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# Hornsby Town Centre Weekend Peak Model

## Traffic Impact form the Proposed Hornsby Park Stage 1 Development

### 1. Background

Hornsby Shire Council (Council) is in the process of transforming the existing quarry site located just to the west of Hornsby Town Centre, into a park open for general public. The Park is located directly to the west of Hornsby Town Centre and represents 59 hectares of bushland and open space encompassing an old rock quarry. The Master Plan for Hornsby Park aims to develop a landmark recreation and leisure destination for local residents and the wider Sydney community as well as domestic and in-bound tourists.

The location of the proposed park is shown in Figure 1.1.



**Figure 1.1: Location of the Proposed Hornsby Park**

Transformation and redevelopment of Hornsby Park will be delivered in stages. Stage 1 development which is the subject of this Technical Note is expected to commence in July 2023 and scheduled to be completed by 2026.

The key features that will be delivered in Stage 1 development of Hornsby Park includes:

- The provision of a 2.4m wide canopy skywalk and cable bridge that connects Hornsby Town Centre to the Crusher Plant precinct on a fully accessible pathway immersing visitors into the bush. The canopy skywalk and cable bridge sit about 25-30 metres above the ground and would cover a total distance of approximately 400m (one way). Views of the bush, mountain bike trails and the Heritage Steps will be available from these works.
- Lift and stairs preserve the opportunity to connect to Old Mans Valley and the first stage link allows future northern and southern extensions of the canopy skywalk into other parts of the bush.
- Activation of the Crusher Plant precinct by delivering approximately 40 car parking spaces, a lawn area for picnics, toilets, space for a coffee cart and an accessible lookout that provides views of the Quarry Void and revegetation/regeneration areas.

There is also the option to build a small play space. The option preserves the development of potential commercial and cultural opportunities, including those associated with the existing Crusher Plant building and adventure play activities, in the future.

- Additional lookouts and trails are also provided to the west and north-west of the Quarry Void. These lookouts will be accessed by the construction of trails and tracks from Rosemead Road.
- The Heritage Steps' missing links are also included, which will complete the link from the Hornsby Aquatic and Leisure Centre to the Great North Walk.

At full development, which is not expected to occur until about 2036 or thereafter, Hornsby Park is projected to generate up to 281 two-way vehicle trips per hour (traffic generation information provided by Hornsby Council).

As part of the Traffic Impact Assessment (TIA) of the proposed park, Council engaged Bitzios consulting to develop a microsimulation traffic model for the weekend peak period. The model will be used to assess the traffic impact of the proposed park on the surrounding road network for various development scenarios including the Stage 1 development documented in this Technical Note.

## 2. **Transport Modelling Assumptions**

Transport Modelling Assumptions for Stage 1 Development:

### ***Traffic Model***

- Modelling documented in this Technical Note is based on the weekend peak period (Saturday 11:00am – 12:00pm) when traffic generation of the site is expected to represent the worst-case scenario.

### ***Park Traffic and Background Traffic Growths***

- A background growth of 1% per annum between 2022 (when base model data was collected) and 2026 when stage 1 is expected to be delivered
- A weekend peak traffic generation of 35 vehicles per hour (18 arrivals and 17 departures) from the proposed park was applied to the transport model trip ends. The traffic generation information is based on the outcome of the analysis undertaken by Council.

### ***Park Access Strategy***

- All vehicular traffic has been channelled to access roads south of Hornsby Park to connect with William Street, Dural Street and Quarry Road. There will be no access via Bridge Road located on the northern side of Hornsby Park boundary.
- Modelling has assumed the following:
  - 70% of drivers visiting the Park will come from areas located south of Hornsby Town Centre using the following key roads: Edgeworth David Avenue east of Woonona Avenue and Pacific Highway south of Ingram Road
  - 30% of drivers visiting the Park will come from areas located north of Hornsby Town Centre using the following road: Peats Ferry Road north of Watson.

### 3. Assessment Criteria

#### 3.1 Overview

The existing and future year traffic performance have been compared to understand the impact of the background traffic and the development traffic on the 2026 road network. The following assessment criteria have been adopted:

- Intersection Performance
- Travel Time.

#### 3.2 Intersection Performance

The intersection Level of Service (LoS) has been assessed based on overall delay in accordance with the TfNSW criteria defined in Table 3.1.

**Table 3.1: Intersection Level of Service Criteria**

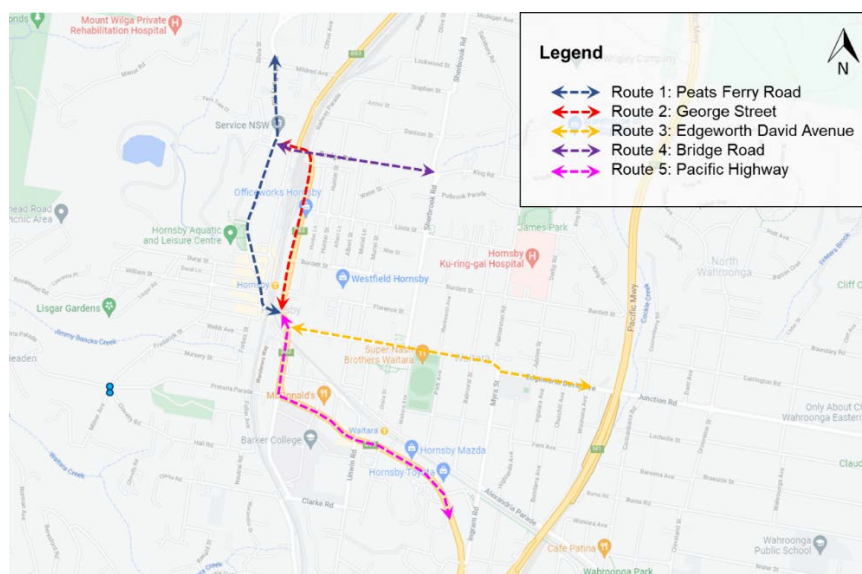
Level of Service (LoS)	Average Delay (s)	Description
A	<15	Good operation
B	15 to 29	Good with acceptable delays and spare capacity
C	29 to 43	Satisfactory
D	43 to 57	Operating near capacity
E	57 to 70	At capacity
F	>70	Unsatisfactory

As per the TfNSW guidelines, the delays presented in this technical note are:

- Average intersection delay for signalised intersections
- The highest turn delay for un-signalised intersections.

#### 3.3 Travel Time

A total of five travel time route had been used for the comparison of Base and With Development scenarios, as shown in Figure 3.1.



**Figure 3.1: Travel Time Routes**

## 4. Assessment Outcomes

### 4.1 Model Scenarios

The scenarios which have been modelled and assessed are described in Table 4.1.

**Table 4.1: Modelling Scenario**

Scenario	Traffic	Network
2022 Weekend Peak Base Case	2022 Traffic	2022 Road Network
2026 Weekend Peak Future Case	2022 Traffic <i>plus</i> Background Traffic Growths at 1% per annum <i>plus</i> Park Traffic	2022 Road Network with <i>no</i> Upgrades Assumed

### 4.2 Intersection Performance

The weekend peak key intersection performance for the 2022 and 2026 scenarios are compared in Table 4.2. The key observations include:

- Generally, the additional background traffic and development traffic will not increase traffic delays at the key intersections. The only exception is the Peats Ferry Road / Bridge Road intersection. In 2026 the traffic delays will increase slightly and the intersection LoS will deteriorate from LoS A to LoS B. Considering the growth in background traffic, this increase is minor, and the intersection would continue to provide acceptable LoS
- The key George Street intersection with Peats Ferry Road and Westfield Access will continue to provide acceptable traffic performance.

**Table 4.2: Key Intersection Performance – (11:00am – 12:00pm)**

Intersections	Traffic Volumes (veh/hr)		Level Of Service (LoS)	
	2022	2026	2022	2026
Peats Ferry Road / Bridge Road	1,670	1,706	A	B
George Street / Peats Ferry Road / Westfield Access	3,557	3,701	D	D
Peats Ferry Road / William Street	1,375	1,393	B	B
Peats Ferry Road / Dural Street	1,072	1,086	B	B

## Travel Time

The travel times for the 2022 Base and 2026 Base plus Development Traffic scenarios are compared in Table 4.3. The results show that the travel times will remain mostly similar. The only exceptions are:

- When compared with the 2022 travel time, in 2026 the southbound traffic on Peats Ferry Road would experience additional delays. The travel time is expected to increase by about one and a half minutes. The site visit observations and later confirmed by the traffic model, show that currently the southbound traffic experience delays with slow moving queues. Generally, in congested conditions a slight increase in traffic volumes contribute substantially to increase traffic delays
- The southbound traffic on Pacific Highway south of the study area would also experience delays. The travel time is expected to increase by about two minutes. The site visit observations and later confirmed by the traffic model, show that currently the southbound traffic experience delays due to queue pushback from the Peannant Hills Road / Pacific Highway intersection to Ingram Road. The additional background traffic would exacerbate the delay.

**Table 4.3: Travel Time Along Key Routes (11:00am – 12:00pm)**

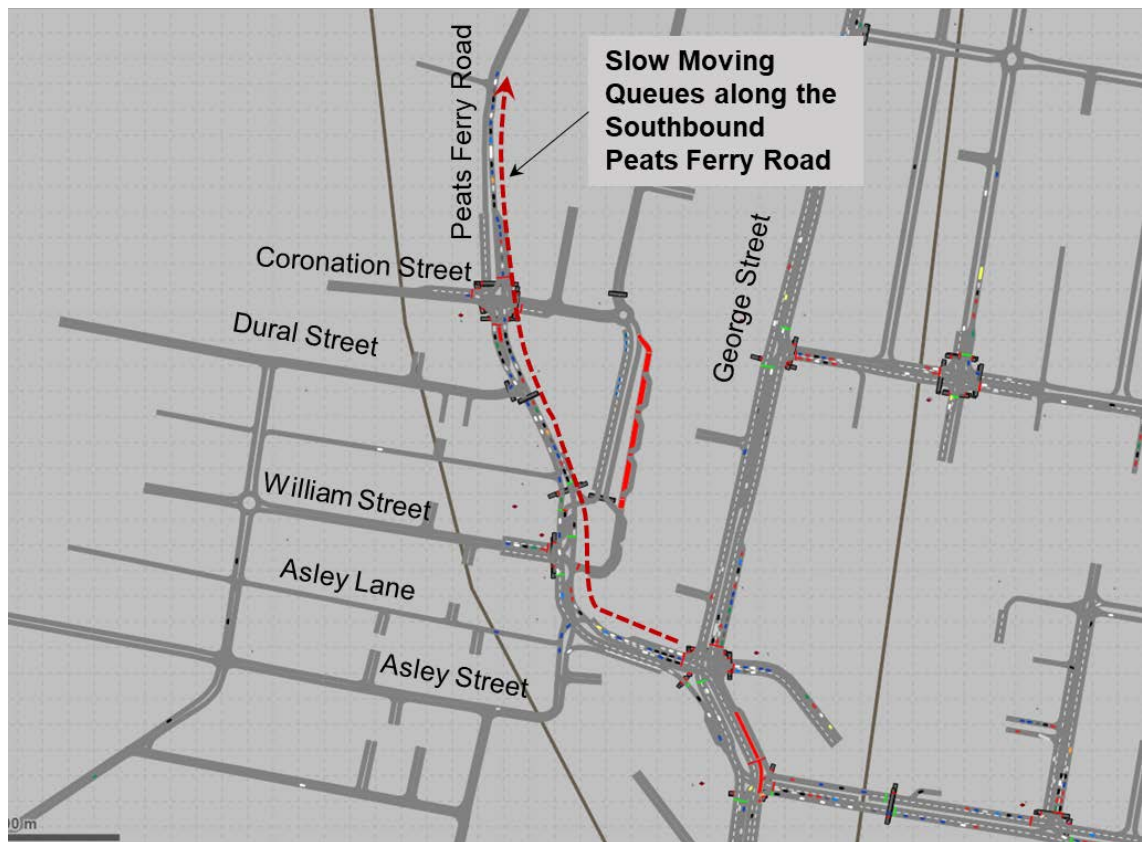
Routes	Direction	Travel Time (mm:ss)		Difference (mm:ss)
		2022	2026	2026
Peats Ferry Road	NB	3:01	2:56	-0:05*
	SB	7:46	9:12	+1:26
George Street	NB	2:03	2:07	+0:04
	SB	4:09	4:08	-0:01*
Edgeworth David Ave	WB	4:13	4:55	+0:42
	EB	3:22	3:29	+0:07
Bridge Road	WB	2:45	2:45	0.00
	EB	2:29	2:27	-0:02*
Pacific Highway	NB	4:22	4:03	-0:19*
	SB	5:42	7:34	+1:52

*\*The insignificant decreases in travel times are well within the day-to-day travel time variability. Moreover, although the model predicts these decreases, in real world insignificant increases in travel times are predicted due to the slight increase in the background traffic.*



#### 4.4 Queue Observations

Currently there are persistent queuing along the southbound direction and the growths in background traffic would further exacerbate the queuing. Figure 4.1 shows the 2026 slow moving queues along the southbound Peats Ferry Road.



**Figure 4.1:** Slow Moving Queues Along the Southbound Peats Ferry Road

#### 5. Car Parking

As part of this proposal, 40 parking spaces will be provided near the crusher plant. This parking will cater for the anticipated parking demand in stage 1.

In order to protect the amenity of nearby residents, parking restrictions may be required in Rosemead Road near the trails and tracks connecting to the lookouts.

## 6. Conclusion

The key findings from the modelling assessment are as follows:

- The Stage 1 Development of the proposed Hornsby Park is expected to generate 35 vehicles in the critical weekend peak between 11.00am and 12.00pm. For the purpose of this assessment, the background was assumed to grow by 1% per annum
- The road network has sufficient capacity to support the Stage 1 Hornsby Park development, acknowledging that the slight and insignificant impacts that would be experienced between now and when stage 1 works are implemented will mainly be due to the growth in background traffic
- When compared with the 2022 performance, in 2026 with the additional traffic the intersection performance will remain similar. The key George Street intersection with Peats Ferry Road and Westfield Access will provide similar performance
- Traffic at the Peats Ferry Road / Bridge Road would experience a slight increase in delays with LoS move from LoS A in 2022 to LoS B in 2026. This is considered to be minor, and that the intersection will continue to provide acceptable LoS
- The travel time along the southbound Peats Ferry Road is predicted to increase by one and a half minutes. Currently southbound traffic experience delays with slow moving queues along the route. The background traffic growth is expected to exacerbate this. Traffic from the Stage 1 development (five vehicles in the southbound direction) is not expected to contribute to the increased delay
- The travel time along the southbound Pacific Highway will increase by two minutes. This is attributed to queue pushback from the Pennant Hill Road / Pacific Highway due to background traffic growth. Traffic from the Stage 1 development (12 vehicles in the southbound direction) is not expected to contribute to the increased delay
- The increase in travel times along the Southbound Peats Ferry Road and Pacific Highway are attributed to background traffic growths. The slight increase in traffic volumes from the Stage 1 development would not impact the 2026 traffic performance.