Addendum

100 Christie Street
St Leonards NSW 2065 Australia
PO Box 164 St Leonards NSW 2065
Australia
T +61 2 9928 2100
F +61 2 9928 2500
www.jacobs.com

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Prepared by	Ben Ison	**Project No.**	IA088400.105
Project	Hornsby Junction Remodelling and Commuter Car Park		

Introduction

This Technical Note has been prepared following design modifications to the Hornsby Junction Remodelling and Commuter Car Park Noise and Vibration Assessment (Jacobs, January 2016).

The modified car park layout and access is shown in Figure 1.

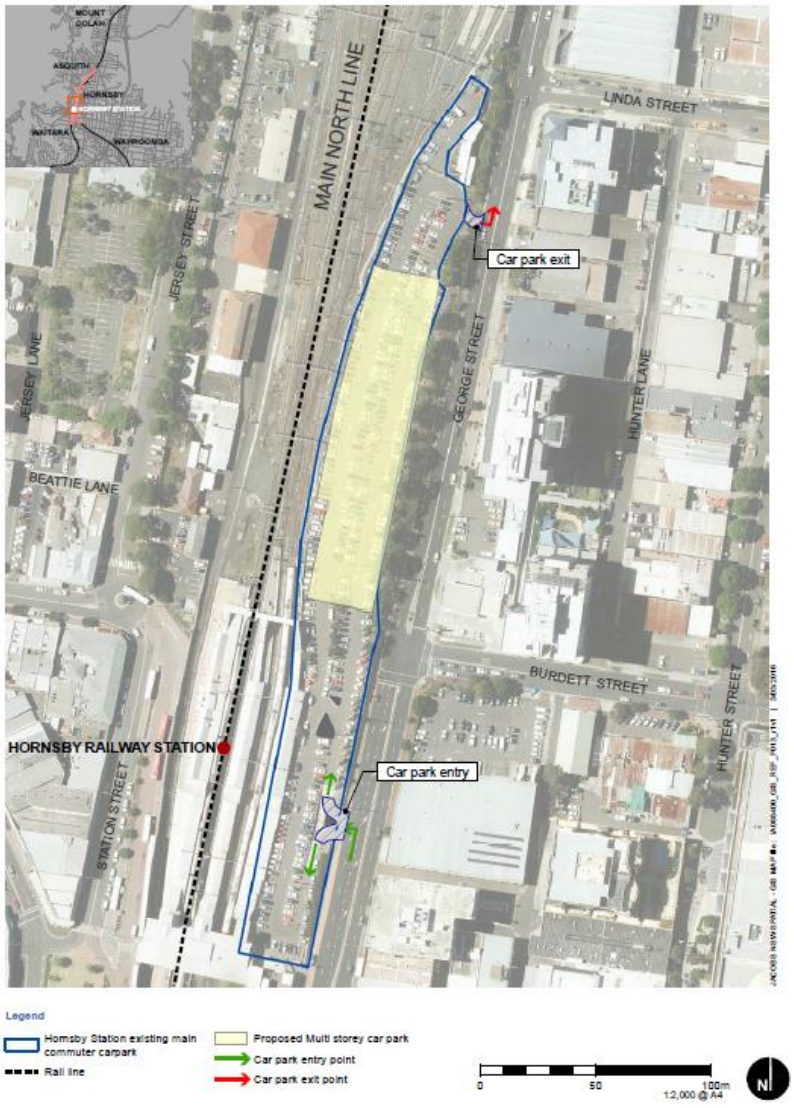

Figure 1 : Overview of updated commuter car park

The key changes to the Proposal include:

- development of the multi-storey car park design from an excavated two level structure to an at grade three storey structure
- modification of the combined entry and exit at the south end of the car park into an entry only point and provision of a new single lane exit point at the north end of the car park
- removal of requirement for reconfiguration of the George Street / Burdett Street intersection
- updated construction activities to accommodate the above design changes.

This Technical Note assesses the environmental impacts of the changes to the Proposal and should be read in conjunction with the original Noise and Vibration Assessment report.

Construction noise and vibration

The number of construction workers, working hours, haulage routes and site access, via the existing commuter car park access off George Street, are expected to remain unchanged as a result of the design modifications.

Additional construction activities to be undertaken during the Stage 2 works would include:

- relocation of drainage and lighting utilities for the provision of the proposed exit ramp at the northern end of the multi-storey car park
- construction of new pavement, kerbs and line marking for new commuter car park exit onto George Street
- construction of a deflection wall between the western facade of the car park and the railway; and deflection walls either side of the railway under Bridge Street.

Works that are no longer required are as follows:

- large scale excavation of car park would no longer be required. Excavated material would therefore be reduced from 27,000 cubic metres to 2,000 cubic metres
- reconfiguration of George Street / Burdett Street intersection would not required
- existing brick retaining wall structure would not be demolished.

As identified during the previous assessment, the noisiest proposed equipment required during construction includes hydraulic hammers, piling rigs and rock saws. The use of this equipment would still be required during all work stages.

It is understood that most construction work on the multi-storey car park would be undertaken during daytime hours. Noise during these works is expected to be worst during the earlier stages of removal, piling activities and earthworks. In addition to noisy activities associated with the construction of the car park, piling would also be required for the deflection walls that are proposed as part of the modifications. The deflection walls would be constructed during track possessions. During piling activities, receivers on George Street are expected to be highly noise affected.

As previously identified, acute noise impacts may be experienced during the above activities by western facing residential units along George Street. These impacts may extend to higher floors of the properties. These findings are consistent with what could be expected for the modified Proposal.

The affected community would be advised of any noise intensive works scheduled to occur outside of standard construction hours and mitigation measures would be used in accordance with Transport for NSW's (2012) *Construction Noise Strategy.*

No construction traffic noise impacts were predicted to occur during either rail remodelling or car park construction activities in the previous assessment. The daily construction truck movements to site would be slightly reduced as the multi-storey car park would now be above ground rather than excavated to street level, resulting in less spoil being removed from the site.

Operational road traffic noise

Potential operational noise impacts have been reassessed to address redistributed traffic movement to and from the new car park during operation as a result of the updated access arrangements (Figure 2). Additional vehicles have been considered along Pacific Highway, George Street and William Street, in addition to Burdett Street and Edgeworth David Avenue. The number of vehicles accessing the car park (via George Street) has been split according to the overall traffic ratios between these roads (Table 1).

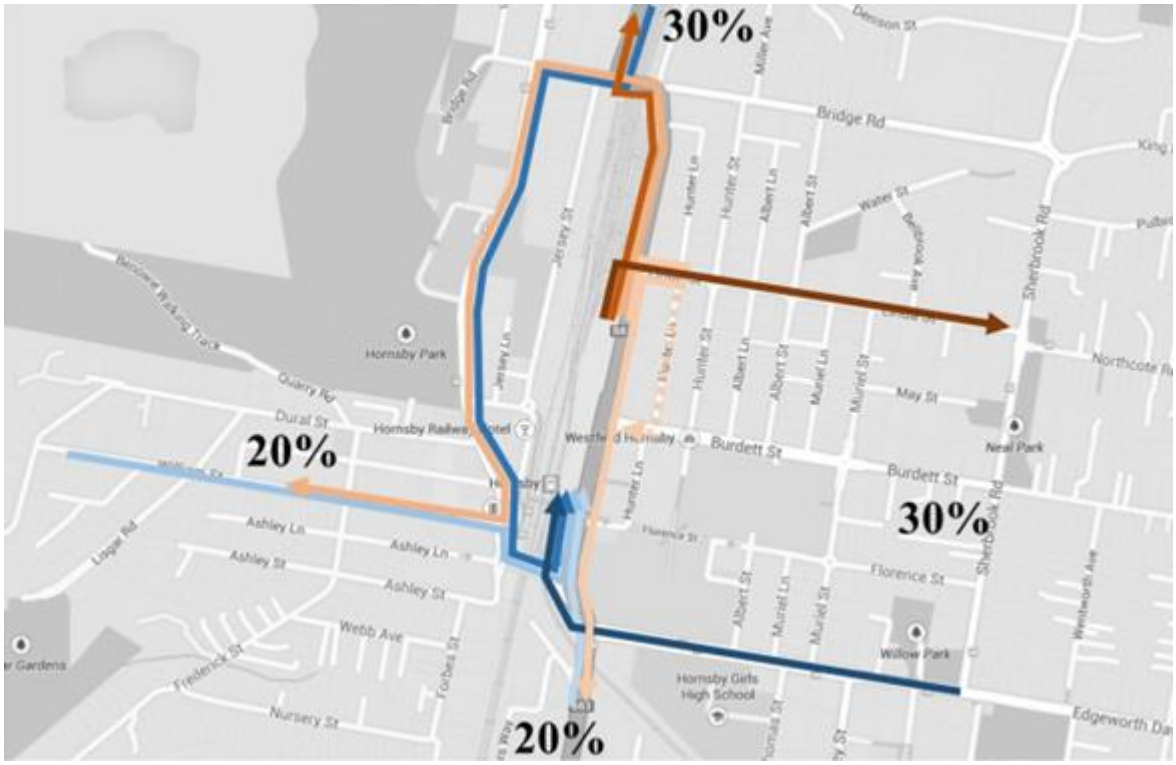

Figure 2 : Traffic distribution *(Source: Traffic and Access Report, Arup 15 January 2016)*

Table 1 : Existing road traffic numbers and assessed increases

Location	Existing total traffic numbers		Additional car park traffic		Final traffic numbers	
	Morning peak (8am - 9am)	Evening peak (5pm - 6pm)	Morning peak (8am - 9am)	Evening peak (5pm - 6pm)	Morning peak (8am - 9am)	Evening peak (5pm - 6pm)
George Street						
North	432	652	230	230	662	882
South	918	485	230	230	1148	715
William Street						
East	156	213	46	46	202	259
West	105	111	46	46	151	157
Pacific Highway						
North	972	974	46	46	1018	1020
South	1279	1326	46	46	1325	1372
Burdett Street						
East	500	533	69	69	569	602
West	351	635	69	69	420	704
Linda Street						
East	393	256	69	69	462	325
West	164	249	69	69	233	318
Edgeworth David Avenue						
East	243	698	69	69	312	767
West	295	604	69	69	364	673

Using these traffic numbers, road traffic noise levels at typical roadside properties along each route have been predicted for both the existing scenario and including additional car park traffic. Calculations were based on the UK's Department of Environment, Calculation of Road Traffic Noise (CORTN) algorithms and assume a nominal 15 metres setback from the traffic stream which is considered to be the minimum setback of existing houses from the centre line of local roads. In accordance with the traffic surveys, a typical 5 per cent heavy vehicle percentage has been used. The predicted increase between the existing and Proposal scenario is presented below in Table 2.

Table 2 : Predicted traffic noise impacts

Location	Predicted increase dB(A)	Allowable RNP increase dB(A)	Comply Y/N
George Street			
Morning peak	1.2	+2	Y
Evening peak	1.5		Y
William Street			
Morning peak	1.3	+2	Y
Evening peak	1.1		Y
Pacific Highway			
Morning peak	0.2	+2	Y
Evening peak	0.2		Y
Burdett Street			
Morning peak	0.6	+2	Y
Evening peak	0.5		Y
Linda Street			
Morning peak	1.0	+2	Y
Evening peak	1.1		Y
Edgeworth David Avenue			
Morning peak	1.0	+2	Y
Evening peak	0.5		Y

These results show that an increase in traffic noise on local roads associated with the operation of the Commuter Car Park are likely to remain below 1.5 dB(A) at all locations and will therefore comply with the allowable increase of 2 dB(A).

Site generated operational noise

The movement of vehicles around the car park would occur at greater elevation compared to the REF car park design. The modelling has been updated for the modified design (Figure 3) to predict sound power levels (SWL) for an operator unlocking, entering and starting a light vehicle, followed by acceleration out of a car park.

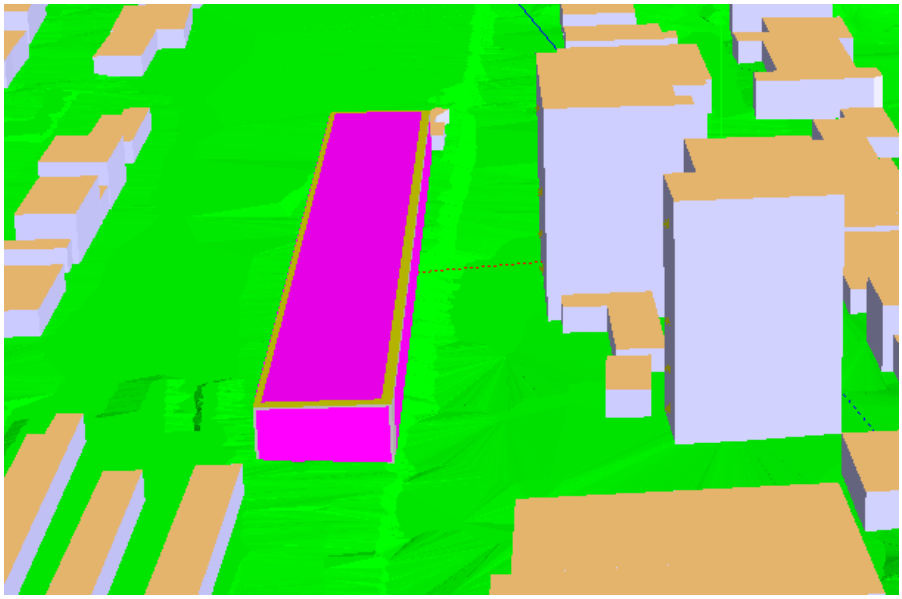

Figure 3 : Operational multi-storey car park noise model (looking north along George Street)

Table 3 presents the likely L_{Aeq} noise levels for these cars operating within the modified multi-storey car park for the nearest residential receivers.

Table 3 : Predicted operation noise levels - Commuter Car Park

Receiver	Maximum $L_{Aeq(1hr)}$	INP noise criteria $L_{Aeq(Day)}$	Complies Y/N
88 - 90 George Street (Avanti apartments)			
40m elevation	50.0	48	**N**
20m elevation	51.5	60	Y
10m elevation	50.4	60	Y
1.5m elevation	49.4	60	Y
1c Burdett Street (Avanti apartments)			
40m elevation	46.5	48	Y
20m elevation	47.6	60	Y
10m elevation	47.4	60	Y
1.5m elevation	43.6	60	Y
25 - 29 Hunter Street (The Madison apartments)			
20m elevation	39.9	60	Y
10m elevation	40.1	60	Y
1.5m elevation	38.6	60	Y

These results show that noise levels are expected to comply with the operational Industrial Noise Policy (INP) noise criteria at most nearby locations during peak usage (worst case scenario). It is

possible that under these conditions, noise levels at the upper floors of the George Street units may marginally exceed INP criteria. Although this assessment considers a worst case noise level, which may last for only peak hour periods of the day, it is important that transmission paths between internal areas of the car park and the higher levels of the Avanti units are considered during detailed design.

As per the previous assessment, this noise modelling does not consider the use of polished concrete, and is recommended that this surface is not used in the facility.

Summary and conclusion

The construction of the modified car park would require similar activities to those already proposed in the REF. The impact of the construction noise and vibration on sensitive receptors in the vicinity of the site would remain unchanged from the car park originally assessed.

The modified car park would facilitate the same number of car parking spaces as the previously assessed car park, however the entrance would be from the existing George Street car park entrance and exit would be via a new exit point to the north of the car park onto George Street. Also, the car park levels would be elevated. It is anticipated that the impact of the modified car park design would continue to have a minimal impact on sensitive receptors during operation.