URS

Summary Paper

Transport and Access at Waterfront Place

Prepared for
City of Port Phillip
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AUSTRALIA

Study area

Introduction

Context

There are a number of key transport and access issues highlighted by the City of Port Phillip (CoPP) in the vicinity of Waterfront Place and Station Pier, including:

- traffic congestion and parking overflow – particularly when the Spirit of Tasmania and cruise ships are docked at Station Pier;
- pedestrian and cyclist safety and amenity; and
- the additional demand on traffic and parking in the area that would come with a possible redevelopment of 1–7 Waterfront Place.

URS Australia Pty Ltd (URS) was engaged by the CoPP to investigate these issues both now and into the future for Waterfront Place and its surrounds for the *Transport and Access Study for the Waterfront Place Precinct, Port Melbourne*. The full study area is shown above.

Purpose of this report

This report focuses on the roundabout at Princes St/Beach St/ Waterfront Pl. It summarises the approach, findings and recommendations, relevant to this area, that came from the *Transport and Access Study for the Waterfront Place Precinct, Port Melbourne* report, prepared earlier this year.

Methodology of the Study

The approach undertaken for this study was typical of that undertaken for traffic impact studies. The following steps outline this approach.

STEP 1 Define the existing conditions

To assess the traffic access and parking in the study area, we must first understand what is happening on the site. The following tasks were undertaken:

- review the context and existing strategies;
- visit the site with CoPP officers;
- agree key intersections in the study area with CoPP;
- undertake traffic counts at the key intersections during busy periods:
  - Monday 19th November 2012 and Sunday 25th November 2012 were selected and agreed with CoPP;
  - Monday represented a fine weather weekday during school term when a cruise ship and the Spirit of Tasmania were both docked at Station Pier;
  - Sunday represented a fine weather day when the Spirit of Tasmania was docked at Station pier and the weather attracted lots of visits to the area, both on foot, by bike, public transport and car; and
- undertake a parking occupancy survey of the study area and extending 500 m from the study area boundary on the same days as the traffic counts.

STEP 2 Assess the existing conditions

During this stage of the study, the roads and intersections were assessed using traffic modelling software called SIDRA. This software is endorsed by AustRoads, the national road authority in Australia. The following steps were undertaken:

- define the time and day when the traffic counts were the highest from the data collected, both morning and night;
- input highest traffic volumes into traffic model to determine how well the intersections are currently operating;
- compare existing parking supply and hourly demand in the study area to identify any shortfall; and
- review VicRoads crash statistics for the area to determine whether there are any safety issues.

STEP 3 Determine the future growth and development

To determine how well the roads in the study area will operate in the future, the growth in background traffic and the traffic generation of the potential redevelopment of 1–7 Waterfront Place was determined using the following steps:

- estimate local area population growth in 5 and 10 years time, apply this to the existing traffic volumes and run traffic models to determine how the roads will perform in the future;
- estimate additional traffic generated by the redevelopment of 1–7 Waterfront Place, based on three density scenarios provided by CoPP;
- run the traffic models with the additional traffic in the future and with the development to determine how the road network will cope with the growth in traffic.

STEP 4 Compare existing and future conditions

In order to determine the impact of future growth and the development, compare the performance of the road network under the existing conditions in Step 2 to the future performance of the road network in Step 3.

STEP 5 Make recommendations

Using the information gathered in the previous stages, determine what improvements can be made:

- identify whether any improvements are required to the intersections in the future based on how they perform in the traffic modelling and road safety observations; and
- determine improvements to the area to improve safety and capacity for cycling and pedestrians.

Impact of the Redevelopment at 1–7 Waterfront Place

For the redevelopment of 1–7 Waterfront Place, three density scenarios were provided by CoPP, a low, medium and high scenario. The traffic generated by these development scenarios was determined using a number of factors, these factors and the resulting traffic generation from the development are explained below.

How was the traffic generation determined

The CoPP Sustainable Transport Strategy specifies that all future development should encourage travel by more active modes such as cycling and walking as top priority, followed by public transport, and lastly private vehicle travel. In addition to this, CoPP identified that parking and traffic generation rates for this development should also reflect that a car share scheme would be in place, similar to other new developments in inner urban areas. Based on this context a parking rate of 0.7 car spaces/apartment was assumed.

For the retail development, it was assumed that there would be 1 employee per 100 m^2 of the retail space and 40% of employees would drive, all deliveries were assumed to be outside the peak hours. Local residents would make up the majority of customers and would arrive by foot or bicycle as per the CoPP Sustainable Transport Strategy, all other customers are assumed to park elsewhere.

What volume of traffic will the development create

Based on the assumptions above the total traffic generated by each of the development scenarios is shown in Table 1 below. It is assumed that these vehicles would be leaving and entering the development by a single access at Beach Street.

Table 1 | Table showing density of each development scenario

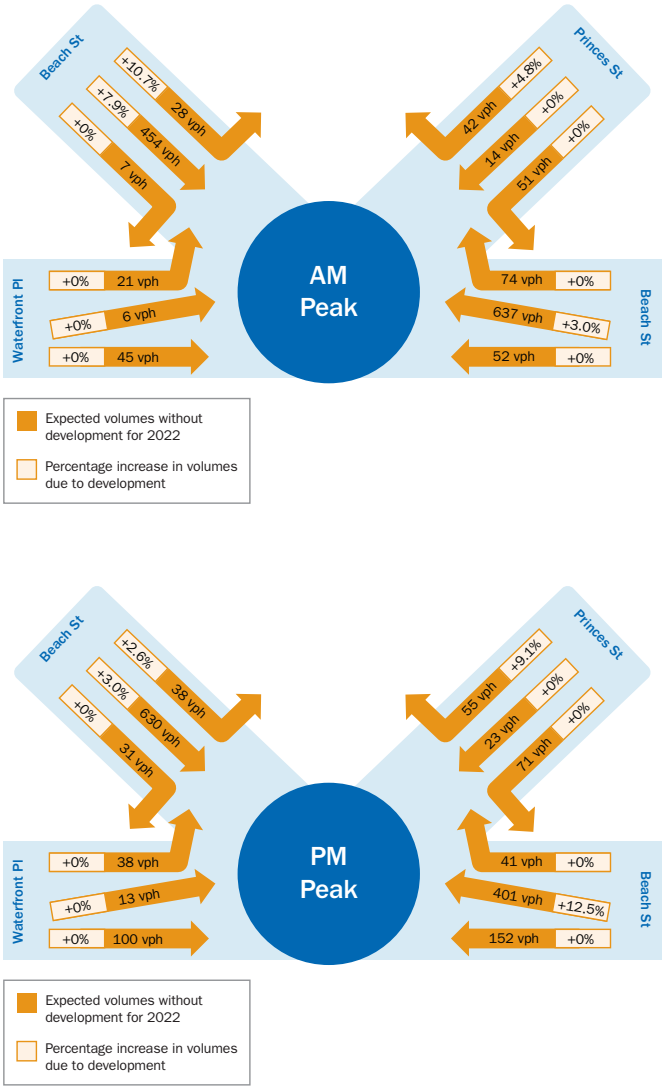
Scenario	No. of Apartments	Retail Space	No. of parking spaces required	Peak hour traffic generation in AM (vph*)	Peak hour traffic generation in PM (vph*)
1	61	2,400 m^2	43	38	36
2	181	2,400 m^2	127	87	85
3	277	2,400 m^2	194	128	126

*vph = vehicles per hour

Impact on Waterfront Place roundabout

The volumes above represent only a small proportional increase to the overall traffic in the area in the future. As an example the first image in Figure 1 below shows the AM peak hour traffic volumes entering the roundabout, both with the development and without the development in 2022 for the high density scenario. This shows there is an only a minimal increase in traffic entering the roundabout due to the development during a typical AM peak, up to 10.7%. The PM peak is the second image, in this case the traffic generated by the development represents an increase of up to 12.5% of traffic entering the roundabout.

Figure 1 | Waterfront Place Roundabout in AM and PM peak



Performance of the Waterfront Place Roundabout

The following section summarises the performance of the Waterfront Pl/Princes St/Beach St roundabout both now, in the future and with the additional traffic generated by the redevelopment at 1–7 Waterfront Place.

How the performance was assessed

The traffic modelling package SIDRA was used to analyse the performance of the roundabout to identify the current traffic characteristics (in 2012 estimates).

The 'degree of saturation' (DoS) and '95% queue length' are used to compare the results of the models. The DoS refers to the ratio of an intersection between the traffic demand at the intersection compared to its total capacity. An intersection with a DoS approaching 0.90 to 0.95 is considered to be at capacity.

The 95% queue length value is used as an indication of the length whereby the probability of exceeding it is only 5% — often referred to as the design queue length. This can be converted to the number of equivalent cars, which is shown in Table 2. Note that the 95th percentile queue length means that queues are only longer than this 5% of the time — ie a total of 3 minutes out of a full hour.

The assessment

The results of the SIDRA modelling for the roundabout are shown in Table 2.

The roundabout is shown to be operating with a DoS under 0.6 in all scenarios. This is well below 0.90 to 0.95 and indicates that the intersection will be operating within the acceptable threshold. The additional traffic generated by the development only results in an increase of up to 0.02 in the DoS and minimal increase in maximum queue length, up to 0.4 of an equivalent car length.

Comparison to a similar intersection

In 2011, URS was commissioned by Sydney Ports Corporation to assess the impact a proposed new cruise passenger facility would have on the intersections accessing the proposed site, a signalised T-intersection, and nearby intersections.

Similar to Waterfront Place, the site is located in a predominantly residential area of inner Sydney, which is both congested and somewhat sensitive to traffic (particularly large vehicles such as buses and commercial vehicles).

The intersection was modelled under existing conditions and worst case scenario conditions arising from movements associated with the cruise ships during the AM peak hour period for the design year 2016.

In 2011, the intersection had a DoS of 0.69, slightly higher than the Waterfront Place roundabout. By 2016, SIDRA modelling software has indicated that the intersection is likely to have a DoS of 0.77. Adding traffic associated with the arrival and departure of passenger cruise ships in 2016, the

Table 2 | Summary of SIDRA Modelling Results for Waterfront Place Roundabout

		AM PEAK		PM PEAK	
		DoS	95% Queue Length (no. of cars) *	DoS	95% Queue Length (no. of cars) *
Existing		0.49	5.2	0.52	5.2
2017	No Development	0.52	5.7	0.55	5.7
	Waterfront Pl Redevelopment (Scenarios 1–3)	0.53 – 0.54	5.8 – 6.0	0.56-0.57	5.8 – 6.1
2022	No Development	0.55	6.3	0.59	6.3
	Waterfront Pl Redevelopment (Scenarios 1–3)	0.56 – 0.57	6.4 – 6.6	0.59-0.60	6.5 – 6.7

* The 95% queue length shown above represents the worst leg in the intersection. In the AM peak, this the Beach St eastern approach, and the PM peak, it is the Beach St north western approach.

intersection was shown to have a DoS of up to 0.82. This is an increase in DoS of 0.05 to the expected growth in traffic.

This shows that even an intersection that is already busier than the Waterfront Place roundabout, in a high density residential area, is still able to operate within its capacity with the addition of traffic generated by a busy cruise terminal.

Conclusion

This report presents a brief summary of the findings for the Waterfront Pl/Princes St/Beach St roundabout taken from the *Transport and Access Study for the Waterfront Place Precinct, Port Melbourne*.

There is concern from local residents that the roundabout is already congested due to traffic associated with cruise ship and Spirit of Tasmania loading and unloading, which would become worse with the addition of more traffic from a new development at 1-7 Waterfront Place.

Based on these concerns, traffic counts were collected during busy periods in the area. A typical weekday and weekend day were counted. Specific days were selected when both a cruise ship and the Spirit of Tasmania were in port and there was fine weather.

The approach used to assess the impact of a potential new redevelopment at 1–7 Waterfront Place was described in detail; it includes an assessment of the roundabout's current and future operation, an estimate of the additional traffic generated by the new development and what impact this would have on the roundabout's future operation. By comparing how the roundabout operates in the future with general population growth to how it would operate with additional traffic from the development, the impact can be determined.

The additional traffic generated by the development is shown to have only a small impact to the roundabout's operation, a maximum increase of up to 0.02 in Degree of Saturation (which is the ratio of traffic demand to the roundabout's capacity) and up to 0.4 of an equivalent car queue length. These are only minor impacts as the traffic generated by the development represents only a small proportion of the traffic already entering the roundabout.

The development's proximity to excellent public transport, walking and bicycle paths means that the residents already have many alternatives to using a private vehicle. If this were complemented by a travel plan for the development that encouraged sustainable travel through measures such as restricted parking allocation, introducing a car share scheme and providing bicycle storage facilities then impact to the local area road network will be kept to a minimum. As a general rule, most travel plans tend to reduce car trips to/from individual sites by around 10–20%.

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