

Attachment 5:**Further information requested under Section 92 of the Resource Management Act 1991****Contents**

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Traffic matters			
T1	Assessment of Alternative Options – Ramarama Interchange	<ul style="list-style-type: none">Please provide assessment of full or Partial Closure of Ramarama Interchange to be provided to address the alternative of full or partial closure of the Ramarama Interchange?	<p>The Alternatives Assessment undertaken as part of the P2B DBC considers three options for the Ramarama Interchange, all of which include retaining or replacing the Ararimu Road overbridge and all four access ramps. However, it is noticed that consideration could be given to the full or partial closure of the Ramarama Interchange, as the transport functions that it provides would be substantially duplicated by the proposed new Drury South Interchange. The Ramarama Interchange primarily facilitates connections between the Southern Motorway and the interchange's immediate hinterland, which, would be available via the new Drury South Interchange and its onward connections to Quarry Road, Maketu Road and Great South Road.</p> <p>The new Drury South interchange is to be located within 2km of the Ramarama Interchange. As elaborated below, this represents a short separation distance between consecutive motorway interchanges by comparison to the recommendations of</p>

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			<p>Austroads Design principles. Not only is this inconsistent with the strategic function of a motorway, but it further risks adverse operational and safety effects resulting from excessive use of the motorway by short-distance trips between consecutive interchanges.</p> <p><i>Austroads Design Principles</i></p> <p>The primary function of a motorway is to facilitate strategic long-distance transport connections. Commensurate with the strategic transport function of a motorway, interchanges should be provided at only select locations, to avoid excessive use of the motorway by short-distance trips between consecutive interchanges.</p> <p>Austroads Guide to Road Design Part 4C recommends the following minimum spacing distances between motorway / 'freeway' interchanges, dependent upon the number of lanes and the geographical context (urban versus rural environment):</p> <p><u>In urban areas, about:</u></p> <ul style="list-style-type: none"> • 2 km on four-lane motorways / freeways (i.e., two lanes in each direction) • 3 km on six-lane motorways • 4 km on eight-lane motorways <p><u>In rural areas, between 5 km and 8 km</u></p>

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			<p>Thus, following the widening of the motorway to 6 lanes, the recommended minimum separation distance between interchanges would be 5 km, based on the current rural environment, or 3 km, if allowing for the increasingly urbanised environment adjoining the motorway. Both of these recommended separation distances are in excess of the 2 km separation distance between the Ramarama and Drury South interchanges.</p> <p>Retaining the Ramarama Interchange in its current form presents the risk of encouraging short-distance traffic movements between the Ramarama and Drury South interchanges, which would utilise the Southern Motorway for less than 2 kilometres. High numbers of short-distance trips are not considered to be consistent with the function of a motorway, which is to facilitate strategic long-distance traffic movements.</p> <p>At an operational level, consecutive pairs of interchange ramps within distances of 2 kilometres or less further introduces potential for additional safety conflict, i.e., conflicting traffic streams weaving across motorway lanes upon respectively entering and preparing to exit the motorway at consecutive interchanges. As recognised in the above Austroads recommendations, additional lanes on the motorway increases the length of road over which such weaving manoeuvres could be expected to take place, hence influencing longer recommended distances between consecutive interchanges.</p> <p>At the time of writing, any predecessor work to the Alternatives and Options Assessment of the P2B DBC has been mentioned, which may have previously considered and discounted an option</p>

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			<p>for full or partial closure of the Ramarama Interchange. Notwithstanding this, further assessment of the following options on a comparative basis can be provided, considering impacts upon traffic operation and safety, both on the motorway and the parallel running local road network:</p> <ul style="list-style-type: none"> (i) As proposed, the provision of north and south-facing ramps at both the Ramarama and Drury South Interchanges (as a ‘reference case’) (ii) Partial closure of the Ramarama Interchange, comprising closure of the north-facing ramps only (iii) Full closure of the Ramarama Interchange, of all 4 ramps
T2	Safety and operational effects between Drury and Drury South Interchanges	<ul style="list-style-type: none"> • Please assess safety and operational effects resulting from the close spacing between the existing Drury interchange and the new Drury South interchange 	<p>Following on from discussion under item T1 in relation to the separation distance between the new Drury South and Ramarama interchanges, the distance between the new Drury South and existing Drury interchanges is approximately 2.25 km, which similarly falls below the 3 km separation threshold recommended by Austroads Part 4C (the 3 km parameter being based on increased future urbanisation on land adjoining the motorway).</p> <p>While section 4.3 of the ATE acknowledges the risk of increased speeds and increased potential for weaving movements as a result of the widening, it does not elaborate on the scope and level of risk associated with such movements nor any potential</p>

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			<p>mitigatory measures which may need to be considered in the short or longer-term.</p> <p>Please undertake further assessment of the potential adverse effects of additional weaving movements occurring over the 2.25 km distance between the interchanges and confirm any potential mitigatory measures. It is noted that both the Drury and Drury South interchanges would fulfil comparatively more strategic transport functions than the Ramarama Interchange, thus making options for ramp closures undesirable. However, could future traffic growth potential warrant consideration of other mitigatory measures, such as the addition of auxiliary lanes between the two interchanges, or reduced or variable speed limits?</p>
T3	Assessment of Merges and Diverges at interchanges	<ul style="list-style-type: none"> • Please assess capacity of merges and diverges of interchange ramps according to Austroads standards. 	<p>The ATE does not include a capacity assessment of the merges and diverges of the interchanges. The Designation Layout Plans in Appendix B illustrate all interchange merges and diverges with single lane merges and diverges adjoining the motorway. Does the NOR Designation allow for the provision of alternative merge and diverge layouts on the interchange ramps if warranted (e.g., on account of high levels of heavy vehicles)?</p> <p>Further assessment of the interchange merges and diverges according to Austroads standards is required to confirm the availability of sufficient capacity to avoid adverse effects, such as tailbacks onto the mainline of the motorway at diverges or traffic entering at slow speeds at merges. Relevant Austroads standards include Guide to Road Design Part 4C: Interchanges,</p>

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			Chapter 5 and Chapter 11, and Guide to Traffic Management Part 2: Traffic Theory, section 8.2.
T4	NOR 5 Future Corridor – Intersection forms	<ul style="list-style-type: none"> • Please confirm philosophy with regards to the choice of intersection forms along the NOR5 route, which vary between roundabouts and signals 	<p>The new link road enabled by NOR5 is proposed to link with a new roundabout with Great South Road to the west, with dumbbell roundabouts at the Drury South Interchange and with a new signalised intersection with Maketu Road to the east.</p> <p>Inconsistency in intersection forms between signals and roundabouts along a given corridor is not generally considered to be ideal practice, although the performance assessment would appear to indicate that there are no major operational issues relative to the spacings between the intersections, e.g., excessive queue lengths.</p> <p>Please confirm rationale behind choices of intersection form, not only in the context of the NOR5 and P2B roading provisions, but also in the context of onward connections towards Pukekohe and eastern Drury and Papakura, both of which are expected to function as Expressway-standard routes. What is the current thinking in relation to intersection forms along both onward routes and will they be consistent with the choices of intersection form on NOR 5?</p> <p>Would the designation in practice allow for some flexibility in the ultimate choice of intersection form?</p>

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T5	NOR 5 Future Corridor – Intersection with Maketu Road	<ul style="list-style-type: none"> Please undertake traffic modelling of this intersection 	<p>The intersection traffic modelling presented in Appendix C does not cover the intersection with Maketu Road. Please can a modelling assessment of this intersection be provided, to determine whether its operation and queue generation will adversely impact upon the adjacent roundabout intersections to the west.</p>
T6	Crash Analysis, Chapter 5 of Assessment of Transport & Traffic Effects (ATE)	<ul style="list-style-type: none"> Please provide a more detailed crash analysis, including a breakdown of crash types and crash trends along the corridor 	<p>The crash analysis in Chapter 5 is high level and provides no breakdown of crash types by location. A more detailed crash analysis, including a breakdown of crash types and crash trends by location along the corridor would assist with providing more insight into existing trends and opportunities to reduce crashes, particularly at and in the vicinity of key interchanges, where major changes are proposed.</p> <p>In the case of crashes near the proposed new Drury South Interchange, it would be useful if the location and outline for the interchange could be confirmed on the crash plot.</p>
T7	Safety – Assessment of KiwiRAP ratings	<ul style="list-style-type: none"> Please confirm current and future KiwiRAP ratings for SH1 Southern Motorway and SH22 	<p>The ATE Report does not include an assessment of Kiwi RAP ratings for collective and personal safety risk along the Stage 2 section of the P2B Southern Motorway corridor, nor along the adjoining length of State Highway 22. An assessment of KiwiRAP ratings is required both on this section of the Southern Motorway and along SH22, including confirmation as to whether</p>

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			the safety ratings would improve as a result of the proposed improvements.
T8	Shared User Path (SUP) – Function, Operation and Volume	<ul style="list-style-type: none"> Please clarify transport functions and usage of SUP 	<p>While the ATE Report refers to there being expected benefits of the SUP, it does not elaborate on its intended transport functions, operation and expected levels of usage.</p> <p>For example, is it expected to cater primarily for leisure trips, commuter and practical / everyday trips, or combinations of these? Do the intended transport functions align well with the connections being provided onto the SUP at the key interchanges and any other locations? Are any ‘soft measures’ being proposed to enhance use of the SUP and encourage modal shift from car trips, e.g., travel demand management initiatives?</p> <p>Is any count data or other survey data available for the existing section of SUP between Papakura and Takanini, which may offer insights into expected usage and likely functioning of the SUP south of Drury?</p>
T9	Construction Traffic Management	<ul style="list-style-type: none"> Is there proposed to be a condition for network performance monitoring? 	While the ATE and conditions refer to an outline approach for a prospective CTMP to avoid, remedy or mitigate adverse effects during the construction phase, the ATE appears to provide little

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	Plan (CTMP) Conditions		<p>insight in relation to the scope and nature of problems to be addressed during the construction phase.</p> <p>A condition is required to establish and monitor minimum network performance parameters to be achieved during the construction phase, including maximum increases in journey time and traffic volumes, along both the motorway and any diversionary routes. In the event of thresholds being exceeded, appropriate Travel Demand Management (TDM) measures should be identified where practicable.</p> <p>Appropriate thresholds for excessive travel times to be determined based on average travel times surveyed over the selected routes prior to the commencement of works.</p>