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To:	Marz Asgar	From:	Chris Rossiter
	Palmerston North		Christchurch
Project/File:	310003282 100.106	Date:	22 April 2022

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**Reference: Whisky Creek Private Plan Change – Transport Engineering Review**

## 1 Introduction

This report provides a review of the transport related components of the Whisky Creek Private Plan Change application to rezone rural land north-west of Palmerston North for residential development.

### 1.1 Referenced Documents

The initial transport review was based on the following parts of the application.

1. Private Plan Change Request for Whiskey Creek Residential Area, Palmerston North. Flyers Investment Group Limited, April 2021.
2. Appendix 3: Urban Design and Landscaping Report.
3. Appendix 10: Transport Assessment Report.

Additional information has been provided by Harriet Fraser, transport advisor for the applicant on 21 April 2022 in response to matters raised in the initial review. A copy of the additional information is attached to this report.

4. Whisky Creek Plan Change 21 RFI response, Harriet Fraser Traffic Engineering and transportation Planning, 21 April 2022.
5. Flyers Line – Benmore Avenue – Meadowbrook Drive Signal Controlled Intersection Concept. Resonant Multi Disciplinary Engineering and Surveying Services, 22 April 2022.

Commentary on the additional information has been provided with information request matter.

### 1.2 General Comments

The review of the Urban Design and Landscaping Report has identified aspects of the proposed structure plan and roads that are inconsistent with the Palmerston North City Council (PNCC) Engineering Standards. It is considered that these are matters that could be addressed as part of the Engineering Approval process and do not affect the assessment of the transport effects.

The primary access to the Plan Change site will be via a new roundabout on Benmore Avenue. Although this would be expected to operate with low levels of delay, safety concerns have been identified in relation to the concept design for the proposed roundabout because the design enables high speed entry and exit for some paths. These concerns and also concerns about the effects of the design on property access will need to be addressed. Ideally, this would be completed through

**Reference: Whisky Creek Private Plan Change**

refinement of the concept design rather than being deferred to the Detailed Design as proposed in the further information response.

There are some concerns relating to the operation of the Rangitikei Street / Bennett Street signals. The information provided in relation to the signals is subjective, has no analytic basis and therefore, it is not possible to comment on whether the future performance of the signals will be acceptable or whether increasing the storage capacity of the Bennett Street approach would represent sufficient mitigation for any effects on the signal operation.

There are number of submissions that relate to the safety of school children using Benmore Avenue. Although Council has installed traffic calming measures along Benmore Avenue, since the Plan Change will increase traffic volumes on Benmore Avenue, it is recommended that a review of the school access routes is undertaken with specific consideration of whether there is a need for any widening of footpaths, any extension of the shared path network or new road crossing facilities between the Whiskey Creek site and school.

### **1.3 Development Controls**

Overall, it is considered that the Whiskey Creek Plan Change proposal can be supported from a transportation perspective subject to specific controls in relation to the vehicle access connections to the wider road network. Controls of the following form are suggested.

- A. *The Benmore Avenue / Meadowbrook Drive intersection shall be upgraded to include a public road access to the Whiskey Creek site that provides for safe movement for all transport modes.*

**Advice Note**

- a. *The design of any intersection improvements will require approval from Palmerston North City Council prior to commencement of any works.*

- B. *A new intersection to SH3 Rangitikei Line shall be constructed prior to 100 residential lots being established.*

**Advice Note**

- a. *The design of any intersection will require approval from Waka Kotahi NZ which must be submitted to Council prior to commencement of any works.*

## **2 Urban Design and Landscape Report**

### **2.1 Structure Plan**

The proposed structure plan allows for logical connections to Rangitikei Lane to the east and Benmore Avenue to the south from a new Collector Road, Road 1. Local roads are proposed to the south of Road 1 with lanes proposed to the north of Road 1. The alignment of roads and separation of intersections does not raise any concerns.

The proposed restriction of turning movements to left-in and left-out at the new intersection on Rangitikei Line could increase pressure on the SH3 / Bennett Street signals because of the increased demand for right turns from Bennett Street in the morning and from SH3 north in the evening. This is discussed further in relation to the Transport Assessment Report. The construction of a Collector Road between Benmore Avenue and Rangitikei Line is likely to attract some northbound movement from the Cloverlea suburban area.

**Reference: Whisky Creek Private Plan Change**

The location of the proposed neighbourhood commercial area close to existing residential development will limit the effects of associated traffic movements on the new residential areas but could affect the nearby, existing properties.

The urban design report does not include any discussion of the measures that could be incorporated in the local road design to promote a low speed, residential environment. It would be desirable for all roads to include measures that would actively encourage drivers to adopt speeds of 30 km/h or less.

## **2.2 Road Cross-Sections**

### **2.2.1 Collector Road**

The Urban Design Report includes proposed road cross-sections for the new roads in the subdivision. These are not aligned with the PNCC Engineering Standards for new roads.

Since Road 1 will connect to Benmore Avenue and Rangitikei Line, its function in the road network will be consistent with the function of Collector Road. The proposed carriageway width of 6.5 m is wider than required by PNCC standards but does not include provision for any on-road cycle path. With the expected operating speed of vehicles likely to be above 45 km/h and with peak hour traffic volumes expected to be over 150 vehicles per hour, provision of a cycle lane is recommended under the Austroads design standards. A shared carriageway would be appropriate if vehicle speeds can be reduced to 30 km/h.

The Structure Plan shows shared paths being provided within the reserves and beside the southernmost section of Road 1. No detail has been provided on the road cross-section for this part of Road 1. While these paths may meet recreational cycle demands, they do not provide for more direct travel towards Benmore Avenue which would be the preferred route for commuter cyclists. It is considered that the shared path network should be extended to the Road 1 / Road 2 western intersection as cyclists can use the local road network between that point and their dwellings. This will also require that an appropriately designed crossing enables cyclists to travel easily and safely between the shared path and road.

*1. Applicant to provide details of shared path widths and Road 1 cross-section between Road 2 and Benmore Avenue.*

- a. The further information provided indicates that all shared paths will be 3 m wide which is an appropriate width in this environment.*
- b. It is not clear how the 3m width will be provided where the path is beside Road 1 but there appears to be sufficient width available through 127 Benmore Avenue to create a 20 m wide road reserve which provides sufficient space for the carriageway and shared path. This represents a matter that can be managed as part of the Engineering Approval process for the new roads.*
- c. The response indicates that a shared path could be continued beside Road 1. A shared path on the western side of the road is supported.*

The proposed cross-section for Road 1 shows footpaths with a width of 1.6 m which does not meet the PNCC design standards for a Collector Road which requires 2.5 m wide footpaths. It is noted that widening the footpaths would create an opportunity for these to be marked as shared use.

Reference: Whisky Creek Private Plan Change

2. Applicant to update plans to widen all footpaths on Road 1 to 2.5 m.

a. It is agreed that Road 1 is likely to have traffic volumes that are more consistent with a local road volumes than a Collector road. The suggested widening to 1.8m is accepted.

### 2.2.2 Local Roads

The manner in which parking is provided on Local Road will influence vehicle speeds on roads. Where kerb-side parking is permitted on narrow roads, parked vehicles restrict movement width to one lane over short sections of road which contributes to slower vehicle speeds. Provision of parking in bays removes these localised restrictions and can result in higher speeds.

The proposed width for local road carriageways is 5.5 m which is below the PNCC standard of 6 m. A 6 m width is preferred as it allows for on-street parking while still providing sufficient space for emergency vehicle access. It is recommended that Road 3-8 are widened to 6 m and suggested that they are formed without parking bays.

3. Applicant to widen Roads 3-8 to 6 m or provide justification for adopting narrower carriageways.

a. The proposed provision of on-street parking in bays does not provide the same degree of traffic calming that would be associated with vehicles being parked in the carriageway. With the short lengths of these roads, the latter option is preferred. This represents a matter that can be managed as part of the Engineering Approval process for the new roads.

Road 2 has a long straight alignment which could result in vehicle speeds being higher than desirable in a residential environment. Since Road 2 is likely to carry higher volumes of traffic than the other local roads, it is suggested that parking is provided in bays on this road and that consideration be given to other traffic calming measures.

4. Applicant to widen Road 2 to 6 m or provide justification for adopting narrower carriageway.

a. The response indicates that traffic calming measures are supported. The detailed design and location of any measures can be managed as part of the Engineering Approval process for the new roads.

The proposed cross-section for the local roads show footpaths with a width of 1.6 m which does not meet the PNCC design standards for 1.8 m wide footpaths.

5. Applicant to update plans to widen all footpaths on local roads to 1.8 m or justify narrower width.

a. The response indicates that all footpaths will be widened to 1.8 m. This can be confirmed as part of the Engineering Approval process for the new roads.

Reference: Whisky Creek Private Plan Change

### 2.2.3 Lanes

The lanes for the multi-unit housing are proposed to be 4.5m wide. Although this width would allow for slow-speed, two-way movement of small private vehicles, it is noted that one-way movement is proposed. The Structure Plan does not show the direction of movement on the lanes but this can be addressed at the Engineering Approval stage.

No commentary has been provided on how waste collection services for the multi-unit housing will be managed. It is desirable for waste to be collected from close to properties to avoid the need for communal collection points which can obstruct footpaths and roads.

6. Applicant to confirm how waste collection from the lanes will be managed.

a. The response from the Applicant indicates that the lanes will be designed to accommodate waste collection vehicles. This can be confirmed as part of the Engineering Approval process for the new roads.

The lanes include small radius curves that are unlikely to be negotiable by fire trucks.

7. Applicant to confirm how access to the multi-unit housing will be provided for emergency vehicles.

a. The response from the Applicant indicates that the lanes will be designed to accommodate emergency vehicles. This can be confirmed as part of the Engineering Approval process for the new roads.

## 3 Transport Assessment Report

### 3.1 Transport Environment

The description of existing movement patterns within the Transport Assessment Report (TAR) refers to count information collected in 2016 and 2017. Given that the Average Daily Traffic Volumes on State Highway 3 (SH3) were showing moderate growth prior to 2020 and the advent of the COVID19 pandemic, it is not clear how any growth in volumes has been accounted for in the subsequent intersection analyses. For a residential subdivision of this form, it would be appropriate to consider how the surrounding road network will be operating in ten years' time.

8. Applicant to confirm what level of traffic growth has been adopted for intersection analyses.

a. Since the primary source of traffic growth at the Benmore Avenue roundabout will be associated with the new residential development, it is accepted that there is no need for any growth factor of existing volumes to be applied to the analysis.

9. Applicant to provide updated analyses taking into account ten years' growth.

a. The additional analysis information provided that takes into account the additional movements associated with the neighbourhood centre and also 2% per annum background growth demonstrates that a roundabout will still operate efficiently.

**Reference: Whisky Creek Private Plan Change**

The TAR states that there is congestion at the SH3 / Bennett Street signals currently but does not provide any details of what this means in terms of delays or queues at the intersection. This does not allow for a robust assessment of how the proposed subdivision will affect the operation of the intersection.

The analysis of crash records excludes Bennett Street and the signalised intersection with SH3. Given that this will represent one of the primary routes between the subdivision and the city centre, analysis of the road safety record is important to understand how this may be affected by the increased usage of this route.

*10. Applicant to provide road safety assessment of the route between subdivision and SH3 / Bennett Street signals.*

*a. Based on the additional information provided, it is agreed that there does not appear to be any underlying safety concerns with the road network that will be exacerbated by development of the Plan Change area.*

### **3.2 Traffic Generation**

The TIA has been based on a development potential of 158 dwellings. Following lodgement of the plan change, the applicant has indicated that the development potential could be greater at 160-170 households. Since the assessment has been based on a peak hour traffic generation rate of 1 vehicle movement per hour per household (vph/hh) which is higher than the rates observed on Meadowbrook Drive, it is considered that the small change in dwelling numbers will not have a substantial effect on the results presented in the TIA.

The Structure Plan includes provision for small commercial centre. The TAR provides no commentary on the expected traffic generation of this centre. Since this will attract customers not just from the new subdivision but also from the surrounding area, this will affect the forecast traffic volumes on Road 1 north of Meadowbrook Drive.

*11. Applicant to provide an assessment of the expected traffic generation of the proposed commercial centre.*

*a. The approach taken to modelling the effects of the commercial centre is accepted. The SIDRA analysis indicates that the roundabout will operate efficiently with forecast traffic volumes in 2032.*

### **3.3 Movement Patterns**

The 2017 intersection survey information presented in the TAR indicates that about 77% of movements were outbound from Meadowbrook Drive in the morning peak hour compared with 30% in the evening peak. On this basis, the rates of 75% and 25% for the new subdivision adopted in the TAR are reasonable.

The same survey information indicates that only 10% of movements to / from Meadowbrook Drive were to Benmore Avenue west in the morning peak period. This increases to 45% in the evening peak period. While the TAR states that the movement patterns have been used to forecast the future movement patterns, it is not clear how that has been achieved. The TIA has assigned some traffic movements to the north but has not stated the basis for this assignment. There are also inconsistencies

**Reference: Whisky Creek Private Plan Change**

in the forecast usage of Benmore Avenue (Table 2 suggests 64 vph in the evening peak but Paragraph 3.3 suggests 72 vph).

12. Applicant to provide details of the traffic distribution analysis.

- a. Neither the ITA nor the further information provided include turning counts for the Rangitikei Street / Bennett Street signals and so it is not possible to confirm whether the proportions of traffic heading north are accurate. However, a cross check with Census information does suggest that 10-15% of movements for employment travel will be to the north and east and on that basis, it is expected that a similar pattern of movement will arise with the new residential zone.
- b. The information provided in relation to the split between travel on Rangitikei Line and Bennett Street / Benmore Avenue is subjective. It is accepted that the choice of route will be influenced by driver preference and also their end destination. In practice, there will be adequate capacity on both routes to accommodate the forecast traffic volumes.

13. Applicant to provide details of expected changes in traffic volumes on Gillespies Line, Milson Line or Rangitikei Line.

- a. The information provided does not include any indication of the north / south split at the Benmore Avenue / Gillespies Line intersection. It is likely that the dominant flows will to / from the south towards the central city.
- b. Based on the information provided, traffic volumes on Rangitikei Line could increase by up to 30 vph at peak times. With existing peak hour volumes of over 1,000 vph, it is accepted that this increase is unlikely to contribute to any noticeable effects.
- c. While there could be some changes in traffic volumes using Milson Line, given the distance from the Plan Change area, it is accepted that any change will be small and unlikely to have any noticeable effects.

### 3.4 Intersection Performance

The TAR provides an assessment of the expected performance for the roundabout that is proposed on Benmore Avenue. While the basis of the forecast traffic flows is vague, a roundabout in this location would be expected to provide a good level of service. The SIDRA analysis that has been presented allows for some background growth to reflect changes since 2017 but does not appear to allow for growth beyond 2022.

The TAR states that the SH3 / Bennett Street signals are subject to congestion at peak times but does not quantify this. The increased flows on Bennett Street will contribute to the congestion. However, without any detailed assessment of the existing operating state, it is not possible to comment on how sensitive the performance will be to additional demands.

14. Applicant to provide a detailed assessment of the SH3 / Bennett Street signals operational performance.



Reference: Whisky Creek Private Plan Change

a. *The response provided is subjective and has no analytic basis, therefore it is not possible to comment on whether the future performance of the signals will be acceptable or whether increasing the storage capacity of the Bennett Street approach represents sufficient mitigation for any effects on the signal operation.*

### 3.5 Roundabout Design

A concept design for a roundabout on Benmore Avenue has been presented in the TAR. No discussion has been provided on what other intersection configurations have been considered or why the roundabout configuration represents the preferred option. The following safety concerns have been identified with the concept design.

1. Three of the four approaches do not appear to have entry radii that would require vehicles to slow down.
2. No assessment has been provided on the effects on safety or manoeuvring requirements of driveways close to the roundabout.
3. Approach visibility of the island will be poor because of the small, raised island.
4. Space for pedestrians in splitter islands is too small to accommodate a cycle or prams.

Addressing these concerns will require some alterations to the roundabout concept design.

15. *Applicant to provide details of other intersection options that have been considered for this location.*

- a. *Although the approach flows are unbalanced, it is considered that a cross-roads intersection could operate efficiently because the overall flows remain low. With the low volumes, the higher number of conflict points represents less of a safety concern but could eliminate property access concerns.*
- b. *A concept design for a signalised intersection has been prepared that shows in principle that this represents a viable option.*
- c. *Overall, it is agreed that a roundabout is likely to represent the most efficient intersection configuration but as noted earlier, there are a number of safety concerns to be resolved.*

16. *Application to submit a road safety audit of the concept design.*

- a. *The response indicates that a concept design audit is not proposed and that audits are only proposed at the detailed design stage and post-construction. This represents a significant risk to the roundabout design because this is the most appropriate stage to identify any significant or serious road safety concerns and ensure that they can be addressed.*



Reference: Whisky Creek Private Plan Change

## **4 Submissions**

### **4.1 S1/4**

Based on the proposed connections between the subdivision and wider road network, the subdivision is unlikely to contribute to higher traffic volumes on Flyers Line because it does not form part of any route between the subdivision and key destinations to the North.

Although the TAR does not provide any commentary on the expected changes in the volume of movements on Milson Line and Rangitikei Line, the additional information provided indicates that any change in traffic volumes on Milson Line will not be noticeable. While there is no supporting analysis for this response, given the distance from the site, this statement is accepted. The additional information indicates that any change in peak hour volumes on Rangitikei Line will be less than 30 vph. It is agreed that this will not contribute to any noticeable effects on the operation of the road.

### **4.2 S2/3**

Based on the proposed connections between the subdivision and wider road network, the subdivision is unlikely to contribute to higher traffic volumes on Flyers Line because it does not form part of any route between the subdivision and key destinations. Similarly, the subdivision would not be expected to contribute to increased demand for travel on Milson Line.

The TAR does not provide any commentary on the expected changes in the volume of movements on Rangitikei Line. The additional information indicates that any change in peak hour volumes on Rangitikei Line will be less than 30 vph. It is agreed that this will not contribute to any noticeable effects on the operation of the road.

### **4.3 S4/1-2**

The submission seeks that the proposed streets and linkages are accepted. As noted earlier, the proposed roads include a number of departures from the Council design standards. These are matters that can be addressed through the Engineering Approval process for the new roads.

### **4.4 S5/2**

The submission seeks specific design measures for the proposed roundabout on Benmore Avenue. These relate to the detailed design which is not a matter for the subdivision approval.

### **4.5 S7/3**

The submission raises concerns about pedestrian safety at the roundabout. Concerns have also been raised in this review of the application. It is recommended that a concept design road audit of the roundabout design is undertaken to identify any other safety concerns and determine whether these could be addressed to an acceptable level.

### **4.6 S8/1**

While the Council submission generally supports the plan change, there are aspects of the road design that do not align with Council standards. These are matters that can be addressed through the Engineering Approval process for the new roads.

Reference: Whisky Creek Private Plan Change

#### **4.7 S11/1**

This is a general submission on road safety. This concern can be addressed through the Road Safety Audit process for new transport infrastructure.

#### **4.8 S12/5**

This submission relates to congestion issues on Bennett Street, Rangitikei Line and Benmore Avenue. The proposed roundabout on Benmore Avenue will operate with a good level of service which will not contribute to congestion. A well-designed roundabout will also act as a control on vehicle speeds along Benmore Avenue which will contribute to improved road safety.

The further information provided in relation to the Rangitikei Street / Bennett Street signals is subjective and has no analytic basis, therefore it is not possible to comment on whether the future performance of the signals will be acceptable or whether increasing the storage capacity of the Bennett Street approach represents sufficient mitigation for any effects on the signal operation.

#### **4.9 S13/1**

The submission relates to the operation and design of the new roundabout. These concerns will need to be addressed as part of the refinement to the roundabout concept design.

#### **4.10 S15/6**

The submission relates to traffic generation of the subdivision. Based on the analysis provided as part of the additional information from the Applicant, the traffic generation information contained within the TAR was low. However, even with the higher volume of traffic now being identified, the new roundabout on Benmore Avenue will be able to operate efficiently.

#### **4.11 S15/7-8**

The submissions relate to the operation and design of the new roundabout. Based on the analysis of the expected roundabout performance, vehicle queues will not extend to Mangaone Stream.

Safe movement paths for all transport modes represents a key design requirement for any new transport infrastructure. It is expected that this can be provided through refinement of the roundabout concept design.

#### **4.12 S15/9**

Construction of a new road through 127 Benmore Avenue does have potential to increase noise at the two adjacent properties. No assessment of the effects of any change in noise level on amenity has been provided.

The submission raises a concern about the potential effects of headlight glare on property. This will require further investigation to be undertaken in the context of any required changes to street lighting for the new roads and roundabout.

Reference: Whisky Creek Private Plan Change

#### **4.13 S17/1**

The submission seeks that the design for access to Rangitikei Line is subject to Waka Kotahi approval processes which is appropriate.

#### **4.14 S17/4**

The submission supports removal of parking on Bennett Street. This cannot be approved via the Plan Change process.

#### **4.15 S17/5**

The submission supports construction of the new roundabout.

#### **4.16 S17/7-9**

The submission seeks further information sought from the Applicant in relation to the walking and cycling networks. This could be addressed with some refinement to the structure plan.

#### **4.17 S19/1**

The submission seeks an extension of cycle facilities between the site and the local school. Since Benmore Avenue forms part of the Council's infrastructure, any alterations to provide either a cycle lane or shared path will require approval from Council.

#### **4.18 S19/2**

The submission supports construction of a roundabout subject to the design meeting the need for active modes, specifically cycling.

#### **4.19 S20/9-11**

The submission relates to the operation and design of the new roundabout.

The roundabout can be designed to be compatible with its location on a public transport route.

The roundabout concept design will need to be refined to demonstrate that it can safely cater for all modes of transport. The requirement for any design to be subject to a formal Road Safety Audit process will address the concerns raised.

#### **4.20 S20/17**

Based on the proposed connections between the subdivision and wider road network, the subdivision is unlikely to contribute to higher traffic volumes on Flyers Line west of Rangitikei Line because it does not form part of any route between the subdivision and key destinations.

#### **4.21 S20/18**

The traffic generation rates adopted by the Applicant reflect published information derived from surveys at a range of locations and are considered acceptable.

**Reference: Whisky Creek Private Plan Change**

#### **4.22 S22/3**

The TAR indicates that the proposed roundabout can operate efficiently.

#### **4.23 S22/4**

Based on the proposed connections between the subdivision and wider road network, the subdivision is unlikely to contribute to higher traffic volumes on Flyers Line west of Rangitikei Line because it does not form part of any route between the subdivision and key destinations.

#### **4.24 S26/2**

The submission relates to the operation and design of the new roundabout. The requirement for any design to be subject to a formal Road Safety Audit process will address the concerns raised.

#### **4.25 S26/3**

Development of the Plan Change area will increase traffic volumes on Benmore Avenue but volumes will remain within the capacity of the road. Based on the information provided, there are no reasons why the bus timetables would be affected.

The concerns relating to school children and movement along Benmore Avenue can be addressed but will require approval from Council.

Ngā mihi,

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Attachments:

- 1) Whisky Creek Plan Change 21 RFI response, Harriet Fraser Traffic Engineering and transportation Planning, 21 April 2022.
- 2) Flyers Line – Benmore Avenue – Meadowbrook Drive Signal Controlled Intersection Concept. Resonant Multi Disciplinary Engineering and Surveying Services, 22 April 2022.

**Reference: Whisky Creek Private Plan Change**

Attachment 1: RFI Response

# Harriet Fraser Traffic Engineering & Transportation Planning

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21 April 2022

Paul Thomas  
Thomas Planning

**Via email:** Paul@thomasplanning.co.nz

Dear Paul

## **Whiskey Creek Proposed Private Plan Change Further Information Response - Transportation**

Please find below responses to the transportation matters raised in the Stantec memo dated 29 March 2022 regarding the Whiskey Creek Private Plan Change application. Each point is addressed in turn below using the same numbering system as in the memo.

### **1. Applicant to provide details of shared path widths and Road 1 cross-section between Road 2 and Benmore Avenue.**

HF comment: As included on page 44 of the Urban Design and Landscape Report, the intention is that the shared paths would have a typical width of 3m. The cross-section of Road 1 between Road 2 and Benmore Avenue is expected to be similar to elsewhere along its length. I recognise that there is an opportunity to provide a shared path along the western side to enable a shared path link from Benmore Avenue into the site. The additional width could be taken from the parking/vegetation strip along this section.

### **2. Applicant to update plans to widen all footpaths on Road 1 to 2.5m.**

HF comment: The Structure Plan as lodged provides for 1.6m wide footpaths along both sides of the Local Collector and Local Roads. I agree as per point 5 below, that all footpaths should be at least 1.8m wide, in line with recently adopted best-practice. While Road 1 has a collector function it is expected to have traffic flows more in line with a Local Road as included in Table 3.1 of the PNCC Engineering Standards for Land Developments (PNCC Standards). Also, as shown in Figures 21 and 22 of the Urban Design and Landscape Report there is a shared path that runs parallel to Road 1 within the reserve area. As such, I do not consider it necessary to widen the path to 2.5m.

### **3. Applicant to widen Roads 3-8 to 6m or provide justification for adopting narrower carriageways.**

HF comment: For Local Roads, the PNCC Standards include a 6m wide carriageway and a 2.1m parking/ planting strip. The Structure Plan includes a 5.5m wide carriageway and two 2.25m wide parking/ planting strips. As such, it is anticipated that parking will be accommodated in parking bays and not within the 5.5m carriageway width. I note that the overall road reserve width included in the PNCC Standards is 15.5m for Local Roads which compares well with the proposed 15.2m width in the Structure Plan. As such, I consider that the proposed road reserve width can be expected to deliver the intended functions for local roads and that modifications to the detail of the cross-section can be made through the consenting process if needed.

**4. Applicant to widen Road 2 to 6m or provide justification for adopting narrower carriageway.**

HF comment: With regard to the road cross-section, see response to point 3 above. I agree that traffic calming measures should be included along Road 2. My expectation is that some or all of the intersections along this section could be constructed on raised platforms. This is a matter that can be addressed through detailed design. It is not anticipated that the delivery of traffic calming treatments will require any changes to the width of the road reserve.

**5. Applicant to widen all footpaths on local roads to 1.8m or justify narrower width.**

HF comment: I agree that all footpaths should be at least 1.8m wide.

**6. Applicant to confirm how waste collection from the lanes will be managed.**

HF comment: I agree that an 8m rigid truck will need to be able to circulate around the lane along the outer edge of the development to the north of Road 1. This will allow for both a rubbish truck and a general fire appliance to circulate around the loop. Widening will be needed to the lane width on the outer corners of the loop, this can be addressed through detailed design.

**7. Applicant to confirm how access to the multi-unit housing will be provided for emergency vehicles.**

HF comment: See comment on point 6 above.

**8. Applicant to confirm what level of traffic growth has been adopted for intersection analyses.**

HF comment: An increase in traffic growth of 10% for traffic on Benmore Avenue between the 2017 traffic counts and the 2021 assessment year. An assessment with future year increases in traffic growth on Benmore Avenue was not undertaken as part of the transportation assessment. Council are actively seeking to deter through traffic from using Benmore Avenue and in the longer term measures included in the Palmerston North Integrated Transport Initiative (PNITI) are intended to encourage freight traffic off the central city streets providing some relief to existing rat-run routes such as Benmore Avenue.

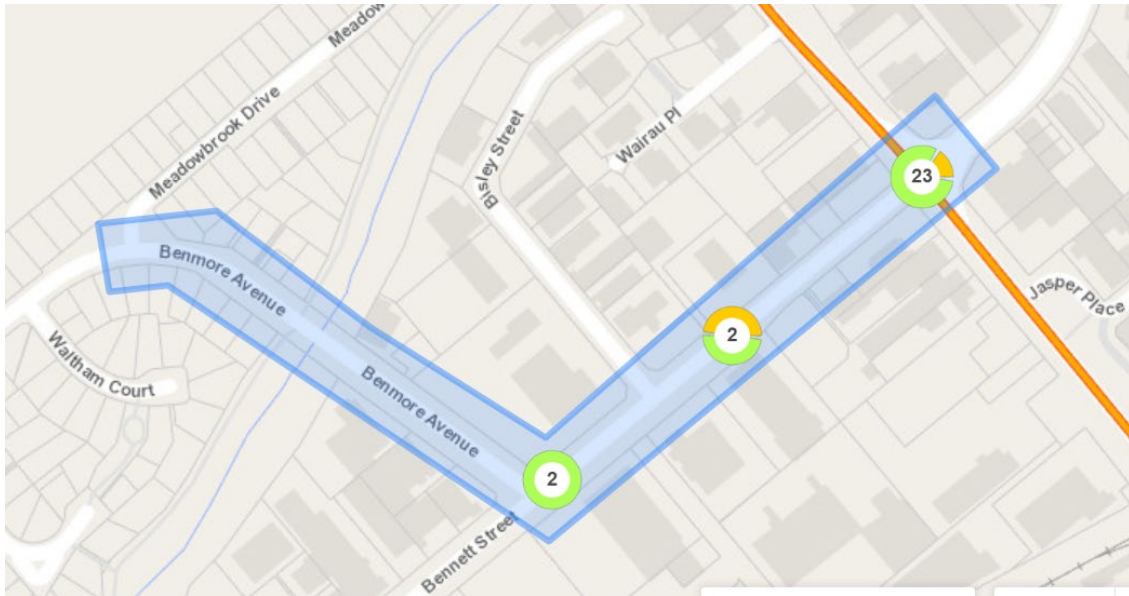
**9. Applicant to provide updated analyses taking into account ten years' growth.**

HF comment: The performance of the roundabout has been reassessed for the year 2032 including allowance for 2% per annum traffic growth for traffic on Benmore Avenue. This is reported on as part of the response to point 11 below given that the forecast traffic volumes have also been amended with regard to changes in the residential units and to include allowance for the traffic activity associated with the commercial centre.

**10. Applicant to provide road safety assessment of the route between subdivision and SH3/Bennett Street signals.**

HF comment: An extract from the Waka Kotahi NZTA crash database is included below for the period 2017 to present. As shown there have been 27 reported crashes. Of these five resulted in minor injury and the balance were non-injury crashes. Of the 27 crashes, nine included factors such as intentional collision, racing, alcohol test above limit or test refused, alcohol suspected or did not stop at steady red light. Of the remaining 18 crashes, only seven occurred during the weekday traffic peaks (7.30-9.30am, 4.00-6.00pm). Given the crash factors involved, the relatively small number of crashes during the traffic peaks, and that no serious or fatal crashes were included, there does not appear to be any underlying traffic safety concerns that are likely to be exacerbated by the additional traffic associated with the proposed rezoning.





### 11. Applicant to provide an assessment of the expected traffic generation of the proposed commercial centre.

HF comment: The transportation assessment included trip generation rates of 1.0 vehicle movements per household in the peak hours compared with the surveyed rates for Meadowbrook Drive of 0.7 and 0.9 vehicle movements per hour per household during the weekday morning and evening peaks respectively. The assumed higher rates included some allowance for traffic activity to and from the external community and the commercial centre.

Further consideration has been given to the likely traffic activity associated with the proposed commercial centre. I have been advised that it might reasonably include 1,000 to 1,200m<sup>2</sup> GFA of retail/ commercial space on the ground floor, with some 13 to 16 apartments above.

When previously investigating traffic activity associated with local commercial centres I have undertaken a traffic survey at a local commercial centre in Upper Hutt. The shopping centre in Totara Park in Upper Hutt has an estimated gross floor area of 950m<sup>2</sup> and at the time of the survey included a hairdressing salon, a fish and chip shop, a Four Square store, a Thai restaurant/ takeaway and a bar/ restaurant. The centre is located within the heart of the suburb, which has approaching 1,000 houses, and is away from through traffic routes.

The survey was done on a weekday between 2.30pm and 5.30pm. Based on the survey data, the peak trip generation rate for the Totara Park shops was 11.5 vehicle movements per hour per 100m<sup>2</sup>. This peak level of traffic activity was observed between 4.30pm and 5.30pm with lesser demands earlier during the afternoon. A trip generation rate of 12 vehicle movements per hour per 100m<sup>2</sup> GFA has been assumed for the Whiskey Creek centre. This would result in some 120 to 144 vehicle movements per hour. The following assumptions have been made:

- 20% of the trips will be associated with local residents and will not appear on the external road network;
- of the external trips, 50% will be new trips to/from the wider Cloverlea area, and 50% will be link diverted trips, that is trips already on Benmore Avenue that divert to/from the site; and
- all the new Cloverlea trips will be to/from the direction of Benmore Avenue west, given that this is where the local residential area is located.

No traffic associated with the commercial centre has been included in the weekday morning intersection analysis. Many of the activities within such a centre can be expected to still be closed during the weekday morning peak.

The forecast traffic activity associated with residential activity has been updated to reflect an increase from 157 to 168 residential lots and up to 16 apartments above the commercial centre.

I have updated Table 1 from the Transportation Assessment to reflect a 2032 future year.

Approach	Weekday Morning Peak (7.45-8.45am) (vph)	Weekday Evening Peak (4.30-5.30pm) (vph)
<b>Meadowbrook Drive L</b>	25	7
<b>R</b>	5	7
<b>Benmore Avenue (W) L</b>	0	15
<b>T</b>	369	172
<b>Benmore Avenue (E) T</b>	165	447
<b>R</b>	9	19
<b>TOTAL</b>	573	667

**Table 1: Forecast Background Traffic Flows Benmore Avenue/ Meadowbrook Drive 2032 (2% per annum growth)**

I have updated Table 2 from the Transportation Assessment to reflect the increased residential activity.

	Weekday Morning Peak (7.45-8.45am) (vph)	Weekday Evening Peak (4.30-5.30pm) (vph)
<b>Outwards</b>		
L to Benmore Ave	103	20
R to Benmore Ave	23	23
L to Rangitikei Line	11	3
<b>Inwards</b>		
L from Benmore Ave	5	61
R from Benmore Ave	28	51
L from Rangitikei Line	14	26
<b>TOTAL</b>	184	184

**Table 2: Forecast Residential Traffic Flows**

Table 3 below shows the changes in the traffic flows at the roundabout associated with the vehicles trips to/from the commercial centre.

Approach	Weekday Evening Peak (4.30-5.30pm) (vph)
<b>Meadowbrook Drive L</b>	0
T	0
R	0
<b>New Road L</b>	0
T	+8(Link Diverted)
R	+28(New) +21(Link Diverted)
<b>Benmore Avenue (W) L</b>	+29(New) +8(Link Diverted)
T	0
R	-8(Link Diverted)
<b>Benmore Avenue (E) L</b>	-21(Link Diverted)
T	+21(Link Diverted)
R	0
<b>TOTAL</b>	<b>+86</b>

**Table 3: Forecast Vehicle Trips to/from Commercial Centre**

The trips in Tables 1, 2 and 3 have been combined and are shown in Table 4.

Approach	Weekday Morning Peak (7.45-8.45am) (vph)	Weekday Evening Peak (4.30-5.30pm) (vph)
<b>Meadowbrook Drive L</b>	25	7
T	5	7
R	0	0
<b>New Road L</b>	0	0
T	103	28
R	23	72
<b>Benmore Avenue (W) L</b>	5	98
T	0	15
R	369	164
<b>Benmore Avenue (E) L</b>	165	426
T	28	72
R	9	19
<b>TOTAL</b>	<b>732</b>	<b>908</b>

**Table 4: Forecast Traffic Activity 2032**

The updated analysis from the SIDRA Intersection runs are summarised in Tables 5 and 6.

Approach	Traffic Flow (vph)	Average Delay per Vehicle (sec)	Level of Service	95th percentile queue (veh)
Meadowbrook Dv	31	7	A	0
New Road	127	6	A	1
Benmore Ave (W)	391	6	A	1
Benmore Ave (E)	209	3	A	1
<b>TOTAL</b>	<b>758</b>	<b>5</b>	<b>A</b>	<b>1</b>

**Table 5: Meadowbrook Drive/ Benmore Avenue Roundabout 2032 AM Peak**

Approach	Traffic Flow (vph)	Average Delay per Vehicle (sec)	Level of Service	95th percentile queue (veh)
Meadowbrook Dv	15	5	A	0
New Road	101	7	A	1
Benmore Ave (W)	284	6	A	1
Benmore Ave (E)	536	3	A	3
<b>TOTAL</b>	<b>936</b>	<b>4</b>	<b>A</b>	<b>3</b>

**Table 6: Meadowbrook Drive/ Benmore Avenue Roundabout 2032 PM Peak**

As shown, the forecast performance of the roundabout with the additional traffic activity remains good.

## 12. Applicant to provide details of the traffic distribution analysis.

HF comment: the estimated trip distribution is based on the following:

- i. 75% outward/ 25% inward during the weekday morning peak and the reverse during the weekday evening peak based on the traffic count of the intersection of Benmore Avenue and Meadowbrook Drive;
- ii. Based on sample turning counts for vehicles turning out of Bennett Street onto Rangitikei Street and John F Kennedy Drive, 9% of departing trips in the morning peak and 13% of departing trips in the evening peak will be towards SH3 north;
- iii. For entering trips from the direction of SH3 (city) and John F Kennedy Drive, for up to one third of the houses, inward trips may be quicker via the left turn in from Rangitikei Line than via Benmore Avenue; and
- iv. The remaining trips will be distributed in similar patterns to at the existing intersection of Meadowbrook Drive and Benmore Avenue.

It is recognised that there can be more confidence in the overall forecast level of traffic generation and the inward/outward split than for the forecast distribution pattern of the traffic onto the local road network. Traffic flows on Benmore Avenue respond to traffic flows and associated congestion on parallel routes such as Tremaine Avenue. Given the grid layout of the roads in Palmerston North and the two connection points from the site, future residents of the proposed plan change area will have options for responding to day to day traffic conditions, as occurs for nearby existing residents at present.

**13. Applicant to provide details of expected changes in traffic volumes on Gillespie Line, Milson Line or Rangitikei Line.**

HF comment: As included in the updated version of Table 2, the proposed plan change is forecast to result in up to some additional 84vph travelling along Benmore Avenue to and from the direction of Gillespies Line. These are the residential trips as the catchment for the commercial centre trips is not expected to extend to Gillespies Line. Given that this residential traffic will disperse north and south on Gillespies Line and into Cloverlea itself, the additional traffic is not expected to have any discernible effect on the safety or level of service of Gillespies Line.

Forecast increases in traffic on Rangitikei Line associated with the plan change area are no more than 30vph. Even with allowance for some through traffic to travel along Road 1 to access Rangitikei Line to head north, the percentage change in traffic flows on Rangitikei Line will be small and unlikely to be discernible from day to day fluctuations in traffic activity.

The traffic associated with the proposed plan change is expected to have no discernible effect whatsoever on the safety or level of service of Milson Line.

**14. Applicant to provide a detailed assessment of the SH3/ Bennett Street signals operational performance.**

HF comment: As included in the updated version of Table 2, the proposed plan change could result in around some additional 103vph on the Bennett Street approach during the weekday morning peak. With an average cycle time of around two minutes, on average there would be around three additional vehicles on the approach during each cycle of the traffic signals. There are two lanes at the stop line so there would be expected to be one or two additional vehicles per lane per cycle of the traffic signals. This level of additional traffic will not be discernible from day to day traffic fluctuations through the intersection.

From observations during my site visits, the biggest effect on the capacity of the Bennett Street approach to the signals is the large proportion of trucks which have an effect on both the ability for vehicles to stack efficiently at the intersection and also their slower acceleration effects the flow rate of vehicles across the stop line.

I understand that Council agree with the recommendation to consider removing the parking along Bennett Street, between the bus stop and Rangitikei Line, around four or five spaces. The benefit of the additional storage space at the stop line can be expected to outweigh the effect of the additional traffic through the intersection as a result of the proposed rezoning.

**15. Applicant to provide details of other intersection options that have been considered for this location.**

HF comment: With the intersection having four approaches, the only options are for it to be a roundabout or signalised. A cross-road arrangement is not considered feasible as the main traffic route will remain along Benmore Avenue and cross-road intersections have a high number of potential conflict points. A signalised arrangement has been sketched up and will be provided separately.

I remain of the view that the best outcome will be a roundabout with raised treatments (either on the approaches or the whole intersection). This will contribute to slow vehicle speeds at all times which in turn will assist with the safety of vehicles turning to and from nearby residential driveways.

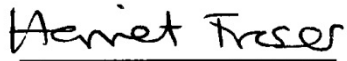
**16. Applicant to submit a road safety audit of the concept design.**

HF comment: A road safety audit of the concept design has not been undertaken. It is anticipated that both a Detailed Design and Post-Construction Road Safety Audit will be needed as the project progresses. It is recognised that one of the key safety concerns is regarding the speed that some vehicles will be able to

travel through the roundabout, albeit that the speeds will be reduced from existing speeds along this section of Benmore Avenue. One option which has merit would be to either include raised treatments on each of the approaches to the roundabout or to place the whole intersection on a raised platform. The inclusion of such treatments can be considered as part of the detailed design.

Please do not hesitate to be in touch should you require clarification of any of the above.

Yours faithfully

A handwritten signature in black ink that reads "Harriet Fraser". The signature is written in a cursive style and is underlined with a single horizontal line.

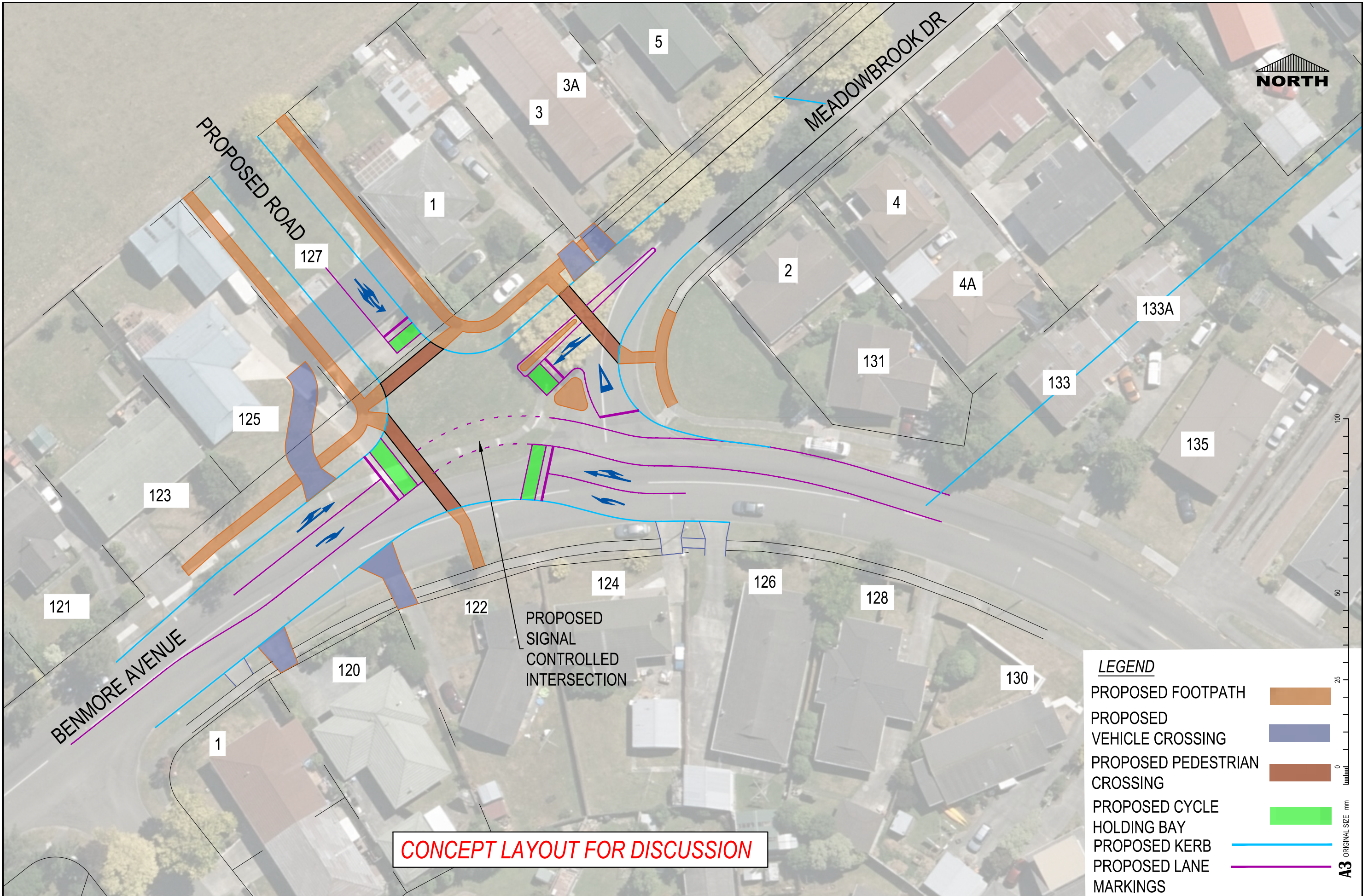
Harriet Fraser

**Reference: Whisky Creek Private Plan Change**

Attachment 2: Signal controlled Intersection Concept



J:\2002\14\214115 Higgins Group\_Urban\_Development\Palmerston North\_Cu\F04\_Civil\Engineering\214115 FLYGERS PROJECT\Production Drawings\Roundabout\214115 Intersection Signals.dwg 4/28/2022 11:27 am



**CONCEPT LAYOUT FOR DISCUSSION**

**LEGEND**

- PROPOSED FOOTPATH  25
- PROPOSED VEHICLE CROSSING  0
- PROPOSED PEDESTRIAN CROSSING  0
- PROPOSED CYCLE HOLDING BAY  0
- PROPOSED KERB  0
- PROPOSED LANE MARKINGS  0

**A3** ORIGINAL SIZE mm

1	ISSUED FOR DISCUSSION	22/4/2022


The Contractor shall check all dimensions on site.

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FLYGERS LINE - BENMORE AVENUE - MEADOWBROOK DR  
PALMERSTON NORTH

**SIGNAL CONTROLLED INTERSECTION CONCEPT**

HIGGINS GROUP

	Initials	Date

DO NOT SCALE. If in doubt ask for dimensions			
Scales A3		Job No.	
1:500		214115	
CAD Path/File	Sheet	of	Sheets
214115 Intersection Signals	1		
			Rev.
			1