

BEFORE THE HEARING COMMISSIONER

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of a subdivision to create 242 residential lots within the C2 Growth Cell, and associated lots for public assets by 3MS OF CAMBRIDGE GP LIMITED (SP/0179/20)

**STATEMENT OF EVIDENCE OF MARK JOHN APELDOORN
(Traffic)**

Dated: 11 May 2021

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Introduction

1. My full name is Mark John Apeldoorn. I have the title Practice Leader: Transport Advisory Private Sector at Stantec NZ Ltd with responsibilities generally across the New Zealand and Australian Regions. I have 29 years' experience as a practising traffic and transportation engineer.
2. I hold a Bachelor's degree with honours in Civil Engineering, a postgraduate Certificate of Proficiency in Transportation Planning and a postgraduate Diploma in Business Management, all from the University of Auckland. I am a Chartered Professional Engineer (CPEng) New Zealand and Australia, a Fellow of Engineers New Zealand (FEngNZ), an International Professional Engineer (IntPE), a Member of Engineers Australia (MEA) and a Registered Professional Engineer Queensland (RPEQ).
3. I have worked as a local authority engineer and currently as a traffic engineering consultant. As a consultant, I have been engaged by local authorities and private interests to advise on traffic and roading development issues covering safety, management and planning matters of many kinds.
4. I have also advised extensively on traffic and transportation matters involving plan changes, designations, and resource consents in the Waikato Region and elsewhere.
5. Stantec was asked by 3Ms of Cambridge Ltd to describe and assess the traffic and transport matters pertaining to application to Waipa District Council (WDC) to subdivide land within the C2 growth cell in Cambridge. I led the preparation of the Integrated Transportation Assessment (ITA) report during 2020 and provided a response to Council's Section 92 request in April 2021.

Code of Conduct for Expert Witnesses

6. I am familiar with the Code of Conduct for Expert Witnesses (Environment Court Consolidated Practice Note 2014) and although I note this is a Council hearing, I agree to comply with this code. The evidence I will present is within my area of expertise, except where I state that I am relying on information provided by another party. I have not knowingly omitted facts or information that might alter or detract from opinions I express.

Scope of evidence

7. My evidence will summarise the following matters:
- (a) Summary of the ITA Report and S92 Response;
 - (b) Changes since the ITA was prepared;
 - (c) Integration with Chartwell Properties access;
 - (d) Performance of Cambridge Road intersections;
 - (e) the Council Officer's S42A report;
 - (f) Submissions;
 - (g) Conditions; and
 - (h) Conclusion
8. I visited the site for the specific purpose of assessing the potential impact of the proposal on a number of occasions during the preparation of the

ITA and also on a number of occasions since to observe progress on other local roading infrastructure works.

Summary of ITA Report and Section 92 Response

9. Sections 2 to 7 of the ITA describe the site location and the existing and planned future transportation networks in the area. The site is within the C2 growth cell and has frontage to Cambridge Road.
10. Cambridge Road was formerly State Highway 1 (SH1) and since the opening of the Waikato Expressway Cambridge Section in 2015, has been changing from a high-volume, high-speed corridor with a focus on traffic movement, to an arterial road that serves a more local function and provides for a range of transport modes.
11. As set out in Section 8 to 10, the ITA assessed a subdivision scenario that included 289 residential lots of varying densities, a 'super lot' of 8.6 hectares (ha) for a retirement village (envisaged to provide 200 units), 0.19 ha of neighbourhood centre, and 4 ha for a future primary school.
12. The subdivision does not enable all of these uses without further consent processes. However, their traffic generation potential was assessed in the ITA for the purpose of establishing access arrangements and road cross-sections that were appropriate for the ultimate potential of the site.
13. Since the ITA was prepared, the anticipated land uses within the subdivision have changed. The anticipated number of residential dwellings has decreased, the retirement village units have increased, and the expected roll at the future primary school has also reduced. The net effect is a reduction in expected trip generation, as I describe later in my evidence.

14. The methodology used to assess trip generation and broader growth demands was generally consistent with previous technical assessments undertaken by BBO Consultants acting for Council, looking at the C2 area as well as other growth areas that use Cambridge Road. I was involved in this work, acting for the Applicant.
15. The previous assessments for Council were based on the full site being developed as residential living. The ITA made an updated estimate that reflected the mixture of standard residential and retirement dwellings that were then proposed, as well as refined expectations for the school.
16. In total, the ITA assessed the external vehicle traffic generation of the subdivision as 963 vehicle trips in the morning peak hour and 544 vehicle trips in the evening peak hour. Internal trips and trips made by public transport, walking and cycling were also anticipated.
17. The ITA looked only at a full development scenario. In the Section 92 response I provided further estimates that considered staged scenarios. These analyses can be taken as superseded by the analysis presented later in this evidence.
18. The overall conclusion of the ITA and the Section 92 Response is that the proposed subdivision can be accommodated on a local road arrangement, ahead of the planned construction of the C2/C3 roundabout and collector road.
19. The ITA also summarised the multi-modal transport network proposed to support the subdivision. This included collector road, local road, and local access road types, each designed to accommodate varying degrees of movement and access, with a focus on a low-speed neighbourhood environment (40km/h) and encouragement of active modes.

20. The proposed subdivision layout achieves a high degree of compliance with the District Plan transportation rules. There is one non-compliance in relation to local road-major arterial road connectivity however this is an anticipated outcome of the Structure Plan in this area and is therefore consistent in that respect.
21. The cross-sections differ in some regards to the District Plan standards however this can be supported on the basis of the intended speed environment and consistency with NZS4404 (Land Development and Subdivision Engineering).
22. In all cases, the design of public roads and intersections is recommended to be subject to Council engineering approvals and an independent safety audit process.
23. With these access arrangements in place, and with the infrastructure improvements and conditions noted in the ITA, it was concluded that the proposed subdivision could appropriately integrate with the surrounding transportation networks, with less than minor effects. The Section 92 reinforced that conclusion.

Changes since the ITA was prepared

24. The ITA assumed a school roll of 1,000 pupils, generating a morning peak hour demand of 609 trips by vehicle. This was later revised down to 300 pupils. I note here that my Section 92 response reduced the roll but did not reduce the traffic generation as much as it should have.
25. The original analysis of the area for WDC (in which I participated as noted at my Paragraph 14) adopted a base school traffic generation rate of 2 vehicle movements per hour (vph)/pupil. With an allowance of 10% made

for travel by other modes, this effectively assumed that 90% of pupils on the roll travel to school in individual cars. Application of this rate in the S92 response led to an estimate of 538 vph generated by the school during the morning peak hour.

26. It is my opinion that this is too high in this context, where a local residential catchment is expected around the school and the surrounding transport infrastructure has been planned and designed to support walking and cycling.
27. In the ITA, the previous rate was revised down to 0.7 vph/pupil which is the 85th percentile rate for primary schools, published in Waka Kotahi Research Report 453 (RR453) *Trips and parking related to land use*. This rate captures all staff and student travel and reflects the cumulative influence of factors including travel by different modes (children walking, riding bikes/scooters and travelling by bus to a greater extent than the 10% assumed), travel at different times (staff arriving and departing earlier and later), attendance on any given day (absences), and multiple children travelling in one car (siblings at the same school for example).
28. Application of this corrected rate to the S92 response analysis would have changed the estimated school trip generation from 538 vph to 188 vph. The S92 response analysis has therefore overstated expected traffic generation from that element of the subdivision. I have made adjustments for this in the analysis later in my evidence.
29. Further engagement with Council's consultant Traffic Engineer is expected prior to the hearing. I expect to provide further information on this, and modelling matters generally, following that engagement.
30. The ITA assessed 289 residential dwellings and 200 retirement units. The Section 92 refined this to 276 residential dwellings and a retirement village comprising 202 townhouses, 80 care beds and 46 assisted suites

and updated the trip generation assessment accordingly. It also made allowances for the trip generation of other elements of the broader growth cell.

31. The local road connection to Kelly Road was introduced via an amendment to the Application after the ITA was prepared. This connection is likely to have a very local catchment and is therefore not assessed as having a material effect on the recommendations of the ITA.
32. The introduction of an additional local road connection is however likely to lessen the reliance that has been assumed (and assessed) on the local road connections to Cambridge Road, thus producing a robust assessment.

Integration with Chartwell Properties Access

33. The Section 92 request (Item 30) sought further information regarding the integration of the proposed site access points with the access to the Chartwell Properties development on the opposite side of the road.
34. In response to this, Stantec prepared a plan (included as Attachment 1 to the RFI response) showing the detailed design layout of the Road 10 and Chartwell Properties intersections with Cambridge Road. The plan extends west to include the proposed Road 8¹ intersection with Cambridge Road.
35. The design includes an extension of the existing central painted median west across the site frontage to provide for continuity and integration of the proposed Road 8 and Road 10 intersections with both the Chartwell Properties site as well as the Kelly Road intersection.

¹ In the ITA the intersections are described as Road 11 (the western most road) and Road 10 (the eastern most). The Section 92 request called Road 11 "Road 8" and this was carried into the Section 92 response. For consistency with the Section 92 response, I have continued to use 'Road 8'.

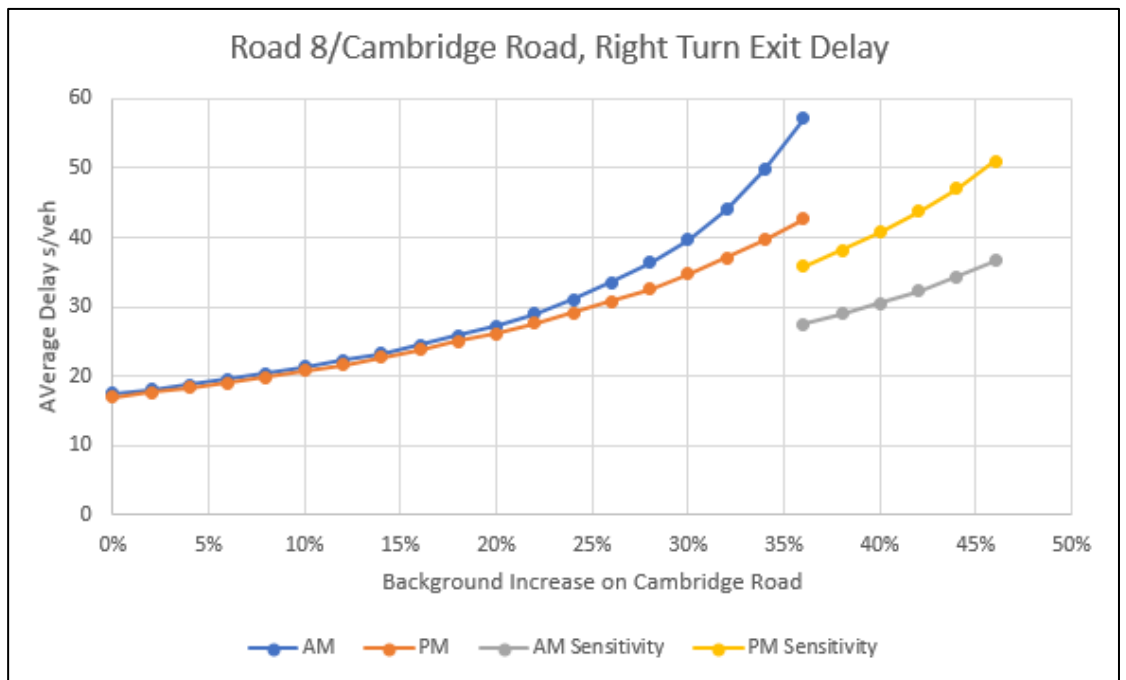
36. Road 10 is shown safely separated from the Chartwell properties intersection by about 81m. Modelling shows that queues are not expected to interact. The painted median has a width of 3.0m safely providing for vehicles waiting on it clear of the adjacent through traffic lanes. The through traffic lanes are shown as continuing to provide for the current level of service at 3.5m with retention of the road shoulder areas.
37. I further note that the location of Road 10 is consistent with the location for an intersection as shown on the C2 area Structure Plan, Appendix S19 – Cambridge C1 and C2/C3 Structure Plans. This also anticipated the Chartwell Properties intersection.
38. The location of the proposed Road 10 was known by Council with some certainty, through its engagement with the land-owner, at the time the Chartwell intersection was granted consent to develop and form the new intersection there.
39. The proposed Road 10 is separated from Kelly Rd by about 130m. Road 8 is also shown separated from Road 10 by a further 230m. Safe intersection sight distances in excess of the Regional Infrastructure Technical Specification (RITS) and Austroads Guide to Road Design Part 3: Geometric Design guidelines. These specify safe stopping sight distances in the range 64m to 81m for an operating speed of 60km/h and a range of 83m to 102m for an operating speed of 70km/h.
40. Development of the C2 growth area is expected to be commensurate with relocation of the speed restriction sign across the site frontage creating a 50km/h speed restriction and an expected 60km/h design speed environment. On-site observations have indicated that in excess of 150m sight distance is available, well exceeding the recommended minimums.

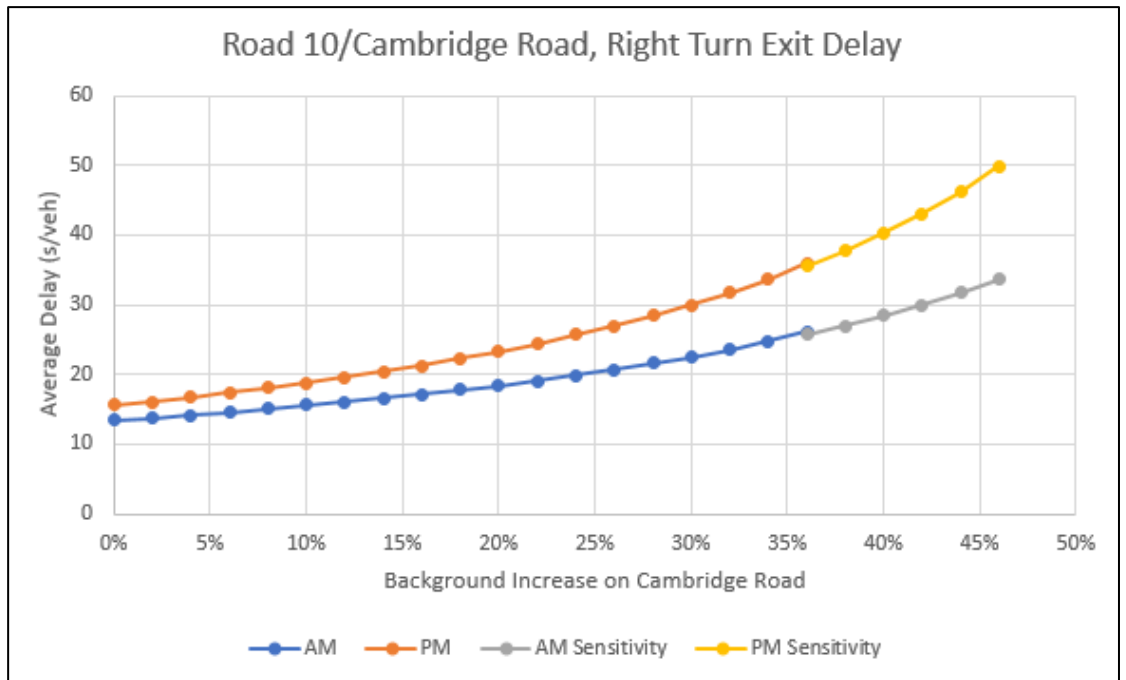
41. On the matters of design layout, operation and performance; and based on the assessments described above, I conclude that the proposed location of Road 10 is aligned with the Structure Plan operational intentions and is able to be safely formed and located as proposed.

Performance of Cambridge Road Intersections

42. The Section 92 response presented an analysis of three scenarios capturing part and full development of the subdivision on the existing (2021) transport network, and full development of the subdivision on a connected future network (2031).
43. In response to concerns from Council regarding the timing of the C2/C3 Cambridge Road roundabout and C2 collector road, I arranged further analysis of pre-roundabout conditions. This analysis assumes that the subdivision is fully developed and accessed solely from two intersections with Cambridge Road. No other connectivity is assumed to be available. All traffic generated has therefore been modelled to pass through these two intersections.
44. The analysis starts with the existing volume on Cambridge Road (the BBO adjusted estimate for March 2020) and increases that volume incrementally until the most critical movement (the right turn out of the subdivision onto Cambridge Road) reaches the upper limit of level of service (LOS) E (50 seconds/vehicle).
45. The analysis does not attach particular years to percentage increases. It is intended to illustrate the overall capacity for growth, irrespective of when the growth happens or what generates it.

- 46. The analysis assumes that the entire 3Ms subdivision is developed at Year 0. The expected trip generation totals have been updated to reflect current land use expectations for the subdivision.
- 47. In total, expected vehicle trip generation is 670 trips during the morning peak hour and 500 trips in the evening peak hour. This is 10-30% lower than the ITA, because of the different land use mix.
- 48. As shown on the graphs below, the critical movement is the right turn out of Road 8. This reaches the upper bound of LOS E with a 34% increase in traffic volume on Cambridge Road.





49. The percentage increase noted is the increase in traffic that is unrelated to the subdivision. The subdivision itself is also a contributor to the growth that will be experienced on the road. When that contribution is taken into account, the overall assumed growth in peak hour volumes is 60-80%.
50. In daily volume terms, this means that the intersections are expected to operate with no worse than LOS E at peak times, while the volume on Cambridge Road increases from its current average daily volume of approximately 11,000 vehicles per day (vpd), to around 18,500 vpd.
51. This provides further evidence that the local road connections can accommodate the subdivision prior to other planned infrastructure and connectivity changes becoming available (such as the C2/C3 roundabout and C2 collector road), with an allowance made for other growth over a reasonable period.
52. As noted on the graphs, a sensitivity was also undertaken, which enabled a further 12% growth to be accommodated. The original analysis assumed

a dominance of movement to and from the west, towards Hamilton, with 60-80% of movements being made to or from this direction.

53. Over time, as Cambridge grows that can reasonably be expected to change with people living in Cambridge having access to a greater range of local services and facilities for education, employment and other activities. The sensitivity test assumed a change to a 50/50 east/west split. This extended the LOS E threshold out a further 12%.
54. This indicates that the existing network can accommodate the proposed subdivision and up to a 46% increase in traffic unrelated to the subdivision. Over a ten-year period, this equivalent to 4.6% annum in background growth being sustained independent of the subdivision.
55. Review of various Waka Kotahi count sites around Cambridge, on State Highways 1, 1B, 21 and 3, shows growth rates of 2.7% to 6.7% per annum, with an average of 5.4% per annum. A background growth rate of 4.6% excluding the subdivision is within this range.

Officer's Report

56. I have read the Section 42A report dated 29 April 2021 including Appendix 6 (Development Engineering Report).
57. The key issue for Council is the interim reliance on local road intersections with Cambridge Road, ahead of the C2/C3 roundabout and C2 collector road. The report notes that the Council has established a timeframe for the location for the roundabout but has not done so for the collector road.
58. The analysis in the ITA, in the Section 92 response and at my Paragraphs 42 to 54 demonstrates that the local road connections can appropriately accommodate the subdivision ahead of the roundabout and collector road.

59. I also note that the retirement village and the neighbourhood centre can only be developed subject to further consent processes. This will provide Council with a further opportunity to review actual traffic conditions and consider the infrastructure and conditions necessary to support those developments at the time.
60. I note that the ITA did not recommend closure of either local road connection, as is implied in these reports. The ITA recommended that Road 11 (referred to in this evidence as Road 8) revert to left in, left out only control once the C2/C3 roundabout was constructed.
61. This recommendation was made on the basis that this intersection is the closest to the future roundabout and its right turns could be replaced by opportunities at the roundabout. It was not a volume-based recommendation and in a situation where the C2/C3 roundabout is not constructed, these intersections remain the primary points of access/egress for the site.
62. I have demonstrated in my preceding evidence that closure of either local road connection is not warranted as a condition of consent. This is consistent with the findings set out in the ITA. It is further my understanding that these roads are to be vested as public roads and as such, would come under the management of Council. Any future closure would come under normal road management processes. That said, it remains my conclusion that Road 8 be established as left in, left out only control once the C2/C3 roundabout has been constructed.

Submissions

63. I have read and considered the submissions as they relate to traffic. Two issues emerge from these – the location of the north-south collector road, and a concern regarding a lack of connectivity through the subdivision, which includes some cul-de-sac roads.
64. In relation to the second point, the use of cul-de-sacs has been kept to a practical minimum. There are three in the subdivision. Two are located either side of the east-west stormwater reserve. It is not practical (or necessary) to provide vehicle access to meet any capacity or efficiency need across here, but provision has been made for walking and cycling connectivity, consistent with the object of supporting and encouraging these modes of travel. There are green spaces (Lot 506 and Lot 504) at or near the end of both Road 18 and Road 14 to provide permeability for those walking or cycling.
65. Road 13 is formed as a cul-de-sac to provide access to properties that either front or are located near Cambridge Road. Direct access to Cambridge Road is shown to have been designed to be avoided because of its arterial function and the desire to provide a continuous off-road shared path along its northern side. The cul-de-sac at the end of Road 13 is an appropriate response to this and to the intersection spacing requirements along roads that intersect with Cambridge Road. A high degree of walking and cycling accessibility is established in within the subdivision layout shown.
66. Concerns regarding the location of the north-south collector road relate to matters such as the future development potential of the land, given the existing holding sizes, and the ability of Council to secure the land and deliver the road in a timely manner. In my assessment, these are not traffic planning matters that have a bearing on the merits of, or the ability to establish the proposed subdivision. The two proposed intersections with

Cambridge Road, together with the recommendation that Road 8 become left in, left out after the construction of the C2/C3 roundabout and C2 collector road, have been demonstrated as being readily achievable while providing for substantive future growth across the wider Cambridge area.

67. From a traffic planning perspective, the proposed location of the north-south collector road is functional and can be appropriately integrated with the existing and planned future road network in this area. The collector road is therefore provided for and the subdivision is planned to enable appropriate integration with it once it is formed. In fact the refined layout, which moves the C2 collector road to the west, results in an improved alignment with the C3 growth cell when compared to the current structure plan.
68. Matters of timing and the performance of the interim access arrangements are described earlier in my evidence. On the basis of that evidence, I remain of the opinion expressed in the ITA, that the subdivision is expected to appropriately provide for interim and staged (Road 8) access as well as longer term integration with the Structure Plan.

Conditions

69. Section 13 of the ITA outlines the conditions I recommend be applied to the subdivision.
70. The recommended changes to Cambridge Road have been supported in principle by Council Officers. These include an extension of the 50km/h speed zone, installation of right turn bays within an extended flush median, and construction of an off-road shared path on the northern side of Cambridge Road.
71. I support draft condition 27(1) which outlines the process for the design and approval of road infrastructure, in consultation with Council and in

accordance with the relevant Regional Infrastructure Technical Specifications.

72. I do not agree with Draft Condition 8 or 9. As noted above at my Paragraph 60 and 61 this has never been intended and was not a recommendation of the ITA. The analysis has demonstrated that these intersections can perform adequately over a reasonable interim period. I have recommend that the intersection closest to the roundabout be reverted to left in left out only operation, once the roundabout is operational to further support the efficient operation of Cambridge Road as an Arterial and to align with the safe long-term access intended by the Structure Plan.

Conclusion

73. I have addressed the submissions and the Council Officer's concerns relevant to traffic matters. I conclude that subject to the changes to Cambridge Road and the conditions proposed by the applicant the subdivision can be appropriately integrated into the existing and planned future transport network.

Mark John Apeldoorn

11 May 2021