



Revelstoke Building Solutions
Kingston Town Warehouse and
Showroom
Traffic Impact Assessment
June 2024



CELEBRATING 15 YEARS
2008 - 2023

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1. Introduction

1.1 Background

Midson Traffic were engaged by Revelstoke Building Solutions to prepare a traffic impact assessment for a proposed warehouse and showroom development at the northern end of the Kingston Town Shopping Centre site.

1.2 Traffic Impact Assessment (TIA)

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management, but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

This TIA has been prepared in accordance with the Department of State Growth (DSG) publication, *Traffic Impact Assessment Guidelines*, August 2020. This TIA has also been prepared with reference to the Austroads publication, *Guide to Traffic Management*, Part 12: *Integrated Transport Assessments for Developments*, 2020.

Land use developments generate traffic movements as people move to, from and within a development. Without a clear understanding of the type of traffic movements (including cars, pedestrians, trucks, etc), the scale of their movements, timing, duration and location, there is a risk that this traffic movement may contribute to safety issues, unforeseen congestion or other problems where the development connects to the road system or elsewhere on the road network. A TIA attempts to forecast these movements and their impact on the surrounding transport network.

A TIA is not a promotional exercise undertaken on behalf of a developer; a TIA must provide an impartial and objective description of the impacts and traffic effects of a proposed development. A full and detailed assessment of how vehicle and person movements to and from a development site might affect existing road and pedestrian networks is required. An objective consideration of the traffic impact of a proposal is vital to enable planning decisions to be based upon the principles of sustainable development.

This TIA also addresses the relevant clauses in Code E5.0, *Road and Railway Assets Code*, and E6.0, *Parking and Sustainable Transport Code*, of the Kingborough Interim Planning Scheme, 2015.

1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *Traffic Impact Assessment Guidelines*, August 2020, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 28 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006

- Master of Traffic, Monash University, 2004
- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)

1.4 Project Scope

The project scope of this TIA is outlined as follows:

- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

1.5 Subject Site

The subject site is located at the northern end of the Kingston Town Shopping Centre site. The site currently contains a shopping centre, service station and car park.

The subject site and surrounding road network is shown in Figure 1.

Figure 1 Subject Site & Surrounding Road Network



1.6 Reference Resources

The following references were used in the preparation of this TIA:

- Kingborough Interim Planning Scheme, 2015 (Planning Scheme)
- Austroads, *Guide to Traffic Management, Part 12: Integrated Transport Assessments for Developments*, 2020
- Austroads, *Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections*, 2023
- Department of State Growth, *Traffic Impact Assessment Guidelines*, 2020
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RMS Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys*, 2013 (Updated RMS Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1)

2. Existing Conditions

2.1 Transport Network

For the purposes of this report, the transport network consists of Channel Highway and Maranoa Road.

2.1.1 Channel Highway

Channel Highway is an arterial road that connects between Sandy Bay and Cygnet. Channel Highway traverses through Kingston CBD and provides access to a number of commercial sites, as well as the local road network associated with the CBD. Between Summerleas Road and Algona Road, Channel Highway provides a collector road function, servicing residential and commercial sites along its length.

The section of Channel Highway between Summerleas Road and Algona Road has a posted speed limit of 60-km/h.

Traffic data for Channel Highway was obtained from the Department of State Growth. Channel Highway north of the Spring Farm Road roundabout carries approximately 12,900 vehicles per day¹. It carries approximately 7.8% heavy vehicles. Peak traffic flows are 1,100 and 1,200 vehicles per hour during the AM and PM peaks respectively. The weekday distribution of hourly traffic flow is shown in Figure 2.

Figure 2 Channel Highway Weekday Hourly Traffic Volumes



¹ 2021 traffic data: 12,838 vpd

2.1.2 Maranoa Road

Maranoa Road is a minor collector road that connects between Redwood Road at a roundabout at its southern end, and Channel Highway at its northern end. It provides access to predominantly residential properties along its length, as well as the secondary access to Woolworths Kingston Town Shopping Centre, and several commercial properties.

Maranoa Road carries approximately 7,000 vehicles per day between Denison Street and Sophia Street. It carries a much lower traffic volume between Denison Street and Channel Highway. The general urban speed limit of 50-km/h is applicable to Maranoa Road, with a school 40-km/h zone applicable during school activity periods.

A school crossing is located in Maranoa Road between the primary and secondary campuses of Calvin (immediately north of the Sophia Street intersection).

Figure 3 Maranoa Road



2.1.3 Shopping Centre Access Turning Movements

Turning movements were undertaken at the Kingston Town Shopping Centre accesses at Channel Highway Maranoa Road during the afternoon peak period (4:30pm – 5:30pm) on Wednesday 6th March 2024. The turning movements are summarised in Table 1.

Table 1 Shopping Centre Access Turning Movements

| Approach | Left Turn | Through | Right Turn |
|--------------------|-----------|---------|------------|
| Maranoa Access | 108 vph | - | 92 vph |
| Maranoa Rd north | - | 132 vph | 96 vph |
| Maranoa Rd south | 121 vph | 139 vph | - |
| Channel Hwy Access | 114 vph | - | 78 vph |
| Channel Hwy north | 156 vph | 540 vph | - |
| Channel Hwy south | - | 545 vph | 96 vph |

It can be seen from the surveys that the accesses have the following PM peak flows:

- Maranoa Road access 417 vehicles per hour (217 vph IN/ 200 vph OUT)
- Channel Highway access 444 vehicles per hour (252 vph IN/ 192 vph OUT)

2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a 5+ year period between 1st January 2019 and 31st January 2024 for the following:

- Kingston Town car park and associated internal access roads.
- Maranoa Road between Denison Street and Cleburne Street.
- Channel Highway between Dollery Drive and Jantina Place.

The findings of the crash data is summarised as follows:

Shopping Centre car park

- A total of 37 crashes were reported.
- Severity. 1 crash involved serious injury; 36 crashes resulted in property damage only.
- Time of day. The majority of crashes were reported during normal business hours (35 crashes between 9:30am and 6:00pm). 2 crashes were reported between 6:00pm and 8:10pm.
- Day of week. No crash trends were evident by day of week. 8 crashes were reported on Fridays; 7 crashes were reported on Wednesdays; 6 crashes were reported on Mondays and Saturdays; 5 crashes were reported on Sundays; 3 crashes were reported on Thursdays; and 2 crashes were reported on Tuesdays.
- Crash types. The dominant crash type was 'other-manoeuving' (23 crashes). 3 x 'parking-vehicles-only' crashes were reported. 11 crashes did not have a crash type recorded (which is considered typical for a car parking environment where minor collisions are reported).
- Crash locations. Crashes were predominantly located in the section of the car park on the south-western side of the shopping centre. 3 crashes were reported on the main access road from Channel Highway.
- Vulnerable road users. 1 crash involved a motorcycle.

Maranoa Road

- A total of 3 crashes were reported.
- Severity. 2 crashes involved minor injury; 1 crash involved property damage only.
- Time of day. Crashes were disbursed throughout the day. 1 crash was reported during the morning; 1 crash reported during the afternoon; and 1 crash was reported during the evening.
- Day of week. No crash trends were evident by day of week. 1 crash was reported on a Wednesday, Thursday and Sunday.
- Crash types. No trends were noted by crash type. 1 crash involved a 'right-through' collision; 1 crash involved a 'off-carriageway' single vehicle collision; and 1 crash involved a 'head-on' collision.
- Crash locations. 1 crash was reported at the shopping centre junction. Both other crashes were reported near the Denison Street junction.
- Vulnerable road users. 1 crash involved a motorcycle.

Channel Highway

- A total of 9 crashes were reported.
- Severity. 1 crash involved minor injury; 1 crash required first aid at the scene; 7 crashes involved property damage only.

- Time of day. 2 crashes were reported between midnight and 5:00am; 3 crashes were reported between 10:00am and 6:00pm; 4 crashes were reported after 6:00pm.
- Day of week. 3 crashes were reported on Mondays and Fridays; 2 crashes were reported on Wednesdays; 1 crash was reported on a Tuesday; no crashes were reported on Thursdays, Saturdays or Sundays.
- Crash types. 2 crashes involved 'emerging-from-driveway'; various other crashes were reported with no clear crash trends.
- Crash locations. 5 crashes were reported near the shopping centre access junction; 4 crashes were reported to the north of the shopping centre junction at midblock locations.
- Vulnerable road users. 1 crash involved a bicycle (minor injury); 1 crash involved a motorcycle (property damage only).

The crash history within the shopping centre car park is considered to be typical of a large car park where minor incidents are reported. The crash rates on Channel Highway and Maranoa Road are considered to be relatively low and typical of an urban, high-volume environment.

The crash history does not indicate that there are any specific road safety issues that may be exacerbated by traffic generated by the proposed development.

3. Proposed Development

3.1 Development Proposal

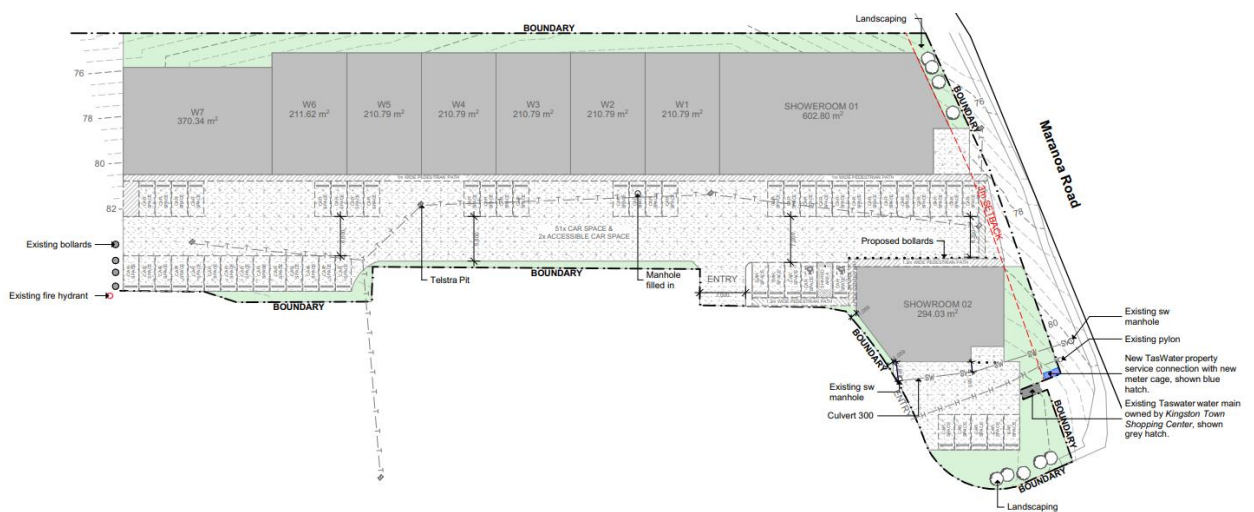
The proposed development involves the construction of 7 warehouse units and 2 bulky goods showroom. A total of 53 on-site car parking spaces are proposed, including 2 disabled spaces.

The floor areas of each of the units is as follows:

- Showroom 1 602.80 m²
- Showroom 2 294.03 m²
- Warehouse 1 210.79 m²
- Warehouse 2 210.79 m²
- Warehouse 3 210.79 m²
- Warehouse 4 210.79 m²
- Warehouse 5 210.79 m²
- Warehouse 6 211.62 m²
- Warehouse 7 370.34 m²
- TOTAL Showroom: 896.83 m² / Warehouse: 1,635.91 m²

The proposed development is shown in Figure 4.

Figure 4 Proposed Development Plans



4. Traffic Impacts

4.1 Trip Generation

Traffic generation was calculated using empirical data obtained from the RMS Guide.

4.1.1 Warehouse

The RMS Guide states that warehouses generate 4 trips per day for each 100m² of gross floor area, with a peak of 0.5 trips per hour for every 100m² of gross floor area.

This equates to traffic generation of 65 vehicles per day with a peak of 8 vehicles per hour. Peak traffic generation relates to the weekday PM peak period.

4.1.2 Bulky Goods Retail

For bulky goods retail, the RMS Guide states that the Thursday evening peak average generation rate surveyed was 2.5 vehicles per hour per 100 m² gross leasable floor area, with a range extending from 0.1 to 6.4 vehicles per hour per 100 m² GLFA. The average generation rate was higher on the weekend, with a mean peak rate of 6.6 vehicles per hour per 100 m² GLFA.

A weekday peak generation rate of 3 vehicles per hour per 100 m² has been adopted for the bulky goods tenancies associated with the proposed development. Daily generation is likely to be 25 trips per 100m² of gross floor area.

This equates to a traffic generation rate of 224 vehicles per day with a peak of 26 vehicles per hour.

4.1.3 Total Trip Generation

The total weekday traffic generation associated with the proposed development is 289 vehicles per day, with a peak of 34 vehicles per hour.

4.2 Trip Assignment

Peak traffic generation will be 34 vehicles per hour. This will equate to 17 inward vehicles per hour and 17 outward vehicles per hour across two accesses.

The proximity of the development site to the Maranoa Road access will result in the majority of traffic utilising this access. A split of 60%/ 40% has been applied to the Maranoa Road and Channel Highway accesses.

The turning movements are assumed to follow the existing patterns identified in the surveys in Table 1. The likely traffic distribution associated with the development's PM traffic generation at both accesses is provided in Table 2 (noting that a slightly higher peak generation of 36 vehicles per hour has been applied to the accesses).

Table 2 PM Traffic Generation Trip Distribution

| Access | Left-In | Right-In | Left-Out | Right-Out |
|-------------|---------|----------|----------|-----------|
| Maranoa Rd | 6 vph | 5 vph | 6 vph | 5 vph |
| Channel Hwy | 4 vph | 3 vph | 4 vph | 3 vph |

4.3 Traffic Capacity Analysis

The operational performance of the shopping centre’s accesses at Marona Road and Channel Highway were examined using traffic modelling analysis.

4.3.1 SIDRA Modelling

Traffic modelling was undertaken using SIDRA Intersection software for key intersections within the study area. SIDRA uses complex analytical traffic models coupled with iterative approximation technique to provide estimates of capacity and performance of intersections. SIDRA is endorsed as a modelling tool by Austroads.

One of the key SIDRA outputs is an indication of level of service (LOS) at intersections. The LOS concept describes the quality of traffic service in terms of 6 levels, with level of service A (LOS A) representing the best operating condition (ie. at or close to free flow) and level of service F (LOS F) representing the worst (i.e. forced flow). Other key outputs of SIDRA include average movement delay and 95th percentile queue lengths².

The level of service method used in the modelling is the Delay method, where level of service is based solely on average movement delay, including geometric delay, as summarised in Table 3.

Table 3 SIDRA LOS Performance standards

| Level of Service | Signals and Roundabouts | Sign Control (Give Way & Stop) |
|------------------|-------------------------|--------------------------------|
| LOS A | $d \leq 10$ | $d \leq 10$ |
| LOS B | $10 < d \leq 20$ | $10 < d \leq 15$ |
| LOS C | $20 < d \leq 35$ | $15 < d \leq 25$ |
| LOS D | $35 < d \leq 55$ | $25 < d \leq 35$ |
| LOS E | $55 < d \leq 80$ | $35 < d \leq 50$ |
| LOS F | $80 < d$ | $50 < d$ |

² This is the queue length not exceeded 95% of the time

The lowest target level of service considered acceptable for an urban environment is LOS D, which corresponds to a maximum delay of 55 seconds for roundabouts. LOS E and F represent the junction operating at capacity, with forced flow conditions.

4.3.2 Existing Junction Performance

SIDRA traffic modelling was undertaken at the two intersections using the turning movements obtained in the traffic surveys (Table 1). The SIDRA movement summaries are provided in Table 4 and Table 5 for the Maranoa Road and Channel Highway junctions respectively.

It can be seen that both accesses currently operate at a relatively high level of efficiency. The Maranoa Road junction operates at LOS A or B for all approaches. The Channel Highway junction operates at LOS D for the shopping centre approach. Delays are currently approximately 30 seconds, but minimal queuing occurs due to the relatively low right turn movements on this approach.

Table 4 PM Peak Existing Conditions SIDRA Summary – Maranoa Rd

| Movement Performance - Vehicles | | | | | | | | | |
|---------------------------------|------|-------------------|------|---------------|-------------------|------------------|--------------------------------|------------|--|
| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | |
| South: Maranoa Rd | | | | | | | | | |
| 1 | L | 127 | 0.0 | 0.145 | 8.2 | LOS A | 0.0 | 0.0 | |
| 2 | T | 146 | 2.0 | 0.145 | 0.0 | LOS A | 0.0 | 0.0 | |
| Approach | | 274 | 1.1 | 0.145 | 3.8 | NA | 0.0 | 0.0 | |
| North: Maranoa Rd | | | | | | | | | |
| 8 | T | 139 | 2.0 | 0.165 | 1.4 | LOS A | 1.0 | 6.8 | |
| 9 | R | 101 | 0.0 | 0.165 | 9.7 | LOS A | 1.0 | 6.8 | |
| Approach | | 240 | 1.2 | 0.165 | 4.9 | NA | 1.0 | 6.8 | |
| West: Kingston Town access | | | | | | | | | |
| 10 | L | 114 | 0.0 | 0.118 | 9.3 | LOS A | 0.4 | 3.1 | |
| 12 | R | 97 | 0.0 | 0.220 | 14.7 | LOS B | 0.9 | 6.0 | |
| Approach | | 211 | 0.0 | 0.220 | 11.8 | LOS B | 0.9 | 6.0 | |
| All Vehicles | | 724 | 0.8 | 0.220 | 6.5 | NA | 1.0 | 6.8 | |

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement
 Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 5 PM Peak Existing Conditions SIDRA Summary – Channel Hwy

| Movement Performance - Vehicles | | | | | | | | |
|---------------------------------|------|-------------------|------|---------------|-------------------|------------------|--------------------------------|------------|
| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m |
| South: Channel Hwy | | | | | | | | |
| 1 | L | 109 | 7.3 | 0.062 | 8.5 | LOS A | 0.0 | 0.0 |
| 2 | T | 1014 | 7.3 | 0.545 | 0.0 | LOS A | 0.0 | 0.0 |
| Approach | | 1123 | 7.3 | 0.545 | 0.8 | NA | 0.0 | 0.0 |
| North: Channel Hwy | | | | | | | | |
| 8 | T | 538 | 7.3 | 0.289 | 0.0 | LOS A | 0.0 | 0.0 |
| 9 | R | 59 | 7.3 | 0.179 | 19.5 | LOS C | 0.6 | 4.6 |
| Approach | | 597 | 7.3 | 0.289 | 1.9 | NA | 0.6 | 4.6 |
| West: Access | | | | | | | | |
| 10 | L | 168 | 7.3 | 0.639 | 30.9 | LOS D | 3.1 | 23.1 |
| Approach | | 168 | 7.3 | 0.639 | 30.9 | LOS D | 3.1 | 23.1 |
| All Vehicles | | 1888 | 7.3 | 0.639 | 3.9 | NA | 3.1 | 23.1 |

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement
 Minor Road Approach LOS values are based on average delay for all vehicle movements.

4.3.3 Development Junction Performance

SIDRA traffic modelling was undertaken of the 10-year (2034) traffic flows on the Channel Highway and Maranoa Road that includes traffic generation associated with the proposed development. The adopted compound growth rate was 4% and 1% per annum for Channel Highway and Maranoa Road respectively.

The SIDRA movement summaries are provided in Table 6 and Table 7 for the Maranoa Road and Channel Highway junctions respectively.

It can be seen that the Maranoa Road junction continues to operate at a high level of efficiency, with the worst movement being an acceptable LOS C (right turn exit).

The Channel Highway junction results in a LOS F for the right turn exit movement. A shift of 20 vehicles per hour from the right turn movement to the left turn movement was applied to account for the fact that vehicles would experience delays for right turning exit movements. The poor level of service is independent of the proposed development, which only increases the loading at the access by 14 vehicles per hour. The reduced capacity for exiting movements is due to the background traffic growth on Channel Highway. In reality, some of this traffic would be redirected to the Maranoa Road junction which has a relatively high spare capacity.

Importantly, the Maranoa Road junction, which is located in close proximity to the development site, can accommodate the traffic generation associated with the proposed development.

Table 6 PM Peak 2034 Conditions – Maranoa Rd

| Movement Performance - Vehicles | | | | | | | | |
|---------------------------------|------|-------------------|------|---------------|-------------------|------------------|--------------------------------|------------|
| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m |
| South: Maranoa Rd | | | | | | | | |
| 1 | L | 134 | 0.0 | 0.152 | 8.2 | LOS A | 0.0 | 0.0 |
| 2 | T | 154 | 2.0 | 0.152 | 0.0 | LOS A | 0.0 | 0.0 |
| Approach | | 287 | 1.1 | 0.152 | 3.8 | NA | 0.0 | 0.0 |
| North: Maranoa Rd | | | | | | | | |
| 8 | T | 162 | 2.0 | 0.183 | 1.5 | LOS A | 1.1 | 7.9 |
| 9 | R | 106 | 0.0 | 0.183 | 9.8 | LOS A | 1.1 | 7.9 |
| Approach | | 268 | 1.2 | 0.183 | 4.8 | NA | 1.1 | 7.9 |
| West: Kingston Town access | | | | | | | | |
| 10 | L | 120 | 0.0 | 0.127 | 9.4 | LOS A | 0.5 | 3.3 |
| 12 | R | 102 | 0.0 | 0.249 | 15.9 | LOS C | 1.0 | 7.2 |
| Approach | | 222 | 0.0 | 0.249 | 12.4 | LOS B | 1.0 | 7.2 |
| All Vehicles | | 778 | 0.8 | 0.249 | 6.6 | NA | 1.1 | 7.9 |

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement
 Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 7 PM Peak 2034 Conditions – Channel Hwy

| Movement Performance - Vehicles | | | | | | | | |
|---------------------------------|------|-------------------|------|---------------|-------------------|------------------|--------------------------------|------------|
| Mov ID | Turn | Demand Flow veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m |
| South: Channel Hwy | | | | | | | | |
| 1 | L | 67 | 7.3 | 0.038 | 8.5 | LOS A | 0.0 | 0.0 |
| 2 | T | 759 | 7.3 | 0.408 | 0.0 | LOS A | 0.0 | 0.0 |
| Approach | | 826 | 7.3 | 0.408 | 0.7 | NA | 0.0 | 0.0 |
| North: Channel Hwy | | | | | | | | |
| 8 | T | 1118 | 7.3 | 0.600 | 0.0 | LOS A | 0.0 | 0.0 |
| 9 | R | 101 | 7.3 | 0.191 | 14.7 | LOS B | 0.7 | 5.3 |
| Approach | | 1219 | 7.3 | 0.600 | 1.2 | NA | 0.7 | 5.3 |
| West: Access | | | | | | | | |
| 10 | L | 168 | 7.3 | 0.397 | 18.0 | LOS C | 1.8 | 13.2 |
| Approach | | 168 | 7.3 | 0.397 | 18.0 | LOS C | 1.8 | 13.2 |
| All Vehicles | | 2214 | 7.3 | 0.600 | 2.3 | NA | 1.8 | 13.2 |

Level of Service (LOS) Method: Delay (HCM 2000).
 Vehicle movement LOS values are based on average delay per movement
 Minor Road Approach LOS values are based on average delay for all vehicle movements.

4.4 Access Impacts

A single access will be provided through the existing car park of Kingston Town Shopping Centre. The access aligns with an existing circulation aisle of the shopping centre car park – the car park is shown in Figure 5. The proposed access is 7.0 metres wide.

The external road connection to the site is via the existing road junctions at Maranoa Road and Channel Highway.

Figure 5 Existing Car Park



4.4.1 Number of Accesses

The Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme states *“No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less”*.

In this case the development provides one access that is located within the existing car park of the Kingston Town Shopping Centre. The number of accesses complies with the requirements of Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme.

4.5 Sight Distance

The Acceptable Solution A1 of E5.6.4 of the Planning Scheme states “*Sight distances at an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1*”.

Table E5.1 is reproduced in Table 8. The “Vehicle Speed” is defined in the Planning Scheme as “*the actual or recorded speed of traffic passing along the road and is the speed at or below which 85% of passing vehicles travel*”. This is often referred to as the “Design Speed” or the “85th Percentile speed” in traffic engineering terminology.

Table 8 Planning Scheme SISD Requirements

| Vehicle Speed | Safe Intersection Sight Distance in metres, for speed limit of: | |
|---------------|---|----------------------|
| | 60 km/h or less | Greater than 60 km/h |
| 50 | 80 | 90 |
| 60 | 105 | 115 |
| 70 | 130 | 140 |
| 80 | 165 | 175 |
| 90 | | 210 |
| 100 | | 250 |
| 110 | | 290 |

Source: Table E5.1, Kingborough Interim Planning Scheme, 2015

The sight distance relates to the two available road junctions that access the site:

- Car park access/ Maranoa Road
- Car park access road/ Channel Highway

The available sight distance was assessed at each access. The available sight distance exceeds 80 metres in both directions at each access. The Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme is therefore met.

4.6 Pedestrian Impacts

The proposed development is likely to generate a moderate amount of pedestrian activity in the network. The existing footpath infrastructure is considered to be of a high standard in the existing road network to cater for these pedestrian movements.

4.7 Road Safety Impacts

The proposed development is not expected to have any significant adverse impact on road safety for the following reasons:

- The peak hour traffic generation of 36 vehicles per hour is split across two access junction and effectively utilises an existing roundabout to distribute traffic flow in the network. The traffic generation was modelled and demonstrated that it will not have a significant adverse impact on the traffic efficiency and general operation of the road network.
- The existing road safety performance of the network in the vicinity of the subject site does not indicate that there are any current road safety deficiencies that may be exacerbated by the proposed development.

5. Parking Assessment

5.1 Parking Provision

The proposed development provides a total of 55 on-site car parking spaces. This includes 2 disabled parking spaces.

5.2 Planning Scheme Requirements

The Parking and Access Code, E6.0, sets out the Planning Scheme parking requirements for a development. The Acceptable Solution A1 of E6.6.1 of the Planning Scheme states: "*The number of on-site car parking spaces must be no less than the number specified in Table E6.1*".

Table E6.1 requires the following parking provision:

- Bulky goods retail 1 space per 50m²
- Warehouse 1 space per 100m² plus 1 space per 40m² of ancillary office area

This equates to a parking requirement for 51 spaces (ancillary warehouse office area of approximately 480m²). The provision of 53 spaces complies with this requirement. The Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme is met.

5.3 Car Parking Layout

The car parking layout is shown in Figure 4.

The Acceptable Solution A1 of Clause E6.7.5 of the Planning Scheme states "*The layout of car parking spaces, access aisles, circulation roadways and ramps must be designed and constructed to comply with section 2 "Design of Parking Modules, Circulation Roadways and Ramps" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking and must have sufficient headroom to comply with clause 5.3 "Headroom" of the same Standard*".

The relevant AS2890.1 requirements are set out in the following sections.

5.3.1 Car Parking Space Dimensions

The car parking layout has the following car parking dimensions (noting that parking is shared for all users):

AS2890.1 defines the car park as User Class 3A, '*short-term, high turnover parking at shopping centres*'. User Class 3 requires the following dimensions for 90-degree parking:

- Space length 5.4 metres
- Space width 2.6 metres
- Aisle width 6.6 metres

The parking space dimensions comply with the requirements of AS2890.1.

5.3.2 Parking Grade

Section 2.4.6 of AS2890.1 states that the maximum grades within a car park shall be:

- Measured parallel to the angle of parking 1 in 20 (5%)
- Measured in any other direction 1 in 16 (6.25%)

All parking spaces are effectively level, thus complying with the AS2890.1 grade requirements.

5.3.3 Access Width

AS2890.1 defines the access to the car park as Category 2 (User Class 3A accessing 25-100 spaces from a local road frontage).

Category 2 accesses require a width between 6.0 to 9.0 metres. The 7 metre access complies with this requirement.

5.3.4 AS2890.1 Assessment Summary

Based on the above assessment, the parking layout comply with the requirements of Acceptable Solution A1 of Clause E6.7.5 of the Planning Scheme.

5.4 Disabled Parking

The Acceptable Solution A1 of Clause E6.6.2 of the Planning Scheme states:

"Car parking spaces provided for people with a disability must:

- (a) satisfy the relevant provisions of the Building Code of Australia;*
- (b) be incorporated into the overall car park design;*
- (c) be located as close as practicable to the building entrance".*

The BCA Code classifies the shopping centre as a 'Class 6' building. This requires 1 disabled parking space for every 50 car parking spaces. This is a requirement for 1 disabled space.

The development provides a total of 2 disabled parking spaces and therefore complies with the requirements of Acceptable Solution A1 of Clause E6.6.2 of the Planning Scheme.

6. Conclusions

This traffic impact assessment (TIA) investigated the traffic and parking impacts of a proposed warehouse and showroom development at the Kingston Town Shopping Centre site.

The key findings of the TIA are summarised as follows:

- The development includes a mix of warehouses and bulky goods retail sites.
- The development will generate 289 vehicles per day with a weekday afternoon peak of 34 vehicles per hour. The majority of this traffic generation is likely to access the site via the shopping centre's access from Maranoa Road.
- The access arrangements meet the requirements of Acceptable Solution A2 of Clause E5.6.2 of the Planning Scheme.
- The impacts of the traffic generation on the performance of the shopping centre accesses on Channel Highway and Maranoa Road were modelled using SIDRA Intersection analysis software. The modelling indicated the shopping centre access at Maranoa Road can cater for the peak traffic generation associated with the development.
- The shopping centre's junction with the Channel Highway will have capacity issues for the right turn exit movement with forecast growth on the highway. The traffic generation associated with the proposed development has little impact on the forecast performance of this intersection. Outside of the weekday afternoon peak period, this will not be an issue. In real terms, traffic is likely to divert to other parts of the network (such as Maranoa Road access and left turn onto Channel Highway) to overcome this issue.
- The development provides a total of 53 on-site car parking spaces. The parking provision meets the requirements of the Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme.
- The car parking layout meets the requirements of Acceptable Solution A1 of Clause E6.7.5 of the Planning Scheme.

Based on the findings of this report the proposed development is supported on traffic grounds.

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