Appendix L

Operational Air Quality Assessment

Jacobs

Memorandum

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Subject	Appendix L - Operational Air Quality Assessment	**Project Name**	Sydney Park Junction
Attention	Damien Wagner	**Project Number**	IA216700
From	Shane Lakmaker		
Date			
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Operational air quality assessment overview

The potential operational air quality impacts of the project have been quantified and assessed. This involved using the air quality screening tool known as TRAQ ("Tool for Roadside Air Quality") to predict the near roadside concentrations of key air quality indicators under and future with and without project scenarios.

TRAQ is a tool that was developed by Transport for NSW (Transport) to quantify potential air quality impacts of existing or proposed roadways. It combines an emission calculation model, based on factors produced by the NSW Environment Protection Authority (EPA) for the Greater Metropolitan Region (GMR) Motor Vehicle Emissions Inventory (MVEI), with a dispersion model, CALINE4, to quantify near roadside concentrations of key air quality indicators. TRAQ is designed to predict worst-case impacts, based on maximum vehicle emission rates and worst-case meteorological conditions.

Two road sections have been selected for this assessment:

- Pacific Highway, between May Street and Campbell Street, and
- Sydney Park Road, between Mitchell Road and King Street / Princes Highway

Data assessment inputs

Table 1 shows the input traffic data and scenarios.

Table 1 Input traffic data and scenarios

Section	2023				2033			
	Without project		With project		Without project		With project	
	Lanes	Daily traffic	Lanes	Daily traffic	Lanes	Daily traffic	Lanes	Daily traffic
Princes Highway, between May Street and Campbell Street	6	30,022	4	17,906	6	27,270	4	16,831
Sydney Park Road, between Mitchell Road and King Street / Princes Highway	4	26,674	2	14,226	4	24,671	2	13,588

Other key settings for TRAQ were as follows:

- Worst-case seasonal emission factors
- Inclusion of cold start emission adjustments
- Residential land use
- "Sydney East" air quality environment
- Worst-case meteorological conditions
- "Arterial" road emission factors for 2021 and 2031 (i.e. the closest years to 2023 and 2033 for which EPA emission factors are available)

Summary of results

Table 2 shows the results from TRAQ. The predicted cumulative concentrations represent the maximum contributions from each road section plus the existing background levels. The EPA air quality impact assessment criteria (from EPA, 2016) have also be shown, although it should be noted that these criteria do not strictly apply to the assessment of near roadside air quality.

Table 2 Predicted near roadside concentrations of key air quality indicators

Air quality indicator and averaging time	Predicted cumulative concentrations 10 metres from the kerb from TRAQ				EPA assessment criteria
	2023		2033		
	Without project	With project	Without project	With project	
Pacific Highway, between May Street and Campbell Street					
Maximum 1-hour average CO concentrations (mg/m^3)	1.5	1.4	1.4	1.4	30
Maximum 8-hour average CO concentrations (mg/m^3)	1.4	1.3	1.3	1.3	10
Maximum 1-hour average NO_2 concentrations ($\mu g/m^3$)	77	72	71	68	246
Annual average NO_2 concentrations ($\mu g/m^3$)	24	23	23	22	62
Maximum 24-hour average PM_{10} concentrations ($\mu g/m^3$)	33	30	32	30	50
Annual average PM_{10} concentrations ($\mu g/m^3$)	20	19	19	18	25
Sydney Park Road, between Mitchell Road and King Street / Princes Highway					
Maximum 1-hour average CO concentrations (mg/m^3)	1.5	1.4	1.4	1.4	30
Maximum 8-hour average CO concentrations (mg/m^3)	1.3	1.3	1.3	1.2	10
Maximum 1-hour average NO_2 concentrations ($\mu g/m^3$)	76	70	70	67	246
Annual average NO_2 concentrations ($\mu g/m^3$)	24	23	23	22	62
Maximum 24-hour average PM_{10} concentrations ($\mu g/m^3$)	32	29	31	29	50
Annual average PM_{10} concentrations ($\mu g/m^3$)	20	18	19	18	25

The following observations have been made from the results in **Table 2**:

- Near roadside concentrations of carbon monoxide (CO), nitrogen dioxide (NO_2) and particulate matter (as PM_{10}) are expected to be below EPA criteria under future with and without project scenarios, for both road sections.
- Near roadside concentrations of all air quality indicators are expected to up to 10 per cent lower with the project than without the project, for both road sections.

From these investigations it has been concluded that project is unlikely to lead to adverse air quality impacts based on modelling which shows compliance with EPA air quality impact assessment criteria.

References

EPA (2016) *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. January 2016. NSW Environment Protection Authority.