



### 1 Change of Opinion

#### (i) Question

Are there any changes of opinion since your interim report? If so, what are the reasons for that change in opinion?

In answering this question, please discuss the extent (if any) to which the written and oral evidence, conclave reports and any further Project Notes have resolved any issues previously raised in your interim report.

Please include a succinct summary in dot point form of any significant outstanding concerns you have in relation to the Project (if any).

#### (ii) Response

My opinions are largely unchanged but the evidence and other material presented at the Hearing has enabled some refinement.

#### Traffic noise

Traffic noise is in NVP1 (for objectives), and NVP2 (for monitoring).

What might the noise objectives be?

My previous opinion was that for noise due to the Project roads (the 'Freeway'), appropriate traffic noise objectives for noise sensitive receptors that respond to the specific circumstances of this proposal might be:

for on-reservation measures to mitigate external noise levels:

- an objective of 63dB(A)L10(15h) (7am to 10pm) for the day-time and evening period for VicRoads Category A receptors;
- an objective of 58dB(A)L10(9h) (10pm to 7am) for night-time for VicRoads Category A receptors; and,
- the objective of 63dB(A)L10(12h) (6am to 6pm) for VicRoads Category B receptors (this retains the existing 12h Category B, but with possible changes to inclusions in that Category);

for off-reservation measures where necessary:

- where it is not practicable, as independently determined, to provide measures to meet the on-reservation objectives, off-reservation acoustic treatments must be

offered to individual noise sensitive receptors. Those must meet the internal noise levels at the upper level of the range specified in the column titled *Design sound level (L<sub>Aeq,t</sub>) range* at Table 1 of *AS/NZS 2107:2016 Acoustics-Recommended design sound levels and reverberation times for building interiors* for the particular noise sensitive receptor, and appropriate to the particular occupancy or activity.

Should the IAC consider recommending the objectives proposed by the Proponent I advise that implementation of a 63dB(A)L<sub>10</sub>(18h) (6am to midnight) objective rather than the extant 68dB(A)L<sub>10</sub>(18h) (6am to midnight) objective on the West Gate Freeway component of the Project will provide a decrease in day-time and evening noise levels compared with the present. That would seem to be about 4dB(A) at noise sensitive receptors. It is likely that the night time benefit would be similar, but the EES does not provide night-time noise levels.

However, that may not be the case in the residential area along and adjoining Railway Place at West Melbourne. That area is likely to experience increased noise levels due to the proximity of the elevated Wurundjeri Way extension. Mr Stead has informed the IAC that further work is needed to assess noise at that location. Contours of noise predictions provided by Mr Tardio from Mr Stead are limited to E-Gate, but suggest increased noise is possible at that residential location. So too might the night-time noise level be increased.

***I confirm my opinion that a project specific night-time noise level is appropriate to the circumstances of the Project.***

***I note the evidence that further consideration needs to be given to possible traffic noise impacts at and near Railway Place, West Melbourne.***

***I suggest that the IREA should review proposed decisions where it is deemed impracticable to provide adequate on-reservation noise mitigation and that off-reservation treatments should be offered to noise sensitive receptors.***

### What are the traffic noise sensitive receptors?

The NVP1 as currently drafted refers to the application of traffic noise objectives to noise sensitive receptors that *are existing and occupied or capable of being occupied at the time of announcing the design on 2 April 2017*. This is not a technical issue. I defer to the IAC in considering the definition and time of application of traffic noise objectives.

### *Passive and active open space and recreation areas*

In my earlier report I suggested that the IAC consider this issue as a social and planning matter with a technical input for possible noise objectives. I indicated that if the IAC is

inclined to advise protection it might consider those areas as VicRoads Category B receptors with a 63dB(A)L10(12h) (6am to 6pm) objective. However, that may not be achievable for the proposed open space near Moonee Ponds Creek close to the interchange of the Project roads and CityLink.

### *Docklands Cotton Mills*

My previous advice was that this creative industry site be considered a Category B noise sensitive receptor. That opinion was based on a number of written submissions from individual organisations at that site.

No further evidence has been available to me at the time of writing that provides comprehensive information on the nature and extent of creative industries there, the prospects for growth, and present and projected internal noise levels.

Accordingly, I have changed my opinion. I do not support that building being so categorised.

Should evidence and submissions be brought to the IAC that enables it to revisit this issue and persuades it that traffic noise level protection is warranted, my interim view can be reinstated.

### *Development sites*

My earlier opinion on this being essentially a planning issue has not changed. I defer to the IAC.

***I defer to the IAC on developing the date for application of traffic noise objectives to noise sensitive receptor sites and describing the state of development or occupancy of those receptors.***

***On active and passive recreation areas my opinion is unchanged.***

***My opinion on noise protection at the Docklands Cotton Mills has changed.***

***Advising on traffic noise protection of development sites is beyond my area of expertise.***

### Where should the objectives be applied?

My previous advice was that, in my view, the description of the geographical application of the objectives in NVP1 is not clear, and in particular the description of road exclusions and inclusions. It appears that expert witnesses share that difficulty.

At the time of writing no varied text for NVP1 has been made available that addresses this issue. I understand that revised text is likely to be provided.

It appears to me that the Project roads to which the objectives should apply are described in *Amendment of Order under Section 3(1) of the Environment Effects Act 1978* published in the *Victoria Government Gazette No. S 153 of Wednesday 17 May 2017* and more particularly Schedule 2 of that Order.

***My opinion remains as before, but I understand that a new version is expected.***

### What habitable level of a noise sensitive receptor is appropriate?

In my previous report I presented my opinion that the habitable level of a noise sensitive receptor at which the objective(s) applies should be the *most traffic noise affected habitable level* and not the *lowest habitable level*.

In his evidence Mr Stead commented '*On West Gate Freeway, residences are already exposed to traffic noise exposure and hence should have included traffic noise mitigation when they were built.*' I have seen no evidence to show that housing adjoining the West Gate Freeway was built after the Freeway. Existing dwellings in and near Railway Place, West Melbourne, also need to be considered. Some of these are more than one storey and are near the proposed Wurundjeri Way extension.

***I confirm my earlier opinion. I believe that further consideration needs to be given to existing multi storey dwellings along the West Gate Freeway and at West Melbourne.***

### How should compliance be assessed?

My previous opinions remain substantially unchanged with the following qualifications.

- The monitoring sites should include all or most of those (some may become unavailable over time) used for the assessment presented in the EES. They may need to be supplemented by measurement at the *most traffic noise affected habitable level* of noise sensitive receptors if that advice is accepted.
- That *VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011* provides a suitable method for traffic noise monitoring subject to the *lowest habitable level* specification in that document being replaced by *most traffic noise affected habitable level*.

***I confirm my earlier advice in principle subject to the above qualifications.***

What is the traffic noise impact on adjoining roads?

There is community concern about increased heavy vehicle traffic on some arterial roads because of the Project and hence of increased noise. Evidence supports my opinion that when assessed by the usual noise metrics, the noise increases would be small, at most. Opportunities to reduce noise at source on arterial roads are very limited. Reducing traffic volume, particularly of heavy vehicles, is the approach being adopted for a number of parallel routes to the Project roads.

My previous advice was that the IAC considers this matter as a traffic, planning and social issue rather than as a purely technical one

### **Tunnel ventilation system noise.**

Tunnel ventilation system noise is in NVP10 (for design), and NVP11 (for monitoring).

What of the tunnel ventilation facility noise statutory requirement?

Submissions and evidence have provided little comment on these two fixed facilities required to ventilate the road tunnels.

EPA submitted that compliance could be achieved through attention to design. It advised that it is considering the application. In a question to Mr Stead, EPA indicated that it may need frequency data for the proposed installation because there is less attenuation of noise at lower frequencies, and any low frequency rumble is to be avoided.

***I confirm my opinion that a Works Approval application for noise emissions from the ventilation systems for the tunnels has been provided and advise that this has not been a matter of significance.***

### Is compliance assessment feasible?

NVP11 requires noise monitoring of the ventilation system for the tunnels to assess compliance and for measures to rectify any non-compliance that may be identified.

In my previous opinion I expressed reservation about how compliance might be assessed by monitoring against a noise background that will change with the opening of the Project roads. I placed a question on notice to the proponent.

From the response (ref. WDA Project Note #44) and evidence from Mr Stead I am satisfied that techniques are available for compliance assessment against that changed background.

***It is my opinion that assessment of compliance to SEPP N-1 by monitoring is feasible, but particular attention may need to be given to the methodology to be used to compensate for the changed background noise levels.***

## Construction noise and vibration

### Are the noise and vibration goals suitable?

The EPR for the development of the CNVMP is at NVP3.

The proposed construction noise goals are in NVP4 (for surface noise) and NVP8 (for regenerated/ground-borne noise).

Those for vibration for various receptors are NVP6 (for amenity), NVP7 (for buildings/structures), and NVP9 (for above and below ground utility assets).

Blasting is presented in NVP5 (for trials), NVP12 (for vibration) and NVP13 (for overpressure).

A number of modifications to some of these EPRs have been suggested. These are discussed in Part 2 of this report.

***I confirm my previous opinion of the broad suitability of the construction noise and vibration goals, but recommend some changes as presented in Part 2.***

### What is the status of these goals?

Unlike the operational noise objectives that are for traffic noise and tunnel ventilation system noise, the construction noise and vibration goals are best regarded as targets, guidelines or triggers.

It has to be recognised that there are likely to be some construction activities that cannot be undertaken within the targets; these are the EPA Publication 1254 *unavoidable works*.

It is clear that in most cases noise and vibration can be kept within the guideline values by actions such as temporary noise barriers, times of operation, and the selection of construction machinery.

At issue is how to ensure that noise and vibration excursions above the guideline values are justifiably for works that are essential, rather than such exceedances being expedient. That is, these exceedances should be kept to an unavoidable minimum and subject to review.

The IAC is referred to Section J of NV21 *Construction Noise and Vibration Management Plan* of the *Melbourne Metro Environmental Management Framework* for a model of unavoidable works. (pp. 69-70).

### How should compliance be assessed?

My earlier opinion was that both construction noise and vibration should be monitored, that that should be done in real time, and that the information, particularly results approaching the target levels should be available to the contractor for a rapid and appropriate response. That would ensure compliance with the guidelines at most times, and that the impact of noise from unavoidable works is kept to a minimum. The monitoring locations could be changed as construction works moved.

Monitoring regenerated noise may be more difficult since that requires access to private dwellings for internal noise measurements.

There is no disagreement with the importance of this measure.

***I confirm my earlier opinion. Monitoring requirements should be included in the CNVMP.***

### Should construction machinery and heavy vehicle noise be controlled?

My opinion was that there is an opportunity to control noise from machinery used for Project construction and for heavy vehicles servicing the construction sites.

These matters might be part of the CNVMP

The IAC is referred to Section H of NV21 *Construction Noise and Vibration Management Plan* of the *Melbourne Metro Environmental Management Framework* for a model for this. (p. 68)

### NV3 and NV4 of the MMRP

I refer the IAC to EPRs NV3 and NV4 of the *Melbourne Metro Environmental Management Framework* .(p.51) These may offer the possibility of enhancing confidence in estimating the construction noise and vibration impacts.

NV3 is about construction noise and vibration modelling for the design phase and NV4 refers to the monitoring for the construction phase.

NV3 enables modelling to be improved by using the then available construction plan. It is possible that the results of that modelling can then inform the construction plan to refine the design of it. NV4 takes early monitoring results and feeds it back into the modelling to refine and calibrate the model for the particular conditions. That in turn may lead to adjustments in the construction plan, and so the process can continue.

***I suggest that the IAC considers modified versions of these EPRs. I provide further comment on this in Part 2 for NVP4.***

## 2 Approval Documents

### (i) Question

What is your opinion on the latest version of the Proponent's proposed approval documents (if any) and any other party's suggested changes to the approval documents (if you have seen those changes by the time you write this report)?

Please include a list of your recommended changes to the proposed approval documents (if any) including any changes to the EPRs or changes to the design plans (in so far as such changes fall within the IAC's terms of reference)?

### (ii) Response

This response has been prepared with reference to the Proponent's version of the EPRs NVP1 to NVP13, Version 5 of 10 September 2017.

I recommend to the IAC that it might consider grouping the EPRs to provide some greater cohesion between topics. For example, NVP4, NVP8 are noise targets; NVP6, NVP7, and NVP9 are vibration targets, NVP5, NVP12 and NVP13 are for blasting; NVP3 is about noise and vibration; NVP1, NVP2, NVP10 and NVP11 are about operational noise.

#### ***NVP1 – Traffic noise limits***

The original drafting of this EPR was less than clear. In Part 1 of this report I have advised of my opinion on the uncertainty in understanding the application of the objectives of NVP1.

Iterations have improved clarity somewhat, including that recently suggested by Mr Elkins. That has not yet been incorporated in the EPR NVPs.

***My opinion has changed marginally. The clarity of NVP1 has improved. Further change may be beneficial to clarity.***

#### ***NVP3 – Construction noise, vibration management, and monitoring.***

The title should reflect what is about viz., *Construction noise and vibration management plan (CNVMP)*.

The recent modifications to this EPR have made significant improvements. That has largely negated the need for an EPR modelled on the MMRP EV21.

I have commented on MMRP NV3 and NV4 before. The elegance of that approach is in NV4 point 3. That provides feedback to the model and hence a process of continuous improvement. I suggest that in NVP3 the words *monitoring* and *modelling* be placed in reverse order, the words *and during* be added after *prior to* and *consultant* be made *consultants* (there are four tasks in this).

At A first dot point, I suggest adding NVP9.

At *Measures to manage night works* under B, I believe that it would be useful to refer to *unavoidable works* as a part of works at night and incorporate MMRP EV21 J, or a version of that.

The dot point about *Vehicle and traffic management* and *EPR TP3* needs to ensure that TP3 is varied to include noise aspects. In turn, that could adopt H1 of the MMRP EV21.

Item C, dot point 3 about *alternative vibration guideline values* refers to Note 2 of EPR NVP7. There are two Note 2s in NVP7. It needs to refer to Note 2 in the section of NVP7 *on long term vibration*.

Some of the following may be useful in that NVP, arising in part from evidence and the conclave. The CNVMP:

- is to be prepared by the contractor;
- the contractor must consult with EPA Victoria, the Councils of the cities of Melbourne, Maribyrnong and Hobsons Bay, and the owners of under and above ground utility assets in preparing the Plan;
- the contractor may consult with other parties, individuals and community groups at its discretion;
- cannot contain performance objectives that are less restrictive than those in the EPRs;
- must be reviewed at regular intervals (six-monthly or annually?) or as required from experience;
- the initial Plan and subsequent refinements must be reviewed and endorsed by the IREA; and
- the document must be available to the public on the Proponent's website.

### ***NVP6 - Construction vibration targets (amenity)***

The IAC has been advised that VDV's are more difficult to monitor than PPV's. Converting VDV's to PPV's requires empirical data from a site or sites. Should the contractor use PPV as the management tool the necessary data must be obtained as soon as possible. That is the subject of Note 2. However, pending that a default level, suggested as 0.7 mm/s, should be used.

I suggest adding to Note 2; *Until a conversion is established, a default value of 0.7mm/s shall apply.*