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Dear Frank,

Yan Yean Road Upgrade (Stage 2) – Transport Impact Assessment Modelling Peer Review

This letter provides peer reviewer endorsement of the transport modelling undertaken for the Yan Yean Road Stage 2 Upgrade Environment Effects Statement (EES).

I undertook the peer review at the request of Major Road Projects Victoria (MRPV) during 2019. The objectives of the review were to investigate the assumptions and methodologies used in the transport modelling for the EES and to assess the reasonableness of the final forecasts.

The scope of my work included:

- a review of the original transport modelling undertaken to assess intersection designs and capacity along Yan Yean Road between Kurrak Road and Bridge Inn Road;

- a review of further transport modelling completed for the Transport Impact Assessment (TIA) which forms a part of the EES.

The review was based on information provided in the following reports and correspondence:

- Arcadis (2018), *Yan Yean Road Upgrade, Stage Two - Reference Design Traffic Analysis*, Report no. A01-AA009647-VC-R-1 (15May2018). The review focused on Chapter 2 (Traffic Forecasting) and Appendix A (Yan Yean Road Traffic Forecasting Pivot Method).

- WSP (2019), 190307_*Yan Yean Road peer review_responses.docx* with accompanying maps and databases, Responses to peer review questions, received 7 March 2019.

- Arcadis (2019), *Yan Yean Road Design Volumes -summary of adjustments.docx*, Responses to peer review questions, received 7 March 2019.

- WSP (2019), OSAR_North_TMVol_Ver0-rl.xlsx, Pivoting spreadsheet.

- WSP (2019), *Yan Yean Road (Stage 2) Upgrade Traffic Forecasting Report*, Revision E, 15 November 2019. This formed Appendix A of Arcadis(2019), *Yan Yean Road (Stage 2) Upgrade Environment Effects Statement Technical Appendix A – Transport Impact Assessment*, Revision D, 20 November 2019.

The scope of my review did not include model computer files and software; therefore my findings have assumed that these reports accurately represent the modelling that was undertaken.

The two phases of my peer review are documented in the following reports:

- Transport Analytics (2019a), *Yan Yean Road Stage 2 Upgrade – Transport Modelling Peer Review*, Revision C, March 2019.
- Transport Analytics (2019b), *Yan Yean Road Stage 2 Upgrade – Transport Impact Assessment Modelling Peer Review*, Revision A, December 2019.

The remainder of this letter summarises the findings of the two phases of the review and confirms that all issues have been satisfactorily addressed.

Phase 1: Intersection Analysis

The first phase of the peer review examined the traffic forecasting undertaken by MRPV's technical advisor, WSP, to assess the performance of proposed intersection designs along the Yan Yean Road corridor. The traffic forecasts were a critical consideration in the determination of the "footprint" of each intersection and the consequent impact on significant trees and native habitat along the road corridor.

The peer review found that the overall modelling methodology was sound and that sensible assumptions were adopted. Noted strengths of the modelling were:

- the comprehensive program of traffic counts provided a good foundation for the analysis and helped to increase confidence in the accuracy of the outcomes;
- the methodology for adjusting the forecasts (using a pivoting process) was appropriate for individual intersections, and appeared to produce logical results;
- the model outputs were carefully considered and adjusted to take account of road capacities and adjacent land use, such as nearby schools;
- sensitivity tests were used to investigate the influence of school traffic, giving greater assurance that the intersection designs would accommodate school peaks; and
- the application of the SIDRA intersection capacity model was clearly documented and consistently applied, with reasonable performance metrics chosen.

The strategic model used for the Yan Yean Road forecasting was taken from the Mordialloc Bypass Transport Impact Assessment. While the Mordialloc model was originally validated in the south-east suburban area, similar validation checks had not yet been completed for the northern suburban area at the time of the peer review. The recommendations for improvement therefore focused on establishing the fitness of the transport model in the Yan Yean Road area.

The main recommendations from the first phase of the peer review were as follows:

- the modelling documentation needed to better demonstrate that the strategic model (as configured for the Mordialloc Bypass study) was fit for the purpose of the Yan Yean Road analysis;

- the land use assumptions for the northern suburban area needed to be checked and updated; and

- given the critical nature of the intersection sizing, sensitivity tests were recommended to determine the traffic volumes that would trigger an increase or reduction in the number of turning lanes at each intersection.

Following the review, WSP carried out further modelling work to address these recommendations. The further work is documented in the memorandum "*Yan Yean Road Stage 2 EES – WSP's response to transport modelling peer review*" (document code 2135645A-N-32-TPLMEM-002 RevB), dated 27 May 2019.

The further modelling resulted in the following outcomes:

1) The model was found to underestimate Yan Yean Road traffic volumes by 21% (southbound) in the AM peak and 28% (northbound) in the PM peak. In my view, the pivoting process adopted by WSP was appropriate and sufficient to compensate for these forecasting discrepancies at the intersections on the Yan Yean Road Stage 2 alignment.

2) Additional models were run using 2018 land use projections, showing some redistribution of population and employment in comparison to the original projections. The 2018 land use projections were also carried forward to the Phase 2 Transport Impact Assessment modelling. In my opinion, the 2018 projections should provide results that more accurately reflect government land use expectations in the Yan Yean Road area.

3) Sensitivity testing was agreed and undertaken later as part of the EES transport impact assessment.

These responses satisfied the recommendations of the first stage of the peer review.

Phase 2: Transport Impact Assessment Modelling

The second phase of the review investigated the transport modelling undertaken for the TIA[1]. The TIA used the same strategic model as was used in the first phase, so the basic functionality of the model in the Yan Yean Road corridor had already been established. My review therefore focused on the model's application for forecasting transport impacts in the wider northern suburban area.

The review identified the following strengths of the modelling approach:

- the use of the Victorian Integrated Transport Model was an appropriate choice for the TIA;

- the model was prepared using a systematic process with up-to-date land use and network assumptions;

- checks of the model were backed with comprehensive traffic count data;

- forecasts for the "No Project" and "With Project" scenarios seemed logical and the conclusions from the modelling analysis appeared to be sound.

[1] The peer review did not cover the application of traffic forecasts to other aspects of the EES, such as noise and air quality assessments.

However, as noted in the first phase of the review, it was evident that the model was tending to underestimate traffic volumes in the Yan Yean Road area when applied to a 2016 base scenario.

Ideally, the model would be adjusted so that its outputs meet published validation criteria. Given that the wider traffic impacts of the Yan Yean Road Stage 2 upgrade were expected to be relatively small, the transport modelling team opted for a simpler approach which dealt with the model's forecasting limitations by:

- presenting difference ranges (for example, "between 500 and 1000 vehicles") when comparing scenarios, rather than quoting absolute point forecasts; and

- carrying out sensitivity tests (including a high-growth scenario) to explore the impacts of higher traffic volumes.

This approach has resulted in logical and defensible outputs that provide a reasonable foundation for the transport impact assessment.

The review recommended several other minor clarifications and corrections to the transport modelling report, all of which have been addressed satisfactorily.

Conclusion

The Yan Yean Road Stage 2 modelling has been carried out using an appropriate methodology, is supported by observed data, uses suitable network and land use assumptions, and has produced logical results.

While acknowledging that the model underestimates traffic volumes in the Yan Yean Road area, the Transport Impact Assessment has included sensitivity tests to assess the impacts of higher and lower traffic volumes. These tests provide evidence that a reasonable range of potential future impacts has been accounted for in the analysis.

Yours sincerely

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