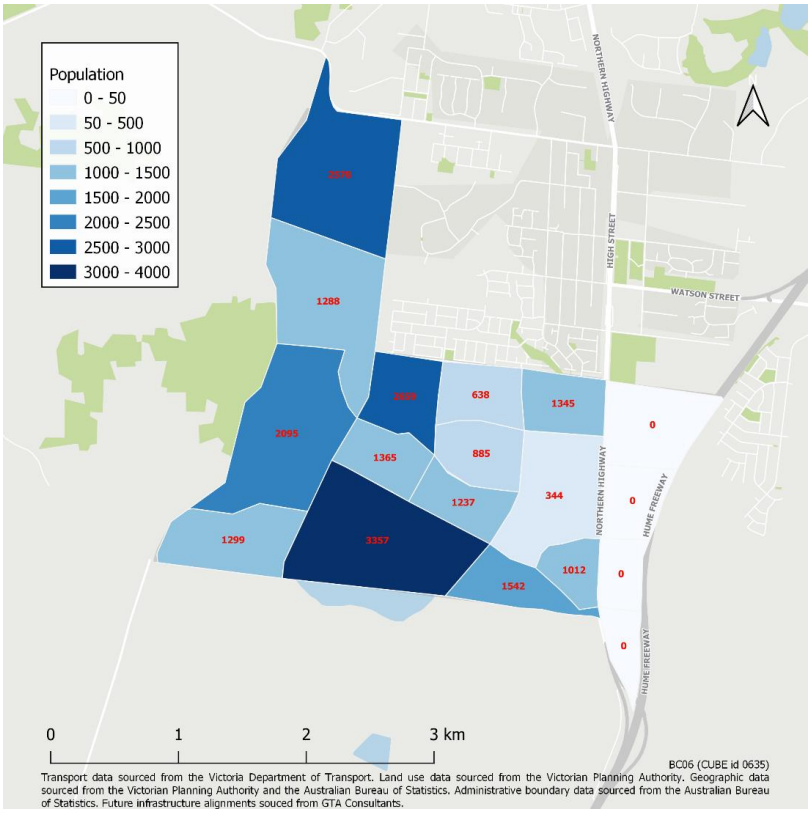


Figure 11: Wallan South Population

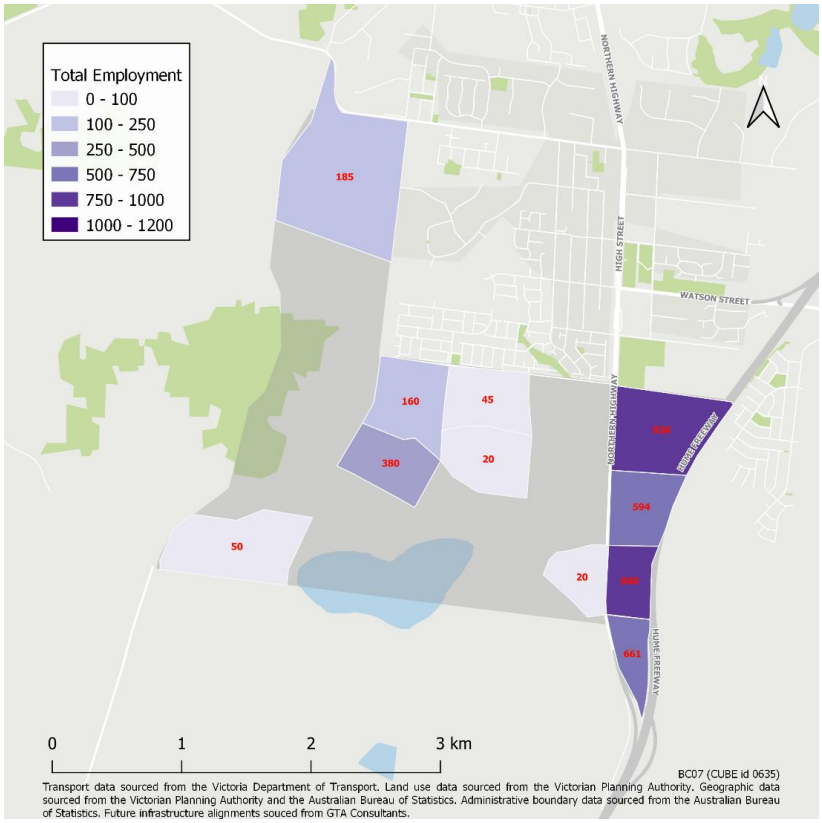


Figure 12: Wallan South Employment

The figures show that all of the population within the Wallan South PSP is west of the Northern Highway, and most of the employment is to the east of the Northern Highway. The remainder of the employment within the PSP is associated with the town centre, local conveniences and schools.

Traffic zones, which are where traffic is loaded onto the network in the model, have been adjusted to reflect the realigned transport network. The zone structure for the Wallan South PSP is shown in Figure 13.

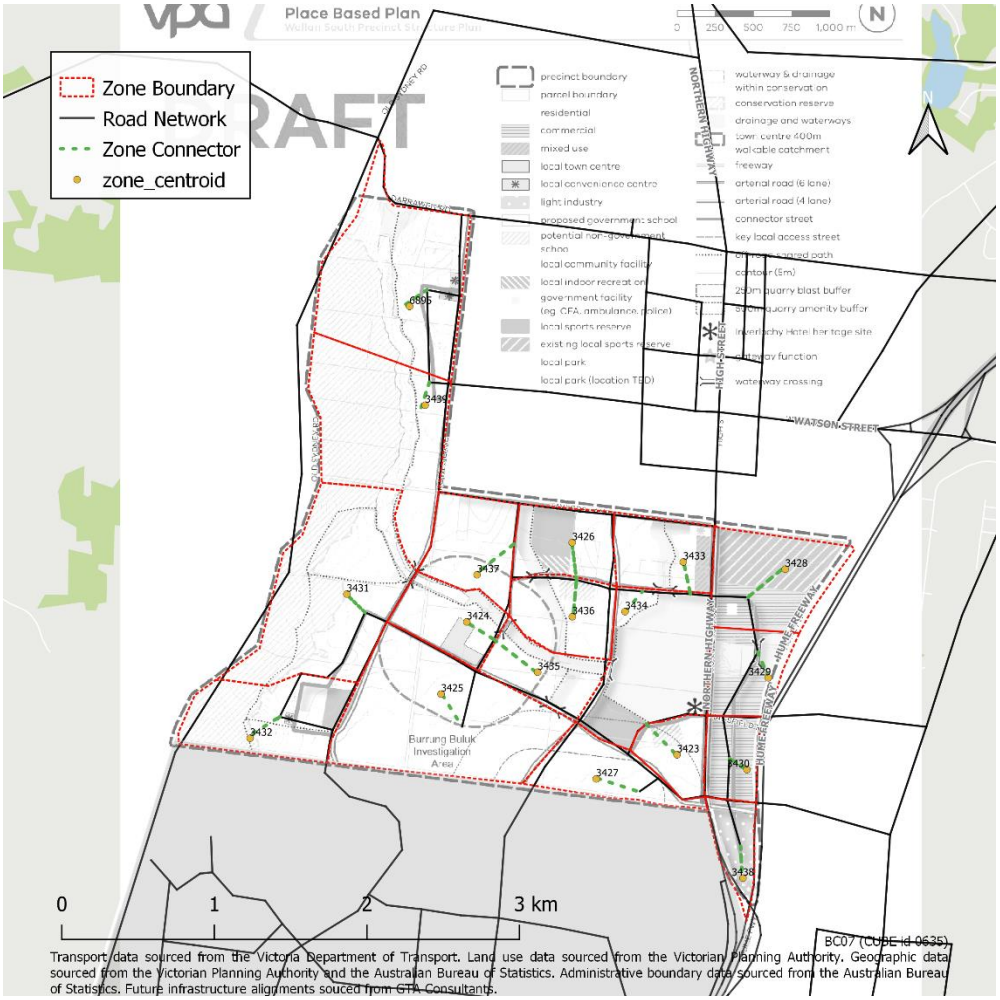


Figure 13: Wallan South PSP Zone Structure

The zones have included the updated land use inputs for Wallan South which have been provided by the VPA.

6.3.2 Networks

The transport networks in the model reflects the Wallan South PSP Placed Based Plan.

Figure 14 shows the number of general traffic lanes for each segment of the road network, Figure 15 shows the VITM road classifications and Figure 16 shows the posted speed limits on the road network.

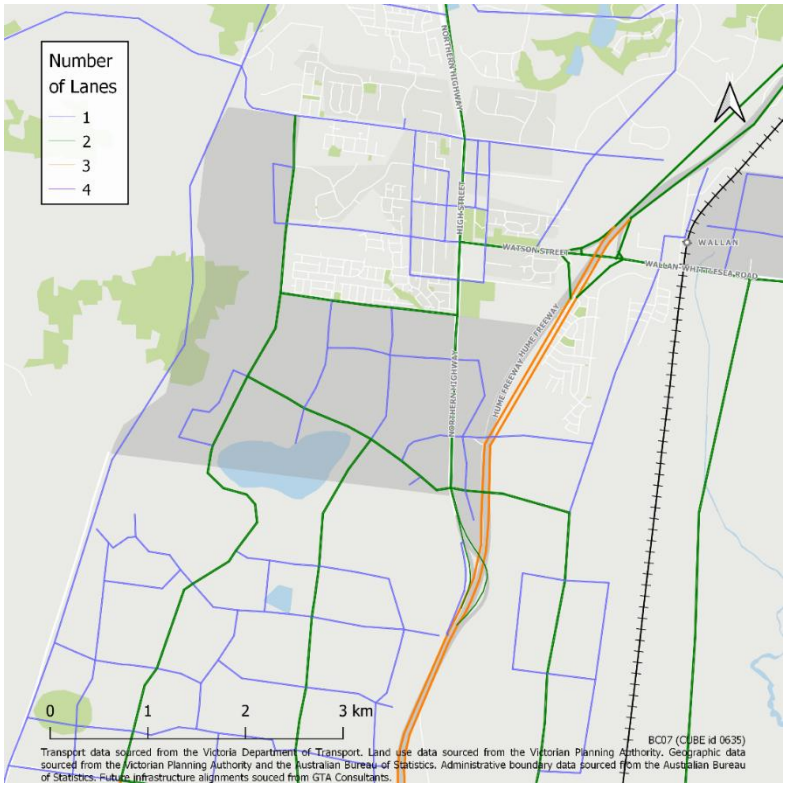


Figure 14: Wallan South and surrounds number of general traffic lanes, per direction

Figure 14 shows the modelled network contemplates one general traffic lane per direction on the Eastern Arterial Road between Hadfield Road and Taylors Lane. It is noted that the cross section of this road within the PSP is planned to be two lanes in each direction with the second lane intended to be used for public transport services as part of the PPTN. Figure 14 shows traffic lanes and as such the dedicated public transport lane is not indicated.

Figure 15: Wallan South and surrounds VITM road classification

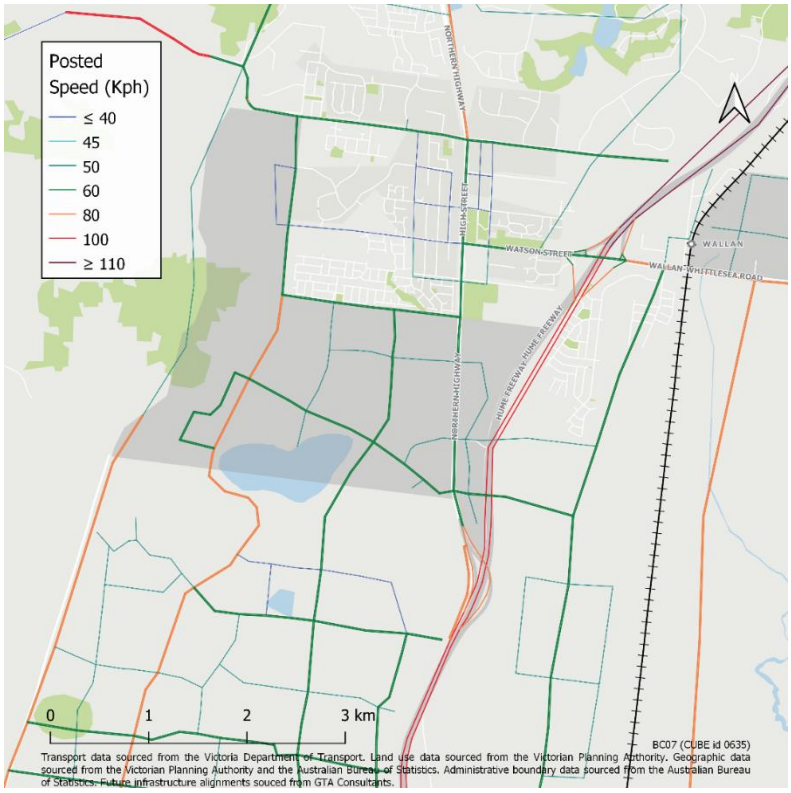


Figure 16: Wallan South and surrounds road speed limit

Figure 16 shows that most of the arterial roads within the Wallan South PSP have a posted speed limit of 60km/h, except for the Western Arterial, which has a posted speed limit of 80km/h. The connector roads within the PSP are generally at 50km/h.

6.4 Results

6.4.1 Traffic Generation

In order to understand the model characteristics, the trip and traffic generation rates have been extracted from each zone in Wallan South, as shown in Table 6.

Table 6: Trip (Vehicle) Generation from Wallan South PSP

Parameter	Number of trips
Trip Productions (daily)	36,465
Trip production rate - per person per day	1.68
Trip production rate - per household per day	5.22
Trip Attractions (daily)	37,067
Trip attraction rate - per person per day	1.71
Trip attraction rate - per household per day	5.31
Total Trips - Per household per day	10.53

Table 6 shows that the model is generating some 1.7 trips per person per day and just over 5.2 trips per household per day. Note that these are productions and the attractions are of a similar order resulting in a total generation rate of 10.53 trips per household per day.

Analysis from VISTA 2018 using the nearby LGA of Hume and Whittlesea indicates that each household will produce in the order of 5.9 vehicle trips per day and 2.0 trips per person. The model outputs for traffic generation are comparable to the VISTA data, albeit lower, which were confirmed as part of the model calibration and validation.

Notwithstanding, the data indicates that the model outputs are suitable for use in this assessment

6.4.2 Traffic Volumes

Based on the land use described in Section 6.3.1 and trip rate assumptions in Section 6.4.1, Figure 17 shows the daily traffic volumes, Figure 18 shows the AM Peak traffic volumes and Figure 19 shows the PM Peak traffic volumes.

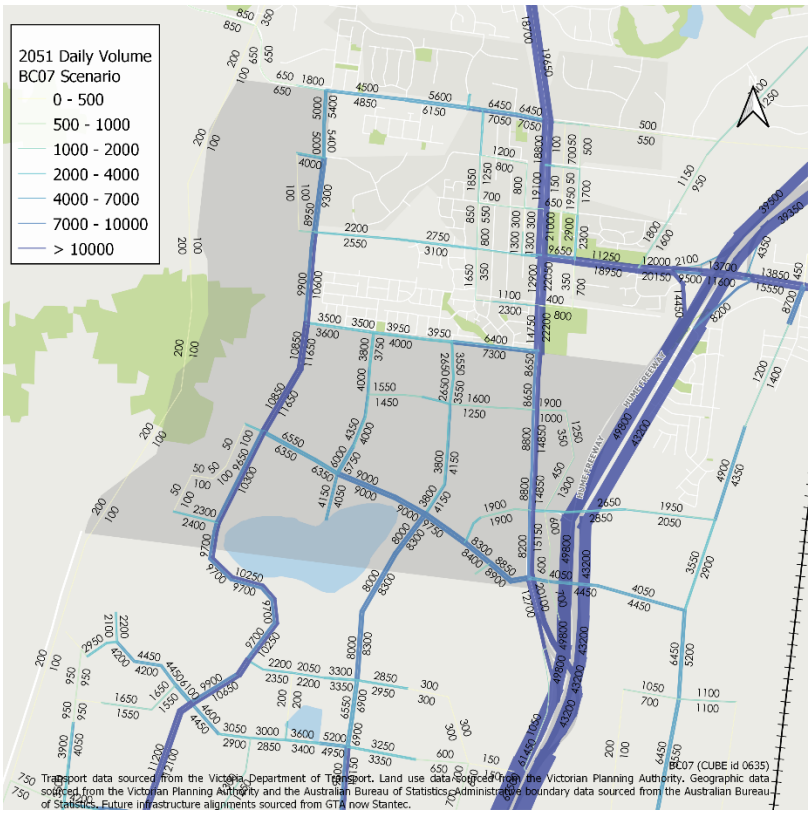


Figure 17: Wallan South Daily Vehicle Volumes

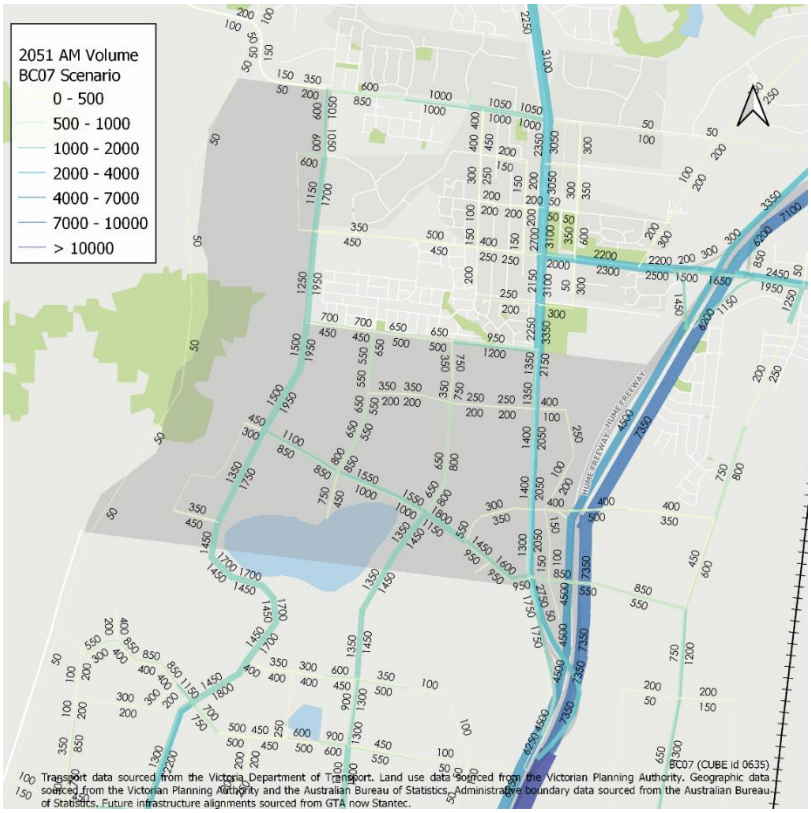


Figure 18: Wallan South AM Peak (2 hour) Vehicle Volumes

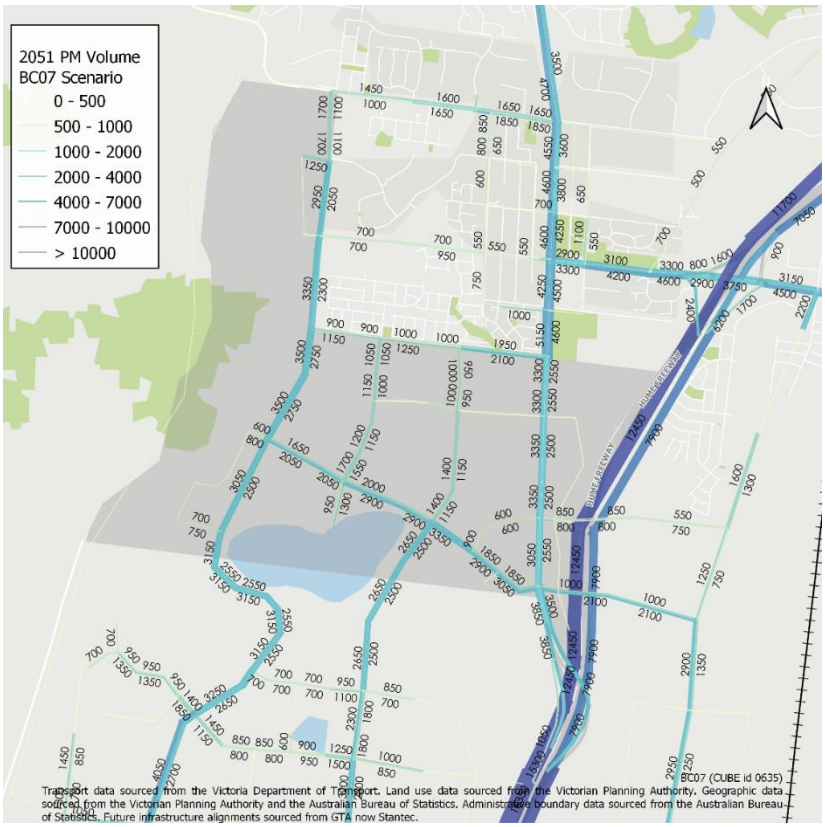


Figure 19: Wallan South PM Peak (2 hour) Vehicle Volumes

The plots are also reproduced in Appendix A. The following comments are provided in relation to the volume plots:

- High Melbourne bound (southbound) traffic volumes are exhibited on north-south roads in the AM Peak, compared to the northbound flows, indicating a higher demand for work trips south of the PSP.
- Conversely, there are high northbound flows on north-south roads in the PM Peak, compared to Melbourne bound (southbound) flows
- Volumes on Hadfield Road east of the Northern Highway are less than 10,000 vehicles per day
- The Western Arterial (just south of Hadfield Road) and Northern Highway (just north of Hadfield Road) have similar vehicle volumes in the PM Peak of around 5,500 vehicles.
- At the southern end of the PSP, the Western Arterial expected to have higher traffic volumes (19,950 vehicles per day) when compared to the Eastern Arterial (16,300 vehicles per day).
- The Eastern Arterial will carry in the order of 6,200 vehicles per day south of Taylors Lane.
- Hadfield Road is the busiest of the east west roads, with daily volumes of just under 18,000 vehicles per day expected in the vicinity of the Northern Highway. Volumes decrease along Hadfield Road further west and in the vicinity of the Western Arterial.

6.4.3 Volume Capacity Ratios

To measure congestion, peak period volume capacity (VC) ratios are used which are a comparison of the demand to the theoretical capacity of a link. Figure 20 and Figure 21 show the VC ratios for the AM Peak and PM Peak respectively.

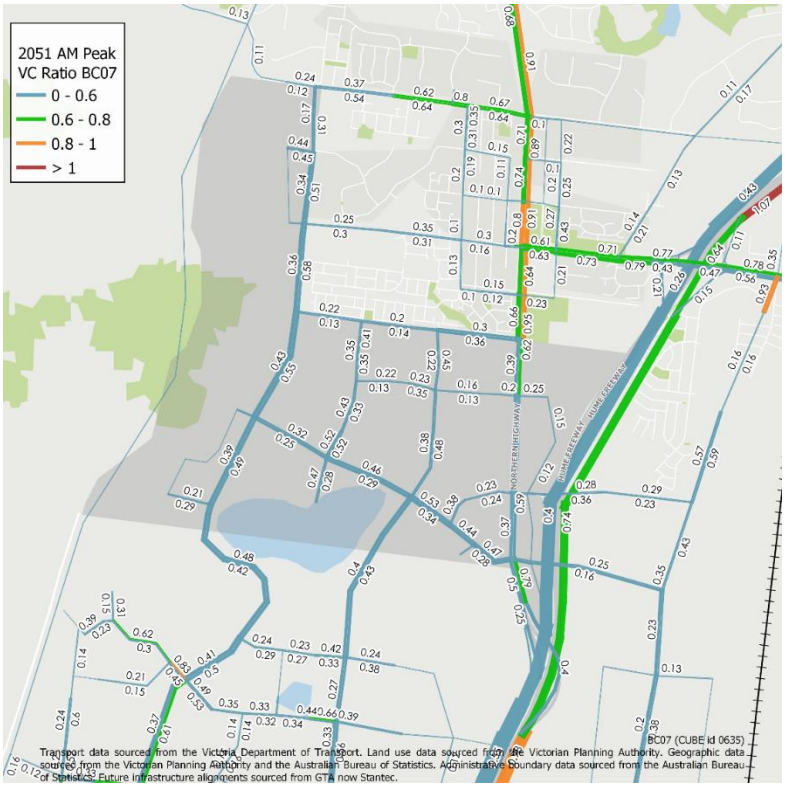


Figure 20: Wallan South AM Peak (2 hour) Volume Capacity Ratio

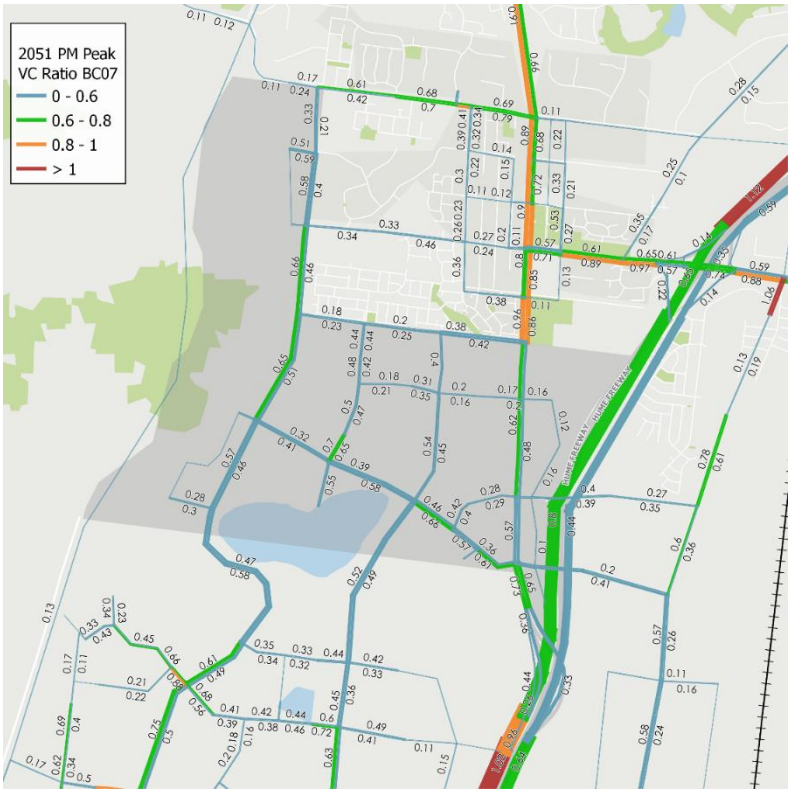


Figure 21: Wallan South PM Peak (2 hour) Volume Capacity Ratio

Links that exhibit volume to capacity ratios of greater than 0.9 will exhibit low speeds and congestion, with links over 1.0 indicating breakdown. Links that are less than 0.5 will operate in uncongested conditions close to free flow speeds. The plots shown in Figure 20 and Figure 21 show:

- All of the roads within the Wallan South PSP operate below their capacity, with values of less than 0.6 in the AM peak and 0.8 in the PM peak.
- The Western Arterial through the PSP will experience values of 0.65 in the PM peak, which is acceptable.
- The PM peak values are generally higher as there are more trips generated in the model during this period as it includes retail trips.

Outside of the PSP, the Hume Freeway operates above capacity in some sections north of Watson Street and south of the Northern Highway. Sections of Watson Street and sections of the Northern Highway at selective times will experience V/C ratios of between 0.8 and 1.0 meaning they are approaching their capacity at these locations.

Overall, the modelling results show that the road network is capable of accommodating the demands generated from the PSP and surrounding areas. Further discussion on this is provided in Section 7.

7 Assessment of PSP

7.1 Key themes and challenges for the Wallan South PSP

Based on the strategic context for Wallan South and a review of existing conditions documented earlier in this report, the preparation of a PSP will need to consider:

- Support place creation and sense of community; leveraging off existing natural assets.
- Be accessible by all modes, but with an increased focus on more sustainable modes, especially with commuter trips.
- Integrate land use and the transport network, by locating higher densities and activity centres proximate to public transport services and create 20-minute neighbourhoods to reduce the reliance on needing to access other regions.
- Integrate the existing and proposed transport networks across the NGC and within each PSP.
- Leverage off and capitalise on the various major projects in and connecting to the NGC, aligning them with the long-term aspirations of the area.
- Be part of the northern gateway to Melbourne.

Each of these themes have been considered as part of the preparation of the PSP, discussed Section 5 and within the following sub-sections.

7.2 Road Network Assessment

A comparison of daily volumes on key roads in the network against the target volumes indicated in the Engineering Design and Construction Manual for Subdivision in Growth Areas, which aim to:

- Standardise development submissions as much as possible and thus to expedite Council engineering approvals,
- Ensure that minimum design criteria are met in regard to the design and construction of infrastructure within the municipalities,
- Provide flexibility to encourage innovation and best practice, and take into account regional or localised conditions within the growth areas.

The assessment of the key roads is presented in Table 7.

Table 7: Wallan South Arterial Road Volumes and Cross Sections

Road	Location	Lanes (each way)	Daily Volumes	Classification	VPA Guidelines on Volumes	Appropriate Capacity for Vehicle Volume
Western Arterial	South of Darraweit Road	2	10,400	Secondary Arterial Road (2 lanes each way)	12,000-40,000	No*
Eastern Arterial	South of Taylors Lane	1 (and 1 bus lane)	6,200	Secondary Arterial Road (2 lanes each way)	12,000-40,000	No*
Taylors Lane	West of Northern Highway	2	13,700	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes
Eastern Arterial	North of Hadfield Road	1 (and 1 bus lane)	7,950	Secondary Arterial Road (2 lanes each way)	12,000-40,000	No*
Western Arterial	North of Hadfield Road	2	22,500	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes

Road	Location	Lanes (each way)	Daily Volumes	Classification	VPA Guidelines on Volumes	Appropriate Capacity for Vehicle Volume
Hadfield Road	East of Western Arterial	2	12,900	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes
Northern Highway	North of Hadfield Road	2	23,350	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes
Western Arterial	South of Hadfield Road	2	19,950	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes
Eastern Arterial	South of Hadfield Road	2	16,300	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes
Hadfield Road	West of Northern Highway	2	17,750	Secondary Arterial Road (2 lanes each way)	12,000-40,000	Yes

Reference: https://vpa-web.s3.amazonaws.com/wp-content/uploads/2020/04/Engineering_Design_and_Construction_Manual-for-subdivision-in-Growth-Areas-FINAL-December-2019.pdf

Table 7 shows that the volumes expected on the network are within the target volumes indicated in the VPA cross sections, except for the two roads marked with an asterisk (*) being the Western Arterial, south of Derreweit Road and the Eastern Arterial, south of Taylors Lane where the daily volumes are less than the target range.

The Eastern Arterial will have sufficient capacity to determine the final make up of its cross section, with the ability to provide kerbside public transport / bus lanes along its length and not altering the movement of traffic. The use of this road space will be determined through its delivery in consultation with Council and the Department of Transport.

Similarly, the Western Arterial will have lower volumes than what is targeted, noting that this is at the northern extent of the road. The final volumes along this section will also be determined by the design of the adjacent land uses and the location of subdivision access points which may influence the outcome.

The assessment undertaken indicates that the proposed network and its function will operate within or below the expected volumes on the network and are considered suitable.

7.3 Walking and Cycling

The finalised road cross sections for Wallan South PSP have not been provided, though past PSPs have shown on-road bike lanes and shared user paths along four lane arterial roads. This would be supported in Wallan South PSP. Figure 9 shows a number of off-road shared user paths taking advantage of the natural features of the PSP, connecting to the arterial roads within the PSP.

The proximity of the Wallan township will mean that there is an opportunity for trips to be undertaken sustainably by walking and cycling. Connecting Wallan South into the existing pedestrian and bicycle networks north of Taylors Lane and along the Northern Highway would support these opportunities.

7.4 Public Transport

The planned transport network within Wallan South shows all roads being capable for public transport services, with the Eastern Arterial and the eastern parts of Taylors Lane forming part of the PPTN. The Eastern Arterial Road is identified as part of the future Principal Public Transport Network (PPTN) and as a proposed High-Capacity Public Transport (HCPT) Route. This allows some flexibility for DoT to plan and deliver bus services and connect to key destinations such as the Wallan township, Wallan Railway Station, Beveridge North West, and the areas east of the Hume Freeway.

The provision of a dedicated bus lane in the kerbside lane at the northern end of the Eastern Arterial within the PSP is supported by the traffic volumes and expected congestion levels. Dedicated bus lanes tend to provide certainty to

passengers and generally signify to passengers there is a high frequency public transport service operating on that part of the transport network.

7.5 Movement and Place

Movement and Place (M&P) is a framework that takes the aspirations of planning and transport and brings them together in the context of the road environment. For transport it considers all the transport modes and road safety, but brings in Place (an area as a destination for people) which previous road hierarchy frameworks have not. It considers each mode or element on a 1 to 5 scale, with 1 been more significant (and generally of state or national importance) and 5 been less significant, and of local importance. Based on the significance of all the movement and place elements, prioritisation of modes and place can occur, and comparison to performance outcomes to meet benchmarks for the that level of modal significance.

For Wallan South, a detailed M&P assessment has not been completed, however the principles are evident through a network that generally resembles a one mile grid alignment. The two arterial roads provide the basis of a movement network with the Western Arterial functioning as a high order traffic route and the Eastern Arterial functioning as a significant link for PT. These are sound in principle and will reduce conflicts between competing modes and allow street designs to developed.

8 Summary

An Integrated Transport Assessment of the proposed Wallan South PSP has been undertaken using transport planning principles and outputs from the Victorian Integrated Transport Model (VITM). The information presented within this report documents the existing conditions, opportunities and constraints, as well as an assessment of the ultimate land use and resultant transport demand for the PSP.

Some of the key elements of the report are:

- The PSP will accommodate some 21,600 people and in the order of 3,785 jobs. The residential communities will be located on the western side of the Northern Highway whilst the majority of employment located on the eastern side of the highway.
- Currently the network has limited urban coverage and transport network.
- The modelling assessment has been completed for full development of the PSP and assumes that the North Growth Corridor will also be delivered
- The model suggests that the PSP will generate in the order of 10.5 trips per household per day, which is consistent with estimates from VISTA.
- Hadfield Road has been realigned to avoid the burrung buluk (former Hanna Swamp). When fully developed, it will carry in the order of 17,750 vehicles per day near the Northern Highway. These volumes will reduce the further west that it travels.
- All roads within the PSP will operate with volume to capacity ratios of less than 0.6 in the AM peak and 0.8 in the PM peak, indicating that sufficient capacity is provided.
- The expected volumes on the network have been assessed against the target volumes for each road which shows that they will be within the expected range and are suitable.
- The provision of a suitable walking and cycling network will encourage sustainable trips between the PSP and the Wallan township.

Overall, the assessment undertaken indicates that the proposed network for Wallan South will operate with minimal levels of congestion internally. It has good connections to the arterial network and its role and functions are consistent with transport planning principles.

Appendix

We design with community in mind

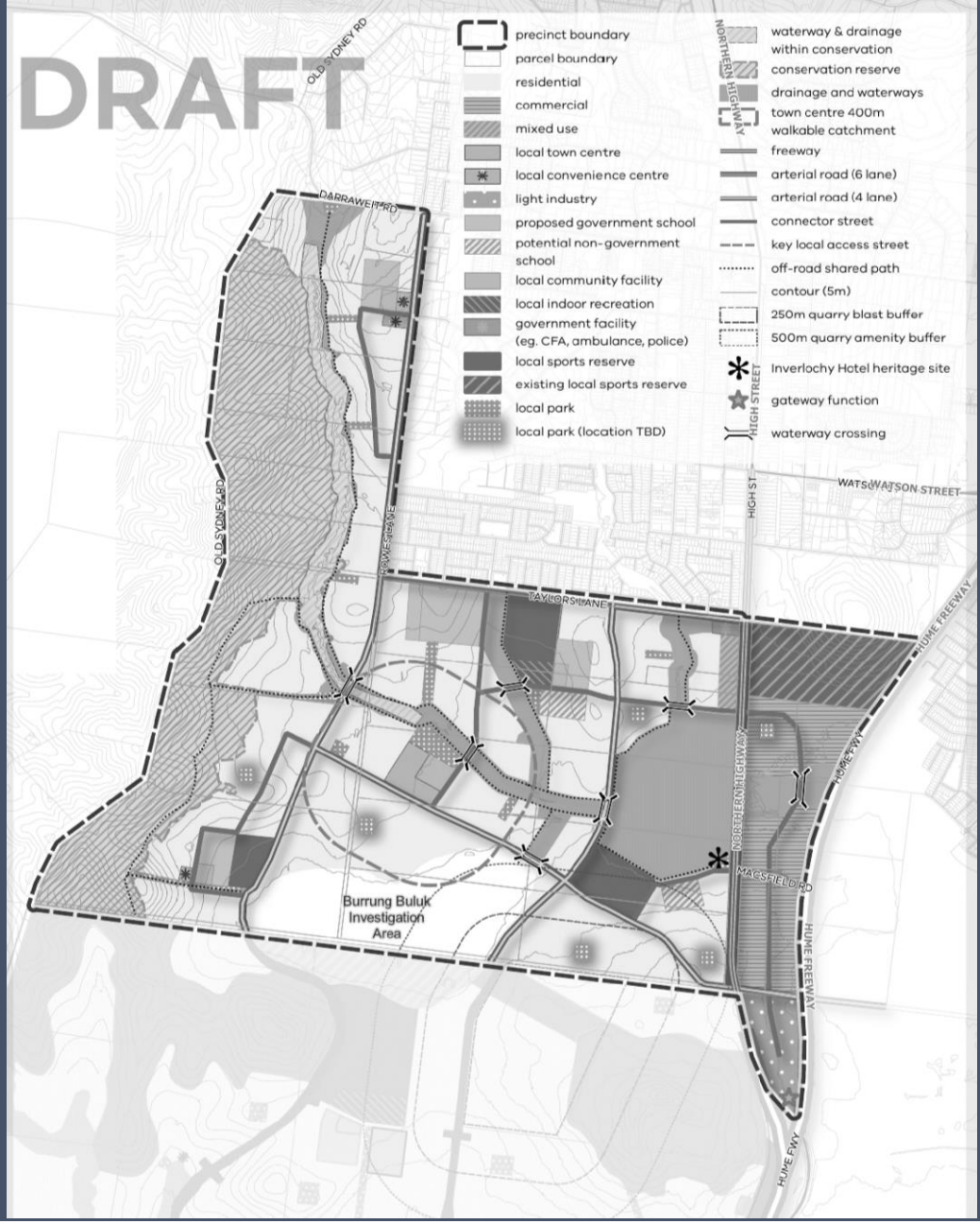
Appendix A Model Outputs

WALLAN SOUTH PSP

SUMMARY OF MODELLING INPUTS AND ASSUMPTIONS

Client: Victorian Planning Authority

Stantec Ref: V196640 // 301400446 // 301400552



INTRODUCTION

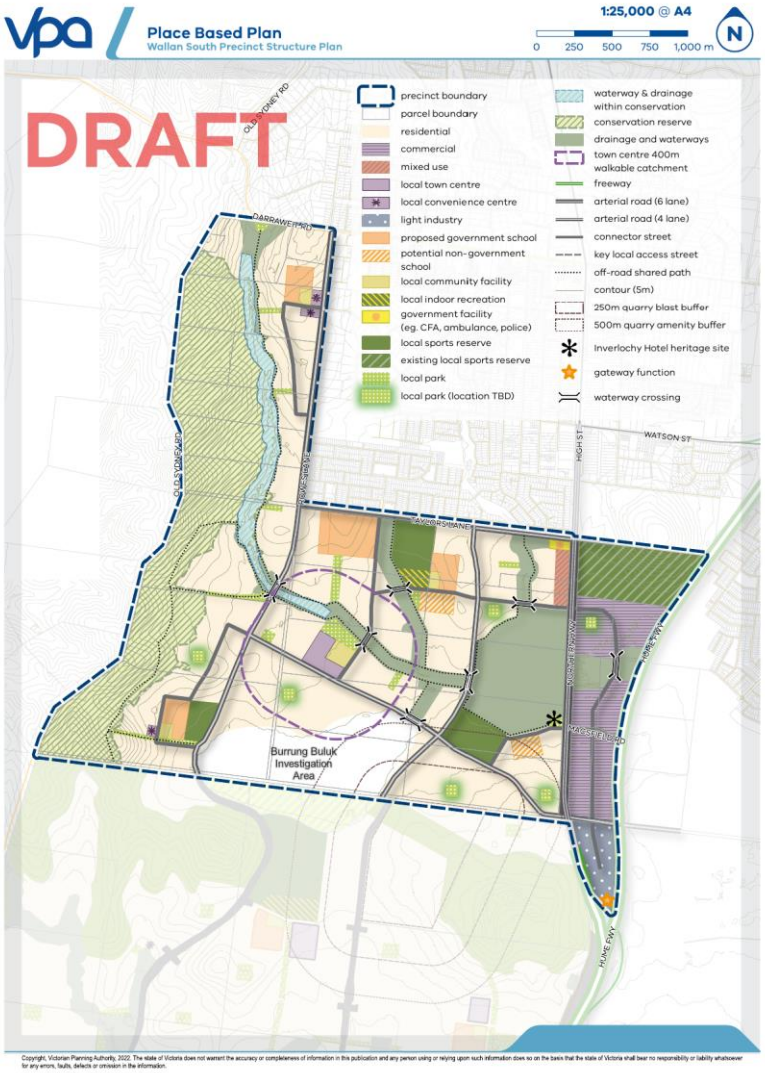
This presentation reports on scenario 7 (BC07) which incorporates the Wallan South VITM network with the land use and network information for the entire North Growth Corridor that is consistent with the information used in the Beveridge North West (BNW) PSP. This work supersedes all previous work for this project and will be used for the testing of the revised Wallan South and BNW Urban Structure's.

Scenario	Land Use	Transport network
Scenario 1 (BC00)	*Incorporates land uses for Wallan South, Wallan East and Beveridge North West PSPs, with the remainder of Victoria as per S-VITM for 2051.*	*Initial Road and PT inputs as per the structure plan.*
Scenario 2 (BC01)	*As per BC00.*	*Updated inputs from DoT in December 2020.*
Scenario 3 (BC02)	*Incorporates the land use changes agreed with the VPA on 12 May 2021.*	*As per updated information provided from DoT and VPA in April 2021.*
Scenario 4 (BC03)	*Removed growth from zone 6185.*	*Included road upgrades from NGC.*
Scenario 5 (BC05)	*The NGC land uses in the Northern Highway model with the agreed land uses outlined in BC03.*	*Included road upgrades from BNW model consistent with the NGC.*
Scenario 6 (BC06)	The NGC land uses in the Northern Highway model with the agreed land uses for Wallan South and BNW as provided by the VPA.	Included road upgrades from BNW model consistent with the NGC and updated with latest plans for Wallan South, Wallan East and BNW provided by VPA
Project Case 1 (PC01)	BC06 land uses.	BC06 network with the removal of Eastern Arterial and PT Network realignment.
Project Case 2 (PC02)	BC06 land uses.	BC06 network with the inclusion of north facing on and off ramps to the Hume Freeway at Hadfield Road.
Scenario 7 (BC07)	BC06 land uses with minor updates for Wallan South as provided by the VPA on 18th May 2022	BC06 road network with minor updates as per latest plans for Wallan South PSP as provided by VPA on 17th May 2022.

SCENARIO MODELLING INPUTS

01

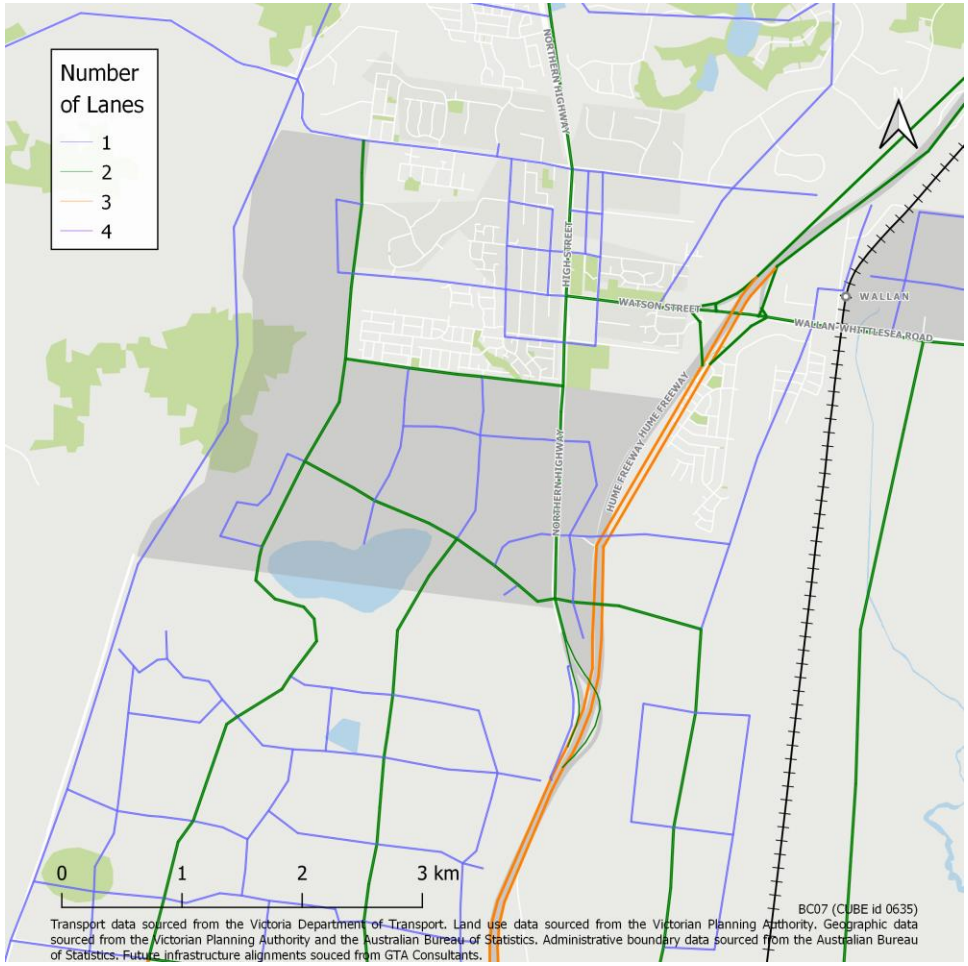
REVISED WALLAN SOUTH PSP STRUCTURE PLAN



received on 17th May 2022

MODEL INPUTS

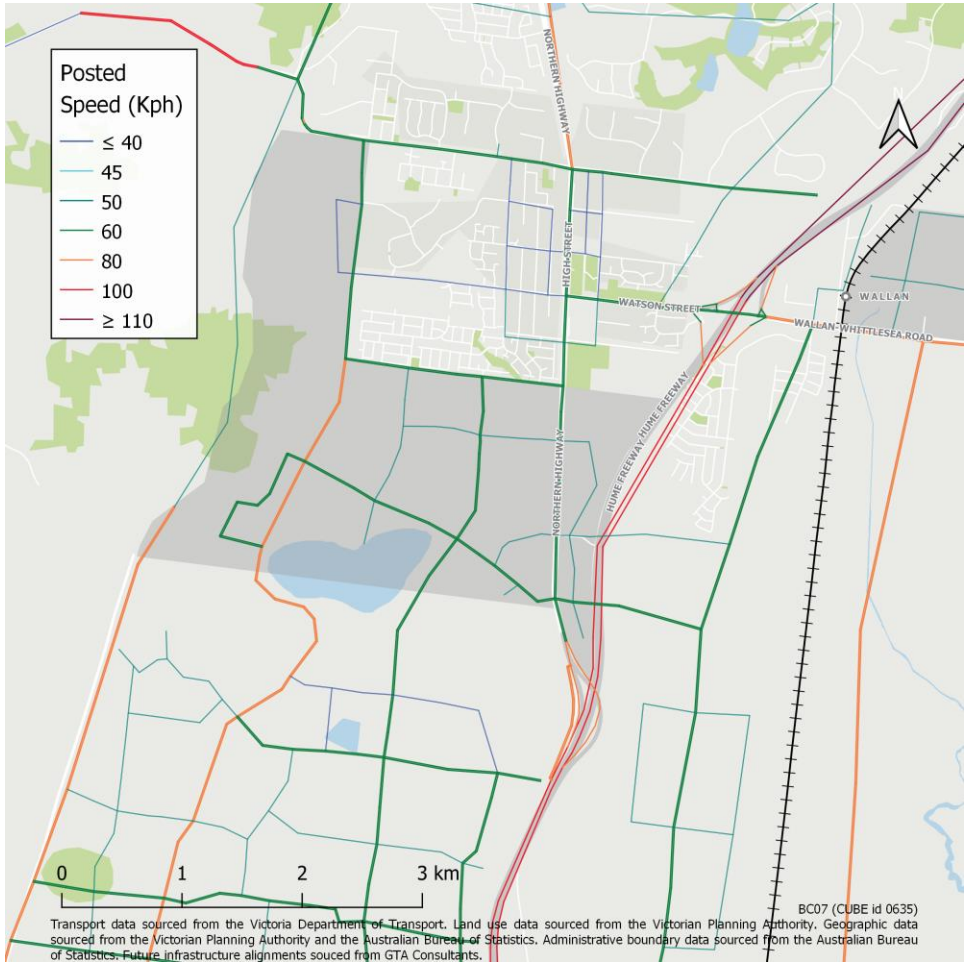
No of Lanes



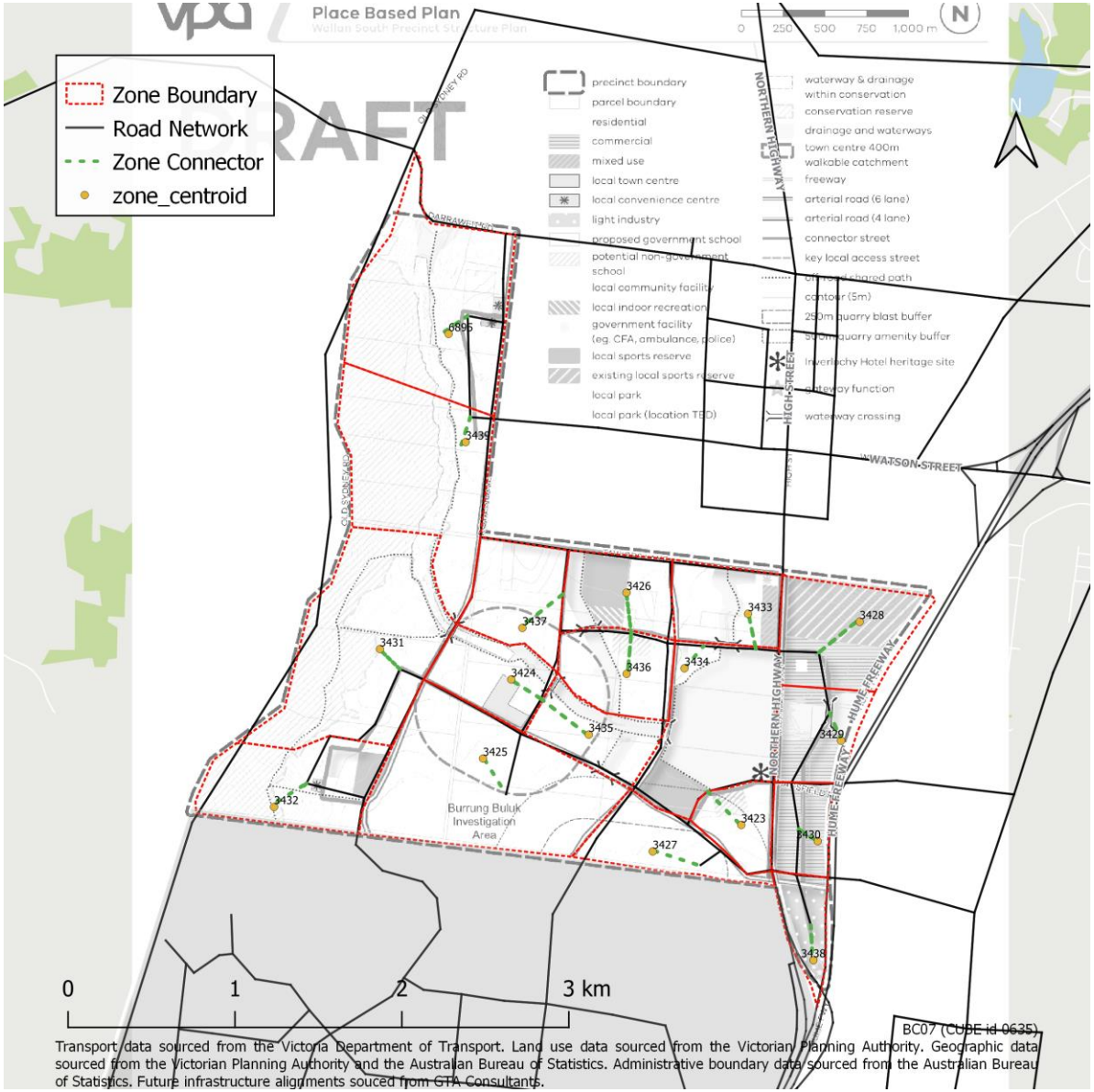
Linkclass

MODEL INPUTS

Posted Speed



ZONES AND CONNECTORS - WALLAN SOUTH



Transport data sourced from the Victoria Department of Transport. Land use data sourced from the Victorian Planning Authority. Geographic data sourced from the Victorian Planning Authority and the Australian Bureau of Statistics. Administrative boundary data sourced from the Australian Bureau of Statistics. Future infrastructure alignments souced from GTA Consultants.

LAND USE – OVERVIEW

Wallan Model - Y2051			
PSP	Beveridge NW	Wallan South	Wallan East
BC07- VPA inputs received on 18th May 2022			
Population	49,600	21,644	7,200
Total Employment	2,005	3,785	140
BC06- VPA inputs			
Population	49,600	21,996	7,200
Total Employment	2,005	3,530	140
BC05 (previously modelled)			
Population	39,200	23,309	7,200
Total Employment	2,005	3,744	140
Beveridge Model – Y2046			
Population	39,200	16,671	4,466
Total Employment	2,005	1,985	150

LAND USE – WALLAN SOUTH (BC07 SCENARIO)

Zone No.	New Population	New Households	Employment retail	Total Employment	Enrolments (primary)	Enrolment (secondary)	Enrolment (Special)
3423	1,012	326	0	20	450	0	
3424	1,365	440	380	380	0	0	
3425	3,357	1,083	0	0	0	0	
3426	638	206	0	45	525	0	
3427	1,542	497	0	0	0	0	
3428	0	0	0	830	0	0	
3429	0	0	0	594	0	0	
3430	0	0	0	840	0	0	
3431	2,095	676	0	0	0	0	
3432	1,299	419	5	50	525	0	
3433	1,345	434	0	0	0	0	
3434	344	111	0	0	0	0	
3435	1,237	399	0	0	0	0	
3436	885	285	0	20	450	0	
3437	2,659	858	0	160	0	1200	144
3438	0	0	0	661	0	0	
3439	1,288	415	0	0	0	0	
6895	2,578	832	140	185	525	0	
Total	**21,644**	**6,982**	**525**	**3,785**	**2,475**	**1,200**	**144**

Please refer to slide no 7 for revised zone boundaries which was agreed with VPA

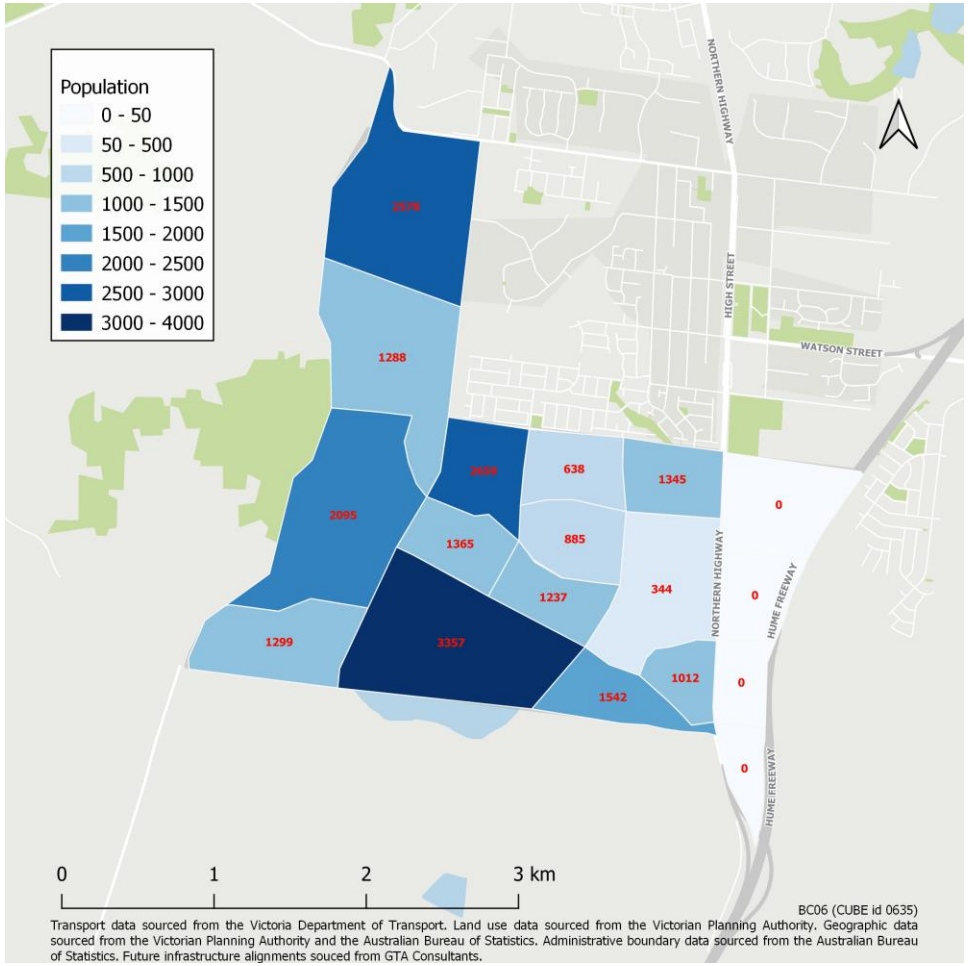
Note: Special Enrolments, are considered as a Primary enrolments

LAND USE – WALLAN EAST

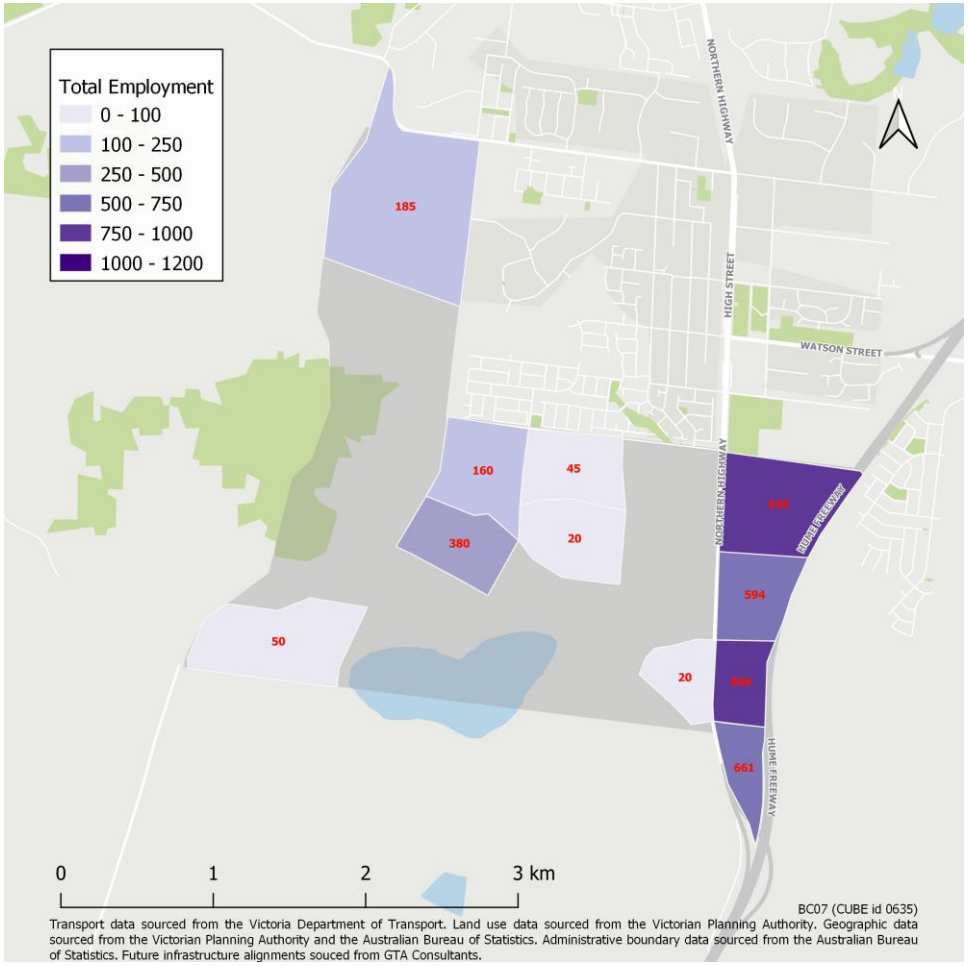
Zone No.	Population	Households	Employment retail	Employment	Enrolments (primary)	Enrolment (secondary)
3440	416	134		20	200	
3441	1,508	486		20	325	
3442	1,395	450	140	140		
3443	1,335	431				
3444	748	241				
6879	1,798	580				
Total	**7,200**	**2,322**	**140**	**10**	**525**	**0**
Previously modelled (B05 & BC06)						
Total	**7,200**	**2,322**	**140**	**10**	**525**	**0**

POPULATION AND EMPLOYMENT- WALLAN SOUTH

Population

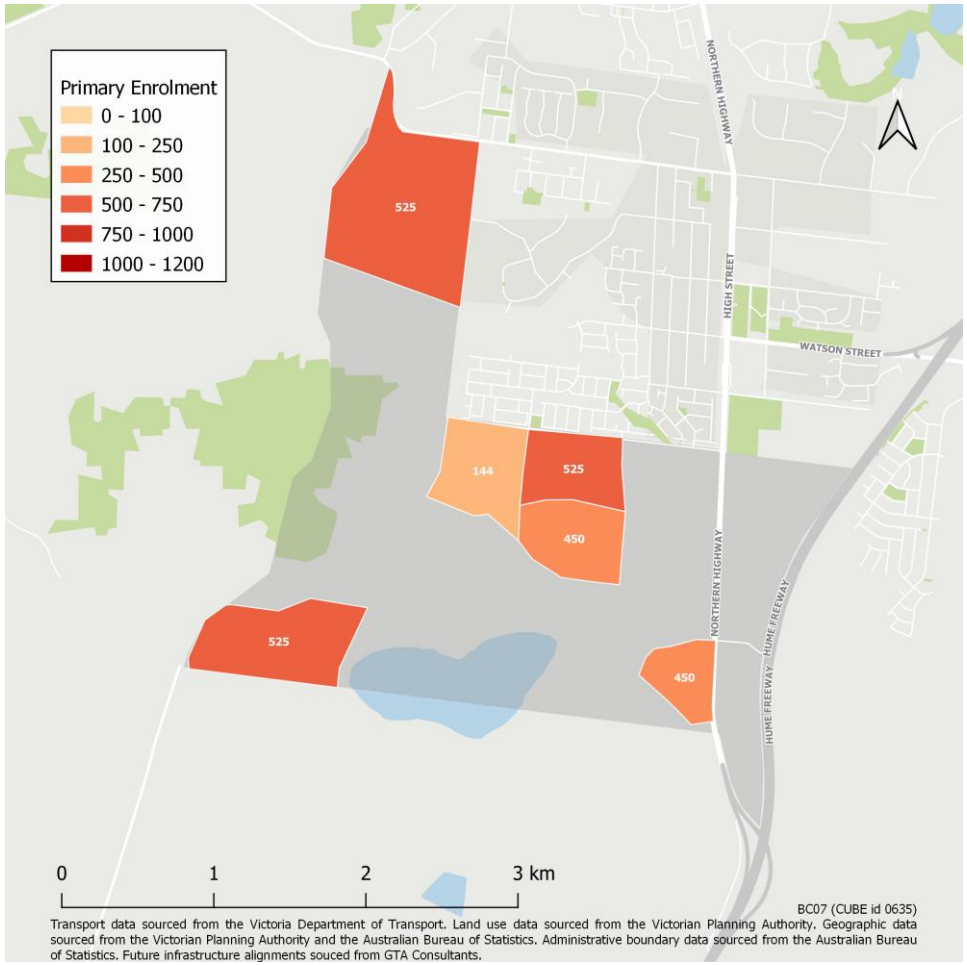


Employment

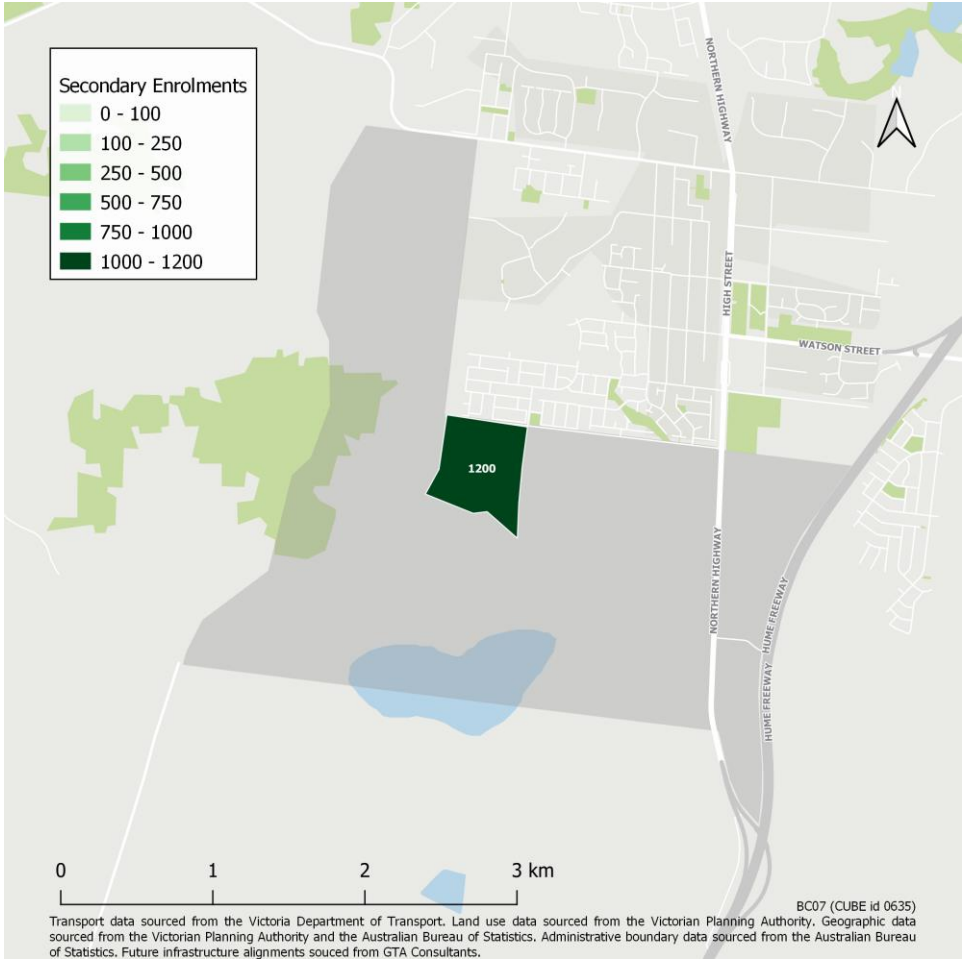


PRIMARY AND SECONDARY ENROLMENTS- WALLAN SOUTH

Primary Enrolments



Secondary Enrolments

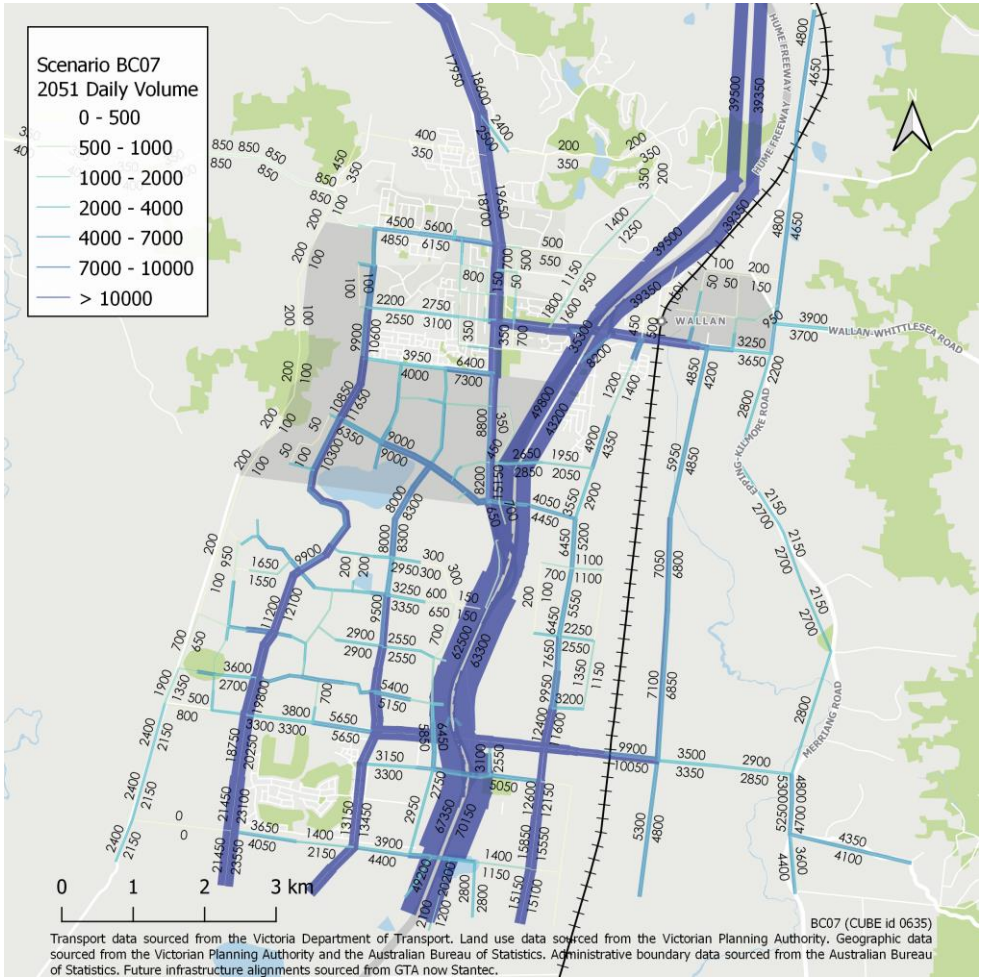


MODEL OUTPUTS

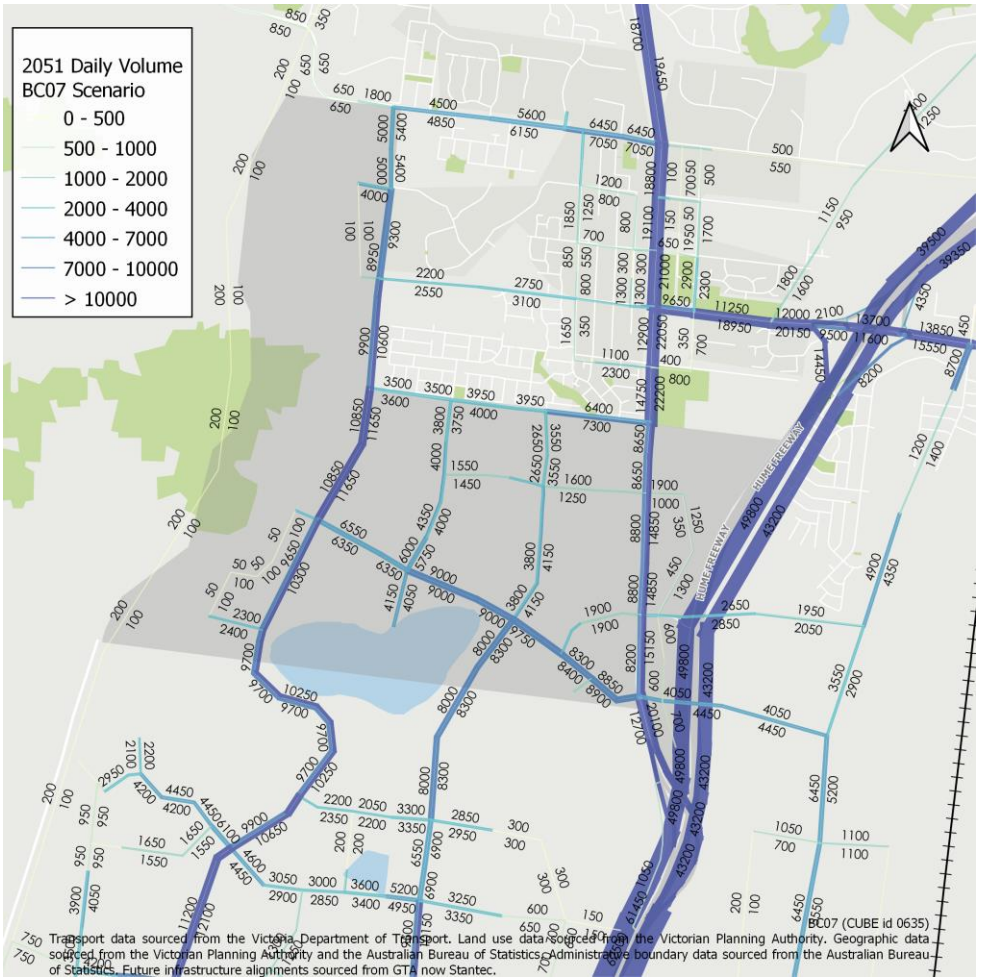
02

WALLAN SOUTH PSP: DAILY VOLUME

Daily Volume

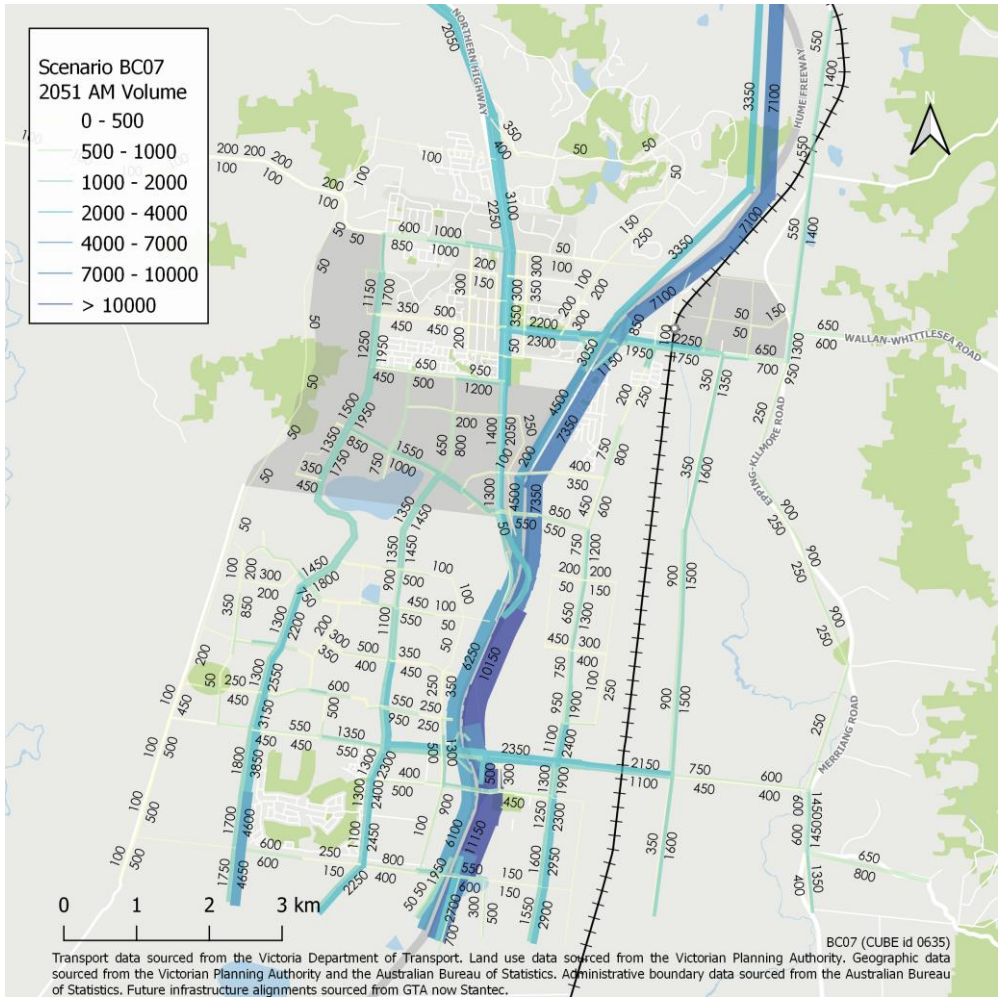


Daily Volume: Zoomed in Wallan South PSP

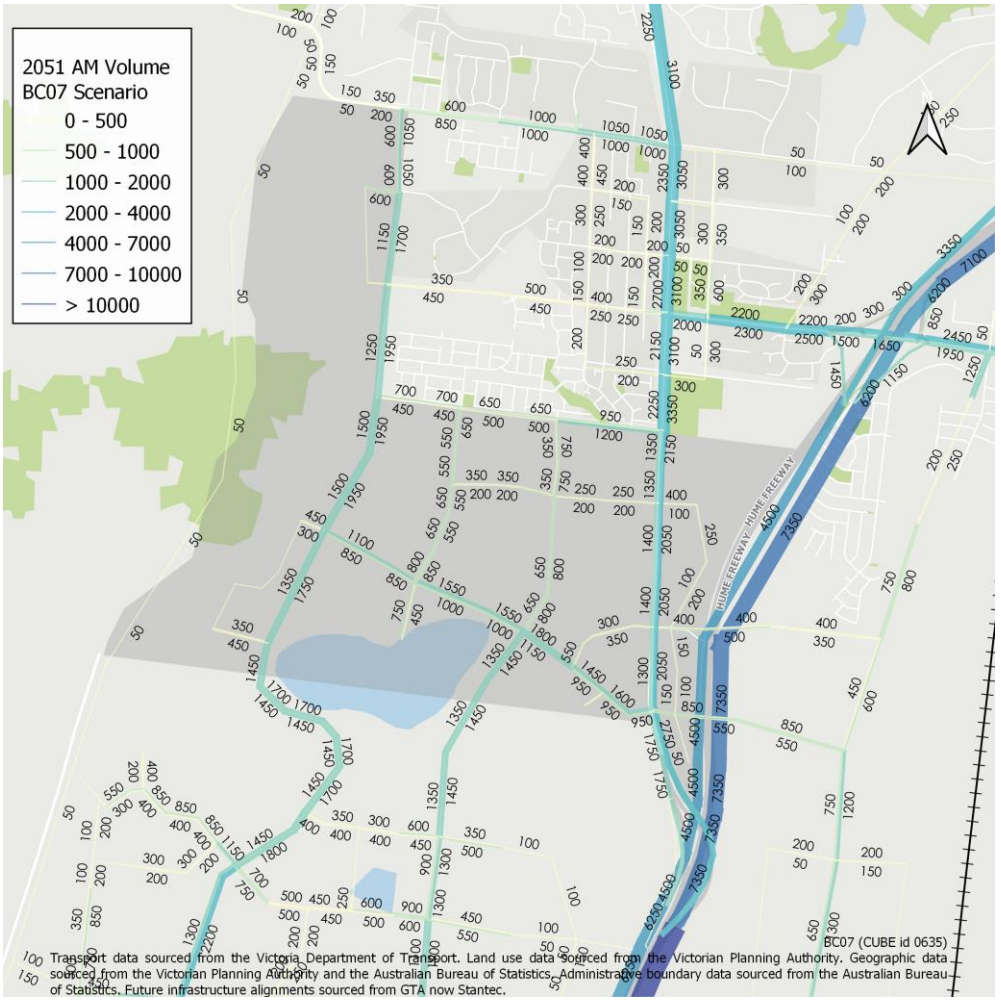


WALLAN SOUTH PSP: AM VOLUME

AM Peak (2Hr)

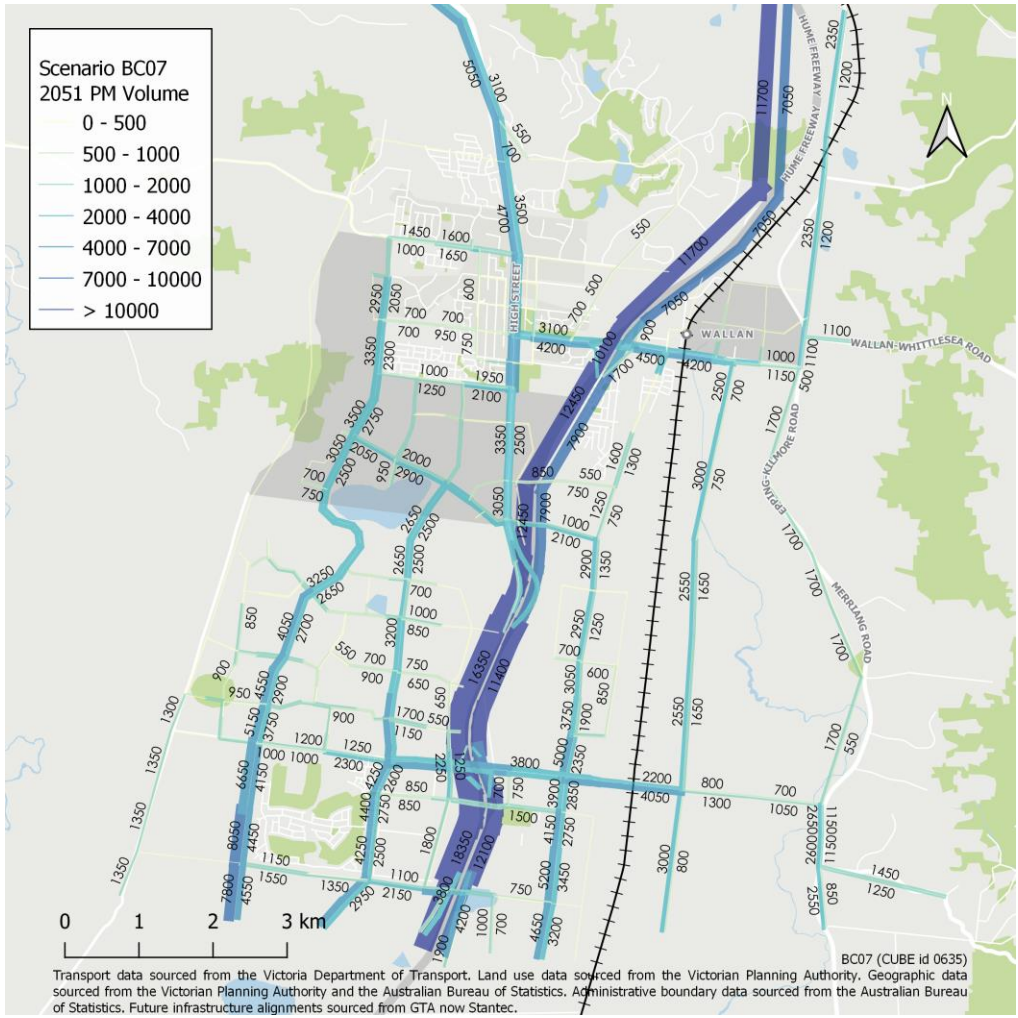


AM Peak (2Hr): Zoomed in Wallan South PSP

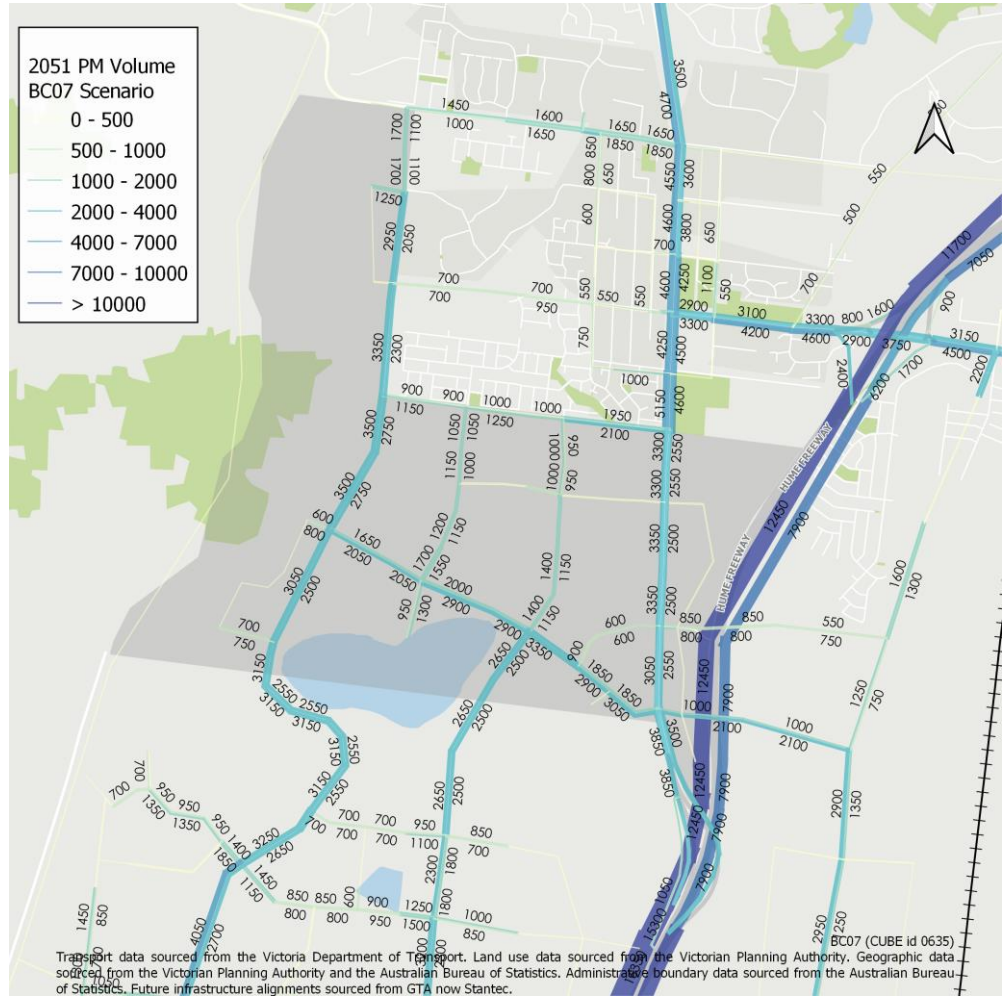


WALLAN SOUTH PSP: PM VOLUME

PM Peak (2Hr)

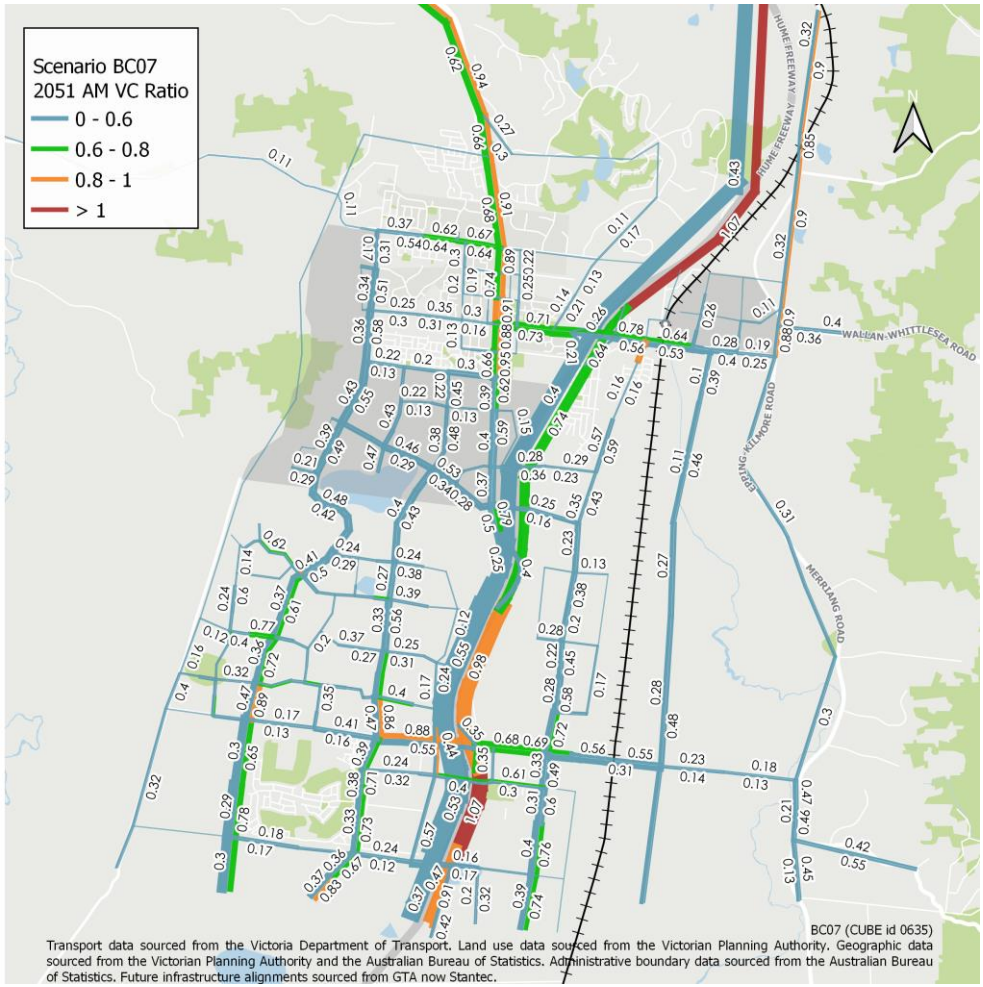


PM Peak (2Hr): Zoomed in Wallan South PSP

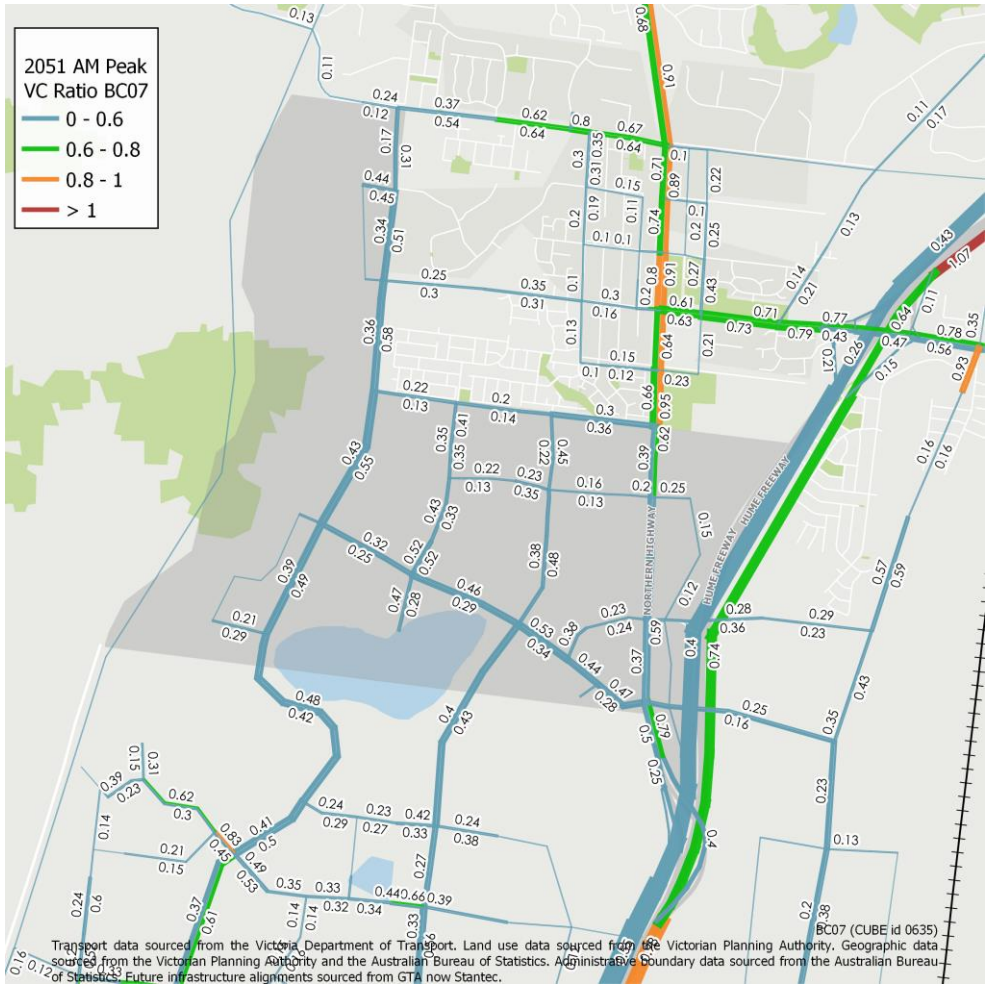


WALLAN SOUTH PSP: AM VC RATIO

AM Peak (2Hr)

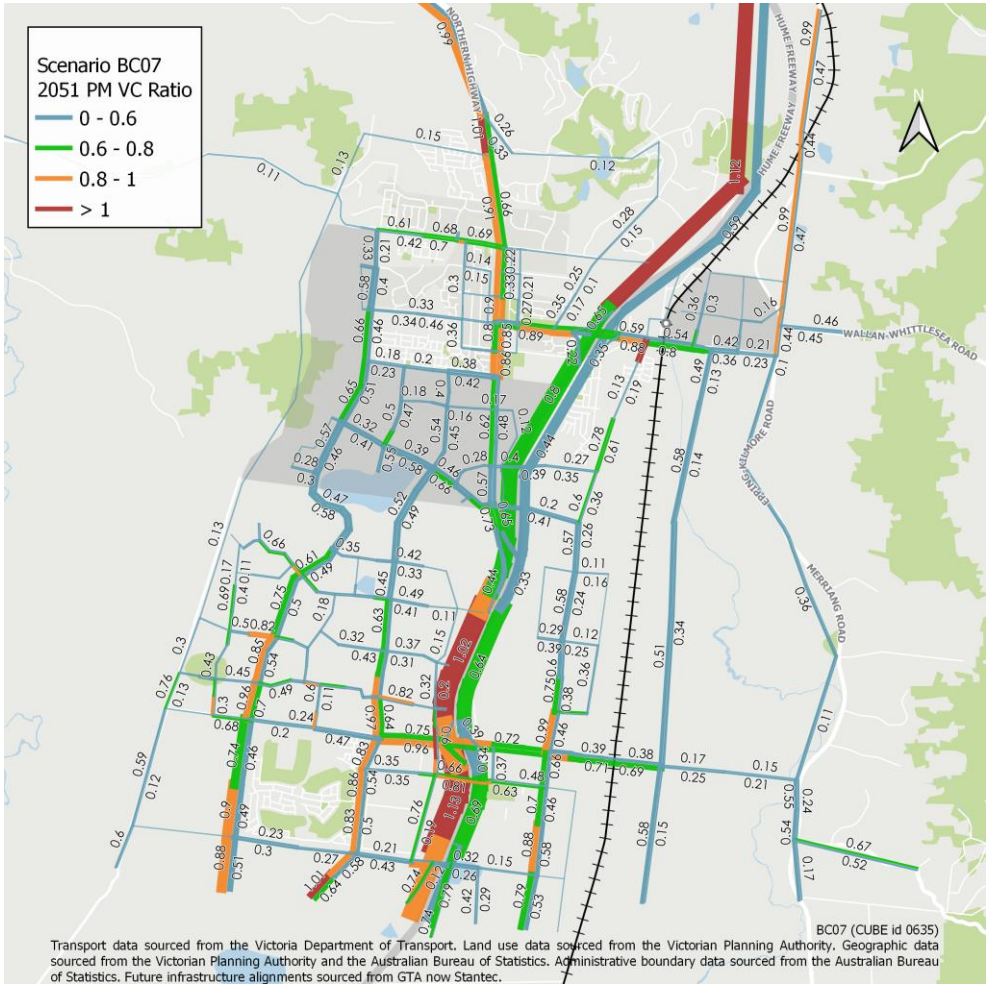


AM Peak (2Hr): Zoomed in Wallan South PSP

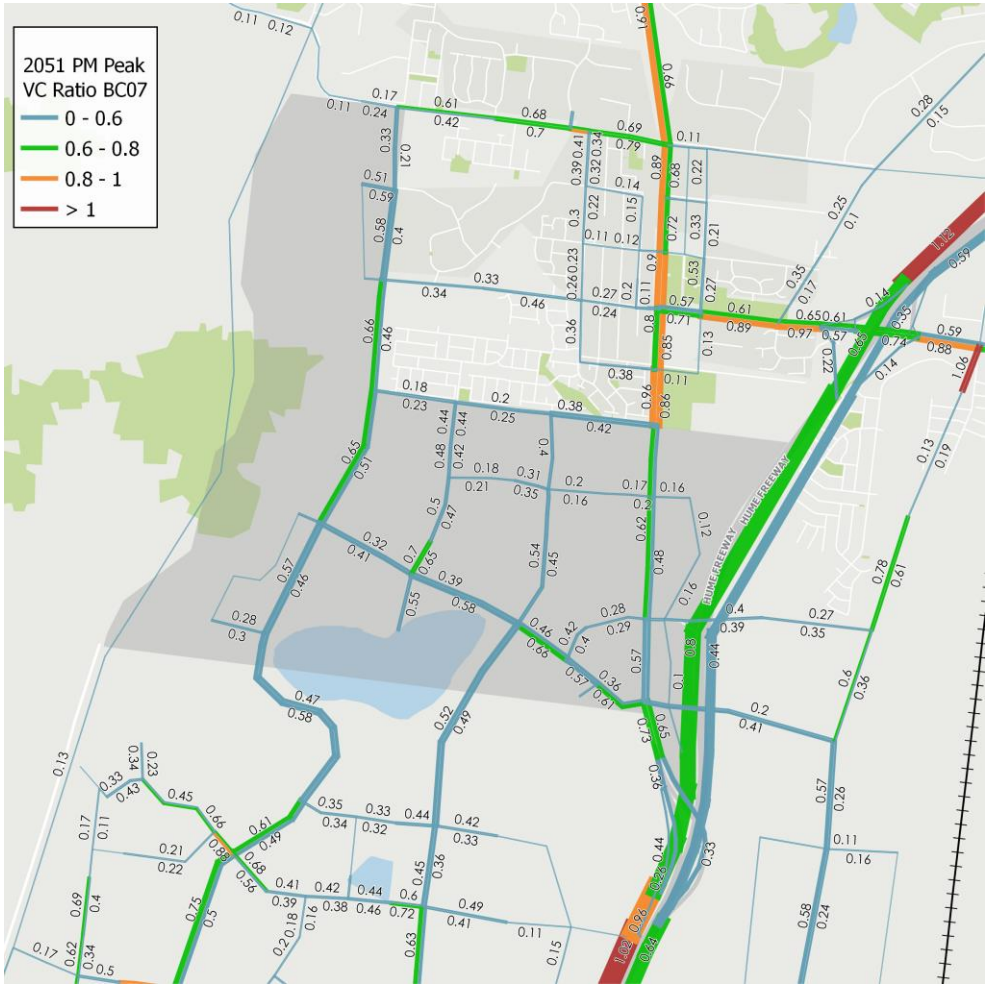


WALLAN SOUTH PSP: PM VOLUME

PM Peak (2Hr)



PM Peak (2Hr): Zoomed in Wallan South PSP



REECE HUMPHREYS
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VIC NSW QLD SA WA

Level 25, 55 Collins Street Melbourne

www.stantec.com
+61 3 9851 9600

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