

Harriet Fraser Traffic Engineering & Transportation Planning

PO Box 40170
Upper Hutt
5140
M 027 668 5872
E harriet@harrietfraser.co.nz

7 April 2021

Kevin Judd
Resonant

Via email: **KevinJ@resonant.co.nz**

Dear Kevin

Whiskey Creek Proposed Private Plan Change Transportation Assessment

Further to your request, I am pleased to provide below a transportation assessment for land on Rangitikei Line in Palmerston North which is proposed to be rezoned for residential purposes through a proposed private plan change process. The assessment that follows includes a review of the existing local transportation characteristics and a summary of the potential traffic effects associated with the development of the site for residential purposes under the proposed Residential zoning.

In summary, the findings of the assessment show that the proposed rezoning would allow for the site to be developed for residential purposes in a manner which is consistent with the District Plan traffic and transportation related objectives and policies.

1. Background

The proposed Plan Change is for the block of land shown in Figure 1.

As shown, the land lies on the northwest edge of the city immediately to the north of the Mangaone Stream. The site has road frontage onto Rangitikei Line. The site is zoned Rural and is currently used for agricultural purposes.

The assessment that follows is based on the assumption that the block of land could potentially yield up to around 157 residential lots. The following tasks have been undertaken as part of the data collection exercise:

- site visits (2017, 2020 and 2021) to the local roading network including Benmore Avenue, Meadowbrook Drive, Rangitikei Line and Flyers Line; and
- weekday traffic surveys of the Benmore Avenue/ Meadowbrook Drive intersection during each of the morning and afternoon traffic peaks in 2017.

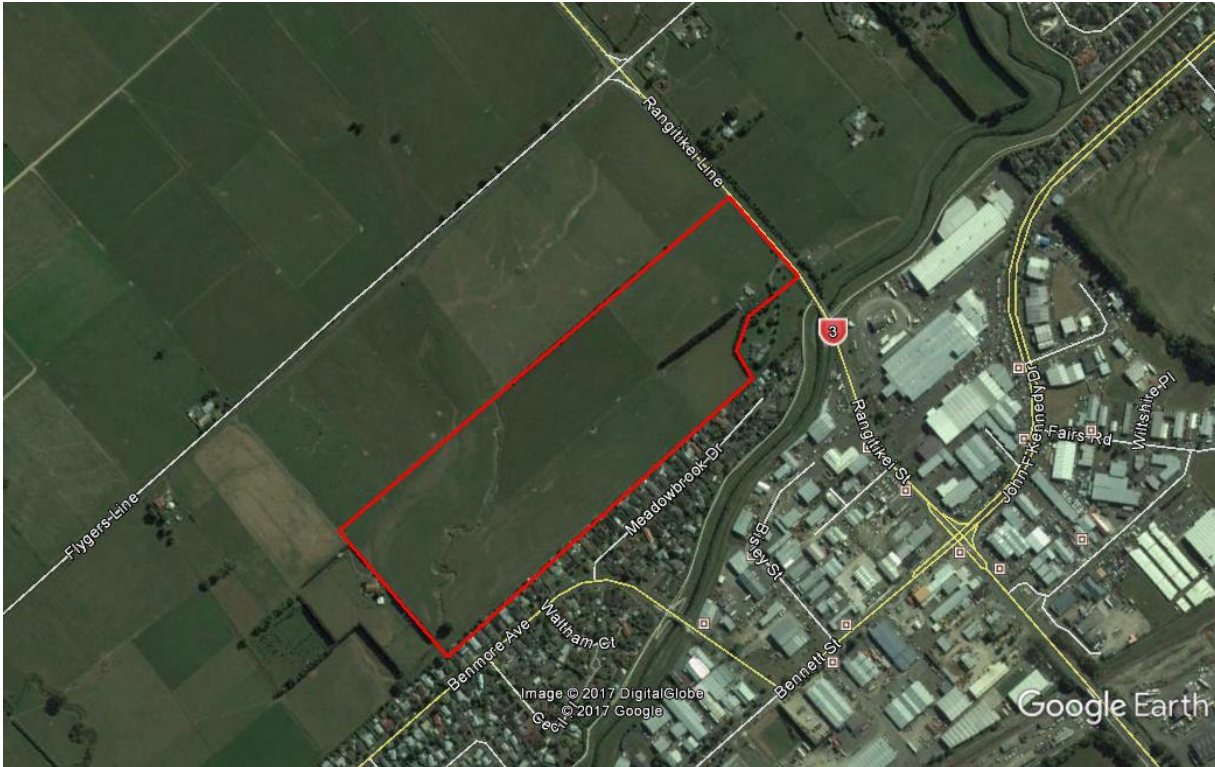


Figure 1: Extent of Proposed Plan Change

2. Local Traffic Environment

2.1 SH3 Rangitikei Line

The proposed subdivision site has a 160m long frontage onto SH3 Rangitikei Line. The site is approximately 50m to the north of the bridge over the Mangaone Stream and approximately 260m to the south of the intersection with Flygers Line. This section of SH3 has a 100km/h speed limit and has a single traffic lane in each direction with sealed shoulders as shown in Photos 1 and 2.



Photos 1 & 2: Looking South and North along Rangitikei Line Respectively

Rangitikei Line is defined as a Major Arterial in the Palmerston North District Plan which describes the function of such roads as follows:

Major Arterials are of strategic importance to the Region. They provide interconnections between areas within the City and distribute traffic from major intercity links. Access is generally at grade but may be limited. Urban traffic volumes are typically greater than 20,000 vehicles per day and rural 5,000 vehicles per day with a significant number of heavy vehicles. Typical urban operating speeds are 50 to 70km/h and rural 80 to 100km/h.

Traffic count data held by NZTA shows 2016 traffic volumes of 11,447 vehicles per day on SH3 at Flyers Line. Of these around 5% were heavy vehicles. Traffic growth over recent years has amounted to around 2.4% per annum.

2.2 Benmore Avenue

Benmore Avenue has a 50km/h speed limit and has a single traffic lane in each direction as shown in Photos 3 and 4. As shown, there are generous sight lines in each direction along Benmore Avenue from Meadowbrook Drive. An aerial image of the existing intersection is shown in Figure 2.



Photos 3 & 4: Looking East and West along Benmore Avenue Respectively from Meadowbrook Drive

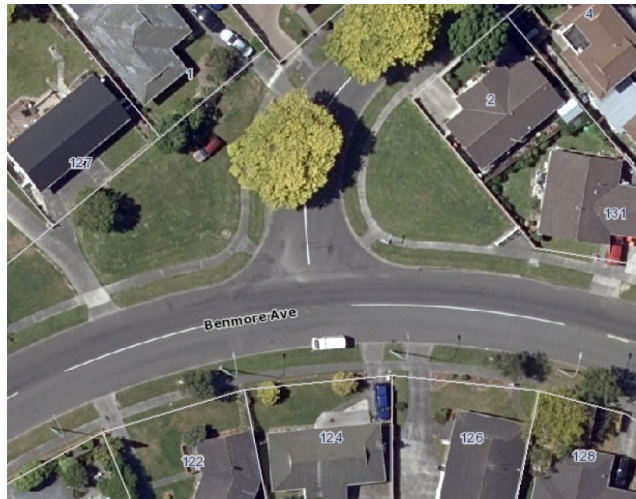


Figure 2: Benmore Avenue/ Meadowbrook Drive Intersection

The carriageway width is around 11.2m kerb to kerb with a marked centreline and occasional parked cars along the kerb. Bus services run along Benmore Avenue providing public transport access to the hospital and central City. Benmore Avenue is defined as a Collector Road in the Palmerston North District Plan which describes the function of such roads as follows:

Collector Roads provide circulation in local areas and links to arterial roads, while balancing these needs with pedestrian and local amenity values. These roads provide access for all modes of transport including public transport. Typical traffic flows are between 3,000 and 10,000 vehicles per day.

Traffic count data held by Council indicates that there are traffic volumes of around 3,300 vehicles per day on Benmore Avenue with up to 390 vehicle movements per hour at peak times. As such the existing traffic flows on Benmore Avenue are at the lower end of the anticipated range for Collector Roads.

Traffic count data collected in 2017 showed weekday morning and weekday evening traffic flows at the intersection between Benmore Avenue and Meadowbrook Drive as shown in Table 1.

Approach	Weekday Morning Peak (7.45-8.45am) (vph)	Weekday Evening Peak (4.30-5.30pm) (vph)
Meadowbrook Drive L	25	7
R	5	7
Benmore Avenue (W) L	0	15
T	284	132
Benmore Avenue (E) T	127	344
R	9	19
TOTAL	450	524

Table 1: Observed Traffic Flows Benmore Avenue/ Meadowbrook Drive

With 55 houses accessed off Meadowbrook Drive, the weekday morning and afternoon trip generation rates are 0.71 and 0.87 vehicle movements per hour per household respectively.

2.3 Walking and Cycling Links

Figure 3 shows an extract from the Council's walkway and cycleway map. As shown, paths in the vicinity of the site include in light green, the existing shared path along the Mangaone Stream and in dark green, on-road cycle lanes.

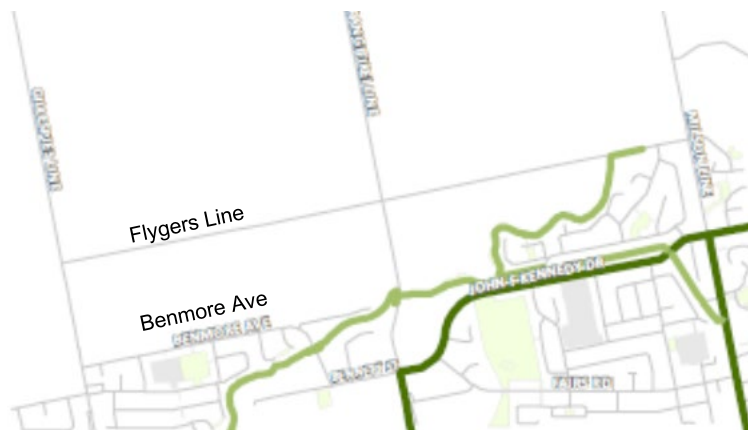


Figure 3: Cycling and Shared Path Network (Extract from Council's Active and Public Transport Plan)

2.4 Public Transport

The nearest bus stops to the site are on Benmore Avenue to the west of Waltham Court, around a 160m walk from the proposed residential area.

2.5 Local Road Safety Record

A search was undertaken of the NZTA crash database for the areas shown in Figures 4 and 5 for the period 2016 to date.

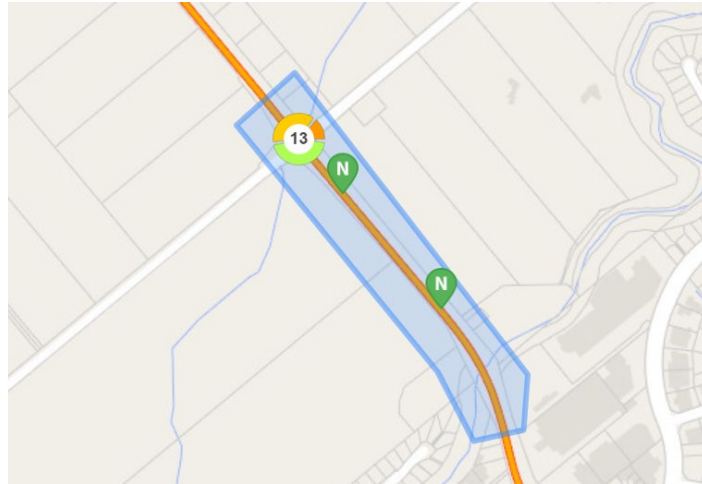


Figure 4: SH3 Rangitikei Line (Mangaone Stream to Flyers Line)

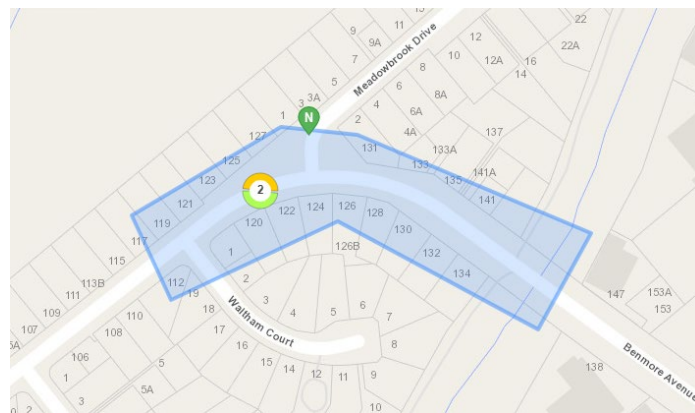


Figure 5: Benmore Avenue

As shown there have been 13 reported crashes during this period at or close to the intersection of Rangitikei Line (SH3) and Flyers Line. Of these two were serious injury, five minor injury and six non-injury. Neither of the two non-injury mid-block crashes on Rangitikei Line between the Mangaone Stream and Flyers Line involved turning vehicles.

Two non-injury and one minor injury crash were reported close to the Meadowbrook Drive intersection with Benmore Avenue. Of these crashes, one involved the crash factor of alcohol test above the limit or test refused and another the crash factor of intentional collision.

3. Proposed Plan Change

The proposed Structure Plan is included here as Figure 6. The key transportation related aspects of the Structure Plan can be summarised as follows:

- primary road connection to Benmore Avenue with a four arm roundabout created with Meadowbrook Drive;
- secondary road connection to SH3 with a left in/ left out only arrangement;
- extensive shared path network within the site which connects with the existing shared path along the edge of the Mangaone Stream at one end and with the footpath network on Benmore Avenue at the other end; and
- an indicative internal road layout that provides route choice options within the subdivision.

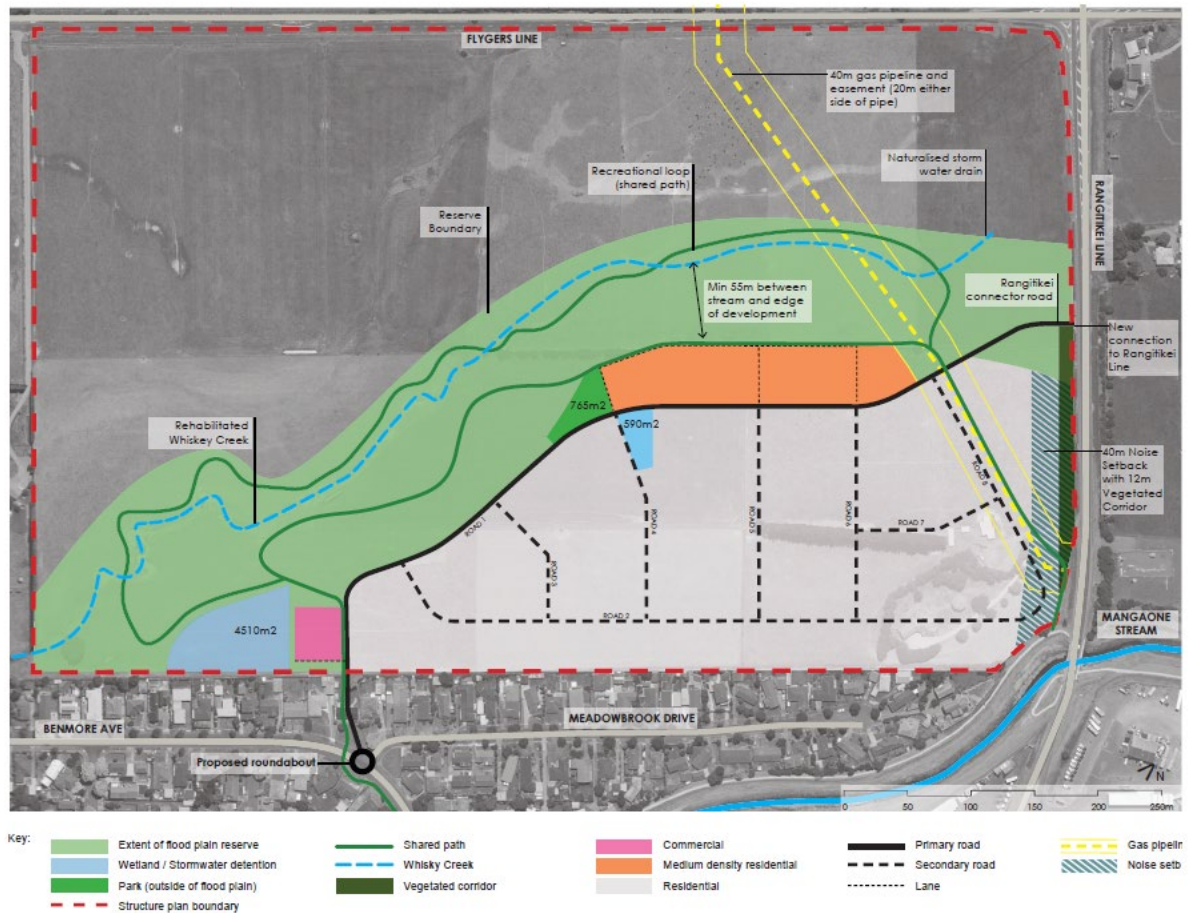


Figure 6: Proposed Structure Plan

There are three types of street within the internal road hierarchy, the collector road that connects Benmore Avenue to Rangitikei Line, the local roads that provide access to area to the south of the collector road and lanes which provide access to housing on the northern side of the collector road. The collector road has a 16.2m legal width reducing to 13.6m alongside the reserve. The local roads have a legal width of 15.2m and the lanes are 4.5m wide and are intended to operate as a shared space with vehicular traffic travelling in a one-way direction. Cross-sections of the collector and local road street types are included in Figure 7 below.

The Plan Change documents show the potential to accommodate up to 157 dwellings along with a commercial area (1,200m² GFA). Trip generation rates of 1.0 vehicle movements per household in the peak hours and 10 vehicle movements per day per household have been adopted to include some allowance for vehicle activity associated with the commercial space. As included earlier, weekday morning and afternoon trip generation rates of 0.7 and 0.9 vehicle movements per hour per household respectively were recorded for Meadowbrook Drive. As such it is anticipated that the site could generate the following traffic activity:

- 1,570 vehicle movements per day; and
- 157 vehicle movements per hour during the weekday traffic peaks.

Based on the traffic count of the intersection of Benmore Avenue and Meadowbrook Drive it is forecast that the directional split will be 75% (118vph) outwards during the weekday morning peak and inward during the weekday evening peak. With 25% (40vph) inwards during the weekday morning peak and outward during the weekday evening peak. Using a combination of the distribution from the traffic counts of the intersection of Benmore Avenue and Meadowbrook Drive, sample turning counts for vehicles turning out of Bennett Street onto Rangitikei Street and John F Kennedy Drive along with the assumption that 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, the forecast trip distribution is shown in Table 2.

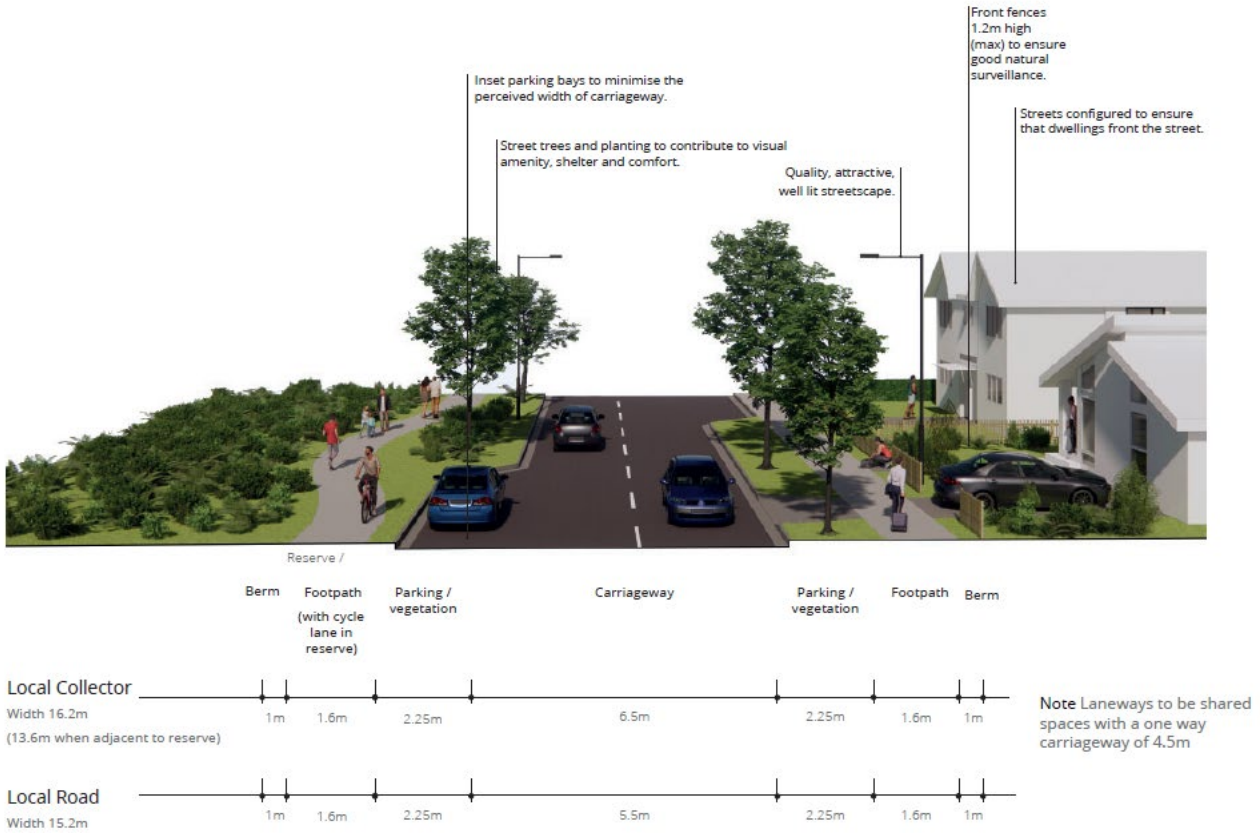


Figure 7: Proposed Street Cross-Sections (from Urban Design Report)

	Weekday Morning Peak (7.45-8.45am) (vph)	Weekday Evening Peak (4.30-5.30pm) (vph)
Outwards		
L to Benmore Ave	89	17
R to Benmore Ave	20	20
L to Rangitikei Line	9	3
Inwards		
L from Benmore Ave	4	52
R from Benmore Ave	24	44
L from Rangitikei Line	12	22
TOTAL	158	158

Table 2: Forecast Traffic Flows

The key potential off-site traffic effects associated with the proposed plan change and associated residential development are:

- safe connection to SH3 Rangitikei Line;
- safe and efficient connection to Benmore Avenue and Meadowbrook Drive; and
- safe and efficient movement of additional traffic through the local road network.

Each of these potential traffic effects are discussed in turn below.

3.1 SH3 Rangitikei Line

Given the 100km/h speed limit, proximity to the Flyers Line intersection to the north and the Mangaone Stream bridge to the south, along with the poor crash history at the Flyers Line intersection, the proposed connection to Rangitikei Line is left in/ left out only. In this location approximately midway between the bridge and Flyers Line, the sight line for exiting drivers towards northbound SH3 traffic is maximised while ensuring an appropriate degree of separation from the nearby Flyers Line intersection. At the detailed design stage it will be necessary to ensure that the design prevents any risk of drivers making right turns in this location.

With regard to likely turning volumes and as included in Table 2, no more than 22 vehicle movements per hour are expected for each of the left turns. This level of traffic activity can be safely and efficiently accommodated. It is recommended that the detailed design of the internal collector road is used to discourage through traffic from travelling through the subdivision to access SH3 to the north.

3.2 Benmore Avenue/ Meadowbrook Drive

The proposed Structure Plan includes the new collector road connecting onto the existing Meadowbrook Drive intersection with Benmore Avenue and forming a four arm roundabout. A concept design for the roundabout is included here as Figure 8. As for the existing intersection, the roundabout would be around 350m from the Bennett Street intersection and around 90m from the Waltham Court intersection. The road reserve is wide in this location and it is anticipated that adequate sightlines can be achieved between the approaches. A roundabout in this location will usefully assist in reducing vehicle speeds, noting that Council is separately investigating adding speed control devices further to the west on Benmore Avenue. Raised treatments could be used on the approaches or the whole intersection could be raised to further reduce vehicle speeds and increase safety for pedestrians and cyclists along with residents accessing nearby properties. Such treatments would be considered as part of the detailed design process and would be subject to road safety audit procedures.

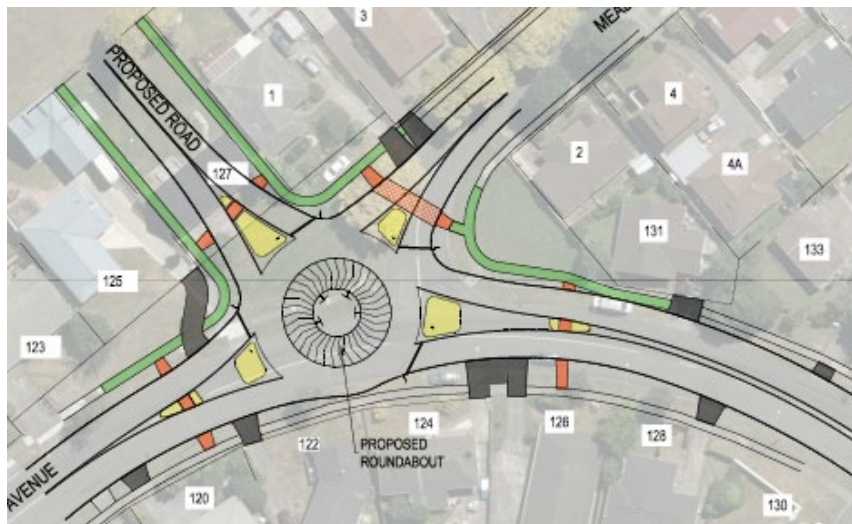


Figure 8: Concept Design for Roundabout

The intersection between Meadowbrook Drive and Benmore Avenue has been analysed with a four arm roundabout and the development traffic using the SIDRA intersection analysis tool. The AM peak results are shown in Table 3 and the PM peak results in Table 4. Allowance has been included for 10% traffic growth for through movements on Benmore Avenue since the 2017 intersection count was completed.

Approach	Traffic Flow (vph)	Average Delay per Vehicle (sec)	Level of Service	95th percentile queue (veh)
Meadowbrook Dv	31	7	A	0
New Road	110	5	A	1
Benmore Ave (W)	317	6	A	1
Benmore Ave (E)	173	3	A	1
TOTAL	631	5	A	-

Table 3: Meadowbrook Drive/ Benmore Avenue Roundabout 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	38	6	A	0
Benmore Ave (W)	212	6	A	1
Benmore Ave (E)	441	3	A	2
TOTAL	706	4	A	-

Table 4: Meadowbrook Drive/ Benmore Avenue Roundabout PM Peak

As shown, a roundabout is expected to be able to readily accommodate the additional traffic. The detailed design of the roundabout will need to include particular consideration of the nearby residential driveways and the safe accommodation of pedestrians and cyclists. Some existing kerbside parking will be removed but sections of kerbside parking will remain available nearby.

3.3 Wider Local Road Network

It is forecast that up to some additional 72vph will travel along Benmore Avenue to and from the direction of Gillespies Line during the weekday evening traffic peak. This amounts to an increase of on average around one vehicle movement per minute. No discernible change in the performance of Benmore Avenue is expected and the traffic flows will remain comfortably within the range anticipated for a Collector Road.

There is some existing peak hour traffic congestion at the signalised intersection of Rangitikei Street (SH3) with Bennett Street and John F Kennedy Drive. The proposed plan change could result in around some additional 89vph 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. The grid layout of the roading network also means that future and existing residents have the option of accessing the city via Benmore Avenue towards the west and then Gillespies Line and Botanical Road.

During site visits it was noted that there is some kerbside parking along the northern side of Bennett Street on the approach to Rangitikei Street. This parking was observed to restrict the storage space at the intersection, in particular due to the large number of trucks accessing the intersection. Separate to this proposal, the Council may wish to consider removing the parking along this section of Bennett Street, between the bus stop and Rangitikei Line, around four or five spaces.

4. District Plan Transportation Requirements

The proposed plan change involves the rezoning of the site from Rural Zone to Residential Zone. Objectives and policies included in the District Plan which have an influence on transportation matters within this site include:

District Plan Provision	Comment on Alignment
<p>City View Objectives</p> <ol style="list-style-type: none"> 1. <i>Planning for residential, industrial, commercial and rural-residential growth sustains a compact, orderly and connected urban form which avoids the adverse environmental effects of uncontained urban expansion into the rural zone.</i> 3. <i>The integrated and efficient provision of, and access to, infrastructure, network utilities and local services is facilitated for all residents.</i> 9. <i>Subdivisions, buildings and infrastructure are designed and constructed to promote a coordinated, healthy and safe environment.</i> 23. <i>Infrastructure operates in a safe and efficient manner, and the effects of activities which could impact on the safe and efficient operation of this infrastructure are avoided, remedied or mitigated.</i> 24. <i>All forms of transport, including public transport, walking, cycling and private vehicles are adequately provided for to assist with sustainable energy use and a healthy lifestyle.</i> 25. <i>Infrastructure and physical resources of regional or national importance are recognised and provided for by enabling their establishment, operation, maintenance, upgrading and protection from the effects of other activities.</i> 	<p>The site will connect directly into the urban road network at the intersection of Benmore Avenue and Meadowbrook Drive.</p> <p>Roading connections included to both the local and arterial road network.</p> <p>With the introduction of a roundabout at the Benmore Avenue/ Meadowbrook Drive intersection and left in/ left out only to SH3 the connections to the external road network are expected to be able to operate safely.</p> <p>The traffic associated with the residential activity that would be facilitated by the plan change is not expected to have a significant effect on the safety or performance of the local road network.</p> <p>Active modes and private vehicles can be readily accommodated within the site. It is anticipated that public transport will be accessed from the existing bus stops on Benmore Avenue.</p> <p>The connection onto SH3 is to be restricted to left in/left out only to ensure the ongoing safety of the highway.</p>
<p>Subdivision Objective 2 To ensure that subdivision is carried out in a manner which recognises and gives due regard to the natural and physical characteristics of the land and its future use and development, and avoids, remedies or mitigates any adverse effects on the environment.</p> <p>Policies</p> <p>2.1 To require lots to have areas and dimensions to meet the needs of users and to sustain the land resource by ensuring that:</p> <ol style="list-style-type: none"> 1. <i>Lots in the Residential Zone have the necessary area and dimensions to enable the siting and construction of a dwelling and accessory buildings, the provision of private outdoor space, service courts, vehicle access and parking in accordance with the relevant Permitted Activity Performance Standards.</i> <p>2.2 To ensure that all new lots have safe and adequate vehicle access from the roading network by providing that:</p> <ol style="list-style-type: none"> 1. <i>Every lot is to have access from a formed existing road, or a new road to be formed, to enable vehicles to enter the site with the dimensions of access sufficient to accommodate the level of vehicle usage anticipated. The access should be</i> 	<p>The indicative site layout includes lot sizes and shapes that allow for vehicle access to on-site parking. Noting that the NPS Urban Development 2020 removes the requirement to provide on-site parking in Palmerston North.</p> <p>The indicative site layout allows for each lot to have its own access to frontage roading. Given the individual accesses to single residential lots with frontages to local or</p>

District Plan Provision	Comment on Alignment
<p><i>designed to enable vehicles to turn within the lot and to leave it in a forward direction.</i></p> <p>2. <i>The construction is to be to a standard and of materials to support the anticipated traffic, require minimum maintenance and to control and dispose of stormwater runoff.</i></p> <p>3. <i>Any allotment with frontage to a Major or Minor Arterial road which has no alternative means of access to an existing public road in the local road network, shall have access arrangements approved by Council, in terms of an Access Management Structure Plan.</i></p> <p>2.3 To ensure safe, convenient and efficient movement of people, vehicles and goods in a high quality environment with minimum adverse effects by providing that:</p> <p>1. <i>The layout of the transport network shall, as appropriate for their position in the roading hierarchy, ensure that people, vehicles and goods can move safely, efficiently and effectively, minimise any adverse effect on the environment, make provision for network utility systems and make provision for amenity values. The layout of the transport network shall:</i></p> <ul style="list-style-type: none"> • <i>provide adequate vehicular access to each lot;</i> • <i>link to, and provide for, and be compatible with the existing and future transport networks, taking into account orderly and integrated patterns of development and adjoining developments;</i> • <i>connect to all adjoining roads, providing for choice of routes where practicable;</i> • <i>identify significant destinations and provide for safe and convenient access to these by all modes;</i> • <i>encourage multi-modal street links, providing pedestrian links; and</i> • <i>provide adequate access for emergency vehicles.</i> <p>2. <i>The development provides for a high quality public realm considering:</i></p> <ul style="list-style-type: none"> • <i>the potential for the street to be a place of recreational walking and cycling;</i> • <i>the safety and visibility of pedestrians;</i> <p>4. <i>The structure of a road shall:</i></p> <ul style="list-style-type: none"> • <i>have a design life of at least 25 years based on Equivalent Design Axle, or equivalent design methods;</i> • <i>be constructed from materials suitable for the intended use;</i> • <i>maintain adequate surface smoothness; and</i> • <i>be protected from the adverse effects of surface and ground water.</i> <p>6. <i>Urban roads are to be well lit by specifically designed street lighting, are to be constructed to such standards and in such materials as will result in minimum maintenance having regard to the anticipated levels and types of traffic.</i></p> <p>2.4 To improve land utilisation, to safeguard people, property and the environment from the adverse effects of unstable land by ensuring that:</p>	<p>collector roads the Permitted Activity Performance Standard for on-site turning does not apply. Noted.</p> <p>The site includes access to both the local and arterial network and Waka Kotahi NZTA have been consulted with regarding the SH3 connection.</p> <p>The indicative site layout allows for each lot to have its own access to frontage roading. Links provided to both local and arterial road network. As above. Indicative site layout includes footpaths connecting with local road network. As above plus connections to existing shared paths included. Internal road layout allows for emergency vehicle access to all properties.</p> <p>Provision for footpaths on local and collector roads. Traffic volumes will be such that cyclists can safely share the carriageway with vehicles. Pedestrians are provided for on footpaths or shared paths.</p> <p>Noted. Noted. Noted. Noted.</p> <p>Lighting will be able to be provided to the required standard.</p>

District Plan Provision	Comment on Alignment
<p>3. <i>When land is subdivided that the resultant lots contain safe and adequate building sites and have roading and access suitable for activities.</i></p>	<p>Resilience is achieved with both the two connection points to the external road network and the layout of the internal road network which provides route choice options for accessing individual properties if needed.</p>
<p>Residential Zone Objective 1</p> <p>To enable the sustainable use and development of the Residential Zone to provide for the City's current and future housing needs.</p> <p>Policies</p> <p>1.3 <i>To promote the efficient use of the urban infrastructure and other physical resources.</i></p> <p>1.4 <i>To ensure network infrastructure and services are available to support residential development and intensification.</i></p>	<p>Efficient road connections to existing road network achieved.</p> <p>As above.</p>
<p>Land Transport Objective 1</p> <p>The City's land transport networks are maintained and developed to ensure that people and goods move safely and efficiently through and within the City.</p> <p>Policies</p> <p>1.1 <i>Identify and apply the roading hierarchy to ensure the function of each road in the City is recognised and protected in the management of land use, development and the subdivision of land.</i></p> <p>1.2 <i>All roads in the City have function and design characteristics consistent with their place in the roading hierarchy.</i></p> <p>1.3 <i>Maintain and upgrade the existing roads in the City and provide for new roads to meet the current and future needs of the City.</i></p> <p>1.4 <i>The road network stormwater control system shall protect the road, road users and adjoining land from the adverse effects of water from roads and minimise any adverse effect on the environment.</i></p> <p>1.5 <i>Require all new public roads, private roads, accessways and privateways to be designed and constructed to meet performance standards relating to the safety and efficiency of vehicle movement, and to ensure the safe use of the road transport network for all users, particularly in respect of:</i></p> <ul style="list-style-type: none"> a) <i>Road width and alignment which should be sufficient for two vehicle lanes except where traffic volumes are insufficient;</i> b) <i>The formation and surface sealing of all roads, accessways and privateways to standards appropriate to the volume of traffic expected to be carried;</i> c) <i>Provision for necessary network utility facilities within roads; and</i> d) <i>Safe design and construction of roads, road access points and intersections, including alignment, gradient, vehicle parking, manoeuvring and turning requirements.</i> <p>1.6 <i>Encourage the development of safe and accessible pedestrian paths and cycleways, as well as convenient and accessible cycle parking, to support the opportunity for people to use active and non-vehicular modes of transport throughout the City.</i></p>	<p>The internal road network includes local roads and a collector road. The development traffic is primarily directed towards Benmore Avenue which has a collector function.</p> <p>As above.</p> <p>Apart from the new roundabout at the intersection of Benmore Avenue and Meadowbrook Drive and construction of the connection to SH3 no other changes are needed to the existing road network.</p> <p>Noted.</p> <p>Allowed for in road cross-sections.</p> <p>Readily achievable.</p> <p>Anticipated.</p> <p>As shown in the indicative site layout a safe design for the internal roading and access arrangements is expected.</p> <p>Extensive shared path network included within the site with connections to the existing shared path along the Mangaone</p>

District Plan Provision	Comment on Alignment
<p>1.7 To support and encourage the provision of public transport and its use throughout the City as an integral part of the transportation system.</p> <p>1.8 Convenient, safe and accessible car parking, loading and manoeuvring facilities are available for residents, staff, visitors and customers for all activities without creating congestion or conflicts with moving vehicles, pedestrians or cyclists on adjacent roads.</p>	<p>Stream and footpaths along Benmore Avenue.</p> <p>The site is within walking distance of the existing bus route along Benmore Avenue.</p> <p>Anticipated that private on-site and kerbside parking will be available. Rubbish collection trucks will be able to efficiently circulate through the internal road layout.</p>
<p>Land Transport Objective 2</p> <p>The land transport network is safe, convenient and efficient while avoiding, remedying or mitigating adverse effects in a way that maintains the health and safety of people and communities, and the amenity values and character of the City's environment.</p> <p>Policies</p> <p>2.1 Restrict the through movement of traffic where the movement has adverse visual, noise and safety effects on the adjoining areas by using the road hierarchy to direct higher volume and heavy traffic movements on identified arterial routes and discouraging this traffic from other areas, such as residential areas.</p> <p>2.2 Avoid, remedy or mitigate the impact of roads and parking areas on visual amenity values of the community by requiring the provision of landscaping.</p> <p>2.4 Avoid adverse effects on amenity and character by ensuring that new roads are well designed and visually complement the character of the surrounding area.</p>	<p>The restriction of turns at the SH3 connection will help with ensuring that only local traffic from the subdivision use this connection. Other measures can be included in the detailed design at resource consent stage to deter through traffic travelling through the subdivision.</p> <p>Addressed in the urban design assessment.</p> <p>Addressed in the urban design assessment.</p>
<p>Land Transport Objective 3</p> <p>The safety and efficiency of the land transport network is protected from the adverse effects of land use, development and subdivision activities.</p> <p>Policies</p> <p>3.1 Avoid, remedy or mitigate the adverse effects of increased traffic or changes in traffic type, which would compromise the safe and efficient operation of any road, or the safe and convenient movement of pedestrians and cyclists on roads.</p> <p>3.2 Require vehicle crossing places and vehicle entrances from public roads to be located, constructed, and maintained to standards appropriate to the expected traffic volume, pedestrian movement and speed environment of each road.</p> <p>3.3 Ensure that buildings and activities do not compromise the necessary clear sight lines for trains and road vehicles at level rail crossings, or of vehicles at road intersections.</p> <p>3.4 Ensure adequate on-site parking and manoeuvring space is provided for each type of activity in a safe and visually attractive manner.</p> <p>3.5 Ensure that buildings and activities make provision for adequate and safe on-site loading.</p>	<p>This assessment has shown that the existing road network will continue to operate safely and efficiently.</p> <p>Detail to be included at resource consent stage.</p> <p>Road cross-sections and building setbacks will allow for satisfactory sight lines at internal intersections. This will be demonstrated at resource consent stage.</p> <p>Detail to be included at resource consent stage.</p> <p>Loading provisions for the commercial area will need to be considered at the resource consent stage. The internal road layout is</p>

District Plan Provision	Comment on Alignment
	such that rubbish collection trucks will be able to efficiently circulate through the site.

As such the proposed plan change and the residential activity that it would facilitate are well aligned with the transport related objectives and policies of the District Plan.

5. Summary and Conclusion

The findings and recommendations of this assessment can be summarised as follows:

- a four arm roundabout at the intersection of Benmore Avenue and Meadowbrook Drive can be expected to perform well;
- the design of the internal collector road will need to deter use by through traffic from outside the development;
- the connection with SH3 should be left in and left out only and located to ensure safe intersection sight distances are achieved; and
- the demands for left turns into and out of the site from SH3 is not expected to exceed 30vph for either movement.

As such, primary access to the site is expected to be able to be accommodated to/from Benmore Avenue via a new roundabout arrangement with Meadowbrook Drive. A secondary access to SH3 Rangitikei Line usefully provides an alternative access point to the road network and provided that the internal roading is designed to avoid through traffic will be lightly trafficked.

In conclusion, the site can be rezoned to Residential Zone and developed for residential purposes with the development meeting the transportation related objectives and policies of the District Plan.

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

Yours faithfully



Harriet Fraser