

Proposed Gore District Plan - McNabb Management Submission

Transportation Review

Prepared for	Gore District Council
Project Number	GODC-J002
Revision	A
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Reviewed by	Dave Smith, Technical Director - Transportation Planning

1. Background

Gore District Council (GDC) is going through a process to replace its District Plan. The Gore Proposed District Plan (PDP) was notified in August 2023, and submissions and further submissions periods have closed. Hearings started mid-2024 and are ongoing.

As part of the development of the PDP, GDC initially considered four areas for industrial zoning, and the land at 10 McKinnon Road (the Site) was one of these. Following initial planning assessments undertaken by GDC the Site was excluded from the PDP. It is understood that this was primarily due to cultural and transportation concerns. Between that and the time of the PDP notification, the landowner asked GDC to reconsider their decision to exclude the Site however due to time constraints GDC advised the landowner (McNab Management Ltd (MML) that this would need to be addressed through the submissions process.

The notified zoning is a mix of General Rural and Rural Lifestyle, see Figure 1.1.

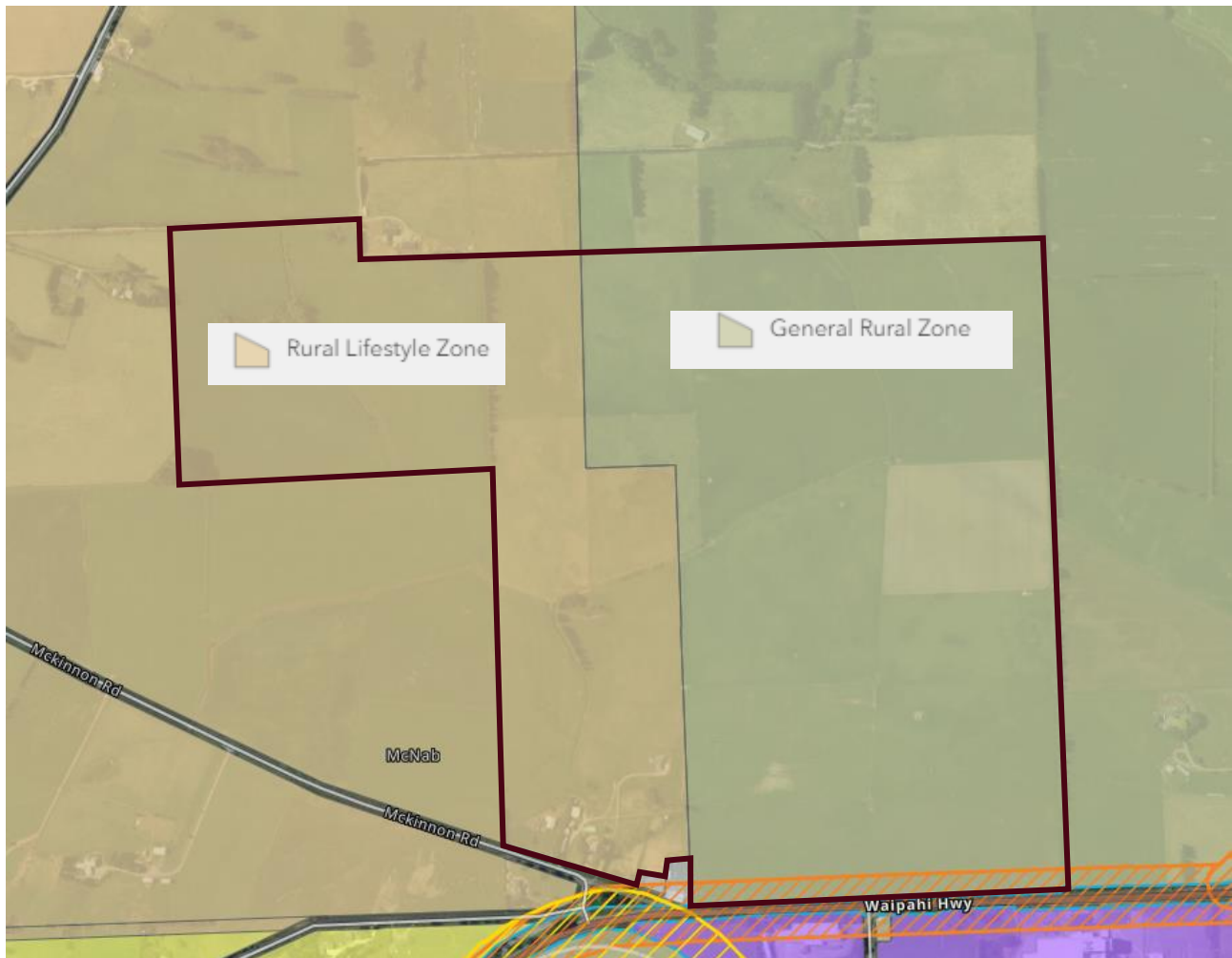


Figure 1.1 PDP Zoning of 10 McKinnon Road

The submission from MML in relation to the Site seeks a different zoning structure on the land from what was notified, generally as follows (and refer to Figure 1.2):

- 10ha of Light Industrial Zoned land (Deferred)
- 36.1ha of General Rural Zoning with Rural Industry Precinct Overlay, 2.1ha of which is understood to be currently operating as a transport yard and located in the southwestern corner of the site.
- 2ha of Maori Special Purpose Zone
- 7.6ha of Mahinga kai Special Purpose Zone
- 43.4ha of Rural Lifestyle Zone

It shows a “future primary site access” directly from Waipahi Highway (State Highway 1 (SH1)) directly opposite Ballast Road.

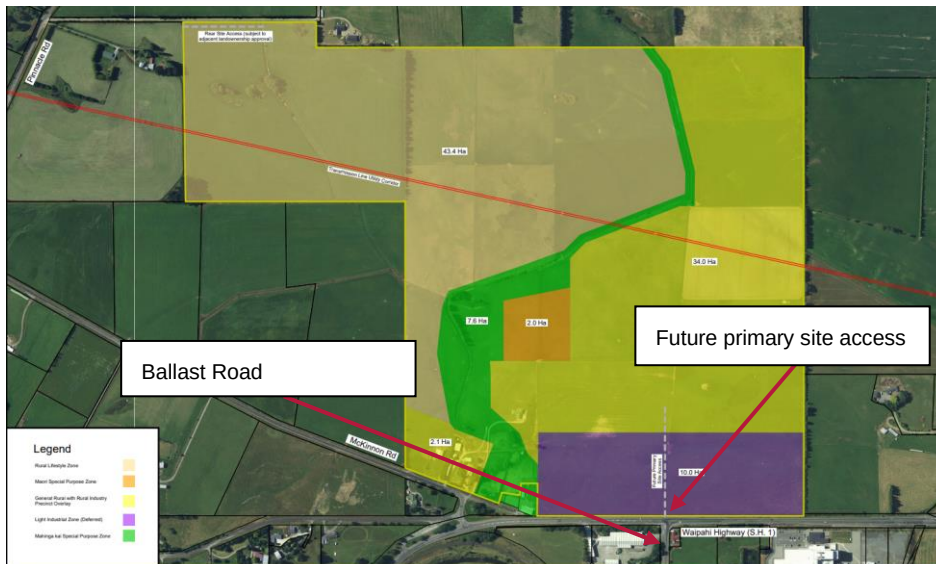


Figure 1.2 MML submission zoning

NZTA subsequently lodged a further submission which seeks that the MML submission be rejected. Their concerns with the submission are (in summary)

- The proposed amendments and additional provisions sought by MML do not give NZTA sufficient certainty about the expected traffic generation that will arise as the Rural Industry Precinct and deferred Light Industrial Zoning develops.
- As a result, NZTA lacks certainty around what upgrades to the local road / SH1 intersection might be required, and when.
- NZTA requested an Integrated Transport Assessment (ITA) report to assess the traffic effects of the proposed precinct, and when the highway intersection would need to be upgraded.
- As part of ITA report, NZTA requested provisions in the PDP to manage the intersection upgrades in a timely manner and to an acceptable standard and funded by the developer(s) of the Precinct.
- NZTA recommended that MML work with them and GDC to achieve an acceptable transportation solution.

The submitter has since lodged expert planning and transportation evidence which seeks a different zoning structure from that shown in their submission, generally as follows (and refer Figure 1.3):

- 52.7Ha of Rural Lifestyle Zone
- 44.8Ha of Light Industrial Zone (McNab Precinct) to be provided in two parts including 2Ha adjacent to McKinnon Road (currently operating as a transport yard) and a 42.8Ha portion located adjacent to SH1.
- 2ha of Māori Special Purpose Zone

It shows a new primary site access extending from McKinnon Road some 60m north of the McKinnon Road / SH1 intersection.

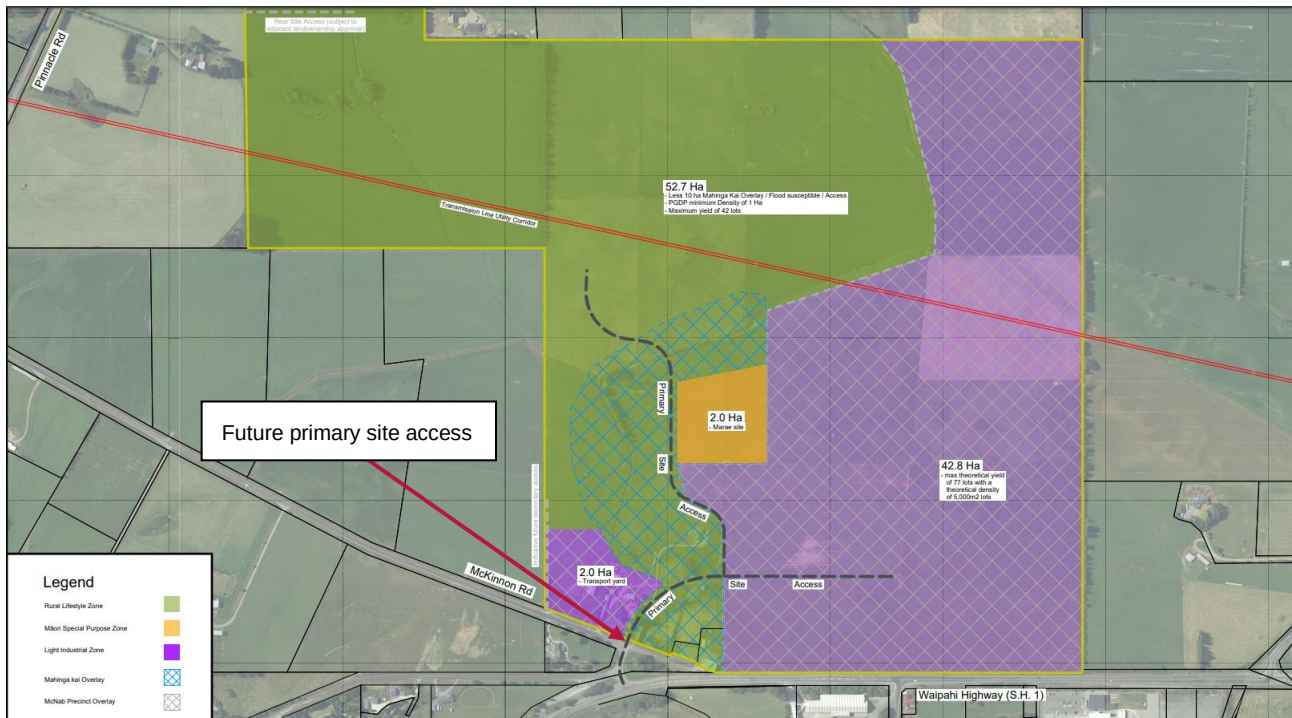


Figure 1.3 Submitter evidence zoning structure

Transportation evidence for the submitter has been prepared by Mr Jason Bartlett of Bartlett Consulting, based on the zoning configuration shown in Figure 1.3.

Abley Ltd (Abley) have been commissioned by GDC to provide transportation advice on the MML submission. Taking into account the evidence of Mr Bartlett on behalf of the submitter (where applicable), this technical note considers:

- The existing transport network
- The transport related effects arising from the Light Industrial Zoning generally, as per the original MML submission (Figure 1.2).
- Access onto SH1 from the original MML submission (Figure 1.2) and the revised plan submitted as part of MML evidence (Figure 1.3).
- Whether trigger points are required to manage intersection upgrades.
- Whether the mitigation proposed by the submitter is sufficient to manage transportation effects.
- A general peer review of the transportation evidence prepared by Mr Bartlett on behalf of the submitter.

2. Existing Site Description & Locality

The site has located approximately 5km north-east of Gore and a 6-minute drive along State Highway 1 (SH1). It is currently accessed from McKinnon Road. The Matura Valley Milk Factory is located opposite the site on the southern side of SH1. The SH90 / SH1 intersection is located approximately 1km east of the McKinnon Road SH1 intersection. Clinton is the next largest town approximately 38km to the east of the site or a 27-minute drive. The current use of the land is generally pastoral but also includes a Marae, a transport yard and a dwelling.

3. Transport Network

The existing transport network is well described in Mr Bartlett's evidence and we consider the description to be accurate. For completeness we note that the site has frontage to SH1 and McKinnon Road. SH1 provides the most direct form of access from the site to Gore, refer to Figure 3.1.

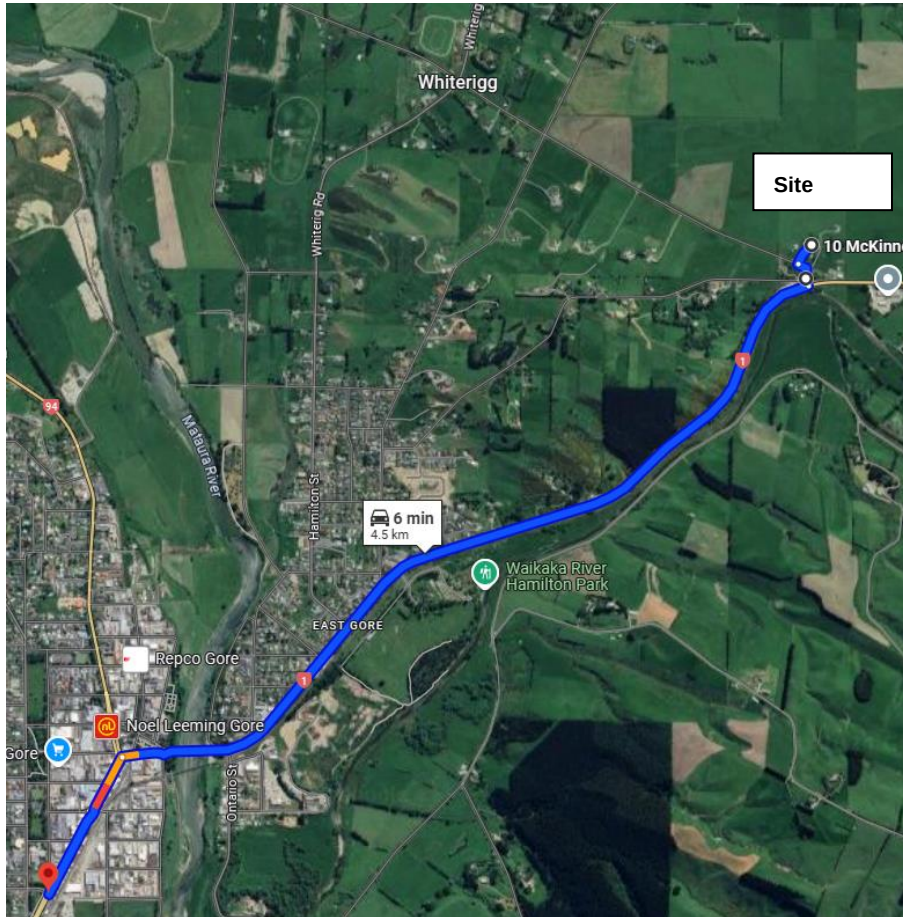


Figure 3.1 Route between the Site and Gore (via SH1). (Source: Google Maps).

However Talbot Street provides an alternative route into East Gore as well as Gore itself via Wentworth Street / SH1, refer to Figure 3.2. The Wentworth Street / SH1 intersection is within a 70km/h speed environment whereas the McKinnon Road / SH1 intersection is within a 100km/h environment, so the former is likely to be an easier way of turning right onto SH1.

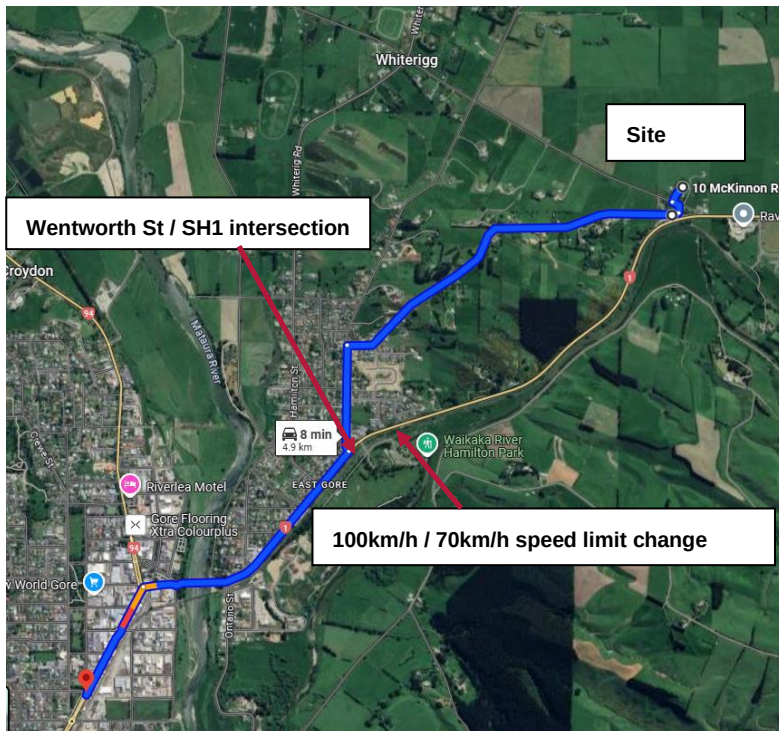


Figure 3.2 Route between the Site and Gore (via Talbot Street/Wentworth Street/SH1). (Source: Google Maps).

Talbot Street is a relatively constrained road that has a sealed carriageway of 5.8m-6.0m wide with no shoulders, undulating vertical geometry and somewhat tortuous horizontal geometry.

There are other routes available that allow drivers to avoid Talbot Street, including McKinnon Road and the Wentworth Street or Whiterigg Road. It is unlikely that drivers would seek to use Whiterigg Road but Wentworth Street is considered a viable option if wanting to avoid the McKinnon Road / SH1 intersection and Talbot Road, refer Figure 3.3.

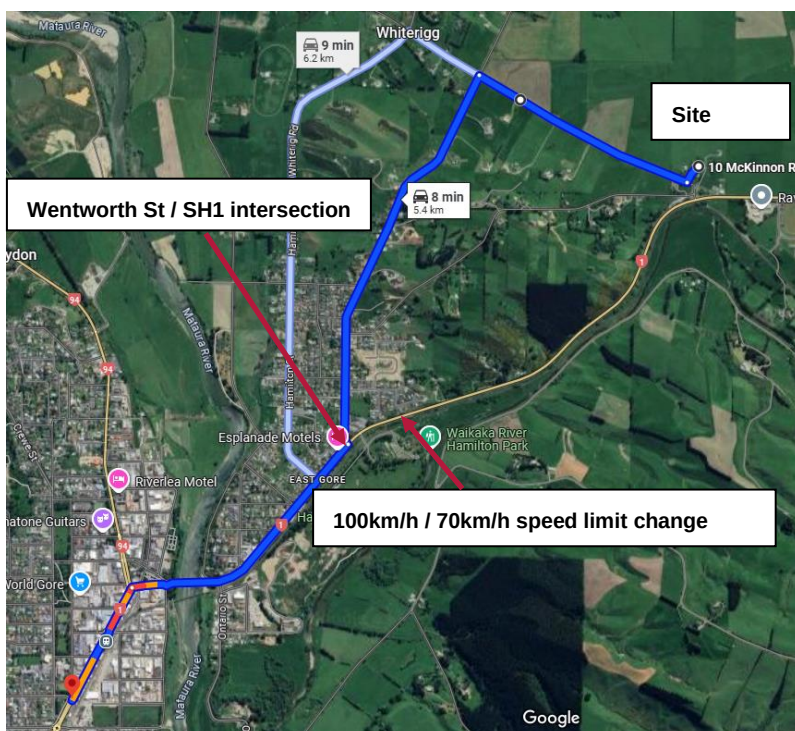


Figure 3.3 Route between the Site and Gore (via Wentworth Street/SH1 & Whiterigg Road / SH1). (Source: Google Maps).

4. MML Submission Transport Effects

We have been asked to consider the transport effects of the submission plan (Figure 1.2). The effects of the evidence plan in Figure 1.3 have not been considered in detail as we have been advised by Ms Woodbridge that this plan is outside of the scope of the original MML submission.

4.1 Intersection Location

In the first instance, we note that the submission plan shows a new intersection from SH1, directly opposite Ballast Road which currently serves the Mataura Valley Milk Factory. We consider that an intersection in this location cannot be supported from a transport perspective because:

- The sight distance to the east is short of the minimums required in Austroads due to a crest in SH1, and
- Introducing a fourth leg to the intersection would create an additional conflict point where there is already expected to be a notable amount of turning activity and by heavy vehicles.

We consider that a new leg in this location would need to be accompanied by a speed limit reduction (maximum of 80k/h) and installation of a new roundabout. We have therefore focussed our assessment assuming that access to the Site is obtained from McKinnon Road instead as proposed in Mr Bartlett's evidence.

4.2 Traffic Generation

The submitter has estimated traffic generation using NZTA Research Report 453 (RR453) for the Rural Lifestyle component and Trips Database Bureau (TDB) for the Light Industrial component. Both average and 85th percentile rates have been used.

Rural Lifestyle

The rates used for the Rural Lifestyle component are 1.1-1.4 trips per dwelling per peak hour which we consider to be conservatively high and would suggest instead that 0.85-0.9 trips per dwelling per peak hour would be more representative in this context given the distance from key amenities and associated likelihood of trip chaining. Given the relatively low number of dwellings (42) we consider the higher trip rate adopted by Mr Bartlett does not have a significant impact on traffic generation but does represent a worst-case scenario for the Rural Lifestyle component.

Light Industrial

The submitter expects that the Light Industrial area would be developed to accommodate transport yards, agricultural equipment sales and servicing and transport servicing and other similar activities.

The rate used for the Light Industrial component of 0.23vph/100m²-0.35vph/100m² (or 23-35vph/Ha) is considered to be an appropriate range in alignment with typical light industry trip rates.

4.3 McKinnon Road / SH1 intersection

Intersection Safety (Warrant Assessment)

The submitter has undertaken an Austroads left turn warrant assessment of the intersection to determine whether the current configuration is suitable to accommodate the projected number of turning movements with development¹.

The key findings from their assessment are (noting that this relates to the larger scale of development in Mr Bartlett's evidence):

- The existing configuration and turning treatments are considered suitable based on current flows and turning movements. We agree with this.

¹ Note that the submitter has assessed a much larger scale of Light Industrial Development, but we have been advised due to scope issues to only consider the impacts of the submission plan.

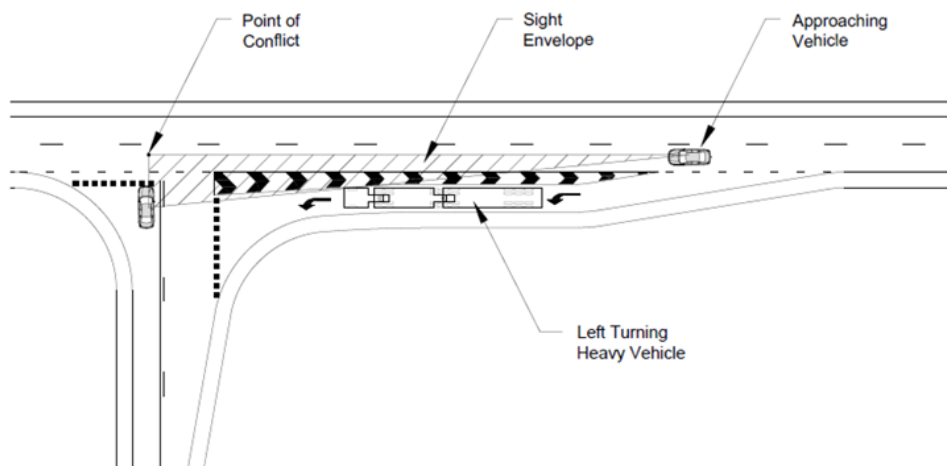
- The existing configuration remains suitable to accommodate the short-term development (which includes the 2ha Māori Special Purpose Zone / Marae and small 2ha pocket of Light Industrial Development for a transport yard in the southwest corner of the Site), which again we agree with. We note that the assessment assumes there would be no new traffic generation from the Marae since it is existing and will therefore not generate any new traffic. We consider that the Marae is unlikely to have a significant impact since its peak times will likely not coincide with network peak hours.
- When the Rural Lifestyle lots are added, if 85th percentile rates are used or if background traffic on SH1 increases significantly, a channelised left turn treatment (CHL) is likely to be required on the SH1 western approach).
- Development of the remaining Light Industrial area (42.8Ha) will warrant the upgrade of the intersection to include a CHL on the SH1. Mr Bartlett considers that 35.8 Ha of this area is developable for industrial activities, and establishes that in terms of timing the upgrade is required when approximately 20% of the Site is developed. We agree with this assessment and note that this corresponds to approximately 7.2 Ha of industrial activity (in addition to the 2 Ha transport yard), which is less than the 10Ha proposed in the original submission. This means that the amount of development proposed as part of the original submission requires the intersection to be upgraded to include a CHL, based on the conclusions of Mr Bartlett's assessment.

In terms of the upgrades specifically we agree with the Mr Bartlett's SH1/McKinnon Road warrants assessment in that a channelised left turn lane is required to support the development, and consider that this will need to occur prior to any development of the 10Ha Light Industrial site. We emphasise that the upgrade will need to include an offset from the through lane to preserve visibility, see Austroads Guide to Road Design Part 4A.

We further note that Mr Bartlett's warrant assessment in Annexure B indicates that a full-length right turn lane (CHR) on the SH1 eastern approach is required. This is identified in the diagram in Annexure B but we note it is not discussed in the body of the evidence. We recommend that the submitter assesses the existing right turn bay and confirm it is in accordance with the CHR treatment as opposed to the CHR(s) treatment.

We further recommend that the CHL treatment be designed in accordance with the Austroads Guide to Road Design part 4A figure 8.6 which is shown here in Figure 4.1.

Figure 8.6: Offset rural CHL treatment



Notes:

- The left-turn channelisation should comply with the layouts for CHL treatments at Section 8.2.4.
- The offset from the adjacent through lane is determined based on the provision of MGSD as per Section 3.2.3.
- Provision of cycle lanes through the intersection should be as per Section 8.2.7. The cycle lane width can be included within the calculated offset and may negate the need for any further offset.

Figure 4.1 CHL with offset as per Austroads

Intersection Capacity

We have reviewed the submitter's transport modelling at the SH1 / McKinnon Road intersection and in addition have undertaken our own modelling analysis to test the impact of 10ha of Light Industrial Zone (per the submission). We have assumed 10ha of light industrial and rural lifestyle (assumed 42 lots). The Marae has been excluded from development traffic as per the submitter's evidence because it is existing, but in any event we would not expect this to have a big impact on the results since its peak times are unlikely to coincide with peak network times. We have also assumed no traffic is generated by the 36.1Ha of General Rural Zone with Rural Industry Precinct Overlay. Typically rural-zones areas would have very low trip generation rates.

Based on this scenario our modelling shows that the intersection would continue to operate at Level of Service (LOS) A which is the best possible level of service in terms of delay times. Delays are in the order of 10 seconds and queues generally don't exceed one vehicle. We have also done a sensitivity test by increasing the SH1 through traffic by 20% on current flows (to account for up to 10 years of future background growth at 2% per annum) and have conservatively assumed that drivers wait for larger gaps in the traffic (due to the higher speed environment). Under that scenario delays are in the order of 20 seconds for the right turn out of McKinnon Road which is equivalent to LOS C which in our view is appropriate and can be supported in this environment. The outputs of the two modelling scenarios are included in Figure 4.2 and Figure 4.3.

On that basis we consider that the impacts of 10Ha of light industrial development on the State Highway 1 / McKinnon Road intersection can be supported subject to intersection upgrades as proposed by the submitter with the addition of confirming the right turn lane is in accordance with CHR requirements as opposed to CHR(s).

MOVEMENT SUMMARY

▼ Site: 101 [SH1 McKinnon no Median Exit 10Ha (Site Folder: Updated Demands)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH1 Clinton														
5	T1	137	13.0	144	13.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	90.0
6	R2	42	10.0	44	10.0	0.034	8.5	LOS A	0.1	1.1	0.38	0.63	0.38	54.8
Approach		179	12.3	188	12.3	0.081	2.0	NA	0.1	1.1	0.09	0.15	0.09	78.2
North: McKinnon Rd														
7	L2	83	10.0	87	10.0	0.073	5.7	LOS A	0.3	2.2	0.36	0.57	0.36	52.4
9	R2	113	10.0	119	10.0	0.201	9.1	LOS A	0.8	6.0	0.57	0.79	0.57	50.1
Approach		196	10.0	206	10.0	0.201	7.7	LOS A	0.8	6.0	0.49	0.70	0.49	51.1
West: SH1 Gore														
10	L2	59	10.0	62	10.0	0.057	8.3	LOS A	0.2	1.6	0.13	0.59	0.13	56.3
11	T1	254	13.0	267	13.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	89.9
Approach		313	12.4	329	12.4	0.149	1.6	LOS A	0.2	1.6	0.03	0.11	0.03	80.8
All Vehicles		688	11.7	724	11.7	0.201	3.4	NA	0.8	6.0	0.17	0.29	0.17	68.8

Figure 4.2 SH1 / McKinnon intersection modelling with 10 Ha

MOVEMENT SUMMARY

▽ Site: 101 [SH1 McKinnon no Median Exit 10Ha SH20%growth (Site Folder: Updated Demands no TWSC)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH1 Clinton														
5	T1	165	13.0	174	13.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	89.9
6	R2	42	10.0	44	10.0	0.047	9.2	LOS A	0.2	1.4	0.42	0.67	0.42	54.6
Approach		207	12.4	218	12.4	0.097	1.9	NA	0.2	1.4	0.08	0.14	0.08	79.5
North: McKinnon Rd														
7	L2	83	10.0	87	10.0	0.115	6.9	LOS A	0.4	3.2	0.44	0.65	0.44	51.9
9	R2	113	10.0	119	10.0	0.399	19.0	LOS C	1.9	14.3	0.76	0.98	1.02	44.1
Approach		196	10.0	206	10.0	0.399	13.9	LOS B	1.9	14.3	0.62	0.84	0.77	47.1
West: SH1 Gore														
10	L2	59	10.0	62	10.0	0.057	8.3	LOS A	0.2	1.6	0.13	0.59	0.13	56.3
11	T1	305	13.0	321	13.0	0.179	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	89.9
Approach		364	12.5	383	12.5	0.179	1.4	LOS A	0.2	1.6	0.02	0.10	0.02	81.9
All Vehicles		767	11.8	807	11.8	0.399	4.7	NA	1.9	14.3	0.19	0.30	0.23	68.4

Figure 4.3 SH1 / McKinnon intersection modelling with 10 Ha + SH Growth + Higher Gap Acceptance

4.4 Trigger Points

In the context of the original submission which proposes 10 Ha of industrial development, we do not consider that trigger points are required for the SH1 / MacKinnon upgrades and the upgrade should be implemented prior to any development on the 10 Ha site.

Should a greater level of development beyond 10 Ha be considered then additional upgrades may be required to safely accommodate the higher traffic generation.

4.5 Proposed Mitigation

The current intersection configuration of McKinnon Road / Talbot Street and the site access is problematic due to the minimal spacing between the intersections. This is of particular concern for vehicles turning left into McKinnon Road from SH1 (blue arrow below) as there is limited space for a driver to react to a vehicle that is turning right into or out of Talbot Street (red arrows below) - refer to Figure 4.4.

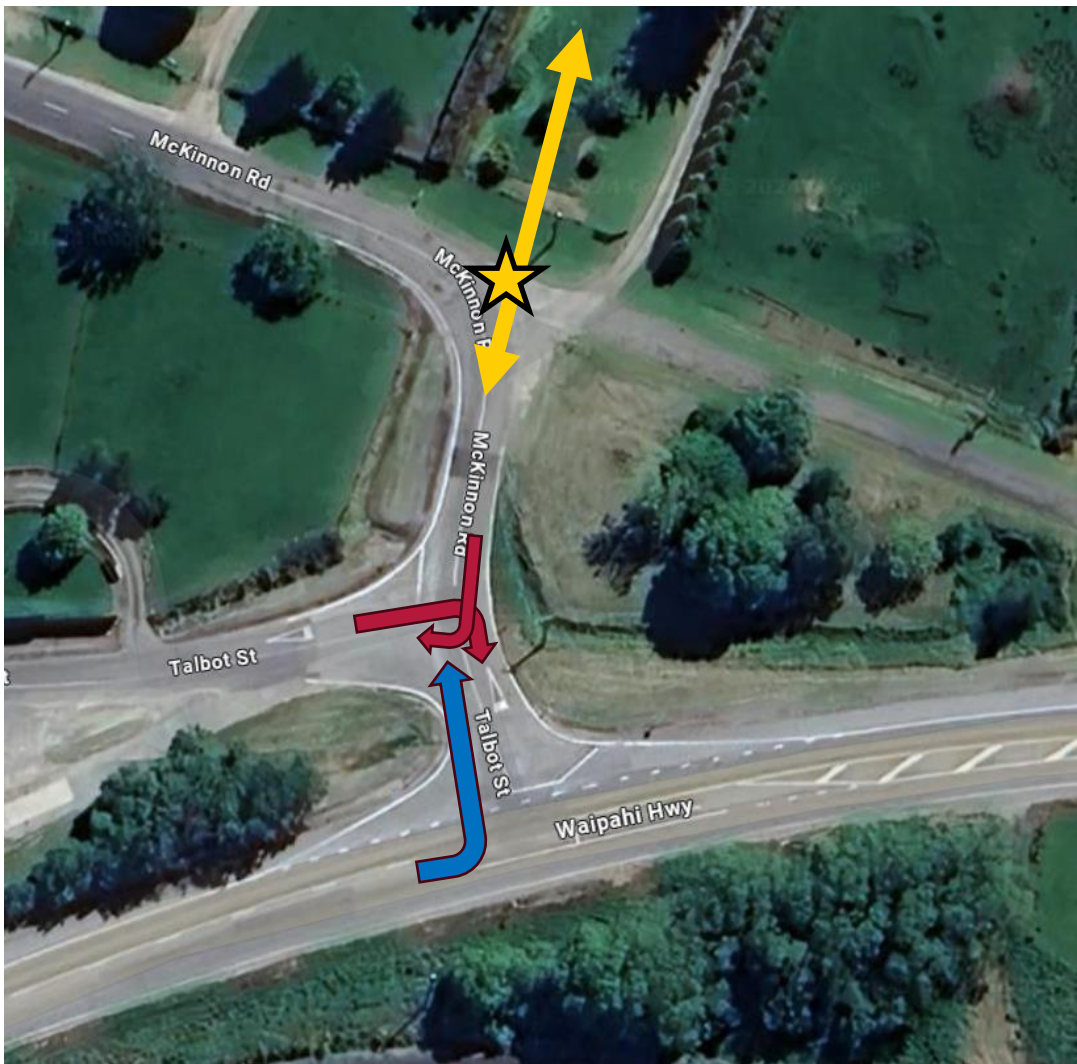


Figure 4.4 Turning conflict (red and blue arrows) and rezoning land access (yellow star and arrow)

We consider the risk of this could be mitigated to some extent as part of the intersection design (such as ensuring the radii of any new left turn bay is sufficiently small to reduce the speed of left turning vehicles), but we recommend that the submitter provides an assessment of this issue.

Moreover, given the relatively low traffic flows currently on McKinnon Road it is likely that should the site be rezoned, the dominant flow with development will be into and out of the new site access. We therefore recommend that should a new intersection be formed at the elbow in McKinnon Road (at the location of the yellow star in Figure 4.4), priority should be given to traffic entering and exiting the development as shown by the yellow arrow in Figure 4.4, with traffic from the existing northwestern approach on McKinnon Road being give way or stop controlled. This would also provide for better sight distances at the new intersection, and at the MacKinnon / Talbot intersection.

4.6 Gap Analysis of Submitter's Transport Assessment

Safe Intersection Sight Distance (SISD)

The Transport Assessment did not review the sight distances at the McKinnon Road / SH1 intersection. Based on a speed environment of 90km/h on SH1 and assuming a reaction time of 2.0s a SISD of 214m is required. This is achieved to the east (refer Figure 4.5) but to the west the sight line passes outside of the road corridor but remains on the inside of the Main South Rail line (refer Figure 4.6). Therefore, the required sight distance is available but due to the horizontal curve it passes through private land. In some cases this would be considered a risk given that land is not in the control of the Road Controlling Authority and could therefore be built out in the future. In this case the risk is low because of the Main South Line.

We also note from the crash analysis that there have been no crashes recorded that could be attributed to a shortfall in sight distance, but given the increase in traffic flows through the intersection we consider it important to ensure that the Road Controlling Authority (NZTA) reviews how the sight line could be protected in perpetuity (such as by monitoring growth of and cutting back any vegetation as part of their maintenance programme).



Figure 4.5 Sight line to the east

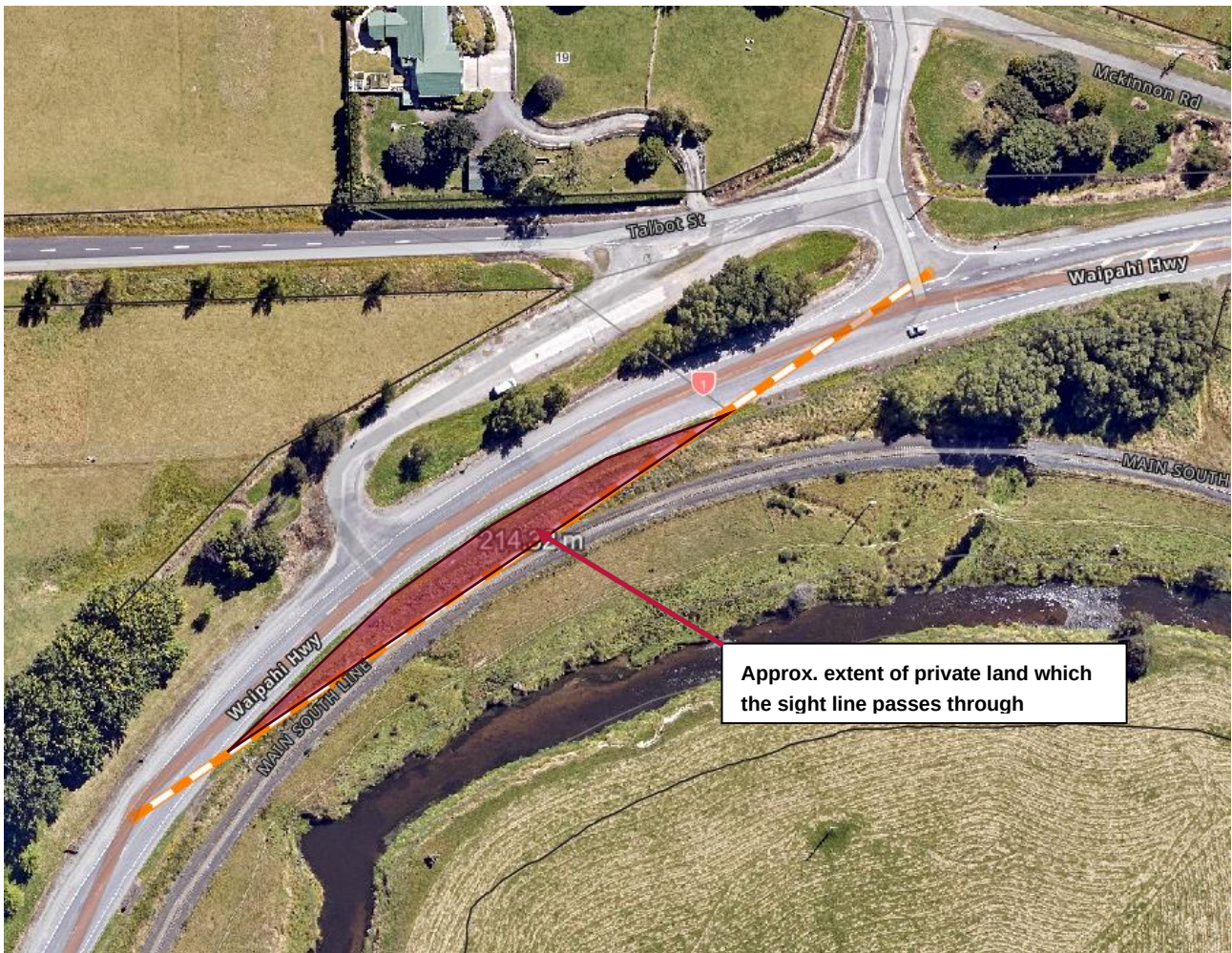


Figure 4.6 Sightline to the west

Use of Talbot Street / Wentworth Street

There has been no assessment of the use of alternative routes between the site and Gore, namely via Talbot Street and Wentworth Street (refer Figure 3.2 & Figure 3.3.)

If drivers want to avoid turning onto SH1 from McKinnon Road it is plausible they may use Talbot Street or Wentworth Street. As noted earlier Talbot Street is relatively constrained in width and alignment and is not conducive to high traffic flows. The ADT of Talbot Street indicates that it is operating as a Collector Road per the Gore Subdivision and Development Bylaw but it is not constructed to that standard.

If drivers want to avoid Talbot Street due to these constraints and want to avoid turning onto SH1 at McKinnon Road due to the high-speed environment, an alternative route would be to use McKinnon Road and then turn left onto Wentworth Street. Although Talbot Street and Wentworth Street are slightly longer and less direct than the SH1 route, they could be attractive alternative routes into Gore if delays and queues at the McKinnon Road / SH1 intersection increase. We note that the traffic impacts of additional use of Talbot Street and Wentworth Street have not been assessed by Mr Bartlett but recommend this be given further consideration.

Pedestrian / Cycle Access

We note there has been no consideration of pedestrian / cycle access and we consider the site is within a comfortable cycling distance of much of Gore. However, we consider that SH1 and Talbot Street are not conducive to walking or cycling in their current configurations. TRANS-P6 in the PDP seeks to *encourage modes of transport that provide lower emissions options, such as public transport or vehicles that uses renewable energy sources, and provide for active transport modes, such as cycling and walking, that encourages a reduced reliance on motorised vehicles, by requiring associated land infrastructure to be planned and provided for in the design of the transport network.* Even though the distance of the site from the main urban centre is such that cycling would be plausible, there is no dedicated infrastructure in place to support cycling either on SH1, Talbot or Wentworth Streets. This is likely to deter people from choosing to cycle to the site, and suggest it would be appropriate for the submitter to review options to support a safe cycling environment. However we are cognisant that in this rural service town context that cycling is unlikely to be a popular mode of transport choice and in that regard we do not consider the lack of provision for cycling to be a significant issue.

5. Conclusion

We have reviewed the transport assessment presented in evidence by Mr Bartlett for a rezoning proposal at 10 McKinnon Road. We have focused on the likely transport impacts of 10 Ha of light industrial activity as per the original MML submission.

We recommend that:

- Access to the wider transport from the rezoning Site be via McKinnon Road and not via Ballast Road / SH1 directly.
- The SH1 / McKinnon intersection should be upgraded to include a channelised left turn lane and confirm the existing right turn lane is in accordance with CHR requirements as opposed to CHR(s) prior to any development on the 10 Ha site.
- Should further development be undertaken on the site beyond the 10 Ha in the original submission, further upgrades may be required.
- The left turn lane from SH1 into McKinnon Road should be designed to substantially reduce the speed of turning vehicles, minimising the potential for conflict with vehicles turning into or out of Talbot Street.
- A potential new intersection at the current elbow in McKinnon Road should give priority to traffic entering and exiting the rezoning site. This improves sight distances and would in our view provide the safest outcome.

- NZTA as the road controlling authority for SH1 should be consulted to ensure their maintenance programme would eliminate the potential for vegetation to obscure the view of vehicles turning into / out of McKinnon Road.
- Additional assessment is required to understand the potential effects on Wentworth Road and Talbot Road.
- Noting that the development is within cycling distance of Gore, any opportunities to provide safer environment for cycling to the site (such as reducing vehicle speeds) would support mode choice. However, we consider that the provision of dedicated cycle facilities between the site and Gore is not required to support the development.

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