

Before Hearing Commissioners

under: the Resource Management Act 1991

in the matter of: Notices of Requirement by the NZ Transport Agency to the Waipa District Council and the Waikato District Council to alter existing designations under section 181 of the RMA for the Cambridge Section of the Waikato Expressway

and:

in the matter of: resource consent applications by the NZ Transport Agency to the Waikato Regional Council under section 88 of the RMA for the Cambridge Section of the Waikato Expressway

Statement of evidence of Jeremy Gibbons (Traffic) on behalf of the
NZ Transport Agency

Dated: 27 June 2011

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STATEMENT OF EVIDENCE OF JEREMY GIBBONS ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My full name is Jeremy Nicholas Gibbons.
- 2 I am a Senior Transportation Project Engineer for Opus International Consultants Limited, in Hamilton. I have practised in the field of civil engineering for 13 years. My experience has been obtained in New Zealand, Australia and Malaysia. Over the past 11 years I have specialised in Traffic and Transportation engineering.
- 3 My relevant tertiary qualifications include a Bachelor of Engineering (Civil), (First Class Honours) and a New Zealand Certificate in Engineering (Civil). I am a Chartered Professional Engineer (CPEng), a Member of the Institute of Professional Engineers NZ (MIPENZ), and a Member of the IPENZ Transportation Technical Group.
- 4 I am responsible for project management, strategic transportation planning, traffic engineering and modelling, technical reports and specialist inputs into major engineering projects throughout the country. Recent examples where I have been the Traffic and Transportation Engineer include the Waikato Expressway Te Rapa Section (I&R phase), SH2 Katikati Bypass, Christchurch Southern Motorway (CSM1) and SH1 Avalon Drive Bypass.
- 5 My evidence is given in support of notices of requirement for alterations to designations (*NORs*) and applications for resource consents lodged by the NZ Transport Agency (*NZTA*) on 22 December 2010 in relation to the Cambridge Section of the Waikato Expressway (*Project*).
- 6 I am familiar with the area in which the Project is located, and the State highway and roading networks in the vicinity of the Project.
- 7 I confirm that I have read the 'Code of Conduct for Expert Witnesses' contained in the Environment Court Consolidated Practice Note 2006. To the extent that the Code is relevant to my statement of evidence, my evidence has been prepared in compliance with that Code in the same way as I would if giving evidence in the Environment Court. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

SCOPE OF EVIDENCE

- 8 My evidence will deal with the following:
- 8.1 A comment on the difference between effects arising from the alterations to designation and those arising from the Project as a whole;
 - 8.2 A summary of evidence;
 - 8.3 My background and role;
 - 8.4 A summary of my traffic assessment;
 - 8.5 Comments on submissions;
 - 8.6 Comments on Officers' Reports and recommended conditions; and
 - 8.7 My conclusions.

INCREMENTAL TRAFFIC EFFECTS RELATING TO THE ALTERATION TO DESIGNATION

- 9 For simplicity of assessment and in response to submitters' concerns, in my assessment of the Project's traffic effects I have generally considered those effects that arise from both the existing designations and the alterations to designations. However, it is important to note that all of the adverse operational traffic effects and the majority of the adverse construction traffic effects (subject to grant of the relevant resource consents) would occur if the existing designations were developed now without alteration.
- 10 In regards to operational traffic effects, it is my opinion that the alterations to the existing designations have positive traffic effects. The alterations allow for a four-lane Expressway to be constructed with design and safety features superior to a two-lane highway, thereby providing improved efficiency and level of service to Expressway users, and an expected reduction in severity of Expressway crashes. In addition, the alterations allow for improved accessibility at local road and interchange connections, thereby providing an overall improved transport network for all users.
- 11 I note that the majority of earthworks (including the cut and fill areas) and the bulk of the pavement area are contained within the existing designated boundaries. As such, the incremental increase in construction traffic associated with the alterations will, in my opinion, be marginal. Therefore, the associated incremental traffic effects of the alterations to designations are, in my opinion, no more than minor.

SUMMARY OF EVIDENCE

- 12 For the reasons set out in this statement, I consider the traffic engineering effects associated with the Project have been appropriately assessed and any adverse effects can be suitably mitigated. In particular:
- 12.1 The Project will provide positive travel time savings for those drivers travelling through Cambridge Township;
 - 12.2 The Project will create substantial crash benefits for the travelling public by providing a safer corridor and removing significant conflict;
 - 12.3 The Project will provide a high level of service well beyond the Project horizon;
 - 12.4 There will be increased traffic on some local roads caused by severance of some corridors. However, this will result in only a localised minor adverse effect for affected users;
 - 12.5 The Project will provide a significant positive effect along the existing SH1 corridor by removing up to 63% of projected traffic volumes;
 - 12.6 The Project will contribute towards Travel Demand Management measures (e.g. promotion of integrated land use, encouragement of increased use of active transport modes and removal of community severances caused by congestion) within Cambridge Township;
 - 12.7 The Project is both compatible and supportive of the walking and cycling initiatives within the Waipa District Walking and Cycling Strategy. It will indirectly support enhanced opportunities for walking and cycling within Cambridge Township by removing significant traffic flow barriers within the urban area;
 - 12.8 The Project provides no specific provision for passenger transport services, but provides a positive enhancement to the Districts by allowing increased opportunity for development of such services;
 - 12.9 I consider adverse traffic effects caused from construction of the Project will be minor with appropriate mitigation. The effects will be temporary and can be readily managed within a Project-specific Traffic Management Plan;
 - 12.10 The Project supports national, regional, and local transportation plans and strategies, and will greatly improve

the safety and efficiency of the overall transportation network.

BACKGROUND AND ROLE

- 13 Since Opus' initial engagement in March 2007, my role has been to provide specialist technical inputs into the areas of traffic and transportation planning.
- 14 Since August 2009, my role has also included actively leading the multi-disciplinary Project team through the investigation phase up to this hearing. This role has included liaison with key stakeholders in conjunction with NZTA staff.
- 15 I compiled the Assessment of Environmental Effects for the Project (AEE) (in liaison with other Opus staff members) and authored the *SH1 Waikato Expressway: Cambridge Section Traffic Assessment – December 2010 (Traffic Assessment)* that accompanied the NORs (Appendix 3 to the AEE).

SUMMARY OF TRAFFIC ASSESSMENT

- 16 My Traffic Assessment comprised four key parts, namely:
- 16.1 A description of the Project, including components relevant to traffic;
- 16.2 A description of the existing transport context;
- 16.3 An assessment of the Project's potential operational transport effects; and
- 16.4 An assessment of the Project's potential construction traffic effects and proposed mitigation measures.
- 17 The following paragraphs summarise my assessment.

Project components relating to traffic

- 18 In my first statement of evidence I provided a description of the key roading components of the Project, in summary:
- 18.1 **General** – 11km length following the existing designation and consists of almost two straight sections of 4.5km joined by a horizontal curve mid-length of the Project alignment.
- 18.2 **Northern Interchange** – Providing grade separated southbound off-ramp (into Cambridge from the north), and a northbound on-ramp (from Cambridge towards the north)

- 18.3 **Northern Interchange to SH1B Interchange** – A generally straight corridor built on a 2m high embankment to cater for overland flow paths. Includes severance of Discombe Road and Forrest Road, and an overbridge for Peake Road to maintain connectivity across the Expressway.
- 18.4 **Central (SH1B) Interchange** – The Expressway passes over SH1B and full directional connectivity is provided by a traditional “diamond” ramp configuration. The ramp termination intersections are controlled by signalised intersections. The interchange also severs Hannon Road.
- 18.5 **Central Interchange to Watkins Road** – The vertical alignment of the Expressway is graded downwards so that it is back to existing ground level by the time it reaches Swayne Road. Swayne Road is realigned over the Expressway on an overbridge. The existing Swayne Road/Appley Road intersection is relocated 200m north of its existing location, with realignment of Appley Road to maintain connection. Between Swayne Road and Watkins Road a vertical crest curve is provided to assist in conveyance of Expressway stormwater flows. Watkins Road is severed by the Expressway.
- 18.6 **Watkins Road to Southern Interchange** – Approximately 250m south of Watkins Road the Expressway is vertically aligned below ground level towards the Karapiro Gully. The horizontal alignment is almost straight except for a small horizontal shift towards the west to avoid effects on the fortified part of an adjacent Pa site. The alignment low point (8m below ground level) is located adjacent to the Thornton Road overbridge, which is built almost at existing ground level. The existing Thornton Road/St Kilda Road intersection is relocated approximately 100m further east than its current location and St Kilda Road is realigned to maintain connectivity. The Project crosses the Karapiro Gully by way of a 220m long and 38m high viaduct. South of the Karapiro Gully viaduct the Expressway is graded upwards to tie back into the existing SH1 corridor (located 1km south of the gully).
- 18.7 **Southern Interchange** – The Southern Interchange provides a southbound on-ramp (from Cambridge) and northbound off-ramp (to Cambridge). The southbound on-ramp is grade-separated and passes below the Expressway before joining SH1 at Chainage 11600. The Southern Interchange also includes separated local access roads to maintain access to adjacent properties. The local access roads join the existing SH1 corridor on the Cambridge side of the Interchange and clear of the ramp merge/diverge areas.

- 18.8 **Local roads** – As described above, several local roads are crossed by the Project route. Several of these are required to be closed, whilst others have been provided with overbridge connectivity. At these overbridge locations, the Expressway forms the demarcation of rural and urban environments and (where appropriate) a speed threshold into the greater Cambridge urban area has been incorporated into the design.
- 18.9 **Cross-sections** – The cross-section of the Expressway provides four traffic lanes, a wide central median (with wire rope barrier), 2.5m shoulders (with continuation across all Expressway bridges), and appropriate clear zone requirements.¹ Where clear zones cannot be provided, such as on high embankments, the use of guardrails will be adopted to minimise earthworks and maintain personal safety. All local road bridges provide 1.5m wide shoulders and 2m² wide separated pedestrian pathways on one side of the bridge.
- 19 I will now explain how the Project incorporates the needs of transport modes other than private vehicles, including walking, cycling and passenger transport.
- 20 The needs of all transport modes have been a key consideration in the development of the Project. The historical presence of the existing designation has assisted in the long-term planning for the Project and enabled Waipa District Council (*Waipa DC*) to plan its local road connectivity and local walking and cycling strategy with the knowledge of where the existing and proposed connections with the Project will be provided.
- 21 The Project allows for cycling by providing 2.5m wide shoulders along the entire Project length, including all Expressway bridges. However, on-road cycling along the Expressway will not be actively encouraged, as the lower trafficked alternative routes are preferred from an overall safety perspective. In addition, all local road overbridges have been provided with 1.5m wide shoulders to cater for on-road cyclists, with 2m wide segregated footpath/cycleways on one side of the bridges. The NZTA has also decided to widen the pathway on the Peake Road overbridge to 3.5m to cater for potential horse traffic. This overbridge will also have elevated barriers to prevent horses and riders accidentally falling from the bridge.

¹ Clear zones provides a clear traversable width with only frangible obstructions, which allow drivers that run off the road to regain control with minimal personal and property damage.

² The exception being Peake Road overbridge, where 3.5m width is provided. See paragraph 21 below.

- 22 The needs of pedestrians and cyclists have been instrumental in the choice of intersection form at the Central Interchange. The use of traffic signals provides a better level of service for these modes (when compared to priority controlled or free flow intersections), whilst adequately catering for on-road vehicles. These signalised intersections can be readily linked with the proposed off-road walking/cycling path included in the Project on the west-side of SH1B.
- 23 Waipa DC has planned for a 30m wide buffer zone adjacent to the Project, which I understand will include a walking/cycling path. The walking/cycling path within the buffer zone will provide strong active mode links throughout the continued growth of Cambridge. These paths will be progressively constructed in line with demand from adjacent land use development. However, the linkage of these paths with the rest of the roading network, and their connection across the Expressway is completely reliant on the provision of linkages within the Project.
- 24 In my earlier evidence, I described how consideration of these active transport modes has helped determine the NZTA's preference to grade separate the Expressway over SH1B and provide ready linkage to indicative proposals for Hautapu development (and an associated buffer zone) on the north side of the Expressway. In addition, provision has been made at the Swayne Road overbridge to allow for the continuation of the pathway at ground level without need to detour around the local road embankments.
- 25 Whilst the Project does not explicitly provide for on-road facilities relating to passenger transport, the Project indirectly supports continued growth of existing and potential passenger services within the local and regional context. In particular, the Project does not inhibit the Cambridge Industrial Branch (designated rail corridor running parallel with the eastern boundary of SH1B/Victoria Road) from being used in the future for passenger services if they are deemed appropriate.
- 26 Access will be maintained to all properties throughout the construction phase of the Project and permanently established during operation of the Expressway. Some accesses will need to be relocated or reconnected through formation of local accessways or establishment of new or realigned local roads.
- The existing transport context**
- 27 My first statement of evidence described the existing site conditions, including information on the existing traffic volumes on the relevant State highways and local roads. In summary, the existing transport context includes three sections of the existing SH1, namely:

- 27.1 **The Northern Section** – extending from Hautapu Road in the north to Kelly Road on the western perimeter of Cambridge. This corridor is generally flat, with a reasonable alignment and a posted speed limit of 100km/h throughout. It includes three passing lanes (two northbound and one southbound) and eight priority controlled intersections.
- 27.2 **The Urban Section** – extending from Kelly Road to Karapiro Stream Bridge (southeast of Cambridge). This section contains the urban portion of the existing SH1 corridor through Cambridge, and includes applicable lengths of Hamilton Road, Victoria Road, Queen Street and Albert Street. The posted speed limit of this section is a mixture of 70km/h at the extents, with 50km/h over the majority of its length. The section has a mixture of transport functions as it provides for both local and State highway (through traffic) needs. The corridor is lined with both residential and commercial accesses, and adjoined by 15 priority controlled intersections.
- 27.3 **The Southern Section** – extending from Karapiro Stream Bridge to a point approximately 1.5km south of the Cambridge Golf Course. This section is essentially within a rural zone, with the posted speed limit (from a point approximately 200m south of the Karapiro Stream Bridge) being 100km/h. The section includes a short uphill section with associated horizontal curvature at the southern extent of the section. The corridor contains approximately 10 property accesses, in addition to the formal entrance to the Cambridge Golf Course. The section contains one priority controlled intersection (Shakespeare Street) immediately south of the Karapiro Stream Bridge.
- 28 The existing traffic flows on roads relevant to the Project include:³
- 28.1 SH1 (north of Discombe Road): 18,000vpd;
- 28.2 Discombe, Forrest, Peake and Hannon Roads: all less than 1,000vpd;
- 28.3 Swayne, Watkins and Thornton Roads: 1,200 to 1,800vpd; and
- 28.4 SH1 (south of Cambridge Golf Course): 15,100vpd.
- 29 The proportion of Heavy Commercial Vehicles (HCVs) on these roads ranges from 7% to 11%.

³ See Annexure B to my first statement of evidence.

- 30 I will now provide additional information relating to the expected change in traffic demand during the Project horizon if the Project were not to progress.
- 31 For my Traffic Assessment, the projection of traffic flows was predicted with the combined use of the Waikato Regional Transportation Model (*WRTM*), the Cambridge Transportation Model (*CTM*), and information from existing and historical traffic count data. Both the *WRTM* and the *CTM* have been developed by others (Gabites Porter) for the purpose of ongoing traffic assessments. The basis of the transportation models includes all known land use changes proposed by Waipa and Waikato District Councils, and reflects the planned land use development within the Waikato Region as defined in the Proposed Regional Policy Statement.
- 32 The prediction of traffic effects on the existing network (without the Project) is complicated by the expected change in traffic flows along the SH1 corridor as other sections of the Waikato Expressway are completed. I will now explain these changes in traffic flows.
- 33 As described in Ms Clark's evidence, the Waikato Expressway has a suggested completion date of 2018/2019. The completion of the Waikato Expressway is expected to have a significant shift in the regional traffic patterns in the north-south direction. Trips that are currently avoiding SH1 (due to congestion) are progressively attracted back onto the SH1 corridor as each section of the Waikato Expressway is constructed.
- 34 In addition, the improvement in route efficiencies in the north-south direction as a result of completing the Waikato Expressway means that additional trips are expected to be induced onto the Expressway corridor. These induced trips are those trips whose origin or destination changes as a result of significant improvements in corridor efficiencies.
- 35 With traffic moving back to the SH1 corridor, the predicted traffic levels on the existing network could be overestimated if the existing network were assumed to include all sections of the Waikato Expressway other than the Cambridge Section. As such, to avoid confusion relating to this phenomenon, the assessment of the traffic effects on the existing road network has been limited to a projected year of 2021 (which coincides with the modelled year within the *WRTM*).
- 36 Traffic growth predictions between 2010 and 2021 are illustrated in Figure 4.11 of my Traffic Assessment.
- 37 In summary, the existing flows along SH1 will increase marginally during the next 10 years at a linear rate of approximately 1% per year. This growth is consistent with underlying regional traffic

growth and the expected resurgence of some localised developments.

- 38 Traffic on SH1B is expected to continue rising at a rate of approximately 3% per year. This rate is significantly greater than that for SH1, which likely emphasises the increasing congestion on the SH1 corridor and the increasing use of alternative routes to avoid SH1.
- 39 Although land use development has slowed in recent years, the development of the Cambridge North and St Kilda areas is expected to progress through to 2021. These developments will generate additional traffic on the local roads.
- 40 In summary, the existing problems associated with the existing SH1 corridor, and the expected worsening of these problems, highlights the need for the Project. In its current form, the existing SH1 corridor does not provide a safe, integrated, responsive, efficient, or sustainable transport system. The significant and growing congestion along the route creates community severance, has environmental and amenity impacts on the town centre, and discourages the use of active transport modes. As such, I consider the development of an alternative route around Cambridge is necessary from a traffic perspective.

The Project's potential operational traffic effects

- 41 The provision of an additional route around Cambridge will provide greater route security for strategic traffic and a much higher level of service than that currently experienced along the existing SH1 corridor. Traffic on the Cambridge Section will flow freely at approximately 100km/h throughout the day and well into the future. At the same time, local road users on the existing SH1 corridor will travel much more efficiently and will be able to readily access adjacent properties.

Trip diversions

- 42 The WRTM indicates that 59% of the SH1 north/south traffic would not wish to travel through Cambridge Township in 2021. This prediction is consistent with survey information previously gathered from Origin-Destination Surveys undertaken in 1985 and 1995 (as part of the original Waikato Expressway investigations), and Household Interview Surveys completed in 2009 (undertaken as part of the development for the WRTM). Of particular significance is that 73% of the existing HCVs that approach Cambridge will also be attracted to the Cambridge Section.
- 43 The reduction of traffic volumes along the existing SH1 corridor, and in particular, the removal of 73% of the HCVs, will have a substantial benefit to the community of Cambridge, by minimising the severance effect caused by the existing congested SH1 corridor.

Safety

- 44 The removal of 7,000 to 10,000 vpd from the existing SH1 corridor (depending on location) will also result in substantial reductions in waiting times for turning traffic from side roads, thereby resulting in reduced driver frustrations. This in turn will reduce risk taking by drivers as they will have larger gaps to choose from and these gaps will occur more often. I have calculated (using procedures within the NZTA Economic Evaluation Manual) that the combination of reduced risk taking on local side roads, and the provision of a high standard of corridor for the Expressway will result in annual crash benefits of approximately \$2.3M.

Level of Service

- 45 Figure 5.1 of my Traffic Assessment illustrates the predicted traffic volumes on the road network once the Project is constructed. This Figure shows that traffic flows on the Cambridge Section (north of the Central Interchange) are in the order of 16,000 to 22,000 vpd for years 2016 and 2041, respectively. The Section will therefore provide a Level of Service (LOS) A along the Expressway in 2041 at any time of the day. The LOS on the existing SH1 corridor will also improve as a result of reduced traffic volumes travelling along the highway. The resultant 2041 flows on the existing SH1 can be accommodated by the existing two lane roadway with similar operating conditions to those currently being experienced.
- 46 Figure 5.2 of my Traffic Assessment illustrates the change in 2021 daily flows on the road network with the Project in operation. The illustration is useful in demonstrating the change in traffic flows on the local network, whilst also illustrating that completion of the Waikato Expressway has an overall effect of changing the underlying flows along the SH1 corridor (illustrated by increases in traffic flows at the diagram extents).
- 47 Whilst the Project (as an alteration to an existing designation) does not propose any change in the connectivity for local roads or for SH1B, I have assessed the change in traffic volumes on these roads as part of the Project's overall operational effects. The closure of Discombe Road, Forrest Road, Hannon Road and Watkins Road will result in re-routing of traffic onto alternative corridors. Section 5.1.7 of the Traffic Assessment describes the effects of each individual corridor.
- 48 In summary, there will be some localised inconvenience to traffic when the roads are severed. However, this traffic has ready access to reasonable alternative routes and trip lengths will only have minimal increases. The increase in traffic volumes on the remaining routes will not significantly deteriorate the level of service of the local roads and all will operate well within their existing capacity. In addition, the severance of local roads is consistent with Waipa DC's

planned road network, which aims to develop corridors with clear road hierarchy levels.⁴

- 49 With respect to the SH1B Victoria Road signalised intersections proposed at the interchange ramp terminations, the operation of these intersections will be acceptable (no worse than LOS C at peak periods) throughout the Project horizon (up to year 2041). Queue lengths are not expected to exceed 100m and therefore no operational issues are expected for these intersections. In addition, the signalisation of these intersections provides a superior level of service to active modes of transport when compared to roundabout or other priority controlled intersections. The traffic signal operation can also be readily adapted to cater for at-grade rail crossings across the eastern ramp approaches, if the rail corridor is re-established in the future.

Travel efficiency

- 50 The WRTM provides an estimation of the increased route efficiency for travelling along the Project corridor, opposed to using the existing SH1 corridor. This is estimated to be 3-4 minutes per vehicle at opening (2016) and approximately 5-6 minutes per vehicle by 2041 (when compared to a "do minimum" scenario⁵).

Travel Demand Management

- 51 The Project contributes towards implementing Travel Demand Management measures within Cambridge, by supporting promotion of linked land use planning and allowing integration of living and employment zones. This support is demonstrated in the choice of grade separation of the Expressway over SH1B (Victoria Road), thereby enabling better amenity in linking the land use areas either side of the Project. In addition, the Project will divert a large portion of traffic from Cambridge Township, thereby providing a corridor with significantly reduced traffic volumes. This will in turn provide relief to a community that has suffered from severance and congestion as a result of the existing State highway, which has been providing a barrier in the promotion of alternative transport modes.

Alternative modes of transport

- 52 The Project is both compatible and supportive of the walking and cycling initiatives planned by Waipa DC. The Project provides facilities, as appropriate, within its initial construction works, or

⁴ Expected road hierarchy levels provided in draft (discussion) form from Waipa DC as part of the preparation of their Proposed District Plan.

⁵ In this case it is assumed that a "do nothing" scenario is not realistic whereby no improvements are made to the existing corridor (i.e. with no improvements, the SH1 corridor would operate with an assumed unacceptable average speed through Cambridge of less than 20km/h). The reference to a "do minimum" scenario reflects an expectation that minor improvements would be made to the corridor to maintain the corridor to an assumed minimum "acceptable" average speed through Cambridge of 20km/h.

makes allowance within its design to allow future facilities to be developed without making them prohibitively expensive to progress.

- 53 Whilst the Project makes no specific provision for passenger transport services, the Project contributes positively by protecting the existing rail corridor for future rail use or use as an alternative transport corridor (such as a walking/cycling link). In addition, the Project has the ability to accommodate specific facilities for passenger transport service if deemed necessary in the future.

The Project's potential construction traffic effects

- 54 I consider any temporary traffic effects caused by the Project construction works can be suitably mitigated through the appropriate development of a Traffic Management Plan (*TMP*). The *TMP* will be developed by the contractor awarded the Design & Construct contract, and will reflect the actual construction methodology and its associated traffic effects. The *TMP* will be prepared in close consultation with the Councils, to ensure that any effects on the local road network are appropriately mitigated.
- 55 The contractor awarded the Design & Construct project may identify alternative fill sites or construction methodologies, whereby the traffic effects will need to be reconsidered and approved within the appropriate Traffic Management Plan. However, I consider my Traffic Assessment and the information contained in my evidence to provide an indication of the likely effects, and suitable mitigation to address those effects.
- Earthfill transportation*
- 56 There will be some temporary disruption to traffic operation during the construction of the Project. The most significant contributor to this disruption is the requirement to transport a large volume of fill material that needs to be shifted (and imported) within the Project site. Whilst there are other aspects of the Project that will require movement of construction traffic, these "other" movements will be negligible in comparison to the transportation of earthfill, or will occur at periods that do not coincide with the transport of earthfill. As such, my assessment of traffic effects has used the embankment fill transport quantities as the worst case scenario for construction traffic movements.
- 57 The transport of this material will primarily be on truck and trailer units, which will utilise the State highway to access the Project site.
- 58 **Annexure A** to my evidence provides an illustration of the most likely earthworks cut and fill balance along the Project corridor and the associated HCV movements required to shift the volumes of earthfill. This illustration assumes a worst case scenario in which the Karapiro Stream viaduct is not available to be used as a haul route between either side of the Gully.

- 59 The cut and fill balance diagram demonstrates that expected import to fill requirements only relate to the northern portion of the Project site.
- 60 A range of options for importing fill material from potential source locations has been investigated (as described in pages 59 to 61 of my Traffic Assessment). In summary, this part of the Traffic Assessment identifies a number of existing sand mines or quarries that currently have resource consents to supply the necessary import volumes. These mines and quarries are in reasonably close proximity to the Project site and have ready access to the State highway network. Figure 6.1 of my Traffic Assessment provides an illustration of the location of these most likely fill sources, and the likely haul roads and access points to the Project site. It also provides an indication of the existing traffic flows on each of these corridors and the expected change in daily volumes resulting from the construction traffic.
- 61 I have assessed the expected traffic volumes related to earthwork construction, based on the required fill transportation needs and assuming a range of operating conditions, including:
- 61.1 130 suitable earthworks handling days per year (this recognises general earthwork shutdown periods, work being undertaken only 6 days per week, and reasonable allowance for wet days);
 - 61.2 Construction operation over a 10 hour period per day; and
 - 61.3 Earthwork construction occurring over a period of 2.5 years;
 - 61.4 Determination of a tolerable level of additional HCV traffic within Cambridge Township. I will discuss what I believe these tolerable levels to be in subsequent paragraphs.
- 62 The resulting daily earthwork construction traffic volumes are presented in Figure 6.2 of the Traffic Assessment, which provides for 114 HCV movements per day through Cambridge Township, and 98 HCV movements per day for import to fill requirements at the northern end of the Project.
- 63 In determination of this tolerable level of daily earthwork construction traffic volumes, I have assumed that this level of construction traffic would operate throughout the full year (i.e. would not be inhibited by the assumed 130 earthwork handling days per year) and would potentially occur throughout the 4 year construction period. This allowance provides for other bulk haulage requirements, such as transport of pavement materials.

- 64 In addition, an allowance of 100 HCV movements per day through Cambridge Township is included in my assessment to provide for water cartage to the Project site for dust suppression and soil compaction requirements. This assumes a worst case scenario in which alternative sources of water are not used.
- 65 For clarification, subsequent reference to "Bulk HCVs" relate to the movement of bulk materials, namely earth fill, pavement materials or water.
- 66 Based on my assessment of the tolerable number of HCV movements through Cambridge Township, I have suggested a condition that limits the maximum number of Bulk HCV movements travelling on SH1 through Cambridge Township to a rounded figure of 220⁶ HCV movements per day.
- 67 Whilst the total additional Bulk HCV movements through Cambridge Township may appear significant, from a traffic perspective the increased number of HCVs on the State highway roads will have a negligible effect on the mid-block operation of the road network in comparison to the existing flows, as it represents a less than 1% increase in the HCV content along SH1 and a 1.5% increase on SH1B.
- 68 I recognise that some sections of the State highway operate in an urban environment and may be more sensitive to increased numbers of Bulk HCVs. This sensitivity may relate to noise, vibration, and congestion. Other technical experts have provided assurances in their assessments that the noise and vibration effects of the increased construction traffic will not adversely impact on the present conditions and will not be detected by most people.
- Controlling use of local road corridors*
- 69 Obviously, the greatest potential for construction traffic effects is the increase in heavy transport movements through the urbanised section of Cambridge Township. Waipa DC and Waikato DC have indicated an expectation that Bulk HCVs will avoid use of specific local roads (outside of the proposed designation) unless Council's approval is obtained, and I support these restrictions. I have therefore prepared a plan that shows the intended local roads to be prohibited from use by Bulk HCVs. This plan is attached as **Annexure B** to my evidence. Please note that this plan reflects my recommended exclusion of Hautapu Road from the 'prohibited road' list, as explained in my response to the District Councils' Officers Report.

⁶ For simplicity, the limit on the number of daily HCV movements has been rounded up from the calculated 214 HCV daily movements to an analysed figure of 220 HCV daily movements.

- 70 As such, the movement of construction traffic should generally be focussed on the existing State highway corridors. This means the increased number of Bulk HCVs through Cambridge will need to negotiate through two State highway intersections, namely the Queen Street/Victoria Road roundabout, and the Hamilton Road/Victoria Road (SH1/SH1B) priority controlled intersection.

Key intersection effects

- 71 I have analysed the effect of construction traffic on the Queen Street/Victoria Road roundabout, and the Hamilton Road/Victoria Road (SH1/SH1B) priority controlled intersection. The change in operation to the Queen Street/Victoria Road roundabout is negligible when assuming the worst case construction traffic, i.e. an additional 110 Bulk HCV movements per direction per day on the State highway legs. Overall, intersection delays increase by only 5 seconds per vehicle in the worst time period (PM Peak). For sensitivity purposes, I have also assessed the effects if the predicted construction traffic were doubled. In this case, the overall intersection delays only increase by 13 seconds per vehicle, although in this scenario queue lengths on the Queen Street east approach (SH1) would be expected to double from their existing length. Overall, based on a proposed limitation of 220 Bulk HCV movements per day through Cambridge Township, I consider the temporary adverse traffic effects on the Queen Street / Victoria Road roundabout to be minor.
- 72 The Hamilton Road/Victoria Road (SH1/SH1B) intersection is a priority controlled T-intersection with low speed prioritisation to SH1 through-traffic, by way of negotiation through a right angle bend. Due to concerns with geometry and existing safety performance at a reasonably congested intersection, I consider temporary traffic management measures will be needed at the intersection during the construction period to provide for the additional Bulk HCV traffic through the junction. I have recommended the use of temporary traffic signals. Whilst this arrangement will impose some additional delay to State highway through-traffic, I consider the arrangement can be managed to provide a reasonable level of service to all users and will significantly improve the safety of the intersection during the construction period.
- 73 I note that the NZTA is also investigating a permanent solution to address the existing Hamilton Road/Victoria Road intersection through its network maintenance contract. As such, the need for any temporary traffic management measures at the intersection during construction of the Project will be dependent on the outcome of those separate investigations.

Connectivity of local roads during construction

- 74 The local connections of Peake Road, Swayne Road, and Thornton Road are to be maintained across the Project through construction

of local road bridges. My earlier statement of evidence responded to the request of Waipa DC to construct the Peake Road overbridge as a high priority, which I support. My assessment recommended constructing a temporary road outside the local road embankments to maintain connectivity throughout construction. However, to expedite the construction of the Peake Road overbridge, Waipa DC has recommended that the local road be temporarily closed until completion of the bridge. The opening of the bridge would be needed before closure of adjacent local roads and construction starting on other local road overbridges. I support this method for the completion of the Peake Road and Swayne Road overbridges as there is ready access to alternative routes. However, the temporary closure of Thornton Road to construct the overbridge would be difficult to implement without substantial disruption to local traffic. Therefore, I recommend the use of a temporary road in this instance.

- 75 In some instances, local roads will need to temporarily cross the Project corridor at ground level. In these situations, the use of temporary traffic lights may be needed to control the interaction between local traffic and construction traffic. This arrangement was used successfully during the SH1 Mercer to Longswamp Expressway construction.

Property access during construction

- 76 Throughout the Project construction phase, the contractor will be required to maintain reasonable and trafficable access to all adjacent properties. In many instances, this will require specific consultation with the landowner to coordinate necessary works or the preparation of specific traffic management plans.

Summary of construction effects

- 77 In summary, the effects from construction traffic are temporary and, in my opinion, can be readily managed through the preparation and implementation of a Project-specific TMP. Mitigation will likely involve the installation of appropriate temporary traffic control measures, as described within my assessment report and detailed within this evidence. The TMP will be updated and adjusted to reflect particular construction elements and refined based on actual vehicle operation. The TMP will be prepared in close consultation with the Councils to determine specific local road mitigation measures.

Conclusion of my Traffic Assessment

- 78 Whilst there will be some localised inconvenience to local traffic when local roads are severed as part of the Project, I consider this inconvenience to be a minor adverse effect and the existing local road network can readily accommodate the associated change in traffic volumes without significant detriment to the operating level of service.

- 79 Overall, in my opinion, the Project provides positive traffic effects associated with improved safety, improved network efficiency, opportunities for increased use of the network by active modes, and provides improved linkages to support compatibility of proposed and future land use developments.
- 80 There will be some temporary disruption to traffic during construction of the Project, which is primarily associated with transport of earthfill through Cambridge Township. However, in my opinion these potential adverse effects can be suitably managed with appropriate mitigation (including development of the TMP, limiting the number and timing of construction HCVs through Cambridge Township, use of physical on-road traffic management controls, and limiting the use of local roads by construction HCVs). Overall, I consider that with mitigation in place and compliance with the recommended designation conditions (as amended by the NZTA), the Project's potential construction traffic effects will be no more than minor.

COMMENTS ON SUBMISSIONS

- 81 I have read the submissions lodged on the Project that raise traffic or issues relevant to my area of expertise. In this section of my evidence I will address issues raised in submissions to the extent not already covered in my earlier Report or the preceding evidence.

Peake Road overbridge

- 82 Mr and Mrs Robinson identify that Peake Road is used extensively by horse traffic and that the proposed Peake Road overbridge will not provide safe passage for these continued movements.
- 83 Earlier in my evidence, I explained that the NZTA has decided to widen the Peake Road overbridge path to 3.5m to cater for potential horse traffic, and will increase the height of the barrier features (on the side of the bridge) to maintain safety for horse traffic.

Susan Jackson and Malcolm & Steven Wallace

- 84 In their submissions, Ms Jackson and the Wallaces⁷ consider the shoulder width requirements on both sides of the Expressway to be excessive. The adoption of 2.5m shoulder widths in the vicinity of their property (and along the entire length of the Expressway) is necessary to provide a safe location to accommodate stopped vehicles clear of the traffic lanes, whilst also providing adequate width for on-road cyclists.
- 85 In addition, the shoulder width is part of the 'clear zone' width, which is kept free of unbreakable obstructions to allow room for vehicles to recover if they cross the edgeline. In my opinion, the

⁷ Ms Jackson owns the property at 276 Tirau Road that the Wallaces occupy.

2.5m shoulder widths are the minimum suitable width for this road corridor.⁸

- 86 These submitters also request that safe temporary access be maintained to their property throughout construction. I can confirm that this will be a requirement of the NZTA's Project construction contract, and will be detailed within the appropriate TMP.

Owen Haskell – Thornton Road access

- 87 Mr Haskell is concerned that his existing entrance on Thornton Road will have insufficient sight distance once the Project is constructed.

- 88 Mr Haskell's entrance is somewhat unusual in that his driveway forms a "horse-shoe" shape to provide two entrances onto Thornton Road separated by a distance of approximately 16m. However, the necessary guardrail from the Thornton Road overbridge will extend past Mr Haskell's western most entrance to Thornton Road, thereby requiring its closure. The eastern entrance onto Thornton Road will remain unaffected and provides safe and legal access.

- 89 I can confirm that the sight distance for Mr Haskell's remaining eastern entrance will be sufficient for the speed environment, even with the slight vertical realignment of Thornton Road over the Expressway.

- 90 I can confirm that we have met with Mr Haskell to discuss the necessary closure of his western entranceway and possible options available to mitigate this effect. Current proposals include internal adjustment to the driveway shape to direct entry and exit to the eastern entrance. Alternatively, we have identified a potential option for a new entranceway to be re-established at a safe location on St Kilda Road. Mr Haskell has indicated that he would be agreeable to the adjustment to the driveway/entranceway, but has not yet confirmed a clear preference for either solution. We are continuing to work with Mr Haskell to determine a preferred solution, and can confirm that any necessary relocation works will form part of these Project works.

SH1B traffic effects

- 91 Several submitters⁹ have raised concerns about the SH1B (Victoria Road) corridor becoming a feeder to the Waikato Expressway and thereby affecting the traffic volumes and speeds along SH1B.

- 92 It is correct that SH1B will feed traffic towards the Expressway through its connection at the SH1B interchange and that traffic

⁸ The NZTA State Highway Geometric Design Manual – Section 6.3.3(b)(i) recommends a minimum 2.5m width.

⁹ Including Mr Kevin Mark, Mark J.E (Proprietor of Aly's Antiques), and Mark J.E & Cooney Trustees Ltd.

volumes are expected to increase along SH1B south of the Expressway. However, it is important to establish that this arrangement is not a result of the alterations to designations as the connection between the Project and SH1B is already provided within the existing designation. In addition, this Project will not alter the speed limits along SH1B.

- 93 As explained in my evidence, the connection of SH1B (Victoria Road) to the Expressway has been established as a key connection in Waipa DC's planned roading network. On completion of this Project, it is likely that the State highway status of SH1B from the Hamilton Road/Victoria Road intersection to the SH1B Expressway Interchange will be revoked so that this section of road will become a local road under Waipa DC's control. Waipa DC has already identified the opportunity to develop corridor management plans for SH1B upon completion of the Project. However, the revocation of a State highway status is subject to a separate legislative process.
- 94 Within my evidence I have confirmed that the projected change in traffic flows on the local and State highway network can be readily accommodated within their existing capacities without significant change in their operating conditions. I therefore consider the change in traffic flows on SH1B to be a minor effect.

Fonterra – Integrated approach to land use and transportation planning

- 95 Fonterra submits that there has not been a coordinated approach by the NZTA in the development of land use and transportation planning.
- 96 It is my belief that the development of the transportation aspects of the Project has indeed been undertaken in a way that is coordinated with land use development. My evidence clearly identifies how land use (and anticipated land use) adjacent to the corridor has influenced the NZTA's choice in preferred options for the Project. Examples includes:
- 96.1 The grade separation of SH1 over SH1B to provide ready connectivity for land use areas either side of the Expressway;
 - 96.2 Future-proofing the design solutions to cater for expected traffic, and active mode, demands;
 - 96.3 The choice of intersection form at ramp terminations to provide better linkage and accessibility across the Expressway for the expected increase in demands associated with land use development; and

96.4 Reducing the need to travel in vehicles by increasing the opportunities for trips to be completed by active modes and providing good linkage between land use zones.

97 In addition, my Traffic Assessment clearly describes how the Project is both integrated and enhances the policies within the relevant regional and local policies (refer to pages 13 to 23 of the Traffic Assessment), including all of the documents referred to in Fonterra's submission, such as Waipa 2050 Strategy, Future Proof, the RPS (and the Proposed RPS), and the Waipa Integrated Transport Strategy.

Grantchester Farms – Construction traffic effects

98 Grantchester Farms Limited (*GFL*) does not agree that construction traffic effects will be no more than minor, and does not consider this conclusion is supported by the facts.

99 It is important to establish that the conclusion regarding construction traffic effects relates to an assessment with the recommended mitigation in place.

100 GFL does not provide any basis in its submission to support its assertion that the effects will be greater than minor, other than to reference an unknown traffic assessment where Opus has come to different conclusions where traffic flows were less.

101 It is my opinion that the assessment of construction traffic effects is robust and appropriate for the scale and importance of the Project. I consider the proposed mitigation measures can readily mitigate any adverse effects from construction traffic to a level being no more than minor.

Waikato District Council – Construction traffic on Council roads

102 The Roading department of Waikato District Council has submitted that it has concerns about the potential impact of construction traffic on its roading network.

103 My Traffic Assessment provides a description of the most likely sources and haul routes for construction material for the Project (pages 59 to 64). My Assessment concludes that the effects to Waikato District Council roads in this scenario will be minimal.

104 One of the key mitigation measures relevant to address the concerns of Waikato District Council is the preparation of a Project-specific TMP.

105 As noted earlier, the Design & Construct contractor could identify alternative fill sources or construction methodologies that could alter the construction traffic assessment described in my evidence. In

this situation, the contractor will reconfirm the assessment of effects and prepare a suitable TMP to address those effects and seek the necessary approvals of the relevant Councils.

- 106 On 23 May 2011, Mr Rajagopal, Mr Moore (both of NZTA), and I attended a meeting with representatives of Waikato DC Roding Department to discuss the expected construction traffic effects and possible mitigation measures. No agreement was reached at this meeting, though we ended with an expectation to meet again and further discuss the issues and agree on suitable mitigation. A follow-up meeting has now been arranged for 30 June 2011, in which I hope agreement will be reached that the proposed mitigation and designation conditions have satisfied the Council's concerns.

COMMENTS ON OFFICERS' REPORTS AND RECOMMENDED CONDITIONS

- 107 I have read the Waipa and Waikato District Councils' Officer's Report (*District Report*) and the Waikato Regional Council's Officer's Report (*Regional Report*).

- 108 In respect of the operational traffic effects, I agree with the summary on page 22 of the District Report that:

"... the operational traffic effects of the NoRs are considered to be no more than minor."

- 109 I also agree with the District Report where it summarises that:¹⁰

"... the impact of increased heavy commercial vehicles (HCV) on the wider network traffic flow is considered to be no more than minor ..."

"The majority of these adverse [construction] affects [sic] will be concentrated to the Cambridge Township".¹¹

- 110 These statements are consistent with my assessment of the Project's overall operational and construction traffic effects.

- 111 I note that the Regional Report makes no reference to operational or construction traffic effects, except in relation to its assessment of other issues (such as Air Quality).

Recommended designation conditions

- 112 The District Report recommends designation conditions relating to traffic (Conditions 6 and 7 of the Draft Conditions). I generally

¹⁰ Page 23 of the District Report.

¹¹ Page 22 of the District Report.

agree with these recommended conditions, however I recommend several minor changes to provide better clarity and certainty as follows.

Both Waipa and Waikato District Councils

- 113 Condition 6.2(j) of both the Waipa and Waikato DC conditions requires the TMP to describe:

The confirmed construction methodology for the project.

- 114 The confirmed construction methodology for the Project will be described within the overall CMP and it is preferable that the TMP refers to this over-arching plan, and only describes the traffic effects relating to the construction methodology. Accordingly, this requirement is repetitive and unnecessary, and I consider this condition should be removed from both the Waipa and Waikato DC conditions.

- 115 Condition 6.2(k) requires the TMP to describe:

Measures to ensure notification to affected parties in accordance with the Stakeholder Communications Plan required under condition 8 of this consent.

- 116 Ignoring the reference to the recommended designation condition as part of a consent, I consider this condition is already suitably addressed under Condition 8.3(e) as part of the Stakeholders Communication Plan (SCP). Condition 8.3(e) requires the SCP to include methods to present information regarding construction traffic (including water cart traffic). As such, I consider Condition 6.2(k) should be removed from both the Waipa and Waikato DC conditions.

- 117 Condition 7.4 of both the Waipa and Waikato DC conditions specifies:

The maximum hours of work for on-site activities shall be 7.30am to 7.00pm.

- 118 This condition is recommended as a General Construction Traffic condition. However, there is no apparent adverse construction traffic effect that this condition is seeking to address. In my opinion, there are no adverse construction traffic effects related to control of onsite operation outside of these hours. I consider there are already suitable controls on associated onsite construction effects, through the construction noise limits proposed in designation Condition 5. As such, I recommend that this condition be removed.

Waipa District Council

- 119 Condition 6.2(l) of the Waipa DC conditions requires the TMP to describe:

Monitoring of the 85th percentile queue lengths on each of the following sections of road and what actions will be undertaken when these queue lengths are exceeded:

- (i) State Highway 1/State Highway 1B (west towards Hamilton)
- (ii) State Highway 1B (north towards Hautapu)
- (iii) State Highway 1 (SH1/Queen St roundabout south towards Cambridge Golf Course).

- 120 By definition, the 85th percentile queue length is a statistical calculation around the observed queue length, whereby the observed queue length will be exceeded in 15 of every 100 observations. This means there is a 15% probability of the queue length being exceeded at any one observation and that the 85th percentile queue lengths are already continually exceeded regardless of the Project traffic effects.
- 121 I consider it is unreasonable to impose restrictions or requirements on the Project in relation to traffic effects that the NZTA has no control over, and that are not the direct result of effects related to the Project. The 85th percentile queue lengths will (by definition) be exceeded with or without the additional construction traffic on the network.
- 122 I have implied from the District Report that this proposed condition is to prevent excessive rat-running of State highway traffic through the local road network.¹² However, in my opinion there is no basis to suggest that exceedance of 85th percentile queue lengths will necessarily increase the occurrence of rat-running. As such, there is no resource management basis for the monitoring of such queue lengths.
- 123 In my opinion, the recommendation to continually monitor queue lengths on the State highway network during the entire construction period is unreasonable, particularly onerous, and unmanageable. Condition 6.2(l) does not mitigate an effect that can be explicitly attributed to, nor the resultant effect be managed by, the Project.
- 124 For example, if queue lengths were to exceed the 85th percentile queue length (as occurs now) and there was no construction traffic on the network, it is not possible for these effects to be managed by

¹² Implied from reference in Section 7.1 of the District Report – Page 33 (seventh sub-bullet item within the first bullet point of page 33).

the Project. In addition, if other development occurs (or regional and local traffic growth continues), which results in increased traffic on the referred sections of road, it makes this condition unmanageable in relation to controlling or mitigating the Project's construction traffic effects.

- 125 The actual construction traffic effects of the Project can be suitably mitigated through the development and certification of the TMP, by limiting actual numbers of daily Bulk HCVs, by controlling the routes that Bulk HCVs use for haulage, and by ensuring construction traffic avoids periods of intense traffic operation (i.e. Sundays, public holidays, or after 4pm on working days prior to long weekends). All of these measures can be readily controlled by the Project. For all of these reasons, I consider that Condition 6.2(l) should be removed.

Waikato District Council

- 126 Condition 6.2(d) of the Waikato DC conditions requires the TMP to describe:

Measures to maintain connectivity on Peake Road, Swayne Road and Thornton Road during the construction of their overbridges and their associated approaches.

- 127 The referred local roads in this condition relate to the Waipa DC roading network and therefore, this condition should be removed from the Waikato DC conditions.
- 128 Condition 6.2(f) of the Waikato DC Conditions contains references to areas contained within the Waipa DC roading network and the reference to approval by Waipa DC needs to be amended. It is recommended that the condition should be amended to the following (deleted text shown as ~~striketrough~~ and new text shown as underline):

Measures to ensure safe access to the Project site from SH1 at the northern ~~and southern~~ ends of the Project and ~~at SH1B (Victoria Road)~~ and not via local roads, unless approved by ~~Waipa~~ Waikato DC

- 129 Condition 6.2(i) of the Waikato DC conditions requires the TMP to describe:

Measures to manage the operation of Project-related water cart traffic in the vicinity of the Cambridge boat ramp to ensure safe and efficient operation of both water cart and boat ramp traffic.

- 130 The referred traffic management for this condition relate to effects within the Waipa DC roading network and therefore, this condition should be removed from the Waikato DC conditions.

131 Condition 7.1(e) of the Waikato DC conditions specifies restrictions on the use of Hautapu Road (between SH1 and the Waikato District boundary).

132 Reference is made to Appendix 6 of the District Report (Traffic and Civil Engineering Review), whereby Section 3.2 and 4.21 refer to:

"Access to the construction site can generally be obtained from State highways, with the actual need to use local roads to access the site limited to those works involving local roads e.g. Thornton Road overbridge and approaches and Peake Road overbridge and approaches."¹³

133 I also refer to requests by Waipa DC staff that the Peake Road overbridge and approaches be completed as priority tasks.

134 To facilitate early construction of the Peake Road overbridge and approaches (as requested by Waipa DC) Bulk HCVs will need to temporarily use appropriate local roads. This use will be required until haulage access can be established along the Project corridor from SH1 to Peake Road. In particular, Bulk HCVs will need to temporarily use Hautapu Road (between SH1 and the Waikato District boundary). To ensure the potential use of Hautapu Road by Bulk HCVs is evident to all parties, it is recommended that Condition 7.1(e) be removed from the Waikato DC conditions.

135 Condition 7.5 of the Waikato DC conditions specifies:

The maximum number of Bulk HCV movements travelling on SH1 between the SH1/Albert Street intersection and the SH1/SH1B intersection shall be 220 per day (with a maximum of 110 movements per day in each direction).

136 This condition relates to effects within the Waipa DC roading networks and therefore, should be removed from the Waikato DC designation conditions.

CONCLUSIONS

137 For the reasons set out in this statement, I consider the traffic effects of the Project have been appropriately assessed and any adverse effects can be suitably mitigated. In particular:

137.1 The Project will provide positive travel time savings for those drivers travelling through Cambridge Township in the order of 3-4 minutes per vehicle at opening and 5-6 minutes per vehicle in 2041;

¹³ Page 120 of the District Report.

- 137.2 The Project will create substantial crash benefits for the travelling public by providing a safer corridor and removing significant conflict. I have estimated these benefits to be approximately \$2.3M per year;
- 137.3 The Project will provide a high level of service well beyond the Project horizon;
- 137.4 There will be increased traffic on some local roads caused by severance of some corridors. However, this will result in only a localised minor adverse effect for affected users;
- 137.5 The Project will provide a significant positive effect along the existing SH1 corridor by removing up to 63% of projected traffic volumes. By itself, this reduction in traffic flows through the township will contribute towards Travel Demand Management measures (e.g. promotion of integrated land use, encouragement of increased use of active transport modes and removal of community severances caused by congestion);
- 137.6 The Project is both compatible and supportive of the walking and cycling initiatives within the Waipa District Walking and Cycling Strategy. The Project will indirectly support enhanced opportunities for walking and cycling within Cambridge Township by removing significant traffic flow barriers within the urban area;
- 137.7 The Project provides no specific provision for passenger transport services, but provides a positive enhancement to the Districts by allowing increased opportunity for development of such services;
- 137.8 The Project supports national, regional, and local transportation plans and strategies, and will greatly improve the safety and efficiency of the overall transportation network.
- 137.9 There will be some temporary disruption to traffic during construction of the Project, which is primarily associated with transport of earthfill through Cambridge Township. However, in my opinion these potential adverse effects can be suitably managed with appropriate mitigation (including development of the TMP, limiting the number and timing of construction HCVs through Cambridge Township, use of physical on-road traffic management controls, and limiting the use of local roads by construction HCVs).

138 For all of the above reasons, I support the NORs and consider that the designations should be confirmed and the consents granted, on the conditions as proposed by the NZTA granted.

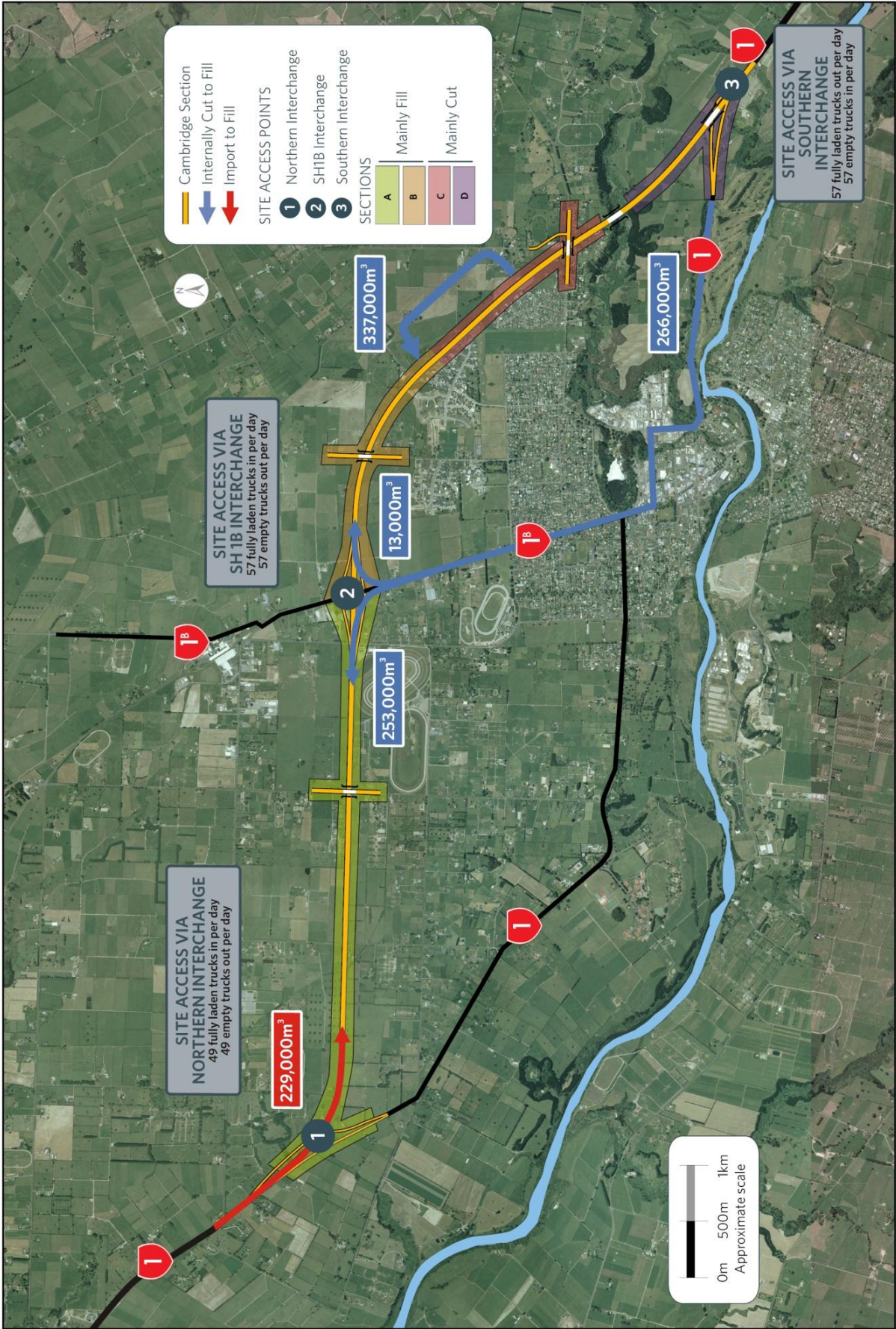
Jeremy Gibbons

27 June 2011

Annexures

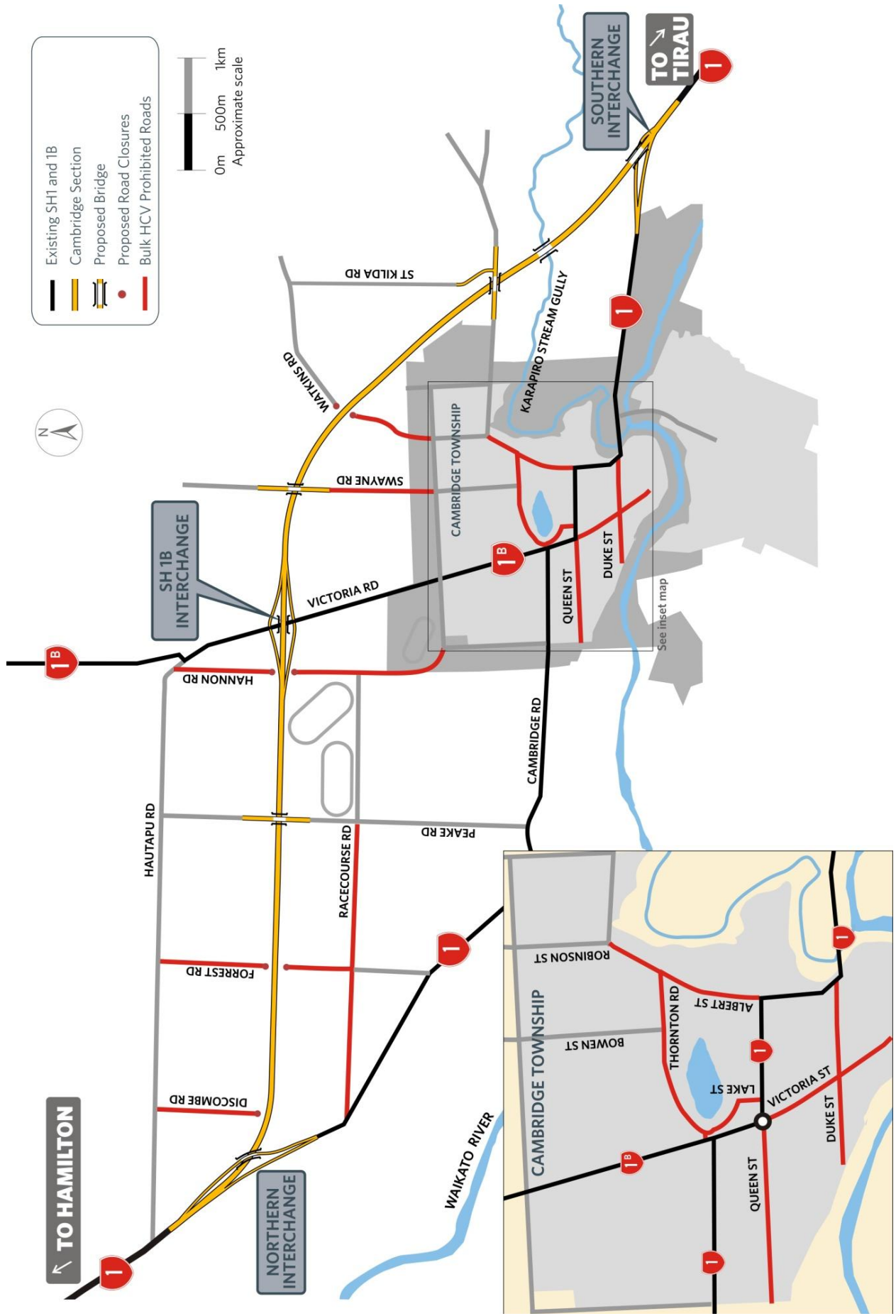
- A Illustration of likely cut and fill balance along Project corridor
- B Local Roads prohibited by Bulk HCVs

ANNEXURE A
ILLUSTRATION OF LIKELY CUT AND FILL BALANCE ALONG
PROJECT CORRIDOR



Annexure A: Aerial map showing likely cut and fill balance along Project corridor

ANNEXURE B
LOCAL ROADS PROHIBITED BY BULK HCVS



Annexure B: Proposed Local Roads prohibited by Bulk HCVs