

**BEFORE THE INDEPENDENT HEARING PANEL ON PROPOSED PRIVATE PLAN  
CHANGE 13 TO THE OPERATIVE HAMILTON CITY DISTRICT PLAN**

**IN THE MATTER** of the Resource management Act 1991 (the Act)

**AND**

**IN THE MATTER** of proposed Private Plan Change 13 to the Hamilton City  
District Plan

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**Statement of Evidence of Sivakumaran Balachandran on behalf of the  
Waikato Racing Club Incorporated  
(Transportation)  
Dated: 26 July 2023**

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## **MAY IT PLEASE THE INDEPENDENT HEARING PANEL**

### **INTRODUCTION**

1. My name is Sivakumaran Balachandran. I am a senior transportation engineer at Bloxam Burnett & Olliver (“BBO”), a firm of consulting engineers, planners and surveyors based in Hamilton. I have been employed by BBO since 2017.
2. I hold a Bachelor of Engineering (Honours) degree in Civil Engineering from the Nanyang Technological University, Singapore (2014). I am a Chartered Professional Engineer (CPEng), a Chartered Member of Engineering New Zealand (CMEngNZ), and a member of the Engineering NZ Transportation Group.
3. I have nine years’ experience in the field of transportation and traffic engineering gained through six years of employment in New Zealand and approximately three years of employment in Singapore.
4. I have experience in transportation and traffic engineering matters associated with resource management, including effects assessment for resource consents, plan changes and structure plans. I also have experience in the design of traffic infrastructure and facilities, road safety engineering, traffic calming, urban design, subdivision design, and traffic modelling.
5. I have appeared as expert transportation engineering witness on the following occasions previously:
  - a. Kirriemuir Trustee Limited for a plan change to the Proposed Waikato District Plan
  - b. Hamilton City Council for a Notice of Requirement for the Peacocke Sports Park designation

## **CODE OF CONDUCT**

6. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note (2023) and I agree to comply with it. In that regard, I confirm that this evidence is written within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

## **INVOLVEMENT IN PROPOSED PLAN CHANGE 13**

7. I have been engaged by Waikato Racing Club Incorporated (“WRCl”) to prepare evidence for Proposed Plan Change 13 (“PC13”). I was involved in the development of the rezoning proposal from the development of the first draft of the Concept Plan. Since then, I have managed the preparation of the Integrated Transport Assessment report (“ITA”) associated with WRCl’s request as I progressed with the transport investigations, data collection and analysis of work. My role also included consultation on transportation matters with representatives of Hamilton City Council (“HCC”) and Waikato Regional Council (“WRC”).
8. I have visited the locality around the site on multiple occasions over the past four years.
9. I have read the relevant parts of the application, the ITA review on behalf of HCC by Ms Isa Ravenscroft and Mr Alastair Black of Gray Matter, the submissions on the application that raise concern relating to my area of expertise, further submissions and the Section 42A Report.

## **SUMMARY OF EVIDENCE**

### **PURPOSE AND SCOPE OF EVIDENCE**

10. The purpose of my evidence is to assess the potential traffic and transportation effects of the proposed rezoning. In that regard, my evidence will:
  - a. Provide an executive summary of my key conclusions;
  - b. Summarise the relevant aspects of PC13 with respect to transportation matters;
  - c. Set out an assessment of PC13 with respect to anticipated transportation effects;
  - d. Address relevant submissions on transport matters; and
  - e. Respond to the transportation matters raised in HCC's s42A Report.
11. My evidence should be read in the context of the evidence of Mr Stuart Mackie, who provides an overview of the Te Rapa Racecourse Medium Density Residential concept plan ("concept plan") and the design philosophy behind the internal transport connections and layout adopted for the Site, and Mr John Olliver who describes the proposal in more detail and addresses the planning issues.
12. The concept plan prepared by Chow:Hill provided the basis for the land use extent and activities used to assess the transportation effects of the rezoning.



## EXECUTIVE SUMMARY

13. WRCI seek to change the zoning of approximately 6.5 hectares (“ha”) of the Te Rapa Racecourse site from Major Facilities Zone to Medium Density Residential Zone with a supporting Precinct Plan, and an area of approximately 1,100 m<sup>2</sup> from Major Facilities Zone to Industrial Zone.
14. The development concept plan envisages approximately 200 residential dwellings to be developed based on a mix of single dwellings, townhouses and apartments. While these dwellings are located close to the racecourse and may have a degree of interaction with it, most of the dwellings are likely to have no direct integration with the Te Rapa Racecourse.
15. The expected trip generation for the completed residential development is approximately 1,500 vehicle trips per day and 160 trips per peak hour.
16. Access to the subject site is proposed via the existing access to the racecourse at Ken Browne Drive and a new access intersection at Sir Tristram Avenue approximately 90 m southwest of the Te Rapa Road / Sir Tristram Avenue intersection.
17. The following key transport infrastructure components (refer to Figure 7) are proposed to facilitate high quality transport outcomes for the rezoning proposal:
  - a. A new access intersection to the site on Sir Tristram Avenue.
  - b. The internal public road network consists of different road sections. Speed management, safety, mode neutrality and ensuring appropriate use is at the core of the network layout and cross-section designs.

- c. A high level of amenity is provided for pedestrian footpaths internally throughout the site to key connection points to the wider network.
  
- 18. The overall transportation effects of the proposed rezoning on the adjoining road network are likely to be moderate to significant without any transport mitigation measures, due to the existing road network infrastructure. However, with the following recommended infrastructure upgrades relating to safety, capacity, connectivity, and accessibility of all anticipated vehicle and active travel modes, I consider that the transportation effects of the rezoning will be sufficiently mitigated to an acceptable level, which is no more than minor.
  
- 19. The following are the recommended infrastructure upgrades. Traffic volume triggers have been assessed and proposed to identify the timing of these upgrades as staged implementation of development occurs:
  - a. Access to the Site:
    - i. A no-parking restriction be introduced along the southwest side (northbound lane) of Ken Browne Drive and on one side of Sir Tristram Avenue.
    - ii. A landscape plan to be submitted to HCC for approval as part of the design for subdivision consent, to identify the trees to be removed to accommodate the new access intersection on Sir Tristram Avenue.
    - iii. The existing racecourse site access at Mainstreet Place to be permanently closed.
  - b. Walking and cycling infrastructure:

- i. The existing footpath on the north-eastern side of Ken Browne Drive be extended for approximately 75 m to the proposed access to the Plan Change area and be connected to the residential development footpaths. A raised safety platform to be provided across Ken Browne Drive at the existing splitter island at Ken Browne Drive / Garnett Avenue / Minogue Drive.
  - ii. The existing footpath on the northern side of Sir Tristram Avenue be extended for approximately 115 m running alongside Fairview Motors property to provide a connection to public transport on Te Rapa Road.
  - iii. A walking and cycling shared path be provided on the southern side of Sir Tristram Avenue between the proposed residential access intersection and the service lane, and along the Te Rapa service lane to a zebra crossing on a raised safety platform (“RSP”) across the service lane.
  - iv. Connect the new shared path to a new mid-block RSP staggered signalised crossing across Te Rapa Road. (The introduction / implementation of a RSP at this location will be subject to a Road Safety Audit and HCC’s decision as road controlling authority).
  - v. Kerb let-downs (pram crossings) to be provided on Sir Tristram Avenue where pedestrians can cross between the footpaths on each side of the road.
- c. Intersection upgrades:

- i. Te Rapa Road / Sir Tristram Avenue intersection to be upgraded to ban the right turn movements out onto Te Rapa Road. The intersection upgrade should be in general accordance with the form illustrated in Appendix B of the ITA. The movements at the intersection will be limited to left-in, left-out and right-in movements only.
20. From the transport modelling and assessments outlined in the ITA, and my evidence in chief, I remain of the opinion that PC13 can appropriately be supported by the existing road network with recommended transportation infrastructure upgrades.
21. The revisions to the PC13 provisions (as outlined in the evidence of Mr John Olliver) appropriately address and respond to all traffic and transportation matters raised by submitters. The development triggers in the rule provisions will ensure that all the required infrastructure upgrades are implemented in a timely manner.
22. Therefore, it is my conclusion that there are no traffic or transport reasons why PC13 should not be approved.

#### **SITE DESCRIPTION AND LOCATION**

23. Figure 1 shows the locality and extent of the PC13 subject site (“Site”). It is located to the west of Te Rapa Road and is bordered by Sir Tristram Avenue to the north and Te Rapa Racecourse Racetrack to the west. The site is approximately 6.5 ha in size and is currently accessed via Ken Browne Drive.



**Figure 1: Site Locality**

24. The Site is zoned Major Facilities in the HCC Operative District Plan (“District Plan”).
25. Properties to the north and east of the racecourse are predominantly occupied by a range of small to medium sized light industrial and commercial activities. One of the commercial premises which is along Te Rapa Road adjacent to the racecourse is owned by the WRCI through its subsidiary company Mainstreet Place LP. That site was originally occupied by ANZ bank and is now occupied by Signature Homes.
26. Immediately to the north of Sir Tristram Avenue is land used for the Thoroughbred Business Park, which is recognised in the HCC Operative District Plan (“District Plan”) as an overlay over the Major Facilities Zone. Currently it is occupied by an office building and a recently consented childcare centre (“BestStart”).
27. The properties which immediately adjoin the racecourse to the south are located off Ken Browne Drive. Properties on the eastern side of Ken

Browne Drive include commercial offices and a mixed use residential and light industrial development and a panelbeaters.

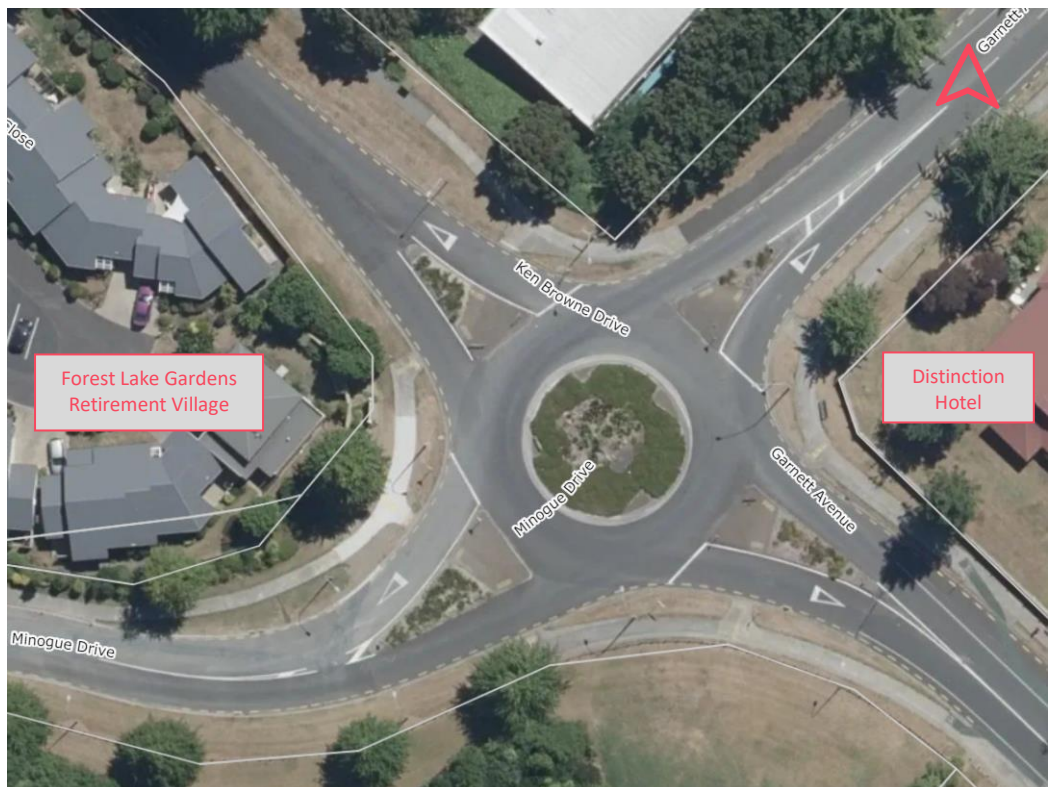
28. The property on the western side of Ken Browne Drive contains the Metlifecare Forest Lake Retirement Village, which includes apartments and villa units fronting onto the racetrack.
29. South of the racecourse is land which has recently been developed by Bupa Care Services as a rest home and care facility. Access is from Minogue Drive.

## **EXISTING TRANSPORTATION ENVIRONMENT**

### **Existing Road Network**

30. Te Rapa Road is considered a strategically important road corridor through the area and is classified as a Major Arterial Transport Corridor in the District Plan road hierarchy. The estimated Average Daily Traffic (“ADT”) volumes along the section of the road between Garnett Avenue and Sir Tristram Avenue are 15,600 vehicles per day (“vpd”) (northbound) and 13,200 vpd (southbound) based on Mobile Road website. This section of Te Rapa Road has a posted speed limit of 60 km/h.
31. Vehicle traffic will access the Site via two local roads, Ken Browne Drive and Sir Tristram Avenue. Current traffic volumes on Ken Browne Drive are approximately 272 vpd with 6% heavy commercial vehicles (“HCV”) while Sir Tristram Avenue has an estimated volume of 388 vpd with 6% HCV. Both roads have a posted speed limit of 50 km/h.
32. Garnett Avenue is a local transport corridor with an estimated ADT volume of 5,600 vpd with 0% HCV.

33. Ken Browne Drive intersects with Garnett Avenue and Minogue Drive in the form of a roundabout approximately 220 m southeast of the Site. The roundabout is four-legged and has one circulating lane. The intersection is illustrated in Figure 2.
34. Sir Tristram Avenue intersects with Te Rapa Road in the form of a large give way controlled 'T' intersection with Te Rapa Road being the main road and Sir Tristram Avenue being the minor side road. The intersection is complicated by the presence of Northbound service lanes on the west side of Te Rapa Road as illustrated in Figure 3. The terminology used in Figure 3 will be consistent throughout my evidence in chief.
35. The Te Rapa Road / Garnett Avenue / Vardon Road intersection is a signalised intersection with all approaches having two or more lanes. Pedestrian crossing is permitted on all approaches except on the north-western Te Rapa Road approach. Figure 4 illustrates the existing intersection layout.



**Figure 2: Ken Browne Dr / Garnett Ave / Minogue Dr Roundabout**



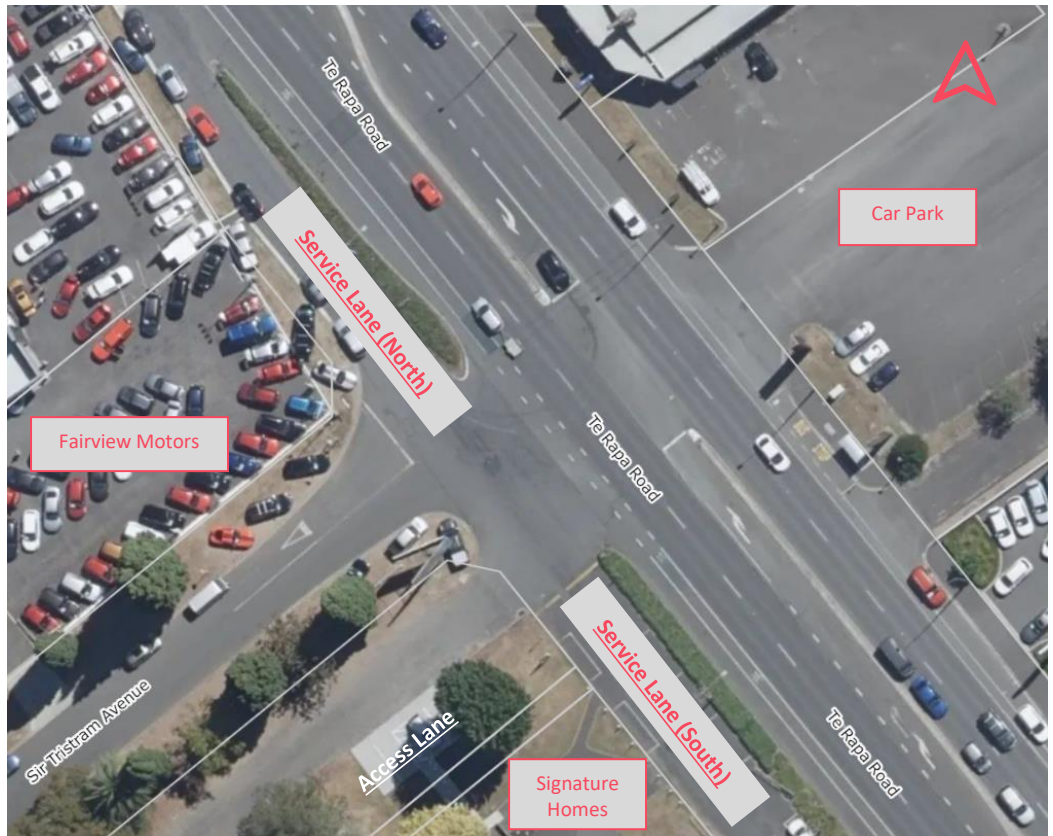


Figure 3: Te Rapa Rd / Sir Tristram Ave Intersection (outdated aerial – intersection was recently upgraded)



Figure 4: Te Rapa Rd / Garnett Ave / Vardon Rd Signalled Intersection



## Existing Transport Modes

36. The locality is well served by public transport (PT) with bus stops being located on Garnett Avenue outside the Te Rapa shops and along Te Rapa Road (nearer to Sir Tristram Avenue intersection). Access to public transport is recommended to be within 600 m of walking distance as per the Waikato Regional Public Transport Plan 2022 – 2032 (Policy 13 – City Coverage). The approximate existing walking distances from the subject site to the nearest bus stops are presented in Figure 5 and they are all within the maximum requirement.



Figure 5: Approximate Walking Distances to Existing Bus Stops

37. There is an existing footpath on the eastern side of Ken Browne Drive which begins from the access to 11 Ken Browne Drive and continues through Garnett Avenue to provide connection to the bus stops.
38. The pair of bus stops on Te Rapa, closest to the Site, are located opposite the Te Rapa Road / Sir Tristram Avenue intersection on the eastern side of Te Rapa Road, and approximately 20 m north of Fairview Motors' access on the western side of Te Rapa Road. There are no footpaths connecting to these bus stops, with passengers being required to walk north along the service lane to access the bus stop near Fairview Motors. To access the bus stop on the opposite side of Te Rapa Road, passengers must walk south along the service lane to the signalised crossing at Te Rapa Road / Home Straight intersection, to cross the road and walk north again along the footpath to the bus stop.
39. Ken Browne Drive includes a 2 m wide pedestrian footpath for approximately 125 m from Garnett Ave, set back from the north-eastern boundary of the carriageway. There is no footpath on the southwest side of the road. There are no cycle lanes on Ken Browne Drive, but it is a low-speed local road environment, so cyclists safely share the road space with vehicles.
40. The Garnett Avenue connector to Te Rapa Road has pedestrian footpaths on both sides of the road. This section of Garnett Avenue also has approximately 1.3 m wide cycle lanes in addition to on-street parking spaces.
41. Sir Tristram Avenue has a 1.5 m wide pedestrian footpath set back from the northern boundary of the road but has no footpath on the southern side of the carriageway. No cycling lanes are present along Sir Tristram Avenue.

42. Te Rapa Road, the section between Garnett Avenue and Sir Tristram Avenue, has a pedestrian footpath on the eastern side of Te Rapa Road and 1.2 m to 1.5 m wide on-road cycle lanes on both sides of the road.

### **Existing Road Safety Environment**

43. The ITA provides a detailed analysis of crash data for a five-year period (2017 – 2021) that was sourced from the Waka Kotahi Crash Analysis System (“CAS”). I have updated the crash data presented in the ITA to include crashes that occurred in 2022. Two more crashes were identified:
  - a. A minor injury crash involving a pedestrian walking along Ken Browne Drive (on the carriageway) towards the racecourse on a race day (i.e., appears to be close to the racecourse entrance based on crash report). A vehicle had driven past, striking the pedestrian.
  - b. A minor injury crash at the Te Rapa Road / Garnett Avenue / Vardon Road intersection involving a vehicle travelling northbound on Te Rapa Road failing to stop at red traffic light signals and crashing into a southbound vehicle turning right into Garnett Avenue.
44. Attachment 1 provides a summary of the number and severity of crashes recorded on the network of roads within the vicinity of the Site including the most recent crashes in 2022.
45. The crash data indicates that the access roads (i.e., Ken Browne Drive and Sir Tristram Avenue) to the Site do not appear to have any underlying road safety concerns apart from the minor injury crash recorded on Ken Browne Drive. The recommended transport infrastructure upgrades (i.e.,

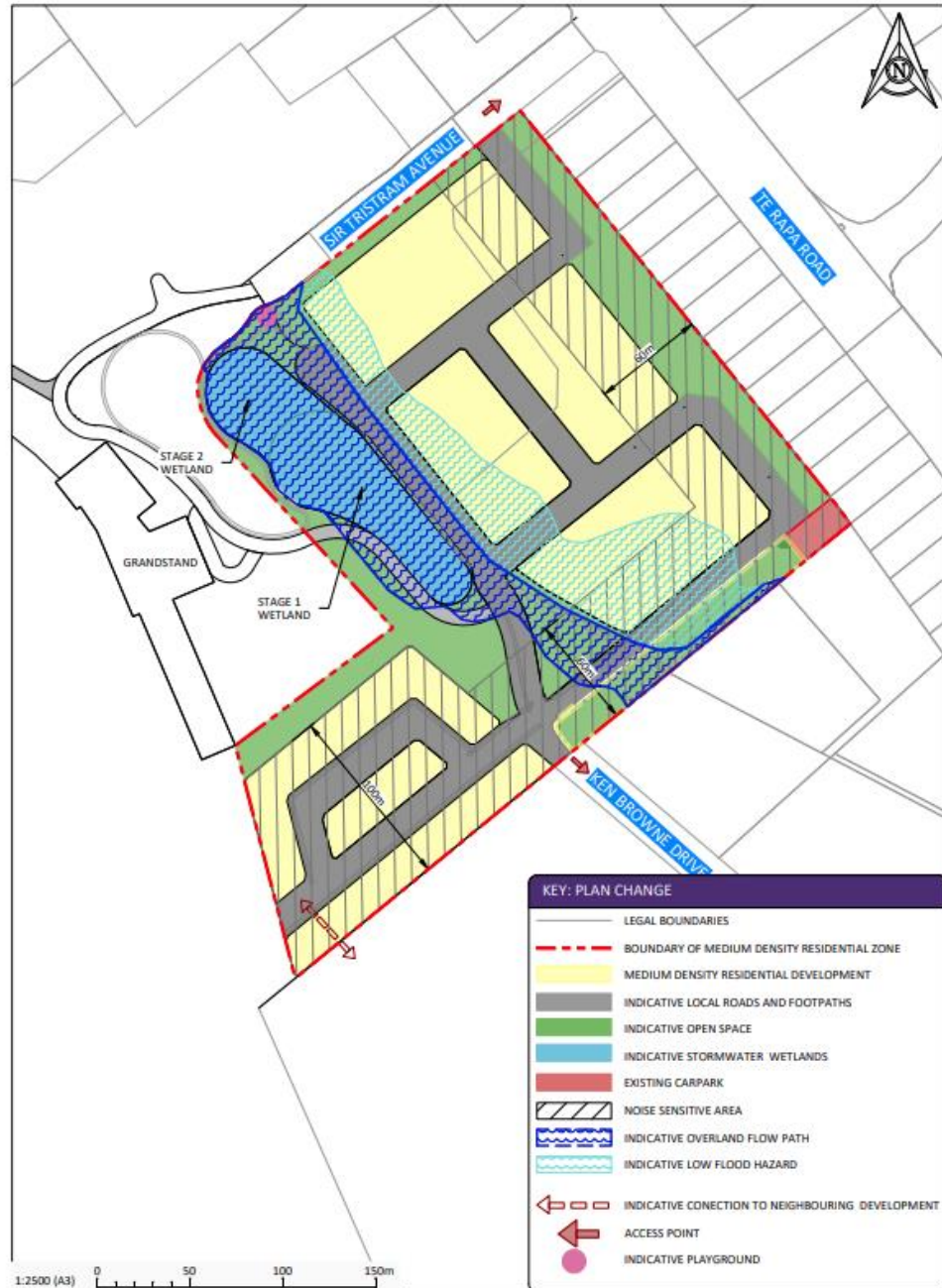
paragraph 19.b) address this concern by extending the footpath along Ken Browne Drive and making it safer for pedestrians.

46. As for the Te Rapa Road / Garnett Avenue / Vardon Road intersection, the crash pattern observed is typical for a signalised intersection. Moreover, the crashes are attributed mostly to drivers' negligence.

### **PC13 PROPOSAL**

47. PC13 seeks to rezone approximately 6.5 ha of the racecourse site from Major Facilities Zone to Medium Density Residential Zone. It will be the Te Rapa Racecourse Medium Density Residential Precinct within that zone, as the precinct is required to spatially manage the layout of development on the site.
48. A Precinct Plan (Figure 6) is proposed to be inserted into the District Plan which demonstrates at a high level, the key elements that will guide development of the site; the principal transport network, proposed development pattern and the stormwater infrastructure required to service the development.

FIGURE 4.5-1 TE RAPA RACECOURSE MEDIUM DENSITY RESIDENTIAL PRECINCT PLAN



**Figure 6: Precinct Plan**

49. A concept plan was prepared by Chow:Hill as shown in Figure 7. This concept plan is based on high level master planning and provides the design basis for the proposed Precinct Plan (Figure 6). The information regarding the development outcome on the site and illustrated in the concept plan is indicative only, and its purpose is to provide an indication of a development outcome on the Site. It demonstrates that the site is suitable for medium density residential development.





**Figure 7: Concept Plan**

**Yield**

50. The potential yield of the Site remains consistent with the ITA, with a yield of approximately 200 residential dwellings expected based on a mix of single dwellings, townhouses, and apartments.

**Internal Road Cross-Section**

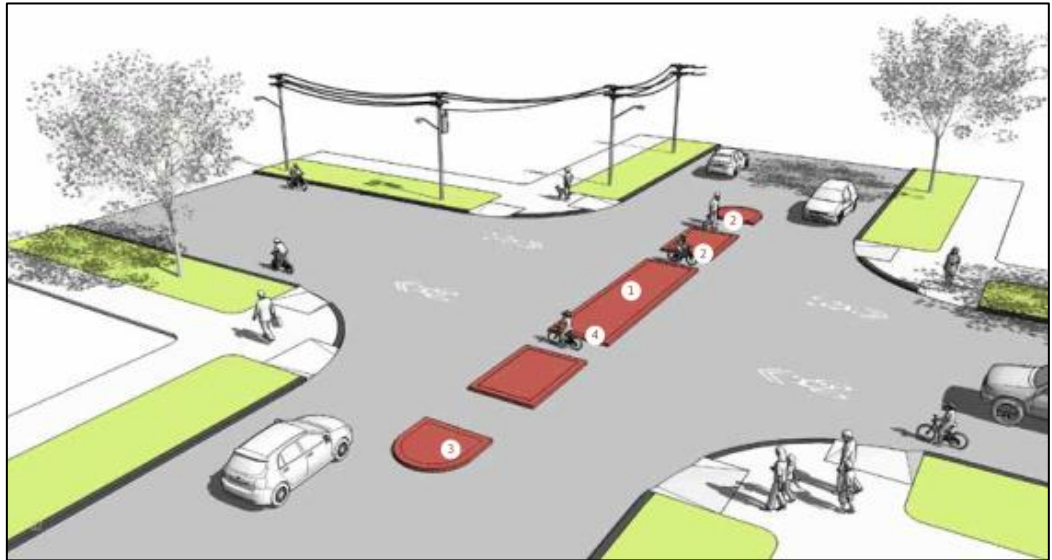
51. The internal road network is expected to be developed in such a way that the design will reflect a low volume and low speed environment. This is intended to also discourage rat-running traffic from utilising the development’s internal road network to connect from Garnett Avenue to Te Rapa Road while avoiding the Te Rapa Road / Garnett Avenue / Vardon Road signalised intersection.

52. As a low trafficked roading connection that primarily provides an access function between the proposed residential development and the arterial

road network (i.e., Te Rapa Road), the internal roading network would best align with the District Plan's definition of a 'local road'.

53. The proposed internal roads will be designed and constructed to a minimum road reserve width of 16.8 m with a carriageway width of 6.0 m. The minimum road reserve is proposed to be increased compared to the originally proposed 16 m in the ITA. This is to ensure that the minimum road reserve width is aligned with the decisions version of PC5 (Peacocke) and the notified version of PC12 (refer to paragraph 142). The typical cross-section will be in accordance with the criteria specified in Table 15-6b (Criteria for the form of Transport Corridors in the Peacocke Structure Plan) of the District Plan for a Local Road. Recessed parking bays will not be provided along the entire length of the internal road. However, pockets of recessed parallel parking bays will be provided at certain sections of the road to accommodate visitor parking.
54. 7 m wide private rear-lanes are proposed with a minimum carriageway width of 5.5 m. The minimum road reserve width of rear lanes is proposed to be decreased compared to the originally proposed 8 m in the ITA. This is to ensure that the width of rear lanes is aligned with the decisions version of PC5 (Peacocke) and the notified version of PC12 (refer to paragraph 142). The typical cross-section will be in accordance with the criteria specified in Table 15-6b (Criteria for the form of Transport Corridors in the Peacocke Structure Plan) of the District Plan for Rear Lanes. These service lanes mainly provide access to resident parking or garages.
55. As illustrated in the concept plan, these rear-lanes create crossroads intersection with the local roads. This increases the number of conflict points and hence increases the risk of crashes. I therefore recommend that a median barrier with pedestrian and bicycle through route be installed like the illustration shown in Figure 8. This would eliminate the

right turns into and out from the service lanes, hence reducing the turning movement volumes (and conflict points) at the intersections. However, I note that this is a concern that can be addressed further during detailed design stage.



**Figure 8: Median Barrier with Pedestrian and Bicycle Through Route**

### **Walking and Cycling Provision**

56. The internal public roads will connect Ken Browne Drive to Sir Tristram Avenue and will include footpaths on both sides of the street to ensure strong pedestrian connectivity is provided to the bus stops on Te Rapa Road as part of the residential development. The extension of footpath infrastructure to the bus stops are discussed in paragraphs 82 to 84.
57. No specific cycling infrastructure is proposed on Ken Browne Drive, Sir Tristram Avenue, or the internal roads. In accordance with the District Plan guidance for Local Transport Corridors, cyclists can be safely accommodated sharing the road space with vehicles. The low-speed environment of 30 to 40 km/h proposed within the Site allows vehicles and cyclists to safely share the traffic lanes, as is appropriate for residential streets. The combination of traffic calming measures and side friction from on-street parking will also reinforce the low-speed environment.



58. The internal public road network will be designed in accordance with the relevant design provisions in the District Plan which include the proposed road cross-sections for the local roads, new vehicle crossing separation distances, sight distances, and a well-connected network of paths for walking and cycling.

#### **TRIP GENERATION**

59. At the time of writing of the ITA, BestStart (childcare facility on Sir Tristram Avenue) was not operational and hence, the assessment adopted a peak hour generation of 176 trips per peak hour for the childcare development (based on the ITA for BestStart prepared by Stantec) into the baseline scenario.
60. Trip generation for the proposed rezoning was calculated in the ITA using the trip rates obtained from the NZTA Research Report 453 – Trips and parking related to land use (“Report 453”) and the RTA Guide to Traffic Generating Developments (“RTA Guide”).
61. Based on a mix of residential dwelling types (i.e., detached dwelling, apartment units and townhouses), the total PC13 area when developed was calculated to generate around 1,500 vehicle trips per day and approximately 160 vehicle trips per peak hour.
62. I consider that the trip generation assessment used in the ITA and on which the various infrastructure upgrades for effects mitigation are based, is conservative. My reasons are as follows.
63. With the Te Rapa Racecourse Medium Density Residential Precinct developed and the recommended walking and cycling infrastructure upgrades (paragraph 19.b) completed, the active mode home to work / work to home trips and the trips that utilize public transport are expected

to significantly increase compared with the existing transport mode-share. However, it is still likely to be a low overall percentage (less than 5%) relative to the potential for trips by private vehicles.

64. For comparison, the 2018 Census data for the neighbouring St Andrews West statistical area identifies that approximately 3% and 2% of home to work and work to home trips are made using public buses and cycling respectively (i.e., a total of 5% of alternative mode of transport). This could be considered as a baseline proxy for the mode-share that is likely to be achieved by Te Rapa Racecourse Medium Density Residential Precinct. A mode share of less than 5% (i.e., approximately 10 vehicle trips per peak hour are made by PT and cycling) is considered negligible overall. Hence, for the purposes of this evidence I have not included any reduction of estimated trips by private vehicle due to alternative transport mode share at this stage.
65. It is to be noted that the predicted trip generation is based on an assumed mix of residential dwelling types (i.e., detached dwelling, apartment units, and townhouses). Therefore, I recommend that a simple ITA be prepared if more than 145 residential units (i.e., mix of residential dwelling types) are to be built within the Precinct. This development trigger is obtained by considering if only single detached dwelling type (highest peak hour trip generator among other dwelling types) are built within the Precinct which equates to a maximum of 145 single detached dwellings that could be built without exceeding the 160 vehicle trips per peak hour trip generation that was assessed in the ITA.
66. Exceeding the development trigger of 145 residential units would mean that the overall trip generation for the Te Rapa Racecourse Medium Density Residential Precinct could exceed 160 vehicle trips per peak hour, and therefore effects on the adjoining road network will have to be

reassessed via a simple ITA and any recommendations adopted as conditions of sub-division consent.

67. The ITA had previously assessed a land area of approximately 1100 m<sup>2</sup> on the southern side of Sir Tristram Avenue (refer to Figure 9) as part of PC13 that is to be rezoned to Medium Density Residential area. This piece of land is currently zoned Major Facilities but does not form a logical part of the Medium Density Residential area as it adjoins Te Rapa Road and will become isolated from the balance of the Major Facilities land. This area of land is now proposed to be zoned Industrial to match adjoining land fronting Te Rapa Road. The Precinct Plan does not include this land as shown in Figure 6.
68. I have assumed a trip generation rate of 15.4 trips per gross hectare per peak hour to understand the effects of this change and what inclusion to the PC13 has on the ITA conclusions. The trip rate of 15.4 trips / ha / hour is consistent with what HCC and Waikato District Council typically use for calculating the expected peak hour trip generation of new industrial sites, including Horotiu Industrial Park and Rotokauri industrial area. On that basis, I anticipate that this piece of land generates an additional 2 trips per peak hour. A sensitivity test has been carried out by increasing the number of trips generated by this piece of land to approximately 50 to 100 trips per peak hour and the effects on the proposed Te Rapa Road / Sir Tristram Avenue intersection layout with the proposed changes is negligible with regards to average delay experienced by vehicles at the intersection. I consider this additional number of trips to have negligible effects on the conclusions of the ITA from a safety and capacity perspective considering the safety upgrades proposed at Te Rapa Road / Sir Tristram Avenue intersection (paragraphs 75 and 76) and the modelling outcomes highlighted in paragraph 96.



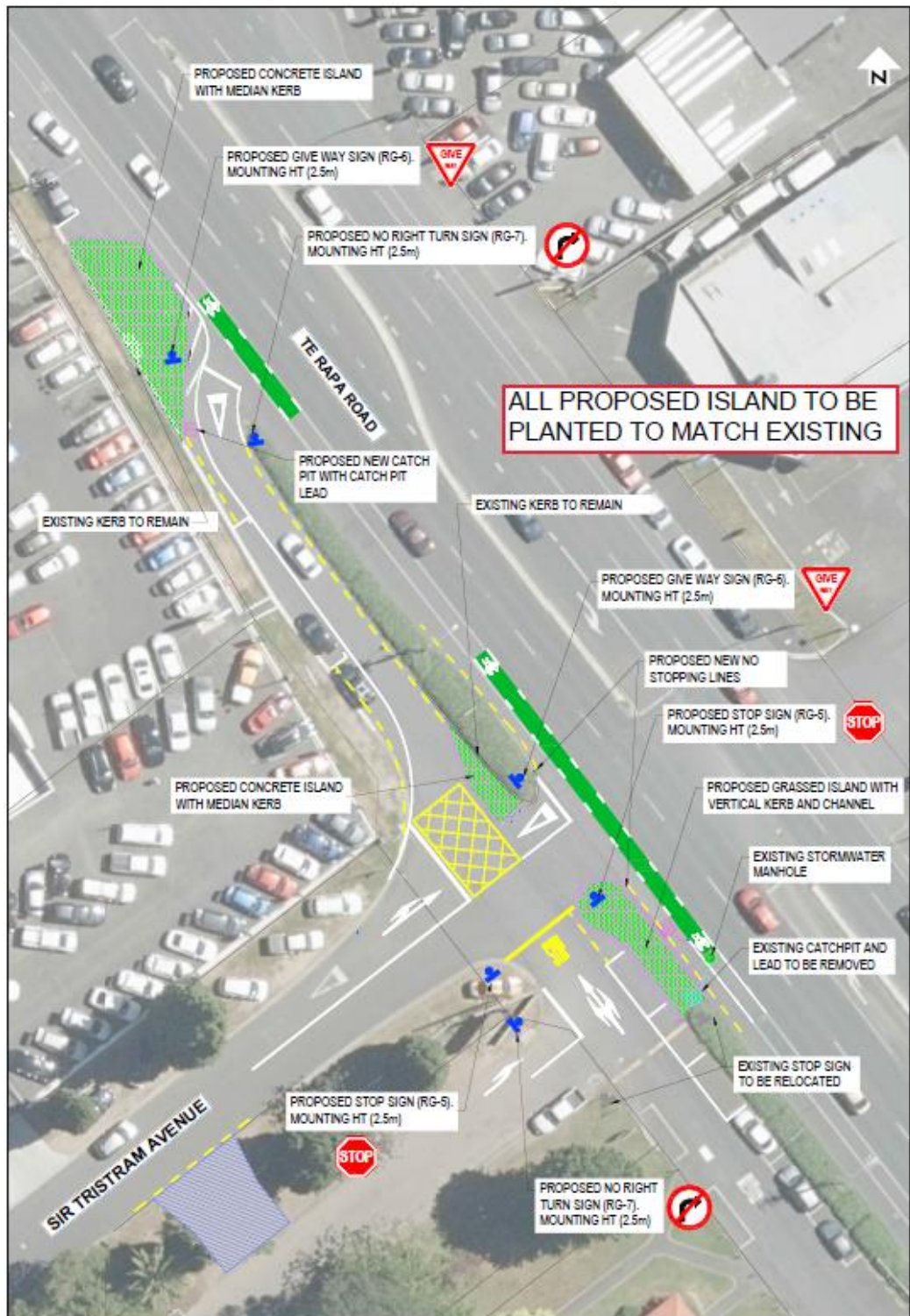
Figure 9: Proposed Industrial Zone

## TRANSPORTATION EFFECTS ASSESSMENT AND PROPOSED MITIGATION MEASURES

### Road Safety

69. The Te Rapa Road / Sir Tristram Avenue intersection was upgraded recently as part of the consent conditions to BestStart childcare centre. The upgrade included additional kerb buildouts and pavement markings to narrow the service lane to the south of the intersection and separate movements to / from the adjacent driveway to the south and Sir Tristram Avenue. A kerb-side island was constructed at the north end of the

service lane where it merges with Te Rapa Road, to reduce the area of potential conflict and providing separation to Fairview Motors access to the north. The service lane was realigned to encourage vehicles to approach the merge area closer to a right angle. Give way signs and markings were installed at the end of the service lane to make it clear that vehicles exiting the service lane are to yield to traffic on Te Rapa Road. The changes to the intersection are illustrated in Figure 10 and Figure 11.



**Figure 10: Approved Te Rapa Rd / Sir Tristram Ave Intersection Upgrade Design by Stantec for BestStart Resource Consent**





**Figure 11: Recently Upgraded Te Rapa Rd / Sir Tristram Ave Intersection**

70. It is my opinion that the intersection upgrade has addressed several safety issues with the original intersection layout, however, there remains safety issues for road users in the new layout.
  
71. Sir Tristram Avenue currently has very low volumes of traffic, which is primarily associated with Fairview Motors and / or race days, and now the new childcare facility. Vehicles accessing Sir Tristram Avenue from Te Rapa Road are currently able to make left and right turns to Sir Tristram Avenue, the latter benefitting from a right turn bay for southbound traffic on Te Rapa Road. The service lane parallel to Te Rapa Road adds to the travel distance for right turning traffic into Sir Tristram Avenue (i.e., three live lanes, two northbound lanes on Te Rapa Road and the service lane). Site observation shows that despite the ban on U-turn movements introduced by the HCC, there are still substantial numbers of southbound drivers on Te Rapa Road making U-turns. The U-turn movements reduces the opportunity for traffic exiting Sir Tristram Avenue to turn right onto Te Rapa Road as the traffic volume in the inside southbound lane is relatively high. Figure 3 illustrates the intersection.

72. To achieve adequate visibility, right turning vehicles exiting Sir Tristram Avenue are required to cross the service lane and sit at the Te Rapa Road boundary whilst awaiting opportunity to merge with southbound traffic. This has now been addressed by the intersection upgrade where a formally marked refuge area (Figure 11) has been introduced for right turning vehicles waiting to undertake this manoeuvre. A 'Keep Clear' area has also been marked at the Sir Tristram Avenue / service lane intersection.
  
73. Although there is no recent crash history associated with vehicles turning right out from Sir Tristram Avenue, this movement is expected to become less practical (and more dangerous) as traffic volumes increase on Sir Tristram Avenue due to PC13. Formalising (i.e., marking out) a refuge area will also increase the risk of collision between Te Rapa Road southbound U-turning vehicles and vehicles waiting to turn right from Sir Tristram Avenue onto Te Rapa Road. The southbound U-turn movement onto Te Rapa Road is currently banned as per The Hamilton Traffic Bylaw 2015, however, the surveyed traffic counts indicate that approximately 40 to 130 vehicles complete this movement during peak periods which is relatively high for a U-turn movement.
  
74. Car transporters servicing Fairview Motors have been observed arriving from the south and parking along the areas identified in Figure 12 to unload vehicles. These areas are undesignated unloading areas. The kerb side island recently introduced at the north end of the service lane where it merges with Te Rapa Road (refer to approved intersection upgrade design in Figure 10), prevents these car transporters from waiting along the service lane. If a car transporter was to wait along the road shoulder of Te Rapa Road, the Safe Intersection Sight Distance ("SISD") of vehicles exiting the service lane based on the realignment of the service lane will be affected which raises safety concerns.

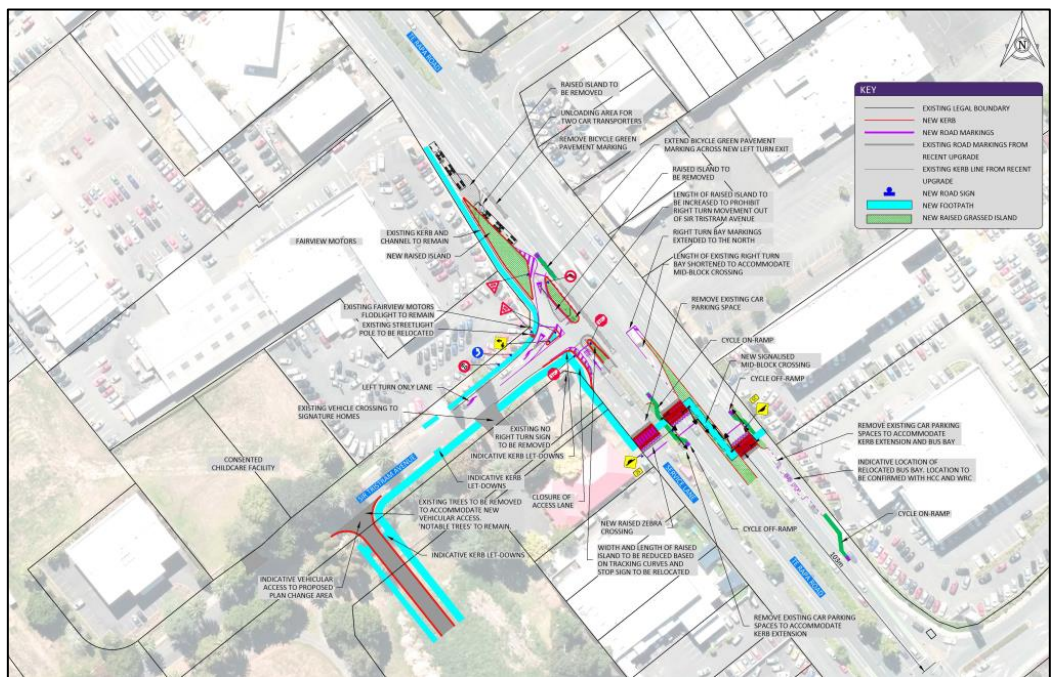




**Figure 12: Car Transporters Waiting Area**

75. For the above reasons relating to safety, I recommend as part of the proposed rezoning to limit the movements at Sir Tristram Avenue intersection to left-in, left-out and right-in movements only. This would mean that the right turn movements out onto Te Rapa Road will be banned. Motorists affected by this movement ban (mostly related to racecourse race days) will be required to use the Te Rapa Road / Sunshine Avenue roundabout to perform a U-turn and return southbound on Te Rapa Road which equates to an extra travel distance of approximately 1 km. This would increase the travel distance and time for motorists wishing to head south, however it is considered a minor inconvenience to achieve the safety improvements by reducing the range of conflict points and the potential for driver confusion.
76. To accommodate car transporters safely at the intersection and to mitigate sight line concerns for vehicles exiting the service lane onto Te Rapa Road, I recommend relocating the left turn exit approximately 30 m

southeast from its current location. The kerb buildout along Fairview Motors is to be re-constructed to allow safe merging of vehicles exiting the service lane onto Te Rapa Road as well as to allow car transporters to safely exit Te Rapa Road and unload vehicles away from the existing bicycle lane. A conceptual design of the proposed Te Rapa Road / Sir Tristram Avenue intersection improvements is presented in Figure 13 and included in Attachment 2. Given the recommended improvements which reduce the number of conflicting vehicle movements at the intersection, I consider that any adverse traffic effects are appropriately mitigated.



**Figure 13: Te Rapa Road / Sir Tristram Avenue Intersection Concept Design**

**Access Road at Te Rapa Road / Sir Tristram Avenue Intersection**

77. Ken Browne Drive is currently sealed to a width of approximately 7.5 m. To accommodate the increased traffic volume on Ken Browne Drive due to PC13, it is recommended that a no-parking restriction is introduced along the south-western side (northbound lane) of the road.
78. Currently, the north-eastern side of the road has a no-parking restriction, and this should be replicated on the south-western side. The parking demand appears to be associated with workers from the commercial and

industrial premises that have access from Ken Browne Drive despite the substantial amount of off-street parking that is provided on those sites.

79. The National Policy Statement on Urban Development 2020 (“NPS-UD”) required the removal of minimum on-site parking requirements from the District Plan. However, for comparison, Appendix C of Report 453, identifies an average parking demand rate of 0.9 to 1.1 spaces per 100 m<sup>2</sup> gross floor area (“GFA”) for warehousing and manufacturing developments, and 2.7 spaces per 100 m<sup>2</sup> GFA for commercial offices. A desktop review of the GFA of the existing premises that have access to Ken Browne Drive is shown in Figure 14. The following high-level assessment of the parking demand indicates that all three premises have sufficient amount of parking spaces provided on site:

a. 11 Ken Browne Drive – large format office building owned by Chartwell Investments Limited and currently tenanted by Tuatahi First Fibre Ltd and Fire Security Services

i. GFA = approximately 2,300 m<sup>2</sup>

ii. Parking demand based on Report 453 =  $(2,300 / 100) \times 2.7$   
= 62

iii. Marked parking spaces provided on-site based on Google Earth imagery = more than 80

b. 6 Ken Browne Drive - 22 live / work units with a first-floor apartment and ground floor commercial warehouse

i. GFA = approximately 2,400 m<sup>2</sup>

ii. Parking demand based on Report 453 =  $(2,400 / 100) \times 1.1$   
= 26

iii. Marked parking spaces provided on-site based on Google Earth imagery = approximately 62



- c. 89 Garnett Avenue – Prestige Collisions Repairs Ltd office building and car yard owned by McMac Properties Ltd which has access to Garnett Avenue as well.
  - i. GFA of office building = approximately 1,500 m<sup>2</sup>
  - ii. Parking demand based on Report 453 =  $(1,500/ 100) \times 2.7 = 41$
  - iii. Marked parking spaces provided on-site based on Google Earth imagery = approximately 43



**Figure 14: Properties with Access to Ken Browne Dr**

80. The line of parked vehicles on Ken Browne Drive reduces the effective carriageway width, and although this does not cause problems at present as the racecourse is not generating much traffic on weekdays, it may cause safety issues in future with the proposed increase in traffic from PC13. As sufficient off-street parking is provided at the adjacent industrial and commercial premises, I consider that widening the road to introduce recessed parallel parking bays on either side of the carriageway as per District Plan local road requirements is not desirable. It would also result in removal of the line of mature trees that are an important amenity feature of the locality.

81. A footpath currently connects the commercial and industrial premises to Garnett Avenue on the north-eastern side of Ken Browne Drive. I recommend that the footpath be extended 75 m northwards to the proposed access to PC13 area and be connected to the internal residential development footpaths. Initial investigations indicate that the footpath can be aligned and designed in such a manner that no tree removal is required as illustrated in Figure 15. The berm width narrows towards the northern end of Ken Browne Drive with a steep slope towards the east. However, a 1.5 m wide footpath can still be accommodated between the kerb and tree. Due to the presence of tree roots, it is recommended that at detailed design stage consideration be given to constructing a short section as a boardwalk similar to that installed along Te Rapa Road (northbound) adjacent to The Base (refer to Figure 16). I consider a footpath on the south-western side of the carriageway is of little benefit as there are no direct property accesses on this side of the road.



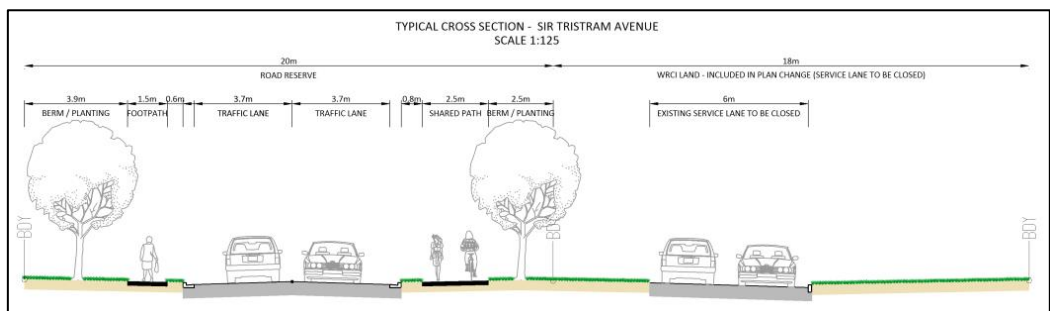
**Figure 15: Proposed Footpath Extension on Ken Browne Dr**





**Figure 16: Existing Boardwalk adjacent to The Base on Te Rapa Road**

82. Sir Tristram Avenue has an approximately 7.4 m sealed carriageway with a pedestrian footpath set back from the northern boundary of the road but has no footpath on the southern side of the carriageway. I recommend that the existing footpath on the northern side of the carriageway be extended for approximately 115 m running alongside Fairview Motors property and leading to the existing bus stop located 110 m northwest of Te Rapa Road / Sir Tristram Avenue intersection. There is sufficient width within the existing road reserve to accommodate the changes proposed as shown in the cross-section in Figure 17.



**Figure 17: Typical Sir Tristram Ave Cross-section with Proposed Changes**

83. There is a pinch point along this proposed footpath route (i.e., the southeastern boundary of Fairview Motors) at which the existing berm narrows to approximately 2.5 m as illustrated in Figure 18. Therefore, at

this location the 1.5 m wide new footpath is recommended to abut the back of kerb. This ensures that the Fairview Motors flood light pole is not in the middle of the proposed footpath and hence need not be relocated. The existing posted speed limit sign, give way sign, street name sign and streetlight pole will have to be relocated such that they are not positioned in the middle of the proposed footpath. Locations of these signs and streetlight pole can be confirmed during detailed design stage.



**Figure 18: Signs and Light Pole to be Relocated to Accommodate Footpath Extension**

84. A 2.5 m wide shared path is also proposed on the southern side of Sir Tristram Avenue from the new residential access intersection towards the service lane and leading towards the proposed signalised mid-block crossing on Te Rapa Road (described in paragraphs 88 and 89). This provides for a continuous and direct path for residents to the bus stop on the opposite side of Te Rapa Road (i.e., 474 Te Rapa Road).
85. Recessed parallel parking bays are not recommended in this case along Sir Tristram Avenue as the only vehicles parked on the northern side of

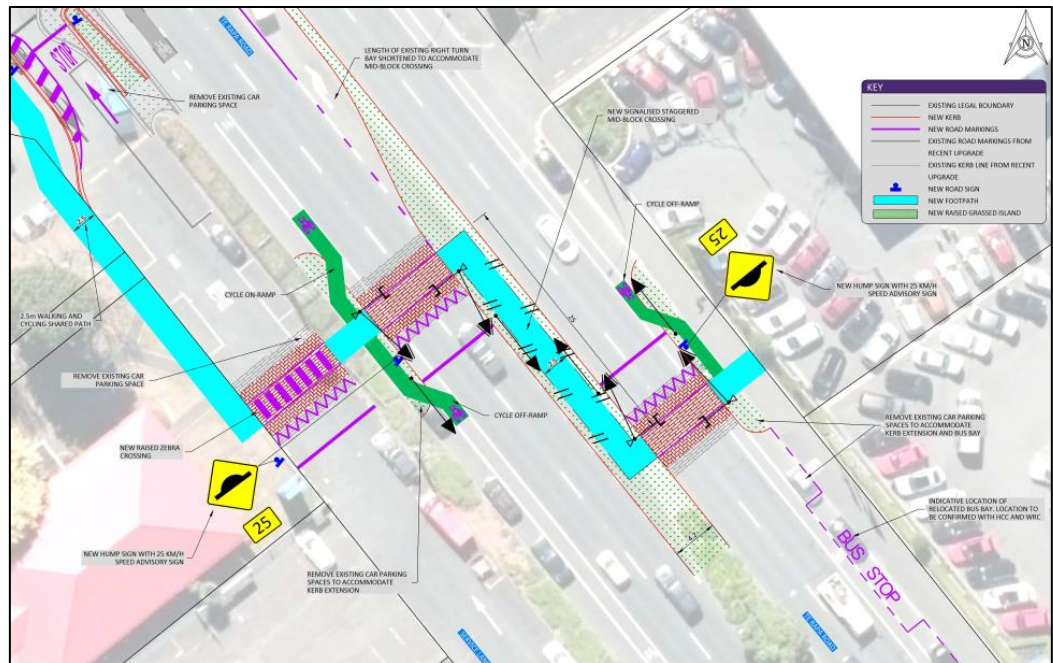
the road or on the berms appeared to be associated with Fairview Motors which has a considerable amount of parking spaces within its site. The street parking is believed to be a way to advertise for sales beyond their boundary.

86. Access to the site on the southern side of Sir Tristram Avenue will require existing trees in the existing median to be removed. I recommend that a landscape plan be prepared during detailed design stage to identify any trees to be removed to accommodate the new access intersection, and any replacement landscaping / planting required.

### **Walking and Cycling**

87. Bus stops are located on Te Rapa Road, within walking distance from the Site, but not connected to the site by footpaths. Appropriate pedestrian connections to bus stops and neighbouring businesses, where residents may walk from or to, are recommended to support PC13.
88. Paragraphs 81 to 84 elaborate on the recommended connections on Ken Browne Drive and Sir Tristram Avenue. In addition to these connections, the new shared path on the southern side of Sir Tristram Avenue is proposed to be extended along the service lane within WRCI owned land which is currently occupied by Signature Homes. This shared path will lead pedestrians / cyclists to a pedestrian crossing (zebra) on a raised safety platform to cross the service lane and connect pedestrians safely from the new path to a new signalised mid-block crossing on Te Rapa Road which proceeds to connect to the existing 3 m wide path on the eastern side of Te Rapa Road as illustrated in Figure 19 and the Te Rapa Road / Sir Tristram Avenue Intersection Concept Design plans in Attachment 2.





**Figure 19: Proposed Signalled Mid-Block Crossing on Te Rapa Rd**

89. The mid-block crossing is proposed as a two-stage signaled crossing on RSPs. The two-stage crossing is necessary due to the number of existing vehicle crossings on the eastern side of Te Rapa Road which does not allow for a typical one-stage crossing across Te Rapa Road. The RSP at the crossings increase the crossing conspicuity, reduce operating speeds of vehicles on the approaches, and allow for seamless (no level change) travel for mobility impaired pedestrians. Kerb extensions are also proposed to reduce the crossing distance and increase the visibility for both pedestrians / cyclists and drivers. Cycle on and off-ramps are proposed for cyclists to join the on-road cycle lanes. The introduction of RSP at this location will be subject to a Road Safety Audit and Council's decision as road controlling authority.
90. As part of this proposal, I recommend relocating the southbound bus stop on Te Rapa Road to reduce the walking distance from the proposed signaled mid-block crossing. Based on consultation with WRC and HCC, it was understood that the existing bus stops at 475 and 474 Te Rapa Road are underutilised with no safe crossing point between them, and that HCC is generally supportive of relocating the bus stops. The southbound bus stop is proposed to be relocated approximately 70 m south from its

existing location. There are currently no safe crossing locations along this section of Te Rapa Road apart from the Home Straight intersection. Therefore, the proposed mid-block crossing also improves the existing connectivity between bus stops and adjacent activities which include Te Wananga o Aotearoa educational facility.

91. The possibility of signalling Te Rapa Road / Sir Tristram Avenue was also considered as an alternative to the provision of a mid-block signalised pedestrian crossing.
  
92. However, given further review, I do not consider that signalling Te Rapa Road / Sir Tristram Avenue intersection would be beneficial overall, for the following reasons:
  - a. Signalisation could potentially provide some capacity relief at the Te Rapa Road / Garnett Avenue / Vardon Road intersection. This would encourage more vehicle-based trips to and from Sir Tristram Ave following PC13 (by accommodating the right turn movement) as opposed to the proposed safety upgrades that physically prevent the right turn movements out of Sir Tristram Avenue as discussed in paragraphs 75 and 76. Restricting access through Sir Tristram Ave as proposed will help encourage future residents of PC13 area to use public transport and walking and cycling rather than private vehicle transport. Promoting infrastructure solutions that increase safety and accessibility for alternative modes of transport is the key to limiting further vehicle-based transport effects on the adjoining road network and environment. Signalling the whole intersection would be counterproductive in this regard.

- b. Integration of the existing service lane with the signalised intersection will be challenging as described in Section 7.6.1 of the ITA and illustrated in Figures 37 and 38 of the ITA.
  - c. The intersection will need to be a crossroads intersection if signalised due to the existing car park access on the opposite side of Te Rapa Road. The width of the car park access is approximately 13.5 m. Signalising the intersection might result in realignment of Sir Tristram Avenue to align with the car park access. With a crossroads intersection, the phasing is expected to increase delays, which may affect the adjoining network operation considering there would be three signalised intersections in a row within 500 m. The proposed signalised mid-block crossing would instead operate with two phases and be only activated when people press the push (or call) button.
  - d. Section 4.5 of the Austroads AP-R556-17 Research Report “Understanding and Improving Safe System Intersection Performance” highlights that eliminating right turn movements from all approaches as a design improvement to the retrofitted combined treatment with the intention to improve the level of Safe System alignment. Banning right turn movements, with support from physical road design changes show a significant reduction in opposing-turning crashes in the post-period (60% to 90% cited in Austroads 2012).
93. Therefore, it is my opinion that banning right turn movement out of Sir Tristram Avenue coupled with the proposed signalised mid-block crossing (safe crossing location away from intersection) is a safer, more beneficial option overall for promoting alternative transport than a retrofitted crossroads signalised intersection.

94. Overall, with the improvements recommended to pedestrian connections which also provide for improved access to public transport, the Site is considered to achieve good connectivity and accessibility for alternative transport modes. The establishment of these connections and traffic calming measures within the proposed residential development will ensure that a high standard of pedestrian safety and amenity is provided.

### **Intersection Effects Assessment**

95. Traffic modelling was undertaken using the industry recognised SIDRA Intersection 9 to assess the effects of traffic associated with PC13 on the adjoining road network. Intersection count surveys were undertaken, and SCATS count information was obtained from HCC to support the intersection modelling carried out. Traffic modelling was also undertaken for race day scenarios.
96. Capacity assessment undertaken indicates that despite the increased vehicle trips associated with PC13, the existing Ken Browne Drive / Garnett Avenue / Minogue Drive roundabout and the Te Rapa Road / Sir Tristram Avenue intersection with the proposed upgrades (refer to paragraphs 75 and 76) will continue to operate satisfactorily in the current and future year (2031) scenarios, including race days. In fact, the performance of the Te Rapa Road/Sir Tristram Avenue intersection is significantly improved by the upgrade proposed through the plan change.
97. The Te Rapa Road / Garnett Avenue / Vardon Road intersection is already performing unsatisfactorily in 2031 without the development. With PC13, the right turning movement from Garnett Avenue worsens. The added delays observed at the Garnett Avenue approach, especially in the future year 2031, with and without the proposed development site trips are not unexpected. However, these delays are mainly due to the existing high

volume of vehicles on Te Rapa Road and the ongoing growth over time (as Hamilton's population increases) which will inevitably demand more green time allocation to the Te Rapa Road approaches.

98. In my opinion, there is no easy solution to increase the capacity of the Te Rapa Road / Garnett Avenue/ Vardon Road intersection without substantial work to create additional lanes. However, providing infrastructure to promote and increase the use of alternative modes of transport is the key alternative to limit impacts on the performance of the intersection. With the strong pedestrian connections to existing bus stops that are proposed as part of the rezoning application (paragraphs 82 to 84, 88 and 89)) as well as the slow speed environment proposed within the development that supports safe cycling, it can be expected that there will be a percentage of trips that utilize the PT network that is readily available in the vicinity and also the cycling network surrounding the site (refer to paragraph 64).
99. Given the performance of the Te Rapa Road / Garnett Avenue/ Vardon Road intersection is already generally poor with existing and future traffic growth from population and employment increase in Hamilton, any upgrade to the capacity or improvements for walking and cycling and public transport should be led by the HCC and potentially the costs shared equitably between all key stakeholders that benefit from the improvements.

#### **District Plan Rules**

100. The District Plan Rule 25.14.4.1 (a)(i) requires a minimum separation of less than 2 m or more than 7.5 m between vehicle crossings on the same side of the road on a 50 km/h posted speed limit transport corridor. Access to individual allotments will be provided via the rear-lanes which will fulfil the minimum requirement. However, if the access arrangement



to individual allotments were to change as part of future resource consents, the proposed development is expected to comply with the rule.

101. The District Plan Rule 25.14.4.1 (c) specifies a minimum separation distance of 15 m from a proposed vehicle crossing to the nearest intersection. The nearest third-party access on Ken Browne Drive (i.e., 15 Ken Browne Drive) is located approximately 75 m south-east of the proposed access intersection to the plan change area. The nearest vehicle crossing to the proposed access intersection at Sir Tristram Avenue would be that of the BestStart childcare facility at 4 – 6 Sir Tristram Avenue which is approximately 36 m away.
102. The Regional Infrastructure Technical Specification (“RITS”) specifies a minimum intersection spacing of 30 m on local roads. This is readily achieved by the separation distances of approximately 195 m to the Ken Browne Drive / Garnett Avenue / Minogue Drive roundabout and approximately 90 m to the Te Rapa Road / Sir Tristram Avenue intersection. Intersections within the proposed development are also expected to comply with this requirement.
103. The District Plan Rule 25.14.4.1 (e) specifies a minimum sight distance of 60 m from vehicle crossings on a 50 km/h posted speed limit transport corridor. As a new residential development this can be achieved through the design. WRCI should ensure that minimum sight distance required by the District Plan is complied with for the proposed rear-lanes with no physical structures (e.g., trees, services infrastructure, or embankments) obstructing the required sight lines.
104. Austroads Guide to Road Design Part 4A – Unsignalised and Signalised Intersections requires the minimum SISD to be approximately 97 m for a design speed of 50 km/h. The proposed access intersection on Sir

Tristram Avenue will comply with the minimum SISD towards the Te Rapa Road / Sir Tristram Avenue intersection.

105. The NPS-UD required the removal of minimum on-site parking requirements from the District Plan, except for accessible car park spaces, loading and bicycle parking. It did not restrict on-site car park spaces being provided as a choice by the developer. The number of parking spaces to be provided will be determined at the detailed design stage of the development.
106. Approximately 14 cycle spaces will have to be provided as per District Plan requirement for apartment units.
107. As for the racecourse, a parking area has been identified to the west of the proposed stormwater wetland. This area is relatively larger than the parking area that is currently available on-site. Hence, the proposed rezoning and the residential development will not affect the parking capacity of the racecourse. The land to the north of the racetrack has been identified as a location for horse truck parking in the concept plan. This land will also be used for overflow public parking on race days.

### **Emissions Reduction**

108. The Emissions Reduction Plan<sup>1</sup> (“ERP”) supports low-emission transport infrastructure and urban form. PC13 is aligned with the ERP by providing the following opportunities to reduce the reliance on cars and support people to walk, cycle and use public transport:
  - a. For connectivity to the wider network, the ITA recommends footpath extensions on Ken Browne Drive and Sir Tristram

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<sup>1</sup> <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/>

Avenue, and a shared walking and cycling path be provided on the southern side of Sir Tristram Avenue between the proposed residential access intersection and the service lane. This shared path will lead pedestrians / cyclists to a pedestrian crossing (zebra) on a RSP to cross the service lane and connect pedestrians safely from the new path to a new signalised mid-block crossing on Te Rapa Road which proceeds to connect to the existing 3 m wide path on the eastern side of Te Rapa Road. (This is captured in proposed Rule 4.8.12 of the PC13 provisions).

- b. For public transport, the southbound bus stop on Te Rapa Road is also recommended to be relocated to reduce the walking distance from the signalized mid-block crossing.

**Staging of Transportation Infrastructure Improvements**

109. Table No: 1 below is copied from the ITA (Table No: 12). It summarises the recommended transportation infrastructure upgrades and timing. The upgrade triggers relate to transport capacity and safety improvements associated with the advancement of the proposed development stages of PC13. These improvements relate to the associated number of trips that are expected to be generated and distributed on the local road network as the site is successively developed. The infrastructure upgrades and timing are reflected in the proposed plan provisions, Rule 4.8.12.

**Table No: 1**

Staging of Transportation Infrastructure Improvements		
No.	Proposed Upgrade	Development Stage Trigger
1	Upgrading of Te Rapa Road / Sir Tristram Avenue intersection (Refer to Figure 13)	When access to Sir Tristram Avenue is provided. OR Prior to the issuance of code compliance certificates under

		section 95 of the Building Act 2004 for more than 60 residential units (or equivalent to 70 vehicle trips per peak hour generated by PC13 through Te Rapa Road / Garnett Avenue / Vardon Road intersection)
2	Extension of existing footpath on the north-eastern side of Ken Browne Drive to connect to residential development and the provision of a raised safety platform across Ken Browne Drive at the existing splitter island on Ken Browne Drive / Garnett Avenue / Minogue Drive roundabout	Prior to the issue of any code compliance certificates under section 95 of the Building Act 2004 for any residential units
3	Extension of existing footpath on the northern side of Sir Tristram Avenue to the existing bus stop located 110 m northwest of Te Rapa Road / Sir Tristram Avenue intersection	When access to Sir Tristram Avenue is provided.
4	Construction of new shared path on the southern side of Sir Tristram Avenue to the Te Rapa service lane; Provision of a raised safety platform pedestrian crossing (zebra) across the service lane. Provision of a raised safety platform staggered mid-block signalised crossing over Te Rapa Road (Refer to Figure 19)	When access to Sir Tristram Avenue is provided.

\* This is based on the predicted trip distribution (Figure 26 of the ITA) to Te Rapa Road / Garnett Avenue / Vardon Road intersection and the assumption that Ken Browne Drive access will be provided from the outset.

## RESPONSE TO SUBMISSIONS RAISED

110. I have read the submissions and further submissions lodged by submitters on PC13 where traffic / transportation matters are raised. I address these submissions by topic in my evidence to follow.

### **Te Rapa Road / Garnett Avenue Intersection**

111. McMac Properties Limited (submission #1) raises concern that the intersection of Garnett Avenue and Te Rapa Road is not fit for purpose and will not cope with the additional traffic generated by PC13.
112. I refer to the ITA that accompanied the PC13 application in terms of the anticipated traffic effects and proposed infrastructure upgrades to mitigate these effects to acceptable levels. I also refer to paragraphs 97 to 99 of my evidence on the matter of intersection capacity effects at the Te Rapa Road / Garnett Avenue / Vardon Road signalised intersection and how providing infrastructure to promote and increase the use of alternative modes of transport is the key alternative to limit impacts on the performance of the intersection. Any improvement to the intersection is a wider network issue for HCC, as its performance is affected by development in the wider network and traffic growth on Te Rapa Road rather than just PC13. I consider that this sufficiently addresses the concerns raised on this matter.
113. PC13 Transportation Review – Issue 5 undertaken by Gray Matter also agrees with the ITA that improvements within the existing road boundary are not practical.

### **Ken Browne Drive**

114. McMac Properties Limited (submission #1) raises concern on where and how parking is provided to compensate for the loss of on-street parking on Ken Browne Drive.
115. Chartwell Investments Limited (submission #6) raises concern that the increased traffic on Ken Browne Drive will cause congestion, given the width of the road formation and there does not appear to be sufficient



parking for the number of houses proposed. The submitter is concerned that Ken Browne Drive will potentially be used for overflow car parking and reduce the availability for customers and staff of business in the area.

116. Mr Lyons (submission #25) raises concerns that increased traffic on Ken Browne Drive will increase risk of accidents at peak hours, and removal of parking on south-western side of Ken Browne will mean that these cars are parked on Garnett Avenue or within the residential development. The submission states there is insufficient parking at present in the industrial area which is why these car parks are full every workday.
117. In response to the loss of on-street parking raised by these submissions, I have addressed this issue in paragraphs 77 to 80 of my evidence. As sufficient off-street parking is provided at the adjacent industrial and commercial premises for customers and staff, I do not agree that there is insufficient parking in the area. I also note that roadside long-stay / commuter parking is the lowest priority in HCC's Parking Policy (August 2022) in central city / commercial, residential and employment areas (refer to PC13 Transportation Review – Issue 5 by Gray Matter). HCC is not obligated to provide on-street parking to support industrial businesses, and existing industrial businesses do not have exclusive right to occupy public road space to meet their private parking needs.
118. With regards to the concern about congestion and the suitability of the existing width of the road to accommodate the increase traffic, I have assessed the existing form of Ken Browne Drive and considered the increase in traffic volumes due to the introduction of PC13. With an estimated future traffic volume of approximately 1,250 vpd to 1,460 vpd, I maintain my conclusion that Ken Browne Drive would still best align with the District Plan's definition of a 'local road' and the One Network Framework's ("ONF") definition of a 'local street'. Therefore, the current road reserve width of approximately 20 m and the current sealed width

of approximately 7.5 m is suitable to accommodate the future traffic volumes. However, for safety reasons, I recommend that a no-parking restriction is introduced along the south-western (northbound lane) side of the road. This recommendation is supported by the submission from Fire and Emergency New Zealand (submission #2).

### **Sir Tristram Avenue**

119. Takanini Rentors Limited (submission #7) raises concern that the increased traffic on Sir Tristram Avenue will cause congestion at the intersection of Te Rapa Road and make it more difficult for traffic exiting the service lane, and there does not appear to be sufficient parking for the number of houses proposed. The submitter is concerned that Sir Tristram Avenue will potentially be used for overflow car parking and reduce the availability for customers and staff. This concern is also repeated in other submissions including Ecostream Irrigation Limited (submission #8), Mr Housley (submission #9), Mr Allen – Ecostream Irrigation (submission #10), Mr Fleet – Purewater Products (submission #11), Mr Brocket – Custom Utes (submission #12), Ms Fisher – NTB Racing (submission #13), Mr and Mrs Trethowen – Ideal Buildings (submission #14), Mr Myburgh – Ehome Building Centre (submission #15), Mr Shadbolt – Miller Electrical Ltd (submission #16), Mr Roberts – Archery Direct (submission #17), Mr Day – Keyport (submission #18), Mr Farnworth – Farnworth Investments Ltd (submission #19), Mr and Mrs Lewis (submission #20), Mr Hopkins (submission #21), Mr Findlay – Katja Hart (submission #22) and Mr Adshead - Kereru Partnership (submission #23).
  
120. Mr Lyons (submission #25) raises concern that Sir Tristram Avenue (and Ken Browne Drive) could potentially be used as short cut in peak hours to avoid the signal intersection of Vardon Road, Garnett Avenue and Te Rapa Road.

121. With regards to the concern about congestion at the Te Rapa Road / Sir Tristram Avenue intersection, I refer to the ITA that accompanied the PC13 application in terms of the anticipated traffic effects and proposed infrastructure upgrades to mitigate these effects to acceptable levels. The traffic modelling results in the ITA, with full development of the PC13 area assumed, shows that congestion on Sir Tristram Avenue is unlikely at the intersection under normal peak period operating conditions. The proposed banning of the right turn out of Sir Tristram Avenue will mean traffic will not be waiting to turn right on to Te Rapa Road and therefore will not block the service lane exit either. In my opinion, the proposed changes to the intersection (refer to paragraphs 75 and 76 of my evidence), will make it significantly safer for road users exiting the service lane to join the northbound traffic on Te Rapa Road since there will be fewer conflicting vehicle movements for drivers to be aware of with the right turn movement to Te Rapa Road removed.
122. The existing properties that have access to Sir Tristram Avenue (i.e., Vela Fishing Ltd, BestStart, Fairview Motors and Signature Homes) have sufficient parking available within their respective sites. Properties that front the service lane have parking spaces within their site as well as along the service lane. PC13 proposes to remove approximately four parking spaces along the service lane, close to the intersection with Sir Tristram Avenue and directly in front of Signature Homes. However, in my opinion, the benefits of removing these four car park spaces to achieve the proposed safety upgrades at the Te Rapa Road / Sir Tristram Avenue intersection and to provide a safe crossing location across the service lane for pedestrians and cyclists outweighs the disadvantages of losing four car park spaces. Signature Homes currently also has parking spaces available at the rear of their site. Therefore, in my opinion there is no need to provide parking spaces on Sir Tristram Avenue for customers and staff.

123. To address the concern of various submitters that Sir Tristram Avenue could potentially be used for overflow car parking by the proposed residential development, refer to paragraphs 134 to 138 as a similar concern has been raised by the Section 42A report. I also note that roadside long-stay / commuter parking is the lowest priority in HCC's Parking Policy (August 2022) in central city / commercial, residential and employment areas (refer to PC13 Transportation Review – Issue 5 by Gray Matter).
124. I do acknowledge My Lyons' concern that Sir Tristram Avenue and Ken Browne Drive could potentially be used as a rat-running route to avoid the Te Rapa Road / Garnett Avenue / Vardon Road intersection. Minimising the potential for this was a key driver in the design of the internal road network shown on the Precinct Plan (Figure 6). As such, I recommend that the internal road network is developed in such a way that the design will reflect low volume and low speed environment via various traffic calming and road alignment strategies. This would reduce the efficiency and attractiveness of the short-cut and therefore discourage drivers from utilising Sir Tristram Avenue, Ken Browne Drive and the internal road network to avoid the signalised intersection at Te Rapa Road / Garnett Avenue / Vardon Road.

### **Crime Prevention**

125. Chartwell Investments Limited (submission #6) raises concern that PC13 could potentially lead to an increase in crime and that pedestrians may look to take short-cuts through adjoining industrial sites due to the development site having limited connectivity. This concern is repeated in other submissions by Takanini Rentors Limited (submission #7), Ecostream Irrigation Limited (submission #8), Mr Housley (submission #9), Mr Allen – Ecostream Irrigation (submission #10), Mr Fleet –

Purewater Products (submission #11), Mr Brocket – Custom Utes (submission #12), Ms Fisher – NTB Racing (submission #13), Mr and Mrs Trethowen – Ideal Buildings (submission #14), Mr Myburgh – Ehome Building Centre (submission #15), Mr Shadbolt – Miller Electrical Ltd (submission #16), Mr Roberts – Archery Direct (submission #17), Mr Day – Keyport (submission #18), Mr Farnworth – Farnworth Investments Ltd (submission #19), Mr and Mrs Lewis (submission #20), Mr Hopkins (submission #21), Mr Findlay – Katja Hart (submission #22) and Mr Adshead - Kereru Partnership (submission #23).

126. Mr Lyons (submission #25) raises concern that there is an increased risk to safety of elderly residents of retirement homes who regularly walk in area, from increased traffic and increased crime.
127. In response to the submission on pedestrians taking short-cuts through industrial sites, I would like to highlight that this will not be possible as pedestrians / residents will not have internal access to these industrial sites. All adjoining properties will be fenced off from the residential precinct. The only access to the adjoining commercial / industrial properties will be via the proposed footpath connections on Sir Tristram Avenue and Ken Browne Drive.
128. Crime Prevention through Environmental Design (“CPTED”) is an urban design principle with a focus on reducing the incidence and fear of crime through appropriate infrastructure design. CPTED is fundamental to ensure accessible and inclusive communities, increase safety for users, minimise maintenance, manage the movement of people around areas and to discourage or encourage activities or behaviour. Objective 25.15.2.3 of the District Plan seeks to facilitate and encourage subdivision and development design to incorporate CPTED principles, so it will be taken into account at the detailed design stage.



129. Mr Lyons' concern about the safety of elderly pedestrians will be addressed by the footpath extensions and improved pedestrian connectivity I have described in paragraphs 81 to 84 of my evidence.

### **Issues for Resolving at Detailed Design Stage**

130. Mr Lyons (submission #25) raises concern that sufficient car park spaces should be provided for every dwelling off – street such that there is no overspill onto the internal roads.

131. My response to the above matter is that the issue of on-street parking is typically addressed during detailed design in consultation with the road controlling authority as part of a subdivision consent, not a Plan Change. It is important to note that the Government removed the requirement for on-site car parking from District Plans, so none can be specified for this plan change.

### **RESPONSE TO THE SECTION 42A REPORT**

132. I have reviewed the Section 42A report on PC13 that has been prepared by Ms Kylie O'Dwyer. Ms O'Dwyer relies on the Transportation Review (Issue 5) by Ms Ravenscroft and Mr Black of Gray Matter.

133. In summary, I agree with all matters addressed by Ms O'Dwyer, Ms Ravenscroft and Mr Black in relation to the transportation related concerns and submission points, and I have no further comments to add. I will proceed to address some statements in Ms Ravenscroft's and Mr Black's review in the following paragraphs which I consider require my response for clarification.

## **Matters for Clarification**

134. Ms Ravenscroft and Mr Black consider that to maintain space for two-way traffic, on-street parking will need to be restricted to one side of Sir Tristram Avenue. Any changes to on-street parking and banning of turns will require changes under the HCC Traffic Bylaw. This will require consultation and decision making through separate Local Government Act (LGA) processes. They recommend that any change in existing on-street parking should be done prior to the first stage development.
135. Ms Ravenscroft and Mr Black consider that depending on the level of parking provided on the individual lots, there is a risk of parking overspill from the residential development onto Ken Browne Drive and Sir Tristram Avenue competing with parking demand from the surrounding industrial and commercial activities, as well as race day activities.
136. To address the concern of Ms Ravenscroft, Mr Black and various submitters (refer to paragraph 119) that Sir Tristram Avenue and Ken Browne Drive could potentially be used for overflow car parking by the proposed residential development, residential lots within PC13 area have not been designed yet but are expected to be able to accommodate their own parking needs on-site. In addition, pockets of recessed parallel parking bays will be provided at certain sections of the internal local roads to accommodate visitor and overflow parking. It is important to note that the District Plan no longer includes any minimum on-site car parking requirements so none can be specified as part of this proposed plan change.
137. As for the day-to-day operations of the racecourse, the land to the north of the racetrack has been identified as a location for horse truck parking in the concept plan. This land will also be used for overflow public parking on race days. Therefore, all parking and loading needs are expected to be

accommodated within the racecourse site, with no reliance on adjoining roads.

138. However, I do agree with Ms Ravenscroft and Mr Black that to maintain adequate width for two-way traffic on Sir Tristram Avenue, a no-parking restriction should be introduced on one side of the road. I do not consider that no-parking restrictions are required on both sides of Sir Tristram Avenue due to the existing low volume of traffic using the road on most days of the week (i.e. average daily volume of 388 vpd) and the assumed percentage of the trips generated by PC13 that are likely to use the Sir Tristram Avenue access which is significantly lower than the Ken Browne Drive access (refer to Section 6 of the ITA). This parking restriction recommendation is also supported by the submission from Fire and Emergency New Zealand (submission #2).
139. As for the timing of the no-parking restrictions, I do not consider them to be installed and implemented prior to the first stage of development. I recommend the no-parking restrictions on both roads be installed before the internal road network is connected to the respective roads, which means that the no-parking restriction on Sir Tristram Avenue could be installed later compared to that on Ken Browne Drive.
140. Ms Ravenscroft and Mr Black consider that a new footpath on the western side of Ken Browne Drive would provide a safer route for pedestrians between the proposed development and Minogue Park.
141. I agree with the intent of that recommendation, however, constructing a footpath on the western side would require the removal of approximately eight to ten mature trees due to the limited berm space available. The line of mature trees is an important amenity feature of the locality, and the sloped berm would also mean that shallow retaining walls may be required to support a footpath. Alternatively, I consider the

existing footpath on the eastern side of the road with a new safe crossing point, for example a RSP (refer to 143.f), is an appropriate alternative to provide a safe accessible route for pedestrians between the proposed development and Minogue Park. A RSP crossing over Ken Browne Drive will provide a safe and seamless crossing facility along with a speed management measure on Ken Browne Drive (refer to 143.f).

142. I agree with Ms Ravenscroft and Mr Black for the minimum Local Road legal width to be increased to 16.8 m and the legal width of rear lanes to be 7 m to be aligned with the decisions version of PC5 (Peacocke) and the notified version of PC12. The typical cross-section will be in accordance with the criteria specified in Table 15-6b (Criteria for the form of Transport Corridors in the Peacocke Structure Plan) of the District Plan.
  
143. I agree with Ms Ravenscroft's and Mr Black's recommendation that the following aspects can be appropriately addressed as part of detailed design for future subdivision consents, with HCC Development Engineering team recommending appropriate conditions at that time:
  - a. Relocation of streetlight poles and traffic signs to accommodate extension of existing footpath on the northern side of Sir Tristram Avenue.
  
  - b. Use of on and off ramps for cyclists at the proposed raised mid-block crossing.
  
  - c. Route for southbound cyclists past the relocated bus stop. I would like to clarify that cyclists will remain on road (same path) and treatment at the relocated bus stop will remain the same as existing situation on Te Rapa Road.

- d. Kerb extensions on both sides of the service lane to enable pedestrians to see past parked cars and past the loading bay.
- e. Construction of footpath extension on Ken Browne Drive without tree removal.
- f. Provision of speed management measures on Ken Browne Drive, for example a RSP at the Ken Browne Drive / Garnett Avenue / Minogue Drive roundabout.
- g. Number of on-street parking spaces within the proposed development.
- h. Any changes to the Te Rapa Road / Sir Tristram Avenue upgrade concept design to consider the future Bus Rapid Transit (“BRT”) network and bus priority programme. This will be identified through consultation with HCC and WRC at the time of subdivision.

144. I also agree with Ms Ravenscroft and Mr Black, and recommend that HCC:

- a. Install “No U-turn” signs at Te Rapa Road / Sir Tristram Avenue intersection for U-turn movements that have been identified as banned in accordance with the HCC Traffic Bylaw.
- b. Review and update the HCC Traffic Bylaw to include the section of service lane north of Sir Tristram Avenue as one-way.

## **CONCLUSION**

145. Based on the modelling and assessments outlined in the ITA and this evidence in chief, I remain of the opinion that PC13 can be appropriately

supported by the existing road network with recommended transportation infrastructure upgrades (as I have detailed), to maintain appropriate levels of safety and efficiency on the adjoining network.

146. In my opinion, the revisions to the PC13 provisions (as outlined in the evidence of Mr John Olliver) appropriately address and respond to all traffic and transportation matters raised by submitters, the Section 42A report and the Transportation Review by Gray Matter. Appropriate triggers to ensure that all the required upgrades are implemented in a timely manner have been included in the revised PC13 provisions, as I have also outlined above.
147. Therefore, it remains my conclusion, that there are no outstanding traffic or transport reasons why PC13 should not be approved.



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**Sivakumaran Balachandran**  
**Dated: 26 July 2023**

## **ATTACHMENT 1**



**Table No: 2**

Crash History 2017 – 2022						
Location	Total Crashes	Crash Severity				Comments
		Death	Serious	Minor	Non-injury	
Ken Browne Dr	1	0	0	1	0	Th minor injury crash involving a pedestrian walking on the carriageway towards the Racecourse on a race day. A vehicle had drove past, striking the pedestrian.
Sir Tristram Ave	0	0	0	0	0	No crashes reported
Te Rapa Rd / Garnett Ave / Vardon Rd intersection	15	0	0	2	13	Rear-end collisions were the most common crash type with drivers failing to stop or slow down for signals. This is a common type of crash at signalised intersections. One minor injury crash involved a turning vehicle onto Te Rapa Road failing to give way to a through moving vehicle. Another minor injury crash involved a vehicle travelling northbound on Te Rapa Road failing to stop at red traffic light signals and crashing into a southbound vehicle turning right into Garnett Ave.
Ken Browne Dr / Garnett Ave / Minogue Dr roundabout	1	0	0	0	1	Involved a driver intentionally crashing into another vehicle for unknown reason.
Te Rapa Rd / Sir Tristram Ave intersection	3	0	0	1	2	The minor injury involved a rear-end collision when a vehicle travelling northbound on Te Rapa Rd failed to stop or slow down for the queue ahead.

## **ATTACHMENT 2**





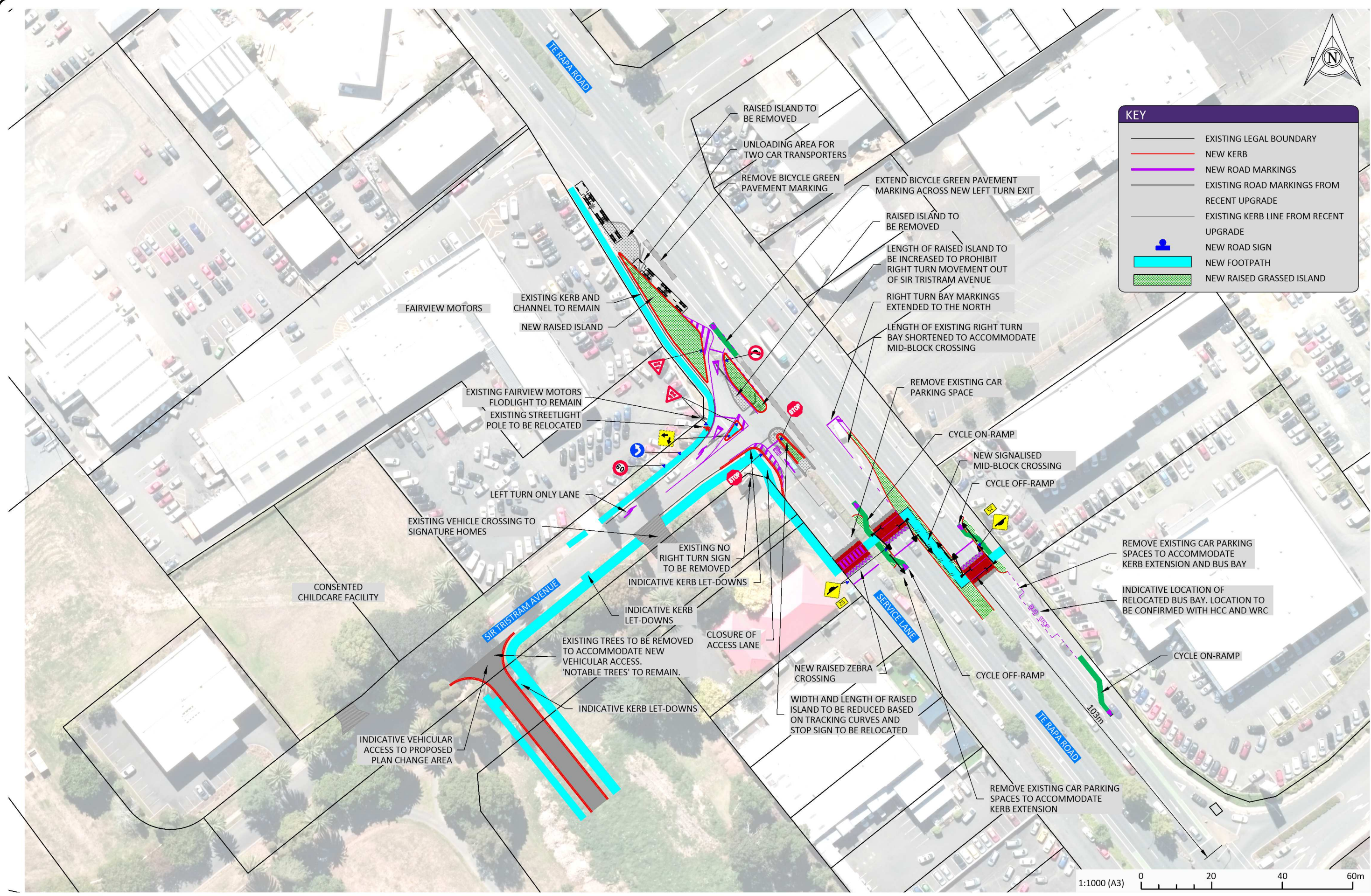
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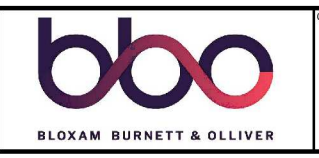
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	NEW ROAD SIGN
	NEW FOOTPATH
	NEW RAISED GRASSED ISLAND



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NO	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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D	08.06.2022	ADDED INDICATIVE KERB LET-DOWN LOCATIONS	SKB	CI	CI
C	23.03.2022	ADDED FOOTPATH ALONG SERVICE LANE	SKB	CI	CI
B	04.10.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI
A	12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

DESIGNED	CHECKED
SKB	CI
DRAWN	APPROVED
SKB	CI



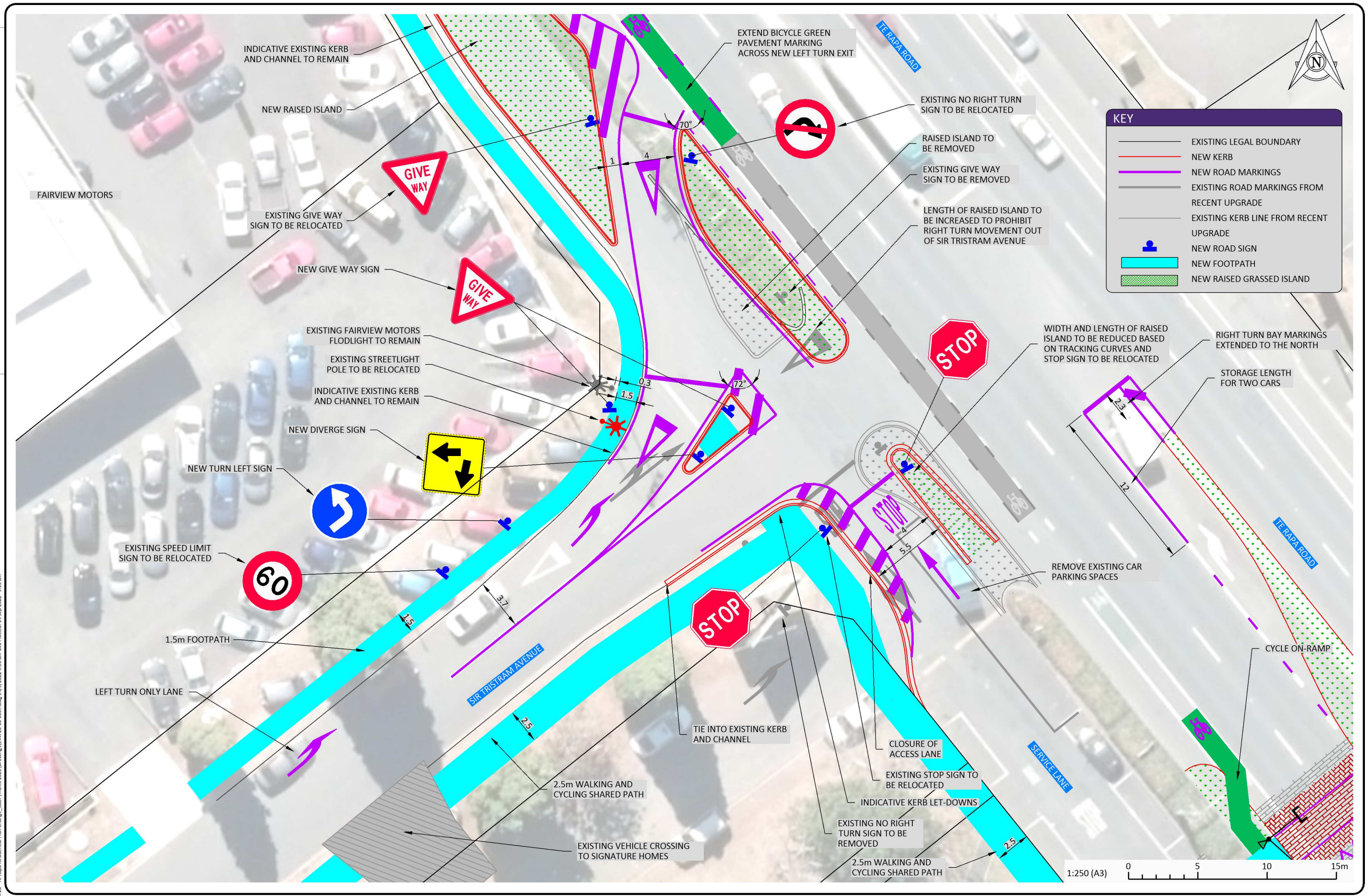
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**TE RAPA RESIDENTIAL PLAN CHANGE**

DRAWING  
**TE RAPA ROAD / SIR TRISTRAM AVENUE INTERSECTION CONCEPT DESIGN GENERAL ARRANGEMENT PLAN**

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Version 4.0 - March 2020



DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR	
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D	08.06.2022	ADDED INDICATIVE KERB LET-DOWN LOCATIONS	SKB	CI	CI
C	23.03.2022	ADDED FOOTPATH ALONG SERVICE LANE	SKB	CI	CI
B	04.10.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI
A	12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

DESIGNED	CHECKED
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DRAWN	APPROVED
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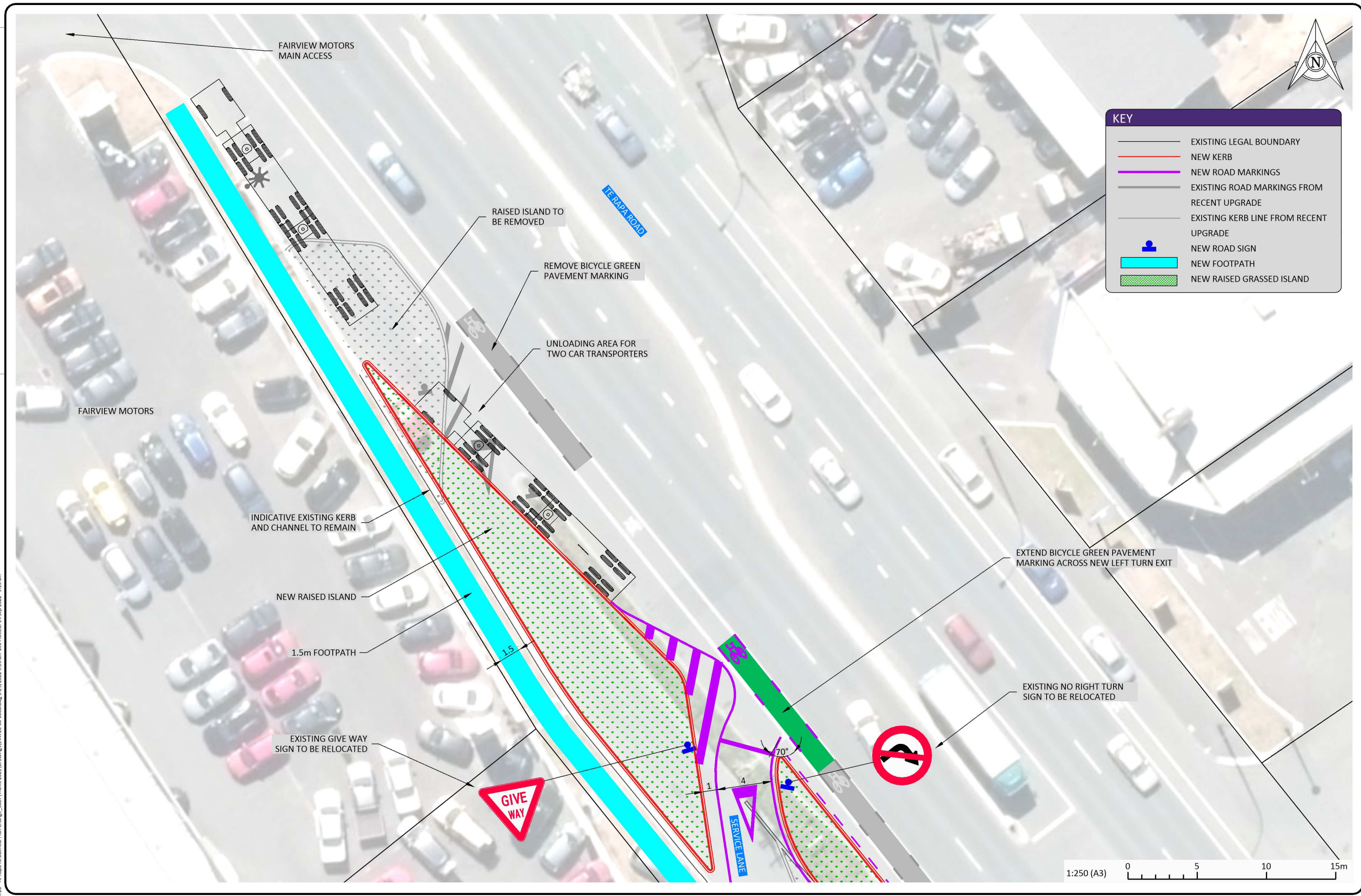
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**TE RAPA RESIDENTIAL PLAN CHANGE**

DRAWING  
**TE RAPA ROAD / SIR TRISTRAM AVENUE INTERSECTION CONCEPT DESIGN ENLARGEMENT PLAN SHEET 1**

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Version 4.0 - March 2020



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A	12.08.2021	FOR RESOURCE CONSENT APPLICATION	SB	CI	CI

DESIGNED	CHECKED
SB	CI
DRAWN	APPROVED
SB	CI

**bbo**  
BLOXAM BURNETT & OLLIVER

CLIENT  
**Te Rapa**  
Waikato Racing Club

PROJECT  
**TE RAPA RESIDENTIAL PLAN CHANGE**

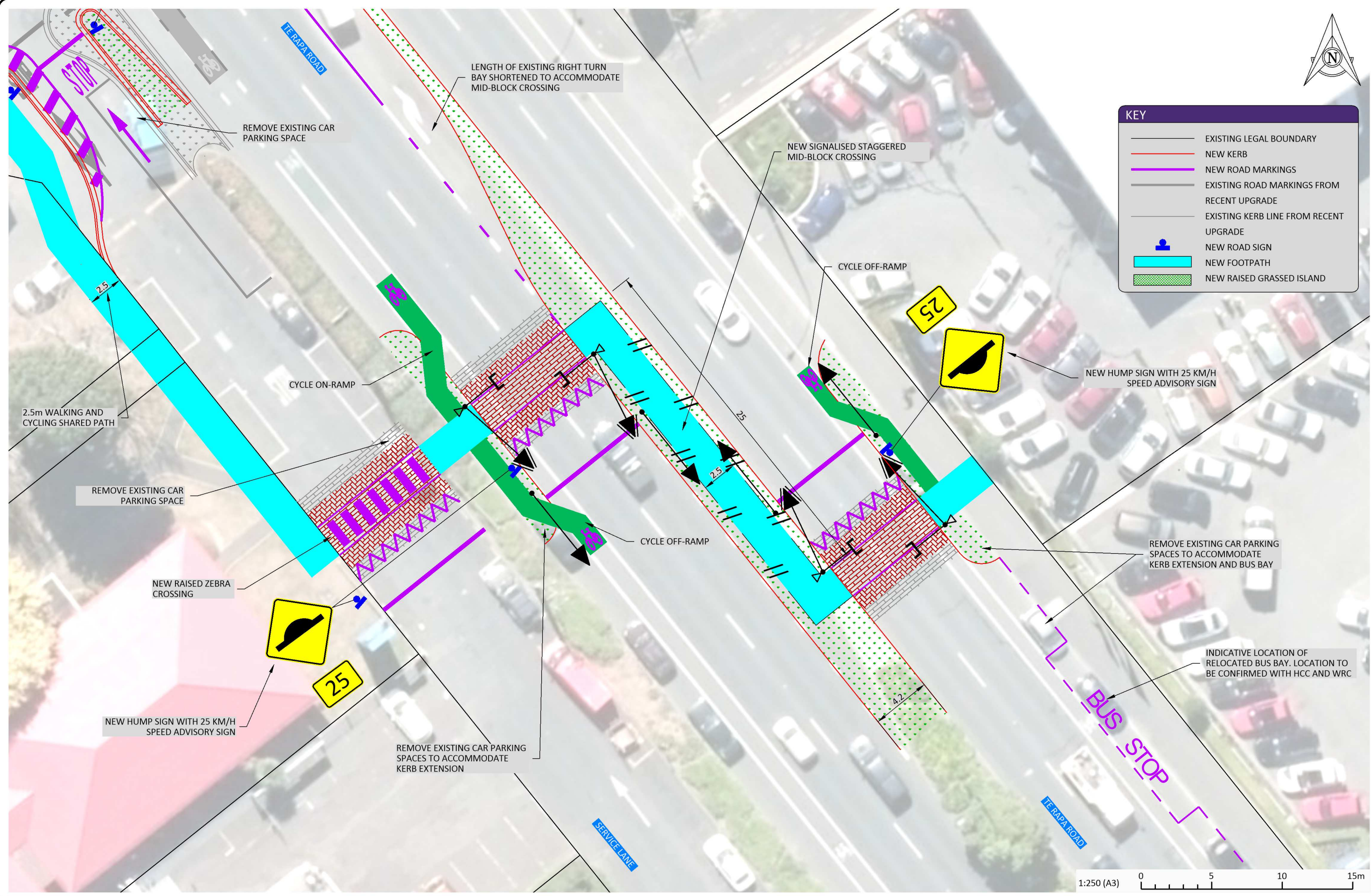
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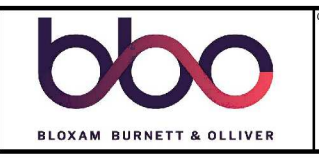
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	NEW ROAD SIGN
	NEW FOOTPATH
	NEW RAISED GRASSED ISLAND

DATE	ISSUE/REVISION DETAIL	SKB	CI	CI
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DESIGNED	CHECKED
SKB	CI
DRAWN	APPROVED
SKB	CI



PROJECT  
**TE RAPA RESIDENTIAL PLAN CHANGE**

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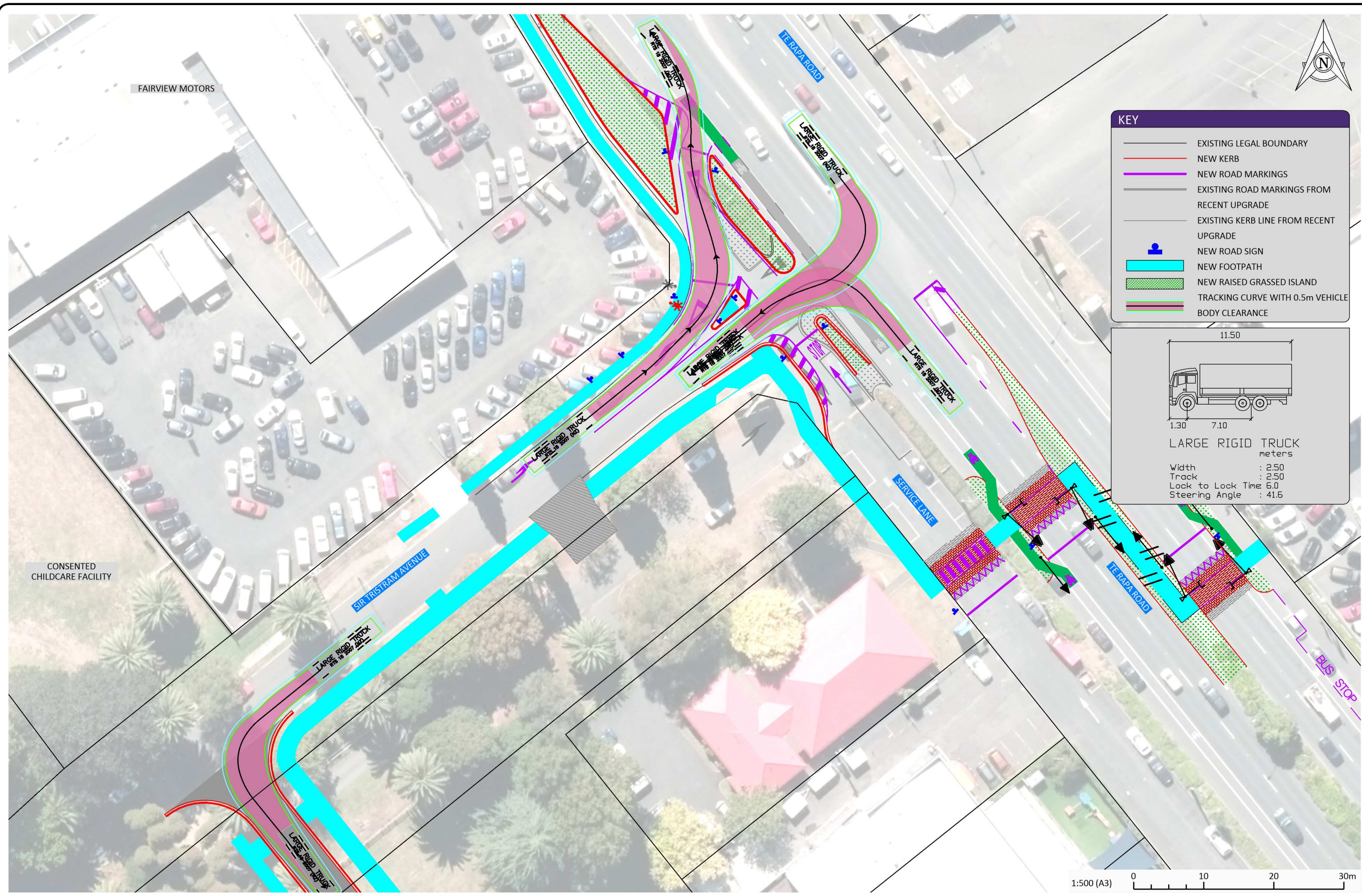
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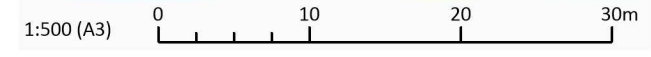
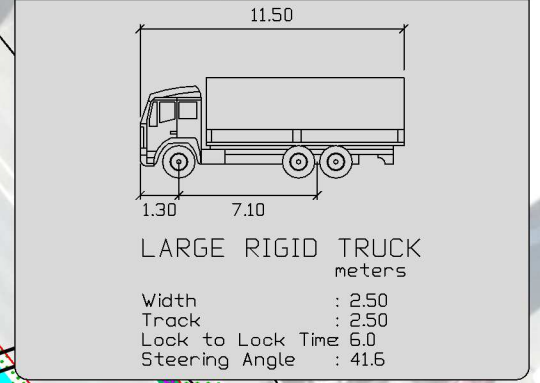
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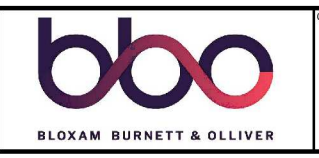


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	NEW FOOTPATH
	NEW RAISED GRASSED ISLAND
	TRACKING CURVE WITH 0.5m VEHICLE BODY CLEARANCE



DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR	
D	18.08.2022	ADDED MID-BLOCK CROSSING ON TE RAPA ROAD	SKB	CI	CI
C	23.03.2022	ADDED FOOTPATH ALONG SERVICE LANE	SKB	CI	CI
B	04.10.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI
A	12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

DESIGNED	CHECKED
SKB	CI
DRAWN	APPROVED
SKB	CI



CLIENT  
**TE RAPA RESIDENTIAL PLAN CHANGE**

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LARGE TRUCK TRACKING CURVES FROM / TO SIR TRISTRAM AVENUE**

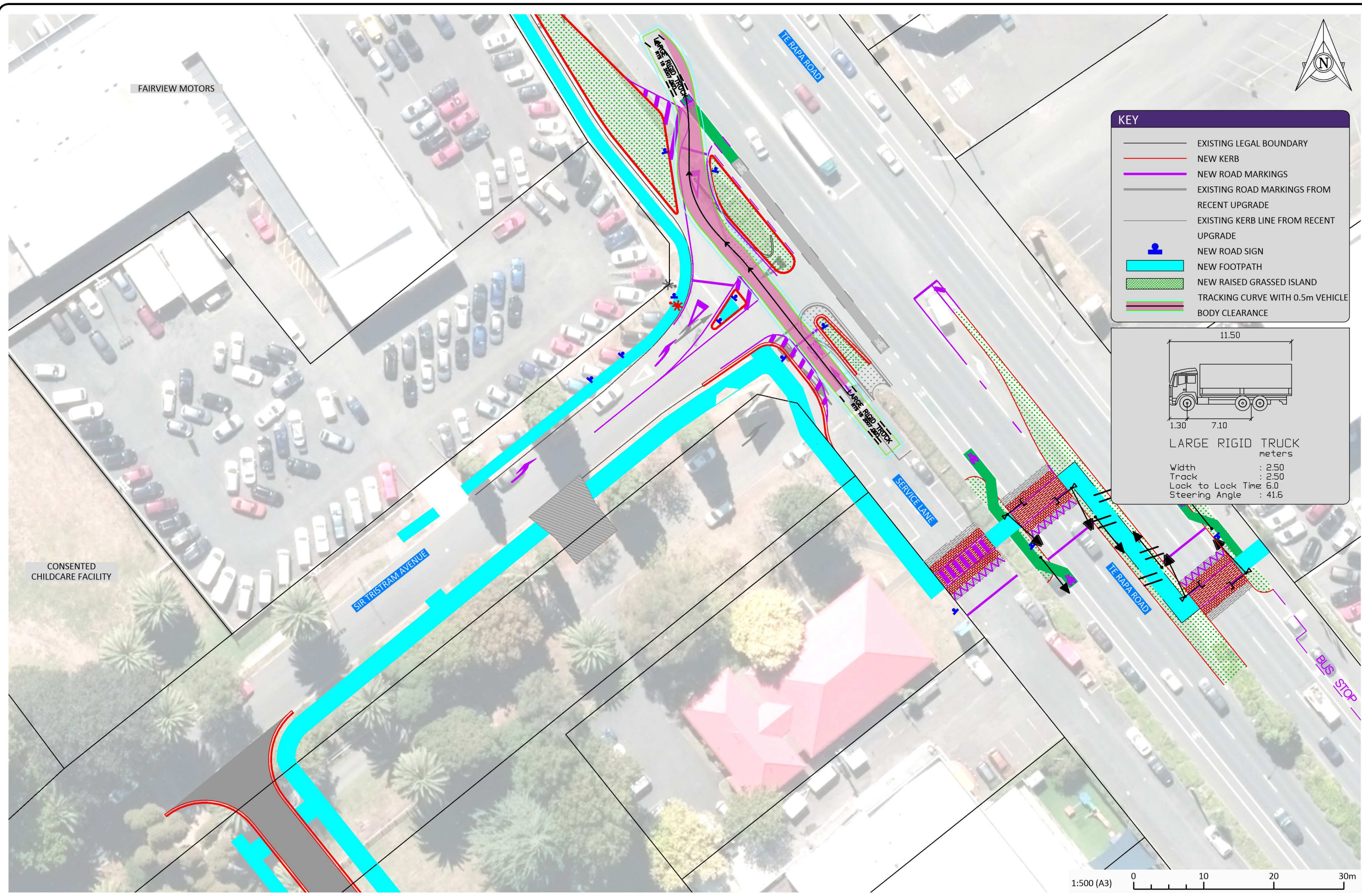
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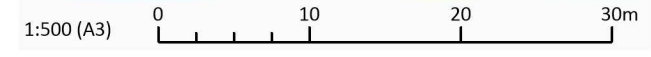
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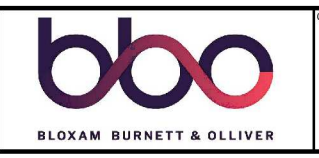
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- + NEW ROAD SIGN
- NEW FOOTPATH
- NEW RAISED GRASSED ISLAND
- TRACKING CURVE WITH 0.5m VEHICLE BODY CLEARANCE

LARGE RIGID TRUCK		units
Width	: 2.50	meters
Track	: 2.50	
Lock to Lock Time	: 6.0	
Steering Angle	: 41.5	



DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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23.03.2022	ADDED FOOTPATH ALONG SERVICE LANE	SKB	CI	CI
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12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

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SKB	APPROVED CI



CLIENT  
**TE RAPA RESIDENTIAL PLAN CHANGE**

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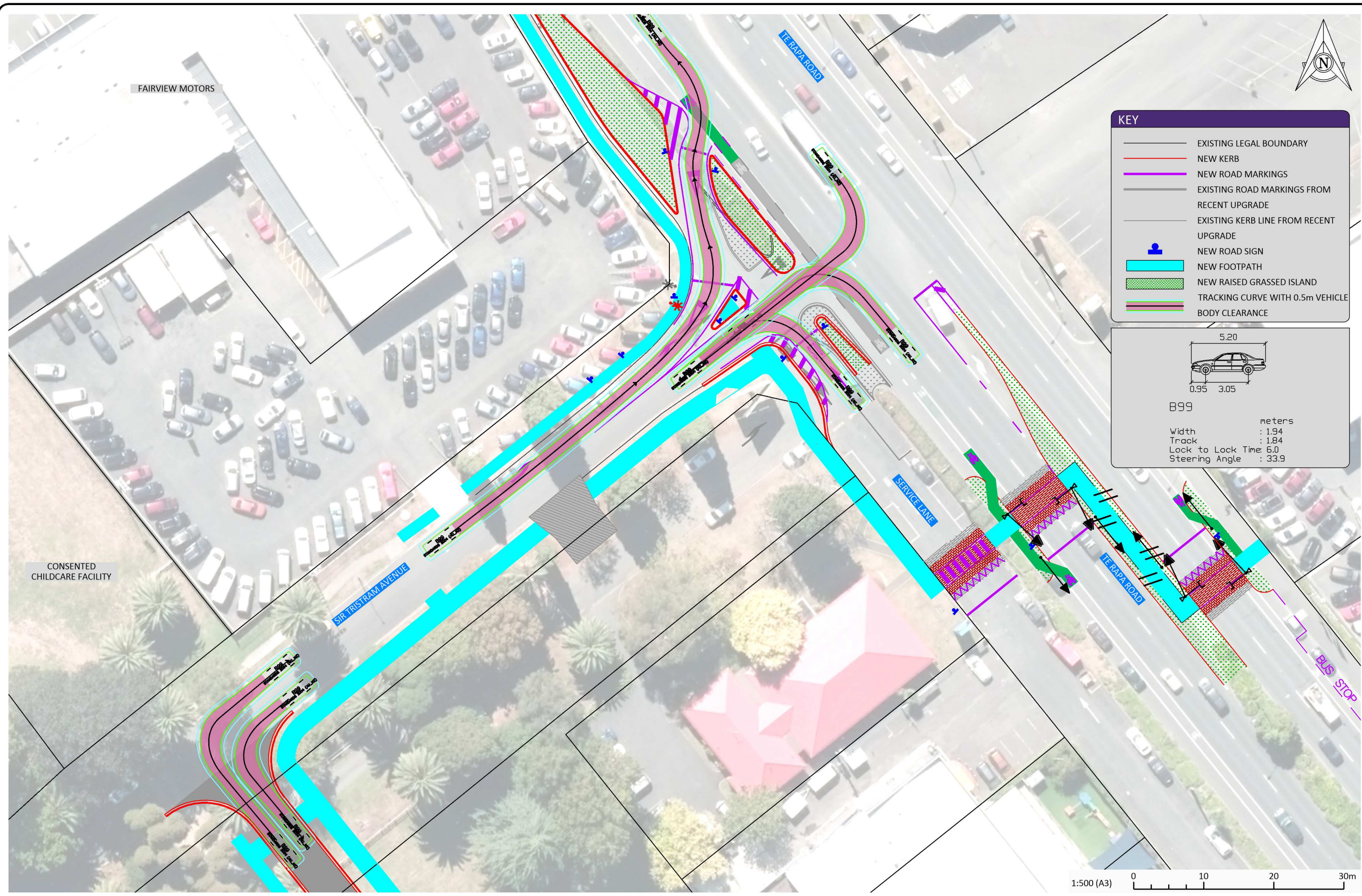
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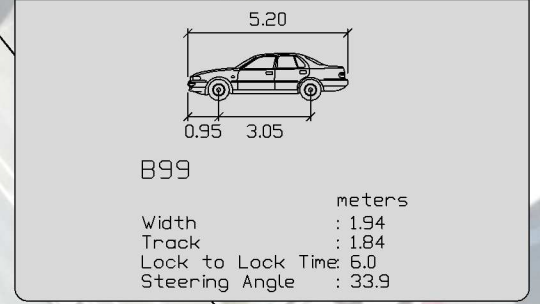
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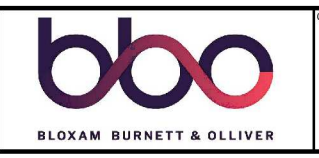
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DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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23.03.2022	ADDED FOOTPATH ALONG SERVICE LANE	SKB	CI	CI
04.10.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI
12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

DESIGNED	CHECKED
SKB	CI
DRAWN	APPROVED
SKB	CI



CLIENT

**TE RAPA RESIDENTIAL PLAN CHANGE**

DRAWING

**TE RAPA ROAD / SIR TRISTRAM AVENUE INTERSECTION CONCEPT DESIGN 99 PERCENTILE CAR TRACKING CURVES FROM / TO SIR TRISTRAM AVENUE**

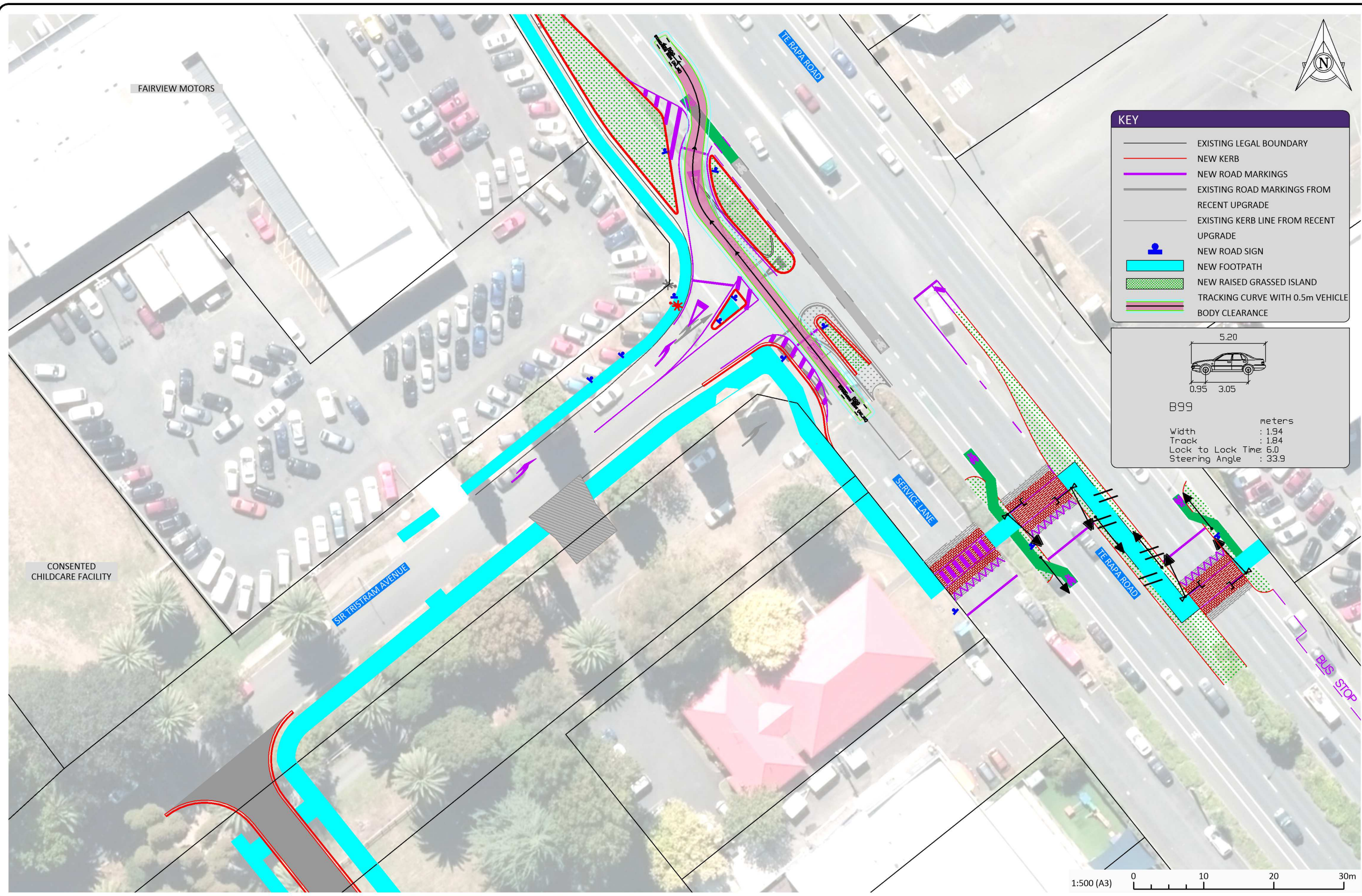
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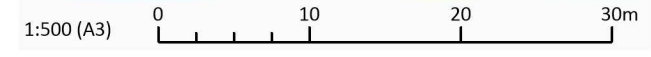
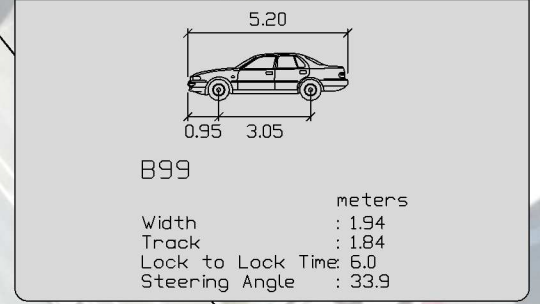
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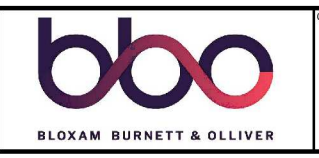


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	NEW FOOTPATH
	NEW RAISED GRASSED ISLAND
	TRACKING CURVE WITH 0.5m VEHICLE BODY CLEARANCE



DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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12.08.2021	FOR RESOURCE CONSENT APPLICATION	SKB	CI	CI

DESIGNED	CHECKED
SKB	CI
SKB	APPROVED CI



CLIENT  
**TE RAPA RESIDENTIAL PLAN CHANGE**

DRAWING  
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