# Transport Impact Assessment

## BENTLEY TECHNOLOGY PARK – PRECINCT STRUCTURE PLAN

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|---|---|---|---|---|
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## Contents

# 1. INTRODUCTION

## 1.1 Precinct Structure Plan Introduction

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Precinct Structure Plan (PSP) over the Bentley Technology Park area. The Bentley Curtin Specialised Activity Centre Structure Plan sets the strategic context at the broader district scale, with that Plan identifying the need for more detailed planning to be undertaken at the precinct level.

The Bentley Technology Park area spans two local government areas, with the Town of Victoria Park (ToVP) to the east of Kent Street and the City of South Perth (CoSP) to the west of Kent Street.

As a major landowner in the Bentley Technology Park Precinct, DevelopmentWA (DevWA) has been tasked by the State Government to establish a vision for Bentley Technology Park to facilitate infill development to enhance and support the notion of a contemporary innovation precinct and unlock opportunities for investment by knowledge and innovation enterprises.

The Bentley Technology Park area is in both the ToVP and CoSP and as indicated by the South West Aboriginal Land and Sea Council website, the site sits within the Whadjuk Region. The location and boundary of the PSP site is shown in Figure 1.

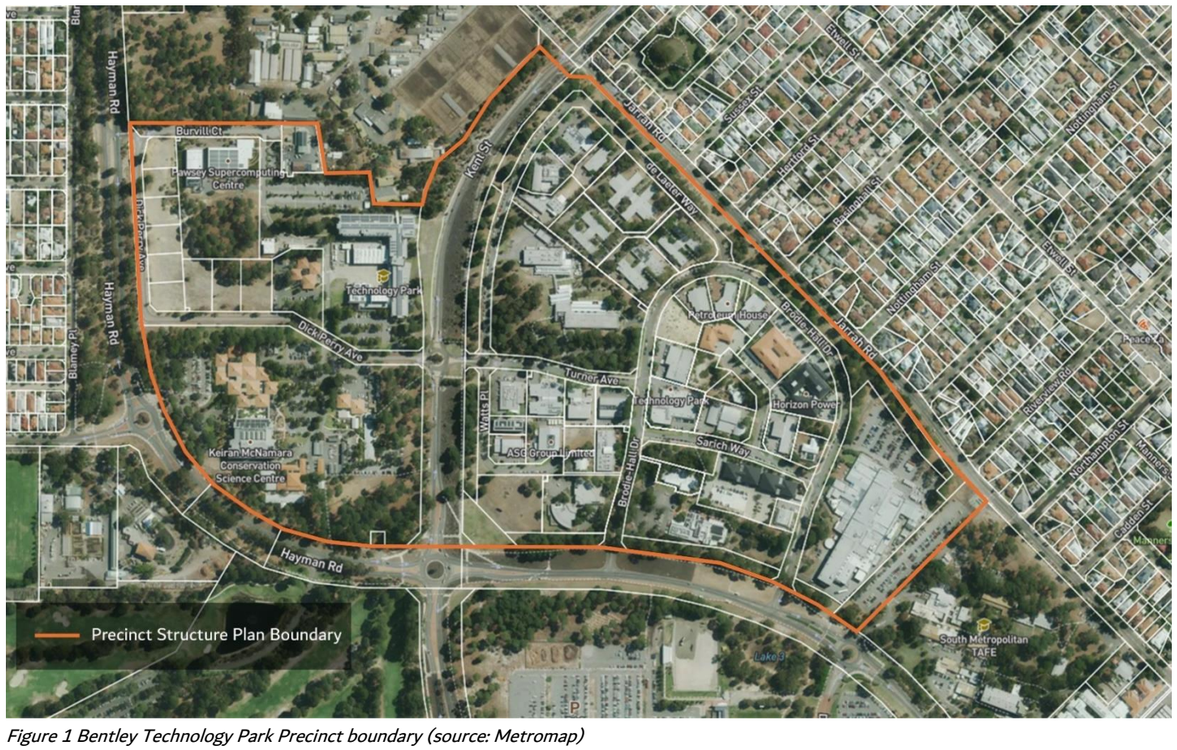



*Figure 1 Bentley Technology Park Precinct boundary (source: Metromap)*

## 1.2 Transport Impact Assessment

This TIA has been prepared in keeping with the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 2 – Planning schemes, structure plans and activity centre plans). The Guidelines promote a layered approach to transport assessment for broad areas or scheme amendments as shown in Figure 2. Overall, this TIA has been prepared to confirm the capability of the site for future infill development from a transport and movement perspective.

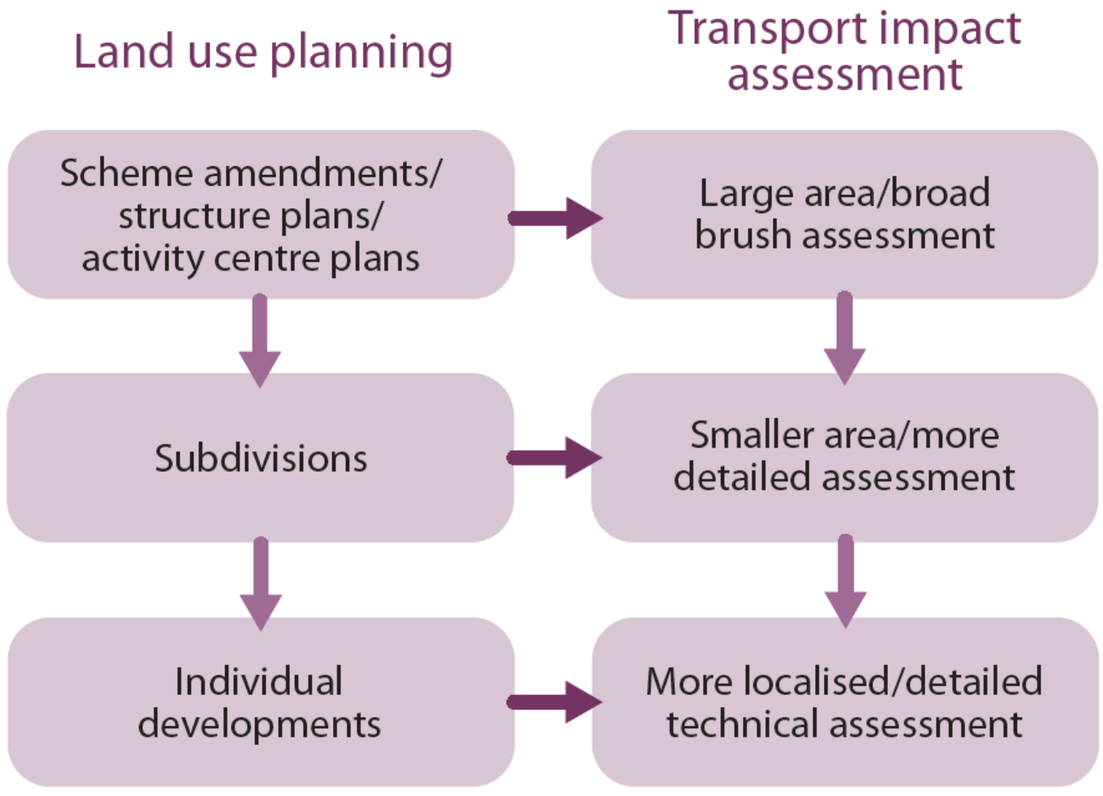



*Figure 2 Land use / transport planning process (source: WAPC Transport Impact Assessment Guidelines, 2016)*

As set out within the WAPC Transport Impact Assessment Guidelines (Volume 2 – Planning Schemes, Precinct Structure Plans and Activity Centre Plans), the following establishes the level of assessment that would be required for this proposed amendment:

> "Structure planning forms a critical stage of the land use planning process. It involves planning at a strategic level, often over large areas, and provides the basis of zoning and subdivision of land. Structure plans can be prepared at a district and local level, and for activity centres. The district structure plan generally addresses the "fatal flaws' for a potential development area and provides for the major structural elements such as major roads, open space, commercial and industrial areas and environmental conditions. A district structure plan may apply to several suburbs or

all or part of a town-site, for example the local structure plan would deal with residential density, subdivisions and the coordination of infrastructure at a neighbourhood level of smaller scale.

*It is therefore important that the transport aspects and in particular the land use/ transport integration, are also adequately assessed at this stage in the land use planning process. The assessment should then be used to provide direction on the later, more localised and detailed, planning stages of subdivisions and individual developments."*

This TIA is set out to address these key issues to establish the appropriateness of the site to cater for the proposed level of development and complete a review and assessment of the transport network that will inform the WAPC, Town of Victoria Park and City of South Perth as to the appropriateness of the potential development.

## 1.3 Report Structure

The report is structured as per the items set out in the previous section taken from the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 2 – Planning schemes, structure plans and activity centre plans), with the following sections included in the TIA:

- Structure plan outline (Section 2)
- Existing transport network situation (Section 3)
- Proposed changes to the network (Section 4)
- Trip generation and traffic volumes (Section 5)
- Summary (Section 6).

# 2. STRUCTURE PLAN OUTLINE

## 2.1 Introduction

The Bentley Technology Park PSP is identified as a precinct within the Bentley-Curtin Specialised Activity Centre (BCSPAC) which is identified more broadly as a Specialised Activity Centre under Directions 2031 and Beyond and *State Planning Policy 4.2 Activity Centres for Perth and Peel*. Given the unique character, land use mix, and constrained positioning across two local government areas, the preparation of a PSP for Bentley Technology Park is required to guide sustainable growth and development to deliver an internationally recognised innovation precinct.

The development of the PSP for DevelopmentWA has been based on over 12 months of engagement, site analysis, technical assessment and refinement of options. The overall process to develop the PSP is set out within the Planning Reporting which this TIA accompanies. The outcomes of the PSP, which has a timeframe of ten years, are shown in Figure 3.

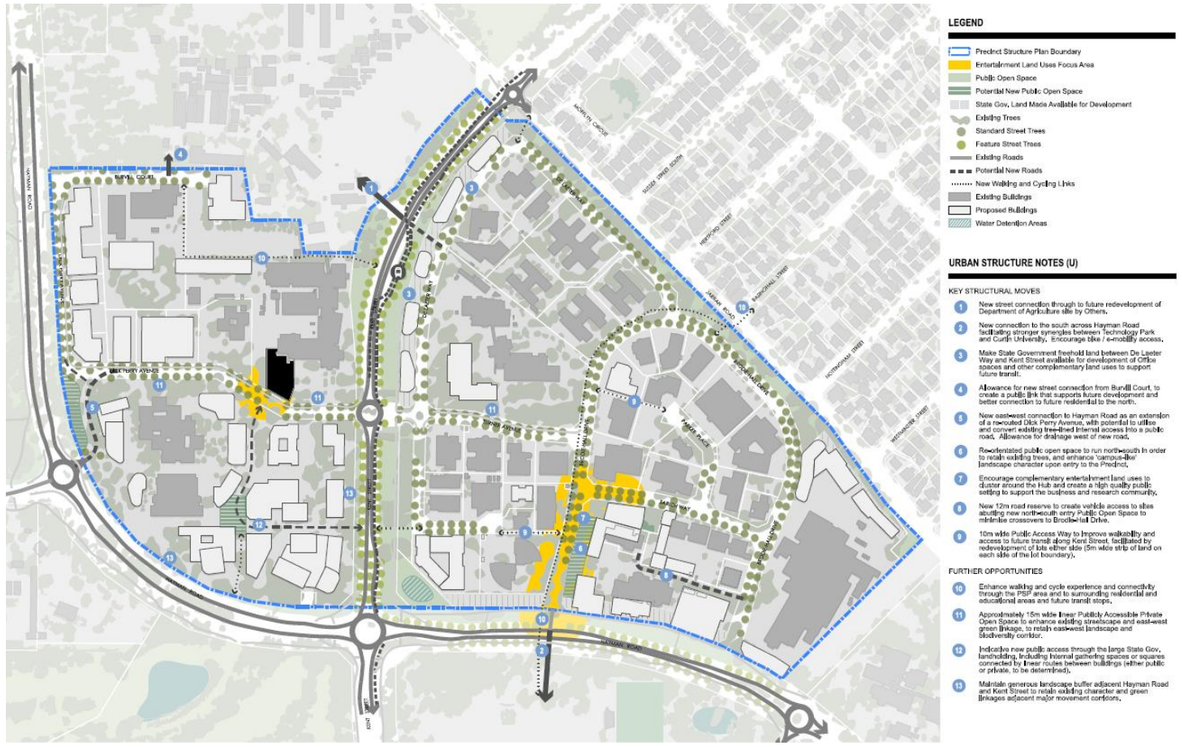



*Figure 3 Bentley Technology Park PSP (source: TBB)*

The key outcomes for the transport network, as numbered in the PSP, are:

- (1 on Figure 3) New street connection through to future redevelopment of Department of Agriculture by others
- (2) New connection to the south across Hayman Road facilitating stronger synergies between Technology Park and Curtin University. Encourage bike / e-mobility access
- (4) Allowance for new street connection from Burvill Court, to create a public link that supports future development and better connection to future residential to the north.
- (5) New east-west connection to Hayman Road as an extension of a re-routed Dick Perry Avenue, with potential to utilise and convert existing tree-lined internal access into a public road. Allowance for drainage west of new road.
- (8) New 12m road reserve to create vehicle access to sites abutting new north-south entry Public Open Space to minimise crossovers to Brodie-Hall Drive.
- (9) 10m wide Public Access Way to improve walkability and access to future transit along Kent Street, facilitated by redevelopment of lots either side (5m wide strip of land on each side of the lot boundary)
- (10) Enhance walking and cycle experience and connectivity through the PSP area and to surrounding residential and educational areas and future transit stops.
- (11) Approximately 15m wide linear Publicly Accessible Private Open Space to enhance existing streetscape and east-west green linkage, to retain east-west landscape and biodiversity corridor.
- (12) Indicative new public access through the large State Government landholding, including internal gathering spaces or squares connected by linear routes between buildings (either public or private, to be determined).
- (13) Maintain generous landscaping buffer adjacent to Hayman Road and Kent Street to retain existing character and green linkages adjacent to major movement corridors.

Existing development within the Bentley Tech Precinct area Covers around 120,000m$^2$ of GFA comprised of medical research facilities, commercial buildings, educational and research buildings and State Government agencies. The development style is a campus layout with significant areas of open space, latent landscaping and minimal road network connections.

# 3. EXISTING SITUATION

## 3.1 Existing Site Use

The Bentley Technology Park area was established as a science and innovation precinct in 1985. It is a location for organisations engaged in industry, trade, science, technology and research. It is divided into two precincts: Technology Park West to the west of Kent Street and Technology Park Central to the east of Kent Street. Existing development across the two precincts is low density.

Bentley Technology Park functions under the Industry and Technology Development Act 1988, which guides the management and types of uses that can occur within the area. The existing built form context for the PSP is shown in Figure 4.


*Figure 4 Existing built form context - Bentley Tech PSP (source: TBB)*

## 3.2 Surrounding Road Network

The precinct is bounded by Hayman Road to the south and west, Jarrah Road to the northeast, and is bisected by Kent Street. Existing internal roads servicing the eastern part of the precinct include Turner Avenue, Brodie Hall Drive, De Laeter Way, Watts Place, Sarich Way, and Parker Place.

Internal roads servicing the western portion of the precinct include Dick Perry Avenue and Burvill Court, with further internal roads Bryce Avenue and the Department of Biodiversity Conservation an Attractions access loop road private rather than public roads. Internal roads servicing the site are all accessed via Hayman Road (three intersections) or Kent Street (one intersection); there is no access to the precinct from Jarrah Road. The Main Roads WA defined road hierarchy surrounding the subject site is shown in Figure 5 and posted speed limits are shown in Figure 6.

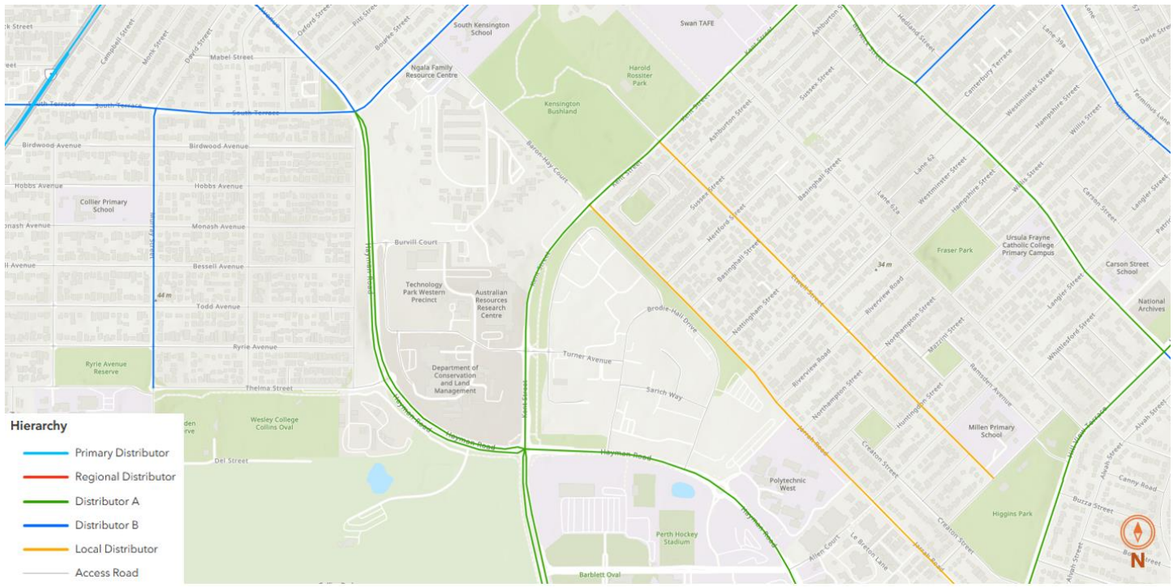



*Figure 5 Road hierarchy surrounding the site (source: Main Roads WA)*

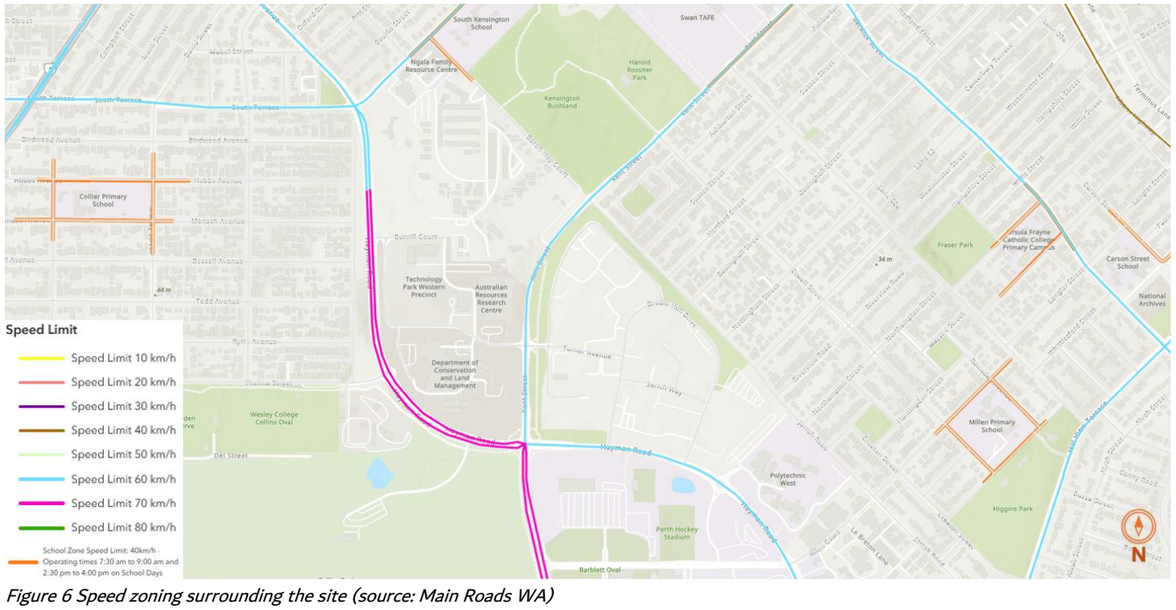



*Figure 6 Speed zoning surrounding the site (source: Main Roads WA)*

### 3.2.1 Hayman Road

Hayman Road is a District Distributor A road, constructed to a four lane divided standard within the City of South Perth (to the west of Kent Street), within a road reserve of at least 60m. Between Thelma Street and South Terrace the Hayman Road reserve includes Blamey Place to the west and the north-south length of Dick Perry Drive to the east. The speed limit of the western section of Hayman Road is 70km/h. A typical cross section of this length of Hayman Road is shown in Figure 7.

*Figure 7 Hayman Road west of Kent St cross section facing north (source: Flyt)*

The section of Hayman Road within the town of Victoria Park is constructed as a single two-lane carriageway along the southern boundary of Technology Park Central, within a road reserve of 57-60m. A typical cross section is shown in Figure 8.

*Figure 8 Hayman Road east of Kent St cross section facing east (source: Flyt)*

An additional lane in each direction develops in advance of the roundabout controlled intersections with Kent Street and Dumas Road. The speed limit in this section is 60km/h. Cycling is accommodated within sealed shoulders/on-street cycling lanes and off-street along shared paths. There is no provision for on-street parking.

### 3.2.2 Kent Street

Kent Street is a District Distributor A road, constructed as a single carriageway with one lane in each direction through the precinct, with a median developing on the approach to the roundabout controlled intersections with Hayman Road, Jarrah Road and Dick Perry Avenue/ Turner Avenue.

The road reserve within the City of South Perth is 30m, however an additional 35m reserve, identified as Technology Park Kent Street verge, is located within the Town of Victoria Park. This reserve was originally identified for a high quality transit corridor to Curtin University.

The speed limit of Kent Street within the Bentley Technology Park in this section is 60km/h. A typical cross section of this length of Kent Street is shown in Figure 9, with the Technology Park Kent Street verge shown in Figure 10.

*Figure 9 Kent Street south of Turner Street cross section facing south (source: Flyt)*

*Figure 10 Technology Park Kent Street verge facing south (source: Flyt)*

Cycling is accommodated within sealed shoulders/on-street cycling lanes and off-street along shared paths. There is no provision for on-street parking.

### 3.2.3 Dick Perry Avenue

Dick Perry Avenue is classified as an Access Street with a 50 km/h speed limit and it is the main street within the Technology Park West precinct. It is constructed to a width of 6m, with 1.5m on-street cycle lanes either side (although these are not signposted and do not have bicycle logo pavement marking) and a 1.8m wide footpath abutting the northern/eastern kerb. The road reserve for the east-west section of Dick Perry Avenue is 20m. There is no provision for on-street parking.

A typical cross section of Dick Parry Avenue is shown in Figure 11.

*Figure 11 Dick Parry Avenue west of Bryce Avenue cross section facing east (source: Flyt)*

### 3.2.4 Burvill Court

Burvill Court is a cul de sac, is classified as an Access Street and provides access to the northern lots within the Technology Park West precinct. It is constructed to a width of 7.5m within a road reserve of 20m, and has a speed limit of 50 km/h. There are no cycle lanes or footpaths. There is no provision for on-street parking. A typical cross section of Burvill Court is shown in Figure 12.

*Figure 12 Burvill Court cross section facing east (source: Flyt)*

### 3.2.5 Bryce Avenue

Bryce Avenue is not a gazetted road; however it is publicly accessible, and provides access to CSIRO from both Burvill Court and Dick Perry Avenue. It is 6m wide, with a 20km/h speed limit painted onto the pavement, with regular speed humps. A typical cross section is shown in Figure 13.


*Figure 13 Bryce Avenue north of Dick Perry Avenue cross section facing north (source: Flyt)*

### 3.2.6 Turner Avenue

Turner Avenue is an Access Street within the Technology Park Central precinct. It is constructed to a width of 7.4m; although 2.4m wide on-street parking bays are marked along its northern side for most of its length. The road reserve is 20m and the speed limit is 50 km/h. A 1.8m wide footpath abuts the northern kerb. A typical cross section is shown in Figure 14.

*Figure 14 Turner Avenue cross section facing east (source: Flyt)*

### 3.2.7 De Laeter Way

De Laeter Way is an Access Street providing access to the northern portion of the Technology Park Central precinct. It is constructed to a width of 7.4m, with 2.4m wide on-street parking bays are marked along one side of the street for most of its length. A 1.8m wide footpath abuts the eastern kerb for a length of 300m from the intersection with Turner Avenue. The road reserve is 16m. and the speed limit is 50 km/h. A typical cross section is shown in Figure 15.

*Figure 15 De Laeter Way cross section facing north (source: Flyt)*

### 3.2.8 Brodie Hall Drive

Brodie Hall Drive is a loop road, providing access to most areas within the Technology Park Central precinct. It is classified as an Access Street, with a 50 km/h speed limit. It is constructed to a width of 7.4m within a 20m wide road reserve, with 2.4m wide on-street parking bays marked along one side of the street for most of its length. A 2m footpath is located on one side of the street. A typical cross section is shown in Figure 16.

*Figure 16 Brodie Hall Drive cross section facing north (source: Flyt)*

Throughout the TIA, Brodie Hall Drive approaches to Hayman Road are either classified as Brodie Hall Drive (West) for that link closest to the Kent Street intersection and Brodie Hall Drive (East) which is closest to the Dumas Road intersection for access into and out of Curtin University.

### 3.2.9 Sarich Way

Sarich Way is an east-west through road connecting the two sides of the Brodie Hall Drive loop road. It is classified as an Access Street, with a 50 km/h speed limit. It is constructed to a width of 7.4m within a 20m wide road reserve, with 2.4m wide on-street parking bays marked along the southern side of the street for its entire length. A 2m footpath is located on the southern side of the street, abutting the kerb. The cross section is shown in Figure 17.


*Figure 17 Sarich Way cross section facing east (source: Flyt)*

### 3.2.10 Parker Place

Parker Place is a cul de sac, classified as an Access Street within a 20m wide road reserve. It is constructed to a width of 7.4m, with 2.4m wide on-street parking bays marked along one side of the street. A 2m wide footpath is constructed along the eastern/northern kerb. The cross section is shown in Figure 18.


*Figure 18 Parker Place cross section facing north (source: Flyt)*

### 3.2.11 Watts Place

Watts Place is a cul de sac, providing access to the western lots within the Technology Park Central precinct. It is constructed to a width of 7.4m, with 2.4m wide on-street parking bays marked along one side of the street. The road reserve width is 16m, and the speed limit of 50 km/h. There are no cycle lanes or footpaths. A typical cross section is shown in Figure 19.

*Figure 19 Watts Place cross section facing south (source: Flyt)*

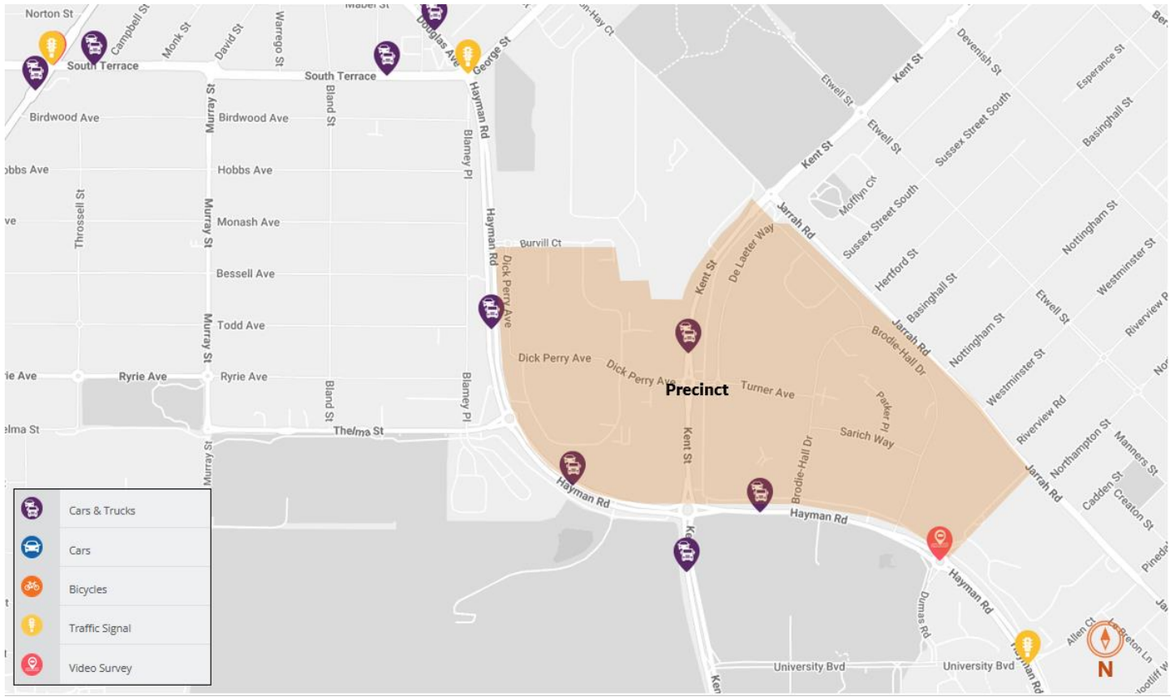



*Figure 20 TrafficMap data collection locations (source: Main Roads WA)*

## 3.3 Existing Traffic Volumes

Traffic data was extracted for the surrounding network from Main Roads WA TrafficMap (Figure 20) and the most recent traffic volumes are reflected in Table 1.

*Table 1 Traffic data on surrounding network (source: Main Roads WA)*

| Road | Location | Year of Data | Daily (vpd) | HV % | AM Peak (vph) | PM Peak (vph) |
|---|---|---|---|---|---|---|
| **Kent Street** | South of Jarrah Rd | 2023 | 10,330 | 8.1% | 830 | 940 |
| | South of Hayman Road | 2023 | 16,200 | 6.8% | 1,270 | 1,410 |
| **Hayman Road** | East of Kent St | 2023 | 9,570 | 8.2% | 890 | 910 |
| | West of Kent St | 2023 | 20,450 | 5.3% | 2,040 | 1,870 |
| | South of South Terrace | 2023 | 13,040 | 12.0% | 1,280 | 1,180 |

## 3.4 Traffic Flow Conditions

The variation of traffic volumes over a 24 hour period and the 85$^{th}$ percentile travel speeds (the travel speed exceeded by only 15% of vehicles) for the TrafficMap count sites are shown in Figure 21.

Information from Google Maps can be used to understand general traffic flow conditions through any given area of a road network. The mapping information provides an indication of typical conditions using a simplistic traffic signal type measurement ranging from “fast” to “slow”.

An extract showing typical Wednesday conditions within the vicinity of the precinct (in the morning peak at around 8.00am and the afternoon at 5.00pm), indicates that the area generally has low levels of congestion in the AM and PM peak hour when vehicle volumes are highest on the overall network. Surrounding the Bentley Technology Park precinct, small reductions in travel speeds occur in the peak periods on the approaches to the roundabout controlled intersection of Hayman Road and Kent Street.

The typical AM peak period conditions are reflected in Figure 22 and the PM peak period conditions in Figure 23.


*Figure 21 TrafficMap daily traffic variation and 85th percentile travel speeds (source: Main Roads WA)*

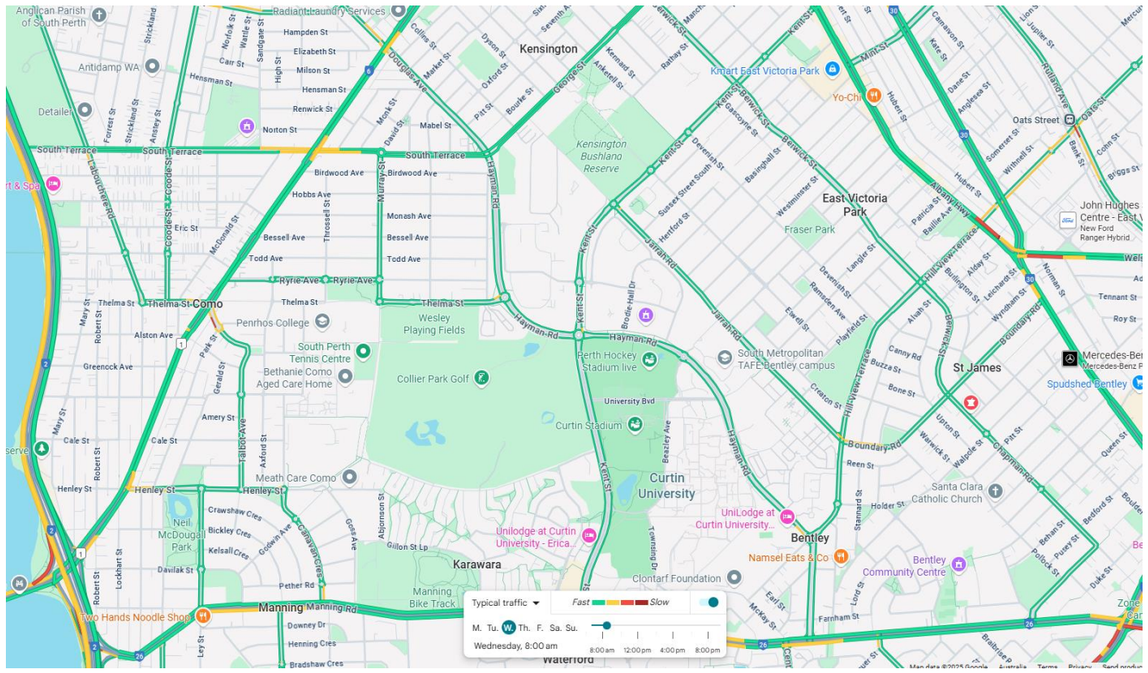



*Figure 22 Typical traffic flow conditions Wednesday 8.00am (source: Google)*

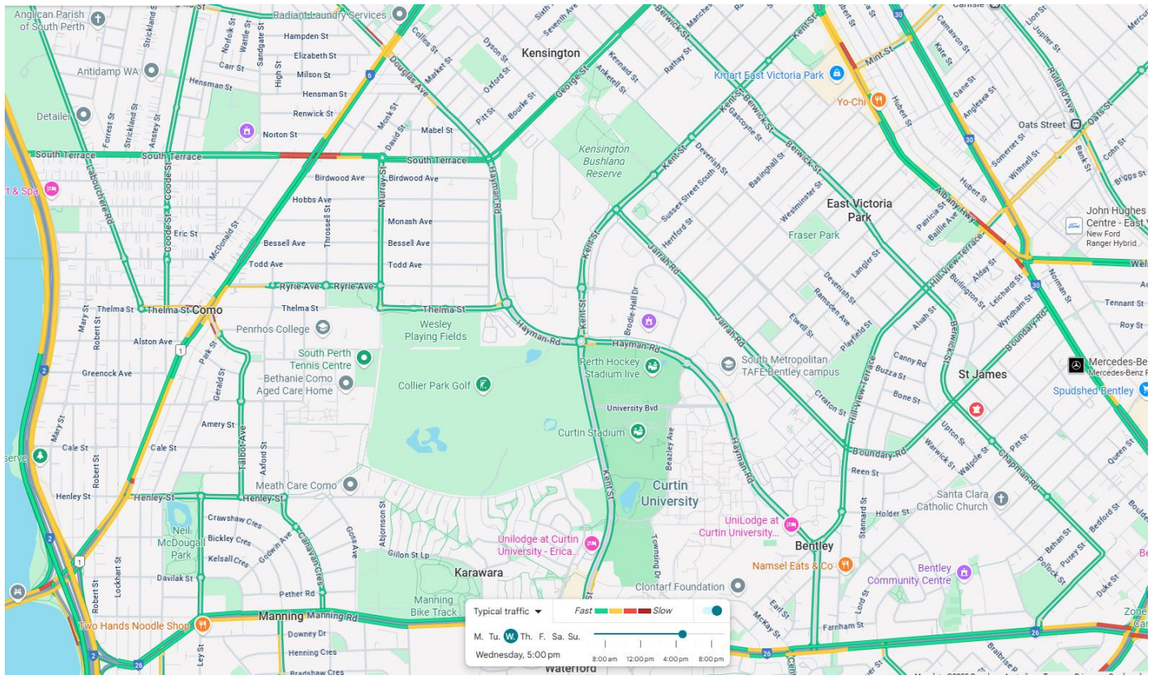



*Figure 23 Typical traffic flow conditions Wednesday 5.00pm (source: Google)*

## 3.5 Existing Intersections

There are 4 intersections of Bentley Technology Park precinct access roads with the surrounding road network, described below and illustrated in Figure 24:

1. Kent Street / Dick Perry Drive / Turner Avenue
   Single lane roundabout controlled access for Technology Park West and Technology Park Central
2. Hayman Road / Burvill Court
   Give Way controlled T-intersection access for Technology Park West
3. Hayman Road / Brodie Hall Drive West
   Give Way controlled T-intersection access for Technology Park Central
4. Hayman Road / Brodie Hall Drive West
   Give Way controlled T-intersection access for Technology Park Central

The roundabout controlled intersections of Hayman Road with Kent Street and Hayman Road with Thelma Street are on the southern boundary of the Bentley Technology Park precinct.


*Figure 24 Bentley Technology Park Precinct road intersections with the surrounding road network (source: Metromap)*

## 3.6 Existing Parking Provision and Usage

On-site parking is comprised of three elements:

- Parking contained within a development lot
- On-street parking within marked bays (not currently subject to paid parking or time restrictions)
- Informal or illegal parking.

On-site observation of parking demands and occupancy was undertaken in May 2024. The precinct was divided into individual sites or streets and then these were grouped into general zones for easier translation of data. The parking sites and zones are displayed on Figure 25.

There are 2,613 bays in total in the precinct (approximately one bay per 190m$^2$ gross area) with the majority being in the eastern side of the site. The distribution per zone is set out in Table 2.

Car parking occupancy surveys were conducted on a mid-morning on two separate weekdays; Thursday 9$^{th}$ May 2024 and Tuesday 14$^{th}$ May 2024, with the average occupancy for each identified zone summarised in Table 3.

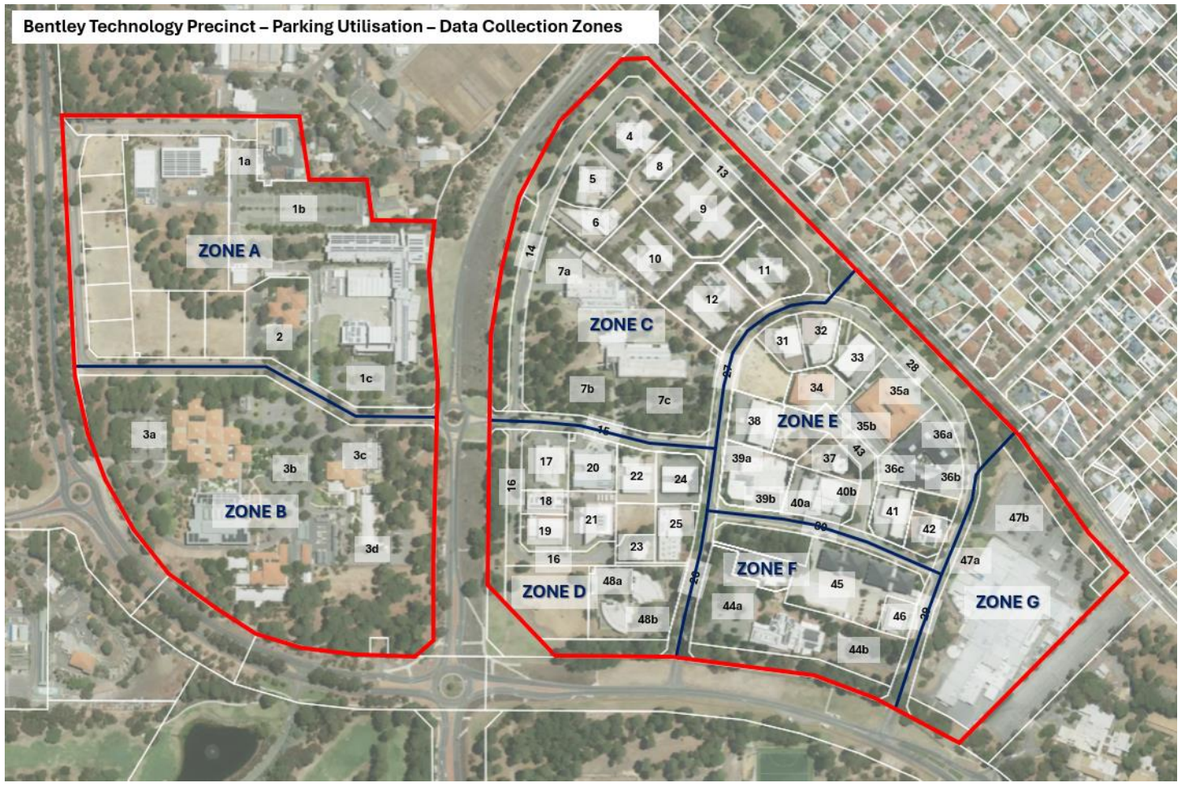



*Figure 25 Bentley Technology Park Precinct zones for parking utilisation counts (source: Metromap)*

*Table 2 Distribution of parking bays within Bentley Technology Precinct*

| Area | Description | Available bays |
|---|---|---|
| **Zone A** | Western side, north of Dick Perry Ave | 349 |
| **Zone B** | Western side, south of Dick Perry Ave | 419 |
| **Zone C** | Eastern side, north-western quadrant | 497 |
| **Zone D** | Eastern side, south-western quadrant | 310 |
| **Zone E** | Eastern side, adjacent to Hayman Road | 519 |
| **Zone F** | Eastern side, adjacent to Jarrah Road | 260 |
| **Zone G** | Eastern edge of project area east of Brodie Hall Drive | 259 |
| **TOTAL** | | **2,613** |

*Table 3 Distribution of parking bays within Bentley Technology Precinct*

| Area | Average Observed Occupancy across 2 weekdays | | | | | | |
|---|---|---|---|---|---|---|---|
| | Car bays | EV bays | Motorcycle bays | ACROD bays | Verge Parking | Total Bays | % Occupancy |
| **Zone A** | 163 | 0 | 2 | 1 | 0 | 166 | 46% |
| **Zone B** | 399 | 3 | 0 | 3 | 45 | 449 | 104% |
| **Zone C** | 253 | 0 | 2 | 2 | 0 | 256 | 50% |
| **Zone D** | 114 | 0 | 0 | 0 | 0 | 114 | 36% |
| **Zone E** | 353 | 2 | 4 | 3 | 0 | 361 | 67% |
| **Zone F** | 142 | 0 | 2 | 1 | 0 | 144 | 53% |
| **Zone G** | 210 | 0 | 0 | 1 | 0 | 210 | 80% |
| **TOTAL** | **1,632** | **5** | **9** | **9** | **45** | **1,699** | **62%** |
| **% Occupied** | **62%** | **32%** | **36%** | **21%** | | | |

Zone B (most notably around the Department of Biodiversity, Conservation and Attractions) was notable for having substantial verge parking beyond the capacity of marked bays. Lowest parking occupancy levels were observed around the south-western corner of the eastern side of the precinct.

Parking supply is substantial and parking is unconstrained and unmanaged outside of individual lot controls. There are some zones where the parking provision is significantly higher than the demand.

## 3.7 Existing Public Transport Network

The project area is adjacent to Curtin University, which has very high public transport accessibility through frequent bus services. Bus routes run on three roads that are adjacent to or bisect the Bentley Technology Park Precinct; Jarrah Road, Kent Street and Hayman Road, but the routes themselves do not route through the precinct. The bus stops are therefore located along the external road network which does require public transport users to cross busy roads to travel to and from the precinct, typically during peak hours.

The bus services are:

- Route 33 – Elizabeth Quay Bus Station to Curtin Central Bus Station
- Route 34 – Perth Busport to Cannington Station via Curtin University
- Route 101 – Canning Bridge Station to Cannington Station via Curtin University
- Route 284 – Curtin Central Bus Station to Belmont (limited service)
- Route 960 – High frequency route between Curtin University and Mirrabooka / ECU Mt Lawley via Central Perth.

The precinct is connected to three train stations – Cannington, Canning Bridge and Elizabeth Quay. Catchment mapping was completed for a 30 minute trip (including walking) for weekdays at 8.00am and 4.30pm. Both catchments were similar so only the morning travel is shown for the western side of the project area in Figure 26 and for the eastern side in Figure 27.

Both sides have similar accessibility, although the western side has greater access to Central Perth in the 30 minute travel time due to the 33 and 34 bus routes.

The overall route maps for the site are set out in Figure 28 and nearest stops per service are shown in Figure 29.

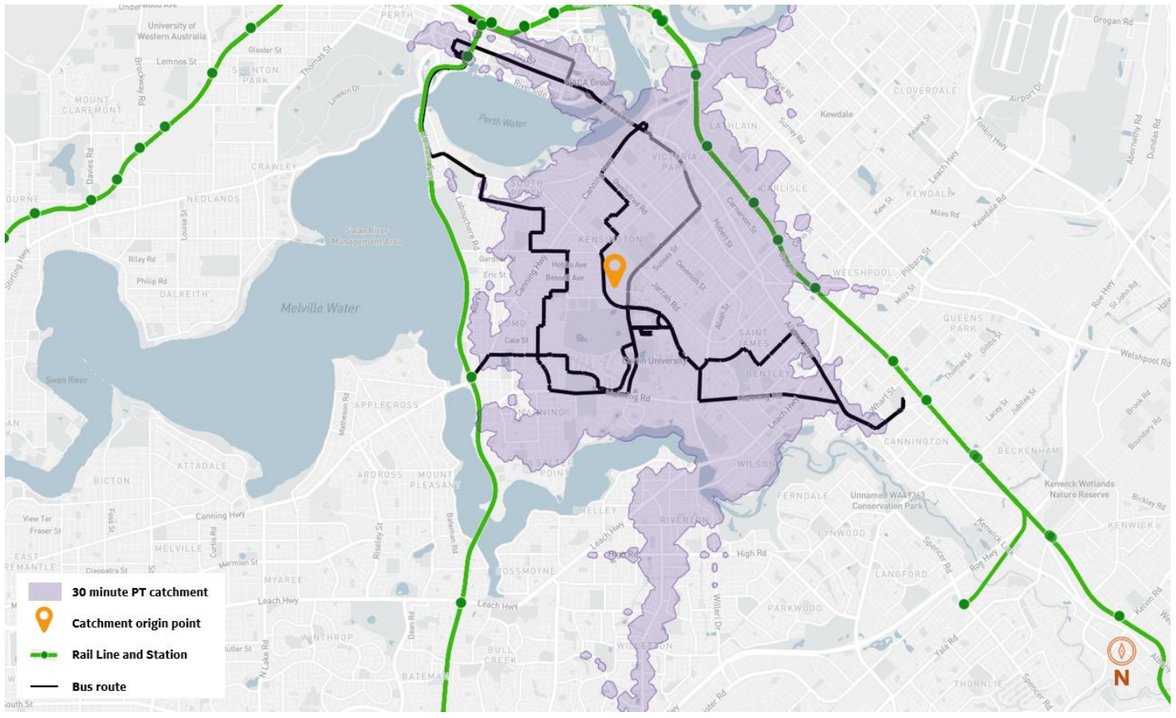



*Figure 26 30 minute AM peak weekday public transport catchment - western side of project area (source: Planwisely)*

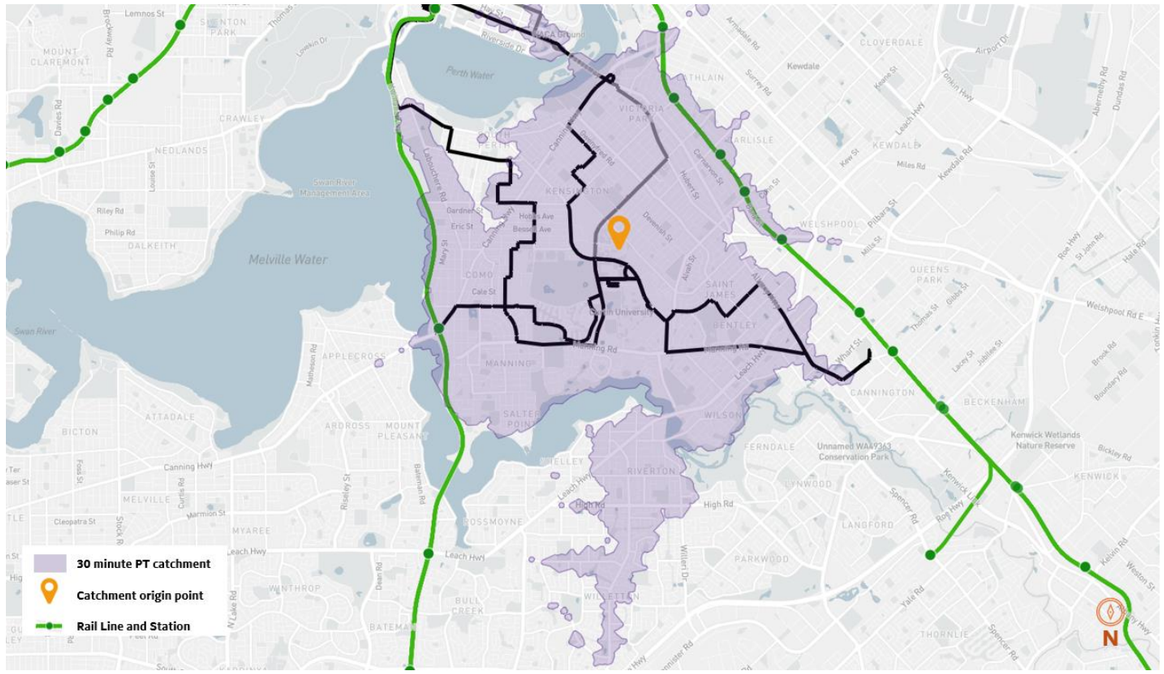



*Figure 27 30 minute AM peak weekday public transport catchment - eastern side of project area (source: Planwisely)*

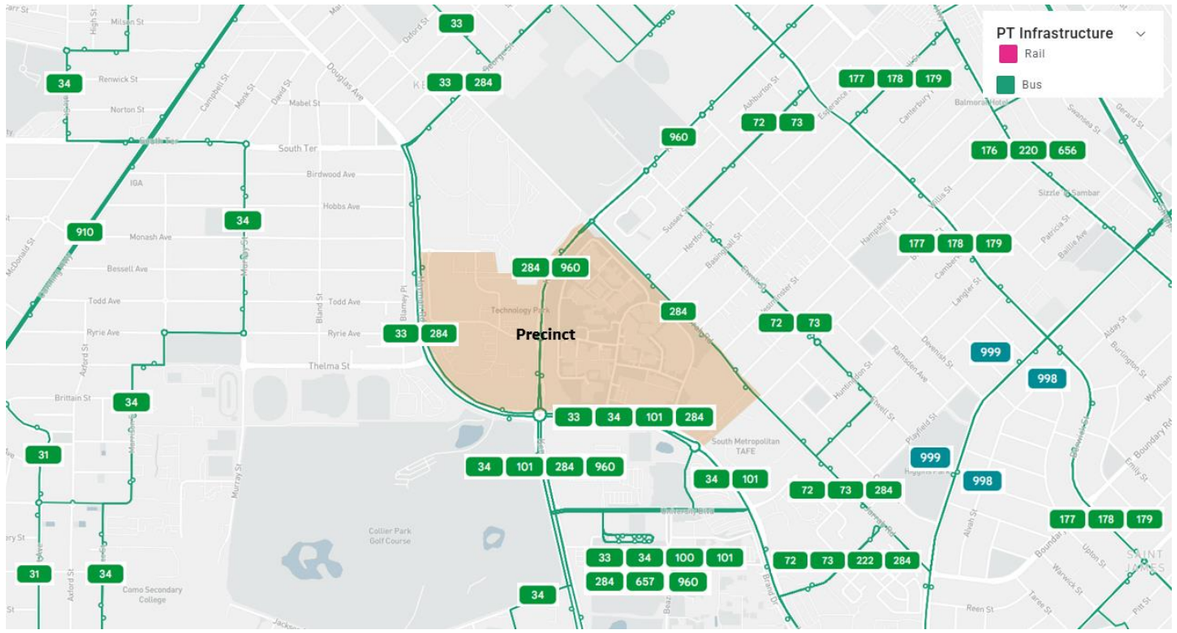



*Figure 28 Public transport routes adjacent to Bentley Technology Park Precinct (source: Planwisely)*

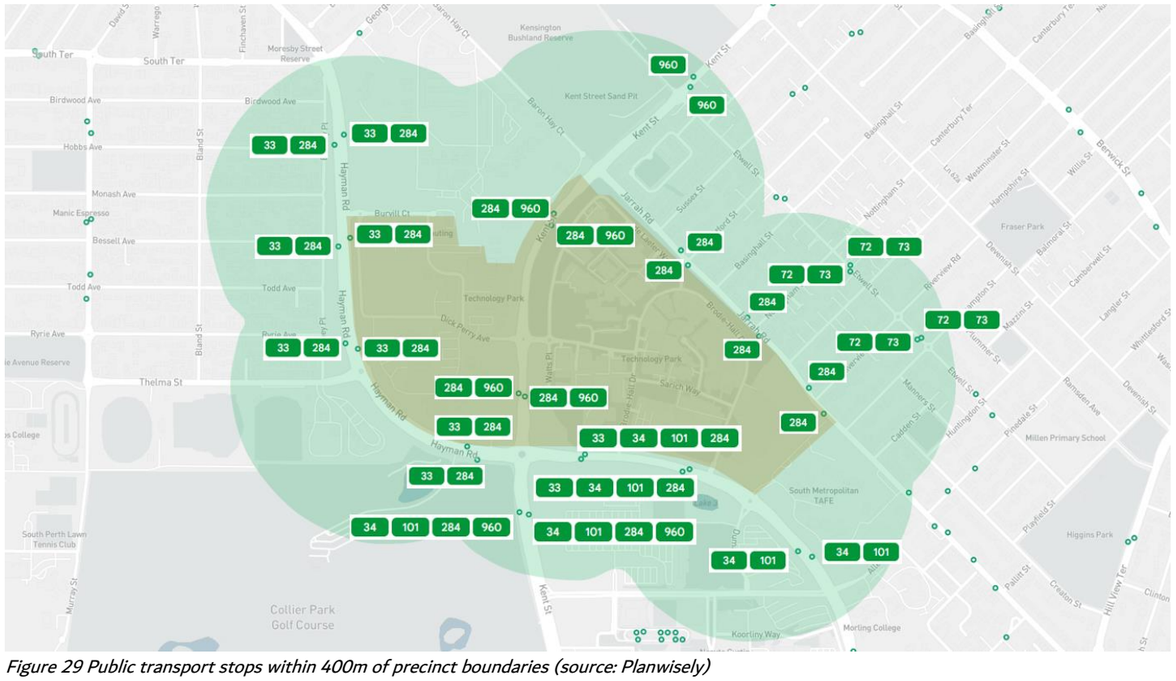



*Figure 29 Public transport stops within 400m of precinct boundaries (source: Planwisely)*

Given Transperth bus routes are not directed through the PSP area, bus stops are located on the surrounding road network requiring crossing busy roads. Climactic factors, both during hotter periods and wet months, can discourage public transport use as the road corridors are generally denuded of shade trees.

Currently bus travel to the precinct has limited attractiveness and has limited competitiveness with private vehicles where they deliver people to free, surplus parking on or adjacent to each development site.

In addition to the Transperth services, there are five existing Curtin Access Bus Services (CABS) that operate between the university campus, Technology Park and nearby suburbs including Waterford, Bentley, Victoria Park and South Perth. The service is a free shuttle that operates on weekdays during semester, between 7am and 8:30pm.

The CABS routes are shown in Figure 30. The Tech Park route travels along Hayman Road, Brodie Hall Drive, Turner Avenue, De Laeter Way and Sarich Way, but does not service the Technology Park west precinct.

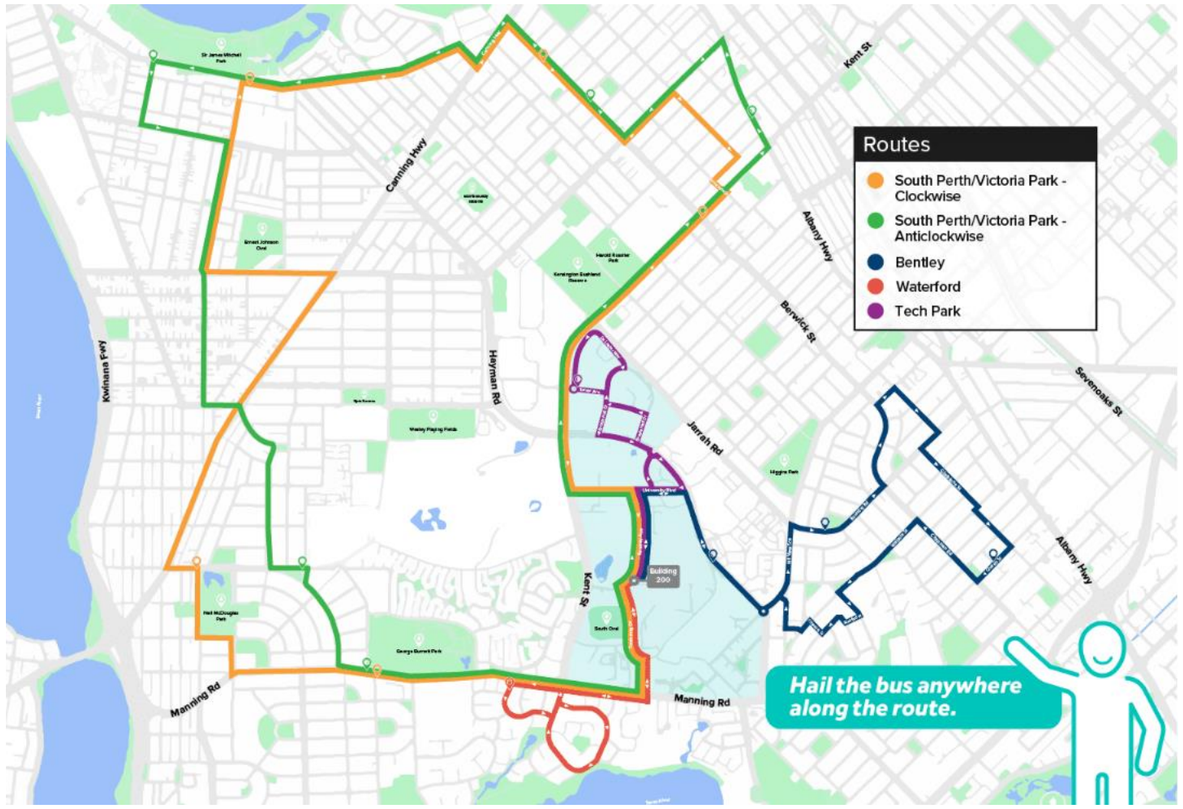



*Figure 30 Curtin Access Bus Service information (source: Curtin University)*

The service uses coaster buses and there is no dedicated infrastructure – it is a drop off and pick up service for any point along the route to assist in safety. This means that dedicated infrastructure, which has full accessibility, is not provided and footpaths and lighting around areas are also not in place.

## 3.8 Existing Pedestrian Network

The external pedestrian network includes shared paths along the eastern side of Kent Street, and along both side of Hayman Road (excluding the section between Kent Street and Thelma Street where there is a shared path on only the southern side). There are also frequent roundabout controlled intersections which are not conducive to pedestrians movements as traffic flow is fast and continuous.

The internal footpath network includes:

- 1.8m wide footpath along eastern/northern side of Dick Perry Avenue
- 1.8m wide footpath for 300m length of De Laeter Way north of Turner Avenue
- 1.8m wide footpath along northern side of Turner Avenue
- 2m wide footpath along one side of Brodie Hall Drive which switches side several times along its length
- 2m wide footpath along southern side of Sarich Way
- 1.8m wide footpath along the eastern side of Parker Place.

All internal footpaths are constructed from in situ concrete and are almost always constructed along the kerb. The footpaths along Turner Avenue, Sarich Way, Parker Place and parts of Brodie Hall Drive are on the same side as on-street parking bays.

The ten minute walking catchment from the precinct boundaries is shown in Figure 31. Both sides of the precinct area are within the ten minute walking catchment of each other, and parts of the precinct is within a ten minute walk of the Curtin University Bus Station and main town square area. The walking catchment also extends into the residential areas of East Victoria Park, Kensington and Como.

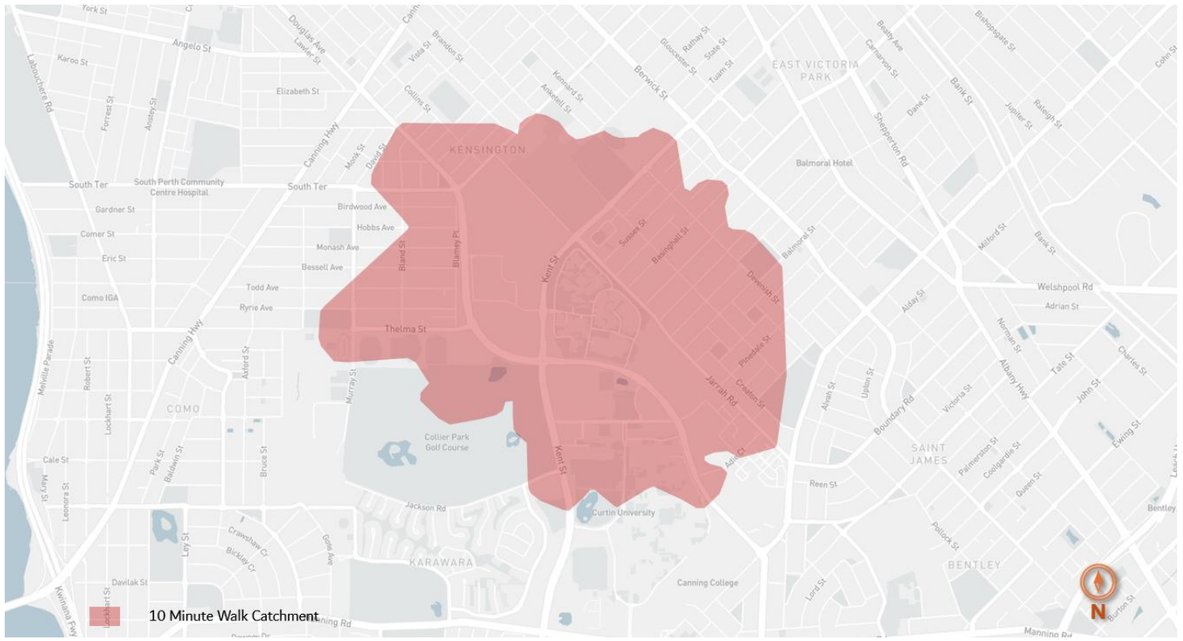



*Figure 31 Ten minute walk catchment from precinct boundaries (source: Planwisely)*

## 3.9 Existing Cyclist Network

The overall cycle network surrounding to the site is made up of a combination of off-street shared paths and low order on-street bike "infrastructure". The overall network is indicated in Department of Transport and Major Infrastructure (DTMI) mapping in Figure 32. Shared paths are provided along Kent Street and Hayman Road and there are also some sections of sealed shoulders/unprotected painted bike lanes which typically end at intersections, do not connect to other parts of the network or force bicyclists onto kerb areas to remove any priority at intersections.

The internal cycle network includes a shared street treatment on Bryce Ave (immediately to the north of Dick Perry Avenue), shown in Figure 33. Dick Perry Avenue is seen as a safe riding environment with red bitumen shoulders/on-street cycle lanes (refer to

Figure 11) that are without signage and bicycle logo pavement marking, have no protection and end abruptly at intersections at the extent of the street within the site.

In the Technology Park Central precinct there are no streets listed as being safe local riding environments, however some riders have been observed using the connection to Jarrah Road through the area.

There is a network of footpaths within the precinct, however these are between 1.8m and 2m wide and are not wide enough to be classified as shared paths. It is legal to ride a bike on the footpath in WA.

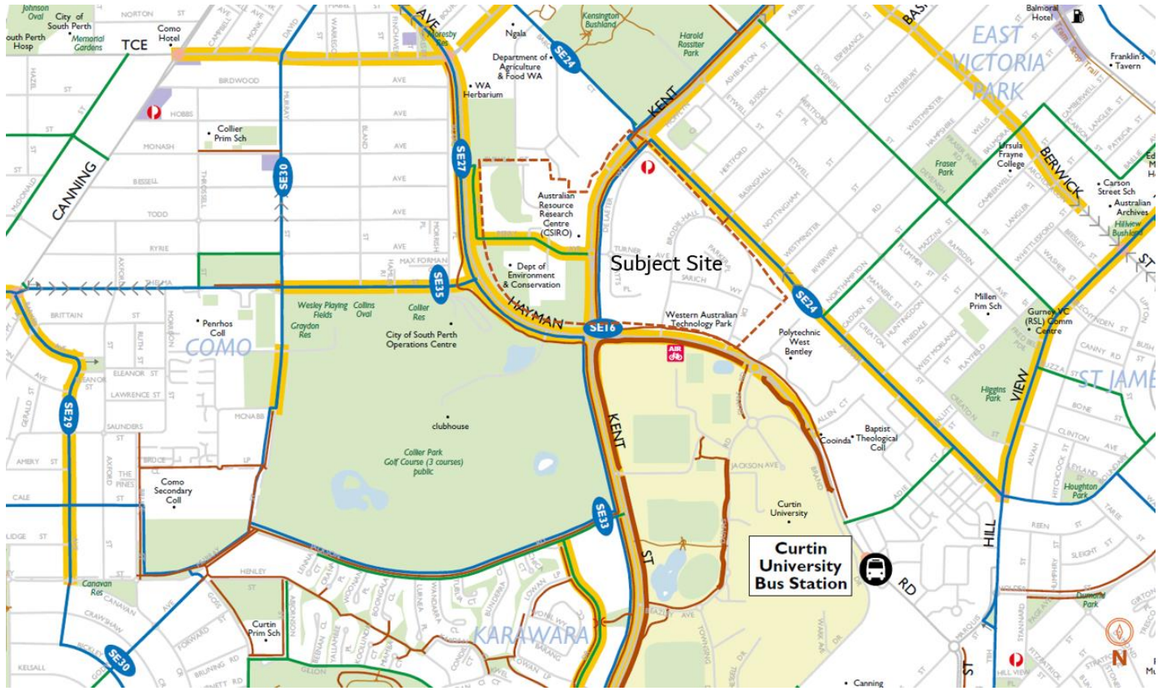



*Figure 32 DTMI cycling map around precinct (source: DTMI)*


*Figure 33 Bryce Avenue (source: Google)*

The site is highly accessible by bike, with a 360 degree external catchment, as shown in Figure 34 with the 20 minute catchment from the precinct boundaries. This catchment extends along the South Perth foreshore, east of the Armadale passenger rail line, south to Canning River and east along the Swan River and Freeway PSP network. More confident and able bicyclists would have an extended catchment.

The future catchment should extend with the development of the Long Term Cycle Network (LTCN) shown in Figure 35 with the 20 minute cycling catchment overlaid and the local connections shown in Figure 36. There are no secondary or primary routes catered for through the project area, with secondary routes classified along Hayman Road and Kent Street (as is).

In the western half of the PSP area, Dick Perry Avenue and Burvill Court linking Hayman Road and Kent Street is classified as a Local Route. Many of the existing streets are classified as local routes, with the proposed connection in the Activity Centre Plan between Kent Street and Brodie Hall Drive (West) also evident. Future local connections, such as that parallel to Sarich Way, would be facilitated by some changes in the PSP however some local routes may have to be reclassified depending on the outcomes of the PSP.

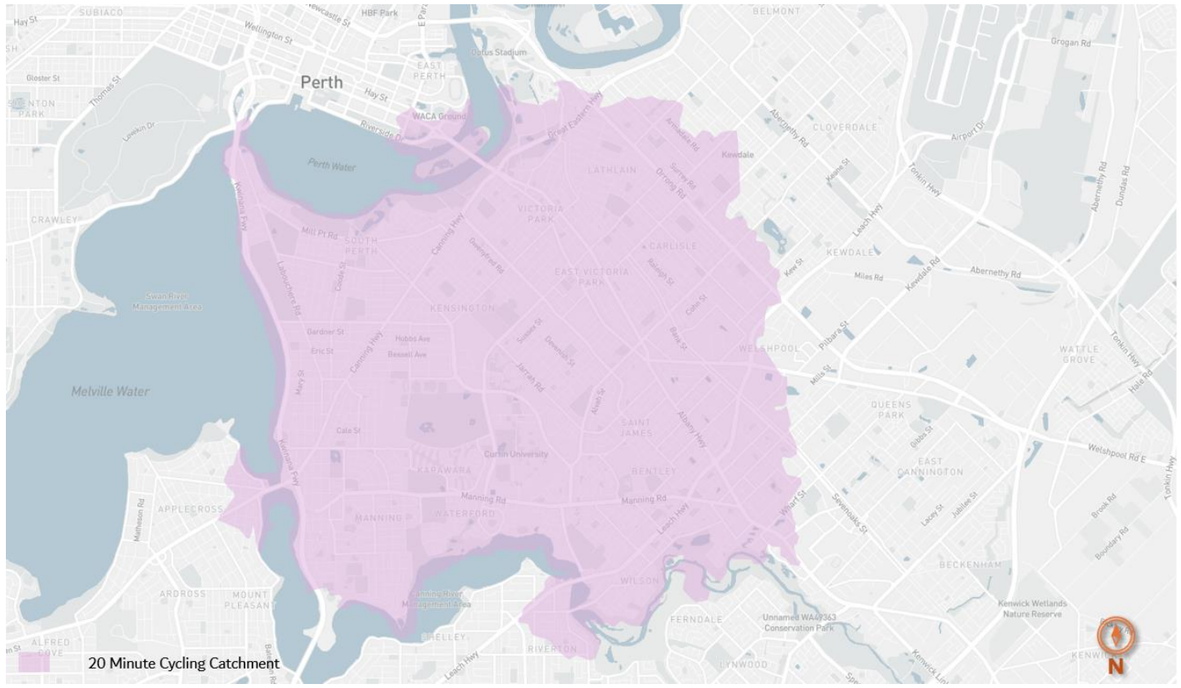



*Figure 34 Twenty minute cycling catchment from precinct boundaries (source: Planwisely)*

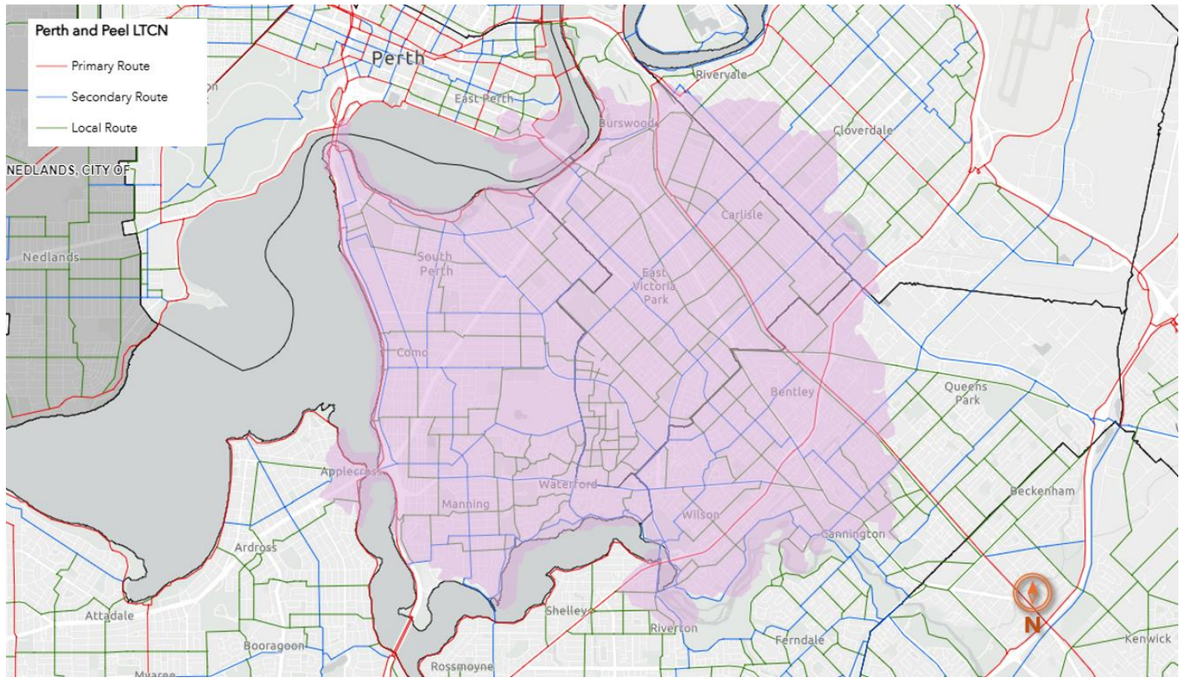



*Figure 35 Twenty minute cycling catchment from precinct boundaries within LTCN (source: Planwisely)*

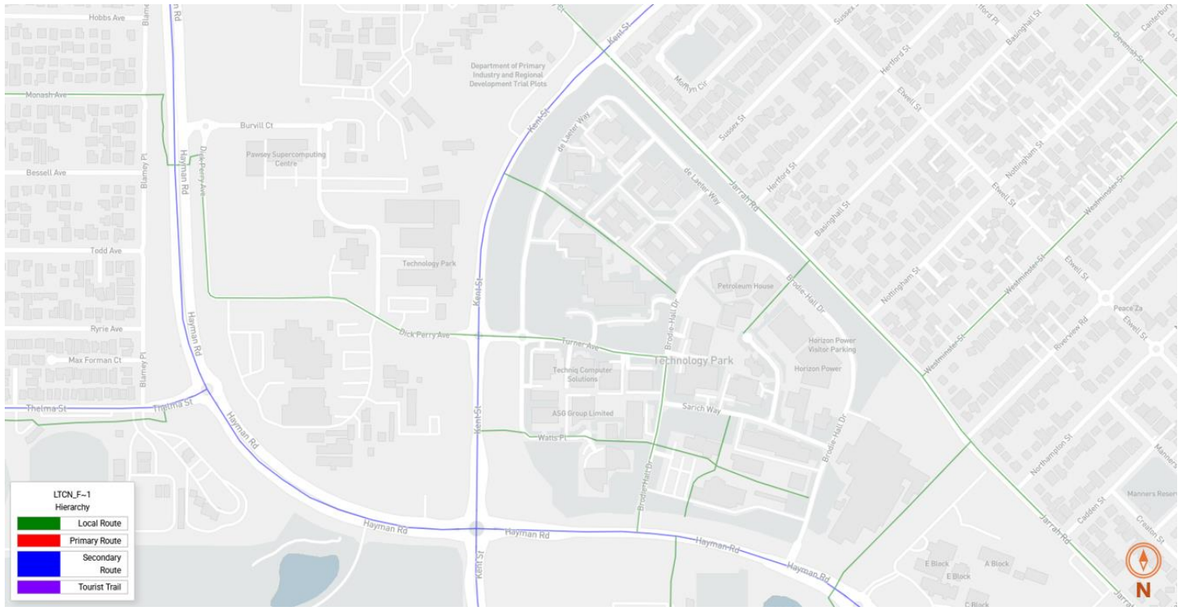



*Figure 36 LTCN network - PSP area (source: Planwisely)*

## 3.10 Road Safety

In the five-year period ending December 31st 2024, there were a total of 76 crashes within and surrounding the precinct, as shown in Figure 37. There were five reported crashes at intersections of the Bentley Technology Park precinct access roads with the surrounding road network and three mid-block crashes and 1 intersection crash along the precinct's internal road network.

There were four mid-block crashes along Hayman Road, four mid-block crashes along Kent Street and 59 reported crashes at intersections. Summary information for the reported crashes is provided in Table 4.

The roundabout controlled intersection of Hayman Road with Thelma Street has a high proportion of crashes where medical attention was required (three out of 11 crashes or 27%); these were all crashes involving a vehicle and a person riding a bicycle. Two crashes at the intersection of Hayman Road with Kent Street also involved a vehicle and a person riding a bicycle and medical attention was required.

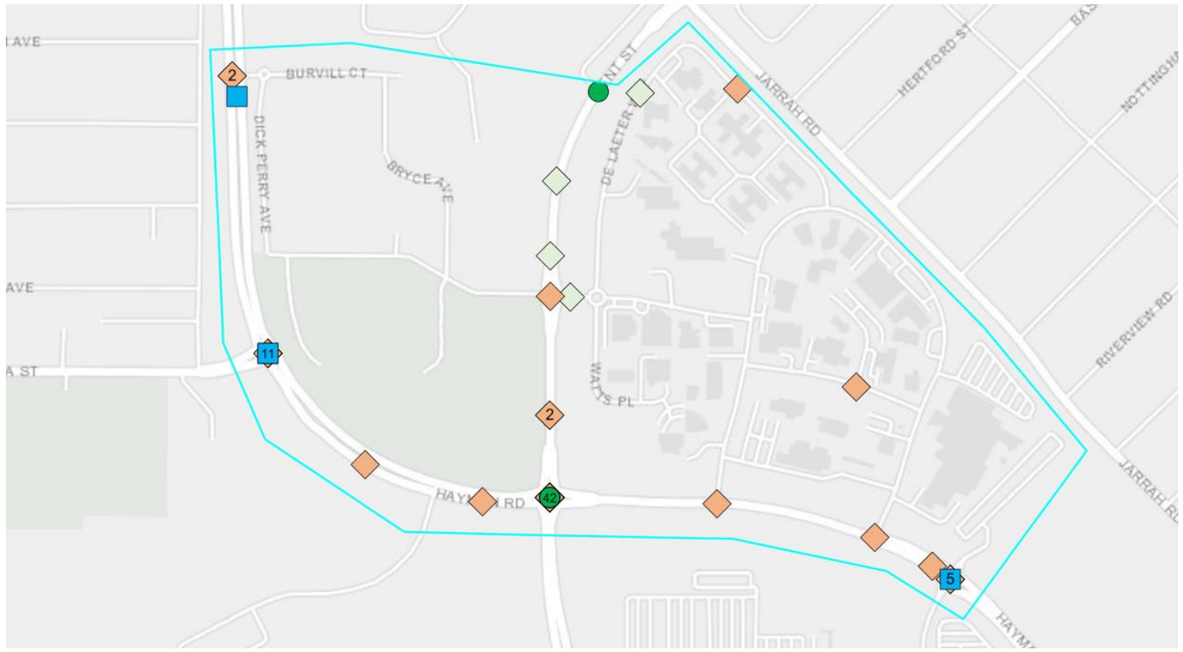



*Figure 37 Crash Reporting tool - area of query and distribution of crashes (source: Main Roads WA)*

*Table 4 Reported crashes within and surrounding Bentley Technology Precinct (source: Main Roads WA)*

| Precinct Area | Intersection or Midblock | Location | Crash Type | Severity |
|---|---|---|---|---|
| Precinct Access Intersection | Intersection | Kent St / Dick Perry Ave / Turner Ave | Right Angle | Property damage |
| | | Hayman Rd / Burvill Court | 1 Sideswipe Same Direction<br>1 Rear End | |
| | | Hayman Rd / Brodie Hall Dr West | Right Angle | |
| | | Hayman Rd / Brodie Hall Dr East | Rear End | |
| Internal Precinct Road Network | Intersection | Sarich Way / Parker Pl | Sideswipe Same Direction | Medical |
| | Midblock | Turner Ave (30m east Kent St) | Right Angle | Property damage |
| | | De Laeter Way (230m north Brodie Hall Dr) | Sideswipe Same Direction | Property damage |
| | | De Laeter Way (300m north Turner Ave) | Rear End | Property damage |
| External Road Network | Intersection | Hayman Rd / Dumas Rd / Bentley TAFE | 3 Sideswipe same Direction<br>1 Lost control of vehicle<br>1 Rear End<br>1 passenger fell from vehicle<br>1 Right turn through | 4 Property damage<br>2 Hospital |
| | | Hayman Rd / Kent St | 24 Right Angle<br>6 Rear End<br>6 Sideswipe same direction<br>6 Right turn through | 35 Property damage<br>7 Medical |
| | | Hayman Rd / Thelma St | 6 Right Angle<br>3 Sideswipe same direction<br>2 Rear End | 8 Property damage<br>2 Hospital<br>1 Medical |
| | | Kent St / Baron Hay Ct | 1 Sideswipe same direction | 1 Medical |
| | Midblock | Hayman Rd (30m south Burvil Court) | Hit object | Hospital |
| | | Hayman Rd (220m south Thelma St) | 1ideswipe same direction | Property damage |
| | | Hayman Rd (100m west of Kent St) | Sideswipe same direction | Property damage |
| | | Hayman Rd (30m west Dumas Rd) | Lost control of vehicle | Property damage |
| | | Kent St (150m south of Baron Hay Ct) | Parking manoeuvre | Property damage |
| | | Kent St (60m north of Turner Ave) | Rear End | Property damage |
| | | Kent St (120m north Hayman Rd) | 2 Sideswipe same direction | 2 Property damage |

# 4. PROPOSED CHANGES TO NETWORK

## 4.1 Structure Plan Changes

The Bentley Technology Park PSP is reproduced in Figure 38. It proposes four new external road connections, two new internal road connections, two new pedestrian/cycle connections to the external road network and two new internal pedestrian/cycle connections.

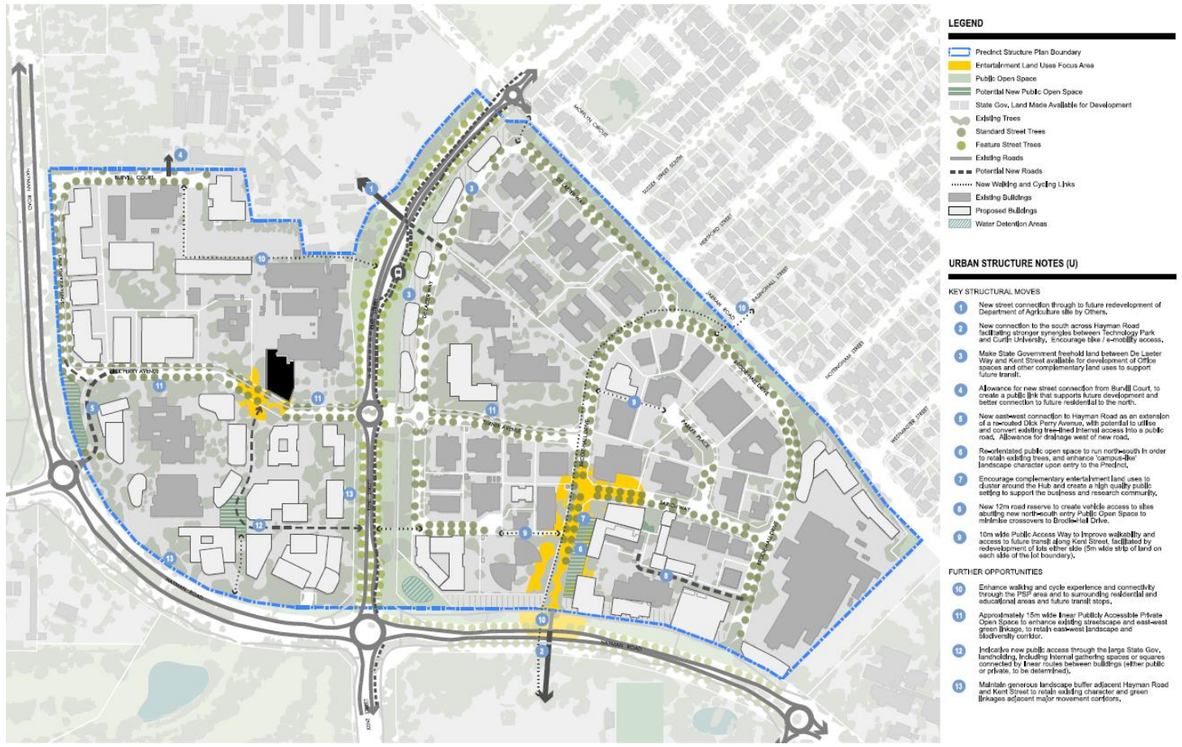



*Figure 38 Bentley Technology Park PSP (source: TBB)*

## 4.2 Proposed New External Roads and Intersections

There are four major outcomes which have been considered within the PSP. These are shown on Figure 39.

Connection 1 (on Figure 39) - A new street connection is proposed north of Burvill Court to create a public link that supports future development and a better connection within the Kensington Precinct land uses to the north. The intersection would be a simple priority controlled T-intersection.

Connection 2 - A new road connection is proposed across Kent Street between De Laeter Way and future development of the Kensington Precinct. This intersection could have traffic signal control, which would provide safe crossing opportunities for pedestrians and cyclists. This connection was planned for in the Activity Centre Plan and is seen as a vital link between precincts in the Activity Centre through to Curtin University. An initial configuration would be dependent on demands and could entail a simple priority controlled intersection.

Connection 3 – Within the Activity Centre Plan, it was always planned to extend Brodie Hall Drive (West) into Karrak Drive and Curtin University. This connection would facilitate stronger synergies between the Bentley Tech PSP area and Curtin University. Traffic signal controls at this intersection would encourage bike / e-mobility access and provide for all turning movements into and out of both side of Hayman Road.

Connection 4 – To facilitate the removal of the existing inefficient Burvill Court connection, a proposed extension of a re-routed Dick Perry Avenue to Hayman Road would become the eastern leg of the existing roundabout controlled intersection between Hayman Road and Thelma Street, with the potential to utilise and convert an existing tree-lined internal access into a public road. This would provide for safer vehicle movements into and out of the PSP area from the West and also provide separation from any future demands associated with the Kensington Precinct.

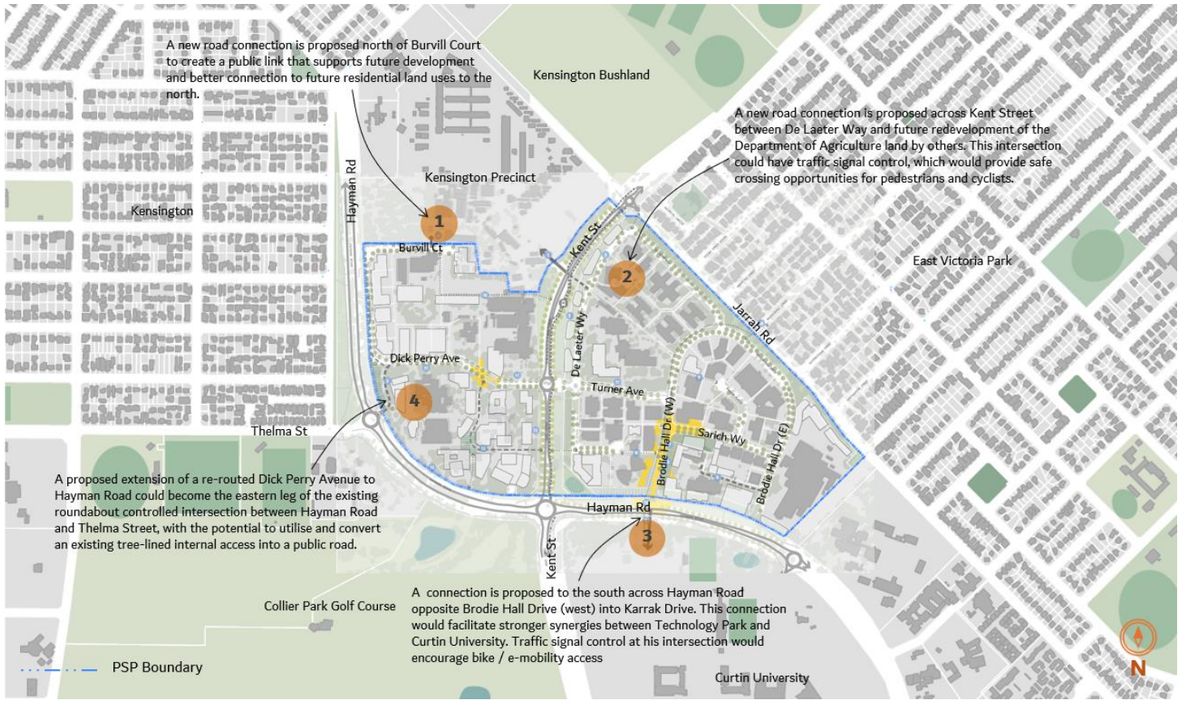



*Figure 39 Road network changes considered within PSP (source: TBB)*

For the purposes of the assessment, and the ten-year timeframe of the PSP, the connections that were considered within the assessment completed within section 5 were the connection of the site on the western boundary of the PSP into Thelma Street and the provision of an intersection for the Kensington Precinct along Kent Street. The proposals for Karrak Way through the State Hockey Stadium project is for a left-in, left-out configuration which this TIA has shown to be deficient because of existing and future background traffic and demands from the PSP and Hockey Stadium. Given the connection off Burvill Court was a local link, it was not assessed in detail.

## 4.3 Proposed New Internal Streets

There are three main outcomes for the internal street network, all of them providing for internal connectivity and access into the site. The connection between Burvill Court and the proposed Kensington Precinct has been discussed in the previous sub-section. The three new street connections, as set out in Figure 40, are:

Connection 1 (on Figure 40) - A new 12m road reserve is proposed from Brodie Hall Drive (East) approximately half way between Hayman Road and Sarich Way to create vehicle access to sites abutting new north-south entry Public Open Space to minimise crossovers to Brodie-Hall Drive.

Connection 2 - A new public access is proposed through the large State Government landholding in the western half of the precinct, forming an elbow link between Dick Perry Drive and Kent Street (approximately 100m north of Hayman Road). The width of the reserve would vary but only form an access street typology of between 12m-15m wide.

Connection 3 - A proposed extension of a re-routed Dick Perry Avenue to Hayman Road could convert an existing tree-lined internal access into a public road. The existing reserve width for Dick Perry Avenue is 20m, however this new connection could be retained within an 18m reserve if existing trees and open space are retained to the west of the proposed link.


*Figure 40 Internal street network changes considered within PSP (source: TBB)*

## 4.4 Proposed External Pedestrian / Cyclist Connections

As set out in  Figure 41, the primary pedestrian and cyclist links considered are proposed between the PSP area and the surrounding residential and educational areas and future transit stops. This includes a link between the northern most section of Brodie Hall Drive across Jarrah Road into the East Victoria Park residential area, and a connection across Hayman Road at the proposed southern extension of Brodie Hall Drive (West), and a connection across Kent Street at the north western boundary of the PSP area.

These proposals will enhance the walking and cycle experience through the PSP area and improve connectivity to surrounding land uses and transit stops. Reconfiguration of landscaping elements, as discussed within the Landscape Plan for the PSP, will further enhance pedestrian connectivity.

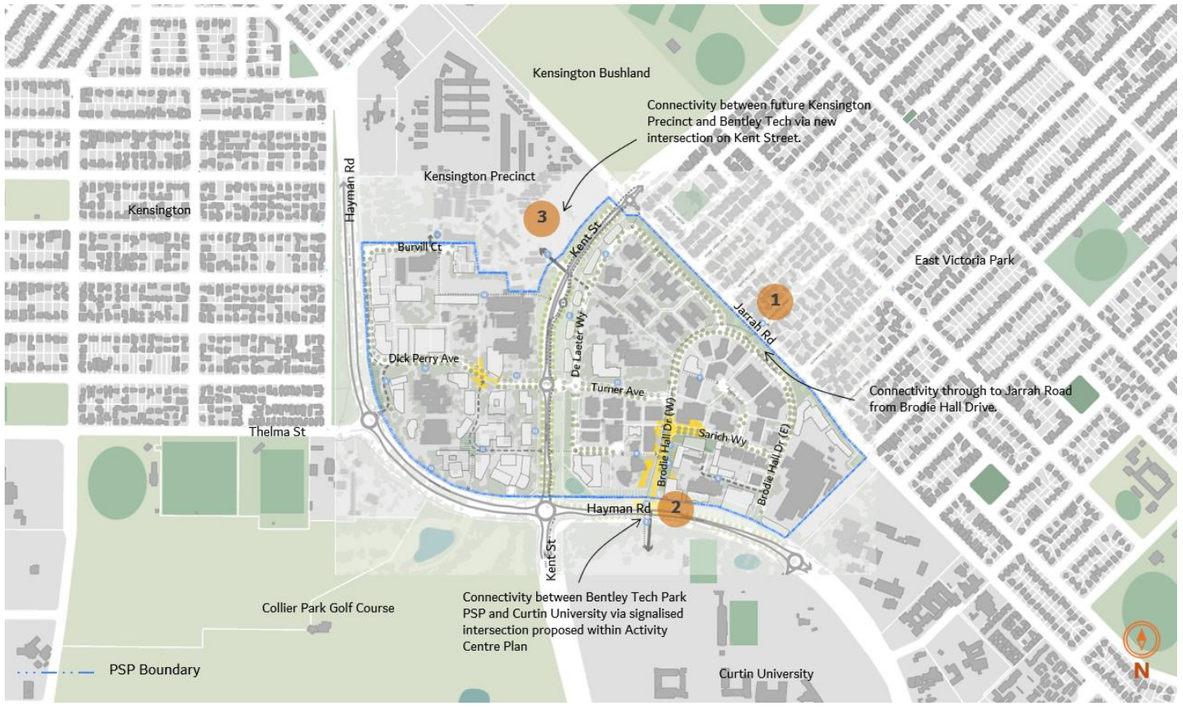



*Figure 41 Proposed pedestrian network changes considered between PSP and external network (source: TBB)*

## 4.5 Proposed Internal Pedestrian/Cyclist Connections

The PSP would include pedestrian infrastructure within the local street network, as well as those connections to the external network as discussed in the previous section. In addition to the pedestrian (and bicyclist) infrastructure that would form part of the local street network, there are a number of ten metre wide Public Access Ways (PAW) proposed that would allow for greater accessibility by pedestrians.

The focus has been on ensuring that the network becomes more permeable and trips that otherwise would not be able to be taken are provided for. The three connections considered within the PSP, as shown in Figure 42, are:

Connection 1 (on Figure 42) - Parker Place and Brodie Hall Drive which would ultimately connect to the link through the Kent Street as considered within the Activity Centre Plan

Connection 2 - Brodie Hall Drive and Watts Place – this would allow for greater permeability in the immediate area, as well as access through to the entertainment land uses focus area off Brodie Hall Drive (West)

Connection 3 - between Burvill Court and Kent Street. These will provide more direct access for pedestrian and cyclists where there are existing culs de sac, improving walkability and access to future transit along Kent Street. This connection would also link up to the proposed local street connection through to the Kensington Precinct.


*Figure 42 Proposed internal pedestrian network changes considered within PSP (source: TBB)*

## 4.6 Proposed Public Transport

The PSP allows for a future transit service and associated transit stops along the Kent Street corridor that has been considered by a range of studies over the past two decades. That corridor is considered a key link for mid-tier or higher order transit between the Bentley-Curtin Activity Centre and Central Perth. The Bentley Tech PSP retains the existing reserve for Kent Street, thereby not impacting on the potential delivery of mid-tier transit along that route. The main stop location considered within the PSP for any form of mid-tier transit is set out in Figure 43.

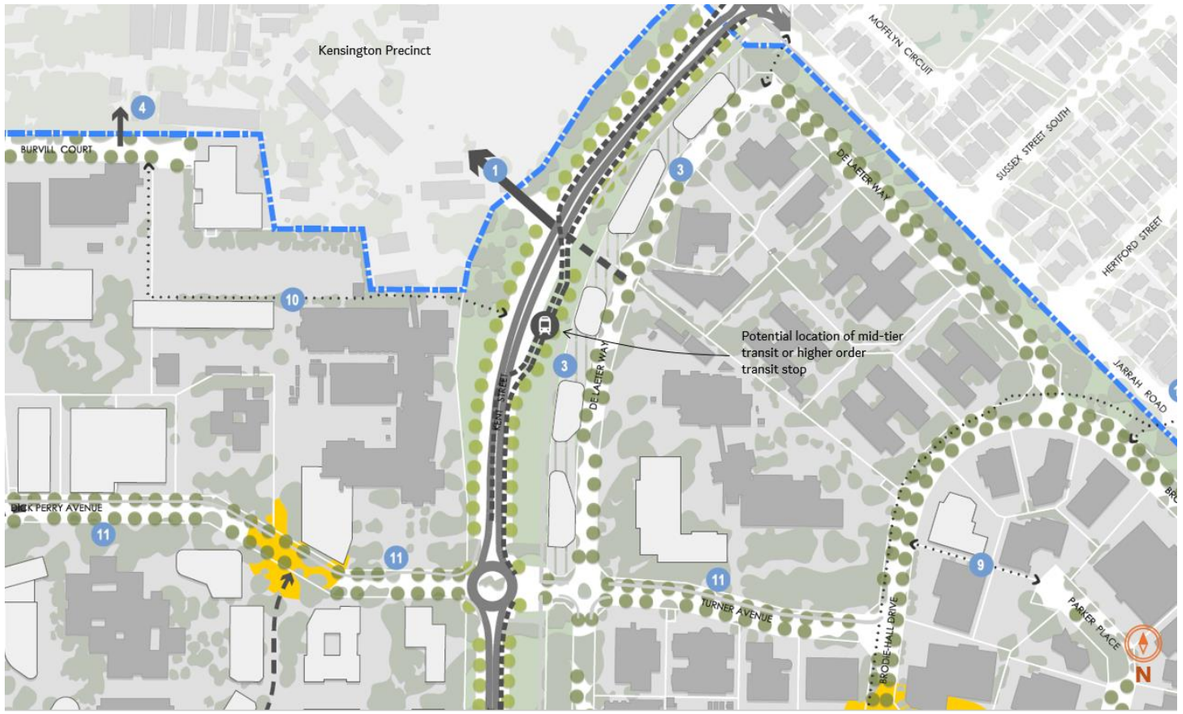



*Figure 43 Potential location of mid-tier transit stop (source: TBB)*

This stop location is central to access points into the Bentley Tech area and would be adjacent to the longer term connection into the Kensington Precinct. Given the nature of mid-tier transit and the requirement to provide more prioritised road space for operational efficiency, the alignment on Figure 43 is shown to the east of the existing Kent Street carriageway. This would allow for high quality station infrastructure to be constructed and make the use of the system attractive.

To allow for the mid-tier system to develop, a number of elements would need to be addressed by the delivery team of that project:

- Intersection priority and configuration – having a dedicated lane for mid-tier would not operate with existing roundabout intersections through the area given the conflict with opposing turns
- The location and spacing of stops would need to be resolved
- The connection to the proposed and existing pedestrian network would require detail design
- Space requirements for the corridor to provide for direct development interface to the Bentley Tech PSP would also need to be addressed
- The connection point into Curtin Bus Station would need to be resolved – would it be through Karrak Drive or Kent Street?

In addition to mid-tier outcomes, greater penetration by local services will significantly improve frontage access to local services and allow for connection to the wider network. At present, bus stop infrastructure is on the regional road network and is isolated from development. This sort of environment penalises users and puts off potential mode shift.

To address, this, the PSP will facilitate the re-routing of local services (at a minimum the 33 and 284) which presently run along Hayman Road and Kent Street. This is illustrated in Figure 44. The connection of Dick Perry Avenue to Thelma Street and the link from Brodie Hall Drive (West) through to Karrak Drive provides an internal loop that could have an additional four stops in each direction. This proposal opens up potential for interchange with services at Curtin University Bus Station and local origin and destination trips.


*Figure 44 Existing and local Transperth routes for Bentley Tech PSP (source: Planwisely)*

## 4.7 Proposed On-Street Parking

*As noted in this assessment, parking in the area is unconstrained, unmanaged and generally over provided. On-street parking in particular has been an issue that has been evident for over a decade, with the Town of Victoria Park nominating the area as a hotspot within the Activity Centre Plan. As set out in the assessment for the Activity Centre:*

*"The Town of Victoria Park completed the development of its Parking Management Plan (PMP) in November 2012. The endorsed plans sets out the examination of issues relating to parking supply and demand within seven "hot spot" areas, of which there is one within the Bentley-Curtin Activity Centre Structure Plan area. A precursor to the endorsement of the PMP was the completion of a detailed study into each of the hot spot areas in 2009.*

*Parking hot spot 7 is shown in Figure 45. This area broadly covers Precinct 1 in the Bentley-Curtin Activity Centre Structure Plan as well as adjoining residential streets in East Victoria Park.*

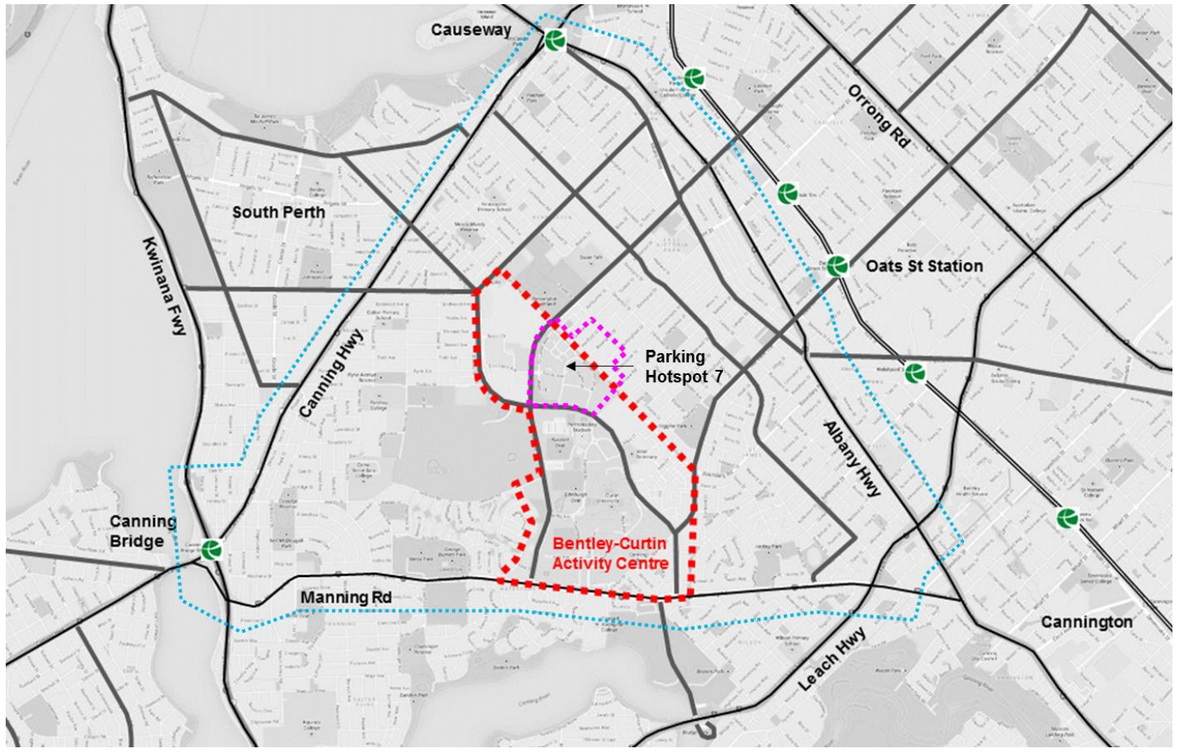



*Figure 45 Parking hot spot 7 (source: Town of Victoria Park Parking Management Plan)*

*The PMP, through the hot spots study and ongoing monitoring of the area through to 2012, determined that there were a range of offences being committed in the area in relation to parking attributed to land uses in both Technology Park and Curtin University. These offences were, in turn, reducing amenity for residents and visitors to the area.*

*A range of measures were proposed within the PMP to manage parking supply and demand in the hot spot area, generally:*

- *Paid parking within Technology Park (all day);*
- *Short term free parking near retail outlet in Technology Park;*
- *Other bays for use by exception in Technology Park (ACROD/service/bus bays etc.);*
- *All day free parking on south western side of Jarrah Rd;*
- *Clamp down on verge parking;*
- *Two hour parking restrictions on residential street between Jarrah Rd and Etwell St; and*
- *Signage and markings to allow for enforcement.*

*Since the completion of the PMP, the ability of the ToVP to implement the recommendations for hot spot seven have been limited due to "ownership" of the roads within Technology Park being outside of the control of Council.*

Parking provision was examined in detail within the Activity Centre Plan, and the outcomes of the PSP should replicate the recommendations within that assessment to ensure consistency in planning. Specific to the Technology Park precinct, the Activity Plan assessment noted:

"*For the purposes of the modelling exercise, the demands from the three precincts within Technology Park were treated separately. This was to reflect the potential impact on the forecast year road network. Trip generation for each of the three precincts was assessed based on the outcomes of planning for the Bentley-Curtin Activity Centre Structure Plan.*

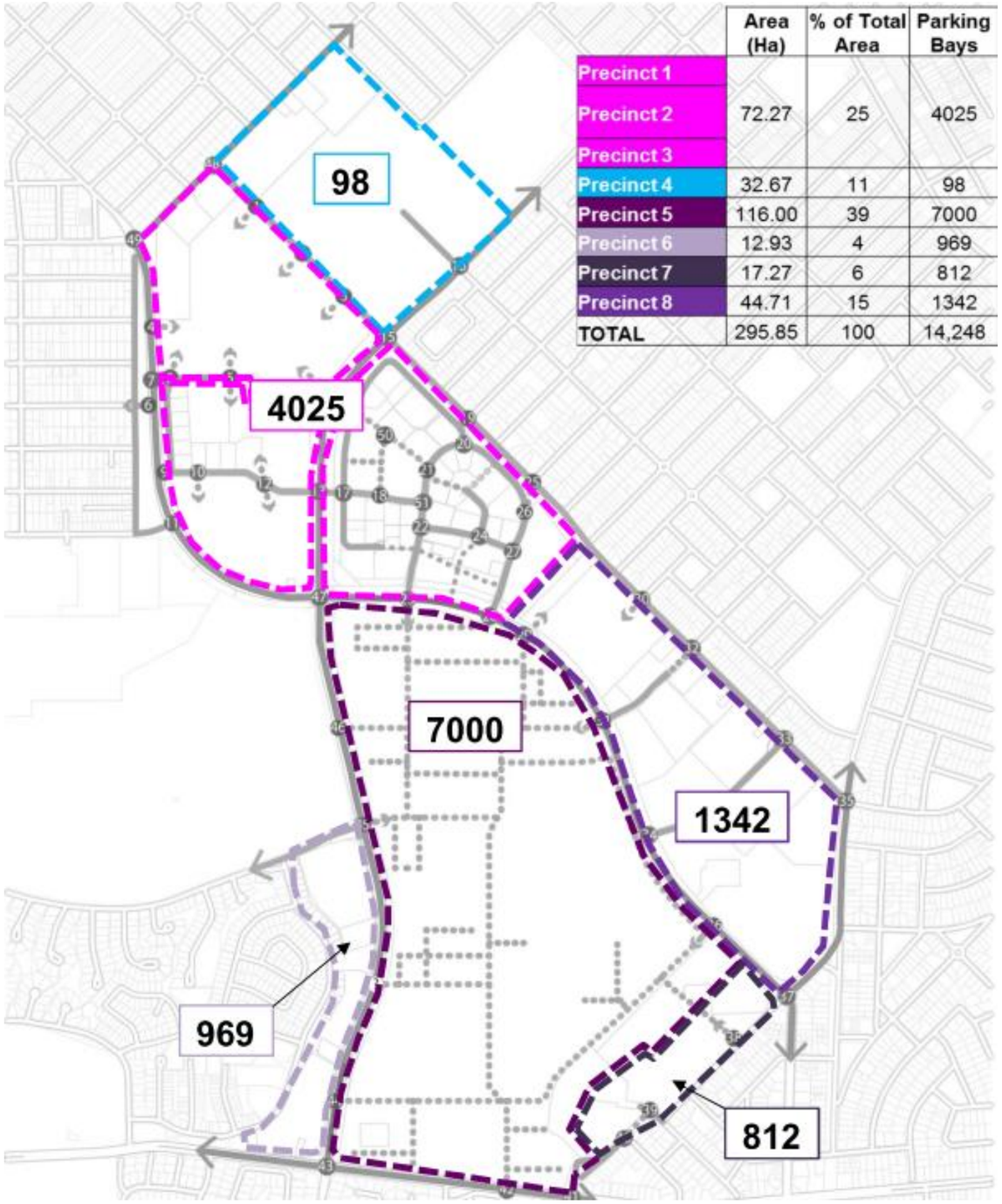
*The land use proposed for this area would be dependent on the overall land use mix proposed within the Structure Plan and the staging of redevelopment, in particular the development of Precinct 3 which currently is home to the Department of Agriculture and Food complex. If the development mix were to be reviewed or altered in this location, the assessment undertaken for the Bentley-Curtin Activity Centre Structure Plan may be overstating demands for some land uses.*

*In order to allow for a wider area examination of parking, it is proposed to include a sub-precinct cap on parking that covers Precincts 1, 2 and 3. The actual limits set the each of the precincts, would be reviewed and applied at a local structure plan stage based on development quantum. Should the land uses be revised for any of the precincts resulting in lower parking provision, the residual parking supply amount could be provided within these precincts as a public parking facility managed by the relevant local authority. If ever progressed, this facility should:*

- *Attract a fee structure that is no less than that charged within Curtin University;*
- *Not be located within ease of access to public transport stops to discourage any informal park and ride activities;*
- *Not include any internal pick-up point for the Curtin University bus system;*
- *Not have direct access to the major road network (Hayman Road, Kent Street or Baron Hay Court);*
- *Be managed by the Town of Victoria Park or relevant local authority; and*
- *Be limited to 200 spaces with the majority being short stay periods (up to 4 hours)".*

The Activity Plan assessment then modelled demands from traffic related to development and established a series of sub-precinct caps on non-residential parking. These are shown in Figure 46, which the PSP would utilise as the basis for managing private vehicle traffic movements.

In addition to the application of these caps, on-street parking should be managed (as proposed by the ToVP) and on-street parking limited along existing streets within the PSP area, including Brodie Hall Drive and De Laeter Way.




| | Area (Ha) | % of Total Area | Parking Bays |
|---|---|---|---|
| Precinct 1 | | | |
| Precinct 2 | 72.27 | 25 | 4025 |
| Precinct 3 | | | |
| Precinct 4 | 32.67 | 11 | 98 |
| Precinct 5 | 116.00 | 39 | 7000 |
| Precinct 6 | 12.93 | 4 | 969 |
| Precinct 7 | 17.27 | 6 | 812 |
| Precinct 8 | 44.71 | 15 | 1342 |
| TOTAL | 295.85 | 100 | 14,248 |

*Figure 46 Precinct based non-residential parking caps Bentley-Curtin Activity Centre Structure Plan (source: DTMI)*

# 5. VEHICLE NETWORK AND IMPACTS

## 5.1 Assessment

The Bentley Technology Park PSP sits within the Curtin-Bentley Specialised Activity Centre. The Structure Plan for that Activity Centre underwent a significant transport assessment through the (then) Department of Transport (DoT) which was finalised in 2016. That assessment forms the basis for the strategic analysis for the entire area, with this assessment for the PSP siting underneath that.

Accordingly, the assessment completed for the PSP focusses in on the more immediate road network implications as the broader analysis for the network and public transport connections sits within the Activity Centre assessment. The focus on the assessment for the PSP has been to provide an understanding of the context of the proposed development outcomes and where there are issues which may require more detailed examination throughout, or beyond, the timeframe of the PSP. This assessment also considers implications of other network alterations or potential impacts associated with three key projects:

- State Hockey Centre
- Kensington Precinct
- Mid Tier Transit.

## 5.2 Activity Centre Plan Assessment

The Transport Assessment for the Activity Centre plan was finalised in 2016 and supported the outcomes of the overall Strategic Centre Plan. The following are excerpts from the Executive Summary of the report which sets out the nature of the assessment completed:

"(The) *Transport Assessment represents the culmination of a 12 month process managed by State Government agencies to support the finalisation of the Bentley-Curtin Activity Centre Structure Plan being developed by the Department of Planning (DoP). The Department of Transport (DoT) is the State Government agency responsible for the completion of a Transport Assessment for the Bentley-Curtin Activity Centre which has examined and assessed transport network proposals within the Bentley-Curtin Activity Centre.*

*The Transport Assessment is based on the Bentley-Curtin Specialised Activity Centre Draft Strategic Plan. This Plan forms the basis for the Activity Centre Structure Plan as well as the basis for assessment requirements set out in State Planning Policy 4.2 (Activity Centres for Perth and Peel). The completion of the Transport Assessment has covered a range of elements and tasks, including:*

- *Review of previous strategies, draft plans and reports;*
- *Testing of land use scenario impacts;*
- *Assessment of transport network characteristics;*
- *Significant transport modelling (macro, meso and micro levels);*
- *Development of Public Transport Strategy; and*
- *Development of a Car Parking Strategy.*

*The development of the Bentley-Curtin Activity Centre Transport Assessment has used a collaborative approach with the involvement of stakeholders in a Project Modelling Group (PMG) with representation from State Agencies, Local Authority and the Consulting Team.*

***Transport and the Activity Centre***

*The Bentley-Curtin Activity Centre has seen significant growth in student numbers and general development over the past decade, primarily through expansion on the Curtin University Campus, Waterford Plaza and Technology Park. This expansion is set to increase through the Structure Plan and the Greater Curtin Master Plan.*

*The number of boardings and alightings by bus has increased over 100% in that time, parking bay numbers at Curtin University has been largely static and like for like comparisons of the road network have shown a negligible 1% growth over a decade in the key morning peak. Public transport has shouldered the load over the past decade in terms of movement growth during peak periods and this Transport Assessment supports the expansion of the importance of public transport combined with increased parking management, improved local and regional connections for cyclists and pedestrians and limitations on significant road building activity.*

***Context***

*This Transport Assessment undertook a review of the potential implications for the Activity Centre using three separate land uses scenarios. These scenarios ranged from a "Business as Usual" situation in 2031 to a scenario which reflected significant progress being made in the delivery of the Greater Curtin Master Plan. That scenario was utilised in the public transport strategy, car parking strategy and modelling analysis to represent the case that would provide the greatest challenge for authorities to deliver.*

*The process used to complete the Transport Assessment was detailed with each component being examined through qualitative and quantitative means backed up with three separate layers of transport modelling. This comprehensive approach was underpinned by outputs from the Main Roads WA ROM24 model and refined land use data taken from the Department of Planning MLUFS database. Wherever possible, observed data was used such as detailed electronic parking information from Curtin University and PTA SmartRider patronage data. This provided for a high degree of certainty in the outputs of the Transport Assessment.*

*All levels of modelling indicated high levels of forecast year traffic on the regional road network. This is a given and would not change if the Activity Centre Structure Plan progressed or not. Further analysis of the impacts relating to the Activity Centre showed that there would be minimal growth attributed to the development proposals in the Activity Centre and this impact would be lessened through parking management and provision of additional Public Transport services and priority on key links.*

*The arrival and departure of public transport users from the Bentley-Curtin Activity Centre was examined to understand the profile of usage and where the critical use times in the network were. In general, most locations in Perth experience very high demands in the morning peak period and a double peak in the afternoon peak period where movement of students and workers is generally spread out.*

*In March 2014, there were nearly 15,500 trips made to and from the Activity Centre by bus. On boardings alone, the Curtin University Bus Station was busier than all but two Urban Rail stations on the entire network in Perth outside of Central Perth. The Bus Station had an average of well over 1000 trips between the hours of 7.00 am and 6.00 pm which is not believed to be replicated anywhere else on the rail network outside of Central Perth.*

*Cycling and walking networks are particularly strong in the Activity Centre and there are significant sections of higher quality shared paths, as should be expected from an area focussed on a University Campus. The Town of Victoria Park has progressed significant infrastructure improvements from their Integrated Movement Network Strategy and the City of South Perth is also planning for additional sub-regional connections.*

*This network, however, is not without its gaps. Some of the gaps are related to land use planning or funding in delivering infrastructure, other gaps are as a result of placing these modes at the back end of overall network priority.*

*The management of parking in the Activity Centre has increased noticeably in the past few years. The Town of Victoria Park has completed a Parking Management Plan which highlights the impacts of parking around the Technology Park location.*

*Curtin University has been progressively introducing a more equitable parking system with set rates amongst user groups and applying a cap of parking provision which is around the current level of parking on campus. These two measures alone will have a marked impact on travel patterns in the Activity Centre in the future.*

*The success of using parking management as a key tool in the overall travel demand management for the Activity Centre is seen below in data recorded for the Campus. Through limiting available parking to current levels as ten years ago, the volume of bus patronage has increased whilst morning peak hour movements into and out of the Campus have risen by only 1%"*

The overall approach for the assessment is shown in Figure 47 with the various modelling layers examined shown in Figure 48. Modelling for that project was undertaken in ROM24 (CUBE), SATURN (Mesoscopic) and Commuter (Microscopic)

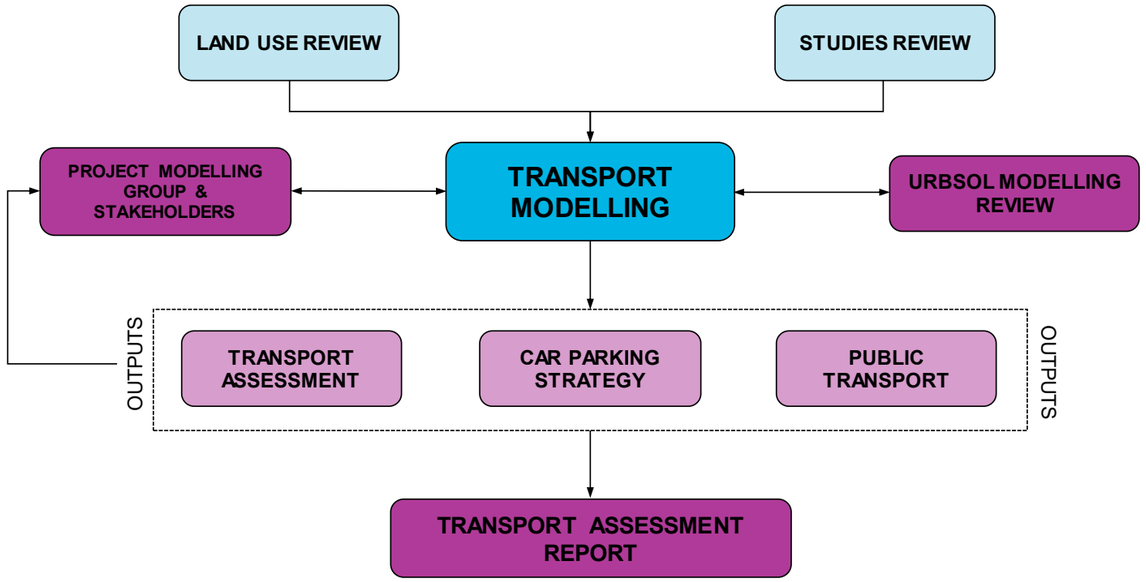



*Figure 47 Project approach - Bentley Curtin Activity Centre Plan Transport Assessment (source: Aecom)*

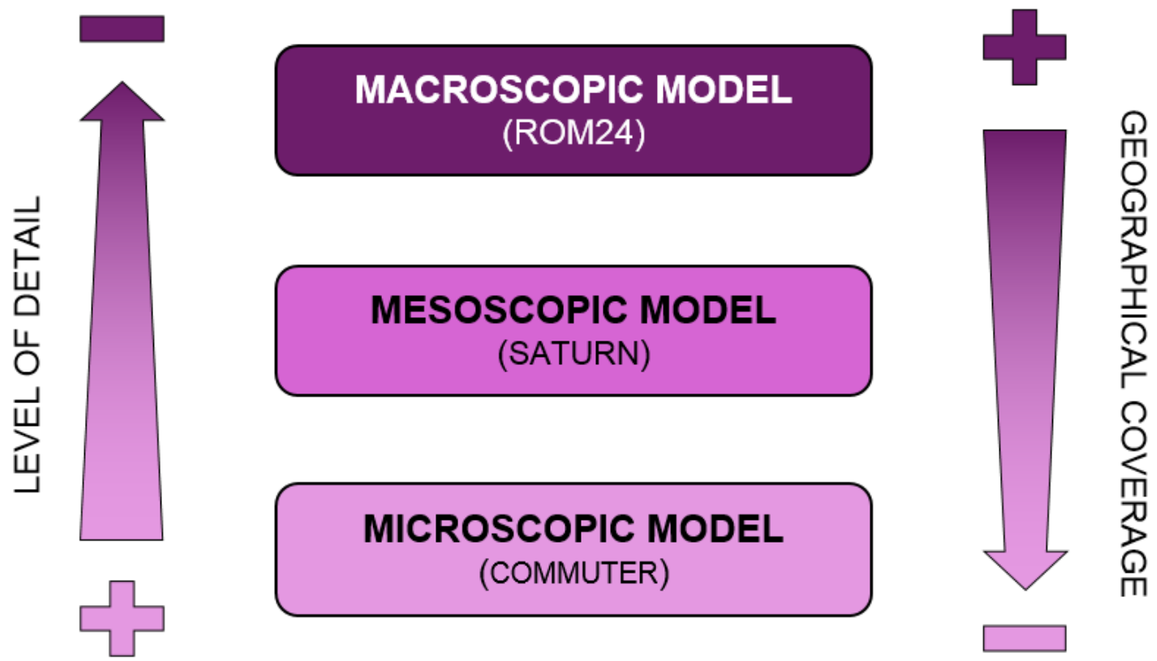



*Figure 48 Modelling layers for Activity Centre transport assessment (source: Aecom)*

The modelling task for the Activity Centre Plan was substantial, with a refinement of the transport modelling approach shown in a flow chart format in Figure 49. The highest level modelling used ROM24 outputs, which had included a process of refining the existing network and zones within ROM24 and then using those outputs in the mesoscopic modelling stage. This illustrates the much wider remit and coverage that the Activity Centre Plan assessment had outside of very focussed or detailed intersection modelling within the Activity Centre Plan – it considered a range of inputs that individual project do not.

The mesoscopic model extents were broadly the geographical triangle area between the Causeway, Canning Bridge and Cannington, as illustrated in Figure 50. The zone connectors, which included three connectors into the zones associated with the Bentley Tech PSP are shown in Figure 51.

The mesoscopic model was calibrated and validated based on a thorough process that was oversee by the Project Working Group and State Government Agencies. In addition, all stages of the model were formally reviewed and assessed independently by a consultant directly employed by the DoT at the time. The completion of the initial stage of the modelling task allowed for the progression of forecast year modelling which focused on 2031. Again, that modelling used a staged approach to examine scenario implications from the macro level through to intersection level within microsimulation.

Specific proposals were modelled through the Activity Centre Plan process and formed part of the approved plan by the WAPC, the most relevant to the Bentley Tech PSP being new traffic signal intersections on Kent Street at the connection into the Kensington Precinct and at Brodie Hall Drive on Hayman Road to form a key four-way intersection into Curtin University. These are all shown in Figure 52.

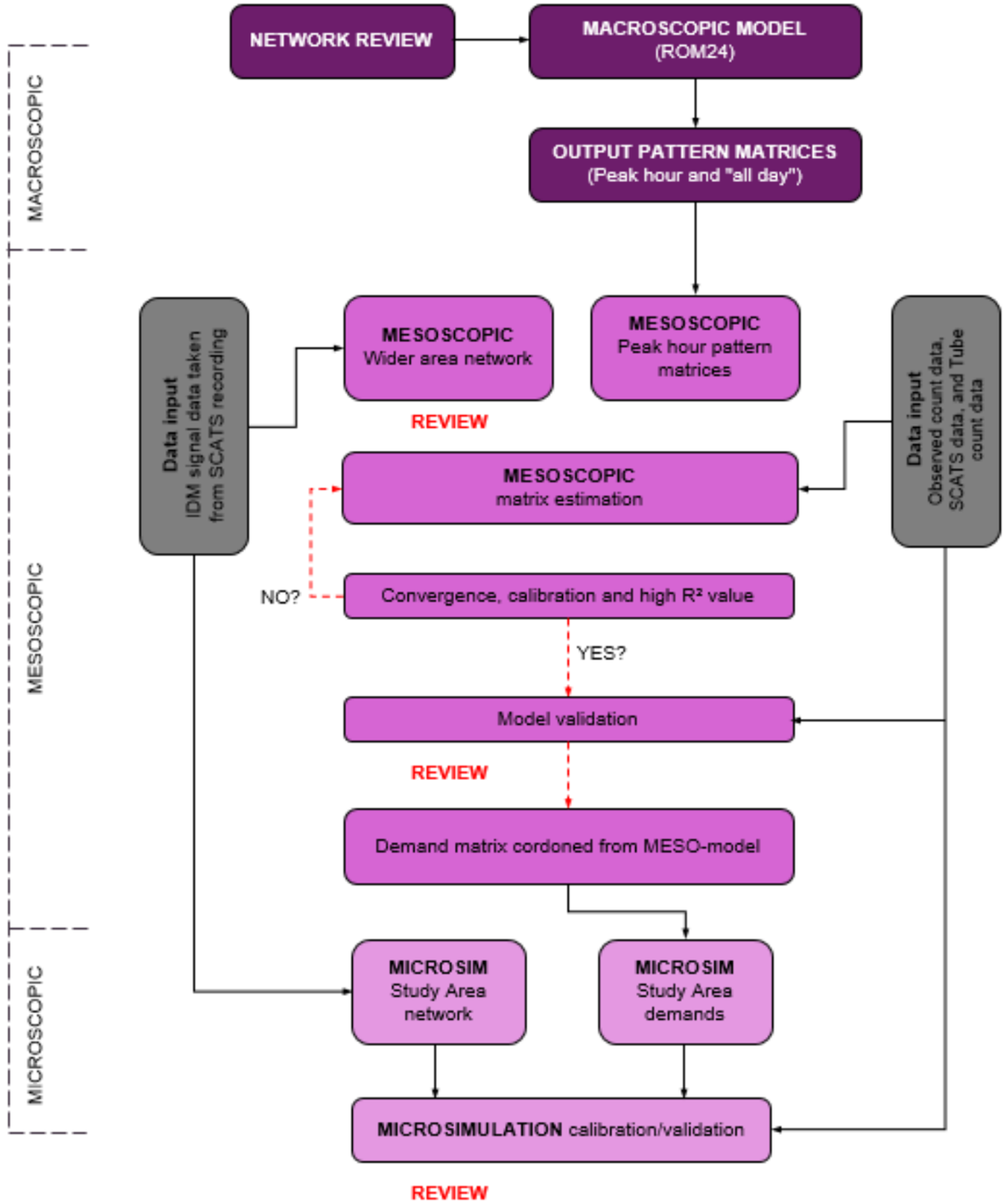



*Figure 49 Modelling tasks - Bentley-Curtin Activity Centre Plan (source: Aecom)*

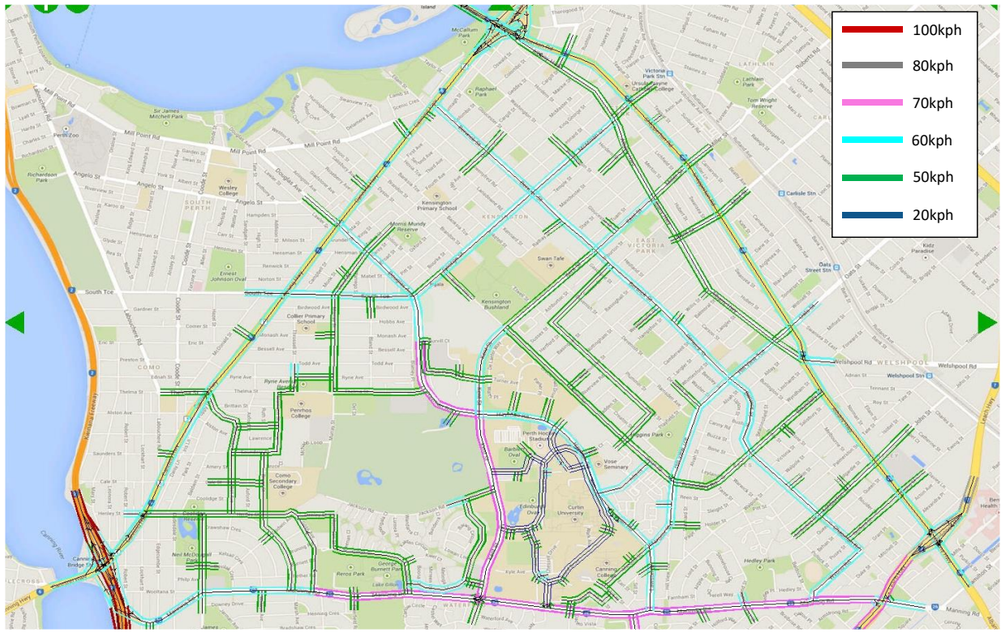



*Figure 50 Extents of mesoscopic modelling for Activity Centre Plan (source: Aecom)*

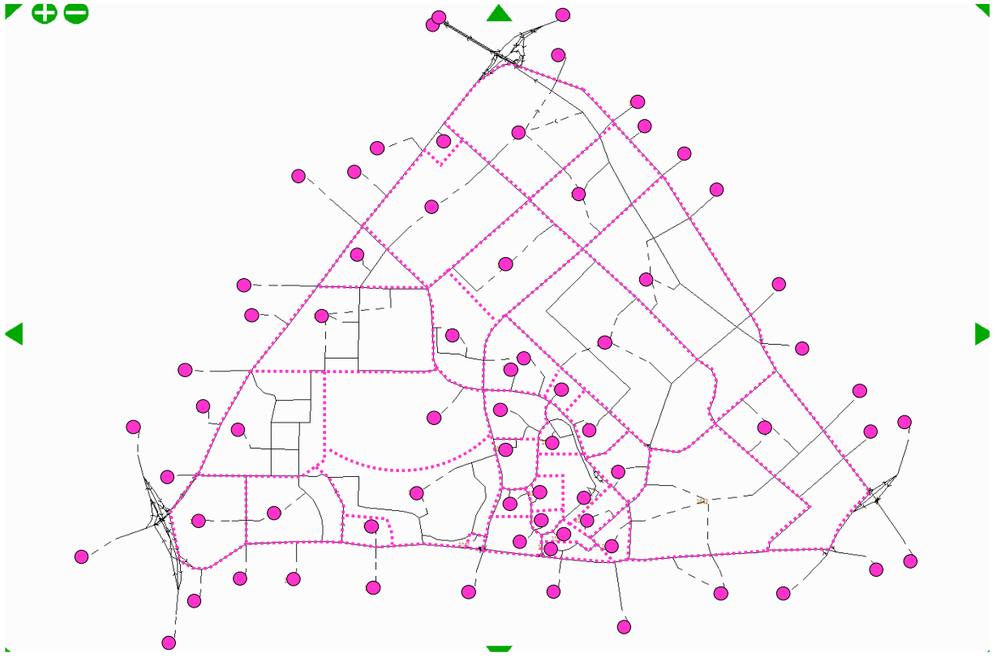


*Figure 51 Zone connectors - mesoscopic model for Activity Centre Plan (source: Aecom)*

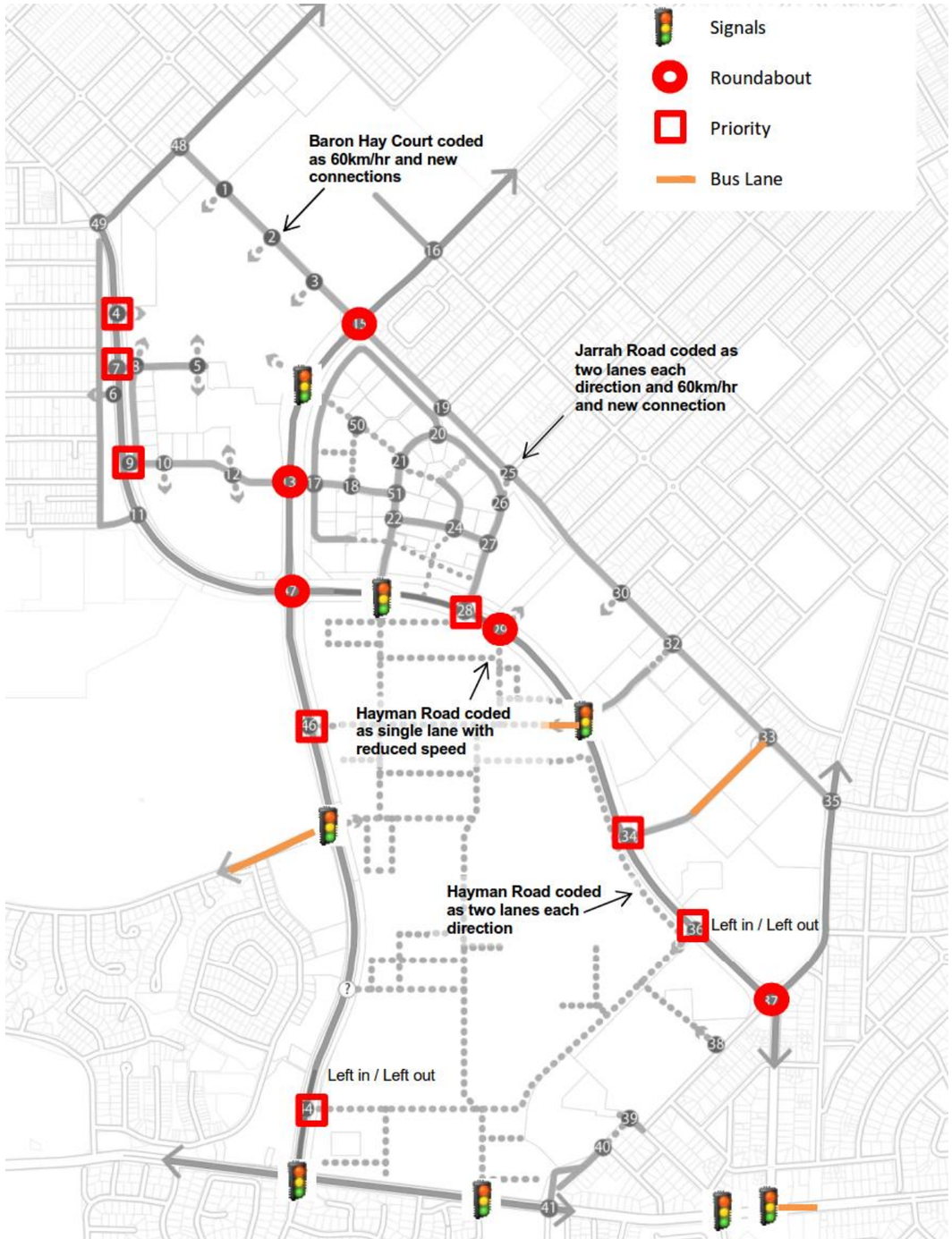



*Figure 52 Activity Centre network proposals (source: DoT – now DTMI)*

These proposals formed the basis for examination of the transport network associated with the Bentley Tech PSP. This approach is the basis of appropriate planning through the use of an approved network and agreed outcomes into a more refined level of planning. To unpick or undermine the strategic outcomes of the Activity Centre Plan would remove a key connection to a plan that has statutory approval through the WAPC.

## 5.3 PSP Modelling Approach

The approach to understanding the base and forecast year implications for the road network was as follows:

- Extract the relevant outputs from the Bentley-Curtin Transport Assessment including network volumes, intersection configuration and trip distribution for use within the PSP
- Collect relevant baseline information for the existing network using project details, resources including counts from Main Roads WA, City of South Perth information, Town of Victoria Park information and details set out within the assessment for the State Hockey Centre
- Undertake traffic generation and distribution exercise for the project to understand the forecast year inputs
- Develop intersection and network models within SIDRA 9.1 for the PSP area for the base year (2025) and ten year scenarios using a Low and Moderate land use set of parameters
- Reporting on the modelling outcomes.

The following sections cover these elements.

## 5.4 Model Inputs

The following were used as inputs to the modelling process for the Bentley Tech PSP:

- Forecast year network configuration and outputs from the Bentley-Curtin Activity Centre assessment, including link volumes and distribution proportions. Survey peak hour traffic data for local network supplemented in 2025
- Geometry of existing network based on Metromap measurements
- TrafficMap data from Main Roads WA for locations on the network on Kent Street and Hayman Road
- Historical traffic count data from Town of Victoria Park online resources (much of which was used in the 2016 Activity Centre assessment) and from City of South Perth information
- Details, including count information, from the State Hockey Centre Transport Assessment
- Information from the Curtin University Master Plan.

For the traffic distribution patterns, the Bentley-Curtin Transport Assessment had four zones which were included in the forecast year model, with the connectors evident in Figure 51. Distribution values were extracted from the model developed for the Activity Centre Plan and then refined based on the outcomes of the PSP project. The four zones (with original titling) and the distribution patterns are set out in Table 5. Only minor alterations were proposed for the distribution given the nature of plans for the PSP.

The existing TrafficMap data for the area is set out in Figure 20, with some turning movements for the internal road network picked up during the Activity Centre Plan supplemented with on-site observations in 2025. Town of Victoria Park information, shown in Figure 53 was used to examine daily flows rather than peak hour movements.

*Table 5 Vehicle trip origin and destination values - Bentley-Curtin Activity Centre Plan assessment*

| | AM (Model) | AM (Proposed) | PM (Model) | PM (Proposed) |
|---|---|---|---|---|
| **Tech 1 Origin** | 39% | 31% | 33% | 23% |
| **Tech 1 Destination** | 33% | 23% | 39% | 31% |
| **Tech 2 Origin** | 12% | 15% | 14% | 19% |
| **Tech 2 Destination** | 14% | 20% | 12% | 15% |
| **Tech 3 Origin** | 32% | 38% | 33% | 42% |
| **Tech 3 Destination** | 33% | 40% | 31% | 38% |
| **Tech 5 Origin** | 18% | 16% | 20% | 16% |
| **Tech 5 Destination** | 20% | 17% | 18% | 16% |

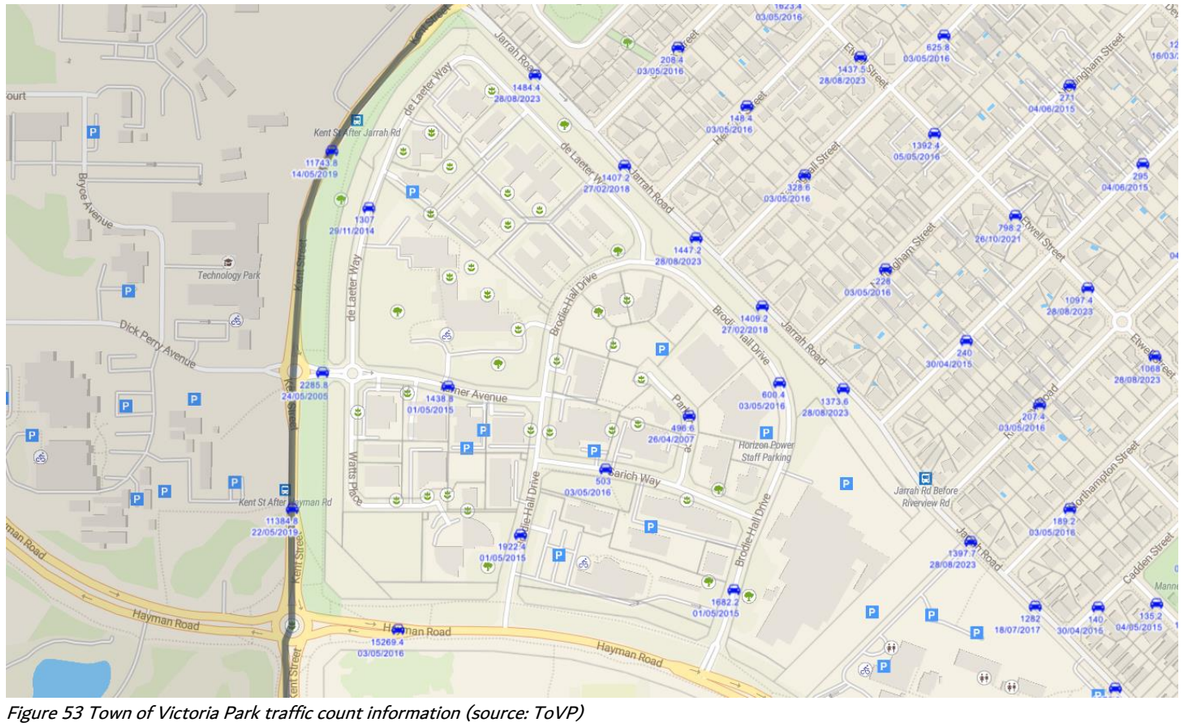



*Figure 53 Town of Victoria Park traffic count information (source: ToVP)*

The development application for the State Hockey Centre included a transport assessment which had collected counts for the network in November 2023. The locations on Hayman Road adjacent to the site are shown in Figure 54 although no count data was collected for Brodie Hall Drive. Given the time of these surveys, the highest values on the network between these counts and those on the Main Roads WA TrafficMap data were used, with values then smoothed or adjusted to reflect higher flows in peak months.

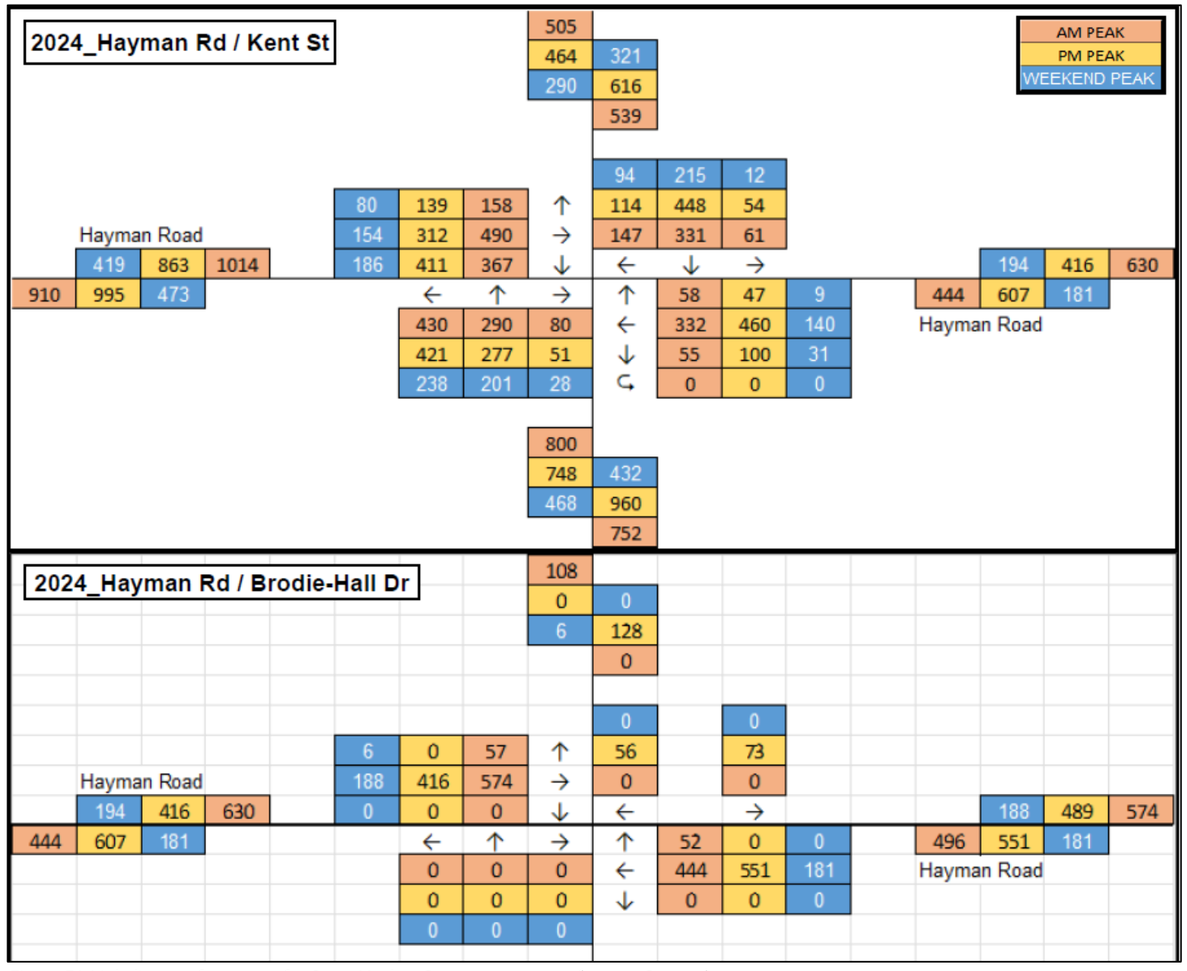



*Figure 54 Link diagram for counts for State Hockey Centre assessment (source: Stantec)*

## 5.5 Traffic Generation

The very nature of the existing land uses within the Bentley Tech PSP area and the future land uses being considered meant that undertaking a very refined traffic generation calculation was subject to potentially large fluctuations. Specialised research facilities, tertiary educational buildings and targeted manufacturing land uses are generally non-standard. Although the CSIRO and DBCA buildings in the western half of the site carry large administration functions, there are still non-standard activities present.

In order to provide a generalised understanding of traffic generation associated with an expansion in the Gross Floor Area of development in the PSP, a ratio of future traffic generation was developed using the existing traffic volumes for inbound and outbound movements alongside the potential expansion in floorspace being considered within two development scenarios – a low

scenario where there is only an additional 20,000m$^2$ of GFA added over ten years and a moderate scenario where over 125,000m$^2$ GFA is added.

Using these scenarios, alongside the existing traffic generation, allowed for the development of headline traffic generation values for the PSP which are set out in Table 6. Application of these traffic generation values for the scenarios are considered an appropriate analysis response for this stage of the planning process, with the potential for the moderate scenario being a conservative one in terms of potential land use outcomes.

*Table 6 Traffic generation for forecast scenarios by GFA*

| Trip Generation - Bentley Tech | GFA | Note | AM In | AM Out | PM In | PM Out |
|---|---|---|---|---|---|---|
| | | Existing traffic volumes | 758 | 281 | 274 | 621 |
| **Existing Floorspace** | 120,000 | Ratio of trips per Floorspace | 158 | 427 | 438 | 193 |
| **Future Floorspace - Low** | 140,000 | Additional Trips per Floorspace (forecast) | 126 | 47 | 46 | 104 |
| **Future Floorspace - Medium** | 255,000 | Additional Trips per Floorspace (forecast) | 853 | 316 | 308 | 699 |

## 5.6 Traffic Distribution

The broader distribution patterns, using the Bentley-Curtin Activity Centre Plan assessment distribution outcomes, are set out in Table 5. The more localised distribution was then taken from the existing movement patterns on the network as taken from observed values in 2025. Although this form of distribution does not take into account wider changes, the fact that trips were assigned to the entry point of the network based on the Bentley-Curtin Activity Centre Plan assessment means that the connection to the Activity Centre modelling was retained. AM patterns for the local network applied are shown in Figure 55 and PM peak in Figure 56.

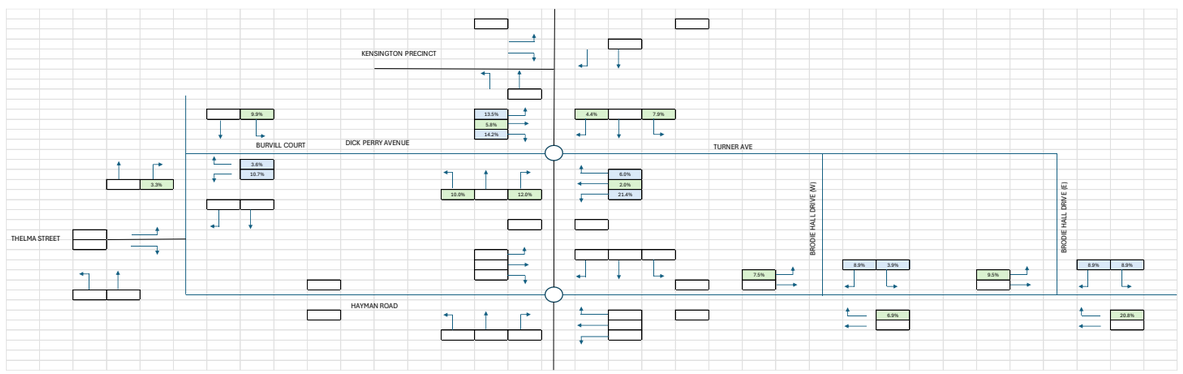



*Figure 55 AM peak hour distribution proportions for forecast scenarios*

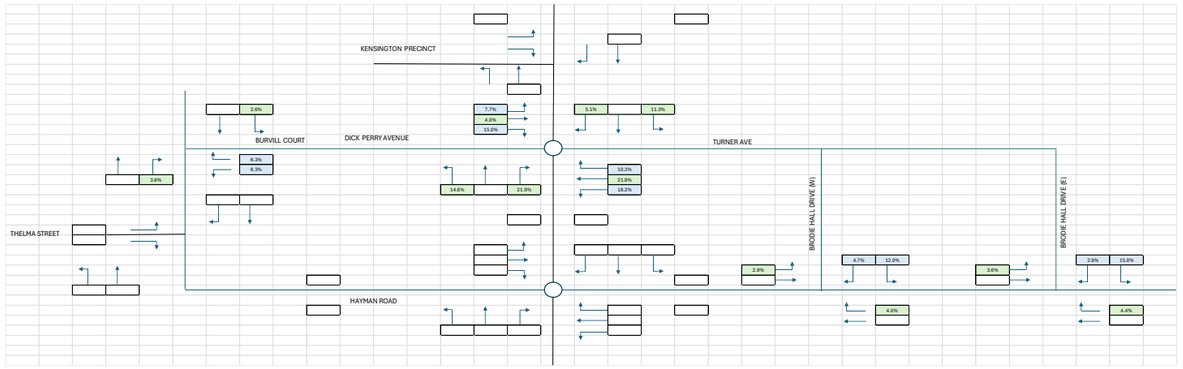



*Figure 56 PM peak hour distribution proportions for forecast scenarios*

## 5.7 Assessment Years and Time Periods

As set out, the base year modelling network was completed for 2025. The overall timeframe of the PSP is ten years, therefore both scenarios countenance a build out within that period, even though from a land use perspective the GFA outcomes set out in Table 6 may take longer to eventuate. The completion of this assessment is based on the requirements of the WAPC Guidelines and provides an indication of potential impacts.

The AM and PM peak hours were modelled for the network given the nature of the location and incidence of peak periods. The peak hour data fluctuated around the network, with data that reflected the highest recorded value utilised in the assessment to show very conservative outcomes in the analysis. Although there were variations, the typical AM peak hour was a 60 minute period between 7.00am and 9.00am and then the PM peak was a 60 minute period between 3.00pm and 6.00pm.

Using fluctuating peaks meant that values had to be adjusted in the networks to take into account differences in background volumes. This would not impact the outcomes of the assessment as the majority of cases this resulted in a conservative outcome. Where practical, the adjustments were made to through movements in the network and not turning movements in to smaller links.

## 5.8 Modelled Networks

There were two separate networks modelled for the assessment:

- 2025 base networks for AM and PM peaks, shown in Figure 57. This includes the existing network with external connections to Kent Street and Hayman Road, including a through connection from Burvill Court to Dick Perry Drive and Turner Avenue through the site. No internal street connections were modelled given low existing and expected flows
- Forecast year networks as shown in Figure 58. This includes the removal of Burvill Court and new eastern leg to the existing roundabout at the intersection of Thelma Street and Hayman Road. There is a new priority turn intersection for the Kensington Precinct to reflect potential demands from that project. Given the uncertainty of development form or nature of connectivity, this form of intersection was included in the modelling as a base case to understand implications for the PSP. The expectation would be that the actual form of connection would be analysed for that project as required. Given barriers

to development of the internal network considered within the Bentley-Curtin Activity Centre Plan, no through connection was modelled, with demands having to be contained within the existing regional road network connection along Kent Street.

The networks reflect the area adjacent to the PSP and do not consider intersections further away given the level of analysis in the Activity Centre Transport Assessment. For the forecast year, the schematic design of the intersection of Brodie Hall Drive, Karak Drive and Hayman Road considered within the State Hockey Centre Transport Impact Assessment was not included.

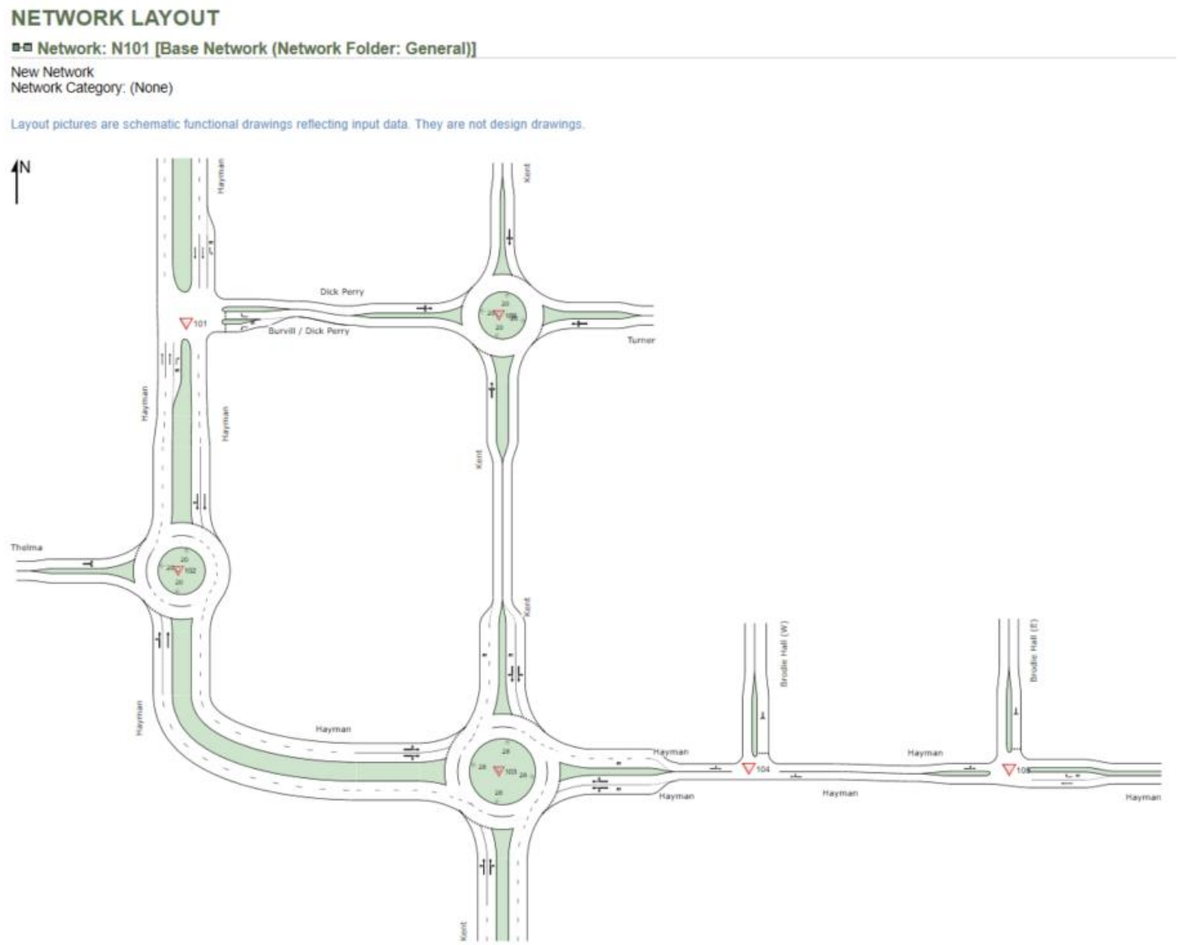



*Figure 57 Base network modelled for PSP (source: SIDRA)*


*Figure 58 Forecast year networks for PSP (source: SIDRA)*

## 5.9 2025 Base Year

Overall modelling outputs for the project, including the movement summaries for each intersection modelled are included within Appendix A. The results within the modelling exercise apply a range of traffic engineering parameters The headline results for the intersection performance for each of the peak hours is shown in Table 7 and Table 8.

In terms of the existing performance of the network, there are no issues evident in traffic engineering metrics for peak hour movements. The overall volumes for each intersection during both peak periods are high, reflecting the nature of the existing connections and sub-regional traffic flows. Each peak period is discussed in more detail in the following sub-sections.

*Table 7 AM 2025 model outputs for Bentley Tech PSP*

| AM 2025 | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Veh | Ave. Back of Queue – Dist. (m) | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Burvill** | 1516 | 10.9 | 1516 | 10.9 | 0.204 | 1.1 | NA | 0.2 | 1.5 | 0.03 | 0.06 | 0.03 | 62.3 |
| **Hayman and Thelma** | 2078 | 4 | 2078 | 4 | 0.419 | 6.9 | LOS A | 0.9 | 6.5 | 0.37 | 0.56 | 0.38 | 49.8 |
| **Hayman and Kent** | 2946 | 6.6 | 2946 | 6.6 | 0.645 | 8.4 | LOS A | 2.5 | 18.6 | 0.7 | 0.72 | 0.76 | 43.7 |
| **Hayman and Brodie Hall (W)** | 1198 | 7.1 | 1198 | 7.1 | 0.359 | 1.4 | NA | 0.3 | 2.3 | 0.1 | 0.16 | 0.1 | 53.6 |
| **Hayman and Brodie Hall (E)** | 1304 | 6.4 | 1304 | 6.4 | 0.332 | 2.1 | NA | 0.3 | 2.2 | 0.11 | 0.17 | 0.11 | 50.8 |
| **Kent and Turner** | 1324 | 5.3 | 1324 | 5.3 | 0.475 | 5.7 | LOS A | 1.4 | 10.5 | 0.44 | 0.5 | 0.44 | 46.8 |

*Table 8 PM 2025 model outputs for Bentley Tech PSP*

| PM 2025 | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Veh | Ave. Back of Queue – Dist. (m) | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Burvill** | 1260 | 6.3 | 1260 | 6.3 | 0.407 | 1.6 | NA | 0.5 | 3.7 | 0.04 | 0.05 | 0.05 | 56.8 |
| **Hayman and Thelma** | 2014 | 5.5 | 2014 | 5.5 | 0.492 | 7.2 | LOS A | 1.2 | 8.3 | 0.37 | 0.57 | 0.39 | 49.2 |
| **Hayman and Kent** | 2983 | 6.8 | 2983 | 6.8 | 0.458 | 8.1 | LOS A | 1.2 | 8.5 | 0.68 | 0.71 | 0.73 | 43.8 |
| **Hayman and Brodie Hall (W)** | 1164 | 7.1 | 1164 | 7.1 | 0.332 | 1 | NA | 0.2 | 1.6 | 0.07 | 0.09 | 0.07 | 55.2 |
| **Hayman and Brodie Hall (E)** | 1260 | 7.1 | 1260 | 7.1 | 0.328 | 1 | NA | 0.3 | 2 | 0.07 | 0.09 | 0.07 | 54.1 |
| **Kent and Turner** | 1376 | 3.4 | 1376 | 3.4 | 0.397 | 5.5 | LOS A | 1.2 | 8.5 | 0.52 | 0.51 | 0.52 | 45.8 |

### 5.9.1 AM 2025 model outcomes

The movement demand flows for the overall network are shown in Figure 59. This reflects volumes for the average existing AM peak hour for all movement classes and the demand flows modelled for each intersection approach.

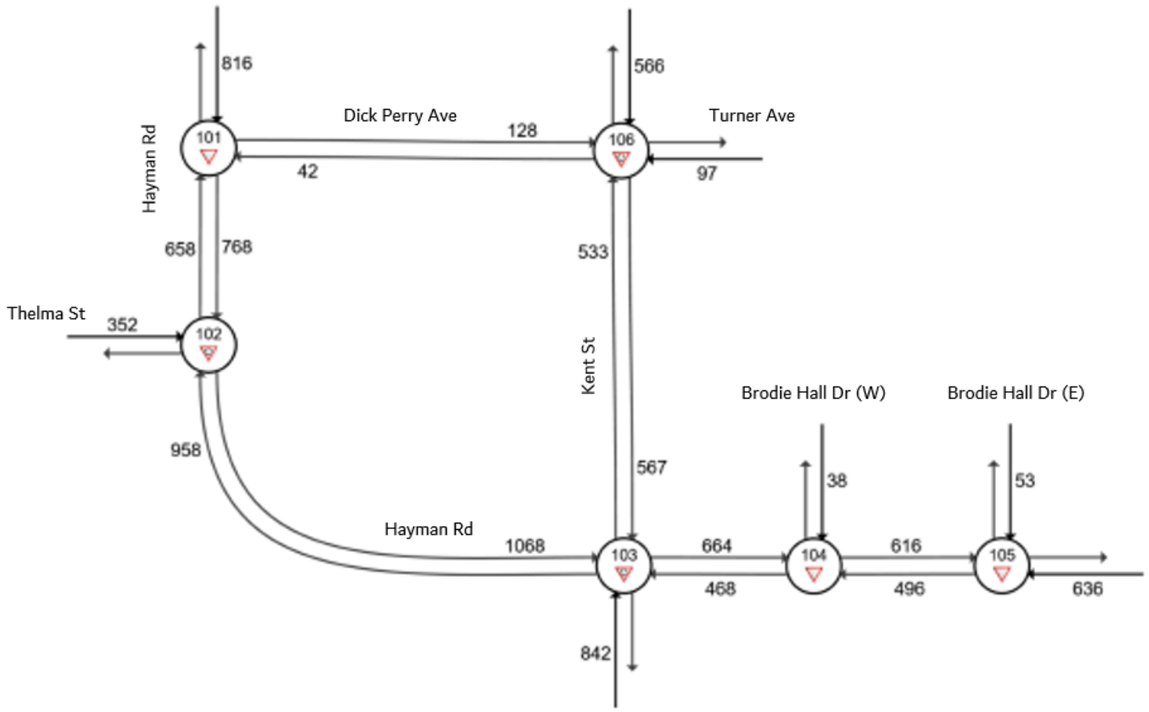



*Figure 59 AM 2025 peak hour movement flows (all classes) (source: SIDRA)*

The Level of Service (LoS) outputs for each approach for the 2025 AM peak hour are shown in Figure 60 and the Degree of Saturation (DoS) outputs are shown in Figure 61. For the LoS indicators, the two notable approaches are Burvill Court to Hayman Road and Brodie Hall Drive (East) to Hayman Road.

The Burvill Court intersection right hand turn movement fails due to the delays resulting from through movements on Hayman Road. This is a result of the coding of the intersection as one movement rather than a split turn. The delay at that intersection for those 10 right hand turn vehicles moves the overall approach to an LoS measurement of LoS C. The right hand turn movement out of Brodie Hall Drive (East) also results in a delay and this underpins the importance of having two exits for Brodie Hall Drive on to Hayman Road.

The DoS along Hayman Road towards Kent Street is notable and simply a result of heavy eastbound flows towards Curtin University and Manning Road in the morning.

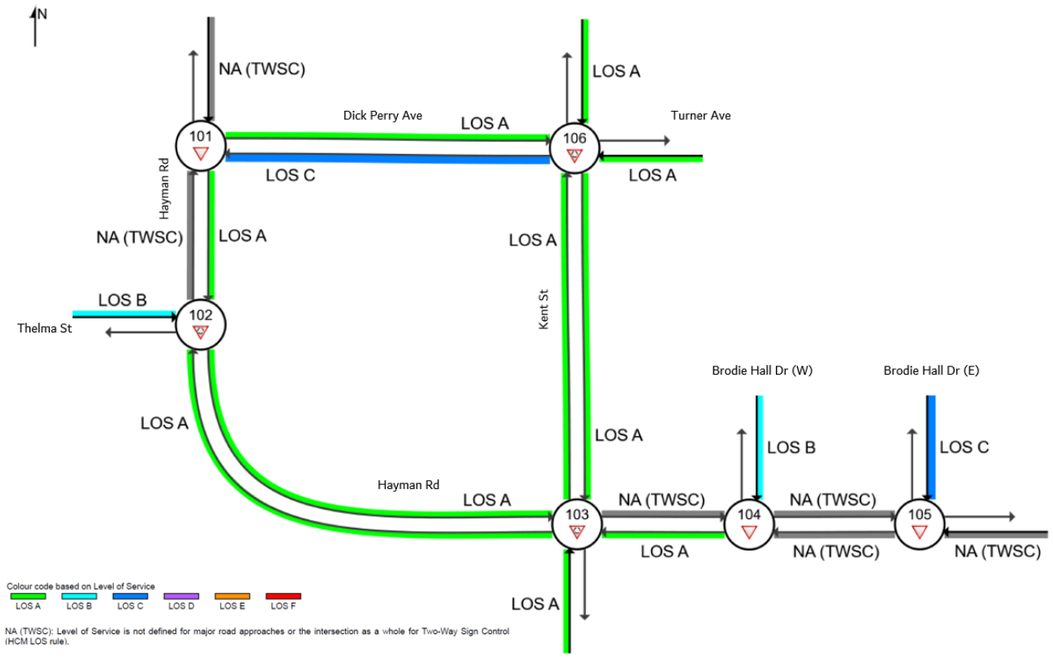



*Figure 60 AM peak hour LoS outputs for approach (source: SIDRA)*

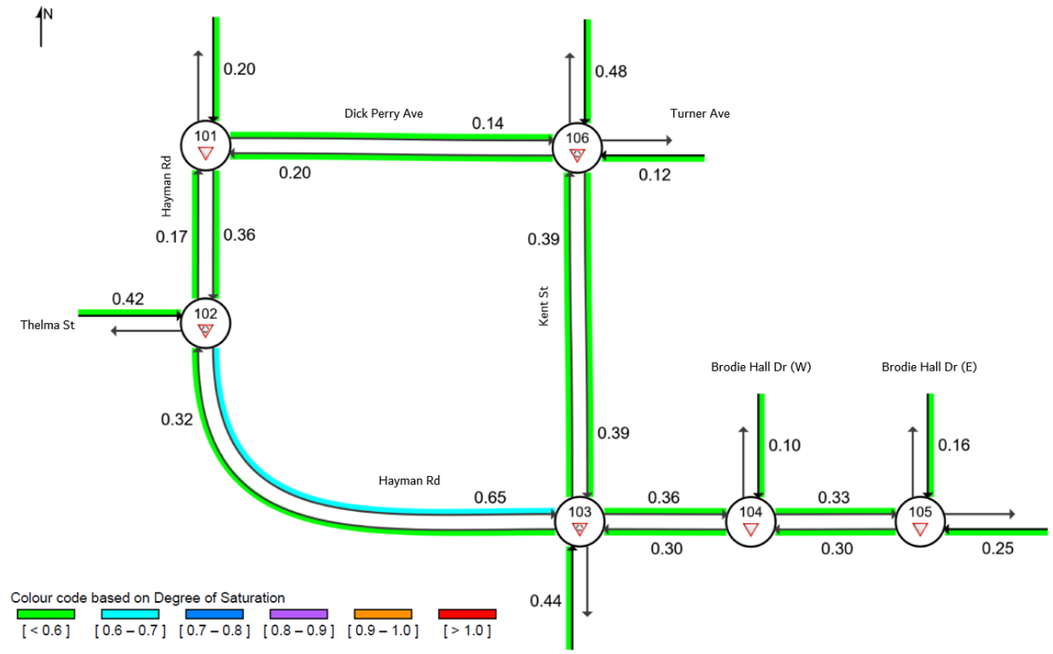



*Figure 61 AM peak hour DoS outputs for approach (source: SIDRA)*

### 5.9.2 PM 2025 model outcomes

The movement demand flows for the overall network are shown in Figure 62. This reflects volumes for the average existing AM peak hour for all movement classes and the demand flows modelled for each intersection approach.

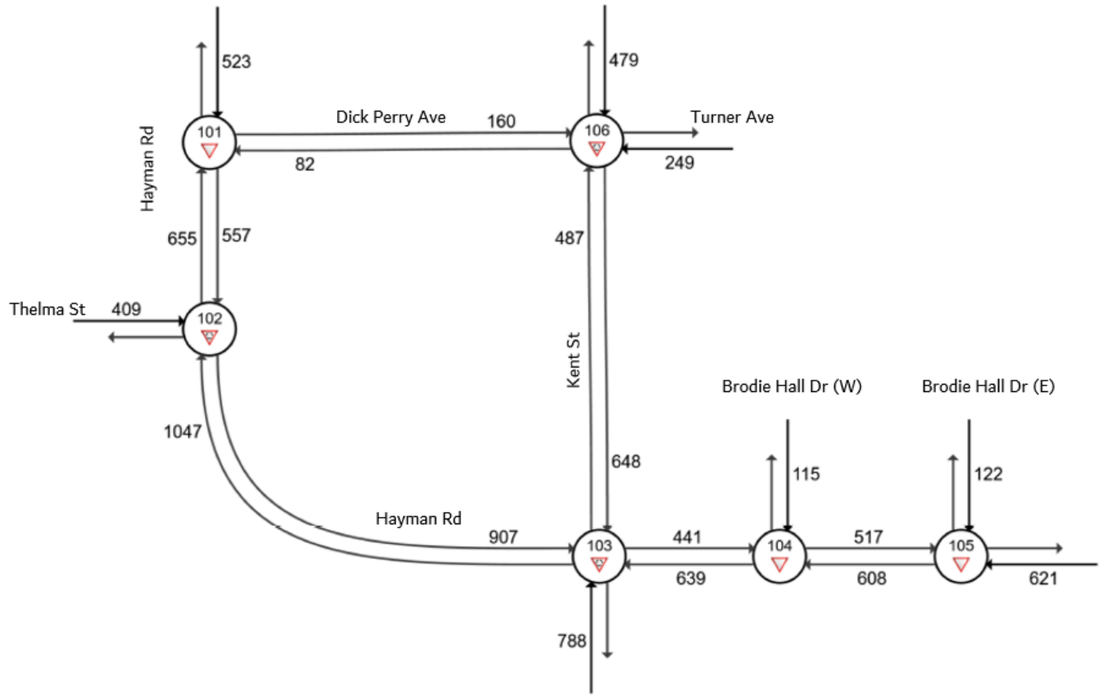



*Figure 62 PM 2025 peak hour movement flows (all classes) (source: SIDRA)*

The LoS outputs for each approach for the 2025 PM peak hour are shown in Figure 63 and the DoS outputs are shown in Figure 64. For the LoS indicators, the notable approach is Burvill Court to Hayman Road.

As with the AM peak period, the volumes of traffic turning right are low but the Burvill Court intersection right hand turn movement fails due to the delays resulting from through movements on Hayman Road. This is a result of the coding of the intersection as one movement rather than a split turn.

The delay at that intersection for those 41 right hand turn vehicles moves the overall approach to an LoS measurement of LoS C and an individual LoS of E.

There are no notable issues with Degree of Saturation for any of the approaches within the PM 2025 peak hour.

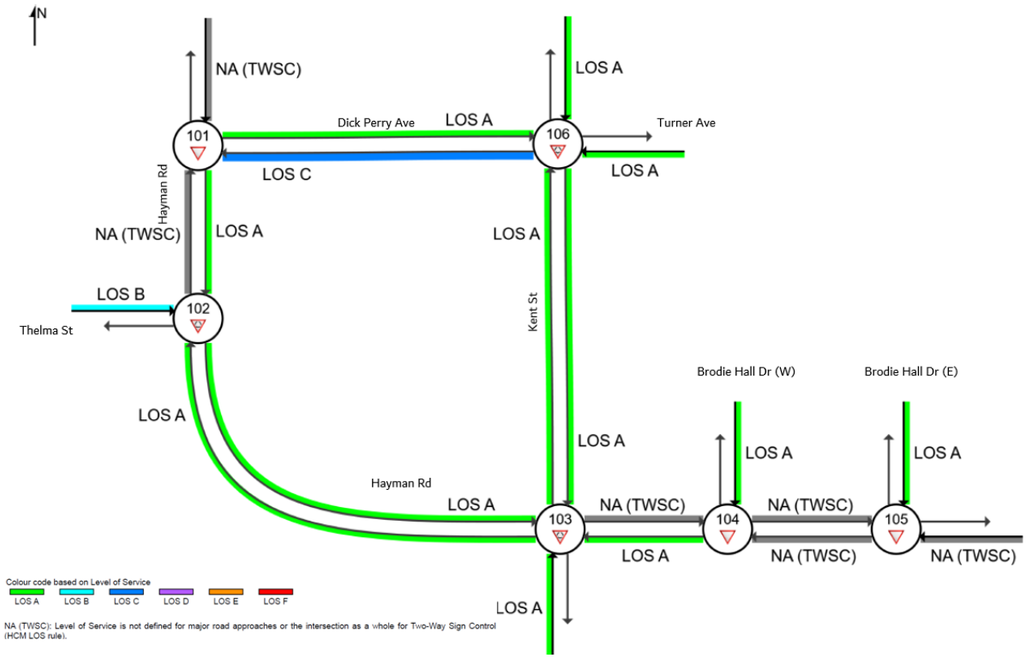



*Figure 63 PM peak hour LoS outputs for approach (source: SIDRA)*

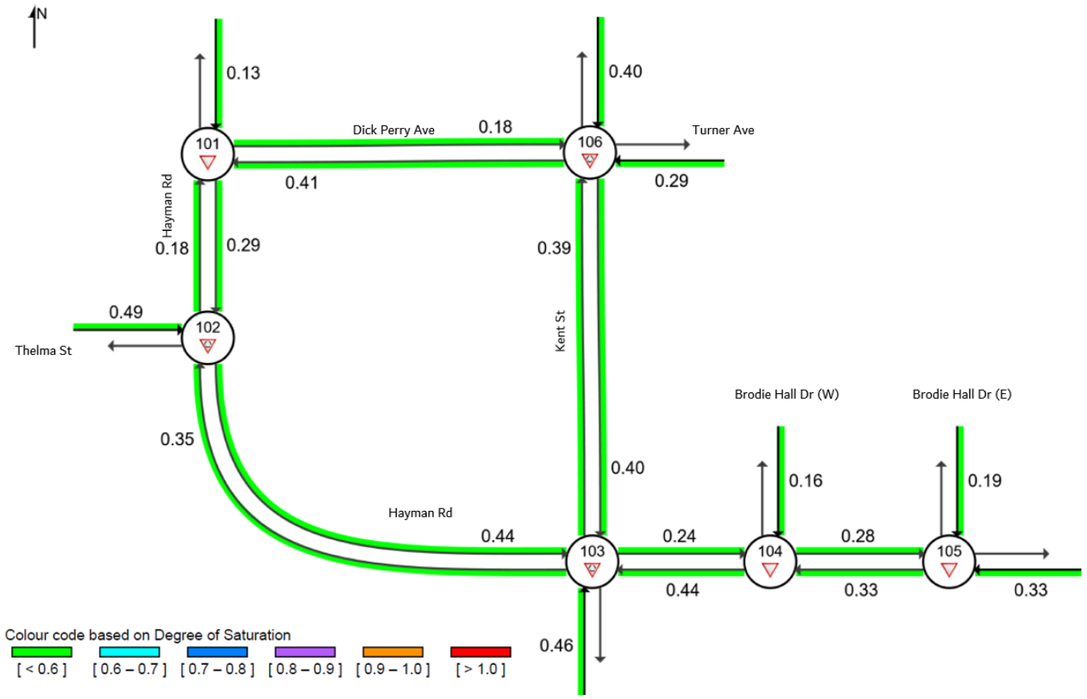



*Figure 64 PM peak hour DoS outputs for approach (source: SIDRA)*

## 5.10 Forecast Year Outputs – Low Development Scenario

The forecast year Low development scenario adds on an additional 20,000m$^2$ GFA within the PSP area. Given the analysis for the 2025 base year, which indicated that the network was performing well within traffic engineering metrics, the addition of a relatively small volume of additional land use in the context of the area should not see substantial impacts.

For the forecast year scenarios, the intersection at Burvill Court has been replaced with a new eastern arm to the roundabout at the Thelma Road intersection. Through movements on to the eastern arm consisted of the existing turning movement on Burvill Court as well as the predicted growth. For overall network background growth, a 5% uplift in 2025 peak volumes was included.

The overall network model outputs for intersection approaches for the Low development scenario in the average AM peak hour are set out in Table 9 with the PM peak hour shown in Table 10. As can be seen, none of the underlying outcomes for the network see a deterioration in traffic engineering performance levels and none of the approaches to the intersections result in any issues when compared to the 2025 analysis.

*Table 9 AM Low Scenario model outputs for Bentley Tech PSP*

| AM Low Scenario | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Veh | Ave. Back of Queue – Dist. (m) | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Thelma** | 2358 | 3.2 | 2358 | 3.2 | 0.475 | 7.3 | LOS A | 1.2 | 8.4 | 0.44 | 0.59 | 0.46 | 53.9 |
| **Hayman and Kent** | 3275 | 5.5 | 3275 | 5.5 | 0.754 | 9.8 | LOS A | 3.9 | 28.4 | 0.78 | 0.8 | 0.93 | 42.3 |
| **Hayman and Brodie Hall (W)** | 1307 | 4.5 | 1307 | 4.5 | 0.382 | 1.8 | NA | 0.4 | 3.2 | 0.12 | 0.18 | 0.13 | 52.6 |
| **Hayman and Brodie Hall (E)** | 1428 | 3.1 | 1428 | 3.1 | 0.346 | 2.5 | NA | 0.4 | 3 | 0.12 | 0.2 | 0.13 | 49.5 |
| **Kent and Turner** | 1573 | 3.6 | 1573 | 3.6 | 0.566 | 6 | LOS A | 1.9 | 13.6 | 0.51 | 0.53 | 0.51 | 40.5 |
| **Kent and Kensington** | 1260 | 4.3 | 1260 | 4.3 | 0.32 | 2 | NA | 0.4 | 3 | 0.08 | 0.12 | 0.08 | 51.4 |

*Table 10 PM Low Scenario model outputs for Bentley Tech PSP*

| PM Scenario | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Veh | Ave. Back of Queue – Dist. (m) | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Thelma** | 2246 | 3.4 | 2246 | 3.4 | 0.561 | 7.7 | LOS A | 1.5 | 10.7 | 0.47 | 0.61 | 0.51 | 52.9 |
| **Hayman and Kent** | 3305 | 5.6 | 3305 | 5.6 | 0.532 | 9 | LOS A | 1.5 | 11.2 | 0.75 | 0.78 | 0.86 | 43.2 |
| **Hayman and Brodie Hall (W)** | 1254 | 4.5 | 1254 | 4.5 | 0.349 | 1.2 | NA | 0.3 | 2.1 | 0.08 | 0.11 | 0.08 | 54.5 |
| **Hayman and Brodie Hall (E)** | 1366 | 3.4 | 1366 | 3.4 | 0.341 | 1.3 | NA | 0.4 | 3 | 0.08 | 0.1 | 0.09 | 53 |
| **Kent and Turner** | 1643 | 3.4 | 1643 | 3.4 | 0.487 | 6.1 | LOS A | 1.6 | 11.8 | 0.62 | 0.56 | 0.62 | 38.3 |
| **Kent and Kensington** | 1265 | 4.3 | 1265 | 4.3 | 0.299 | 2 | NA | 0.4 | 3 | 0.08 | 0.12 | 0.09 | 51.8 |

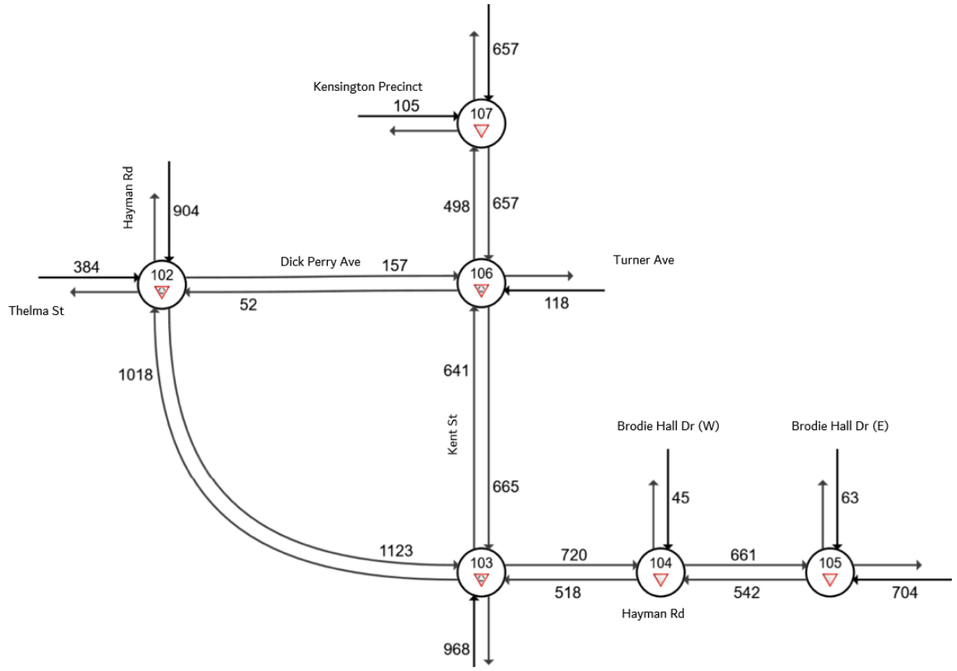



*Figure 65 AM forecast low scenario peak hour movement flows (all classes) (source: SIDRA)*

### 5.10.1 AM low scenario model outcomes

The movement demand flows for the overall AM low scenario network are shown in Figure 65. This reflects volumes calculated for each link based on the traffic generation and distribution for this scenario and the demand flows modelled for each intersection approach. The LoS outputs for each approach for the AM low scenario forecast network are shown in Figure 66 and the DoS outputs are shown in Figure 67.

For the LoS indicators, none of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions. Some additional delays are noted for some approaches when compared to the AM 2025 base outputs. The new intersection coded for the Kensington Precinct includes a right hand turn movement which is an LoS D. This indicates that planning and design of that intersection may require additional management controls if the volumes are expected to be higher than the nominal 50 movements per turn that have been included in this modelling assessment.

In addition, the right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

There are no notable issues with DoS for any of the approaches within the AM low scenario peak hour although the increase in traffic volumes along Hayman Road and the additional background movements indicates that the overall performance of that link would reduce.

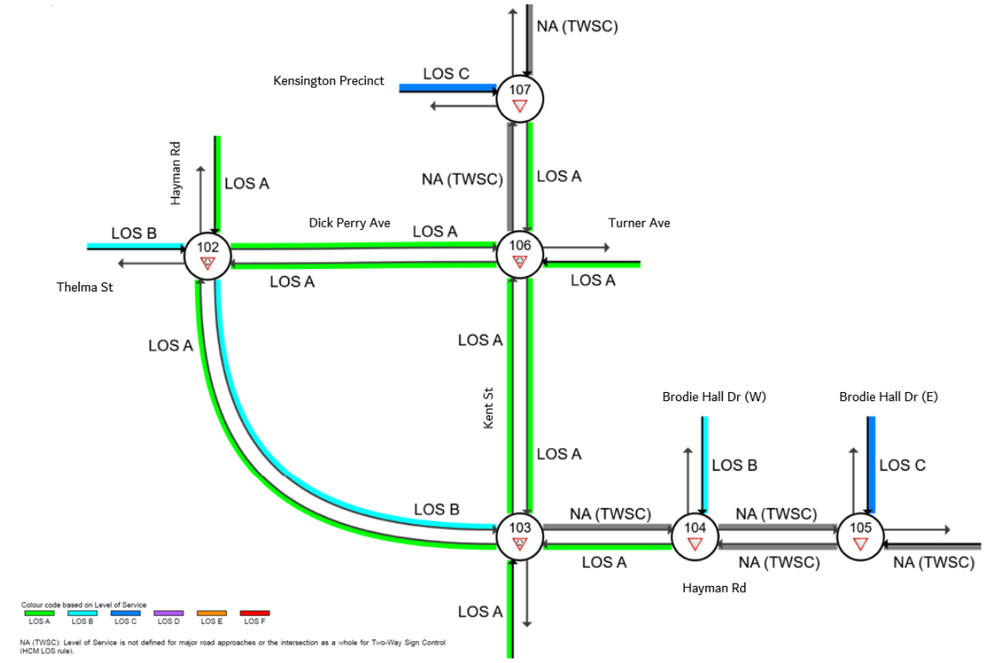



*Figure 66 AM forecast low scenario peak hour LoS outputs for approach (source: SIDRA)*

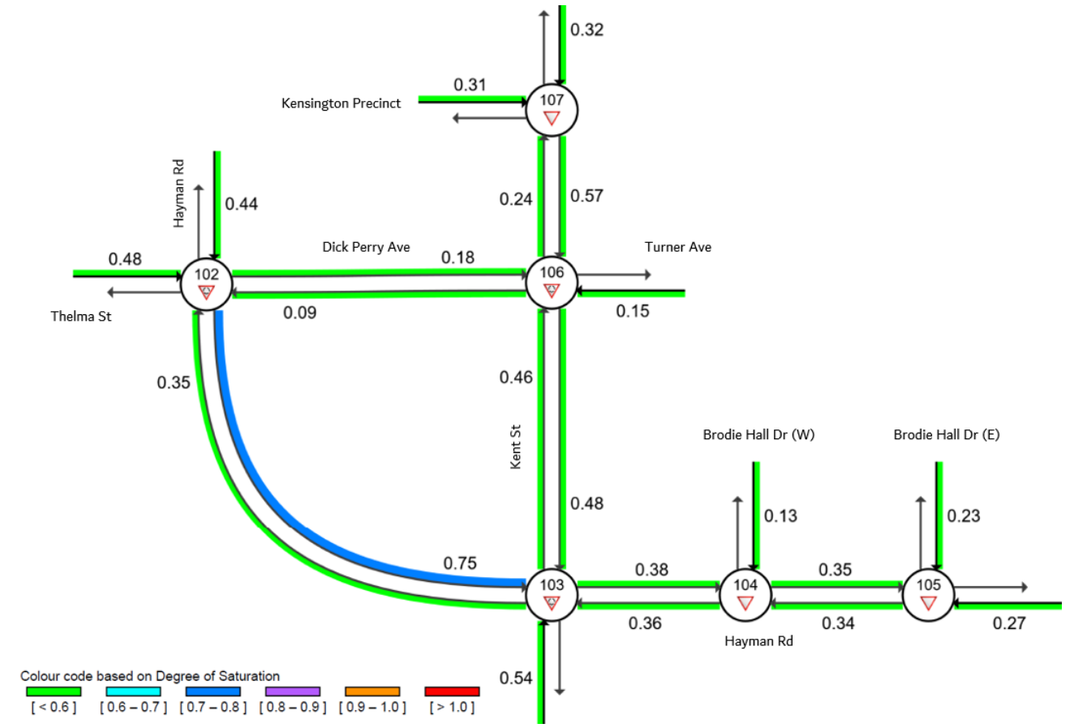



*Figure 67 AM forecast low scenario peak hour DoS outputs for approach (source: SIDRA)*

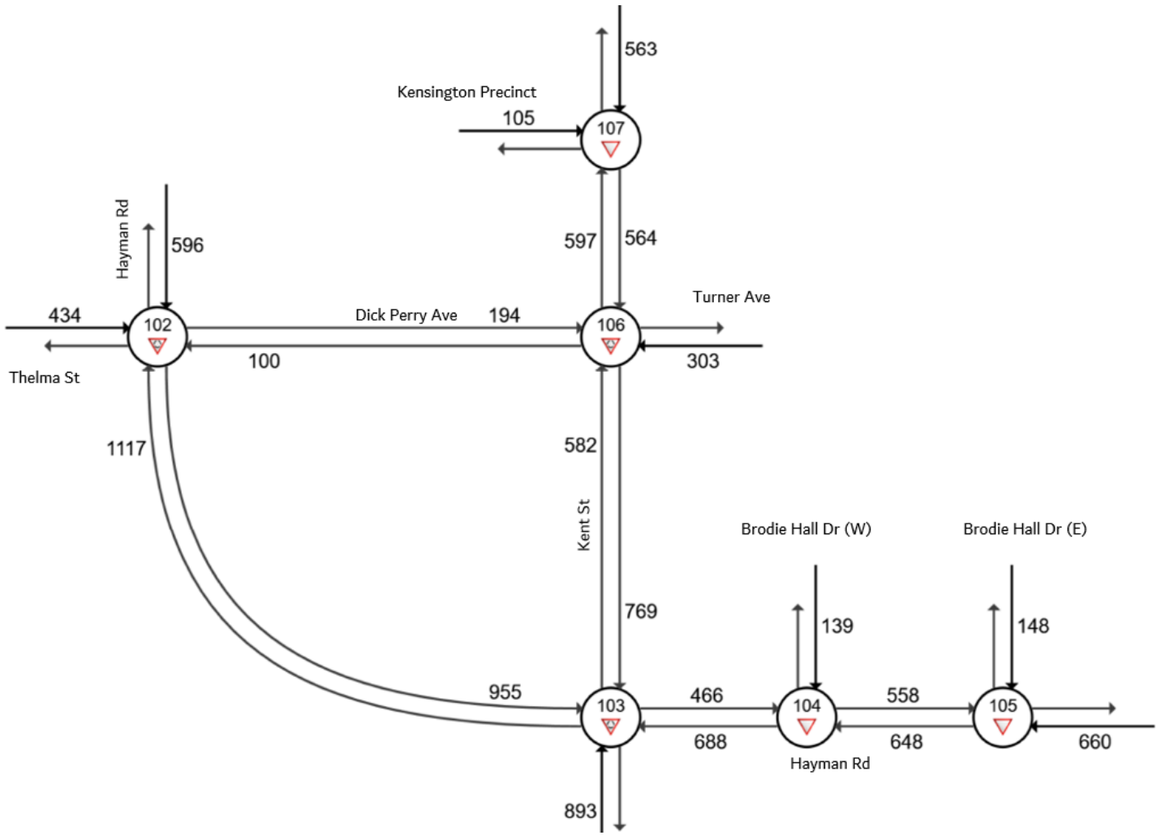



*Figure 68 PM forecast low scenario peak hour movement flows (all classes) (source: SIDRA)*

### 5.10.2 PM low scenario model outcomes

The movement demand flows for the overall PM low scenario network are shown in Figure 68. This reflects volumes calculated for each link based on the traffic generation and distribution for this scenario and the demand flows modelled for each intersection approach. The LoS outputs for each approach for the PM low scenario forecast network are shown in Figure 69 and the DoS outputs are shown in Figure 70.

For the LoS indicators, none of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions during the PM peak. As with the AM peak hour, the new intersection coded for the Kensington Precinct includes a right hand turn movement which is an LoS D. This indicates that planning and design of that intersection may require additional management controls if the volumes are expected to be higher than the nominal 50 movements per turn that have been included in this modelling assessment.

In addition, as with the AM peak hour, the right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

There are no notable issues with DoS for any of the approaches within the AM low scenario peak hour although the increase in traffic volumes along Hayman Road and the additional background movements indicates that the overall performance of that link would reduce.

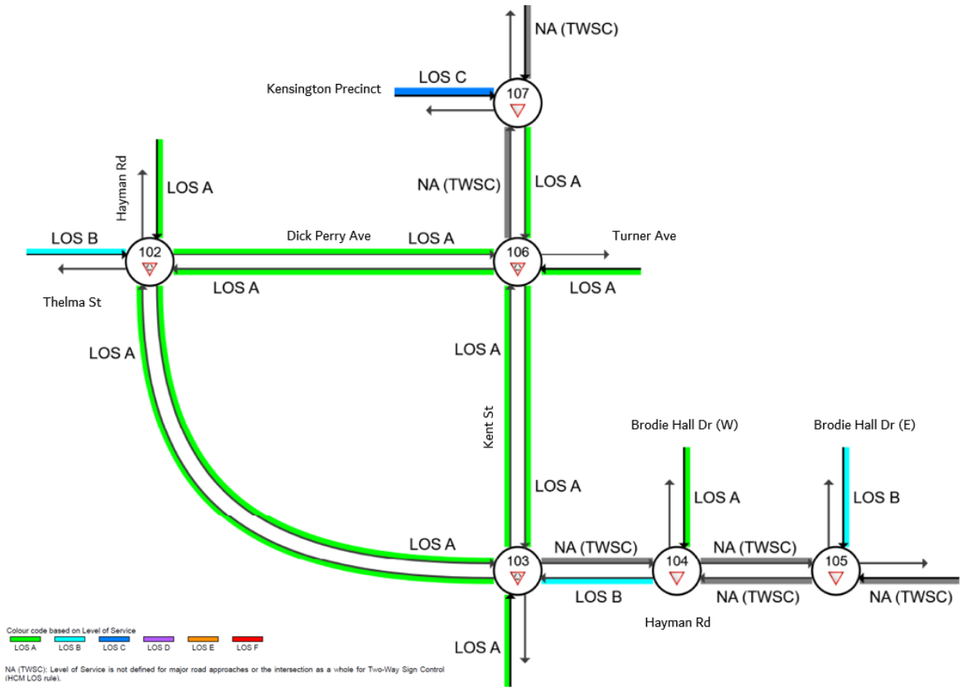



*Figure 69 PM forecast low scenario peak hour LoS outputs for approach (source: SIDRA)*

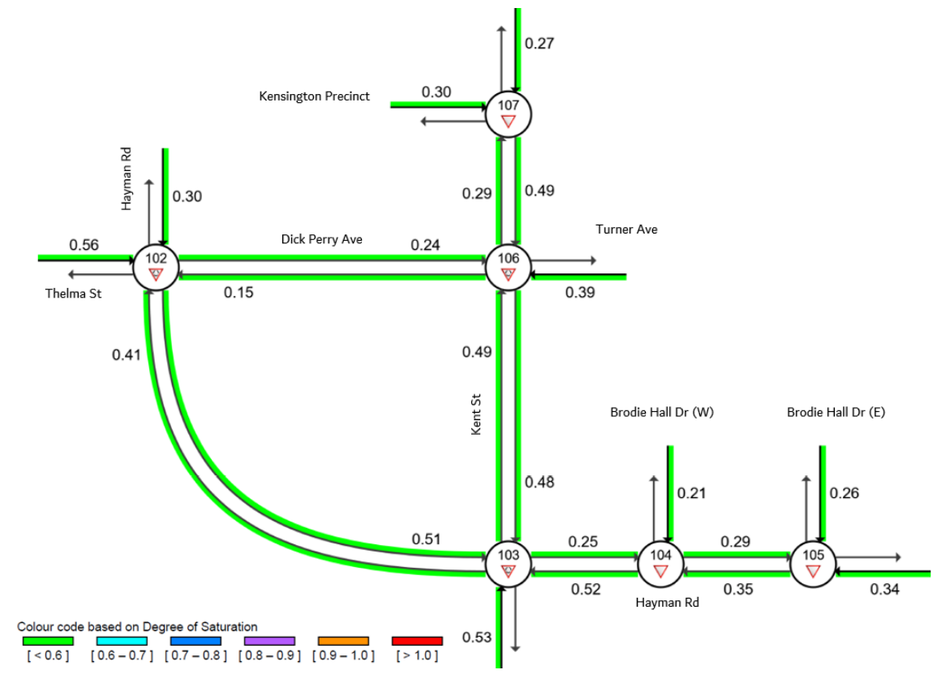



*Figure 70 PM forecast low scenario peak hour DoS outputs for approach (source: SIDRA)*

## 5.11 Forecast Year Outputs – Moderate Development Scenario

The forecast year moderate development scenario adds an additional 135,000m$^2$ GFA within the PSP area, which is a substantial uplift in development over the course of the PSP. Traffic estimated to be generated from that level of development has been added on to the 2025 volumes alongside a 5% background traffic uplift.

As with the low forecast scenario, the intersection at Burvill Court has been replaced with a new eastern arm to the roundabout at the Thelma Road intersection. Through movements on to the eastern arm consisted of the existing turning movement on Burvill Court as well as the predicted growth.

The overall network model outputs for intersection approaches for the moderate development scenario in the average AM peak hour are set out in Table 11 with the PM peak hour shown in Table 12. As can be seen, there is a general reduction in network performance for some intersections, with the DoS at the Hayman and Kent Street roundabout being notable for very high outcomes in the AM and the intersection of Kent Street and Turner Ave also approaching high levels of saturation that would see levels of congested conditions.

The AM and PM peak outcomes for the scenario are discussed in the following sub-sections.

*Table 11 AM moderate scenario model outputs for Bentley Tech PSP*

| AM Moderate Scenario | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Ve | Ave. Back of Queue – Di | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Thelma** | 2649 | 3.1 | 2649 | 3.1 | 0.616 | 8.4 | LOS A | 1.7 | 12.4 | 0.56 | 0.66 | 0.63 | 52.8 |
| **Hayman and Kent** | 3718 | 5.5 | 3718 | 5.5 | 1.009 | 21.9 | LOS C | 15 | 109.8 | 0.88 | 1.18 | 1.67 | 31.8 |
| **Hayman and Brodie Hall (W)** | 1603 | 4.3 | 1598 | 4.3 | 0.491 | 4.2 | NA | 1.6 | 11.6 | 0.21 | 0.3 | 0.35 | 46.4 |
| **Hayman and Brodie Hall (E)** | 1774 | 2.9 | 1770 | 2.9 | 0.626 | 5.4 | NA | 1.2 | 8.5 | 0.21 | 0.34 | 0.33 | 42.8 |
| **Kent and Turner** | 2053 | 3.1 | 2051 | 3.1 | 0.771 | 9.1 | LOS A | 4.4 | 31.8 | 0.77 | 0.7 | 0.88 | 36.4 |
| **Kent and Kensington** | 1409 | 4.4 | 1409 | 4.4 | 0.435 | 2.4 | NA | 0.6 | 4.3 | 0.07 | 0.11 | 0.08 | 50.6 |

*Table 12 PM moderate scenario model outputs for Bentley Tech PSP*

| PM Moderate Scenario | Demand Flows | Total HV % | Arrival Flows | Total HV % | Degree Saturation | Average Delay | Level of Service | Ave. Back of Queue - Veh | Ave. Back of Queue – Dist. (m) | Proportion Queued | Effective Stop Rate | Average no. of Cycles | Average Speed km/hr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hayman and Thelma** | 2464 | 3.4 | 2464 | 3.4 | 0.651 | 8.5 | LOS A | 2 | 14.4 | 0.58 | 0.66 | 0.64 | 52.2 |
| **Hayman and Kent** | 3705 | 5.6 | 3705 | 5.6 | 0.705 | 11.5 | LOS B | 2.4 | 18 | 0.85 | 0.9 | 1.11 | 40.7 |
| **Hayman and Brodie Hall (W)** | 1442 | 4.2 | 1442 | 4.2 | 0.406 | 2.2 | NA | 0.8 | 5.7 | 0.14 | 0.2 | 0.19 | 50.7 |
| **Hayman and Brodie Hall (E)** | 1617 | 3.3 | 1617 | 3.3 | 0.556 | 2.8 | NA | 1.2 | 8.9 | 0.14 | 0.2 | 0.23 | 48.2 |
| **Kent and Turner** | 2182 | 2.9 | 2182 | 2.9 | 0.813 | 12.3 | LOS B | 5 | 35.6 | 0.88 | 0.97 | 1.18 | 31.1 |
| **Kent and Kensington** | 1424 | 4.4 | 1424 | 4.4 | 0.436 | 2.5 | NA | 0.6 | 4.3 | 0.08 | 0.12 | 0.09 | 51.2 |

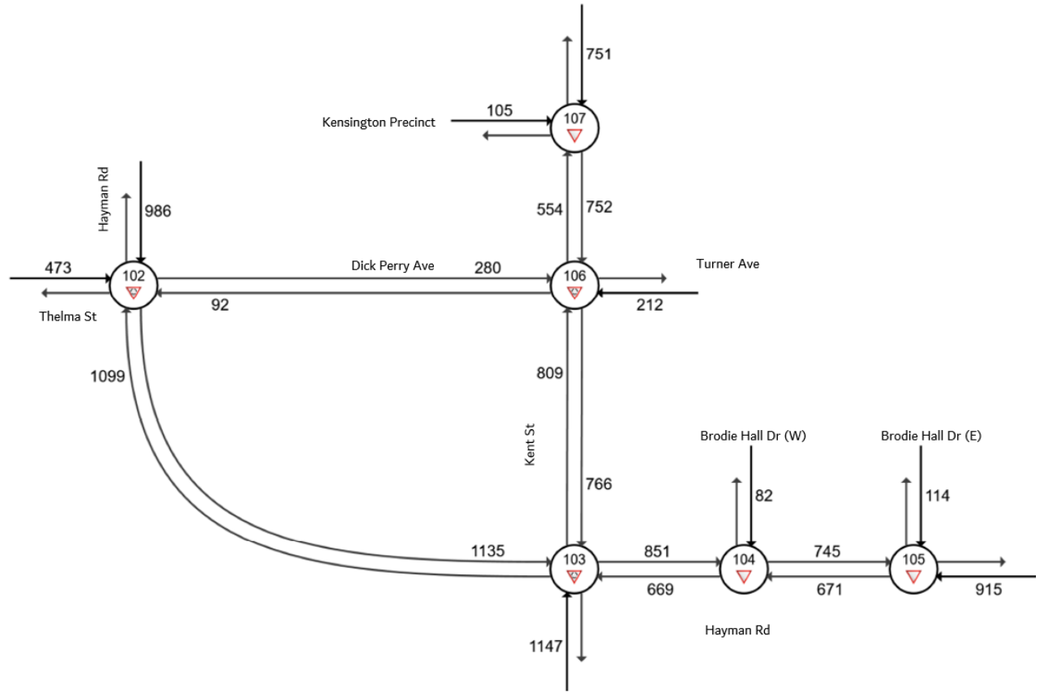



*Figure 71 AM forecast moderate scenario peak hour movement flows (all classes) (source: SIDRA)*

### 5.11.1 AM moderate scenario model outcomes

The movement demand flows for the overall AM moderate scenario network are shown in Figure 71. This reflects volumes calculated for each link based on the traffic generation and distribution for this scenario and the demand flows modelled for each intersection approach. The LoS outputs for each approach for the AM moderate scenario forecast network are shown in Figure 72 and the DoS outputs are shown in Figure 73.

For LoS, there are a range of impacts on the network in comparison to the low forecast scenario, being:

- Reduction in the LoS on the Hayman Road approach to Kent Street from LoS B to LoS D
- Reduction in the LoS on the Brodie Hall (West) approach to Hayman Road from LoS B to LoS C
- Reduction in the LoS on the Brodie Hall (East) approach to Hayman Road from LoS C to LoS E
- Reduction in LoS on approaches along Kent Street from LoS A to LoS B
- Dick Perry Ave approach to Kent Street going from LoS A to LoS B.

Although the more minor changes in LoS for local street intersections would not necessarily be seen as significant, the impacts along Hayman Road are more evident. The right hand turn off Brodie Hall Drive (East) fails in this scenario, and turning movements off the Kensington Precinct are a LoS E. The approach lanes on Hayman Road at Kent Street are LoS E which is a significant impact on the overall network.

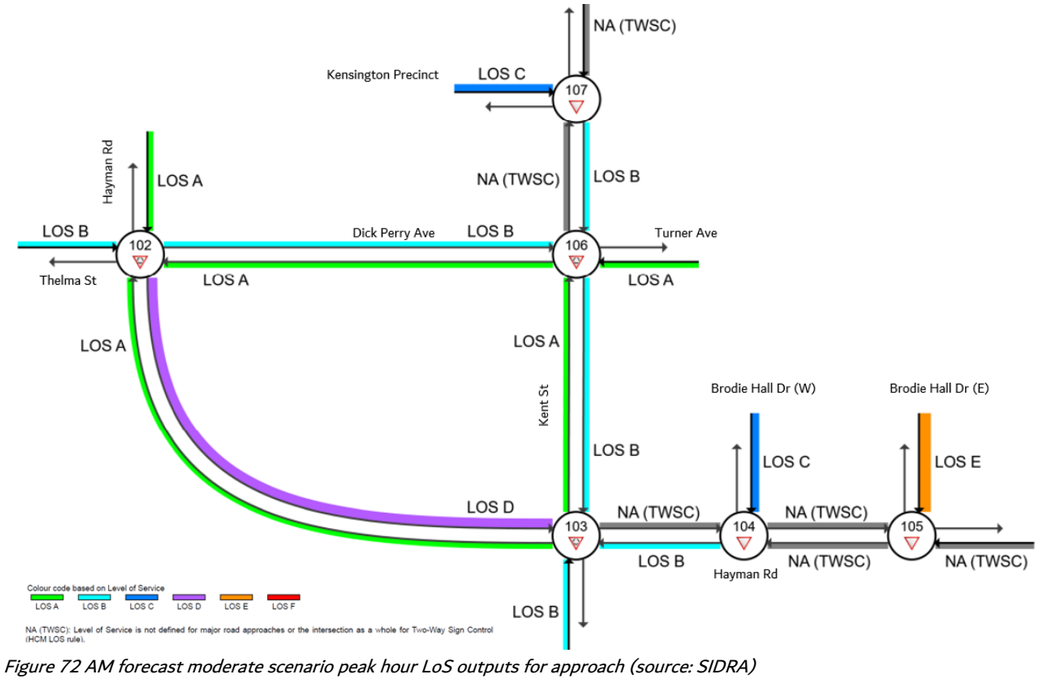



*Figure 72 AM forecast moderate scenario peak hour LoS outputs for approach (source: SIDRA)*

The poor performance of the Hayman Road approach to Kent Street is indicated in the DoS outputs for this scenario where that approach has a DoS of over 1. This results in a queue during peak hour of 100m+ distance and an average delay of over a minute to complete a through movement or left hand turn at the intersection.

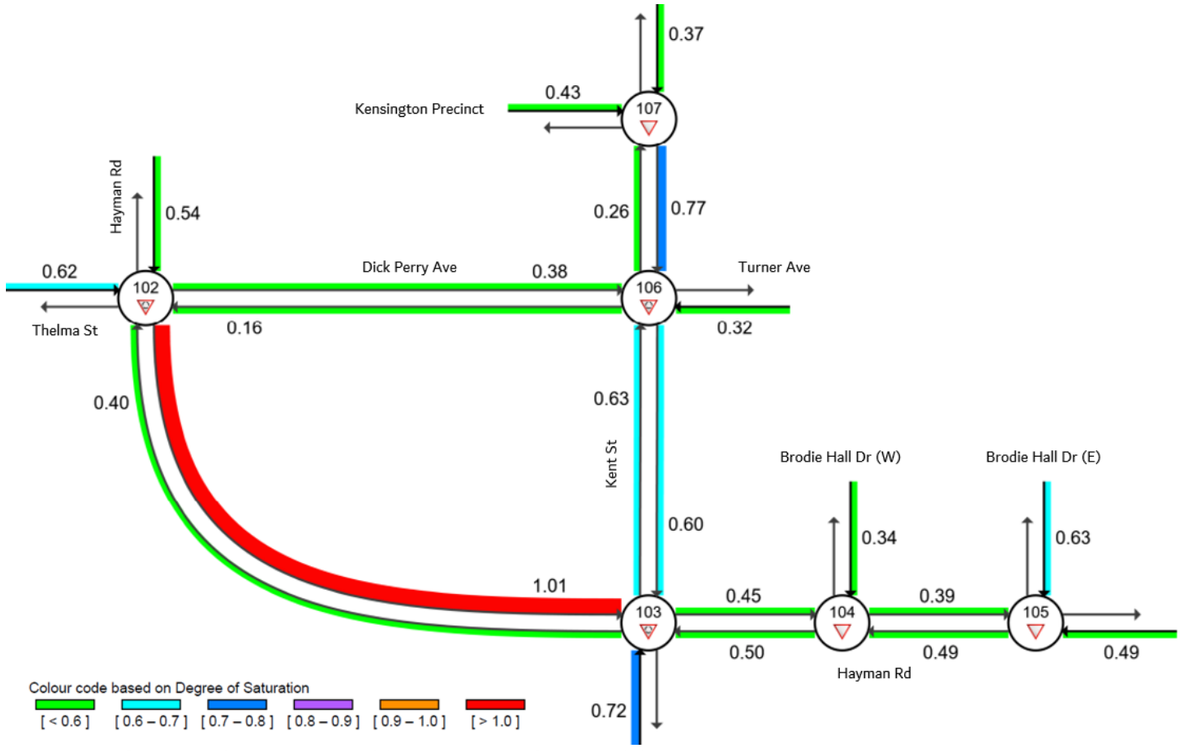



*Figure 73 AM forecast moderate scenario peak hour DoS outputs for approach (source: SIDRA)*

### 5.11.2 PM moderate scenario model outcomes

The movement demand flows for the overall PM moderate scenario network are shown in Figure 74. This reflects volumes calculated for each link based on the traffic generation and distribution for this scenario and the demand flows modelled for each intersection approach. The LoS outputs for each approach for the PM moderate scenario forecast network are shown in Figure 75 and the DoS outputs are shown in Figure 76.

For LoS, there are a number of increases in LoS measurements on the network in comparison to the low forecast scenario but unlike the AM scenario, there are no results for approaches that result in substantial impacts being evident.

No individual turning movements fail in this scenario, with the right hand turn off Brodie Hall Drive (East) and turning movements off the Kensington Precinct are a LoS E. This indicates significant delay for those movements and an indication of requiring additional management.

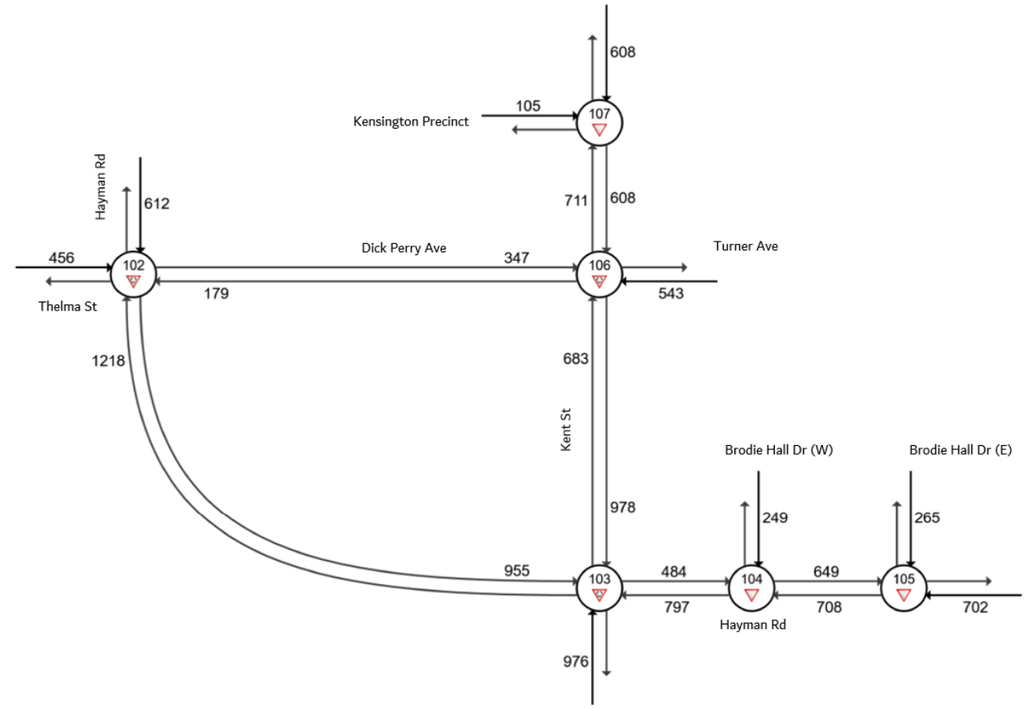



*Figure 74 PM forecast moderate scenario peak hour movement flows (all classes) (source: SIDRA)*

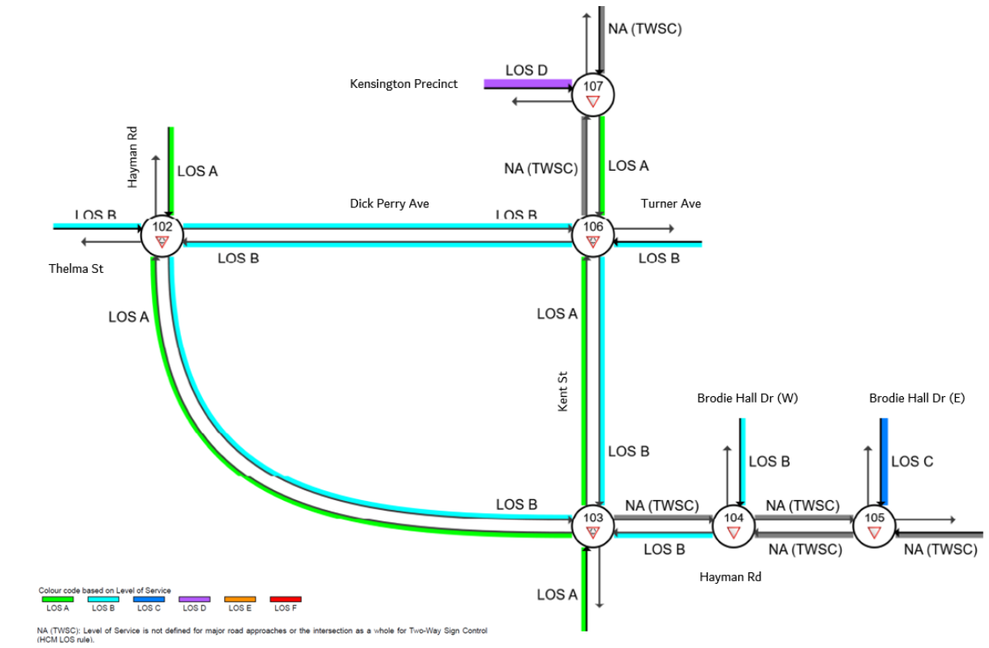



*Figure 75 PM forecast moderate scenario peak hour LoS outputs for approach (source: SIDRA)*

There are fewer DoS impacts evident in the PM peak hour, with traffic departing the eastern area of the PSP via Turner Avenue recording over saturated conditions. This would have implications for turning movements inside the PSP area, including the roundabout intersection to the east at De Laeter Way.

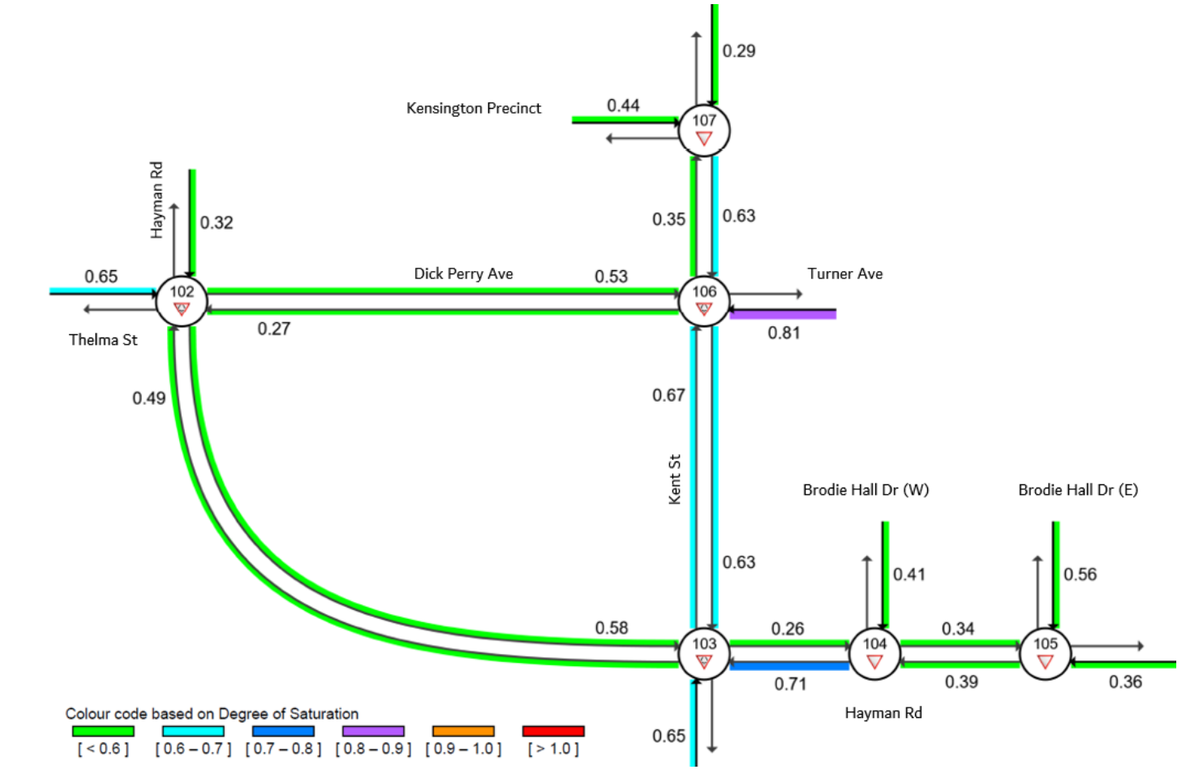



*Figure 76 PM forecast moderate scenario peak hour DoS outputs for approach (source: SIDRA)*

## 5.12 Traffic Assessment Outcomes

The traffic assessment completed for the Bentley Tech PSP has considered strategic modelling undertaken with the wider area Bentley-Curtin Activity Centre Plan Transport Assessment alongside more localised intersection and network modelling that has helped inform the PSP process. The completion of a modelling exercise that is connected directly to the Activity Centre Plan also ensures that there is a connection between the two.

The localised modelling exercise for the PSP has been undertaken for weekday peak hours for a base year (2025) and then forecast scenarios for low and moderate levels of development over the ten year period of the PSP being in effect. This modelling exercise has included traffic generated by land uses within that ten year period, even though the moderate land use scenario may be conservative.

The very nature of the existing land uses within the Bentley Tech PSP area and the future land uses being considered meant that undertaking a very refined traffic generation calculation was subject to potentially large fluctuations. Specialised research facilities, tertiary educational buildings and targeted manufacturing land uses are generally non-standard. Although the CSIRO and DBCA buildings in the western half of the site carry large administration functions, there are still non-standard activities present.

In order to provide a generalised understanding of traffic generation associated with an expansion in the Gross Floor Area of development in the PSP, a ratio of future traffic generation was developed using the existing traffic volumes for inbound and outbound movements alongside the potential expansion in floorspace being considered within two development scenarios.

For the base year 2025 outputs, there were no specific issues that were evident within intersection performance when set against standard traffic engineering metrics. AM peaks for all scenarios are notably busier and more intense given the mix of commuting trips, educational trips and background traffic is compressed within a more intense period than the PM peak.

For the AM, the Burvill Court intersection right hand turn movement fails due to the delays resulting from through movements on Hayman Road. This is a result of the coding of the intersection as one movement rather than a split turn. The right hand turn movement out of Brodie Hall Drive (East) also results in a delay and this underpins the importance of having two exits for Brodie Hall Drive on to Hayman Road.

The DoS along Hayman Road towards Kent Street is notable and simply a result of heavy eastbound flows towards Curtin University and Manning Road in the morning.

The forecast year low development scenario adds on an additional 20,000m$^2$ GFA within the PSP area. Given the analysis for the 2025 base year, which indicated that the network was performing well within traffic engineering metrics, the addition of a relatively small volume of additional land use in the context of the area should not see substantial impacts.

For the forecast year scenarios, the intersection at Burvill Court has been replaced with a new eastern arm to the roundabout at the Thelma Road intersection. Through movements on to the eastern arm consisted of the existing turning movement on Burvill Court as well as the predicted growth. There is a new priority turn intersection for the Kensington Precinct to reflect potential demands from that project. Given the uncertainty of development form or nature of connectivity, this form of intersection was included in the modelling as a base case to understand implications for the PSP. The expectation would be that the actual form of connection would be analysed for that project as required.

For overall network background growth, a 5% uplift in 2025 peak volumes was included.

For the AM peak, the following issues for the low growth scenario were evident:

- None of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions.
- Some additional delays are noted for some approaches when compared to the AM 2025 base outputs.
- The new intersection coded for the Kensington Precinct includes a right hand turn movement which is an LoS D. This indicates that planning and design of that intersection may require additional management controls.
- The right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

For the PM peak, the following issues were evident for the low growth scenario:

- None of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions during the PM peak.
- As with the AM peak hour, the new intersection coded for the Kensington Precinct includes a right hand turn movement which is an LoS D.
- As with the AM peak hour, the right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

For the AM peak, the following issues for the moderate growth scenario were evident:

- There is a general reduction in network performance for some intersections, with the DoS at the Hayman and Kent Street roundabout being notable for very high outcomes in the AM and the intersection of Kent Street and Turner Ave also approaching high levels of saturation that would see levels of congested conditions.
- There are reductions in the LoS on a number of key approaches including Hayman Road approach to Kent Street from LoS B to LoS D, Brodie Hall (West) approach to Hayman Road from LoS B to LoS C and Brodie Hall (East) approach to Hayman Road from LoS C to LoS E
- Although the more minor changes in LoS for local street intersections would not necessarily be seen as significant, the impacts along Hayman Road are more evident. The right hand turn off Brodie Hall Drive (East) fails in this scenario, and turning movements off the Kensington Precinct are a LoS E. The approach lanes on Hayman Road at Kent Street are LoS E which is a significant impact on the overall network.

For the PM peak, the following issues for the moderate growth scenario were evident:

- For LoS, there are a number of increases in LoS measurements on the network in comparison to the low forecast scenario but unlike the AM scenario, there are no results for approaches that result in substantial impacts being evident.
- No individual turning movements fail in this scenario, with the right hand turn off Brodie Hall Drive (E) and turning movements off the Kensington Precinct are a LoS E. This indicates significant delay for those movements and an indication of requiring additional management.
- There are fewer DoS impacts evident in the PM peak hour, with traffic departing the eastern area of the PSP via Turner Avenue recording over saturated conditions. This would have implications for turning movements inside the PSP area, including the roundabout intersection to the east at De Laeter Way.

Given these outcomes, the impacts on Brodie Hall Drive at both intersections are of key concern. The State Hockey Centre proposal to remove the potential for a right hand turn from Brodie Hall Drive (West) means that additional turning movements would be attracted to Brodie Hall Drive (East) or Turner Avenue. The Brodie Hall Drive (East) intersection is already failing in this moderate scenario and Turner Avenue intersection is at a saturation point of being unstable and resulting in sustained congestion meaning that any additional demands from the Brodie Hall Drive (West) intersection would exacerbate the impacts.

In short, the Bentley Tech project could then be saddled with having to undertake major works on Hayman Road at one of the Brodie Hall Drive intersections because turning movement options were taken away.

In the Activity Centre Plan, the Brodie Hall Drive (West) intersection, Hayman Road and Karrak Drive was modelled as a traffic signal intersection because of demands and also implications for the overall Activity Centre Plan. Given the outcomes of this analysis, that configuration should be revisited along with a reconfiguration of the Brodie Hall Drive (East) intersection to remove unsafe turns.

For the introduction of a dedicated transit corridor along Kent Street into Curtin University, the configuration of key intersections in the PSP area would need to be changed by that project to allow for dedicated, safe running. An example of the potential issues are shown in Figure 77 through the Turner Avenue corridor. If there were to be a segregated transit alignment, there would need to be signalised priority through this area. The close proximity of two roundabout intersections does not afford this priority.

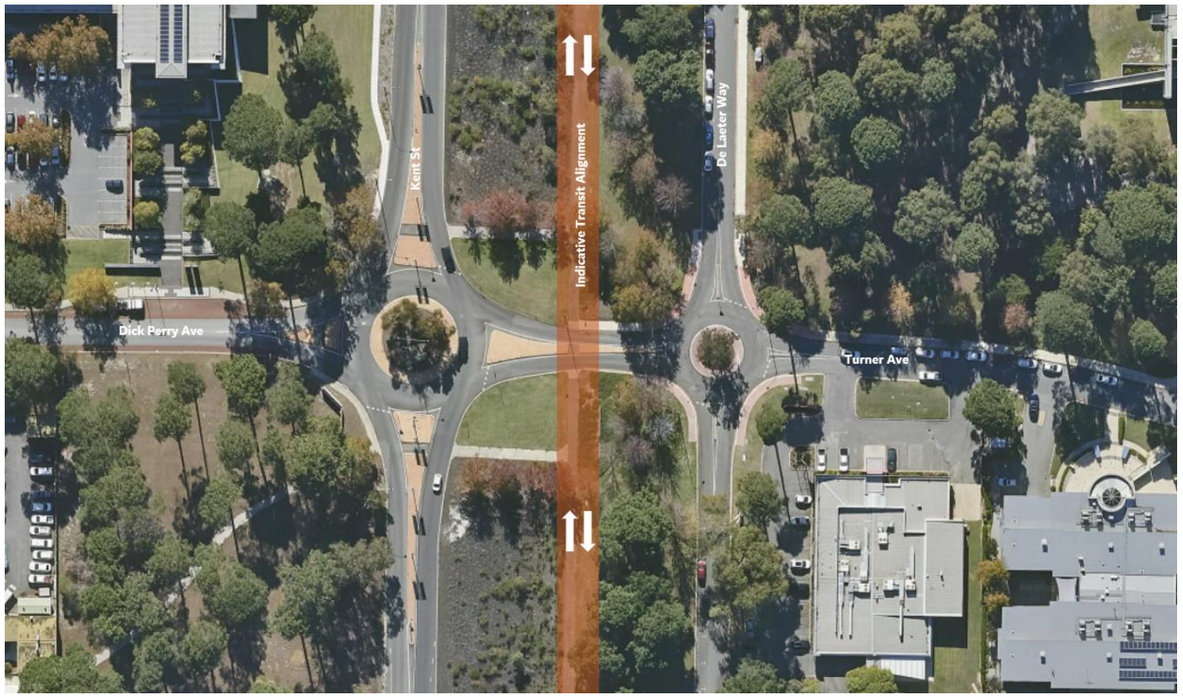



*Figure 77 Potential mid-tier transit alignment*

This type of alignment would generally replicate a middle-running configuration for a mid-tier transit system like that seen in Canberra. All crossing points of that corridor are controlled by signalised priority which allows the LRT vehicle to have consistent through running or be able to factor in LRT movements and vehicle demands. Even where there are roundabouts adjacent to the LRT corridor, intersections are signalised, as seen in the example shown in Figure 78.

Irrespective of the location of any dedicated mid-tier alignment through the area, priority would be required unless there is no priority planned for mid-tier and the vehicles are on-street (such as buses). Those outcomes would be required to be modelled and any alterations to the street network within the PSP area modified as a result of the mid-tier project.

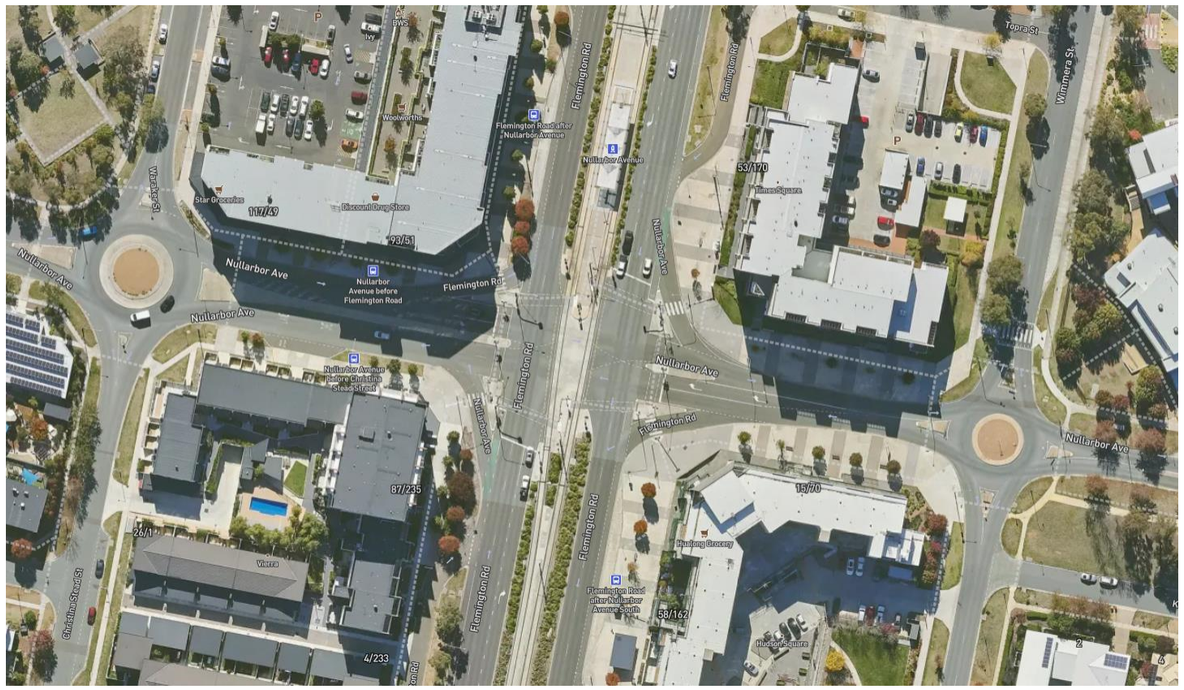



*Figure 78 Example - Canberra LRT intersection treatments (source: Metromap)*

In addition to any wider area modelling and assessment required for the progression of any mid-tier transport scheme, individual development sites would be required to undertake assessment as part of standard development application processes.

# 6. SUMMARY

## 6.1 Precinct Structure Plan Assessment

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Precinct Structure Plan (PSP) over the Bentley Technology Park area. The Bentley Curtin Specialised Activity Centre Structure Plan sets the strategic context at the broader district scale, with that Plan identifying the need for more detailed planning to be undertaken at the precinct level.

The Bentley Technology Park PSP area spans two local government areas, with the Town of Victoria Park (ToVP) to the east of Kent Street and the City of South Perth (CoSP) to the west of Kent Street.

As a major landowner in the Bentley Technology Park Precinct, DevelopmentWA (DevWA) has been tasked by the State Government to establish a vision for Bentley Technology Park to facilitate infill development to enhance and support the notion of a contemporary innovation precinct and unlock opportunities for investment by knowledge and innovation enterprises.

The Bentley Technology Park PSP area is in both the ToVP and CoSP and as indicated by the South West Aboriginal Land and Sea Council website, the site sits within the Whadjuk Region.

As set out within the WAPC Transport Impact Assessment Guidelines (Volume 2 – Planning Schemes, Precinct Structure Plans and Activity Centre Plans), the level of assessment that would be required for this proposed amendment covers the broader impacts of the proposed PSP.

> *It is therefore important that the transport aspects and in particular the land use/ transport integration, are also adequately assessed at this stage in the land use planning process. The assessment should then be used to provide direction on the later, more localised and detailed, planning stages of subdivisions and individual developments."*

This TIA has addressed the key issues required by the WAPC to establish the appropriateness of the site to cater for the proposed level of development that will inform the WAPC, Town of Victoria Park and City of South Perth as to the appropriateness of the potential development. Specifically for the transport network, this TIA has also taken inputs and outcomes from the assessment of the Activity Centre Plan and ensured that there is a direct connection and flow through of strategies and recommendations from that higher level of planning.

From this assessment, more detailed assessments of street network characteristics will be undertaken at the subdivision stage which will occur at some point in the next ten years. In addition, there are a number of other projects which will influence the outcomes of the Bentley Technology Park PSP, most notably any plans associated with the Kensington Precinct, progression of any delivery of mid-tier transit along Kent Street and plans associated with Curtin University.

The development of the PSP for DevelopmentWA has been based on over 12 months of engagement, site analysis, technical assessment and refinement of options. The overall process to develop the PSP is set out within the Planning Reporting which this TIA accompanies.

The existing transport network within the PSP area is highly defined. The site is a campus style development that has a range of land uses that are unique in a development sense. In general, land uses are dispersed through the project area and the transport network and land use outcomes are heavily favoured to cater for private vehicle trips. The site has easy access to the regional road network via Kent Street and Hayman Road and there are no substantial issues with congested conditions during peak periods and / or capacity constraints.

The PSP area does have access to public transport via bus services and active transport networks, which are mainly provided along the regional road corridors. Pedestrian infrastructure within the PSP area is limited and crossing of major road corridors is poorly catered for in general – there are no priority or segregated crossings for pedestrians between the two sides of the PSP project area. Overall accessibility into and out of the area is generally considered good from a sub-regional context, which would be expected given its location in a highly developed inner urban location such as Bentley.

The PSP proposes a range of new connections for all modes to overcome some of the existing deficiencies of the area. These cover a range of new internal street connections, active transport improvements and recommendations on how bus services can penetrate into the core of the PSP area and provide far greater and more equitable accessibility for users.

The PSP supports the intent and recommendations of the Activity Centre plan in relation to the provision of non-residential parking and also the management of on-street parking within the PSP area. At present this is largely unconstrained and this contributes to an outcome that is highly tuned into providing free space for vehicle movements and storage but has little benefit in terms of creating a place that is welcoming, distinct in character and a location where people would choose to spend time or characterise as having endearing features.

An extensive traffic modelling exercise, leaning directly into the assessment undertaken for the Activity Centre, was completed for the timeframe of the PSP. The completed assessment focusses on the more immediate road network implications as the broader analysis for the network and public transport connections sits within the Activity Centre assessment. The focus on the assessment for the PSP has been to provide an understanding of the context of the proposed development outcomes and where there are issues which may require more detailed examination throughout, or beyond, the timeframe of the PSP.

The localised modelling exercise for the PSP has been undertaken for weekday peak hours for a base year (2025) and then forecast scenarios for low and moderate levels of development over the ten year period of the PSP being in effect. This modelling exercise has included traffic generated by land uses within that ten year period, even though the moderate land use scenario may be conservative.

The very nature of the existing land uses within the Bentley Tech PSP area and the future land uses being considered meant that undertaking a very refined traffic generation calculation was subject to potentially large fluctuations. Specialised research facilities, tertiary educational buildings and targeted manufacturing land uses are generally non-standard. In order to provide a generalised understanding of traffic generation associated with an expansion in the Gross Floor Area of development in the PSP, a ratio of future traffic generation was developed using the existing traffic volumes for inbound and outbound movements alongside the potential expansion in floorspace being considered within two development scenarios.

For the base year 2025 outputs, there were no specific issues that were evident within intersection performance when set against standard traffic engineering metrics. AM peaks for all scenarios are notably busier and more intense given the mix of commuting trips, educational trips and background traffic is compressed within a more intense period than the PM peak.

For the AM, the Burvill Court intersection right hand turn movement fails due to the delays resulting from through movements on Hayman Road. This is a result of the coding of the intersection as one movement rather than a split turn. The right hand turn movement out of Brodie Hall Drive (East) also results in a delay and this underpins the importance of having two exits for Brodie Hall Drive on to Hayman Road.

The Degree of Saturation (DoS) along Hayman Road towards Kent Street is notable and simply a result of heavy eastbound flows towards Curtin University and Manning Road in the morning.

The forecast year low development scenario adds on an additional 20,000m$^2$ GFA within the PSP area. Given the analysis for the 2025 base year, which indicated that the network was performing well within traffic engineering metrics, the addition of a relatively small volume of additional land use in the context of the area should not see substantial impacts.

For the forecast year scenarios, the intersection at Burvill Court has been replaced with a new eastern arm to the roundabout at the Thelma Road intersection. Through movements on to the eastern arm consisted of the existing turning movement on Burvill Court as well as the predicted growth. There is a new priority turn intersection for the Kensington Precinct to reflect potential demands from that project.

Given the uncertainty of development form or nature of connectivity, this form of intersection was included in the modelling as a base case to understand implications for the PSP. The expectation would be that the actual form of connection would be analysed for that project as required. For overall network background growth, a 5% uplift in 2025 peak volumes was included.

For the AM peak, the following issues for the low growth scenario were evident:

- None of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions
- Some additional delays are noted for some approaches when compared to the AM 2025 base outputs
- The new intersection coded for the Kensington Precinct includes a right hand turn movement which is a Level of Service (LoS) D. This indicates that planning and design of that intersection may require additional management controls
- The right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

For the PM peak, the following issues were evident for the low growth scenario:

- None of the individual approaches exceed traffic engineering metrics which would indicate that the network would suffer from congested conditions during the PM peak
- As with the AM peak hour, the new intersection coded for the Kensington Precinct includes a right hand turn movement which is an LoS D
- As with the AM peak hour, the right hand turn movement out of the Brodie Hall Drive (East) intersection also has an LoS D outcome, with an average delay of nearly 30 seconds. This indicates a poor outcome at this intersection, especially when considering the roundabout to the east of the project area.

For the AM peak, the following issues for the moderate growth scenario were evident:

- There is a general reduction in network performance for some intersections, with the DoS at the Hayman and Kent Street roundabout being notable for very high outcomes in the AM and the intersection of Kent Street and Turner Ave also approaching high levels of saturation that would see levels of congested conditions
- There are reductions in the LoS on a number of key approaches including Hayman Road approach to Kent Street from LoS B to LoS D, Brodie Hall (West) approach to Hayman Road from LoS B to LoS C and Brodie Hall (East) approach to Hayman Road from LoS C to LoS E
- Although the more minor changes in LoS for local street intersections would not necessarily be seen as significant, the impacts along Hayman Road are more evident. The right hand turn off Brodie Hall Drive (East) fails in this scenario, and turning movements off the Kensington Precinct are a LoS E. The approach lanes on Hayman Road at Kent Street are LoS E which is a significant impact on the overall network.

For the PM peak, the following issues for the moderate growth scenario were evident:

- For LoS, there are a number of increases in LoS measurements on the network in comparison to the low forecast scenario but unlike the AM scenario, there are no results for approaches that result in substantial impacts being evident
- No individual turning movements fail in this scenario, with the right hand turn off Brodie Hall Drive (E) and turning movements off the Kensington Precinct are a LoS E. This indicates significant delay for those movements and an indication of requiring additional management
- There are fewer DoS impacts evident in the PM peak hour, with traffic departing the eastern area of the PSP via Turner Avenue recording over saturated conditions. This would have implications for turning movements inside the PSP area, including the roundabout intersection to the east at De Laeter Way.

Given these outcomes, the impacts on Brodie Hall Drive at both intersections are of key concern. The State Hockey Centre proposal to remove the potential for a right hand turn from Brodie Hall Drive (West) means that additional turning movements would be attracted to Brodie Hall Drive (East) or Turner Avenue. The Brodie Hall Drive (East) intersection is already failing in this moderate scenario and Turner Avenue intersection is at a saturation point of being unstable and resulting in sustained congestion meaning that any additional demands from the Brodie Hall Drive (West) intersection would exacerbate the impacts.

In short, the Bentley Tech project could then be saddled with having to undertake major works on Hayman Road at one of the Brodie Hall Drive intersections because turning movement options were taken away.

In the Activity Centre Plan, the Brodie Hall Drive (West) intersection, Hayman Road and Karrak Drive was modelled as a traffic signal intersection because of demands and also implications for the overall Activity Centre Plan. Given the outcomes of this analysis, that configuration should be revisited along with a reconfiguration of the Brodie Hall Drive (East) intersection to remove unsafe turns.

Overall, the assessment highlights a number of key issues that have to be addressed in the following detailed stages of planning. Of primary note for the road network are connections from and across major road corridors. For the internal street network, reconfiguring the existing street form and addressing the impact of unconstrained parking are key. Provision of connections for pedestrians and cyclists through the area is also of paramount importance if the character of the place is to pivot from a campus style development into an urban form similar to that now seen on the northern end of the Curtin University campus.

The PSP would also benefit from confirmation of mid-tier transit improvements and the form that stop and priority infrastructure would take. The benefit of providing higher quality and more frequent public transport connections is clear, but the form of stops and internal connectivity into the PSP area is also critical.

APPENDIX A

# Modelling Outputs