

Fingerboards Mineral Sands Project

Inquiry and Advisory Committee

Traffic Engineering Evidence
Stephen Hunt – Ratio Consultants

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Engagement and Project Overview

Instructions

- I was initially engaged by Planology on behalf of East Gippsland Shire Council in December 2020.
- I was instructed to review technical reports and related documents prepared for the Fingerboards Mineral Sands Project EES relevant to my expertise, together with Council's submission to the EES and prepare a statement of evidence for consideration of the IAC.
- I was specifically asked to consider the adequacy of:
 - the technical reports,
 - the conclusions expressed in the EES and supporting documentation,
 - the proposed mitigating measures as outlined in the EES.

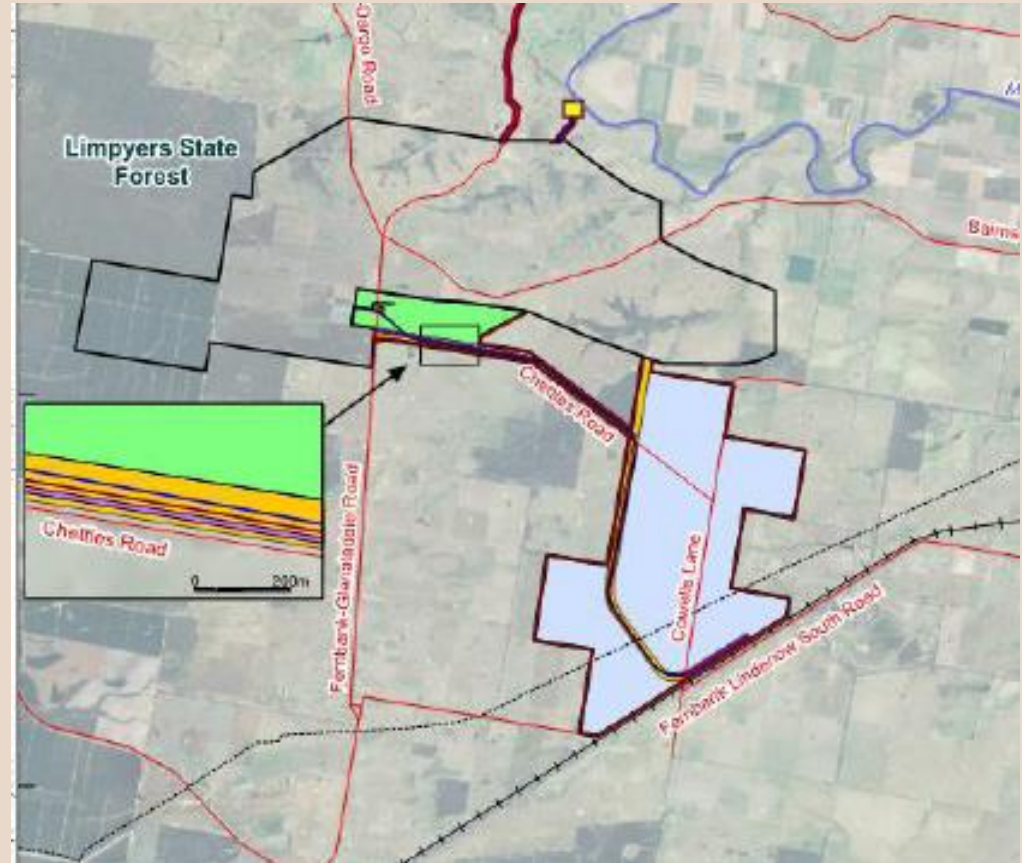
I was further instructed to review and comment on additional documentation submitted by the proponent to DoT on 14th January 2021, including updated plans of proposed road deviations, intersection treatments and concept designs for the Ferndale East Rail Siding.

Proposal and Transport of Product

- Kalbar Operations Pty Ltd propose to mine mineral sands in the Fingerboards area of East Gippsland.
- Mining is proposed 24 hours a day, 7 days a week with processed concentrate stockpiled on site prior to being transported for further processing overseas.
- Concentrate is proposed to be transported by road, rail or a combination of both with three options considered in the Traffic and Transport Impact Assessment (TTIA) contained in Appendix A012 of the EES Report.
- The three Options considered are described as :
 - Pre-Avon River bridge to Maryvale and Port Anthony or Barries Beach Marine Terminal
 - Post Avon River Bridge – Option 1 to a new rail siding at Fernbank East, and
 - Post Avon River Bridge – Option 2 to Bairnsdale rail siding.

Preferred Transport Route – Post Avon Bridge Option 1

- The stated preferred option for transporting concentrate is via a new purpose built rail siding at Fernbank East, (Post Avon – Option 1) with material transported to the siding via a private internal haulage road.

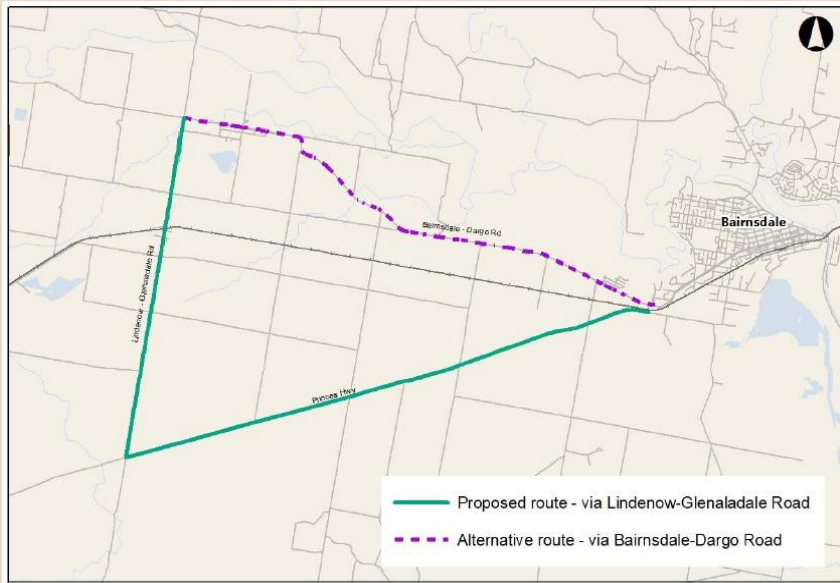


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Alternate Transport Routes

- As an alternative to the construction of a rail siding at Fernbank East, the TTIA identifies an option to upgrade the existing siding at Bairnsdale and haul concentrate to the siding via:
 - Bairnsdale – Dargo Road,
 - Lindenow – Glenaladale Road, and
 - Princes Highway to Bairnsdale siding via Racecourse Road.
- Alternate routes to Bairnsdale siding are considered in the TTIA in two sections:
 - Between the site and Princes Highway, Bairnsdale:
 - via Lindenow- Glenaladale Road -Princes Highway, and
 - via Bairnsdale-Dargo Road
 - Between Princes Highway and the Bairnsdale siding:
 - via Racecourse Road, Forge Creek Road South and Bosworth Road,
 - via Main Street, Collins Street and Bosworth Road, and
 - via Main Street, Forge Creek Road North and Bosworth Road.

Alternate Routes to Bairnsdale Siding



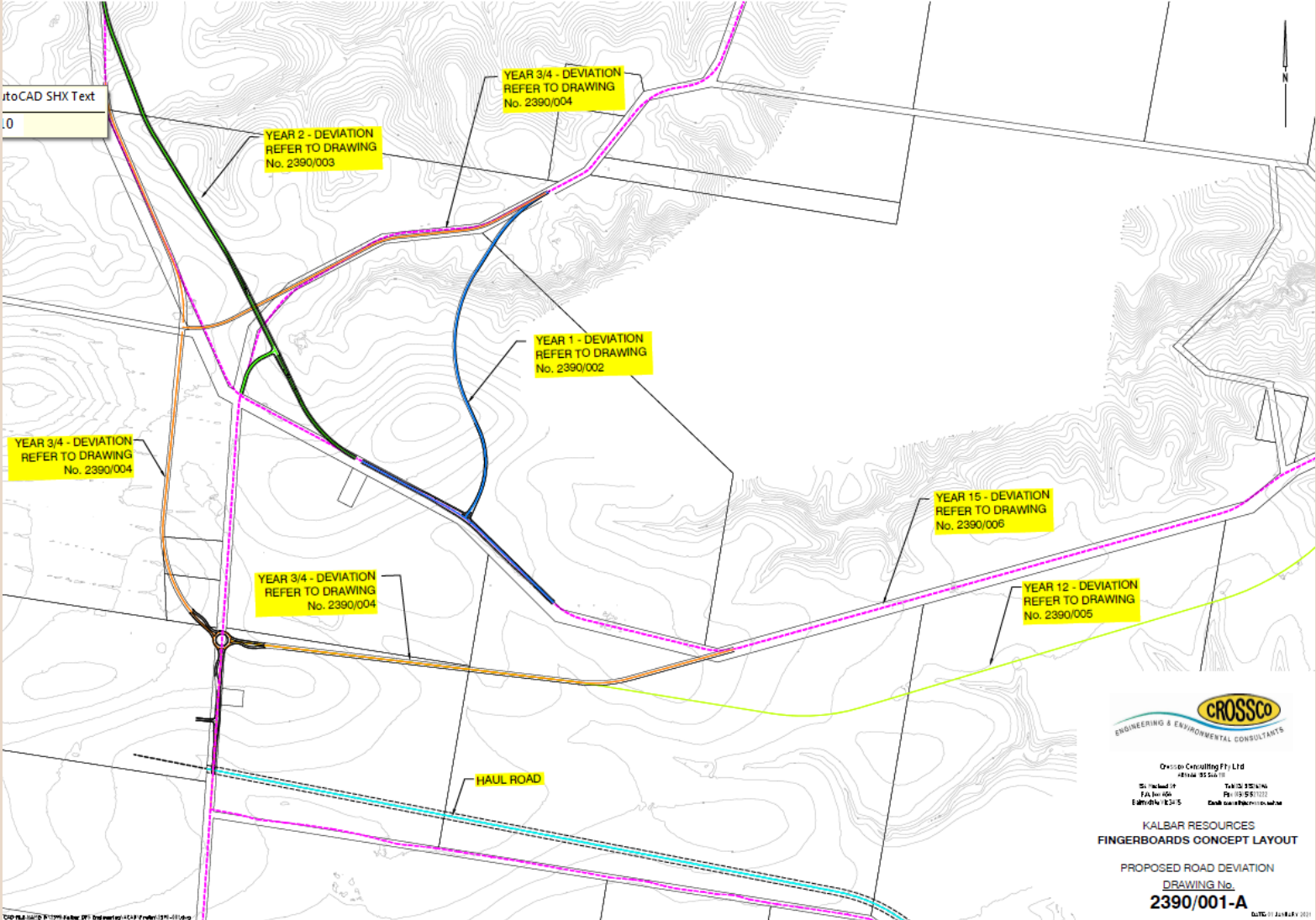
Road Deviations

- In conjunction with the staging of mining on the site, it is proposed to realign or divert a number of public roads.
- As exhibited in the EES , the road deviations proposed are described as follows:
 - Removal of the existing Fingerboards Intersection,
 - Construction of a new 4-leg roundabout to the south east of the existing intersection, with the western leg forming the main access road into the site.
 - Realignment of Fernbank-Glenaladale Road to the north of Bairnsdale Dargo Road to the west and between Bairnsdale Dargo Road and Chettles Road to the east to meet the new roundabout.
 - A new intersection on Ferndale- Glenaladale Road with the private haulage road between the new roundabout and Chettles Road, assuming the construction of a purpose-built rail siding at Ferndale East in the Post Avon Option 1 scenario is pursued.

Revised Road Deviations

- Alternate road deviation layout plans developed by the proponent following completion of the EES were submitted to DoT on 14th January 2021.
- It is understood that the plans remain under consideration and subject to ongoing discussions with Council and DoT.
- The amended road deviation proposals are understood to have been undertaken to:
 - Provide for road diversions on land either owned by Kalbar or likely to be able to be acquired by Kalbar.
 - Avoid permanent diversion of Fernbank–Glenaladale Road north,
 - Reduce upfront pre-operational road diversions, and
 - Refine designs to conform with Austroad’s Design Guidelines.
- The amended plans also relocate the Fingerboards intersection to the south, with the intersection forming a 3 leg (rather than 4leg) roundabout.
- Site access is proposed from Fernbank-Glenaladale Road 220m to the south of the roundabout and 130m north of the haulage road crossing point.

Revised Road Diversion Plan



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KALBAR RESOURCES
FINGERBOARDS CONCEPT LAYOUT

PROPOSED ROAD DEVIATION
DRAWING No.
2390/001-A

DATE: 01/24/18 v. 001

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Review of EES Documentation

Traffic and Transport Assessment Report

Overview

- TTIA considers the traffic and transport impacts of the proposal for both the construction and operational phases.
- For each of the three product haulage options considered, a detailed assessment on the implications of the effected road network was undertaken as follows:
 - identification of potential haulage routes,
 - review of existing traffic volumes and road standards,
 - estimate of additional traffic generated during both the construction and operational phases,
 - assessment of traffic performance on identified routes,
 - assessment of transport safety including review of level crossings and intersections,
 - identification of standard and additional mitigating measures,
 - a relative risk assessment of the identified mitigating treatments.

Traffic and Transport Assessment Report

- While I consider that the TTIA generally satisfies the scoping requirements of the EES, in my opinion it should be updated to assess the revised road deviations plans and updated mitigating work proposals submitted.
- In addition, existing conditions data on candidate transport routes should be updated to provide a sound basis for understanding the implications of projected increases in traffic activity.

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Traffic and Transport Impact Assessment

Updated Existing Conditions Data

- Traffic volumes data, which forms the basis of the TTIA was collated from a variety of sources including DoT data base and extrapolation of 15 minute spot surveys.
- Further data collected in November 2020 referenced in Mr Carter's evidence statement showing significant variations from initial estimates in the TTIA.
- In my opinion, more comprehensive traffic data needs to be collected as a basis for a more accurate assessment of:
 - future traffic volumes, particularly to identify the relative increases in heavy vehicle volumes on haulage routes in the operational phase,
 - the implications of traffic increases on intersection and road network performance, and
 - the appropriateness of mitigating treatments identified.
- Updated data to include:
 - 7-day classified tube counts on all identified haulage routes, and
 - Two hour counts at key intersections along haulage routes.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 1

Construction Traffic

- TTIA estimates that during the construction phase, the project will generate 150 vehicle movements per day, 130 light vehicle and 20 heavy vehicle trips.
- Estimated volumes are based on the establishment of the mining site and related infrastructure (including road deviations).
- It is unclear if volume estimates will increase if the Fernbank East siding and private haulage road is being constructed simultaneously.
- In my opinion, construction traffic analysis should be updated to reflect revised initial road deviations and the construction of the rail siding, considering the impacts on effected roads and intersections.
- The analysis will identify requirements for any initial mitigating works which may be required during the construction phase and form the basis for a Construction Traffic Management Plan.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 1

Operational Traffic

- TTIA estimates that during the operational phase, the project will generate 120 vehicle movements per day related to staff movements and maintenance / service vehicles.
- As such, the revised assessment of construction traffic and identified mitigating works will be adequate to understand ongoing operational impacts on the broader road network.
- For Option 1, the impact during the operational phase will effectively be confined to the movement of product by B-double vehicles along the private haulage road to the proposed Ferndale East siding.
- The principal issues in relation to use of the private haulage road are:
 - the crossing point of Fernbank – Glenaladale Road and control of the intersection,
 - The resultant spacing of intersections along Fernbank – Glenaladale Road south of the relocated Fingerboards intersection.

Traffic and Transport Impact Assessment

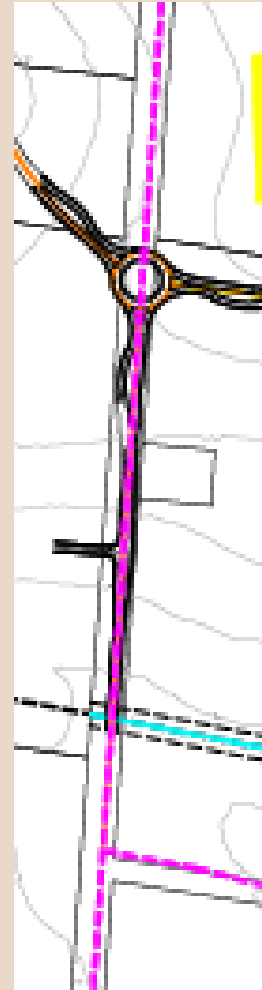
Post Avon Bridge Option 1

Operational Traffic

- The spacing of proposed intersections along Fernbank – Glenaladale Road is as follows:
 - Fingerboards roundabout / site access point (210m)
 - Site access point / private haulage road crossing point (150m)
 - Haulage road crossing point / Chettles Road (130m)

Traffic and Transport Assessment Report

Post Avon Bridge Option 1
Operational Traffic
Glenaladale Road, Intersection Spaces



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Traffic and Transport Impact Assessment

Post Avon Bridge Option 1

Haulage Road / Fernbank - Glenaladale Road Intersection

- Mr Carter in his evidence presentation, having conducted a review of the vertical geometry of Fernbank – Glenaladale Road, assess that the site access intersection and haul road intersection will have to be move further north or the vertical alignment of the Fernbank-Glenaladale Road modified.
- The likely reduction in spacing between intersections exacerbates potential issues of intersection spacing and impact on traffic using Fernbank-Glenaladale Road identified in my evidence statement.
- I agree that further deign reviews, road safety audits and consultation with the road authorities will be required to resolve the design issues, including the control and management of the haulage road crossing point intersection.
- In my opinion, in association with the review of modified road deviations and access to the site, grade separation of the haulage road and Fernbank – Glenaladale Road should be considered.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 2

Operational Traffic

- The TTIA identifies that during the operational phase, the site will generate 120 light two-way traffic movements per day related to staff and maintenance vehicles, together with 40 B-double movements hauling concentrate to Bairnsdale siding and returning each day.
- The TTIA conducted a high level review of the nominated preferred route (via Racecourse Road), identifying a number of key considerations including:
 - B-double traffic using local roads, in particular Racecourse Road which is not a declared B-double route.
 - Intersection safety and geometry at Princes Highway / Racecourse Road and Princes Highway / Lindenow-Glenaladale Road intersections.
 - Road pavement issues in Forge Creek Road and Bosworth Road.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 2

Operational Traffic

- On the basis of the risk assessment undertaken and in particular the safety risk, the TTIA recommends that roundabout treatments be installed at Princes Highway / Racecourse Road and Princes Highway / Lindenow-Glenaladale Road intersections.
- Road pavement upgrades are also recommended in Bosworth Road and Forge Creek Road.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 2

Operational Traffic

- The extent of mitigating works for Option 2 is expanded in the *Mitigation Register* of the EES, with a series of additional interventions proposed in association with Option 2 including:
 - Lighting at key intersections along the nominated product haulage route to the Bairnsdale siding,
 - Channelised right turn lane at Bairnsdale Dargo Road / Ferndale Glenaladale Road and extended barrier lines on west approach,
 - Boom gates at Lindenow South Level Crossing,
 - Haulage traffic to be scheduled to avoid school bus routes during school times, and
 - Widening of shoulders and linemarking reinstated on Racecourse Road and the Forge Creek Road bend.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 2

Operational Traffic

- It is noted that, subsequent to the preparation of the EES and the TTIA, additional work and investigations have been undertaken on behalf of the proponent with respect to Option 2, as documented in the evidence as filed by Mr Carter and hence in his evidence presentation.
- This includes:
 - A review of safety through Walpa having regard to the vertical alignment of Bairnsdale – Dargo Road, and
 - A review of pedestrian safety at the South Pines Golf course in Lindenow South.

Traffic and Transport Impact Assessment

Post Avon Bridge Option 2

Operational Traffic

- In my opinion, if Option 2 is to be pursued, either as the preferred option or as an interim haulage route, an updated TTIA should provide a more detailed assessment of potential routes including:
 - Functional designs of the proposed treatments, including the proposed roundabouts at the Princes Highway / Racecourse Road and Princes Highway / Lindenow-Glenaladale Road.
 - Updated traffic counts at the intersections and SIDRA analysis of future conditions to demonstrate that satisfactory operation can be achieved, including during peak holiday periods.
 - Further review of Bairnsdale-Dargo Road between the site and Lindenow-Glenaladale Road, Lindenow-Glenaladale Road including through Lindenow South and the rail level crossing to Princes Highway to identify additional mitigation and or upgrade works which may be required.

Attachment H – Mitigation Register

Overview

- Attachment H of the EES provides a *Mitigation Register* which includes a range of traffic and transport mitigation measures proposed to be implemented in association with the various haulage routes options identified..
- I have reviewed the list of mitigating measures and consider that it is comprehensive and generally satisfactory.
- As stated in the Part A Submissions on behalf of the proponent, it is no longer intended to ship concentrate from Port Anthony and, as the Avon River Bridge has been completed, the Pre Avon River Bridge Option would appear to be redundant.
 - As such treatments in the Mitigation Register related to this option are no longer relevant and should be deleted.
 - Works related to the development of the Fernbank East Rail Siding (Option 1) should include grade separation of the haulage road at Ferndale – Glenaladale Road.

EES Conclusions

- Conclusions contained in Chapter 13 of the EES Report are informed by the TTIA contained in the Technical Appendix and are largely consistent with the analysis and the risk assessments undertaken in that report.
- While recognising the clear benefit of Option 1 and construction of the Fernbank East Siding and internal haulage road, the EES does not commit to that option.
- As clarified in the DoT submission to the IAC, while considering that “on balance” the road safety outcomes that are achieved from Option 1 is preferable, the Department maintains that both options must be fully examined as part of the EES Process.
- In my opinion, with both options remaining under consideration, a higher level of assessment of alternate haulage routes in Option 2 is required to satisfy the scoping requirements of the EES, including alternate routes should Racecourse Road not become an approved B-double route.

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Review of Submissions and Issues Raised

Issue : Study Process and Methodology

- It was agreed at the conclave of experts that the methodology adopted for assessment of the project in the TTIA was generally satisfactory.
- While I am satisfied with respect to the estimates of future traffic generation and distribution, I consider that the existing conditions data as collated in the TTIA is inadequate to enable a rigorous assessment of post development traffic conditions to be understood.
- Should the IAC recommend that an updated TTIA (and EES) be prepared in response to additional information now available, I recommend that updated existing conditions data be collected and analysed as follows:
 - 7 day classified tube counts on nominated or potential haul roads, identifying hourly volumes and traffic composition,
 - Two-hour turning movement counts during the AM and PM weekday peak periods,
 - Pedestrian surveys in Lindenow South, Racecourse Road and other areas where potential interaction with sensitive abutting land uses has been identified.

Issue : Study Process and Methodology

- This data will be needed in any event to inform detailed design of mitigating treatments as identified and to secure necessary approvals from DoT and Council.
- In addition, I recommend that updated analysis be undertaken using the SIDRA program to confirm that traffic capacity issues will not arise, particularly to inform detailed design of intersection treatments.
- Sensitivity testing of the performance of intersections along Princes Highway should be undertaken to ensure that intersection modifications being contemplated at Lindenow – Glenaladale Road and Racecourse Road in Option 2 will not result in excessive delays and queueing for traffic on the Highway during peak school holiday periods.

Issue : Route Options for Transport of Product

- It was agreed at that the conclave that, on the basis of transport impacts that Option 1 is the preferred option.
- It is noted that DoT have now stated that, on balance, the road safety outcomes that are achieved through the construction of the Ferndale East Siding and haulage via a private haulage road is the preferable outcome and that the movement of material by rail is appropriate and consistent with efficient transport network provision.
- Discussions between the proponent, DoT and V/line are however preliminary and details have not been confirmed with respect to:
 - Access to the rail network,
 - Proposed rail timetables, and
 - Upgrades and modifications which may be required to allow transport of mineral sands.

Issue : Route Option for Transport of Product

- In my opinion, in traffic, road safety and amenity terms, the development of a new purpose-built rail siding at Fernbank East is clearly the preferred means of transporting concentrate from the site, effectively reducing traffic increases on the road network to staff and maintenance vehicles, with haulage to the rail siding able to be achieved via construction of an internal private road.
- Haulage of concentrate to an upgraded rail siding at Bairnsdale, while likely to be manageable is the least preferred option.
- From a traffic management and road safety perspective, the movement of product as contemplated in Option 2 should only be pursued if :
 - the Fernbank East siding cannot be achieved from a rail operational perspective, or
 - It is required on an interim basis if the Fernbank East siding is unable to be completed prior to mining operation commencing.

Issue : Route Option for Transport of Product

- It was also agreed at the conclave that rail capacity to allow transport of concentrate from either Fernbank East or Bairnsdale has now been established and, as such the Pre-Avon River Bridge Option is, in transport terms, redundant.
- In my opinion, this option should only be considered if both Option 1 and Option 2 are not feasible in other than transport terms.

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Issue : Haulage Road / Fernbank- Glenaladale Road Intersection

- I consider that, given the proposed spacing of intersections along Ferndale – Glenaladale Road south of the relocated Fingerboards junction and vertical alignment issues, consideration should be given to grade separating the Private Haulage Road crossing.
- This will provide a significantly improved outcome in road safety terms compared with at-grade treatments contemplated in the TTIA and the EES.
- I also note that road diversion plans already contemplate grade separation of internal roads with Bairnsdale – Dargo Road.
- It was agreed at the conclave that further investigation is required as to the means of control of the (now) 3-leg Fingerboards intersection, in particular if the proposed roundabout control is appropriate or necessary.
- It was also agreed that vertical alignment considerations, and subsequent spacing of intersections required further detailed investigation.
- In my opinion, this should be undertaken in conjunction with preparation of an updated TTIA in consultation with Council and DoT.

Issue : Princes Highway Roundabout Treatments

- I consider that the construction of roundabouts at the intersections of Princes Highway / Lindenow – Glenaladale Road and Princes Highway / Racecourse Road to control B-double movements over the 20 year operation period is inconsistent with the relative functions of the intersecting roads.
- I acknowledge that approval of intersection treatments in association with Option 2 (if pursued) is a matter for DoT and roundabout control as proposed may be approved for road safety reasons.
- Traffic analysis based on updated volume data should be undertaken however to confirm that roundabouts will operate satisfactorily, including sensitivity analysis during peak holiday periods.
- As agreed at the conclave, if haulage of material to Bairnsdale siding is only contemplated as an interim treatment prior to completion of the Ferndale East siding, an alternate range of mitigating works would need to be considered, including the suitability of roundabout treatments.

Issue : Alternate Route to Bairnsdale Siding

- Racecourse Road is not a declared B-double route and as such, Council approval for the use of Racecourse Road as a haulage route to Bairnsdale siding is required.
- I understand that, in response to issues raised with respect to B-double usage of Racecourse Road, Council may not endorse upgrading of the road to a designated B-double route.
- In my opinion, the use of Main Street / Collins Street / Bosworth Road remains a viable alternative for access to Bairnsdale siding if Option2 is pursued, currently being an approved B-double route.
- An updated TTIA, as recommended, should investigate adoption of this route in conjunction with Option 2, including potential additional mitigating treatments which may be required.

Issue : Amenity Impacts of Increased B-Double Traffic

- Amenity impacts of increases in B-double traffic on Bairnsdale – Dargo Road, Lindenow – Glenaladale Road and Racecourse Road in Option 2 has been raised in submissions.
- To appropriately understand the impact of increase B-double traffic, an understanding of existing traffic usage along the designated haulage route is required, including the extent of existing use of trucks of various classifications, including B-doubles.
- I have recommended that this be undertaken in conjunction of an updated TTIA, informing the EES report.
- I disagree with the assessment of “environmental capacity” undertaken by Mr. Carter in his evidence presentation, which was based, at least in part, on volume ranges for local urban streets taken from Clause 56.06 of the Planning Scheme.
- In my opinion, the analysis of acceptable increases of B-double traffic on nominated roads should be based on an undertaking of the relative increases in large vehicle traffic and associated noise and vibration assessments.