Proposed Mixed Use Development
86-90 Mill Point Road, South Perth

Transport Impact Assessment

PREPARED FOR:
Southlink Investment Properties Pty Ltd trading as Peakstone

January 2021

Document history and status

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1.0 Summary

This Transport Impact Assessment (hereafter TIA) has been prepared by Transcore on behalf of Southlink Investment Properties Pty Ltd trading as Peakstone with respect to the proposed mixed-use development to be located at 86-90 Mill Point Road in South Perth (hereafter the subject site).

The subject site is also located to the north of the existing signalised intersection of Labouchere Road/Mill Point Road.

The development proposal entails replacement of existing structures located at the subject site with a multi-storey, mixed-use development comprising predominately a residential component with some retail and commercial land uses.

The focus of this report is the traffic impact of the proposed development including assessment of the key local intersection of Mill Point Road/Ferry Street and the signalised intersection of Labouchere Road/Mill Point Road. This report also considers pedestrian and cyclist facilities, public transportation and availability of public parking in the vicinity of subject site.

For the purpose of this TIA, Transcore undertook traffic count surveys at the intersection of Mill Point Road/Ferry Street and Labouchere Road/Mill Point Road during the established morning and afternoon critical peak hour of traffic activity on Friday 27 November 2020. Further, Transcore undertook onsite observations at the signalised intersection to establish the actual cycle times to be used in the intersection analysis.

2.0 Introduction

The subject site is situated in the South Perth Peninsula immediately north of the signalised intersection of Mill Point Road/Labouchere Road/Freeway on/off ramp located a short distance from the Kwinana Freeway interchange and within walking distance of the Swan River ferry terminal as shown in **Figure 1**.

Figure 1: Location of the subject site

The development proposes to amalgamate Lots 2, 15 & 16 at the southeast corner of the Mill Point Road/Ferry Street intersection.

The existing single storey building and associated car park presently located at the subject site are served by one crossover on Ferry Street. The developments formerly accommodated at the subject were also served by two crossovers on Mill Point Road.

The subject site is zoned *"Special Control Area SCA 1 – South Perth Station Precinct"*. The site is located within an area comprising a mix of residential, office and commercial land uses.

3.0 Development Proposal

The development proposal contemplates a 36-storey development comprising residential apartments with small-scale retail and commercial components and associated multi-level car parking facility.

The development plans of 17 December 2020 and 12 January 2021 indicate the following elements:

- Total of 175 residential apartments comprising a mix of townhouse, 1-bed, 2-bed 3-bed and penthouse apartments over 35 levels;
- Swimming pool, gym, sauna, ground floor function rooms, live/work spaces and similar other amenities for residents and visitors;
- Small-scale wine bar of approximately 138m^2 GFA at ground floor;
- Small-scale café of approximately 145m^2 GFA at ground floor; and,
- Office space (co-working) of approximately 166m^2 GFA at ground floor.

Parking will be fully provided on-site across four levels of car park (two basements, ground floor and one podium level) totalling 360 car and 27 motorcycle/scooter parking bays served by a pair of crossovers on Ferry Street. All car parking levels are connected by an internal two-way ramp system.

The existing crossovers to the subject site will be rationalised from the current three (one on Ferry Street and two on Mill Point Road) down to two access/egress points on Ferry Street intended to serve the whole development. The two crossovers on Ferry Street form part of the semi-circular loop road system which provides access to the development's car park facility, visitor bays and the porte-cochere (i.e. drop-off/pick-up facility) at ground floor.

The crossovers also serve as an access/egress point for the proposed internal service yard with a loading dock for the use of service and delivery vehicles. More details on parking provision are provided in section 8.0 of this report.

The secure bicycle storage areas for the residents are provided at two locations at Podium 1 level with a total of 113 bike bays/racks. In addition, a secure bike parking room with end-of-trip facilities (showers and lockers) is provided at ground floor and conveniently located near retail/commercial tenancies. Total non-residential bike parking provision is eight parking spaces.

Pedestrians will access the development from the external footpath network along the Mill Point Road (existing) and Ferry Street (to be constructed as part of the development) frontages. Lobby with lifts is provided for residents/visitors while the employees/patrons of the retail/commercial tenancies can access these components directly from Mill Point Road. Both lift lobbies are accessible directly from Ferry Street and Mill Point Road. Parking and access arrangements for each mode of transport will be discussed in greater detail in subsequent sections of this report. Refer to **Appendix A** for plans of the proposed development.

4.0 Existing Situation

The subject site (approximately 4,760m^2) is located at the northeast corner of the signalised intersection of Labouchere Road/Mill Point Road/Freeway on/off ramp and is bound by Mill Point Road and Ferry Street as shown in **Figure 1**. The subject site is located a short distance from Kwinana Freeway interchange with Mill Point Road and within walking distance from the Swan River ferry terminal. Refer **Figure 1** for aerial photo of the locality.

4.1 Existing Road Network

Mill Point Road, north of Labouchere Road and in the immediate vicinity of the subject site, is a 9m wide, two-lane two-way road with pedestrian paths along both sides of the road (refer **Figure 2**).

Figure 2: Southbound view along Mill Point Road in the vicinity of the subject site

According to Main Roads WA *Functional Road Hierarchy*, Mill Point Road, north of Labouchere Road, is classified as a *Local Distributor* road.

There are no available traffic counts for Mill Point Road (section north of Labouchere Road); however, based on the available SCATS data for the Labouchere Road/Mill Point Road/Freeway on/off ramp intersection it is estimated that this section of Mill Point Road presently carries in the order of 5,000 vehicles per day (vpd).

Mill Point Road, north of Labouchere Road operates under the default built-up area speed limit of 50km/h.

Ferry Street is a typical residential street approximately 7m wide with on-street parking permitted on its northern side only. A pedestrian footpath is in place on the northern side of the road (refer **Figure 3**).

Figure 3: Westbound view along Ferry Street towards Mill Point Road intersection

Ferry Street is cul-de-sacced at its eastern end extending some 95m from Mill Point Road eastbound. There are no available traffic counts for this road but based on the manual counts undertaken by Transcore it is estimated that Ferry Street carries under 500vpd.

According to Main Roads WA *Functional Road Hierarchy*, Ferry Street is classified as an *Access Road*. Ferry Street operates under the default built-up area speed limit of 50km/h.

Labouchere Road, at this location, is a four-lane divided road with a 2.4m wide painted and raised landscaped median. Pedestrian paths are in place on both sides of the road with regular pedestrian crossings.

According to Main Roads WA *Functional Road Hierarchy*, Labouchere Road is classified as a *District Distributor B*. Labouchere Road at this location operates under a 60km/h posted speed limit. Refer **Figure 4** for more details.

Based on the latest available traffic counts sourced from Main Roads WA, Labouchere Road (south of Judd Street) carried approximately 14,600 vehicles per day in 2018/19.

Figure 4: Northbound view along Labouchere Road

Mill Point Road forms a 4-way signalised intersection with Labouchere Road and Freeway on/off ramp at the southern corner of the site. Ferry Street forms a priority-controlled T-intersection with Mill Point Road at the western end of the site.

Main Roads WA Intersection *Crash Ranking Report* provides detailed crash data for the Labouchere Road/Mill Point Road/Freeway on/off ramp intersection over the 5-year period ending 31 December 2019. Crash report information for this intersection is presented in **Table 1**.

Table 1: Crash history for the Labouchere Road/Mill Point Road/Freeway on/off ramp intersection

Intersection				Total Crashes	Casualty
Labouchere Road/Mill Point Road/Freeway on/off ramp				30	5
Right Thru	**Rear End**	**Pedestrian**	**Cycle**	**Wet**	**Night**
10	12	0	N/A	2	8

The crash history data for the Ferry Street/Mill Point Road intersection suggests no crashes in the previous 5-year period.

4.2 Public Transport Access

The WAPC Development Control Policy 1.6 – *Planning to Support Transit Use and Transit Oriented Development (January 2006)* indicates that the use of transit facilities

is dependent on the walking distance to these facilities. In particular, about 10-15 minutes walking time (800m) would be the ideal walking distance threshold for rail stations, transit interchanges or major bus transfer stations/terminals, and about 5 – 7 minutes walking time, or 400m, would be the threshold for bus stops located on bus routes with multiple bus services that are high frequency of 15 minutes or less during peak periods.

The subject site is located within an established commercial/residential district that is well served by high frequency bus services and the nearby Swan River ferry. The high-frequency buses No. 30 and 31 operate along Labouchere Road (connecting Perth Busport and Curtin University), with a pair of bus stops some 180m to the south of the subject site.

In addition, bus service No. 35, connecting The Old Mill with Esplanade Busport, has a bus stop on Mill Point Road within comfortable walking distance (approximately 350m north of the subject site), while bus service No. 34, connecting Cannington Train Station with Esplanade Busport has bus stops on Mill Point Road within comfortable walking distance from the subject site (approximately 300m to the south). All bus stops are accessible from the subject site via existing footpaths and pedestrian crossing facilities.

The existing bus services provide connection to the Esplanade Busport, thus enabling access to the Metropolitan-wide bus and rail network.

The public transport services available within walking distance of the subject site are listed in **Table 2** and illustrated in the relevant TransPerth service map (see **Figure 5).**

Table 2: Bus services available within the locality

Service #	Route Details
30	Perth Busport/Curtin University Bus Station
31	Perth Busport/Redmond Street-Howard Parade (Salter Point)
34	Perth Busport/Cannington Station
35	Elizabeth Quay Bus Station/The Old Mill

The existing Mends Street jetty, providing ferry links to the Perth CBD, is located within close proximity of the subject site (some 260m to the east) and is also accessible via the existing path network.

The future South Perth train station on the Perth to Mandurah Line is planned to be located within relative proximity of the subject site. This station is intended to be located within the median of the Kwinana Freeway near the northwest corner of Richardson Park about 450m southwest of the subject site.

At this stage the exact timing for the construction of this train station is unknown but due to the intensive redevelopment of the precinct the construction of this train station may be brought forward.

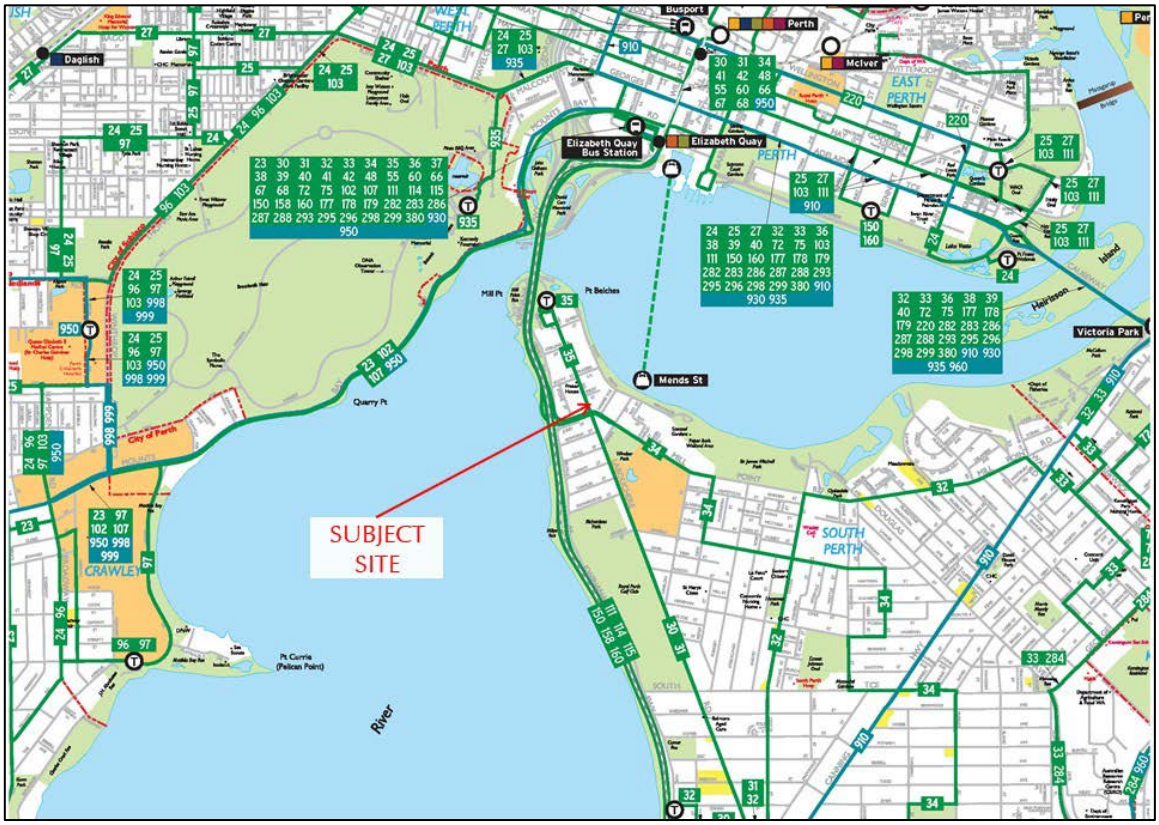


Figure 5: Local bus map (source: Transperth)

4.3 Pedestrian and Cyclist Facilities

A comprehensive pedestrian footpath system serves the subject site complemented by a shared path along the southern bank of the Swan River and a Principal Shared Path (PSP) along Kwinana Freeway. The PSP is accessible via a foot bridge across Kwinana Freeway which is located on Melville Parade some 650m walking distance southwest of the subject site and accessible via Lyall Street, which itself is classified as a "good road riding environment" due to low speed and low level of traffic.

The Swan River recreation path can also be accessed via the PSP near the Narrows Bridge at the northern tip of South Perth peninsula which is also easily accessed via existing paths. Refer **Figure 6** and **Figure 7** for more details.

The standards of pedestrian and cyclist facilities and network are considered adequate with no major shortcomings identified, particularly as it relates to this development.

Figure 6: Perth bike map series – local area (source: Department of Transport)

Figure 7: City of South Perth bike plan

5.0 Changes to Surrounding Transport Networks

The *"South Perth Station Precinct Plan (August 2016)"* suggests that if local area development continues to occur in line with the projected development potential, a number of local road network improvements may need to take place within the precinct in order to maintain access and traffic flow throughout the area.

These measures generally include downgrade of a number of existing full-movement intersections along Labouchere Road as well as introduction of new traffic signals at Labouchere Road/Richardson Street and Labouchere Road/Angelo Street intersections.

The downgrade of the existing full-movement T-intersections of Hardy Street and Lyall Street with Labouchere Road may also be contemplated in the future as part of the infrastructure upgrade package. However, the implications of such intersection modifications are yet to be considered in more detail and are outside the scope of this assessment.

A bus queue-jump lane for buses on Labouchere Road starting at the signalised intersection with Kwinana Freeway on/off ramps is also a modification long sought by the Public Transport Authority.

These improvements are required to manage the future traffic operations within the precinct.

The City of South Perth proposal for road network upgrades and modifications involving Mill Point Road (section north of Labouchere Road/Mill Point Road/Freeway on/off ramp) is currently being developed. The proposal aims to improve the traffic flow in this vicinity and minimise the negative impacts on the operation of Mill Point Road/Labouchere Road/Freeway on/off ramp signalised intersection.

Proposed changes to the existing parking strategy within the precinct also form part of that study.

6.0 Integration with Surrounding Area

The proposed mixed-use development comprises residential, retail and commercial components (primarily intended to serve the immediate locality) which are in line with the planned land uses for the locality.

The access system for the development is carefully planned in recognition of the current and future standard and function of the surrounding roads.

This strategy provides benefit for the operation of Mill Point Road as it removes the now redundant two crossovers on this road thus removing the conflict points adjacent to the key local intersection of Labouchere Road/Mill Point Road/Freeway on/off ramp.

7.0 Traffic Assessment

7.1 Assessment Period

The proposed development is expected to generate heaviest traffic movements during the typical weekday morning and afternoon peak hours when the combination of development traffic and weekday commuter traffic results in highest demand on the local road network. Based on available traffic counts for the surrounding road network, the combination of the traffic generated by the development and the peak road network traffic period on adjacent roads is anticipated to result in the greatest demand on the road network during the 7:45-8:45AM and 5:45-6:45PM weekday periods.

Accordingly, trip generation is estimated and traffic analysis is undertaken for the critical weekday AM and PM peak hour periods.

7.2 Trip Generation and Distribution

The traffic volume that will be generated by the proposed mixed-use development has been estimated using trip generation rates derived from the Institute of Transport Engineers *Trip Generation Manual* (10th Edition) and Transcore's own traffic surveys.

The assumed morning and evening weekday trip rates applied for the constituent land uses of the proposed retail/commercial development of Stage 2 are presented in **Table 3**.

Table 3: Assumed trip generation rates for proposed mixed-use development

Land use	Units	Type	Source	Trip rate per unit		
				Daily	AM	PM
Residential Apartments	175	Units	TDT 04a	4.37	0.39	0.22
Offices (co-working)	166m^2	GFA	TDT 04a	11*	1.6*	1.2*
Wine Bar (Quality Restaurant 931)	138m^2	GFA	ITE 10th	90.25*	0.78*	8.39*
Café (Hi Turnover Restaurant 932)	145m^2	GFA	ITE 10th	120.75*	10.70*	10.52*

*trip rate per 100m^2 GFA

Accordingly, it is estimated that the proposed development would generate approximately **1,084** total weekday trips (both inbound and outbound) with approximately **89** and **67** trips (both inbound and outbound) during the weekday AM and PM peak periods, respectively.

The development's directional traffic distribution assumptions were based on the layout of the local and regional road network, the traffic data for the surrounding roads and the location of local and regional attraction nodes and are reported as following:

- 30% to and from Kwinana Freeway north direction;
- 30% to and from Kwinana Freeway south direction;
- 20% to and from Labouchere Road south direction; and,
- 20% to and from Mill Point Road southeast direction.

7.3 Traffic Flows

The traffic movements generated by the proposed development have been manually assigned on the adjacent road network and the resulting traffic movements generated by this development during typical weekday AM and PM peak hours are shown in **Figure 8.**

Figure 8: Estimated development-generated traffic – weekday AM and PM peak hour traffic

In order to establish the existing traffic volumes and patterns at the adjacent intersections, Transcore undertook traffic turn count surveys at the intersections of Labouchere Road/Mill Point Road/Freeway on/off ramp and Mill Point Road/Ferry Street during the AM and PM peak hours on Friday 27th November 2020. These counts, supplemented with the SCATS data recorded for the same day (Friday) on 25th September 2020 (sourced from Main Roads WA) were used as a basis for determining the current traffic flows at the two relevant intersections. Refer **Figure 9** and **Figure 10** for more details. These counts were used in the subsequent traffic analysis as they represent the most up-to-date and relevant traffic data for this intersection.

Figure 9. Existing traffic flows at the key local intersections (Transcore survey results + SCATS data) – weekday AM peak hour

Figure 10. Existing traffic flows at the key local intersections (Transcore survey results + SCATS data) – weekday PM peak hour

The construction of the proposed mixed-use development is expected to occur over a two-year period. Hence, for the purpose of this assessment it is assumed that the proposed development would be completed by the end of year 2022 so this year was assumed for the post-development assessment scenario.

7.4 Analysis of Key Local Intersections

The operation of the key local intersections of Mill Point Road/Ferry Street and Labouchere Road/Mill Point Road were analysed for the existing situation and the post-development scenario (year 2022) during critical weekday AM and PM peak hour periods.

For the signalised intersection of Labouchere Road/Mill Point Road Transcore undertook on site observations during both AM and PM peak hours to establish the range of actual cycle times that occur at this intersection. For the purpose of the SIDRA analysis the average cycle time was calculated and used.

The 10-year time horizon assessment also forms part of the typical TIA scope and as such the 10-year time horizon scenario (assessment year 2032 in this case) was also undertaken for the relevant two intersections.

The existing traffic counts for the Labouchere Road, Mill Point Road and Kwinana Freeway on and off ramps indicate that daily traffic volumes have somewhat stabilised over the past several years. Nonetheless for the purpose of this assessment a background traffic growth of 2.0% p.a. was allowed for the post-development and 10-year horizon scenario (year 2032) in order to allow for a robust assessment. This is reflected in the subsequent intersection capacity assessments reported in section 7.4 of this report.

Capacity analysis of the two intersections for the weekday AM and PM peak hours was undertaken using the SIDRA NETWORK computer software package.

SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation**: is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service**: is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: is the queue length below which 95% of all observed queue lengths fall.

Ferry Street/Mill Point Road intersection

The results of the SIDRA analysis for the Ferry Street/Mill Point Road intersection during the morning and afternoon peak hours for the existing situation, post-

development scenario and 10-year horizon scenario are shown in **Table 5** to **Table 10** in **Appendix B** and discussed in the following paragraphs.

The result of the SIDRA analysis shows that this intersection presently operates at an overall intersection Level of Service (LoS) A, with negligible queues and delays and at 17% and 14% capacity during the weekday AM and PM peak hour periods, respectively.

The addition of the development-generated traffic to the intersection resulted in negligible increases in the overall delays and queues. No change in the overall level of service for the intersection is recorded in the post-development stage either. The intersection degree of saturation increased only moderately in both cases.

The SIDRA assessment for the 10-year horizon during AM and PM peak periods rendered similar results comparable to post-development scenarios with again marginal increases in delays and queues and no changes to the Level of Service for any of the turns. Importantly, this intersection retains ample spare capacity for future traffic growth post 2031.

Accordingly, it is concluded that this intersection has sufficient capacity to accommodate the development-generated traffic.

Labouchere Road/Mill Point Road/Freeway on/off ramp intersection

The results of the SIDRA analysis for the Labouchere Road/Mill Point Road/Freeway on/off ramp signalised intersection during the morning and afternoon peak hours for the existing situation, post-development scenario and 10-year horizon scenarios are shown in **Table 11** to **Table 16** in **Appendix B** and discussed in the following paragraphs.

SIDRA analysis of this intersection indicates that this intersection presently operates with an overall intersection LoS D and at about 82% of capacity during the weekday AM peak and 77% of capacity during the weekday PM peak hour period. The most pronounced queues are recorded on Labouchere Road and Mill Point Road (east) approaches during the morning peak period and on the freeway approach during the PM peak period. The queues are less pronounced during the afternoon peak period.

There is a limited impact on the operation of this intersection in the post-development stage where the addition of the background traffic growth and development-generated traffic results in relatively moderate increases in delays and queueing. The intersection capacity is at about 90% and 81% level during the AM and PM peaks, respectively. No change in overall intersection Level of Service is recorded and it remains at LoS D during both peaks.

The addition of 12 years' worth of growth of background traffic at a rate of 2% p.a. results in a notable impact on the operation of this intersection as it exceeds (107% in AM peak) and reaches (100% PM peak) its practical capacity at this stage.

It is therefore recommended that the City of South Perth commissions an area-wide transport study to identify key initiatives which would assist to arrest traffic growth

through improvements of existing road infrastructure and connectivity, improvement in existing public transport services and upgrade of the existing parking and pedestrian/cyclist infrastructure.

Accordingly, it is concluded that the proposed development will not have an adverse impact on the operation of Labouchere Road/Mill Point Road/Freeway on/off ramp intersection in the post-development (year 2020) and 10-year time horizon (year 2031) stages, subject to moderation of background traffic growth.

7.5 Impact on Surrounding Roads

Ferry Street is serving only local residential developments and estimated to carry up to 500vpd. With the proposed development this level of daily traffic would increase to about 1,600vpd; however, even with such an increase Ferry Street total post-development daily traffic volume would still be within the physical capacity and function of this road.

Mill Point Road between Ferry Street and Labouchere Road at present is estimated to carry in order of 5,000vpd based on SCATS data for the Mill Point Road/Labouchere Road intersection. The section of Mill Point Road south of Ferry Street is expected to attract the bulk of the development's traffic which will result in daily traffic volume increase in order of 18.4% bringing total post-development traffic to about 5,920vpd. This level of increase is within the physical capacity of the road and broadly within the desirable threshold based on the function of this road.

The impact on Mill Point Road, section north of Ferry Street, is expected to be in the order of about 163vpd representing an increase in the order of about 3.3%. This level of traffic increase is negligible and well within the road capacity.

Based on the 2018/19 traffic counts sourced from Main Roads WA, Labouchere Road carried approximately 14,600vpd adjacent to Mill Point Road intersection. The development-generated traffic will result in daily traffic volume increase in order of 1.5% bringing total post-development traffic to about 14,820vpd. This level of increase is within the physical capacity of the road and broadly within the desirable threshold based on the function of this road.

7.6 Analysis of Development Crossovers

Due to the location of the proposed development and the way Ferry Street connects to the adjacent local road network it is concluded that virtually all of the traffic movements at the two development crossovers would be right-in and left-out only, as very little traffic would be attracted to and from the east on Ferry Street.

With regards to the anticipated peak hour traffic volumes split between the two crossovers and the existing Ferry Street traffic activity it can be concluded, without a need to undertake a detailed assessment, that the development crossovers would operate satisfactorily.

7.7 Traffic Noise and Vibration

Due to the location of the proposed development and with regard to the surrounding land uses, traffic noise and vibration are relevant only to the residential areas directly fronting the site's perimeter roads.

It generally requires a doubling of traffic volumes on a road to produce a perceptible 3dB(A) increase in road noise. The proposed development will not increase traffic volumes or noise on Mill Point Road anywhere near this level. The level of traffic increases on Ferry Street is not expected to have a negative noise impact on the locality.

7.8 Road Safety

No particular road safety issues have been identified for the proposed development.

8.0 Parking

The total parking provision for the proposed development comprises 360 car parking bays over two basements, ground floor and one podium level (B02, B01, GF, and P01 level). One ACROD bay will be provided at the ground floor and adjacent to the car park entry.

A two-way ramp system provides internal connectivity between all parking levels.

The provisional parking schedule is provided in **Table 4**; however, the car park design is flexible enough to allow for future changes.

Table 4. Indicative parking schedule

Parking Component	Parking Provision	Level
Residents	70 bays	Podium 1 (P01)
Visitors (residential & commercial)	25 bays	Ground Floor (GF)
Commercial (employees)	10 bays	Ground Floor (GF)
Residents	4 bays	Ground Floor (GF)
Residents	121 bays	Basement 1 (B01)
Residents	130 bays	Basement 2 (B02)
Total	**360 bays**	

The car parking allocation of 25 visitor bays at ground floor also allows for two parking bays within the porte-cochere (drop off/pick-up facility) and one ACROD bay.

The parking supply consists of 118 tandem and 242 single bays. Tandem bays will be allocated only to the residents (typically a pair of tandem bays per dwelling), while single bays will be set aside for visitor and commercial uses.

All residential bays are gated off for security reasons, while visitor and commercial bays will be accessible during commercial tenancy operation, with secure access permitted after hours.

According to the advice provided to Transcore the proposed car parking supply is adequate and in line with the relevant town planning scheme requirements.

In addition to car bays a total of 27 motorcycle/scooter bays are also proposed for the development. These bays are located across all car park levels. The parking supply for motorbikes/scooters was determined based on anticipated demand derived from the latest census data indicating that approximately 8.1% of home owners use motorcycles/scooters for transport.

A separate service area with a loading dock is proposed to be located centrally and within the ground floor carpark. The service area is accessed via the eastern Ferry Street crossover and a driveway leading into the car park.

A turn path assessment using a 8.0m long truck (typical City of South Perth waste collection vehicle) was undertaken to confirm the suitability of the proposed loading bay design. The design of the service loading dock necessitates that trucks enter the site and ground level car park, reverse into the bay and exit the site in the forward gear.

The turn path assessment indicates that the site and car park design can safely accommodate the service vehicle of such size. A turn path plan is shown in **Appendix C**.

All residential, retail and commercial loading/unloading activities including rubbish collection activities will take place within the service loading dock.

9.0 Conclusions

This Transport Impact Assessment has been prepared for the proposed mixed-use development to be located at 86-90 Mill Point Road in South Perth.

The multi-storey mixed-use development comprises residential and small-scale commercial and retail components.

The development is proposed to be served by a pair of crossovers on Ferry Street which are internally connected to form a loop road/porte-cochere and to provide access to the development's car park facility and internal service area.

The parking provision for the development totals 360 parking bays for cars and 27 bays for motorcycles/scooters. Two of these bays are provided within the porte-cochere in front of the building. The development provides for resident and visitor bike parking including appropriate end-of-trip facilities.

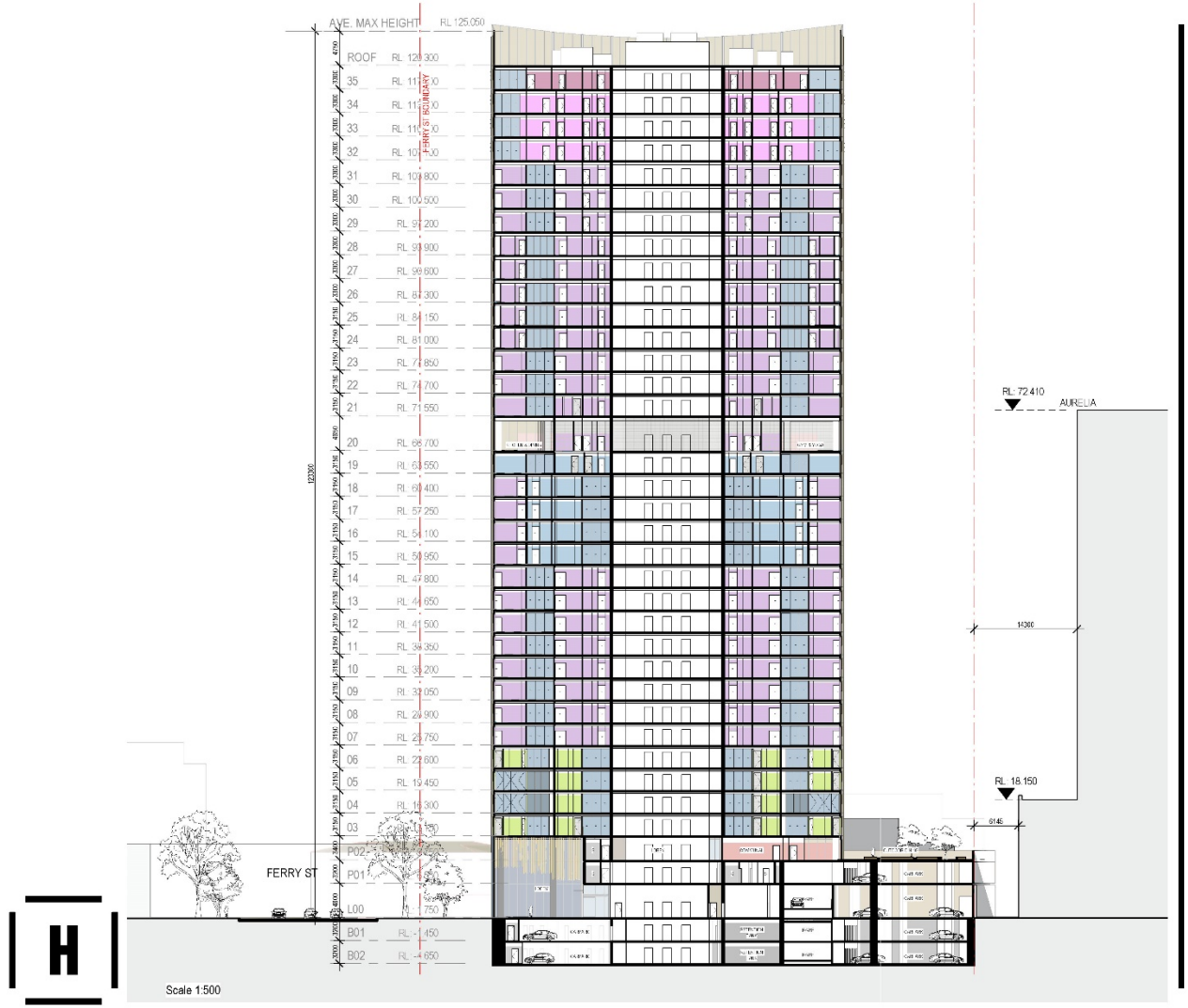
Traffic modelling and analysis indicates that the proposed development is estimated to generate approximately 1,084 daily trips (i.e. 542 inbound and 542 outbound) with approximately 89 and 67 trips during the weekday morning and afternoon peak periods, respectively.

The capacity assessment of the key local signalised intersections of Labouchere Road/ Mill Point Road/Freeway on/off ramp has confirmed that this intersection has the capacity to accommodate the development-generated traffic. Capacity issues at the Mill Point Road/Ferry Street are also not anticipated as this intersection maintains ample spare capacity to accommodate additional traffic.

The results of long-term modelling suggest that the local road network may require modification and/or upgrade works to secure sufficient capacity for the future traffic growth within the peninsula regardless of the proposed development. Hence, it is recommended that the City undertakes an area-wide transport study to identify key initiatives which would assist to arrest traffic growth within the subject locality through improvements in the existing road infrastructure, connectivity, public transport services and parking and pedestrian/cyclist infrastructure.

Appendix A

DEVELOPMENT PLANS (17 DECEMBER 2020 & 12 JANUARY 2021)



REFERENCE MAP

NORTH

NOTES
1. Do not scale drawing. Written dimensions govern.
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings.

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
A	Development Application	17/12/20

- TOWNHOUSE UNIT
- 1B
- 2B
- 3B
- 4B
- PENTHOUSE
- AMENITIES
- COMMUNAL

CONSULTANT

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CLIENT
PEAKSTONE

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALIA

STATUS
DEVELOPMENT APPLICATION

DRAWING TITLE
SECTION 1_FERRY ST

REVIEWED	SCALE @ A3
Checker	As indicated
APPROVED	PROJECT NO.
Approver	019032
DRAWING NO.	REV NO.
SK_300	A

B2 BASEMENT LEVEL 2

_130 CAR BAYS (6 SMALL CAR)
_6 MOTORCYCLE
_0 BICYCLE
_54 STORES

B1 BASEMENT LEVEL 1

_121 CAR BAYS (5 SMALL CAR)
_14 MOTORCYCLE
_0 BICYCLE
_41 STORES

H

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REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
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2. All dimensions are in millimetres unless noted otherwise.
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REV	DESCRIPTION	DATE
A	Development Application	13/12/20

CLIENT
PEAKSTONE

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALIA

STATUS
DEVELOPMENT APPLICATION

DRAWING TITLE
BASEMENT 01 & 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
SK_100

SCALE @ A3
1 : 500

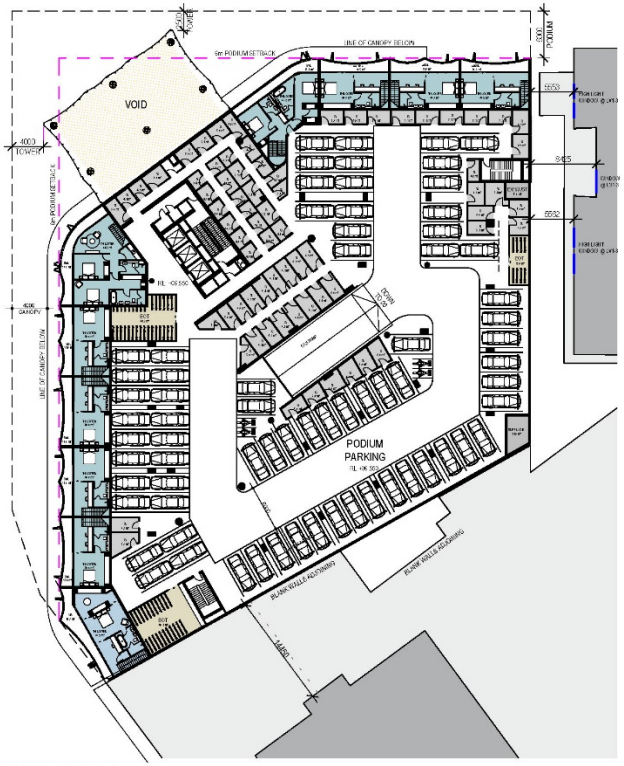
PROJECT NO.
015063

REV NO.
A

GROUND LEVEL

ALL CAR BAYS 5.5m x 2.5m UNLESS NOTED OTHERWISE

_39 CAR BAYS (6 SMALL CAR)
25 Visitors
10 Commercial
4 Residential
_3 MOTORCYCLE BAYS
_8 COMMERCIAL BICYCLE RACKS



PODIUM LEVEL 01

ALL CAR BAYS 5.5m x 2.5m UNLESS NOTED OTHERWISE

_70 CAR BAYS
_4 MOTORCYCLE BAYS
_113 BICYCLE BAYS IN COMPOUND
_71 STORES

H

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REV DESCRIPTION
A Development Application

DATE
17.11.20

CLIENT
PEAKSTONE

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALIA

STATUS
DEVELOPMENT APPLICATION

DRAWING TITLE
LEVEL 00 & 01

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
SK_101

SCALE @ A3
1 : 500

PROJECT NO.
015032

REV NO.
A

PODIUM LEVEL 02

_STORES 9

TOWER LEVEL 03

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NORTH

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REV	DESCRIPTION	DATE
A	Development Application	17.11.20

CLIENT
PEAKSTONE

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALIA

STATUS
DEVELOPMENT APPLICATION

DRAWING TITLE
PODIUM 02 & 03

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
SK_102

SCALE @ A3
1 : 500

PROJECT NO.
015052

REV NO.
A

Appendix B

SIDRA OUTPUTS

Table 5. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday AM peak period – (existing situation)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	142	0.2	142	0.2	0.083	0.1	LOS A	0.1	0.4	0.05	0.03	0.05	59.2
12	R2	8	0.0	8	0.0	0.083	6.8	LOS A	0.1	0.4	0.05	0.03	0.05	46.0
Approach		151	0.2	151	0.2	0.083	0.5	NA	0.1	0.4	0.05	0.03	0.05	58.9
East: Ferry Street														
1	L2	12	0.0	12	0.0	0.012	5.0	LOS A	0.0	0.3	0.39	0.57	0.39	25.9
3	R2	2	0.0	2	0.0	0.012	5.8	LOS A	0.0	0.3	0.39	0.57	0.39	49.6
Approach		14	0.0	14	0.0	0.012	5.2	LOS A	0.0	0.3	0.39	0.57	0.39	36.6
North: Mill Point Road														
4	L2	1	0.0	1	0.0	0.169	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	47.6
5	T1	339	0.2	339	0.2	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		340	0.2	340	0.2	0.169	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		504	0.2	504	0.2	0.169	0.3	NA	0.1	0.4	0.02	0.03	0.02	59.2

Table 6. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday PM peak period - (existing situation)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	152	0.2	152	0.2	0.087	0.1	LOS A	0.0	0.4	0.03	0.03	0.03	59.3
12	R2	7	0.0	7	0.0	0.087	6.5	LOS A	0.0	0.4	0.03	0.03	0.03	46.4
Approach		159	0.2	159	0.2	0.087	0.4	NA	0.0	0.4	0.03	0.03	0.03	59.1
East: Ferry Street														
1	L2	3	0.0	3	0.0	0.004	4.8	LOS A	0.0	0.1	0.35	0.54	0.35	26.3
3	R2	1	0.0	1	0.0	0.004	5.5	LOS A	0.0	0.1	0.35	0.54	0.35	49.7
Approach		4	0.0	4	0.0	0.004	5.0	LOS A	0.0	0.1	0.35	0.54	0.35	40.5
North: Mill Point Road														
4	L2	4	0.0	4	0.0	0.141	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	47.6
5	T1	280	0.2	280	0.2	0.141	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		284	0.2	284	0.2	0.141	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.5
All Vehicles		447	0.2	447	0.2	0.141	0.3	NA	0.0	0.4	0.02	0.02	0.02	59.3

Table 7. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday AM peak period - post-development scenario (year 2022)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	148	0.2	148	0.2	0.104	0.4	LOS A	0.2	1.6	0.14	0.11	0.14	57.6
12	R2	31	0.0	31	0.0	0.104	6.9	LOS A	0.2	1.6	0.14	0.11	0.14	42.6
Approach		179	0.2	179	0.2	0.104	1.5	NA	0.2	1.6	0.14	0.11	0.14	56.6
East: Ferry Street														
1	L2	74	0.0	74	0.0	0.067	5.2	LOS A	0.3	1.8	0.40	0.61	0.40	25.8
3	R2	2	0.0	2	0.0	0.067	6.3	LOS A	0.3	1.8	0.40	0.61	0.40	49.5
Approach		76	0.0	76	0.0	0.067	5.2	LOS A	0.3	1.8	0.40	0.61	0.40	28.5
North: Mill Point Road														
4	L2	11	0.0	11	0.0	0.183	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	47.5
5	T1	353	0.2	353	0.2	0.183	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach		363	0.2	363	0.2	0.183	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.1
All Vehicles		618	0.2	618	0.2	0.183	1.2	NA	0.3	1.8	0.09	0.12	0.09	57.0

Table 8. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday PM peak period - post-development scenario (year 2022)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	158	0.2	158	0.2	0.115	0.4	LOS A	0.3	1.9	0.15	0.12	0.15	57.3
12	R2	40	0.0	40	0.0	0.115	6.7	LOS A	0.3	1.9	0.15	0.12	0.15	42.0
Approach		198	0.2	198	0.2	0.115	1.6	NA	0.3	1.9	0.15	0.12	0.15	56.0
East: Ferry Street														
1	L2	31	0.0	31	0.0	0.026	4.9	LOS A	0.1	0.7	0.35	0.57	0.35	26.3
3	R2	1	0.0	1	0.0	0.026	5.9	LOS A	0.1	0.7	0.35	0.57	0.35	49.7
Approach		32	0.0	32	0.0	0.026	4.9	LOS A	0.1	0.7	0.35	0.57	0.35	29.5
North: Mill Point Road														
4	L2	17	0.0	17	0.0	0.153	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	47.3
5	T1	292	0.2	292	0.2	0.153	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach		308	0.2	308	0.2	0.153	0.3	NA	0.0	0.0	0.00	0.03	0.00	58.5
All Vehicles		538	0.2	538	0.2	0.153	1.1	NA	0.3	1.9	0.08	0.10	0.08	56.9

Table 9. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday AM peak period – 10-year horizon (year 2032)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	178	0.2	178	0.2	0.122	0.4	LOS A	0.2	1.8	0.14	0.09	0.14	57.7
12	R2	31	0.0	31	0.0	0.122	7.4	LOS A	0.2	1.8	0.14	0.09	0.14	42.9
Approach		208	0.2	208	0.2	0.122	1.5	NA	0.2	1.8	0.14	0.09	0.14	56.9
East: Ferry Street														
1	L2	74	0.0	74	0.0	0.141	5.5	LOS A	0.3	1.9	0.45	0.67	0.45	24.8
3	R2	2	0.0	2	0.0	0.141	6.9	LOS A	0.3	1.9	0.45	0.67	0.45	49.1
Approach		76	0.0	76	0.0	0.141	5.6	LOS A	0.3	1.9	0.45	0.67	0.45	27.5
North: Mill Point Road														
4	L2	11	0.0	11	0.0	0.215	5.6	LOS A	0.7	4.9	0.00	0.01	0.00	47.5
5	T1	423	0.2	423	0.2	0.215	0.1	LOS A	0.7	4.9	0.00	0.01	0.00	59.6
Approach		434	0.2	434	0.2	0.215	0.2	NA	0.7	4.9	0.00	0.01	0.00	59.2
All Vehicles		718	0.2	718	0.2	0.215	1.1	NA	0.7	4.9	0.09	0.11	0.09	57.3

Table 10. SIDRA results for the Ferry Street/Mill Point Road intersection – weekday PM peak period – 10-year horizon (year 2032)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Mill Point Road														
11	T1	189	0.2	189	0.2	0.134	0.4	LOS A	0.3	2.1	0.15	0.11	0.15	57.5
12	R2	40	0.0	40	0.0	0.134	7.0	LOS A	0.3	2.1	0.15	0.11	0.15	42.4
Approach		229	0.2	229	0.2	0.134	1.6	NA	0.3	2.1	0.15	0.11	0.15	56.4
East: Ferry Street														
1	L2	28	0.0	28	0.0	0.026	5.1	LOS A	0.1	0.7	0.39	0.58	0.39	25.9
3	R2	1	0.0	1	0.0	0.026	6.4	LOS A	0.1	0.7	0.39	0.58	0.39	49.5
Approach		29	0.0	29	0.0	0.026	5.1	LOS A	0.1	0.7	0.39	0.58	0.39	29.3
North: Mill Point Road														
4	L2	17	0.0	17	0.0	0.181	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	47.4
5	T1	348	0.2	348	0.2	0.181	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.4
Approach		365	0.2	365	0.2	0.181	0.3	NA	0.0	0.0	0.00	0.03	0.00	58.7
All Vehicles		624	0.2	624	0.2	0.181	1.0	NA	0.3	2.1	0.07	0.08	0.07	57.3

Table 11. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday AM peak period – (existing situation)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	967	0.3	967	0.3	*0.816	47.5	LOS D	28.7	214.0	0.96	0.91	1.04	33.6
2	T1	45	0.3	45	0.3	0.183	44.3	LOS D	3.2	24.2	0.87	0.72	0.87	24.3
3	R2	21	0.3	21	0.3	0.183	48.7	LOS D	3.2	24.2	0.87	0.72	0.87	33.9
Approach		1034	0.3	1034	0.3	0.816	47.4	LOS D	28.7	214.0	0.95	0.90	1.03	33.3
East: Mill Point Road East														
4	L2	9	0.2	9	0.2	0.821	53.2	LOS D	27.9	206.6	0.99	0.96	1.08	33.5
5	T1	895	0.2	895	0.2	*0.821	46.1	LOS D	27.9	206.6	0.97	0.93	1.07	34.2
6	R2	35	0.2	35	0.2	0.140	37.9	LOS D	1.5	11.0	0.75	0.73	0.75	27.0
Approach		939	0.2	939	0.2	0.821	45.8	LOS D	27.9	206.6	0.96	0.93	1.05	34.0
North: Mill Point Road North														
7	L2	77	0.3	77	0.3	0.816	66.3	LOS E	11.5	85.9	1.00	0.96	1.22	21.5
8	T1	107	0.3	107	0.3	*0.816	61.7	LOS E	11.5	85.9	1.00	0.96	1.22	22.1
9	R2	166	0.3	166	0.3	0.758	63.7	LOS E	10.1	75.3	1.00	0.88	1.14	21.6
Approach		351	0.3	351	0.3	0.816	63.7	LOS E	11.5	85.9	1.00	0.92	1.18	21.8
West: Kwinana Freeway Ramp West														
10	L2	71	0.2	71	0.2	0.351	23.1	LOS C	11.3	84.0	0.62	0.59	0.62	37.5
11	T1	608	0.2	608	0.2	0.351	17.6	LOS B	11.4	84.9	0.62	0.56	0.62	46.3
12	R2	228	0.2	228	0.2	*0.817	64.6	LOS E	14.2	105.1	1.00	0.91	1.19	28.8
Approach		907	0.2	907	0.2	0.817	29.8	LOS C	14.2	105.1	0.72	0.65	0.77	39.6
All Vehicles		3231	0.2	3231	0.2	0.821	43.8	LOS D	28.7	214.0	0.90	0.84	0.98	33.8

Table 12. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday PM peak period – (existing situation)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	708	0.3	708	0.3	*0.702	45.4	LOS D	19.6	146.0	0.93	0.84	0.94	34.2
2	T1	26	0.3	26	0.3	0.437	60.3	LOS E	3.8	28.4	0.99	0.76	0.99	19.9
3	R2	39	0.3	39	0.3	0.437	64.6	LOS E	3.8	28.4	0.99	0.76	0.99	29.2
Approach		774	0.3	774	0.3	0.702	46.9	LOS D	19.6	146.0	0.94	0.84	0.94	33.5
East: Mill Point Road East														
4	L2	22	0.2	22	0.2	0.756	54.4	LOS D	20.6	152.3	0.98	0.91	1.02	33.0
5	T1	659	0.2	659	0.2	*0.756	46.6	LOS D	20.6	152.3	0.96	0.88	1.01	34.0
6	R2	41	0.2	41	0.2	0.220	44.0	LOS D	1.9	14.5	0.82	0.75	0.82	24.8
Approach		722	0.2	722	0.2	0.756	46.7	LOS D	20.6	152.3	0.95	0.87	1.00	33.6
North: Mill Point Road North														
7	L2	80	0.3	80	0.3	0.700	63.7	LOS E	8.1	60.6	1.00	0.86	1.09	21.9
8	T1	56	0.3	56	0.3	0.700	59.1	LOS E	8.1	60.6	1.00	0.86	1.09	22.5
9	R2	147	0.3	147	0.3	*0.774	66.1	LOS E	9.1	67.9	1.00	0.90	1.18	21.2
Approach		283	0.3	283	0.3	0.774	64.0	LOS E	9.1	67.9	1.00	0.88	1.14	21.6
West: Kwinana Freeway Ramp West														
10	L2	92	0.2	92	0.2	0.342	15.1	LOS B	10.4	77.3	0.47	0.49	0.47	44.6
11	T1	738	0.2	738	0.2	0.342	9.5	LOS A	10.5	78.1	0.47	0.45	0.47	51.5
12	R2	459	0.2	459	0.2	*0.761	44.5	LOS D	24.4	180.9	0.95	0.88	0.98	34.2
Approach		1288	0.2	1288	0.2	0.761	22.4	LOS C	24.4	180.9	0.64	0.61	0.65	43.2
All Vehicles		3067	0.2	3067	0.2	0.774	38.1	LOS D	24.4	180.9	0.82	0.75	0.85	35.8

Table 13. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday AM peak period – post-development scenario (year 2022)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	1006	0.3	1006	0.3	*0.865	53.6	LOS D	32.6	242.9	0.98	0.95	1.13	31.8
2	T1	54	0.3	54	0.3	0.208	44.6	LOS D	3.7	27.8	0.87	0.72	0.87	24.3
3	R2	22	0.3	22	0.3	0.208	49.0	LOS D	3.7	27.8	0.87	0.72	0.87	33.8
Approach		1082	0.3	1082	0.3	0.865	53.1	LOS D	32.6	242.9	0.97	0.93	1.12	31.6
East: Mill Point Road East														
4	L2	9	0.2	9	0.2	0.889	63.2	LOS E	33.1	245.0	1.00	1.06	1.20	30.7
5	T1	931	0.2	931	0.2	*0.889	56.0	LOS E	33.1	245.0	0.98	1.04	1.20	31.3
6	R2	42	0.2	42	0.2	0.180	39.2	LOS D	1.9	13.8	0.77	0.74	0.77	26.5
Approach		982	0.2	982	0.2	0.889	55.3	LOS E	33.1	245.0	0.97	1.03	1.18	31.2
North: Mill Point Road North														
7	L2	92	0.3	92	0.3	0.839	66.5	LOS E	13.6	101.4	1.00	0.98	1.24	21.5
8	T1	123	0.3	123	0.3	0.839	61.9	LOS E	13.6	101.4	1.00	0.98	1.24	22.1
9	R2	212	0.3	212	0.3	*0.850	67.6	LOS E	13.6	101.2	1.00	0.96	1.26	20.9
Approach		426	0.3	426	0.3	0.850	65.7	LOS E	13.6	101.4	1.00	0.97	1.25	21.3
West: Kwinana Freeway Ramp West														
10	L2	83	0.2	83	0.2	0.382	24.6	LOS C	12.5	92.9	0.65	0.62	0.65	36.3
11	T1	633	0.2	633	0.2	0.382	19.1	LOS B	12.7	93.9	0.65	0.59	0.65	45.4
12	R2	238	0.2	238	0.2	*0.899	73.7	LOS E	16.1	119.5	1.00	0.99	1.36	26.9
Approach		954	0.2	954	0.2	0.899	33.2	LOS C	16.1	119.5	0.74	0.69	0.83	38.1
All Vehicles		3444	0.2	3444	0.2	0.899	49.8	LOS D	33.1	245.0	0.91	0.90	1.07	31.8

Table 14. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday PM peak period – post-development scenario (year 2022)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	737	0.3	737	0.3	*0.762	49.4	LOS D	21.7	162.0	0.96	0.88	1.01	33.0
2	T1	36	0.3	36	0.3	0.562	62.3	LOS E	4.5	33.8	1.00	0.77	1.02	19.5
3	R2	40	0.3	40	0.3	0.562	66.6	LOS E	4.5	33.8	1.00	0.77	1.02	28.9
Approach		813	0.3	813	0.3	0.762	50.8	LOS D	21.7	162.0	0.96	0.87	1.01	32.3
East: Mill Point Road East														
4	L2	23	0.2	23	0.2	0.807	58.2	LOS E	23.1	171.4	1.00	0.97	1.09	31.9
5	T1	685	0.2	685	0.2	*0.807	50.2	LOS D	23.1	171.4	0.97	0.93	1.08	32.9
6	R2	52	0.2	52	0.2	0.289	45.0	LOS D	2.5	18.6	0.83	0.76	0.83	24.5
Approach		760	0.2	760	0.2	0.807	50.1	LOS D	23.1	171.4	0.96	0.92	1.06	32.5
North: Mill Point Road North														
7	L2	87	0.3	87	0.3	0.667	61.1	LOS E	8.7	65.2	1.00	0.84	1.05	22.5
8	T1	62	0.3	62	0.3	0.667	56.5	LOS E	8.7	65.2	1.00	0.84	1.05	23.1
9	R2	171	0.3	171	0.3	*0.777	64.5	LOS E	10.5	77.9	1.00	0.90	1.16	21.5
Approach		320	0.3	320	0.3	0.777	62.0	LOS E	10.5	77.9	1.00	0.87	1.11	22.0
West: Kwinana Freeway Ramp West														
10	L2	111	0.2	111	0.2	0.367	15.7	LOS B	11.5	85.3	0.49	0.52	0.49	43.7
11	T1	767	0.2	767	0.2	0.367	10.2	LOS B	11.6	86.3	0.49	0.47	0.49	51.0
12	R2	477	0.2	477	0.2	*0.811	48.7	LOS D	27.1	200.9	0.98	0.91	1.05	33.0
Approach		1355	0.2	1355	0.2	0.811	24.2	LOS C	27.1	200.9	0.67	0.63	0.69	42.2
All Vehicles		3247	0.2	3247	0.2	0.811	40.6	LOS D	27.1	200.9	0.84	0.78	0.90	34.8

Table 15. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday AM peak period – 10-year horizon (year 2032)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	1200	0.3	1200	0.3	*1.030	117.3	LOS F	60.0	447.4	1.00	1.21	1.69	20.4
2	T1	62	0.3	62	0.3	0.243	45.0	LOS D	4.4	32.7	0.88	0.73	0.88	24.1
3	R2	26	0.3	26	0.3	0.243	49.4	LOS D	4.4	32.7	0.88	0.73	0.88	33.7
Approach		1288	0.3	1288	0.3	1.030	112.4	LOS F	60.0	447.4	0.99	1.18	1.63	20.6
East: Mill Point Road East														
4	L2	12	0.2	12	0.2	1.048	112.2	LOS F	51.5	381.4	1.00	1.35	1.77	18.8
5	T1	1109	0.2	1109	0.2	*1.048	115.6	LOS F	51.5	381.4	1.00	1.42	1.79	19.1
6	R2	49	0.2	49	0.2	0.238	39.4	LOS D	2.2	16.5	0.78	0.75	0.78	26.4
Approach		1171	0.2	1171	0.2	1.048	112.3	LOS F	51.5	381.4	0.99	1.39	1.74	19.2
North: Mill Point Road North														
7	L2	107	0.3	107	0.3	1.045	130.8	LOS F	23.0	171.4	1.00	1.43	1.91	13.1
8	T1	144	0.3	144	0.3	1.045	126.2	LOS F	23.0	171.4	1.00	1.43	1.91	13.3
9	R2	245	0.3	245	0.3	*1.047	132.8	LOS F	23.0	171.4	1.00	1.30	1.92	12.8
Approach		497	0.3	497	0.3	1.047	130.5	LOS F	23.0	171.4	1.00	1.37	1.91	13.0
West: Kwinana Freeway Ramp West														
10	L2	97	0.2	97	0.2	0.447	24.9	LOS C	15.4	113.9	0.67	0.64	0.67	36.1
11	T1	755	0.2	755	0.2	0.447	19.3	LOS B	15.5	115.2	0.67	0.62	0.67	45.3
12	R2	283	0.2	283	0.2	1.070	148.8	LOS F	28.9	214.0	1.00	1.27	2.00	17.1
Approach		1135	0.2	1135	0.2	1.070	52.1	LOS D	28.9	214.0	0.76	0.78	1.01	31.4
All Vehicles		4091	0.2	4091	0.2	1.070	97.9	LOS F	60.0	447.4	0.93	1.15	1.52	21.3

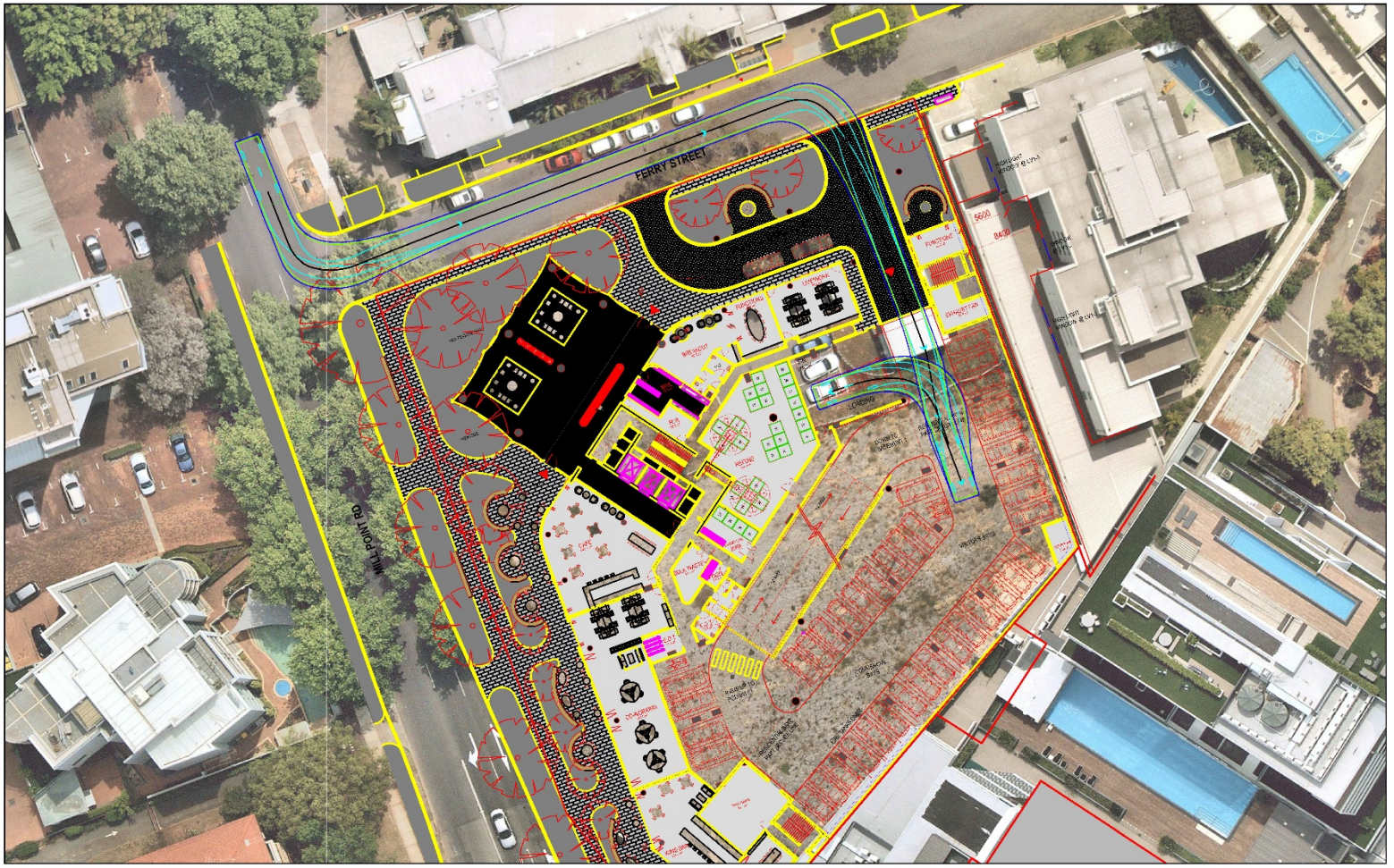
Table 16. SIDRA results for the Labouchere Road/Mill Point Road intersection – weekday PM peak period – 10-year horizon (year 2032)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Labouchere Road South														
1	L2	879	0.3	879	0.3	*0.899	63.7	LOS E	31.3	233.1	0.99	0.99	1.25	29.2
2	T1	41	0.3	41	0.3	0.664	63.6	LOS E	5.5	40.7	1.00	0.82	1.10	19.2
3	R2	48	0.3	48	0.3	0.664	68.0	LOS E	5.5	40.7	1.00	0.82	1.10	28.5
Approach		968	0.3	968	0.3	0.899	63.9	LOS E	31.3	233.1	0.99	0.98	1.23	28.9
East: Mill Point Road East														
4	L2	27	0.2	27	0.2	0.988	104.0	LOS F	40.8	302.4	1.00	1.33	1.53	22.8
5	T1	817	0.2	817	0.2	*0.988	95.1	LOS F	40.8	302.4	0.99	1.29	1.55	23.5
6	R2	59	0.2	59	0.2	0.388	46.7	LOS D	3.0	22.2	0.86	0.78	0.86	24.0
Approach		903	0.2	903	0.2	0.988	92.2	LOS F	40.8	302.4	0.98	1.26	1.51	23.5
North: Mill Point Road North														
7	L2	103	0.3	103	0.3	0.846	69.1	LOS E	11.4	84.6	1.00	0.99	1.28	20.8
8	T1	74	0.3	74	0.3	0.846	64.5	LOS E	11.4	84.6	1.00	0.99	1.28	21.3
9	R2	200	0.3	200	0.3	*0.976	94.8	LOS F	15.6	116.4	1.00	1.15	1.66	16.7
Approach		377	0.3	377	0.3	0.976	81.9	LOS F	15.6	116.4	1.00	1.08	1.48	18.4
West: Kwinana Freeway Ramp West														
10	L2	129	0.2	129	0.2	0.431	15.9	LOS B	14.2	105.3	0.51	0.53	0.51	43.6
11	T1	915	0.2	915	0.2	0.431	10.3	LOS B	14.4	106.6	0.51	0.49	0.51	50.9
12	R2	569	0.2	569	0.2	*1.004	102.7	LOS F	50.8	376.9	1.00	1.14	1.58	22.2
Approach		1614	0.2	1614	0.2	1.004	43.4	LOS D	50.8	376.9	0.69	0.72	0.89	34.3
All Vehicles		3862	0.2	3862	0.2	1.004	63.7	LOS E	50.8	376.9	0.86	0.95	1.18	28.2

Appendix C

SERVICE VEHICLE TURN PATH ASSESSMENT PLAN
(8.0m RIGID TRUCK)

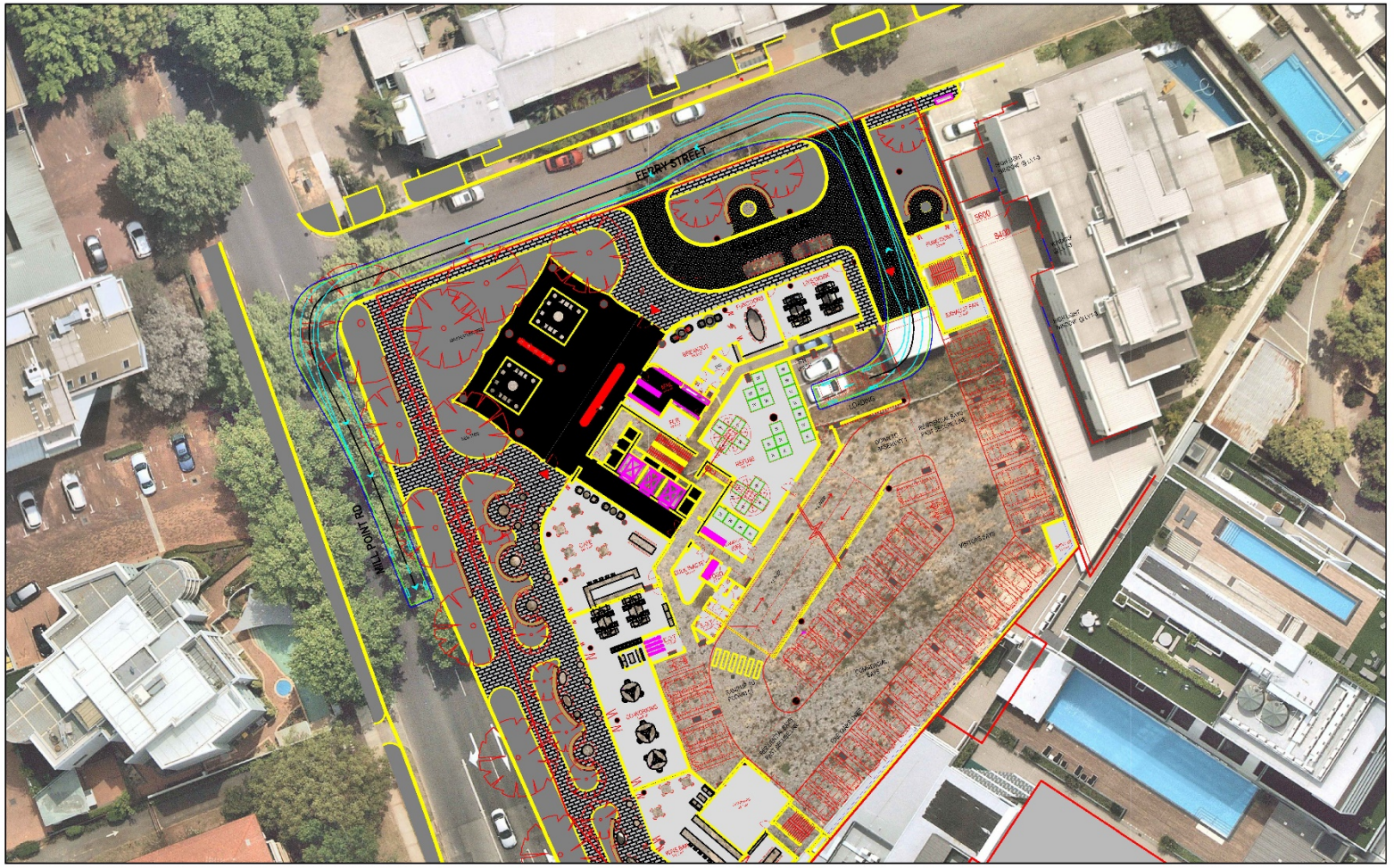


88 Mill Point Road, South Perth
8.0m Service Vehicle
Service Vehicle Entry

LEGEND
Vehicle Body
Wheel Path
250mm Clearance

t20.239.sk01
07/12/2020
Scale: 1:400 @ A3

transcore



88 Mill Point Road, South Perth
8.0m Service Vehicle
Service Vehicle Exit

LEGEND
Vehicle Body
Wheel Path
250mm Clearance

t20.239.sk02
07/12/2020
Scale: 1:400 @ A3

transcore